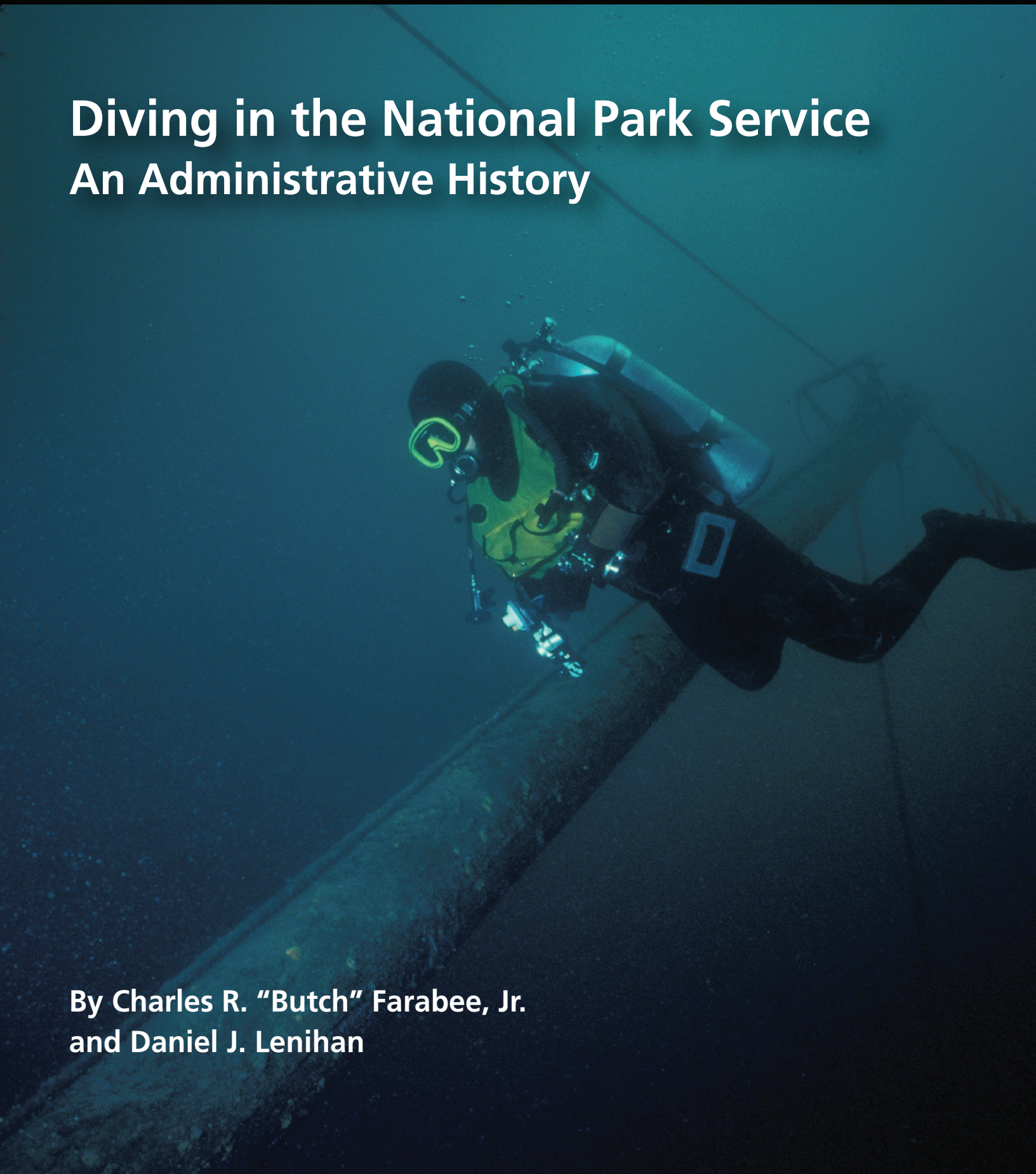
U.S. Department of the Interior
National Park Service

Submerged Resources Center

Diving in the National Park Service
An Administrative History



By Charles R. “Butch” Farabee, Jr.
and Daniel J. Lenihan

Diving in the National Park System

An Administrative History

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and Daniel J. Lenihan

A product of the National Park Service

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EPIGRAPH

"Within moments of Cal and me entering the ice-cold, flood-swollen river, the current had shoved me into a massive log pile: I knew I was in trouble. My head hit first, hard. It hurt but scared me more. I collided with one log, then another, a whirlpool of branches swirled violently around me. Within seconds, I was sucked into a hole in the logjam, folding me in half over a tree. I couldn't move. All I saw was green bubbly water as my death grip on my regulator and mask blocked my vision. Frantic, I knew my time might be ending. Then a sudden, powerful jerk sped me down the log I was pinned against, my tank acting as a skid plate against the slippery bark. Again, my head hit hard, knocking my mask to the side, flooding it. Numbingly cold water hit my face. Desperate to clear my mask, I turned my head. Daylight! Like an elevator, the current shoved me back up. And as quick as it began, it was over. I was free of the terrifying logjam. But where was Cal? Grasping a passing limb, I reached the bank. My regulator no longer worked because of ice. My pressure gauge showed I had been trapped underwater far longer than I thought . . ."

Buffalo National River Park Ranger Rob Arnberger, on a search in the flooded Buffalo River for the pilot of a helicopter crash, December 13, 1977.

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National Park Service

FOREWORD

The natural and cultural resources managed and protected by the National Park Service (NPS) are among the most valued in the country. It's amazing that until just a few decades ago, many of these treasures were unavailable and unseen, submerged by water. Then came scuba diving and a new world was revealed, not only to the NPS, but to a great many people who visited.

During my career with the NPS, scuba was introduced for search and recovery, a new tool to enable the NPS to more effectively manage water-related accidents. It soon became obvious, however, this was a tool that could be used in many other ways. The discovery, study, documentation, preservation, and interpretation of important submerged resources was suddenly a real possibility and something we would quickly take a leadership role in.

Incredible natural, archeological, and historic items and sites were hidden within national parks and related protected areas. The list includes animals and plants in streams, lakes, and oceans, shipwrecks, historic artifacts and structures, fossils, and archeological remains. Maintenance of submerged structures, docks, and buoys and related equipment was improved, and searches, rescues, and recoveries were drastically enhanced.

The NPS was fortunate to establish an early relationship with Scripps Institution of Oceanography, and specifically with the Chief Diving Officer, Jim Stewart. Through his mentoring and unparalleled training over a twenty-five-year association, many NPS divers were given the ability and confidence to better perform their jobs in the parks. I am proud to call him my friend.

This book records the development of the NPS dive program by recounting incidents and experiences of many involved. I can think of no better people to author this book than Dan Lenihan and Butch Farabee. Both are former NPS employees, were deeply involved in the evolution of scuba diving in the NPS and are well acquainted with its history and development.

Butch was a park ranger when I first knew him in the early 1970s, when we both worked in Yosemite National Park. This is where he developed both his mountain rescue and scuba diving skills. Since retirement, though, he has proven his expertise in researching and recording significant park incidents and events in an interesting and informative manner. Butch is an author or co-author of several books, most related to these accidents and the resulting search and rescue operations.

I first met Dan when he was involved in documenting, studying, and sometimes recovering the numerous archeological remains being buried by the waters of the newly constructed Glen Canyon Dam in Arizona. Later we worked together on numerous projects when he was the first Chief of the NPS Submerged Cultural Resources Unit. Dan has authored or co-authored several books related to diving as well as a number of other interesting books.

Just during my time in the NPS, the underwater program, its effectiveness and significance, has developed and improved tremendously. I remember tentatively using the early two-hose regulators back in the 1950s when I was first learning to dive. Now the NPS uses rebreathers, nitrox, GPS mapping, remote controlled submerged vehicles, video and photography, sonar, magnetometers, and computer-generated 3-D imaging. The increased ability for the NPS to handle water-related accidents and to improve its maintenance of water-based structures and equipment is obvious.

The entire culture and attitude of the NPS management has changed to recognize the significance of submerged resources. When reading Isle Royale National Park files, past managers had recommended dynamiting some of the shipwrecks to remove "hazards to navigation." Now these same remains are officially listed in the National Register of Historic Places. All across the country, from the mighty USS *Arizona* in Hawaii, to the vast but delicate coral reefs of Florida and the Virgin Islands, to the endangered, tiny desert pupfish in dry Death Valley, these underwater resources are now well-known, researched, protected, and interpreted, all part of an exciting development in equipment, techniques, and attitude. This book is a much-needed, valuable and interesting documentation of these people, advances, and events.

Jack Morehead

INTRODUCTION

The National Park Service was the first civilian federal agency to formally adopt Self Contained Underwater Breathing Apparatus (SCUBA) as a management tool. As stated by Congress in its 1916 Organic Act: the service's dual mission "…is to conserve the scenery and the natural and historic objects…and to provide for the enjoyment of the same…" The agency manages parks in their entirety: including the many underwater components of those areas. Meeting that obligation made the service a prime candidate for scuba diving: for both the classic ranger role of recovering victims of tragedy and sharing the rich world beneath the water's surface through science and interpretation.

With Crater Lake National Park and Sulphur Springs Reservation (Chickasaw National Recreation Area) being set aside in 1902 and Alaska's Glacier Bay National Monument in 1925, it became apparent that major water bodies encompassed by parks presented unique management challenges. For example, Yellowstone Lake covers more than 125 square miles, almost half the size of Florida's Biscayne National Park.

In the National Park System of 2016, there are 88 ocean and Great Lakes units, across 22 states and four territories, with 11,000 miles of coastline and 2.5 million acres. In 2015, there were 86 million recreational visits in those areas, with an estimated $3.6 billion in economic benefits to their respective regions. An ever-increasing percentage of this activity is related to scuba diving. Included in the park system are 14 National Recreation Areas with diving opportunities, such as Lake Mead, Glen Canyon and Amistad. Numerous other areas also see occasional recreational scuba activity, such as Glacier National Park, Buffalo National River and Delaware Water Gap National Recreation Area. Lastly, there are areas that require at least sporadic NPS-sanctioned diving, such as in Yosemite and Grand Canyon National Parks, and even the isolated, tiny desert reservoir at Arizona's Hubbell Trading Post, a National Historic Site in the middle of the Navajo Reservation.

At the end of WWII, snorkeling and scuba gear became publicly accessible. Soldiers and sailors returned from the South Pacific with a smattering of dive training, experience, and equipment courtesy of Uncle Sam. Books, movies, and even war-oriented comics inspired a number of mostly younger generation park visitors to go underwater, even if only by holding their breath. A few resolute rangers (and soon-to-be rangers) quickly followed suit.

Through the 1950s, a scattered handful of NPS areas, such as Channel Islands, Cabrillo, Lake Mead, Olympic, Isle Royale and even Death Valley (home of Devils Hole) reported scuba activity, and others such as Fort Jefferson, Virgin Islands, and Cape Hatteras were seeing scuba diving by the general public. Interestingly, many of the places in the National Park System that initially received the most attention from divers were inland such as Lake Mead, Amistad, and Glen Canyon National Recreation Areas. In the mid- to late-1950s, a few intrepid NPS personnel also began diving. Although lacking formal certification and training, we know of isolated instances of employees diving as part of their NPS duties at this time, with one effort, a quasi-official fish survey, as early as 1957 in Sequoia National Park.

As scuba diving increased among visitors in the 1960s, rangers weren't the type to merely watch their bubbles. As with other parts of the job, "rangers needed to range." They familiarized themselves with the resources they were there to protect, while helping visitors adjust to a park experience that had expanded to a third dimension. Rather than just playing in the ocean surf or paddling canoes on high-mountain lakes and rivers, they were dropping to the depths. Body recoveries and other underwater emergency assistance attained a new level of complexity. At times, tough calls had to be made regarding the use of non-NPS divers. It took a while to adjust to the new role and responsibility, as illustrated by the tragic death of a 26-year-old volunteer rescue diver, Tom Dumay, in Glacier National Park in 1963.

Partially in reaction to Dumay's death, the internal NPS diving policy was first issued in 1963. In the more than fifty years since that incident, the use of scuba has greatly increased for protection, research, maintenance, interpretation, and cultural and natural resource management. Since the mid-1960s, dive tanks have been added to guns, ropes, and fire packs in ranger caches.

As of 2018, there were approximately 150 NPS personnel diving as part of the NPS Dive Program. In the course of a year they recover drowning victims, conduct biological and archeological surveys, maintain docks and buoys, and monitor the condition of historic shipwrecks sunk in park waters. By 1985, then Southwest regional director Robert Kerr recognized the responsibility of NPS to protect and provide access to the more than 1,000 shipwrecks estimated to be under the agency's jurisdiction at the time. Service archeologists had begun surveying

shipwrecks in the early 1970s, but now important management figures far from the sea were readily acknowledging the agency's obligations.

The sea, rivers, and lakes of the national park system, the nation's most conspicuous underwater areas, were starting to get the attention they needed. The early embrace of diving as a tool to care for submerged parklands was much of the reason. Staff at Channel Islands National Park currently make between 3,000 and 5,000 research dives per year solely to check the 32 sites scattered throughout the park that monitor the health and stability of its world-renowned kelp forest. Rangers have counted endangered pupfish, dived white shark breeding grounds, surveyed WWII ships sunk in nuclear blasts, explored deep submerged caves, felt among the detritus of New York Harbor for weapons used in crimes, and recovered body parts of drug pushers along the Rio Grande. They removed boating obstacles with underwater explosives and Oxy-arc torches. They have made dives in high altitude lakes under ice to look for bodies, drugs, and murder weapons in places where losing the exit hole is tantamount to losing one's life.

NPS divers sometimes carry wire cutters when diving in reservoir recreation areas to free themselves from entanglements with trotlines and barbed wire. They have entered inundated dam structures and ranch houses to recover drowned divers and pulled pilots from submerged helicopters in rushing rivers. Others have tracked lobster migrations at night over coral reefs, excavated the HL *Hunley* (a Civil War submarine), and accompanied French divers on 200-foot deep air-dives to the remains of the CSS *Alabama*, a Confederate raider sunk in the English Channel. NPS divers regularly monitor the oil leaking from the USS *Arizona* in Pearl Harbor. They have participated in saturation diving, mixed gas diving, cave diving, searching submerged planes, helicopters and automobiles for accident victims, used deep-water submersibles, entered deep ship wrecks, and jumped from helicopters in full scuba gear.

For comparison, newer agencies dedicated specifically to ocean research such as The National Oceanic and Atmospheric Administration (NOAA), have a more narrowly defined diving mission. They are more formalized in their approach and usually more restrictive. All federal agencies have their own culture regarding risk management. The NPS is a protection agency with strong ties to law enforcement and a century-long tradition in rescue and recovery. This ranger-oriented culture has suffused the agency, regardless of the any given employee's position description. The service by nature seems less risk averse and more likely to have changes emanate from the field level.

Many professions have traditions, but few are more proudly maintained than that of park ranger: self-reliant, tenacious generalists and risk takers. Many of the most active divers in the NPS program are not classified in the official park ranger series. They are maintenance personnel, biologists and archeologists. Others are with the US Park Police. When they show up to do a job with other agencies they all quickly become referred to as "rangers." This is an agency-wide custom that defines any service employee engaged in diving. And so, for clarity's sake, all will hereafter be referred to as "rangers" in this book, except where the difference is striking or relevant to the event being discussed.

The early 1960s saw Service dive teams become key to the agency's search, rescue, and body recovery capabilities. However, the biggest change in the role of the NPS dive program since its earliest beginnings, is the expansion of its scientific, interpretive, and facility management aspects. Since the late 1960s, research biology and archeology, and in the 1970s, comprehensive maintenance and resource management diving, have rounded out the program. Participants stay active even when visitation is low, conditions are poor and there are no bodies to search for.

Early NPS biological researchers such as Gary Davis, Rich Curry, and Jim Tilmant brought much needed scientific backgrounds and interests into the mix. Their NPS scuba experience allowed several to take part in saturation diving–essentially living underwater. In the Tektite (Virgin Islands) and FLARE (Florida) projects of the late-1960s, NPS aquanauts saturated their tissues with nitrogen at a particular depth and slowly decompressed over days before coming to the surface.

National Park Service archeologists weren't far behind the biologists. George Fischer and Cal Cummings ran underwater research operations at Montezuma Well in 1968. By 1972, Fischer conducted projects at Fort Jefferson National Monument (now Dry Tortugas National Park) and hired Dan Lenihan, a graduate teaching assistant in anthropology at Florida State University, as his assistant. Dan was already a diving instructor. Fischer wanted him to supervise the diving operations for a shipwreck survey at Gulf Islands National Seashore in 1973. Lenihan eventually developed a specialized NPS dive team called the

Submerged Cultural Resources Unit (SCRU) which was renamed in 1999 as the Submerged Resources Center (SRC). It is still alive and well in 2019 in its 44th year of existence. When the service celebrated its Centennial in 2016, SRC's roots were buried almost to the half-way mark of the agency's history.

In the early 2000s, Divers from the SRC and others in the underwater archeology field began using mixed-gas, such as helium and oxygen, to safely dive to depths approaching 300 feet. The SRC, as of 2015, adopted closed-circuit rebreathers exclusively for their personnel. Biologists and protection rangers in some areas, particularly in the Western Region, are likewise evaluating rebreathers.

Service personnel have also used submersibles on several occasions. Aboard these small submarines, divers are kept in a one-atmosphere (essentially a surface) environment. Ranger-biologist Mark Buktenica descended to almost 2,000 feet in a one-man sub at Crater Lake in 1988. Others who have made similar submersible dives are Larry Murphy, Dan Lenihan, Matt Russell, Dave Conlin, Brett Seymour, and Doug Lentz to the resting place of a Japanese midget sub in more than 1,000 feet of water outside Pearl Harbor. Gary Davis rode to 1,200 feet to study white abalone at Channel Islands, and in 2004, Larry Murphy, working in partnership with NOAA, journeyed almost three miles (14,000 feet) down to the RMS *Titanic* in a Russian submersible.

In addition to manned submersibles, several parks have invested in side-scan sonar and remotely operated vehicles (ROV). Essentially a swimming robot, an ROV with video eyes is sent to the depths to work in places either too hazardous for normal scuba operations or in support of divers. They have become an integral part of the agency's tool kit for responding to underwater needs. Pat Horning, park diving officer at Glen Canyon, has been a prime proponent in applying this technology to body recovery efforts and has developed a program that is award-winning and internationally respected. It has been used numerous times in areas of the park system as well as in several neighboring states. ROVs and side-scan sonar were successfully utilized by Olympic National Park ranger Dan Pontbriand, in his intriguing quest to solve the mystery of two people lost in Lake Crescent when their Chevrolet disappeared in 1929.

In October of 1987, staff at Channel Islands, in partnership with NOAA, conducted probably the most comprehensive undercover law enforcement operation on submerged sites in US history. Two rangers from the Western Region, Yvonne Menard and Mark Senning, booked trips with a dive club and charter operator that was known to flagrantly flaunt laws regarding looting of underwater antiquities. The 19 divers and boat operators were cited as a result of their investigation, with resulting fines as high as $100,000.

In our best estimation, the NPS has conducted about 60,000 person-dives. Although much of the national attention for NPS divers comes from big-ticket items such as underwater monitoring of the USS *Arizona,* the heart of the program is still the day-to-day efforts to fix buoys, count fish, monitor resources, and recover bodies. They have recovered the bodies of hundreds of park visitors who have met a tragic end while enjoying their nation's crown jewels. Their recovery brought an element of closure to a much larger number of bereaved survivors.

The decision to use scuba as a management tool is a complicated one. Decisions by superintendents and chief rangers are based on need, available resources and cost comparisons. Besides usually being the most cost-effective approach, park staff prize the first-hand familiarity with submerged resources that in-house diving provides. Some areas of the system have had diving programs continually since the mid-1960s. In others, where the need or cost effectiveness of maintaining staff divers is more questionable, there has been an ebb and flow. The number of parks that keep diving programs has changed little over time but which parks those are is variable.

Diving safety within the service has been heavily stressed, always keeping lockstep with the expertise demanded as use of this tool has matured and grown through the years. Despite calculated exposure to hazardous situations and conditions, particularly in search, rescue, and recovery, the NPS has not lost one of its divers through a diving accident, although there have been a few near misses.

Body recoveries are the original reason the National Park Service became involved with scuba diving. This duty, as well as evidence recovery and related law enforcement responsibilities are major functions of service divers. Most importantly, recovery teams bring closure to grief-stricken relatives while demonstrating symbolic control of all aspects of visitor safety in a park—on land or underwater. Natural resources, archeology, interpretation and facility management would soon follow. But extending the classic ranger role of trauma and death management to submerged park lands was the appropriate place to start.

The first recorded drowning in a national park was in Yellowstone (established in 1872) on August 15,

1883. Crossing the Yellowstone River on horseback, a John H. Fogerty and Thomas A. Parker, ages unknown, both disappeared. Believed to have been murdered by two casual companions, their bodies were soon recovered downstream, their death apparently from drowning, according to Lee Whittlesey's 1995 book, Death in Yellowstone: Accidents and Foolhardiness in the First National Park.

However, 13 years before, Yosemite (not yet a park) experienced its first recorded drowning in June of 1870, when a boy, John Morgan Bennett somehow fell off a mule while crossing the Merced River in Yosemite Valley. Death Valley experienced its first water-related death on a hot summer day in 1906. Morris Titus, a young mining engineer from the East, along with two companions, set forth on a prospecting trip from nearby Rhyolite. Soon needing water, the trio split up and Titus wandered into a narrow, twisting gorge. In Death Valley's Victims, author Daniel Cronkhite writes, "Years later, remains of his rifle stock and several gold coins were found in the rocky part of the canyon, now bearing his name. Historians conclude a violent cloudburst snuffed out the life of the young engineer and carried his heat-ravaged remains into oblivion." Titus Canyon and Titus Cave are named after Morris Titus.

Per the Center for Disease Control and Prevention, during 2005-2014, there was an average of 3,868 persons dying from unintentional drowning, including boating accidents, annually in the United States. That is 1.29 deaths per 100,000 people, which includes boating accidents. And probably no surprise, males are almost four times more likely to die drowning than females.

Drownings, motor vehicle wrecks, and falls have always been the chief causes of accidental deaths in parks. At Glen Canyon National Recreation Area there were 171 accidental deaths between January 1969 and December 1996. There were 128 drownings, accounting for 75 % of the total for that period of time. In June 2000, Glen Canyon divers purchased a new ROV, a Phantom HD2+2. This ROV has been be used quite frequently for locating objects, particularly bodies of people involved in accidents and drownings. It is also used in neighboring states at the request of other agencies.

Lake Mead is even more deadly. Of the 1,441 recorded deaths between 1952 through 2005, 514 were drownings. For Yosemite, between 1852 and 2014, there have been at least 159 recorded drownings, second to motor vehicle accidents; even more than deaths from climbing, hiking and scrambling. And finally, between 1971, when records were first kept, until 2007, there have been 28 drownings in Great Smoky Mountains National Park, again, the second leading cause of traumatic death behind motor vehicle accidents in that park.

Drownings in the national park system run the full gamut of causes including overturned boats and people literally wandering in over their heads. There are shark attacks and scuba diving mishaps. Every year people die, very often young children, because they do not appreciate just how slippery water-polished granite can be or how fast river rapids are. An increasing yet tragically preventable cause is cliff diving, particularly at Glen Canyon National Recreation Area. Far too often, these (mostly) young people do not check out the area being jumped into or understanding their physical limits or mortal frailty when intoxicated.

We do not know when a diver made the first underwater body recovery or even made the first attempt in a national park area. We do know, however, that on August 10, 1929, a hardhat suit and attendant air supply were secured for use in searching for a missing couple believed to have accidentally driven into Olympic National Park's Lake Crescent. Frank Mapes, a trained hardhat diver and former employee of a local salvage company, was underwater for twelve minutes, down to about fifty feet, but was unsuccessful in locating the couple. Recoveries by hardhat divers were additionally attempted in Lake Mead (1939 & 1949) and Yosemite (1943), possibly other areas as well, prior to the advent of scuba equipment.

On September 17, 1947, scuba diver Maurice Fargues, a petty officer with the French Navy and a close associate of Jacques Cousteau, died in the Fountain of Vaucluse, a water-filled cave in France. He was trying to determine the maximum depth a scuba diver could reach. He lost his life doing so, thus he has the ignominy of being the first person known to die while using scuba. He reached 390 feet and subsequently died when nitrogen narcosis and oxygen toxicity overtook him, causing him to drop his mouthpiece. Cousteau, as a result, would deem 300 feet the maximum a diver could safely go on compressed air.

The viability of using scuba for bringing up victims of water-related accidents was quick to gain a foothold in this country. As early as1953, the Salem, New Hampshire Wing of the Civil Air Patrol had an underwater rescue team. The earliest record we have of a body recovery using scuba within a national park

was in the cold waters of Olympic the next year, 1954. Soon after this effort, the local Port Angeles dive club, NEMGORF came into existence. On November 6, 1954, they recovered the body of Russell Heuhsliem, age 37, who had lost control of his vehicle and driven into Lake Crescent the night before.

Just over five months later, Nevada's Lake Mead is the site of the second record we have. Charles "Chuck" J. Rowland, a local marina roustabout, found a 19-year-old drowning victim. After two days of searching, Don Matney was brought to the surface on April 27, 1955, east of Las Vegas Wash by Rowland. There were two other successful body recoveries at Lake Mead in the 1950s using scuba. Wayne K. McDorman, 20, drowned in Hemenway Harbor on March 27, 1957. He was also brought up by Chuck Rowland. On August 15, 1959, Lucene Turner, III, age 15, drowned near Echo Bay. He was also recovered by a concession employee, although the records do not indicate if it was again by Chuck Rowland.

NPS divers have executed an extraordinary amount of underwater recoveries since the early 1960's when the dive program first became active. They refined dragging techniques and special diving protocols were shared during regional dive workshops. For example, Warren Beitel and other rangers at Amistad kept a hula hoop threaded through the open end of a burlap sack. They would back a patrol boat up to a decomposed body on the surface with their masks on. Once there, they slipped the wide mouth of the sack over the victim and edged him onto the dive platform. And Lake Mead rangers insured a knife was available to cut open a rubberized body bag, so a dead person in the water could be more easily slipped into it and the water drained out. According to author Farabee, "you did not want to be 'downstream' of those openings."

This is why NPS divers in the Southwest Region developed an underwater body recovery form. At first it was printed on special paper called underwater ascot and later the retrieved data was photocopied onto Mylar. Information critical to understanding why a scuba diver drowned was obtained on the bottom before the corpse went through the pressure changes inherent in surfacing from a dive. This process was adopted by regional dive officer Dan Lenihan from his experience with the cave diving community. Related forms were soon developed by Dave McLean for documenting boating accidents for insurance claims.

Of course NPS divers perform other law enforcement-related acts unrelated to body recoveries as well. And they are quite varied, and surely number into the hundreds, if not thousands. In preparation for President Ford's visit to Minuteman National Historical Site, three divers were assigned to a special detail to make two dives to 15 feet, to check for explosives on bridges on April 18, 1976. The NPS Scuba Diving Log (Form 10-418) lists the divers as supervisory ranger Vern Hurt from Cape Cod National Seashore, along with Ken Morgan and Mike Stephenson.

And as anyone involved with diving in the NPS knows, Lake Mead has way more than its share of underwater related law enforcement activity. Here are a couple of examples extracted from the Regional Quarterly Scuba Report written by regional dive officer, Dave McLean: "[Lake Mead] had a 7-year-old boy drowned by his mother in a car." "[Lake Mead] divers recovered one drowning victim, a stolen safe, and a stolen car."

Former regional dive officer Wayne Valentine provided some interesting examples of where NPS diving involved law enforcement. On September 11, 1986, he recalls from his log book, "Crime scene investigation, Elk Creek Marina, Curecanti NRA." The store had been burglarized two nights previous. Park divers Mark Igo and Valentine located a cash drawer still containing traveler's checks, and an intact window pane which was processed for fingerprints. "Initial dive for 33 minutes in 60 degree water to 25 feet. A second 18-minute dive to 35 feet to continue search for evidence of crime." Three years later, on December 19, 1989, again his log book says, "Investigation of commercial aquarium fish collecting, Atlantic Ocean NNE of Fowey Light, Biscayne National Park. Investigation of vessel anchored in approximately 60 feet of water at or near park boundary. Two professional fish collectors with one topside and a diver on hookah on bottom." Park divers Chris Johnson and Valentine made a 12-minute dive to 73 feet investigating unauthorized commercial collecting. Then there was the time where they were investigating "Several lobster poaching cases at [Biscayne] made by rushing up on boats anchored in lobster sanctuary areas and jumping in with mask, fins and snorkel."

In Olympic National Park in 2000, bombs were found in 35 feet of water by sport divers near Sledgehammer Point in Lake Crescent, according to Dan Pontbriand. The divers called 911, who in turn called the NPS dive team. The team called in the Washington State Patrol Bomb Squad, who closed US Highway 101, running through the park at this spot. The state and the NPS dive team removed the bombs, relocated

them to a location outside of the park, and detonated them. A second, somewhat similar dive took place at Sledgehammer Point in August of 2001, when additional bombs were discovered. The suspects who threw the bombs in the lake were never identified. And finally in Olympic, reported in the NPS Morning Report on Oct 8, 2009:

"On September 28th [2009], park dive team members recovered a weapon from the Bogachiel River near La Push, Washington. The Forks Police Department asked that the team search for the gun, as it was a critical piece of evidence in a homicide case that had occurred a few days previously. The weapon was found by a park dive officer Mark O'Neill and diver Mike Kalahar in 22 feet of water after a search that lasted about two hours. The weapon was turned over to an investigator from Forks PD. A suspect has been charged in the case."

Other examples of underwater involvement of law-enforcement have been included throughout this book, including three stories that are reported in more depth and hopefully further illustrate the variety of challenges of National Park Service law enforcement diving. The 1977 heist of a Purolator Armored Truck and the subsequent kidnapping and murder of the two guards, involving Lake Mead (SEE PAGE 104); the 1977 smuggling of several tons of marijuana aboard a twin-engine aircraft which accidentally crashed into a high-altitude lake in the backcountry of Yosemite (SEE PAGE 102); and lastly, the 1987 looting of a submerged shipwreck in Channel Islands and the precedent-setting undercover, sting operation that took place, resulting in over sixty criminal charges being filed (SEE PAGE 150).

To embrace a culture of compliance and safety, the agency brought a national diving safety officer, Steven Sellers, on-board in December of 2010. The National Park Service continues its program to date, conducting 6,440 dives by 218 divers in 28 parks/programs in 2013. Today's National Park Service divers are well-trained, highly motivated and live in the shadow of a great tradition. This is their story.

PRE-1960

In documenting the beginnings of National Park Service (and system) diving, we made every effort to adhere to an unfolding chronology. As the following history progresses, please remember this is an attempt to highlight individuals, happenings, and diverse events taking place prior to 1960 for this chapter, and by decade up to 2000 for the following chapters. Please note that in this chronicling of history, particularly with the earlier events, the nexus for diving was the national park **system**, not service. Additionally, readers need observe: the authors are cognizant of the subtle but real trap of using too many superlatives, particularly the term "the very first." Although we relish identifying "the very first" and strived to do so, it is often impossible to do so with authority.

Here, lucky reader, is a short diving road trip back through time.

In 332 BC, Greek philosopher Aristotle described a diving bell used by Alexander the Great at the siege of Tyre. Leonardo de Vinci designed the first known scuba apparatus, appearing in his *Codex Atlanticus*. A diving bell was developed in 1535, and in 1650 Van Guericke designed the first effective air pump. These were followed by a weighted barrel of air replenished by a pipe from the surface, patented by Edmund Halley in 1691.

New World Spanish explorer and navigator Ponce de Leon anchored in what is now Dry Tortugas National Park in 1513. These dangerous reefs and shallows were soon placed on rudimentary charts for other intrepid sailors to follow. The Tortugas became home to pirates and those who wanted to salvage the inevitable shipwrecks, at times by employing rudimentary diving.

Then Juan Rodriguez Cabrillo and his crew made landfall in what is now California in October of 1542. Cabrillo was a Portuguese explorer noted for his exploration of the west coast of North America on behalf of Spain, and he is commemorated by Cabrillo National Monument, an area with early, important NPS dive connections. Some believe that he may be buried on San Miguel Island, within Channel Islands National Park.

On the Gulf Coast, an ill-fated journey from Veracruz to Havana en route to Spain in 1554 lost all but one ship to a hurricane off South Texas. Most on-board the *Santa Maria de Yciar*, the *Espiritu Santo* and the *San Esteban* perished, but not all. Within months, another Spanish expedition located the wreckage and salvaged part of the treasure. The remains of these three ships now lie buried in the shallow waters of Padre Island National Seashore.

Resulting from the 450 years of sailing in the New World, thousands of shipwrecks lie lost; submerged throughout the national park system. It is safe to assume coastal parks such as Acadia, Fire Island, Gateway, Cape Hatteras, Cape Lookout, Biscayne, Virgin Islands, Buck Island, Padre Island, and Gulf Islands were sites of early diving, albeit as part of rudimentary salvage attempts of sunken materials and treasures. The same is true for the inland waters. Park areas in the Great Lakes, or associated with Civil War battles, have lost vessels or other cultural remains. Collectively, there are a great number of submerged wrecks with untold and fascinating histories.

Inland, in addition to early vessel salvage efforts in future NPS areas such as Isle Royale and Apostle Islands, there was hardhat diving related to the construction of several of this country's largest dams, including those of Olympic's Upper Elwha in 1927, Hetch Hetchy in Yosemite, completed in 1923, and Boulder Dam (now known as Hoover Dam) in Lake Mead, completed in 1935. Other dam sites scattered throughout the system may have seen similar early construction diving activity. There are 389 dams within the National Park System, with 263 of them under the direct control of the NPS.

Scuba diving, as we know it today, was not a common sight prior to the 1960s. Before WWII, most divers were using cumbersome hardhats to perform work underwater, mainly for the construction and salvage industries. They were also used for the occasional body recovery. Diving helmets were used in very early explorations of NPS areas like Montezuma Well, attempts to plumb the depths of Death Valley's Devils Hole, and early underwater archeological investigations of shipwrecks in the York River, in Colonial National Historic Park.

The US Navy's Deep Sea Diving School, located in Washington, DC, was founded in 1927. At the end of WWII, service members, trained in diving through the military, returned home and continued to use their skills. Soon self-contained diving equipment, like the emblematic Cousteau-Gagnan

Aqua-Lung®[1] became available in the US at a few small dive shops starting in 1946. By the end of the 1940s, dive equipment was available at a number of outfitters around the country.

Cavers are a forceful, determined community and it did not take long for them to capitalize on this new tool. The National Speleological Society (NSS), the nation's premier caving organization, was formed in 1941, and published perhaps the first information on cave diving in a domestic publication, in the *NSS Bulletin* in September of 1947.

1951 saw the first non-military dive training course for students at the Scripps Institute of Oceanography, in San Diego, California. In 1954, training was being made available to the public through a program hosted by Los Angeles County; this was the first public training course in the nation.

Occurring in tandem with this increased equipment and training availability, dive clubs began to spring up around the country throughout the 1950s in places like the Great Lakes, Las Vegas, Nevada, San Diego, California, and Port Angeles, Washington, which were near the NPS areas Isle Royale, Lake Mead, Channel Islands, and Olympic (respectively), and most certainly made use of these areas for diving. Popular publications like *The Skin Diver* (later renamed *Skin Diver Magazine*) and TV shows like *Kingdom of the Sea* and *Sea Hunt* helped popularize the sport and drive more people to explore underwater.

With the heightened exploration of underwater areas within the NPS, it became clear that the current legislation was not adequate to determine the ownership of submerged cultural resources like shipwrecks. Legislation in 1953 set the precedent for later questions of ownership of cultural resources discovered within park waters.

1957 was a watershed year for diving because the US Navy repetitive dive tables were published for the first time, providing a framework for recreational and scientific divers to plan multiple dive days. It was also the first year that neoprene rubber was widely available, which revolutionized thermal protection for divers. As diving activities became more common in NPS areas, NPS rangers had to, at a minimum, become trained in the sport for body recoveries. This was especially necessary at parks like Lake Mead, Olympic, and Yosemite, which had high numbers of fatalities from diving, vehicle accidents, and other incidents that resulted in submerged corpses. From that necessity, diving spread throughout the NPS and eventually become an invaluable means for accessing and protecting underwater lands within the service.

1926

Fort Jefferson National Monument

The world's first underwater color photos, called autochromes, were taken by a team with *National Geographic Magazine* in a bird sanctuary that would eight years later be designated Fort Jefferson National Monument, now part of Dry Tortugas National Park. The diver was in a helmet using surface supplied air. A flash for color saturation was provided by a pound of magnesium powder ignited on a raft and reflected into the water by a white sheet. One of these experimental flashes resulted in first-rate pictures, which were published in the January 1927 issue, as well as second-degree burns to the surface crew.

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1 Notice the term Aqua Lung®. While in modern times the term scuba is used somewhat indiscriminately to describe any autonomous underwater breathing system, the phrase was originally used to describe an early version of the closed-circuit rebreather. This technology was initially known as LARU, the Lambertsen Amphibious Respiratory Unit. Christian J. Lambertsen was a medical doctor, focusing on environmental medicine and diving medicine. He developed a closed-circuit rebreather as a student at the University of Pennsylvania School of Medicine. He built a back-mounted tank that used scrubbing filters: the diver inhaled oxygen and exhaled carbon dioxide, all in a manner which did not emit bubbles. Just the thing for clandestine warfare.

Upon graduation from medical school in 1943, he joined the Army and was assigned to the OSS, the forerunner of the CIA. Using this technology, he accompanied American commandos on missions against Japanese vessels late in the war. It was also at this time that Dr. Lambertsen filed a patent on his invention, dated May 2, 1944. After WWII, he joined the faculty of his alma mater and in 1948 began training US Navy divers on improved versions of the LARU. During this period, what we now call scuba was generally referred to as an Aqua Lung, the patented name of the open-circuit regulators invented by Emile Gagnan and Jaques-Yves Cousteau in 1943. In 1952, Dr. Lambertsen coined the term self-contained underwater breathing apparatus, or scuba, in a paper he wrote about his rebreather invention.

1929
Olympic National Park

Mount Olympus in Washington was proclaimed a national monument on March 2, 1909, and for the next 23 years was administered by the United States Forest Service before being transferred to the NPS in 1933. Five years later, it was renamed and re-designated Olympic National Park. Within the park is Lake Crescent, in a glacially carved valley. It is at least the second deepest lake in Washington at about 1,000 feet in depth and has never been officially plumbed in its entirety. On July 3, 1929, Russell and Blanche Warren, in their 1927 Chevrolet sedan, disappeared below the lake's surface. The car was finally located on April 13, 2002.

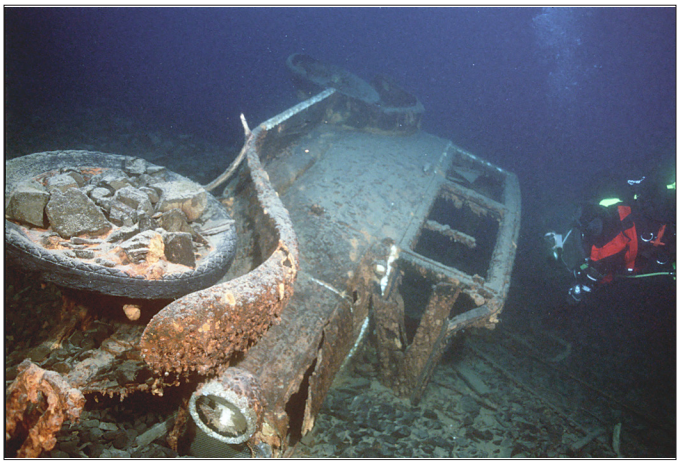
A month after the car disappeared, Washington's Clallum County Sheriff Jack Pike and his deputies were dragging the lake bottom from a rowboat in search of what they now believed was a vehicle underwater. As documented in the 2014 book *The Missing Ones* by Dan Pontbriand,

> Marks on brush where the beach shelved off convinces me that a car went into the lake. No evidence of a car leaving the road is apparent from shoreline except several bits of broken roadway. But when we rowed out from shore and looked into the clear water, we could see where brush under the water had been broken in two places.

They needed further assistance and turned to the US Navy. Sheriff Pike, along with County Prosecuting Attorney John Wilson, asked Commander Ferguson of the navy vessels then anchored in Port Angeles, for divers and equipment. The request was denied: they were leaving the harbor in several days and needed these tools and personnel. Up steps Frank Mapes, a trained diver and former employee of the Finch Diving Company of Seattle, who somehow discovered the need and then volunteered his services as a diver when he learned the navy was unavailable. On August 10, 1929, Pike was able to secure the cumbersome hardhat suit and relevant surface-supplied dive gear from Finch Diving Company to outfit Mapes. R. R. Blain, a company employee, transported the equipment to Lake Crescent and acted as principal tender for Mapes. A small floating platform was towed to the scene to act as a support vessel for the relatively unique operation.

> Frank Mapes began his dive at 11:09 a.m. and descended to a depth of 50 feet landing on a "mountain of shale rock under water." Mapes was able to make it to a depth of 78 feet before running out of air hose. He was back at the surface by 11:21 a.m., a 12-minute dive.
>
> He reported to Sheriff Pike that "There is a mountain of shale down there into which the car may have plunged and covered itself by now. And even if it is not covered up, the dragging operation would only tend to pull dead trees and shale rock over it."

Further diving by Mapes was discontinued.



The long-lost Warren car was discovered at 171 feet deep in Lake Crescent in 2002. Olympic National Park collection.

1934
Colonial National Historic Park

In the fall of 1934, between October 8 and December 10, the first documented underwater archeological work in the United States was begun at Virginia's Colonial National Historical Park. Under the joint sponsorship of the Mariners' Museum at Newport News and Colonial superintendent Floyd Flickinger, a significant number of artifacts were recovered from numerous British war ships of Cornwallis' Fleet, which had been burned and sunk in the York River in October of 1781.

A hardhat diver, Frank Lange, under the direction of Joseph Holzbach, superintendent of the Museum, was used. Working from a 75-foot long by 22-foot-wide wooden barge, equipped with a pump, winch, derrick and clamshell bucket, this primitive-by-today's-standards labor concentrated on the wreckage of two vessels found lying close together in forty feet of water. Salvage stopped on December 10 due to adverse weather and rough water, then resumed on May 14, 1935. It went until July 1, 1935.

THE MISSING ONES

By Dan Pontbriand

Note from the authors: Dan Pontbriand, a 31-year NPS veteran, retired as the chief ranger at Isle Royale. He oversaw the law enforcement, emergency medical services, search and rescue, safety and dive programs for the NPS while in the NPS headquarters office. This article is reprinted from Ranger Magazine, Spring 2011, with permission from the Association of National Park Rangers.

The mysterious disappearance of a young couple, Russell and Blanche Warren, in 1929 would haunt their two young sons and descendants for 73 years. The Warrens were last seen driving a 1927 Chevy sedan headed toward their cabin on the Olympic Peninsula. A massive search effort by the Clallam County Sheriff's Department in 1929 failed to find the missing couple.

In the mid-1950s, the story captured the imagination of a local man, Bob Caso, diving the local lakes and coastal areas of the northern Olympic Peninsula.

I met Bob in April 2001. He arrived at Olympic's Storm King Ranger Station lugging an armful of maps and file folders. It was clear that he had a story he needed to tell. Bob and I hit it off immediately, our common link being diving. Bob, then 78 years old, had not been diving for quite a few years but his passion was still burning deep in his heart. He and his friends formed the NEMGORF (frogmen spelled backwards) Dive Club and began looking for the Warrens in 1956. It would turn out that Bob had actually searched the right area but had not gone deep enough due to the limitation of equipment and training.



NEMGORF divers at Sledgehammer Point on Lake Crescent, Olympic National Park, 1954, during their search for the missing Warren car from 1929. From left to right: Bob Caso, Chuck Widden, and Dick Owens. Courtesy of Bob Caso.

After hearing him tell the Warrens' story, I was hooked. As a ranger and park dive officer, I felt like I had something to contribute to the cold case. The Olympic dive team decided to use the case as a deep dive training opportunity. Our team splashed for the first of many dives on July 3, 2001, 72 years to the date of the Warrens' disappearance.

The first place we chose was Ambulance Point because of its uncanny likeness to the description of the possible accident location Clallam County Sheriff Jack Pike had given. Everywhere we looked there was evidence of accidents from the past: rusty car parts, fenders, tires, hubcaps. We searched to a depth of about 90 feet but didn't find the Warren car. As months passed and additional dives were made near roadside turnouts, news of our efforts reached the newspapers. This led to the discovery of Blanche and Russell's grandchildren living nearby.

On Saturday, Dec. 7, a clear and beautiful morning, the Olympic dive teams splashed at Ambulance Point near a slight curve in the road. The hope was this was the same "little curve in the road" mentioned by Sheriff Pike in 1929. Visibility was great and the water temperature was approximately 50 degrees. At about 90 feet, the bottom dropped off vertically to an unknown depth. We searched east of the "little curve" at about 70 feet in depth, and in a 6-foot-wide crevice we found a black, glass flower vase. We also located a washing machine lid dangling on the edge of the drop-off. In 1929 the Warrens had purchased a washing machine before leaving Port Angeles. The lid we discovered was from a Norge machine dating to about 1929. Could this actually be the lid from [the] Warrens' washing machine? The trail was getting hot.

The winter storms of 2002 combined with a lack of sunlight to significantly decrease visibility. Therefore, the team decided to wait until April for the sun to return and water to clear. On Saturday, April 13, two divers splashed with instructions from me to send up a buoy if they found something. About 10 minutes later a buoy popped to the surface. The surface support team had to wait an hour while the divers decompressed, then surfaced with news of what they found. Bob was aboard the dive boat next to me when the divers broke the surface.

They had found the car. I looked at Bob and began to shed a tear. Here was the man who had been searching for the Warrens for nearly 50 years and now we had found the car.

With this discovery, one burning question remained. Were the Warrens inside? The next day our dive team visited the car, at a depth of 171 feet, with a video camera to document the site. With permission of the Warren family who had been with us each weekend and the park cultural resource management specialists, we excavated the inside [of] the car. We recovered a woman's blouse and some personal items, but no human remains. It seemed that another mystery was at hand. Perhaps the Warrens were not quite ready to reveal their secrets.

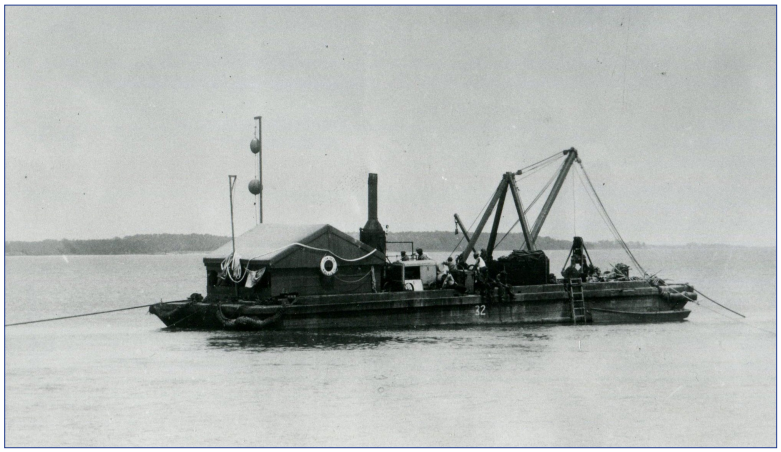
In May 2004, during a dive to return the personal artifacts to the car, a diver noticed what appeared to be human remains while on a decompression stop at 150 feet. Could these human remains be the Warrens? The Warren family, as usual, was on the shore waiting for the safe return of all divers. We were silent for about five minutes, shocked by the news.

In December 2004, the NPS Submerged Resource[s] Center dispatched a team of three technical divers to Lake Crescent to assist me in confirming and recovering the human remains. During the course of the project, the team located additional remains just below 200 feet while using an ROV to investigate the site. A recovery plan was implemented using mixed gas, site measurements and photography, and specially built lifting containers to keep the human remains in Lake Crescent water until examination by a forensic lab. The bones were shipped to an FBI lab in Alexandria, Virginia, for DNA analysis.

Russell Warren's sister, Emily Helen Warren Mattson, had a daughter, Jessie Wilma Mattson Ewing living in Wisconsin. She provided a biological sample from which mitochondrial DNA was extracted. In December 2005, the FBI lab reported that the two DNA samples were consistent — the bones in the lake were those of Russell Warren. His remains were returned to the family, and in 2009 they placed his ashes at the shore of the lake where he could once again rest near his beloved wife.

After one month the operation was moved to the Gloucester side of the James River. There, work was undertaken on the wreck of at least one more vessel. This salt-water salvage project was finally abandoned on July 24, 1935, owing to alleged infringement on privately leased oyster rights. The recovered items, including several swivel guns, bar-shot, fragments of glass, wood objects and pottery, were put on display at the Mariners' Museum.

A report published on this effort in 1939 called *Salvaging Revolutionary War Relics from the York River* indicates that some salvage effort was also made immediately after the battle in 1781, again in 1852. Apparently an antique gun dealer had advertised an iron cannon, claiming a diver had retrieved it from the York River around 1881. Later work on the sites demonstrated most of the diving had been done on the wreck of the British warship HMS *Charon*. The Yorktown Battlefield (part of Colonial NHP) visitor center displays a number of the artifacts in a partial replica of the warship. (SEE PAGE 17)



The barge that served as a platform for hardhat diving operations in Colonial National Historic Park in 1934. The divers uncovered at least three vessels and numerous artifacts from the Cornwallis Fleet that sank in the York River, 1781. Colonial National Park collection.

1936

Lake Mead National Recreation Area

The June 19 issue of the *Boulder Dam Challenge*, a one-page newspaper "Perpetrated Weekly at Boulder City, Nevada," and in existence while Boulder Dam[2] was being built, reported that Albert Straub, a federal lifeguard, was regularly diving to forty feet in a homemade diver's helmet. He had been diving during his college days with "genuine store boughten [sic] helmets and knows what it's about." Lake Mead was three months short of being designated as Boulder Dam National Recreation Area.

2 Hoover Dam (originally called Boulder Dam) was authorized by Congress in 1928, and major construction began on March 11, 1931. The bypass gates were closed on February 1, 1938 and Lake Mead began to fill. Its primary purpose was power generation, with anticipated added benefits of flood control, agriculture, recreation and domestic water for drinking. The US Bureau of Reclamation, was the parent agency of the dam and original caretakers of Lake Mead.

1937
Lake Mead National Recreation Area

Three young sailors, while boating in the now-filling Lake Mead, vanished, never to be found. Charles R. Lillibridge (27), Herbert Bowen (24) and Milo A. Slawson (25) disappeared at mid-Boulder Basin, where the water was already 388 feet deep. These three are the first to drown in the recreation area. According to the archives at Lake Mead, over 450 people lost their lives in the waters of Lake Mead and Lake Mojave over the next fifty years through boating, swimming, fishing, cliff diving, scuba diving, rescuing someone else, water skiing, suicide, and homicide. One man even died while parachuting in 1950.

1939
Cape Hattaras National Seashore

Thor Borresen, the junior park research technician from Colonial NHP in Virginia, investigated the remains of a shipwreck on Bodie Island, North Carolina, within Cape Hatteras National Seashore. The wreck was seen on May 3, although it seems it was first observed in 1903 and again in 1936. The derelict had been heavily featured in the local press and subsequent storms periodically uncovered and then hid it again. At the time, there was a significant contingent of Civilian Conservation Corps (CCC) on Cape Hatteras. Mr. Harry White, the project superintendent in charge of the CCC Camp #436 asked for volunteers to excavate the ship over the May 6th and 7th weekend, since the CCC did not have an official request to work on it. It is reported that one hundred men responded to his request.

Borresen and Mr. Joseph Holzbach, superintendent and curator of the Mariners' Museum in Newport News, Virginia, took photographs of the wreck and made numerous measurements of all the remains. Various materials from the ship were later forwarded to laboratories for identification: ceramics, wood, metal fittings, etc. The wreck was subsequently identified, thanks to Borresen's detailed research, as a War of 1812 US Navy gunboat, Gunboat #146, lost in an explosion off Ocracoke Island in 1813.

1939
Lake Mead National Recreation Area

According to the *Boulder Dam Recreation Area Monthly Report* from April 1939, at approximately 2:50 p.m. on April 9:

> Tom Haake, 19-year-old Las Vegas youth, fell from the stern of his father's speedboat about one mile toward the [Hoover] Dam from the Hemenway Wash Boat Landing. Unable to swim, the young man drowned before it was possible to get aid to him, although within a few minutes there were several boats on the scene of the accident. Intensive searching, dragging… a search by a deep-sea diver hired by the father of the youth, and other efforts at recovering the body proved of no avail, and at the close of April the body was still missing.

On May 5, the young man's body was finally recovered from the waters of Lake Mead.

1943
Yosemite National Park

Four years after Tom Haake drowned in Lake Mead, diving was again used as a tool for an underwater body recovery. Per the *Yosemite National Park Monthly Report* for September, 1943:

> Edson Dale Bonar, 16, disappeared on July 8, while fishing in the Merced [River] above Nevada Falls. [The boy was found on September 3] Rangers worked 2.5 days…to dislodge the body, which was wedged in between logs and rocks under 10 feet of water. With the use of a diver's helmet, they were at last successful in sawing out the logs and bringing up the body.

1947
Montezuma Castle National Monument

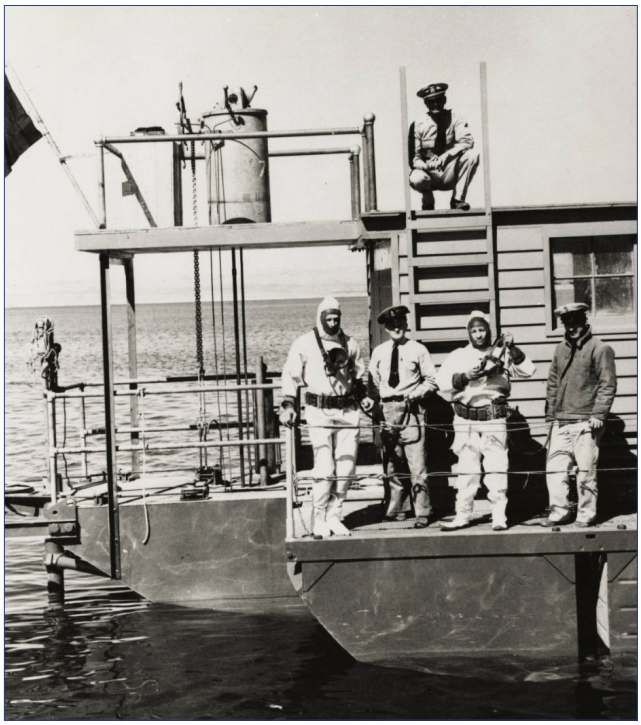
In July of this year a research study was undertaken in Montezuma Well, but not totally under the auspices of the National Park Service. It came about as a result of the interests of archeologists and anthropologists from the Museum of Northern Arizona in nearby Flagstaff. Dr. Harold Colton and Edwin McKee took soundings of the 368-foot-wide sinkhole using a string with a weight attached at the end. The deepest depth

they recorded was 55 feet, near the well's center. The following year, Dr. Colton, along with Ferrell Colton, Richard Suraunt from the Museum, and the National Monument's archeologist Albert Schroeder, returned to further research the well, this time with a former US Navy diver.

1947/1948
Lake Mead National Recreation Area

The US Bureau of Reclamation (BOR) recognized that an underwater current brought large loads of clay sediment and other dissolved solids the Colorado River, but there was no way of accurately determining the effects of this deposition. These particulates would eventually cycle through the various machinery of the Hoover Dam. Although monitored since the initial construction, there were aspects of the currents and material settlement the BOR wanted to study in more detail.

A meeting was held in the fall of 1947, which began the preliminary process of this study. Participant representatives were from the Department of the Interior, US Navy and Department of Commerce. The Office of River Control was given general responsibility for the proposed work for the BOR and that the execution of the necessary technical program should be by the Water Resources Division of the Geological Survey. The plan was approved by the Secretaries of the Interior and Navy. Ultimately, the study took place in 1948 and 1949.



US Navy divers conducting Lake Mead sedimentation survey, circa 1948. US Bureau of Reclamation collection.

We know the US Navy provided "deep-sea divers" to assist this effort during at least some of this time, although we do not know much about them including where they came from, which units they belonged to, how deep they went or exactly what their functions were. The one photo we have seen shows two divers in dry suits, with lightweight surface-supplied air equipment.

1948
Montezuma Castle National Monument

"Diver Encounters Swarms of Leeches in Montezumas [sic] Well," read the lead article on the front page of the May 21, 1948 *The Arizona Daily Sun* out of Flagstaff. With the assistance of Custodian Homer F Hastings, on May 15, 1948, former US Navy diver Herbert J. Charbonneau (in some records his name is spelled Charboneay) of Flagstaff went down into the sinkhole six times over a three-hour period using a homemade hardhat.

Charbonneau, with a compressor borrowed from Wupatki National Monument and capitalizing on his three years of navy salvage work in the South Pacific, donned a diving helmet constructed from a surplus navy Mark III gas mask.

> The bottom of the Well averages from 55 to 60 feet from the surface…Until a few months ago it was considered bottomless." The Flagstaff newspaper article continued, "The diver found the bottom of the famous prehistoric water hole…to be covered with about three feet of silt. The leeches were encountered at about the 35-foot level and…continue from there to the bottom.

Montezuma Castle National Monument's archeologist, Albert H. Schroeder, wrote a three-page, *Memorandum Report in Exploratory Dive in Montezuma Well, May 15, 1948*, to his supervisor, Custodian Hastings.

> Mr. Charbonneau supplied all the necessary equipment except for the air compressor...All equipment was lowered into the Well area from the rim by means of ropes and slings. Considerable trouble with the air compressor motor caused several hours' delay, but after the difficulty

was located and corrected, exploration proceeded uninterrupted beginning about 2:30 P.M. Mr. Richard Suraunt, Charbonneau's assistant, operated the compressor in the boat and the undersigned [Schroeder] worked on the life line.

The first exploratory dive was made near the center where descent was accomplished to about 40 feet. The diver reported that the bottom was muddy and plant life was absent. On coming up from the dive he took off all clothing except trunks stating that it was uncomfortably warm. He further remarked that he was unable to see any distance after passing approximately the 35 feet depth.

The third dive was made in the deepest area previously located when soundings were taken July 19, 1947. This dive substantiated the 55 feet figure.

The fifth dive was made still closer to shore near the edge of the shelf underneath the small cliff dwellings. It was here that Mr. Back* had observed a bubbling action on several occasions in the spring of the year. Bottom was encountered at about 40 feet. Here, while taking up the slack in the life line, the undersigned noted that the diver was apparently going "up and down hill" in walking around on the bottom. On surfacing, he stated that he had encountered two mounts of white sand 8 to 10 feet in diameter close to one another. They were quite apparent in contrast to the surrounding muddy bottom in appearance and also afforded a more solid footing. Unfortunately, no container was available for obtaining a sample. [*Mr. Back is probably the owner of the property before the national monument was established.]

From this point we moved north about 30 feet and the diver stated the water was cold compared to the remainder of the Well. He descended to about 40 feet and walked toward the shelf finding again that it rose abruptly with a slight talus slope being at the base.

As it was now after 4:00 P.M. and the diver was getting cold and part of the Well was in shadows, diving was discontinued. All equipment was carried out by hand it was remarked that whoever had referred to the compressor as a portable outfit must have had his tongue in his cheek as it took four of us to carry it out.

1948

Lake Mead National Recreation Area

On July 21, Captain Robert M. Madison, a WWII veteran with more than 163 combat and 3,335 total flight hours, throttled back on the huge, four-engine aircraft and saw his outboard engine on fire. He had just completed the B-29 bomber's last low pass at 1,000 feet above Lake Mead. Flying at 230 mph and wedged tightly between 5,000-foot-high rocky, barren peaks, Madison had few options and ditching the plane in the waters below seemed like a good idea at the time. All six members of the atmospheric research mission barely escaped the sinking plane before the 101,000-pound Superfortress sank in about 300 feet of water.[3]

3 Due to severe regional drought conditions and lake drawdown in the late 1990s, the plane was located in the Overton Arm on August 6, 2002 by local divers. Subsequently, and after the NPS Submerged Resources Center was sent to inventory and survey the sunken craft, the park met with local divers and developed a management plan for the deep diving attraction.

On August 18, 2003, US District Court ruled the Historic Aircraft Recovery Corporation, which somehow believed it owned the plane, failed to meet its burden of proof in their contention/motion about the alleged ownership. The *NPS Morning Report* for August 25 stated that the court ruled:

"…NPS has demonstrated its interest in the B-29 as an important historical artifact by issuing diving restrictions to protect the aircraft and the site and…eligibility of the aircraft and site for the National Register of Historic Places. The NPS has defended its interest on behalf of the American people, in this, and a previous lawsuit."

On December 4, 2014, Lake Mead National Recreation Area issued a prospectus for two Commercial Use Authorizations. They included two-year permits for guided scuba diving on the site, limited to 100-client dives per year. On April 15, 2015, the NPS issued one of those permits to Scuba Training and Technology, based in Lake Havasu, Arizona.

1948/1949
Channel Islands National Park

There are conflicting and/or obfuscated reports surrounding this particular piece of dive history. It seems that twelve regulators made their appearance at Rene's Sporting Goods Store on Broxton Avenue in Westwood (a suburb of Los Angeles) in 1948. They were adapted for modified aircraft oxygen cylinders. The following year an additional twelve regulators were imported from France. Aqua-Lungs® also began appearing. Since nearby Anacapa and Santa Barbara Islands have been within the nearby Channel Islands National Monument since 1938, it should be without question that scuba was quick to be used in these very attractive underwater sites. If so, this may be the first use of scuba in an NPS area although admittedly, we do not know what was taking place in the Virgin Islands, Fort Jefferson, Cape Cod, and other such areas. In 1949 in New York, Arnold Post started selling the Aqua-Lung® and related gear at Richards Sporting Goods. At the same time, Charlie Marshall offered similar equipment at the exclusive New York outfitter, Abercrombie & Fitch. In Chicago, Vern Pederson stocked the Aqua-Lung® at his medical gas supply business, Chicago Oxygen.

1949
Colonial National Historic Park

Additional work was done on the Yorktown wrecks, a cooperative effort by the Mariners' Museum, US Army divers from New Jersey's Fort Dixon, and the National Park Service. Some of the work was in the gaps left from the 1934-1935 efforts.

1949
Lake Mead National Recreation Area

When the PBY Catalina (a WWII-era flying boat) came in for landing on the waters of Lake Mead on October 24, it unfortunately still had one wheel down. It struck the water, cartwheeled over and caught fire. Four people died and the amphibian patrol bomber sank in 250 feet of water. The plane had recently been converted for civilian use, and met its end on a test flight out of nearby Boulder City Airport. As reported in the *Las Vegas Review Journal* in the fall of 1949:

> Operations by the diver John True of Las Vegas were discontinued when he slipped on a wing Monday and cut his suit and the resulting leak made it necessary to bring him to the surface without decompression. He suffered a mild case of "bends"… expected to continue salvage efforts for the Babb Company until his contract runs out.[4]

Within days of John True diving on that crashed plane in 1949, he was back again with his hard hat, this time looking for two local fishermen who had disappeared.

1950
Death Valley National Park

Devils Hole is a water-filled planar fissure formed by geologic faulting located in far western Nevada. Very isolated, it is a separate forty-acre section of Death Valley National Park, thirty miles east of the main park. Its 93°F waters have been known by hard-rock miners from at least the end of the 1800s. In 1952, it was assimilated into what was then Death Valley National Monument and is dedicated to protecting the Devils Hole pupfish (*Cyprinodon diabolis*). The endemic, one-inch long fish was scientifically described in 1930.

In February, 1950, there was a preliminary survey of Devils Hole by caver Peter Neely and physician and dedicated cave scientist Dr. William Halliday, documented in Halliday's 1976 book, *Depths of the Earth*. Holding their breath, they were able to get to a ledge, twenty-five feet down. Excitement grew among the members of the recently established National Speleological Society Grotto in Southern California. That June, a three-man team, led by Walter S. Chamberlin of Pasadena and with the NSS, descended to 75 feet using hardhats and a cumbersome air hose. This site would be subject to multiple exploration attempts and, sadly, several diver deaths in the following decades.

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4 In 2007, NPS divers re-located the wrecked and submerged PBY. That October, Lake Mead superintendent Bill Dickinson ordered the location of the aircraft be made known to the diving community. Less than two years later, February 9, 2008, a 40-year-old man from Las Vegas died while scuba diving on it.

1951

1951 was a year of many "firsts."

The earliest scuba-diving claim by an NPS employee, George F. Schesventer, was documented. The long-retired Fort Caroline National Memorial superintendent became a serious scuba diver beginning in 1951. While in the US Navy and stationed in San Diego, Schesventer taught himself to dive. Recalling his early experience in a phone call to the author on Sept. 24, 2013, he bought an Aqua Lung®, a double-hose, brass Cousteau-Gagnan regulator. "I believe it was the Cadillac of regulators at that time." He also purchased a mask, fins, spear gun, but "no safety vest," in a small dive shop in nearby La Jolla.

1951

The very popular *Skin Diver Magazine*, the leading chronicle on all things diving for the next half-century, was first published in December, 1951. It was initially titled *The Skin Diver* until being renamed in October, 1956. The inaugural issue, costing 25 cents, consisted of 12 pages and was "…for the purpose of creating a further interest in skin diving and spearfishing and to provide an advertising medium for manufacturers and retail merchants of equipment used by underwater fishing and hunting enthusiasts." This first issue announced that on December 15, 1951:

> …the first annual Skin Diving Derby will be underway. Underwater fishermen and women from Monterey to San Diego will be exploring the kelp beds and underwater reefs for big fish, abalone, lobster and etc. in an effort to win one of the prizes being offered…The prizes consist of Aqua Lungs, Rubber suits, Spears, Guns, Masks, Flippers and a variety of other equipment amounting to almost a thousand dollars.

Obviously the emphasis was on the sport of spearfishing, although "lungers" were increasingly being seen on the coast. In this first issue of *The Skin Diver*, there is an ad from Rene Sports with an illustration of a lung diver. It was four more months, until the March-April, 1952 issue when the first photo of a lunger, Ed Fisher (founder of Aqua Lung, Inc.) was published in the magazine. It was not until January of 1953, that someone with a tank, albeit with a spear gun and dead grouper, graced the cover. The term "scuba'"was still years away from being used.

1951

In 1951, the Scripps Institute of Oceanography in San Diego, California, instructed a course in scuba; a first outside of the military. (SEE "THE NPS AND SCRIPPS" ON PAGE 30)

1952

Fort Caroline National Memorial/ Timucuan Ecological and Historic Preserve

The "firsts" continued in 1952 with the first recorded use of scuba in a national or future national park. Based on records in the Timucuan Ecological and Historical Preserve, museum technician Josh Salestrom wrote:

> In 1952, the National Park Service and the Department of the Navy partnered in an effort to discover the specific location of Fort Caroline, built by the French in 1564 in an attempt to colonize what is now Florida. The project was supervised by Charles H. Fairbanks, a well-respected archeologist from Ocmulgee National Monument in Macon, Georgia. The project was initiated at the behest of Congressman Charles Bennett (D-FL), who was working to develop the Fort Caroline lands into a National Monument. The project was divided into two parts: a terrestrial effort on the shores of the St. Johns River, and an underwater search of four specified areas of interest extending approximately 600 yards into the waters of the St. Johns River.
>
> Land excavations began on September 29 and lasted until October 7, during which time nothing of colonial significance was discovered. On October 13, the US Navy dispatched Mine Disposal Unit 2 from the US Naval Minecraft Base in Charleston, South Carolina. The dive team consisted of R.A. Cassidy, T.R. Washington, and J.D. Brewster. The team was commanded by Lt. S.C. Bartlett, Jr. Underwater operations began on October 15, and lasted until October 23. They operated from a landing craft moored in the St. Johns, and used a MK 3 ordinance detector set in hopes of detecting any large metal artifacts such as cannons or cannonballs. Unfortunately, the operation was canceled early due to the arrival of a large aircraft carrier at nearby Naval Station Mayport,

> and only two of the four specified areas of interest were explored. Nothing of significance was discovered, and Congressman Bennett declined an offer from the Navy to return to examine the remaining two areas of interest. No publicity, and therefore no photography, was allowed because some of the equipment used by the Navy was classified as "secret."

To the authors' knowledge, this is the first in a very long and rewarding, albeit intermittent, US Navy and NPS diving relationship.

1952

In the May issue of *The Skin Diver*, there was a one-page technical article by Rene Bussoz (of Rene's Sports), "Underwater Physiology" which highlighted the mindset for sport diving safety at the time:

> Professional divers must follow the rules of reliable decompression tables for long and deep dives. Sport divers using the average cylinder on the market (60 to 70 cubic feet of free air) should limit. . . dives to two cylinders. . .24-hour period. Such tanks would not allow. . .to stay down long enough and/or deep enough to have to worry about "the bends."

1953

Death Valley National Park

In the spring of 1953, several researchers from the La Jolla, California-based Scripps Institution of Oceanography dove in Devils Hole, this time using scuba. In the group were Andy Rechnitzer, Connie Limbaugh, and future NPS dive mentor Jim Stewart. Dr. Carl Hubbs, a world-renowned ichthyologist from Scripps, accompanied them. All were there to study the pupfish.

However, comments made by Harry Wham of Whamco Divers in a future incident report from the Lake Mead infer that he was diving there in 1953. So, Devils Hole and Lake Mead may tie as far as the second earliest recorded use of scuba in an NPS area. The name Wham or Whamco does not appear again until 1958.

1953

That same Conrad "Connie" Limbaugh, who was the first chief diving officer for Scripps and a leading marine scientist, taught a scientific diving course at the school. He published "An Outline of Lung Diving," and established 32 rules to follow for dive safety. Most were common sense; some would eventually end up in NPS-4, the National Park Service's diving policy. Limbaugh was well respected in the budding scuba diving industry, even called the "Greatest Diver in History" by *Skin Diver Magazine*.

Limbaugh's course in 1953 was attended by Los Angeles County sports director Al Tillman and lifeguard Bev Morgan. Based on this course, the two developed the first public skin and scuba education program in the United States the next year, 1954. The Los Angeles County program quickly became the template for dive training in the future. It is also the program in which future NPS rangers Jim and Phil Martin learned to dive in 1955.

1953

Yosemite National Park

On May 9, Stanford University student Jon Lindberg, the son of famed aviator Charles Lindberg, dove in Bower's Cave just outside the Big Oak Flat Entrance of Yosemite National Park. Although not quite technically in the park, it was close enough to fool the average newspaper reporting on this very noteworthy, and for that period, adventurous event. A month later, the June 1953 issue of *The Skin Diver* reported the Salem, New Hampshire Wing of the Civil Air Patrol claimed it was "the only known underwater rescue team" in the world.

1953

The year 1953 saw two pieces of legislation having a definite bearing on diving in NPS areas. On May 22, the Submerged Lands Act of 1953 relinquished title and jurisdiction of tidal and submerged lands within three nautical miles of shore to the individual states. Texas and the Gulf coast of Florida had an extended range of three marine leagues (approximately nine nautical miles). Then on August 7, the Outer Continental Shelf Lands Act declared that the federal government was responsible for the management of submerged lands seaward of the state coastal waters (three miles from shore) to the edge of the Outer Continental Shelf of the US. The act placed authority in the Secretary of the Interior to regulate the management of resources within the area, predominantly for oil and gas exploration.

Thus the lands on the Outer Continental Shelf fell under the provisions of the Antiquities Act of 1906. During this time, the United States government wrestled with the question of whether submerged objects found in the coastal waters of the few national park areas existing at that time would be considered objects of antiquity, as the Antiquities Act stipulated. This would have direct bearing on diving and artifact retrieval from shipwrecks in NPS areas such as Channel Islands, Fort Jefferson, Everglades, Point Reyes and Acadia.

1953

Death Valley National Park

According to Halliday in *The Depths of the Earth,* William Brown, with others of the active Southern California NSS crowd assisting him, reached a depth of 150 feet in Devils Hole on August 1, 1953. The next day, team leader Brown, again wearing his double tanks, discovered the large, air-filled cavern now known as Brown's Room. His stay there was brief; he continued to breath from his tanks for fear the very moist air in the room was toxic. Nearby Devils Hole Cave was also explored, to a depth of forty feet.

1953

Finally that same year, there were now two or three fully-functioning dive shops open on the West Coast including San Diego, Venice and Torrance. Bob and Bill Meistrell started the "Dive 'N Surf" in Hermosa Beach, California. With Meistrell still the owner in 2013, the Dive 'N Surf is probably the oldest scuba retailer on the West Coast; it is hard to believe that divers were not in and around Channel Islands by this time. And, no doubt, many of these same divers were being guided by the sport's first real diving manual, the 86-page *Underwater Safety*, published by E. R. Cross. Cross was affiliated with *Skin Diver Magazine* for a great many years, writing the "Technifacts" section.

1954

The February *The Skin Diver* mentions the Minnesota Skin Divers, the "first known skin diving operation in [Lake] Superior's frigid water [Gooseberry River State Park]." And then on February 19, 1956, the Great Lakes Skin Diving Council was formed. Dive shops in Duluth, Minnesota as well as Rhinelander, Wisconsin also existed, so it seems logical there was some diving already underway on the many underwater wrecks in and around Isle Royale National Park, not that many miles away

.

1954

Scripps dive officer Connie Limbaugh, in a burgeoning effort to professionalize the young sport of scuba, published an article in the February issue of *The Skin Diver*, "Qualifications for a Diving Certificate." Parallel to what he did the year before with his article, "An Outline of Lung Diving," he identified 23 requirements with "the suggestion that the individual clubs adopt similar rules." Among these standards were:

- swim 1,000 feet without fins in the ocean;
- swim underwater for 75 feet with one breath and no fins;
- skin dive to a depth of 18 feet;
- swim underwater for a distance of 125 feet with only 5 breaths and no fins.

These, as well as several other requirements spelled out by Limbaugh, would in a decade become the requirements for prospective National Park Service divers to remain at Scripps that very first day of training while the service's diving "godfather," Jim Stewart, watched on.

Almost prophetically, this year in several issues of *The Skin Diver*, Jim Stewart, the same "godfather," still in high school but also the youngest member of the Bottom Scratchers dive club in San Diego, was mentioned at least three times.

1954

Montezuma Castle National Monument

Per the Montezuma Castle National Monument website, there have been nine documented dives in the desert sinkhole. The first was the aforementioned dive by Herbert J. Charbonneau in 1948. The second, and only known illegal dive, was on March 7, 1954. Fritz Holmquist, a Phoenix surveyor and civil engineer, his son John Bruce (who also went on to become a civil engineer), and a friend and co-worker Larry D.

Dadisman smuggled scuba gear into the sinkhole. John made two dives before their apprehension. His experience was described in an email message written on his behalf by his daughter-in-law, Kitty (Mary) Klingler, to the author on January 19, 2013:

> He was 30 years old when he ordered by mail, through Popular Mechanics, scuba diving gear, he believes cost $130. He went to Lake Pleasant near Phoenix to try out his new gear, he believes the lake was 100 feet deep. He talked his dad…and…Dadisman, to go with him to Montezuma Lake [sic]. He thought it was a lake as it had a dock and boats, which he borrowed/stole one to go out to the center to do this dive. He was the only diver. The well was 68 feet deep and had two large springs at the bottom. He estimates the springs were producing 100 gallons per minute. There were millions of small "fish" at the bottom. Upon coming to the surface and being confronted by a ranger, he realized they were leeches and he was covered all over with them. He was told it was illegal to scuba dive and given a warning.

1954
Olympic National Park

In May, 1954, the NEMGORF Dive Club of Port Angeles, Washington was active in Olympic's Lake Crescent. NEMGORF is FROGMEN spelled backward. Members included Bob Caso, Dick Owens, Chuck Widden, and Sergeant Johnny Sweatt of the Port Angeles Police Department. According to *The Missing Ones,* the year before, Caso and two friends purchased "three complete sets of dive gear that included a Bel Aqua® dry suit, mask, fins, gloves, single steel compressed air cylinder and Aqua Lung® double-hose regulator." They made their own lead weight belts.

It wasn't long after NEMGORF came into existence that they were put to work looking for the victim of an automobile accident in Lake Crescent. This is the earliest record the authors have of a body recovery using scuba within a national park area. Again from *The Missing Ones:*

> On Friday, November 5, 1954, at about 7:00 p.m., a pickup truck driven by Russell W. Heuhsliem, age 37, spun out of control while traveling east near Meldrim Point carrying Russell to his death. Divers John Sweatt and Richard Owens retrieved the truck and Russell's body still in it the next morning from fifteen feet of water. Witnesses … could see headlights from the truck two hours after the accident. Olympic National Park Chief Ranger John F. Alton was in charge of the recovery operation assisted by local rangers, the county sheriffs, and state patrol officers.

Two years later NEMGORF began looking for Russell and Blanche Warren, or more likely, their 1927 Chevy sedan. Despite their efforts, they did not find the vehicle or the Warrens. (SEE PAGE 12)

1954
Death Valley National Park

Six divers from the active Southern California NSS Grotto spent four days exploring Devils Hole and collecting rock samples in November of 1954, described in R.J. Hoffman's 1988 USGS Report *Chronology of Diving Activities and Underground Surveys in Devils Hole and Devils Hole Cave, Nye County, Nevada, 1950-86*. Peter Neely, Richard Lawhorn, and Robert Lorenz may have also made the first, albeit unofficial, Devils Hole pupfish count, documenting 300 fish. (SEE PAGE 90) They laid out guidelines to prevent getting lost, as well as underwater phone lines for communications between the surface and Brown's Room.

1954

Finally, 1954 saw the first underwater-oriented television series, *Kingdom of the Sea*, starring Ms. Zale Parry, as well as the publication of *The Science of Skin and Scuba Diving* by the Council for National Cooperation in Aquatics. This book became *the* cornerstone textbook for fledgling NPS diver education for at least the next 15 years. An expanded edition appeared in 1959, a third-edition, *The New Science of Skin and Scuba Diving* came out in 1962, and by 1974, when the fourth-edition was published, more than a million copies of the manual had been printed. It was definitely used by rangers in scuba training at least through the early 1970s.

With the art of scuba and its burgeoning relationship to science, certainly within the national park system, it is probably a good time to provide the following quote from *Four Thousand Years Under the Seas*, a book by Phillipe Dioles, first published in 1954 in France: "It is easier to make a diver of a scien-

tist, than a scientist of a diver."

1955

Through research in the National Park Service correspondence file "Underwater Archeology, Pre-1968," located at the Southeast Archeological Center Archives, the first record the authors have found referencing diving and the NPS at the national level is in a memo from the service's staff archeologist, Dr. John W. Corbett, to Mr. R. F. Lee, chief of the Division of Interpretation, on March 2. The subject of this memo is "Antiquities Act Application to Under-Water Archeology." "Pursuant to your request of February 20, I have talked to Mr. Price, who suggested that I should talk to Mr. Sanders regarding the Antiquities Act and its possible application to under-water archeology." On that same day, Corbett goes on to draft (and Director Conrad L. Wirth will formally send out on March 24) a memorandum from the director to "Legislative Counsel, Office of the Solicitor." The subject line for this missive is: "The Antiquities Act of 1906, P. L. No. 209 – Application to Underwater Archeology." "Since there is a growing interest in the salvage of objects of antiquity from offshore waters, this Service would like to request you to render an opinion as to whether or not the Antiquities Act is applicable in any of the cases." The authors do not know who either Mr. Price or Mr. Sanders are.

We did not find a reply to this March 24 memo to the legislative counsel, but we did see that over the next several years the Office of the DOI Solicitor rendered opinions and comments about this subject. The next memo in this file about this subject from the solicitor was on December 7, 1956. (SEE PAGE 24)

1955

Lake Mead National Recreation Area

Just over five months after NEMGORF divers recovered Russell W. Heuhsliem from Olympic's Lake Crescent, Lake Mead became the site of the second record we have of scuba use for the recovery of a body within an NPS area, recorded in the Lake Mead NRA Archives. Charles "Chuck" J. Rowland, a local marina employee and a charter member of the park's Coast Guard Auxiliary Flotilla 73, found Don Matney, a 19-year-old drowning victim. After two days of searching, Rowland brought him to the surface on April 27, east of Las Vegas Wash. It is unclear if Rowland made his efforts at the behest of the service or just went ahead and dove on his own. There were two other body recoveries at Lake Mead in the 1950s using scuba.

1955/1956

Death Valley National Park

Here is another early statement by an NPS employee, retired Hawai'i Volcanoes National Park superintendent, Jim Martin, of having experimented with scuba. Much of what Jim did in his early days was in conjunction with the NSS, and as of 2016 he was still a member. The NSS additionally honored Jim by bestowing on him its prestigious 2010 Honorary Member Award for his outstanding contributions to the caving world. In an email exchange with the author in March, 2012, Jim recalled:

> Phil [Martin] and I [brother, Jim Martin] started Scuba diving in the early 1950s. We were free-diving probably by 1949 off of Southern California. Ed Simmons [mentioned previously] with the NSS Southern California Grotto had double-tank Scuba gear and Phil and I had one hybrid early Scuba tank, single hose, etc. Ed would let us take his gear when we wanted to so we made lots of dives off the Southern California coast and a couple with the Grotto at Devils Hole. We of course went back on our own and did a few more dives. Probably around 1955 or 1956.
>
> We got certified first through LA County Recreation Department so we could get air in our tanks…around 1955...Phil always was skinny and wore a full dry suit. Always funny to see… punched a hole in it and would come out looking like an elephant. I wore wool long johns.

1956

Channel Islands National Park

On the West Coast, an aviation operation utilized a fleet of six, twin-engine Grumman-Goose amphibian airplanes in early 1956 to make daily scheduled trips from the mainland to Catalina Island. They also offered charter dive flights further out. From the May, 1956 issue of *The Skin Diver:*

> How'd you like to leave home at 7:00 A.M. and be back at 3:00 P.M. having dived for four hours, some

> eighty miles away in virgin waters where the lobsters practically jump into the sack and sheepshead, calico bass, bull bass, mill around you while you take your pick? All you need is a twenty-dollar bill, along with seven other divers. . .and you have the price for a seaplane trip to any of the channel islands [emphasis added] within a hundred mile radius from the Long Beach, California Municipal Airport.
>
> The Isle of San Nicholas, little touched by any but commercial fishermen has now been found by skin divers, and is a diver's utopia, after the much-dived local waters. You will dive in an area that is not unlike the underwater topography of the Laguna and Palos Verdes area. You will find long, deep ledges, loaded with lobster, abalone and fish with the common leafy growth, eel grass, and kelp patches, with numerous white sandy areas that look like they were just designed for barndoor halibut.

We will never know what havoc these flights between the mainland and the Channel Islands may or may not have had on the budding scuba community on the mainland. It definitely was before there was a body of knowledge and/or concern about the effects of flying and diving.

1956
Montezuma Castle National Monument

In April of this year, investigators from Phoenix Community College made dives to 65 feet in Montezuma Well using scuba. Under direction of Dr. Alice Shultz, two divers collected underwater plants and invertebrates. While this effort was documented in the park's administrative history, it appears that Dr. Shultz did not publish a report of her research.

1956
Virgin Islands National Park

Virgin Islands National Park was established on August 2. It began as a 5,000-acre gift from philanthropist and major conservationist, Laurance Spellman Rockefeller. The park, which covers much of the island of St. John, has since expanded to 12,900 acres, with 5,650 acres offshore and underwater.

1956
Crater Lake National Park

One of the earlier scuba dives within a national park took place in, of all areas, Crater Lake, Oregon, this year. On August 25 and 26, three divers entered the crystal-clear waters of the United States' deepest lake. The team consisted of 34-year-old Allen Cherry, *Life Magazine* staff photographer A. Y. Owen and veteran diver Phillip Bayouth. It was to be a main story in an upcoming issue of *Life* magazine but was delayed by the sinking of the super cruise ship, *Andrea Doria*. It was ultimately published in the November, 1957 issue of *Skin Diver Magazine*. That first day, the trio did an initial dive to 40 feet. The following day they got to 90 feet, all the while being clearly visible to Ranger Bernie Packard and the NPS support boat above them. A July 22, 1996 article about this historic dive was written up by Lee Juillerat in the Klamath Falls paper *Herald and News*.

Allen Cherry had been a US Navy Seabee in the Pacific in WWII. Returning, he developed an interest in diving, buying a prototype Aqua Lung®. "When I saw Crater Lake, I said to myself, 'I've got to dive there.'" Easier said than done! Keep in mind, Crater Lake National Park was the first area within the system specifically set aside for science, and Cherry was not a scientist. However:

> . . .Cherry's desires were politely rejected by park rangers. Undaunted, he contacted a powerful Oklahoma senator. . .contacted the Secretary of the Interior. After three months of negotiations, permission was granted. The curiosity dive became a scientific event. Cherry. . .Bayouth were designated to study Circular "holes" southwest of Wizard Island. A professor at the University of California believed the holes. . . formed before the lake level reached its current height, but a scholar at the University of Michigan theorized the depressions are tree casts formed by lava flows that trapped trees in an upright position.

1956
Olympic National Park

On the same day, August 25, that Allen Cherry was beginning his first dives for science into Crater Lake, a rather bizarre but historically interesting accident took place in Olympic National Park's Lake Crescent. A local ambulance en route to Port Angeles with a 56-year-old logger suffering a suspected fractured leg

plunged into the lake at Meldrim Point. In addition to the victim, Ernest Dahlgran, who was strapped onto a gurney in the back, there were three attendants and a driver. All but the ill-fated Dahlgran survived, although the 18-year-old driver had to have artificial respiration performed on him. Recounted in *The Missing Ones:*

> Scuba divers from Port Angeles, John Sweatt, Lewis Sample, and William Wilson, recovered Dahlgran's body from 90 feet of water outside the ambulance…An investigation…revealed skid marks…struck a tree…then hit a second tree before rolling into the lake…debris scattered on the slope where the ambulance rolled into the lake…rolled end over end…Divers attached a rope to the ambulance and removed it from the lake.

1956

Cape Hatteras National Seashore

As mentioned under the year 1955, the Department of the Interior solicitor, J. Reuel Armstrong, formally answered an official inquiry from Director Wirth. The subject of Reuel's December 7, 1956 memorandum is: "Capstan washed ashore at Cape Hatteras National Seashore." In the memo, the solicitor begins by quoting a part of the request from the superintendent of Cape Hatteras to the director.

> After hurricane "Ione" the remains of an old sailing vessel appeared on the ocean beach of the National Seashore southwest of Hatteras Village. It may be a portion of the "Carroll Deering" which has disappeared from its former resting place on Ocracoke Island.
>
> An old iron capstan was a part of the wreckage when first observed shortly following the storm and this item has been salvaged by a local merchant to become an attraction for his roadside place of business.
>
> Please advise if authority exists whereby this person …required to return the capstan to its natural resting place … and control such activities in the future.

The solicitor then went on to say in his three-page reply that essentially the federal government did not have any real jurisdiction to this artifact and the item probably legally belonged to the State of North Carolina. There would be additional similar interpretations by the Solicitor on this general subject.

1957

Sequoia and Kings Canyon National Parks

As evidenced by Allen Cherry and his undoubtedly shivering plunges into Crater Lake the year before, as well as the several body recoveries from Olympic's Lake Crescent, scuba was catching on. There were now a smattering of intrepid individuals around the service with an interest in scuba, for both work and recreation. Sequoia National Park fire control aid Robert O. "Bob" Binnewies was one. Bob described his experience in emails to the author in April 2011:

> I used Scuba gear in [summer of] 1957 in the South Fork of the Kaweah River to count fish. I was assigned at Clough Cave [fire control station]. Local anglers were complaining that the river had been "fished out," and wanted it stocked. My boss, backcountry ranger "Skinny" Kirk, asked me to make a dive into a deep hole in the river to see if any fish were left.
>
> I bought my equipment in Fresno, a tank, regulator, weight belt, mask and flippers…no training, except…advice from the salesman about how to clear my mask…inspired…by stories I heard of…Cousteau's pioneering efforts…I started experimenting when I got back to…Clough Cave by going into small pools and paddling around. Delightful; a whole new underwater world.

Responding to the "fished out" complaints, Bob literally jumped into his work.

> I found a big pool not far from my cabin… ten or twelve feet deep, maybe fifty feet long, put on my gear, and went down for a look. Plenty of fish, some eight to ten inches, one even larger. I radioed the unscientific results to [Sub-district ranger Hal W. Packard, in Sequoia since 1954] and heard nothing more of the matter.

Twenty-two years later, Bob Binnewies was superintendent of Yosemite National Park (7/22/79 – 2/1/86).

Now retired, NPS ranger, Federal Law Enforcement Training Center instructor, and diver Loren Casebeer was 11 in 1957 when he developed an interest in diving. Per an April 10, 2011, email to the author:

> My first Scuba training was in 1957 when my family was living at Marine Corps Air Station (MCAS) Cherry Point, North Carolina. The "Special Service" office offered a recreational ten-week (?) Scuba program…I asked my folks if I could participate. My Dad said it was only for marines (not de-

pendents) but if I wanted to show up and try to wiggle my way in it was OK with him, but he wasn't going to help me get in, I had to do it on my own.

I showed up on the first day and watched the group of about 20-25 young, fit Marines getting ready for the swim test. I asked if I could participate, and was told no, but I could watch. I said "great" but I'd like to watch from in the water. Nobody complained, so I just participated in all the swim test events, just from the other side of the pool…and while the Marines rested between events, I just treaded water while they lounged poolside. By the time the swim test was over, the instructors realized I was pretty serious. They relented and told me I could "monitor" the training, sit on the edge of the group and don't be noisy. (I was in!)

Stuff like "Boyle's Law" and other diving physics were way beyond anything I was learning in school but I read the mimeographed material and did my best to understand it. Eventually it all went very well and I was essentially "adopted" by the instructors and the young marines…like a mascot. We did all the class work and pool work, and I was in Heaven!

Back then everything was two-hose regulators and mostly homemade tank harnesses with "D" ring quick releases and weights cast from recovered bullets and old car batteries. Miraculously, when we got to the actual stage of donning tanks and beginning the pool work—one of the instructors showed up with a half tank in a harness that a friend had fabricated over in the (parachute) rigger loft. It was all pretty fun.

1957

Isle Royale National Park

There is a short article in the September, 1957 *Skin Diver Magazine*, about "Jack Coghlan, young salvage expert of Port Arthur, Ontario" scuba diving on the passenger steamer SS *America*, on a rocky ledge off the west shore of Isle Royale National Park.

> Jack retrieved a soup bowl for a souvenir and continued on, deep into the belly of the ship…The dive had taken on definite possibilities. Lifting the contents from the "Cash" drawer didn't turn out to be rewarding in a monetary sense after all, but produced the most phenomenal souvenirs of the adventure. The "Banknotes" were a package of photographs…pictures were in remarkably good condition and reproduction have since been made for souvenirs. This, after having been submerged for 29 years.

To reinforce Coghlan's story about early diving and artifact hunting in Isle Royale, Dick Metz, a former Isle Royale National Park boat operator and now a long-retired Lake Superior tugboat captain, confirmed that artifact reaping was already pronounced when he started diving on the wrecks in 1960. (SEE PAGE 39)

1957

Channel Islands National Park

It may be that Channel Island's famous wreck, the *Winfield Scott*, which was built in 1850 and sank in 1853 off of Anacapa Island, was first dove in 1957. Per a December, 1990 article in *Skin Diver Magazine*, Technifacts' author, E. R. Cross states he, along with Dick Anderson (who apparently did not remember this particular dive) believes they were "the first scuba divers to visit her."

1957

In the March, 1958 *Skin Diver Magazine* there is a short reference to an incident from the summer of 1957 that a "law prohibiting the use of skin diving in public pools has recently been passed by the District Commissioners [Washington, DC] governing the operations of public pools…(including pools operated by US Park Service)." The law was enacted because of a minor accident occurring in a public pool when a "swimmer dived from a board and lacerated his knee on a submerged diver's scuba tank."

1958

Jamestown National Historic Site/Colonial National Historic Park

National Park Service staff archeologist, John M. Corbett, in a response letter to Mr. John Huston, secretary of the Council of Underwater Archaeology of San Francisco, suggested that Huston contact J. L. Cotter, regional archeologist in Region Five, "about two years ago Mr. Cotter undertook some underwater archeology in connection with the exploration in his search for remains of the first fort at Jamestown. Al-

though the results of this search were negative, his methods and procedures might be of interest to you." Ironically, years later in the mid-1990's, work by archeologist William Kelso showed that earlier conjectures about much of the original fort having eroded into the James River were not true, and discovered the much-sought original settlement and its palisade on land facing the river.

1958
Lake Mead National Recreation Area

According to the May 1958 issue of *Skin Diver Magazine*, there was at least one dive club now located in Southern Nevada, the Hacienda Skin Divers of Las Vegas. The next year the Whamco Divers Scuba Club was advertised. We can assume by the presence of these clubs that recreational diving was occurring in Lake Mead at this time. As the following will illustrate, Harry Wham was important to the NPS diving scene for another decade or more.

When 22-year-old Danny Kolod fell overboard in Lake Mead's Swallow Cove on June 29, Harry Wham, owner of Las Vegas' then only dive shop, Whamco Divers UD-10, made the first of a number of body recoveries in the recreation area. He held NAUI Instructor Card #237 and was also a YMCA instructor. Wham would go on to make his mark in Service dive-history between the mid-1960s and mid-1970s by instructing several NPS dive classes with staff from both Lake Mead and Glen Canyon, all while maintaining both a dive shop and a local piano bar.

Harry Wham is reputed (this piece of diving lore had been passed down from ranger/divers at Lake Mead and its origin and veracity are unknown) to have served as a double at least once for actor Lloyd Bridges, a.k.a. Mike Nelson of television's *Sea Hunt* fame. The well-received television series began in January, 1958, with several of the 155 episodes shot at Lake Mead and Wham reportedly doing some of the diving. Terribly simple in retrospect, the thirty-minute-long productions undeniably helped propel scuba into nation-wide visibility.

Although there had been at least two earlier television series focusing on diving—*Kingdom of the Seas*, beginning in June of 1955, quickly followed that fall by *Captain Fathom*, with ultimately 39 episodes, it was *Sea Hunt* that introduced a whole new generation to scuba. If television ratings are any measure, audiences loved both the danger-magnet Mike Nelson and scuba.

1958
Lassen Volcanic National Park

Also in the summer of 1958, Lassen Volcanic National Park district ranger Jim Randall (SEE PAGE 189), witnessed his very first diver with a "real-life" scuba tank. Several locals asked for and were given permission to clean the bottom of the park's Manzanita Lake by using their dive equipment.

1958
Padre Island National Seashore

In October of 1958, the Corpus Christi Piscadores (also known as Pescadores) Diving Club formed. Corpus Christi, Texas is the Headquarters of Padre Island National Seashore, which was established in 1962. Although diving off the beach in the seashore is not particularly attractive, mostly devoid of life and color, it has to be assumed that some scuba diving was taking place in the area during this time, mostly for treasure.

1958
Fort Jefferson National Monument

And treasure hunting continued in the Dry Tortugas. Fort Jefferson National Monument was set-aside in 1935 and re-designated Dry Tortugas National Park in 1992. The fort only occupies a small portion of the 64,700 acres of the park, so it is unknown if the following-mentioned search took place in what is now Dry Tortugas National Park.

In the fall of 1958, a crew from the Bill Burrud television show *Treasure*, searched for a sunken ship off the coast of the Dry Tortugas. They were looking for a French frigate said to have foundered in the area. The frigate lay in about sixty feet of water with only its ribs still standing. Reported in the December 1958 issue of *Skin Diver Magazine*, "However nothing was found of the valuable cargo of silver or copper it was

said to be carrying, nor of its strongbox. The third day brought to light a small swivel-mount cannon of a much earlier date than that of the 1880 frigate."

1958

This year *Natural History* magazine raised the profile of underwater archeology significantly with two separate articles on the subject. One was by archeologist/paleontologist Stanley Olsen, who discussed the extraordinary potential of Florida Springs for reconstructing the early human interaction with critters such as mastodon and mammoth in the Americas. He worked for the state at the time but partnered with pioneer Florida State University (FSU) student divers to obtain stunning pictures of finds at depths well in excess of 200 feet. Stan then taught at FSU in the early 1970s and was an inspiration to graduate students including Dan Lenihan (co-author of this book) who took several courses under him. Also in 1958, Stephen de Borhegyi wrote in *Natural History* of prehistoric archeological finds in spring fed Lake Amatitlan in Guatemala. He said the potential was so great it made archeology on land seem almost prosaic in comparison. He would influence other FSU students like Wayne Prokopetz who later became career NPS archeologists.

1959

Future Lake Mead ranger and scuba instructor Don Weir took the first of several scuba courses at San Diego Divers Supply in 1959 while attending San Diego State College. He was 21. (SEE PAGE 193)

1959
Lake Mead National Recreation Area

Harry Wham and his company, Whamco Divers UD-10, seemed to have stayed fairly active at the ever-popular Lake Mead. From the May, 1959 issue of *Skin Diver Magazine*:

> The Vegas Divers were contacted when the hydroplane Maverick mysteriously exploded and sank in 160 feet [in Lake Mead]...After fruitless searching in 130 feet of water, an oil slick and continuous stream of bubbles were sighted. Harry Wham followed…discovered…tied a line…hydroplane was surfaced by dropping 55 gallon drums and attaching to the boat.

1959
Glen Canyon National Recreation Area

On the Utah and Arizona border, upriver of the Grand Canyon, in what would soon become Lake Powell and Glen Canyon National Recreation Area, scuba was first used by a local construction worker on a tragedy in June of 1959. While on a troop outing, a young Boy Scout from Holladay, Utah, fell thirty feet onto a rocky ledge, rolled another seventy feet, and then dropped into the brown waters of the Colorado River near the Crossing of the Fathers (in Utah), several miles upstream of the Glen Canyon Dam under construction. The *Page Signal* reported on June 24, 1959:

> Skindiver O. D. Mort was sent for at once to enter the eddy to determine if perhaps the boy's remains weren't still there. His search yielded nothing and a further search with grappling hooks, flown in from Salt Lake City…brought no results…After several days…it was decided to call off the hunt and the boy was officially assumed to be dead.

No records were located to indicate if the boy was ever found.

1959
Vicksburg National Military Park

In 1956, Edwin C. Bearss, a park historian at Vicksburg National Military Park, NPS historian Warren Grabau and M. Don Jacks, "an old river expert" and a maintenance man for the park, together studied old documents of the War Department. They were searching for clues to the location of the USS *Cairo*, among the first ironclad warships, and one of many built to battle the Confederacy. It had struck a submerged mine and went down in this part of the Yazoo River in 12 minutes, at 11:55 a.m. on December 12, 1862. The *Cairo* was the first armored warship sunk in this manner, according to James Delgado, a maritime archeologist with a long career with both NPS and NOAA. (SEE PAGE 185)

After records pinpointed the submerged wreck to within a three-mile stretch of the river, the three men

mounted a pocket compass to the bottom of Jacks' small boat and floated downstream. As they passed near the USS *Cairo*, the compass deflected about 180 degrees and the searchers knew they were above a noteworthy metal anomaly. Probing with a twenty-foot-long iron bar confirmed that significant metal lay below. *Skin Diver Magazine*, reported "Rebels Attack USS *Cairo*," in February 1960:

> Work was discontinued until 1959, when [Bearss] a [Service] historian, sold the idea of exploration to Ken Parks, a skin diver and television executive…In October, Parks and Skeeter Hart dived on the *Cairo*…recovered some rusted spikes, but the cold water forced them to abandon the diving. On November 5, 1959, an exhibition [sic: expedition] equipped with wet suits, lights, and extra tanks was formed…Leading the trip were [Bearss] and Jacks…we anchored over the wrecked *Cairo*, and divers…down into the murky river. The first recovery was an aperture cover which covered a peep-hole on one side of the pilot house. [5]

1959
Virgin Islands National Park

In the southeastern corner of Virgin Islands National Park is Lameshur Bay, as well as the Lameshur Estate House. This became a small, active marine laboratory in the fall of 1959. The old and rather impressive house is perched on a hill overlooking the park's ranger station. The lab was one of the results of an agreement between the National Park Service and the University of Miami. Shortly after it was entered into, Dr. John Randall, his wife Helen, and their children arrived "with fish tanks, aqua lungs, spear guns, flippers, bottles and jars, underwater cameras and reference books." Their range of studies included identifying and cataloging local fish and their distributions, as well as documenting the life histories of the queen conch and the West Indian top shell.

Also working in Virgin Islands National Park at this time was supervisory ranger Bob White. So involved in the area was Ranger White, that he and his wife Helen named their son, born January 23, 1960, Loren Lameshur White. According to Bob in a letter to the author on Feb 27, 1990, "I started diving in the Virgin Islands with the University of Miami Research Team and the Navy UDT Unit, but none of the 75 dives I made down there were logged, although they ranged from 50' to about 150 feet."

1959
Lake Mead National Recreation Area

Among the first deaths of someone using an Aqua-Lung® in an NPS area was Gregory Lynn Alberts of Las Vegas. On November 8, 1959, while diving in Lake Mead, the 15-year-old was fifty yards off the park's primary swimming beach when he drowned. It is reported the young man was recovered within four minutes of his disappearing in fifty feet of water by a nearby swimmer: "artificial respiration was applied by Chapman [rescuer], but to no avail. Artificial respiration was also given by Rangers Tidwell and McLean." Dave McLean, who wrote the report for this death, would go on to become the Western regional dive officer. This is the first scuba death in a Service area we have found.

1959

Jack Morehead, who rose from field ranger to Alaska regional director, beseeched his superiors while at Yosemite to send him to dive training. But before this could happen, he accepted a transfer to the landlocked Colorado National Monument. There he was privately trained to use scuba by the Colorado River Skippers Dive Club in Grand Junction in 1959.

Most importantly, however, Morehead was soon an instructor at the service's Horace M. Albright Training Center where part of the curriculum for the rangers would be familiarization with scuba as a management tool. He went on to several areas in which diving was vital, such as Glen Canyon and the Everglades. At every oppor-

5 There was a follow up four-page article in *Skin Diver Magazine* in September, 1965, including the highlighting of Bearss, who at this time was the NPS Southeast regional historian and now working out of Vicksburg. The article, "Survey *Cairo*," describes some of the underwater efforts to stabilize the gunboat, anticipating its raising. Now partially restored, the Civil War ironclad USS *Cairo* was raised in 1965 and is a central display for Vicksburg National Battlefield Park. It should be noted that Bearss, recipient of numerous prestigious awards and considered an expert on the Civil War, retired as the chief historian for the National Park Service in 1994.

tunity, he championed scuba as a viable protection, resource, and maintenance tool. While superintendent of Isle Royale, he petitioned then NPS chief anthropologist Doug Scovill to consider creation of a permanent, in-house underwater archeological team, eventually to become the service's Submerged Cultural Resources Unit, affectionately referred to as SCRU. (SEE "THE SUBMERGED CULTURAL RESOURCES UNIT" ON PAGE 113)

Following Jack Morehead and taking his lead, other Albright Training Center ranger / instructors, who into the 1980s were crucial to the service's scuba program, included Don Jackson, Don Brown, Stu Croll, Jim Brady, and J.T. Reynolds. Closing out the 1950s, the YMCA refined the first national diver certification program in 1959. That same year The Underwater Society of America was formed, as well as the Council of Underwater Archaeology. These two groups were key in professionalizing this specific science for the National Park Service.

THE NPS AND SCRIPPS

Unless otherwise indicated, this history of the National Park Service – Scripps relationship was largely pieced together from oral interviews with Tommy Tucker (3/30/2010) and Jim Stewart (3/31/2010), as well as the article "Scientific Diving at Scripps" by Eric Hanauer in *Oceanography*, 2004.

Scripps Institution of Oceanography's (SIO) first scientific diver was a Chinese graduate student named Ceng Kwai Tseng, who collected abalone using a hardhat in 1944. In response to the death of a UC Berkeley student diving off the coast of La Jolla a few years later, the Scripps director asked his staff to develop a training program in scuba. The first official diving course was held in 1951. It was principally taught by graduate student Ray McAllister, who had Scripps Dive Card No. 1, and was blessed by Dr. Conrad "Connie" Limbaugh. McAllister began sorting out the many nuances of being underwater that we enjoy today. This included teaching the differences between the bends and air embolism. As can be imagined, with the expertise and proximity in San Diego of the navy, their training of Underwater Demolition Teams heavily influenced the curriculum. In the article "The Early Days of Scuba" in the January, 1989 issue of *Skin Diver Magazine*, McAllister wrote:

"We taught our divers to breathe regularly or exhale on the way up, to observe…Navy Decompression Tables and I added what I could about diving diseases, pressurized gas problems, hypothermia, and equipment problems.

"Shortly thereafter, I was given Diving Instructor Card #1 from Scripps. I believe it may have been the first instructor card in the US outside of the Navy. We helped the Los Angeles Department of Parks and Recreation develop its training program and instruction book, based upon our experience. They were, of course, only a short time behind us, as were many other groups."

Jim Stewart (not to be confused with the actor of the same name), a young, aggressive, and talented San Diego State College graduate student, with a degree in botany from Pomona College, got hold of some of that scuba equipment in the early 1950s and eventually became the second dive officer for SIO. In 1951, Jim became a member of the oldest skin-diving club in the country, The Bottom Scratchers, an elite Southern California group of 15-17 members that began in 1933. In an interview with the authors on March 30, 2010, Jim said he began diving "before fins," meaning such a club was built around breath-holding and spear fishing prior to the days of scuba. Big technological advances at that point centered on face masks and swim fins rather than air delivery. To be accepted in the club you had to take three abalones in thirty feet of water on one breath, take a ten-pound lobster and grab a four-foot long shark by the tail. "Fortunately," he says, "I got a shovel nose shark." Once a month while in school he would go out and "find a Black Sea Bass as large as this table" for his food.

Jim Stewart helped the burgeoning NPS program standardize its protocols. In 1964 he began providing dive training to National Park Service employees and continued to do so for the next two decades. (SEE PAGE 194)

The relationship between SIO and the NPS was a very important and formative one. It reached the policy level and affected how the agency defined and managed its program on paper. Originally, the service's first dive policy was modeled after the Navy's. By the mid-1960s, NPS divers had adopted a Scripps model. This latter served as a genesis for the diving policies of a large number of other academic and public services agencies, including the American Academy of Underwater Sciences.

Tommy Tucker transferred to Cabrillo National Monument in January of 1962 as the "acting, acting chief ranger." Soon Tucker, with his many skills and talents, ended up as the chief ranger.

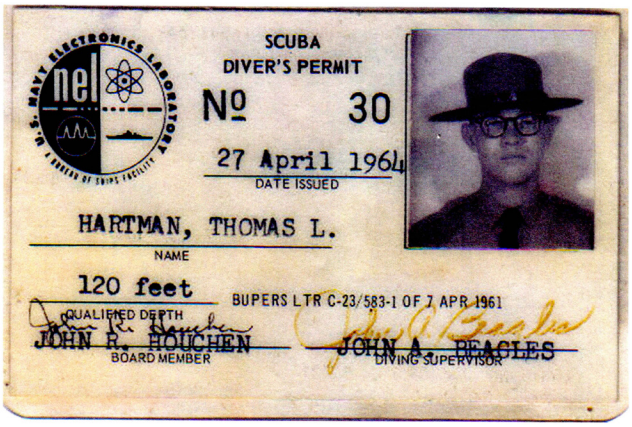
Based on what Tucker had been involved with as a ranger earlier in his career in Yosemite, he thought the park was being operated in a shameful manner. Per Tucker's recommendation, Superintendent Robinson soon hired Tom Hartman, a seasonal from Shenandoah NP, as a field ranger. In early April 1963, Robinson ran afoul of the Regional Office and by mid-August, was transferred to Crater Lake with a demotion to assistant superintendent. Tucker was made the acting superintendent of both Cabrillo (CABR) and Channel Islands (CHIS) National Monuments, and then soon, superintendent(s). The two parks were managed jointly at the time.

Superintendent Tucker began tackling some difficult issues such as feral goats and burros, and over-population of rabbits. With a lot of ocean in or near his domain, he thought his rangers needed scuba diving skills. Tucker hired Bob White, a permanent from Great Smoky Mountains NP and Jerry Lee, a seasonal from Coulee Dam NRA (now Lake Roosevelt NRA), as additional rangers for the two parks. White brought some diving skill as well as boating experience.

In 1963 Tucker contacted John Beagles at the Naval Electronics Laboratory (NEL) at San Diego's Point Loma. NEL was the next property to the north of Cabrillo. A civilian employee of the navy, Beagles was the NEL dive officer and was responsible for dive training.

On March 2, 1964, CABR and CHIS' rangers Tom Hartman and Jerry Lee began training with the nearby NEL. The six-week, 150-hour long scientific scuba diving course was intense. Hartman received NEL Scuba Diving Permit #30 and Lee received #31 on April 27, 1964. The two were certified to 120 feet. Almost fifty years later, in his 2013 letter, Lee added:

"I had rather serious problems with my ears during and after the NEL training. I often had great difficulty in getting them to clear and on a few occasions simply couldn't get down. At one point I had to have a tube inserted through my right ear drum to allow drainage. Consequently, I never really enjoyed diving and was glad to give it up."



Certification cards for Cabrillo National Monument Rangers Thomas Hartman and Jerry Lee for completing the Navy Electronics Laboratory 150-hour dive school, 1964. Courtesy of Thomas Hartman and Jerry Lee.

After this long NEL course, it struck Tucker the instruction his rangers had just received was far too heavy on combat conditioning and light on the resource management and search and rescue skills needed in a water-oriented park. Now chief ranger, Bob White knew that Jim Stewart from nearby Scripps might be able to provide that training. Stewart was a biologist and had been teaching graduate students how to dive for years, and most importantly, had been coming to Cabrillo for several years to engage in tide pool studies. White and then soon Tucker had come to know Stewart in that context and asked for some assistance, utilizing his expertise.

Beginning on June 29 and ending on July 17, 1964, White and Albright Training Center ranger skills' instructor Jack Morehead attended the SIO three-week diving class. Then Stewart held them over for an additional week to learn more about deep diving, decompression, and other advanced topics. They were issued blue SIO dive cards signed by Stewart, instead of the NAUI cards he later provided. This is the derivation of the NPS' diving "blue cards," first issued to Service divers in the fall of 1969.(SEE PAGE 68)

Superintendent Tucker was sure that what Scripps had to offer would be appropriate for what was needed at his parks. Over time and in retrospect, however, Tucker said Rangers White, Lee and Hartman never were really called upon to enhance the dive program at Cabrillo and Channel Islands but definitely were able to spread their knowledge to other parks. Soon the rangers moved on: Hartman went to Yosemite, White to Curecanti, and Lee to Lava Beds NM. Tucker said he only ever had two other rangers attend dive training: Vern Appling and George Bowen. This was in case there was some need for diving operations, but there never was.

Cabrillo paid for the equipment that Stewart wanted for his training. In 2013, Lee wrote: "I do remember that the park did pay for all diving equipment at Cabrillo including custom made wetsuits for Bob, Tom and I. Since I had no use for mine in later assignments I sent it to Bob White [for use in his park]."

Tucker began having SIO students out to the park one evening for a dinner hosted by the park. This became a much-welcome tradition for at least a decade. So, the Scripps Institution of Oceanography—National Park Service die had been cast and this relationship was cemented, lasting until Jim Stewart retired in September of 1991.

When Stewart and Scripps came into the picture in 1964, it was to first bring Ranger White up to speed in resource work and afterwards, there was no commitment to further training. Once the word got out, however, that Morehead and White had trained so productively at SIO, other parks and superintendents began calling Tucker for help. Tucker went to Stewart to see what he thought and Stewart, in turn, spoke to his boss William "Bill" Nierenberg, director of Scripps. A very persuasive Tucker worked out a deal with Nierenberg to slowly have NPS people rotate into vacant slots in the school's course. This was permitted and a significant number of divers went through the Scripps course, from 1967 to 1983.

At the time, the two National Monuments were separate park areas but until May of 1967, they were jointly administered out of Cabrillo. At this point

Channel Islands consisted of Anacapa, Santa Barbara, and San Miguel Islands, although it seems that Channel Islands did not have any jurisdiction over San Miguel. According to Tucker, "no one ever got to San Miguel and seldom did any rangers get to Santa Barbara, either." Jerry Lee, who was a field ranger at Cabrillo and Channel Islands from December, 1963 through August of 1966, wrote in a letter to the author on Jan. 26, 2013:

"There were probably 5-6 patrols to Santa Barbara Island during the time I was there. All of them were by Navy helicopter out of Pt. Magu. We would fly out, be dropped off for 3-4 days, and then picked up. We had no communication with anyone while on the island. We did shoot a few feral rabbits most trips. I was able to cite one commercial fisherman who shot a sea lion then came ashore. He was very surprised as he said he had never seen anyone there before."



1969 Scripps NPS class. Photo is on Lake Mead's Hemenway Harbor parking ramp (no longer there). The second of the two weeks of instruction was spent at Lake Mead. Jim Stewart is in rear, fourth from right. Stewart's assistant and the SIO Dive Locker supervisor, Al Stover, is on bottom, furthest on right. Two of these trainees are graduate students at SIO, the other 12 are NPS trainees. Farabee is bottom, third from right. Butch Farabee collection.

The early Scripps pre-scuba training swimming standards were hard if you were not a good swimmer or confident of your skills in the ocean. A 1,000-foot swim, which originally was around the daunting, often mist-shrouded Scripps Pier, turned into a round-trip of 2,000 feet in about twenty minutes. Initially it was to be done using only breast and sidestrokes because of awkwardness of using the crawl with a tank on. Additionally, dive students had to:

- Swim 50 yards underwater using four breaths (simulating intermittently surfacing between wave crests)
- Swim 25 yards underwater on one breath.
- Conduct a 15-foot-deep surface dive that was tested by struggling to the bottom at the end of the pier and bringing up a handful of sand. Divers could not use fins or masks, and this task was done regardless of the conditions.

All of these standards came directly from US-Navy Commander Doug Fane who had developed them for UDT-1, the underwater explosives team based in San Diego, and a good friend of Stewart's. When Scripps was developing its own dive program, the boot camp that Fane had developed was the prototype. It was then adapted along with some other standards by the NPS for entry into the agency's dive program.

Students had to demonstrate they could meet the swimming requirements and as a rule, NPS students had to prove this ability in their home park before they would show up at Scripps. As Stewart remembered, none of the new NPS students were ever failed and sent home that first day. However, in a budget request for fiscal year 1978 (dated October 13, 1978) by the Western regional dive officer Dave McLean, he says, "For the first time in three years it was not necessary to fail (and send home) a National Park Service trainee." Because of the semantics, it might be no student failed the first day, but would wash out at some point later? This is unknown.

In later years when Stewart was asked about the quality of NPS students, he said he did not see any difference in character, personality, or skill level with the average SIO graduate student who was also attending. The first NPS classes were integrated with SIO students. All students had to pass the same tests. "I want someone who is comfortable. I could pretty well tell who was going to make it when they first put their tank on."

Women and minorities were fairly common as Scripps graduate students, although they were not common within the NPS as divers. In 1975, naturalist turned protection ranger Linda Brown from the Hoh Rainforest of Olympic was the first NPS woman to attend Scripps training. Within a year or two, Brown would revert back to being a park naturalist, and would soon leave the service to get married. Virginia "Ginny" Rousseau, an eager young ranger from Yosemite was the second woman, in 1977, and two years later, in 1979, Glacier National Park's Julia "Judi" Kuncl, was the third and last woman to attend Scripps while in the service.

Although this chapter is about the relationship of the NPS and Scripps, it should be remembered at this point that there were already three women diving very actively for SCRU in 1976: Toni Carrell, Sandy Rayl and Cathy Tarasovic. (SEE "THE SUBMERGED CULTURAL RESOURCES UNIT" ON PAGE 113)

Until relatively recently, the service had little racial diversity within the protection-ranger ranks. It appears the first African American to attend Scripps

from the NPS was a ranger from Virgin Islands National Park. The authors are unsure of his name; it was possibly J. Seymour Parkes or Edmond E. Roberts. The second was James "J.T." Reynolds, a ranger from Yosemite in 1977.



Scripps Dive Training Class, fall 1977. Virginia "Ginny" Rousseau in the bottom row and Jim Stewart standing above her in the center of the center row. Ginny was the second of only three NPS women to attend a Scripps class. Second from right in center row is James T. (J.T.) Reynolds. Courtesy of Virginia Rousseau.

One of the important aspects of the Scripps training was exposure to the professionalism of the Scripps dive locker: for many years it was run by Al Stover. Stewart said both he and Stover ran a pretty tight ship. "We had paperwork on almost everything: pressure tests, compressor tests, dates of purchase of equipment, etc." This type of documentation and attendant procedural discipline promoted great control and order that, hopefully, the NPS divers took back home.

Stewart also had the opinion that people coddled gear too much. Dan Lenihan recalls going into the Scripps locker after a dive, disrobing and kicking his wetsuit into a corner. "If the gear can't take it, buy gear that can," was Stewart's singular but revealing comment.

Superintendent Tucker instructed the park's administrative officer, Kay Leahy, a former WWII Navy WAVE, to secure billeting for the students in the bachelor officers quarters at the nearby Navy Training Center for the first few classes over the next several years. Some of the better/more interested divers were encouraged to come back over time to secure additional training and serve as divemasters. Often, much of the first few days of the class took place at the upscale Torrey Pines Resort in La Jolla, which had a heated 25-yard indoor pool.

From September 18 – 29, 1978, Wayne Valentine, then a park naturalist at Gulf Islands National Seashore, attended his first two-week session at Scripps as an advanced diver candidate. This class consisted of 14 prospective advanced divers and five divemasters. "To be under the tutelage of diving guru Jim Stewart was icing on the cake." Following are some fond memories from Valentine's first class with Stewart, with McLean assisting, from a letter to the author in June, 2011.

"We met Monday, the first morning of training, at 0600 in a 25-meter pool to participate in the swim test which consisted of:

- Underwater without fins, mask or snorkel for 75 feet without surfacing,
- Swim without fins, mask or snorkel for 13 laps, not using the crawl,
- Underwater swim without fins, mask or snorkel for 150 feet, surfacing four times for one breath each.
- Approach and surface-carry a victim the length of the pool.

"I had grown up spending my summers along the coast of Delaware… an ocean lifeguard for several summers…so testing did not seem difficult to me. Some…came from areas with limited in-water opportunities, and they were not as comfortable in the water as I was. The longer underwater swim, which required exactly four surfacings for just one breath each, proved hard for many…this was Stewart's attempt to ensure we could deal with surf conditions or heavy swells where one breathe might be all we got before another wave rolled over us.

"On day 3 we had pool time on SCUBA–mask clearing, buddy breathing, etc. Thereafter we had a chilly surf entry at Bird Rock with mask, fins, snorkel but no wetsuits. Day 4 was the last day of pool time with us carrying 20 pounds of weights across the pool. I believe that was an effort to give us feel for what drowning might be about. Classroom time was interspersed throughout the week.

"Friday found us again at Bird Rock, but this time on Scuba. In class that day Stewart very casually told us about being in the territory of a 6' gray shark in 1961 off Wake Island…noticed…scaring…his arm and shoulder.

"Stewart, a scientist as well as dive officer, was the first to describe the posturing the shark did prior to the attack. Stewart advised us to stay on the bottom and 'put your back up against something.' I believe it was at this session that I first heard about 'yum-yum yellow' and how contrasting colors might be a shark attractant. Thereafter, as dive officer at Gulf Islands, I always went with black buoyancy compensators and black tanks-never yellow--for the dive locker. I even painted my two personal 'yum-yum yellow' tanks black upon returning home.

"Saturday found us at the end of the Scripps' pier in wetsuits and Scuba but no buoyancy compensators. Stewart frowned on divers overly depending on the relatively recent innovations. We did buddy breathing ascents, free ascents while exhaling, weight doffing and donning and swam 4 legs of a square with

measured leg thrusts and 90 degree turns, ending up back at the pier where we started. We then did a surf entry to the beach, although the surf was calm.

"The following year, I returned to attend the dive master class. We met in Stewart's Jacuzzi with a Tupperware container of wine and another of Scotch to discuss the upcoming two weeks of training. I remember Stewart stressing the need for us to recognize first signs of panic in our students.

"A Notable Jim Stewart quote:'Man is the slowest thing that has gone back into the water, and look at all the crap he has to take.'"

Over time and by partial happenstance, NPS slowly acquired a cadre of scuba instructors, developing from within. Ranger Don Weir became a NAUI instructor in 1971. Dan Lenihan, a Florida marine archeologist and soon-to-be head of the service's reservoir inundation study team, became a NAUI instructor in 1972, and marine biologist Gary Davis was similarly certified in 1974. Stewart participated in one Service-wide class in the east, at Biscayne with instructors Weir and Davis in 1973. They did their graduation dive at Fort Jefferson. Lenihan was certified as both an NPS dive instructor and regional dive officer after a special five-day course with Jim Stewart, who certified him to 200 feet.

Other active Service instructors at this time were Larry Nordby, a NAUI instructor and supervisory archeologist from the Division of Archeology in Santa Fe, who had become a part-time member of the Submerged Cultural Resources Unit (SCRU) team. Toni Carrell, a NAUI instructor and archeologist from SCRU also worked in this function with Dave McLean. Lastly, Larry Murphy, a giant of a man and also an archeologist with SCRU, was a PADI instructor and involved in various capacities with NPS students.

An important meeting took place at Scripps on September 23, 1971, of a key cadre of NPS divers. It set the tone for the NPS—SIO partnership for over a decade to come. Present were Jim Stewart, Bob White, and Don Weir from Olympic, Everglade's Tom Hartman, and Leroy Brock from Lassen Volcanic. Not present but having commented were Don Brown from the Albright Training Center, Jack Morehead and Bud Inman of Yosemite, and Marvin Miller from Yellowstone. White, chief ranger of Glen Canyon, was acting as the team's scribe and summarized the meeting in a February 10, 1972 memo from "National Park Service Diving Examiners" to "Chief, Division of Training."

This group agreed the 1963 version of the existing NPS Dive Policy in the Special Park Uses Handbook was, "out of date and that the revisions suggested by Richard Wilburn, Safety Officer of the US Park Police and amended by letters from various Service divers went a long way toward updating…" Bob White further wrote:

"It was the consensus of opinion of the diving examiners present…Mr. Stewart…NPS should not… certify its own instructors and carry out its own Scuba diving instruction program. Mr. Stewart has found that no other…organization can give as comprehensive a…course as…SIO...diving program…it is the consensus…outside organizations including NAUI, YMCA, military and naval diving groups…turning out divers whose training will be acceptable…provided that divers trained by such organizations are evaluated by an NPS diving examiner prior to their certification as a NPS diver...Service continue where possible to use Scripps as the primary source of divers' education…we recognize…other organizations to train divers provided they are evaluated prior to their certification by the NPS."

During the heyday of the NPS—SIO relationship, the service gratefully acknowledged the continuing key role Scripps was playing with the dive program. In late 1972, NPS associate director for operations, Ray Freeman, presented a certificate of appreciation to Dr. Nierenberg, director of SIO, for his continued support of the service's scuba diving program. This was at a dinner meeting of the Cabrillo Historical Association Board of Directors in San Diego.

Freeman was noted saying in the *National Park Courier* (January 1973 issue) that Dr. Nierenberg "is personally responsible for the continuation of the NPS diver training program and standardization of the SCUBA rescue policy throughout the Service." This recognition of Dr. Nierenberg was almost surely orchestrated through the gracious, behind-the-scenes efforts of Stewart and one way to keep the NPS—SIO relationship healthy. Nierenberg, with a PhD from Columbia University in physics, had worked on the super-secret Manhattan Project during WWII, and then taught physics at several schools, including the University of Michigan and University of California, Berkeley. Just prior to accepting the directorship of Scripps, Dr. Nierenberg had been the assistant general secretary of the North Atlantic Treaty Organization (NATO) in charge of scientific affairs. He was director of SIO from 1965 to 1986.

Throughout the service, by those who understood the NPS diving program, Stewart was universally acknowledged as the moving force behind the success of the program and was openly revered by those who went through "his" Scripps program. Interestingly, however, there may be some question as to exactly his official status, if any, with the service. Dive officer McLean referred to this in his 1980 Regional Diving Control Board Meeting summary:

"James Stewart was unable to attend…wanted to convey some personal thoughts on his relationship with [NPS]…Board concurs that James Stewart, Scripps Institute of Oceanography Dive

Officer, should receive official recognition from WASO identifying his relationship with the [NPS] on SCUBA diving…present his designation is unofficial. The Board recommends he be designated the 'National Park Service SCUBA Program Collaboration/Adviser.' He spends a significant amount of time with our agency and official designation will help justify the time he is away from his Scripps job."

Beginning in 1980 and over the next several years, the NPS increasingly used its own instructors for the servicewide dive program, particularly Lake Mead assistant chief ranger Dave McLean. McLean, certified as a NAUI instructor in 1975 and the western regional dive officer, who often served in an assistant role with Stewart in the national courses, hosted the first half of the NPS dive training at Lake Mead, then the trainees would move on to Scripps. In the early 1980s, the second half of the class shifted to Channel Islands with Stewart still contributing his extensive expertise and program guidance. Stewart felt the momentum was for NPS instructors to take over more responsibility from him each year. In the 1980 regional dive control board meeting, McLean said:

"A new emphasis in Servicewide SCUBA training was announced. Parks and Regions will be encouraged to conduct or contract, through national certification agencies such as NAUI, PADI, NSDS, YMCA, etc., basic certification courses for prospective National Park Service divers. This will enable the employee to receive the basic fundamentals of diving and to receive some significant diving experience before entering the Albright Training Center sponsored course.

"The Servicewide course will consist of a combination of 12 Advanced candidates, four Divemaster candidates and possibly one Assistant Instructor candidate. The Divemaster students would start their training three days prior to…students who would attend a ten-day advanced certification course. The Divemasters would finish with a NAUI Divemaster certification. The Assistant Instructor candidate would use the 13 days to begin his training program, the finals of which would result in an eight-day NAUI instructor certification course later in the year.

"Albright Training Center has received funding for the west coast pilot program in May and may request it on the east coast in October. The west coast sites will be Lake Mead and San Diego."

McLean in his second quarter (April, May, June) 1981 scuba summary, speaks to the course being held, and goes on to say:

"The combination Advanced Divemaster and Assistant Instructor course was very successful and we are pleased our region was able to serve as the host region. Albright Training Center has informed us they have budgeted another one for FY 82, but a decision as to its location has not been made."

With the coming of 1983, the formal role of Scripps in NPS dive certification ended, but Jim remained both an important informal advisor and served formally on the NPS National Diving Control Board as an individual. Stewart has long been viewed as the founding father figure of the service's dive program. He had provided training for at least 18 years, certified several hundred students, and provided invaluable counsel to the program for almost two decades after that. Stewart was always on the payroll of Scripps; other than receiving reimbursement for travel, Jim never saw any compensation from the NPS for his many thousands of dedicated hours of time and toil.

By 1986, however, the NPS diving training was loosing its momentum, as reflected in what McLean said in his summary of the regional diving control board meeting of November 17, 1986, held at Channel Islands. "As requested by the Board the RDO made a follow-up call to J. T. Reynolds at the Albright Training Center. When asked about the status of the ATC sponsored Advanced/Divemaster training, J. T. indicated it remains low in the funding priority due to the emphasis on Resources Management training."

Stewart retired from SIO in September, 1991. Upon his official retirement, the University of California System's Board of Regents, in a proclamation signed by the UC system's president, made him an *Emeritus*, which Jim said was like providing him a PhD without actually getting one. He was afforded an office at SIO and was considered staff. Among his many other retirement accolades, including having a mountain peak in Antarctica officially named after him, NPS director Jim Ridenour signed an Honorary Park Ranger citation which was presented to him at his retirement ceremony by several of his former NPS students, including Bill Ehorn, Craig Johnson, Norm Blair, Gary Davis, and Dave Stoltz. In early 2012, Jim Stewart left his *Emeritus Dive Officer* desk at the Scripps Institution of Oceanography due to illness. He passed away Jun 7, 2017.



Jim Stewart instructing the 1975 NPS Scripps class at the SIO pool. National Park Service collection.

1960 – 1969

The first half of the decade saw a dramatic increase in diving interest, including activity within national park areas. Establishment of new marine reserves, both state and federal, in places like California and Florida helped fuel a desire to see what lied beneath. Divers began to explore more obscure places, and dive clubs were springing up all over the country in areas not generally associated with scuba diving, such as Modesto, California, Indianapolis, Indiana, Amarillo, Texas, Hartford, Connecticut, and Flushing, New York.

There was an increased emphasis on training in NPS, especially after a slew of drownings and the death of a volunteer rescue diver in Glacier National Park in 1963. This prompted a new era of standardization and instruction, with NPS divers being taught in official scuba courses by instructors Jim Stewart of Scripps Institute of Oceanography and Harry Wham of Las Vegas' Whamco. In-water rescue techniques were taught in conjunction with the US Navy Underwater Swimming School in Florida, and NPS rangers attended the US Navy's Deep Sea Diver School in Washington, DC. Rangers who participated in these courses would go on to have long careers diving in the NPS. The service issued its first official dive policy in 1963 to address primary safety and management concerns.

The mid 1960s saw several underwater search and recovery efforts in NPS areas, including a major effort to find to lost divers in Devils Hole. By the late 1960s, diving certification cards were becoming the norm, and most divers found that they would have to go through a certification course to even fill their air tanks.

With the increase in diving activity, a greater emphasis was put on understanding the impact of divers on underwater resources. Underwater trails, such as the one in Virgin Islands National Park, were laid out to guide divers and snorkelers through rich seascapes and to reduce impacts on sensitive resources. Legislative efforts continued to clarify protections of submerged cultural resources.

In 1968, the NPS' first diving archeologists explored a sinkhole in Northern Arizona called Montezuma Well, part of Montezuma Castle National Monument. The divers were a group of young archeologists, Cal Cummings, George Fisher, and the first female NPS diver, Marion Riggs. They pioneered using scuba as a research tool in the parks.

At the end of the decade, the Tektite I project began in Virgin Islands National Park. It was the first nationally sponsored man-in-the-sea program and launched a new era in underwater exploration and saturation diving.



Ron Kerbo diving with a double-hose regulator in San Solomon Springs, Texas, 1960, prior to his NPS service. Courtesy of Ron Kerbo.

1960

Olympic National Park

On the night of January 24, two young couples driving to Washington's Port Angeles in a 1950 Dodge sedan slid on the ice and plunged into Olympic National Park's Lake Crescent. All four somehow struggled free of what quickly could have been an underwater death trap and barely escaped from the freezing dark waters. Their car quickly disappeared. Local diver John Sweatt was summoned to the scene. He dove to 150 feet and reported the auto fell off a steep cliff at about 100 feet and into an unknown depth. What makes this harrowing, albeit somewhat routine, non-fatal motor vehicle accident worthy of inclusion in this history of NPS scuba is what took place in the same spot, more than four decades later.

Beverly Sherman, who sustained stitch-requiring cuts to her face after striking the windshield, was 20 at the time of the accident in 1960. The car had been full of her luggage from a recent trip to New York and clothing for her upcoming 21st birthday party. Fast-forward to July 4, 2003, when Sherman returned to the exact spot of this ill-fated accident that occurred 43 years prior. She was there at the invitation of Dan

Pontbriand, Olympic's district ranger at the time. He was doing research for the previously mentioned *The Missing Ones*, a book about Blanche and Russell Warren, who had seemingly vanished in Lake Crescent in 1929.

Sherman and Pontbriand walked the road and she recalled with great detail the nearly fatal events of that night. Coincidentally at this time, Pontbriand's two friends, Dale and Ed Jacobs, were experimenting nearby with a recently built remotely operated vehicle (ROV). They agreed to help search for the vehicle, and found the car after 30 minutes of searching, in 200 feet of water. As retold in *The Missing Ones*:

> Beverly…was given the once-in-a-lifetime opportunity to revisit the car. The Jacobs took Beverly… aboard their boat and provided her with video goggles, while the ROV toured the car…that nearly took her life, so many years ago. A few days later, off-duty ranger divers, Art Sandison, I, and Bill Walker…found the car…retrieved a hubcap. I returned the hubcap to the owner…Dale Steele… waiting on shore…Several months later, a volunteer dive team…with special assistance from Dale and Ed Jacobs (who were able to open the trunk [with] the ROV) recovered and returned all the possessions…including clothes, books, and jewelry. Dale and Dee Dee Steele…Beverly Sherman were at the scene when divers surfaced with their possessions…Inside Edition…television show…documented the story in a program called "What Lies Beneath."

1960
Everglades National Park

On April 11-15, Everglades National Park hosted the service's first water safety and rescue seminar, held at Flamingo. Rangers from 13 NPS areas participated, as well as representatives from the US Forest Service, US Fish and Wildlife Service, American Red Cross and the US Coast Guard.

Also in Everglades in May, a meeting was held with the park's upper management, Emmet L. Hill, director of Florida Board of Parks and Historic Memorials, and Walter A. Gresh, regional director of the Fish and Wildlife Service, to discuss rules and regulations for the proposed Key Largo Coral Reefs Underwater State Park. Warren F. Hamilton was the superintendent of Everglades at this time.

The state park can trace its origin back to 1928 with Florida's Tropical Everglades National Park Association and the resulting Everglades National Park, authorized in 1947. Due to political opposition from local landowners, the reefs of Key Largo were not included in the boundaries of Everglades when it was designated, although it was part of the initial proposed area.

In 1959, Governor Leroy Collins gave the Coral Reef Preserve (Key Largo) control of the ocean bottom to the three-mile limit off the coast. On March 15, 1960, President Eisenhower authorized Key Largo Coral Reef Preserve. On that December 10th, the preserve was dedicated by Governor Collins as John Pennekamp Coral Reef State Park. Pennekamp, a long-time advocate for the preservation of the area, was an editor at the locally influential *Miami Herald*. The bronze, nine-foot high, two-ton "Christ of the Abyss" statue, which rests in 25 feet of water, has become its signature attraction.

Along with the Pennekamp State Park, 1960 saw the creation of Point Lobos State Marine Reserve in California. The state acquired 348 acres of privately owned land in 1933 intent on making some form of park or protected area, which would eventually become Point Lobos State Natural Reserve. In 1960, 750 acres of underwater holdings were added to create the adjoining State Marine Reserve, one of the first no-take marine reserves in California. The marine portion of the area became a marine ecological reserve in 1973 and in 1992 it became part of the Monterey Bay National Marine Sanctuary, the nation's largest marine reserve at the time.

1960
Lake Mead National Recreation Area

Lake Mead has been a hotbed of NPS-oriented dive activity through the years. Brothers Jim and Bill Horning, seasonal lifeguards, seemed to have performed the first scuba recoveries in the park by NPS employees, although Lake Mead had no official dive program at that time. They retrieved 29-year-old Richard Meister who drowned after falling out of a boat in Callville Bay on July 24, 1960. In nearby Las Vegas, Whamco Divers Scuba Club, as well as the Hacienda Skin Divers of Las Vegas, were diving in Lake Mead and were listed in a dive club directory of the February 1960, issue of *Skin Diver Magazine*.

Just before this July 24th recovery by the Horning brothers, the Clark County Sheriff's Underwater

Recovery Formation (SURF) made its first of at least 24 body recoveries in the recreation area. They found a 51-year-old who drowned on May 28 in Lake Mohave's Cottonwood Cove. SURF was filling a void: the NPS had no official divers. SURF was an integral part of search and recovery at Lake Mead and Lake Mohave for years. The relationship was generally very good. When Lake Mead formed its first dive team in August/September of 1964 in a small class taught by Wham, SURF formally relinquished command responsibilities for search efforts within the area. SURF still assisted, however, for at least another decade, perhaps even longer. According to the archives at Lake Mead, between 1960 and 1970 there were 44 people searched for with scuba at Lake Mead. Of this number, one had faked his disappearance, later being discovered, and two were never found.

1960

Sequoia and Kings Canyon National Parks



Kings Canyon National Park, August 1960. A hardhat diver recovering six bodies from a B-24 bomber lost on Dec. 5, 1943 in remote Hester Lake. Sequoia National Park collection.

Kings Canyon National Park's seasonal ranger Leroy Brock was spending the summer at the LeConte Canyon backcountry ranger station with his wife and six-month-old daughter. On July 28, 1960, while on an off-trail scouting trip of the area Brock, along with a two-man US Geological Survey party (Stanford University graduate student, Frank Dodge and lead researcher, Dr. James G. Moore) stumbled upon the broken remains of a long-missing WWII B-24 bomber. Much of it rested in a tiny remote lake, still partially frozen over, bordered by a nearly-inaccessible granite bench at the 11,200-foot level of LeConte Canyon, high above the ranger station. Unattractive to even the most avid fisherman, the obscure lake and nearby cliffs had kept this secret for 17 years. The army four-engine Liberator (#41-28463), just over 67 feet long with a wingspan of 110 feet, had disappeared while approaching Fresno's Hammer Field after a night-time, cross-country training flight in the early hours of December 5, 1943.

Braving frigid waters, Dr. Moore stripped and waded into the lake to retrieve a parachute canopy along with a single boot entangled nearby. The boot contained a human foot, well preserved with flesh and hair. Within three days of the wreck's discovery, even before the army could notify next-of-kin or gather a dive team together, a reporter and a photographer from the *San Francisco Chronicle* had taken photos from a plane and then rode 15 miles to the ranger station by horse back with packer John Boothe. Led by Brock, the next day all four men then worked their way up to the difficult-to-reach crash site. On Monday, August 1, 1960, the first article on the crash site was in the *Chronicle*.

A few days later, two more newspapermen, again led by Boothe and Brock, crawled their way up to the wreck. Meeting them at the yet unnamed lake was Chief Ranger Pete Schuft, having been flown in by small helicopter. This time, the photographer from the *San Mateo Times*, Bob Fischer, brought scuba gear. Too tired (or afraid) to don the equipment himself, Fischer allowed Brock, who had a little diving experience, to use it.

On August 3, a three-man US Army team from the Presidio in San Francisco flew in. Major John E. Thayer, assistant Sixth Army operations officer, along with two divers, Lieutenant Robert C. Hartmann and Staff Sergeant Henry M. Waskavitch, both with the 561st Engineering Company, landed near the lake. They made an initial survey with "shallow diving equipment" and determined most of the lake was too deep for scuba diving. Things now got much more complicated and a major exploration and recovery expedition was launched.

The next day, an 18-man crew of soldiers including two divers, bringing hard-hat dive suits, air compressors, scuba tanks, food and camping equipment, began shuttling into Little Pete Meadow, one-half mile up canyon of Brock's summer home. They were using a "Flying Banana," a Piasecki H-21, to get to the 8,960-foot high meadow. Twelve of the crew then transferred to a smaller but more powerful machine, a twin-bladed Kaman HH-43 Huskie.

The Huskie pilot, upon first seeing the proposed, higher landing spot, believed it too risky to land, so all of the equipment and all of the men were off-loaded from eight feet above the ground, 700 yards below the lake. To their credit, however, within three hours, the first dive was being made. There were two divers, Sergeants Waskavitch and Douglas McCoy. Water clarity varied, sometimes extremely clear and sometimes the divers navigated by touch.

These army divers (and Ranger Leroy Brock), were performing some of the highest scuba dives in the world, at an elevation of 11,255 feet in what is now officially known as Hester Lake. Lieutenant Robert Hester, 24, was the co-pilot of this aircraft. Poignantly, his father Clint had combed the surrounding Sierra for 16 years, looking for Robert. Clint suffered a fatal heart attack in February 1959, and he never learned what happened to his son. The official report from this expedition says that after eight days of searching the lake bottom and surrounding area, only one airman, Staff Sergeant Robert O. Bursey, the flight engineer, was positively identified. Despite five of the six airmen being officially interred in Arlington National Cemetery on October 3, 1960, much of their remains are still in the lake.

There was at least one successful, subsequent scuba dive effort on Hester Lake, not including several additional groups of people just snorkeling around the lake. The scuba trip was somewhat of a fluke in communications; acting superintendent of Sequoia and Kings Canyon granted permission to two brothers named DeSalvo, to fly by private helicopter into Hester Lake. This was done in September of 1989. They believed that what they saw was in "fabulous shape" but also going on to say in their report that it was also a "big tangled mess." Due to weight limitations on the helicopter, it does not seem the DeSalvos could have carried enough gear for more than one or two scuba dives. They did say the wreckage was concentrated at "50-60 feet of water with some scattered debris to 120 feet in depth." In the summer of 2015, a five-person team climbed to Hester Lake and explored the wreck site with a remotely operated vehicle (ROV). Their effort seems to have been pretty successful, with significant video being recorded of the wreck down to the lake's depth of 115 feet.

1960
Grand Portage National Monument

Grand Portage National Monument had a flurry of diving interest in October. In the October 23 *Minneapolis Sunday Tribune*, an article with photos showcased a set of 18 nesting metal kettle pots, surely from the Fur Trading era and lost while portaging a bad spot, found at the base of a small waterfall in the Pigeon River. Recreational scuba divers searching the area for just such artifacts had found them. Originally it was believed the antiquities were within the boundary of the monument, although Superintendent Eliot Davis quickly decided otherwise. Nonetheless, the valuable find precipitated quite a dialogue between Davis and the solicitor's office as well as the regional office. The park was clarifying the government's obligations for items found underwater, which would help set a precedent throughout the NPS. In a memorandum from the superintendent of Grand Portage to the regional director of Region Two, on October 25, 1960, "What we need to know is, who has jurisdiction over the water of the river and of Grand Portage Bay in order to see if the artifacts will fall within the scope of the Antiquities Act."

1960
Isle Royale National Park

This year, 1960, Richard "Dick" Metz brought his diving interest to the park. In an August 18, 2011 phone call with the author, Metz, who had been a Lake Superior tugboat captain and a diver in Wisconsin lakes since 1956, said, "I had never even heard of the place [Isle Royale] until then. That year [1960], when I first started diving on the wrecks in the park I ran into other divers who, when asked whether any of the ships' artifacts still remained, said 'There are not many left.' That year, I met one of the park's rangers, Bernie Gestall, who was also diving recreationally." It should be noted that in Ontario, Canada, not far from Isle Royale, there were at least nine dive clubs.

According to Metz, "My goal was to see everything there was to see on the bottom. I began diving at Isle Royale with a 3/16th-inch wetsuit, instead of a drysuit like everyone else, as well as a double-hose regulator, which I used for 25 years. My first dive was on the wreck *America* and ultimately I went to about 240 feet on my deepest dives."

1960

The first half of the 1960s saw the greatest increase in diving in the national park system. Sport divers as well as service employees, current or soon-to-be, were jumping into the sport. As a minor example, in the summer of 1960, 18-year-old ranger-to-be Butch Farabee "defied death" and began teaching himself to dive in the 10-foot deep Elks Pool where he life guarded, with scuba equipment bought locally in Tucson. The same is probably true for many others as well.

NAUI, the National Association of Underwater Instructors (formerly the National Diving Patrol) was created in the summer of 1960, becoming the first international certifying agency. That August 22-26, and at a cost to each student of $75, its first instructor certification course was held in Houston during the first convention of The Underwater Society of America. NAUI basically adopted the Los Angeles County Recreation Department's dive program. The course text for this first NAUI training, *The Science of Skin and Scuba Diving*, was by Bernie Empleton. Al Tillman, the Los Angeles County sports director in 1954 when the County Recreation Department first came out with the country's first public skin and scuba diver education program, holds NAUI Instructor Card #1.

Sometime in 1960, United States Park Police Officers William "Bill" Dove, Cornealius Gibbons "Neal" Vermillion and a third man whose identity remains unknown to the authors, attended a class at the US Navy Underwater Swimming School in Key West, Florida at the behest of the United States Park Police (USPP). Vermillion was a patrolman assigned to the USPP horse-mounted unit. The school was established on June 15, 1954 and ran until 1973. It was open to all branches of the military as well as other civilian federal agencies. It has since morphed into UDT, Special Forces, SEAL and Army Combat Diving Schools. These three USPP officers may be the first NPS employees to be sent to any form of dive training.

Per his widow Dorothy in 2014, her husband Neal Vermillion "was a fish" and used his training to recover items that tourists dropped in the waters in the parks in Washington, DC. He soon went on to write an un-dated, thirty-page instruction manual called, *Don't Panic: Under-Water Swimmer's Instruction Manual*. On the front cover is written, "C. G. Vermillion, Instructor." It is unclear how and where the designation of instructor came from, other than it was either somehow earned as a result of graduating from the navy diving school or perhaps he was so designated by the NPS, such as Jim Randall would soon be in 1962. Also on the front cover, included with a pen-and-ink drawing of a scuba diver with a double-regulator, are two hand-drawn dive flags: "CIVILIAN" and "NAVAL." At the time of writing, little else is known about his endeavor since two of the three NPS attendees of the navy diving school are deceased and the third park policeman is unknown.

1960

One of the most important pieces of legislation relating to the future of the NPS dive program as well as underwater archeology as it is now practiced in this country, was signed into law on June 27, 1960. The Reservoir Salvage Act of 1960 would be the genesis for the service's principal underwater archeology programs as practiced by the NPS Southwest Regional Office under Cal Cummings, of which more will be written. (SEE "NATIONAL RESERVOIR INUNDATION STUDY" ON PAGE 78)



Diving effort by NSS members in Devils Hole, 1961. Death Valley National Park collection.

1961

Death Valley National Park

In February of 1961, Bill Brown and Ed Simmons returned to Devils Hole for further diving. They led a team of eleven divers, and used more than 100 air tanks in the single weekend of diving. Two of these divers got to 240 feet.

1961
Lake Mead National Recreation Area

The Boulder City, Nevada-based Dam Divers Scuba Club hosted skin diving and scuba lessons in and around Lake Mead the summer of 1961 and continuing at least into the summers of 1962, 1963 and 1964. And, per the June 1961 issue of *Skin Diver Magazine*:

> Engineers of the James Montgomery Co. hired diver Harry Wham to descend 200 feet below the surface of Lake Mead adjoining Saddle Island for a topography report to assist in…a decision on the type of water intake device to install there. Wham's report…showed…it would be necessary to alter the lake's bottom by blasting.

The second recorded death of a scuba diver in a national park area again took place at Lake Mead, this time on October 2, 1961. Jackie Dale Yoss, 25, died a half-mile south of Boulder Island in an out-of-air situation. His body was recovered at 160 feet by his dive buddy, Ed Murphy. Noteworthy is the depth at which the young man was retrieved, and that it was done by one person.

1961
Sequoia and Kings Canyon National Parks

Future park ranger Jim Martin, who was referred to earlier, made at least one resource-oriented dive in Sequoia National Park's Soldier's Cave, which is on the South Fork of the Kaweah River above Clough Cave, in 1961. Described in an April 2011 email to the author:

> We did get permission from the NPS for the dive…a ranger looked over the equipment (Not Scuba trained!) and checked out the ropes and steel-cable ladders. After his inspection he gave us the permit…started to leave, he said, "by the way, can you get deep enough in the cave where you can't see any light?" OK, so much for NPS cave management.
>
> I had been in Soldier's Cave many times with the NSS; probably I was around 13 or 14 the first time I went in. I always wondered if there was cave beyond the water filled sumps at the lowest part of the cave. I was very interested in microbiology and particularly if there could be evidence of human contamination of regularly visited parts of the cave versus that area protected by water sump. So the plan was to collect soil and water samples if we reached more air filled passage. I had use of a lab at a medical research facility in Pasadena at the time.
>
> I was with a friend Bill Hollinger … learned to dive in Hawaii. We used Aqua Lung® double-hose regulators, 72 [cubic foot] tanks with what I think was called a "T" valve [J valve] which had a wire attached you could pull if you were running out of air, gave you a few minutes more. Bad, bad, bad for caves where it could be scraped…and you would find nothing left.
>
> Interesting how cave diving has changed. We had several light sources. Primary was a sealed-beam light on…a 6 v battery [per Author Lenihan, it was common practice at this time to use a light from a motorcycle, such as he had]. It worked well in fresh water but had some problems in salt water as I remember. Use to pack Vaseline around the battery terminals to keep it from corroding. Other light source was a rubber utility flashlight. Safety line was a standard 7/16" climbing rope. I had the end of the rope and was also clipped in with a carabiner so I could move…Bill was clipped in the line in a similar way.
>
> I doubt we were more than 10 feet lower than the entry point at any time. We were down for about 15 minutes when we had a hint that the end of the room was a flat ceiling that met the floor. At that point things got very serious. We were together when we turned around. Problem was we did not weight the end of the safety line so it was moving with us as we followed it back to the entry point. Not too serious, but certainly a mess of tangles to deal with. The big deal was silting out. The sealed-beam lights which gave us a magnificent view of the room as we entered reduced their output to faint amber light.
>
> We would have been screwed if we had tried it without a safety line. We got back to the entry point with no real problems but I think the only comment was something like, "Wow, that was fun!"
>
> …at that time I think we had a good dive plan, good escape plan but just did not have the equipment we needed. I say this thinking of diving with some of the best off Channel Islands, pulling lead line through kelp forest, in near storm surge conditions. I distinctly remember completing some dives there with the same comment, "Wow, that was fun!"

1961

On November 14, service aquatic biologist, Orthello L. Wallis, presented a 23-page paper while on a panel titled, *Biology of Coral Reef Fishes*, which was co-sponsored by the International Oceanographic Foundation and the NPS. Held in Miami Beach, Florida, it was a joint session of the Sixth International Game Fish Conference and the 14th Gulf and the Caribbean Fisheries Institute. The paper was titled: *Coral Reefs: A Challenge to Conservation*. Although the vast majority of Wallis' thesis focused on the conservation of reefs and their ecosystems, he was vocal about the role and impact divers and diving were beginning to play on reefs in general and those in national parks in the Caribbean, specifically.

1961

Buck Island Reef National Monument

Finally for 1961, on December 28, President John F. Kennedy authorized Buck Island Reef National Monument in Saint Croix, US Virgin Islands. Initially set aside and somewhat protected in 1948, it was not until 1961 that the 880-acre reserve was placed into the system (18,000 more acres were set aside by President Bill Clinton in 2001). The following May, with Virgin Islands NP superintendent John Lewis officiating, Buck Island Reef National Monument Underwater Trail was dedicated. The monument and the trail were first mentioned in *Skin Diver Magazine* in June of 1962. The area was one of only five national monuments set aside by presidential proclamation between 1943 and 1978.

> Secretary of the Interior Stewart L. Udall donned snorkel gear recently to go underwater with Virgin Islands Governor Ralph M. Paiewonsky...As the traditional ribbon was cut, a host of snorkel fans, including officials of the territorial government and their wives, swam into the newly sign-posted underwater gardens…Mr. Udall said: "This is the first time I've seen this underwater trail and it is one of the most exciting projects in the conservation field…"

1962

Washington Support Office

Somehow, a three-man delegation from the Underwater Society of America finagled a meeting with NPS director Connie Wirth on February 9. The three were David Stith, special assistant to the president, Underwater Society of America, Walter Feinberg, executive secretary of the Academy of Underwater Arts and Sciences, and James Dugan, a well-known author of a history of underwater exploration, *Man Under the Sea*. At least Dr. John M. Corbett, the service's chief archeologist was present, and probably others. The subject was underwater archeology, because in a follow up letter of March 23, Corbett writes to Stith, and said:

> …the Director asked me to chair a small committee…which might outline some policies, procedures and guidelines for underwater archeology not only in the Service but in the Department…a main stumbling block in this matter is the legal question of which government agency, if any, has jurisdiction over off-shore waters of the continental shelf. Over a year ago,…asked the Solicitor's office for an opinion along those lines and we have not as yet received an official reply.

The authors have never seen anything resembling a policy or any results of any committee that Dr. Corbett may have formed pursuant to the request by the director. However, we do suspect there was some action and possibly an answer to Director Wirth. The first approach to such a thing we have seen is the *Prospectus for Underwater Archeology* authored by George Fischer and Marion Riggs in late 1968, which was published in March 1969.

1962

Lake Mead National Recreation Area

Out West, with at least 24 members, the Las Vegas Silver Flipper Scuba Diving Club, sponsored by Whamco Divers, was active in Lake Mead in 1962. That year they were called upon by the park, in conjunction with Dr. Jim Deacon of the University of Nevada, Las Vegas, to work on identifying a jellyfish-like, quarter-sized creature invading the area. It turned out to be *Craspedacusta sowerbyi*, a freshwater jellyfish that is native to China. After its introduction to the US in the late 1800s, it has become established in freshwater bodies in most regions of the country.

Through the years, in addition to biological studies by divers in the area, there would be the need to

dive in response to the ubiquitous suicides at the park. On July 5, 1962, Harry Hall of Las Vegas was the first recorded jumper off the downstream side of the 726-foot high Hoover Dam.

1962
Channel Islands National Park
Craig Johnson was certified in July of 1962, while serving four "glorious" years in the United States Marine Corps. While at California's Camp Pendleton in a close-air radio support unit, Craig asked his commanding officer if he could get in on the new sport being taught off-duty on base. Only five years later, while at Sequoia-Kings Canyon, Ranger Johnson attended the second NPS Scripps class. He went on to become both Channel Islands' chief ranger as well as a Gates of the Arctic National Park chief park ranger and pilot.

1962
Montezuma Castle National Monument
Also in 1962, diver G. J. Murray and at least two members of the Desert Divers Club from Phoenix first reported that the bottom in the mysterious Montezuma Well was perhaps not the bottom. In the article "Treasure of Montezuma's Well" in the July 1962 *Skin Diver Magazine*, Murray reported on the eeriness of swimming "'. . . in a bottomless pit' with thousands of free swimming leeches." He labeled it as such after observing what he assumed as the bottom appearing as "an irregular boiling surface, like that of thin mush cooking."

1962
Early in 1962, Washington, DC based forester/ranger Jim Randall joined a local Virginia dive club and began exploring various nearby water-filled rock quarries. Looking around the country and recognizing that scuba was here to stay, Jim and his supervisor, Wayne Cone in the Division of Ranger Activities, began discussing the need for diving expertise within the NPS. After some inquiry, Cone soon made arrangements with the US Navy Deep Sea Diving School, based on the polluted Anacostia River in DC. This prestigious school, mostly devoted to hardhat diving, was established in 1927. On October 23, 1962, the chief of naval personnel authorized the NPS to join in with the training. Perhaps the navy contacts and precedent were set in motion in 1960 when the three US Park Police officers attended the navy dive school in Key West, Florida.


Sgt. Ted Chittick in Tidal Basin in Washington, DC, 1965. Chittick was looking for a billfold that a visitor dropped in the water. He found it and received a letter of appreciation from NPS Headquarters for his effort. Courtesy of Ted Chittick.

Between November 5 and 23, Randall, along with Rangers Art Johnson (Buck Island, Virgin Islands), Private Richard "Ted" Chittick, (US Park Police) and George Schesventer (Everglades) completed three weeks of intensive dive instruction by the navy. To illustrate just how unusual this training was at this time, there is a note in the Everglades superintendent's monthly report for October 1962, "Ranger George Schesventer passed a physical examination for SCUBA Diving School to be held in Washington, D.C., the first of November." According to Randall in an interview with the author in March 2011, all four NPS'ers were excellent swimmers and always did well against the young sailors. "The NPS guys were far better swimmers than the swabbies." The first week was classroom, the second in the pool and the third was spent under field conditions. "It was late November and there was ice floating on the [Anacostia] river. One of our compass destinations from the landing craft we were diving from was a sewer outflow on the south shore. . .just headed for the source of the foam."

The instructors for this school were first- and second-class corpsmen who had both hardhat and scuba diving experience and training. The trainees received a physical examination and once they had passed that, made a hyperbaric chamber dive to 130 feet. This depth was soon adopted as the maximum for all

future "routine" NPS scuba diving and was formally written into the very first NPS dive policy. In an era of common, pre-national dive certifications, Randall and his cohorts were further authorized "to serve as an instructor for in-Service diving training." This was from NPS chief of ranger services, Larry F. Cook, in a memo to the chief of personnel in December 1962. Looking back nearly 40 years later, a long-retired Jim Randall never taught nor certified anyone to dive.

US Park Police Officer Ted Chittick got into this same 1962 dive program when he heard about the potential training and asked his chief to be included. He went on to become the US Park Police's very first helicopter pilot in 1973, and retired as a captain in 1983. In a May 10, 2011 telephone interview with the author, Chittick said:

> The Anacostia and Potomac Rivers were terribly polluted in those days. The week we dove them, there'd be a Navy medic waiting for us when we surfaced to put special medical drops into our ears because of fear of infection! On another dive, the four of us were tethered together by an eight-foot piece of line. We were instructed to go to the bottom, find a cable partially buried, and follow it for fifty yards. It was only eight feet deep but the visibility was non-existent, maybe two inches. As we groped for the cable I felt this awful tugging and jerking but could not see what was causing it. Fearful of disregarding the instructions not to surface, I did anyway. There was Schesventer, very glad to see me. He had lost his mouthpiece and could not find it in the blackness and was near-panic.

George Schesventer was already an experienced scuba diver by now. According to him in a September 24, 2013 interview with the author:

> Not long before I was to report to the Deep Sea Diving School in DC in 1962, I remember sitting on the dock at Fort Jefferson [in the Dry Tortugas] after diving when a large boat motored up, two men in "out-of-place" dark suits stepped out and sized us and the area up. Not long after this, the 13-day long Cuban Missile Crisis happened! Days later, I went to Key Largo and the Navy Base to be certified for this upcoming school. One test was to put on a large, brass diving hard hat and walk around the bottom of the bay. I guess they were making sure I would not panic underwater. It was strange, because of the real threat of war, the Base was virtually empty at this time, except for us.
>
> In Washington, I remember us learning how to search underwater, off Haines Point. We did the standard circular pattern with a stretched line and found golf balls and glass shards. I also recall the thought of running into rays or barracudas while in the poor visibility. But we did just fine!

Schesventer, two years after attending the 1962 diving school, became superintendent of George Washington Birthplace National Monument, ultimately retiring out of Fort Caroline in 1989. While at George Washington Birthplace, however, the Washington Support Office teamed George up with a pretty prominent and accomplished NPS photographer, Woodbridge "Woody" Williams for a vital assignment for the service. Woody, who joined the NPS in 1961, was an excellent partner since he was already an aquatic biologist out of Scripps Institution of Oceanography. He was also an accomplished photographer, earning great credit for his journalistic photos, including those in books published by *National Geographic* and *Readers Digest*. The two, George with his own waterproof Nikonos, were sent off to take photos around the Caribbean for the well-known founder of the NPS interpretive philosophy, Freeman Tilden.

1962

Lastly for 1962, Gary E. Davis began his several-decade diving career by being first certified by The National Association of Scuba Diving Schools (NASDS) instructor Bill Johnson at the San Diego Divers Supply. He would go on to possibly make more on-duty dives than anyone else in the history of the NPS, and ultimately retire in 2007 as the chief ocean scientist for the service.



Ranger Don Jackson below Glen Canyon Dam in Glen Canyon NRA, 1963, after inspecting infrastructure. Courtesy of Don Jackson.

1963

Glen Canyon National Recreation Area

At the beginning of 1963, northern Arizona's isolated Glen Canyon Dam was high enough to begin im-

pounding water. Huge steel gates closed over the diversion tunnels on January 2 and Lake Powell, named after the director of the BOR, began to fill. As a result, an estimated 900 archeological sites were impacted, that is drowned, by the rising waters of the 187-mile-long reservoir over the next two decades. Agency interest in documenting these lost archeological sites ultimately led to the founding of the NPS Submerged Cultural Resources Unit, a team of underwater archeologists. (SEE "THE SUBMERGED CULTURAL RESOURCES UNIT" ON PAGE 113)

1963
Lake Mead National Recreation Area

Way downstream, Lake Mead was being administered by the NPS although technically it was under the BOR. Representative Walter Boring (D-NV) introduced legislation on February 21 formally establishing Lake Mead National Recreation Area and thus removing the area from administration by the BOR. Public Law 88-639 was finally enacted and the area was now under the jurisdiction of the NPS.

Three days later at Lake Mead, a 16-year-old died in a scuba accident at Rotary Cove because he was wearing too much weight. Las Vegas' Whamco Divers recovered the boy the next day. The first three deaths while using scuba in all service areas occurred at Lake Mead: 1959, 1961 and 1963.

1963
Carlsbad Caverns National Park

In the summer of 1963, a young Carlsbad Caverns tour guide, Jim Martin (a future NPS superintendent), having already cut his teeth on diving in Sequoia's Soldier's Cave just two years before, and Death Valley's Devils Hole in the mid-1950s, went underwater spelunking again. In an email to the author on March 16, 2011, Jim wrote:

> When I came on…1963 I brought my Scuba gear…Phil [brother] and I did a short dive behind the Chocolate Drip in the New Mexico Room. Really…short series of underwater sections of a slot passage and then opened up above water line. Not much new passage, but I think it was the first dive in Carlsbad.

1963
Glacier National Park

While the NPS guidelines for diving were being drafted, a double tragedy began on June 27, 1963 in Montana's spectacular Glacier National Park. This accident highlighted the need for dive guidance for the service and a much-needed internal scuba program.

Six-year-old Gregory Trenor, playing along the edge of the park's McDonald Creek near the headwaters of Lake McDonald, fell into the cold, swift current at 8 p.m. and disappeared. The Underwater Recovery Team of the Flathead Rescue Association from nearby Columbia Falls quickly responded with eight divers, including 26-year-old Tom Dumay. The hard-working volunteer team searched until 10:30 p.m. that night, returning the next morning at about 7 a.m.

Dumay was a strong young man, certified as a shallow-water diver. Due to his lack of experience, he was assigned to the relatively safe 30-foot level. But he exhausted his air supply that morning. Dumay and his partner Ronald Koppang, aided by the confusion of the unfolding emergency, soon found themselves in the darkness at 90 feet. From the Glacier archives, the event was described in "Report to Superintendent, Glacier National Park from Chief Park Ranger Lyle H. McDowell, July 12, 1963,"

> While attempting to assist Dumay, both divers were caught in a subsurface current of cold water flowing from McDonald Creek under the warmer lake water...cold water was flowing off these ledges… probably caught the divers unaware.

Koppang, who was qualified to 100 feet and was the group's only qualified deep diver, soon dropped his weight belt and rushed to the surface at 7:45 a.m. Suffering serious decompression sickness, he had to be flown to the nearest hyperbaric chamber at Brownlee Dam in Idaho. Dumay was unable to surface and was found later that day. Both Dumay and Trenor's bodies were ultimately recovered.

1963

Dr. John Corbett attended the first Conference on Underwater Archaeology in St. Paul on April 26 and 27, sponsored by the Minnesota Historical Society. Essentially this was a follow up to the Council of Underwater Archaeology being founded by John Huston. The council lasted from 1959 to 1967, coming to an end when Huston died. At this time, Corbett was chief archeologist in the Division of History and Archeology. Also attending were Eliot Davis, superintendent of Grand Portage National Monument and Ed Bearss, who then was the Southeast regional historian, duty stationed at Vicksburg. Written in "Memorandum from Chief Archeologist to Assistant Director, Public Affairs, May 13, 1963,"

> Mr. Bearss gave a most intriguing paper with slides on his search for the location, identification, and salvage of some of the material from the Union gunboat, *Cairo*…
>
> About 150 people were in attendance…many of course, were scuba divers interested in underwater archeology as a sport. Others were professional archeologists who have found that dry land…techniques can be applied underwater, although with considerably more difficulty.
>
> Without a doubt, scuba diving is increasing as a sport, and this Service will find itself more and more concerned in this activity. Potentially, there are some of our areas which may contain archeological or historical remains underwater. At various times the Service will want to be in a position to either protect these remains in place or salvage them.

1963

Park Police Officer Ted Chittick, the year after graduating from the navy diving school, asked his Park Police supervisors for much-needed dive equipment:

> I put together a proposal for a small boat with a 7-horsepower engine and three sets of dive equipment. The total was not more than $1700. The Park Police Budget Officer denied the request, believing it was way too much money….

Just over five months after Randall, Chittick, and company completed their navy dive training, the US Navy's Deep Sea Divers again hosted the National Park Service, allowing Rangers Robert "Bob" Scott (Glen Canyon) and Jerry Phillips (Rocky Mountain Region), to attend the three-week program. Washington Support Office's chief of ranger services, Lawrence Cook, signed off on their record of training. Graduating on May 3, 1963, they went through the same regimen as did Randall's group.

Randall, based on his dive training with the navy the year before, and largely using the Navy Dive Manual, along with input from Johnson, Schesventer, and Chittick, soon authored "Field Order 11-63: GUIDELINES FOR USE OF SCUBA AND OTHER DIVING APPARATUS BY NPS EMPLOYEES ON OFFICIAL BUSINESS." Per Randall:

> I was in the Washington Office when John F. Kennedy was President and Stuart Udall was Secretary of Interior, it was a great time to be there. I had great latitude and I realized that we did not have any policy or guidelines on Scuba.

Randall may have had some other impetus, as well. Service archeologist and scuba diver, Calvin R. Cummings, noted in an unpublished report from 1997 that "in 1962 NPS Director [Conrad] Wirth asked NPS Chief Archeologist…Dr. John M. Corbett to form a committee and draft a diving policy for the Service."

Among other things, this first NPS dive policy prohibited the use of mixed gas or dives deeper than 130 feet; mandated the use of dive logs; and identified the need for a "qualified diving supervisor on each operation who will be responsible for its planning, conduct and safety." These guidelines were reviewed by Navy Dive Commander Prescott and signed off on by NPS assistant director for administration, Hillory A. Tolson on August 20, 1963 in the memo: "Guidelines for use of SCUBA (self-contained underwater breathing apparatus) by Service personnel." Tolson's cover memo read:

> The use of SCUBA by employees engaged in official business is increasing and these activities must be well controlled and supervised to minimize the inherent hazards. Diving is an exacting skill and can be business extremely hazardous if the participants are not properly trained, experienced, and equipped. Each park where there is a possibility of underwater operations…by the Service or its cooperators must see to it that selected staff members are fully trained in this activity so that adequate management will insure the greatest possible measure of human safety. This is an activity wherein halfway training and experience is worse than none at all.

Additionally, Randall, in conjunction with the Washington Support Office "forms person," Millis Patton, designed the first NPS Diving Chart, Form 10-419. Like the NPS dive guidelines, the form was based on the Navy Diving Chart. According to Jim, he did not think the original design of the form was applicable to NPS diving, so he revamped it. Scripps' dive officer Jim Stewart, based on his experience, later tweaked this chart.

1963

Bill Halainen, who would go on to be a long-time park ranger (joining the NPS in 1974) and the three-decade editor of the National Park Service's "Morning Reports" and "Inside NPS," was a junior in high school in the summer of 1963 when he and close friend Dennis completed a diving class in Eastford, Connecticut. The school was conducted by Tri-State Divers School of Diving. There was no certifying body such as PADI or NAUI, and no number for either Halainen or the primary instructor, John Vandermark. Well qualified, at least for that era, Vandermark was in WWII and part of an Underwater Demolition Team (UDT). In an email to the author on December 8, 2011, Halainen said:

> Quite a guy, not to be trifled with. On the flip side [of the dive card], there are four levels of qualification—free diving, basic Scuba, advanced Scuba and instructor. I qualified for the first two, both on August 13, 1963.
>
> Mostly I remember an exercise where you donned your gear and went down to the bottom of the pool, then John came down and ripped off your mask or tank or mouthpiece…you had to recover. Also…gear was at the bottom and you had to free dive to the bottom, put everything on, clear your mask and mouthpiece and hoses…surface. The rest was standard, like laps, long-term treading water, etc.…good classroom sessions, learning Boyles Law and Charles Law and diving tables and so forth.

1963

Lastly for 1963,the service issued an all-capitalized "News Release (Interior 4214), NATIONAL PARK RANGERS CHANGE GREEN UNIFORMS FOR UNDERWATER GARB." Although we are not sure, this was probably in response to the efforts of Jim Randall, Bob Scott and the other few rangers and US Park Police that were gathering at this time. The letter from which this information was obtained (from Harry Dugan to Conrad L. Wirth, NPS director, November 22, 1963) was written the day President John F. Kennedy was assassinated.

1964

On March 2, Cabrillo and Channel Islands' park rangers Tom Hartman and Jerry Lee began intermittent training with the nearby Naval Electronics Lab (NEL) on Point Loma. The six-week, 150-hour scientific scuba diving course was intense. (SEE "THE NPS AND SCRIPPS" ON PAGE 30)

During this NEL training, Hartman was additionally tasked to assist in an Arctic pool experiment to determine optimum protection clothing for Arctic scuba diving. He recalled, not surprisingly, that he was very cold. That May, Hartman and Ranger Bob White joined in with the navy and Scripps in defining the perimeter of La Jolla Canyon for the NEL and Sea Lab II project.

Sequoia National Park's Kings District ranger Don Dayton and fellow ranger Bill Wendt started an eight-week YMCA scuba class in Fresno on March 17, 1964. In a letter to the author on February 22,1990, Dayton wrote:

> Bill [Wendt] and I requested approval to take dive training. Since there was no organized NPS training program for diving at that time, we had to pay for the training in Fresno. The Park did provide us transportation to make the 120-mile roundtrip weekly, however. We made our final test dives at Morro Bay off the coast of California. After the successful completion of the dive course, the submission of evidence…course completion and a complete medical certification, I was given a written certification signed by Regional Director [Ed] Hummel. Since a Regional Dive Certification Officer had not been selected in the Western Region, he was the only certifying officer.

In the letter that Dayton received from Ed Hummel certifying him to dive, it says, "at that time there were only 10 rangers qualified to use underwater breathing apparatus in the NPS." The certification was from

the YMCA. These other divers probably included: Tom Hartman, Art Johnson, Jerry Lee, Jerry Phillips, Jim Randall, George Schesventer, Bob Scott and Bob White. Several others who were not officially credentialed through the NPS but still may have been diving, at least somewhat officially: Bob Binnewies, Jim Martin, and Phil Martin. Additionally, there were at least three US Park Police officers who were certified to dive by the NPS at this time.

1964

Lake Mead National Recreation Area

On May 19, 1964, eight rangers and maintenance men at Lake Mead NRA graduated from a 36-hour-long dive program taught by entrepreneur and Las Vegas piano-bar owner, Harry Wham. This was under the semi-newly formed National Association of Underwater Instructors (NAUI). NPS personal who completed the course were Rangers Art Partin, Wayne Schultz, Charles Wyatt, Dick Newgren, and Jim Anderson; maintenance personnel Darnie Boaz, and Dave Littler; and seasonal ranger Don Estes. Superintendent Chuck Richey's motivation was that the trained staff would be a valuable asset for diving visitors and emergency needs.

This training did not come easily, however, as testified to by Lake Mead National Park ranger and future Department of Interior Valor Award recipient, Joe Cayou. In an October 20, 1993 letter to Author Farabee, Cayou said:

> Because of the number of drownings we experienced Art [Partin] and I got to know Mr. Wham quite well and in many of our conversations he encouraged us to start a NPS diving team. We thought that was a great idea as in most cases when someone drowned it was a good three to four hours before the rescue squad from Las Vegas would arrive…Also waiting around with family members of the individual involved got old real quick.
>
> Over the next year and a half we asked Chief Ranger Bernie Packard, on several occasions to let us start a diving team, he always said that he had talked to the Superintendent, Charles Richey, about it and the Superintendent always said no. One day I was taking Mr. Richey on a VIP trip and I asked about diving and explained our problem with waiting for the rescue team to arrive. His response was that he had been trying to get the chief ranger to look into an NPS diving team and to see if any of the park employees were interested in such a program. Needless to say we ended up getting the blessing of the chief ranger to go ahead.
>
> As far as I know most of the individuals that took the diving course from Harry Wham were quite impressed with him, especially his classroom lectures. Most of what he taught was from experience, which was obvious from the beginning of the course. Most of the field work, diving, was conducted by individuals working for Mr. Wham.
>
> Each diver was required to buy his own wet suit, face mask, snorkel, fins and booties. Tanks and regulators were purchased by the park. Knives, depth gauges and other equipment were also purchased by the individuals if they were wanted but were not considered essential at that time… all of the divers had international orange wet suits, they looked good but you know they all shrunk so bad that in later years you could hardly get into them. Wonder how that happened.

Well trained now, there is a guesstimate from Cayou in 1969 that they had 2,500 hours of water time by that point and had only suffered one ruptured eardrum. In the same 1993 letter, Cayou went on to say:

> Also, I heard the people at Scripps had a very low opinion of Harry Wham and his instructional methods…I understand the feeling was mutual. I never went through Scripps but heard some individuals that had gone through both Scripps and Harry's course thought Harry's was the better of the two, especially the classroom portion. I guess diving in the Pacific would be a little improvement over Lake Mead.

This initial 1964 Wham class became the nucleus of the Lake Mead dive team. The very next day after the team graduated, May 19, they made their first recovery using scuba. Bobbie Hager, 25, drowned because of alcohol and fatigue. After an hour of searching by the newly minted divers, he was found in 15 feet of water near the Boulder Beach swim beach.

If further incentive had been needed for this Lake Mead dive class and an NPS dive team, it may have been the disappearance a couple of months earlier of George F. Knoop. On March 27, 1964, while presumably scuba diving, Knoop's car and clothing were found near the shoreline, along with footsteps

leading down to the water. But the 34-year-old machinist did not drown. Remarkably, he had faked his death and for the next three years freely lived under the alias, John Deviland. He and his "before-his-death" wife had greedily conspired to cheat the government of thousands of dollars in Social Security benefits, while allowing him to re-marry and start a whole new life.

1964
Glen Canyon National Recreation Area

Also in June of 1964, Glen Canyon's ranger Bob Scott began teaching the first six of the recreation areas's rangers to dive: Don Jackson, Dick Barber, Dave Miller, Roger Brask, Chris Cameron and Phil Martin. Scott was born in 1933 in Hastings, Nebraska, and developed an interest in diving while working towards his rank of Eagle Scout and his two years of service in the US Navy. When asked in a September 2, 2013 interview with the author as to how and why he had been selected to attend the Navy's Deep Sea Divers scuba course in 1963, Scott could not remember.

Some four months before, on January 20, Scott was delegated a scuba instructor by a memo from the (acting) regional director, Southwest Region, James M. Carpenter. Director Carpenter's principal caveat, however, was that "No trainees will receive instruction under your authorization in your current duty assignment without prior approval of the Superintendent of the Glen Canyon…"

Almost fifty years later, in June 2010, long-retired ranger Don Jackson, would smile and somewhat fondly recall that "he knew" the first Lake Mead class "had hurried up" so they would graduate before he and his fellow Glen Canyon divers would. Scott's class graduated one week after the first Wham course at Lake Mead.



(photo by Jean Duffy)

Lake Rangers Trained For Underwater Rescue And Salvage Work

Scuba-trained rangers is the goal of the National Park Service at Wahweap with Ranger Robert E. Scott as instructor. Here, Phil Martin, left, helps Dave Miller adjust his underwater diving gear as the two rangers prepare to practice in Wahweap Creek. Others participating are Dick Barber, Chris Cameron and Don Jackson. The scuba (self-contained underwater breathing apparatus) diving skills are needed to maintain public docks and piers, work on hulls of Park Service boats, and salvage government equipment. Visitors are only permitted to dive in groups—never alone, and never out of the main channels except during an authorized search. Ranger Scott attended a U. S. Navy diving school in Washington last summer and conducted classroom sessions here in the spring. They took to the water two weeks ago

News article from the *Page Merchant* about the Glen Canyon NRA training of rangers in diving in summer 1964. Ranger Phil Martin is on left and ranger Dave Miller on right.

In addition to teaching this 1964 class at Glen Canyon, Scott principally wrote the recreation area's first Diving Manual (Section 800 of the Ranger Manual). Among other things, the manual specified: a three-man dive team, mandated a physical exam every two years, ability to swim 1000 yards on a compass bearing in full scuba gear and established a minimum of 25 hours of training in physics, physiology, and diving tables. Like at Lake Mead, the park provided most dive equipment except for personal snorkel gear.

Scott, a key player in the early diving history of the service, left his assignment at Glen Canyon not long after teaching this first scuba class for the NRA. He never worked in a diving park again, and eventually went on to become superintendent of three NPS areas: Fort Clatsop, Craters of the Moon, and retiring out of San Juan Island.

1964
Scripps Institute of Oceanography

June of 1964 continued to be a busy scuba training period for NPS staff. Rangers Jack Morehead and Bob White, both of whom already had considerable dive experience, began attending the La Jolla, California-based Scripps Institution of Oceanography (SIO) two-week course. At the time, Jack was the rangers' skills instructor at the Grand Canyon's Albright Training Center and was at SIO validating the level of training available. Bob White was the chief ranger at Cabrillo with dive experience with the University of Miami research team and the Navy UDT while with the NPS in the Virgin Islands. Stewart held the two over for an additional week to learn more about deep diving, decompression and more. According to White, over time

"It became a contest to see who could become qualified for the deepest diving, I'm afraid." It was said that while White was training, he would get so seasick that he was nicknamed Ralph for his propensity for vomiting.

Tom Tucker, superintendent of Cabrillo wanted his rangers, in this case, Bob White, to learn diving from the service's conservation, management and rescue perspective and thus helped organize training with Scripps. (SEE "THE NPS AND SCRIPPS" ON PAGE 30) The course began June 29, and Morehead and White graduated on July 17, becoming the first of many NPS students to attend Scripps over the next two decades.

The certifying dive cards Morehead and White were issued, signed by Scripps dive officer Stewart, under the auspices of the school, were blue. Later, Jim would give out NAUI cards. It is fair to state the National Park Service's diving Blue Cards, which were first printed in July of 1969 and issued that fall, can be traced back to the early cards that Scripps provided.



Horace M. Albright Training Center instructor Don Jackson giving an orientation to diving to new park rangers in 1965. Jackson had recently been certified at Glen Canyon NRA the summer of 1964. Butch Farabee collection.

1964

Padre Island National Seashore

Through the years, beachcombers and treasure hunters had collected Spanish coins and ship fragments from the beaches of the park, on the South Texas coast. History buffs knew that because of a hurricane, there had been three ill-fated Spanish galleons wrecked in 1554 somewhere in the Gulf of Mexico north of Brownsville. The ships were en route from Veracruz to Havana. Three hundred Spaniards survived and within days began their long trek south to Tampico, Mexico. It was a terrible saga of deprivation and hardship: only a few survived to tell the tale. Several months later, a Spanish expedition located the wreckage and salvaged part of the treasure. Eventually the wrecks slowly disappeared under the sand and water of Padre Island, to be mostly forgotten over time.

As author W. Dwayne Jones wrote in his 1998 *Padre Island National Seashore Administrative History*, for 1964:

> Vida Lee Connor discovered…one of the [three] wrecks during a summer Scuba diving adventure off the island. For two years she conducted research…shipwrecks and… privately documented her discovery. In 1966 Connor announced her find and marked…location with buoys. She returned later to observe a diving party excavating the shipwreck. Ms. Connor's discovery unlocked the long-held mystery of…the three shipwrecks and created one of the longest controversies over antiquities ever experienced in the State of Texas.
>
> The first of the three shipwrecks, the *Santa Maria de Yciar*, lay approximately 42 miles north of the mouth of the Rio Grande. During dredging of the Mansfield Channel in the late 1950s, workers destroyed the site leaving virtually no remains of the wreck…A second wreck, the *Espiritu Santo*…lay roughly three miles north…and a third, the *San Esteban*, another two-and-one-half miles north…All three shipwrecks rested in the tidelands on the edge of the National Seashore.
>
> In the fall of 1967, Platoro, Ltd., of Gary, Indiana, began excavation of the middle shipwreck, *Espiritu Santo*. The company salvaged some 500 items including gold bars…jewelry, and early navigational equipment. When [Texas] General Land Commissioner Jerry Sadler heard of the excavation he protested that the recovered items belonged to the State of Texas. Over the next few years, Platoro and the State of Texas argued in court over rightful ownership. At the same time, the Texas Legislature…debated and passed the Antiquities Code of Texas in 1969 to protect future archeological work.
>
> After passing the Antiquities Code, the State Legislature set up an Antiquities Committee to oversee and review proposed excavations on public lands. In 1970 staff of the Underwater Archeological Research Section of the Committee arranged for Underwater Research of Dallas to

conduct a one-month magnetometer survey of some twenty miles of the coastline. The survey team uncovered the northernmost shipwreck and confirmed its presence.

After excavations in 1972, 1973, and 1975, the artifacts were mostly sent to the Archeological Research Laboratory at the University of Texas in Austin. All three sites were listed in the National Register of Historic Places on January 21, 1974, as the Mansfield Cut Underwater Archeological District.

1965
Glen Canyon and Lake Mead National Recreation Areas

Diving at Glen Canyon received some media exposure with a two-page article, "Under Lake Powell," written by Dr. Cyril D. Foutz, for the March issue of *Skin Diver Magazine*. "The six park rangers positioned there are all scuba-trained, and have their own compressor for air. Wahweap landing has plans to set up an air station in the future." Recreational diving never really caught on, despite the glowing *Skin Diving Magazine* articles, and the principal hospitality concession never did make diving air available for visitors to Lake Powell.

NAUI instructor Harry Wham taught a number of scuba classes to park personnel and local law enforcement at both Lake Mead and Glen Canyon, down through the years. There were at least two "Wham Classes" at Lake Mead the first half of 1965. Wham taught staff at Lake Mead through at least 1971, possibly longer. The records are unclear.

Late that summer, Wham traveled to near Page, Arizona (Wahweap) for one class, graduating 15 NAUI students at Glen Canyon National Recreation Area (including several from the Bureau of Reclamation) that September 29. For this class, relatively "newly-minted" Lake Mead scuba diver/rangers Jim Brady and Jim Zink accompanied Wham and fellow Whamco instructor Harry Bosford, to assist. In a small, rented aircraft piloted by a contractor, the four flew from Las Vegas to Wahweap (Glen Canyon's first Operations Center, near Page, Arizona) twice a week for several weeks to conduct the forty-hour school. Author Farabee was a graduate of this class.



Glen Canyon dive class, fall of 1965. Harry Wham from Las Vegas was the instructor (bottom row, 2nd from right). Graduate Butch Farabee is in the back row, third from right. Butch Farabee Collection.

1965
Yellowstone National Park

Seasonal ranger Don Yestness was one of the eight staff in Lake Mead that completed a NAUI course taught by Harry Wham in June of 1964. It is believed Don had also received earlier dive training in the military, possibly as a "frogman." The following year, 1965, Yestness was a seasonal ranger in Yellowstone. Dale Nuss was the park's chief ranger at the time. That summer Yestness put on an abbreviated scuba class for a number of the rangers in the park, including fellow seasonal ranger Rick Smith. Recalling this course, Smith wrote in a May, 2015 email to the authors:

> My buddy that day was Jim Brady. Our assignment—sit on the bottom of Yellowstone Lake and buddy breathe, an exercise in case we had to do it for real. We were certainly no more than 40 to 50 feet. We settled in and Brady passed me his mouth piece. I immediately began to choke because it was covered with Copenhagen. That was the last time I buddy breathed with him.

1965
Death Valley National Park

Just before Wham began teaching these 1965 NPS classes, two divers disappeared in Death Valley's Devils Hole: Paul Giancontieri, 19, and David Rose, 20. On June 20, a trio of friends from Las Vegas entered the boxcar-sized opening and dropped to two hundred feet, but only two of them surfaced. One went back down to search for his friend, and he did not come back. Once the authorities were alerted about the missing pair, the first group to respond and enter the water-filled cave was SURF, the Las Vegas underwater

recovery team, under their mentor, Harry Wham. Then the US Navy came, as did volunteers from Nevada and Southern California. The Air Force also flew the District of Columbia's National Capital Cave Rescue Team in, with five divers. It became a media circus as well as an organizational nightmare.

During the intense, two-day search effort, about 45 divers worked around-the-clock, catnapping as best they could. At these depths it is possible the around-the-clock diving was planned that way because of the Navy Standard Air Dive Tables. The 12-hour surface intervals supposedly cleansed the system. The deepest dive in the cave, 315 feet, failed to produce anything comforting to the two mothers who stood silent vigil on the pool's rim. To date, nothing has ever been found of the two young men. (SEE PAGE 53)

1965
Yosemite National Park

On August 8, 1965, 12-year-old Daniel R. Duda, a visitor from Baillant, Ohio, crawled under the railing at the top of Vernal Fall, and in full sight of several witnesses, including his shrieking mother, was swept helplessly over the lip of the 317-foot high fall. The boy's body became trapped amidst the rocks and boiling hydraulics at the bottom, periodically appearing only then to disappear. Between agency frustration and family pressure, Chief Ranger Bob Smith finally asked assistance of Lake Mead and its dive team in early September. So Willow Beach Sub-district ranger Dick Newgren and Boulder Beach ranger, Al Denniston, flew to nearby Mariposa in Lake Mead's Cessna-182 patrol plane by Pilot Warner James. All three rangers were recent graduates of Harry Wham's dive class of 1964. Recalled by Dick Newgren in an email to the author on May 20, 2015:

> The day we flew over from Mead, the boy came up and went down. My boss, Chief Ranger Bernie Packard, insisted of Yosemite that we save our energy and we not hike up to the dive site, but rather fly in. So we flew to the top of the waterfall by the park's three-person ship, from Sentinel Dome Helipad to above Vernal Fall. Yosemite rangers carried our weight belts, tanks, ropes and rescue gear up by hand and Al and I took only our wet suits. Of course, it would have been easy and certainly safer just to walk the short, half-mile to the dive site, but it was both fun and exciting.
>
> None of us really understood the dangers (or lack thereof) that existed and so we had rope safeties from both sides of the pool. There were foot-high whitecaps and blinding spray, scary until you went under and then it was crystal clear and pretty calm. The bottom has these giant, VW-sized boulders with right-angles and deep crevices. But it did not take us long, maybe twenty minutes of tank time, to decide the boy was not there. We later learned he had floated out the night before and ultimately was located on October 16, wedged in the rocks half-way to Happy Isles.
>
> The dangerous and scary part of the dive was actually when the three of us flew out of Mariposa, which sits at 2200 feet, with all of our gear and wet wetsuits. We were so heavy, and it was so warm, the tail dropped onto the runway on takeoff, scaring the hell out of us, except for our pilot, Warner. Finally, the airport manager had to lift up the tail of the plane until the prop wash could do it. We knew nothing about flying after diving as we flew over the Sierra home to Boulder City. In reality, we were not down very deep and for very long.

1965
Point Reyes National Seashore

In 1965 and 1966, NPS and the Council of Underwater Archaeology sponsored a test survey with a magnetometer at Point Reyes. They were seeking information on the existence of historic shipwrecks, if any, in Drake's Bay. Specifically, they targeted the supposed location of the 1595 Spanish Manila galleon *San Augustine*, or some *in situ* evidence of the visit of Sir Francis Drake. This effort was mentioned in the service's newsletter from April 20, 1967. Almost half-a-century later, this spot would be declared the Drake's Bay Historic and Archeological District, a National Historic Landmark, on October 17, 2012.

1965

April 15 through April 17, the Second Conference on Underwater Archaeology took place in Toronto, Canada. Coordinated by the Royal Ontario Museum and the Council for Underwater Archeaeology, the Southeast Region's historian, Ed Bearss, gave a session on "Further Developments on a Civil War Wreck." There were thirty presenters.

AN EARLY SCUBA SEARCH & RESCUE MISSION IN A NATIONAL PARK

Scott Thybony is an independent writer living in Flagstaff, Arizona, who specializes in regional environmental, cultural, and outdoor-oriented subjects. The following is a narrative he wrote for the archives of Mojave National Monument and Preserve in 2006, about the disappearance on June 20, 1965 of Paul Giancontieri and David Rose in Death Valley's Devils Hole. At 16, Scott Thybony was the youngest member of the Washington, DC-based National Capital Cave Rescue Team, which assisted on the search. He has graciously permitted its reprinting.

The rescue squad had been in existence for less than a year, and Devils Hole was our third major incident. The Air Force had flown us to New York in midwinter, to Arkansas for an underwater rescue, and now to the Mojave Desert of Nevada on the edge of Death Valley. Only 16-years old at the time, I was the youngest member of the team. My job on this occasion was to backup those making the deep dives. The most experienced member was Jim LaVore who later became a Navy SEAL. Bill Karras, the head of the rescue team, had worked as a hard-hat diver collecting sponges in Florida. Most of his scuba experience came from diving on wrecks off the coast.

An Air Force version of a DC-6 flew us from Washington, DC, to Nellis Air Force Base on the outskirts of Las Vegas. A helicopter…shuttled the team to the cave site near Ash Meadows. Coming straight from the green of Virginia, I kept looking out the window of the chopper at great expanses of nothing. It was a sun-blasted world, stripped to bare rock, where mountains crumbled down to empty wastelands. No rivers, no lakes, no trees. It wasn't the type of country where you expected to find a deep cave filled with water.

Once on the ground we were briefed on the situation. Four divers from Las Vegas had been determined to explore Devil's Hole, despite being closed to diving. Bill and Jack Alter, Dave Rose, and Paul Giancontieri climbed a chain link fence at night to avoid the rangers. They descended to a cliff-sided waterhole, 15 feet by 40 – the size of a swimming pool at a budget motel. The opening is deceiving since an immense body of water lies below ground. As an indication of this, the pool responds to lunar cycles with a tidal fluctuation of about half a foot. This crystal-clear water is 93 degrees at the top, and the temperature increases with depth. It also has no discernible current; when packets of dye are released, they hang suspended without dispersing.

Three of the young divers strapped on single air tanks and dove into the submerged passageway. It angles down from the surface for about 90 feet to a room as large as a football field. Jack Alter remained on the surface. Those descending played out a 100-foot length of rope, standard procedure in cave diving. That meant only 10 feet of it dangled from the ceiling into the main room. The divers unclipped from the rope, which was not standard procedure, and explored the room for about 10 minutes before having to pull their reserves. They turned back with the two experienced divers in the lead and the inexperienced diver bringing up the rear.

Reaching the surface, the first two waited for the last man to join them. When he didn't appear, his brother-in-law quickly strapped on a double tank to see what had happened. He swam down through the passage and disappeared. Neither diver was ever seen again. Bill Alter drove 100 miles to Las Vegas for help.



The Washington, DC-based, National Capital Cave Rescue Team, posing before flying to Las Vegas for the search-and-rescue operation following the June 20, 1965, disappearance of two divers in Devils Hole. According to Scott Thybony, in this photo, they flew out in Air Force 2. Courtesy of Scott Thybony.

The sheriff was nominally in charge of the operation, and in those days they didn't have an incident commander. Rescues were *ad hoc* affairs, especially when teams had to be called in from outside. The National Park Service wasn't directly involved with the search efforts, as far as I could tell – no budget for underwater rescues in the desert, I suppose. When we arrived, Bill Karras took over operational control, working closely with the sheriff and the divers already on the scene. "Karras had told them," LaVore remembered, "that we had a lot more experience than we actually did, and we got a lot more responsibility than we deserved. I guess it was that grandiose arrival by helicopter than impressed everyone."

A command center had been set up at Ash Meadows, a fly-in brothel with the only air conditioning around. Being underage, they let me inside it just once for a meeting. As the deputy drove us into the compound he removed his badge, going off duty temporarily. Back at the cave site relatives of the missing men kept vigil, and I met a couple of them. The young wife of one victim was too distracted to say much. She kept looking past me toward the cave as if expecting to see someone emerge from the water.

Searchers from Las Vegas, joined by navy divers, had already searched the upper passageway and a portion of the central room. Karras organized a systematic search of the main room and the chambers connected to it. I recall two of these, and the one containing an air pocket became the primary target. Divers soon reached it without finding any sign of life. All areas previously searched were searched again. A navy chief, juggling a stack of clipboards, kept track of all divers and their decompressions. Our team wore bulky dive computers on their arms to back up the navy dive tables. During the fifteen dives, a couple of small items of gear turned up, but nothing positively linked to the missing divers.



Some 45 divers, several from Washington, DC, dove round-the-clock on the recovery effort. The search was directed by the Clark County Sheriff's Department. Death Valley National Park collection.

The…cavern formed as a series of chambers and connecting passages. From what the other divers told me, it was a fairly simple system with a few branching leads that quickly dead-ended. The floor of the main room lay at a depth of 300 feet with a single passageway continuing downward. No one had previously explored it. Since all other possibilities had been checked, it was our last hope of finding survivors. They may have become disoriented and headed down instead of up. Jim Houtz, a professional diver who had mapped the system two years before, volunteered to make the final dive. No one had gone that deep within a cave before, adding to the risk. To improve his chances if anything went wrong, Jim LaVore and my brother accompanied him for most of the descent.

Decompression stations were established at various depths, supplied with extra air tanks, where the deep divers had to spend a set amount of time when ascending. Surfacing too quickly would trigger the bends. I ran the station closest to the surface at the 20-foot level. This gave me a chance to become acquainted with the pupfish, a relict population isolated for the past 20,000 years after the climate shifted. Found nowhere else in the world, they would be listed as an endangered species two years later. The fish tended to hang out close to the surface. I don't remember seeing many of them, perhaps a couple of dozen individuals, with the rest lying low due to the unusual activity. LaVore wasn't particularly impressed by them. "Those pupfish," he said, "looked like a bunch of malnourished black mollies."

The final dive began. LaVore and my brother reached the 285-foot level, an extreme depth. Houtz continued even deeper and entered the lowest passage. It slanted downward for about 10 feet before opening into an immense room. He stopped at a depth of 315 feet, the deepest cave dive ever made at the time. In perfectly clear water, the diver shined a half-million candle power light around without seeing the bottom or sides. Since then, divers have descended more than 100 feet deeper and could see another 500 feet below. Nothing, no end in sight.

When Houtz finally surfaced after slowly decompressing, the extreme pressure had turned the whites of his eyes blood red. "There's no hope," he said. "Even if they reached a chamber with air, it would have been exhausted by now." No sign of the lost divers ever turned up, and what happened to them remains a mystery.

1965

On June 2, the Department of the Treasury transferred the responsibility for making contracts and other provisions for the preservation, sale, or collection of wrecked, abandoned or derelict property to the General Services Administration by Public Law 89-30. This would have potential effect on the National Park Service as it relates to salvaging and restoration of historic shipwrecks and related artifacts. In fact, Secretary of the Interior, Stanley A. Cain, recognized this responsibility in an April 1965 letter to then GSA deputy administrator Lawson Knott:

> The Historic Sites Act charges the [Secretary of the Interior] with carrying out a national program of preserving "historic sites, buildings and objects of national significance." In executing this program, we have regarded vessels as historic objects and have recognized as nationally significant objects the USS *Constitution*, USS *Constellation*, USS *Olympia*, and the Gundele *Philadelphia*.

1965

Lastly in 1965, a number of NPS areas with significant-sized reservoirs were officially opened in conjunction with the Bureau of Reclamation. In addition to Glen Canyon, there were Bighorn Canyon, Curecanti, Amistad, and Sanford (later renamed Lake Meredith).

1966

Biscayne National Park

South Florida's Biscayne Bay was actively being assessed for values worthy of making it a national park area. To that end, *Biscayne National Monument: A Proposal*, was issued. The 27 pages of the NPS document are filled with references to snorkeling and diving.

1966

Yosemite National Park

As documented in the Yellowstone superintendent's monthly report of June 1966, "Ranger Jack Morehead of Grand Teton National Park conducted Part I of a Scuba school held at Bridge Bay on June 6 with several Yellowstone rangers attending." Despite what the superintendent writes, Morehead, who was then stationed in Grand Teton, was only conducting a scuba familiarization for rangers in Yellowstone and not a school. That same year scuba diving organizationally intensified nationally, as evidenced by the Professional Association of Diving Instructors (PADI) being formed.

1966

Glen Canyon National Recreation Area

Although in 1959 there had been at least one use of scuba for a body recovery at Glen Canyon (technically before it became a Service area), probably the first use of the Glen Canyon dive team was on May 16, 1966. At 09:45 a.m., a radio report was received at park operations in Wahweap from the Rainbow Bridge Marina that a 7-year-old boy, Rex Allan Schultz, had drowned near Sheep Canyon, forty miles up-lake of Wahweap.

It is an understatement to say Glen Canyon has a complicated jurisdiction, with several counties in two separate states potentially being involved in this death. The sheriff of Kane County in Utah was contacted and said, "take the body to Page, although he said he would check with the County Attorney." Page is in Coconino County, Arizona. The sheriff of Utah's San Juan County was called when he learned the body might be in his domain. From the official report regarding the fatality at the Glen Canyon archives:

> The old Colorado River Channel marks the line between Kane and San Juan Counties and the exact location of the disaster would have to be determined before knowing which county had jurisdiction.
>
> The search began, first along the water's edge and then when nothing was found, inland. The discovery of tracks led the search to continue away from the water for about two hours. When they returned to the shore…found the fishing pole Rex had been using. It had fallen into the water as apparently had Rex Allan. It was then that they decided Rex had indeed drowned…recovery team dispatched, and recovery of the body accomplished by SCUBA divers…discovered…body in about 30 feet of water…Rex Allan Schultz could not swim nor wearing a life jacket.

Glen Canyon ranger Bob Scott was designated a diving examiner per a May 31, 1966 memo, signed by acting assistant regional director Thos. J. Williams.

> You are hereby designated as one of several in the Southwest Region to be an Examiner of NPS personnel who have had training and experience in the use of Self Contained Underwater Breathing Apparatus (SCUBA)…Authorization to dive, good for two years, may be made for any employees you find qualified technically and physically…Medical certification of fitness is required… Fees…may be borne by…Service.

1966
Lassen Volcanic National Park

While attending San Diego State College (now University), soon-to-be NPS biologist Gary Davis began his diving career in the spring of 1966. The school had begun its scientific diving program that year, led by Dr. Richard Ford. Ford joined the SDSC faculty that same year and he adopted the protocols and standards that Scripps had developed. Per a series of emails to the author from Gary Davis in May, 2011:

> It was basically the same program Jim Stewart used for the NPS, with the same entrance qualifications, training and operational oversight, with additional attention to scientific sampling design and data collection. I took the course at SDSC in the spring of 1966. Dick and a graduate student, Rod Wing, taught the course. Certification was only applicable on the SDSC campus. There was no American Academy of Underwater Sciences yet, to provide reciprocity or broader community standards.

That June, Ranger Davis, while serving as a road patrolman in Lassen's South District, was asked by the supervisor of the park's roads and trails crew to "help them clear a blocked culvert on the main park road at the upper switchbacks below Emerald Lake at an elevation of about 7,000 feet." The weight of the impounded water was pushing the roadbed down slope and the road's surface was cracking.

> The park had neither a dive program nor…equipment…Mike Snyder, a local member of the trail crew, had some experience with explosives and road construction, and he was a recreational diver. I was a certified scientific diver at San Diego State College and had my diving equipment with me to conduct lake surveys for a potential master's thesis project.
>
> Our initial plan was to dive into the impoundment, locate the culvert intake, and assess the blockage. We discovered…the impoundment was about 18 feet in depth, and visibility below five feet was virtually zero. We quickly determined that we could not visually find or assess the blockage. The bottom was smooth and covered with heavy, sticky, silt. After groping in the silt to locate the culvert intake for 30 minutes, we decided to place an explosive charge at/near where we believed the culvert intake was located. After two attempts to clear the blockage…we abandoned the diving. The blockage was eventually cleared.
>
> On my lieu days in July and August, I conducted ecological surveys of nine lakes near the LAVO park road: Ink, Emerald, Helen, Terrace, Shadow, Cliff, Summit, Hat and Manzanita Lakes… included Scuba…park staff wanted to know why introduced fingerling rainbow trout (*Oncarthynctus mykiss*) sometimes survived but rarely persisted in Terrace, Cliff and Shadow Lakes, and why the planted rainbows never survived long in Hat Lake and Hat Creek. I snorkeled extensively…and used SCUBA to augment my free diving…below 50 feet.

Unfortunately for Gary Davis, all of his hard, pioneering resources efforts in the lakes of Lassen, were for naught. Although receiving an MS in biology in 1971, these fish surveys were not deemed appropriate for a master's project at that time. Both Lassen Volcanic National Park and the National Park Service lost out. It was not until 1976 before the then chief of resource management, Al Denniston, hired two fisheries biologists to survey the park's lakes.

1966
Yosemite National Park

On July 15, 1966, Rangers Lew Alberts, Dick Marks, and Tom Hartman obtained authorization from the Western Region to form a Yosemite dive team. They had their first body recovery using scuba a month before, on June 7. While fishing, an unfortunate 23-year-old Gilbert Reid slipped into the icy cold, snowmelt waters of the Merced River cascading into Steamboat Bay, an Olympic-sized swimming pool-like, boulder-filled hole near the Arch Rock entrance station.

Ten days later, July 25, the Yosemite dive team used their skills again, this time on Tenaya Lake. Three young Tuolumne Meadows Lodge employees proceeded out onto the frigid waters in a crude wooden raft.

An air mattress being used in their craft blew off and John I. Buckley, Jr. chased after it. After several minutes in the cold water, the 28-year-old man went under. The others were unable to reach him and the divers recovered his body the next day.

1966
Scripps Institute of Oceanography

Alberts and Marks would then attend the third (or first, if you decide it was the earliest because it had an all-NPS contingent) Scripps class on November 13, 1966, finishing nine days later on the 22nd. Hartman was already trained while at Cabrillo. George Bowen, another participant, wrote the following in a letter to the author on August 12, 1993:

> Pool work was done at the Torrey Pines Country Club and then we moved to the Dive Locker at Scripps. Ocean dives were done off the Scripps Pier. . .and black water navigation dives were done in the Mission Bay estuary which was actually the San Diego storm sewer outfall. I picked up [Chuck] Woodbury at the San Diego Airport on Saturday [day before class began] and he and the rest of the out-of-towners lived in BOQ on the Naval Training Center base. I remember Stewart introducing me to quesadillas at the Mexican restaurant in La Jolla and after lunch, Marks and Alberts got into a Yosemite unmarked patrol car and startled the township with the outside PA hurling insults at Stewart. Hartman joined us in mid-session to take his qual dives for deep water.

In 1996, then Cape Hatteras National Seashore superintendent Tom Hartman, along with Western Regional Office staffer Merle Stitt, Cabrillo National Monument superintendent Tom Tucker, and Scripps dive officer Jim Stewart, sat down in San Diego to draft new scuba policy and develop equipment lists.

1966
Isle Royale National Park

Also in the summer of 1966, Richard "Dick" Metz went to work for Isle Royale as its tugboat captain. In an August 18, 2011 phone call with the author, Metz discusses that he had learned to dive in 1956 in the lakes of Wisconsin, having obtained his early training from a Duluth, Minnesota dive shop owner, Vince Jordan. That year he was of some help to Ranger Bill Oswald, in teaching him how to dive. The park bought a compressor, air bank, as well as several wetsuits, scuba tanks and related equipment from Jordan to begin a park dive team. Unbeknownst to the park, throughout the years Metz, possibly while both an employee as well as before and after his employment (which ended in 1973), was harvesting artifacts from park shipwrecks.

Metz always contended he did not know taking these antiquities was against the law. In August of 2011, at age 75, Metz finally recognized that his collection was of significance to the history of the area and that several artifacts were of museum quality and needed to be in the park's collection, such as the telegraph from the *Emperor* and the helm from the *Algoma*. He turned his treasures over to the park in a much publicized, mutually rewarding ceremony. Chief Ranger Dan Pontbriand enthusiastically facilitated this effort.



Metz and Jordan, December 19, 1959. Dick Metz collection.

1966

Although probably not directly connected to Captain Metz and the previously mentioned taking of artifacts from Isle Royale shipwrecks, An Act To Establish A Program For the Preservation Of Additional Historic Properties Throughout The Nation, And For Other Purposes, was enacted October 15, 1966. Often shortened, thankfully, to The National Historic Preservation Act, Public Law 96-515 partially helped address the need for the continued protection of our country's irreplaceable cultural heritage.

Finally in 1966, the 183-page paperback book *Archaeology Under Water*, written by George F. Bass,

was published in London by Penguin Books. (Frederick A. Praeger, New York City soon published it in the United States.) The book is written for the general reader but shows a primary concern for the techniques that, according to Bass, would enable the archeologist to become "*homo archaeologicus aquaticus.*"

In the 1972 review of this book by Vronwy Hankey, there is a "brisk chapter on discomforts, dangers and problems which makes the reviewer agree that 'diving is a very serious and complex matter. Three chapters on search, survey, raising and salvage…" This quote and book review are from *The International Journal of Nautical Archaeology and Underwater Exploration,* Volume 1, March 1972 and published by The Council for Nautical Archaeology. The council (formerly the committee) was formed in London in 1964 "to ensure that the many underwater archeological discoveries made by divers should not go by default through lack of contact with the appropriate bodies, and to act as a channel of communication."

In the same journal, immediately following the above book review, is an appraisal of another diving-related book, *Nautical Archaeology, A Handbook*. The point of mentioning these two books at this time is to highlight that in Europe it seems underwater archeology was being done quite successfully. The authors think it important to offer some points of clarification. Shipwreck archeology was off to a bumpy start in the US because in the 1950s and 1960s professional archeologists in the Americas saw New World shipwrecks as being in the realm of history; post-Columbus wrecks weren't seen as old enough to require attention of archeologists. The term archeologist was often used as a synonym for "prehistorian" and American archeologists are often more tied to the anthropological community in the US, not history. There was not even a venue for New World historical or shipwreck archeologists to submit a paper until formation of the Society for Historical Archaeology in 1967, which was co-founded with the Advisory Council on Underwater Archaeology.

On the other hand, the American work with prehistoric underwater sites was proceeding in Mesoamerica, and most dramatically in Florida with the 1950s research in sinkholes by the University of Florida and the 1958 work at Wakulla Springs (SEE PAGE 78). In 1968, a steamboat was discovered on federal land in the Desoto Wildlife Refuge. It was later excavated by private permit holder with another agency (the old Bureau of Sport Fisheries and Wildlife). But supervision and documentation were by NPS (SEE PAGE 63). The NPS printed the first US site report on a shipwreck, *The Steamboat Bertrand: History, Excavation and Architecture* by Jerome Petsche. The *Bertrand* sank on April 1, 1865 a week before the Civil War ended. Although an important pioneer shipwreck report, it should be noted for this particular discussion that it wasn't a diving operation. It was in a cornfield and the water level was kept manageable with the use of well points.

Note that even after conducting an excellent project on Mediterranean vessels, George Bass, who was a classical archeologist could still not get funding from the archeological community in the U.S as late as the 1980s. He used an historical particularist approach to studying classical period shipwrecks rather than one steeped in social science. American archeologists were anthropologists. They required research designs and discussion of how one's methods addressed social organization and change. The fact that his work was setting a new practical standard for working underwater was not enough to get his grant proposals approved in their eyes.

1967

Karl T. Gilbert, chief of the Division of Resources Management and Visitor Protection, who oversaw the service's application of NPS diving as well as the service's law enforcement efforts, had some concern for the antiquities that might be underwater in national park areas. The following is language of Gilbert's April 26th response to a request for a Marine Environment Study Plan. We are unsure what part of the NPS or DOI asked for this, except the name Mr. Buschman, is mentioned in the memo.

> Increased members of professional and recreational-amateur skin divers are exploring the submerged lands of our coasts and the Great Lakes. They are discovering many items of significant historical and archaeological importance. Legal questions regarding the application of the Antiquities Act of 1906 in marine archaeological sites and artifacts, to the salvage of historic vessels (including old naval vessels), etc., are raised by these activities. When, where, and for what objects does the Antiquities Act apply? If it does not apply, what other Federal or State or International laws do apply.

1967
Chickasaw National Recreation Area
When now-retired Chickasaw ranger Butch Hill began at what was then known as Platt-Arbuckle National Park in 1967, the area already had a well-established NPS dive team. According to Hill in a 2011 phone call with author Farabee, the team included Bill "Bunny" Burnside and Bill Germeraad. The park was buying some or all of their equipment, although the park did not get a dive compressor until about 1976. Ranger Germeraad had received his initial dive instruction in the fall of 1965 while stationed at Glen Canyon.

1967
Rocky Mountain National Park
In late spring of 1967, rangers in Rocky Mountain National Park became very interested in diving. Jerry Phillips, who had gone through the US Navy Deep Sea Divers course three years before, began to coach Tom Griffiths and Doug Erskine in the local Estes Park pool. Jim Randall was now chief ranger and soon contacted Dick Smith of Colorado Divers Supply in Denver to put on a school for park staff. In addition to Phillips, Erskine, and Griffiths, other participants were Rangers Morris Brown, Roger Pfeiffer, Hank Jones, and Cecil Lewis and Al Simonds from Shadow Mountain, as well as the local Estes Park physician Dr. Sam Luce. He gave them all physical exams as well as then participating in the training himself. As recounted by Jim Randall in a 2011 interview with the author:

> We bought regulators and other equipment from Smith at a big discount. We did not make any open water qualifications with Smith. . .a NAUI certificate on July 12, 1967. Using the Shadow Mountain patrol boat we made a 130-foot dive, using an anchor line to go down. My partner was Ranger Cecil Lewis. My underwater light went out at ninety feet but we went to the bottom. As we ascended, my light came back on. Long after our training, our Scuba instructor Dick Smith was arrested smuggling drugs into the country by hiding drugs inside of his Scuba tanks. After the arrest, his son took over the business.

1967
Scripps Institute of Oceanography/Cabrillo National Monument
The article, "Scubans at Cabrillo," written by Cabrillo National Monument correspondent Kay Leahy, appeared in the December 1967 issue of the service's magazine, *National Park Courier*:

> . . .on the Star-Trek-like apparitions above, SCUBA—Self-Contained Underwater Breathing Apparatus—The first Service-wide SCUBA Training Course was held at Scripps Institution of Oceanography in San Diego September 11 through 22. Instruction was in charge of Diving Officer James R. Stewart.
>
> Over the past few years several Cabrillo Rangers have graduated from this course. In the fall of 1966, a pilot class was arranged for Western Region trainees only. This year's candidates for the course came from all over the country; were selected, for the most part, early in the summer, and were advised by the Diving Officer that only those in prime physical condition should report. Size of the class was limited to 12, as Mr. Stewart felt that was the maximum number that he could train at one time on a concentrated two-week course. At the end of [the] training period, nine candidates were certified for diving to a depth of 30 feet. The other three developed varying degree of sinus or ear infections during the course which precluded their diving.
>
> [Recipients of] certificates were: Raymond A. Kimpel, Cape Cod; Gary N. Brown and W. Tom Milligan, Yellowstone; Donald H. Weir and Larry B. Thomas, Lake Mead; Billy L. Bessett, Platt-Arbuckle; James R. Liles, Point Reyes; Robert C. Johnson, Sequoia; and Newton Sikes, Grand Portage.
>
> The training was provided free of charge by Scripps, and economical billeting was arranged with the Naval Training Center, which included quarters in Chief Petty Officers Quarters at no expense to the National Park Service, and meals at a minimum charge.

1967
Lake Mead National Recreation Area
Don Weir joined the NPS in 1966. After the initial three-month-long "Introduction to Park Operations" training at the Albright Training Center and then being assigned to Lake Mead as a patrol ranger he got his wish, along with eight others from seven other NPS areas, of going to Scripps in 1967. "I found the experience exhilarating and not only found out what I should be doing but also found out that a good deal of

what I had been doing was downright dangerous." He would go on to become the Lake Mead dive officer in 1970 and a NAUI instructor the following year.

One of several former servicemen to become an NPS diver was Orville E. Rogers, who retired as a US Navy chief boatswain mate with twenty years. He had principally been a hardhat diver, with cross-training in scuba later in his military career. In the fall of 1957, using the GI Bill, he entered Humboldt State College (in Arcata, California) in biology. Eventually armed with several summers as a seasonal ranger in Olympic and now a college degree, he soon landed at Lake Mead as a supervisory park ranger, stationed at Las Vegas Wash, about 1967. Rogers was a massive, solid man, and at least 6'7" tall, a scuba tank seemed small on his back. With his high skill level and many years of confidence born of nasty situations, his fellow NPS divers loved him as a buddy, particularly when faced with literally feeling around for the likes of a dead body at sixty feet in the shadowy gloom of the Vegas Wash gypsum shelves.

Lake Mead bought a large air compressor in 1967. Later that same year or in early 1968, rangers salvaged seven surplus oxygen tanks from nearby, Las Vegas-based Nellis Air Force Base (seven more tanks were added in 1970). Local Whamco Divers hydrostatically tested them and then the rangers built a compressed-air cascade system in the basement of the new Boulder Beach Visitor Center (now the Alan Bible Visitor Center). They could fill about fifteen dive tanks with the cascade system and they had at least thirty tanks ready at all times.

1968

The "National Park Service Free Diving Policy and Guidelines," was published as Part 5, Chapter 1, Release No. 3, in the *Special Park Uses Handbook*, issued September 26, 1968. This document finally led to the service devoting a separate guideline to diving, not as a section of a handbook. It eventually morphed into becoming the *Service SCUBA Diving Policies and Guidelines*, first published as *SCUBA Diving Management Guideline, NPS 4*, in September of 1975, the fourth such service-wide guideline to be released.

A serious, service underwater archeological study finally took place at, of all spots, the 368-foot wide sinkhole within northern Arizona's Montezuma Well, in October of 1968. This was the first such project by the National Park Service using scuba. The superintendent was Hugh B. Ebert, who reportedly was fully supportive of this novel research effort in the remote desert.

Ironically, however, over six months *before* these dives ever took place, Chester A. Thomas, the chief of the Southwest Archeological Center in Globe, Arizona, wrote an April 1 memorandum to the chief archeologist in Washington, John Corbett. This must have been in response to a "Due Date Request" by Dr. Corbett of all of the NPS regions, for information on underwater archeological projects in their areas.

> It is very doubtful that there would be any potential for underwater archeology in the Southwest Region with the possible exception of Padre Island National Park [Sic: Seashore]. While there are some rumors of sunken ships along the coast. . .I know of no particular site. . .
>
> We have two. . .of our staff who have the requisite swimming ability and an interest in developing skills in underwater archeology and SCUBA diving.
>
> Martin Mayer. . .Don Morris. . .both of these young men have expressed keen interest in learning SCUBA diving and underwater archeological techniques...opportunities for training should be brought to their attention.
>
> We have no one on the staff at present who has had experience either in SCUBA diving or underwater archeology.

Martin Mayer became a diving archeologist at Golden Gate National Recreation Area and is deceased. Don Morris worked as an archeologist and diver, retiring out of Channel Islands National Park and as of 2016, is still alive and very active.

1968

Montezuma Castle National Monument

Some 100 miles away from Chester Thomas and the Southwest Archeological Center in Globe, research at Montezuma Well was being led by NPS archeologists Cal Cummings and George R. Fischer, and included Marion Riggs and Roberto Costales. Fred Mang of the Washington Support Office documented the effort with photos. Dive gear was rented in Phoenix. In his 1975 report published by SEAC, "Montezuma Well: An Experimental Underwater Archeological Investigation," Fischer noted:

> All dives were made using conventional SCUBA with standard 72 cf single tanks. Air was supplied by a Cornelius compressor… operated from a 12-foot boat with safety lines on each diver. One person in the boat kept the craft positioned while a second assisted the divers on entry and exit and tended the safety lines. The tender also served as safety diver.
>
> The initial diving was exploratory and took place near the center of the lake. The first observation of the dives was that they had been confused by information from a limnological study of the Well…which stated that water turbidity, when compared to a bank of distilled water, was zero. Clear distilled water must be as difficult to find in Central Arizona as diving equipment, since the visibility was limited near the surface and nearly zero at maximum depth.
>
> The cultural material collected totaled nearly 700 items, predominantly pottery, but including worked obsidian and chert flakes (many exhibiting fire fracturing), ground basaltic stone, argillite, fired clay, animal bone (all charred), and a single fragment of human bone.

Cummings began his NPS career at Wupatki in 1962, then to Tuzigoot until 1967. He became scuba certified while an archeologist at Sanford Recreation Area (now Lake Meredith NRA), working there between 1967 and 1969, which is where he was when he agreed to dive at Montezuma Well with Fischer. Also providing logistical support on this historical endeavor was Roberto Costales, an archeologist at Montezuma Castle. Costales was physically fit but was not a diver, although he had been a navy rescue swimmer.

Fischer began his NPS career in 1959, as a seasonal ranger and archeologist at Mesa Verde and Wupatki. In 1962 he became a permanent archeologist at Montezuma Castle, which also administers Montezuma Well. During this time he met Cal Cummings, who was at nearby Tuzigoot. They used to exchange jobs one day a week to keep the boredom down. Four years later he found himself in the Washington Support Office, where he served as a GS-11 staff archeologist and where he became very interested in underwater archeology. To this end, he and fellow archeologist, Marion Riggs, took scuba lessons at the YMCA during the summer of that year in Washington, DC. The certification was paid for by the Office of Archeology and Historical Preservation, which was created the year before and where they both worked. They were now the second and third archeologists officially trained to dive for the National Park Service, behind Cal Cummings.

After their initial diving at Montezuma Well, Fischer and Riggs were able to purchase three sets of diving equipment, including scuba tanks. Their supervisor, Dr. John Corbett, the chief archeologist for the NPS in the newly created Office of Archeology and Historic Preservation (OAHP), was very supportive of their efforts. In fact, he had attended earlier conferences on underwater archeology. Corbett's boss, however, Dr. Ernest Allen Connally, a historical architect from the University of Illinois and newly arriving in 1966 after the recent passage of the National Historic Preservation Office, was not. Fortunately for the program Connally's superior, deputy associate director Johannes E. N. "Joe" Jensen, a WWII US Navy hard-hat diver, was eager for all of this to bear fruit.

Riggs was a 29-year-old GS-7 archeologist, with the Washington Support Office being her first permanent assignment. "I was actually hired to start and improve the Department of the Interior museum in the Main Interior building. I never really got to do that." Previously, beginning in January of 1967, she had been a temporary hire, working as an archeologist for the Western Regional Office in San Francisco while doing graduate work at San Francisco State. Most notably, she is the service's first female diver. In personal communications with the author in 2013, Riggs recounted her early experiences:

> I just fell into it and was in the right place at the right time. To some degree, both of us, myself as a woman and with George, were pushing the envelope on a lot of interesting fronts. Many difficulties, such as we had to get special permission just to get wetsuits, especially one specifically designed for a woman. Mine was a colorful psychedelic green! How that got through purchasing, I will never know.
>
> I was in the middle of the agency's bias against women doing "ranger things, like law enforcement or search and rescue," [a bias tacitly supported by much of the Service's upper management—Author Farabee] I do know that once I was certified and we had done the Florida and Montezuma Well dives, I really wanted to write the Director a memo to point out that women were now diving under NPS auspices—and perhaps the instructors at Albright might need to refrain from telling female rangers they couldn't do XYZ aspects of traditional Park Ranger duties (search and rescue, law enforcement, diving, etc.). But the commentary didn't come until I sent in a suggestion form a year later about changing the women's uniform….

In addition to being the first woman diver in the NPS, Marion Riggs is probably better remembered as a principal member of the milestone revamping of the agency's women's uniforms, championed by Director George B. Hartzog in the late 1960s. So key was she in this effort to re-style the women of the service, she is the featured photo on the cover of Bryce Workman's monumental work on NPS uniforms, *National Park Service Uniforms: Breeches, Blouses and Skirts: 1918-1991--Number 4*.



Montezuma Well, 1968. Left to right: Cal Cummings, George Fischer, Roberto Costales, and Marion Riggs preparing to dive in the Well. NPS photo by Fred Mang.

She was one of a half-dozen women who were used, not only as uniform models when Director Hartzog unveiled the seven different styles on June 27, 1970, but also selected to show the product to the field. This included a solo performance with President and Mrs. Lyndon B. Johnson at the Texas White House. She gave the President and Ladybird a private showing of the uniforms, just the three of them. In addition to being on the cover, Riggs is also featured in no less than five other photos in Workman's book.

Needless to say, diving at Montezuma Well was at the least, very interesting, particularly for those with limited experience, such as Riggs and Fischer:

> …at first as we descended in an upright position we were unaware we had reached bottom until, at a depth of 50 feet, it began to cover our face masks…we began to rapidly ascend upward. Our movements produced a rate of ascent of the bottom material greater than ours and we were soon enveloped in a black cloud of extremely fine silt…The water was then filled with an abundance of leeches…but none of the divers were bitten. It was disconcerting, however, to occasionally discover one trying to mate with its reflection in your face plate.
>
> I only dove twice. I clearly remember coming up from my first dive, after being down in the heavy soupy, quicksand-like water, with almost no visibility, and saying, "This is really, really scary." The sediment stirred up by the constant inflow of water into the Well is what keeps the visibility near zero and the suspended silt was somewhat the consistency and color of thickened café au lait. It was unsettling, and nothing like diving on the Florida Keys or even in the Patuxent River where I had recently learned to dive (maybe close in terms of visibility, however).
>
> On our team, in addition to George, Cal and myself, was Roberto Costales, the permanent archeologist at Montezuma Castle. He was a tremendous help, able to quickly see solutions to our problems. Such as getting the boat, tanks and other equipment down to the water; because of those logistics, it seems to me we were actually just in the water eight or ten hours.

The only other diving Riggs did as an archeologist, was when she and Fischer acted as "some kind of consultant when treasure hunter [Tom Gurr] found a shipwreck in the Florida Keys," the galleon *San Jose y las Animas* of the 1733 Spanish fleet. Both scientists worked on the Smithsonian Institution's project to map the *San Jose*, which had sunk in about thirty feet of water in a devastating 1733 hurricane off of Islamorada, Florida. This short assignment was just prior to going to Montezuma Well, after which she served in the Washington Support Office for only nine months before being "downsized" to Walnut Canyon National Monument in Flagstaff, Arizona. In 1977 Marion Riggs transferred to the US Forest Service as an administrative clerk, never diving professionally again nor serving as an archeologist. She retired in 1992.

As has been stated but which is worth repeating, the underwater archeological investigation that took place at Montezuma Well in 1968 was the beginning of a long and ongoing proud heritage of National Park Service scuba diving research efforts. Cummings, Fischer, and Riggs were the federal government's first diving archeologists, or at least the first to use it in an official context.

1968

Curecanti National Recreation Area

That summer "Larry Waldon, Rich Littlefield and I [Bob White] did a particularly nasty dive in the stilling pond at Morro Point Dam below Curecanti NRA in completely opaque water, looking for rocks and other obstacles." This was described in a February 1990 letter from Bob White to the author.

1968/1969

Midwest Archeological Center (NPS)

The *Bertrand* was a paddle wheeler traveling regularly up the Missouri River carrying supplies from St. Louis to settlers in Ft. Benton in the Montana Territory. She sank in March of 1865, in what is now Desoto National Wildlife Refuge on the Missouri River, between Nebraska and Iowa. A major excavation utilizing archeologists from the Midwest Archeological Center was conducted throughout 1968 and 1969. The team excavated over 200,000 items. Much of the cargo was still packed in the original crates, with the names of the manufacturers, shippers and consignees and all dated on the morning of April 1, 1865. The recovered items provided a remarkably thorough representation of the flow of goods from St. Louis to the Montana Territory at the time. Jerome Petsche was the director of this project. No diving was involved as well points kept the site dry. This is noteworthy as it is the first shipwreck excavated by the NPS.[1]

From July to September 1969, George Fischer from SEAC assisted with the excavation of the 19th century steamboat. For Fischer, the experience exemplified the nature of historic shipwrecks, which allow explorations into a specific day or event caught in time.

1969

Virgin Islands National Park

The following article was highlighted in the July 1968 *National Park Courier*: Although this article came out in 1968, the two Tektite missions did not begin until 1969.

> *Tektite Underwater Human Habitat Project Underway at Virgin Islands National Park*
>
> Four Department of the Interior scientists will live and work on the bottom of Great Lameshur Bay in Virgin Islands National Park at a depth of 50 feet for 60 consecutive days during a joint ocean research program that will be staged early next year…Operation TEKTITE I…will involve the US Navy, the National Aeronautics and Space Administration, the Department of the Interior, and the General Electric Company.
>
> The overall objective of this program is two-fold: (1) to conduct extensive marine science studies on the ocean bottom, and (2) to study and observe the behavior of men living in relative isolation in an alien environment under stress. Such data…applied…future undersea missions and…extended…space missions.

The two projects' names, Tektite I and Tektite II, were inspired by tektites, which are small mineral objects found both on land and in the ocean that have survived a flaming passage from space through the earth's atmosphere. Tektite was the first scientists-in-the-sea program sponsored nationally. The four Department of Interior aquanauts, Ed Clifton, Conrad Mahnken, Richard "Rick" Waller (who was instrumental in the drafting of NPS dive policies), and John Van DerWalker, descended to the ocean floor in Great Lameshur Bay in Virgin Islands National Park on February 15, 1969. This site was chosen because of its extremely clear, warm waters and its lush tropical plant and animal life. Abundant coral reefs supported prodigious reef-fish populations, plus spiny lobsters and other species, providing an excellent opportunity

1 Petsche's report in 1974 is a classic as the first significant documents in shipwreck archeology in the New World. *The Steamboat Bertrand: History, Excavation and Architecture* by Jerome Petsche was published by the NPS with a foreword by Rogers Morton, secretary of the Department of the Interior, and a preface by Ronald Walker, director of the National Park Service. An important work, it set the bar for shipwreck work in the United States. Wilfred Logan, chief of the Midwest Archeological Center in Nebraska, was given special mention, as was George Fischer for putting the team in contact with authorities on steam-boating and the time spent working in hot and muddy conditions. It set a precedent for NPS dealing directly with shipwrecks, dry or wet, that had begun with Ed Bearss in the 1960s work on the *Cairo*. The service's later handling of the *Cairo* site demonstrated, along with the *Bertrand*, that shipwrecks were important pieces of the nation's heritage and would receive close attention by agency professionals.

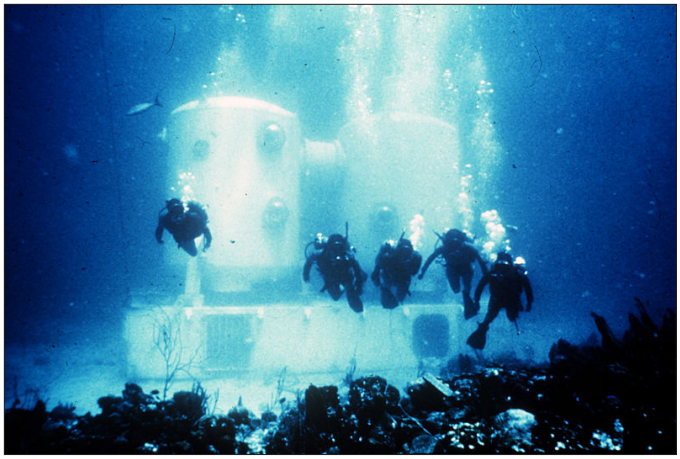
for direct biological and oceanographic studies. However, much of the research for the Tektite project centered around humans in the new environment. Topics investigated included blood changes, sleep patterns, oxygen toxicity, microbiology, decompression sickness and mycology.

By March 18, the four had established a new world record for saturation diving by a single team. They returned to the surface on April 15, 1969, with over 58 days of scientific studies, and needing more than 19 hours of decompression time. The US Office of Naval Research coordinated Tektite I, while the US Department of the Interior coordinated Tektite II in 1970.

The undersea habitat was constructed by General Electric's Missile and Space Division in Valley Forge, Pennsylvania. It served as the home and laboratory for two full months for the team of four DOI scientists. Their contact with the outside world was limited to voice communication. Behavioral scientists and physicians were to observe the diver scientists both inside and outside the habitat via closed-circuit television.



Placement of the Tektite habitat in Lameshur Bay, Virgin Islands National Park, 1969. Photo by Gary Davis.



Divers from the Tektite I team swimming away from the habitat in Lameshur Bay, Virgin Islands, 1969.

Their home-away-from-home consisted of two vertical structures 12 feet in diameter by 18 feet high connected by a flexible, four-foot diameter tunnel. It was seated on a rectangular base in about fifty feet of water. Each structure had two living compartments, one above the other. Food supplies were stored in the capsule before its descent. Water and a breathing mixture of oxygen and nitrogen were supplied through a lifeline linking the capsule with a shore-based complex. Separate cables provided power and communications. There was also a small two-man submersible for the scientists to use on excursions away from the habitat.

The shore-based support complex was constructed by US Navy Seabees adjacent to the Ecological Research Station operated by the College of the Virgin Islands in the park. From the March, 1969 volume of the *National Park Courier*:

> Aquanauts To Surface On April 15 [1969]
>
> TEKTITE operations at the Lamesure [sic] Bay Underwater Human Habitat Project are reported to be moving along on schedule…They plan to surface around April 15. Park Ranger Gary Davis, one of the back-up diver-scientists, is providing surface support and is actively participating in various phases of the biological program.

On March 17, the two-hour-long documentary, "Three Young Americans in Search of Survival," aired on ABC-TV. The news special, narrated by actor Paul Newman and promoted by renowned journalist Peter Jennings, "probes the ideas, ideals and energies of three Americans…[one of which was] Mary Margaret Goodwin, 30, and interested in research work aimed at ending world pollution." Goodwin, while calling attention to local environmental concerns, was snorkeling and diving in Virgin Islands National Park. While shown in the water in but a two-minute snippet, she was accompanied by an African-American NPS ranger who was also using scuba. This is the earliest account of black NPS employees diving on duty, although it is possible he was not the first. According to now-retired SEAC archeologist George R. Fischer, in personal communication with the author on April 28, 2011, the diver was Ed Roberts, who soon transferred to Big Bend National Park.

Dan Lenihan, a key player in the upcoming evolution of NPS diving, was teaching fifth grade at Tutu Elementary School (a Title I School, a President Kennedy/Johnson-era program for teaching underprivileged

children) on St. Thomas in the Virgin Islands in 1969, when he learned to dive . . .sort of. Before leaving the Peace Corps in 1968, he was lent a facemask and pointed towards a mediocre reef in 15 feet of water. While there wasn't much to see, Lenihan was transfixed. He couldn't believe the intricacy of alien life on the reef. This snorkeling was part of the impetus for him to accept the teaching position in the Virgin Islands in 1969.

> . . .teaching in St. Thomas, he spent about ten hours a week in the water familiarizing himself with reefs. . .He finally sprang for. . .fins to go with his mask. . .snorkel without a Ping-Pong ball. . .a Scuba course at Joe Vogel's Dive Shop in Charlotte Amalie. His course was one morning long. . .[He] learned important things: you could clear a mask without taking it off and you can't stay underwater forever without consequences from something called decompression sickness. If you followed a certain schedule you could more or less avoid it—but niceties in the schedule eluded him. He knew you shouldn't dive more than forty minutes to eighty feet. But if you came up and got a new tank, well, he figured. . .do that all day long.

Dan hadn't quite grasped the concept of residual nitrogen and was lucky since he was diving frequently. He soon took another four-hour course, Advanced Diver, and "got a card to prove it!" Not bad for a total 8 hours of training. He had mastered the decompression tables but found things worth diving for at 80 to 100 feet. Being that deep while doing hard work ("dragging a heavy bag of conchs with no buoyancy compensator") caused another problem: nitrogen narcosis. Lenihan decided it was just one more benefit to diving, a free high that was entirely legal, so he forged ahead with his self-education. He would take the ferry from where he lived in St. Thomas to St. John and Virgin Islands National Park. He remembers seeing a sign erected to explain to visitors that something called Tektite was going on. It sounded like a great idea to him but a little risky. Years later he learned that NPS scientist Gary Davis was doing support dives for the program. Dan was still a few years from his first NPS job.

Dan bought his own regulator while still in the Virgin Islands. It was a new design, having only a single hose and was purchased from Bill Slosky, who had written a book on diving. He returned to the mainland US to work at another Title I School in Maryland. He took classes in diving from NASDS. With a friend, he supported his diving habit by breaking ice in the Patuxent River, and diving for oysters that he traded for air and wet suit parts at a local dive shop in Washington, DC. For the remainder of 1970 and first half of 1971, Dan taught school. By 1971, Lenihan was, in his words, "a full-blown diving freak."

1969

In February, the Office of Marine Resources, an office of the DOI at the time, requested "information about the. . .Service's potential requirements for submersibles during FY 70." This was a request of all relevant civilian agencies as to hours of manned submersibles that might be used in support of the "International Decade of Ocean Exploration." The IDOE, as it was often abbreviated, was a program proposed by President Lyndon B. Johnson as an international, long-term initiative to improve the use of ocean resources for the benefit of mankind. The idea for a decade of ocean exploration was endorsed by the United Nations General Assembly in December 1968. In the US the program was managed throughout the 1970s by the Office for the International Decade of Ocean Exploration, established within the National Science Foundation.

In the March 11 response to this request, the National Park Service's Marine Resources Program coordinator, Orthello L. Wallis, said:

> [NPS] cannot anticipate that it could utilize deep submersibles to depths of 600 feet or greater in support of its program during 'FY 70. However, in support of our anticipated archeological survey of the submerged lands adjacent to the Dry Tortugas in the Gulf of Mexico within Fort Jefferson National Monument, submersibles could be effectively employed to facilitate the survey.
>
> We understand that your current request is for information. . .with an estimate number of dives we could effectively use if the Navy had a fleet of submersibles on lease and available for assignment to various agencies on a free-basis to provide underwater support for various anticipated or projected programs.

From the SEAC archives of his correspondence, it appears that Wallis submitted a guesstimate of 45 dives that a submersible might be used on for projects within the system. The memo from which all of this information was gained is incomplete but Wallis identified five dives at Biscayne and two hours in the City of Refuge National Historic Park (now Pu'uhonua O Hōnaunau National Historical Park).

Also in March, the National Park Service published *Prospectus for Underwater Archeology* by service archeologists and newly minted scuba divers, George R. Fischer and Marion J. Riggs. At this point, Fischer was still in Washington but Marion Riggs had transferred to Walnut Canyon. This document came on the heels of the success of the recent Montezuma Well dives and investigation.

Here the term "success" is relative, meaning the dives were a positive first for the NPS, providing a beginning, conceptual template for later efforts around the system. Despite the fact that the results of their initial dives were negligible, Fischer used the experience as a jumping-off point to develop a more extensive program. It appears to the authors that this prospectus is among the earliest NPS proposal relevant to diving and NPS resource management.

This proposal was an important first step in defining the possibilities and practicality of developing an NPS program in underwater archeology. The 23-page document described a range of needs and potential projects in separate areas throughout the system, many of which were later accomplished. In the introduction, Fischer and Riggs say:

> In early 1968 the staff of the Division of Archeology began investigating the rapidly developing field of underwater archeology for the purposes of determining: legal responsibilities of the National Park Service in this field; present and future needs for underwater investigations on lands under Service jurisdiction; existing National Park Service capabilities in underwater archeology; and the possibilities and practicality of developing a Service program in the field.
>
> There has been a rapidly growing interest among laymen, archeologists, and historians in submerged historic and prehistoric remains. The Service is increasingly called upon to answer inquiries and provide advice or assistance on problems regarding collection of underwater treasure, salvage of sunken vessels, preservation of artifacts recovered from water, and other similar subjects relating to submerged antiquities. The legislation pertaining to these matters, and Service and Departmental policies and regulations, are intricate, ambiguous, and sometimes apparently in conflict. There is a need for clarification of the scope and nature of the Service's responsibilities, and for policy decisions regarding involvement in underwater research and preservation.

1969

Fort Jefferson National Monument

Between April 13-19, George Fischer and Zorro Bradley from the NPS Division of Archeology, Mendel Peterson, a military historian for the Smithsonian Institution, and Emmy Boynton, a Bahamas archeologist, conducted a shakedown survey of underwater cultural resources of Fort Jefferson National Monument, now part of Dry Tortugas National Park. Their goal was to evaluate known wrecks, including an iron-hulled motor vessel, and to excavate a large test area in the fort's moat. According to the *Dry Tortugas National Park: Submerged Cultural Resources Assessment* by Larry Murphy, published by SCRU through the NPS Southwest Cultural Resources Center in 1993, this was the first extensive shipwreck survey by the NPS on park property. It noted more than twenty sites. It also resulted in a recommendation that the Bird Key wreck, a well-preserved iron-hulled motor-vessel in six feet of water, be utilized for interpretive snorkeling.

1969

Glen Canyon National Recreation Area

Ranger Bob White recalled two notable experiences at Glen Canyon that year:

> Late in August, Jack Morehead and I went up lake to try and recover a man who jumped overboard from a small boat in the middle of Goodhope Bay after lunch with his wife the day before, he never surfaced. We were met by the Sheriff of Garfield County (I think) and learned he was short of respect for us "Government men" especially "young" ones, and was a real old timer, having arrived in Utah via covered wagon in the late 1800s
>
> Lousy diving conditions, a knot-and-a-half bottom current, silt so bad visibility on the bottom at 110 feet was less than arm's length with a light. It was covered with truck sized rocks. We hung on to the anchor line for ten minutes and then ascended to tell the old guy the body was probably part way down due to temperature differentials--we weren't going to find it with this current.

He asked if the body would eventually float and we told him (after looking sage, checking water temps, the victim's food and drink intake and consulting together) that it would be about a week. So the sheriff put a deputy on the lake the next week and sure enough made a recovery on day nine half-a-mile downstream. Ranger stock (at least Jack's and mine), went way up.

Later in 1969:

> . . . I was back up at Glen Canyon, again diving with Jack Morehead. In a whole series of progressively deeper dives, we finally culminated in a 200' dive, inspecting the cables holding the Rainbow Bridge Marina, after which, to kill time before our next dive, we hiked up to Rainbow Bridge, climbed up to the top, and came back and did a 150' dive to check the rest of the cables. I notice my log book notes say, "No evidence of narcosis in either diver. Good dive!"

Jack Morehead, then chief of protection, interpretation, and resource management of Glen Canyon, added to what Bob White remembered about their 1969 dive on the Rainbow Bridge Marina in a July 27, 2012, email to the author:

> Frankly, I think the reason for the dive was more to go to 200' rather than any pressing problem about the anchors. We had carefully planned out the dive, had secured decompression tanks on the target cable, etc.; all using the Navy Dive Tables for our calculation of decompression times/depths that would be needed. Way before dive computers, of course. I clearly remember the dive, we had planned on going down one of the main corner anchor cables to below 200'.
>
> We weren't positive about the anchor depth, so we planned to get just below 200' and turn around, and we never did actually see the anchor. When we got to just below 200', we found another anchor cable that was lying across the one we were on. In my opinion (obviously slightly narked) I signaled that we should ascend by the new cable to inspect it also. Thankfully Bob was less narked, he insisted we return by our original route (where our decompression tanks were). I blissfully agreed with him and we ascended with no problems. Fun dive.

1969
Lake Mead National Recreation Area

As an additional personal observation regarding that period of time in NPS diving, author Farabee suggests White and Morehead were not alone in seeking the 200-foot level as a "fun dive." The acknowledged maximum depth of NPS dives was 130 feet and every Service diver knew it. However, there was something about that 200-foot depth that was a milestone and a goal for those inclined to push the envelope. In the same vein that Morehead and White had done, Farabee and fellow Lake Mead ranger Don Chase made a bounce dive to 200 feet in 1969. Without much forethought but with a fair number of challenging Lake Mead dives under their belts, and armed with more bravado than brains, Farabee and Chase both believed the water intake for the facility at Calville Bay in Lake Mead, rested on the bottom at "about" 200 feet. Stupidly, neither ever questioned the maintenance man that provided the two with the depth information!

Holding hands, with their free hand on the line and with no lights and quickly unable to see their depth gauges, the pair just kept sliding down the cable. Somewhere about 130 feet, marginal visibility morphed into zero visibility. Sinking into the silt-covered bottom, the two immediately began a controlled ascent. It was not until they surfaced and again checked with the maintenance division did they learn they had gone to 210 feet.



Sanford Recreation Area (now called Lake Meredith NRA) with park divers. May, 1967. Lake Meredith NRA collection.

1969
Sanford National Recreation Area

Created by the Sanford Dam on the Canadian River in the Texas Panhandle, Sanford NRA was administered with the Bureau of Reclamation,

beginning on March 15, 1965. It changed to Lake Meredith National Recreation Area in 1972. Lake Meredith is not a pretty place to dive. However in the early years there were a lot of drownings, with up to ten per year.

When Chickasaw NRA transplant Butch Hill first arrived at Lake Meredith in 1969, Service divers were already well established there, per an August 8, 2011 phone call with now long-retired Hill. Among the early NPS divers there, were Chief Ranger Art Partin, Bill Burke, Ranger Larry Waldron and maintenance man Cal Myers. Park management was seemingly very supportive and there was a small dive locker in the park with a compressor. Interestingly enough, the Amarillo Skin Divers Association was founded near landlocked Sanford in 1956, long before Lake Meredith came to be in 1965.

1969
Death Valley National Park

On November 2, 1969, Devils Hole claimed its third and last victim to date, 35-year-old Jindrech Carl Vollbracht. Unlike the first two, Vollbracht's body was found. He had scaled the new seven-foot high cyclone fence around Devils Hole, topped by three strands of barb wire, for a solo exploration before his fellow diving countrymen arrived. On arrival of his three companions, bubbles were seen by them indicating he was already below. They suited up to join him, but upon submerging they found Vollbracht floating, unconscious. He was dead when they got him to the surface.

1969
Carlsbad Caverns National Park

Ron Kerbo, who retired as the national cave specialist for the NPS about 2006, explored the Chocolate Drip in Carlsbad Caverns' New Mexico Room in 1969 and again in 1971.

1969

According to an article in the December 1969 issue of *Skin Diver Magazine* by the publisher, Paul J. Tzimoulis,

> Over 550,000 scuba certification cards have been issued to date, indicating that the majority of Scuba tank owners are covered while the number of non-card holders continues to shrink. Nationwide acceptance of the C-card as "proof" is inevitable. If you don't presently hold a C-card, it's time you get one—for the C-card may soon be your only passport to diving.

By the time Tzimoulis' article came out and he made his point, the NPS had been using a dive certification card for upwards of a year, although it was seemingly spotty and haphazard and is actually hard to pinpoint the start date with exactness. In an October 23, 1978 memorandum, regional dive officer McLean claims, "The existing SCUBA Diving Certification Card (Form 10-420) now in use is not used uniformly throughout the Service, much less in our Region. Inconsistencies in the old card do not make it a workable document." He went on to propose a similar, but much more usable card with attached drawings. Per McLean, the advantages of the revised card were that it allowed increased depth certifications and annual medical exams to be recorded by the park dive officer. Also, when called upon to dive out of the park, or for another agency, the card would assist in serving as an indication of the diver's qualifications. His suggestions were adopted, and the official NPS "Blue Cards" were first printed in July 1969, with a Department of the Interior printing code of 10-420. These blue-colored, state drivers' license-sized dive cards began being issued to NPS divers soon afterwards. Author Farabee received Card No. 17 on November 1, 1969 while stationed as a ranger and diver at Lake Mead. Robert Gibbs, chief of the Division of Park Operations, signed it.

The oldest scuba certification C-card-authorizing entity in this country is Los Angeles County, beginning in 1954. The largest dive training organization at that time, however, was the YMCA, which began a C-card program in 1959. Tzimoulis' article stated that the YMCA had so far issued 111,181 cards. Additional certifying agencies began to appear: NAUI in 1960, Southwest Council Instructor Program in 1965, Florida Skin Divers Association in 1965, and finally PADI in 1968.

To add to this confusion, dive operations offering instruction also often issued their own C-card or diploma. Tzimoulis' one-page article continues to recount instances of turf wars between dive shops around the country, which would not recognize the scuba completion cards from competitors. We believe the service got caught up at this point in this period's apparent need for a national scuba diving identity.

The following few concluding remarks in this section are a personal observation of author Butch Farabee, and for which he takes full responsibility. NPS diving in the latter 1960s, in retrospect, occasionally pushed the limits of the currently accepted norms for safe diving. Readers have probably raised their eyebrows a few times when learning of dives totally counter to the present NPS Dive Policy (and good sense), such as the casual high-altitude dives in Rocky Mountain and Yosemite's Tenaya Lake, 200-foot "for fun" bounce dives in Lake Mead and Glen Canyon; and cave diving sans training in Sequoia and Death Valley's Devils Hole.

It was not uncommon among Lake Mead (and perhaps elsewhere) rangers, such as author Farabee, to exhaust their air supply while on training dives during this period, surfacing while sucking "the very last lungful of air." And this was done after pulling down on their J-valve, activating the reserve air supply. Sometimes this last breath of air was taken when still underwater, but in sight of the surface. It was a matter of pride to say to your partner—if by luck, he was any place close by—"I was down to my last breath!" Fortunately, and maybe surprisingly, we lived through it all!

Knowledge surrounding scuba in the pre-1970-era was rapidly evolving, dramatically becoming more sophisticated worldwide, with increasing emphasis on dive safety and "lessons learned." Park equipment would eventually be enhanced and expanded upon, such as in 1979 when the seven large air tanks were installed at the main Lake Mead dive locker in Boulder Beach, as well as satellite diving lockers equipped for emergency use and placed at strategic locations in the NRA, such as Katherine, Callville Bay and Echo Bay.

However, learning about these standards and implementing them into training classes was very slow. This was certainly true for NPS diving. It was new enough that there was little or no appreciation of longer-term ramifications--as long as we got to the surface unhurt. There was a true sense of indestructibility, a calculus of confidence and bravado, strongly nurtured by ignorance and sheer luck.

Risk taking in diving and associated areas like law enforcement was less monitored and less criticized in these then, heavily male-dominated cultures. My point here is to remind the reader that we are reporting on diving as it was often done then in the NPS: not necessarily as it *should* have been done.

NPS SCIENTISTS STUDY NATURE IN THE DEPTHS

By Gary E. Davis

National Park Service marine biologist Gary Davis served as president and vice-president of the American Academy of Underwater Sciences in the mid-1980s, helping to bring service diving programs into mainstream underwater science and to introduce National Park Service diving to the rest of the science diving community.

Modern technology including snowmobiles and high-tech camping equipment has increased access to remote areas of the National Park System for masses of visitors, while doing little for the underworlds of lakes, rivers, and coastal oceans. What Jacques Cousteau called "*Le Monde du Silence*" remains as difficult to access in the 21st century as in the mid-20th. Vastly improved underwater imagery helps, but can't substitute for personal experience. Far from being protected by this isolation, submerged resources in national parks are too often perceived as part of an inexhaustible ocean, and exploited with little attention paid their special status.

The state of scientific diving sprang forward dramatically in the 1950s with the development and increased availability of scuba equipment, neoprene suits, and repetitive dive tables. Scientists explored previously inaccessible submerged portions of national parks that had suffered from "blue-map syndrome." Maps that detailed topographic, geological, and vegetation information on terrestrial portions went to flat blue at the shoreline, as if to say—*just water from here on out folks*.

This lack of interest, ultimately stemming from lack of experience, caused 'nature' in the submerged portions of parks to be afforded less oversight than those with more familiar wildlife on land. It wasn't just that the blue areas weren't as well known; they weren't knowable in the same ways. Predictably, fish and marine life were exploited. What people cannot experience firsthand is harder to identify with.

Connecting people to the underwater world in parks helps protect them. It improves ecosystem integrity and promotes human well-being. Through the 20th century, commercial and recreational fisheries annually removed thousands of tons of fish and marine life from more than 30 national parks in the US. Hopefully, as resource depletion becomes more apparent, the need for protected areas to restore ocean productivity will be realized. Is that happening fast enough? We'll see.

In 1883, scientists mapping coral reefs and other habitats in what is now Dry Tortugas National Park in Florida had only the tools used by ancient Greeks. They peered through glass-bottom buckets and examined lead sounding-weights tipped with tallow to sample deep sediments. Fewer than 100 years later, park scientists used aerial photographs and scuba to make detailed observations of those same reefs and seagrass beds—showing a century of constant growth. Then, following a cold-water mortality event in 1977, they also learned that a century of coral reef development could be lost overnight.

In the few hours it took the cold-water mass from the shallow Gulf of Mexico to drift across the Dry Tortugas' reefs, more than 90% of the fragile, fast-growing, branching corals (staghorn, elkhorn and finger corals), whose delicate skeletal forms act like radiators, succumbed to hypothermia. Slow-growing, massive corals (star and brain corals) survived the temporary cold spell; their massive solid skeletons retained enough heat to keep the relatively small surface layers of the colony alive. Playing out like Aesop's fable *The Tortoise and the Hare*, the race between the branching coral "hares" and the ponderous massive coral "tortoises" was won by the slow and steady—the tortoises. A hundred years of rapid growth by branching corals was lost in four hours.[1]

Today, in a technology-rich world of orbiting satellites and global positioning, live maps that monitor the status of ocean ecosystems are on the forefront of ocean science. They need to become commonplace—essential elements of park stewardship.

The NPS scientific diving program evolved as the country emerged from WWII into a global race for dominance in space and ocean during the Cold War. The service improved awareness of submerged resources by establishing underwater trails, advancing ocean exploration, and utilizing saturation diving and submersibles. It excites audiences with live, interactive underwater education via the Internet. Diving park scientists demonstrated the value of area-based ocean stewardship and pioneered marine reserves as protected refuges to

1 This type of coral death occurs when cold temperatures cause the coral colonies to expel zooxanthellae, a type of photosynthesizing algae that live symbiotically within the coral's tissue. These algae provide the vibrant colors of corals, and it is obvious when the corals have reached this point of cold stress because they appear bright white due to the loss of these colorful microscopic algae. This is called coral bleaching. If the stress is strong enough, the corals won't re-absorb the algae and they will die.

rebuild depleted fisheries. These serve as environmental benchmarks of global change and sources of inspiration to mitigate the effects of weakening ecosystem function.

Park Stewardship: Science for Parks, Parks for Science

Diving scientists support park stewardship by advancing knowledge of the natural world. Scientists in the Ecological Society of America recognized the value of parks for research and became proponents of establishment of Glacier Bay NM in 1925. As a result, Glacier Bay became one of the largest and earliest ocean parks in the world when 600,000 acres of submerged lands were included in the park boundaries. Science has informed and bolstered conservation interests in underwater park design. In the late 1950s, Dr. Jack Randall, University of Miami, was studying reef fishes in newly-established Virgin Islands NP and exploring the waters around Buck Island off St. Croix, in the US Virgin Islands. He recommended boundaries for what became Buck Island Reef NM in 1962. Opportunities to study nature in relatively unimpaired condition underwater are increasingly rare. Scientists soon recognized the value of national parks as environmental benchmarks for understanding the effects of humans on the biosphere.

Diving is a powerful tool for national park stewards through four major activities: *exploring* to understand nature, *restoring* damaged resources, *protecting* parks, and *connecting* people to parks. Scientific diving has historically supported all four of these activities. The following stories highlight a few examples of how NPS diving has enhanced both national parks and scientific endeavors both nationally and globally.

Explore and explain

The earliest National Park Service scientific diving was basic exploration of the parks. Divers needed to discover just what was in all those deep glacial tarns, high mountain lakes, and coastal oceans to better explain how nature was organized and how it worked. This chapter's author conducted lake surveys with scuba in Lassen Volcanic NP in 1965-66 to discover why planted rainbow trout fingerlings only survived a few years in high lakes on the north slopes of Lassen Peak (frequent winter-kill events were caused by snow drifts covering frozen lakes that blocked sunlight for months). The NPS hosted some of the nation's first civilian "Man-in-the-Sea" efforts with park scientific divers on the aquanaut teams, supporting research roles on Project Tektite in Virgin Islands National Park in the late 1960s and early 1970s, and with the Florida Aquanaut Research Expedition (FLARE) in Biscayne National Monument in 1972. These saturation diving exercises NPS supported allowed humans to essentially live on the bottom while they carried out their research, much like spending prolonged periods in space.



Hemispherical port on the Tektite habitat. Photo by Gary Davis.

The NPS Vital Signs Inventory & Monitoring program provides information to park managers, similar to providing vital signs of patients to physicians. This fundamental stewardship program was based largely on an underwater kelp forest monitoring project at Channel Islands National Park, California, that began in 1981 and continues as of this writing in 2019. The program engaged more than 500 scientific divers in its first 30 years, and spawned similar diver-based park programs on coral reefs in the Caribbean, South Florida, and the Pacific islands. These long-term monitoring programs are establishing baseline conditions and identifying critical management issues.

Such monitoring provides early warnings of problems requiring changes in management. Monitoring white abalone populations in Channel Islands National Park revealed the plight of this rare species and led to its designation as the first marine invertebrate on the US Endangered Species List in 2001. Even so, the abalone population quickly declined from once being able to supply commercial divers landing 40 metric tons a year to population densities so low that reproduction was impossible; in the 1990s it took five days in a research submarine, at depths of 80 to 200 feet, to locate six live white abalone scattered across 15 acres of prime habitat that once supported 60,000 adult abalone. *The smallest individuals found indicated that the last time reproduction occurred was 30 years before, in the 1960s*. The fate of white abalone is still in the balance, but the early warning of its plight from park divers may have helped save the species. Monitoring in parks continues to drive innovation and technology to improve stewardship with timely analysis, and communicating the results with creative media.

Another area scientific diving advances knowledge and understanding for park stewardship is in the field of environmental damage assessment. Oil spills, ship groundings, and hurricanes all impact the submerged parts of parks as well as the uplands and coastal facilities. Park divers document damage to natural and cultural resources, assess potential remedial actions, and guide restoration. Following extreme damage to national parks in Florida from Hurricane Andrew in 1992, scientific divers played a significant role in the incident response and raised awareness of the value of such assessments.

Restore and design

Ocean fisheries policy in the 1960s largely managed one species at a time. Habitats, or living places, were considered important only if they critically limited population productivity. Testing such limits by creating artificial reefs with solid waste, such as discarded vehicle tires, became popular. In 1971, the US National Marine Fisheries Service proposed testing habitat as a limiting factor on coral reef fish populations in Biscayne National Park. To do so, they wanted to dump several hundred used tires in a pile on the sand near Pacific Reef to see if reef fish would relocate from other reefs, or if fish populations increased in the region because of the new 'habitat' afforded by the tires.

The idea of dumping trash in the park to compensate for failing fisheries management seemed inappropriate at best, and a serious impairment to park integrity and scenery. As National Park Service legal experts were uncertain about authority to prevent the action, the park struck a deal to issue a research permit for the 'artificial reef' of tires, stipulating the reef would be removed at the conclusion of the study. After two years, it was clear that lack of habitat was not limiting fisheries productivity at that site, and the tires were re-dumped beyond park waters.

Nevertheless, artificial structures placed underwater in national parks have proven effective in mitigating impacts of coastal development of park facilities. When an old and collapsing, rip-rap lined marina on Elliott Key in Biscayne National Park, Florida, was slated for replacement in the mid-1970s, NPS designers proposed vertical concrete bulkheads to replace the sloped, coral reef-like, limestone boulder rip-rap walls. The interstices of the collapsing boulder walls also provided shelter for 1,000 to 3,000 juvenile Florida spiny lobsters, depending on the season. Park divers provided the lobsters with an alternative habitat of hollow concrete building blocks, arrayed on a sand flat adjacent to the marina during construction. They hoped when construction began the lobsters would move to the new block grid, (quickly nicknamed the "lobster ghetto') because the pyramids were arranged in regular rows. Within days, the lobsters moved into their new homes. Lobster occupancy averaged 1,500 residents for the next few years. When construction was completed, the block pyramid habitats were redeployed. The lobsters moved back into the marina as well, providing visitors opportunities to see ocean wildlife up close while supplying the offshore fishery with healthy, rapidly growing, juvenile lobsters.

The ability of diving scientists to make detailed direct observations of marine life also helped people understand the intricate interdependence of species in such complex ecosystems as coral reefs and kelp forests in national parks. Managing for ecosystem integrity is a hallmark of national park stewardship that was unusual in ocean management for most of the 20th century. Most ocean fisheries of the time were managed as individual species, with special cases of conservation concern identified as threatened or endangered species. Gradually, as fisheries began declining, managers began to consider critical habitats as parks presented the opportunity to observe natural conditions in small protected reserves in parks.

Research on the ecological effects of fishing in parks by divers helped pioneer these new place-based strategies to restore ecological integrity, resilience, and capacity for self-renewal by designing fully-protected marine reserves within parks. What began in the 1960s with small protected areas (tens of acres) around underwater nature trails in Virgin Islands NP and Buck Island NM, gave birth to single species reserves for lobsters, stone crabs, and conch in Dry Tortugas, Everglades, and Biscayne in the 1970s. Based on these experiences, and those of other marine parks, additional research-informed design and establishment of ecosystem-based networks of large reserves now fully-protect tens of thousands of acres. Established in the early 21st



Sign along the underwater interpretive trail established in 1960s at Trunk Bay on the island of St. John in Virgin Islands National Park. National Park Service collection.

century, such reserves and research natural areas in Channel Islands, Glacier Bay, Dry Tortugas, and the Virgin Islands are demonstrating how protected areas can enhance local fisheries and restore ecosystems to their undisturbed state. Nowhere is this more apparent than in Buck Island Reef NM, US Virgin Islands, where all marine life in the park is as fully-protected as the wildlife is on land.

Protect and mitigate

As annual visitation to once remote ocean parks dramatically increased in the late 20th century, concern for park resources also increased. For example, when visitation rates skyrocketed in the 1970s, from 1,000 to over 21,000 a year at Fort Jefferson NM, recreational divers removed nearly half of the adult lobsters from the park during an eight month-long season in 1973-1974, even with a bag limit of only two lobsters per day taken by hand. It would have taken 7-10 years to grow replacements for the lobsters taken during that fishing season. Clearly the policies in place did not adequately protect park integrity. Sustainable stewardship required a new strategy. Consider that Fort Jefferson is now Dry Tortugas NP with 100,000 visits annually.

Studies of tagged lobsters by diving scientists further revealed that adult lobsters are keystone predators which sustain ecosystem structure, biodiversity, and resilience, and that they seasonally migrate into surrounding areas, thereby supporting regional fisheries with both larvae and juveniles. Protection of adult lobsters in the park became the cornerstone of fishery management in the Florida Keys. Similar studies of juvenile and adult lobsters in Everglades and Biscayne showed that lobster protection in those parks also contributed significantly to sustaining capacity for self-renewal of lobster populations throughout South Florida. This park-based research led to establishment of lobster sanctuaries in the Tortugas, Florida Bay, Biscayne Bay, and other nursery habitats, making Florida's spiny lobster fishery one of the state's most productive and stable.

Connect and inspire

In addition to improving knowledge and understanding of nature in ocean parks, and designing conservation strategies for protection and mitigation of threats, diving scientists provide stories that connect people to the remote and foreign worlds of underwater parks. By sharing the excitement of exploration and discovery, scientists engage the next generation in park stewardship. We've come a long way since rangers and lifeguards met park visitors on the Trunk Bay beach in Virgin Islands NP on Tuesday and Thursday mornings to teach snorkeling and introduce city dwellers from New York and Boston to coral reefs, which the author and colleagues did in the 1960s. Today, park rangers share their giant kelp forest explorations off Anacapa Island at Channel Islands with live online broadcasts. While underwater in the kelp forest, they hear and answer questions from students in Europe, Asia and the Americas twice a week in a program called "Channel Islands Live". This program grew out of the technology and ecological knowledge developed by a research program to monitor the kelp forest ecosystem. It now reaches non-diving audiences, connecting them to an alien environment otherwise beyond their reach. It's putting color into that pale blue map.

Science helps us understand nature and provides explanations that help people understand otherwise frightening situations. One such example involves scientists diving far from the ocean in the Teton Mountains of Wyoming. In the mid-1980s, local recreational divers in Jackson Hole, Wyoming, expressed extreme concern to the superintendent of Grand Teton NP that remnants of a mature spruce forest were standing submerged at depths of 60-80 feet on the bottom of Jenny Lake. It appeared to these divers and their community that a large block of earth under this forest had dropped 80-100 feet intact during an earthquake, submerging the forest. If that were true, it indicated that a recent environmental assessment for expansion of the Jackson Lake Dam was inaccurate. The entire community would be at risk should such a large earthquake occur again, perhaps causing the dam to fail and catastrophically flood the valley. How that spruce forest came to be on the floor of Jenny Lake became more than an idle curiosity.

The integrity and reliability of federal agencies which had certified the safety of the dam design were on the firing line with local citizens. A careful examination of the Jenny Lake underwater 'forest' was undertaken by NPS divers, archeologist Daniel Lenihan and marine biologist Gary Davis, summoned by Superintendent Jack Stark—one that helped calm fears of earthquakes and failed dams. The upright trees at the bottom of the lake all contained boulders in their root balls, and they were concentrated at the bottom of a large avalanche chute on the slope above the lake. Over centuries, avalanches carried thousands of trees into the lake. Eventually they became waterlogged and sank to the bottom, scattered horizontally across each other like pick-up sticks, and were covered by fine lake sediments like duff on a forest floor. A few of the trees, those ballasted by large rocks in their roots, floated in an upright position until they, too, sank, still upright, settling on the mat of crisscrossed trees on the bottom. The sediment accumulated over their roots, covering the mat of trees beneath them,

leaving the appearance of a forest of trees in growth position. So what initially appeared the result of a sudden active geologic event, was in fact the result of a slow, passive deposition of debris that accumulated over centuries. Scientific observations and careful measurements eventually told a story consistent with all of the evidence. This helped the park allay fear and gain trust in the larger community.

Connecting people to underwater parks is challenging. These parks are largely out of sight and out of mind, and known largely for things that people love to take from them—such as artifacts from shipwrecks, or fish and other marine life.

To raise people's awareness of the plight of fish and ocean wildlife beyond the few species taken by fishing, other National Park Service scientists and I founded an annual event for citizen-scientists and the scientific diving community called the Great Annual Fish Count (GAFC). It was designed like the Audubon Christmas Bird Count, which sought to engage local citizens in gathering information on local bird populations that they had once hunted during the holiday season to put in festive pies. Now entering its third decade, the GAFC began with a handful of divers in the early 1990s in Channel Islands. It now engages thousands of recreational divers around the world to collect standardized fish population data from their favorite places, including parks and sanctuaries, during the month of July. The program also provides specialized fish identification courses for divers throughout the year, and helps assess the status and trends of fish populations in local communities. It is organized and nurtured by the Reef Environmental Education Foundation (REEF) in Key Largo, Florida, which makes data from these assessments available to the public online and is used by fishery managers to guide ocean stewardship.

NPS Scientific Diving and the American Academy of Underwater Sciences

The service diving program owes much to marine science and academic diving programs because of the link forged by rangers seeking training at Scripps Institution of Oceanography (SIO) in La Jolla (University of California, San Diego) and the long association and dedication of long-time SIO dive officer Jim Stewart. The NPS reciprocated in a small way by helping found and lead the American Academy of Underwater Sciences in the early 1980s to share experiences and establish community standards for scientific diving and to continue the remarkable safety record amassed by divers trained under guidelines of SIO and NPS.



Members of the NPS south Florida parks dive team, circa 1973. Gary Davis Collection.

EARLY NPS DIVING AT BISCAYNE & EVERGLADES NATIONAL PARKS

By Jim Tilmant

Author's note: Jim never intended this for publication but he let us pare it down for inclusion. What impresses one is how the diving is so intensely focused on monitoring the health of parks' living resources as they go through impacts from nature, visitors and commercial use. Also, how scuba-based research is used to gain monetary compensation from those responsible for causing damage to parks.

Background

In November 1974, I was hired as Biscayne National Park's (then Monument) first staff management biologist. The park, established a few years earlier, faced issues with both terrestrial and marine resources but Biscayne has 90% of its resources underwater. Prior to that time, Gary Davis (the marine program leader at the South Florida Research Center) had been doing lobster and stone crab population studies but the park didn't have a formal dive program. Don Weir, the chief ranger at Biscayne was an NPS diver and NAUI instructor, and two of the park rangers, Loren Casebeer and George Sites (a past treasure diver who had dived with Mel Fisher around Florida and the Bahamas) were scuba divers. They comprised the extent of diving expertise in the park at that time.

Reef Study & Initiation of Biscayne's Formal Park Dive Program (1975)

Biscayne received funding from the NPS Southeast Regional Office in 1975 to evaluate the impacts of recreational diving and snorkeling on the park's patch reefs. Large numbers of snorkelers and scuba divers from the Miami area used the park reefs daily. Park managers were concerned about impact on the coral. We bought scuba diving gear, a compressor to refill tanks, and initiated a formal dive program at Biscayne. We converted an old concrete restroom facility into a formal dive locker.

The Biscayne reef study involved intensive diving over a six-year period in cooperation with Gary Davis at Everglades NP and coral reef biologists Walter Jaap and Jennifer Wheaton Smith of the Florida Marine Research Institute. Walter and Jennifer focused on coral populations and conditions while the park divers documented fish and mobile invertebrate populations, monitoring algal growth on the reef surface, damaged coral, and water quality at the study reefs. The research design called for five individual patch reefs to be designated "experimental" and five similar reefs used as "controls." The major features of each reef were mapped in detail and the experimental reefs buoyed for easy location by visitors. We made a brochure that described each location and what could be observed diving on them. Control reefs were also mapped and monitored but not marked with buoys. They generally received very little use in comparison to the experimental reefs. We monitored each reef noting fish and invertebrate abundance, coral abundance, extent of algae growth, frequency of damaged coral, and water quality with three observation periods for each of the ten study reefs a year (thus a lot of diving). We continued the study for a five-year period making between 100 – 125 dives a year associated with this study. Comparing differences between "experimental" (heavily used) patch reefs and the "control" (little used) reefs allowed us to determine the extent of impact from recreational use.

Results of this study helped park management understand the degree of impact on coral reefs from recreational use, the natural dynamics of coral reefs and reef inhabitants, and what impacts might be expected with future growth in the number of park visitors. The park could establish an effective mooring buoy system to reduce anchor damage by recreational boats. Results were published in professional publications and presented at coral reef management symposiums.[1]

Park biologists who assisted on the Biscayne Reef Study included Dan Robbin ('75-'76), Karen Jettmar ('76-'77), Richard Tobin ('76-'77), Michael Sutton ('77), George "G.P." Schmahl ('77-'82), Richard Curry ('77-'82), Gail Romero ('77), Lana Forrester ('77-'78), Scott Andree ('78), Doug Morrison ('78-'80), Richard Conant ('79-'81), and, Tom Burns ('80-'82). Most of these folks were graduate students hired under various student and seasonal appointments. Park ranger staff that assisted us on dives during this study included Dennis Kuenzel, Tim Setneka, Linda Amidon, Bud Forrester, Bobby Jarmez, and Carol McNulty.

1 A repeat of the reef fish portion of the Biscayne reef study was conducted on the same study reefs in 2006-2007 by National Marine Fisheries Service biologists. This additional study allowed a thirty-year comparison of reef fish population change. Substantial differences were documented in the reef fish assemblage, plus a decline of fishery-targeted species.

Commercial Sponge Study (Initiated in FY 1977)

Shortly after coming to Biscayne, I initiated a recreational and commercial fisheries harvest monitoring program. It involved boat ramp and commercial fishermen surveys and interviews. A number of commercial fisheries operated under a special provision in the park's enabling legislation and many boaters recreationally fished at the park. Park managers wanted to know the impact on park resources. The program implemented was similar in design to that being used at Everglades National Park. It provided us with data on species harvested, methods, locations, amount of fishing effort and estimates of total fish taken.

We soon realized there was also a relatively large commercial sponge harvest. Although there were historical accounts of sponge harvesting along the Florida Keys, that activity had declined following the advent of cellulose sponges. However, it had increased in Biscayne Bay to an historic high, due to the influx of former Cuban fishermen who recognized the economic potential. Managers felt we needed a greater understanding of our sponge populations and the amount of harvest that could be supported.

In fiscal year 1977, we began studying commercially valuable sponge species within the park. Coupled with the ongoing reef study, this required a large amount of diving by park biologists over a several year period. We determined the aerial extent and overall abundance of commercial sponge species within the park, while documenting growth and recruitment rates to determine years required for an individual to reach harvestable size.

To determine distribution and abundance of sponges, we conducted survey counts within the entire bay and near shore habitat on a 2-kilometer grid interval. Sponge counts at each site consisted of two divers counting commercial sponge species while swimming over randomly established 10-meter circular plots. Five circular plots were counted at each sampling site and sponge density averaged to obtain overall density per square meter for that grid area. A total of 73 grid sites were surveyed over a two-year period.

Results of the Biscayne sponge study revealed sponge harvest was sustainable at the time, as long the existing populations were not impacted by a sponge disease epidemic known to impact sponges in south Florida and the Bahamas. Later, these studies helped the park work with the State to eliminate commercial sponging within the park.

Over 50 dives a year by park biologists were devoted to the Biscayne commercial sponge study during fiscal years 1976 and 1977. Fifteen to twenty dives a year were required to continue the growth and recruitment aspects of the study up to 1980. Biologists assisting with this study included Richard Tobin, Michael Sutton, G.P. Schmahl, Richard Curry, and Dick Conant.

Ancillary Dive Activities at Biscayne

Because of the extent of diving by the biologists at Biscayne, they attracted a very competent and active core of divers available to assist the park with other functions. Examples of these include:

- Assistance with evaluation of resource damage from boat and ship groundings.
- Evaluation of sea grass recovery in boat prop scars.
- Translocating lobster habitat during Elliott Key Marina construction activities.
- Photographing significant park submerged resources.
- Assisting park maintenance changing boat props on a large transport vessel.
- General submerged park resource and submerged boundary surveys.
- Assisting the NPS SCRU evaluate shipwrecks and other cultural resources within the park. For example: In 1975, during an archeological survey being conducted by the Southeast Archeological Center and SCRU, a new shipwreck was found within the Legare Anchorage in Biscayne. This 18th century shipwreck appeared to have been recently exposed due to shifting bottom sediments. In assessing NPS options for salvage, recovery of surface artifacts, or *in situ* preservation, the need for a detailed biological description of the site as well as bottom sediment characteristics was needed. In response a short term research study was initiated by the NPS South Florida Research Center. We conducted a series of underwater surveys to grid and map the area and artifacts in detail, monitor sediment loss/changes, document the biological growth on artifacts and record currents, surge, and sediment transport potential around the wreck. A report of our findings was made available to park management in June 1982.

Assistance to Other National Park's Studies

Biscayne's core of experienced research divers often helped Gary Davis and the South Florida Research Center and other Caribbean parks conduct marine studies that involved diving. Examples include lobster and stone crab surveys at Biscayne, assistance with the Tortugas Reef Atoll Continuing Transect Studies (TRACTS) program at Dry Tortugas, a highly successful interagency cooperative program Gary was heavily involved with; as well as cold-water coral kill and marine reef sponge surveys at Dry Tortugas.

Post-Biscayne Diving

In 1981, I transferred to the South Florida Research Center, under Everglades National Park as the new Marine Program Leader after Gary Davis transferred to Channel Islands National Park (South Florida Research Center is now the South Florida Natural Resources Center). Several interesting diving projects were completed while I was at Everglades, detailed below.

Hurricane Hugo, Virgin Islands National Park

One project involved assisting Buck Island Reef NM and Virgin Islands NP in evaluating the impact to their coral reefs from Hurricane Hugo in 1989. It was clear that considerable damage occurred to coral and other marine organisms, but the depth to which this damage extended and extent of impact to the reef fish populations was unknown. The biologists at these parks requested our assistance to help them document the hurricane's impact to their fish populations. In addition to Virgin Islands park staff (Caroline Rogers, Alan Friedlander, and Jenifer Bjork), Joe Kimmel (of the Florida DNR Marine Research Lab), and Jim Beets (of the Virgin Islands Natural Resources Agency) also assisted. We made numerous dives on the Buck Island reefs, newly established Salt River Bay Ecological Preserve at St. Croix Island, and around St. John Island to observe and document fish populations over about a three week period.

M/V *Mavro Vetranic* Grounding, Dry Tortugas

A second project involved the grounding of the motor vessel *Mavro Vetranic* on a reef at Dry Tortugas National Park in 1989. This large commercial freighter ran aground on a section of reef near the north end of the park and was unable to back off. Considerable damage to the reef occurred. We were able to quickly assemble a dive team to go to Dry Tortugas and document the impacts. When we arrived on scene the vessel was still grounded on site. We were able to obtain underwater photographs, install markers outlining the exact location of the hull, and make observations related to how the ship came to rest where it was (the track taken onto the reef, etc.). After removal of the ship, we gridded and mapped the entire site and provided detailed observations of impacts and made estimates of the number of corals and other organisms damaged. The resulting report was used to obtain a million dollar plus court settlement from the shipping company. Persons participating on the dive team that assessed this grounding included myself, Bill Hudson (Biscayne), Nancy Brown (Dry Tortugas), Walt Jaap and Jennifer Wheaton (both of Florida Department of Natural Resources).

Other Significant NPS Diving Contributions: Hurricane Andrew

Following Hurricane Andrew, which devastated much of extreme south Florida including Biscayne and Everglades National Parks in August 1992, the National Park Service assembled a team of scientists to document the resource impacts to the terrestrial, freshwater, and marine ecosystems of these parks. I led the marine resource assessment team and using scuba, we resurveyed many of the sites at which I had collected data during earlier years at Biscayne and Everglades, and extensively documented impacts to other marine resources in these parks. The results of the post-hurricane assessment were published in the journal BioScience in 1994. Divers participating on the marine assessment team included myself, Richard Curry (Biscayne), Ronald Jones (Florida International University), Alina Szmant (U. Miami), Joseph Zieman (U. Virginia), and Michael Robblee (Everglades).

Department of Interior Coral Reef Initiative

In 1998, the Department of Interior, in response to the President's Special Commission on Ocean Resources (as well as several scientific reports emerging on the decline of coral reefs and ocean resources), established a National Coral Reef Task Force and developed a funding initiative to help agencies with coral reef management responsibilities. I served as the NPS representative on the task force and, through a series of general snorkeling and scuba surveys, was able to develop an inventory of NPS units that qualified for this initiative and secured two years of base funding increases for each of these parks. This funding helped several parks develop dive programs to monitor submerged park resources.

NATIONAL RESERVOIR INUNDATION STUDY

NRIS - SCRU - SRC

Underwater archeology was comparatively new and not seriously pursued until the introduction of scuba, post-WWII. The first effort in the Americas was the famous, perhaps infamous 1904-1910 dredging and hardhat diving of the Sacred Cenote of Chichen Itza in Mexico. In the NPS in the fall of 1934, an early diving effort took place in Colonial National Historical Park on warships of Cornwallis's fleet, sunk in in the York River in 1781. Then Arizona's isolated, karst-like Montezuma Well saw several investigative, hardhat dives in 1947 and 1948.

Until the 1970s, water-filled sinkholes (cenotes), rather than shipwrecks, were generally the focus of archeologists in the New World. Students of both the University of Florida and Florida State University (FSU) began using scuba in the early 1950s to conduct research in the state's limestone sinks and springs. Efforts in Wakulla Springs, near Tallahassee, recovered mastodon and mammoth remains several feet from hundreds of ancient bone projectile points. Their remarkable finds were published in *Natural History* magazine by Stanley Olsen in 1958. His writing emphasized not only what the finds proved but what they didn't. Dan Lenihan admired Olsen, and in 1972-73 took courses from him at FSU. He began experiencing the sparseness of research designs and the elusive nature of 'proof' in underwater archeology. These impressions were a principal sidebar to Lenihan's projects for the rest of his career, and were important because he would later direct the National Reservoir Inundation Study (NRIS) and become the founding Chief of the service's Submerged Cultural Resources Unit (SCRU).

Until this point, there had been scattered archeological diving and salvage in areas such as Florida and Texas, as well as the Union gunboat *Cairo* near Vicksburg and the shipwrecks of Isle Royale National Park. Initially the *Cairo* was found by NPS historian Ed Bearss and friends using a super low-tech magnetometer (a compass in a bucket). It was later excavated in an exercise which suffered significantly from a lack of precedent, and it was ultimately judged a disaster and referred to as a cautionary tale by archeologists. The efforts of NPS personnel to do well by the salvaged remains afterwards, however, were no less than heroic. Bearss helped correct early mistakes and usher the NPS into the complicated world of shipwreck excavation. The work of Jerome Petsche and archeologists from the Midwest Archeological Center on the Steamboat *Bertrand,* excavated in a cornfield using terrestrial techniques, was an important pioneer effort. (SEE PAGE 63)

In 1968, and finally ushering in the era of scuba and NPS archeology, George Fischer, Cal Cummings, and Marion Riggs, helped by Roberto Costales, dove at Montezuma Well, a first for NPS archeologists. This, and shipwreck surveys run by Fischer and Cummings at Fort Jefferson and Gulf Islands in the next few years, carried the ball into the 1970s. It should be noted that during the 1960s there were major advances in the conduct of shipwreck archeology in the Mediterranean–-much of it by American archeologist George Bass. But Bass had poor interaction with traditional land archeologists in the US due to the non-anthropological approach taken in his research. This will be touched on in the section on SCRU where issues of shipwreck archeology are better addressed. (SEE "THE SUBMERGED CULTURAL RESOURCES UNIT" ON PAGE 113)

In the 1930s to 1960s, this country undertook dam building efforts that impounded waters over huge areas as reservoirs. NPS areas Lake Mead and Glen Canyon NRAs for example, each flooded 250 square miles of prime archeological real estate. Additionally, older impoundments had their water levels increased, each covering a much larger area. Among the other reservoir projects affecting the NPS were Amistad, Bighorn Canyon, Curecanti, Flaming Gorge and Lake Meredith. Significant attention was paid to these issues in the Reservoir Salvage Act of 1960. NPS underwater archeology took a step into the future by focusing on understanding effects of flooding on this country's irreplaceable, tangible remnants of the human past. One major question needed addressing: *What are the effects of inundation on these heritage sites*?

Cal Cummings

The NPS archeologist who first addressed reservoir impacts in a systematic way was Calvin "Cal" R. Cummings, the regional archeologist for the Southwest Region in the early 1970s. He was most interested in the opportunity this might allow for NPS to partner with other agencies to build an underwater archeology program within the service. As the nation's lead preservation agency, NPS was often asked to assist others. It made great sense to have an underwater capability. But to do it correctly involved significant upfront expense—and dollars that could only come from competition with the service's terrestrial archeology programs. Cummings thought this untenable in an already underfunded field. He believed it was critical that NPS have funding support from other agencies.

Cummings served as both a ranger and superintendent in southwestern parks before arriving in Santa Fe. He believed most funding crises at his level came from artificial limits set by people above him—people who had little understanding of the real effects of losing nonrenewable archeological resources. He began building a remarkable empire in Santa Fe called the Southwest Cultural Resources Center (SWCRC). Within three years he had hired 35 archeologists, historians and technicians using creative funding mechanisms tied to mitigation of impacts on cultural resources. He had crucial support from Doug Scovill, NPS chief anthropologist. The loss of heritage sites in reservoirs would be one of Cummings' key foci.

Cummings earned the confidence of his peers in the dam building agencies; they too, wanted practical answers to these inundation questions. Cummings, a certified NPS diver, probably the service's first archeologist so trained, soon took the lead in creating a project to address these issues. As chief of the Southwest Region Division of Archeology he had the experience and standing among NPS regional managers to pursue program building with outside agencies.

In 1973, Cummings had just returned from a shipwreck survey at Gulf Islands National Seashore run by George Fischer, an NPS archeologist and NPS certified diver from the Southeast Archeological Center (SEAC) in Tallahassee. Cummings and Fischer, who spent from 1959 to 1988 in the service, shared a vision of NPS leadership in underwater archeology. Fischer had an FSU graduate student, Dan Lenihan, serving as his assistant and dive officer at the Gulf Islands shipwreck survey. Fischer thought Lenihan had promise, and soon Cummings did as well. Lenihan was close to finishing his master's degree in anthropology, was highly thought of at the university, and had excellent diving credentials. Cummings hired Lenihan to work with him on interagency assistance and the pieces began falling into place for a National Reservoir Inundation Study.

Fischer and Cummings were both working hard to build an effective underwater archeological capability in the NPS but there were important differences in each man's vision. Fischer wanted the team to be based at SEAC (soon to move to the FSU campus). Cummings wasn't adamant about the team ultimately being in Santa Fe, but he was in the process of building a first rate cultural resources center, SWCRC, which would provide a perfect interim home for the NRIS. Cummings also had issues with SEAC being based at FSU. SEAC's chief, Pete Faust, was openly averse to the notion of underwater archeology at SEAC, believing it took attention away from more important things. But most significant to Cummings, SEAC was inextricably bound to one university. He thought it crucial that the NPS be interactive with many universities but never tied to a single academic institution.

Dan Lenihan

Lenihan was hired by Fischer at SEAC in September 1972 as a part-time, GS-4 park ranger/archeologist. He was thrilled at the opportunity and well-positioned to help Fischer interface with the anthropology department at FSU. SEAC was not yet on campus and as yet, had little interaction with the department. Lenihan was the elected representative of the anthropology graduate students, and attended faculty meetings in that role. He served as a conduit to the student body for Fischer, recruiting students for the upcoming survey at Gulf Islands.

Cummings hired Lenihan in April, 1974 as a GS-9 archeologist on a one-year appointment. He gambled that while in Santa Fe, Lenihan could lay the groundwork for a permanent NPS underwater team principally focused on reservoir impacts to archeology. His bet would soon pay off.

The Blue Book

In 1974, the term "submerged cultural resources" was brand new. It reflected a growing preference of archeologists in the early 1970s for a term more inclusive than "historic preservation," which was replaced with "cultural resources management," or "CRM." The first time the underwater version of the term appeared in print was as the subtitle of *Underwater Archeology in the National Park Service: a Model for the Management of Submerged Cultural Resources*, often referred to as "The Blue Book" due to its physical appearance. This served as a formal declaration of purpose; it gave a summary of previous NPS underwater efforts by Cummings and Fischer and urged creation of an NPS underwater cadre along lines the two men had promoted since the mid-1960s. Lenihan finished the two-page introduction with:

"It is hoped that this publication will help increase awareness of the great potential of underwater sites in the United States, and underline the leadership role that the park service could and should take in developing this resource."

The book also introduced the idea of a National Reservoir Inundation Study:

"Many such sites in areas controlled by the National Park Service have been and will be submerged due to dam...projects...proper protection and administration of these resources is contingent on understanding what will happen to them if flooding occurs. Solid systematic data on inundation effects is unavailable at this time and park managers are often forced to make decisions without the benefit of a body of facts to base them on."



Gulf Islands National Seashore, Florida, 1973. Cal Cummings had just dragged George Fischer out of water and is delivering mock-CPR during a rescue exercise. This was part of training that Lenihan had them undergo before being allowed to dive on the project. Fischer and Cummings were director and assistant director. They reinforced safety of project by abiding by Lenihan's decision they couldn't dive at project's opening. Photo by Dan Lenihan.

Cummings' strategy was to use the far greater financial assets of the reservoir construction agencies to build the foundation of an internal, NPS underwater capability. At project's end, he was hoping the NPS would have a proven team, completely equipped and ready for conversion to in-park purposes.

Lenihan and Murphy collaborate on diving issues: 1974/1975

At the same time the NPS worked to fund the NRIS, the state of Florida was confronting research diving issues at Warm Mineral Springs. Lenihan met Larry Murphy, the diving officer for the Florida Bureau of Archives and History at a New Year's Eve party in the final days of 1973. Already scuba certified, Murphy had been trained as a commercial hard hat diver at the Divers Training Academy in Charleston, South Carolina. Before Lenihan left for Santa Fe in March 1974, he certified Murphy as a cave diver after two intensive months of training. During that year, 25 divers drowned in Florida caves, more than ever before or since.

Murphy had worked as a field agent for the state, overseeing commercial treasure hunting permitted by Florida law. Murphy believed this to be a short-sighted giveaway system that he deeply resented. Lenihan noted that Murphy spoke enthusiastically of archeological theory and practice. His obligations tied him to Florida for some years but Lenihan resolved to bring him into the NRIS if possible. In the meantime, they collaborated on what they saw as the most pressing research diving issues: in-water oxygen decompression, altitude diving, and redundancy in life support.

Both Lenihan and Murphy were greatly interested in making research diving operations as close to foolproof as possible—Lenihan for NPS and Murphy for the state of Florida. Lenihan knew the elite team he envisioned at the end of the NRIS would have questionable longevity after even one serious incident of decompression sickness. Since they would often be far from hyperbaric facilities, he wanted a silver bullet to make the threat very unlikely. One possibility was a technique Florida cave divers used; while they had a chilling fatality rate, they were rarely struck with bends. A specific procedure they embraced had greatly mitigated this problem; their illegal but ingenious use of bootleg oxygen on decompression stops. Illegal because in some states the use of pure oxygen needed a doctor's prescription. From an agency perspective, to have a device with an oxygen-intake fitting connected to an air regulator violated industry standards and could easily result in fines and penalties by the newly created Occupational Safety and Health Administration (OSHA).



Larry Murphy SCRU deputy, 1974, is being certified by Lenihan for cave diving NACD. He was deputy for 20 years from 1980 to 1999. He came to NPS in 1979 for the Inundation Study and was converted to a permanent NPS employee with other members of the NRIS team, 1980. Larry became Chief of SRC in October 1999 when Lenihan retired. Larry served as chief until 2009 when he retired. Photo by Dan Lenihan.

The oxygen issue in brief

The mechanism was simple--100% oxygen substituted for air on the decompression stops released inert gases from the diver's body at a much faster rate. Lenihan and Murphy had no intention of reducing the required stop times for air, their divers would use normal US Navy Tables. In a nutshell, the problem was this—not only did they want to use the oxygen in-water at 10 and 20 feet; but at a depth of 30 feet where it was particularly effective. Divers would be using oxygen below the 25-foot maximum set by industry and the military.

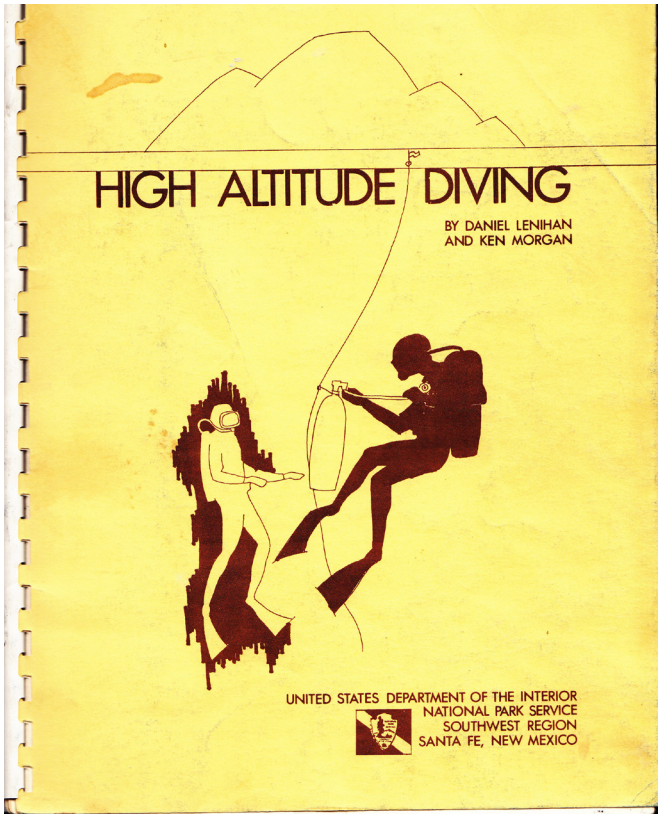
There was an additional benefit. The team would often be diving at altitude. Reservoirs are almost always above sea level and most water bodies in inland parks were as well—for example, the 125-square mile Yellowstone Lake is at 8,000 feet. The US diving community had no way to accurately measure water depth at altitude despite the array of depth gauges on the market. Neither oil-filled nor capillary gauges were effective. The team usually used a non-stretch, marked line to measure depth except where ceilings in caves or wrecks came into play. This oxygen safety factor would also compensate for most of the questionable issues of altitude diving.

Lenihan and Murphy thought the answer for their concerns would be the legal access to oxygen at the decompression stops—substitute oxygen for the air on the US Navy standard air decompression tables, especially at the 30-foot stop. This presented a huge safety factor but raised the specter of oxygen poisoning—the accepted maximum depth for oxygen was 25 feet. Approval would be tough, particularly in a federal agency. Luckily, Jim Stewart at Scripps was the official consultant to the NPS diving program. He gave his full support. But that was not enough; the two men also wanted the assurance of physiologists.

Murphy convinced Dr. George Bond, head of the Sea Lab program, one of the most advanced underwater efforts in the world, to put his support for the idea into writing. Lenihan meanwhile sought out Al Behnke, a renowned oxygen expert at a high-altitude diving conference. He got Behnke to also support them using oxygen in-water. By 1975, Murphy had four, 200-cubic foot oxygen bottles set up at Warm Mineral Springs that distributed oxygen to his divers on ascent. In two years of intense diving, including over 200 exceptional exposures (190'+), he had zero incidence of decompression illness. Lenihan had already been using the oxygen, but could now do it without looking over his shoulder. Formulating this process was complete just months before the NRIS was funded. It would be used for the next quarter century, through SCRU and into the change to SRC. Between them, Lenihan and Murphy would run the NRIS, SCRU, and SRC from 1975 to 2009, and supervise almost 50,000 person-dives. They did so without a single case of decompression sickness or a serious diving accident.

The American diving community hadn't adequately addressed the consequences of diving at high elevations, as only a tiny percentage did it. Many of the altitude diving concerns were addressed by the use of oxygen. All reservoir diving is altitude diving as long as water runs downhill and rivers empty into the sea. Remember, all this was occurring before dive computers; adequate ones were still 15 years in the future. E.R. Cross had developed conversions to the US Navy Dive Tables that went a long way to correct for this problem but confusion amongst sport divers was rampant.

Research dives in reservoirs had an additional problem—the only way to accurately tell depth was with use of a marked line. This posed a major problem for archeological data collection. Ken Morgan, Southwest regional safety officer (and NPS diver), collaborated with Lenihan on a booklet entitled *High Altitude Diving*, published in 1975. Request for the booklet came from other agencies, academic institutions and as far away as the Royal Australian Navy. NRIS and later SCRU divers used this as a reference for combinations of capillary gauges at shallow depths, oil-filled at deeper depths, and marked lines for scientific measuring. The third concern Lenihan and Murphy addressed together was redundancy in life support; a critical but more generic problem. It is briefly discussed below in the conclusion of this section as it was ultimately solved by the diving community just as the NRIS began procuring equipment.



High Altitude Diving Since all reservoirs are above sea level, The Guide to High Altitude Diving, by Dan Lenihan and Ken Morgan was an important guide for NPS diving. It was printed in 1974, one year before the inundation study. The recommendation for decompressing at 30 feet on up with oxygen was highly controversial, but a religious commitment for the SCRU team.

NRIS is funded

Within a year of the Blue Book's late-1974 distribution, the multi-agency NRIS was funded in September 1975. The team had written agreement from the Corp of Engineers, Bureau of Reclamation and Soil Conservation Service for a million dollars over four years. Only one-tenth of the total cost came from the NPS. In January 1976, Lenihan, moved by Cummings to a four-year appointment, was hiring staff. Literally every targeted issue covered in the 100-page Blue Book, typewritten with whiteout corrections, was eventually addressed by the NRIS, SCRU or SRC.

The NPS contribution from Doug Scovill, the service's chief anthropologist, was an early example of the critical support rendered to NRIS and SCRU for the next two decades. Doug's timely contribution also included a provision that at the end of the NRIS, all physical assets including dive equipment would remain with the NPS to be used for the creation of a yet-to-be-named entity which was, of course, SCRU.

The primary mission of the NRIS was to determine the effects of freshwater immersion on archeological sites. The study was now a done deal, and Cummings put Lenihan in charge.



Late 1975, signing the paperwork to provide funding for the NRIS. Left to right: Cal Cummings (seated), NPS, Dick Leverty (standing), head of environmental compliance US Army Corps of Engineers, Ward Weakly (seated), chief archeologist Bureau of Reclamation, and Dan Lenihan, NPS. The Soil Conservation Service also contributed. National Park Service collection.

Off and running, Lenihan quickly went to Scripps for a week of testing with University of California dive officer Jim Stewart. He approved Lenihan's appointment as Southwest regional dive officer. This was important because it enabled Lenihan to demonstrate his team's ability to raise the standard for all divers in the region, not just archeologists. The NRIS, SCRU, and SRC all followed this model. Lenihan noted the archeologists Cummings had hired for land archeology were skilled in three-dimensional renderings. Those archeologists were then trained to dive. Some, such as Larry Nordby and Jim Bradford, became long term, part-time members of the NRIS and SCRU team for decades. As of 2016, Bradford still worked on projects for SRC, 34 years later. Scientific illustrator Jerry Livingston, who had worked on the *Bertrand* and some of George Fischer's projects, became critical to later SCRU operations.

Recruiting the team

Toni L. Carrell: In January, 1976, Lenihan first hired Carrell, a diver with a recently acquired BA in anthropology from the University of California, Santa Cruz. She had also worked for several months for the Warm Mineral Springs project. Carrell had already undergone rigorous training and several months of experience under Murphy. She ended up working for the NPS for 14 years and earned a PhD in maritime archeology. In 2001, she was inducted into the Women Divers Hall of Fame.

Carrell worked for the NRIS from inception to completion. Along with Murphy and Lenihan, she transitioned to SCRU in 1980. During the NRIS she oversaw contracts with numerous archeologists in the private sector and state offices. This included work in dozens of reservoirs around the country, and experimental archeology in Ozark National Scenic Riverway, all the while raising two children on her own. Along with Cathy Tarasovic and Sandy Rayl, she was one of three women subjected to the team's rigorous diving standards. This included daily 200-yard walks with double 80s on her back. For Toni at 5'3", this was no easy trick. Team members, male and female, had to demonstrate they could meet standards of a NAUI instructor test on any given day, such as jumping into a pool with hands tied behind their backs and surviving in the water, unassisted, for ten minutes. The standards were extreme, as was the NRIS diving; often in unfamiliar desert environments in intense heat. But after leaving 106° F in the boat and descending to 130 or 150 feet deep, water temps dropped to the 40s or 50s.

In addition to Lenihan and Murphy, who were already instructor rated, Toni was the first new team member to be certified as a NAUI instructor, in 1978. This was important as it allowed the NRIS to train archeologists at the SWCRC to dive. Toni was instrumental in training Nordby and Bradford to dive—themselves already leaders in traditional NPS terrestrial archeology.

Thomas Hopkins and Catherine Tarasovic: The next two NRIS hires were Hopkins and Tarasovic; a couple also trained by Murphy for the Warm Mineral Springs project. After leaving the Florida-based project, the two worked in South Texas on the Padre Island Shipwreck Survey under Texas state

marine archeologists Carl Clausen and Barto Arnold. Once done with the NRIS in 1980, they no longer engaged in professional archeology.

Sandra L. Rayl: In 1976, Lenihan hired Rayl, an experienced Southwest archeologist with a master's degree from Northern Arizona University in Flagstaff, Arizona. She had served as a field archeologist for the Museum of Northern Arizona. She had underwater experience working for Charles Hoffman at a mammoth-kill site in Silver Springs, Florida. At the conclusion of the NRIS, she continued in terrestrial Southwest archeology.

Wayne Prokopetz: Prokopetz was brought into the NRIS in 1976. He had undergraduate and graduate degrees in Anthropology from Florida State University. While in graduate school, in addition to being part of the "Scientist in the Sea" program, Prokopetz obtained a NAUI open-water certification from Lenihan as well as experience in caves. At this point, he worked seasonally for Fischer and over time, aided in NPS archeological studies at Gulf Islands and Virgin Islands. As of 2014, now armed with a PhD from the University of Utah, he was the chief of research and resource management at Dinosaur National Monument for 19 years.

Stephen Fosberg: Hired in 1977, Fosberg was a land archeologist with an emphasis on the Southwest. After being part of the NRIS, he returned to doing terrestrial archeology, first for the US Forest Service and then the Bureau of Land Management.

John A. Ware: Lenihan hired Ware in late 1977; not yet a PhD, but well along. A fourth-generation Arizonan with a deep love of the Southwest, he had prior sport diving experience in Mexico, but like most of the others, not in underwater archeology. In 1989, while working for the Museum of New Mexico, he was contracted by the Corps of Engineers to write a manual for reservoir managers explaining how to use the NRIS Final Report for designing research to serve as a mitigation method. In late 2014, he retired as head of the Amerind Foundation in Southern Arizona.

Larry Murphy: The last to be hired was Murphy in 1979, for the final year of the NRIS and its subsequent write up. At the time, Murphy was still affiliated with the State of Florida, but available for contract work. Murphy had already been assisting Lenihan in training of NPS divers. He was contracted for Southwest Region dive workshops at Amistad in 1977, 1978, and 1979. He taught underwater cutting and blasting, and other topics highly enjoyed by the park staff. Murphy would remain with the NRIS and then SCRU, replacing Lenihan as Chief of SCRU in October 1999, the same date that SCRU changed its name to Submerged Resources Center (SRC).

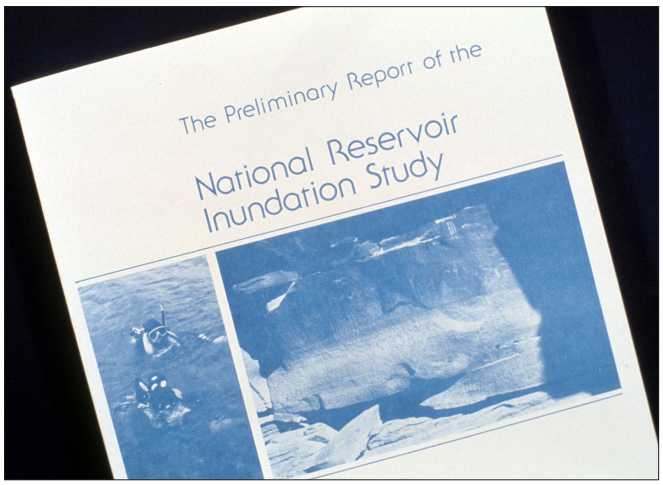
NRIS Research Design

The overall strategy of the NRIS was to be open, explicit, and to invite discussion and challenge. The approach was scientific and collaborative. They were to help find the best approach to preserving the past, given the decision to build dams had been made. The study's research design was developed during a literature search and preliminary field research that took place in 1976. The research design, its assumptions and conclusions were available for challenge and modification in its 1977 Preliminary Report.

NRIS Products

The Preliminary Report of the National Reservoir Inundation Study, by Lenihan, Carrell, Hopkins, Prokopetz, Rayl, and Tarasovic, Department of the Interior, SWCRC, Santa Fe. New Mexico. 1977 (277 pages) captured the approach of the study. The document reflected a full year of research in the library and the field wherein the team developed an understanding of potential impacts sufficient to spell out detailed, testable hypotheses. It discussed mechanical and chemical effects on archeological materials and impacts on analytical procedures. Specific hypotheses were then generated for three years of testing. This met the highest standard of proof-through-testing embraced by the archeological community in the US in the 1970s.

The final report, a two volume, 1,300-page account of the NRIS, was completed in 1981. Volume I was a summary of the study's findings and Volume II focused on experiments and unique



The 1977 NRIS Preliminary Report laid out the research design and testable hypotheses addressed in the 1,300 page final report issued in 1981.

impacts needing special discussion. It became a foundation for federal agencies to use in setting priorities for reservoir salvage work for the next twenty years. Almost 3,000 copies were distributed by the NPS, the reservoir agencies, and over the years by SCRU. The physical report was sent to requesting archeologists for the first twenty years until roughly the year 2000, when it became accessible online.

NRIS Diving

The NRIS core team employed highly redundant life-support features in their equipment, required intense physical conditioning, and emphasized ongoing training of divers. The routine use of redundant tank manifolds on double-tank rigs was an easily recognizable trait of the team when in the field. These manifolds also emanated from the cave diving community in the early 1970s. Unlike standard manifolds, these allowed a total failure of one regulator (first or/and second stage) while leaving the backup regulator full access to air in both tanks. The alternative was to rely on an "octopus" rig that offered redundancy only for the regulator's second stage. For working deep or under ceilings as in shipwrecks or caves, this was a great safety factor. These Ideal manifolds became commercially available in 1976 as the NRIS began. Before then, some cave divers who were good welders, including Larry Murphy, made their own.

This team of diving archeologists developed procedures and a philosophical approach to research diving still reflected in decisions made by the SRC today. During the NRIS, Service staffs of many parks were exposed to the professionalism, strength, and capability of the group in conducting underwater archeological surveys and training personnel in advanced operational diving. Several park managers including Jack Morehead (Isle Royale superintendent, later of Yosemite and associate director of NPS) petitioned Chief Anthropologist Doug Scovill to create a permanent, in-house underwater archeological team. Through the years, Scovill, with the full support of several SWR directors including John Cook, Joe Rumberg, Lorraine Mintzmeyer and Bob Kerr, gave critical support including funding. Kerr was regional director at the time NRIS became SCRU in 1980. He extended his personal support at a very vulnerable point for the team. Kerr was responsible for the decision that SCRU be kept in Santa Fe, where it stayed for 30 years before moving to Denver in 2009 under the name SRC.

The NRIS dived in many reservoirs, documenting impacts to archeology. The team contracted land archeologists to document such impacts in 21 areas that could be examined without diving.



NRIS archeologists/divers Sandra Rayl (left) and Toni Carrell (right), circa 1977, doing a "tank walk," required by Lenihan at least twice a week in all conditions, year-round at the NPS Southwest Cultural Resources Center in, Santa Fe, New Mexico. NPS Submerged Resources Center collection.

The latter was in cases when there had been a drawdown of water from inundated sites or drought had caused it naturally. Included for this purpose were multiple operations in:

- Amistad, Lake Meredith and Brady Reservoir, Texas,
- Glen Canyon, Arizona/Utah
- Ozark National Scenic Riverway and Table Rock Lake, Missouri,
- Bull Shoals and Blue Mountain Lake, Arkansas,
- John Day Dam, Washington,
- Navajo Lake and Blue Hole, New Mexico,
- and numerous others in addition to non-reservoir areas such as Silver Springs, Florida.

The personnel and equipment infrastructure of the NRIS was retained at the conclusion of the project to form the new, in-house capability in 1980. Lenihan, with Cummings' approval, coined the title Submerged Cultural Resources Unit (SCRU), because the words fit the mission, and the acronym was perhaps slightly edgy, reflecting an intense program pushing boundaries in archeology and diving. Its role and function emphasized conduct of model studies of cultural resources in underwater environs while responding directly to needs of the park superintendents.

1970-1979

With support from congress to build an underwater archeology program, major archeological investigations took place in parks like the Dry Tortugas and Gulf Islands, utilizing remote sensing technologies. In addition, management efforts focused on natural resources like coral reefs and lobsters in the south Florida parks. A landmark case surrounding the critically endangered Devils Hole pupfish highlighted set a precedent for the conservation of water resources on federal lands.

Man-in-the-sea programs continued in national parks, with Tektite II in Virgin Islands, and the NOAA-sponsored FLARE project in Biscayne. NOAA (the National Oceanic and Atmospheric Administration) entered the scene at the beginning of the 70s as the second federal agency tasked with protecting America's submerged lands and resources, through the National Marine Sanctuary program. Part of their aim was to extend the protections provided by NPS in estuaries and coastal waters. Ultimately this led to the designation of sanctuaries adjoining several national parks. This was the start of a long partnership with NPS that continues at the time of writing.

Dan Lenihan began his 36-year NPS career as a part-time seasonal employee at SEAC in 1972, and soon was heading up the newly authorized NRIS in 1975. The NRIS laid the groundwork for decades of archeological research in the National Park Service, leading to the founding of SCRU at the end of the decade.

The single, sad death of a park diver diving on duty, 56-year-old Lake Mead ranger Thomas "T.K." Brown on August 31, 1973, was from a heart attack. We'll never know if this could have been avoided but medical experts never tied his death to the rigors of the dive. Whatever the case, it was a tragic outcome and the loss of a very good man.

Continued training efforts to prepare NPS divers for disasters and hazardous search and rescue operations took place. In addition, regulations affecting the operations of NPS divers were largely self-imposed until the Department of the Interior accepted oversight by OSHA (Occupational Safety and Health Administration) in 1977. Regional diving review boards were set up to ensure the dive policy was followed.

The late 70s saw two major criminal investigations; the fatal crash of a plane smuggling tons of marijuana in an alpine lake in Yosemite, and the kidnapping and murder of two armored van drivers, whose remains were found in Lake Mead. NPS law enforcement agents and divers were deeply involved in both cases.

Toward the end of the decade, a legal case began in 1978 over the location and rights to the wreck of the HMS *Fowey*, which had sunk in Biscayne in 1748. This battle stretched over the next five years and helped to garner congressional support for new legislation regarding abandoned shipwrecks.

1970

Olympic National Park

During the late 1960s Olympic had an active dive program, led by Ranger Don Brown. Between May 1970 and October 1971, divers participated in at least eight separate, specialized training sessions, including swift-water rescue, ocean diving from boats, surf entry and exit, body and property recovery, altitude diving, zero visibility diving behind Elwha River Dam, and cold-water diving. Scripps dive officer Jim Stewart traveled to Olympic to assist on at least one of these region-wide training sessions.

Also in Olympic at this time, sub-district ranger Jack Hughes, even at that time a "ranger's ranger," attempted to form the Professional Ranger Organization (PRO). This group intended to further the ideals and craft of being a park ranger, including diving. Hughes did not get very far with this idea, a concept before its time and which the National Association of Park Rangers would soon fill. Early on, Hughes visibly and very vocally criticized the service's upper management, including Director George Hartzog. This was right at the time the July 4th "Yosemite Riot" had taken place in 1970, and the service's highly-controversial Field Operations Study Team (FOST) program was being implemented. Needless to say, it was a period of great flux in the service. [1]

1 In 1965 the Civil Service Commission directed all agencies to review their personnel classification series to separate non-professional duties and skill requirements from professional positions. This would permit additional career opportunities for persons, particularly minorities, who would otherwise be unable to qualify for professional positions. To make the review, NPS appointed a FOST task force, chaired by J. Leonard Volz, then superintendent of Crater Lake NP with a park ranger background.

1970
Southwest Region (NPS)
Nearly at the same time in 1970, the Southwest Region scuba diving review board was formed to regulate and standardize the growing NPS diving search and recovery activities, including oversight and coordination on certification and training in the relevant parks in the region. Tom F. Ela, the regional chief of protection and ranger services was designated as the chairman from 1970 to 1975. From 1975 through 1978, Cal Cummings served as the chairman of this board, followed by Dan Lenihan.

1970
Lake Meredith National Recreation Area
One of these parks with an active dive team was the previously mentioned Lake Meredith National Recreation Area. They were being supported by the Amarillo, Texas-based Southwest Council of Skin Diving Clubs, which also provided instruction to NPS employees, such as maintenance man Calvin Myers who was certified on June 9, 1970. A year later, Cal was indoctrinated into the Lake Meredith dive program when Chief Ranger Art Partin certified him to dive to sixty feet.

1970
Lake Mead National Recreation Area
Not all scuba used by rangers was used underwater. On July 11, 1970, a 19-year-old from the Yuma, Arizona Marine Corps Air Station was overcome by poisonous gas while exploring in a deep mine in the California desert across the Colorado River, in nearby Imperial County. The mine had suffered a fire the week before and was full of carbon monoxide. A fellow marine, trying to reach his friend, was also overcome. Lake Mead field rangers Don Chase, Rick Gale and Jerry Phillips were asked by the county sheriff to come down and assist. Chase and Phillips were trained divers and use to the nuances of tanks and regulators, Gale was not.

When the trio arrived on the scene, they joined 14 other rescue organizations trying to reach the two young men in the 600-foot-deep shaft. Chase and Gale, unable to use standard fire rescue breathing tanks because of insufficient airtime, wore the larger scuba tanks. Needless to say, their regulators were not designed for noxious gases but, because "it seemed like a good idea at the time," they were lowered into the mine anyway! From author Farabee's book, *Death, Daring, & Disaster: search and rescue in the National Parks*, "At one point, Gale vividly remembered, he had 'to take my tank off over my head, wiggle it through a narrow crack and then crawl through sideways behind it.'" The two marines were soon recovered and the Imperial County Sheriff, for their invaluable assistance, officially cited the three Lake Mead rangers.

1970
Rocky Mountain National Park
Another "it seemed like a good idea at the time" foray was in Rocky Mountain National Park, less than a month later. On August 3, 1970, young and strong, and in retrospect "dumb and lucky," Longs Peak rangers Charlie Logan and Pete Pederson, along with Charlie's brother, Doug, hefted their 80 to 90-pound Kelty frame packs, bulky and cumbersome with neoprene wetsuits, steel scuba tanks, and weight belts, and headed up the winding trail to 11,802-foot-high Chasm Lake. It was a little over four miles from the Longs Peak Ranger Station, elevation 9,200 feet, to the lake. It was a hump to gain the 2,600 feet. "Our gear also included the Mae West [a type of inflatable vest worn by WWII pilots and divers]…with the push-to-blow valve stems. To inflate the vest to adjust buoyancy, we had to take a deep breath, remove our regulator from our mouth, and blow air into the vest."

Charlie Logan was a 1969 graduate of Scuba Schools International out of nearby Ft. Collins, Colorado and like most early divers, he and the other two had little or no understanding of high-altitude diving. They made two dives each in Chasm Lake that day, as described in an email from Logan to the author on September 16, 2011. Once submerged, the threesome quickly lost sight of each other. Ranger Logan got to 85 feet and when it turned pitch black, "that pretty much did it for me." Doug bottomed out at 100 feet. "I remember my brother surfacing like a Trident Missile because he didn't vent fast enough through his ascent. His BC was as tight as a drum when he surfaced."

Pederson made a much shallower, and in hindsight, saner (and slightly safer) dive. Without any real surface interval time, they then made their second dive in the lake down to 20 feet to clean up beer cans and submerged litter. Adjusting for altitude, it was a 30-foot depth equivalent. "We were very lucky, on several levels, not to have suffered a serious accident." This was one of those "because it was there" adventures. Although these are certainly some of the highest dives in the United States, neither were the highest in a national park area nor in this country. [2] (SEE PAGE 155)

1970
Yellowstone National Park

Ranger Rick Smith recalled two of his most memorable dives in Yellowstone that year, in communications with the author in 2016:

> In Yellowstone, two dives stand out. One was at Lewis Lake looking for a USFWS employee who was working on fish censuses in Shoshone and Lewis Lakes. When his boat was found without him, we immediately began a search. We rigged a rather ingenious, I thought, search method. We rigged our boat with two ski ropes and divers dragged along a grid that the topside people laid out. After about 15 or so minutes, we found him. I will never forget rolling him over. He still had his sunglasses on.
>
> The second was looking for a lost teenager in the Yellowstone River. He had been fishing with waders on. Somehow he slipped, his waders filled with water and he was swept away. The two recovery divers made several passes near the spot where he was last seen. We finally found his body caught on a large, submerged tree. It took us several more passes to free the body from the tree because the current was fairly strong there and we could not stay in one place for long.

1970
Virgin Islands National Park



The all-female team splashing on Tektite II, Virgin Islands, 1970. Gary Davis Collection.

On November 22, 1970, Tektite II, the previously mentioned ambitious man-in-the sea program directed by the Department of the Interior (with part of the funding coming from NASA), was concluded within Virgin Islands. NASA was interested in the psychological study of the scientific teams working in closed environments, similar to that of spacecraft. The Tektite II missions were the first man-in-the-sea mission to also undertake in-depth ecological studies. Tektite II comprised ten missions lasting 10-20 days each. One of these ten missions was all-female, and included Dr. Sylvia Earle, who would become a well-known explorer, oceanographer, author, and in 1990, the first female chief scientist of NOAA. From the January, 1971 issue of the *National Park Courier*:

> The seven-month project proved to be the longest and most intensive experiment in undersea living and research ever conducted, reports O. L. Wallis, National Park Service TEKTITE Coordinator….In the sea floor program, 10 crews of four marine scientists and an engineer lived and worked on the bottom of [Great] Lameshur Bay at a depth of 50 feet for two-to-four-week periods in a two-cylinder, four-compartment habitat.

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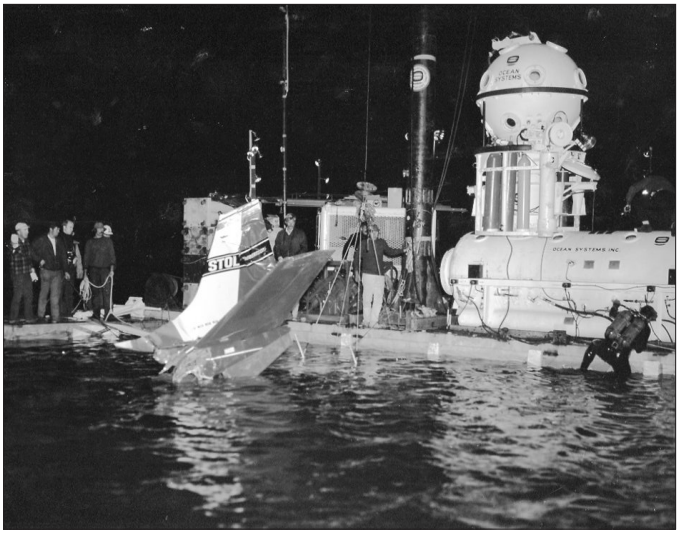
2 The dive was a great adventure and accomplishment but the nagging question, in retrospect is how did they know they were at 85 and 100 feet? This issue always comes into question with high altitude diving. To measure depths at that time there were marked lines, oil-filled bourdon tube gauges, and capillary gauges. Capillary gauges were cheap and accurate, if diving less than 50 feet deep at sea level, but if diving at altitude they would be shallower than their gauge noted. If using an oil-filled gauge, they were actually diving deeper than they thought. At 11,802 feet, if their capillary read 85 their actual depth was 60 feet. But their bodies were being affected as if they were actually at 85 feet, hence the capillary was correct for decompression needs but inaccurate for mapping. If they had an oil-filled gauge and their gauges read 85, they were about 125 feet. Also, reading a capillary from 0-34 feet is easy but from 35 feet to infinity all had to fit into the second half of the gauge. It became largely a guess. The only accurate way, albeit, often impractical, to determine depth at altitude in 1969, was a marked line.

1970
Lake Mead National Recreation Area

Three days after the highly successful Tektite program concluded on the 25th of November, the Lake Mead ranger patrol plane, a Cessna 206, N-736, crashed and sank in 390 feet of water near the west end of the lake's Boulder Canyon. They were surveying for potential damage incurred during nearby atomic bomb testing, when a sudden down draft caught them. In addition to pilot Chuck Rowland, who is credited with making the first Lake Mead scuba recovery in 1956, there were three officials of the Atomic Energy Commission (AEC), including Theos Thompson, one of the three commissioners. Miraculously, a struggling Rowland broke free of the sinking aircraft.

Lake Mead dive officer Don Weir, in conference with Harry Wham, knew this was definitely beyond all of their capabilities. We'll never know what kind of intra-governmental politics took place right after this accident, but the Department of Defense soon volunteered their technical services.

After pinpointing the location of N-736, Ocean Systems, a navy contractor and acknowledged deep-diving experts, were brought in for the recovery. The Florida-based, mixed-gas, deep-sea divers brought a small, two-person diving bell, courtesy of a military C-141: a first for the desert. Working from the bell at a depth of nearly 400 feet, divers had only twenty minutes to labor before a long decompression. They worked in the cold darkness, attaching steel hoisting lines. After six round-trips, the plane was slowly brought to the surface. Two of the three passengers were still onboard the craft, the third official was never found.



With a diving bell (upper right) flown in from Ocean Systems, Inc., Florida, the Lake Mead patrol plane (left) is recovered from 400 feet of water. Three died in the crash on November 25, 1970, but the pilot escaped. Photo by Don Weir.

As noted in Farabee's *Death, Daring, and Disaster*, the Atomic Energy Commission, stridently citing national security to the park staff which was providing logistical support, including several boats and a lot of diving, "clamped the [publicity] lid on." The AEC confiscated all the film being shot, including that of Lake Mead ranger Don Weir. Author Farabee, through a Freedom of Information Act request in 1990, was able to eventually secure Don Weir's photos.

1970
Fort Jefferson National Monument

That December, George Fischer, Zorro Bradley (then NPS deputy chief archeologist) and NPS archeologist Jerome Petsche used scuba to survey East Key and Hospital Key of Fort Jefferson. They found building bricks and monument stone, apparently associated with the yellow fever hospital, and explored a very long shipwreck. This was the second step of three at Fort Jefferson, culminating in a major project in May and June of 1971. Zorro Bradley became scuba certified on his own, between 1968 and 1970, according to George Fischer.

1971
Washington Support Office (NPS)

In January, the National Park Service hosted the Second Annual Conference on Underwater Archaeology, held concurrently with the Fourth Annual Meeting of the Society for Historical Archaeology. In March, the *NPS Newsletter* (Vol. 6, No. 4) came out with a note that Scripps had trained most of the 39 NPS divers.

On June 6, there was a small conference on scuba in Santa Fe. The major subject was the proposed revisions to the *National Park Service SCUBA Free-Diving Policy and Guide*. At the time, the 1968 diving policy was: *Special Park Uses—National Park Service Free-Diving Policy and Guidelines.* Richard "Dick" Wilburn, safety officer for the US Park Police, chaired the conference. A non-diver, Dick would soon

become the safety officer for the Western Region and ultimately, in the mid-1980s, become the safety officer for the NPS. Also in attendance were Jack Morehead (assistant superintendent, Glen Canyon), Thomas Ela (chief of protection and ranger services, Southwest Region) and Jim Stewart from Scripps.

George Fischer had difficulty with the findings of this conference and believed it represented "rangers and safety people," developing a "we and them" perspective. In a July 17, 1971 memo from Fischer to Sanford Recreation Area archeologist Ron Ice, Fischer wrote:

> I'm not overjoyed with what they are doing. Wilburn, who is head of the committee, doesn't know much of anything about diving, and the revisions have been suggested by the Santa Fe crowd for the most part. We have been asked to comment and I would like to work up an extensive critique of the whole thing, with the end in view of developing an independent policy for research diving. This has a number of flaws scattered throughout, but training and certification are the greatest. I cannot see having to be checked out by one of their two-week Scripps wonders, who may not have been doing enough diving to be legally current in certification himself. . ."

Also in 1971, the NPS Division of Archeology in the Washington Support Office gave a contract to the State of Florida to conduct a survey of historical shipwrecks around Pulaski Light and East Key in the Dry Tortugas, with a provision for other areas determined necessary by NPS.

1971
Olympic National Park

There were occasions when park divers found that their skills and equipment could be useful out of the water. Stu Croll, ranger at Olympic, recalled a fiery evening in January:

> A concessioner employee was cleaning the floor of the dining room and kitchen at Lake Crescent Lodge when the cleaning fluid he was using exploded. Windows had been closed. Was it cold, snowy and windy? You bet. Flash fire – everything black and terrible smoke damage to the whole downstairs. Cleaning person not burned, except for his coat, and luckily, the fire put itself out. Don Brown and myself and 4 others were at the lake diving (Winter/cold water diving was in my blood, I guess, a forerunner/requirement for Isle Royale.) Don and I were still in our wet suits and are the only ones who can stand the smoke – smell (using face masks and regulators) entered the lodge and checked all floors and attic to see if the fire was out. Walking around the attic on just beams for footing, in our rubber booties, with air tanks and face masks and carrying fire extinguishers just in case, was interesting to say the least. This was the era of versatile rangers! OSHA Be Dammed.

1971
Fort Jefferson National Monument

The third and final field season of surveys and excavations took place at Fort Jefferson. Washington Support Office's George Fischer, the project's principal investigator, began this undertaking in 1969. The three goals of this 1971 effort were the excavation of the moat, an architectural evaluation of the submerged walls of the fort, and an open water survey of shipwrecks. Background research was provided by historian Ed Bearss and moat excavation was supervised by Cummings. From the May 17, 1971 issue of the *NPS Newsletter*:

> The NPS Division of Archeology started. . .largest project in underwater archeology, thus far conducted in the U.S. . ..investigation of Fort Jefferson. . .excavation within the moat to determine the architectural conditions. . .recover fort-related artifacts known to be buried...Within the 75-square miles. . .the Monument, archeologists will use sophisticated metal sensing devices. . .important shipwrecks. . .chart locations. . .identify their period and nationality. . .leader George Fischer. . .members are Jerry Petsche, WASO; Calvin Cummings, Gran Quivara; Jerry Livingston, Midwest Archeological Center; Ron Gibbs, Museum Clearinghouse; Ron Ice, Sanford Recreation Area; and Ed Sudderth, WASO.

Described in a May 17, 2013 email to author Farabee, Everglades marine biologist Gary Davis made his first visit to Fort Jefferson from July 15-18, 1971:

> [When I] visited FOJE. . .for the first time. I dove with John Bellinger and Dave Hoover, Park Ranger, FOJE. . .Hoover took us to his favorite lobster reef. . .southeast of Bird Key Harbor. . .we discovered poachers had taken at least 70 very large lobsters. . .wrung the tails and left the carapaces on the bottom. We. . .took them back to Fort Jefferson. . .While taking measurements, a visiting NPS

> executive, Fred Packard, NPS Chief of International Affairs, took a few snap shots…subsequently showed to NPS Director Hartzog. A few days later, Superintendent Brown [EVER & FOJE] received a phone call from the Director…something needed to be done…We immediately began a study of sport-take of lobsters…we discovered even with a daily bag limit of two lobsters, sport-take removed half of the population in eight months and that it would take 12-15 years to replace that take. Working cooperatively with the State of Florida, NPS decided to protect the lobsters in the Monument so that they could replenish surrounding areas with larvae and juvenile lobsters and support the fishery as a reserve of full-sized adults.

1971
Everglades National Park
In late June or early July, Everglades assistant chief ranger Tom Hartman, Everglades marine biologist Gary Davis and Biscayne's acting chief ranger, George Sites, started the first South Florida Parks' dive team: Biscayne, Everglades and Fort Jefferson. These three men, along with Washington Support Office's marine biologist John Bellinger, dove on Biscayne's Ajax Reef on July 9, 1971. Also in 1971, Hartman was appointed the Southeast regional dive examiner.

1971
Death Valley National Park
Increased groundwater pumping by landowners in the nearby Ash Meadows area caused the water level in Devils Hole to decline dramatically. Particularly egregious was a 12,000-acre ranch that was established there several years prior. The pumping, which supported irrigation and other farming activities, threatened the survival of the resident endangered pupfish species. An August 1971 federal court injunction put a halt to pumping and the attendant water drawdown of wells in the neighborhood, which caused a reversal in the declining water level. The ranch and the State of Nevada, which had joined the case, appealed unsuccessfully.

1972
Lake Mead National Recreation Area
A January 18, 1972 memorandum from the Lake Mead acting assistant superintendent, Doug B. Evans, to the director, Western Region, referencing the *1971 Annual SCUBA Diving Summary*, reads:

> Lake Mead Rangers accrued a total of 295 man dives (i.e. diver leaving the surface, descending to a depth of 10 feet or more, remaining under for 2 minutes or more) in 1971. As of December 31, 1971, we had five NPS divers, two transferring in January 1972. We have six NAUI certified Rangers waiting for NPS certification...It would serve our needs very well, and save the government money, if the Lake Mead Diver Officer could be approved and trained by the NPS as a Diving Examiner…divers supply their own dive suit and personal gear, such as hood, gloves, boots, mask and snorkel. We are studying the possibility of supplying the personal dive equipment items, other than the dive suit itself, for the certified active NPS divers.

1972
Death Valley National Park
In April, the first official attempts at counting Devils Hole pupfish by scuba were done by Bill Acree and Howard Dimont, both out of Lake Mead, as well as Charles Osborn, US Bureau of Sport Fisheries and Wildlife (now USFWS). In an April 7, 1997 email to the author, Acree wrote:

> "The first dive in Devils Hole to count the pupfish was made on April 6, 1972 by myself [Acree] and Dimont, depth to 90'. Downtime was 34 minutes. A second dive was made the same day by me, Dimont, and… Osborn… depth to 65', and downtime of 40 minutes."

They counted 38 fish at depths from ten to seventy feet. They also noted the fish "were without exception, judged to be entirely at ease, even curious, in the presence of divers." This claim to be the first real attempt at counting was in a Lake Mead dive summary, written by dive officer Acree, although as discussed previously, an unofficial count had been made back in 1954. There is an 18-year span of time—1954 to 1972—in which these two pupfish counts were lost to each other. We suspect the same may be said for other "firsts"

and other "earliests," claimed and documented here.

Between 1972 and 1986, James Deacon and his students at the University of Nevada, Las Vegas, continued the use of scuba for research into the life history and management of the pupfish. They made near-monthly counts during this period. In addition, scientific studies by Deacon and his colleagues provided valuable information concerning the fish for continued legal action regarding water pumping in the area.[3]

1972
Biscayne National Park

In January, NOAA Fisheries proposed building an artificial reef of 500 discarded automobile tires at a depth of 45 feet near Pacific Reef in Biscayne. The goal was to enable the study of reef fish populations on it from a portable habitat with aquanauts as part of Project FLARE: Florida Aquanaut Research Expedition. The FLARE project's aquanauts were housed in the EDALHAB (Engineering Design and Analysis Laboratory Habitat). The portable habitat was originally built by engineering students at the University of New Hampshire and retrofitted for use in the FLARE project to be supported by a moored catamaran overhead. The project manager was John VenDerwalker, a colleague and fellow Tektite aquanaut of Gary Davis and with whom Gary collaborated. The tire reef was removed at the end of the two-year experiment.

Reported in the *NPS Newsletter* article "Sub-Tropical Biscayne" by Jean Bullard in the May 29, 1972 issue (Vol. 7, No. 10):

> Last month the EDALHAB II undersea habitat was located in the monument and Gary [Davis] and George [Sites] worked with the numerous scientists. They compared natural and artificial reefs and studied the effects of the human community on reefs, the geology and chemistry of the reefs, and the reaction of fish to traps.

1972
Fort Jefferson National Monument

SEAC announced that it had located and identified the wreck of the *Nuestra Senora de Rosario* in the Dry Tortugas. The vessel was one of the 1622 Spanish "plate" fleet, its name originating from the word *plata*, which means silver in Spanish. Because it was a treasure ship its discovery drew a lot of attention, but the service elected not to excavate it.

1972
Yosemite National Park

On December 1, 1972, Bruce Norris, 26, and 20-year-old Lorraine J. Sutton went over 1400-foot-high Upper Yosemite Falls. The coroner ruled Ms. Sutton had been murdered by Norris, a graduate physics major. He threw her in and then he jumped into the waterfall himself. Within a day, rangers had reached Norris, who was embedded in the frazzle ice at the base of Upper Yosemite Fall. Ms. Sutton's leg was also recovered but the rest of her was never found. Rangers spent the next several days looking for her from the base of Upper Yosemite Fall down through Lower Yosemite Fall. Mark Forbes, relatively new to the ranger force in Yosemite at that time, talks about his recollections of diving, looking for Lorraine Sutton:

> It was my first official, on-the-job dive. I had graduated from the NPS Dive School at Scripps in September and had been on several training dives in the Merced River that fall.

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3 These early efforts at managing and counting the Devils Hole Pupfish are quite in contrast to the way these endangered fish are managed in 2015. Per an email to the author in Dec, 2012, Death Vally fish biologist Bailey Gaines said:

> "A minimum certification of Introductory Cave is currently required…our program has facilitated training needs of the VIP divers who have ultimately been responsible for the sustainability of diving operations at Devils Hole. There are currently 3 Park Service FTE [full-time] employees that are Blue Carded here at DEVA…Typical annual dive operations in Devils Hole consist of Spring and Fall pupfish counts for a total of only 4 dive days and 3 four-person dives per day. Diving by NPS staff, while a benefit to our program, is not mission critical and thus not required but rather an individual option for FTEs. With this in mind, it is critical that we continue to keep our VIP divers engaged for long term sustainability of a dive program and annual scientific pupfish surveys at Devils Hole. We currently have 7 active VIP divers, 5 from Palm Springs area who generally serve as safety divers and 2 from Las Vegas who have traditionally served as the counters on the pupfish dives. NPS divers typically facilitate dive operations before, during, and after annual count dives and fill in on dive operations when short-handed."

As we stood on the Lower Fall's Footbridge, looking up at the waterfall and talking about getting to the dive site, I wasn't too concerned about the dive itself. I was comfortable in water, had good equipment, a new ⅜" thick neoprene wetsuit, and was partnered with an experienced diver, Butch Farabee. We talked about the approach up the creek bed. We would be in our wetsuits because of the mist off the fall and the need to carry all of our equipment, tanks, and gear bag on our backs over the rocks and boulders. I can't remember if there was snow on the ground or just frazzle ice. Either way, it had a "winter wonderland" feel. We also talked about our dive plan while at the bridge. It would be too noisy at the base of the fall to really talk. We would gear up, get into the pool, do our search, and get out. Visibility would be poor, so we would hold onto each other's tank pack straps. The pool wasn't that large, and the water would be in the mid-30,s, so we planned on being in the water for only 10 to 15 minutes.

Up to this point, I kept telling myself, this was just another dive in a new and unique location. Yosemite Falls is an icon for Yosemite National Park and I was going to dive at its very base. Not many people get to do that. In my mind, however, I knew why we were diving in that pool, and I wasn't looking forward to this. Several days before, two people had gone over the Upper Falls, a possible double suicide or homicide/suicide. One victim landed between the two waterfalls on the ice cone. The other, a female, was swept beyond. We had recovered the first victim and parts of the second victim the previous day. Butch and I were to search the pool for a badly mangled body, in almost zero visibility and near freezing water.

As we started up the creek bed, in wetsuits, carrying our load, I kept thinking I wanted to dive in the pool because of its uniqueness, but I didn't want to find the body, underwater, in zero visibility. I had been on recoveries before, where victims had fallen some distance. That was not an issue, anymore. However, those had all been out in the open, where I knew where the victim was. I had a job to do, and there were distractions while doing that job. Looking for this body was different. We didn't know if she was there, we wouldn't be able to see her, and we would have to bump into her to find her. Walking up the creek bed, searching for her body in the stream along the way, I was thinking "What am I doing here?" I had graduated from college two years before, and they certainly hadn't covered this sort of thing in forestry school.

We got to the pool and geared up. There wasn't a lot of room with all the boulders. We checked each other out, tried to talk over the noise of the fall, decided on a search pattern, and got into the water. I recall looking around and thinking we were in Glacier Bay, Alaska. Frazzle ice and snow covered the boulders almost to the water's edge. The noise was deafening and as we went under, we couldn't see our hand in front of our faces. As I took my first few breaths, I tried to concentrate on the dive and calm myself. I had a firm grasp of Butch's harness; he wasn't getting away from me. We started with a few kicks of our fins, and all I could hear was a giant heartbeat, amplified a thousand times. The water off the giant fall had a rhythm, and that's all I could think of, a heartbeat, while looking for a body I didn't want to find.

We probably searched five, maybe ten minutes. The pool wasn't that big, we couldn't see between the boulders, and we were cold. Once out of the water, I recall thinking how cool the dive was, happy it was over, and remembering that giant heartbeat.

I know that I would have been okay if we had found the victim, at least after the initial contact. The time at Scripps had really prepared me to be comfortable in the water: relax and stay calm, think about what I was doing, and be ready for anything. I did go on other SCUBA related body recoveries during my NPS career and was fine. They continued to be my least favorite type of dive, but none came close to that first experience and that heartbeat.

1972

National Oceanic and Atmospheric Administration

NOAA was created in 1970 as part of the US Department Of Commerce. The United States Congress then passed the Marine Protection, Research and Sanctuaries Act in 1972 (P.L. 92-532). Among many things, the act aimed to extend the protection afforded by national parks to estuaries and coastal waters. NOAA established the National Marine Sanctuary (NMS) program that same year.

In 1975 NOAA designated the USS *Monitor* as the first sanctuary in the program. There was now a second federal agency mandated to work with marine protected areas. Unlike the NPS however, NOAA worked within a multiple-use framework. Eventually they would be a source of numerous partnerships with NPS, including offering additional protection through marine sanctuaries for five of the eight Channel Islands (1980), the Florida Keys (1990) and the Olympic Coast (1994).

In 1985 NOAA turned to NPS for help in managing the USS *Monitor* and assessing its significance and developing an archeological research design – Lenihan, Murphy, Cummings and Jim Delgado all worked on this.

1972

Southeast Region (NPS)

From Cummings' previously referenced, unpublished 1997 manuscript on the role of the National Park Service in underwater archeology:

> The [NPS] reorganization of 1972 moved the Southeast Archeological Center from Ocmulgee National Monument…to the campus of Florida State University…with a major restructured role and function. [SEAC] was to have become the [NPS] Center specializing in underwater archeology for the entire [NPS]…[George] Fischer was transferred from the Washington Office in July of 1972 to [SEAC] as the resident underwater Archeologist and to build an [NPS] Underwater Archeological program.

In NPS historian Cameron Binkley's 2007 administrative history of the SEAC, *Science, Politics, and the "Big Dig,"* the author describes the unofficial nature of underwater archeology in the initial agreement between NPS and Florida State University (FSU):

> The signed 1972 accord did not specify cooperation in underwater archeology although the first drafts by SEAC Chief John Griffin did specify this feature. NPS and FSU did not actually sign the first accord until SEAC was under the direction of Richard D. Faust. Faust was not a strong supporter of NPS underwater archeology. In 1978 the accord was modified to include underwater investigations specifically, but these were again removed in subsequent renewals because of the decision to consolidate underwater archeology in Santa Fe, New Mexico by 1987.

1972/1973

Southwest Region (NPS)

By 1972, Lenihan was a NAUI instructor and in 1973, a National Association for Cave Diving (NACD) instructor.[4] He taught introductory cultural and physical anthropology at FSU for his graduate teaching assistantship and then taught basic diving in the afternoon to support his cave diving habit at night. He and his dive buddy Tex Chalkley (a state attorney) would drive west from Tallahassee to the panhandle at night to search for new caves, or east to join with Sheck Exley and others for midnight dives in central Florida.

Don Weir, now a Biscyane ranger, was the only other certified instructor in the NPS at the time. After being brought on part-time by SEAC in 1972, Lenihan was hired by Cummings, then chief of the Southwest Region Division of Archeology in March 1974. Except for a few months hiatus to North Carolina in 1975, Lenihan stayed with NPS in Santa Fe through 2009. He retired as Chief Sept. 30, 1999. But the next day he continued as a rehired annuitant for SRC for ten more years.

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4 The authors have included here a brief discussion about the NAUI 1972 and 1973 NACD institutes Lenihan attended to help the reader understand the nature of the times and thinking in the world of diving. The NAUI philosophy at this point was pointedly not to train but to test—7 days of intense testing. Lenihan, won the class pin for 1st place, so felt he earned the right to criticize when asked to speak for the class. He said he admired the NAUI staff and their serious intent but failing 66% of the candidates (14 out of 21) including some fine instructors was unacceptable; it indicated a weakness in their process. NAUI eventually changed to having 'ITCs' which were twice as long, had high standards but also trained people. Lenihan also said it was inappropriate for the staff to make derisive comments about the Florida cave diving community and its "suicidal fatality rate." The staff accepted his criticism constructively. When certified as an NACD instructor a year later, Dan was happy to see Glen Egstrom, head of NAUI, attend. Tom Mount and Dave Desautels who ran the 1973 NACD institute were instrumental in bringing cave diving into a more positive light in the US.

1973
Lake Meredith National Recreation Area

Billy Sims was the president of the Amarillo Skin Diver's Club, and a scuba instructor. Over the years he had helped instruct divers at Lake Meredith as well as taught local Texas Panhandle divers in the reservoir. Apparently, either the park or the region was interested in making Sims an official dive instructor for NPS divers, and Lake Meredith an alternate training facility for the service. In response to a request to evaluate Sim's program by associate director Lawrence Hadley, Jim Stewart of Scripps, said in a February 23, 1973 memorandum:

> Director Sims is a proficient diver in his own right and no doubt is a capable instructor. If he could provide a diving course in accord with the newly developed Service Standards with more than one open water checkout dive he now provides his students, at least a minimum of ten dives, then we would categorically recommend his school as an alternate training facility. This is not the case, however, and Mr. Sims does not feel he has any latitude in his training schedule to make that change and deliver this degree of service. Therefore…[NPS might] accept as an alternative:
>
> Completion of Sims course would qualify the student as a "diver in training." Each candidate would be required to pass the same pre-test and physical (as outlined in the Standards). This test would be administered by a qualified Service instructor examiner. At the conclusion…course, each diver…required to demonstrate his proficiency during a minimum of six dives…I would be willing to travel to [Lake Meredith] to make that evaluation personally.

1973
Southwest Region (NPS)

The scuba review board for the Southwest Region met in April and consisted of Thomas Ela and Cal Cummings (Southwest Region), Allen Hill (Platt-Arbuckle), Alford Korzan (Amistad) and William Burke (Big Bend). Also attending were Jim Stewart from Scripps, Dick Marks from Division of Ranger Activities in Washington, and George Fischer from SEAC. They drafted a revision of the NPS Diving Policy and Guidelines. The *Special Park Uses Handbook Part 5*, has appendices of the policy, "Amendment No. 2," with the date at the bottom as October 1973. Mockups of a Blue Card are in the policy, dated 1969.

Fischer was not originally invited but showed up anyway when Cummings alerted him to the meeting; Fischer had draft policies in hand with recommendations that he distributed. He got into a confrontation with Marks when he complained that only protection rangers were going to Scripps. Marks said it was for search and rescue and Fischer challenged Marks to write on a piece of paper how many rescues had been performed, versus recoveries. According to Fischer, it quickly became heated and when it was all over, Marks' copy of all of the recommendations put forth by Fischer, ended up in the wastebasket.

1973
Southwest Region (NPS)

In a June 28 memo from the associate director of management, Monte Fitch, to the associate director of operations, "Southwest Region would like to designate Lake Meredith Recreation Area, Amistad Recreation Area, Platt-Arbuckle, and Padre Island National Seashore as areas where SCUBA diving is of prime importance."

1973
Gulf Islands National Seashore

The first underwater archeological project conducted by SEAC took place that summer; a survey of shipwreck sites along the Gulf Islands coast, mostly near Pensacola, Florida. It involved FSU from the start under the auspices of the SEAC-FSU cooperative agreement. The project was directed by George Fischer of SEAC. His site evaluation director and dive officer was seasonal park ranger/archeologist Dan Lenihan. Fischer had hired treasure hunter Marty Meylach to gather magnetometer data with his personal equipment. Al Mamelstein analyzed aerial data and Jim Quinn, director of the Neville Public Museum of Green Bay, Wisconsin, was a diver and general contributor to the project. This survey used 16 divers (a mix of NPS and non-NPS) to search for shipwrecks around Santa Rosa Island and Perdido Key

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Cal Cummings, co-director, was the regional archeologist of the Southwest Region. Other NPS divers included Ron Ice, Jerry Livingston and Ed Sudderth.

Southeast Region diver-examiner Don Weir was sent to Gulf Islands to check the project for dive safety. He was very impressed with the discipline and safety procedures and submitted a positive evaluation to the region. Lenihan said,

> I didn't clear Fischer and Cummings to dive for most of the project. The fact that Fischer, the boss, respected my decision from the first day, had an effect on everybody. A GS-4 part-time, seasonal park ranger really was the dive officer. George did as much for dive safety on that first day as I did for the rest of the project.



Gulf Island National Seashore, 1973. Cummings (left), and Fischer (right), during rescue training, demonstrating mask-off buddy breathing. Photo by Dan Lenihan.



Participants in the 1973 Gulf Islands Project directed by George Fischer of SEAC. From left to right bottom: George Fischer, Cal Cummings, Nancy Fischer, Al Marmelstein (Earth Satellite Corp), Dan Lenihan, Jim Quinn (Neville Public Museum), Unknown, Jerry Livingston, Ed Sudderth and Ron Ice (far right). The top tallest figure is Marty Meylach (treasure hunter), other back row figures are unknown. NPS Submerged Cultural Resources Center collection.

1973
Padre Island National Seashore

After the Gulf Islands project, Cummings took Lenihan to help evaluate diving conducted by State of Texas archeologists at Padre Island on the 1554 Spanish fleet. Lenihan concluded the archeology was acceptable but the project was unsafe. He wrote a paper entitled "Dive Safety Considerations in Underwater Archeology." It was later printed in *Underwater Archeology in the NPS: a Model for the Management of Submerged Cultural Resources, 1974*. The students were at Padre Island as part of a nine-week-long University of Texas at Austin field course in underwater archeology, directed by Carl Clausen, Texas state archeologist.

1973
Lake Mead National Recreation Area

The only park diver who has died while diving on duty was Lake Mead ranger Thomas "T.K." Brown. He suffered a fatal heart attack at the age of 56 while on an official NPS dive on August 31. He and his dive partners, rangers Harry Steed and John Chew, were below Hoover Dam at river mile marker 30, which is on the downstream side of the Ringbolt Rapids. Jim Burnett was surface tender in the boat. Brown had received a Whamco Divers' certificate on September 19, 1971, followed by a NAUI certificate also signed by Harry Wham that following December 17.

Per an email message from Mack Shaver, a retired Channel Islands superintendent and former service diver, to Butch Farabee on November 29, 2012:

> T. K. worked nights, so he came to me [Shaver was the Boulder Beach sub-district ranger] and asked if he could do the Ring Bolt [Rapids] dive because with his schedule it was impossible to keep up training dives and certification. I said sure, even though as you remember, that was about the time the NPS was getting uptight about unauthorized overtime, comp time, etc., because of the Fair Labor Standards Act and folks claiming it when it wasn't pre-approved. Anyway, because T. K. was on his own time, personnel denied his widow [Gwendolyn Brown] any benefits. Fortunately the management team there was top notch so we were able to get the chief ranger and superintendent in our court and reverse the decision. It would have helped if I had

> put T. K.'s request in writing…the only thing irregular about his being on the training dive was that it wasn't on his regular duty schedule. He was on the dive team and a qualified diver.

1973
Biscayne National Park
Twenty-four NPS employees were scuba certified for tropical diving. This was the only NPS-Scripps Course conducted on the East Coast. Although advertised as NPS-Scripps training, with Stewart lending both his name and his overall leadership to the effort, NPS dive instructor and Biscayne chief ranger Don Weir probably should receive equal billing for providing instrumental effort and coordination. Also significantly assisting with this training was Gary Davis from Everglades, who at the time, was solidifying his underwater credentials in preparation for soon becoming a NAUI instructor.

1973
Washington Support Office (NPS)
United States Congress asked the NPS to build an underwater archeological program. In the service's fiscal year 1973 request or "directive," it stated: "Additional requirements of the [NPS] program: (4) the development of an [NPS] underwater archeological capability for the scientific investigations of submerged lands which are under the jurisdiction of the Secretary of the Interior…"

The authors could not determine where this emphasis in Congress came from. We do know, however, per numerous back-and-forth memorandums found in the archives of the St. Augustine Lighthouse and Museum in Florida that this was a confusing and often tempestuous period of change regarding the archeological leadership within both the service and the Department of Interior. SEAC had just moved from Georgia down to Tallahassee, and leaders in Washington had no real interest in underwater archeology. To this end, and as a possible response to the criticism of Congress, George Fischer of SEAC wrote "Underwater Archeology in the National Park Service: Problems in Resource Management." This paper was presented at the Fourth Annual Conference on Underwater Archaeology in Saint Paul, Minnesota.

1973
The Bureau of Land Management's Alaskan Outer Continental Shelf Office asked Cummings to participate in an underwater archeological technical evaluation panel in Anchorage, Alaska, in September. They were to consider a feasibility study for underwater archeology of the Bering Land Bridge and Chuckchi Sea.

1974
Southeast Archeological Center (NPS)
Fischer delivered a paper to the Fifth Annual Conference on Underwater Archaeology, held in Oakland, California in January. The paper was titled "A Survey of the Offshore Lands of Gulf Islands National Seashore."

1974
Fort Jefferson National Monument /Gulf Islands National Seashore
Shipwreck remote sensing took place that spring at Fort Jefferson and Gulf Islands, Alabama. Marmelstein was the principal investigator for Earth Satellite Corp. Fischer accompanied Marmelstein on the Fort Jefferson segment.

1974
Grand Canyon National Park
In ending his 1990 letter to author Farabee, Glen Canyon chief ranger Bob White related a humorous diving incident at the Grand Canyon.

> In May 1974, the Grand Canyon asked me to go to the North Rim to help a contract engineer diver inspect their above-ground, steel 1,000,000 gallon water tank. When I arrived there and climbed up the ladder to the top of the tank, I was followed by a district naturalist in full dress uniform who proceeded to pour a gallon of Clorox® over me and my wet suit, saying that the water tank constituted the North Rim drinking water supply, and he didn't want to contaminate it.

"Needless to say, I was a bit offended…even more…when I found out the contract engineer was afraid to go into the tank because the roof had collapsed and there was no air space above the water, and I had to do the entire inspection dive by myself! When completed, I went over to the district office and told the young lady behind the desk to tell the district naturalist that Bob White had peed in his water tank, and I went home!

1974
Lake Mead National Recreation Area
On September 14, a major flash flood swept down Lake Mead's narrow Eldorado Canyon at the northwest end of Lake Mojave and erased the small concession's operation, as well as the park's ranger station and homes of several employees. In addition, 38 vehicles, 19 boat trailers, and five trailers were lost or destroyed. Lake Mead staff, as well as local rescue agencies launched a massive effort, including the use of scuba, to search for the nine people who were missing. Eight of the bodies were recovered during the effort, some of them as far as 2. 5 miles from the former boat landing. The last body was found 38 days after the flood. The Eldorado Canyon Search and Recovery Team received the Department of Interior's Unit Award for Excellence of Service. It named 79 NPS employees as well as 20 other agencies. (SEE PAGE 218)

1974
Buffalo National River
The first scuba dives into Indian Rock Shelter at Buffalo took place on October 22, by Lenihan (Southwest Region) and Larry Murphy (State of Florida Archives and History diving officer). They took photographs that showed tight squeezes in the spring/cave system, as well as color images of life in the river.

1974
Biscayne National Park
Divers from the South Florida Parks' dive team mapped four patch reefs in Biscayne for special underwater interpretation. They provided NPS mooring buoys and habitat maps identifying natural history highlights, such as especially large brain coral colonies or cleaner fish stations, as a lower maintenance and cost alternative to underwater trails like the ones created in the Virgin Islands.

1974
Gary Davis and Dave McLean were both certified as NAUI diving instructors in June. They joined Weir and Lenihan to become the third and fourth service instructors.

In response to serious safety issues that Arthur Ullrich noted in underwater research projects in and out of the NPS, Lenihan delivered a presentation entitled "The Question of Dive Safety in Underwater Archaeological Projects" at IQ6--a NAUI sponsored function. It was printed in the *Proceedings of the 7th International Conference on Underwater Education*, Edited Arthur Ullrich 1975, Colton, California.

Tom Lewis, a fireman with the Littleton, Colorado Fire Department, self-published an early instruction booklet on underwater emergency searches. Lewis, a rescue diver with considerable experience, issued *ORGANIZATION, TRAINING, SEARCH AND RECOVERY PROCEDURES FOR THE UNDERWATER UNIT.* This 84-page, spiral-bound manual was implemented and utilized by NPS scuba search teams, at least in the west.

1975
Washington Support Office (NPS)
Cummings published an article titled, "Professional Criteria for Underwater Archaeology," in Volume 9 of *Historical Archaeology: Journal of the Society for Historical Archaeology.* In it he states:

[NPS] established a three-member "qualification and standards review board" to provide professional and technical advice and assistance specifically for those involved in operations on the Outer Continental Shelf, but also, for any problem area involving submerged cultural resources. This advisory board met in New Orleans the first week of October 1974,…first order of business was to define the minimum qualifications…individuals working with submerged cultural resources on

> the Outer Continental Shelf. This was done with a large amount of input from the archaeological profession. The Board determined…two classifications necessary…marine archaeologist and… marine archaeological surveyor. The Board defined only the qualifications for the "Marine Archaeological Surveyor" since this was the area of immediate concern. The members felt that the criteria for "Marine" or "Underwater Archaeologist" should come from the profession and made no attempt to define professional criteria.

In this three-page article, Cummings goes on to say there have been "very few universities [with] special courses in underwater archeology. Florida State University, Arizona State University, the University of Texas, Southern Methodist University, and the University of Pennsylvania, among others, have on occasion provided such courses…"

1975
Southwest Region (NPS)
Dan Lenihan and Southwest Region safety officer Ken Morgan compiled and distributed *High Altitude Diving Considerations* for NPS divers in February. The two synthesized information from E.R. Cross at *Skin Diver Magazine, NAUI News*, information from the US Navy, as well as from the recently attended 1974 NAUI high altitude diving conference at Lake Tahoe. (SEE PAGE 81)

1975
Bighorn Canyon National Recreation Area
Per the Yellowstone *Superintendents Monthly Report*, April of 1975, the first Rocky Mountain Region diving control board met at Bighorn Canyon on April 25. Regional dive officer Jim Randall was the coordinator.

1975
Ozark National Scenic Riverways
Mid-Western Region diving control board was held at Ozark in May, to revise a draft of *Scuba Management and Guidelines (Release No. 1)*.

1975
Scripps Institute of Oceanography
Ken Morgan, the Southwest Region safety officer and diver-examiner left for a position in the Northeast Region. The Southwest regional director sent Dan Lenihan to Scripps for several days for a series of dives with Jim Stewart and he was cleared as both an NPS instructor and regional dive officer.

1975
Western Region (NPS)/ Lake Mead National Recreation Area
On July 6, David McLean assumed his duties as "Park Ranger (Regional Diving Officer)," with position number 8368-12, as a GS-12, Step 5 and $20,923 per annum. He was supervised by the chief, division of resources management and visitor protection, Western Region. This was a new position and would be the only full-time dive officer, either at the park or regional level that the NPS would have until Steve Sellers was hired in December of 2010.

1975
Scripps Institute of Oceanography
Linda Brown, a naturalist turned protection ranger from Olympic's Hoh District, attended Scripps in the fall, becoming as far as we can determine, the first NPS woman to go through dive training there. After attending both the Federal Law Enforcement Training Center and Scripps, Brown recognized she was not interested in the protection side of rangering and returned to being a naturalist, leaving the service around 1976.

1975
Washington Support Office (NPS)
Scuba Diving Management Guideline, NPS-4 was released in September. Until this point, the service's diving guidelines and/or policy was not a stand-alone document. It was part of a larger directive such as the service's then current *Special Uses Handbook*. Now it was a distinct policy document.

1975
Southwest Region (NPS)
In September 1975, three reservoir construction agencies sent letters to NPS Southwest regional director Joe Rumburg confirming their contributions to funding of the National Reservoir Inundation Study (NRIS). This was the result of more than a year of meetings in which Cal Cummings, chief archeologist of the Southwest Region and Dan Lenihan convinced the chief environmental compliance figures in the Corp of Engineers, Bureau of Reclamation and Soil Conservation Service to fund such a study. NPS Chief Anthropologist Doug Scovill provided a key contribution of $25,000 from the NPS to demonstrate it had skin in the game. Lenihan was designated as the director of the study, with a budget of $250,000 per year for at least four years. It was part of Cumming's master plan to use funding from high-dollar dam-building agencies to create a permanent, in-house capability for the service.

1975
Biscayne National Park
Now stationed in Santa Fe, Lenihan was sent by Cummings to help SEAC and Fischer run an underwater survey at Biscayne from September 1-10. After picking up a jon boat on a trailer at SEAC, they proceeded to the park. In addition to Lenihan, the other NPS divers were Wayne Prokopetz, Don Weir, Jim Quinn, Al Marmelstein, Jon Ehrenhard, Jerry Livingston, and Charlie Jordan. The boat flipped in chop near Elliot Key. Lenihan refused to use this type of boat any more, so Biscayne ranger Charlie Jordan provided great support and took the divers assigned each day in a park patrol boat to continue surveying. In prior months, Jordan had been recording site-positions of wrecks spotted on patrol. When these were confirmed by the divers they would reestablish locations for site map with Ilons or "horizontal sextants." This was the origin of many of the new sites recorded in the 1975 survey.

1975
Lake Mead National Recreation Area
In response to a drowning in Lake Mohave, a Lake Mead diver (name unknown) designed a "diving plane" to be trailed behind a moving motorboat for use by a submerged diver to cover significantly more search area. On November 2, it was used, and in the follow-up employee suggestion form, it saved considerable air, effort and was claimed to be far more efficient than merely diving.

1975
Lenihan and Murphy co-author and co-deliver a paper entitled "Cave Diving and Archaeology" at IQ7, in Miami, Florida, September 26-28. It was published in *The 7th International Conference on Underwater Education,* 1976, Edited by Lou Fead, Colton, California.

Lenihan presented a paper in Albuquerque, New Mexico at the National Cave Management Symposium, held October 6-10. It was entitled "Resource Potential of Submerged Caves and Suggested Procedures for Safe Exploration and Study," published in *National Cave Management Symposium Proceedings 1976* by Speleobooks.

It should be noted that as 1975 ended, a four-year period closed in which there were eighty fatalities in Florida caves, A second wave of legislation was building in Florida for cave diving prohibition, and Murphy's boss, Wilburn Cockrell, was trying to get funding to continue his archeological studies in Warm Mineral Springs, a large, water-filled sinkhole in Florida.

1976
Southwest Region (NPS)
In a letter dated January 5, 1976, Scripps' Jim Stewart recommended that Lenihan be designated the Southwest regional diving examiner, with a 200-foot depth rating. A month later, February 5, regional associate director Monte Fitch designated Lenihan as both the regional dive officer and the regional diving examiner.

1976
Virgin Islands National Park
SEAC, Wayne Prokopetz, and Christopher Hamilton surveyed Buck Island and St. John from February 9 through April 2. The underwater survey portion was concerned with the examination of areas associated with prehistoric or historic sites. This work attempted to locate submerged areas of prehistoric sites and anchorages of shipwrecks connected with known plantation-period European activities. Extensive underwater surveys at Cinnamon Bay Cemetery located several gravesites in 3 to 8 feet of water. A shipwreck, the *Santa Monica*, was also reviewed; it had sunk in 1782.

1976
National Reservoir Inundation Study
The new NRIS team conducted mobile diving operations from a towed trailer and leased vehicles from March through August in Amistad Lake, Arizona's Lake Havasu, Roosevelt Lake, Lake Mead and Lake Mojave, as well as Table Rock Lake in Missouri and Silver Springs in Florida.

1976
Washington Support Office (NPS)
A memo from Director Gary Everhart was issued to the directorate: "Return of line control of the operations of the Interagency Archeological and Historic Preservation Salvage Program (P.L. 93-291) to Regional Directors." Effective on April 1, this seven-point, three-page memo spelled out that field operations of the interagency salvage program would be assigned line supervision to the regions, most relevantly the Southeast, Southwest and Western regions. This transfer of line control was transitional between then and the final implementation of the realignment of service activities, then under review in the department. To this end acting deputy director John Cook was assigned overall responsibility for implementing the directive from Director Everhart.

Nine months later, Cook became the Southwest regional director on January 1, 1977. Being the region in which the NRIS was being conducted made this a very positive stroke of good luck for servicewide underwater archeology. The team's previous regional director, Joseph C. Rumburg, Jr. (2/17/74 – 12/31/76), was also very supportive of the work being done and the direction taken by Cummings and Lenihan.

1976
Western Region (NPS)
Per a July memo from regional director Howard Chapman, the regional dive officer position was being abolished as a stand-alone job due to conflicts with position ceilings. However, it was retained as a collateral assignment for Dave McLean, who became the Lake Mead assistant chief ranger, resource management.

1976
Fort Jefferson National Monument
Coral reefs were mapped in the Dry Tortugas in July by NPS divers and the Tortugas Reef and Continuing Transect Study (TRACTS). The study was initiated with the Florida Department of Natural Resources as well as the United States Geological Survey. TRACTS' purpose was to establish a baseline from which to monitor the long-term health of coral reef ecosystems. Diving with numerous agency and educational partners, Gary Davis was able to complete a map of submarine habitats in the park, including coral reefs and sea grass beds.

1976
Montezuma Castle National Monument
Members of the NRIS, led by Lenihan, conducted a reconnaissance dive in Montezuma Well in July. Lenihan noted it to be of little relevance to the reservoir study but recommended in his trip report that it should be completely surveyed.[5]


NRIS divers exiting Montezuma Well in 1976. Sandra Rayl is the third down on the trail, hauling up her double tanks after the dive. Scenarios like this were the reason for tank walks all year in training. NPS Submerged Cultural Resources Center collection.

1976
Amistad National Recreation Area
The NRIS team ran the first annual Southwest region diving workshop in August. It was the introduction for regional divers to the intense diving style of Lenihan and the team of diving archeologists from Santa Fe that would become a permanent NPS establishment. Three of the team were women: Toni Carrell, Sandy Rayl and Cathy Tarasovic. Southwest Region diving had become very serious.

1976
Isle Royale National Park
Superintendent Jack Morehead believed dive operators, "mostly out of Thunder Bay, Ontario (and at least one commercial dive company out of Duluth, Minnesota, per an email from Morehead to the author in February, 2014) were marketing their charter dive trips by offering artifacts off of wrecks in the park and the opportunity to make 'ghoul' dives to ships with bodies still inside." Organizing an undercover operation, Morehead brought in Rangers Mack Shaver from Channel Islands, Rocky McCreight from Death Valley, and Larry Thomas (park unknown), to assist from September 3-6. Shaver recalls, "I remember I sewed a spearfishing patch which said, 'Eat Your Catch' over the arrowhead on my wetsuit hood before arrival. Described in a February 23, 2014 email to the author, Shaver said that the trio of undercover rangers were to:

> …get to know some of the clients or operators and find out, so we were to anchor near them on dives and spend the nights near them in anchorages. The park provided a boat operator/dive tender…They flew us out…in a charter floatplane and dropped us off on a small island with an employee cabin, completely stocked and said they would be back to brief us…They didn't want anyone at headquarters to see us or know about what was going on. I think we spent a day and a night there, just two of us…sent the chief ranger and a small cabin I/O with the operator out the next morning...We did meet folks in the anchorages at night, but never got a hint of anything out of line…In fact, while we were out there working, the screw off of a very recently discovered sunken tug was stolen. No one supposedly knew about the wreck but the NPS divers (including Jack) who surveyed it after the recent discovery.

Jack Morehead went on to add:

> Several other folks knew of the new tug discovery in one of the bays near Amygaloid Bay. I even remember getting at least one phone call from a commercial dive charter operator asking me to pinpoint the location, and I talked to another who was dragging a grapnel hook trying to find the tug.

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5 Lenihan did return to survey it...30 years later, with the SRC in 2006. Superintendent Kathy Davis and staff gave great surface support. Lenihan, now 61 years old, noted the single tank used on this dive was somehow heavier than the doubles he used in 1976.

Fascinating video footage by Brett Seymour showed current SRC chief Dave Conlin on the bottom feeding a probe into one of two pools of fluidized sand, swirling slowly in a circular depression at 55 feet. The probe in this west pool dropped an additional 68.75 feet, to an overall depth of 123.75 feet. In the east pool the probe sank 20 feet, or 74 feet from the surface. SRC distributed an extensive technical report on this work, authored by Conlin and Lenihan, with color photos and sonde (probe) readings. The SRC video is available on the park's website. *Natural History* magazine published *Diving Montezuma Well,* an article by Lenihan about SRC work at the well in its May 2011 issue.

1976
Death Valley National Park

In 1976, a landmark United States Supreme Court decision, *Cappaert v United States* provided permanent protection for the water-filled ecosystem and the rare Devils Hole pupfish. Reported by Ranger P.G. Sanchez in the September 11, 1976, *National Park Service Newsletter:*

> The plight of the pupfish. . .was not argued under the Endangered Species Act. The issues at stake were more than some fish and a ranch corporation. The issues involved States and Federal water rights. For that reason Nevada and, later, fifteen other States joined with the defendants.
>
> Previous court decisions affirmed the Federal Government's right to surface water on its lands. But Devils Hole is not flowing surface water. It is, in fact, a window open to the water table. The court found that surface and underground water are inseparable. Therefore, under the "reservation of water doctrine" the United States can protect its water from diversion whether surface water or groundwater. Because Devils Hole was added. . .in 1952 to protect the pupfish, the Government had, by implication, also reserved an amount of water necessary for the fish's survival.
>
> The Supreme Court ruling spans more than endangered species or national parks. In saving the pupfish, the high court also assured all the rights on ALL Federal lands—more than 73 million aces covering 34 percent of the United States. That's a landmark decision stemming from an inch-long fish living on a remote rock ledge measuring only 10 feet by 16 feet.

1976
Yosemite National Park

On December 9, 1976, a retrofitted, WWII-era Lockheed PV-1 Ventura plane went into Yosemite's remote Lower Merced Pass Lake at an elevation of about 9,000 feet. Pilot Jon Scott Glisky and Jeffrey Carl Nelson, both from the Seattle area, crashed into this backcountry lake a dozen miles southeast of the park's famous Glacier Point. It went undiscovered until the following January 25, when four cross-country skiers stumbled across a wing stuck in the trees. After a couple of days working their way to the ranger station, the crash was reported to the park's search and rescue officer Tim Setnicka, whose records showed nothing of this plane crash. When he called N-80BD into the Air Force Rescue and Coordination Center (AFRCC) in Illinois, the response was immediate.



Lower Merced Pass Lake, February, 1977. Divers, left to right: Rangers Mark Forbes, Rick Smith, and Bob Tostenson, the owner of Bob's Dive Shop in Fresno. Butch Farabee collection.

Glisky, Nelson, and this particular souped-up plane were wanted by several agencies including the US Customs. It had been reported missing to the US Coast Guard by Glisky's wife several days after it disappeared. Customs had been following the plane and when it disappeared it had been carrying an estimated three tons of high-grade marijuana. The dope was being flown from 170 miles south of Tijuana and was to be delivered to the Reno area; this was the second round-trip flight for this craft and crew that day. A motor literally fell off the wing due to an oil line break while over the Sierra. Clipping several lodgepole pines, it cartwheeled into the six-acre, 20-foot-deep lake strewing both wreckage and marijuana. The day the plane was reported to the park and then to the AFRCC, two rangers and

a crew from Lemoore Naval Air Station determined the crash was not survivable and revealed some clue as to the plane's contents. Eighty-pound bags of marijuana, now saturated with water, hydraulic fluid, and aviation fuel, were frozen into the lake and lying along the bank.

The day after the plane was reported to the AFRCC, US Customs flew up from San Diego and shuttled a dozen rangers and officials to the site. This included park divers Butch Farabee, Rick Smith, Mark Forbes and Bill Wendt. Additionally, Bob Tostenson, owner of Bob's Dive Shop in Fresno, California, was brought in and for the next two days, the divers removed marijuana and looked for the bodies of the two men. Most of the diving was done by Tostenson, a professional with a drysuit, and communications equipment. However, the other four rangers made some dives, as well, including Butch Farabee and Rick Smith. In the words of author Farabee in a previous book, *Off the Wall: Death in Yosemite*:

> I have to say that, in my entire fifty years of diving, the several dives that I made. . .were done under the worst conditions I have ever experienced. . .at nearly 9,000 feet elevation in thirty-three-degree water. Our neoprene wetsuits were not designed to function in this sort of cold for more than a few minutes. Our only entrance into the lake was by sliding down through a manhole-sized opening sawed through the foot-thick ice. The surface here looked black and greasy with hydraulic fluid and aviation fuel. It also tasted that way. Visibility in the water below the ice was less than two feet. We groped our way around in the fifteen-foot deep water like blind men exploring a strange room booby trapped with knife blades. Razor sharp pieces of ragged metal jutted down from the ice above us and up from the muck below. Those overhead had floated up (buoyed by attached insulation, et cetera) to be frozen in place and now hung down, guillotine-like. Beneath us lay the mother of all jungles of sharp edges, the mangled fuselage itself. During our searches we remained linked to the surface tender on the ice with a thick manila rope—a nylon line would be too easily severed on a jagged edge of the plane. A lost tether, of course, could easily spell death under the opaque ice. All of these tricky and extremely hazardous conditions added up to very good reasons for us to have brought in a professional diver like Bob Tostenson.

Ranger Rick Smith, who also dove on this aircraft, in an email to the author on May 17, 2015, added:

> I consider this the most dangerous dive of my career. The water of the lake was fouled with fuel and hydraulic oil from the plane, creating almost zero visibility and there were cables, wires, jagged metal everywhere. The hot water we poured into our wet suits did not last very long in the water that was under ice. This made the dive unpleasant in addition to dangerous. I was glad to get back to the hole in the ice through which we entered the lake.

After two days on-site, the notorious Sierra weather took over and the five agencies that were involved in this incident—with the NPS having taken the lead—agreed the plane would be left. Everyone believed the craft, its two occupants, and the dope, would be safe due to isolation and harsh conditions. Several weeks later, the park got word the local climbers had in fact reached the lake. It is impossible to tell how long they had been there, probably several days. There are stories of climbers making off with large amounts of marijuana. When the park personnel returned to the lake on April 13, there was now a 24/7 presence until June 16, when the two bodies, Glisky and Nelson, were recovered.

In order to legally establish the identity of the relatively well-preserved two men, Rangers Don Coelho and Farabee—gingerly using brush pruning shears—removed all twenty fingers and placed each in its separate bottle of preservative. Quickly they were sent to the FBI Laboratory where latex was injected under the skin and fingerprints were able to be lifted.[6]

1977

Mammoth Cave National Park

There is a singular reference to cave diving in Mammoth Cave, per a 1982 summary report for a research effort on the Kentucky cave shrimp (*Palaemonias ganteri*). In the same report as well as several subsequent years' worth of similar documents, there are a few more references to cave diving while researching the shrimp.

6 The legend of "Dope Lake" continued to grow over the years. Sylvester Stallone's 1993 *Cliff Hanger* blockbuster movie had its genesis in this crash. Jeff Long wrote *Angels of Light* using this incident as a backdrop, as did mystery writer Nevada Barr, who in 2004 published fictitious *High Country*. It is the 12th in a series of 19 (as of 2016) Anna Pigeon novels allowing Ranger Anna Pigeon to solve another mystery.

1977
Channel Islands National Park
A saltwater workshop and scuba training and refresher course was held in the park from March 27-30. The *Coral Sea* charter boat in Santa Barbara hosted the 29 divers; representatives were from Lake Mead, Redwood, Lassen Volcanic, Yosemite, Grand Canyon, Channel Islands, and Point Reyes, as well as four from the Bureau of Reclamation.

1977
Cape Hatteras National Seashore
In April, an archeological survey was carried out at Frisco, Salvo, Ocracoke, Whalebone Junction and Little Kinnakee Junction within Cape Hatteras. It was conducted by George Fischer of SEAC.

1977
Fort Matanzas National Monument
A reconnaissance survey was made of Fort Matanzas by Fischer of SEAC on April 24. The original research strategy was to include two FSU graduate students. The research was not completed at this time, but it was done two years later, in 1979.

1977
Glen Canyon National Recreation Area
In early May, the Rocky Mountain Region held a three-day dive refresher at Glen Canyon, followed by a regional Diving Control Board meeting. Sixteen regional divers and one Denver Service Center diver participated. The board discussed fitness requirements, including annual swim tests.

1977
Fort Jefferson National Monument
In May, the Third International Coral Reef Symposium was held in Miami, followed by a three-day diving field trip to the Dry Tortugas, hosted by Gary Davis.

1977
Lake Mead National Recreation Area
On May 24, 1977, two Purolator Security Company driver-guards, Russell Dempsy (53) and Cecil Newkirk (50), left Phoenix at 8 a.m. in an armored van on their run to several banks in northern Arizona. Their first stop was to be the Great Western Bank in Prescott, about a two hours' drive from their company office. The van carried $328,150, of which $288,000 was currency. North of Phoenix at the Bumblebee exit on Interstate-17, the van was stopped by the Poland brothers: Michael (37) and Patrick (27). The two were disguised as highway patrolmen, armed with at least one Taser gun, driving a small car fitted with emergency lights, siren and a police scanner. The Polands took the two guards captive. By mid-morning, Purolator officials knew something was wrong and quickly called law enforcement.

About 6 a.m. the next day, authorities found the abandoned Purolator van west of that same interstate exit, north of Phoenix. A $500 bill and a total of $34,650 in coins remained in the vehicle, and officers observed bloodstains inside. There was no further clue as to where the two guards were or what had happened. The ensuing investigation pretty quickly ruled the two guards out as suspects in a crime, since both had worked faithfully for the company for over twenty years. That same morning, Michael Poland rented a boat from the relatively isolated Temple Bar Marina on the Arizona side of Lake Mead National Recreation Area and piloted the craft to little-used Bonelli Landing, 14 miles from Temple Bar, where he met his brother. They put the guards into two six-foot-long canvas bags, purchased from a local tent and awning company under an assumed name, took their captives across the lake, and dumped them into the water at Debbie's Cove, on the Nevada side of the lake.

On June 16, three weeks after the robbery and kidnapping, a boater discovered a body floating in the cove. A canvas bag covered the upper portion of the corpse. Eight days later, June 23rd, a second body surfaced approximately 100 yards from the first. Both bodies were in advanced stages of decomposition. The Clark County, Nevada (Las Vegas) medical examiner identified them as Dempsey and Newkirk and

concluded both men had drowned, although there was a possibility that Dempsey might have died from a heart attack before his body was placed in the water. Michael Poland would later tell investigators that during the robbery, one of the guards had a heart attack and died. He said that he knew he would be charged with felony murder because of the guard's death and had no alternative other than to kill the second guard.

Once the first body surfaced, sheriff and NPS divers spent considerable time and energy searching for clues in Debbie's Cove. Frustrated by the lack of results, the FBI soon asked Jim Stewart, the dive officer for Scripps join in. He was able to find a bent license plate, weights from the canvas bags and related evidence.

After lengthy court proceedings, retrials and attendant judicial maneuverings, both brothers were ultimately sentenced to death in Arizona. The older brother, Michael Poland, was executed on June 17, 1999. One week before his fiftieth birthday, Patrick Poland died in the same death chamber as his brother almost a year later, on March 15, 2000. He was the 23rd murderer executed in the United States in 2000. The Supreme Court had denied three requests for stays.

1977
Occupational Safety and Health Administration

On July 22 the US Department of Labor's OSHA issued final notice of the adoption of a permanent diving standard (42 F.R. 37605), which became effective on October 20, 1977. OSHA's original diving standard, 29 CFR Part 1910—Subpart T "Commercial Diving Operations" established mandatory occupational safety and health requirements for commercial diving operations.

Regulations affecting the operations of NPS divers were largely self-imposed until the Department of the Interior accepted oversight by OSHA in 1977. Regional diving review boards were set up to ensure the dive policy was followed. With implementation of OSHA subpart T, the parks found the regulation were largely inappropriate for an agency that dove in remote areas for resource protection and emergency purposes. Hence, the NPS used both the Public Service waiver and Research Diving exemption to carry out those functions (the effort to gain this exemption was championed by Jim Stewart). When NPS divers perform maintenance tasks, they operate under OSHA standards.

1977
Scripps Institute of Oceanography

Scripps and Jim Stewart conducted a fall class for the NPS from September 11-23; Virginia "Ginny" Rousseau, a field ranger from Yosemite, was in it. She was the second (of only three) NPS woman to go through the school and by this time, there were or had been, five other women diving for the NPS. It was not easy for Ginny but she was successful. The following excerpt is from a journal she kept that summer, shared with the author via email on May 10, 2015:

> I was thrilled I was accepted to Scripps but very nervous as I was a mediocre swimmer, but really more afraid I would fail and be sent home. I did not want to let those who supported me, down. It would give ammunition to those who didn't believe women should be doing this job. I swam almost every day that summer in the Yosemite Lodge Pool to get ready. I'd work out with J.T. Reynolds, also attending, and had Butch [Farabee] standing over me, watching. I focused on breast and side strokes and increased my endurance and strength. Technique over muscle. To also ensure success, in August/September I traveled to Fresno, on my own time, and completed a 40-hour NASDS course at Bob's Dive Shop. This gave me a good idea of what I would be getting into at Scripps.
>
> Like always there are the anxieties of the unknown. Saw a number of people who were Park Service but I think it's better to let them get use to me gradually. If I make it through the first week, I think I'll have a lot of fun. Here I go being pessimistic (wish I were working night shift!)…[named several Yosemite rangers] all think I can do it and deep down I think I know that too, but I'm scared to admit it!
>
> The only problem is the four breaths. THE FOUR BREATHS…Well, if persistence counts for anything I won't quit, may drown but won't quit. And I won't do that—they have a reputation to uphold—they can't let me drown. Tomorrow should tell! At least swimming laps tonight made me more comfortable with the pool.

Monday: First day. In the pool at 7 a.m., r 150' the first time. Swam to end of [Scripps] Pier, dove down to get sand and it kept slipping out between my fingers! Wednesday: This is really a fast pace! No time for stragglers or practice. Kurt still had to pass the 150'. Everyone else did. Thursday: Kurt and I got split up, he was freaking out and I don't know enough to know what to do. He was really making me nervous. Friday: Since Kurt left I have been with various dive masters. Interesting, some I feel really comfortable with and others I don't. Met the guy who invented the wetsuit. Neat group. Stewart is really charming. Like an old sea captain. I bet he has lots of ladies in love with him. Lots of charisma. Saturday: Stewart promises it will get easier and more fun from now on. The hard part is over. The final thing today was off the end of the Pier. Had to descend to bottom, hand Dave McLean my weight belt and make free ascent, one breath and then go down and put on belt.



Virginia Rousseau, Scripps class of 1977. Courtesy of Virginia Rousseau.

1977
Washington Support Office (NPS)

From October 25-27, the NPS held a superintendent's conference in Estes Park, Colorado. On the third day, there was a panel on national seashores, lakeshores and scenic riverways. It was chaired by Larry Hadley, superintendent of Cape Cod National Seashore. Summaries from each panel were described in a special edition of *Courier: The National Park Service Newsletter* in May, 1978. Resolution #1 from that gathering was:

> . . .that the Park Service seek concurrent jurisdiction with States for waters of lakeshores, seashores and riverways in the Park System. The consensus was that ¼ mile jurisdiction would be adequate to regulate uses such as fishing, swimming, surfing, diving and boating. Concurrent jurisdiction. . .permit the Service to exert some influence over local pollution around marinas, docks and boating areas.

Also in Washinton in 1977 and through at least 1994, the Department of Interior medical history and standards form was routed through the DOI medical advisor, Dr. Mariano Pimental. He would then review this medical form for divers and approve their diving.

1977
Amistad National Recreation Area

A week-long Southwest regional diving workshop took place in October. After a full day of water and written instruction and tests, participants learned how to cut steel underwater using special oxygen torches. Evening sessions were voluntary, but they were filled. Larry Murphy was introduced to the Southwest Region divers by Lenihan. He became a favorite at these workshops. Toni Carrell showed the others how to quickly take their regulators apart and put them together; then do the same blindfolded. Jack Morehead, superintendent of Isle Royale was there as was Jim Randall, the head of ranger services from what was then the Rocky Mountain Region. The divers were videotaped going through obstacle courses underwater and driving cars into the lake with tanks on so they could learn how to deal with victims. Morehead gave a slide show on the wrecks of Isle Royale--which just happened to be the first park that SCRU worked in when the unit was formed in 1980.

1977
Buffalo National River



Car sinking exercise at Amistad in 1977 during the SWR dive workshop. In response to accidents at boat launches, rangers learned what to do when a car was sinking. NPS Submerged Cultural Resources Center collection.

On Dec. 10, an Arkansas Army National Guard OH-58 helicopter crashed into the Buffalo River, killing three. Two bodies were found immediately, the third not until day three. Maintenance man Cal Myers and Ranger Rob Arnberger decided to try to find the pilot, David Irby, anyway. Arnberger described his harrowing experience in an email to the author on June 15, 2015:

> The river was running strongly and before us it turned at an angle to the right piling up water, logs and debris into a massive eddy pile that we believed the body might be caught in. We had a rope staked into the gravel bar with handles knotted into it that we planned on using as a pivot point that would hopefully sweep us just in front of the eddy pile and allow us to get an underwater view of the log pile. It was risky, really risky, but we thought we could do it. In fact, holding on to the rope handles, rather than tying in, was a safety plus because it would allow each of us to get free if we got into trouble.

They went in and immediately got into trouble, caught up in the swollen river. Arnberger was pulled into a terrifying logjam. Quickly overwhelmed, they lost the ropes and lost each other.

> My tank was flat against a log and it seemed caught because I couldn't move. My knees began to buckle backwards and my waist began to buckle forward. I knew that if I was bent I would be forced into an even smaller opening and probably die. I had to break the force of the water onto my body somehow, try to free my tank and hope the current would do something else to me besides squeeze me into another log. I spent several minutes trapped in this upright position, unable to move. My head hurt from banging it and my ribs were starting to complain. My jaw hurt from biting so hard on my mouthpiece.

Arnberger and Myers lived through this misadventure. Myers actually avoided most of the ordeal, but seemingly only by accident and good luck. Lenihan, Southwest regional dive officer at the time, remembered the incident. The divers were communicating via telephone to him in Santa Fe. Lenihan pointedly reminded them that the pilot was dead and they weren't. "I could have called it off as RDO [regional dive officer] but Arnberger sounded clearheaded, if stressed, and this is what they had been training for." Lenihan believes swift river recoveries are the most dangerous thing a diver can do.

> Finally, Cal and the others noticed me and came running. I was in horrible shape, hypothermic and stumbling . . .but alive! We all got into a tent with a large propane heater, got out of my wetsuit and into a sleeping bag to recover. As I was warming up I reflected on how close I had come and that my hubris and adrenalin had nearly killed me and maybe my partner. I had displayed horribly bad judgment and nearly paid a price for it with my life. Cal and I didn't discuss it much, if at all.
>
> The local dive team showed up in the early afternoon in pickup trucks towing trailers full of equipment. I was up and at it again and was appalled to see this supposed professional team with rag tag equipment, good old boys able to chew Red Man [tobacco] underwater, and infected with worse hubris and bad judgment than even I had displayed. They got briefed and immediately divorced themselves from any federal control and said, "they would do their thing and do not interfere!" The sheriff agreed and was not about to let the feds do any more work in his "County." Despite this admonition, I went back in to help.
>
> Then in front of me and slightly below I saw the pilot's body. I reached it and grabbed some clothing and began to surface. As I surfaced, I found that several of the local divers had seen the same thing and since they were not wearing fins but were wearing tennis shoes, they were "walking" their way to my location. They proudly informed the sheriff that they had made the recovery and dragged the body out of the river and let it lay there as they fumbled around for body bag which they discovered they did not bring. I provided an NPS body bag. . .

1978
Western Region (NPS)
A three-day saltwater workshop was conducted/coordinated at Channel Islands by regional dive officer Dave McLean. There were 23 divers in attendance on the chartered 85-foot boat.

1978
Southwest Region (NPS)
Cal Cummings was elected to serve as a member of the Advisory Council for Underwater Archaeology at the January international conference, held in San Antonio, Texas. In the September 1978 issue of *Courier: The National Park Service Newsletter:*

> He was chosen for his scholarly reputation, knowledge and research endeavors in the field… The Advisory Council is a 12-person international group, which functions in conjunction with the Society for Historical Archaeology, and is dedicated to coordinating high quality scientific research, education, preservation and protection of historic and prehistoric remains located underwater.

1978
Lake Mead National Recreation Area
Lake Mead hosted five, three-day freshwater diving refresher workshops between March and May. A total of 36 regional divers participated. Subjects covered were the standard ones, with the exception of a car-exiting exercise. This turned out to be the highlight of the sessions. An old, two-door Mercury Comet obtained locally from Big John's Wrecking Yard was stripped of all polluting fluids and materials. With the concurrence of the Bureau of Reclamation, the vehicle, with numerous divers inside, was allowed to roll down a ramp near the dam and end up being submerged. All safety precautions were taken with both internal and external safety divers being present. The driver did not have a tank on and was expected to exit the vehicle as it began to sink. Each diver repeated this several times, and as each did so, his/her confidence was increased significantly. Dennis Burnette, one of the participants, recalled:

> I didn't get NPS certified until I took the certification class with Dave McLean. Once we passed the pool test, the training was incredible. Most took place above Hoover Dam. This included an obstacle course of submerged buoys and tires; swimming through the tires (taking our tanks off, swimming through the tires with the tanks front of us, then putting them back on); buddy breathing; and riding a coasting car down a ramp until submerged, then exiting the vehicle and swimming to the surface. The last thing was a float dive below the dam on Lake Mojave for a couple of miles.

Also that spring, Lake Mead hosted an ecology dive, which involved about 100 local divers bringing up trash. Trophies were provided.

1978
Glen Canyon National Recreation Area
The NRIS team rented a houseboat for a month to examine inundated rock shelters and other sites in Glen Canyon in March/April. Together five NPS divers logged roughly 250 dives in this period. The data was used in the NRIS Final Report published in 1981. Divers were John Ware, Sandy Rayl, Jerry Livingston, Steve Fosberg, Toni Carrell and Dan Lenihan. Larry Nordby joined at the end.

1978
Castillo De San Marcos National Monument
An underwater survey off the Castillo de San Marcos in St. Augustine, Florida was conducted by the FSU scientific diving techniques class on June 17. Joan Koch supervised the survey, under the direction of George Fischer of SEAC. A team of four divers was used but the effort had to be terminated due to tides.

1978
Washington Support Office (NPS)
"*Release No. 1 of the Diving Management Guideline, NPS-4*," was distributed in September.

1978
Ozark National Scenic Riverways
A series of dives were conducted at Ozark in September in support of the National Reservoir Inundation Study. At the close out of their visit to the park, team leader Dan Lenihan was showing Superintendent Art Sullivan some black and white video shot on September 18:

> [There was footage] of where we placed artifacts in Alley Spring (120' deep). I said I thought the place had been dived…it was very attractive and I couldn't believe not checked out by cave divers. He chuckled and said "no way." I showed more footage. He pointed at the screen and he asked, "where's your line going?" I told him "I don't know, we didn't put it there."

1978
Washington Support Office (NPS)
Anthony "Tony" Andersen came in October, with diving as a primary responsibility, along with emergency medical services, search and rescue and health and fitness. Arriving from Olympic where he had been the assistant chief ranger, his new supervisor was Dick Tousley. Prior to this, diving duties were an aside by others in that office, making Andersen's appointment a first for the Washington office. He was a Scripps-trained diver but by his own admission, he paid little attention to this in his new position. Mostly, he was interested in a method for paying search and rescue overtime and hazard pay, as well as focusing on the NPS to allow fitness time on duty. Andersen was there from October, 1978 through January, 1981.

1978
Biscayne National Park
In October, Gerald Klein, a local South Florida sport diver filed an *in rem* complaint in Admiralty Court for the title to the wreck of a long-abandoned vessel (later identified as the HMS *Fowey),* located in what eventually would be determined to be in Biscayne's Legare Anchorage. The ship struck a coral reef and sank on June 27, 1748. When found, the diver mistakenly believed the wreck was a gold-laden Spanish galleon.

> It was not, but his claim led to a precedent-setting court battle that would help define and clarify the standards and merits of federal and state protection of submerged cultural artifacts…state officials familiar with the case notified the [NPS] because general coordinates…indicated proximity to…[Biscayne].

This wreck had been noted (but not exactly located or identified) by Fischer in 1975 in the first survey of such sites in Biscayne. (SEE PAGE 132)

Cameron Binkley, a historian with the NPS Southeast Region would go on to say, in his January 2007 history of the Southeast Archeological Center:

> Legal suits over salvage rights to Spanish gold were common in Florida during this time. Such disputes were between not only salvors and the Park Service, but also involved jurisdictional collisions between the state and the federal government regarding which held authority over the management of historic shipwrecks. Indeed…the state of Florida actually sanctioned treasure-salvage operations in order to claim a percentage of the value gained by the salvor, making the boundaries of a park hugely important. Concern over this issue may have been another reason that Florida's state government initially resisted the creation of an NPS underwater archeological effort in Tallahassee.

1978
Amistad National Recreation Area
The Southwest Region diving workshop was held in October at Amistad. Dan Lenihan was the director. The workshop used explosives and cutting torches underwater, under Larry Murphy's supervision, with participation from the Rocky Mountain Region and John Benjamin from Glacier.

1978
Isle Royale National Park
Despite extensive training, unexpected challenges and risks were constant in park diving operations. Isle Royale ranger Stu Croll recalled:

Jack Morehead and I did not use dry suits, they were relatively new and very expensive. Dive plan was to anchor near Canoe Rocks and surface swim to the *Emperor* on the north side of Isle Royale. Did the normal prep, fill our wet suits with very hot water from thermoses, plunge in and swim to where we would go down to the *Emperor*'s bow. This was before we installed buoys on all the wrecks. Water was in the mid-forties and a nasty chop coming from the northwest. Snorkeling was tough. I was constantly clearing the breathing tube. Half-way out, my breathing abruptly stopped. To say I was a bit nervous was the understatement of the day. Immediately put regulator in mouth but no air, tested it but had excellent airflow. Jack noticed my frantic waving and immediately came to my side. Problem: cold water esophageal seizure.

Resolved problem by turning away from the chop and staying as high out of the water as possible and using air from regulator. We managed to get back to our boat, a Sea Ray and a warm jacket plus drink. Needless to say our dive for the day was over.

1979
Southwest Region (NPS)

On February 27, the first Southwest Region Diving Control Board meeting in six years was held in Santa Fe, chaired by Ron Ice and attended by Allen Hill, Ron Kerbo, Mike Smith, Byron Brown, Warren Beitel and RDO Dan Lenihan. Within two hours, reports arrived of a quadruple drowning at Lake Meredith. Smith, the park's dive officer left right away, the rest finished and dispatched for the recovery.

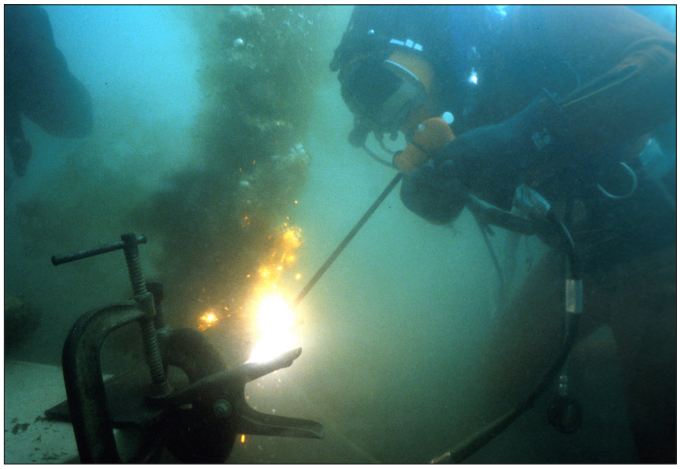


SWR dive workshop in 1978, at Diablo East Launch Ramp, Amistad NRA. In performing the bailout skill, the diver has to jump in the water with all their gear in-hand and get into it on the bottom. Nearest man stooping down on left is John Benjamin from Glacier, others unknown. NPS Submerged Cultural Resources Center collection.

1979
Lake Meredith National Recreation Area

The park hosted an underwater blasting school in May. A surface-blasting instructor from the Bureau of Indian Affairs and Larry Murphy from NRIS taught the course. Murphy had prior training in this from the Diver Training Academy and experience from his pre-NPS work as a commercial diver. Per the short article on page 12 of the November, 1979 *Courier: The National Park Service Newsletter:*

> Superintendent John Higgins…is experimenting with the use of explosives as a management alternative to maintaining buoys and warning flashers on boating obstacles on the lake. As water levels vary with different seasons and weather cycles… maintenance crews are kept busy keeping up with rock reefs and trees that emerge in boating lanes. Higgins feels that the safety hazard presented by reoccurring offenders may best be dealt with by selective low level blasting operations. "Buoys are expensive to maintain, deteriorate, need constant attention and are often lost…We are finding that several pounds of explosives can often cure the problem in short order, saving much in work hours and dollars spent in trying to warn visitors of the hazard."



SWR Dive Workshop at Amistad in the late 1970s. Divers were trained by Larry Murphy to cut metal underwater, which was useful for marina maintenance and removing navigational hazards. Important to note they are using oxy-arc not acetylene. A normal land mix would be explosive after about 20 or 30 feet underwater. NPS Submerged Cultural Resources Center collection.

1979

Scripps Institute of Oceanography

On July 17, Jim Stewart, Glen Egstrom, Dan Lenihan and Toni Carrell conducted checkout dives for several astronauts as part of their NASA training. Dives were made from the *Bottom Scratcher* at the Coronado Islands. Service divers Lenihan and Carrell were both NAUI instructors qualified to do the open-water evaluations. Carrell recounted the day in a March 16, 2016 email to the author:

> In July 1979, shortly after completing my NAUI instructor class, I found myself in southern California on other NPS business. Scripps Dive Officer Jim Stewart invited Glen Egstrom (President of NAUI), Dan Lenihan, Jerry Livingston and me along for a day of boat diving off Los Coronados. Scripps already had a long relationship with the NPS so the invitation wasn't unusual. The reason, however, was. We were asked to do checkout dives of five astronauts who were completing their astronaut candidate training. All astronauts were scuba trained to prepare them for working in a weightless and hostile environment and being underwater was as close as they could get to that on earth. I remember thinking this was a BIG deal!
>
> The Class of 1978, known as the "Thirty-Five New Guys," was NASA's first new group of astronauts since 1969. It was special for many reasons, including having the first African-American and first Asian-American astronauts, and it was also the first class to include women, six to be exact. Until that time astronauts were recruited from the military and needed to be pilots, so women were excluded. To have the chance of meeting NASA astronauts was exciting enough. To have the chance to actually spend a day of diving with them was too good to be true.
>
> To my surprise and delight, one of the five astronauts that day was mission specialist Anna Fisher. Being a woman working in a primarily man's world, doing primarily a man's job, and having been only one of two women of a class of 30 completing a NAUI instructor class, I felt a special kinship to her. I also was curious how Anna's astronaut classmates interacted with her and how they would react to me. Women dive instructors weren't as rare as women astronauts but were certainly uncommon.
>
> Pilots Rick Hauk, Dick Scobee, and Dave Walker, and mission specialists Jim Buchli and Anna Fisher were poised, articulate and friendly with each other and us in a way that put everyone at ease. They treated each other with respect and courtesy and I realized that was surely a model of how men and women could and should work together. I was lucky enough to be paired up with Dick Scobee for the checkout dive and was probably more nervous than he was; it simply wouldn't do to lose an astronaut so early in my instructor career! It was a simple exercise of mask clearing, regulator clearing and buoyancy control then off to sight see and enjoy the bright yellow Garibaldis. They all passed with flying colors!
>
> I recall this day with great fondness for many reasons; from meeting Anna I learned something about myself and my chosen career –to simply stick with it and work hard and who knows where it will lead. From meeting the rest of the astronaut team I learned that men and women can work together in even the most demanding professions and truly support one another to achieve success. Dick Scobee died in the *Challenger* disaster in January 1986. I feel very lucky to have met him and the others and to have shared a great day of diving.
>
> The six women in the 1978 NASA class were: Sally Ride, Judith Resnik, Kathryn Sullivan, Anna Fisher, Margaret Rhea Seddon, and Shannon Lucid.

1979

Ozark National Scenic Riverways

In September, the NRIS team spent two weeks diving in Arkansas and in Ozark National Scenic Riverway. Sites included Round Spring and Alley Spring, where the divers retrieved artifacts and placed others for testing for the inundation study.

1979

Washington Support Office (NPS)

At the regional director's conference in September, Director Whalen approved a regional occupational health plan for Western Region employees involved in high-risk activities. Based on a pilot program

developed by a regional task force and tested in several Western Region parks in April 1979, the program was to be implemented immediately. It would cover employees assigned to activities that could cause severe injury or death, such as fires, diving, search and rescue, and law enforcement.

1979
Amistad National Recreation Area

The annual Southwest regional diving workshop was again held in October. A partial list of participants included Byron Brown, John Benjamin, Bill Burke, Keith Gaines, Diane Lipman, Debbie Gibbons, David Griese, Dan Peregoy, Warren Beitel, Larry Nordby, Eric Reubin, Dan Lenihan, Larry Murphy, and Toni Carrell. Ron Kerbo and Andy Galewsky from Carlsbad Caverns also participated. Topics this year included low-visibility techniques; oxy-arc cutting was taught by Murphy. On a mock rescue that was being timed by the team, Kerbo was carried by NPS van from the park's ranger station, suiting up in his diving gear in the rear. Within 16 minutes he had been dropped at the dam, a line deployed and he rappelled with full scuba equipment down the dam to the water level. Video was shot, followed by an underwater segment where he then entered a vehicle and removed a mock victim.



Ron Kerbo rappelling down the face of Amistad Dam to simulate a rescue of a victim trapped in a submerged vehicle, during the Southwest regional diving workshop in 1979. The speed of the rescue operation was approximately 16 minutes (with a ready-pack and van under red light and siren, as well as a buddy helping Ron don his equipment and climbing gear). Earlier in the 1970s, it was proven that people could survive immersion for over an hour in cold water, prompting many response teams to find quick ways to rescue submerged victims. Courtesy of Rob Kerbo.

1979
Fort Matanzas National Monument

FSU Scientific Dive Program, with George Fischer of SEAC supervising, performed an underwater survey of the Matanzas River near the Fort. The effort was to see what, if anything, might be of significance. According to the report, little was found, which in itself was of some significance.

1979
Glen Canyon National Recreation Area

The park brochure, "Glen Canyon Dam and National Recreation Area," was printed for the third time (The first printing was in 1965 and the second in 1970). This new printing had the "diver down flag," a first. However, there was no mention of diving in the text, nor had there been in either of the other previous two editions.

1980
National Reservoir Inundation Study/Submerged Cultural Resources Unit

Between 1975 and 1980, the National Reservoir Inundation Study personnel participated in submerged cultural resource work in:

- Arkansas Post National Monument, Arkansas
- Biscayne National Park, Florida
- Buck Island Reef National Monument, Virgin Islands
- Castillo de San Marcos National Monument, Florida
- Fort Frederica National Monument, Georgia
- Fort Jefferson National Monument, Florida
- Fort Matanzas National Monument, Florida
- Glen Canyon National Recreation Area, Arizona
- Gulf Islands National Seashore, Florida
- Isle Royale National Park, Michigan
- Montezuma Castle National Monument, Arizona
- Padre Island National Seashore, Texas
- Virgin Islands National Park, Virgin Islands

THE SUBMERGED CULTURAL RESOURCES UNIT

NRIS - **SCRU** - SRC

Submerged cultural resources include shipwrecks and all remains of human habitation, survival, passion, and play now underwater. The NPS team that conducted the National Reservoir Inundation Study (NRIS) was the foundation for the Submerged Cultural Resources Unit (SCRU). As the NRIS finished its final report, three of the six archeologists and the team secretary stayed on to became the first members of SCRU. Their prime focus now was submerged resources throughout the national park system.

SCRU officially came into existence in 1980. In addition to responding to the needs of park managers, the team was expected to conduct studies of submerged archeological resources in a manner that set a standard for the national park system, and ultimately the federal government. As the lead program for underwater archeology within the lead agency for historic preservation (NPS), the unit's products had to meet scholarly scrutiny, yet be useful to NPS field personnel caring for the sites. There were no useful precedents for such work when SCRU started, so most of its projects became prototypes subsequently applied in other parks.

Before their first fieldwork, SCRU designed report formats to address different stages of submerged resource inventory and documentation. These included **site reports**, which focused on a particular shipwreck or prehistoric feature, **surveys** of park bottomlands for new sites and **studies** that were comprehensive reports on all known submerged archeological resources in a park. Specific site reports were written for *Noquebay* (1985) at Apostle Islands and *Charles Spencer* (1987) at Glen Canyon. The 1984 SCR Survey at Point Reyes laid out a template for other survey reports from Biscayne and Dry Tortugas. The 1987 SCR Study of Isle Royale became a template for further such studies in Pictured Rocks (1989), Pearl Harbor National Historic Landmark (1989), and an assessment of warships sunk by atomic blasts at Bikini Atoll (1991). Experimental interpretive devices were included, such as an underwater interpretive trail at Isle Royale. The team's detailed mapping in Pearl Harbor provided data for construction of an eight-foot-long in-situ model of the USS *Arizona* for the visitor center at the memorial.

The vehicle for creating SCRU was the NRIS. The individual who conceived this approach was Cal Cummings, chief of the Division of Archeology in what was then the NPS Southwest Region. Daniel Lenihan worked with Cal to create the NRIS, then SCRU. Lenihan then led both teams for a total of 25 years from September 1975 to October, 1999. The team's name was changed to Submerged Resources Center (SRC), when Dan stepped down as chief in 1999. The new name reflected a long-demonstrated reality—that the team's work was not limited to cultural sites. Larry Murphy followed Dan as chief from 1999 to 2009, and Dave Conlin would succeed him; from 2009 through this writing in 2016.

Cal Cummings

After all Cummings had done to create SCRU, the nascent organization would never report to him. To Cummings, the NRIS was important, but only the first part of his ultimate goal. Cummings' strategy for the NRIS was ingenious. The project focused on prehistoric sites, most important to archeologists in academia, and the study's results provided clear guidelines for a new but fast-growing community of contract archeologists. Cummings had foreseen the importance of an authoritative study of inundation effects that would end the quarreling that attended mitigation efforts in reservoirs. Invalid assumptions about the effects of immersion advanced by both archeologists and reservoir engineers fell off sharply after the study's publication. Challenges to NRIS conclusions were rare and minor, which was surprising given its importance for the conduct of many large projects by established terrestrial archeologists.

The NRIS had been one of several divisions of the Southwest Cultural Resources Center (SWCRC) that Cummings built with funding from other agencies. Within three years, his cultural resource management staff (Ron Ice, Bruce Anderson and Lenihan) expanded in meteoric fashion to 35 professionals. Cummings was considered an empire builder by upper-level managers, an opinion he embraced. He believed this empire was necessary to raise the stature of cultural resources in the NPS. The top of the food chain didn't see it that way. By 1978, Cummings was promoted—to a comfortable oblivion. He was sent to a higher office in Denver, with no potential for growing empires or building the aggressive, effective programs he was famous for.

Michael Soukup, PhD, retired NPS associate director of natural resource stewardship & science, recalled in communication with the author:

"I've always had a strong interest in oceanography and marine archeology, dating back to the adventures of Jacques Cousteau and his sidekick Dumas. Hence I was amazed to find that the National Park Service had developed the government's only professional underwater archeology team, the Submerged Cultural Resources Unit. It was obviously a product of the passion of a small number of individuals who had a vision and bucked the bureaucracy to make it happen

(Is that why they named it SCRU I wondered?). It is that individual passion and dedication that makes government work, often in spite of itself. In NPS, the power of individuals has also led the way to world class programs in cave management, night sky protection, and the world's first biodiversity inventory.

I always suspected that the serendipitous individual initiative factor accounted for a premier diving operation being located in Santa Fe. When its fate fell into the hands of Washington, I spent time as part of agency leadership trying to co-locate the Center at either Scripps Institution, Woods Hole Oceanographic, or Rosenstiel School at the University of Miami—to provide the most powerful context for SCRU. That it has wound up in Denver, well that's the way bureaucracy works sometimes. Still, wherever if works from, it is a monumental achievement for protecting the incredible underwater heritage of our nation."

NPS mission meets principles of conservation archeology

In 1974, Cummings had Lenihan accompany him to a meeting in Denver at which the American Society for Conservation Archaeology (ASCA) was founded. Lenihan's notion of what underwater archeology should look like in the NPS was greatly influenced by that session. Land management agencies provided the ideal environment for growing non-consumptive archeology. The protect and preserve mission of the NPS prized a low-impact, well-considered approach. Research designs ensured the archeologist could demonstrate how their research justified consumption of a limited resource.

Until the early 1980s, American archeologists had little understanding of the value of submerged sites—most saw themselves as pre-historians, focusing on sites that pre-dated the written record. Submerged remains in Mexican cenotes or Florida springs made sense to them, but New World shipwrecks were considered fodder for the historians who focused on these modern sites. There was no real venue for studies in historical archeology (dry or wet) until the Society for Historical Archaeology (SHA) formed in 1967. To park superintendents, however, the need for a submerged resources management capability in the service had already become quite real. Treasure hunting was rampant in or close to NPS jurisdictions in Florida and Texas parks including Biscayne, Dry Tortugas and Padre Island. At Channel Islands in California, the wreck of the *Winfield Scott* was repeatedly looted. Divers visiting Great Lakes parks (e.g., Isle Royale, Apostle Islands, Pictured Rocks and Sleeping Bear Dunes) still collected artifacts but outreach by rangers was beginning to have an effect. *Skin Diver Magazine* dubbed Isle Royale shipwrecks a 'world-class' experience—though located in a very serious diving environment. Increased popularity brought an unintended consequence; an increase in diving accidents including fatalities.

Such resource protection and visitor safety issues are what finally led to securing funding for SCRU. In 1978, Jack Morehead, superintendent of Isle Royale, attended a diving workshop run by NRIS at Amistad in Texas. Jim Randall, head of Rocky Mountain Region visitor protection, came with him. Both were experienced divers with significant stature as rangers and park managers. They were impressed with the Santa Fe team's approach to submerged sites and their ability to transfer diving skills to field personnel. Morehead presented a slide show with images of Isle Royale shipwrecks, mesmerizing the workshop participants. The visual and historical presence of the wrecks was stunning—the prospect of protecting them in a park, increasingly attractive. This became a turning point.

As the former chief ranger of Yosemite, Morehead's credibility with the ranger community helped solidify the team's allies in the field. Just as Cummings predicted, after a few years of exposure to the NRIS team, the service would be loath to lose it. Morehead joined other superintendents and chief rangers lobbying to have the group made permanent. In 1980, chief of anthropology Doug Scovill, with the active support of Southwest regional director Bob Kerr, moved $125,000 of Cultural Resource Protection Program (CRPP) money to base funding to see the idea to reality. Isle Royale was identified as the park needing the most immediate attention.

John Cook became Southwest regional director in 1983. Like Bob Kerr, he nurtured SCRU; Cook's reign in Southwest Region lasted for 15 years. This support from traditional park managers provided the institutional cover for SCRU to flourish; the new chief of the SWCRC was Dr. Richard Sellars. Sellars became another solid supporter of NRIS and SCRU's work (a talented historian and personal friend of Lenihan's, he helped with research for this document). Rick Smith, a 1973 Scripps-trained diver and former instructor at the Albright Training Center, was a lucky selection as the associate regional director. He was the immediate supervisor of Lenihan and SCRU. SCRU quickly became high profile, even beyond the NPS—a circumstance both good and bad. It can be useful but also drew fire from those in agency leadership roles who felt they had been overshadowed or ignored. The reality is that people like Cal Cummings, Doug Scovill, Bob Kerr, John Cook and Rick Smith kept the impact of such ill will to a minimum and made SCRU possible. Scovill has passed away and Cummings died in 2000. But not his legacy. Presently, those visiting the SRC (latest *nom de guerre* of SCRU) in the field may ride the team's well-appointed research

boat, the RV *Calvin R Cummings*, as well as spend time in the Calvin R. Cummings Memorial Library in the Denver office of the SRC.

Emergent underwater survey methods Point Reyes, 1982, 1984, 1996, 1997

There was significant underwater work conducted at Point Reyes in the early-1980s and mid-1990s by SCRU, resulting in published reports. The SCRU team was helped by park staff and local wreck diver Dave Bueller. Also in the later 1990s, SCRU archeologists were helped by both NOAA as well as the park staff and NPS divers from Channel Islands.

Aside from being towed behind the boat in a mask, almost all underwater surveys were based on remote sensing. Chief sensor tools were magnetometers (detects presence of iron) and side-scan sonar (detects structure extruding from the sediment). But the trickiest part of marine surveying was simply knowing where you were, or positioning. LORAN, developed after WWII, was adequate for navigational purposes but far too crude for surveying. The use of radio-wave positioning gave required accuracy but was expensive and time-consuming, plus, it positioned one in a world of one's own making; which had to be converted to real world coordinates. The world-changing development was, of course, GPS. SCRU was often given free access to new devices for evaluation. Larry Murphy, later the unit's deputy chief, was the key staff person responsible for shaping the team's survey philosophy and application.

Developing methods to document large ships Isle Royale 1980-1986

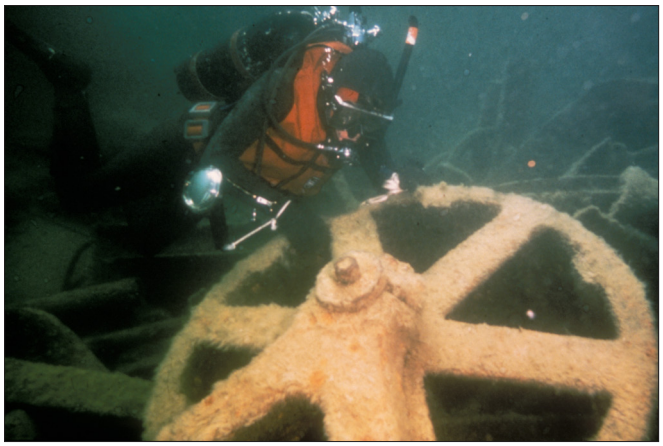
It was at Isle Royale that SCRU taught itself to map large ships. Final renderings were in the capable hands of Jerry Livingston and Larry Nordby. But the problem was bigger than one of technique. It was a challenge to one's thinking about shipwrecks in parks. Each of the ten wrecks was probably ten times bigger than anything mapped by underwater archeologists in the past. These vessels were not particularly old, nor famous in their own right, and if mapped like a Phoenician galley SCRU would still be working on them. But what level of detail and accuracy was appropriate? The ten vessels were material touchstones to the past under jurisdiction of a national park. They gave substance to the Great Lakes maritime past, an under-appreciated aspect of American history. Through trial and error, the team created and refined a method that would work for mapping large sunken ships underwater—and not a moment too soon. In 1983, these techniques would be called upon to map the iconic USS *Arizona* in Pearl Harbor.

The people

Toni Carrell was the first archeologist hired to the NRIS; January 1976. She set up many contracted studies in the NRIS and was a contributor to its preliminary and final reports. With SCRU, she led one phase of work at Point Reyes and compiled a report on the Charles H. Spencer steamboat and mining operation at Lee's Ferry. She pulled research results together from many SCRU projects in Micronesia for a major report, Submerged Cultural Resources of Micronesia, for the SCRU publication series. Carrell also held leadership positions in both the Society for Historical Archaeology as well as the Advisory Council on Underwater Archaeology. An excellent diving instructor (NAUI), she trained many for work on SCRU projects. She stayed with SCRU until 1993.

Larry Murphy provided an important contribution before he was even hired by the NPS. As discussed in the prior section on the NRIS, he collaborated with Lenihan on setting new precedents for research diving, principally the in-water use of oxygen for decompression. Both men knew a serious diving accident could be catastrophic for a new team.

Murphy became deputy chief of SCRU and with the new millennium, chief. He maintained SCRU's leadership in the field of interfacing positioning with magnetometer and sonar sensing. In pre-GPS times, that was perhaps the most challenging technical aspect of underwater archeology. For a federal agency, knowing where archeological values are located in a marine environment is critical, but almost as important is knowing where they are not. Together, they form the basis for decisions about appropriate visitor use. Geographical information systems (GIS) allows cross-utilization of data from the natural and cultural sciences. Lenihan



Isle Royale, 1986. A SCRU diver on the *George M. Cox*, a passenger steamer sunk in 1933. During this dive, a BBC crew filmed the SCRU team for a documentary. NPS Submerged Cultural Resources Center collection.

gave Murphy the lead in addressing these complex aspects of the team's work. Murphy saw to the hiring of GIS expert Tim Smith and kept the team in the forefront of submerged sites survey techniques in underwater archeology.

A fifth SCRU position was soon established; a dual role to supervise the team's dive locker, and serve as a commissioned law enforcement (LE) officer. This was filled first by Ken Vrana, from Isle Royale, then Mike Eng, from Gulf Islands. Ultimately this dual position morphed from dive locker/LE—to dive locker/photography. Members of the team in the later role were Randy Johnson, John Brooks and, currently, Brett Seymour. Seymour upgraded the role of video and photo inventory in SCRU's mission. In 2014, he became deputy chief of SRC. The secretarial position Darlene Romero held was later filled by Barbara Stanislawski. Its next occupant, Fran Day, was promoted to administrative assistant. In 1988, Fran began her long, indispensable role as the administrative glue in the organization; then, she took on publishing. Fran assembled many of the reports in the SCRU series that ultimately numbered 14 publications, not including NRIS reports.

Adjunct members of the team—Nordby, Bradford, Livingston, Ice, Koza, Delgado

Two NPS archeologists, Larry Nordby and Jim Bradford, and NPS scientific illustrator Jerry Livingston, began working with the team regularly as it transitioned to SCRU. Ron Ice, head of the Southwest Region Division of Archeology, also participated in the demanding diving at Point Reyes and other parks. These were significant commitments of time, not just in the field, considering what it took to remain qualified as SCRU divers—current medical clearance, strict training standards, and readiness for deployment in full uniform. Like Ice, Nordby and Bradford were supervisory archeologists with strong backgrounds working on three-dimensional ruins in Anasazi sites. Lenihan gambled that training them to dive might be a sound investment. It paid off for decades. Not only could they render underwater sites on paper but they could also write about them with an archeologist's insight on the human dimension.

Both became NAUI instructors, energetically training rangers in advanced diving skills. This was no short-term fancy; they worked in these roles for periods of 20 to 34 years. Jim Bradford, now head of the Division of Archeology in Santa Fe as of 2014, started with SCRU in 1980; he still works with the SRC in 2016. Jim Koza, a diver and ranger from Lake Mead, began with SCRU on an occasional basis in the mid-1980s; he returned in retirement to work with SRC on dozens of projects as a volunteer. These men are referred to in this document simply as members of the SCRU team. The same applies to NPS maritime historian Jim Delgado, who served on many SCRU projects from the mid-1980s to early 90s.

1993—A new wave of talent

The SAIP, Systemwide Archeological Inventory Program, became a major component of SCRU operations. Cummings, though long separated from day-to-day association with SCRU, was key to getting the funds for the NPS. He and chief anthropologist Doug Scovill designed the $1.8 million per-year program so that the regional archeologists could disburse 90 percent as they saw fit, but 10 percent would go to SCRU for the service-wide underwater program. Finally, proper underwater survey was possible.

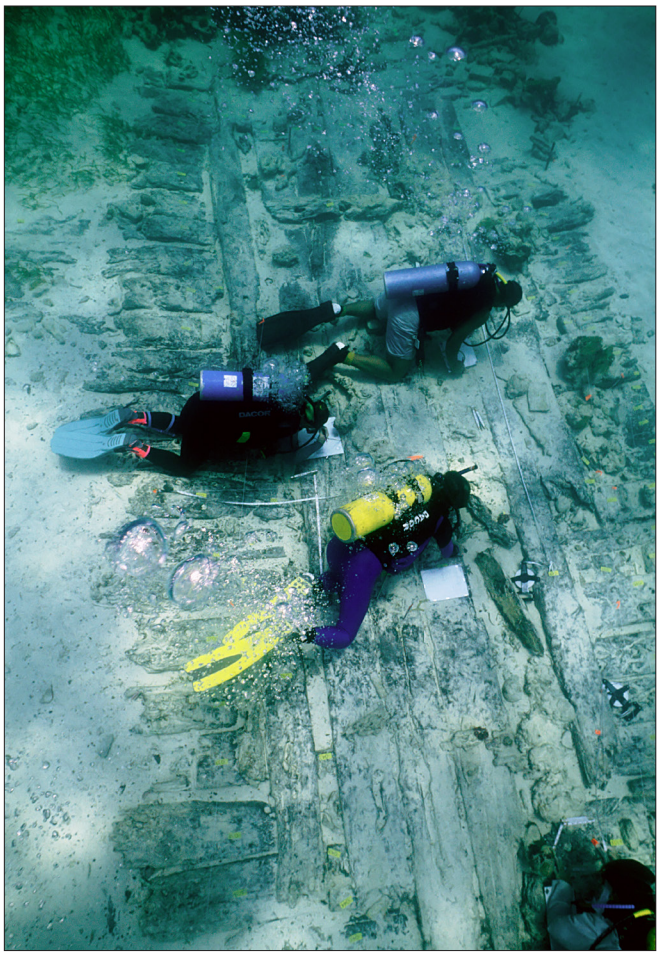
With new funding, new personnel could be hired. Lenihan left the hiring to Murphy, who was in charge of survey operations. He recruited two young bloods, Matt Russell and Adriane Askins, recent graduates from the East Carolina Maritime Archaeology Program. Through a longer, more complicated process he also hired Dave Conlin, a graduate student at Brown University. Around the same time, Brett Seymour, a young and an extremely talented photo/video technician, began volunteering/working for SCRU. This quickly became useful one day when Bradford ushered three park superintendents into Lenihan's office. They had some wild-eyed idea about doing a video on ruins' stabilization. SCRU loaned Brett to the superintendents for several weeks. There was no money for travel but they assured Lenihan they would take good care of him. Brett produced a film for them called Vanishing Treasures. It became the first step in one of the most successful cultural resource management programs in NPS history.

In 1993, much of SCRU's energy returned to large-scale shipwreck surveys, which had been discontinued due to a lack in specific line-item funding. They were too expensive and time consuming for the returns. In 1993, there was a convergence of opportunity and money when the NPS initiated SAIP. Pilot parks chosen for application included Dry Tortugas and Biscayne National Parks. Additional parks surveyed were Gateway, Fort Sumter, Yellowstone, Gulf Islands and Point Reyes, plus the Bay of Campeche in Mexico in association with Instituto Nacional de Antropología e Historia, Mexico's federal anthropological and historical preservation agency.

Highlights from SCRU's 20 years of operation

Biscayne was an early win. Murphy's facility with survey technology was key to successful completion of an early SCRU/SEAC job in 1980, which documented the location of the 1700s wreck of the HMS *Fowey* within the boundaries of the

park. The use of a radio-wave positioning system allowed the team to locate the wreck within a week. Fischer was on the magnetometer, Lenihan supervised ground-truthing of anomalies, and FSU grad student Russell Skowronek later determined the wreck's identity as the *Fowey*. Interestingly, the first NPS diver to contact the wreck was Jack Morehead, the recently appointed superintendent of Everglades National Park at the time.



NPS divers on the HMS *Fowey* in Biscayne National Park. NPS Submerged Cultural Resources Center collection.

In 1981 SCRU was called to Kosrae, the eastern-most of the Caroline Islands and a state in the Federated States of Micronesia (FSM) to locate and document remains of the wreck of *Leonora*, a ship commanded by the notorious Bully Hayes. For their work there, SCRU received a letter of commendation from the National Advisory Council on Historic Preservation. The SCRU report on *Leonora* was included in its entirety in "Of Wooden Ships and Iron Men," by Scott Russell, published in the *Journal of the Trust Territories of the Pacific Islands*. It was attributed to SCRU but curiously, authors Murphy, Carrell and Lenihan were not mentioned. The team also took on assessment dives at War in the Pacific NHP in Guam for Superintendent Stell Newman, and consulted with managers of another FSM park at Chuuk Lagoon.

One of the signature traits of SCRU was that it was designed to include park personnel in field operations whenever possible. A good example would be the many times SCRU worked at Isle Royale National Park. The Isle Royale rangers became an important component of the SCRU project; an approach that became standard operating procedure. Ken Vrana, Ellen Maurer and Jay Wells were park divers familiar not only with some of the dive sites but also local underwater conditions. During the 1980-86 field sessions, these divers played an important role as did Stu Croll, the chief ranger. The team's leased tug, operated by its owner, was damaged when it ran aground on a rock reef while running side-scan sonar. Croll, in a matter of hours, reassigned a 32-foot park patrol boat operated by Vrana as the prime surface craft. This kind of back-up from field personnel was invaluable. Problems became "ours" rather than those of a visiting team.

Shipwreck Anthropology seminar and publication

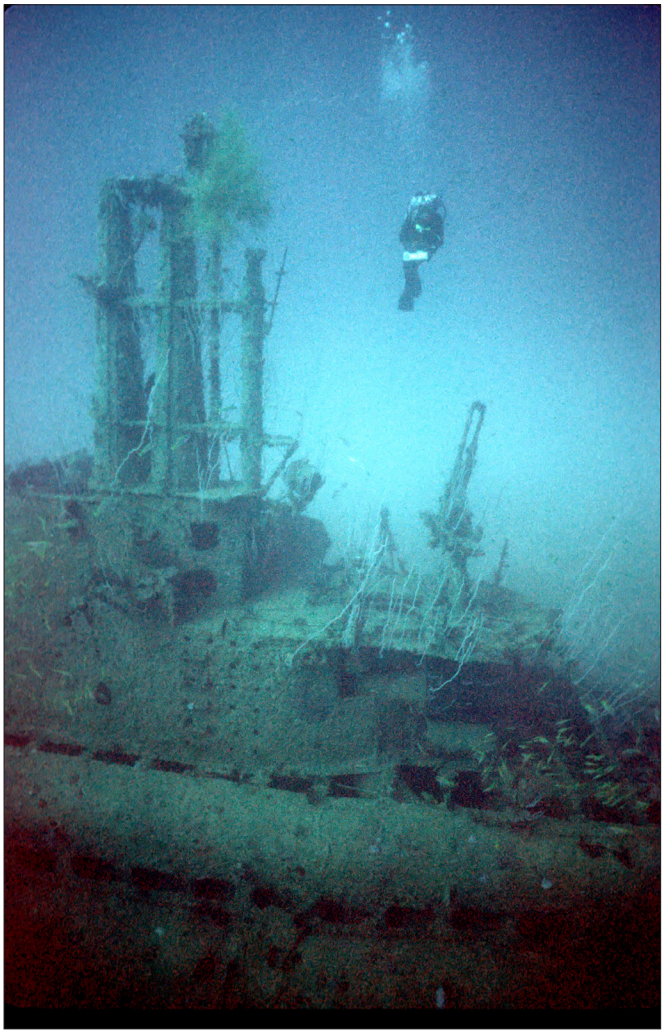
In the 1980's, research designs for shipwreck archeology were nonexistent. The best marine excavations in the world had been carried out by classical archeologists in the Mediterranean, focused on the material items discovered at the sites. Painstaking and diligent, they made no effort to relate their results to anthropology. Archeology in the United States is rooted in anthropology, which ties all human endeavor to general principles of human behavior. Operating blind to that reality might be acceptable abroad, but not in the US. Lenihan visited Doug Schwartz, president of the School of American Research in Santa Fe to propose a seminar in which top theoreticians worked with active underwater archeologists to address this problem. Richard Gould chaired the seminar and Murphy and Lenihan presented papers along with nine others. In 1983, *Shipwreck Anthropology*, edited by Gould was published. Many see it as a landmark text in shipwreck research.

SCRU joins the Navy (or more accurately, the Navy joins SCRU)

In 1986, SCRU returned to Pearl Harbor to put finishing touches on the 1983/84 mapping operations (SEE "THE USS ARIZONA PROJECT" ON PAGE 120). Livingston had turned in the five-part series of drawings of the ship's hull to win the John Wesley Powell Award for Historic Display. This year the BBC also completed an award-winning documentary series edited by Derek Towers on underwater archeology. More than half of the last episode was devoted to the work of SCRU at Pearl Harbor, Guam and Isle Royale.

This was also the point at which two individuals had an extraordinary impact on the next decade of

SCRU operations. Otto Orzech, a naval reserves' commander finishing his doctoral work in oceanography, met Lenihan at a conference at Scripps. He brought his team from Long Beach to Pearl Harbor to assist SCRU work on the wrecks of USS *Arizona* and USS *Utah* for their annual active duty training. Commander Dave McCampbell had just taken over leadership of the active command in Hawaii, Mobile Diving Salvage Unit One (MDSU-1), which serves the entire Pacific for US Navy diving operations. Lenihan and Murphy carefully observed how navy reservists might enhance SCRU projects, and McCampbell and Orzech observed how SCRU projects might enhance navy diver training. By 1987, all were hip-deep in a program called Project Seamark. Counting adjunct members and temporary assignments, SCRU could rarely field more than seven or eight individuals on a project. The team was experienced, motivated and well-equipped but...small. Three things magnified its impact:



Bikini Atoll, 1989. Jerry Livingston sketches over the submarine *Pilotfish*, resting at 180 feet. NPS photo by Larry Murphy.

- SCRU steered away from anything resembling excavation, incurring little-to-no obligation for post-project artifact care;
- it regularly incorporated local NPS personnel in its work;
- it incorporated navy assets.

Some time was invested in training and overseeing Navy personnel, but the payoff was the ability to deploy divers to far-reaching projects. These included mainland marine parks and the former Trust Territories of the Pacific Islands, including the Federated States of Micronesia, Commonwealth of Northern Marianas, Palau and the Marshall Islands.

With the fall of Japan in WWII, these areas became Trust Territories under the League of Nations and then the United Nations. The United States administered them, with the Department of the Interior (DOI) providing oversight from 1951 until 1986, when the territories began a multi-year process of gaining their independence. DOI encouraged its agencies to assist present and former Trust Territories. No special authority was required to use NPS resources in support of historic preservation in these areas, as well as National Historic Landmarks, regardless of whose jurisdiction it was.

As a result, SCRU had 15 to as many as 200 trained divers at their disposal for projects, plus navy assets such as boats, side-scan sonar units with operators, ROVs, etc. For work in the Aleutian Islands, a 250-foot navy salvage ship was made available to SCRU for a month. Seamark is its own story in size and scope. Activated from the mid-1980s to mid-1990s, Seamark was used in Pearl Harbor, Kalaupapa, Guam, Saipan, Palau, Chuuk, Kosrae, Pohnpei and the Marshall Islands, including Majuro, Kwajalein and Bikini Atoll. (SEE "PROJECT SEAMARK" ON PAGE 123)

SCRU proved adept at working effectively in the world of inter-island politics. Assistance was provided mainly in the area of submerged cultural resources inventory and protection. The Advisory Council on Historic Preservation and the NPS Western Regional Office had done a good job insuring that historic preservation officers (HPOs) were established in each island group. The team was frequently invited to conduct underwater surveys or train the HPOs to dive and monitor submerged cultural sites. The Western Regional Office National Register Program, with Margaret Pepin-Donat, as well as the support of others, should be credited for these many successes. It should also be noted that one of the side benefits or unintended consequence of the US Navy/NPS presence in these remote areas, per the late HPO Teddy John, was that their presence discouraged commercial treasure hunting. In addition to these sites in the Pacific, Seamark projects took place at Ellis Island, Alcatraz, Golden Gate, Channel Islands, Cape Cod, Dry Tortugas and Amistad.

Bikini Atoll

The Department of Energy requested the assistance of Commander McCampbell to document the ships sunk in two atomic blasts (Able and Baker) at Bikini Atoll in 1946, and to determine if they could be made available to divers. He told them the best way to handle it was a joint navy/SCRU operation. The Pearl Harbor EOD (explosive ordinance disposal) team located and buoyed the wrecks in preparation for SCRU who followed shortly after. In 1989 and 1990, a team consisting of Murphy, Livingston, Nordby, and Delgado, led by Lenihan, documented the vessels in two intensive, three-week diving sessions. Simultaneously, a team of Bikinians were trained to dive and monitor the ships for the Bikini Council. The SCRU report on Bikini was edited by Delgado, with contributions by Murphy and spectacular drawings by Nordby and Livingston. The foreword was by the secretary of the interior. Lenihan wrote a section discussing the team's recommendation that the site be open to diving. As expected, this was not met with universal approval but the site remains open to diving and is now a UNESCO World Heritage Site, so designated in 2006.

In retrospect

SCRU was a marvelous adventure for those who partook in it. It was successful in good measure because the timing was perfect. The NPS truly needed such a team and Cal was there to do it. It put the agency where it should be in Congress's grand design—the lead in dealing with submerged archeological sites. The team was composed of rabid preservationists, but that is not an adverse position to take in the National Park Service. Its greatest strength was that it could work well in parks. These weren't archeologists sent to work with the service. They were the service; they wore the uniform and they identified with the mission. And through the time of writing the SRC continues in that role. Dave Conlin leads a center full of young, talented people who love the parks and what they are doing in them.

Recently SCRU formalized its longstanding association with the Naval Historical Center (NHC) in Washington D.C. The latter called on support from SCRU since 1989 to conduct underwater operations on the brig USS *Somers* in Veracruz, Mexico (the vessel the novella Billy Budd is based on), the CSS *Alabama* in France, the HL *Hunley* (Civil War sub) in South Carolina, the possible *Bonhomme Richard* lying off the coast of the United Kingdom, and sites in the far Pacific. SCRU entered a relationship in which NPS would hire underwater archeologists to work under agency protocols and policy but be stationed in Washington. They were entirely paid for by the NHC, plus 15 percent overhead and reassigned to NPS projects on an as-needed basis if not otherwise committed. The NHC also provided funds to assist with sites important to US Naval history in the parks, like the USS *Arizona*.

Since its inception in 1980, SCRU has been a recognized leader in the federal government in underwater archeology. It has conducted over 120 separate field operations ranging from Alaska to most of the water parks in the Lower 48, as well as the Virgin Islands, Hawaii, Micronesia, Polynesia, and foreign waters including France, Honduras, England and Mexico. SCRU has provided evidence and expert witnesses to NPS court cases through the DOJ in over a dozen separate cases. Unit members have conducted over 20,000 person-dives in all conditions and supervised approximately 40,000 dives with only one serious diving accident due to equipment malfunction. Almost every diver in the National Park Service has served in the field with SCRU. The Southwest Region and later Intermountain Region dive officer position was occupied by SCRU or SRC divers from 1975 until this writing in 2016: over forty years. Occupants were Lenihan, Nordby, Carrell, Murphy, John Brooks, Brett Seymour and Steve Sellers.

NPS/NAVY JOINT VENTURES

USS *Arizona* Survey and Project Seamark

The USS *Arizona* survey was one of the signature projects of SCRU. The mission was to document *in situ* the battleship which sank with the loss of 1,177 sailors and marines just minutes into the Japanese attack on Pearl Harbor in 1941. As it settled upright with its mast and superstructure above water, plumes of thick black smoke from ruptured fuel lines were caught on film. It became America's collective nightmare image of the attack that ensured their entry into a second World War. The Navy salvaged most of what was above water in 1943, but for the next forty years, no effort was made to document the remains.

Gary Cummins, appointed first superintendent of the USS *Arizona* Memorial in the spring of 1980, believed he had insufficient information to fully manage the site.

"As we began...we assumed the Navy would have reams of documentation on the attack and on the USS *Arizona* itself. We were wrong. Not only was information on the ship lacking, it was not seen as important. Another concern was resource management. Although the Navy actually owned the USS *Arizona*, we found Navy officials relatively unconcerned about its preservation. The public however was concerned over the *Arizona*'s upkeep, and furthermore believed since the NPS operated the *Arizona*, it must own the battleship."

Before long, Cummins was discussing an underwater survey with Rear Admiral Stanley Anderson, commander of the Pearl Harbor Navy Base and his staff; they controlled the waters of Pearl Harbor. Anderson seemed amenable, but some of his staff were shocked by the idea.

"...they could not understand why we would want to investigate something about which 'everything was known.' When we told them the things we didn't know…general condition of the ship, and exact location of other damage, they were still puzzled…the Navy felt the public had no business asking…questions, and that we should simply refuse to answer them… 'Why not leave it alone?'"

To a great many, including vital navy officials, the warship was in effect, a shrine. The idea of conducting a survey amid the remains of the more than 1,100 men entombed, was unsettling and considered impossible in the conditions. Cummins had to tread lightly. When Rear Admiral Conrad J. Rorie replaced Anderson, a persistent Cummins again engaged:

"As it turned out, Rorie was a Civil War buff. He asked about several Civil War sites managed by the NPS and I was able to provide him with interpretive material and archeological field reports and other documents. I think this convinced him the service set high professional standards and this helped cement the deal."

In 1982, Superintendent Cummins requested the assistance of SCRU and the team ultimately mapped and photo-documented *Arizona* in 1983 and 1984.

Imaging the 608-foot-long hulk in the low-visibility harbor was daunting; a subject of this size in these conditions had never been surveyed before. Its successful completion in 1984 and the release of award-winning drawings in 1985, however, garnered international attention. An unintended but welcome consequence of this NPS/navy effort was a decade-long partnership between SCRU and the navy diving community. It became known as Project Seamark, with many of its more memorable results highlighted later in this section.

The USS *Arizona* Project

To less-than-expert eyes, the remains of the *Arizona* make little sense. When Cummins proposed SCRU map and document *Arizona*, he envisioned architectural-style drawings, enabling visitors to better comprehend what they were seeing. Cummins had a graduate degree in military history with substantial advanced training and education in archeology, and was a certified NPS diver with considerable underwater time in Hawaii—hence, he was one of the few people equipped to fully comprehend the difficulty of what he proposed.

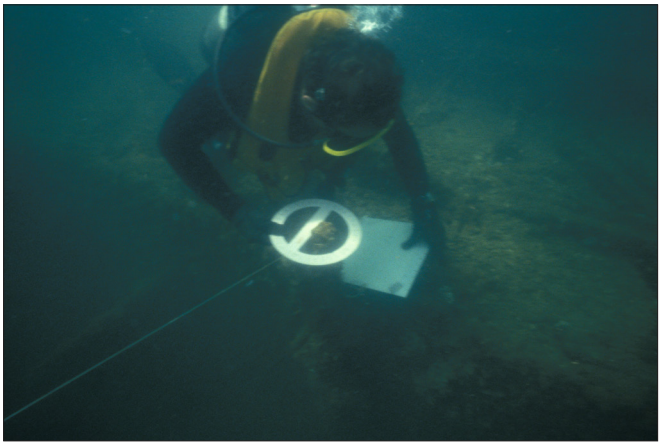
Lenihan scheduled the project in 1984, with a prior week onsite in 1983 for the team to refine its approach. SCRU was one of the few archeological teams with experience documenting large metal shipwrecks, having done so at Isle Royale, although in water with much greater visibility. On September 13, 1983, Lenihan, and Cummins made the first dives. Additionally, in this preliminary team were archeologists Larry Murphy, Larry Nordby, illustrator Jerry Livingston, Western Region diving officer Dave McLean, and Ranger Jim Miculka from War in the Pacific NHP in Guam. Divers from the *Arizona* Memorial were Cummins, John Martini and Farley Watanabe.

Visibility was five to seven feet, but the water was warm and shallow, maximizing down time. Prior wreck drawings were usually done in the Mediterranean on areas the size of a tennis court; *Arizona* was two football fields long. The objective was to render port and starboard profile drawings, plus a bird's eye (planimetric view) of the sunken hulk. This equaled 1,824 linear feet of maps to

be made. SCRU would be conducting the 1/3 mile's worth of surveys on a ship with an average height of 35 feet (mud-line to water surface). The width for the planimetric view ranged from 2 feet at the bow and stern to 106 feet amidship. This was well before practical applications by computers or GPS. Cummins also hoped for a photographic inventory, if possible. Gary Beito, the CEO of the *Arizona* Memorial Museum Association, agreed to underwrite the entire cost of the project and Carol Lin, the *Arizona* Memorial food concessioner, provided food for the project crew.

In answer to the navy's concerns about the sanctity of the *Arizona,* Cummins agreed,

"…that under no condition would divers enter the hull. Thus we could reassure everyone the remains would rest undisturbed. I thought this would also make the operation safer by [preventing] a diver becoming disoriented…Dan recommended the survey be conducted over a two-year period, with the first devoted to approximately two weeks which would concentrate on the ship's bow section…When we took the refined proposal to Admiral Rorie, we were much better received…he and his staff were impressed with Lenihan's credentials and the overall approach to the subject."



Dan Lenihan laying first line down on USS *Arizona* for the mapping operation, 1983. The team eventually laid over a one-quarter-mile of line on the site for mapping operations. NPS Submerged Cultural Resources Center collection.

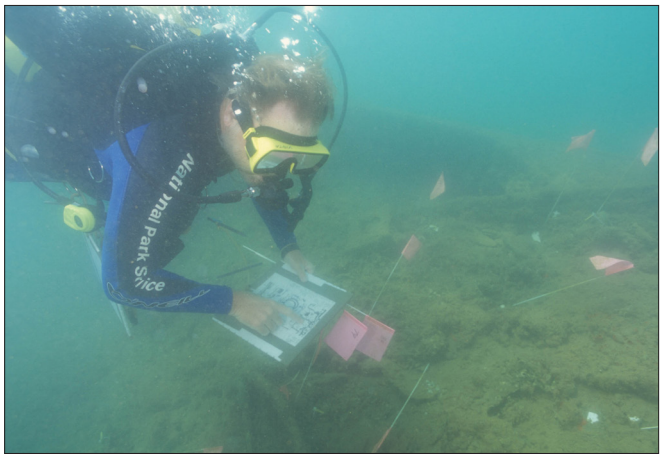
Just before heading to Honolulu, SCRU had a marvelous stroke of luck—a self-contained underwater video housing with a three-inch monitor mounted inside. It was a prototype rushed to Lenihan the night before he left for Hawaii. Until this point, SCRU used a reel-to-reel, black-and-white video recorder to capture details for illustrators.

The new housing, just perfected by Jaymar Industries, held the monitor next to a JVC home video camera. Footage was recorded on a twenty-minute cassette in the housing. It caused a media frenzy even during the 1983 preliminary workup session—no one had ever seen images of *Arizona* underwater. That September, Gary Cummins and a mesmerizing pan of the *Arizona* suddenly appeared on the local and then national evening news. Not surprisingly, there were few further questions as to why the service was diving the USS *Arizona*.

While the cameras whirred, SCRU worked intently on adapting its "string-n-things" approach to a low-visibility environment. The technique was simple and effective, using 1/16th inch cave diving line, numbered clothespins and high school geometry, to tie unknown wreckage features to known points in the real world.

In mid-October, 1984, the team was mobilized within a day of their arrival. Murphy was on leave working on his PhD at Brown University, but the rest of the team was intact. Jerry Livingston and Larry Nordby were in charge of the mapping. Livingston worked on the bird's eye view while Nordby handled the profiles. Nordby assigned Farley Watanabe from the memorial, and Mark Senning from Hawai'i Volcanoes NP, one profile each to supervise. They funneled hundreds of measurements via divers back to Nordby. Dave McLean again served as the project's diving coordinator, maintaining the flow of tanks and supplies and serving as the interface between navy and NPS divers. Dozens of navy divers helped, sent below to where the NPS illustrators had identified points to be measured. With great excitement, everyone, including park visitors, watched the ship take shape on nine-foot-long graph-paper hung from the walls of the memorial's antechamber. Simple geometry did its magic; no angles were used, just distances, or trilateration, which works better underwater.

With Superintendent Cummins' approval in early 1985, Livingston sent an artistic collage of the ship's views for judgment in a national competition. Later that year, the Society for History in the Federal Government bestowed the John Wesley Powell Award for Historic Display on this rendering. Cummins used this recognition to demonstrate to other agencies the importance of knowing your resources.



Archeologist Larry Nordby mapping the USS *Arizona.* NPS Submerged Cultural Resources Center collection.

Return to Pearl Harbor (*Arizona, Utah*, planes and submarines)

In 1986, SCRU returned to Pearl Harbor, again responding to a request from the park's management, this time from new superintendent Bill Dickinson, who succeeded Cummins at the Arizona.

"…this project and working with the SCRU was one of the highlights of my career…I was not dive certified…it seemed strange that I would be responsible for an incredibly significant submerged cultural resource…but unable to experience it up close. Almost immediately, I signed up for a dive class…filled with Navy divers and me."

Ultimately the finished work by SCRU from 1983-1989 was the result of their combined vision: Cummins had laid the groundwork by breaking the ice with the navy and demanding an answer to an obvious question, "What's there under the water?" Bill then asked the next managerial question, "What's happening to what's there?" Studies began on the corrosion process taking place on the *Arizona*, and the rate of oil leaking from the wreck. Dickinson also asked Lenihan to begin documenting the USS *Utah*, the only other ship remaining in the harbor from the attack.

Dickinson had several distinct objectives, some of them new:

"The work completed by Gary and Dan resulted in an excellent and graphic representation of what was there, but not assessment of baseline resource conditions or the establishment of an ongoing resource monitoring program. Dan's team…[along with others] developed a dive plan and submerged resource project plan…that resulted in the safe completion of a resource condition assessment and the establishment of a USS *Arizona* submerged resources monitoring program."

A critical element of this program was studying the metal corrosion and bio-fouling on the huge structure. Dickinson also wanted detail added to the bird's eye view as requested by Robert Sumrall. Sumrall was constructing a unique, eight-foot long *in situ* model of *Arizona* for the visitor center—one showing the ship on the harbor bottom. There was already an eight-foot 'as was' model of the USS *Arizona* showing how it looked before the day of the fateful attack.

Dickinson also wanted a map of the USS *Utah*, now a target and training vessel sunk on the other side of Ford Island. He envisioned *Arizona* and other submerged attack sites tied into one project. The components were to be the *Arizona* map, the *Utah* map, along with narrative ship histories, images of Japanese planes that crashed in the water and perhaps images of a Japanese midget sub sunk by the USS *Ward* an hour before the attacking planes arrived.



USS *Arizona*, circa 1984. Oil sample being taken. NPS Submerged Cultural Resources Center collection.

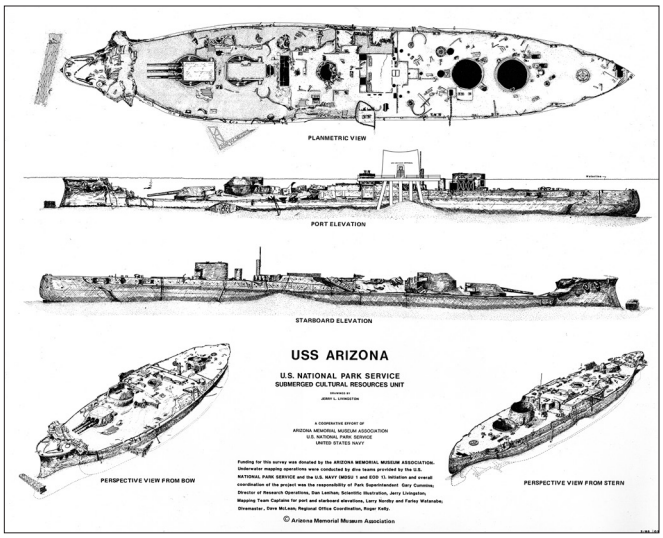
The operation began in July 1986. SCRU ran two sites at once. The diving on *Arizona* was controlled by McLean and Nordby, and operations on the *Utah* by Murphy and Livingston. This included having Scott Henderson, biologist from the Naval Ocean Systems Center, set up stations to study bio-fouling's role in the corrosion process on the *Arizona*. Murphy, newly returned from leave to Brown University for his PhD work, had surveyors shoot in key points and had Jerry Livingston start mapping the ship. Meanwhile, he built a dossier on WWII in Pearl Harbor, wrote archeological descriptions for the *Utah* site, and was coordinating offshore surveys for plane crash sites and midget subs. He also began an assessment of the effects of escaping oil this year, which is still being monitored at the time of writing. In addition to the support of Dickinson's staff, Lenihan was impressed that the energetic superintendent was also encouraging SCRU to publish a monograph on what was quickly becoming an extremely complex project.

Dickinson and Lenihan met with representatives of the *Arizona* Memorial Museum Association, which promised to fund a comprehensive report on not only *Arizona* but on the entirety of Pearl Harbor National Landmark. SCRU had published three monographs in the past three years, including surveys at Point Reyes and Apostle Islands. The team was also finishing a large volume on submerged sites at Isle Royale, which was published in 1987.

There were two archeologists on the SCRU at this time; Murphy and Lenihan. A law enforcement officer, Ken Vrana, and secretary Darlene Romero were involved as well. Additionally, the Southwest Cultural Resources Center had a pool of talented professionals, some becoming regulars on the team. Larry Nordby, Jerry Livingston, and Jim Bradford were most active among them, later joined by Art Ireland.

The 1989 publication that captured this entire body of work was the *Submerged Cultural Resources Study, USS Arizona and Pearl Harbor National*

Historic Landmark edited by Lenihan. In addition to SCRU writers, some sections were authored by park personnel, including historian Daniel Martinez and both superintendents. Jim Delgado from the Washington Support Office also contributed. In addition to meeting professional obligations, the report became a popular sales item at the memorial. As of 2013 more than 40,000 copies had been sold to the general public.



The award-winning 1985 collection of drawings from the 1983 and 1984 USS *Arizona* mapping project by SCRU diver Jerry Livingston.

An unintended but fortuitous consequence of the 1986 work at Pearl Harbor was a decade-long association with the US Navy Reserves. Commander James Orzech met with Lenihan several months earlier and promised to devote thirty reservists from Long Beach to the project. No support would be needed from the NPS except mapping supervision. They were put to work on both the *Arizona* and *Utah*. It was during this mammoth effort that SCRU's ability to work well with the navy was noticed by a person of unique importance for the future—Commander Dave McCampbell.

Commander Orzech introduced Lenihan to Commander McCampbell, the new active-duty CO of the navy's Mobile Diving Salvage Unit One. McCampbell was head of all Navy diving operations in the Pacific. Lenihan took the Commander on long dives on the *Arizona* and *Utah* where he could watch closely the interface between the NPS and navy. He saw the excited reservists from Long Beach being shown by Livingston and Nordby how to feed their measurements into the detailed maps. McCampbell watched his reserve divers labor to preserve an American icon instead of doing typical training dives. The implications of this meeting would be felt for the next ten years. Project Seamark was born.

Also at this session in1986, came a BBC television dive team and two producers, Derek Towers and Russ England. They had already acquired footage of SCRU at Isle Royale for use in a major documentary film. By the end of this session, Murphy would accompany them to Guam to take part in yet another segment of the film. This involved help from NPS divers Jim Miculka and Rose Manibusan, both stationed at War in the Pacific. More than half of their resulting film, *Discoveries Underwater: Science Salvage or Scrap,* was devoted to NPS projects. The producers were particularly interested in the approach SCRU used for incorporating rangers and navy divers on its projects. The largely peacetime navy during this period found that focusing its reserves' training on SCRU projects in Hawaii and the western Pacific was far superior to make-work tasks off navy piers. Besides doing real jobs, they were getting letters of thanks from Pacific Island-states that had only recently been trouble spots for navy personnel.


NPS archeologist Larry Nordby on left with the maps in-progress tacked up on the wall of the USS *Arizona* Memorial, 1986. On far right is Commander Dave McCampbell, USN, a principal person in Project Seamark. NPS Submerged Cultural Resources Center collection.

Project Seamark

The "Project Seamark" label had been approved at high levels in the navy, which gave clearance for finance officers to quickly free up divers and assets (such as side-scan sonar, ship and boat support) to all associated ventures. After being initiated by Orzech, McCampbell became Seamark's chief proponent, working with Lenihan to plan numerous operations in the western Pacific. McCampbell even found ways to extend the opportunity to navy divers on the east coast. Work had begun at Cape Cod in September 1985 and included North Atlantic Region divers Dennis St. Aubin, Bill Geeslin, Stan Robbins and SCRU divers Nordby, Vrana and Lenihan. Navy divers were brought in to assist with mapping the Bark *Frances* at Cape Cod National Seashore in 1987. It was completed in that same year as part of Seamark,



Cape Cod National Seashore, 1987. Park Service and US Navy Reserve divers as part of Project Seamark. NPS Submerged Cultural Resources Center collection.

and the final map was drawn by Larry Nordby. He was able to catch *Frances* at different points in being covered and uncovered by sand.

Although Seamark projects took place in many park areas, including Dry Tortugas, Cape Cod, Ellis Island, Alcatraz, Golden Gate, Amistad, and War in the Pacific, some of the greatest help for SCRU came in Micronesia. It was tied to a wider Department of the Interior mandate to assist former Trust Territories of the Pacific Islands (TTPI) in survey and protection of submerged resources. Project Seamark, signed off on by appropriate admirals, allowed bureaucratic hurdles to fall. In addition to the navy, *National Geographic Magazine* donated film, cameras, and most importantly, remotely operated vehicles (ROVs) and operators to the NPS for these projects.

Rangers Jim Miculka and Rose Manibusan were frequently involved in diving operations in the western Pacific and cleared the way administratively for SCRU involvement in and out of the parks. Jim Delgado, the NPS chief maritime historian (and an NPS diver), became personally involved in the NPS/Navy operations and Western regional archeologist Roger Kelly provided strong administrative support. Though based in Washington, DC, Delgado became an adjunct member of SCRU. The agency gave him permission to dive in any region on SCRU projects if his training was kept up to date and SCRU controlled the dive site.

In 1988, Delgado had his first involvement with the *Arizona* and *Utah,* and true to his reputation for being highly productive, Jim wrote National Historic Landmark nominations that were subsequently accepted. Although the ships were part of Pearl Harbor NHL in the past, they now had their own specific designations. This gives them an even higher level of protection than they had previously. This was more important for the *Utah* which doesn't enjoy the same level of public profile as the *Arizona*.

SCRU's activity in the Pacific as part of Seamark included survey and documentation projects in Kalaupapa National Historic Park on Molokai in 1988. ROVs were sent into the park's Kauhako Crater. The vehicles reached to depths in excess of 500 feet, revealing that the murky surface water cleared after 20 feet of depth. The US Marines provided four CH-46 helicopters to transport gear and equipment to the remote location, and the navy contributed a half-dozen skin divers for surface support. At water level in the crater, part of the helicopters actually were under a ceiling. (SEE PAGE 145)

In 1987 and 1988, NPS divers Jim Miculka and Rose Manibusan undertook a survey of the invasion beaches in Guam, at War in the Pacific NHP. They also worked with Carrell and local volunteer divers at American Memorial Park in Saipan. SCRU ran a ten-week operation documenting WWII wrecks in Palau in 1988 using Carrell, Bradford, Nordby, and Livingston. Lenihan and Miculka coordinated activities of six of the eight reserve detachments of MDSU-1; more than 200 US Navy Reserve divers and support personnel.

In 1992, Murphy, Livingston, Nordby, Bradford and Lenihan, plus volunteer SCRU diver Joe Canepa, took part in the so-called Micronesian Sweep, in which they certified local historic preservation officers (HPOs) from the Federated States of Micronesia (FSM) as divers so they could survey their islands' submerged sites (most SCRU divers held NAUI instructor ratings so they could grant civilian certifications). The leader of the external NPS Cultural Resources program in the Western Region, Margaret Pepin-Donat, was trained as an NPS diver by SCRU and helped organize the operation. Islands targeted for the work were Chuuk, Guam, Pohnpei, Kosrae and Majuro. Teddy John, head of FSM historic preservation officers was a great contributor to this operation. Sadly he died shortly after the project.

Toni Carrell was responsible for pulling together a report that would capture the various projects on different islands and demonstrate how they could be seen as a model for addressing underwater archeological needs in that part of the world. It was published by SCRU in 1991 with the title *Micronesia, Submerged Cultural Resources Assessment*, edited by Toni Carrell.

Project Seamark—Bikini

Perhaps the most unusual diving tied to Seamark was SCRU's work at Bikini Atoll in August 1989 and April and May 1990. In 1988 officials of the Department of Energy (DOE) and the Bikini Council requested the head of navy diving operations in the Pacific to provide assistance locating and imaging the ships sunk in the 1946 atomic bomb tests. The chief player from the navy was Commander McCampbell. Without

hesitation he recommended combining navy active duty personnel and the SCRU team for such a job.

McCampbell recommended the sunken ships be pinpointed by an EOD side-scan team headed by him and special-ops divers from Pearl Harbor. They would locate the target ships and set buoys for NPS and DOE divers, greatly facilitating work on site. The SCRU team arrived shortly after the navy departed to avoid straining the Bikini Support Facility run by military contractor Raytheon. The navy prep work in buoying the sites was excellent.



Bikini Atoll, 1990. Left to right top row: Larry Nordby, Jerry Livingston, Eric Hanauer from Raytheon, Jim Delgado, Larry Murphy. SCRU team taught Bikinians to dive and guide tours. NPS Submerged Cultural Resources Center collection.

As this project involved diving on ships sunk by nuclear weapons, safety by SCRU was paramount. There were some ambiguities, however, related to diving on 'nuked' ships. The DOE was using an excellent safety advisor, Dr. Robison, who spent hours explaining the radiation risks in detail. Lenihan trusted but also verified—by going to a friend in radiation effects at Los Alamos National Laboratory (a forty-minute drive from Santa Fe and SCRU) who confirmed the interpretation given by Robison. Lenihan felt he could confidently say there were no exceptional risks of residual radiation at Bikini.

The survey required moderate deep diving; most of the sunken vessels lay in water 180 feet deep, with only remote access to decompression facilities. The standard worries about diving at significant depth with long exposures, far from an emergency chamber, were once again the chief concerns. SCRU philosophy was that divers uneasy with a situation should never be talked into participating; work would be on a voluntary basis. Divers who ultimately took part in the two, three-week deployments (1989 and 1990) were Nordby, Livingston, Murphy, Delgado, and Lenihan. Delgado, at first nervous about the depth involved, partnered with Lenihan on deeper dives. Livingston and Nordby were deeply involved with sketching, and Murphy oversaw the photography. Soon, Delgado was able to contribute even on the deeper sites, narrating on video from a special facemask. Lenihan always avoided specific tasking for himself so he could fill in as needed. But he made a rare decision at Bikini—as usual, if he was disabled for any reason, Murphy was in charge. But for this project, if Murphy also had to stand down from diving, the project would be over.



Bikini Atoll circa 1989. The entire NPS team decompressing after a dive to 150 feet to map the submarine *Pilotfish*. NPS photo by Larry Murphy.

The target ships for this survey included the 890-foot-long aircraft carrier, USS *Saratoga*, as well as the *Nagato*, flagship of the Japanese Navy during the attack on Pearl Harbor. The *Nagato* was in the Sea of Japan during the attack, but on its bridge that day, Admiral Yamamoto heard the infamous "*Tora, Tora, Tora*" transmission from his planes before they struck Pearl Harbor. Also included was the German cruiser *Prinz Eugen*, which the team dived at Kwajalein; it had been towed there from Bikini after the 1946 bomb tests.

Though these ships received the greatest attention from SCRU, there were nine others, six of which the team dived. The diving was intense

but the project went well. Livingston did his usual superb work but agreed to let Nordby take on the *Saratoga*, the largest object SCRU would ever hand-map underwater (even *Arizona* was a football field less in length). The results were splendid. Delgado helped by organizing the assembly of the final report at his Washington office. There is a specific section in this book's bibliography of publications resulting from work on the USS *Arizona,* Bikini, and Project Seamark in general.

Project Seamark—Aleutians

Another unique Project Seamark operation was in the Aleutian Islands of Alaska. In 1989, in an arrangement brokered by Commander McCampbell, the USS *Safeguard*, a 250-foot navy salvage ship with a crew of ninety, was made available to SCRU and MDSU-1 to survey harbors of Attu and Kiska. The Aleutian sites are very difficult to access due to extreme weather conditions, some of the worst in the world. They are managed by the US Fish and Wildlife Service but their personnel sometimes had to wait years before they could make it to Kiska using available craft. Even with *Safeguard* (with a dynamic bow thruster), it could be difficult to enter windswept harbors. The following might give a sense of the complexity in these operations in the late-1980s to mid-1990s.

As SCRU stopped over in Honolulu in August 1989 on the way home from its first field session at Bikini Atoll, Murphy diverted to *Safeguard* (in Pearl Harbor). His return was timed to meet the ship and head to the Aleutians. Lenihan proceeded home for a short break with family before rejoining Murphy. Other NPS divers on the Bikini operation, Nordby, Livingston and Delgado, headed to Mexico to take part in a survey with Mexican divers from the Instituto Nacional de Antropología e Historia, Mexico's federal anthropological and historical preservation agency. They were working on the US Brig of War *Somers*, sunk off of Tampico in 1846.

Larry Murphy rode *Safeguard* to the Aleutians, giving him time to design a survey of Kiska Harbor based on the ship's radar in conjunction with a side-scan sonar donated by a Navy EOD team. Then in Adak, Wrangell St. Elias chief ranger and NPS diver Jay Wells, was picked up. Wells had been of great help to SCRU in 1985-86 at Isle Royale. He worked with Murphy on diving operations at Kiska before Lenihan arrived.

Returning to Adak, Muphy had *Safeguard* pick up Alaska Region cultural resources personnel. Susan Morton and Sandy McDermott were provided by regional director Jack Morehead to the survey. Morehead, a longtime supporter of SCRU, had played a major role in the 1980 conversion of the NRIS unit to permanent status. Also boarding in Adak were Lenihan and a number of historians and scientists from US Fish and Wildlife and the US Air Force. Mike Eng, Murphy, Wells and Lenihan were the NPS divers for this September 1989 operation. Others were Navy divers, some of whom worked with SCRU on other projects. The USS *Safeguard* was ideal because it had built into its hull two large hyperbaric chambers.

"When I [Dan Lenihan] arrived, the ship's navy skipper, new to SCRU operations, was curious what rank I held compared to Murphy. In the navy, rank is important. I said 'keep working directly with Larry, you two are doing fine.' Typical of good-natured exchanges between navy and SCRU personnel, the skipper dropped his mouth in sudden revelation—'Ah!' He pointed to me and said 'Commanding Officer.' Then, his finger circled slowly back to Murphy as he blurted out 'Executive Officer!' 'You got it, skipper. First try,' I said."

Murphy had already worked closely with navy technicians on the *Safeguard* and developed a strategy for fixing locations of vessels found by sonar. It involved using the ship's radar system as a fixed base for positioning. The trip had excellent results with several Japanese war vessels located and identified. These included a Japanese Vickers-class submarine found in 100 feet of water. SCRU used underwater photography and video to document these sites in addition to archeological narrative. An interesting consumer of the video was NHK, a Japanese American network. The imagery was well-received not only in the US but in Japan.



Kiska Harbor, Aleutian Islands, Alaska, Sept. 1989. Larry Murphy (left), Dan Lenihan (right), getting ready to dive on side-scan sonar contacts..NPS Submerged Cultural Resources Center collection.

1980-1989

In 1980, the NRIS team transitioned into SCRU. They got right to work, using new technologies to confirm the location of the HMS *Fowey* within Biscayne National Park. This discovery was important to the ongoing court case over the title rights to the wreck. SCRU also spent significant time in Micronesia conducting shipwreck surveys and training local park divers. Regional NPS dive teams continued to be trained in underwater surveying skills.

The 1980s were a breakthrough decade for the mapping of large shipwrecks by SCRU, first at Isle Royale and then in Pearl Harbor, where they successfully mapped the sunken battleships USS *Arizona* and USS *Utah*. The projects in Pearl Harbor also fostered a decades-long collaboration with the navy called Project Seamark, including notable projects at Bikini Atoll and the Aleutian Islands.

New imaging technologies, like cameras mounted to ROVs in Isle Royale, and live-broadcast underwater video in the Channel Islands, helped to transport viewers into the underwater world of national parks. New developments in underwater image acquisition for education and outreach continue in the service to this day. The late 1980s also saw some deep-water exploration in a manned submersible used to explore Crater Lake

Visitor dive accidents continued to be a safety issue, especially in the parks with significant dive activity. The first ever DOI Exemplary Act Award was bestowed on dive team at Amistad and two divers from SCRU for their exceptional performance during a risky body recovery in the powerhouse of the Rough Canyon Dam. Butch Farabee became the first NPS emergency services coordinator in 1987, responsible for the coordination of the dive program and all other aspects of emergency response at the national level.

The park also saw a major bust of an underwater artifact salvaging operation in the Channel Islands, documented by two undercover park rangers on a diving live-aboard. The final ruling on the HMS *Fowey*, as well as a push to utilize the national register as a tool for shipwreck conservation, continued to solidify the role of NPS in protecting shipwrecks.

1980

In 1980, SCRU was formed from NRIS personnel with a complete equipment locker and became a permanent NPS entity.

1980

Washington Support Office (NPS)

This was the Year of the Coast. Dave Sherman was the Washington Support Office chairman of the NPS Year of the Coast Committee and was quoted in the lead article in the April, 1980 issue of *Courier: The National Park Service Newsletter:*

> The Park Service is in a peculiarly advantageous position…We have the opportunity—even the obligation—to inject the historic note into the Year of the Coast. The coastal zone is under attack everywhere—from the land and from the sea, and we need to do our Paul Revere act in defense of the natural resources that are under such cruel pressures.

1980

Western Region (NPS)

Per the First Quarter Regional Scuba Summary from the Western regional dive officer Dave McLean, May 28, 1980, there were park dive officers in the following Western Region parks: Lake Mead, Channel Islands, Death Valley, Grand Canyon, Lassen Volcanic, Point Reyes, Golden Gate, Redwood, and Yosemite.

1980

Biscayne National Park

The location of a historic period shipwreck by commercial treasure hunters within Biscayne in 1978 resulted in litigation mandating the NPS to locate the disputed site, to establish that it was indeed within the park's boundaries and jurisdiction. SEAC was assigned the task of locating the shipwreck. It was located and brought under protection by the NPS on July 4, 1980. It is sometimes called the Fourth of July wreck (SEE PAGE 132). A survey was conducted by George Fischer and Richard Johnson, both of SEAC.

SCRU archeologist Murphy was in charge of survey boat positioning using a Del Norte system. He and Lenihan had stopped in Texas to train in its operation on their way to Biscayne. This system required transponders to be set up with new batteries every day. Every second, all magnetometer and positioning hits were captured together. SCRU had insisted on this device being used, backing up resistance by Fischer to the Southeast Regional Office. George's regional directorate had insisted on using sextants—though much cheaper, it was impossible to use with a computerized positioning system. Fischer operated the magnetometer for the survey, Lenihan coordinated the dive boat following up on the hits and the first NPS diver to come down on the mag-hit that found the wreck was Jack Morehead. Afterwards SCRU videoed it (still with an old black and white unit that Lenihan had to use with a full facemask to record artifact descriptions). SCRU gave the tape to Fischer and left Florida as a team of divers came in from SEAC to map the site. SEAC handled future work on this site, eventually identifying it as the 1748 wreck of HMS *Fowey*. An FSU student that worked for Fischer, Russell Skowronek, much later co-authored a book on this effort and later research by SEAC on the site, entitled *HMS Fowey Lost and Found*, published in 2009.

Also in Biscayne that year, a survey and investigation was conducted by SEAC from October 3-17, with Fischer taking the lead. Artifacts were received by the park by Doug Biggers of Key Biscayne and the site needed to be identified. It is called the Glauber-Biggers site.



NPS divers mapping the wreck of the HMS *Fowey* in BISC, circa1980. NPS Submerged Cultural Resources Center collection.

1980
USS *Arizona* Memorial

Gary T. Cummins became the superintendent of the USS *Arizona* Memorial on August 18. The memorial was officially established October 10, 1980. Cummins conceived of the idea of having SCRU map the site and worked for three years to overcome concerns of the military community. Trained in archeology, history, and as an NPS diver, he tirelessly worked to clear the bureaucratic hurdles and succeeded in getting SCRU there to map and document the USS *Arizona* in 1983-84. Lenihan maintains that Cummins overcame the biggest obstacles to mapping the vessel before SCRU even arrived—convincing the navy it could be safely done. Cummins was there for exactly five years, leaving on August 18, 1985. When he left, he took with him a set of award-winning drawings of the submerged ship that had been hanging on his office wall.

1980
Channel Islands National Park

On two separate dates, August 25 and again on September 9, Ranger George Leone suffered symptoms of what would later be thought to be decompression sickness (bends). Leone was stationed on Anacapa Island, and the second event resulted in George being flown from the island by US Coast Guard helicopter and ultimately placed in the hyperbaric chamber on Santa Catalina Island. The two events were serious enough to warrant a board of inquiry, chaired by the park's biologist, Gary Davis. George stopped diving, which was the recommendation by the board, and soon retired.

Pursuant to the Marine Protection, Research, and Sanctuaries Act, 16 USC., NOAA established the Channel Islands National Marine Sanctuary, October 2, 1980. This includes the marine waters surrounding the islands of the Channel Islands out to a distance of six nautical miles.

1980
Fort Frederica National Monument

The Academic Diving Program at FSU conducted a limited survey at Fort Frederica from November 15-16. The survey searched for surface confirmation of 15 magnetic anomalies and covered a 20-meter by 50-meter area. The survey was under the direction of George Fischer, SEAC, with Richard Johnson, NPS, serving as divemaster.

1980
Western Region (NPS)
The Western Region Diving Control Board met on November 24, and one of the main topics was the clarification of hazard pay for both the federal government's General Schedule and Wage Grade classifications. Recommendations included hazard pay be applied only to "working" dives, per stipulations in NPS-4. Working dives were essentially non-scheduled dives. In McLean's research for Wage Grade, he was unable to find rules and regulations that would apply to Wage Grade employees and his recommendation was for them not to be included.

1980
Grand Canyon National Park
There was a service-wide scuba diving training meeting held at the service's Albright Training Center from December 1-2. In attendance were Jim Brady (HOAL) Dave McLean (Western regional dive officer), Craig Johnson (Grand Canyon) and Jim Stewart (Scripps).

1981
Kosrae, Micronesia
At the request of the President's Advisory Council on Historic Preservation and the Trust Territories of the Pacific Islands, Dan Lenihan, Larry Murphy and Toni Carrell of SCRU were asked to examine a shipwreck in Utwa Harbor, Kosrae. During a three-week trip the team determined that the wreck was the *Leonora* belonging to Bully Hayes. They did underwater site documentation with black and white, reel-to-reel video, which was the first television ever seen in Kosrae. Carrell, in 2016, recalled in communications with the author: "working on Kosrae, I had to buy local patchwork skirts to wear whenever we were not on the boat because it was not proper for women to wear trousers – looked pretty funny with my park service uniform shirt as I recall." SCRU also visited Chuuk and Ponapae.

1981
War in the Pacific National Historic Park
In February, SCRU consulted with Superintendent Stell Newman's new dive team at War in the Pacific in Guam. There, Newman had become an avid diver himself. He was very enthusiastic to have SCRU return for future projects. Newman died in an awful motor vehicle accident on the island's slippery-when-wet coralline roads on December 27, 1982. Lenihan, Murphy and Carrell were stunned to hear of his death. Jim Miculka and Rose Manibusan were instrumental in seeing Newman's interest in future SCRU work at the park realized over the next several years in spite of his tragic death.

1981
Channel Islands National Park/Biscayne National Park
Two divemaster courses took place in these two parks, during March 10 - 19 and April 21 - 30 respectively. The important outcome was that the requirements for a divemaster qualification were spelled out. In addition to being a nationally certified Basic NPS Diver, the candidate also needed 25 additionally logged dives, with a minimum of 20 hours of bottom time under various conditions.

1981
Fort Jefferson National Monument
From October 5-12, SEAC, in cooperation with the FSU Academic Diving Program, undertook nondestructive documentation of two archeological sites located in 1971.

1981
Dan Lenihan and Larry Murphy co-authored a paper on what they thought to be one of the most critical issues in underwater archeology at the cusp of the 1980s. "Considerations for Research Design in Shipwreck Archaeology." In *Underwater Archaeology: The Challenge Before Us. The Proceedings of the Twelfth Conference on Underwater Archaeology*.

1981
Western Region (NPS)
Per Western regional dive officer Dave McLean's annual dive report, "As of the end of 1981, ten parks within the region had dive programs: Lake Mead, Channel Islands, Golden Gate, Yosemite, Lassen Volcanic, Point Reyes, Redwood, Haleakalā, and War in the Pacific. We ended 1981 with 70 divers on the rolls, including 22 Divers-in-Training, two Divemasters, two Assistant Instructors, and two Instructors."

1982
Amistad National Recreation Area
A very difficult body recovery of a scuba diver was carried out in the powerhouse of the Rough Canyon Dam on February 23. The incident was described in Farabee's book, *Death, Daring, and Disaster.* After receiving the report of the missing diver from his dive buddies, Amistad rangers Mark Igo and Deborah Gibbons, and administrative officer Dan Peregoy, located the submerged powerhouse where he was presumed to be in two-foot visibility, at a depth of ninety feet in wintry conditions on February 21. The risk to them was too great to continue because of heavy silt, so they obtained help from the SCRU team and Larry Nordby, who had taken over as Southwest regional dive officer. On the second day of penetrations into the powerhouse Dan Lenihan and Larry Murphy recovered the victim. The entire team of divers were the first NPS recipients of the newly created DOI Exemplary Act Award. Years later, author Lenihan would say,

> What was important to me is that the park divers at Amistad knew exactly when to stop and go no farther. We had hammered home in NPS workshops that we didn't want them searching under ceilings. They found the window and signs of entry and didn't try to be heroes…very professional…neatly done. I was proud as hell of them.

1982
Isle Royale National Park
The NPS hosted a submerged cultural resources management workshop at Isle Royale from June 3-8. Including instructors, there were 26 participants, with 18 from NPS.

1982
Fort Jefferson National Monument
In June and July, SEAC, George Fischer, and the FSU Underwater Field School conducted a survey in the Dry Tortugas, mostly documentation of the wrecks *Rosario* and *Ludert Cooper*.

1982
Point Reyes National Seashore
In the fall, SCRU conducted a detailed remote sensing and dive survey. Survey activities were coordinated by Larry Murphy using a Motorola Miniranger positioning system—which interfaced magnetometer with positioning and sidescan sonar. A number of wrecks were identified: SS *Pomo*, *Richfield*, *Munleon*, *Hartwood* and *Shasta*, and the likely site, buried in the surf and beneath heavy sand, of the 1595 galleon *San Augustin*. Participants included Russ Lesko, Dan Lenihan, Toni Carrell, Jerry Livingston, and Ron Ice from SCRU and the Southwest Regional Office in Santa Fe, as well as Jim Delgado, Marty Mayer, Don Morris for Golden Gate and Channel Islands. This and other survey efforts at Point Reyes would be published in two separate SCRU reports. (SEE PAGE 134)

1982
Kosrae, Micronesia/Saipan, Northern Mariana Islands
Of Wooden Ships and Iron Men: An Historical and Archaeological survey of the Brig Leonora (Report # 15, Micronesian Archaeological Survey), edited by Scott Russell, was published in Saipan in 1982. Pages 23-67, and other smaller sections of the 107-page document are word-for-word from the 1981 SCRU report Toni Carrell, Larry Murphy, and Dan Lenihan submitted. Although other authors' names are assigned to other chapters, Russell uses SCRU as a generic attribution for the NPS authors. Aside from this curious anomaly, the report seems well-edited.

1982
Western Region (NPS)

Western regional dive officer McLean reported 24 drownings at Lake Mead with many dives made in recovery efforts. He also went on to report that the region conducted 1043 person-dives and that there was a scuba fatality at Channel Islands with no recovery.



Dan Lenihan in front of the USS *Arizona* Memorial. NPS Submerged Cultural Resources Center collection.

1983
USS *Arizona* Memorial

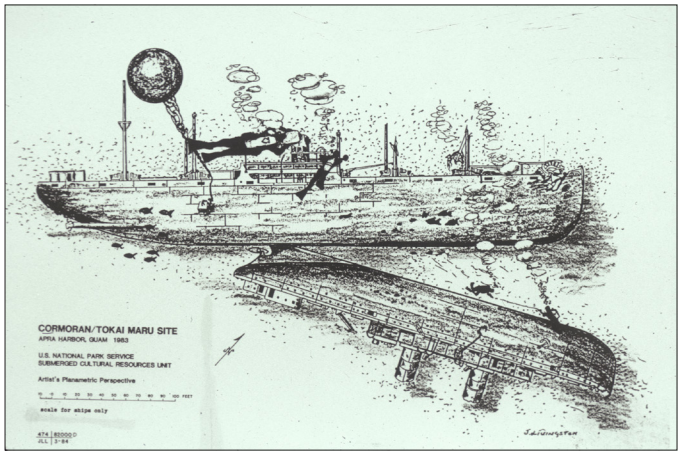
Superintendent Gary Cummins, who had snorkeled the USS *Arizona* with Lenihan in 1982, formally requested SCRU to survey the ship. In September, 1983 they began a series of assessment dives for ten days. Murphy, Livingston, Dave McLean from Lake Mead, Farley Watanabe, Jim Miculka from Guam, and Andy Johnson took part in the diving. The team ran the 1/16 inch cave diving line they had used for surveys at Isle Royale, adjusted the size of home-made survey clips and made a dozen small adjustments in technique to adapt to the new environment. The biggest change was the self-contained color video recorder that arrived the day before they left for Pearl Harbor. The 1/2 inch, 30 minute color video camera plus color monitor in a fiberglass box made the project a national star during the shakedown trip, Lenihan reported they could map the remains in about a month's time with help from park staff and navy personnel. They planned a full-scale mapping operation for the next year.

1983
Golden Gate National Recreation Area

Larry Murphy was the supervisory archeologist at Golden Gate National Recreation Area. He executed a shipwreck reconnaissance survey in area of *C.W. Lawrence's* reported loss. Remote sensing was used.

1983
War in the Pacific National Historic Park

Ralph Reyes, born on Guam and of Chamorro descent, became superintendent of the park in April of 1983. Born in 1926, he was fifteen years old when the Japanese bombed Guam on December 8, 1941. During the 2.5-year Japanese occupation of Guam, the Japanese used Reyes and many other Chamorro to construct some of the defensive structures that Reyes later would protect as superintendent. At his request, the SCRU team mapped the wreck site of the WWII freighter *Tokai Maru*, which lies partially on top of the hull of the WWI German raider SMS *Cormoran*. Murphy and Lenihan were supervisory archeologists. A drawing of the dual wreck site was done by Jerry Livingston. It became popular with the large dive community on Guam and ended up on numerous t-shirts on the



SCRU illustration of the *Tokai/Cormoran* site, by Jerry Livingston. Based on dives made in 1983 in Apra Harbor, Guam. *Tokai Maru* (top) is a WWII casualty that came down on SMS *Cormoran*, a WWI German Raider.

island and visiting divers from the mainland and Japan. SCRU also documented a live ammunition dump underwater near Camel Rock. They received help from a very active park dive team led by Ranger Jim Miculka and interpretive ranger Rose Manibusan.

In March, Toni Carrell came to War in the Pacific and led training on submerged cultural resources management. Her workshop was attended by park divers as well as by GovGuam staff and local community leaders.

1983
Biscayne National Park

In May and June, testing was conducted on the Legare Anchorage (HMS *Fowey*) shipwreck in Biscayne. Principal investigators were George Fischer and Russell Skowronek of SEAC. The project included a magnetometer survey and some excavations; it was conducted because of some confusion over the identity of the ship and also because the site was suffering continuing degradation by unauthorized salvaging.

The location of the ship now confirmed, the Southern US District Court of Florida issued the final ruling in *Gerald Klein v Unidentified Wreck and Abandoned Sailing Vessel* in favor of Biscayne on July 28. According to NPS historian Cameron Binkley, the court sided with the park due to "demonstrated NPS stewardship and [George] Fischer's expert testimony." The precedent setting case helped build congressional interest in passage of the Abandoned Shipwreck Act of 1987.[1,2]

1983
Isle Royale National Park

SCRU was at Isle Royale National Park in June to continue documentation of passenger steamer *George M. Cox*, and bulk freighters *Glenlyon*, *Chester A. Congdon,* and *Emperor.*

1983
Yosemite National Park

Ranger Charles Peterson is one of the few divers to ever perform a rescue as opposed to a recovery, underwater. While using scuba to clear a water-filled highway culvert in Yosemite on June 17, he saved fellow-ranger John Daley who had been sucked into the culvert. In 1992, this dramatic effort was recreated in a 15-minute segment of "Heart of Courage," a Discovery Channel television documentary. Peterson, a Valley District shift supervisor at this time, was presented the DOI Valor Award on April 24, 1985.

1983
Moores Creek National Battlefield

From August 29 through September 1, a six-person team from SEAC did an underwater archeological survey and testing of Moores Creek as it runs through the park. Special consideration was given to the area surrounding the site of the historical bridge. Participants included George Fischer, Richard Vernon, Richard Johnson and three others. In the October 1983 survey report put out by SEAC, author David Brewer noted that:

> In the final analysis, there was very little cultural material obtained and none can as yet be associated with the 1776 battle. That is not to say that there is no related material yet to be found.

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1 Abandoned Shipwreck Act of 1987: 43 USC. 2101-2106; P.L. 100-298

2 The site is a nationally significant resource, listed on the National Register of Historic Places. Archeologically, it continues to provide information about 18th century maritime life and the historic maritime landscape of South Florida. On August 15, 2013, in a ceremony at Biscayne, Director Jon Jarvis signed a memorandum of understanding (MOU) with the United Kingdom of Great Britain and Northern Ireland regarding the wreck of the British Naval frigate, the HMS *Fowey*. The MOU recognized British title to the wreck and expresses the NPS's intention to continue to care for the wreck in accordance with its own policies, the Sunken Military Craft Act of 2004, and the UNESCO convention on Underwater Cultural Heritage. The signatories also agreed to exchange information and consult on matters affecting the management and preservation of the site.

During the ceremony, Director Jarvis said the MOU codifies the NPS commitment to care for HMS *Fowey* and other submerged resources in our national parks. He highlighted the NPS preservation ethic, noting that not only are NPS staff driven by a mission to preserve America's treasures, but also that they have a great deal of expertise and technical skill in managing of cultural heritage sites like HMS *Fowey*. He particularly commended the staff of the NPS Submerged Resource Center, led by Dr. Dave Conlin, and Southeast Archaeological Center, under the direction of Dr. David Morgan.

1983
Glacier Bay National Park and Preserve
From September 24-26, service diving advisor Jim Stewart spent three days certifying park rangers Don Chase, Gary Vequist and Jerry Case, as well a diver from the Alaska Region (name is unknown), in the use of dry suits. Additionally, it served as a dive refresher for these four divers and the beginning of the Glacier Bay dive team. To the authors' knowledge, this is the first official dive team in the Alaska Region.

1983
Lake Mead National Recreation Area
The Training Announcement Special Issue of the *Courier: The National Park Service Newsletter*, advertised both advanced operational scuba diving and divemaster scuba certification classes. Both classes were to take place at Lake Mead from September 6-21, 1984, through a combined effort of both Lake Mead and Scripps. There were to be three divemasters and 12 regular students.

1983
Amistad National Recreation Area
A three-day course in underwater mapping and historic site surveying techniques was hosted by Dan Lenihan and Larry Murphy for a group of sport divers this summer. It was reported in the October 1984 issue of the *Courier: National Park Service Newsletter.*

1983
Olympic National Park
On December 29, Ranger Richard Thomas, after being alerted to a family vehicle going into 30 feet of water, donned dive gear and successfully located two infants still trapped inside. The two infants were resuscitated, although they ultimately died. Thomas received the DOI Valor Award for this effort.[3]



Divers and local volunteer divers mapping the wreck of *Noque Bay*, built 1872, sunk in 1905 at Apostle Islands National Lakeshore, ca. early 1980s. NPS Submerged Cultural Resources Center collection.

1983
Scripps Institute of Oceanography
In personal communications with the author, Stu Croll, former Isle Royale chief ranger (1977-1994) recalled some memorable dives from this time period:

> Don Brown, Superintendent of Isle Royale and I were in La Jolla, California working with Jim Stewart and Scripps. Done with business, we went diving. We snorkeled out to the Maritime Preserve until we were over the beginning of the La Jolla Canyon and dove. I think we went to a depth of 125 feet and started to work our way back up checking out small fish and plants. Slowly ascending we noticed a lot of silt coming down the walls and the water began to cloud. The following day, I paid a visit to Jim Stewart's office. He wanted to know if I felt the earthquake yesterday. I said no but we were in the water over the trench and saw all of the silt come down. Our first underwater earthquake.
>
> Don wanted to do a night dive, I reluctantly said OK so we went to Children's Beach. Great place since there where huge stands of seaweed and lots of fish BUT the swells are big and you do not escape the water movement with depth. Having survived the South China Sea storms I was having a ball. All of a sudden, where was Don? Not on the bottom not entangled in the seaweed but

3 Richard Thomas was later killed while on a Civil Air Patrol training mission on June 22, 1984.

on the surface losing his dinner. Seasick diving! I then remembered he was the only person I ever knew who got carsick driving his own car.

1983
Western Region (NPS)
Regional dive officer McLean reported two drownings at Channel Islands, 14 at Lake Mead. Channel Islands rangers took part in multi-agency helicopter deployment and Golden Gate divers recovered a helicopter and pilot.

1983
Southwest Region (NPS)
Late in 1983 and early 1984, Dan Lenihan of SCRU and Larry Nordby, regional dive officer, floated a concept paper to various dive parks around the system: *National Park Service Interregional Emergency Diving Response System: A Proposal*. Responders, including among others Jim Randall, Stu Croll, and John Benjamin, were very supportive, however it appears the proposal never got beyond that stage.

This year *Shipwreck Anthropology* was published by the School of American Research in Santa Fe. It became one of the more influential books in shipwreck archeology. Edited by Richard Gould, it had chapters on theoretical issues by both Larry Murphy and Dan Lenihan.

1984
Channel Islands National Park
Interpretive rangers conducted the first live, underwater video programs for non-diving visitors to experience the kelp forests of the Channel Islands. Bill Ehorn, a long-time diver himself, was the park superintendent at the time.

1984
War in the Pacific National Historic Park
Nobuo Ichihara, chief ranger at Chubu-Sangaku National Park, Japan, took part in a one-year exchange program with War in the Pacific in Guam. Ichihara had been with the Japanese Environmental Agency for eight years and had served as a park ranger at four national park areas in his homeland. He participated in the submerged cultural resources assessment of the WWII sites on Saipan.

1984
American Memorial Park
American Memorial Park on Saipan, established in 1978, was administered by War in the Pacific in Guam. Rangers Jim Miculka and Rose Manibusan conducted a preliminary survey of underwater resources in and around the park. As a result, it was recommended a more extensive survey be carried out in the future.

1984
Point Reyes National Seashore
SCRU published *Submerged Cultural Resources Survey of Portions of Point Reyes National Seashore and Point Reyes and Point Reyes-Farallon Islands National Marine Sanctuary (phase I reconnaissance) (Sessions 1 and 2, 1982)* edited by Larry E. Murphy. Additionally, it published *Submerged Cultural Resources Inventory: Portions of Point* Reyes *National Seashore and Point Reyes and Point Reyes-Farallon Islands National Marine Sanctuary,* edited by Toni Carrell. SCRU reports are all part of the Southwest Cultural Resources Center's report series authorized by DOI. They are available today online. (SEE PAGE 227)

1984
Lake Meredith National Recreation Area
On January 27, a two-seat Beechcraft 77 plane disappeared somewhere over the Texas Panhandle, with a real potential that the plane and its two occupants had fallen into Lake Meredith. The park,

with support from the SCRU team with its side-scanning sonar, spent at least six days diving and searching the frigid waters in very wintry conditions. Nothing was found.

On May 30, 2008, two teenagers canoeing on the lake discovered the tail section and part of the fuselage of the missing aircraft protruding from the water near Harbor Bay. It took 24 years to clear the mystery and provide much-needed closure for the families.

1984
Southeast Archeological Center (NPS)
According to Cameron Binkley's 2007 Administrative History of SEAC, National Park Service director Russ Dickenson issued a memo on February 17:

> . . .directing SEAC to phase out its underwater archeological capability by September 30, 1984, and thereafter to acquire similar research services from SCRU. . . The director's decision to terminate underwater archeology at SEAC was made on the advice of the realignment committee. . .

1984
Biscayne National Park
SEAC archeologist George Fischer and Florida State University student John Broward did a reconnaissance survey of the *Nuestra Senora del Populo,* part of the Spanish plate fleet, from March 5-10. They recorded location data of the *Populo*, did a general assessment of the wreck site, and took gross measurements of the ballast, timbers and relationships. (SEE PAGE 155)

A joint field survey was conducted on the underwater resources of the park in June and July. Principal investigator George Fischer and advanced graduate students from FSU located 22 sites. The majority of them were shipwrecks. One of the goals of the report was to strengthen the nomination to the National Register of Historic Places. There were 44,000 hours of volunteer time on this effort by students of FSU.

1984
Washington Support Office (NPS)
Associate director Jerry L. Rogers circulated a draft Special Directive in July, codifying SCRU as the "subunit authorized to provide professional support services to park managers throughout the service."

1984
Golden Gate National Recreation Area
There was a substantive article in the August *Courier: The National Park Service Newsletter*, "Recreation area manages maritime resources," by Jim Delgado, the park historian at Golden Gate. The laudatory, two-page article spoke to the discovery of a number of historic shipwrecks as well as other contributions by both park and volunteer divers in and around the area. It included the wreck of SS *Tennessee* (1853), and remains of wrecks exposed on Ocean Beach, San Francisco, by beach erosion, namely *King Philip* (1878), *Neptune* (1900) and *Reporter* (1902). Based on this first work, Delgado and Larry Murphy went on to author a paper for the annual Society for Historical Archaeology Proceedings on beached shipwrecks, about the implications for natural site formation processes.

1984
Mid-Atlantic Region (NPS)
Members of the Mid-Atlantic Region dive team participated in a workshop in September, which focused on underwater surveying, sketching and other elementary archeological work. The workshop was featured in articles in the March, 1985 *Courier: The National Park Service Newsletter* by Art Miller, and in an issue of *State Trooper Magazine* by Joy Murphy, then Larry Murphy's wife. The regional dive officer Skip Cole organized the event and had Dan Lenihan come in as an instructor. The Virginia State Police essentially hosted the seven NPS divers, along with three of their own divers led by Sergeant Val Connors.

The training began with dives on the *Gulf Hustler,* a large fishing boat sunk in seventy feet of water off Virginia Beach. This turned into a dive that none would soon forget. Lenihan was teaching the team techniques for video documentation of sites, which would also work for modern crime scenes,

when a group of seven large bull sharks entered the action. Lenihan filmed while Connors linked arms with him facing the other way covering his back. The other divers came down and huddled in the forecastle watching the event transpire. Sharks swam casually up to the camera lens when Lenihan or Connors would make a loud but short burst of air from a buoyancy compensator which would scatter them briefly. The local dive shop featured the footage for years after—the owner said he had never seen sharks on the site. Besides Skip, other regional divers included Bob Van Nordwith, Art North, Ted Little, Carol McNulty, Karl Theune, Al Henry, and Pete Dessaur. Participating Virginia State Police divers were D.T. Connor, R.W. Wessells, and R.C. Keeper, Jr.

The team also met up with John Broadwater, chief underwater archeologist for the Virginia Historic Landmarks Commission. From the aforementioned *Courier* article:

> For their final day…Broadwater… invited the divers to take an underwater look at the ship he was investigating at Yorktown [which had a cofferdam built around it]. The…supply ship for Cornwallis' English Army, was sent to the bottom by artillery fire 200 years ago during the Battle of Yorktown. One by one, the team…dived to the bottom of the caisson to see this remnant of the last major engagement of the Revolutionary War.

1984
Grand Teton National Park

Gary Davis and Dan Lenihan were called to Grand Teton from Channel Islands and the Southwest regional office, to examine trees thought to be rooted at the bottom of Jenny Lake. The BOR and locals were disturbed over reports of the sunken trees. If they were there due to subsidence, it was bad news for the agency; suggesting the dam at man-made Jackson Lake had been built in a tectonically active area.

From October 3-4, Davis, Lenihan and Grant Teton ranger Rocky McCreight dove in Jenny Lake, at 7,000-feet of elevation. They had a Nikonos 35mm camera, a housed VHS video camera and a metal rod to poke beneath the trees. The divers found trees that appeared to be rooted in rather dramatic fashion, however, they also found a ratio of 32:1 of down to up trees. (SEE PAGE 73)

The NPS divers finished on the 4th. The Park Service had closed due to Congress not passing a Continuing Resolution. A large detachment of BOR divers using surface-supplied systems also started documenting the site but seemed to be having a difficult time in the conditions. Davis and Lenihan visited their operation on their second day and left a tape and completed report with them. The trio of NPS divers had worked, despite the federal government being shut down, much to the surprise of the BOR personnel.

1984
USS *Arizona* Memorial

SCRU fully mapped and videotaped the USS *Arizona* in Pearl Harbor. The intensive, month-long session involved very close coordination between Superintendent Gary Cummins and SCRU. Color video images of the *Arizona* that so excited the media during SCRU's practice-run a year earlier had primed them for the real thing in 1984. Scientific illustrator Jerry Livingston and archeologist Larry Nordby were tasked with responsibility for the underwater mapping. (SEE PAGE 120)



.50 caliber machine gun rounds on the deck of the USS *Arizona*, 1984. They are labeled in place like most portable artifacts on the wreck. NPS Submerged Cultural Resources Center collection.

1985
Western Region (NPS)

Regional dive officer McLean reported 11 drownings at Lake Mead, Channel Islands divers began their underwater video interpretation program and investigated two incidents of submerged cultural resource disturbances at the park. Yosemite had four visitors swept over the park's falls. Lenihan, from SCRU, helped McLean conduct a workshop at Pu'uhonua o Hōnaunau National Historical Park in Hawaii.

1985
War in the Pacific National Historic Park
From reports filed by Western regional dive officer McLean on May 17, 1985, and Feb 7, 1986 (respectively), housed at the Western Archeological and Conservation Center:

> Toni Carrell, SCRU, taught a three-week session in WAPA on submerged Cultural Resources Management. A preliminary agreement was made with the Commonwealth of the Northern Mariana Islands for the WAPA team to conduct research in Saipan, Rota, and Tinian. Also, an agreement with the Government of Guam will enable the team to conduct research on Spanish Galleon sites on the eastern shore of Guam. An English Frigate was believed sunk in Apra Harbor in 1675.
>
> Working with the Micronesian Area Research Center the WAPA team participated in a cultural resources survey on Saipan. They located two Japanese ships. . .underwater videotaping was used.

1985
Southwest Region (NPS)
Toni Carrell of SCRU became the first female regional dive officer in the National Park Service, a position she held through 1989.

1985
Biscayne National Park
A cargo ship, *Reefer Merchan*t, grounded at Ledbury Reef on May 5. As a result of the investigation of the grounding, a previously unknown underwater archeological site was discovered. The investigator for the damage assessment and case report was Richard Curry of Everglades. The survey that followed the grounding was conducted by SEAC and Larry Murphy of SCRU.

1985
Padre Island National Seashore
In July, Larry Nordby, a program leader himself on large archeological projects on land, led a month-long shipwreck survey operation at Padre Island National Seashore in Texas, with backing from SCRU. Larry Murphy, expert with marine mag and use of offshore excavation equipment plus other SCRU personnel like Ken Vrana (LE specialist and diver) engaged in terrestrial magnetometer surveys and site evaluations of shipwrecks through testing offshore anomalies in recorded areas of sinking. Sites dated back to the 16th century.

1985
Channel Islands National Park
For two weeks in August, a magnetometer survey, site evaluation and subsequent documentation took place at Channel Islands.

1985
Fort Jefferson National Monument
For two weeks in August and September, photography, video documentation and evaluation of shipwreck sites and natural areas took place around Fort Jefferson.

1985
Isle Royale National Park
In August, the research vessel *Seward Johnson* was brought to Isle Royale to deploy submersibles on the *Kamloops*. The vessel operation's officer had never consulted the information passed to him by the NPS, and decided on-site that the dive was too risky. The *Algoma*, a secondary target, was emphasized. Some useful survey work was done but it was judged a minimally successful project from SCRU's point of view. In addition to shipwrecks, there was an effort to look at lake trout, opossum shrimp, and rare-earth trace elements.

A notable discovery at the park this year was that of a 14th-century clay cooking pot, reported in the July 1986 issue of *Courier* in the article "Cracked pot gives clues to the past" by Bruce Weber:

> The basketball-size relic was found. . .lying in a bed of sand at a depth of 70 feet in Rock Harbor, where cold waters. . .provided an optimal, stable environment for 700 years. The discovery was made

accidentally by Scott McWilliam…working with the…(SCRU), while performing an underwater search for the remains of a pontoon plane that crashed in 1935. McWilliam quickly recognized the pot—-first noticed by his dive partner—to be something of great significance: "the largest most intact piece of Indian pottery ever recovered in this area."

1985
USS *Arizona* Memorial

William "Bill" Dickinson transferred to the USS *Arizona* Memorial on September 1, from the Grand Canyon, (where he was the management assistant to Superintendent Dick Marks, an early Scripps diver) becoming the memorial's second superintendent. Not a diver when he arrived, he soon became certified, participating in the work of the SCRU. Dickinson was superintendent until October 8, 1988.[4]

1985
Fort Jefferson National Monument

At the request of Superintendent Jack Morehead, the SCRU team, led by Dan Lenihan and including Larry Murphy, Ken Vrana and Rich Curry with Morehead, performed a photo documentation survey around Fort Jefferson from September 7-14. Video footage and 35 mm color transparencies were taken at New Ground Reef, Shipwreck *Henrietta Marie*, Nine Cannon Wreck Site, Swivel Guns Site, and several other sites. The team also filmed possibly 100 nurse sharks in an unusual grouping in shallow water. It looked like if one were so inclined, they could run over the solid mass of sharks for some distance.



Survey photo from a wreck site at Fort Jefferson National Monument, circa 1980s. NPS Submerged Cultural Resources Center collection.

1985
Bighorn Canyon National Recreation Area

Anthony Schetzsle, park dive officer, completed a YMCA scuba instructor course in September.

1985
Lake Mead National Recreation Area

In 1985, there were again announcements for advanced operational scuba diving as well as a divemaster scuba certification courses, with both trainings to be split between Lake Mead and Scripps, scheduled for the middle of September.

1985
Washington Support Office (NPS)

The NPS entered into an interagency agreement with the NOAA National Marine Sanctuary Program to provide the services of Cal Cummings to build a complete cultural resource management program. This was a two-year contract (Oct. 1, 1985 to Sept. 31, 1987) in response to a change in Title III of the Marine Protection, Research and Sanctuaries Act of 1972.[5]

As a result of pressure from the United States Senate, there was a major conference of cultural resource specialists and historians focused on developing guidelines for protecting submerged ships by using the power of the national register. Chief NPS historian Ed Bearss was a participant in the November 21-22 conference.

4 He was followed by a superintendent who was not a diver and whose staff was occupied with the 50th commemoration of the attack on Pearl Harbor in1991. The Park Service's focus on of the submerged resources of the memorial was not emphasized again until Kathy Billings took over in October of 1995.
5 Marine Protection, Research and Sanctuaries Act of 1972: 16 USC. 1431.

1985
Washington Support Office (NPS)

The United States Congress requested in the FY 85 appropriation for the NPS:

> [That the NPS] in cooperation with the Maritime Preservation Community and the National Trust For Historic Preservation. . .conduct a survey of historic maritime resources, including those of the Service; recommend standards and priorities for the preservation of those resources; and recommend the appropriate Federal and private sector roles in addressing those priorities.

James P. Delgado, then the park historian for Golden Gate, was detailed to an acting position as maritime historian for the National Maritime Initiative. On November 8, 1987, Delgado was officially appointed to a permanent position on the Washington Support Office history division staff as the first maritime historian for the NPS.

1985
Submerged Cultural Resources Unit

Between 1981 and 1985, SCRU participated in submerged cultural resource work in Apostle Islands, Assateague Island, Biscayne, Cape Hattaras, Fort Jefferson, Golden Gate, Isle Royale, Jean Lafitte, Moores Creek, Padre Island, Point Reyes, USS *Arizona* Memorial, Visckburg, War in the Pacific, and Wrangell St. Elias.

1986
Isle Royale National Park

Deep shipwreck work took place with the park and SCRU, in partnership with *National Geographic* photographer Emory Kristof. A Deep Sea Systems ROV, piloted by company president Chris Nicholson, is shown in a BBC documentary capturing footage of portions of the *Kamloops* at 240 to 300 feet deep. The NPS, through Lenihan and Superintendent Don Brown, did not allow the release of footage of saponified bodies (of sailors that went down with the vessel, which remain visible in the wreck) but obtained them for park use. The results were excellent, with superb images and documentation acquired to complete the survey and help produce a superb documentary entitled, *Discoveries Underwater: Science Salvage or Scrap.* Lenihan pointed out the *Kamloops* was surveyed completely during this project in contrast to the much more expensive *Seward Johnson* operations in 1985, which accomplished nothing. Although the latter had not cost the NPS anything, it took time. It increased SCRU's reluctance to take part in big ship operations it couldn't control unless it was with the Navy.



Isle Royale, 1986. The propeller of the *Kamloops* in 230 feet of water, being filmed by an ROV piloted by Chris Nicholson under direction of Emory Kristof from National Geographic. Courtesy of National Geographic.

1986
USS *Arizona* Memorial

SCRU worked on both the USS *Arizona* and USS *Utah* this year. On the *Arizona*, Larry Nordby added detail to the planimetric view of the hull completed by Jerry Livingston in 1984. This included mapping in loose artifacts and debris for the use of Robert Sumrall, a model-maker from the Naval Academy Museum. He was building an 'as-is' scale model of the wreck from the SCRU drawings to be placed in the visitor's center at the end of the self-guided tour.

Commander Orzech, head of the MDSU reserve detachment from Long Beach, California, had brought his 25 navy divers to the site to fulfill their annual active-duty training by helping on the project; a result of meeting Lenihan earlier in the year at Scripps. Commander Orzech then introduced Lenihan to Commander McCampbell, the new active-duty commanding officer of the MDSU-1, who saw the benefit in having reservists doing meaningful work alongside SCRU. It was the start of Project Seamark, which would prove invaluable to both the NPS and navy for the next decade. (SEE PAGE 123)

Lastly, a BBC camera crew making a documentary film on SCRU also participated. They had already accompanied the team to Isle Royale. Before returning to London, Lenihan had Murphy accompany them to Guam and Chuuk to show them results of NPS work at War in the Pacific and in Chuuk Lagoon in the Federated States of Micronesia. Larry appears at the end wrapping up the eight-part series.



Navy and SCRU personnel admiring Sumrall's model of the USS *Arizona*, based on the SCRU mapping. NPS Submerged Cultural Resources Center collection.

1986
Chickasaw National Recreation Area
For one weekend in April, Larry Murphy was principle investigator at Veteran's Lake, Chickasaw National Recreation Area for an underwater magnetometer survey.

1986
Death Valley National Park
On May 7, two divers experienced the effects of a 7.7 magnitude earthquake while gearing up to leave Brown's Room in California's remote Devils Hole. The epicenter was 3,000 miles away, off of Atka Island in the Aleutian Islands, Alaska. Sounds similar to water draining from a bathtub were heard and then over the next hour, the static level of the water ebbed and flowed up to six inches.[6]

1986
Padre Island National Seashore
Over three weeks in June, the SCRU team undertook the second phase of a project started the year before for magnetic anomaly location and test excavation. Larry Nordby, Larry Murphy and Ken Vrana from SCRU participated. They used a magnetometer to relocate a magnetic anomaly found years earlier by the state archeologists.

1986
Biscayne National Park
Three men were caught stealing artifacts from the *Pillar Dollar* wreck, on June 28, Case #86-0295. They were eventually found guilty under The Archaeological Resources Protection Act of 1979 (ARPA). George Fischer of SEAC was the principal archeological investigator.

1986
Southwest Region (NPS)
The NPS National Register Office sponsored a workshop hosted by SCRU on submerged cultural resource management and the national maritime initiative in Santa Fe, New Mexico, from September 22-24. It also involved NOAA. It was here that the basic work for the National Register Bulletin #20 on criteria for nominating shipwrecks to the National Register of Historic Places was written. Ed Bearss and Jim Delgado attended from Washington, and Delgado edited the final draft of the bulletin.

1986
Channel Islands National Park
In the Channel Islands, the "Underwater interpretive program was in full operation. Twenty-three programs were presented to 986 park visitors. This is the program involving NPS divers using u/w video and hard line to the surface boat monitor." This effort by the staff was noted by Western regional dive officer Dave McLean in his annual dive summary for 1986. The program was also reported in the January 1987 *Courier:*

6 At least one other earthquake has been experienced by divers in Devils Hole, on August 17, 1991. This was a 6.8 level shake with an epicenter in the Pacific, 65 miles west of Crescent City and 640 miles northwest of Devils Hole.

> For the first time, several hundred visitors to Anacapa Island were able to follow a SCUBA diver via video camera and ask him questions about his surroundings. "What the visitor sees on the video monitor is as close to an underwater nature walk as he can get without getting wet," said William E. Ehorn, superintendent. Ehorn explained that the concept simply involved one diver with a video camera filming another diver underwater.

However, the authors point out that this took a bit more diving savvy than suggested from that remark. The Channel Islands team had to maintain surface (visitor)-to-diver communications along with diver-to-diver coordination from the surface. Not as easy in 1986 as it might have appeared.

1986

Grand Canyon National Park

This is a short article that Sheck Exley[7] wrote for the August, 1987 *Underwater Speleology*. Exley was one the world's foremost cave divers. This one-day trip to the Little Colorado River on the eastern edge of Grand Canyon National Park was short but notable for him. It is included here due to the novelty of diving in the Grand Canyon and to suggest there may be more to be had in the park, reputed to have the most caves of any national park unit.

> Butch [Farabee] and ranger Rick Mossman woke me up at 3:30 a.m. to drive to the section of the Canyon where Blue Springs lies. "Why such an early start?" "We want to be at the springs before the temperature hits 130 degrees." "But I thought there was a trail to the springs." "There is . . .sort of." Sort of means 19 miles of strictly 4 x 4 road in the park's high-clearance 4WD. Finally, well after sunrise, we parked at the edge of the canyon and I passed out my padded packs containing the minimum possible cave-diving equipment, including my 15-cubic foot pony bottle and no fins or wetsuit. "All right, now where's the trail?" Butch pointed straight down a 1,000-foot cliff. I gulped. Obviously, the definition of "trail" out West is different from mine. I was thankful for the fact that Butch and Rick are both accomplished rock climbers. . .
>
> I had endured some difficult access to the water before. . .but getting to Arizona's Blue Springs is in a class all by itself. The "trail" consisted of old, hard-to-find rock cairns, and our initial route involved zigzagging back and forth on ledges on the cliff, trying to find a way down. Being a flatlander, I wouldn't have minded a belay for the entire cliff, but Butch and Rick watched after me carefully and belayed the most dangerous spot, a 25-footer with an overhang at the bottom. After the cliff followed a mile of wandering over steep rubble and short pitches. About halfway down, I wrenched my right knee, and by the time we reached the bottom of the canyon both knees were so weak that they were trembling uncontrollably. But as soon as I saw the bright blue plumes of spring water jetting into the clear green of the Little Colorado River, I forgot my pain and fatigue.
>
> Blue Springs is the headwaters of the Little Colorado in the dry season, and I estimated the combined flow of all the springs to be 200-300 cubic feet per second. The spot is so beautiful that it is sacred to the Navajo Tribe. . .We located 19 springs along a half-mile stretch of the river. [Twelve were on river left and seven are on river right.] All were crystal clear, 70-75 degrees F., silt-free, and entered the Little Colorado at or within 5 feet of the surface of the river. We saw small dry caves and rock shelters in the canyon walls just above the springs, some of which may be former spring vents and may even connect with the springs.
>
> The three of us took turns diving the most promising springs. Small underwater caves were entered. . .#8 may also be good, but to dive it required a crawl over some sharp-looking rock so we passed it up. #18 was the best. Wearing the pony bottle on my side like I had been taught. . .I wiggled into a 20-foot-long passage 18 inches wide and 3 feet high. The depth was 8 feet deep, and the strong flow kept the floor clean of silt. The passage turned to the left and opened into a five-foot diameter room with a height of 4 feet, then after another 20 feet turned to the right again. I figured that this was far enough with my tiny air supply and [only] light, so surveyed out from that point.

7 Dan Lenihan, a good friend of Exley's, had introduced him to Farabee. Sheck Exley died in a cave diving accident on April 6, 1994, while attempting to set a world depth record in Zacaton, a cenote in Tamaulipas, Mexico.

> We rested until the sun was low enough that the 130-degree midday heat was reduced, then began our climb out. My knees had suffered with pain, so Butch prepared me for our two-mile trek up the half-mile-deep canyon with two Midol® tablets. We made good time to the top of the talus, then I got the first thigh cramp of my life. From that point on both of my legs were subject to the most severe and painful cramps that I'd ever had…

1987
War in the Pacific National Historic Park
SCRU ran a training operation on the wreck of *Aratama Maru,* a WWII Japanese transport sunk in Talafofo Bay, Guam. The site was mapped while training divers from the territorial government, NPS and local volunteers. Ranger Ken Vrana and archeologist Toni Carrell from SCRU were sent on a reconnaissance trip to Palau at the end of the project in the company of the Palauan dive team. They reported back to SCRU chief Lenihan there was high potential for research and a very willing and capable Historic Preservation Office. Lenihan consulted with navy commanders McCampbell and Orzech (MDSU) and obtained a promise of their support in Palau for the next year. NPS divers taking part were Murphy, Lenihan, Carrell, Vrana, from SCRU, Pepin-Donat from the National Register, and War in the Pacific divers Jim Miculka and Rose Manibusan. (SEE PAGE 145)

1987
Washington Support Office (NPS)
On May 31, Butch Farabee became the service's first emergency services coordinator. As such, he was responsible for the overall coordination of the NPS dive program at the national level, along with search and rescue, emergency medical services, incident command, aviation, caves, lifeguards and health and fitness.

On August 15, per a request by Farabee of the associate director, operations, Bob Stanton, the first service-wide inventory of current NPS scuba divers began. The survey indicated 188 divers representing 9 regions and 45 separate units.

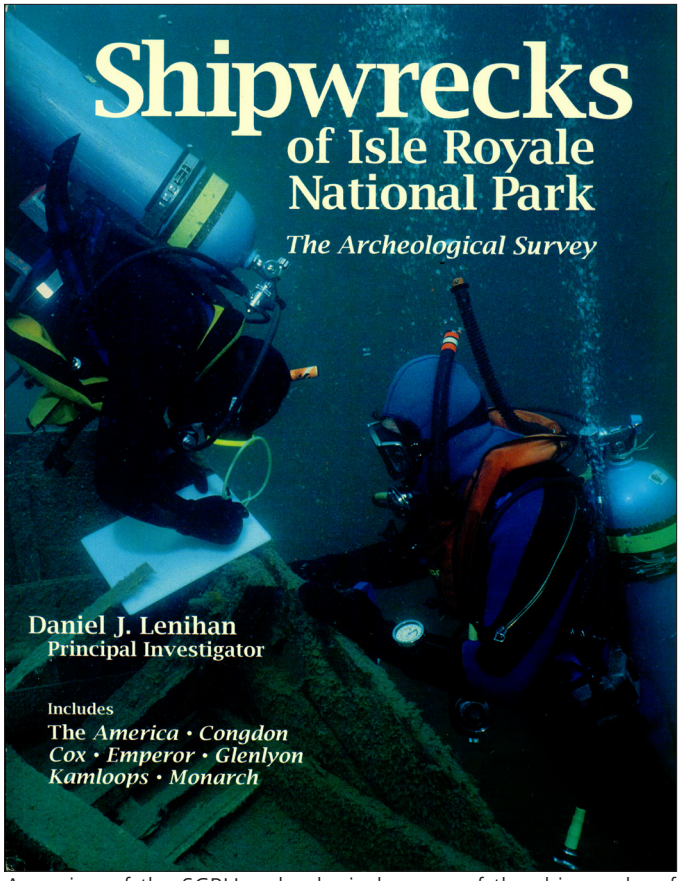
1987
Washington Support Office (NPS)
On June 22, *A Prospectus--Man and Water-Changing Values, Changing Use: A Proposal for a Five Year, Multi-Agency, Riverine/Lake/Estuarine/Reservoir Inundation Study* was issued by the service's senior archeologist, Cal Cummings. Other signer/authors were James Maxon (BOR senior service archeologist), Dr. Adrienne Anderson (Rocky Mountain Region archeologist), and Daniel Lenihan (chief, SCRU). This was a follow up concept paper for a phase II of the recently completed National Reservoir Inundation Study. It was 13 pages in length and explored the project description, needs, logistical considerations, scope of work, budget, and staffing.

1987
Crater Lake National Park
In 1987, in response to the requirements of Public Law 99-591 for identification of significant thermal features in national parks, the NPS funded a three-year program to evaluate the hydrothermal features in Crater Lake. The effort began that summer when two principal researchers from Oregon State University, oceanographers Dr. Jack Dymond and Dr. Robert Collier, sent a small ROV down into the crystal-clear waters. They used cameras on the ROV to capture many images for scientific research as well as prepare for the next two summer seasons. During the twenty-day period, the ROV went down seven different times. For the next two summers, a single-person submersible was brought to the lake to continue this research. (SEE PAGE 146)

1987
Biscayne National Park
George Fischer of SEAC led an underwater investigation of the *Pillar Dollar* wreck for the FSU Academic Diving Program underwater archeology class.

1987
Isle Royale National Park

The Submerged Cultural Resources Study of Isle Royale National Park was published, a major study centered on the known shipwrecks of Isle Royale. It was edited by Lenihan and had chapters, sections and drawings by all team members including Murphy, Carrell, Vrana, Livingston, and Nordby. The Isle Royale study was picked up by Lake Superior Publishing and reworked for a sales item. Two chapters not designed for public consumption were removed at request of the superintendent and color images were added. *Shipwrecks of Isle Royale National Par*k: *The Archeological Survey* was the result and republished in 1994 as a sales item for Lake Superior Publishing.



A version of the SCRU archeological survey of the shipwrecks of Isle Royale, released for a general audience in 1994.

1987
Channel Islands National Park

In October, members of a Los Angeles-based diving club took a trip on the boat *Vision* to the Channel Islands National Marine Sanctuary (CINMS), which includes marine waters surrounding Channel Islands out to a distance of six nautical miles. The club participated in dives at four shipwrecks within the sanctuary. Two NPS rangers serving undercover were on board the *Vision* and witnessed violations of CINMS regulations by several divers. The rangers were Yvonne Menard and Mark Senning, both working in Hawaii parks at the time. They personally witnessed sites in park and sanctuary waters being vandalized and they filmed much of the same, ultimately documenting their findings in Channel Islands' Case Number 93-55140. This is the same boat that was later involved with diving deaths.

Artifacts were removed and "one site looked like a minefield due to the divers' activities." Murphy, Delgado and Channel Islands archeologist Don Morris documented the serious predations of the *Winfield Scott*. The subsequent appeal to the United States District Court for the Central Division of California was submitted on June 8, 1994 and filed on September 12, 1994.

Based on the two rangers' testimony, that of NPS archeologists Larry Murphy and Jim Delgado, as well as other evidence, NOAA assessed civil penalties against appellants for violations as well as filed a criminal case. NOAA's Ted Buettler was the prosecuting attorney in the civil matter. (SEE PAGE 150)

1988
Reno, Nevada

NPS senior archeologist, Cal Cummings, presented a paper to the 1988 Conference on Historical and Underwater Archaeology, from January 13-17. The 17-page paper was "National Professional Standards and Guidelines for Underwater Archaeology." In it Cummings asked that all of the various federal and state agencies cooperate on formulating standards and guidelines for protecting and preserving submerged cultural resources and underwater archeological remains. As the new maritime historian for the NPS, Jim Delgado was the underwater chair for these meetings and editor of the proceedings.

1988
War in the Pacific National Historic Park

The park's submerged resources team had a rare underwater opportunity, when the Cousteau Society invited Jim Miculka and Rose Manibusan to join the crew on board the Society's windship, the *Alycone*, while they conducted research around Guam as part of their "Rediscovery of the World" tour. Beginning in 1987 and continuing for the first several months of 1988, the two park rangers participated in many of the activities of the Cousteau Society. "While the park's dive team failed to become fluent in French," reported Superintendent Reyes, "they did manage to work on many exciting dives, have hot showers after each dive, and simple French cuisine from the ship's chef." The park staff made a video and shot a number of slides. Recalled by Miculka in communication with the author in 2016:

> While assigned to the Cousteau team, I was always buddied up with the ship's chef. With the exception of the chef, the entire French crew was fluent in English and we communicated in English because I did not speak French. The chef and I were buddied up because I refused to learn French and he refused to learn English. The crew figured we would be forced to at least learn a few words of each other's language. Instead of trying, we mostly got by with pointing and indicating through hand gestures to each other because we were so stubborn. On one of our dives from the *Alcyone*, we were both outfitted and jumped into the water. Exchanging my snorkel for my regulator, I realized that I forgot to turn on my air valve. I swam over to one of the divers to ask them to turn my air on. He said you need to ask your dive buddy. I swam over to another Cousteau diver and asked and got the same response. Finally, one told me what I needed to say in French to my dive buddy so that he would turn on my air. With much humiliation I swam over and told him in French to please turn on my air valve, and he did. The Cousteau team got a good laugh at my expense. And to this day, I still remember that phrase.

1988
Fort Jefferson National Monument

Larry Nordby, Southwest regional supervisory archeologist, mapped a number of shipwrecks in the park via scuba in March. Lenihan and Navy divers from MDSU took aerial images of the wrecks from a Navy helicopter. Senator Bill Bradley, sponsor of the Abandoned Shipwreck Act, visited the operation. The group also ran a baseline biological transect to gather data on distribution of marine organisms. The shipwreck measurements resulted in the Windjammer site map, often used in NPS and private publications.

1988
Washington Support Office (NPS)

On March 17, the director issued *NPS-4, Diving Management-Release 2*. The NPS-4 Work Group, chaired by James T. Reynolds, consisted of Rob Arnberger, John C. Benjamin, Paul B. Cole III, Stuart L. Croll, Richard W. Curry, Charles R. Farabee, Jr., Daniel J. Lenihan, David J. McLean and Larry V. Nordby.

The Abandoned Shipwreck Act (1987) was signed into law (43 USC. 2101-2106; P.L. 100-298) on April 28, 1988 by President Ronald Reagan. This act overrode the long-established Admiralty Court law and asserted federal title to three categories of abandoned shipwrecks. It also directed the NPS to prepare guidelines to assist federal and state agencies in developing legislation and regulations to carry out their responsibilities. All historic shipwrecks not specifically owned already are claimed within the three-mile limit. Title to the wrecks were passed to the states except for those areas which were owned fee title by the United States, essentially National Park Service and American Indian lands. Maritime archeologist and historian James Delgado, and Washington archeologist Michelle Aubry wrote the "Abandoned Shipwreck Act Guidelines," which were published in the *Federal Register* 55:50116-50145 on December 4, 1990.

Later in 1988, the NPS dedicated the entire August issue of the *National Park Service Courier*, the service's news magazine, to maritime issues. Lenihan and Delgado were guest editors. Director William Penn Mott, Jr. provided the lead article.

1988
Biscayne National Park
An underwater site cleanup was made of the HMS *Fowey* in July. The effort was led by David Brewer of SEAC.

1988
War in the Pacific National Historic Park
The park was celebrating its tenth anniversary that year. One of the many celebratory activities organized was a dive of the SMS *Cormoran* and the Japanese *Tokai Maru* in Apra Harbor. In late August, Jim Miculka, Suzanne Hendricks, Bill Cooper and Rose Manibusan led 28 divers in an exploration of the two adjacent ships. Around this time, the park publicized its desire to acquire these two vessels from the US Navy by expanding the park to include a ten-acre satellite unit with the *Cormoran* and *Tokai Maru*, suggesting that the NPS could provide greater protection of the vessels from vandals. The inclusion of these two resources never occurred.


Diver on the wreck of the *Tokai Maru* in WAPA, Guam. NPS Submerged Cultural Resources Center collection.

1988
Micronesia
SCRU ran a large operation using the entire west coast navy diving command in Palau and Guam over a period of ten weeks. More than 200 US Navy divers (active and reserve) were flown in by the US Department of Defense to participate in the operation. Six wrecks were surveyed, and reconnaissance runs made to other sites in the Palauan archipelago. Concurrently, operations were run in Guam at the invasion beaches of War in the Pacific and on the *Kitsugawa Maru* in Apra Harbor. NPS divers with oversight included Carrell, Bradford, Livingston and Lenihan from SCRU, and Miculka and Manibusan from War in the Pacific in Guam.


Navy divers with Project Seamark on the *Kitsugawa Maru* in Apra Harbor, 1988. NPS Submerged Cultural Resources Center collection.

1988
Kalaupapa National Historic Park
Supported by Project Seamark, SCRU conducted the first dives in Kauhako Crater at Kalaupapa National Historical Park, using an ROV provided by *National Geographic*. Photographer Emory Kristof and ROV builder Chris Nicholson again donated key assets, as they had in Isle Royale in 1986. The only way to get equipment to the lake surface without impacting vegetation thought to be indigenous at the time was via helicopter. The US Marines provided several CH-46s out of their base in Kaneohe, and the Navy MDSU from Honolulu provided capable skin divers. The water in the crater went from less than a foot visibility to crystal clear and anaerobic at 21 feet. They explored to a depth of 540 feet with the ROV and ran out of cable. Earlier depth sounding indicated the water to be well over 700 feet deep.

1988
Submerged Cultural Resources Unit

SCRU and the NPS were interested in beginning to use oxygen-enriched air and mixed-gas for its diving program. On December 15, Michael Eng, research diving technician for SCRU, along with Richard Curry, Southeast regional dive officer, met with Dick Rutkowski of Hyperbarics International to discuss the use of nitrox for NPS diving operations. One of the recommendations written up in the December 29 memo to the chief, SCRU, was to "Develop budget recommendation to enable SCRU to have independent NITROX capability in remote locations."

Also in December 1988, the Washington-based emergency services coordinator, Butch Farabee, approached the regional dive officers to suggest that pending health, fitness, strength, and endurance tests for law enforcement and fire teams could be used for diving examinations as well.

1988/1989
Crater Lake National Park

Over both the summers of 1988 and 1989, the one-person *Deep Rover* submersible made a total of 47 dives in Crater Lake, including down to the deepest known point in the lake, 1932 feet. Crater Lake is the deepest lake in the United States, and one of the clearest in the world. There were three operators trained to take the small sub down, Oregon State University oceanographers Dr. Jack Dymond and Dr. Robert Collier, as well as Mark Buktenica, an NPS aquatic biologist stationed at Crater Lake. Mark made 17 of the project's 47 dives, qualifying to do so after a one-week, intensive training course about the intricacies of the complicated little machine. The 7,000 lb. submarine was valued at $1,000,000, and cost $5,000 a day to operate. Crater Lake ranger Fred VanHorn recalled his experience working with *Deep Rover* in personal communications with the author:



Deep Rover in Crater Lake, 1988. National Park Service collection.



NPS ranger Mark Buktenica in *Deep Rover*, 1988. National Park Service collection.

> Ranger Jim Webster and I had the unique opportunity to SCUBA dive in support of the submarine *Deep Rover*. . .flown into the caldera to study the chemistry, biology, hydrology and geology of the bottom of Crater Lake.... Diving there was a unique experience. When underwater and out of site of the shore, the lack of perspective quickly distorted ones senses and made it feel otherworldly. In addition to diving in support of the submarine, we served as escorts for press divers, allowing them to photograph the submarine as it dove. We also had the pleasure of being joined at one point by esteemed marine biologist Sylvia Earle who owned the company that developed the *Deep Rover*. She was later appointed Chief Scientist at the National Oceanic and Atmospheric Administration.

Buktenica wrote a short article about a particularly memorable dive in the submersible called, "Why Enter a Sleeping Volcano in a Submarine?" for the small periodical *Nature Notes from Crater Lake* in 1996 (vol. 27):

> I was sitting alone in Crater Lake, 600 feet underwater…I had just completed collecting rock samples…135 pounds of rocks in a basket attached to the front of the submarine. Unknown to me at the time, a couple of O-ring seals were leaking throughout the dive. Water seeping through the seals… combined with condensation from my breathing, created an uncomfortable amount of water on the floor. My feet were near the front of the vessel, and as I prepared to start to the surface…the submarine tilted forward…the water level at my feet rose rapidly, giving the

distinct impression that the submarine was filling with water. Garbled and intermittent communications with the surface crew aggravated the situation. Everyone operated expertly and efficiently…Actual dangers and repairs turned out to be minimal, and the submarine dove again the next day. Nonetheless, I thoroughly reviewed emergency procedures at my first opportunity.

Deep Rover's mission in Crater Lake ended on September 4, 1989, when the submersible was flown out of the caldera by helicopter.

1989
Pictured Rocks National Lakeshore

This year SCRU came out with its *Submerged Cultural Resources Study: Pictured Rocks National Lakeshore* by C. Patrick Labadie, SWCRC professional papers #22. From SCRU, Toni Carrell, Jim Bradford, Michael Eng and Ken Vrana were key players in the diving and coordination with Patrick on this park. Lenihan thought Labadie was one of the best human resources they found in the Great Lakes to help on SCRU projects.

1989
Channel Islands National Park

Five scuba accidents involving park visitors produced six victims, including two fatalities, in a nine-week period:

- May 6, 1989, William Jack, Jr. suffered a serious bends incident on a Truth Aquatics boat.
- May 21, 1989, William Damron 32, died diving the south side of Middle Anacapa Island.
- July 1, 1989, Craig Lockwood of Channel Islands suffered severe decompression sickness.
- July 9, 1989 Jay Wells (not the NPS diver of same name) suffered an embolism in the brain.
- July 13, 1989 Robert McGlaphlyn on the *Vision* (the same dive boat involved in the *Winfield Scott* looting case) died at Santa Cruz Island while trying to free lobster from a trap at 60 feet. Sara Graves suffered decompression sickness from the same incident.



Bikini Atoll, 1990. Bikinian dive team being trained to map by Eric Hanauer. This forward port on the USS *Saratoga* flight deck is around 100 feet deep. The structure on the deck behind the divers is unique to Bikini—a blast gauge tower that held various instruments to measure force of the explosion. This tower was about 400 yards away from one of the blasts. NPS Submerged Cultural Resources Center collection.

1989
Glen Canyon National Recreation Area

On May 29, 22-year-old Troy Nelson was on a University of Utah Kappa Sigma fraternity houseboat outing on Lake Powell, about a dozen miles from Bullfrog when he, his girlfriend, and another couple decided to go diving from a nearby 70-foot cliff. He was an experienced swimmer who had considerable experience diving from Lake Powell's cliffs in the past. According to his girlfriend, he over-rotated during his dive, struck the water improperly, and failed to surface. The park dive team responded and searched the lake, which is 240 feet deep at that point. They were unable to find him, so eventually had an underwater camera brought in to assist. His body was recovered several days later, and an autopsy showed he had broken his neck.

1989
Bikini

From August 8-26, five members of the SCRU team and its expanded roster, including Lenihan, Murphy, Nordby, Livingston and Delgado, went to Bikini Atoll to survey the ships sunk during the 1946 nuclear tests called "Operation Crossroads." This trip and a follow-up one in 1990 resulted in another of SCRU's books in its prized series as well as the award-winning film documentary for NBC, "Forbidden Paradise." They emphasized work on the aircraft carrier USS *Saratoga*, Japanese battleship HIJMS *Nagato* and US submarine *Pilotfish*, as well as the USS *Gilliam* and *Arkansas*, as well as some landing crafts in the shallows.

1989
Aleutian World War II National Historic Area

Larry Murphy and Dan Lenihan of SCRU used the USS *Safeguard*, a Navy salvage/rescue ship (ARS-50), to survey Kiska Harbor in the Aleutian Islands in September.

The 250-foot ship, with a crew of ninety, was assigned to SCRU for three weeks to survey for WWII wrecks. This was enabled by Project Seamark. NPS divers included Lenihan, Murphy, Mike Eng and Jay Wells, chief ranger of Wrangell-St. Elias NP. Archeologist Susan Morton and historian Sande McDermot, both of the Alaska Regional Office, also took part in the terrestrial part of the operation. Discovered vessels included ships and a Vickers-class submarine in great states of preservation. A couple of months after the return of the team from the Aleutians, a report was forwarded to the Alaska Regional Office where it sat for years. Ultimately an article by Larry Murphy and Daniel Lenihan, "Underwater Archaeology of the World War II Aleutian Campaign" was published in *Alaska at War, 1941-1945 The Forgotten War Remembered* edited by Fern Chandonnet.



USS *Safeguard* at Kiska Harbor, Aleutians in 1989. Through Project Seamark, the Navy made large vessels available to SCRU. In this case it was a 250-foot rescue-salvage vessel with a crew of 90. The side-scan sonar unit has been loaded in the small boat, which was positioned for surveys using *Safeguard*'s radar system. NPS Submerged Cultural Resources Center collection.

1989
France

On October 3, representatives of France and the United States signed an agreement in Paris concerning the protection and study of the wreck, CSS *Alabama*. The wreck was located on October 30, 1984, by French divers about seven miles off the Normandy coast of Cherbourg. The craft, a Confederate raider, sank on July 19, 1864. The agreement was the culmination of several years of diplomacy as to the ownership of the ship. This would lead to the remains of the CSS *Alabama* being dived by SCRU in 1993 with the French team. According to James Delgado in personal communications with the author in May, 2014:

> The Service's Chief Historian, Ed Bearss, and WASO played a key role in this; Bearss sent me [Jim Delgado] off record to London to meet with the British Government on the matter and to roust some support. I passed a note to the British Foreign Minister, which was later the subject of a French protest to President Reagan, who just shrugged.

1989
Carlsbad Caverns National Park

On December 23, National Speleological Society (NSS) member David "Dave" Bunnell (#14760RL) became the first scuba diver to explore any of the lakes in Lechuguilla Cave, located within Carlsbad Caverns National Park. Lech, as it is nicknamed, is the second deepest cave in the United States and is currently known to be the third longest cave in the country. By any account it is one of the world's most spectacular caves, with significant and unusual mineral formations; several which are not known in any other place on the planet.

Bunnell had recently been certified as a cave diver, but diving was not uppermost in his mind on the

trip in 1988. He was on a team associated with the Lechuguilla Cave Project surveying virgin passages in Lech's Nirvana section. Climbing over a pile of boulders, called a breakdown rise, the group spotted the glint of emerald green at the lowest point in the room. Subsequently the 50-foot long by 25-foot wide pool was named the Lake of the Blue Giants, a name that Bunnell suggested. The Blue Giants are at least five large stalagmites submerged not too far below the surface of the water; at least one is over 12 feet tall. Getting to this spot is very strenuous and involves considerable rope work, pits to negotiate and holes to crawl through. It took his group over six hours to reach this place.

In the *NSS News*, August 1996 article, "Diving The Lakes Of Lechuguilla," Bunnell wrote, "It reminded me far more of the submerged caves in the Yucatan than a cave in the United States. And below a desert, at that. . ." Diving solo, Dave got to about 70 feet in depth and could see the bottom another 20 feet below. He had laid out 250 feet of line in the 68-degree water. Diving in a shorty wetsuit, upon surfacing he was shivering violently. But he felt he had fully explored the lake and did not feel there were any further exploratory prospects in Blue Giants.

However, while on this trip they did find a second lake only ten minutes away from Blue Giants. It was subsequently named Stud Lake. (SEE PAGE 154)

1989/1990

War in the Pacific National Historic Park

Jerry Livingston from SCRU first went to Guam with Murphy, Lenihan, to work with the park divers including Miculka and Dave Hendricks in mapping the *Cormoran* in November of 1989. The work in Guam and other parts of Micronesia continued into 1990. Toni Carrell, with assistance from many others in SCRU and Jim Miculka, assembled a 550-page report that described numerous underwater resources in Micronesia that SCRU had helped document and assess, including those in and near the park. Six known sites related to the Pacific Theatre of WWII were located within the two offshore areas of the park. These sites were discovered during partial transects of each unit with maximum depths of 60 feet. These six sites are:

- amphibious tractor treads (Asan Beach Unit)
- American Landing Vehicles Tracked-Amtrac unit (Asan Beach Unit)
- Camel Rock Ammunition Dump (Asan Beach Unit)
- Gaan Point Amtrac (Agat Beach Unit)
- American Pontoon Barge (Agat Beach Unit)
- amphibious tank turret (Agat Beach Unit).

A WWII dumpsite on the south side of nearby Orote Penninsula was also described. Carrell noted that both the Asan and Agat Beach Units needed more surveying.

1990

Submerged Cultural Resources Unit

Between 1986 and 1990, SCRU participated in submerged cultural resource work in the following areas of the NPS: Biscayne, Cape Cod, Cape Krusenstern, Chickasaw, Fire Island, Fort Jefferson, Glen Canyon, Isle Royale, Kalaupapa, Padre Island, Point Reyes, Statue of Liberty, USS *Arizona* Memorial, and War in the Pacific.

The following is by former NPS maritime historian Jim Delgado in personal communication with the author in 2014. When he dived for the NPS he could only do so as an adjunct member of SCRU. He recalled his last dives with the SCRU team, which were in 1989 on a shipwreck off the coast of Mexico:

> My last official NPS dives were leading an NPS joint project with Mexico's Pilar Luna on the 1846 wreck of the US Naval Brig *Somers*, lost off Veracruz. The *Somers*, setting for the only recorded mutiny in US navy history, was the inspiration for [Herman] Melville's *Billy Budd*. The documentation of the site was organized by NPS and INAH, working with the Armada de Mexico,. . .I was on the delegation to Mexico City for the agreements. Divers who participated [from SCRU] were me, Larry Nordby, Jerry Livingston and John Brooks.

1987 SHIPWRECK LOOTING INVESTIGATION

Channel Islands National Park and National Marine Sanctuary
The account on this precedent-setting case was written by Rangers Yvonne Menard and Mark Senning for this history of NPS diving, in April of 2015.

In the fall of 1987, Channel Islands National Park rangers Yvonne Menard and Mark Senning went undercover to investigate what became the largest underwater archeological theft prosecution in US history. The case, ultimately appealed to the United States Ninth Circuit Court of Appeals and upheld, yielded 63 criminal and civil charges with significant fines and legal fees.

Investigating rangers Menard and Senning, were new to the area having arrived as law enforcement (LE) rangers in May 1987. They had transferred from Hawai'i Volcanoes NP and the USS *Arizona* Memorial respectively. Menard had worked as assistant LE specialist and front country patrol ranger. As a protection/interpretive ranger and park dive officer, Mark served as project coordinator for the 1984 and 1986 USS *Arizona* and USS *Utah* submerged cultural survey dive operations. They were principle team divers in both *Arizona* projects, gaining invaluable experience for the underwater looting investigation of 1987.

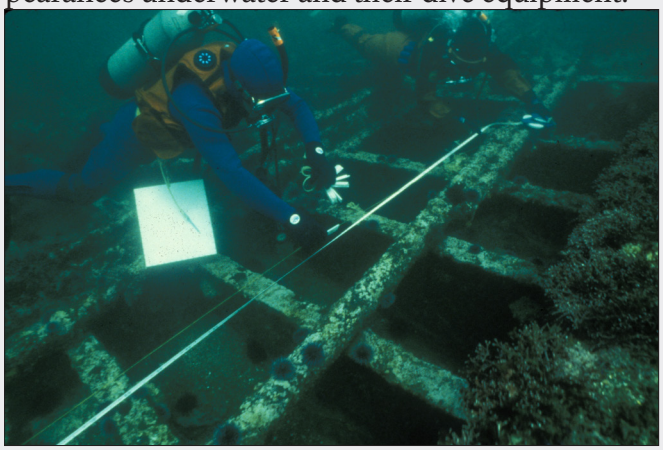
By the time they arrived at Channel Islands National Park (CHIS), Ranger Jack Fitzgerald had already made a couple of cases against members of the California Wreck Divers (CWD) club for taking items from the wreck of the SS *Winfield Scott*, off of Anacapa Island. These were difficult to prosecute, as the defendants claimed the artifacts found in their possession had been taken from locations in the Florida Keys.

The CWD club had conducted a charter dive trip into CHIS and Channel Islands National Marine Sanctuary (CINMS) waters to dive on shipwrecks in the fall of 1986. When the CWD announced a similar trip for October 1987, Ranger Fitzgerald met with Chief Ranger Tim Setnicka to outline an undercover diving investigation for the upcoming CWD club charter to the Channel Islands.

Menard and Senning were chosen for a number of reasons. Both were new to the area, reducing the likelihood of being identified as federal agents. As a young couple, it was felt they would arouse less suspicion than a couple of guys. They had acquired valuable experience working together as divers assisting on documenting the USS *Arizona*. In that capacity they worked with numerous other divers from the NPS as well as US Navy. Being able to identify and work with others while underwater would be important in this investigation. Later in the courtroom, respondents' attorneys attempted to impeach their ability to accurately identify their clients underwater. Lastly, Menard held a Level 1 Federal Law Enforcement Commission, an important technical requirement for the operation.

The operation was launched with less than a week of preparation and no special funding source. When they boarded the Truth Aquatics Company dive vessel *Vision* on the night of Thursday, October 1, Senning wrote a personal check from their own bank account for the full cost ($550) of the three-day, October 2-4 dive trip. The best agent cover usually includes elements of reality, and their covers related to their past. Menard presented herself as a primary school teacher, relating to her NPS interpretive experience with the general public as well as school groups. Mark's cover was as a paramedic, as he had graduated from a one-year paramedic program in September 1986.

Over the three-day trip they participated in each dive. Although the first stop, at the wreck of the SM-1 (a former mine sweeper), was just offshore of the Hollister Ranch and outside the waters of CHIS/CINMS, they conducted two dives there. This allowed them to blend in with the other club divers and become familiar with CWD member appearances underwater and their dive equipment.



NPS divers mapping the *Goldenhorn* wreck in Channel Islands, circa1980. NPS Submerged Cultural Resources Center collection.

After sleeping at anchor off Pt. Conception, the *Vision* arrived off Santa Rosa Island in the vicinity of the *Goldenhorn* (a four-masted iron barque built in 1883). After a two-hour search, *Vision* dropped anchor and at approximately 10:00 a.m. they participated in the first dive on the wreck. Before the dive gate was opened, CWD divemaster Jack Ferguson made an announcement on the PA system that the *Goldenhorn* wreck site was within a federally pro-

tected reserve. "During our forty minute dive, we observed four looting violations that included the use of tools attempting to free up objects on the wreckage such as pipe sections and cross ribbing."

After their dive they hung around the back deck and dive step to observe returning divers regarding their retrievals and "finds" from the wreck. They observed and later documented a half-dozen objects that divers described taking from the wreck such as a brick, a small steel grommet, a piece of teak wood from an area of decking, several pieces of coal, and block and tackle sail rigging hardware.

One of the most interesting moments was the display of a line and shroud by CWD member Bill Wilson, thought to be part of the sail rigging.

Shortly thereafter, Wilson was pulled aside by divemaster Jack Ferguson and a low volume discussion ensued. Then Wilson announced within our earshot that he was going to be returning the object to the wreck. Ferguson then made a public announcement to remind divers of the protected status of the wreck.

Also on deck following the *Goldenhorn* dive, Wilson approached Menard and asked her in a half-joking, half-serious way, whether or not she was a "state commissioner." After Menard's incredulous response, "What is a state commissioner?" Ferguson and Wilson turned to Senning nearby and asked the same question. He gave a similar dumbfounded response to the question and said, "No, I am not a state commissioner." Menard and Senning were uncertain what brought about this suspicious behavior from Ferguson and Wilson, although they knew they were the only non-wreck divers on the roster. There were no other questions of that nature the rest of the voyage.

In order to capture observations for timely, reliable documentation, the pair met, usually on the boat's flying bridge, to discuss and record observations. This location allowed them to not be overheard by others. Each night in their bunk space they also detailed observations in field notes. With the constant noise of the boat generator and other ambient noise, they could converse in hushed tones when necessary. Contemporary note taking was especially important due to the growing number and variety of violations/violators involved.

At approximately 2:15 p.m. they arrived at Ford Point off Santa Rosa Island to dive the *Crown of England* wreck. The PA informed them the island was closed to the public and "then the usual reminder regarding the protected status of the wreck." Since little remains visible, only a few divers entered the water. Nevertheless, they both jumped in for the second dive of the day. Directly after the dive, one of the divers showed Menard a porthole rim he proudly claimed to have removed from the *Crown of England*.

While at the anchorage at Skunk Point, Santa Rosa Island, diver Dan Purdie showed Menard six brass items taken from the wreck site. Also 11 CWD members were dropped off to visit the grounded remains of the *Jane L Stanford*. They returned with a variety of artifacts and other items from the island. They included square nails, plant life, bones, a small bottle, and a brass bolt. As was becoming typical, these folks showed their finds to anyone who may have showed interest.

The next morning the *Vision* arrived at Middle Anacapa Island and dropped anchor adjacent to the wreck of the SS *Winfield Scott*. As was the case the previous morning, Divemaster Jack Ferguson made a PA system announcement that the wreck was federally protected. He stated ranger patrols and boardings were possible, but *Vision* would use its underwater alarm system to alert divers if rangers approached the dive boat. Yvonne overheard the captain offering Ferguson places on board where artifacts could be hidden from NPS ranger patrols in the event of a boarding.

At an average depth of 25–30 feet, bottom time at the *Winfield Scott* was virtually unlimited and most CWD members jumped in with enthusiasm. It was a beautiful, clear morning with better than 30-foot visibility underwater.

The rangers chose the noisy, pre-dive environment at this time to make a radio call (as pre-arranged) to Jack Fitzgerald and inform him they would be returning to Santa Barbara Harbor with over a half-dozen abalone (their code word for violations). Senning had called from the bathroom with a park radio. Needless to say, the number of violations reported was dramatically less than would be the case after the explosion of violations which took place that day at the *Winfield Scott*.

Menard and Senning made one joint dive in the morning followed by observations on the deck of the *Vision*. Due to the high volume of violations observed, Menard stayed on the vessel to continue monitoring returning divers at the stern where club members displayed their finds. Senning made a second, solo dive at lunch time to capture more underwater observations. By splitting locations, the two were able to increase the number of violations observed. By the time the *Vision* got underway, the number of violations witnessed both below and above the water line, eclipsed the violations which had occurred the previous two days.

The pair witnessed numerous divers hammering, chiseling rock and ship fabric at the *Winfield Scott*. Rock was being excavated in hopes of finding valuable artifacts in the nearby cracks and crevices. Others utilized hack saws to cut pure brass, through hull fastening spikes from the wreck. One diver utilized a crow bar and another even had a pneumatic

chisel tool which was powered from one of his air tanks. Underwater as well as on deck, Yvonne and Mark were able to see many of the recovered artifacts taken. These included anti-fouling copper hull sheeting pieces, numerous copper nails or fasteners, brass through hull spikes and dowels.



An NPS diver holding nails at the *Winfield Scott* site, circa1980. NPS Submerged Cultural Resources Center collection.

Probably the most celebrated recovery was an immaculate 1843 two and a half dollar gold coin. Dan Purdie stood on the deck showing it to everyone present. He even allowed Ranger Senning to photograph him holding it in his front teeth. After this find, a wave of "gold fever" swept through the club members, motivating divers to go in again. No other gold artifacts were known to have been recovered that day. Shortly after the coin was recovered, one of the divers acknowledged proudly to Menard that to date, the CWD club had taken 161 gold coins from the *Winfield Scott*. They then pulled anchor.

As *Vision* approached dockside, the two undercover rangers positioned themselves at the starboard stern and port bow. This allowed them to have the fullest view of the deck perimeter. They had concerns that once the boarding announcement was made, individuals might attempt to throw artifacts overboard.

As they made final approach to the dock, Menard and Senning each announced, "We are US National Park Service rangers." They ordered all passengers to keep their hands in view and to stand by for inspection for violations of NPS and National Marine Sanctuary laws and regulations. Reactions ranged from disbelief to shouts and snarls of anger. During the trip, the two had become friendly with several of the divers and had been invited on future dive trips and home visits.

Park rangers, Santa Barbara County sheriff's deputies and National Marine Fisheries Service (NMFS) special agents met the boat as it docked. Menard and Senning used the list of violators/violations they had compiled to assist NMFS agents, with their assistance, conducted interviews, seized items of evidence and issued NOAA Notice of Violations to each violator. They were then allowed to depart the *Vision*.

Due to an insufficient number of officers on board *Vision* during the interviews, the lower bunk area was left unguarded and someone was able to take several rolls of film in Senning's overnight bag. Among images lost, was the incriminating shot of the diver holding the gold coin in his teeth. He ended up paying his fine, nonetheless.

Menard and Senning spent a solid week reviewing their recollections and field notes, while they were fresh, and recorded them in a 48-page case incident report. The contemporaneous nature of both the notes as well as the case report was referenced by Judge Dolan in his Initial Decision as strength in the credibility of the government's case. On Thursday, October 8, 1987 the rangers returned to the *Winfield Scott* wreck site with a photographer and park archeologist to map and photograph the violations.

The investigation yielded 33 violations conducted by 19 individuals. The cases were prosecuted in Santa Barbara and Ventura Counties and in federal civil court. Seven individuals were tried in NOAA administrative hearings. A total of 52 complaints, including 32 criminal and 20 civil, were filed against members of the CWD and the dive boat owners and captain. Nineteen individuals and one corporation (Truth Aquatics) were charged with violating both federal and state laws which protected submerged cultural resources within the park and Sanctuary. Twenty individuals were charged with 32 criminal misdemeanors in the Ventura and Santa Barbara County Courts; 31 civil charges were processed through NOAA and Channel Islands Marine Sanctuary civil proceedings. Fifty-three of the 63 charges were successfully prosecuted.

In June 1988, a NOAA Administrative Hearing was held. Twelve respondents settled their cases and paid fines totaling $58,425. They received penalties ranging from $20,000 for the dive boat owners to $1,000 for some individuals. The seven remaining respondents requested a federal civil administrative hearing which was heard by a NOAA administrative law judge. The hearing lasted nearly five weeks and written arguments and rebuttals were submitted subsequent to the hearing.

NOAA General Counsel Ted Beuttler spent a week preparing Menard and Senning for the hearing. A gag order was imposed between Menard and Senning within the first day of the hearing. Menard spent over six days testifying, Senning spent almost four, each being cross-examined by five attorneys. The case incident report and original notes were useful references in the hearing.

Testimony from the government included the park archeologist Don Morris, Service Historian Jim Delgaldo, and NPS Submerged Cultural Resources Unit archeologist Larry Murphy, among others. These experts were critical to establishing the cultural and archeological significance of the shipwrecks and the recovered artifacts. In October 1990, Administrative Law Judge Dolan held all seven respondents liable on all charges and levied fines ranging from $1,000 to $100,000. The respondents were fined a total of $132,000.

In February 1989, in Santa Barbara County Court, all but one defendant pled guilty and each was fined $750. They were also each given a three-year probation in which they could not dive on wrecks within the park without prior notification to the NPS. One case in Santa Barbara County was dismissed for insufficient evidence. In April 1990, 12 defendants pled guilty to 21 criminal charges in Ventura County Court and were each fined $750. They were also each given a two-year probation in which they could not dive on wrecks within the park without prior notification to the NPS.

On June 6, 1990, one defendant went to jury trial and after a five-day hearing and two days of jury deliberation the trial ended with a hung jury with nine guilty and three not-guilty. The Ventura County District Attorney declined to retry the case. Three Ventura County defendants failed to appear, and arrest warrants were issued. Overall, $13,500 in fines was collected from the criminal proceedings in the two counties. Additionally, the Truth Aquatics dive boat captain received a twenty-day jail sentence and the CWD divemaster received a sentence of sixty days in the honor farm.

In June 1994 the respondents appealed Judge Dolan's ruling to the District Court for the Central District of California. The basis was the NOAA regulation prohibiting alteration to the seabed is unconstitutionally vague as applied to the divers' excavation activities. The district court upheld the lower court ruling. In September 1994 respondents files their appeal to the United States Ninth Circuit Court of Appeals. The Ninth Circuit upheld the Central District Court ruling and stated that the regulation was not overboard nor unconstitutionally vague.

Notable quotations from the case:

From "The Wreck and the Reckoning : U.S. Park Service Wins Its Case Against Undersea Treasure Hunters in the Country's Largest-Ever Archeological Protection Venture." Los Angeles Times, 12/27/90:

"I haven't had anything like it before or since. I've done murder cases, and this was just as intellectually challenging as that." Eric Hanson, Senior Deputy District Attorney for Santa Barbara County

"If I find a $20 gold piece on the floor in a National Park and Ranger Rick isn't looking I'm going to take it!" Jim Dunn, President of the California Wreck Divers.

From Judge Hugh J. Dolan's written decision from NOAA federal hearing:

"The issue Respondents attempted to raise respecting difficulty in identifying individuals in wetsuits with scuba gear, goggles and other equipment is rejected. These respondents by their conduct individually and as a group have demonstrated that they deserve no consideration as credible persons. This entire excursion was aimed at looting wrecks in and out of the sanctuary. They all willingly and eagerly participated in it and carried with them the tools to accomplish such purpose. In the investigation they lied. In this proceeding they have continued to prevaricate. No utterance from their mouths, individually or collectively, deserves consideration as to credibility. The identification of the various individuals on the vessel and underwater by the rangers was clear and positive. It is accepted as established."

"The respondents knew and reminded themselves that the very conduct they engaged in was prohibited and that those charged with protecting the sanctuary were on the watch for predators. Never the less, individually and collectively, they proceeded to do the very acts they knew were prohibited. Their belief and understanding were accurate. Their conduct was reprehensible."

"The journey of the *Vision* on or about October 2-4, 1987, constituted at least in part, a deliberate and successful effort to plunder the wrecks of the *Goldenhorn* and the *Winfield Scott* within the closed areas of the Marine Sanctuary. These respondents and the others aboard set out with their picks, hammers, chisels, booty bags, and other wreck-raiding paraphernalia, fully intending to remove objects from these wrecks in the closed area within the sanctuary, and that is what they did."

1990-1999

The 1990s saw expansions in the exploration and protection of underwater landscapes and cultural sites. New technologies, including GPS and GIS, enabled more efficient survey missions for submerged shipwrecks. Using mixed-gasses, divers set a depth record at 437 feet in Devils Hole, with greater depths still visible below. Divers also explored submerged areas inside spectacular Lechuguilla Cave, within Carlsbad Caverns, and Goodenough Springs at Amistad. On the opposite end of the spectrum, divers undertook the highest dive in the NPS in Lake Tulainyo, within Sequoia National Park. In 1992, hefty fines associated with 52 civil and criminal counts were levied upon divers who had been found to be ransacking the shipwreck *Winfield Scott* within Channel Islands National Park. These counts were upheld by the US Court of Appeals 2 years later.

In order to maintain strict control of diving and compliance with regulations, the regional diving control boards were replaced by a Servicewide National Diving Control Board, which met for the first time in Denver, Colorado, on February 17-22, 1992.

Several international maritime heritage protection and archeology efforts were undertaken in the 90s. SCRU members evaluated work being done by French archeologists on the CSS *Alabama*, an American Civil War vessel sunk in the English Channel in 1864, represented the US in the writing of the draft of the UNESCO *International Convention on the Protection of Underwater Cultural Heritage,* and were part of an international team evaluating salvage methods used on the RMS *Titanic*. Domestically, SCRU played a major role in the mapping, and (in 2000) the ultimate excavation of the HL *Hunley*, a Civil War submarine that was sunk in outer Charleston Harbor, South Carolina in 1864.

In 1997, NPS and NOAA entered into a reciprocity agreement that allowed divers to work on inter-agency projects and diving operations. This agreement has fostered successful research partnerships since its inception.

At the end of the century, SCRU officially changed its name to the Submerged Resources Center. It also expanded its mandate to provide assistance in the area of natural (in addition to cultural) resources.

1990
Big Thicket National Preserve

Underwater blasting took place at Big Thicket National Preserve in Texas. Archeologist Larry Murphy, regional blasting officer at the time, led the operation. NPS divers were Dan Lenihan and Randy Johnson. They blew dozens of pylons and stumps out of the water which had been boating hazards, including a large sunken stump that required forty sticks of dynamite to remove.

1990
Bikini

SCRU continued documenting the wrecks of Bikini. An ABC special documentary entitled "Bikini, Forbidden Paradise" was filmed and aired the next year. Lenihan wrote the SCRU opinion that the sites should be opened to diving in *The Archeology of the Atom Bomb*. Written by James Delgado, Daniel Lenihan and Larry Murphy in 1991, the foreword was by the secretary of the interior, Manuel Lujan. Divers were Nordby, Livingston, Delgado, Murphy and Lenihan. The illustrations for the book included more superb line drawings by Livingston and Nordby.



Dave Bunnell diving in Lake of the Blue Giants when he returned to Lechuguilla in 1990. Photo by, and courtesy of, Michael "Nick" Nichols for National Geographic.

1990
Carlsbad Caverns National Park

On March 30, Dave Bunnell got his chance to dive in Stud Lake in Lechuguilla Cave, in conjunction with the National Geographic Society photography expedition. Because of the funding by the society, there

were paid gear haulers to help carry in equipment. On this dive he used the same equipment from the Blue Giants dive but added a small pony tank for further security. The entrance pool was measured at just over 100 feet in length with a 20-foot width. Again, diving by himself, he quickly saw what were described as "subaqueous pool fingers." These seem to be unique to Lech and are curving speleothems up to 8 inches in length and ½-inch in width. Cavers theorize these were formed when the water was much lower and winds were present to curve the mineral formations as they were growing. Stud Lake is about 400 to 450 feet in length and up to 40 feet in depth. Per Bunnell in his article in the NSS News, "This is without doubt the largest (by volume) body of water in the cave…" (SEE PAGE 156)



Dave Bunnell just before diving in Stud Lake in Lechuguilla Cave, 1990. Photo by, and courtesy of, Michael "Nick" Nichols for National Geographic.

1990
Biscayne National Park

Bill Halainen wrote in the NPS Morning Report on June 20, 1990:

> Biscayne NP--While conducting routine inspections of archaeologically significant shipwreck sites on June 13, 1990, rangers discovered that the wreck of the Spanish galleon *Nuestra Señora del Populo* had been looted. The ship is thought to have sunk during a hurricane in 1773 along with numerous other ships of a Spanish fleet. The site is well known to local divers and its location has been published. The primary disturbance to the site was the destruction of a mound of ballast stones which had been removed to facilitate digging for artifacts in the sand below. At least five pits were dug, exposing several of the hull's timbers and ribs. The ballast pile was likely covering and protecting artifacts. An investigation is underway.

On July 23 the park was involved in another site vandalism, the investigator for this incident was David Brewer of SEAC.

1990
Channel Islands National Park

On October 17, a US Department of Commerce administrative law judge fined seven Los Angeles area scuba divers a total of $132,000 for removing artifacts from two historic shipwrecks in Channel Islands and the associated marine sanctuary. Penalties in the civil prosecution ranged from $1,000 to $100,000. This concluded (until the appeal) the joint enforcement between the park and NOAA involving the prosecution of twenty individuals unlawfully taking artifacts during a dive trip. In all, 52 counts charging civil and criminal violations of federal and state laws were brought against the various individuals, including both the owner and the captain of the charter dive boat *VISION*. (SEE PAGE 150)

1991
Carlsbad Caverns National Park
In 1991, British cave diver Peter Bolt dove Lake of the White Roses in Lechuguilla Cave, located in the Far East section of the cave complex at the cave's deepest known point. The entire expedition lasted for two weeks and consisted of 24 Welsh, English, American, and Canadian cavers. This dive effort was written up by Bolt in "Lake Of The White Roses Expedition," in the *NSS News*, August 1996. At one point there were 25 separate loads of equipment and supplies delivered to the area. During the dive, Bolt went through a tight sump, not more than a few feet wide. At several levels he stopped to take water samples before proceeding. He reached a depth of 92 feet, making Lech at -1593 feet deep, the deepest known solution cave in the country. He could see maybe ten feet below him and thought the passage continued. However, in Bunnell's accompanying article, "Diving The Lakes Of Lechuguilla," he says "Lake of the White Roses, at the deepest point of the cave, was bottomed by British cave diver Bolt, reaching the deepest known pool of the cave at -1601."

1991
Death Valley National Park
On August 15, Alan Riggs (USGS) and cave divers Sheck Exley and Paul DeLoach (NSS: Cave Diving Section) reached a maximum depth of 437 feet in Devils Hole using mixed gasses and open-circuit scuba. They were monitoring calcite deposition for determining geological ages. This may have been a US cave-diving depth record at the time. Riggs was one of several USGS divers collecting water-level and related chemistry on Devils Hole, beginning in 1983. Though they had been working there for almost a decade and had made a great many dives, the NPS finally mandated they complete an NSS cave diving course. The divers attended a class taught by Exley in Florida in August of 1991. Thus, there is the nexus between Exley, DeLoach and Devils Hole.

1991
Rod Farb had permission to investigate the USS *Monitor* under a NOAA research permit. Larry Murphy went as the 'project research archeologist' on loan from SCRU for two weeks in August - September. He would be diving on air 200 feet deep using oxygen decompression. NOAA divers weren't allowed to use these deep air techniques due to their agency policy. From SCRU's perspective, if conditions were acceptable, this would be an excellent opportunity to gain badly needed information on a site balled up in legal controversy for years. Unfortunately, weather conditions terminated the expedition as they were unsafe for diving during the entire time that Larry could be spared.

1991
Sleeping Bear Dunes National Lakeshore
In August, Larry Murphy was sent to Sleeping Bear Dunes National Lakeshore for two weeks to lead an assessment of the Grace Harbor docks and some shipwreck sites.

1992
Washington Support Office (NPS)
In a briefing statement to national emergency services officer Jim Lee by the chairman of the National Diving Control Board, March 13, 1992:

> A review of the diving activity in the NPS during 1991 revealed the following information. There were 3090 documented dives during the year with two regions not reporting. Fifty percent of the dives were related to resource management and research. 18% were for training with a similar number of dives directed toward maintenance type activities. Eight percent of the total were classified as search and rescue (SAR) dives, which includes law enforcement dives, and the remaining 6% were related to cultural research and resource management.

1992
Big Cypress National Preserve/Biscayne National Park/Everglades National Park
Hurricane Andrew, a Category 5 storm, made landfall on August 24. It significantly impacted the entire tip of southern Florida, including three of the area's national parks. SEAC and SCRU, led by George Fischer, conducted an Archeological Damage Assessment in response. They evaluated both terrestrial and underwater sites during the month. On September 29, the team issued the *Hurricane Andrew Resource Damage Survey, Archeological Damage Assessment, Big Cypress…, Biscayne…, Everglades National Park*. There were 1053 photo logs and Journal Recording Notes.

Everglades' Jim Tilmant led the marine resource assessment team, which conducted extensive scuba surveys in areas the park had been monitoring for years prior. His team's results were published in the article "Hurricane Andrew's Effects on Marine Resources" in the journal *BioScience* in 1994.

1992
Channel Islands National Park
In an email to the author in May 2011, NPS fisheries biologist Gary Davis described the origins of the Great American Fish Count[1], a program now carried out annually on a global scale:

> One endeavor the NPS dive program ought to lay claim to is the Great Annual Fish Count (GAFC). I started it as the Great American Fish Count in 1992 at Channel Islands NP, but changed it immediately when I got queries from the Bahamas and all over the Caribbean about participating. The National Marine Sanctuaries Program adopted it and carried it for several years…I founded GAFC to increase public awareness of the plight of fish in parks, sanctuaries, and other presumably protected areas by engaging recreational divers in citizen science. It's based on the Audubon Christmas Bird Count concept (which was started for the same reasons for birds…). GAFC was designed to provide an annual media event to focus broad community attention on the activities of recreational divers assessing local fish populations.

1992
Micronesia
SCRU went to Chuuk, Ponape, Kosrae, Majuro, Guam, and Hawaii, and then some members continued on to National Park of American Samoa. This amounted to three months of consecutive diving operations in Micronesia and Polynesia fulfilling DOI's mandate to assist former trust territories in historic preservation. Many wrecks were documented, historic preservation officers were trained and certified in diving, and management plans were developed with the help of local staff.

NPS diving archeologists, illustrators, and rangers involved in this operation included Larry Murphy, Toni Carrell, Jim Bradford, Larry Nordby, Jim Miculka, Jerry Livingston, Rose Manibusan, and Dan Lenihan. Margaret Pepin Donat from the Western Regional Office also participated as a diver. This event was triggered by Teddy John, the chief historic preservation officer of the Federated States of Micronesia who had worked with SCRU as far back as 1981 on the *Leonora* project in Kosrae. He visited Santa Fe to ask SCRU for help. The NPS Western Region and National Register staff were doing what they could, but underwater treasure hunters were threatening historic sites yet again. After the big SCRU/Navy project in Palau they had stayed away from Micronesia for years, and now he wanted SCRU to visit the lesser known islands like Ponape, Majuro and Kosrae. Onsite presence of diving archeologists always seemed to help dissuade looting.

1992
US Department of the Interior
The Department of the Interior responded to the increased scrutiny of agency diving programs by developing its own diving safety policy. In this regard, on February 26, Larry Murphy of SCRU was appointed the NPS representative to the Diving Safety Task Group of the Office of Safety and Occupational Health by the Washington Support Office Chief, Branch of Loss Control Management. Bart

1 The event is currently coordinated by the Reef Environmental Education Foundation (REEF), and the name was officially changed to the Great Annual Fish Count to reflect its international scope.

House, designated DOI safety and health official, made a request of the agencies on March 23, 1992. Meetings were held with different bureau officers several times this year and a draft policy was developed. Russ Dyrland from USFWS and Ron Circe from USGS were the key figures in this process, as was the NPS National Diving Control Board.

1992

Dan Lenihan was asked by the International Council On Monuments and Sites (ICOMOS) to serve as the official representative of the United States on the ICOMOS International Committee on the Underwater Cultural Heritage.

1992

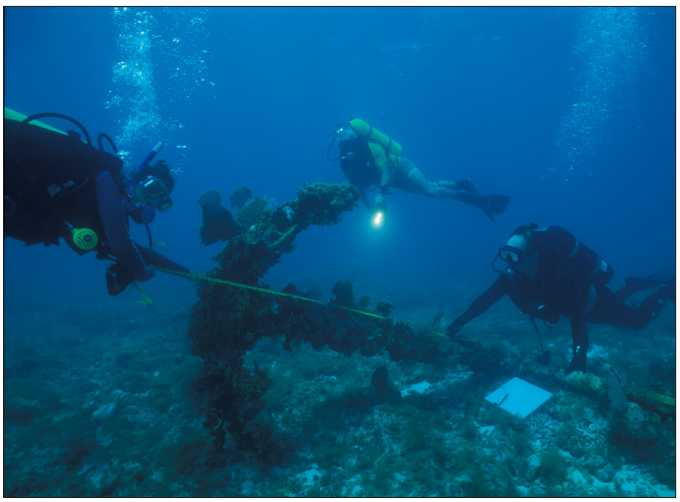
In 1992, the National Park Service issued Personnel Management Letter (PML) No. 92-6, "Special Wage Schedule for Divers and Tenders," rescinding PML 76-50 and PML 76-51. This essentially said that employees who perform diving duties will be paid 175 percent of the locality WG-10, step 2 rate for all payable hours of the shift. This also applied to tenders.

1993
Washington Support Office (NPS)

This year funding started for the Systemwide Archeological Inventory Program (SAIP). As active as SCRU had been in past years, it had been constantly battling for project funding. It was base funded to exist, but its project dollars came from individual parks or external sources. National project dollars for archeology never came its way, as the Washington Support Office handled those funds and archeology in general was underfunded in the service. The regions competed for a very small pot. In 1993, the influx of SAIP funding presented two million dollars in additional money per year. Cal Cummings was a key player in generating this new funding source. He and chief anthropologist Doug Scovill decided the new monies would have one proviso: 10 % would go directly to SCRU. These dollars were key to SCRU developing a state-of-the-art underwater survey system for application in many different parks. SCRU received roughly $180,000 a year to work with and Lenihan put Larry Murphy in charge of building the system and operationalizing it in several parks as test cases.

1993
Dry Tortugas National Park

Larry Murphy led the first major application of the new funds at Dry Tortugas with a GIS-based remote sensing survey, anomaly investigation, site evaluation and mapping. It involved 25 volunteers and 12 US Navy instructors from the Naval Salvage and Diving School.



Mapping operations in Dry Tortugas, 1993. NPS photo by John Brooks.

1993
Biscayne National Park

Over seven weeks in May and June, GIS-based, remote sensing of Biscayne was used to produce a three-dimensional model of the seabed and natural and cultural resources as part of the Hurricane Andrew mitigation study. Survey methods included GPS, magnetometry, bathymetry, RoxAnn bottom classification and sub-bottom profiling.

1993
France

In June, SCRU went to France at the request of, and funded by, the Naval Historical Center. They were there for three weeks to monitor the work of the French archeologists on the CSS *Alabama,* sunk by the

USS *Kearsarge* in 1864 in a ship-on-ship battle in the English Channel off of Cherbourg. The CSS *Alabama* was a Confederate raider that sank more than 60 Union merchant vessels during the Civil War. Dan Lenihan, Larry Murphy and team photographer John Brooks made a series of 200-foot dives on air with in-water oxygen decompression. They evaluated the work, approved it, and recommended that the French be allowed to continue research operations on the American vessel. Because it was lost in war to the US and the Union never relinquished title to confederate vessels, the CSS *Alabama* is seen as sovereign property of the United States.

1993
Biscayne National Park
From July to October, SCRU, with Larry Murphy as principal archeological investigator, conducted surveys of the HMS *Fowey* to evaluate the effects of Hurricane Andrew. Additional assistance was provided by the University of Miami. In October, Murphy provided assistance with debris-removal survey of the Channel Lease-Hold area.

1993
Glacier Bay National Park and Preserve
The *Yorktown Clipper*, a 257-foot tour boat operating in Glacier Bay, ran aground on Geikie Rock on August 18. The ship sustained significant damage to the forward hull and immediately began taking on water. Nearby vessels, including four NPS boats, responded to the Mayday call and were able to transfer all 134 passengers and the majority of the 42-person crew. The captain and 15 other crew members stayed aboard to stabilize the vessel. Salvage divers were flown in from Ketchikan that night and transferred to the Clipper by park rangers. They did a damage assessment of the hull and assisted with temporary repairs that allowed the boat to sail to a shipyard.

1993
Gulf Islands National Seashore
For two weeks in October/November, a GIS-based remote sensing survey took place at Gulf Islands. Offshore park areas were surveyed with GPS-controlled fathometer and RoxAnn bottom-classification device to locate spilled coal. Matt Russell and Larry Murphy from SCRU were co-principal investigators.

1993
Calendar year stats indicate NPS divers made 4064 dives (79 divers listed). Pacific Northwest and Rocky Mountain Regions were not counted for some reason. Southwest Region (including SCRU) had most: 1398. Western Region had 1183.

1994
Washington Support Office (NPS)
The National Diving Control Board met in 1994 at the newly opened Aquarium of the Americas in New Orleans. Dan Lenihan chaired the meeting. Afterwards, the board developed a request for a change to maintenance diving wage grade hazardous duty and wrote a memo to NOAA on a dive reciprocity issue. The board met here on several occasions during the 90s.

1994
Golden Gate National Recreation Area
For two weeks in February, Larry Murphy was a co-principal investigator for the *Terrestrial Survey and Anomaly Testing of Ocean Beach*, in Golden Gate National Recreation Area. M. Purser from Sonoma State University was the co-principal investigator.

1994
US Naval Academy
For two weeks in March, a magnetometer survey took place offshore from the US Naval Academy, in the Severn River in Annapolis, Maryland. Larry Murphy worked with John Seidel as co-principal investigators.

1994
Curecanti National Recreation Area
On April 30, Gary L. Fabiano, a 45-year-old NPS volunteer diver for Curecanti, experienced enough symptoms of decompression sickness to be treated in a hyperbaric chamber at Denver's St. Luke's Presbyterian Hospital. Fabiano had been participating in a Rocky Mountain Region dive refresher at Glen Canyon.

1994
US Department of the Interior
From at least the mid 1980s and as of late 1994, the Department of the Interior medical officer was Mariano B. Pimentel, Jr. M.D. At this time, this was the person through which medical clearances were obtained for diving. Also in this office in November was Christy N. Lipapis, who also reviewed these forms.

1994
Channel Islands National Park
As reported by Jack Fitzgerald in the NPS Morning Report on September 16, 1994:

> The United States Court of Appeals, Ninth Circuit, filed a ruling affirming the decision of a district court which had previously ruled in favor of the government and denied the appeals of the four remaining defendants in a 1987 case dealing with theft of archaeological resources from the park. At that time, an investigation and undercover operation by park rangers on a dive boat. . .led to the citing of 19 individuals and one corporation with 53 violations of state and federal criminal and civil laws. To date, all charges but one have been successfully prosecuted in favor of the government. The four remaining defendants face individual civil penalties that range from $1,000 to as high as $100,000. It does not appear likely that the matter will be heard by the Supreme Court. The Ninth Circuit ruling on this case has major significance both within the circuit and nationally; it establishes precedent for the protection of submerged cultural resources in national parks and marine sanctuaries. . .

1994
Rocky Mountain Region (NPS)
In October the regional director, Bob Baker, released a Memo #P3421 (RMR-AP) addressing the issue of pay disparity between Wage Grade and General Schedule employees in regard to "Hazard Pay for Scuba Divers." Prior to this, hazard pay for diving only pertained to Wage Grade unless the GS personnel were actually involved in a real incident, such as a body recovery, or survey or excavation of some kind. Before the 1980s, any kind of hazard pay was hit or miss for divers.

1994
Southwest Region (NPS)
The 1994 Southwest Region Diving Summary noted that Academy Award winner Gene Hackman and his wife Betsy, both living in Santa Fe, were official Volunteers-In-Parks (VIP), as well as Divers-In-Training for the region. The Hackmans befriended Dan Lenihan, then head of SCRU, with Gene ultimately co-authoring three novels with Dan. John Brooks, the team photographer, invited them to the Dry Tortugas to make a shipwreck preservation public service announcement (PSA) at a SCRU project. At this time, Gene was filming the 1995 *Quick and the Dead*, a movie of Old West gunfighters.

Director and co-star Sharon Stone donated the time of a camera crew to help. Part of the PSA was on a set in Tombstone, Arizona, with Gene dressed as a gunfighter. Later Hackman dove a couple of wrecks



Dry Tortugas National Park, 1994. Gene Hackman, far left, being filmed for a PSA, John Brooks on the far right, Brett Seymour center, others unknown. NPS Submerged Cultural Resources Center collection.

at Tortugas with Lenihan to gather footage for the second half of the PSA. SCRU photographer John Brooks filmed the underwater sequences and edited them to promote underwater preservation in the national parks. At the time of writing, SRC's current photographer/cinematographer Brett Seymour marveled, telling others that one of his first NPS assignments when he was hardly old enough to buy a drink was to work with one of America's Hollywood icons. The PSA aired on networks in areas the NPS had underwater holdings.

1994
Isle Royale National Park
Then-active (and real-life) NPS ranger Nevada Barr's mystery series about fictional ranger Anna Pigeon took a dive into the underwater world of Isle Royale in *A Superior Death*. The novel was the second installment in the series. It was released on March 23 of 1994. For this book she was one of seven finalists for the 1995 Dilys Award by the Independent Mystery Booksellers Association. The following is the Barnes & Noble dust cover advertisement for the book:

> Park ranger Anna Pigeon returns, in a mystery that unfolds in and around Lake Superior, in whose chilling depths sunken treasure comes with a deadly price. In her latest mystery, Nevada Barr sends Ranger Pigeon to a new post amid the cold, deserted, and isolated beauty of Isle Royale National Park, a remote island off the coast of Michigan known for fantastic deep-water dives of wrecked sailing vessels. Leaving behind memories of the Texas high desert and the environmental scams she helped unravel, Anna is adjusting to the cool damp of Lake Superior and the spirits and lore of the northern Midwest. But when a routine application for a diving permit reveals a grisly underwater murder, Anna finds herself 260 feet below the forbidding surface of the lake, searching for the connection between a drowned man and her age-old cargo ship. Written with a naturalist's feel for the wilderness and a keen understanding of characters who thrive in extreme conditions, *A Superior Death* is a passionate. . .page-turner.

1995
Dry Tortugas National Park
From March 23-April 3, a joint investigation was made by SEAC and the FSU Academic Diving Program of the Coast Guard Dock Ballast Pile Site, a shipwreck site on the southeast site of Loggerhead Key. David Brewer of SEAC led the project.

1995
Amistad National Recreation Area
On May 19, District ranger Warren Beitel located a surface disturbance at Amistad indicating he'd found the emergent waters of Goodenough Springs, which had been inundated by the reservoir. Lenihan and John Brooks from SCRU dived the area. After descending through 100-feet of pea soup-green lake water, they hit crystal clear, warm, aquifer water of the drowned spring. They entered the cave at 130 feet but could go no farther, unable to overcome the strong outflow. There are no reports of divers finding it earlier, but it's possible they did and were quiet about it. There were no signs of guidelines or other cave-diver tracks. There were many pieces of monofilament line however, with fishhooks that draped over the sinkhole at the bottom. Anglers weren't exactly sure where it was, but they were close enough to leave their tracks. Since the late-1990's non-NPS divers have been pursuing deep exploration of the site with some success. One of John Brooks' photos of Lenihan exiting in the current on this day was printed in *Underwater Wonders of the National Parks,* a field guide to diving opportunities in the National Park System.

1995
Kaloko-Honokōhau National Historical Park / Pu'uhonua o Hōnaunau National Historical Park
Dan Lenihan, the US representative to the International Committee on the Underwater Cultural Heritage (ICMOS) hosted a meeting in July in Kailua-Kona, Hawaii. The UNESCO *International Convention on the Protection of Underwater Cultural Heritage* was hammered into a draft document here; it was eventually modified by others and approved in 2001. NPS archeologist Jim Adams, from the USS *Arizona* Memorial, helped Lenihan introduce the foreign guests to underwater sites in Hawaii, including the USS *Arizona* and the USS *Utah* in

Pearl Harbor. The group included senior archeologists from Australia, Holland, Denmark, Argentina, Canada and Sri Lanka. It took many nations ratifying the document before it was entered into force in 2009.

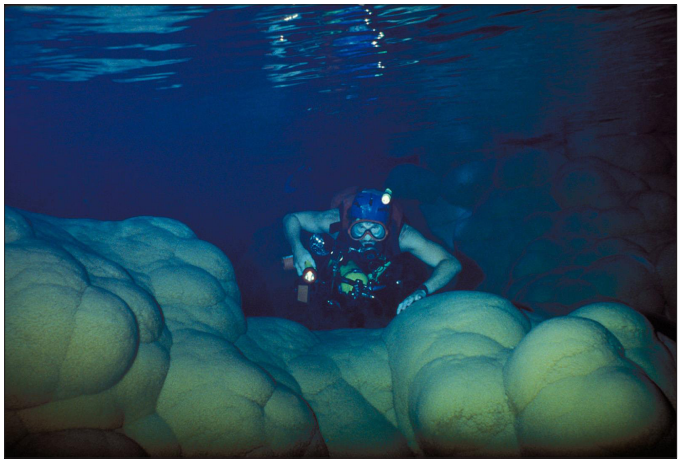
1995
Carlsbad Caverns National Park

In July, National Speleological Society member Dave Bunnell returned to Lechuguilla Cave. Due to spelo-politics surrounding the exploration of the cave, Bunnell had not been able to return until the summer of 1995. Lechuguilla Cave, is without argument, one of the most spectacular caves in the world and among serious cavers, it is an honor to be able to cave in it. On this trip Bunnell, along with fellow diver Ron Simmons, dove into Lake Castrovalva. At over 100 feet across, it is, according to Bunnell in his August 1996 article in the *NSS News*, the largest lake in the cave (in terms of surface area).



A caver at the edge of Lake Castrovalva, Lechuguilla Cave, on a 1995 exploration. Cpurtesy of Dave Bunnell.

This body of water is a good six hours into the cave, and that is with a veteran leader who knows where the obstacles are and how to handle and rig for them. Exploration of Lake Castrovalva was fairly easy and fairly quick. There are several significant sights underwater, including the mammillaries, or rounded formations which occur throughout the lake. Bunnell and Simmons only got to a depth of about 25 feet before running into dead ends. Though disappointing not to find any passage, as Bunnell said, "…it was, like all of the lakes of Lechuguilla, simply an awesome place to dive."


Dave Bunnell diving in Lake Castrovalva. Photo by Ron Simmons, courtesy of Dave Bunnell

1995
Glen Canyon National Recreation Area

From the NPS Morning Report on July 31, 1999:

> On the afternoon [of July 26]…Jim McDowell, 42, was waterskiing with four other people behind a boat when the rope he was using became tangled around his wrist, tightened and severed his hand. Park medics responded and evacuated him to a hospital in Page. Park divers were called out in an effort to retrieve McDowell's hand in the hope that it could be reattached. The water at that location, however, was about 150 deep, which reduced the likelihood of recovering it. Doctors also determined that such surgery would not be feasible due to the nature of the injury. The search was accordingly terminated.

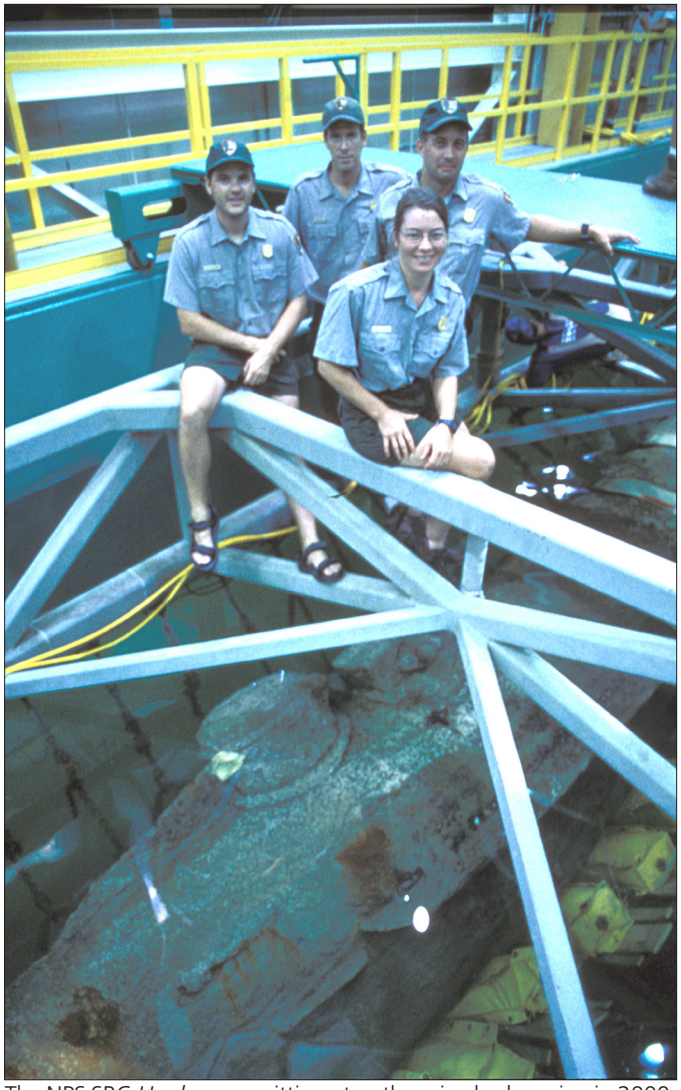
1995
Pearl Harbor, Hawaii

On July 26, Jim Adams, Dan Lenihan, and navy EOD divers made the first reported post-war dives on several large sunken landing craft (tank landing ships and landing craft tanks) in Pearl Harbor's West Loch. These were destroyed in a massive explosion in 1944, as the craft were being prepared for an invasion of Saipan. Apparently 163 men were killed and 396 were wounded; the incident had been veiled in secrecy at the time and details were not declassified until 1960. Lenihan recommended that these vessels be included if the SRC were to follow up on the 1989 USS *Arizona*/Pearl Harbor National Historic Landmark report in future years.

1995
Yellowstone National Park
On August 15, Dan Lenihan and John Brooks suspended exploration of the vents in Yellowstone Lake at West Thumb Geyser Basin when they bumped into a thermocline (a layer of water with a drastically different temperature) that burned them.

1995
In September, Brian Lockwood, an NPS diver from Biscayne, was on a two-week refresher training at Lake Mead and Channel Islands. He made several dives during this time and due to symptoms of decompression sickness was ultimately placed into a hyperbaric chamber at St. Johns Pleasant Valley Hospital in Ventura. When released, he returned to his home in Florida, having been told not to dive for a month. On November 11, he made a dive to twenty feet. Surfacing he again felt mild symptoms of decompression sickness. On November 15, he was placed into a second hyperbaric chamber, this one at Mercy Hospital in Miami, Florida.

1995
Submerged Cultural Resources Unit
Between 1991 and 1995, SCRU participated in submerged cultural resource work in the following areas of the NPS: Biscayne, Buck Islands, Carlsbad Caverns, Dry Tortugas, Golden Gate, Gulf Islands, Hawai'i Volcanos, Kaloko-Honokōhau, Padre Island, Pu'ukoholā Heiau, Salt River Bay, Sleeping Bear Dunes, Virgin Islands, War in the Pacific, and the USS *Arizona* Memorial.


The NPS SRC *Hunley* crew sitting atop the raised submarine in 2000. From left to right: Brett Seymour, Matt Russell, Claire Peachy, Dave Conlin. NPS Submerged Cultural Resources Center collection.

1996
Outer Charleston Harbor, South Carolina
HL *Hunley*, a Civil War submarine operated by a hand-cranked screw and sunk in battle in 1864,, had been found in 1995 by divers from the National Underwater and Marine Agency (NUMA), a maritime heritage preservation group financed by novelist Clive Cussler. It was uncovered in the outer harbor of Charleston, South Carolina, and mapped by SCRU in May of 1996. Dan Lenihan from SCRU and Chris Amer from the State of South Carolina were co-principal investigators. Larry Murphy was the operations officer and essentially led this project. The site of the *Hunley* was confirmed and documented, and later entirely excavated. Cussler often financed projects looking for symbolically important vessels. In earlier contacts with the NPS, it became clear he was not interested in treasure salving but in working constructively with preservation agencies.

Work on the site was complicated by low visibility on the bottom—usually less than three feet. In addition, a huge mass of small jellyfish delivered stings continually. Divers took to wearing panty hose over their faces and under their neoprene hoods with holes cut for their facemask and regulator. Still they reported surfacing with swollen lips, as if they had been "kissing a car's exhaust pipe." This assessment provided the confirmation this was *Hunley*, ex-

posed on the bottom, which allowed detailed plans to be made for later excavation in one piece. It also provided a SCRU imprimatur—particularly valued in this case because the team rarely recommended excavation as a viable option. During this period, Dave Conlin, Matt Russell, and Tim Smith played major roles. Ultimately, Conlin and Russell would co-lead the later excavation of HL *Hunley* in a major project at the turn of the millennium.[2] The vessel is now on public display while undergoing conservation in Mount Pleasant, South Carolina, at the Warren L. Lasch Conservation Center.

1996
Washington Support Office (NPS)
John Brooks, chairperson of the National Diving Control Board, orchestrated a realignment of the board when the regions / field areas realigned themselves in 1995. He was able to get regional directors John Cook (Intermountain Region), Bob Barbee (Alaska Region), Bill Schenk (Midwest Region), Bob Stanton (National Capital Region), Marie Rust (Northeast Region), Stan Albright (Pacific West Region) and Bob Baker (Southeast Region), to sign off on it.

1996
Yellowstone National Park
For three weeks in August, investigations by SCRU took place in Yellowstone Lake. The team used side-scan sonar, bathymetry and bottom classification to locate cultural and natural resources. Team members were Lenihan, Murphy, Matt Russell, John Brooks, Brett Seymour.

1996
Biscayne National Park
For two weeks in December, Larry Murphy led a remote sensing damage evaluation of the *IGLOO MOON* grounding at Biscayne National Park.

1997
Washington Support Office (NPS)
On January 1st, the NPS entered into a one-year reciprocity with the NOAA Diving Program, which allowed NPS employees to participate in NOAA-sponsored projects and diving operations. This agreement has been maintained up through the present time.

On February 15, Calvin R. Cummings, the NPS senior archeologist, completed a final draft of *Submerged Cultural Resource Management and Underwater Archeology: A History of National Park Service Contributions*. Never published, one draft manuscript copy can be obtained in the records of the SRC office in Lakewood, Colorado, and a second is located in the SRC archives housed in the Western Archeological and Conservation Center in Tucson, Arizona. Although not numbered, it is at least a 300-page document.

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2 The Civil War submarine HL *Hunley* was raised in Charleston Harbor on August 8, 2000. The archeological field director was Dave Conlin, assistant field director was Matthew Russell, underwater photographer was Brett Seymour and conservator, Claire Peachy. All the NPS divers were uniformed personnel from the SRC.

In preparation of this raising of the submarine, blue plasticized VIP guest badges were made to aid in access to the event. Dave Conlin had told both the NPS and the assisting commercial dive crews, as well as other local NPS'ers, to invite themselves as well as their families to witness this historic occasion. Unbeknownst to Conlin, State Senator Glenn McConnell (as of 2013, South Carolina Lt. Governor) had issued these VIP badges to his friends and political cronies and were no longer available to those Conlin had invited. This caused quite a stir and did not sit well with the SRC team.

On the night before the raising, SRC member Matt Russell stayed up all night and fabricated new VIP guest badges, virtually identical to the real ones. Approximately 120 of these forged badges were distributed. There were now many more guests than the original boat could hold and Conlin was able to secure a second vessel from the state's Department of Natural Resources for the overflow. The event proceeded on schedule.

Dr. Conlin, at the time of this writing is the chief of what is now renamed the SRC. He is still officially *persona non grata* in South Carolina but takes great pride in successfully raising the HL *Hunley,* as well as being able to accommodate the "added" guests in such fine fashion.

Cummings' manuscript is dedicated to Dr. Jesse L. Nusbaum, "the first Departmental Consulting Archaeologist in 1927, when the position was created by the Secretary of the Interior, and served from 1927 to 1958." It is also dedicated to Dr. John M. "Long John" Corbett,

> …the Departmental Consulting Archaeologist, US Department of the Interior, and as the Chief Archaeologist of the National Park Service, from 1958 to 1971. Dr. Corbett contributed more to the development of American Archaeology and the Archaeological Programs of the National Park Service than any other single individual.

1997

Larry Murphy was part of a Federal Interagency Submerged Cultural Resources Working Group. Working with an International Congress of Maritime Museums committee, they evaluated recent RMS *Titanic* artifact salvage methodology of RMS Titanic, Inc., IFREMER (the French Research Institute for the Exploitation of the Sea), and the Greenwich Maritime Museum. He also served as an expert witness in the case *United States v. Melvin A. Fisher et al.*, Case No. 92-10027.

Murphy coordinated the input from SCRU personnel for about 20 important definitions in the *Encyclopedia of Underwater and Maritime Archaeology*, by James P. Delgado and published by Yale University Press in 1998. The terms worked on by the SCRU team included: sampling, remote sensing, site formation systems, global positioning systems, assemblage, and computer modeling—literally determining the language used in the field. This was an act of real trust and an indication of his international standing in underwater archeology. Lenihan was one of nine on the encyclopedia's editorial advisory board. It was also published for distribution in Europe by the British Museum Press.

1997/1998

Sequoia and Kings Canyon National Parks

The highest known dive in an NPS area was in Lake Tulainyo, located at 12,802 feet in Sequoia National Park, on the eastern edge of the Sierra Crest. It is about one mile north of 14,496-foot-high Mt. Whitney, the highest point in the continental United States. Probably in the late summer of 1997, (the exact date is unknown but the reference article was in the fall of 1998) photographer Peter Hemming and David Moore lugged two small pony tanks and wetsuits to this lake. They climbed up from the east side near Lone Pine, and took two days to make the trek. Hemming described their experience in an article titled "Lake Tulainyo: Up and Under In the Sierras" in the October 1998 issue of *Sport Diver Magazine*.

Knowing there were potential dangers due to the severe elevation, they did not go below thirty feet in the crystal clear water. They used rocks for weights. "After the dive Dave and I packed our dive gear and began the long climb back down to civilization. But before I did, I carved our initials into a quarter and tossed it into the lake to commemorate our dive. The highest Scuba dive in the Continental US was ours." Though untrue, it was a record within the NPS.[3]

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3 The highest dive in the United States, continental or otherwise, seems to be in Lake Waiau, which sits at 13,020 feet on Hawaii's Mauna Kea. This 10-foot-deep pool was first dived on April 4, 1976 and the seven divers, principally scientists, agreed to stay down for no more than twenty minutes due to their concerns about such an elevation. Dr. Ron S. Nolan wrote about the dive in "High Dive in Hawaii" in the November 1976 *Skin Diver Magazine*. The participants believed it to be the highest dive in the world. But they were wrong.

On November 26, 1955, divers in Mexico dove at an altitude of 13,828 feet in a lake in the 15,534-foot high Mexican stratovolcano, Nevado de Toluca. In the April 1956 *Skin Diver Magazine* article, "The Mexican Frogmen Club," which was founded in 1954, claimed that diving in the volcano's Lake of the Sun was a high-altitude record. Scuba has been used in this lake at least once more. Since then, however, on August 20, 2014, Geoff Belter lost his life in Peru's Lake Sabinacocha, which is a reservoir at a record-setting elevation of 15,988 feet. He and a dive partner were looking for Inca artifacts at a depth of approximately 200 feet. Belter's body has not been recovered. In fact, both groups ended up being wrong. In 1982, Johan Reinhard, an Explorer-In-Residence with the National Geographic Society, along with possessing other impressive credentials, dove in Licancabur Lake on the mountain of the same name. Along with four others, he scuba dived at an altitude of 19,400 feet on the peak in Chile. He had a purpose for diving there. A few years previously, Dr. Reinhard had discovered several frozen mummies on top of a few peaks in Argentina and Peru. He was diving at that altitude to possibly learn more about these Aztec sacrifices found not far away.

1998
Submerged Cultural Resources Unit
Underwater Wonders of the National Parks, by Daniel J. Lenihan and John D. Brooks was published by Compass American Guides (Fodor's) with cooperation and funding from the National Park Foundation. Written by two members of the Submerged Cultural Resources Unit, the book provides a masterful overview of diving opportunities in the various areas of the national park system.

The HL Hunley *Site Assessment* was printed and delivered to an eagerly awaiting audience. The 200-page document provided the official findings of the 1996 site-assessment carried out by SCRU and the South Carolina Institute of Archaeology and Anthropology. The editor was Larry Murphy, and it included the work of nine authors including Adrian Askins, Tim Smith, Matt Russell and Lenihan. It recommended raising the *Hunley* and a long process of display and conservation in South Carolina.

1999
Washington Support Office (NPS)
NPS Guidelines #4, "Diving Management," was superseded and replaced by *Director's Order and Reference Manual 4 (RM-4)* on May 3. Its sunset date was May 3, 2003, or four years. This was signed into effect by Robert Stanton, director of the NPS.

1999
Charleston Harbor, South Carolina
In June and July, SCRU archeologist Dave Conlin was detailed to the Naval Historical Center to document the USS *Housatonic*, lost in battle to the confederate submarine HL *Hunley* in Charleston Harbor in 1864. Conlin used a creative set of experimental techniques to record the vessel in zero visibility. Probing, scratching at surfaces and core samples enabled him to completely document the vessel.

1999
Submerged Cultural Resources Unit
SCRU became the Submerged Resources Center (SRC) in October. With the name change, came a new mandate to assist in the area of natural resources. Lenihan retired as chief but remained as a rehired annuitant, and Larry Murphy took over leadership of the team.

Then on February 21, 2016, according to The Explorers Web, a Hungarian diver and mountaineer, Dr. Emo Toski dove on Chile's Ojos del Salado, at an elevation of 20,926 feet. Ojos del Salado is the second highest mountain in South America and is reputed to be the highest volcano in the world. After preparing for five years and making an aborted attempt a year or so before, he finally went to six feet and stayed ten minutes. It is believed this may be the highest diveable body of water in the world.

INTO THE 21ST CENTURY

As the National Park Service moves into the new millennium, the dive program continues to evolve. From its genesis of rangers using scuba as a public safety tool for search and recovery in the 1960's and 70's, the program continued its shift toward science and resource management in the 1980's and 90's. By 2003, the percentage of law enforcement and recovery dives had dropped to 15% in the service's national statistics, while resource management had grown to 61% of the 5387 dives recorded that year. At the National Park Service's centennial in 2016, the percentage had increased and plateaued at nearly 72% of the 8259 dives completed by the service. In the 16 years since 2000, the annual number of dives done by National Park Service divers has increased by nearly 3000, with 35% fewer divers in the program. In short, the NPS dive program of is conducting a greater number of dives with fewer divers and accomplishing more than ever. In short, the NPS dive program conducts a greater number of dives with fewer divers, and accomplishes more than ever.

Another area of growth within the NPS Dive Program has been advances in technology for both diving operations and the ability to study and communicate the importance of underwater park areas. In 2005 the Submerged Resources Center (SRC) was the first NPS program to adopt the use of closed circuit rebreathers (CCRs), with a historical documentation project on a B-29 Superfortress in Lake Mead in nearly 200 feet of water. Currently, three additional NPS programs (out of 24) and 14 divers (out of 150) are utilizing CCRs for NPS diving operations.

Since embracing the use of rebreathers, the SRC has repeatedly demonstrates a 35% increase in bottom time and productivity over open-circuit scuba on an annual basis. Rebreathers are enabling a small number of NPS divers longer, no-decompression, bottom times allowing them to safely accomplish more work underwater for the agency. CCRs also permit NPS divers to safely access deeper coral habitats and shipwrecks for resource management purposes, penetrate further into cave environments for training, and stay longer on underwater sites that are remote, inaccessible, or rarely diveable due to environmental conditions. NPS divers on CCRs have the added benefit of a universal equipment configuration for mixed-gas diving operations where the narcotic effects of air can impair a diver. While the scientific diving application for rebreathers is still relatively young, technological advances will continue to produce more reliable, easier to use, and more cost-effective systems, making it possible for NPS programs to utilize it for resource management diving operations.

Technology plays a major role in how the NPS Dive Program accesses and manages the agency's underwater resources. It also has revolutionized how the public experiences and understands the NPS underwater world. NPS divers now have the ability to greatly contribute to the outreach and education of a park's interpretation division with the use of digital underwater cameras. Parks and NPS programs now use social media platforms to regularly showcase underwater park resources, while also highlighting the benefits and the need for park dive programs. The NPS Dive Program is regularly generating and sharing live underwater content via the web, utilizing low-cost hardware and existing Internet infrastructure. These types of broadcasts required dedicated satellite trucks and large project budgets in their early days. Programs have the ability to engage students in real-time as part of Channel Islands Live, or take questions from an online audience while divers are on the deck of the submerged battleship USS *Arizona*. There are several web pages within the NPS website that have been developed for the sole purpose of engaging the public in diving opportunities within their national parks.

In addition, the quality and scope of underwater imaging technology have made significant advances since the turn of the century. The SRC regularly pioneers the use of emergent imaging techniques. Immersive 3D and ultra high-definition 4K video have become formats for capturing mission footage by the team. Still photography technology has also progressed, allowing for ultra high-resolution images and seamless photomosaics of large-scale wreck sites. Adding to the tools now in use for underwater resource management, 3D photogrammetry (the creation of a 3D model built from photographs) has been applied to underwater sites, allowing for highly accurate models of underwater features *in situ*. These advancements in 3D modeling have the potential to not only accurately document underwater resources from shipwreck sites to coral reefs, but also measure changes over time, and do so in a photorealistic manner that is engaging to the public and capable of generating 3D prints or virtual reality products.

Although there has been an historical lack of diversity within the NPS, particularly in diving operations, the face of the service is changing. There has been an immense push to make the agency a more accurate representation of the country it serves, through new hiring initiatives, internship and training opportunities, and youth engagement programs. Many park dive teams are now increasingly represented by women, and women hold positions in dive leadership throughout the service as instructors, park dive officers, and regional dive officers. As the service continues to promote and attract a diverse workforce, the dive program in particular has built unique partnerships to encourage interest in NPS diving from people, youth in particular, of diverse racial, cultural, urban and at-risk backgrounds.

Throughout its history, the NPS dive program has organized, responded, and adapted to the changing needs of the service. It has flourished within the boundaries of a federal agency that has traditionally tolerated a measure of risk as acceptable for its highly trained and motivated workforce. This dive program has been on the forefront of scientific discovery, visitor safety, and embracing new technology since its creation. Its origins were the foundation and operational model for the scientific diving community and still remains a well-respected leader in that field. As federal government's oldest non-military diving program, it has been instrumental in the management and protection of the underwater world at the very core of the National Park Service mission – to "…preserve unimpaired the natural and cultural resources and values of the national park system for the enjoyment, education, and inspiration of this and future generations"… even underwater.

SCUBA DIVING DEATHS IN NATIONAL PARKS

Beginning with the death of 15-year-old Gregory Alberts at Lake Mead on November 8, 1959, there have been at least 69 documented deaths of scuba divers in national parks. The following is a list of individuals who died while scuba diving (two while free diving) in national park areas through 2014.. It has been put together through various sources such as news clippings, park records, and for many of the later records, the invaluable assistance of Bill Halainen and the *NPS Morning Report*. We are sure it is not complete. This does not include the well-publicized disappearance of George F. Knoop from Lake Mead's Boulder Beach, who appeared to have died in a scuba incident in the Boulder Basin area of Lake Mead. His car, clothing, and shoes were found near the shore, as well as clear footsteps leading to the water's edge. However, the machinist had not died; he faked his death for the next three years and lived freely under an alias, John Deviland. He and his then wife had conspired to cheat the government of Social Security benefits while allowing him to "re-marry" and start a whole new life. Lake Mead ranger Dick Newgren, in an email to the author on May 20, 2015, said that during this period, often when they needed to make a refresher dive, "we would go to where Knoop was last seen and perform circle searches and any other kind of search we could think of. Nothing, no wonder."

11/8/59 Lake Mead NRA Gregory L. Alberts, age 15, died in a scuba related accident 50 yards north of Boulder Beach. His body was recovered by a citizen within 4 minutes of the incident from a depth of 50 feet.

10/2/61 Lake Mead NRA Jackie Dale Yoss, 25, died a half-mile south of Boulder Island in an out-of-air situation while scuba diving. The body was recovered by Ed Murphy, dive buddy of the deceased, at 160 feet.

02/24/63 Lake Mead NRA Dennis Lyle Wenzl, 16, died in a scuba incident in which he was wearing too much weight in Rotary Cove. The body was recovered a day later by the Las Vegas-based Whamco divers.

06/27/63 Glacier NP (1 killed 1 badly bent) Divers from the Flathead Lifesaving and Rescue Association made an effort to locate the body of a six-year-old boy who had fallen into the whitewater of McDonald Creek. The divers looked in the area where the creek enters McDonald Lake. Tom Dumay, a 21-year-old rescue diver ran out of air at 90 feet. His partner, fellow rescue diver Ron Koppang tried to share air and ascended much too fast. Ron Koppang suffered from decompression sickness from the experience, but Tom Dumay drowned. Other rescue divers recovered Dumay at a depth of 110 feet. This was a major impetus for the NPS in formalizing a servicewide dive program.

07/20/65 Death Valley NM (2 deaths) Paul Giancontieri, 19, and David Rose, 20, never returned from an illegal scuba dive in Devils Hole. Forty-four divers made numerous dives round-the-clock for a three-day period but were not successful in locating the boys. At least one of the searchers ventured below a depth of 300 feet in this effort. At this writing, neither the boys nor their equipment has ever been found.

11/2/69 Death Valley NM Czechoslovakian Jindrech Carl Vollbracht, 35, scaled the new seven-foot high cyclone fence around Devils Hole, topped by three strands of barb wire, for a solo, illegal dive before his three dive buddies arrived. Upon arrival his friends saw his bubbles and suited up to join him, but when they submerged they found Vollbracht floating, unconscious. He was dead when they got him to the surface.

06/3/72 Lake Mead NRA Bill Watson, 42, died in an out-of-air scuba incident near the Calville Bay Marina. He was recovered within minutes by a concession employee.

08/31/73 Lake Mead NRA Ranger Thomas "T.K." Brown, 56, born on July 21, 1917, suffered a massive heart attack and died during a scuba training dive below Ringbolt Rapids in Lake Mohave. Although T.K. was participating in a park-sanctioned dive and needed to remain current with his certifications, he was off duty, having to work nights and thus unable to participate in the routine dives generally scheduled during the daytime. Initially, his widow was denied the benefits obtained from an on-duty death.

However, his supervisors, principally sub-district ranger Mack Shaver went to bat for this declaration and was able to get the park's upper management (the chief ranger and superintendent) on-board as well. Ultimately, they reversed their decision and she was able to obtain these benefits.

05/23/74 Lake Mead NRA Robert Vagnier, 19, died in an out-of-air scuba incident near Big Boulder Island in the Boulder Basin at Lake Mead. His body was recovered 25 hours after the incident by five National Park Service, seven Sheriff's Underwater Recovery Unit (SURF), and one Bureau of Reclamation divers. He was engaged in a training dive with an instructor-trainee from Whamco Divers. An assistant instructor was supervising from the beach. He drowned in 125 feet of water.

11/76 Isle Royale NP Donald Lienhardt, 20, drowned in the "Forbidden Room" of the wreck of the *America*. His equipment became entangled in the 'dogs' or latches on a large, heavy steel door wedged partly opened in a room aft of the ship's galley about 70 feet deep. Due to this incident and a number of near misses recorded by park staff as related to them by divers, Superintendent Brown asked the SCRU team to remove the door. While conducting a survey at the park in 1982, Dan Lenihan, Larry Murphy and Toni Carrell pried the door off its hinges with a large pinch bar and let it sink into the silt. No more incidents have been recorded at that location.

08/6/79 Isle Royale NP Don Curran, 26, drowned during a deep dive (250 feet) on the *Kamloops*. On 8/16/79 his body was recovered after a long series of harrowing dives conducted by local divers overseen by park staff. NPS divers with supervisory non-diving roles were Jack Morehead, Ken Vrana and Stu Croll.

08/11/79 Amistad NRA Park visitors Walter Garrett and his father, James Garrett, 48, went diving at about 3:30 p.m. About ten minutes and thirty feet into the dive, father and son were together and not having any problems. When they hit the surface, James told his son that he needed help and that he was having trouble breathing and keeping afloat. James slipped under the surface and Walter was unable to reach him. James Garrett was pronounced dead on arrival at the hospital, with drowning the probable cause. Regional dive officer Lenihan told the park to send the victim's equipment to Jim Stewart for evaluation at Scripps and UCLA. Tests at these institutions revealed hairline cracks in the diaphragm of the old regulator. It could breathe adequately at the surface but at thirty feet, it admitted water—this was judged to be a contributing factor to cause of James Garrett's death.

08/19/79 Isle Royale NP The dive boat *Mystery Ship* reported a female did not return from a dive on the 1898 wreck of the *Chisholm*. Rochelle Gause, a 24-year-old from Minneapolis failed to come up from a dive to 120 feet on the engine-prop area. She was recovered from a depth of 140 feet draped over a portion of the engine. Physiological indications suggested barotrauma was the initial cause.

1980 Channel Islands NP This diving fatality was related to kelp entanglement. Nothing more is known about this incident.

06/28/81 Lake Mead NRA Paul M. Fockler, 21, died in a scuba incident near Katherine Landing in Lake Mojave. He was recovered in five feet of water by wading NPS officials, approximately 4.5 hours after his disappearance.

08/16/81 Amistad NRA James Rutledge was a student in an open-water scuba certification course. At 5:30 p.m. he was engaged in an emergency swimming ascent skill test from a depth of about thirty feet, accompanied by an assistant instructor. Upon surfacing, Rutledge groaned and became unconscious. The instructor and assistant instructors transported the victim to the water's edge and began mouth-to-mouth resuscitation. NPS rangers arrived on the scene and loaded the victim into a vehicle where they administered oxygen and transported the patient to the local hospital, then to a decompression chamber in San Antonio, arriving at about 10:00 p.m. Mr. Rutledge remained in a coma until he died on October 12, 1981.

02/21/82 Amistad NRA Divers alerted park rangers when their buddy, Juan D. Saenz, from Houston, did not surface from a submerged power house at Amistad. Two rangers and a park administrative officer searched the exterior of the submerged three-story building but were unable to locate the remains. Regional dive officer Larry Nordby and Dan Lenihan and Larry Murphy from the Submerged Cultural Resources Unit were called to search within the building, which was determined to be too hazardous for the park dive team. Swimming through rooms with no visibility, full of cables and pipes eighty feet below the surface, the divers maneuvered through the dangerous submerged building. On the second dive of the third day of recovery operations, the victim was discovered wedged between a wire switch cage and an interior wall. Nordby, Lenihan, Murphy, and Amistad's Mark Igo, Daniel Peregoy and Deborah Gibbons received DOI Exemplary Act Awards; it was the first time this award was bestowed.

05/82 Channel Islands NP The Annual Scuba activities summary by Western regional dive officer Dave McLean mentions "Channel Island divers are investigating another scuba fatality; probable cause was human error."

1984 Glen Canyon NRA Jeffrey Thomas Abromaitus, 21, of Chagrin Falls, Ohio and a student at the US Air Force Academy, drowned while diving near Bullfrog Marina. He was part of a larger group at the park officially from Colorado Springs to dive and train. The status of the recovery is unknown.

1984 Channel Islands NP Diving fatality at Channel Islands. Nothing more is known about this incident.

07/31/86 Channel Islands NP A 28-year-old California man was scuba diving near Cat Rock off Anacapa Island when he became separated from his dive partner, who reported him missing. The Coast Guard and the park were notified and a search was begun. His body was recovered later that day. The cause of death was not known at the time. The man was an experienced diver and his name is unknown.

06/14/86 Lake Mead NRA Robert L. Kennedy, 37, died in an alcohol-related scuba incident near Kingman Wash in the Boulder Basin of Lake Mead. He was recovered from a twenty-foot depth by his dive buddy within minutes of the incident.

11/15/86 Channel Islands NP A 40-year-old California man was diving with a partner near Anacapa Island. The two became separated; the missing man was found twenty minutes later in thirty feet of water. He had become entangled in kelp and had exhausted the air in his tank. CPR was performed when he was brought to the surface but to no avail. His name is unknown at this time.

03/7/87 Amistad NRA David L. Johnson was discovered floating in the lake. He was pronounced dead at 2:47 p.m. at the Val Verde Memorial Hospital, Del Rio, Texas. He and his partner had been asked to recover a winch for the Diablo East Marina. The dive, their second of the day, was to be at seventy feet. Retrieving the winch, Johnson surfaced to obtain extra line for the buoy line. When he did not return, his partner surfaced and looked for him. Within minutes Johnson was discovered floating near the breakwater. The cause of death was from natural causes and not related to scuba diving.

10/12/1987 War In the Pacific NM Scott Brackett, a 22-year-old airman from Anderson Air Force Base, along with three other diving airmen, was on Asan Beach in Guam. The four had been down to at least 140 feet and then all surfaced but Brackett. Two of the three remaining airmen went back down and found their comrade at 210 feet. They quickly surfaced with the dead man and in doing so, got the bends. They were placed into a hyperbaric chamber and survived the incident. The cause of death for Brackett was not determined at the time of the report.

08/12/87 Channel Islands NP Richard Molton, from Palmdale, California was diving from a dive boat near Anacapa Island in the afternoon. Others found him unconscious about 200 yards from island around 1 p.m. CPR was performed without success. The death was ruled probable drowning. His age was not known.

07/30/88 Biscayne NP A 38-year-old Tennessee man was sport diving with an organized group in the afternoon, when he disappeared in forty feet of water. An air search was initiated by rangers with the assistance of the Coast Guard and Florida Marine Fisheries. Some of his equipment, including air tanks and flotation devices, was found about 300 yards from the dive boat. Underwater search efforts were underway at the time of the report, but were being hindered by six to eight-foot seas. The outcome of this recovery and his name is unknown.

07/30/88 Biscayne NP A 35-year-old Florida man was scuba diving in twenty feet of water near Ajax Reef when he began having difficulty. He was low on air, so surfaced, told his two diving partners of his problems, and began to swim to their nearby boat. About half way to the boat, he stopped swimming and lay face down in the water. All efforts to revive him failed. There were, in fact, two separate and independent scuba deaths in Biscayne on this same day.

05/6/89 Channel Islands NP There was a serious bends incident on a Truth Aquatics boat. The victim was Mr. William Jack, Jr. Nothing else is known and it is unclear if he survived.

05/7/89 Lake Mead NRA John D. Whiltet, 63, was trapped while scuba diving Ringbolt Rapids in Lake Mojave. The report was received via marine radio and within 35 minutes, NPS divers, using a helicopter, were on scene. According to the original report they might have saved him but because the river was flowing at 22,000 cfs, they could not get within thirty feet of him. The river was dropped to 8,000 cfs before divers could get him out. He was recovered four hours later by the divers in thirty feet of water.

05/21/89 Channel Islands NP William Damron, 32 and from Lancaster, California, died while diving from a commercial dive boat on the south side of Middle Anacapa Island. He became separated from his partner and was later found floating on the surface. The cause of death was investigated but a final report could not be found.

07/13/89 Channel Islands NP (1 fatality & 1 bent) Robert McGlaphlyn and Sara Graves were diving from the *Vision* near Santa Cruz Island. Although it is not yet clear what happened, both were stricken with decompression sickness while diving and had to be transported—McGlaphlyn by a Navy helicopter and Graves by a Coast Guard helicopter—to Los Robles. Graves recovered from decompression sickness, but McGlaphlyn died the following day. There is a possibility they were trying to free a lobster from a trap at sixty feet.

This was the third of three incidents that month for serious diving injuries at Channel Islands. On July 1, 34-year-old Craig Lockwood was off Anacapa when he suffered from decompression sickness. He was flown by a Coast Guard helicopter to the hyperbaric chamber at Los Robles. He reportedly suffered from severe brain stem and cerebral damage. Then, on July 9th, 21-year-old Jay Wells (not NPS ranger Jay Wells) was diving from the *Scuba Luver* off Santa Cruz Island when he was stricken with an air embolism to the brain while ascending to the surface. Two park rangers responded to the scene to administer first aid and evacuate the patient by Coast Guard helicopter to Los Robles. Wells spent seven hours in the chamber and apparently recovered fully.

07/14/90 Channel Islands NP Two rangers picked up a distress call from the vessel *Prime Time* while on patrol off the southwest shore of Anacapa Island on the morning of July 14. A 60-year-old retired Army National Guard major general, Raymond Henbrank, was scuba diving with his son when he experienced some problems with his diving gear, ascended rapidly to the surface, and apparently had difficulty punching through the kelp ceiling. Shortly after reaching the surface, he became unconscious. Family members immediately began efforts to resuscitate him. The rangers arrived within minutes and continued CPR efforts for another forty minutes. Shortly thereafter, a Coast Guard helicopter picked up the victim and flew him to St. John's Hospital in Oxnard, where he was pronounced dead. The cause of death was drowning.

08/26/91 Biscayne NP Howard Messner, 43, was scuba diving from a boat off Fowey Light on the evening of August 26, 1991. When he failed to surface at a pre-arranged time, his companion in the boat flagged down a passing vessel, whose operator notified the USCG. The Coast Guard and Florida Marine Patrol

began a joint air and water search of the area. The search continued until midnight, then resumed the following morning, at which time rangers joined the search effort. Teams concentrated on an area northwest of the point where he was last seen. The results are unknown.

06/30/92 Biscayne NP Odalys Villanova, was diving with the victim, Rene Miret, 34, in one of the narrow channels in the north end of the park. When they surfaced, he became unconscious. Odalys removed Miret's weight belt and scuba gear and attempted to swim with him back to their boat. The current was too strong, however, so she swam to one of the nearby Stiltsville houses with Miret in tow. Odalys could not lift him out of the water, so she tied him to a stairway on the house and eventually was able to flag down a passing boat. The incident was investigated by Metro-Dade, although the outcome of the investigation is unknown.

08/25/92 Gulf Islands NS Robert Little, 44, of Mobile, Alabama, was scuba diving with family and friends off the Fort Pickens jetty on the morning of August 22nd when he disappeared. His fellow divers immediately called for assistance from the Coast Guard and park rangers, and a search for Little was begun. He was found unconscious in about 15 feet of water and was brought to shore. Responding EMS personnel were unable to revive him. Rangers learned this was Little's first dive following the receipt of his diving certificate about two weeks prior. He was accompanied by his diving instructor and nephews at the time of the accident. The medical examiner indicated death by drowning.

04/3/93 Lake Mead NRA James F. DeRosa, 41, died in an out-of-air scuba incident in the Boulder Basin in Lake Mead. The body was recovered by NPS divers at a depth of 29 feet within 16 hours of the disappearance.

04/10/93 Amistad NRA Timothy Bazar drowned while with a partner in fifty feet of water. He apparently panicked for unknown reasons and lost his regulator. His partner unsuccessfully attempted to re-establish airflow, then surfaced to get assistance. When he returned, he found Bazar unconscious, again without his regulator. Rangers and paramedics attempted to revive him, but without luck. Bazar was pronounced dead on arrival at the hospital in Del Rio. Alcohol was not involved and a technical expert was to look at the regulator to see if it failed.

06/26/94 Point Reyes NS (free diving death) Robert Lalley, 25, and Bill Eicher, 32, both of Citrus Heights, California, were dropped off by boat to swim ashore and snorkel for abalones near Bird Rock. Eicher made it to shore but saw Lalley was having difficulty. The US Coast Guard sent a helicopter and a boat and Sonoma County sent a medical helicopter. Eicher swam to Lalley, found him unresponsive, pulled him to the rocks and administered CPR. Attempts proved fruitless. Eicher reported Lalley may not have been wearing his snorkel and mask over his face and may have also had too much weight on his belt.

07/22/94 Isle Royale NP Twenty-three-year old Keith Eisen of Owatana, Minnesota, went diving on the *Emperor*, a wreck located off the park's northeast shoreline, along with others from a charter vessel, *The Royal Diver*. When Eisen surfaced from the 130-foot dive, he became unconscious and his breathing and circulation stopped. A paramedic aboard *The Royal Diver* immediately began CPR and administered oxygen. Park rangers were notified by marine radio of the accident and arrived at the site approximately an hour later. Rangers continued advanced life support measures while transporting Eisen by boat to Passage Island for helicopter transport to Thunder Bay, Canada via *Bandage III*, a medical air rescue unit. Eisen was pronounced dead at the Passage Island helipad.

11/12/94 Glen Canyon NRA Brian Liechty was inspecting the hull of a houseboat moored at the Wahweap Marina when he told his companion, Brian Malis, that he was going to dive down and, "touch the bottom of the lake," not realizing the water is over two-hundred feet deep at that location. Malis tried to stop Liechty and swam after him to a depth of approximately forty feet, where he lost sight of him. Malis waited about ninety minutes for Liechty who never resurfaced. On April 19th, his body was found by a small, remotely-operated submersible on loan from a private foundation and was raised to a depth where divers could safely retrieve it.

12/09/94 Channel Islands NP Jim Robinson, 40, a commercial sea urchin diver from the Santa Barbara area, was diving at Talcott Shoals off of San Miguel Island on December 9th when he was attacked by a shark, probably a great white. His tender got him on board their boat, then contacted the Coast Guard. A helicopter was dispatched and transported Robinson to a hospital in Goleta. Although Robinson was still conscious when he was picked up, he died before arriving at the hospital.

01/05/95 Dry Tortugas NP Park staff at Fort Jefferson intercepted an emergency radio message regarding a missing diver from the sailing vessel *Tabitha* in the Garden Key anchorage area on the afternoon of January 5th. When park personnel arrived, they found a diver surfacing, holding the victim, identified as Nestor Crimmins, age 20. Crimmins had no pulse and was not breathing. CPR was begun with the help of a physician's assistant, a pediatrician and another doctor. A Navy helicopter transported Crimmins to a hospital on Key West, where he was pronounced dead.

08/10/95 Lake Mead NRA Len Dayt, 45, of Las Vegas was scuba diving alone near Boulder Beach. After surfacing and indicating he needed help, a companion on a nearby boat swam to him, attempting to pull the diver back into the boat, but was unable to keep him afloat. Park efforts to locate the body were repeatedly unsuccessful. The diver's wife hired a marine salvage company which searched for 15 days over several months and finally found Dayton's body at a depth of two-hundred feet.

08/12/95 Channel Islands NP On the afternoon of August 12th, Omer Joly, 31, of Lompoc, California, was scuba diving with friends near Painted Cave off Santa Cruz Island. The group was between eighty and one-hundred feet below the surface when Joly indicated to his partners he was returning to the surface then disappeared. NPS staff and the Coast Guard were on scene within two hours and began an extensive search of shorelines and nearby ocean areas, employing three patrol boats and a helicopter. Four scuba divers conducted a hasty search of the area. Due to lateness, remoteness, and the depth of the water, an effective search could not be conducted that night. Fourteen park and Santa Barbara County Sheriff's divers found his body the next day at 85 feet.

09/3/95 Biscayne NP Brent Dennison, 36, of Miami, was diving with three men in sixty feet of water at Triumph Reef, about six miles off-shore. The other divers lost track of Dennison while underwater; when they surfaced, they found they were more than a quarter mile from the dive boat and being swept north. One diver discarded his spear gun and held onto a lobster trap float to keep from drifting any further. After about thirty minutes, this diver was sighted and picked up by a fishing vessel. The other two divers were soon rescued, but Dennison could not be found. A search was begun which utilized park, Coast Guard and county vessels, Coast Guard and private helicopters and aircraft, and Coast Guard divers. Despite the good conditions at the time, no sign of Dennison was found. Dennison's family chartered a plane to search for him and the body was found floating within a mile of the point last seen, just outside the park's eastern boundary. Park, Coast Guard, and Florida Marine Patrol units recovered his body.

05/04/96 Amistad NRA Steve Browneller, a scuba diver with ten years' experience, was diving in the lake with novice David Wallace, 44, on Saturday, May 4th, when the two became separated. Browneller searched for Wallace after surfacing, but was unable to find him. He called the sheriff's office via mobile phone, and they notified the park. The park's dive team made two efforts to find Wallace that day, but without success. Browneller told rangers he and Wallace had been diving in the area the day before, and that Wallace had trouble keeping up with him. Browneller therefore decided to follow Wallace in Saturday's dive in order to assure they stayed together, but he got hung up in filament line and lost sight of his partner in heavy brush. Park divers eventually recovered Wallace entangled in monofilament line in about seventy feet of water. Wallace's knife was still in its sheath and he had placed 16 pounds of weights in the pockets of his BC, which was not equipped with dump pouches.

08/10/96 Lake Mead NRA Leonard Dayton, 45, died while scuba diving near the water intake at Boulder Beach. The depth there ranges from 210 to 240 feet and visibility is extremely poor. Repeated efforts by

park divers to find him were unsuccessful. In September, Dayton's wife hired C.R. Cleland's Marine Salvage Search and Rescue to conduct additional searches. Company divers searched on 15 days over several months during the fall and early winter. During their last scheduled dive on December 31st, they found the body at a depth of 200 feet with a remotely operated underwater vehicle. The divers recovered the body and turned it over to the county coroner's office.

10/6/96 Upper Delaware Scenic and Recreational River Diver Mark Podgorski was diving with a group from Penn State University on a deep dive, just over one-hundred feet. His companions reported they'd been at that depth for about thirty minutes. The trio stopped at a depth of 15 feet while ascending for a five-minute safety stop when Podgorski began making hand signals and surfaced. His companions found he was having difficulty breathing and helped him to shore where they began CPR when he stopped breathing. Taken to a medical facility, he died of brain hypoxia, a result of decompression sickness.

06/06/97 Fire Island NS Anthony Carone, 39, was last seen on his vessel anchored in the Great South Bay at Talisman on the afternoon of June 6th, when he told another party he was going to replace some of the mooring chain on his sailboat. He had donned scuba gear and began diving. Suffolk County police divers and helicopters were searching the anchorage at the time he was reported missing. Although the water is only ten feet deep, eel grass in the area hampered search operations. He was found by police divers three days later.

09/21/97 Gateway NRA, Sandy Hook Unit On the afternoon of September 21st, 51-year-old James Sicina advised Sandy Hook rangers he was unable to locate his diving partner, 44-year-old Carlos Narciso. The two, both very experienced divers, had been together in the shallow waters of Horseshoe Cove. They became separated in the low visibility and Sicina became alarmed when Narciso failed to surface at the expected time. Narciso's body was found in five feet of water that evening.

06/11/98 Lake Mead NRA Michael Shepard, 49, died while scuba diving near Davis Dam in Lake Mohave.

07/30/99 Isle Royale NP The park received an urgent call from a chartered commercial dive boat moored near a shipwreck off the shore of Isle Royale at 1:40 p.m. on July 30th. The caller reported there was an unconscious diver aboard who might have suffered an air embolism. Douglas Van Damme of Baldwin, Wisconsin, and partner Rick Funk had completed a one-hundred-foot dive to the bow of the *Congdon*. Van Damme signaled his intention to ascend just ten minutes into the dive. At a depth of around sixty feet, Funk saw Van Damme sink past him toward the bottom. Funk swam back down and found Van Damme unconscious and with his regulator out of his mouth. He grabbed Van Damme and made an emergency ascent and others on the boat began CPR. Van Damme was pronounced dead at the helicopter ambulance.

08/24/03 Sleeping Bear Dunes NL On August 24th, Ranger Nate Mazurek responded to Leelanau County emergency radio traffic regarding a possible scuba drowning at the *Three Brothers* shipwreck off South Manitou Island. The victim's family used their powerboat, which had been moored at the buoy at the shipwreck, to transport her to the South Manitou Island dock. When Mazurek arrived, two people were administering CPR to her on the floor of the boat. Two visitors – a paramedic and a registered nurse – came aboard and continued CPR. Eventually she was moved to the dock, where an AED was employed. CPR continued until the Coast Guard arrived and flew her to Munson Hospital and was declared dead. The woman's name is unknown.

11/29/06 Gateway NRA, Sandy Hook Unit On November 29, Gateway's Sandy Hook Unit rangers, with assistance from local police and EMS, responded to a medical call for a diver who was on shore but not breathing. Attempts to revive the diver were unsuccessful; he was later declared dead at the Monmouth Medical Center.

07/13/07 Channel Islands NP Diver Stewart Hindley, 54, of Glen Allen, California, was reported missing by his diving partners around 9:30 a.m. on Tuesday. Hindley was on the third day of a three-day diving trip and was diving off the Adventure Sports dive boat *Vision* off Sandstone Point on Santa Cruz Island.

He was last seen at a depth of seventy feet about 100 yards from the point where the boat was anchored. NPS and Coast Guard personnel and Los Angeles county lifeguards responded and conducted an extensive air, sea and underwater search until dark, but were unsuccessful. The search resumed the next morning, with the Santa Barbara County Sheriff's Department joining in. The park and county conducted a joint underwater search off the NPS vessel *Ocean Ranger*. County divers found the body on the seabed at a depth of about 80 feet around 10:30 a.m.

09/24/07 Biscayne NP An unnamed diver, 45, died in 60 feet of water, off Homestead. The Miami-Dade Police Department's Homicide Bureau was investigating the cause of death, according to a news release from Detective Carlos Maura, a spokesman for the department. The man and two friends were diving in about sixty feet of water about 11:45 a.m. when the incident occurred, the release said. A friend noticed he had become separated from his diving equipment. When emergency personnel arrived, the man was pronounced dead. "No foul play is suspected," police said.

02/09/08 Lake Mead NRA A 40-year-old Las Vegas man died during a technical dive on the PBY Catalina Flying Boat that crashed, burned and sank in the lake on October 29, 1949 and was re-located by NPS divers in 2007. In October 2007, the craft's position in Boulder Basin was given to the diving community by order of Superintendent Bill Dickinson and divers invited to use it at their own risk. The diver was with three other men when he apparently developed trouble with his air supply.

03/17/08 Dry Tortugas NP Rusty Mason, 54, a Florida Department of Environmental Protection employee, died following a diving accident. He was working on a survey of the sea bottom. He was diving from the National Oceanic and Atmospheric Administration Patrol Vessel, *Peter Gladding*, and participating in a joint dive operation. Between the distress alert by his dive partner, until the victim was onboard the 57-foot vessel, only seven minutes had elapsed. CPR and oxygen were administered immediately. The victim was found on his side in 103 feet of water, which had about a one-hundred-foot visibility. They rushed Mason to Fort Jefferson where they were met by a rescue helicopter, which flew him to the Lower Keys Medical Center in Key West.

07/05/2010 Biscayne NP (free diving death) Blanco Hernandez, 23, was free diving with three companions along the outer reef tract near Fowey Rocks on July 5th when he failed to surface from a dive. His companion, Pedro Fernandez, dove down to where he'd last seen Hernandez and found him lying face down in sand in about 40 feet of water. Fernandez eventually recovered Hernandez' body and transported it to Miami. Police and the coroner's office are investigating the death. Hernandez immigrated to the United States from Cuba six years before and was an avid spear-fisherman and free diver.

12/11/10 Delaware Water Gap NRA John Osterhoudt, 26, of Wappingers Fall, New York died after diving in the Delaware River. Osterhoudt was one of four diving near the Dingmans Ferry Bridge, where it is about 14 feet deep. Two of the divers were instructors and two, including the victim and his wife, were students. One of the instructors signaled the students to surface; the Osterhoudts acknowledged and began a normal ascent. Due to the current, they became separated as they were ascending. As the man swam toward shore, one of the instructors soon noticed that John Osterhoudt was face down in the water and unresponsive. He began surface breathing while towing the man to shore, where CPR was immediately started. A ranger responded and applied an AED, without success.

09/29/12 Lake Mead NRA Xavier Fleuranceau , a 49-year-old Utah man, died of unknown causes while scuba diving in the Black Canyon area of Lake Mead. At 12:47 p.m., the park's Interagency Communication Center received a marine-band radio distress call, reporting a diver floating face down in the water. Fleuranceau was a mixed-gas instructor who was diving with a group at depths around 350 feet when he ran out of air. His dive partner shared a spare tank as the two began to ascend. At some point, Fleuranceau separated from the safety line and performed a free ascent without gas. The other divers ascended using normal decompression without incident.

06/01/2013 Lake Mead NRA William Meyer, 52, from Las Vegas, Nevada, was the victim of a diving accident in the Kingman Wash area, located on the Arizona side of Lake Mead, just north of the Hoover Dam. Witnesses said that the man was unresponsive when he surfaced. People aboard a bystander boat initiated CPR and transported the victim to Hemenway Harbor where emergency personnel from the NPS provided advanced life support; they were unable to resuscitate the diver.

07/13/2013 Isle Royale NP Lloyd W. Krohn, 55, from Wyoming, Minnesota, was pronounced dead by park EMTs after suffering problems while scuba diving off Isle Royale National Park. Krohn was part of a charter group diving with the charter *Lake Superior Diver* at the shipwreck of the *Kamloops*. At about 10 a.m. his diving partners noticed Krohn was experiencing difficulties. They attempted to assist him but were forced to send him to the surface alone after he became unconscious. He was spotted by the boat crew and was brought aboard unresponsive and not breathing. Park rangers responded to the incident after receiving a distress call on marine-band radio. The *Kamploops* is considered an expert dive due to the depths involved. Most of the wreck, located approximately 300 feet from the north shore of Isle Royale near Todd Harbor, lies below 200 feet. The ship, a 250-foot Canadian package freighter, went down in a severe storm in December 1927. Its location was unknown until sport divers located it in 1977.

10/02/2014 Channel Islands National Park Michael Grennier, 53, from Oxnard, California, was found floating alongside a recreational dive boat in the Frenchy's Cove area of Anacapa Island.

SOME KEY PEOPLE IN NPS DIVING
(ALPHABETICAL)

There have been numerous people down through the years who have made the National Park Service diving program an unqualified success and the authors wish to genuinely thank them. Additionally, we also understand and want to acknowledge that there are many others who may remain nameless but have contributed to this program in countless ways, making it safe, productive, and an envy within the federal government.

John Benjamin was born in Freeport, Long Island, New York on October 28, 1943. He began his long NPS career as a park naturalist, spending the summers of 1968 and 1970-71 in Dinosaur National Monument, while both an undergraduate and then graduate student at New York State College of Forestry at Syracuse University. His first permanent NPS position was as a ranger at Lake Mead, beginning in 1973, where he received his basic NAUI diving certification in 1974 and divemaster in 1976. He was a very active member of the Area's dive team performing many maintenance dives and the always ubiquitous, body recoveries.

In 1977, he moved to Glacier National Park as the assistant wilderness specialist, where again he was a leader in the park's diving efforts. There were four NPS divers in Glacier at the time. John worked with a local PADI instructor to be trained as an ice diver and in swift water diving. He significantly improved the park's dive locker and equipment, including securing dry suits for the team. Additionally, and maybe more importantly while in Glacier, Benjamin was very involved in both Rocky Mountain and Southwest Regional diving activities, including coordinating several workshops and serving as an assistant regional dive officer.

In 1981 and for the next eight years, he worked as the Wahweap district ranger at Glen Canyon, where he again was very active in both underwater maintenance and recovery operations for the many victims of water-related accidents. He served as the Rocky Mountain Region dive officer from 1986 until he transferred to the Grand Canyon as the South Rim district ranger in October of 1989. Benjamin went on to be the deputy superintendent of Boston National Historic Park (1991-1996), superintendent of Lake Meredith National Recreation Area (1996-2001), deputy superintendent of Everglades National Park (2001-2005) and in March of 2005, became superintendent of Carlsbad Cavern National Park. Throughout Benjamin's long NPS career, he has always been among the Service's leaders in diving-oriented management and totally committed to the agency's diving program. With 45 years in the service, he retired on October 3, 2013.

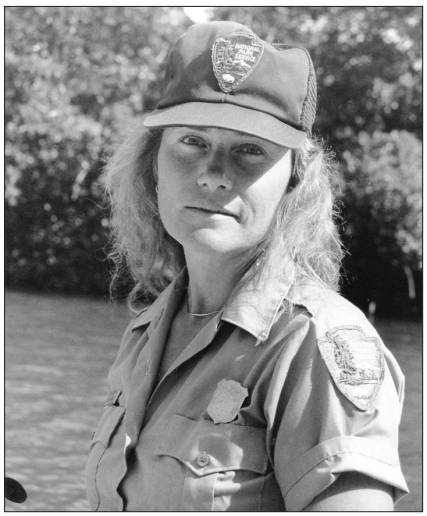
Jim Bradford was born in 1950 in Morenci, a copper mining town in southeastern Arizona. He graduated from Morenci High School and then Northern Arizona University, with a degree in Archeology. Starting with the NPS in Santa Fe in 1978, he participated in SCRU/SRC operations and trained NPS divers in underwater documentation when available for 37 years. He was certified as a NAUI diver by Dan Lenihan in a course run by SCRU instructors in Santa Fe. A longtime terrestrial archeologist in the (former) Southwest and Intermountain regions, Jim served as the Intermountain regional archeologist for the last 14 years. Bradford is an expert at mapping and evaluating sites on land and underwater. He took part in many submerged site surveys for SRC, covering 25 parks in five NPS regions, including Dry Tortugas, USS *Arizona* Memorial, Biscayne, Lake Mead, Isle Royale, Lee's Ferry (Glen Canyon), Olympic, Amistad, Channel Islands, American Samoa, Ellis Island, Yellowstone, Kaloko-Honokōhau and Glacier, to name a few.

Former SCRU/SRC Chiefs Lenihan and Murphy say that almost as important as his own work is his ability to convey his knowledge to others, teaching many sessions on underwater mapping and documentation to park and law enforcement dive teams. Towards this end, in 1995 he was certified a NAUI instructor (#16928) for nine years, certified in open circuit mixed-gas technical diving (for deep diving as part SRC ops in Lake Mead), and recorded over 1,100 dives to date. Bradford brought extensive experience in NPS archeological resource management to the table at SRC projects and contributed to reports and publishing for SCRU/SRC operations. He was senior author of *Yellowstone National Park Submerged Resources Survey* (a 2003 product of the Systemwide Archeological Inventory Program), authored chapters in the 1987 *Charles H. Spencer Mining Operation and Paddle Wheel Steamboat Site Report,* coauthored an article for *Natural History* magazine, and contributed underwater photographs for other articles on NPS underwater archeological operations.

Bradford retired as the Intermountain Regional Archeologist in 2016 and lives in Santa Fe, NM.

Thomas Kenneth "T.K." Brown was a Lake Mead patrol ranger/diver. At the age of 56, he died of a heart attack while on an official NPS dive on August 31, 1973, performing an advanced dive in Ringbolt Rapids. The divers were below Hoover Dam on the Colorado River at river mile marker 30, which is on the downstream side of the Rapids. His dive partners were Rangers Harry Steed and John Chew. Jim Burnett was surface tender in the boat. Brown had received a Whamco Divers' certificate on September 19, 1971, followed by a NAUI certificate also signed by NAUI instructor Harry Wham, on December 17.

Originally the government denied Brown's widow, Gwendolyn, any death benefits, claiming Brown had died while off duty, which was technically correct. However, due to his patrol schedule and the inability of his being able to maintain credentials while on duty, he was authorized by his then supervisor, Mack Shaver, to dive on that refresher that day. Eventually, the federal government overturned its original decision and declared that Brown had died on government duty. Brown was born on July 21, 1917 and is the only NPS diver to die while diving.



Toni Carrell, PhD was born in Oakland, California on June 15, 1946, while her father served in the US Army. She is an underwater archeologist who has worked on sites from the Great Lakes to the western Pacific, and from WWII to early man. She received her BA in anthropology in 1975 from the University of California, Santa Cruz, where her love of both diving and archeology began. She received her basic scuba certification in 1973. Toni's first full blown underwater archeological project was in 1975 at Warm Mineral Springs, Florida on an early-man underwater site.

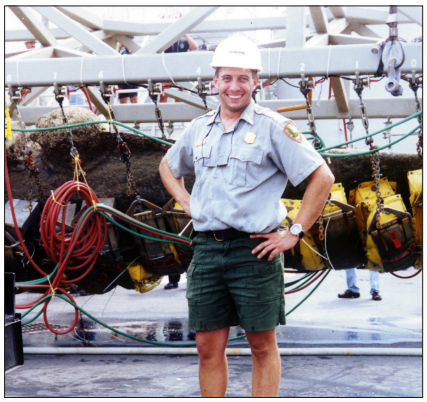
Carrell joined the NPS in 1976 as a member of the National Reservoir Inundation Study. Two years later, she completed a course in underwater photography and videography at the Oceaneering International Commercial Diving Center. In 1979 she was the first NPS employee to be sent to a NAUI instructor Training Course, earning top marks in her class. At the same time, she was cross-certified as a NAUI and YMCA instructor and rescue diver instructor. When SCRU started in 1980, she became one of the founding members, remaining an integral part of the elite group for the next ten years.

From 1985 through 1989, she was the first female NPS regional dive officer, serving in the Southwest Region. While with the NPS as well as in future endeavors, Toni worked in many foreign countries and on numerous "firsts," such as with US Navy divers directing the first archeological documentation of shipwreck sites in Palau. On April 7, 1990, she left the NPS and SCRU and began work with Ships of Discovery, an underwater archeological organization in Santa Fe, New Mexico.

In 1995, she assumed the highest elected position in her field, chair of the Advisory Council on Underwater Archaeology. She was the first woman to do so, and in 2007 was elected as an *emeritus* member of the council. She earned her PhD in maritime history at University of St Andrews, Scotland in 2002. Among her many accolades and awards, she was elected to the prestigious Women Divers Hall of Fame in 2001, an international organization that recognizes women divers. Dr. Carrell was elected to the UNESCO International Committee on Underwater Cultural Heritage in 2007 and today continues her active involvement in underwater cultural heritage management issues and still works with Ships of Discovery.

John Cook is not a diver but was one of *the* driving forces behind the creation and continuance of the Submerged Cultural Resources Unit in Santa Fe. Suffice it to say that if it were not for Cook, SCRU might not have either come to into being or remained. He is a third-generation member of the NPS family; as of 2016 four generations of Cooks have served in the NPS. He was born in Williams, Arizona, while his father was stationed at Grand Canyon National Park. Cook began his NPS career in 1953 as a seasonal packer (mule skinner) in Saguaro National Park, where his father was superintendent. He graduated from Northern Arizona University, where he was student body vice-president, with a BS degree in business administration and education in 1957. In 1993, NAU conferred upon him an honorary doctorate degree in recognition of his "exemplary contribution to the university and the greater scholarly community."

He began his quick management rise in a highly unusual move. Interior Secretary Stewart Udall personally plucked young Cook from his job as a supervisory park ranger at Yellowstone in 1963 and appointed him assistant superintendent at Canyon de Chelly National Monument, and in 1966 he became the superintendent. The NPS at that time was "lily white" and the Secretary wanted someone who could speak Navajo, and Cook could. He went on to become the associate director in the NPS, as well as the regional director in two NPS Regions (Southwest and Rocky Mountain/Intermountain) and one to-be region, Alaska. Cook was the regional director of the Southwest Region (the home of SCRU) twice, the first time was January 16, 1977 to March 18, 1979 and then again on August 3, 1986.



Dave Conlin, PhD was born in 1964 in Boulder, Colorado, and was raised there. He always wanted to be an underwater archeologist, "since I was eight, thanks to articles in National Geographic." He learned to dive in 1983 in the Hood Canal near Portland, Oregon, while working on his undergraduate degree from Reed College. He received a master's degree from Oxford University in Aegean and underwater archeology and then followed this with another master's and then a PhD in anthropology and archeology from Brown University. While there, Conlin began volunteering with the NPS Submerged Cultural Resources Unit, beginning in 1993 during the extensive field seasons at Dry Tortugas National Park.

From 1993-1996 Conlin split his summers between the Dry Tortugas and Greece, where he was doing PhD research on Mycenaean Bronze Age maritime trade. From 1997-1999 he lived in Greece and finished his dissertation. "My first underwater archeological school was Texas A&M with Donny Hamilton at Port Royal in Jamaica in 1987." Following graduation from Brown, he took a position as an underwater archeologist with the NPS but, detailed to the United States Navy. While with the navy he helped plan and execute the recovery of the world's first successful combat submarine, the Confederate submarine HL *Hunley;* lost off of Charleston, South Carolina in 1864.

Following the *Hunley* project, Conlin moved to Santa Fe to join the Service's Submerged Cultural Resources Unit (which became the Submerged Resources Center while he was there) and continue diving on shipwrecks around the country and the world. Along with Brett Seymour and Matthew Russell, he became a NAUI instructor through Jeff Bozanic in Santa Fe, in 2000. As an NPS diver, Conlin has trained and used many different types of diving equipment including scuba, open circuit mixed gas, closed circuit rebreathers, and commercial surface-supplied helmets. He received his initial rebreather training with Bozanic while at Lake Mead in 2006, preparing for a project on the sunken B-29. In 2009, after the SRC moved from Santa Fe to Denver, he assumed the position of chief of the Center. As of 2016, he is the Chief of the NPS Submerged Resources Center and lives in Boulder, CO with his wife Michelle.

Stu Croll was born in Baltimore, Maryland on May 8, 1937. He received a BA from the University of Virginia in 1960 and from 1960 till 1965, was an officer in the US Navy, where he carried out oceanographic and hydrographic research in conjunction with the Thai and Burmese governments. He began his NPS career in 1966 as a sub-district ranger in Olympic National Park and from 1966 to 1972 was the park's assistant chief ranger. In 1968 Croll became a member of the Olympic dive team. He was in a class taught by Scripps' Jim Stewart while in Olympic in 1970. From 1972 – 1973, while an Albright Training Center training specialist, he assisted co-worker Don Brown in coordinating NPS training at Scripps. Then, from 1974 to 1976, he became the service's coordinator for the annual Scripps training. In 1975 he was on a Servicewide task force to review and revise the NPS diving policy. He finally attended Scripps as an advanced diver in 1977. From 1977 – 1994, Croll was the chief ranger at Isle Royale National Park and was a member of the park's very active dive team. Beginning in 1980, Isle Royale began a systematic study of all of its shipwrecks, using the fifty-foot research vessel *SPRUCE HILL* from Northern Michigan University. This was prior to the study started by the service's SCRU.

The following is from Croll's application for his Enhanced Law Enforcement Retirement (6c) application:

> Isle Royale has the largest and best collection of fresh water shipwrecks in North America. They act as a magnet for shipwreck divers from all over the Great Lakes region and from around the

country. These valuable … resources were being depleted…To adequately protect these artifacts, I established a Dive Program which included technical training in deep, cold water and under ice diving for Commissioned Park Rangers, under water archeological mapping and wreck site inventory in conjunction with the SCRU…a mooring buoy system to protect the wreckage fields from indiscriminate anchoring, a medical assist program to respond to diving emergencies…In addition, through an active campaign of diving with users, instigation of charter boat services under a concession permit, developing a brochure on diving for widespread dissemination, implementing a registration system, developing underwater interpretive devices, and having well-equipped patrol boats with knowledgeable and experienced law enforcement ranger/divers on board, turned 700 divers who made over 2300 dives/year into the best protectors of the resource… All PFT and STF law enforcement officers were trained SCUBA divers. I was a qualified Dive Master, the Regional Dive Officer (1980—1994) and a member of the National Diving Control Board.

Gary T. Cummins, from Crow Agency, Montana, was born on September 9, 1940. He worked as a high-altitude test subject for the US Air Force, as a seasonal park ranger at Glacier National Park and Padre Island National Seashore, a military intelligence analyst at the Defense Intelligence Agency, and a university administrator at the University of Montana, New Mexico State University, and the University of Hawai'i. He received a BA and MA in history at the University of Montana, but also studied anthropology and archeology at New Mexico State University. In 1972, while working at the University of Hawai'i and as a volunteer at the Bishop Museum in Honolulu, he met T. Stell Newman. Newman (superintendent at Guam's War in the Pacific National Historic Park when killed in a tragic auto accident 1982) was leading a statewide survey of historic and archeological sites in Hawaii and offered Cummins a job as a survey historian on the project. Two years later, Newman joined the Service as an archeologist at the Denver Service Center and Cummins took over as manager of the statewide survey. During this time, Cummins became NAUI certified through Dan's Dive Shop in Honolulu and became highly active in diving in Hawaii.

While heading up the Hawaii statewide survey, Cummins developed personal and professional relationships with NPS Pacific Area director, Bob Barrell, Pacific Area historian Russ Apple, and Pacific Area archeologist Ed Ladd. He was soon recruited and joined the NPS in the Service Center, where he was mostly involved in historic preservation and compliance matters. He describes himself as an "archeocrat," rather than an archeologist at that time, and missed working directly with the resources.

In 1980, Cummins got a call from Barrell about a job in Hawaii. Hawaii Senator Dan Inouye, dissatisfied with the Navy's interpretation program at the USS *Arizona* Memorial, had inserted language in a Defense Authorization Bill that called for the Navy to construct a visitor center on the shore near the memorial in consultation with the NPS. In August of 1980, Cummins became the first superintendent of the memorial. He brought SCRU in to complete the first-ever survey of the *Arizona* wreck in 1983/84, resulting in a ground-breaking work that shifted the paradigm for large-scale, low-visibility mapping techniques. This work would not have been possible without Cummins' extensive coordination with the Navy, which set a precedence for NPS/navy collaboration for years to come. He estimates he did 250 dives in and around the park during the five years he was there. In 1985 he moved on to a DOI management training slot at the Washington Support Office. In 1986, he moved to Cabrillo National Monument and was the superintendent there until 1989. He pretty much "hung up his fins" when he went to Petrified Forest National Park as superintendent. He went on to Grand Canyon as deputy superintendent, and finally as manager of the Harpers Ferry Center, retiring in 2005.

Calvin Roy Cummings was born in Flagstaff, Arizona on March 19, 1939. His family lived immediately outside of Grand Canyon National Park. He was a major influence in early NPS research diving and in the forming of SCRU. During most of his career he was involved, in some fashion, with a great many projects, conferences, and various gatherings, dealing with diving and underwater archeology. He began his NPS career in 1962 as an archeologist/ranger at Wupatki National Monument. He then served at Tuzigoot National Monument as a park archeologist, followed by Sanford Recreation Area (now Lake Meredith National Recreation Area) as a protection ranger. From 1969 to 1972 he served as the superintendent of Gran Quivira National Monument (now Salinas Pueblo Missions National Monument). From 1972 to 1978 he

served in the Southwest Region in Santa Fe, where he became the regional archeologist. He then went to the Denver Service Center, and in 1983 and 1984 he served as the NPS chief archeologist. From 1985 until his retirement, he was the NPS senior archeologist.

He was a search and rescue diver at Lake Meredith, and participated in research dives at Montezuma Well in 1968, Dry Totugas in 1971, and Gulf Islands in 1973. He was the prime mover in obtaining money for forming the NRIS core team and partnered heavily with Doug Scovill, NPS' chief anthropologist, toward that end. He hired Dan Lenihan in 1974 from Southeast Region and nurtured the development of the NRIS through to its completion in 1980. He was a driving force for the formation of SCRU in 1980, along with Scovill and Jack Morehead. He served as president of the American Society for Conservation Archaeology and also served on the Advisory Council for Underwater Archaeology. On March 1, 1997, he retired as the Service's senior archeologist after 35 year with the NPS. Cummings died on September 2, 2000 of lymphoma.

Richard Curry was a longtime contributor to the NPS diving program. Almost all of his long NPS career was spent at Biscayne National Park. He was trained as a marine biologist and worked in that role from the early 1970s to his retirement. Curry was involved in the Florida Aquanaut Research Expeditions (FLARE) project, which included saturation diving and an undersea habitat in south Florida. In addition to being a NAUI instructor, he was the chairman of the first National Diving Control Board and Southeast regional dive officer in 1992 and 1993. Curry often contributed to SRC operations when they took place in South Florida.

Gary Everett Davis' *Curriculum Vitae*, which includes publications (nearly 150), consultations, directorships, keynote speaker, agency representative, trainings, and numerous awards, is extensive and very impressive. After coming to the Service in 1964 as a ranger/trainee at Lassen Volcanic National Park, he retired in 2007 as the chief ocean scientist of the National Park Service. He had been a working NPS diver for 43 years; perhaps the longest consecutive collateral duty in the history of the National Park Service.

In 1962 he was first certified through the National Association of Scuba Diving Schools (NASDS) by Bill Johnston with San Diego Divers Supply, although he received informal dive training as early as 1957. In 1964 he showed his NASDS card to the chief ranger and went to work doing resource monitoring and explosives work to clear road drains in Lassen. By 1968 Davis found himself at Virgin Islands National Park as a park ranger. He now had an MSc in biology from San Diego State College and an assignment that would keep him on his toes for at least two years. He was an aquanaut and Service representative to the Tektite I project from 1968-69, during which his job title became marine biologist. This was a project in which aquanauts, saturated with nitrogen, lived underwater; he studied lobster feeding ecology. He developed an interest in how marine systems replenished themselves in the face of pressure from a modernized fishing industry.

From 1971 and into 1980, Davis served as a marine biologist in varying capacities, with increasing responsibilities in Everglades. In 1971, he was trained as an NPS divemaster at Scripps, followed by a NAUI instructor certification (#3774) at La Jolla in 1974. He and Don Weir, a NAUI instructor from Biscayne, co-taught an NPS course there that same year. Davis moved to Channel Islands National Park in 1980 and worked to establish long-term monitoring protocols in the park and associated National Marine Sanctuary. He remained stationed at Channel Islands until his retirement, although from 1993 through 1997, he actually served with the US Geological Survey. He returned to the NPS in 1997 and remained with the Service as science advisor and chief ocean scientist until 2007.

He served as president-elect of the American Academy of Underwater Sciences from 1985 to 1986, and as president of AAUS 1987-1988. He represented natural resources programs on the NPS National Diving Control Board from 1985-1993 and chaired it for the new National Biological Survey (now USGS) from 1993 to 1996. During 1993-6, Davis was also president of the prestigious George Wright Society. With the possible exception of Dan Lenihan, until his retirement in 2007, Davis possibly made more NPS dives than anyone else in National Park Service history.

James P. "Jim" Delgado, PhD was born in 1958 in San Jose, California, and was raised there. He always wanted to be an archeologist; his first excavation was at age 14. In 1978 he joined the NPS through the Cooperative Education Program and worked at the Western Regional Office. He then headed to Golden Gate National Recreation Area as a ranger at the Historic Ships Unit at Hyde Street Pier before being

assigned as the park's first (acting) historian. He was made permanent in 1981 when he graduated with a BA in history at San Francisco State University. He learned to dive at the Presidio of San Francisco, trained by MSG Lawrence "Dutch" Bowen, and received a NAUI basic certification in 1981.

He soon earned a master's degree from East Carolina University in maritime history and underwater research in 1984-1985, while on leave from Golden Gate. Jim left the NPS after serving for nearly five years as the first maritime historian of the NPS and head of the National Maritime Initiative, having "done everything we promised Congress we would do, on time, and under budget." His next stop was Vancouver, British Columbia, to become the executive director of the Vancouver Maritime Museum where he served for 15 years.

At the museum, he also served ten years as one of Canada's representatives on the International Committee on Underwater Cultural Heritage for UNESCO. As president of the Council of American Maritime Museums, and as a member of the board of the International Congress of Maritime Museums, he took a leading role in dealing with the RMS *Titanic*, and in 2000, was the first archeologist to dive to the wreck. Jim also served six years as host of the National Geographic international television series, *The Sea Hunters*, focusing on shipwreck archeology and preservation with author Clive Cussler.

In 2006, he received his PhD in archeology from Simon Fraser University in British Columbia. He left the museum that year to become the president and CEO of the Institute of Nautical Archaeology, serving until September 2010, when he rejoined the federal service as the director of maritime heritage for NOAA's Office of National Marine Sanctuaries. He is the author of 33 books, numerous articles, and "has had the privilege to participate in a number of exciting shipwreck projects."

As an NPS diver, Jim trained primarily in scuba. With advanced and scientific diving certifications and as a NOAA scientific diver, he is now well into his third decade of diving, having logged over 2,000 career dives. As of 2016, Jim lives in Jacksonville, Florida with his wife Ann. He is currently the senior vice president of the archeological consulting firm SEARCH, Inc. "I am proud of my time in the NPS and greatly value the friends and colleagues I worked (and still work) with."



Charles R. "Butch" Farabee, Jr. was born in Valparaiso, Indiana on October 18, 1942. He began his NPS career in 1961 as a seasonal laborer on the trail crew in Sequoia & Kings Canyon National Parks. When he retired on the last day of 1999, he had 35 years of federal service. Butch was the Service's first emergency services coordinator, from 1987 to 1991, with emergency medical services, diving, search and rescue, health and fitness, incident command, and aviation in his portfolio. As such he coordinated diving within all of the regions and compiled the first list of all NPS divers in 1988. While in that role he completely revamped and updated Service's *NPS-4 – Diving Guidelines* as well as was heavily involved in regional dive matters.

Farabee first put a scuba tank on in 1958, in of all places, Tucson, Arizona. Later, while attending the University of Arizona, he bought equipment and taught himself to dive in 1961, the first year he began working as a trail crew laborer for the NPS. He finally became NAUI certified by Whamco Divers during his first permanent ranger assignment at Glen Canyon National Recreation Area in October of 1965. Due to his mother's health he soon left Glen Canyon and began a three-year term with the Tucson Police Department, after which he rejoined the NPS and went to Lake Mead from 1968 to 1970, in a position created for him due to his police training and experience. He moved to Yosemite in 1971, where he served as a field and supervisory park ranger as well as the Yosemite dive officer for ten years.

He went through Scripps training in 1969 and then returned as a divemaster several years later. He transferred to Grand Canyon in 1981 as assistant chief ranger, where diving and search and rescue counted among his among his other duties. After four years in the Washington Support Office, he spent the next five as the superintendent of Padre Island National Seashore, finishing his career as the assistant superintendent of Glacier National Park. In 1999, he retired as the acting superintendent for Glacier. Ultimately, he worked in 11 units of the NPS, with diving responsibilities in Glen Canyon, Lake Mead, Yosemite, Grand Canyon, and in the Washington Support Office. With now approximately 900 dives, he continues to dive recreationally today and fortunately, not for bodies.

George R. Fischer was born on May 4, 1937 in Susanville, California. He received a BA in anthropology from Stanford University in 1960, completing graduate work there as well. His NPS career began in 1959, serving as a seasonal ranger and archeologist at Mesa Verde National Park and Wupatki National Monument until 1962, when he became a permanent archeologist at Montezuma Castle National Monument. In 1964 he moved to Ocmulgee National Monument and then two years later, to the Washington Support Office to serve as a staff archeologist in the Division of Archeology and Anthropology. While there he performed general archeological resource management and research and began pursuing his interests in underwater archeology. To this end and while in Washington, he obtained a basic diving certificate from the YMCA in early 1968. This soon led to participating, along with three other NPS divers, in the first underwater archeological investigation using scuba in the NPS, at Montezuma Well (part of Montezuma Castle) in 1968.

In 1972, Fischer took a position as a research archeologist at the Southeast Archeological Center (SEAC) in Tallahassee, Florida. SEAC's close association with the Florida State University (FSU) Department of Anthropology led Fischer to work with archeology faculty and students there. Upon his retirement from the NPS in March of 1988, with more than 27 years of service, he became a courtesy assistant professor. During this time with FSU, Fischer served as an instructor of key underwater archeological courses, and can take credit for mentoring a great number of students, some of whom have gone on to become well-recognized in fields related to underwater archeology.

George served as an investigator on numerous field projects, both on land and in the water, throughout both his NPS and FSU careers. They include the mentioned Montezuma Well operation, as well as significant efforts at Fort Jefferson, Gulf Islands, Virgin Islands, Padre Island, Biscayne, and Fort Matanzas and Castillo de San Marcos National Monuments. In recognition of his contributions to the field, FSU dedicated the George R. Fischer Laboratory of Underwater Archaeology. At the 43rd Annual Conference on Historical and Underwater Archaeology in 2010, Fischer was presented with the Society for Historical Archaeology's Award of Merit, "for his many contributions to the development of underwater archeology and for his exemplary service on the Advisory Council on Underwater Archaeology." This was just one of numerous awards that he received for his service. At retirement, he was the supervisory research archeologist at SEAC. On May 29, 2016, Fischer, age 79, passed away in his home of Tallahassee, Florida, with his wife Nancy at his side.

Pat Horning was born in Phoenix, Arizona on July 26, 1959, and has worked for NPS facilities management at Grand Canyon, Olympic, and Glen Canyon since 1987. As of 2016, he is the Facilities Manager for Operations and Special Projects at Glenn Canyon NRA. In 1985, his wife Lisa Riedel fell while rock climbing and lost the use of her legs. They both took up diving in 1987 to remain active together outdoors. A year later, shortly after being NAUI certified, he was asked to join the Glen Canyon dive team. In 1995, he was made the park dive officer. That same year he became a PADI divemaster, as well as an advanced and rescue diver, finally in 2011, Pat became a NAUI instructor for the NPS.

> When I heard Park Dive Officer Ron Martin was retiring in 1995, I knew I had to have the position he vacated. I was selected…my goal was to be the best public safety dive team in the nation…Because of special circumstances, I made the first of my roughly 250 body recoveries, alone. At that point, something stirred inside me and I knew this was important work and I felt as if I had finally found what I was meant to do.

Horning has been very successful, passionately guiding the Glen Canyon Underwater Recovery Unit to become a much sought-after resource, not only within the Service. In 2011, it was recognized as the best unit in the NPS, and arguably may be the best public safety diving team in the country. The park has become a leader in large scale, deep, rough terrain searches.

> It is our system of search that makes it work, this includes how we gather information, interview witnesses, apply theories of probability, use GIS and mapping and finally our dedicated and knowledgeable divers, side scans and ROVs, along with diligence and commitment to the job.

They have assisted numerous national parks in the west as well as Alaska's Kenai Fjords National Park. Additionally, there is considerable demand for their skills and tools by non-NPS law enforcement and emergency agencies, with recoveries and various searches in neighboring states. They have refined the use of side-scan sonar and remote operated vehicles for deep searches and dives, with their deepest recovery at 497 feet, as well as going to 800 feet in Crater Lake. Their deepest body recovery on air was at 187 feet.

Ron Ice was born on a farm east of Lamar, Colorado on November 5, 1932, graduating from nearby Holly High School in May 1950. He spent the next three years in the US Navy, until November 1953, and then headed to Louisiana State University, graduating in 1961 with a BA in cultural geography/anthropology. Graduate school came next, from 1961 to 1965, at the University of New Mexico. His NPS career began as a seasonal ranger/archeologist at Gran Quivira National Monument in November, 1964, receiving a permanent appointment as a park ranger on July 4, 1966. He then served as either a park ranger and/or archeologist at Petrified Forest, Tonto National Monument, and Lake Meredith, as well as was the Southwest Region archeologist from 1975 to May 1993. He retired then from the NPS after 27 years with the NPS, and 32 years of total federal service.

In order to participate on the Lake Meredith search and recovery team, Ice did scuba training in Amarillo, Texas, being certified on June 9, 1970, by the Southwest Council of Skin Diving Clubs. He received a NAUI advanced diving certification in October 1979. Ron began his involvement with diving archeology the summer of 1971, while participating in the major underwater project in the Dry Tortugas, with a shipwreck survey of many segments of reef within the monument boundaries and with large-scale excavations in the moat at Fort Jefferson. At this time, he was serving as an archeologist at Lake Meredith. During the following 17 years, Ron assisted in many underwater archeological projects, with his last professional dive being again at Fort Jefferson in 1988. During this entire time, he strongly supported and promoted the Service's underwater archeology program.

SCRU Chief Dan Lenihan made a further personal observation about Ron Ice.

> These guys were the "older warriors" in the group. They hit those sites all business, going a little slower than the others. Typically, a couple of weeks later the young guys had gotten quieter, more tired, irritable, inclined to sickness and sharp words. But the greybeards never missed a beat, they kept that same steady pace, smiled more, casting knowing glances at each other as the energetic spark of youth wilted around them. SCRU projects were killers—exciting but exhausting and humbling to those who couldn't find their cruise control.



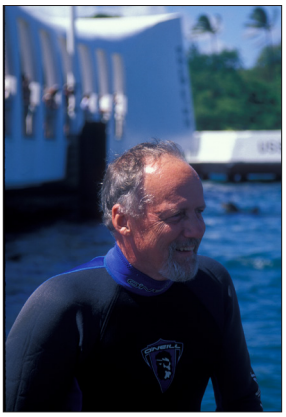
Jim Koza was born in St. Helena, California in September of 1946. When Dave McLean, who was both the Western regional dive officer as well as the Lake Mead park dive officer, retired in 1988, Koza became the park dive officer until his retirement in 2005, serving in that capacity for 17 years. From email correspondence with the author in March, 2013:

> My first memory of the "underwater world" was snorkeling in Lake Tahoe (age 9 or 10) until my parents drug me out of the water shivering and damn near blue…introduction to scuba…was in a public swimming pool in 1963. A lifeguard friend of mine put me in the pool with a hand-held tank, a regulator and an ill-fitting mask. I was 17 years old and hooked.
>
> I was not very involved with the NPS national diving. I stuck close to home…because I had plenty to do, and besides I was never asked… Sometimes I think I was overlooked or dismissed because I was a "cloth tag." Someone who never wore a badge, wasn't a ranger. It sucks, but we both know that separation does exist. I don't feel bitter or abused or over looked. I had an awesome job, the best job in the NPS…

He began his involvement with NPS diving while working at Glen Canyon. In January of 1975 he was certified as a NAUI advanced diver at Scripps, returning in 1982 where he obtained a NAUI divemaster card. He transferred to Lake Mead in September of 1975. He made several pupfish counting dives in Devils Hole, as well as helped Channel Islands to install some of the early kelp forest monitoring transect lines. During his thirty years of diving, Koza participated in over 300 drowning and boating accident victim recoveries.

> The mapping I did with SCRU at CHIS in 1984 was on the *Goldenhorn*. I dove on the *Scott* but did no mapping there. I may have been the dummy end of a measuring tape…The work at Lee's Ferry on the *Charles H. Spencer* was my first big SCRU project and it was damn near life changing. There was more to diving than body recoveries, dock inspections, dragging cables through the mud and attaching anchors.

In October of 2002, with the discovery of the location of the B-29 Superfortress in Lake Mead, Koza again found himself working with the Submerged Resources Center, a many-year association lasting well beyond his retirement. In January of 2005, as the aids to navigation specialist at Lake Mead, Koza retired from the NPS with 32 years of NPS service and 38 years of federal service. As of 2016, he still serves as a volunteer diver, divemaster, and boat operator for the SRC, participating in projects at the USS *Arizona*, Virgin Islands, Dry Tortugas, Biscayne, Isle Royale, Channel Islands, and Lake Mead.



Daniel J. Lenihan was born on June 2, 1945 in Northport, New York. He started with the NPS in 1972 as a seasonal park ranger/archeologist when he was a graduate student in anthropology at Florida State University. Certified as a NAUI instructor in 1972, Lenihan then became an instructor for the National Association for Cave Diving the following year. He worked as dive officer for the NPS Gulf Islands Shipwreck Survey in 1973. In 1974 Cal Cummings hired Lenihan to work with the NPS Interagency Archeological Services in Southwest Region and to lay the groundwork for a permanent underwater archeological program within the Service. Cummings and Lenihan obtained written commitment from four agencies for a million dollars to be spent over four years to conduct the National Reservoir Inundation Study (NRIS) in 1975. That project ran until 1980, when the NRIS team and all of its assets became the NPS Submerged Cultural Resources Unit (SCRU). SCRU operated under that name for two decades until Dan's retirement, when it changed its name to the Submerged Resources Center or SRC, in October 1999.

Lenihan was the Southwest Region dive officer from 1975-1980. From 1991 to 2005 he was the US representative to the International Committee on Underwater Cultural Heritage (ICOMOS) which is part of UNESCO. He was a member of the NPS National Diving Control Board until 2000. He received the DOI Superior Service award for his role in improving the southwest region diving program, the 1983 Appleman Judd award (national) for his work with submerged cultural resources, and the George Melendes Wright award for Excellence in 2003 for promoting submerged resources preservation in and out of the National Park Service. He was a co-recipient of the DOI's first Exemplary Act award for recovery of a body in a submerged dam at Amistad under hazardous conditions. Among books he has written, he co-authored *Underwater Wonders of the National Parks* with John Brooks in 1997 and authored *Submerged: Adventures of America's most Elite Underwater Archeological Team* in 2002.

Jerry Livingston was born on October 1, 1934 and was raised in western Nebraska. He spent four years in the navy as an electronics technician after which he earned a BFA from The University of Nebraska in 1960. After five years as an archeological scientific illustrator for the Smithsonian Institution, he transferred to the NPS. While making drawings of the Steamboat *Bertrand,* which sank in the Missouri River north of Omaha, he was asked if he was a diver. Within weeks of getting his scuba certification from the YMCA and NAUI in 1971, he joined the NPS diving program as an underwater scientific illustrator on a project basis. He received a divemaster certification from Scripps in 1972.

Jerry began his involvement with underwater archeology in 1973, with the NPS Southeast Archeological Center shipwreck survey at Gulf Islands. With the formation of the SCRU in 1980, Livingston participated in almost every project of the unit until his retirement. From 1983 – 1986 he made underwater drawings of the USS *Arizona* and the USS *Utah*. One of his drawings of the USS *Arizona* deck is on permanent display on the memorial. He has drawings in over 400 publications and many now reside in the national archives. Not only did he contribute greatly to each of the projects in the field but produced many of the outstanding illustrations used to document these projects and to enhance the final reports. Along with Dan Lenihan, Jim Stewart, and Toni Carrell, he helped check out an incoming class of NASA astronauts on their open-water checkout dives in San Diego in July of 1979. In February of 1993, Jerry Livingston retired from the NPS with 33 years with the Service and 37 years of total federal service.

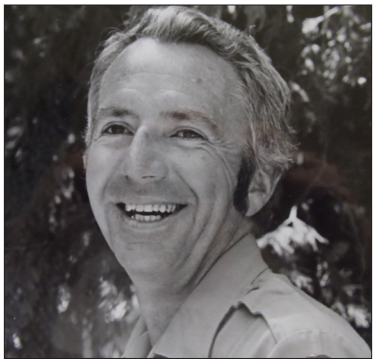


Dave McLean was born in Santa Barbara, California on April 23, 1933. He received a BS in wildlife management from Humboldt State College in 1956. He began his NPS career in 1955 as a seasonal, and in 1958 became a permanent ranger at Lake Mead. From 1968 to 1971 he served as the first NPS law enforcement specialist and was stationed at Yosemite in what was then an experimental program. In 1968 he was certified as an open-water diver by Harry Wham of Whamco Divers, and in 1972 received his advanced NAUI card from Scripps. He began helping in Scripps courses, and in 1975 he petitioned the Western Region director to allow him to serve as regional dive officer without his assistant chief ranger duties. He was allowed to do that for one year but then due to budget constraints, it returned as a collateral duty under his assistant chief ranger title at Lake Mead.

From 1975 to his retirement in 1988 he served as the dive officer for the Western Region. Under his leadership the NPS program in the Region was standardized and brought under much tighter control. He was certified as a NAUI instructor in 1976 and taught many workshops for divers in his region, helping to raise the stakes for policy compliance in other regions.

McLean was a significant force in standardizing both the training and programmatic aspects essential to tight park diving operations. Parks had to meet reporting requirements or risk losing their diving capabilities. McLean's "straight-arrow" demeanor could occasionally be compromised with interesting results. During one of his training exercises which involved driving a car into the lake to practice rescuing the occupants, he painted GSA (for General Services Administration, a government agency tasked with managing the basic functioning of federal agencies) in large letters on the roof and sides. The Las Vegas newspapers found this a compelling visual image and plastered it above the fold for several days much to his panicked chagrin.

Among his far-flung diving assignments, he served in 1983/84/86 as dive officer for mapping sessions on the USS *Arizona*. Not only was the diving well supervised, Dan Lenihan felt McLean even out-prepared the navy and set up a strong working relationship between the NPS and navy divers. In 1988 McLean retired from the NPS, but his diving career hadn't ended. He experimented with a dive-shop in Thailand and then settled in to work in security at the Mirage Hotel in Las Vegas from 1994-1997. By 1997, McLean became the dive safety officer for the Dolphin Habitat at the Mirage, finally retiring for a second time, this time because of cancer. McLean passed away from pneumonia in Henderson, Nevada on February 24, 2016.



Jack Morehead was born on September 4, 1932 in Greeley, Colorado, but grew up in nearby Estes Park. He spent over forty years in the NPS, beginning with his first job as a trail crew laborer in Rocky Mountain National Park in 1951 (earning $1.25 an hour) while working toward a degree in forestry recreation from Colorado A & M (now Colorado State University). He was drafted in to the Army after college, and served with its elite Mountain & Cold Weather Training Command (Tenth Mountain Division) as an instructor of skiing and climbing at Fort Carson and Camp Hale, both in Colorado. Rejoining the NPS after the Army, he worked in 11 field parks and two central office positions while winding his way up through the ranks, including being the technical advisor for the NBC-TV series *Sierra* in 1974-1975.

In 1959 he earned a NAUI basic diving certificate while off-duty at Colorado National Momument. He was an active diver from then until after his retirement when he still volunteered for SCRU. In his career of more than forty years of diving, his interest in, impact on and influence with, the NPS diving program was broad reaching and of great consequence. His influence began as a district ranger at Lake Mead in 1962/63, although there was no dive program there at this time. He became an instructor at the Albright Training Center, where early on, he recognized the upcoming role of scuba for the NPS. So in 1964, he became one of the first two NPS employees to attend Scripps for training, earning a NAUI card and forging a longtime friendship with Jim Stewart. Eventually, he would obtain advanced, ice and nitrox PADI certifications, as well.

His influence relative to diving expanded and then evolved while serving as the chief ranger and assistant superintendent of Glen Canyon (1968-1971), chief ranger in Yosemite (1971-1975), superintendent of Isle Royale (1975-1980), Everglades (1980-1986), and operational oversight of other park areas with diving while both associate director and Alaska regional director. He was totally engaged with the diving NPS program even after he rose to higher management levels. While superintendent at Isle Royale, he was instrumental in orchestrating one of the earliest and most prominent studies by SCRU, the Isle Royale Shipwreck Survey in 1980, and as Everglades superintendent he served as a photographer with SCRU during projects in the Dry Tortugas. After retirement, he continued as a dive assistant for SCRU at Biscayne and Dry Tortugas. As of 2014, Jack lives in Morro Bay, California.



Larry Murphy came to the NPS in 1979 but had significant involvement in the Service's submerged resources documentation since 1974. He was contracted as a field supervisor for a shipwreck survey at Fort Jefferson. He volunteered for work with Dan Lenihan at Buffalo National River and as an instructor at several Southwest Region workshops in the late 1970s. Lenihan brought him in to teach commercial techniques for maintenance diving including rigging, cutting and blasting. Larry came to the NPS as a certified cave diver and PADI diving instructor, making him the 5th instructor in the Service after Weir, Lenihan, Davis, and McLean.

Murphy was a graduate of the Divers Training Academy in Charleston, South Carolina and obtained a BA in anthropology from Florida State University. He later obtained an MA in anthropology at Brown University and completed all the work on his doctorate except for the dissertation when he went back to working full time for the SCRU team. He dived heavily for the Service between 1974 and 2004. In 1999 he became chief of the SRC at which time the name changed from SCRU to Submerged Resources Center (SRC).

Before working for NPS, Murphy had supervised major underwater archeological investigations at Warm Mineral Springs, for the state of Florida, and on the Tennessee-Tombigbee Waterway for the Corp of Engineers and the University of Alabama. He was a leader in computerizing remote sensing technology and adapting underwater survey results to GIS. He was project director of the largest underwater surveys run by NPS at Biscayne and Dry Tortugas.



Larry Nordby was born in Mankato, Minnesota on November 12, 1946. He attended the University of Colorado, studying archeology with a focus on Southwestern cultures, receiving BA and MA degrees in the early 1970s. He was hired as an archeologist by the NPS Southwest Region in 1975, where his first assignment was to direct ruins stabilizations at Pecos National Historic Park. He later served as chief of the Branch of Cultural Research, and the chief of the Division of Anthropology until transferring to Mesa Verde National Park as research archeologist in 1995. At Mesa Verde, he created the Archeological Site Conservation Program, which won numerous national and regional preservation awards. He was awarded the Director's Roy Appleman, Henry Judd, and Ralph Lewis Award for excellence in historic preservation and retired in 2005. He has worked as a consultant and with archeological laser imaging since that time.

In 1976 he received NAUI credentials. While with the National Reservoir Inundation Study, Dan Lenihan asked him to develop a stabilization mortar that would set underwater to preserve cliff dwellings at Lake Powell. Although only partially successful, it brought him into contact with NPS diving. Soon thereafter, he attended Scripps for dive training. In 1979, Nordby attended the University of Michigan's Sea Grant instructor institute and became a NAUI instructor. From December 1979 to June 1985, Nordby served as the Southwest Region dive officer.

He also continued to work with the Submerged Cultural Resources Unit up until moving to Mesa Verde. In that role, he participated as a diver, mapmaker and illustrator, on underwater NPS archeological projects throughout the nation, and in the waters of the Pacific, and Mexico. Altogether, he has mapped

or drawn between 25 and 30 shipwrecks, including the USS *Saratoga* at Bikini Atoll and the USS *Arizona* at Pearl Harbor.

After retiring with the NPS, Nordby was approached by the city of Breckenridge, Colorado to develop management recommendations for a partially submerged gold dredge located nearby. In 2008, he helped coordinate the first underwater archeological project ever conducted in Colorado. He has written numerous books and articles on terrestrial and underwater archeology. Currently living in Placitas, New Mexico, he continues to write on the many projects that he was compelled to leave unfinished during his NPS career.

Dan Pontbriand was born in Auburn, Maine, in 1955. He attended the University of Maine and received a BS in parks and recreation resource management. During his college summers, he worked as a ranger for the Maine Department of Conservation at Sebago Lake State Park. After graduation he started with the NPS as a seasonal at Grand Teton National Park in 1979, then Big Bend National Park and Shenandoah National Park. He got a permanent NPS ranger position in December of 1984 and retired as the chief ranger of Isle Royale in November of 2011 after 30 years of service. From 2005 to 2008, Dan served as the chief of the Branch of Emergency Services in the Washington Support Office. As such, he coordinated emergency medical services, search and rescue, diving, incident management and motorboat operator certification courses for the service.

Dan Pontbriand was certified by NAUI in 1980 in Lewiston, Maine, where he began diving, and then later dove in Florida. He first applied his diving to the NPS when blue-carded in 1986, while stationed at Big Hole National Battlefield. He was most active in NPS diving after transferring to Olympic in 1990, serving as the park dive officer from1995 to 2005. He became a NAUI master diver in 1995, received technical and cave dive certifications in 2002, a NAUI divemaster in 2006 and served on the NPS National Dive Control Board from 2005 to 2008. Dan is one of the very few NPS divers certified in mixed gas.

Among the underwater tasks Dan tackled at Olympic were body recoveries, maintenance, submerged cultural and natural resources protection, and the extraordinary investigation of a motor vehicle accident that took place in 1929. He located the vehicle, relatives and eventually, with the help of the SRC, removed skeletal material for DNA analysis and established the identity of the victim. He wrote a book on this event entitled: *The Missing Ones: A True Story,* published in 2012. As of 2016 he lives in New Hampshire.

James"Jim"Arthur Randall was born on October 29, 1928 in Wichita, Kansas. After graduating from high school, he served in the US Navy from 1946 to 1948 as a flight deck director on the USS *Boxer*. He received a BA in forest recreation from Colorado A&M (now Colorado State University) in 1952. While there he earned letters in football and baseball and was named in *Who's Who Among Students of Colleges and Universities*. Randall worked seasonally for the NPS at Rocky Mountain National Park in 1950/51, and Mesa Verde National Park in 1952. He got a permanent position with the NPS at Carlsbad Caverns National Park as a tour leader and supervisor in 1953.

In 1962, while serving as the GS-11 Washington Support Office-based forester, Randall joined a local Virginia dive club and began exploring water-filled quarries in the area. Looking around the country and recognizing scuba was here to stay, Randall and his supervisor Wayne Cone in the Division of Ranger Activities, identified the need for a service-wide scuba program. Randall attended the US Navy Deep Sea Diving School, based in Washington, DC. On October 23, 1962, he graduated and became one of the service's first divers. Along with several others, he developed the Service's first diving guidelines (NPS-4). In an era of pre-diving certifications, Randall was authorized "to serve as an instructor for in-Service Scuba diving training" by the NPS chief of ranger services, Larry F. Cook, in December, 1962. He never exercised this authority. He was again certified, this time as a NAUI diver in 1967 and then several years later attended Scripps as a divemaster. Over the years and in many ways. Randall worked behind the scenes in the Service developing a dive program, as well as serving as the Rocky Mountain Region dive officer for a number of years. Rounding out his NPS career, he also worked in Chiricahua National Monument, Lassen Volcanic, Grand Canyon, Canyonlands, and Wind Cave National Parks, and the Washington Support Office. Randall retired in 1985. At age 84, he died on October 21, 2012 in Estes Park, Colorado.



Matthew A. Russell, PhD, RPA is a specialist in maritime archeology and has participated in and/or directed more than 30 underwater archeology projects for state, federal and international agencies since 1993. Born in 1968 in Redondo Beach, California and growing up in nearby Rancho Palos Verdes, he received his undergraduate degree in anthropology from the University of California, Santa Barbara and then a graduate degree in underwater archeology from East Carolina University in 1993.

Beginning then and through 2011, he worked as a project director with both the Service's SCRU and the SRC. Russell was first trained as a scuba diver as an undergraduate at UC Santa Barbara, where he went through the scientific diving program. He then became a NAUI instructor (#36303), and certified in mixed-gas and ice diving, among other specialties. He was deputy field director for the Civil War submarine HL *Hunley* recovery project in 2000 and was the project director for the USS *Arizona* preservation project from 2000-2006. Russell was a member of the Advisory Council on Underwater Archaeology (ACUA) from 2003-2010, and served as ACUA chair for the last three years of his appointment. He has been a member of the Society for Historical Archaeology (SHA) since 1992, is past-chair of SHA's UNESCO Committee. His research interests include nineteenth-century ship construction and archeological site formation processes. He received his PhD in anthropology at the University of California, Berkeley in 2005.

As of 2016 he was a program manager in archeology for the private-sector consultant firm Environmental Science Associates, and lives in the San Francisco Bay Area with his wife and two boys.

George F. Schesventer started out in 1961 as a district ranger on Key Largo in Everglades National Park. He had taught himself to dive in La Jolla, California in 1951 during his service in the US Navy. To brave the cold waters off the La Jolla beaches and caves and unable to afford a dry suit or anything warmer, he donned the very heavy, tight wool underwear worn by navy hardhat divers. Mostly interested in spear fishing, he helped form a skin diving club, The Reef Raiders, second behind the La Jolla Bottom Scratchers. His introduction to diving is the earliest report the authors have found of an NPS employee learning to scuba dive.

After the navy, he spent several years crewing in the Merchant Marines, schooling at Baylor University and Louisiana State University, applied to both the US Border Patrol and the National Park Service. The NPS called first. Park management, quickly recognizing his skill and great interest in the new sport, soon had the young ranger taking underwater photos in the Everglades, and eventually at Fort Jefferson and the Virgin Islands. The next year Schesventer, along with three others, was invited to the US Navy Deep Diving School, based in Washington, DC, attending for three weeks in November of 1962.

He soon went on to be superintendent of George Washington Birthplace (1964-1967), and then Mound City Group, now Hopewell Culture National Historic Park (1967-1971), and Castillo de San Marcos and Fort Matanzas National Monuments (1971-1980), before retiring from Fort Caroline National Memorial in 1989.



Brett Seymour has been carrying an underwater camera in National Parks since his second dive with SRC as a volunteer in 1994. Born in Concord, New Hampshire, in 1971, Brett spent countless hours as a young boy exploring new ways to stay underwater at his dad's camp on Lake Winnipesaukee. This early draw to the underwater world was solidified by watching an aged Cousteau direct the divers of the *Calypso* and paging through the imagery of *Skin Diver Magazine*. He was certified as an open water diver while attending Messiah College in Grantham, Pennsylvania, in 1992. He graduated with a degree in television and film production in 1994; a great beginning for his chosen NPS career.

After graduation, his entrance into the NPS was as a volunteer with the SRC at Dry Tortugas, filling tanks, photographing shipwreck sites, and any other duties as assigned. From 1994 to 2001, he worked a series of contracts, seasonal appointments, emergency hires and any other position the SRC could generate to keep him on the team. In 2001 he gained a permanent position as the SRC's audiovisual production specialist, and as of 2016, he is the SRC deputy chief.

Seymour has been a DAN member since 1995, a NAUI and DAN instructor since 2001, and certified in closed-circuit rebreathers since 2005. As the dive safety officer for the service's only full-time dive team, he is responsible for the equipment, safety and instruction of the eight-member dive team of underwater archeologists and photographers. Since his appointment as dive safety officer in 2001, Seymour has taken the lead in the team's advancement from open-circuit air through mixed-gas, closed circuit rebreathers. As an NPS instructor, he has been staffing both park and national diving workshops for the past 15 years. For the past nine years he has served as the chairman of the NPS National Diving Control Board. As of 2016, he is the deputy chief of the NPS Submerged Resource Center and chair of the NPS National Diving Control Board - a position he has held for the past 10 years. His photographic work documenting the NPS underwater world (and elsewhere) can be found at www.brettseymourphotography.com.



James "Jim" Stewart was born in National City (near San Diego), California on September 5, 1927. As WWII was winding down he found himself spending several years in the Army Air Corps, much of it in Nome, Alaska. He went to the North Pole from there. Stewart was one of a dozen individuals pioneering scuba diving procedures in the 1950s to help scientists conduct their underwater research. In 1960 he became manager of the diving program at Scripps Institution for Oceanography, and in 1967 he began a long period of consultancy to the National Science Foundation and developed the polar research diving policy. He later served as advisor to NASA, Coast Guard, FBI, Special Forces, SEAL teams and many universities. During the early 1960s he developed the original Scripps Institution of Oceanography and University of California diving guide, much of which the NPS uses.

In 1963 he took the nascent NPS diving program under wing, and today is considered the godfather of NPS diving. At other points in this document there are lists of the rangers trained by Stewart and numerous references to his personal involvement as a trainer and diver in the NPS diving program. In addition to his assistance to the NPS in diving operations, he also provided invaluable assistance in helping the agency develop its own policy and accommodate the OSHA policy on diving.

In 1969, Stewart, now partway into his mentoring of NPS divers, was awarded a prestigious NOGI award in the sports/education section. Dating to 1960, the NOGI began as a spearfishing award at the New Orleans Grand Isle (NOGI) fishing tournament. The NOGI is the oldest and maybe the most prestigious award in the diving industry. Other recipients of a NOGI include Captain Jacques-Yves Cousteau (1966), Dr. Robert Ballard, underwater explorer (1975) and the author of *Jaws*, Peter Benchley (2005).

Stewart retired from Scripps Institution of Oceanography in September of 1991. Upon his official retirement, the UC system's Board of Regents, in a proclamation signed by their president, made him an *Emeritus*. He was awarded an Honorary Park Ranger citation which was presented at his retirement ceremony. In early 2012, Stewart left his *Emeritus Dive Officer* desk at Scripps due to illness. He died on June 7th, 2017 in Irvine, California at age 89.

Dave Stoltz was born on May 1, 1957 on the Hamilton Air Force Base in San Rafael, California. He earned his basic PADI certification in nearby Oxnard in September of 1979. Stoltz started his NPS career as a temporary summer appointment at Channel Islands, serving as a deckhand on the 41-foot NPS vessel *Sea Ranger* in April, 1979. That October, he became a seasonal deckhand and then the following March, a permanent (subject-to-furlough) deckhand. September, 1980 saw him attend the 100-hour advanced diver course held at Lake Mead and Scripps. In June of 1983, he was appointed the Channel Islands park dive officer and then attended the 100-hour divemaster course, again held at both Lake Mead and Scripps. During these early years at Channel Islands, among other duties, he assisted Gary Davis with the park's Kelp Forest Monitoring Program, became a licensed USCG 100-ton Motor Boat Captain, and then in 1985 was promoted to captain of the park's boat *Pacific Ranger*. In March, 1988, he was named Outstanding Candidate for the Los Angeles County underwater instructor course, becoming a NAUI instructor (#10377).

Beginning in January, 1989, until his retirement in July, 2012, Stoltz served as the Western Region (and later Pacific West Region) dive officer, a total of more than 23 years; longer than any other person to serve as a regional dive officer. During this time, he supervised and mentored a great many Channel Islands

divers and implemented technological modifications for the park's *Live Dive* program. During his tenure, there were numerous programs for the park, including educational dives and hikes which were broadcast from the islands. He trained divers for five new Pacific Area dive programs, including those involved with the park's Coral Reef Initiative. He supervised the dive operations for *Jason XIV*, hosted by Channel Islands; this consisted of 55, one-hour broadcasted programs. He implemented and trained divers for the Death Valley's most recent Devils Hole pupfish program, which as of 2014, employed three, full time scientist-divers. He retired in July of 2012, after 33 years in the NPS and 2,500 service dives.

Jim Tilmant started with the NPS as a seasonal naturalist at Shenandoah National Park, where he worked the 1996/67 summer seasons while completing a degree in fisheries and wildlife sciences at New Mexico State University. Graduating in 1968, he spent a season as a temporary park ranger at White Sands National Monument before entering the Coast Guard Officer Candidate School. He served three years on the Cutter *Mackinaw*, a 290-foot icebreaker on the Great Lakes; it was here he was first exposed to scuba and oversaw the ship's dive team.

Discharged, Tilmant was hired back into the NPS as a seasonal naturalist at Everglades, soon converting to a permanent biological technician. He took a leave of absence in the fall of 1973 and earned a master's degree at Humboldt State University, again returning to Everglades. The following year, he was hired into a newly created management biologist position at Biscayne. While there, he attended the University of Miami's Rosenstiel School of Marine and Atmospheric Sciences. Soon, he completed a NAUI course and became an NPS diver within a year.

While at Biscayne in the 1970's, Tilmant developed a scuba program that benefited the park's natural resource as well as ranger and interpretive staffs. Incorporation of an active dive program into the park's organization allowed Biscayne managers to gain a much greater understanding of the park's coral reefs and other marine resources as well as to scientifically document resource impacts received. This program also allowed park staff to be much better prepared to address many emergency dive and underwater issues. Tilmant was also able to participate in some of the earliest natural resource studies in the Dry Tortugas, which contributed substantially to the overall understanding of that park's marine resources. He completed NPS divemaster training at Scripps in 1977, and served as a Southeast Region dive examiner.

He was Biscayne's management biologist for seven years before transferring to Everglades, where he served as the marine program leader under the South Florida Research Center. At the Center for eight years, he served as its director the last two years, before transferring into the service's Departmental Training Program and then on to Glacier as the chief of science and natural resources. In 1997, Jim transferred to the NPS Ecological Sciences Center, to assume the fisheries program leader for the NPS and remained there until his retirement at the end of 2007. Tilmant also served on the NPS Diving Review Board until his retirement.

Thomas "Tommy" Richard Tucker was born in San Diego, California on October 27, 1922, but grew up in and around Mariposa, California, near Yosemite. He was the principal force behind the National Park Service and Scripps Institute of Oceanography joining forces. He was not a diver, but he was responsible for recognizing the need for diver training, and then developing the relationship with Scripps. He retired as the superintendent of Cabrillo National Monument. He began working in Yosemite in March of 1940 as a temporary laborer. Tucker transferred to Cabrillo in January of 1962 as "acting, acting chief ranger."

Superintendent Tucker achieved a great deal in his long NPS career and was well recognized for his professionalism and many achievements. He earned a Department of Interior (DOI) Meritorious Service Award and a DOI Distinguished Service Award. He was knighted by the president of Portugal for providing a meaningful and long-lasting Portuguese cultural fair at Cabrillo for the Portuguese community in San Diego. Additionally, he received numerous commendations and colorful accolades from current and past community and military leaders in San Diego. Tucker died peacefully in La Jolla, California on February 24, 2012.

Wayne Valentine was born on October 7, 1949 in Philadelphia, Pennsylvania. He graduated from the University of Tennessee in 1972 with a degree in zoology. Having grown up in the Northeast, he spent his boyhood summers along the seacoast, working five summers as an ocean lifeguard before and during college. It is not surprising that throughout most of his career he sought out park areas with water-based

activities. He held seasonal positions at Gulf Islands National Seashore in 1974-1975 as a park naturalist, and also as a Young Adult Conservation Corps work coordinator. He did a short season as an interpreter at Cape Hatteras National Seashore before being offered a full-time NPS position, returning to Gulf Islands in 1977 where he continued to hone his aquatic skills.

Valentine's introduction to scuba came in 1970 during a spring break trip to Crystal River, Florida. His first certification was the NASDS at Skipper's Diving, Inc., in Pensacola, Florida in 1977. In 1978, while serving as a park naturalist at Gulf Islands, he was selected to attend advanced dive training at Scripps, followed by divemaster training there the next year.

Throughout his career, Valentine developed and maintained a solid field ranger background, with specialized skills in terrestrial and aquatic search, rescue and recovery. He organized the park dive program at Gulf Islands and served as the dive officer until a transfer in 1982. He was also involved in dive operations at Buffalo National River, Curecanti and Delaware Water Gap National Recreation Areas, and Biscayne. Between 1997 and 2006, he was the Northeast Region dive officer as well as served on the NPS Dive Control Board from 1998 until his retirement in 2006, as chief ranger of Fire Island National Seashore.

According to Valentine, one of his most rewarding NPS responsibilities involved his role as a dive examiner, training incoming divers into the dive program and instructing others in water related emergency responses. In addition to these accomplishments, he was the recipient of the Harry Yount Ranger of the Year Award in 2002. Valentine still dives and actively captains and crews on sailboats on the East Coast.

Don Weir, PhD was born in Annapolis, Maryland in 1939. Weir was an early stalwart in the NPS dive program. He was the Service's first active dive instructor, although not teaching until later. In 1957 he passed both the Red Cross water safety and first aid instructor courses, allowing him to work for many summers as a beach lifeguard in San Diego. He graduated from San Diego State College with a BS, with a heavy emphasis in biological oceanography.

In 1959, at the age of 21, he took his first scuba course at the San Diego Divers Supply. In a 2010 email to the author, Weir said:

> I used this training to explore the coves, underwater canyons, rocks and jetties of San Diego… interested in the underwater world I became aware of Scripps…visited there on many occasions. I tried to gain access to their premier SCUBA course but was told that it was for students only.

In 1966 he joined the NPS and several months later was assigned to Lake Mead. Within six months of arriving, he got his earlier wish and went to Scripps in the second NPS class in 1967. At Lake Mead he averaged working some twenty body recoveries per year. In 1970 he invigorated the park's dive operation when he was made the park dive officer. This included writing a park dive plan as well as implementing a dive-per-month program. In 1971, he became a NAUI instructor.

In 1971 he moved from Lake Mead to Olympic, where he was both the park and Northwest Region dive officer. He taught one course for NPS and county officers at a community college while there. The next year, he transferred to Biscayne, where less than 4,450 acres of the nearly 173,000-acre park are above water. He set up a dive locker on Elliot Key and then taught (with Gary Davis) a NAUI / NPS scuba class, the only NPS scuba certification class east of the Mississippi. He was one of three members of the NPS Southeast Regional Diving Review Board along with Gary Davis (Everglades) and Ed Roberts (Virgin Islands).

Beginning in 1974, he participated with other dive boards to update the NPS Diving Guidelines, under the guidance of the Washington Support Office's Dick Marks. The Southeast Regional Diving Board met several times.

> In 1973, we reviewed the dive plans and dive experience and certifications within the Region…I was assigned to check out certification of the SEAC dive team working at Gulf Islands under Fischer and Lenihan. I was tremendously impressed with the diving ability, training and professionalism…and certified the divers for work in the SE Region.

Also in 1974 he transferred to Fire Island National Seashore and headed up an active dive team of four rangers. Ultimately the activity level did not support a program, however. Weir retired from the NPS in 1997, then earning a PhD from Cornell University in 2001 in park management. As of 2013, he and his wife Julia reside in Florida.



Harry Paul Wham was a well-known and colorful fixture in the Las Vegas nightclub and music scene—but one with an apparent dark side. However, his contribution to early NPS diving was considerable. Wham was a self-taught diver, becoming an early NAUI instructor (#237) as well as a YMCA instructor. Harry was reputed to have doubled at least once for actor Lloyd Bridges in television's *Sea Hunt*. In addition to owning the Keyboard Lounge, not far from The Las Vegas Strip, he also owned Whamco Divers. He trained many locals how to dive, including almost a decade of NPS divers at Lake Mead and on at least one occasion, Glen Canyon. There is at least one record that Whamco Divers came into existence as early as 1953, with him sponsoring a local dive club in 1958, Whamco Divers Scuba Club. On May 19, 1964, eight rangers and maintenance men at Lake Mead graduated from a 36-hour long scuba program taught by Wham, the first dive class specifically for the NPS.

Wham was born on September 21, 1919 in Oklahoma. He died at the age of 63, shot to death in an ambush in his garage in Las Vegas on February 13, 1983. Surviving a previous attempt on his life of January 26, 1983, Wham did not survive the second. His seventh wife, Peggy, had him assassinated by a hired gun, John Oliver Snow. Snow was sentenced to death, and as of 2016 remains on death row in Nevada. Originally Peggy was serving life-without-parole imprisonment for orchestrating the murder. However, after 16 years, she was able to secure a release from the Nevada pardons board in early 1999.

EARLY PARK DIVE TEAMS

National park system dive teams seem to ebb and flow, making their early days often sketchy and hard to trace, albeit very interesting. For the sake of this history, a dive team may consist of even one diver, and will be defined by whether the park purchases equipment, sponsors training, or in some way managerially supports a dive effort. As you may easily guess, many of these teams and their perceived need and use, particularly in peripheral, non-traditional dive areas, were often personality driven and based on personnel located within the area and that individual's interest. As an example: if a scuba-trained ranger transferred into a park with even only a slight potential need, a dive team might result and ultimately be supported by management. Then, when that ranger moved on, diving momentum would die and the team could possibly disappear.

The following are areas with a definite dive team history or at least are areas where, because of the associated waters, there was potential diving and maybe even a dive team. Every effort has been made to be accurate with this information but, particularly for the earliest dates, it was often difficult to locate information, reliable or otherwise. This is not meant to be a comprehensive dive team history of each park.

Note - where park land and underwater acreages, as well as jurisdictional notations are made, they were obtained from two sources: *The National Parks: Index 2009-2011*, and a 2004 article by now-retired NPS chief ocean scientist, Gary Davis, "Maintaining unimpaired ocean resources and experiences: a National Park Service ocean stewardship strategy," in the *The George Wright Forum*.

Acadia National Park has 52 miles of shoreline. Of the 47,400 acres of the park, 11,900 of them are underwater. Joe Abrell, chief of resource management in Acadia National Park from September, 1982 through July, 1988, recalled in a May 2013 email to the author: "There was no dive team at Acadia (1982-1988) and I never heard of one…don't remember anyone doing any diving in water that was in any way associated with the park…in fact, I don't remember diving ever even being mentioned."

American Memorial Park is an adjunct area of the NPS. Authorized on August 18, 1972, the park is on Saipan, 150 miles north of Guam. It is owned by the Commonwealth of Northern Marianas, a Trust Territory of the United States. With three miles of coastline, the park's 133 acres are all non-federal, none underwater. Despite great diving right offshore, the park has never had a dive team.

In an unpublished, final draft manuscript by the service's senior archeologist Cal Cummings, *Submerged Cultural Resource Management and Underwater Archeology: A History of National Park Service Contributions*, dated February 15, 1997, he states:

> On October 28-30, 1983, the War In The Pacific National Historical Park [War in the Pacific] submerged research team conducted their first survey on Saipan in the Mariana Islands…carried out by James E. Miculka, Chief Ranger, and Rose S. N. Manibusan, Park Ranger. On December 15-17, 1983, a second survey was conducted within American Memorial Park [Saipan] by the War in the Pacific National Historical Park research team…

As a result of four surveys by War in the Pacific staff, over fifty submerged sites were identified. The earliest known is the *Nuestra Senora de la Conception*, a Spanish Manila galleon wrecked in 1638.

Amistad National Recreation Area was administered under cooperative agreement with the International Boundary and Water Commission starting in 1965. It was then authorized as an NRA on November 28, 1990. Amistad Dam was completed in November 1965. In 1973, Amistad had 3 staff divers, but a notation was made in the records stating that a total of 6 would be needed to make an optimum team. In 1974, the divers were Clay Lee, Cruz McGuire and Cecil Ferguson. Beginning in September of 1976, and every year thereafter for the next eight, AMIS hosted the Southwest Regional Dive Workshop, generally coordinated by Southwest regional dive officer Dan Lenihan.

Apostle Islands National Lakeshore, established in 1970 and consisting of 21 islands in Lake Superior, has approximately 40 % of its over 69,300 acres, underwater. There has been service diving since at least July 1982 in the lake as well as the Stockton Island Quarry when SCRU did a two-day survey of submerged

historical sites conducted by project supervisor Larry Murphy and Jerry Livingston. SCRU and Toni Carrell then came back to do a preliminary survey of the shipwreck, *Noquebay* in September of 1984.

It had at least one dive team beginning in 1990, created by Larry Johnson and Dave Snyder. Larry was a field ranger and Dave was the park's historian. Apostle Islands used a group of NPS volunteer divers in 1987 and 1988, and they used their own equipment as the park didn't have any. Johnson obtained funds from the NPS Volunteers-in-Parks program to purchase an underwater camera, which was used by the volunteers for a shipwreck monitoring program. In an email message from Johnson (now superintendent of Ozark National and Scenic Riverways) to Butch Farabee, December 7, 2012:

> I arrived at APIS in 1986 and did some dives on my own time with my own gear, as did…other employees who were divers. But the park dive team using NPS employees and equipment didn't start until 1990.
>
> I was the Park Dive Officer and that year, we also worked with East Carolina University through the Wisconsin State Historical Society to document the shipwrecks in and around the islands. Dave Cooper, now at APIS, was the State Underwater Archeologist…pioneered the program…I do recall that APIS used the ISRO dive team up to that time for dives.

Assateague Island National Seashore was authorized in 1965 and has 22,079 acres of water. From 1969 until his retirement in 2001, Mel Olsen served as a district ranger in the seashore. Per personal communication with Olsen in January 2013, there was never a dive program there. Once in the late 1970s, either the Mid-Atlantic or National Capital Region dive team participated in a week-long dive training at the Coast Guard Station on the southern end of the island.

Big Bend National Park was never designated a diving park, but at least in 1973 and 1974, the park had two NPS divers, Victor Carrasco and J. F. Carithers. In October of 1973, Carithers and another diver (possibly Bill Burke) used scuba to make a body recovery from the Rio Grande. On March 1, 1974, Carithers made a request of Ken Morgan, chairman of the Southwest Region Diving Review Board, for a small compressor. "The nearest source is Industrial Communications of Pecos. This is a 450-mile round trip for us and this is why we usually dive at Balmorea [State Park, northwest of Big Bend National Park]."

Bighorn Canyon National Recreation Area was established in 1966, with the 71-mile long Bighorn Lake created by the Yellowtail Dam on the Bighorn River. Bighorn Canyon had a dive team at least as early as 1978. In 1980, Richard Williams was the park dive officer and the team had six team members. In the spring of 1983, Tony Schetzsle transferred in and took over the program, and in 1984 they had four divers in addition to Tony: Crystal Avey (née Coffey), Doug Germeraad, Richard Hougham, and Al Pond. For equipment and tanks, Bighorn Canyon would deal with Mountain States Divers Supply in Billings, MT. Tony became a certified YMCA scuba instructor in the spring of 1986.

Big Thicket National Preserve has no record of a park dive team. In an October 28, 1975 memo from Thomas Lubbert at Big Thicket to the associate regional director of the Southwest Region: "We have no trained or experienced divers in the park at the present time. We may in the future have need for such personnel but I do not envision training any of my existing staff for these positions."

Biscayne National Park was established as a National Monument in 1968 and designated a National Park in 1980; it has 168,666 acres of submerged lands. In late June or early July of 1971, Everglades assistant chief ranger, Tom Hartman, Everglades marine biologist Gary Davis, and Biscyane's acting chief ranger, George Sites, started the first South Florida Parks' dive team: Biscayne, Everglades, and Fort Jefferson. These three men, along with Washington Support Office marine biologist John Bellinger, dove on Biscayne's Ajax Reef on July 9, 1971. Early on, a primary focus of Biscayne's efforts was to monitor coral reef population and studies of the lobster and queen conch.

In 1972, NAUI instructor and ranger Don Weir transferred into Biscayne from Olympic. Per Don, the first dive locker was set up on Elliot Key and included a small compressor and a four-bottle cascade system. Jim Tilmant, a marine biologist stationed in Biscayne, then added in a 2012 email message to Farabee,

that a second "dive locker was established at BISC when we received funding for the study of recreational impacts on the patch reefs. This was in 1975 and we set up a locker with compressor in what was previously a shower house for…county park…"

SCRU conduced the *Biscayne National Monument Shipwreck Survey* in the summer of 1975. Larry Murphy was the team leader. There were several other SCRU projects at Biscayne including in 1980, 1987, 1991, and 1995.

Buck Island Reef National Monument was proclaimed on December 28, 1961, although protection for the 880-acre reserve began in 1948. An additional 18,000 acres was added in 2001. It may have the finest coral reefs in the Caribbean and was one of the first areas to be preserved for its underwater values. The park would have experienced some of the earliest NPS diving, even before it was created. Buck Island joined with nearby Christiansted NHS and Salt River Bay NHP with its dive team requirements. Each had limited resources and manpower so they consolidated efforts. In an October 22, 2003 "Memorandum to all Regional Directors from the Associate Director, Visitor and Resource Protection," the three parks joined efforts, with a dive team of five NPS and three volunteer divers, as well as having a park dive officer.

Buffalo National River was authorized on March 1, 1972 and offers both swift-running and placid stretches. There are 136 miles of river within the park, with areas up to twenty feet deep. Soon after establishment, the NPS felt there was a need for a park dive team. District ranger Francis Kocis was a Scripps' trained diver in September 1972. In 1974 he was deemed medically unable to dive due to an ear injury sustained early in life, but he was re-instated the following June. Additionally, district maintenance foreman Cal Myers had received certification on June 9, 1970, from the Southwest Council of Skin Diving Clubs in Amarillo, TX while he had been stationed at Lake Meredith.

In a May 21, 1975 memo, acting regional director, Ted Thompson, wrote that Cal Myers and Francis Kocis "successfully passed all requirements for SCUBA recertification." In a June 5th response, Superintendent Donald M. Spalding wrote, "We now have three qualified divers at Buffalo River…" The third was Robert Arnberger, who had attended Scripps in January of 1975. Soon a fourth diver was added; Charlie Petersen, also Scripps class of 1975. According to Arnberger in a 2011 phone conversation with the author, they did not really use their dive training while he was there, except once in 1978 when a helicopter crashed into the river.

The Submerged Cultural Resources Unit, with project director Dan Lenihan and Larry Murphy, both expert cave divers, conducted and reported on a *Reconnaissance of Underwater Cave and Section of the River Bottom*, in October, 1974. In July, 1981, the Buffalo dive team had six members. In a memorandum from Larry Nordby, then Southwest regional dive officer, to Cal Cummings (who was serving as chairman of the Southwest Regional Dive Control Board) on July 24, 1981: "Two of them are new people with no previous NPS experience, one is a transfer with diving experience into the area, and three are experienced in diving at BURI [Buffalo River]"

Cabrillo National Monument SEE CHANNEL ISLANDS NATIONAL PARK

Canaveral National Seashore was authorized in 1975. SCRU went there at least once to perform a magnetometer survey in June of 1991. Canaveral ranger Brian Carey recalled the following in a January, 2013 email to the author:

> I started at CANA in 1985 and spent ten years there. We never had any park divers and I never heard of any diving activity prior to that or ran into any records. I was a park diver at BISC prior to that so I know the NPS program was just getting into a more organized phase at that time. Many of the diving assignments that dealt with cultural resources in the SE Region were outsourced to the Southeastern Archeological Center out of Tallahassee at that time.

Canyonlands National Park had a dive team from 1977 and for the next several years ...sort of. Skip Cole was a hardhat diver who was trained by the Divers Training Academy in Link Port Harbor, Florida. He had worked for the US Corps of Engineers and was superintendent of one of their areas, Big Bailey Lake. In an email to the author in April, 2011, Cole wrote:

> I finally got into the NPS as a district ranger at Canyonlands in 77. I was able to convince Jim Randall, who was in the RMRO at the time, that they should let me stay current because of my background and what I could bring to the program…While at Canyonlands, I was able to get RMRO to recognize us, and I kept four other divers current…I doubt there is any record of it and frankly it made no sense but Randall told me that he had designated me as the regional dive officer for RMRO. With the other divers in the region at true dive parks and with more NPS experience, I didn't pursue it and think that fact may never have been known.

Cape Hatteras National Seashore has virtually no dive-able waters within the jurisdiction of the park. A search of the archives in Cape Hatteras, often called the Graveyard of the Atlantic, does not show that a park dive team was ever instituted.

Cape Cod National Seashore never had a dive team, "never even owned a boat," according to former ranger Dennis Burnett. However, at least during 1975 and 1976, supervisory ranger Vern Hurt signed his NPS SCUBA Diving Log (Form 10-418) with "Vern Hurt, Park Diving Officer." This was also reflected in the local newspaper, *The Oracle*, article on May 8, 1975: "Wellfleet to begin 'Ecology Dives' in town ponds." "At the time, Ranger Hurt told the selectman he serves as the diving officer for the National Park Service in this area…" For much of that time, however, Vern was also the only NPS certified diver at Cape Cod. Hurt died on February 19, 2013, at 73 years old.

It is also known that in September of 1985, Cape Cod had three NPS divers: Richard Lorange, Jim Ebert, and Dennis St. Aubin. St. Aubin authored a memo to Toni Carrell of SCRU on September 25, 1985, pursuant to a North Atlantic Region dive workshop that month at the national seashore, signing it as the "Cape Cod NS Park Dive Officer." Currently there is no dive program.

Cape Lookout National Seashore's do not show that a park dive team was ever instituted. The park boundaries extend into the ocean for 150 feet in some areas and there is occasional boat diving from Morehead City and Beaufort, North Carolina.

Carlsbad Caverns National Park never had a dive team, even though there have been several scuba dives made in Carlsbad Caverns by park employees Jim Martin (in 1963) and Ronal Kerbo (in 1969 and 1971) on their own time and inclination. However, in May of 1979, Kerbo and Andrew Galewsky were recognized by both the park and the Southwest Region as being NPS divers and were included on the regional dive roster. Both had agreed to begin diving again, the year before. The park assisted with training and an equipment cache for these two. In June of 1978, Kerbo and Lenihan also checked the bottom of Lake of the Clouds in Carlsbad Caverns, finding no leads.

On June 26 and 27, 1978, Kerbo and Galewsky logged dives with Lenihan at Santa Rosa Blue Hole in New Mexico. Then on August 25, Lenihan and Kerbo, with support from the park (Galewsky and others) extended exploration of Border Cave near the Texas/New Mexico state line (known to some as State Line Cave). They reached a depth of 110 feet where the wall they were following turned into a sloping ceiling. Low on air and in single tanks, they abandoned penetration and returned to the surface overcoming an entanglement problem on the way. They attempted this dive about a year later with doubles but after a difficult penetration (2 1/2 hours) through mud to the water's surface, they tried diving for five minutes (dropping 50-60 feet deep) searching for clear water. Finding none, they thought blind penetration too dangerous and turned back.

On October 25, 1979, Larry Murphy, Ron Kerbo and Toni Carrell tried to help force Lenihan through the powerful constriction at San Felipe Springs in the Del Rio Golf Course. Lenihan suffered neck and head pains; no aftereffects. Lenihan believes it was at this workshop (October 1979) that Kerbo rappelled from the top of Amistad Dam to the water in full scuba for a black and white videotape presentation assembled by Richard Knox under contract to the NPS (National Reservoir Inundation Study). Lenihan had Knox under contract for a couple years at this time shooting and editing videos on NPS underwater operations for NRIS reports and the NPS southwest region dive training program. Kerbo entered the water from the rappel, swam to a car placed underwater for the skit and removed "the body" of an NPS diver who was waiting wearing street clothes and breathing from a concealed regulator.

In 1982, both Kerbo and a third Carlsbad Cavern employee, Donna Giannantonio were then dropped from the regional list of divers due to their inability to maintain the required number of dives per month and year. However, on April 7, 1983, Kerbo joined Lenihan and Murphy in another exploration of San Felipe Spring at Del Rio. They were giving lectures to Southwest Region divers that week on cave diving, how to detect when divers were utilizing a cave in the park, and basic safety considerations.

Lechuguilla Cave is also within the boundaries of Carlsbad Caverns. There were several dives done in this cave, beginning in 1989 with follow-up dives in 1990, 1991 and 1995. Divers were Dave Bunnell, Ron Simmons and Peter Bolt.

Castillo de San Marcos National Monument was established on October 15, 1924. Per George Schesventer, superintendent at the monument from 1971 to 1980, there was never a dive team there, at least through his time and for a number of years afterward. However, SEAC's George Fischer relayed in personal communications with the author in 2014 that in the early 1970s at least two maintenance men were diving, as Fischer gave them an air compressor through his ability at the newly established SEAC.

Channel Islands National Park consists of five islands off the California coast near Santa Barbara, and was proclaimed a national monument on April 26, 1938. For much of this time, Channel Island was administered by Cabrillo National Monument. In 1963, the park(s) hired Ranger Bob White from Great Smokey Mountains. White brought significant diving experience from a stint in the Virgin Islands. Also relatively new to the staff were Rangers Jerry Lee and Tom Hartman, who were trained in scientific diving at the San Diego-based Naval Electronics Lab on Point Loma in the spring of 1964. Cabrillo/Channel Islands now had a dive team of three.

George Bowen, a Scripps-trained dive graduate in 1966 and a now-retired ranger recalls, that when the two parks were separated in May of 1967, he was attending the Albright Training Center at the Grand Canyon. In email correspondence with the author in December 2012, Bowen wrote:

> We had to move back to San Diego, immediately pack our furniture and find a place to live near Point Hueneme. Skip Betts and I were the first CHIS dive team. We had accumulated our dive gear during and after our Scripps gig. We moved our two vessels—*Arrowhead* and *Cougar*—from Shelter Island Marina, San Diego up to Channel Islands Harbor at Ventura during the spring of 1966 and took over a spare warehouse at the Pt. Hueneme Navy Base. Our offices were in a professional building in downtown Oxnard.

A bit later in the history of the Channel Islands dive team, Craig Johnson still smiled more than two decades after his 1988 NPS retirement when reflecting during an interview with the author in April 2011:

> In the late 1970s, while Chief Ranger at Channel Islands, we organized a joint training exercise with the Navy out near San Nicolas, the most distant of the seven islands. We were doing "10 and 10s" [While scuba equipped, jumping from a twin-rotored Sea Knight helicopter from 10 feet high and moving forward at 10 mph. This maneuver is no longer performed, even by trained Navy Seals!]. I'm not sure the Navy ever knew we had intentionally scheduled these training dives on the first day of Lobster Season. But I am proud to say, we got our limits.

Chatahoochee River National Recreation Area was designated on August 15, 1978 by President Jimmy Carter, the park unit consists of major portions of a 48-mile stretch of the river between Atlanta, GA and Lake Sidney Lanier. In 1994 Ranger Irv Brock had recently transferred in from Kaloko-Honokōhau. Despite his efforts to start a dive team at Chatahoochee, he did not receive any institutional support or interest from fellow rangers. The park relies on local dive support, such as the Fulton County dive team, for body recoveries and other dive incidents.

Chickasaw National Recreation Area, a combination of Platt National Park and Arbuckle National Recreation Area, was designated on March 17, 1976, although both had been in existence since at least 1902. The Arbuckle Reservoir has 4210 acres and was created by the Arbuckle Dam in 1964, and diving began soon after. In 1967, seasonal ranger Butch Hill started in the park and remembers that both Rangers Bill "Bunny" Burnside and Bill Germeraad, were already diving for the park. Germeraad had been trained and

NAUI certified by Harry Wham at Glen Canyon in the fall of 1965. In October 1972, park technician Butch Hill was the park's only working diver. There was management support and around 1975, the park bought a compressor to fill tanks.

In 1981, Chickasaw had four divers: team leader Bill Warren, Allen Hill, Robert Cheadle and Eric Reuben. In April and May of 1986, SCRU did a magnetometer survey of Veterans Lake while also conducting training for the park's divers on submerged cultural resources.

Christiansted National Historic Site has a one mile of coastline within its 27-acre park. SEE BUCK ISLAND REEF NATIONAL MONUMENT.

Crater Lake National Park The first diving in Crater Lake was on August 25 and 26, 1954 by three men: Allen Cherry, a local who received some dive training in the military, *Life Magazine* staff photographer A. Y. Owen, and Phillip Bayou of Oklahoma. Per a May, 2013 email from Mark Forbes, a field ranger at Crater Lake from 1978 to 1985:

> We had a dive team while I was at CRLA and Mark Buktenica took over when I left. He did the lake research. . .We mostly did. . .lake cleanup, some salvage work, lake research, anchor-line installations, etc. The hardest part. . .was carrying equipment down the 1-mile trail to the lake (and the 850-foot elevation drop and gain). The park didn't really have any dive equipment. . .I did get some things from Dave McLean at LAME.

In the National Diving Control Board Special Meeting Minutes of May 15, 2003, Crater Lake is listed as having two divers with Mark Buktenica as the park dive officer.

Cumberland Island National Seashore was authorized in 1972. From retired ranger Dick Newgren in a November 2013 conversation with the author:

> We never had any reason for a dive team or diving effort. The Intercoastal Waterway was on our western edge with the Kings Bay Submarine Base so close, with its Navy's divers. The park's boundary was high tide and who would want to dive in that surf anyway!

Curecanti National Recreation Area is composed of three reservoirs, Blue Mesa, Morrow Point, and Crystal, and extends for forty miles along the Gunnison River. Blue Mesa is the largest lake in Colorado and the Blue Mesa Dam was completed in 1965. The area has been administered under a cooperative agreement with the Bureau of Reclamation, beginning on February 11, 1965. Bob White was the area's first district ranger and a well-trained diver, being one of the first NPS divers, and started working at Curecanti at least as early as 1967. It is safe to assume he was diving there at that point and possibly even earlier. In November of 1968, Sanford Recreation Area rangers Littlefield and Waldron participated in several working dives, along with Bob White, below the Morrow Point Dam. It appears that White was the only Curecanti diver at that time.

When Ranger Tom Griffiths arrived in 1972, having been trained in diving in Rocky Mountain in the spring of 1967, Tom "hired a couple of seasonals who were certified. One was an LA County instructor. . . Most of our dives were related to recovering equipment that had been dropped in the lake. We didn't really have a 'dive team.'"

In October of 1985, Curecanti had a four-person dive team with Perry Thompson serving as the park dive officer.

Death Valley National Park's first dive team was Ranger Rocky McCreight and it (he) came into existence in the mid-1970s solely to coordinate the counting of the Devils Hole pupfish. Rocky was a Scripps-trained diver and would routinely accompany other divers who came over from Lake Mead, as well as the University of Nevada, to assist in the fish counting. Rocky created a certificate of achievement for those who dove on behalf of this effort.

McCreight transferred to Grand Teton around 1978 and there were a few others who then did the pupfish diving, including Jim Clayton and Michael Wilson (1978), Gary Vequist (1976-1980), and John Bundy (1985). According to Vequist in a July 9, 2013 email to the author, the Death Valley program fell "under the

[Lake Mead] program…Once a month I made two dives in Devils Hole with a UNLV [University of Las Vegas] professor in cool 92-degree water. I had equipment purchased by the park."

Delaware Water Gap National Recreation Area was authorized on September 1, 1965, this scenic and historical area preserves relatively unspoiled lands on both the Pennsylvania and New Jersey sides of the Middle Delaware River. The forty-mile segment of the river flows through the famous gap in the Appalachian Mountains. Retired NPS special agent Bob Van Nortwick recalls that the first dive team was in 1975. In an email to the author on April 2, 2013 from Art North:

> …prior to 1975, the state police dive teams from Pennsylvania and New Jersey were responding to…the incidents that required divers. The DEWA folks assisted with boat support, water transports, etc. It is believed that the state folks encouraged the NPS to get more actively involved, and that led to the start of the program. Karl J. Theune and Paul Tyner were the first two divers. Karl went to Scripps in 1975 and although unconfirmed, probably Tyner as well." [Author--The Scripps list does not have Tyner in it.] It is believed Tyner moved from DEWA in early 1977 and Van Nortwick filled his position in 1977 and went to Scripps that October…and Theune attended for Dive Master training. Theune was the Dive Officer and served intermittently as the Regional Dive Officer for the next 20 years until his premature death (kidney cancer) in October 1997…Van Nortwick and Theune for several years supported by the state dive units until the early 1980s.

Dry Tortugas National Park was originally proclaimed Fort Jefferson National Monument in 1935 and re-designated Dry Tortugas National Park in 1992. Fort Jefferson was built in 1846-66. Of the 64,701 acres of the park, only about forty are above sea level. In May and June of 1971, the NPS conducted a study utilizing scuba, titled *Fort Jefferson - Moat Investigations*. It was presented as a paper at the 3rd Annual Conference on Underwater Archaeology and at the annual meeting of the Society for Historical Archaeology, January 13-15, 1972, in Tallahassee, Florida. In late June or early July of 1971, Everglades assistant chief ranger, Tom Hartman, Everglades marine biologist Gary Davis, and Biscayne's acting chief ranger, George Sites, started the first shipwreck survey. It was in association with the state of Florida, with project director, W. A. Cockrell. The dive team for Dry Tortugas was coordinated with Everglades. SEE BISCAYNE AND EVERGLADES NATIONAL PARKS

Everglades National Park was established in 1934 and today has 625,000 acres of submerged lands. At that time, the superintendent of Everglades also administered Fort Jefferson and its associated waters. This was years before Dry Tortugas National Park was established. There was significant diving in the area and surely within both parks. In the late 1960s, Tom Hartman got to Everglades as the assistant chief ranger. With a background in diving, it did not take long to begin using this skill for the park, although it seems he was the only certified NPS diver in the park.

Fire Island National Seashore was authorized in 1964 and had 52 miles of coastline and 4,411 submerged acres within its 19,579 total acres. In at least 1974, now-retired chief ranger of Fire Island, Don Weir, says, "While there was an active dive team of four rangers, the duties and activities of the Seashore did not support the continued activities and the team ceased." SCRU was at Fire Island at least once, in September 1987, with the US Navy Mobile Diving and Salvage Unit, in conjunction with efforts by Larry Murphy and Dan Lenihan at Cape Cod National Seashore.

Flaming Gorge Recreation Area was administered by NPS via an agreement with the Bureau of Reclamation, July 22, 1963, and transferred it to the US Forest Service on October 1, 1968. The 207,363 acres is almost equally divided between Utah and Wyoming. We assume diving took place while under the jurisdiction of the NPS, but details are unknown.

Fort Jefferson National Monument SEE DRY TORTUGAS NATIONAL PARK

Gateway National Recreation Area was established on October 27, 1972, with 17,989 of its 26,607 acres being underwater. In the diving summary for 2001 from the Northeast Region dive officer, Wayne Valentine, there were four divers listed for Gateway. According to Valentine, there were periodic dives being made by the US Park Police but they were fairly haphazard and generally not in NPS-4 compliance.

Glacier National Park did not have any park divers before 1970, instead it relied on the volunteers in the nearby Flathead Rescue Association for body recoveries. In late summer of that year, Chief Ranger Reuben Hart asked Ranger Larry Feser, who was then stationed at the park's remote Goat Haunt Ranger Station (on the Canadian border) if he wanted to go to Scripps. Larry was there because of the very complicated recovery of the five climbers who died by avalanche on 10,448-foot high Mt. Cleveland--the park's highest point--the previous December 30. Feser recalled his experience in a July 22, 2013, conversation with the author:

> I was interested but a poor swimmer. After practicing in the Waterton Townsite [in Canada] swimming pool extensively, coached by sympathetic lifeguards, I got so I could do the side kick pretty well but not the crawl.

With Reuben's encouragement, Larry began practicing but soon got interrupted, being deployed to Yosemite on a law enforcement detail after the July 4th "Yosemite Riot". Chief Ranger Hart said, "You can practice in the Yosemite pool!"

> Since I had a day job, I could. Swimming after hours, I worked hard. With a week to go till I was to report to Scripps, I went from Yosemite to my sister's home in Southern California where she had a large pool and I again practiced a lot, particularly with a lot of swimming underwater. I was afraid I would flunk out and in fact, I think I was the closest diver to go through Scripps who did not actually fail. Even Jim Stewart's assistant Al Stover, thought I might not make it. When I talked to Al at La Jolla after Yosemite and before the week at my sister's, he said, "I've got to tell you, you won't be able to use the crawl!"
>
> That wasn't bad news! I didn't quite complete the initial swim test. They said I could try it again later. It never came up, but I doubt if I could have come as close as I did the first time. If it had not been for the constant encouragement of my dive partner, a big African American ranger from Virgin Islands, who was the strongest swimmer in the group, I probably would not have gotten through. As it turned out, however, I never did any diving in Glacier after Scripps but having gone to Scripps was a factor in my being selected for the Northwest District Ranger job in Olympic.

Glacier had a dive team, at least as early as 1972, however. Records are unclear but we know Oakley Blair was the dive officer in 1975, until at least 1980. In July of 1977, there were four NPS divers and, according to Ranger John Benjamin in a May 15, 2013 email to the author:

> . . .a small compressor that was used to fill Scott Air Packs for fire fighter use as well as SCUBA tanks. . .worked with the Maintenance Division to convert a small store room into a proper filling station for air tanks with a new powerful compressor and attached air bank. It was a relatively small step to transform that space into a proper dive locker for the park. John worked with a local PADI instructor to be trained as an ice diver and in swift water diving. Ice dives were conducted in Swift Current Lake at Many Glacier and on Lake MacDonald with the park's divers, all of them in wetsuits. That experience prompted him to order dry suits for the team.

Dan Lenihan and Matt Russell from SCRU came to Glacier in July 1996 and did a submerged resources reconnaissance assessment in Fish Creek Bay of Lake McDonald, and in Bowman Lake. In March of 2000, park dive officer Charlie Logan suggested to Glacier chief ranger Steve Frye that the park do away with the dive team since there was minimal maintenance and emergency diving necessary. According to an email from Logan in September 18, 2011, the Team was terminated in early 2002 with any recovery dives deferred to the local Flathead Valley volunteer groups.

Glacier Bay National Park was established in 1925, and has 601,600 acres of water with a great many opportunities for very cold-water diving, principally scientific. Likely the first diving in the park, at least professionally, was by David Duggins, beginning around 1975. Having earned his dive certification in 1962 from the YMCA in St. Louis, he was part of a multi-discipline inter-tidal and tidal research contract

(he was not an NPS employee) with the University of Washington. He was studying how the Canadian Newmont Minerals company's proposed mining and export of vast nickel deposits, found under the Brady Glacier, would affect the wildlife of the park's outer coast. He was diving at least once a month, year-round, for several years and was analyzing one-meter plots in about fifty feet of water. When he completed the project, he wrote a doctoral dissertation in Marine Ecology, *Kelp dominated communities: experimental studies on the relationships between sea urchins, their predators, and their algal resources*, in 1980. Upon completing the project, he left his tanks, compressor and related equipment, to the park.

Don Chase, a Scripps-trained diver with considerable experience from Lake Mead, arrived in 1976 and began doing some shallow diving in the park. He was always accompanied by a couple of divers from the community. Superintendent John Chapman was very supportive, although the generally anti-government locals often thought Don was "just playing." In 1980, and through 1988, Gary Vequist, the park's resource management specialist, joined in. They, along with new district ranger Jerry Case who soon became part of the now three-man dive team, actively dove, partially to keep their skills up, perform routine maintenance on docks and boats and lastly, as a prelude to some marine-oriented scientific research.

On September 24-26, 1983, service diving advisor Jim Stewart spent three days in Glacier Bay certifying rangers Chase, Vequist and Case, as well a diver from the Alaska Regional Office (name is unknown), in the use of dry suits. Additionally, it served as a dive refresher for these four experienced divers and the beginning of the Glacier Bay dive team. This is probably the first "official" dive team in the Alaska Region. In a 2012 email to the author, the now-retired Vequist recalled:

> Don Chase, Jerry and I [Gary Vequist] made up our team. We had equipment provided by the park, however for the first year Don and I dove with our wetsuits and would pour warm water down to build up some courage. We were good for about thirty minutes when the shivering started. We upgraded with dry suits and improved our compressor and went to town. We did some maintenance diving and some SAR on sunk vessels. I remember a search with State Patrol divers after an anchored fishing vessel sank off Pleasant Island (Gustavus)—two missing. A year later a skull was found miles away on the beach. We had our dry suits then and the state divers provided an underwater sled that would be towed by a boat…Interesting!
>
> I assisted on some sub-tidal research dives with Dave Duggins (UW) [there is some difference on these dates provided by Vequist and Chase] and with other research divers over the years. Our compressor ran on gas so the exhaust was well vented in our Bartlett Cove well house (not much of a dive locker). But we could disconnect it and fill tanks on NPS MV *Nunatak,* a 65-footer—6 passenger capacity—no luxury ship like the CHIS vessel. Toward the end of my stay at GLBA we worked on certifying a couple of other people but I don't remember who they were. It was pretty much the Don, Jerry and Gary Show…Diving in GLBA required knowledge of slack water, tides and current—often a lot of swell. You definitely need a tender in skiff above while diving…never knew where you would pop up.

As of 1995, Glacier Bay had a very active dive program, principally marine research. National Biological Service (now USGS) divers were the most active, although there were several from the park as well.

Glen Canyon National Recreation Area's dive team began in June of 1964 when Ranger Bob Scott, who had attended the Navy's Deep Sea Divers' training in Washington, DC in 1963, began teaching the first six Glen Canyon rangers to dive: Don Jackson, Phil Martin, Dick Barbar, Roger Brask, Chris Cameron and Dave Miller. Martin already knew how to dive and even owned a dry suit.

Four months before, on January 20, Scott had been authorized to serve as a scuba instructor by (acting) Southwest regional director, James M. Carpenter. Scott's class completed their course one week after the first Wham course at Lake Mead. In addition to teaching this 1964 class with the six divers, Bob Scott principally wrote the park's first diving manual (Section 800 of the *Glen Canyon National Recreation Area Ranger Manual*). Among other things, the manual required a three-man dive team; mandated a physical exam every two years; swim and navigation skills testing and established a minimum of 25 hours of training in physics, physiology, diving tables, and orientation to equipment and procedures.

Tragically, on February 21, 1965, Ranger Phil Martin died at the age of 27 from hypothermia in the 50-something-degree waters of the Colorado River. He was sport kayaking at Glen Canyon's Lees Ferry

while home for the weekend from training at the Albright Training Center on the South Rim of the Grand Canyon.

The government provided all diving equipment except masks, fins, snorkels and wet boots. It was said, "This latter equipment is relatively inexpensive and, since it is of a somewhat personal nature, individual divers must provide it at their own expenses." The NPS bought tanks, depth gauges, expensive watches that were kept in a safe when not diving, regulators and vests. The park also bought a MAKO compressor. There was not another one closer than Phoenix, at the time. Once a month, the park sent a tank to Linde Oxygen in Phoenix for testing for purity, just to check the compressor. The park dive team took it everywhere, including on-board their 34-foot cruiser. They put an air intake hose up to the flying bridge so that the exhaust fumes couldn't affect their air. It seemed to work great as there was never a negative test, according to now-retired ranger Don Jackson in an email to the author on Sept. 12, 2009.

Golden Gate National Recreation Area certified and approved "the first Golden Gate National Recreation Area search and recovery team: Jay Eickenhorst, Scott Tye, Terry Swift and Scott Cruss (USPP) [Sic: Scott Cruz]," per the September 15, 1978 Western regional dive officer report for April, May, and June. Golden Gate supervisory lifeguard Scott Tye was the first park dive officer. Per a March 19, 2013 email to the author from Jay Eickenhorst about the first Golden Gate dive team:

> It was pretty much a luxury from the beginning…many other agencies in the area that could provide diving services, and numerous businesses, but …it was lots of fun and a great way to enjoy being a park ranger / lifeguard. The driving force behind it was …The Ships—now known as San Francisco Maritime National Historical Park and the ongoing underwater maintenance of same.
>
> And…because of our lifeguarded beaches (Ocean Beach, China Beach, Aquatic Park and Stinson Beach) the occasional "rescue" …was always a body recovery.
>
> The Channel Islands marine resource inventory happened a couple times during our "heyday," we hosted a regional dive refresher…almost lost a buddy team in the bay near Angel Island, Terry and Pat did a deep dive to recover the body of a helicopter pilot that crashed into Lake Lagunitas…The initial team was Pat Norton, Terry Swift, Scott Tye and Jay Eickenhorst. Bob Del Secco and Larry Noral later, but as alternates. The HQ for the team was Stinson but we had gear at China Beach and Aquatic Park as well. The lifeguards always had "bail-out bottles" on the Zodiacs just in case…seldom used except for training and fun.

Grand Canyon National Park did not have a dive team prior to the 1980s, although over the years there were individuals stationed at Grand Canyon who were NPS-trained divers. Don Jackson, a diver trained at Glen Canyon in 1964, was at the Albright Training Center as early as 1965 and there were others as well, such as Craig Johnson, Craig Dorman, Stu Croll, Don Chase and Glenn Fuller. These divers maintained their certifications by participating in various dives around the region but the park did not support a dive team. In communications with both Jack Morehead and Stu Croll, both of whom were divers as well as training specialists at the Albright Training Center in the 1960s and 1970s, neither recalled the park having a dive team prior to 1981.

The Grand Canyon's first dive team began that year when Butch Farabee transferred in from Yosemite and became the assistant chief ranger. During this time there were up to six active divers, scuba tanks and equipment were purchased. There were several body-recovery efforts made in the Colorado River in the 1980s. The first record of using scuba for a body recovery at Grand Canyon was probably for Jeffrey Kaplan, 16, who disappeared and presumably drowned on August 7, 1983 at river mile 2.5. Less than an hour into an OARS, Inc. raft trip, the boatmen stopped for lunch and the boy was exploring in and around the river. Butch Farabee searched the area the following day without success; the boy was ultimately discovered less than two miles downstream, 23 days later.

Grand Teton National Park didn't have a formal dive team yet in the 1960s, although from 1965 through 1968, Jack Morehead, an early NPS diver, was stationed there. According to Morehead in a November 30, 2012 email, there was no dive team or management at the park at that time, but he used his own scuba equipment and did some dives, mostly on his own. In June of 1967, he also provided some familiarization on scuba to rangers in Yellowstone.

In 1978, Ranger Charles "Rocky" McCreight, was transferred from Death Valley, where he had done numerous dives in Devils Hole and was stationed at John D. Rockefeller, Jr. Memorial Parkway, adjoining Grand Teton. Probably as a result of his interest in diving, Grand Teton had dive suits, dive planes, tanks, and regulators stationed at Coulter Bay in the late 1970s. In 1989, Rocky was the assistant park dive officer and Scott Berkenfield was the park dive officer. In 1995, Jeff Rader was the Grand Teton dive officer.

Retired Hawai'i Volcanoes superintendent Jim Martin wrote to the author in March, 2011:

> I may have made one of the earliest salvage dives in the NPS. Phil [brother] was a seasonal ranger… in 1958 or 1959 stationed at Coulter Bay. During a bad storm a patrol boat was sunk off the boat ramp. Phil asked I bring the SCUBA gear up when I came up…I made a very short dive off the end of the boat ramp and attached a line to the boat…

Great Smoky Mountains National Park was the scene of 28 drownings (five of which occurred at the Sinks, a short, turbulent waterfall) from 1971to 2006, second only to motor vehicle accidents. The park is often assisted by the Blount County Rescue Squad, who provide scuba diving and swift water rescue services. According to Clayton Jordan, acting superintendent of the park in January, 2015, "We went back as far as the late 1970's, [nothing] to suggest there was ever a dive program."

Gulf Islands National Seashore was authorized in 1971 and is broken into two separate districts, Mississippi and Florida. In July and August of 1973, SEAC did the very extensive *Gulf Islands Shipwreck Survey, Magnetometer and Site Survey.* The project director was George Fischer. Then in 1974, Wayne Valentine went to Gulf Islands. He wrote to the authors on January 23, 2013:

> …Spring of 1974 at GUIS…there was no dive program. I attended Scripps as an advanced diver in 1978 and a divemaster in 1979…my requests to Richard Curry, Jim Tilmant, NPS dive examiner from BISC came…in June 1979 and conducted check-out dives for GUIS staff member Dennis Parsons, Mike Farley and Diane Craig…I was blessed as a dive examiner…conducting diver-in-training dives thereafter. It therefore appears the dive program began at GUIS in 1978 and I served as the Park Dive Officer until…in 1984…the program fizzled out in the Florida Unit but I believe lingered on in the Mississippi Unit a bit longer. Through those years I conducted training both in the Florida and Mississippi Units. Additional participants…Dave Spirtes, Mike Magley, Jerry Case, Jim Webster, Jim Ray, Jim Hummel, Jack Fitzgerald, Pat Toope, Shawn Green, Sue Cabal, Lamark Lochard, Brian Fitzgerald and Mark Holloman.

Haleakalā National Park's dive team was proposed in a July 22, 1980 memorandum to the Western regional director, the superintendent of Haleakalā, Hugo H. Huntzinger.

> At the present…no organized NPS dive team in the Pacific Area. A NPS certified dive team located at Haleakalā could be utilized by other NPS areas within Hawaii if the need arose. There is not an organized dive team on East Maui and local authorities must rely upon those NAUI certified individuals who just might be available at the time of need. The availability of a trained NPS team would be a community plus and might even help to improve our image which is presently strained due to the land acquisition controversy.

On July 31, 1980, in a follow up memo to Superintendent Huntzinger, Western regional director Howard Chapman, responded:

> We have reviewed your proposal for a dive program at Haleakalā National Park, and concur that it is a desirable and practical project. We have also discussed this with Dave McLean, Regional Dive Officer…You and your staff are to be commended for your efforts in this regard, both for the benefits to the National Park Service and employees, and for the community relations aspects you discuss in your memorandum.

The Haleakalā dive team was finally certified by Dave McLean, with Channel Islands biologist and NAUI dive instructor Gary Davis assisting, on February 27, 1982. Participating in this five-day review and team certification process, were: Kimo Cabatbat, Terry Lind, and Perry Bednorz, all from Haleakalā, and Ralph Clyne and Bob Siebert from Hawai'i Volcanoes.

Hawai'i Volcanoes National Park did not have a dive team. On May 10, 1982, Superintendent Dave Ames, made a formal written request of the Western Region to assist in having two rangers, already certified in scuba, officially supported as a park dive team:

> While I would not visualize HAVO developing into an active dive park, there certainly would be times when divers could benefit both NPS and local agency operations. We presently have a number of rangers that dive recreationally…two recently completed an NPSW dive workshop. Both… have their own equipment and are interested, for both a career development and NPS/public service standpoint, in obtaining NPS Diver Certification. I would like to request the certification of these two individuals—Robert Seibert (backcountry district ranger) and Ralph Clyne (park technician—law enforcement) as NPS divers. I have discussed this with Chief Ranger Sholly and he concurs. With your, and the Regional Office's concurrence, I will contact Dave McLean and initiate the certification process.

Although Clyne and Seibert were certified divers, Western Region did not agree that they should be part of an official dive team for Hawai'i Volcanoes. On June 15, 1982, in a memorandum to superintendent Dave Ames, acting regional director John D. Cherry refused the request and responded:

> It is our understanding that the Hawaii County Fire Department maintains an excellent rescue squad with full diving and water recovery capabilities, and that they are willing and able to respond to our occasional requests for assistance, and have done so in the past. This seems logical and appropriate to us, since the NPS has no jurisdiction over offshore waters at Hawai'i Volcanoes…In short, we see no compelling need for initiating even a minimum-level diving program at Hawai'i Volcanoes when the lack of jurisdiction, the few water-related emergencies, the existence of the County capability, and the potential expense and number of work hours which are required for certification and currency are all considered.

Indiana Dunes National Lakeshore never had a dive team at least through 1981, according to retired Midwest regional protection specialist John Townsend in an email to the author on Oct. 11, 2011.

Isle Royale National Park was authorized on March 3, 1931, with boundary changes, some of which affected the underwater portion, taking place in 1934, 1938, 1942, 1958, 1972, and 1976. It was once listed by a major sport diving magazine as one of the top seven dive sites in the world. The Isle Royale dive team began in 1966, although there was sport diving there much earlier, principally on several of the ten known major wrecks. That was the year Dick Metz came to work as the park's tugboat captain. He worked for the NPS from 1966 to 1973. Metz had been diving since 1956, learning (but no certification) in the lakes of Wisconsin and taught by Vince Jordan, owner of a Duluth, Minnesota dive shop.

When Metz first started diving at Isle Royale in 1960, he met Ranger Bernie Getstall, who was also diving recreationally. Metz began helping other rangers learn to dive, as well. And that year, 1966, according to Metz, the park bought a compressor, air bank, wetsuits, tanks and related dive equipment from Vince Jordan's dive shop.

From 1980 through 1986 the SCRU team dived there every year for a period of 3-4 weeks to inventory the shipwrecks and underwater sites associated with land facilities. *Submerged Cultural Resources Study, Isle Royale National Park,* edited by Lenihan, was published in 1987 by the government printing office. A 568-page document, it became the model for future studies of parks with large, known shipwreck populations. This study was republished by Lake Superior/Port Cities Publishing in 1994 under the title *Shipwrecks of Isle Royale National Park.* Sections on underwater components of land-based sites were removed from this popular version along with some discussions of management strategies at the request of park managers.

Kalaupapa National Historical Park was authorized on December 22, 1980 to manage and interpret the site of the Molokai's Hansen's disease (leprosy) settlement; the park includes 2,000 acres of ocean which includes habitat for rare and endangered species. A park dive team began in 2003 and is under the leadership of Eric Brown, PhD marine biologist. There were three divers at this time, and it was created in response to the Pacific Coral Reef Initiative. It remains active as of 2016.

Kaloko-Honokōhau National Historical Park was first designated as the Honokōhau Settlement National Historic Landmark in1962. In 1978 it was established as a National Historic Park and expanded to include the ocean waters between Noio and Wawahiwa'a Points. Irving Brock, the author quoted below from an Oct 21, 2014 email, dove these waters three years earlier in 1975, and in 1990 he was transferred in as the park's first protection ranger and diver:

> . . .and immediately Supt. Francis I. Kuailani, Sr. had me scheduled for the Annual Dive Physical at the Naval Base Pearl Harbor before the month was over. He then introduced me to NPS Partners Jeff and Teri Leicher, local owners of Jack's Diving Locker. They completely outfitted me in the best SCUBA gear and equipment minus the tanks. They were also the exclusive Dive Operators for PADI Diver, Grateful Dead founder Jerry Garcia. I remember an official dive in May 1990 where I went diving with the Leichers and Jerry Garcia was onboard! He was diving to be interviewed by video in support of boat moorings to be installed to save the Coral Reef. The Grateful Dead's Non-Profit Charity donated $10,000 and he gave testimony at the Hawaii Public Hearing.
>
> The Park's prehistoric fishponds are cultural resources that were being adversely affected by invasive Red Mangrove. I was supervising the Exotic Plant Management Team and recruited them to make-up the first KAHO Dive Team. In June '90, WRO Dive Officer David Stotlz came. . .to put on the Blue Card class sponsored by KAHO. Participating was Steve Makuakane-Jarrell* from USAR and my dive buddy. He later would transfer into my position when I transferred out. The first Park Dive Team members were Rizal Fronda, Herman P. Kunewa, Supt. Kuailani and myself. [*National Park Ranger Steve Makuakane-Jarrell was shot and killed while on patrol in KAHO on December 12, 1999.]
>
> KAHO was unique in that there were purported underwater cultural features/artifacts in caves (lava tubes), ancient fishponds and off of Wawahiwa'a Point. I dove with the team in the ponds and into caves hoping to document the grave of King Kamehamaha I. Then in December 1990 we received the support of Dan Lenihan. . .I dove with him to map the ocean floor in transects to document these purported features. We were again supported by Jeff and Teri Leicher. . .as we still didn't have a boat or much equipment.
>
> I was able to eventually rectify the lack of a boat as I received a transfer of property of a 19-foot Grady White runabout: "to monitor the. . .300 yard restricted whale watching vessel limit" for the National Marine Fisheries Service. It [also now] became the Park's Dive Boat. . ..

As Brock mentions, the SCRU got involved at Kaloko-Honokōhau for the first time in December 1990, wanting to determine if there were prehistoric cultural remains in the park. They returned in late June of 1992 and, according to Dan Lenihan, "hit it hard" with the whole team, since they were returning from two months of operation in Micronesia. Adding support were Hawaii state police divers and the NPS area director, Bryan Harry. Before long they decided there was not much underwater cultural significance.

Then in 2000, the Pacific Coral Reef Initiative (PCRI) began, with four parks: Kaloko-Honokōhau, War in the Pacific, National Park of American Samoa, and Kalaupapa. PCRI ecologist Sallie Beavers: "When I got there, the dive gear was all stored in a small metal locker within the LE [law enforcement] cage (an area in our attic enclosed by chain link fencing.)" Sallie Beavers was the park dive officer as of 2016.

Kenai Fjords National Park was proclaimed a national monument in 1978 and a national park exactly two years later. It has 669,983 acres, none of which are underwater, despite 468 miles of shoreline. Peter Fitzmaurice, a Scripps-trained diver and the park's chief ranger, was there from March, 1988 through August, 2001. According to him, there was no formal diving program and the only dive he made was one winter to help winterize the park's boat.

Kings Canyon National Park SEE SEQUOIA – KINGS CANYON NATIONAL PARKS

Lake Mead National Recreation Area dive team began on May 19, 1964, when eight rangers and maintenance men at Lake Mead graduated from a 36-hour-long scuba program taught by Harry Wham. The training was under the relatively newly formed National Association of Underwater Instructors. Per Superintendent Chuck Richey, as reported in the Boulder City News on June 18, 1964:

> This training will benefit visitors…by having trained personnel…for information and assistance in this fast growing sport. At the same time a more serious result of the training is the availability of divers in case of an emergency in the Area.

Each diver bought his own wet suit, face mask, snorkel, fins and booties. Tanks and regulators were purchased by the park. Knives, depth gauges and other equipment were also purchased by the individuals if they were wanted but were not considered essential at that time.

Lake Meredith National Recreation Area was originally Sanford National Recreation Area, created by the Sanford Dam on the Canadian River in the Texas Panhandle. It was administered in cooperation with the Bureau of Reclamation, beginning on March 15, 1965. Sanford NRA was re-designated as Lake Meredith NRA in 1972. By most accounts, Lake Meredith is not a pretty place to dive, but at least in the early years, there were a lot of drownings, with up to perhaps ten per year.

Ranger Jim Anderson transferred from Lake Mead to Sanford in 1965, and over the next two years proceeded to train park staff in diving, creating the first underwater search and recovery team dive team for both the park and the region. Cal Cummings was part of that team, certified by Anderson in 1967.

As early as 1967, the dive operation included Chief Ranger Art Partin, Rangers Larry Waldron and Bill Burke, who received a YMCA Certification instructed by an Amarillo dive operator, possibly by the owner of Aqua Shop, as the instructor. Park management was supportive, there was a small dive locker with a compressor.

Lake Roosevelt National Recreation Area was originally Grand Coulee Dam National Recreation Area, formed by Grand Coulee Dam (part of the Columbia River Basin Project) which was completed in 1946. The 130-mile long Franklin D. Roosevelt Lake is the principal feature of the 100,000-acre recreation area. Per Ranger Jerry Lee,

> I transferred back to Grand Coulee in 1970 and spent the next four years there before moving to nearby North Cascades. Even though I had been a trained NPS diver at Cabrillo, I never dove again and there was no diving program in the park.

Subsequent search of the Lake Roosevelt files does not show a dive team afterwards although it must be assumed there is recreational diving in the park.

Lassen Volcanic National Park saw its first use of scuba in the summer of 1958. Jim Randall, a district ranger, witnessed his very first diver with a "real-life" scuba tank. Several local divers asked for and were given permission to clean the bottom of the park's Manzanita Lake by using their dive equipment. In 1968, seasonal ranger Gary Davis, a San Diego State College-trained diver, brought his personal dive equipment to the park. That June he was asked by the park's roads and trails crew to help clear a blocked culvert. At the time the park had neither dive equipment nor a dive program. On Gary's lieu days he did ecological surveys on nine of the park's lake, often either snorkeling or using scuba.

Other than with Gary Davis and his efforts, it does not appear that Lassen Volcanic had a dive team in any fashion until 1976, when Larry Feser transferred in. Larry had gone through Scripps in 1970 and again in 1973 as a divemaster. He and fellow ranger John Lounsbury did some diving in the park. Over the years, supported by Chief Ranger Al Schneider, Lassen Volcanic had a small dive program with Larry Feser, who in 1980 (through at least 1988), was the dive officer, along with Steve Kelly and Michael M. Wilson and later, Dutch Ackart and Peter Fitzmaurice.

Little River Canyon National Preserve does not have a dive team although it was set aside to highlight the Little River as well as the deepest canyon east of the Mississippi River. Prior to the NPS acquiring the 14,000 acres, the land had been protected by the Alabama State Park System. There have been, per the area's chief ranger, at least eight drownings and one vehicle recovered by the use of local divers between mid-1997 and 2014.

Millerton Lake Recreation Area's management by the NPS was arranged by agreement with the Bureau of Reclamation on May 22, 1945, and then transferred to the State of California on a lease agreement on November 1, 1957. When full, the lake covers 4,900 acres and has some 40 miles of shoreline. Although a little

diving was likely taking place there prior to 1957, the authors do not know about the dive history in this area. **Mammoth Cave National Park** has a history of cave diving in the several significant underground waters in the park, including Mystic River, Roaring River and the River Styx. In addition to the obligatory exploration for the sake of understanding the extent of the cave, there has also been major research on the endangered, elusive cave shrimp, (*Palaemonias ganteri***),** ongoing since at least 1982 by the Department of Biological Services of Old Dominion University in Norfolk, Virginia. Research summaries from 1982 and 1984 mention cave divers observing the shrimp.

Mount Rainier National Park developed a dive plan in 1969, according to Olympic ranger and the park's dive officer, Dan Pontbriand. This plan has not been located.

Natchez Trace Parkway was designated in 1938, when construction of the 444-mile-long parkway began, following a historic trail and eventual postal road that spanned territories of several American Indian tribes. There were additional land acquisitions through 1961. The parkway was completed in 2005.

> The Tennessee River impoundments in Northwest Alabama are managed by the Tennessee Valley Authority. The [NPS] jurisdiction is from Colbert County Public Boat Ramp and Pickwick Lake (Colbert Ferry Ranger Station) to Lauderdale County Public Use Area connected by the one-mile long Natchez Trace Bridge. The TVA had boats and divers galore from Knoxville, Tennessee to Lake Wheeler in Florence, Alabama…Since this was the furthest Southwest jurisdiction of the TVA, the NPS had a Dive Team from the late-1970s to mid-1990s.

The quote above is from Irving Brock, a former ranger of Natchez Trace. In his effort to help the authors learn more about the Natchez Trace dive history, he contacted retired Natchez Trace rangers. Based on their recollections of an earlier dive team, it is believed there was an NPS dive team on the Trace prior to the early 1980s. Further details could not be obtained.

National Park of American Samoa was authorized on October 31, 1988, with a fifty-year lease. Its three units sit on three volcanic islands, and of its 9,000 acres of non-federal land 2,500 are of submerged marine lands.

In 1992, the Southwest regional director temporarily diverted SCRU from the several-month-long work it was doing in Micronesia, to spend several days in NPSA. Doug Cuillard, the park's first superintendent, needed a quick assessment of the area's underwater values to help put together a management plan. Jim Bradford, John Brooks and Dan Lenihan went. The following is from the diving log books of Dan Lenihan:

> On July 7, we dived W. side of Palo, Tutuila to "recon park bottoms," 65' max. 43 mins; and 1/3 the way from Palo west 80' max. 39 min. (nondescript bottom)
>
> July 8, Pago Pago, look for USS *Chehalis* 143' max, 20 mins. Brooks and I did bounce dive on singles. The ship was part of some disaster in Samoa involving fire in the harbor. We took a quick shot at finding it and missed—visibility was crummy. It was not in the park but somebody (Navy?) was talking of getting SCRU to map it. Navy had sent almost 300 divers to help us in Palau, Kosrae, Ponape, Guam and Majuro the last few months.
>
> July 9, American Samoa, Leone Hbr 78', 44 mins. Examined old harbor area used in days of sail.

When the park hired Jim Nimz, a marine ecologist for the Pacific Reef Inventory Study in 2001, he also became the park dive officer. According to an email from Michael Larson, chief of interpretation and education for NPSA, to the author on August 15, 2013:

> …2001-2006 the park dive program remained relatively small, 3 to 4 people. Despite the size, the staff began many of the programs in place and established agreements between local agencies that are still active today. The primary focus for that period was the monitoring of coral reef around the territory.
>
> 2007-2009 the park dive program grew, the number of divers was up to eleven active divers (2 staff and 9 VIP) despite the growth of the diver population the research output stayed about the same. The main concentration stayed at reef monitoring, in 2007 the Pacific West Region implemented an Inventory and Monitoring (I &M) program which has become a major component of the NPSA dive workload. Along with reef monitoring the NPSA waters became more of an interest to outside organizations.

Late 2009 the entire NPSA headquarters and dive operations were hit with a tsunami. Following the tsunami it took about one year for the program to be up to full strength. Following the rebuild of the park, the NPSA dive staff was left with three active divers. We now continue to monitor reefs throughout the Pacific West. NPSA marine environment has become of greater interest to the academic community due to the growing threat of global climate change.

North Cascades National Park includes both Lake Chelan and Ross Lake National Recreation Areas. Although there is significant water in the three areas, according to casual conversation regarding this matter with rangers in the park, it seems unlikely there was ever any diving done here, certainly not by the NPS.

Olympic National Park was used for scuba diving by locals from Port Angeles in Lake Crescent as early as 1954. On at least several occasions, these local divers were called upon to perform body recoveries and assist on motor vehicle accidents in the Lake. There was a dive team of sorts, at least as of the summer of 1967. It is believed there was one earlier, as well, but this has not been substantiated. Ranger Don Brown was involved and eventually helped to teach Stu Croll. In 1970, dive instructor Don Weir and Ranger Larry Feser joined the staff, helping to bolster the team. At the request of Superintendent Roger Allen, Don Weir wrote a park dive plan in 1970.

Ozark River National Scenic Riverways was authorized in 1964 and established in 1972. Ozark River was the first national scenic river. The 134 miles of the Current and Jacks Fork Rivers, provides a variety of recreational opportunities, although much of the year the rivers are too shallow for anything more serious than snorkeling. Determination of whether the park ever had a dive team was sketchy at best but it does not appear there was ever a dive program at Ozark River..

Padre Island National Seashore was authorized in 1962 and established in 1968. Nearby Corpus Christi boasted of scuba in1958 with the founding of the Corpus Christi Piscadores dive club. Park dive team history is unclear but it seems that in 1973, the park had at least "2 trained divers, had little need for a full Team, had no program to utilize the 2 divers they had and had no plan to buy any equipment." The park had drafted a *Padre Island Diving Safety Plan* in May of 1985 for its diving. From July of that year through June of 1986, SCRU, with project director Larry Nordby, performed the *Padre Island Magnetometer Study* and the diving safety plan may have been related to this effort.

There was considerable public diving in the park, mostly in relation to the three ill-fated 1554 Spanish galleons wrecked within the southern portion of the park. In 1964, Vida Lee Connor discovered the location of one of the wrecks during a summer scuba diving adventure off the island. For two years she conducted research on the Spanish wrecks and privately documented her discovery. This discovery led to another ten years of searching by locals, the State of Texas and the National Park Service.

Pearl Harbor National Memorial SEE USS *ARIZONA* MEMORIAL

Pictured Rocks National Lakeshore was authorized on October 15, 1966; it was the first national lakeshore. Per now retired but long-time Superintendent Grant Petersen, himself a Glen Canoyn-trained diver from 1965, Pictured Rocks never had a dive team. He "vetoed the idea years ago when it was first proposed because the cost was not worth the benefit." The Michigan State Patrol and a nearby county sheriff both had adequate dive teams for emergencies. Grant did say that on occasion he'd use his own equipment to help set a buoy, check a dock, etc. SCRU did at least one Shipwreck Survey at Pictured Rocks in 1988 and 1989 with Patrick Labadie as project director.

Point Reyes National Seashore borders the Pacific Ocean and has a reef and several significant shipwrecks. Leroy Brock, a 1968 graduate of the Scripps diving course, went to Point Reyes as the chief ranger in March of 1975. He and Bruce Albert became the park's first dive team. The park supported the effort although they never bought a compressor, as there were many available nearby. According to Brock in a September 20, 2011 conversation with the author, in retrospect there was no resource or emergency use for the diving and the

only reason they dove was to keep active and maintain certifications. The team ended when Brock retired in the late 1990s. Brock said that if he had to do it over again, he would not have dived there, due to the dramatic increase in great white sharks. When he started there were few, if any, great whites.

SCRU went to Drake's Bay in Point Reyes in 1982 and 1983. They performed a California shipwreck survey and site evaluation with remote sensing, side scans, magnetometer, etc. The project director was Dan Lenihan with Larry Murphy.

Pu'uhonua o Hōnaunau National Historical Park was originally authorized on July 26, 1955 as City of Refuge National Historical Park. It was renamed on November 10, 1978. There are 420 acres within the Hawaiian park, with one mile of coastline. The park does not include any part of the Pacific Ocean and even though staff has been diving off of park land for years, there has never been a park dive team.

Redwood National Park includes almost 6,000 acres of water within its legal boundaries, interestingly, more than in Virgin Islands National Park. From 1973 till 1994, Ranger Norm Blair and for lesser amounts of time, seasonal ranger Evan Jones and a park maintenance man (name unknown), were encouraged by Chief Ranger Homer Leach to be a dive team. The park bought tanks, allowed for dive training, obtained Lake Mead's first air compressor and, in other ways, supported a dive program. This was initiated and principally maintained at the request of Blair in order to provide community support. These few individuals performed several body recoveries under hazardous conditions, as well as evidence searches for the local sheriff's office of Del Norte County.

An October 5, 1983 memorandum from Dave McLean listed Norm Blair, Bill Donati, James Harrington, Terry Hafston and Malcolm McConaghi, as Redwood divers.

Rocky Mountain National Park's dive team began in late spring of 1967, when Jerry Phillips, who had attended the Navy's Deep Sea Divers course three years before, began to coach Tom Griffiths and Doug Erskine in diving in the local Estes Park pool. Jim Randall was now chief ranger and soon contacted Dick Smith of Colorado Divers Supply in Denver to put on a scuba school for park staff. In addition to Phillips, Erskine, and Griffiths, other participants were Rangers Morris Brown, Roger Pfeiffer, Hank Jones Cecil Lewis and Al Simonds, as well as the local Estes Park physician, Dr. Sam Luce. Dr. Luce gave them all physical examinations.

Saint Croix National Scenic Riverway had a dive team on the record in 2003. In the minutes of the 2003 National Diving Control Board Special Meeting held in Reno, Nevada on May 15, was listed that Saint Croix had six divers: three NPS, two FW and one VIP. Bob Whaley was the park dive officer.

Salt River Bay National Historical Park and Ecological Preserve Authorized on February 24, 1992, 600 of the 978-acre park in the Virgin Islands is listed as underwater. The park preserves upland watersheds, mangrove forests, estuarine and marine environments. SEE BUCK ISLAND REEF NATIONAL MONUMENT

San Juan Island National Historical Park does not have a dive team. Even though the 1,752-acre area, authorized in 1966, is on an island in Puget Sound, the park boundary stops at the water's edge. One of the more recent superintendents was Bob Scott, who was a service diver in 1963.

Sequoia – Kings Canyon National Parks first started supporting divers in 1964. March 17, 1964, district ranger Don Dayton and fellow ranger Bill Wendt began an eight-week YMCA scuba course in Fresno. They had asked to attend the once-a-week class on government time, but were denied. The park did allow them, however, to use a government vehicle to travel the 120 miles to class. When they graduated in May from the YMCA course, the Western Regional Office did certify them as divers.

In 1966, Ernest "Ernie" O. Scott, who was working as a ranger at Cedar Grove at the time, was called in and asked by Superintendent Frank Kowski, if he wanted to go to Scripps. "I could barely swim!" He actually lived for about ten days at a motel in Fresno so that he could learn. Every morning he would swim 1000 yards, 25 yards underwater with one breath, and other exercises, all done preparing to go to Scripps. Apparently he was

successful, he ended up diving "quite a bit in Sequoia. I enjoyed it." He had a wetsuit custom made. In those days, all of the equipment stayed with the diver, so when he soon transferred to Mount McKinley National Park, he took it with him. He was the only diver at Mount McKinley and never had to dive using scuba during his four years there, although he did use his wetsuit to plunge into a raging river, "30 times for the body of a girl."

Between 1967 and 1972, Sequoia and Kings Canyon had several divers in addition to those mentioned above: Ash Mountain patrol ranger George Bowen, Lodgepole interpreter Jack Rockwell and backcountry rangers Craig Johnson and Don Chase. The parks did not have a compressor, instead they had to fill tanks in Fresno.

Shadow Mountain Recreation Area was managed by Rocky Mountain National Park pursuant to a June 27, 1952 agreement with Bureau of Reclamation. In the spring of 1967, Rocky Mountain rangers began taking dive training from Dick Smith of Colorado Dive Supply in Denver. Included in this training were at least two rangers from Shadow Mountain, Cecil Lewis and Al Simonds. The rangers from both Rocky Mountain and the Recreation Area made combined dives in Shadow Mountain reservoir. Per Jim Randall, "Using the Shadow Mountain patrol boat we made a 130-foot dive, using an anchor line to go down. My partner was Ranger Cecil Lewis…"

The dive equipment assigned to Shadow Mountain was transferred to Curecanti on October 22, 1976, in anticipation of the area transferring to the Forest Service, which occurred in 1979. SEE ROCKY MOUNTAIN NATIONAL PARK

Shenandoah National Park never had a dive team, per a phone conversation on May 22, 2010 with "old time" retired chief ranger Larry Hakel. At least once, however, a local, non-NPS diver was used to find someone. In the mid-1980's a girl went missing along a creek with deep pools. She was eventually found pinned underwater between some rocks.

Sleeping Bear Dunes National Lakeshore was established in 1970 and is in Lake Michigan. The dive team in the early 2000s was suspended by the regional dive officer because they hadn't kept up their required training. In 2005, per a December 7, 2012 email from Larry Johnson, who at this writing (2016) is the Superintendent of Ozark National and Scenic Riverways: "We turned that around and got the team active again in 2005 I think, and it is still active today." SCRU had at least one project at Sleeping Bear Dunes in 1990 and 1991, a magnetometer instruction and survey of six shipwrecks. The project director was Larry Murphy.

United States Park Police started supporting divers sometime in 1960, when USPP Officers William "Bill" Dove, Neal Vermillion and a third man who remains unknown, attended the US Navy Underwater Swimming School in Key West, Florida at the behest of the park police. It appears these three USPP officers are the first NPS employees to be sent to a dive school.

Upper Delaware Scenic and Recreational River was authorized in 1978, and the park covers over 73 miles of river along the New York and Pennsylvania border. Al Henry, who as an assistant district ranger, was the park's first diver. Other divers up through 1986 were Cliff Daniels, Deb Qualey, Robert (Bill) Weber, III, and Dennis Youngblood. Sometime before 2000, Weber became a Scuba School International dive instructor, although he never taught any NPS classes. The park's first dive locker was on the third floor of the District Office in Cocheton, New York. In a memo to the regional directors from the associate director of visitor and resource protection, on October 22, 2003, the park had four NPS divers and a dive officer.

USS *Arizona* Memorial is now part of **Pearl Harbor National Memorial.** According to Dan Lenihan:

> …first NPS presence started in 1980—with Gary Cummins as Superintendent. There was never NPS scuba diving on the ship before SCRU arrived. Gary got permission to have the park divers snorkel to pick up trash or coins thrown from people visiting the site via boat launch but they couldn't use air until we arrived. The Navy had occasional permission to bounce dive for re-enlistment ceremonies…Gary Cummins was the main man in and out of the water—diving there was

> very sensitive so he knew when anyone even thought about it. Some Navy officials thought it was very dangerous which it's not if you don't penetrate. . .after the project shakedown phase started in 1983, Cummins and his staff became involved with the diving. . .Superintendent Bill Dickinson. . . also dived quite a bit and was the prime mover after Gary—both bit into that forbidden fruit and really nurtured our projects while they were there. . ..Impressive to watch them.

A May, 1982 article in the *Courier* on diving the USS *Arizona* says, "Diving onto the sunken hull of the USS *Arizona* is a routine maintenance task for the staff. . ." This meant skin diving with mask and snorkel, not using scuba.

The Western regional dive officer, Dave McLean's, "Annual SCUBA Summary, 1983," says:

> The Regional Dive Officer traveled [September] to Hawaii. He certified a new park dive team at the USS *Arizona* Memorial and served as divemaster for the initial survey project. The Submerged Cultural Research Unit team performed the technical phase of the work.

Later in this same summary, McLean lists Superintendent Gary Cummins and John Martini and seasonals Bill Folk, Andy Johnsen and Farley Watanabe, as being members of the area's first dive team.

Virgin Islands National Park is known as s one of the world's premier dive spots. It is hard to say when the very first dive took place in what is now Virgin Islands National Park, although it was probably no later than 1950. In 1959, the University of Miami entered into an agreement with the National Park Service about a small, active marine laboratory that fall. Shortly after it was entered into, Dr. John Randall arrived "with fish tanks, aqua lungs, spear guns, flippers, bottles and jars, underwater cameras and reference books."

Working in the park at this time was supervisory park ranger Bob White. According to Bob in a Feb. 27, 1990 letter to the author, "I started diving in the Virgin Islands with the University of Miami Research Team and the Navy UDT Unit, but none of the 75 dives I made down there were logged, although they ranged from 50' to about 150'."

Voyagers National Park was established in 1975. This waterway of four large lakes with up to 500 islands has a lot of water but little diving. According to former chief ranger Bruce McKeeman, in personal communication with the author on September 6, 2011, the park never had a dive team and the few "governmental" dives made were by local counties or by construction workers putting in docks, etc. However, when Larry Johnson transferred to Voyagers about 1995, he brought his Blue Card to the park and "dove a few times for equipment recovery and resource management missions but eventually didn't dive there anymore as there was no real need for my diving services." There are probably other instances where individuals did the same as Johnson and dove in the park on their own.

War in the Pacific National Historical Park was authorized in 1978 and of its 2,037 acres, 1,002 acres of it are underwater. Regional dive officer Dave McLean, in a memo to the superintendent of War in the Pacific National Historical Park on September 17, 1981, refers to having reviewed the park's General Management Plan, which apparently makes a request to establish a scuba team. "I am very excited about the program and hope it will be approved." In the same memo, McLean says he has initiated an order for some scuba equipment—two BC Jackets, two Sherwood Magnum regulators, two submersible pressure gauges, and four aluminum 80-cubic foot tanks with K valves.

Apparently establishing a dive program for the park in Guam was a success, since Dave McLean says in his 1981 Annual Scuba Activities Report, "We are pleased to welcome two new dive parks in the regional program; Haleakala National Park and War in the Pacific National Historical Park." McLean and Gary Davis from Channel Islands went to Haleakalā and War in the Pacific, establishing the dive programs. Interpretive specialist James E. Miculka is identified as the War in the Pacific park dive officer and Ranger Rose S. N. Manibusan was a principal member, as were several VIPs.

Whiskeytown-Shasta-Trinity National Recreation Area was represented at the November 6, 1978 Western Regional Diving Control Board Meeting by Vic Jurrasco, where he indicated the park was interested in forming a dive team. Per Dave McLean's November 24, 1981 Memorandum: "Regional Diving Control Board Meeting," which was held on November 17, 1981, he says, "Twelve parks have active dive teams and it

appears two parks (Whiskeytown and Cabrillo) have the potential for entering the program in 1982."

Wrangell-St. Elias National Park and Preserve never had a dive team and it is unknown what little early diving may have taken place along the very isolated seashore. However, the SCRU went to the park's Malaspina Forelands and worked on the shipwreck *Satsumaru* in August of 1984. The project director was Dan Lenihan. But Dan points out that the project had nothing to do with diving as the shipwreck was buried in sand, not underwater.

Yellowstone National Park's first record of diving in was by Bob Binnewies, who was just beginning his first permanent ranger position in the NPS, from a June 14, 2015 email.

> This was on the Firehole River near Madison Junction in the summer of 1961. I had brought up my scuba gear with me. There was a deep pool near the road that had become an impromptu, popular swimming hole, mostly used by concessionaire and NPS employees who had learned of it, word-of-mouth. On my patrols, I would stop by to check in with the young crowd and just show the badge, so to speak. The person who lost the class ring had graduated a few weeks earlier from West Point. He was in the pool when the ring slipped off his finger. He and others tried to dive for it, but the depth (at about 15 feet, as I recall), current, and visibility were too much against them. I went back to my quarters at Madison Junction, got my scuba gear, returned, dove down and easily found the ring. It was lying in some sand, illuminated by wavering sunrays that reached that deep. I popped back to the surface and handed the ring to the happy owner. Hopefully, he's still wearing it.

In June of 1964, military-trained diver and seasonal ranger Don Yestness completed a NAUI course at Lake Mead taught by Harry Wham. The following summer Yestness was a seasonal ranger in Yellowstone with Dale Nuss as the park's chief ranger. That summer, Yestness put on an abbreviated "short course," for a few of the rangers in the park, including Rick Smith. According to Smith, Southwest Region's now-retired associate director and 1973 Scripps graduate, in a letter to the author on March 12, 2007:

> There was never any formal graduation or any formal recognition. It never was listed on any skills inventory, but everyone in the park knew who went through the course with Don...Nuss bought enough [equipment] for three or four divers and it was stored, as I remember it, at the Bridge Bay Marina. I don't remember where we got our air, but Nuss might have bought a compressor to service his "divers." I'm sure that for a while, Yestness was the only one who had ever been formally qualified as a diver...But, Nuss did have one rule. No one, and I mean no one, touched the diving gear that had not been through the Yestness short course…Yestness didn't let us go much deeper than 100 feet…most were training. Don did not want anyone to get hurt or die in his program… The first permanent I remember going through it was Jim Brady [The Subdistrict Ranger at Old Faithful, Brady had been through Wham's course the year before at Lake Mead]. Most of us were seasonals who were too dumb to know better and more expendable than the permanents.

In 1984 David Spirtes was the Yellowstone dive officer and in 1995, Wes Miles was the Yellowstone dive officer.

Yosemite National Park 's ranger Tom Hartman, transferring in from Channel Islands and already possessing a great deal of scuba training obtained in the early 1960s, was probably the driving force behind the park's first dive team. On July 15, 1966, along with Hartman, Rangers Lew Alberts and Dick Marks got authorization from the Western Regional Office to form a dive team. They had already performed their first body recovery using scuba a month before, on June 7. Alberts and Marks then attended the third (or first, if you decide it was the first with an *all-NPS* contingent) Scripps class which began on November 13, 1966, finishing nine days later, the 22nd. The Park's first tanks were used aircraft oxygen tanks, approximately 30 cubic feet, coupled together with an in-park manufactured yoke.

All through the 1970s the dive team was very active with Butch Farabee as the park dive officer. At one time there were ten active divers, armed with a full arsenal of tanks, regulators and related gear in the park's search and rescue cache. Tanks had to be filled in Fresno as there was no adequate compressor in the park. Each diver was supplied a wetsuit, mask, fins, snorkel and related personal equipment. Training dives were regularly made in the Yosemite Lodge swimming pool, the Merced River, including under the ice, as well as in Tenaya Lake, among the highest elevation of diving within the national park system.

Around 1994, Chief Ranger Bob Andrew disbanded the dive team, stating training and budget aspects had become too onerous. The slack for body recoveries in the park fell to the Mariposa County Search and Rescue Team. Yosemite employee Dave Thorpe performed much of the body recovery work using scuba but as a member of the county search and rescue team, not as a member of the Yosemite National Park search and rescue effort.

SPECIAL AWARDS RELATED TO NPS DIVING

The following is a synopsis of awards and recognitions earned by people and/or units of the National Park Service related to scuba and / or diving. It may be incomplete.

1963 On June 27, six-year-old Gregory Trenor drowned while playing along the edge of McDonald Creek near the headwaters of Glacier National Park's cold Lake McDonald. The Underwater Recovery Team of the Flathead Rescue Association from nearby Columbia Falls quickly responded with eight divers, including 26-year-old Tom Dumay. Dumay drowned while diving for the little boy and the local Columbia Falls High School established a **Tom Dumay Memorial Scholarship**.

1969 While a ranger in Virgin Islands National Park, Gary Davis served as a scientist aquanaut on the Project Tektite 1 Man-in-the-Sea Program, and was awarded the **Meritorious Service Award of the Department of the Interior**. The citation states "in recognition of outstanding contributions to marine science…in the Tektite 1 Project… [for] development and execution of the biological, geological and biomedical missions of the project…In recognition of his contributions to today's scientific community and the doors which have been opened for future ocean exploration and research, Mr. Davis is awarded the…" Signed Walter Hickel, Secretary of the Interior.

1970 On July 11, two marines from the Yuma Corps Air Station died from poisonous gases when they entered an abandoned mine in Southern California. Lake Mead National Recreation Area rangers Donald Chase, Richard Gale and Jerry Phillips were presented a **Certificate of Appreciation** from Imperial County, California for the successful body recovery of the two young men who were trapped deep in the mine. Although not underwater, Chase and Gale used scuba tanks and regulators to enter the dangerous gas-filled mine tunnels.

1972 NPS associate director for operations, Ray Freeman, presented a **Certificate of Appreciation** to Dr. William Aaron Nierenberg, director of Scripps Institute of Oceanography, for his continued support of the service's scuba diving program.

1974 On September 14, Eldorado Canyon in Lake Mead National Recreation Area was engulfed by a 1000-year flashflood, sweeping through the facilities on the lakeshore and killing nine people. Eldorado Canyon Resort and Nelson's Landing were obliterated. "Scuba divers searched the harbor area under extremely hazardous conditions." A **Department of the Interior Unit Award for Excellence of Service** was earned by the Eldorado Canyon Search and Recovery Team. There were 21 agencies and 79 NPS individuals named in this award.

1978-1980 Ranger Dan Lenihan received a **National Park Service Special Achievement Award** for upgrading the Southwest Region operational (Ranger Activities) diving program.

1982 On February 21, a scuba diver became lost and subsequently drowned in a submerged concrete powerhouse in Amistad National Recreation Area. Initially, NPS divers at the park made an effort to recover the body but the degree of difficulty was beyond their skill and regional dive officer Larry Nordby was contacted by the park's chief ranger, Eldon Kohlman. Nordby, Dan Lenihan and Larry Murphy of the SCRU were asked to assist, and were able to successfully recover the body. Ranger / archeologists Lenihan, Murphy and Nordby, as well as Rangers Deborah A. Gibbons and Mark Igo and administrative officer Daniel M. Peregoy ultimately were awarded a **Department of the Interior Exemplary Act Award**. This was the department's first Exemplary Act Award.

1982 The director of the National Park Service received, on behalf of the SCRU, a "**Commendation**" from the President's Advisory Council on Historic Preservation for its underwater archeological field work in Kosrae, Micronesia. Dan Lenihan, Toni Carrell, and Larry Murphy were recognized.

1983 The **National Park Service's Appleman-Judd Award** was bestowed on Dan Lenihan for his work in submerged cultural resources. In a letter to Lenihan, Director Russ Dickenson, said: "Your contributions to the Submerged Cultural Resources Unit, and to the precedent-setting work of the unit on resources such as the varied and well preserved shipwrecks at Isle Royale National Park, richly merit attention." The 1983 award was granted in 1984.

1983 On December 29, Olympic National Park ranger Richard Thomas made a rescue dive in the park's Lake Crescent for two of the five victims of an automobile accident. He was able to save a five-year-old child and a twenty-month old infant trapped in the vehicle, although they ultimately died from their injuries. For his heroic efforts, Ranger Thomas earned a **Department of the Interior Valor Award**. Richard Thomas was killed on June 22, 1984, while participating in an un-related Civil Air Patrol search and rescue training mission.

1983 On June 17, Yosemite National Park rangers Charlie Peterson and John Daley were using scuba to help clear away downed limbs and debris from a highway culvert to keep the road from being breached and washed out. Daley became trapped in the culvert by the rush of the water and Peterson was able to dive and extricate him from his trap, saving his life. This drama was recreated in the fall of 1992 on a 15-minute segment of *Heart of Courage*, a Discovery Channel television docudrama. Peterson was awarded a **Department of the Interior Valor Award** on April 24, 1985.

1986 The Society for History in the Federal Government bestowed **The John Wesley Powell Award for Historic Display** to the Submerged Cultural Resources Unit for the "Graphic Presentation of USS Arizona at Pearl Harbor," created the year before by Jerry Livingston as a part of the USS *Arizona* mapping project. The Society created the annual prize to recognize a federal historic preservation or display project. This was the first year of the Award and the certificate was dated April 18, 1986.

1986 In November, the navy awarded two 1986 "**Outstanding Navy Diving Project Awards**," one for the Space Shuttle *Challenger* recovery, and the other to the Long Beach US Navy Reserve Mobile Diving and Salvage Unit One, for the joint US Navy – National Park Service project on the USS *Arizona* and the USS *Utah*. The awards were presented at the 1986 Dive Cross-Tell Conference in Panama City, Florida.

1988 Ranger Dan Lenihan was bestowed a **Department of the Interior Superior Service Award** for improving the Southwest Regional Diving Program.

1991 Jim Stewart, upon his retirement, was made an **Honorary Park Ranger** by NPS director Jim Ridenour.

1994 On March 23, *A Superior Death*, the second installment in author and then-active National Park ranger Nevada Barr's Anna Pigeon mystery series, was issued. The book took place in Isle Royale and featured the main character, Ranger Pigeon, diving the wrecks of the park to solve a murder. For this, she was one of seven finalists for the **1995 Dilys Award** by the Independent Mystery Booksellers Association.

1996 In January, the NPS SCRU was awarded the "**Society of Historical Archaeology Award of Merit**" for 25 years of developing techniques and setting standards for preserving and exploring the underwater heritage of the United States.

1997 On August 12, Antelope Canyon, a side canyon of Lake Powell, was hit by a major flash flood, killing eleven slot-canyon hikers on a commercial tour. Glen Canyon National Recreation Area Underwater Recovery Team was awarded a **Department of the Interior Unit Citation** for their work.

2000 On June 15, a man and his grandson were offshore in their 25-foot fishing boat in Charleston Harbor, South Carolina. Without warning, the boat's engine filled with water, and the craft capsized before

the two could send a Mayday call. Dr. Dave Conlin of the SRC, was working nearby on the raising of the HL *Hunley*. Alerted to this accident, Conlin took immediate action, picked up the two and rendered aid. The weather deteriorated rapidly immediately following the rescue and, according to the United States Coast Guard, if not for Conlin's quick, decisive action, these two people might not have survived because they were drifting to the open sea. For his prompt response and dedicated service during this rescue, Dr. Conlin was granted an **Exemplary Act Award of the Department of the Interior** by the director of the NPS.

2000 "The National Park Service honors the work of the HL *Hunley* project team, Cultural Resources 2000." The **Certificate** was signed by Robert Stanton, director.

2001 Brett Seymour of the SRC was presented the **Roy E Appleman / Henry A Judd Award for Cultural Resources**.

2003 Ranger/archeologist Dan Lenihan of the SRC was awarded the George Wright Society's **George Melendez Wright Award for Excellence** for promoting submerged resources preservation.

2003 The House of Representatives of the State of New Mexico, Forty-Sixth Legislature, First Session 2003, **House Memorial-33** sponsored by Representative Jośe A. Campos, "Recognizing The National Park Service's Submerged Resources Center Based in Santa Fe, New Mexico For Its Outstanding Achievements With Underwater Archeology, Signed and Sealed Ben Lujan, Speaker and Representative Jośe Campos."

2007 The Intermountain Region presented a **Group Award** to the SRC. "Regional Director Michael Snyder, honors the Following Individuals for Their Expertise, Professionalism and Leadership: Larry Murphy, Matthew Russell, Brett Seymour, Francis Day, David Conlin, Daniel Lenihan, James Bradford and Arthur Ireland."

2009 Dr. Dave Conlin was presented the "**Partners In Conservation Award**—Battle of the Atlantic Expedition," signed by Secretary of Interior Ken Salazar.

2014 On May 8, SRC member Jessica A. Keller was presented a **Department of the Interior Valor Award** by Secretary of Interior, Sally Jewell. On November 4, 2012, "while engaged in a routine training dive utilizing rebreathers at Lake Mead. . .saved the life of her dive partner [Dr. Dave Conlin] after his equipment malfunctioned causing a dangerous and ultimately toxic overabundance of oxygen. . ."

Department of Interior Exemplary Service Awards were issued by NPS director Jon Jarvis to the other dive and rescue team members who were involved in this accident,"in recognition for the decisive, professional, expert manner in which skills and equipment were utilized during a scuba diving accident that substantially contributed to the saving of the live of a fellow employee." Those awarded included SRC members Brett Seymour, Sami Seeb, Susanna Pershern, Bert Ho, Andres Diaz, John Bright; NPS diving safety officer Steve Sellers; NPS Our World-Underwater Scholarship Society intern Tim White; and Lake Mead rangers Mark Hnat, Todd Austin, Joel Hyzer, Greg Morse, Eric Rowe.

2015 The Glen Canyon National Recreation Area Dive and Recovery Program received **Department of the Interior Unit Award** for its continuing superior and innovative efforts in search and recovery for two decades, 1995 through 2014. These ongoing efforts not only helped resolve and bring closure to the many unfortunate accidents and tragedies in Lake Powell, but for other areas of the National Park Service, as well as for outside jurisdictions.

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APPENDIX I: NPS DIVING INSTRUCTORS

Table 1. NPS Certified Diving Instructors

Note: Following are NPS individuals certified (or authorized by the NPS) as scuba instructors, although that person may never have taught a class either inside or outside the service. It may be incomplete. This list is chronological but its accuracy is uncertain.

Name	Certifying Park	Agency	Date
C. G. "Neal" Vermillion*	USPP	NPS	1960
Jim Randall**	WASO	NPS	1962
Art Johnson**	VIIS	NPS	1962
George Schesventer**	EVER	NPS	1962
Ted Chittick**	USPP	NPS	1962
Bob Scott***	GLCA	NPS	1964
Jim Anderson****	SANF	NPS	1965
Don Weir	BISC	NAUI	1971
Daniel Lenihan*****	SEAC/SCRU	NAUI	1972
Daniel Lenihan	Florida	NACD	1973
Gary Davis	EVER	NAUI	1974
Dave McLean	LAKE	NAUI	1974
Larry Murphy*****	SCRU	PADI	1979
Toni Carrell	SCRU	NAUI	1979
Larry Nordby	SWRO	NAUI	1979
Jim Adams	USAR	PADI	
John Brooks	SCRU	NAUI	
Tony Schetzsle	BICA	YMCA	1985
Skip Cole			
Jim Bradford	IMRO	NAUI	1995
Robert Weber	IIIUPDE	SSI	pre-2000
Matthew Russell	SCRU	NAUI	2000
Brett Seymour	SCRU	NAUI	2000
Dave Conlin	SCRU	NAUI	2000
Rich Curry	BISC	NAUI	
Mike Eng	SCRU	NAUI	
Mike Croll	DEWA	NAUI	2011
Steve Martin	ISRO	NAUI	2011
Thomas Kelly	VIIS	NAUI	2011
Melissa Croll	CURE	NAUI	2011
Patrick Horning	GLCA	NAUI	2011

*The status of instructor for Neal Vermillion is very unclear. He authored an undated but probably pre-1962 diving manual, *Don't' Panic: Under-Water Swimmer's Instruction Manual*, with an author title of Instructor. (SEE "1960" ON PAGE 40)

**Randall was authorized "to serve as an instructor for in-Service Scuba diving training" by chief of ranger services, Larry F. Cook in a December, 1962 memo to the service's chief of personnel. He never served as an instructor. Since Art Johnson, George Schesventer and Ted Chittick went through the same program at the same time and probably received the same memo, they should receive the same acknowledgement as an instructor.

***Bob Scott was designated a scuba instructor on January 20, 1964 by acting southwest regional director James M. Carpenter. He instructed six divers from Glen Canyon.

**** It is unknown where and when Jim Anderson was trained or through what certifying agency.

*****Dan Lenihan and Larry Murphy both came into the NPS with previously earned instructor certifications.

APPENDIX II: ACRONYMS

Table 2. Acronyms Referenced in Text

Acronym	Meaning
AAUS	American Academy of Underwater Sciences
AEC	Atomic Energy Commission
AFRCC	Air Force Rescue and Coordination Center
AKR	Alaska Region (NPS)
BOR	Bureau of Reclamation
DOD	United States Department of Defense
DOI	United States Department of the Interior
DSO	Diving Safety Officer
EMS	Emergency Medical Services
FBI	Federal Bureau of Investigation
FSM	Federated States of Micronesia
FSU	Florida State University
GIS	Geographic Information System
GPS	Global Positioning System
GSA	General Services Administration
HOAL	Horace M. Albright Training Center (NPS)
HPO	Historic Preservation Officer (NPS)
ICOMOS	International Council On Monuments and Sites
ICS	Incident Command System
IMRO	Intermountain Regional Office
INAH	Instituto Nacional de Antropología e Historia (Mexico)
LORAN	Long Range Navigation system
MAR	Mid-Atlantic Region (NPS)
MDSU	Mobile Diving and Salvage Unit (US Navy)
MWAC	Midwest Archeological Center (NPS)
MWR	Midwest Region (NPS)
NACD	National Association for Cave Diving
NAR	North Atlantic Region (NPS)
NASA	National Aeronautics and Space Administration
NASDS	National Association of Scuba Diving Schools
NAUI	National Association of Underwater Instructors
NCRO	National Capital Regional Office
NDCB	National Diving Control Board (NPS)
NEL	National Electronics Laboratory
NER	Northeast Region (NPS)
NHC	Naval Historical Center
NOAA	National Oceanic and Atmospheric Administration
NPS	National Park Service
NRIS	National Reservoir Inundation Study (NPS)

Table 2. Acronyms Referenced in Text Cont.

Acronym	Meaning
NSS	National Speleological Society
OSHA	Occupational Safety and Health Administration
PADI	Professional Association of Diving Instructors
PDO	Park Diving Officer (NPS)
PNWR	Pacific Northwest Region (NPS)
PWR	Pacific West Region (NPS)
RDO	Regional Diving Officer (NPS)
RMR	Rocky Mountain Region (NPS)
ROV	Remotely Operated Vehicle
SAR	Search and Rescue
SCRU	Submerged Cultural Resources Unit (NPS)
SEAC	Southeast Archeological Center (NPS)
SER	Southeast Region (NPS)
SIO	Scripps Institute of Oceanography
SRC	Submerged Resources Center (NPS)
SWAC	Southwest Archeological Center (NPS)
SWR	Southwest Region (NPS)
SWRO	Southwest Regional Office (NPS)
TTPI	Trust Territories of the Pacific Islands
UNESCO	United Nations Educational, Scientific and Cultural Organization
USCG	United Stated Coast Guard
USFWS	United States Fish and Wildlife Service
USGS	United Stated Geological Survey
USN	United States Navy
USPP	United States Park Police (NPS)
WACC	Western Archeological and Conservation Center (NPS)
WAVE	Women Accepted for Volunteer Emergency Service (branch of the US Naval Reserve during WWII)
WR	Western Region (NPS)
WRO	Western Regional Office (NPS)

APPENDIX III: PARK CODES

Table 3. Park Unit Alpha Codes

Park Code	Park Name	State	Region
ACAD	Acadia National Park	ME	Northeast
ALEU	Aleutian World War II National Historic Area	AK	Alaska
AMIS	Amistad National Recreation Area	TX	Intermountain
AMME	American Memorial Park	CNMI	Pacific West
APIS	Apostle Islands National Lakeshore	WI	Midwest
ARPO	Arkansas Post National Memorial	AR	Midwest
ASIS	Assateague Island National Seashore	MD, VA	Northeast
BIBE	Big Bend National Park	TX	Intermountain
BICA	Bighorn Canyon National Recreation Area	MT	Intermountain
BICY	Big Cypress National Preserve	FL	Southeast
BISC	Biscayne National Park	FL	Southeast
BITH	Big Thicket National Preserve	TX	Intermountain
BUFF	Buffalo National River	AR	Midwest
BUIS	Buck Island Reef National Monument	USVI	Southeast
CABR	Cabrillo National Monument	CA	Pacific West
CACO	Cape Cod National Seashore	MA	Northeast
CAHA	Cape Hatteras National Seashore	NC	Southeast
CAKR	Cape Krusenstern National Monument	AK	Alaska
CALO	Cape Lookout National Seashore	NC	Southeast
CANA	Canaveral National Seashore	FL	Southeast
CANY	Canyonlands National Park	UT	Intermountain
CASA	Castillo De San Marcos National Monument	FL	Southeast
CAVE	Carlsbad Caverns National Park	NM	Intermountain
CHIC	Chickasaw National Recreation Area	OK	Intermountain
CHIS	Channel Islands National Park	CA	Pacific West
CHRI	Christiansted National Historic Site	USVI	Southeast
COLO	Colonial National Historic Park	VA	Northeast
CRLA	Crater Lake National Park	OR	Pacific West
CUIS	Cumberland Island National Seashore	GA	Southeast
CURE	Curecanti National Recreation Area	CO	Intermountain
DEVA	Death Valley National Park	CA	Pacific West
DEWA	Delaware Water Gap National Recreation Area	NJ, PA	Northeast
DRTO	Dry Tortugas National Park	FL	Southeast
EVER	Everglades National Park	FL	Southeast
FIIS	Fire Island National Seashore	NY	Northeast
FOCA	Fort Caroline National Memorial (managed by TIMU)	FL	Southeast

Note: NPS units all have a four-letter code derived from the park name. This table includes the park units referred to in this book; it is not a complete list of parks in the NPS. Highlighted entries indicate park names that are no longer in use.

Table 3. Park Unit Alpha Codes Cont.

Park Code	Park Name	State	Region
FOFR	Fort Frederica National Monument	GA	Southeast
FOJE	Fort Jefferson National Monument (became DRTO in 1992)	FL	Southeast
FOMA	Fort Matanzas National Monument	FL	Southeast
GATE	Gateway National Recreation Area	NY, NJ	Northeast
GLAC	Glacier National Park	MT	Intermountain
GLBA	Glacier Bay National Park and Preserve	AK	Alaska
GLCA	Glen Canyon National Recreation Area	AZ, UT	Intermountain
GOGA	Golden Gate National Recreation Area	CA	Pacific West
GRCA	Grand Canyon National Park	AZ	Intermountain
GRPO	Grand Portage National Monument	MN	Midwest
GRSM	Great Smokey Mountains National Park	NC, TN	Southeast
GRTE	Grand Teton National Park	WY	Intermountain
GUIS	Gulf Islands National Seashore	FL, MS	Southeast
HALE	Haleakalā National Park	HI	Pacific West
HAVO	Hawai'i Volcanoes National Park	HI	Pacific West
ISRO	Isle Royale National Park	MI	Midwest
JAME	Jamestown National Historic Site	VI	Northeast
JELA	Jean Lafitte National Historical Park and Preserve	LA	Southeast
KAHO	Kaloko-Honokōhau National Historic Park	HI	Pacific West
KALA	Kalaupapa National Historic Park	HI	Pacific West
LAKE	Lake Mead National Recreation Area	AZ, NV	Pacific West
LAMR	Lake Meredith National Recreation Area	TX	Intermountain
LAVO	Lassen Volcanic National Park	CA	Pacific West
MACA	Mammoth Cave National Park	KY	Southeast
MOCA	Montezuma Castle National Monument	AZ	Intermountain
MOCR	Moores Creek National Battlefield	NC	Southeast
MORA	Mount Rainier National Park	WA	Pacific West
NPSA	National Park of American Samoa National Park	AS	Pacific West
OCMU	Ocmulgee National Monument	GA	Southeast
OLYM	Olympic National Park	WA	Pacific West
OZAR	Ozark National Scenic Riverways	MO	Southeast
PAIS	Padre Island National Seashore	TX	Intermountain
PERL	Pearl Harbor National Memorial	HI	Pacific West
PIRO	Pictured Rocks National Lakeshore	MI	Midwest
PORE	Point Reyes National Seashore	CA	Pacific West
PUHO	Pu'uhonua o Hōnaunau National Historic Park	HI	Pacific West
REDW	Redwood National Park	CA	Pacific West
ROMO	Rocky Mountain National Park	CO	Intermountain
SANF	Sanford National Recreation Area (became LAMR in 1972)	TX	Intermountain

Table 3. Park Unit Alpha Codes Cont.

Park Code	Park Name	State	Region
SARI	Salt River Bay National Historic Park and Ecological Preserve	USVI	Southeast
SEKI	Sequoia and Kings Canyon National Parks	CA	Pacific West
SLBE	Sleeping Bear Dunes National Lakeshore	MI	Midwest
STLI	Statue of Liberty National Monument	NY	Northeast
TIMU	Timucuan Ecological and Historic Preserve	FL	Southeast
TUZI	Tuzigoot National Monument	AZ	Intermountain
UPDE	Upper Delaware National Scenic and Recreation River	NY, PA	Northeast
USAR	USS Arizona Memorial (now Pearl Harbor National Memorial)	HI	Pacific West
VICK	Vicksburg National Military Park	MS	Southeast
VIIS	Virgin Islands National Park	USVI	Southeast
WAPA	War in the Pacific National Historic Park	GU	Pacific West
WASO	Washington Support Office (NPS)	DC	———
WRST	Wrangell - St. Elias National Park and Preserve	AK	Alaska
YELL	Yellowstone National Park	ID, MT, WY	Intermountain
YOSE	Yosemite National Park	CA	Pacific West

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