# 2017
# Internship Program Report

## MOSAICS IN SCIENCE
Diversity Internship Program

National Park Service
MOSAICS in Science

Environment for the Americas
Greening Youth Foundation
National Park Service
National Oceanic and Atmospheric Administration
NOAA
U.S. Department of Commerce

# MOSAICS IN SCIENCE DIVERSITY INTERNSHIP PROGRAM REPORT 2017

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## INTRODUCTION

Greening Youth Foundation and Environment for the Americas collaborated for a second year to coordinate the Mosaics in Science (MIS) Diversity Internship Program for the National Park Service. Our combined efforts began with planning, outreach and recruitment and continued through a post-internship report and final evaluation of the program.

In 2016, we improved MIS by increasing diversity of the participants, incorporating on-line trainings, creating a program Blog, and providing interns with a manual to help with their experience. This year, we continued to make improvements by refining our on-line trainings, developing a manual for supervisors, and hosting interns under the Direct Hire Authority.

Our recruitment reached 940 applicants. Each intern worked 11 weeks or more and had a 4-day career workshop following the park portion of the internship. 7 of the 24 interns were male.

TOTAL BUDGET: Each partner received $150,000 to administer half of the Mosaics in Science internships. In addition, two internship were extended at a cost of $7,740.

The National Oceanic and Atmospheric Administration (NOAA) funded 4 interns for its Internships in Marine Geography Program. In its pilot year, interns participated in weekly webinars and the MIS career workshop for an inter-agency collaborative effort.

# MOSAICS in SCIENCE

## Mosaics in Science Statement of Purpose

The Mosaics in Science Diversity Internship Program provides minority youth that are under-represented in natural resource science career fields with on-the-ground, science-based, work experience in the National Park System. Established in 2013, this multi-disciplinary program provides opportunities for undergraduate/graduate college students and recent graduates to work on inventorying and monitoring, research, GIS and other technologies, and interpretation and education projects. The Mosaics in Science Program helps parks complete high priority science projects at a low cost to the federal government, connects the public to our parks through educational and interpretive programs led by the interns, and builds the next generation of park stewards The program is administered by the NPS Geologic Resources and Youth Programs Divisions in partnership with Environment for the Americas and Greening Youth Foundation.

## Program Objectives

- Encourage diverse youth to study and pursue careers in STEM fields,
- Provide meaningful and relevant science-based internships in parks for minorities 18-35 years old,
- Introduce program participants to science careers in the National Park Service, and
- Increase relevance, diversity, and inclusion in the NPS workplace.

## Funding Amounts

The total budget for 2017 Mosaics in Science Internship was $300,000 from the National Park Service, Youth Programs Division to support 24 interns. Modification budgets added $7,740.08 to extend interns at sites in Boston Harbor Islands National & State Park, MA and Lewis and Clark National Historical Park, OR; and to cover costs for speakers at the career workshop. The partner cost share for this year's program was $101,600. Total budget was $307,740.

## WHO'S WHO IN MOSAICS IN SCIENCE

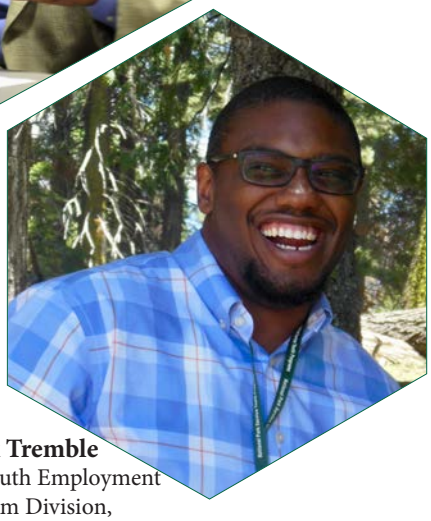
Mosaics in Science is supported by a dedicated team at the National Park Service and the coordinating organizations Greening Youth Foundation and Environment for the Americas. The selection of host sites, promotion of the program, recruitment and hiring of interns, site visits, organization of the culminating intern workshop, and programmatic reports required over one year of effort. The success of this program is due to the tremendous support for all aspects of Mosaics in Science. Greening Youth Foundation and Environment for the Americas appreciate the opportunity to be involved in such a valuable program that promotes youth engagement at national parks and opportunities to gain important career-building skills at some of the most beautiful and spectacular places in the United States.

**Lisa Norby**(right)
Chief, Energy and Minerals Branch,
Geologic Resources Division
Mosaics in Science and
Geoscientists-in-the-Parks
Program Manager
&
**Limaris Soto** (left)
Geoscientists in the Parks & Mosaics in
Science Program Assistant

**George McDonald**
Program Manager,
Youth Programs Division

**Brenda Woods**
Acting Liaison to the Mosaics
in Science Program, Youth
Programs Division

**Lina Oliveros**
Program Analyst,
Youth Programs Division



**Alex Tremble**
National Youth Employment
Program Division,
Youth Programs Division

**National Park Service, Geologic Resources Division** ***go.nps.gov/geology***
The Geologic Resources Division assists the National Park Service and partners in the Service-wide coordination, support, and guidance necessary to understand and implement science-informed stewardship of geologic and associated park resources; reduce impacts from energy, mineral, and other development; and protect visitor values. GRD also manages two Service-wide internship programs — Mosaics in Science Diversity Internship and Geoscientists-in-the-Parks.

**National Park Service, Youth Programs Division** ***www.nps.gov/subjects/youthprograms***
The Youth Programs Division engages youth between the ages of 5 and 35 years old in various National Park Service programs to develop a life-long commitment to support our national parks and protect our natural environment and cultural heritage. Currently there are over 25 youth programs operating throughout the National Park System. Youth programs encompass a wide range of missions and responsibilities including the fostering of a strong relationship between youth and the natural and cultural resources managed by the NPS and instilling a work ethic into our nation's youth.

**Environment for the Americas** ***www.environmentamericas.org***
Environment for the Americas (EFTA) is a non-profit organization that connects people to conservation across the Western Hemisphere and works to diversify the field of natural resources. EFTA coordinates works with the National Park Service, U.S. Forest Service, Bureau of Land Management, and U.S. Fish and Wildlife Service to provide internships to over 50 youth in science, preservation, research, and interpretive internships.

**Greening Youth Foundation** ***www.gyfoundation.org***
Greening Youth Foundation (GYF) is a federal non-profit partner whose mission is to engage diverse youth and young adults in environmental and conservation programs and expose them to careers in conservation. With headquarters in Atlanta, GA, GYF operates many national programs across the country with the National Park Service, the US Fish and Wildlife Service, US Forest Service, Bureau of Land management, and Bureau of Reclamation to provide internships to over 400 youth and young adult.

**NOAA's Internships in Marine Geography** ***www.noaa.gov***
The goal of NOAA's Internships in Marine Geography program is to establish a pipeline that will allow a diverse set of candidates an entry point into the workforce. Piloted in 2017, NOAA's Office of Coast Survey has created a program that allows highly-motivated individuals the opportunity to put their academic geography skills to test with real-life work experience the field of marine hydrography and cartography.

- **Funding Amounts (Include Other Sources not Just Those Provided by NPS)**
  - $300,000 provided by the NPS Youth Programs Division

- **Park funding for extensions:**
  - Lewis and Clark National Historic Park: $3,032
  - Boston Harbor Islands National and State Park: $4,708

- **Overview Of The Program Success**
  - 905 unique applications

## TYPES OF PROJECTS SUPPORTED

- Texas Tortoises (Gopherus berlandieri) Radio Tracking Project
- Development of an interpretive astronomy program at Great Basin National Park
- Monitoring the effects of the removal of the invasive A. petiolata has on the invasive P. rapae and native butterfly species
- Wildlife sounds survey via active and stationary recording sites
- Baseline ambient monitoring
- Visitor outreach and education
- Evaluate the productivity of naturally grazed and ungrazed seagrass meadows
- Evaluate the effects of seagrass pasture characteristics on green turtle foraging behavior
- Model the carrying capacity of Caribbean seagrass pastures for recovering green turtle populations
- Determine which climate drivers have more of a profound effect on wetland dynamics and productivity
- Perform bird surveys, habitat surveys, and habitat management to support the quail population in the park
- Aquatic restoration
- Re-establishment of native frogs
- Reintroduction of the Western pond turtle
- Develop citizen science programs
- Creation of a story map blog using GIS mapping techniques

## SUCCESS STORY

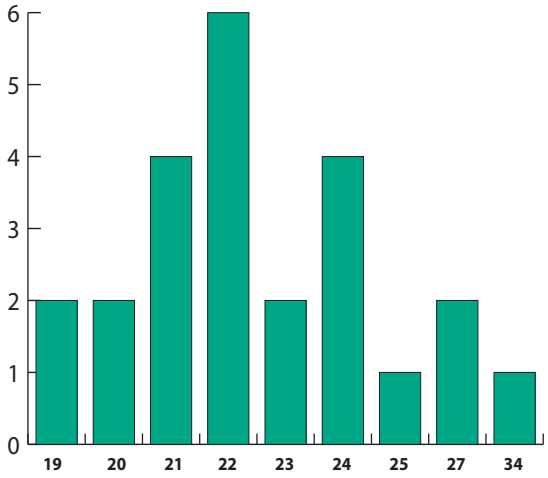
Mosaics in Science tracks the success of its interns and helps them find subsequent positions with the National Park Service and other federal and non-governmental organizations.

*I will be forever grateful to you all at Mosaics in Science for making my dream to work in the National Park Service a reality. It's only been a year and a half since I first began working in the park service, and I've met the most amazing people, grown exponentially as a biologist, and seen such beautiful pieces of nature. My life is forever changed and I cannot thank you enough.*

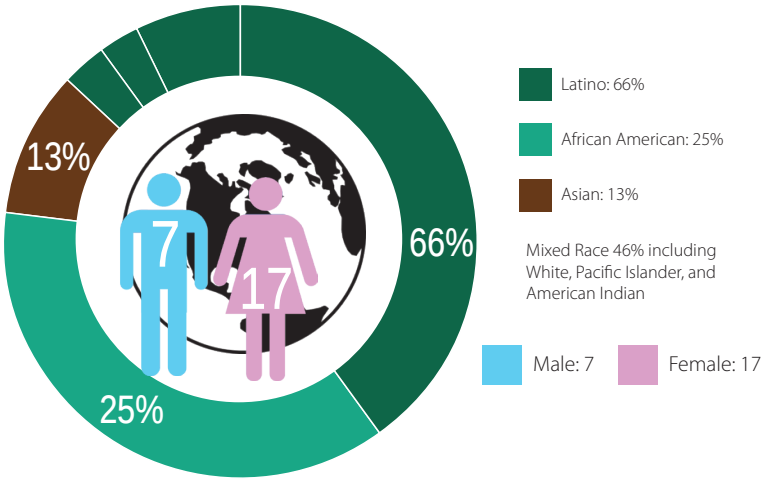
*Best regards,*
*Gabi, 2016 Intern*

# DEMOGRAPHIC INFORMATION

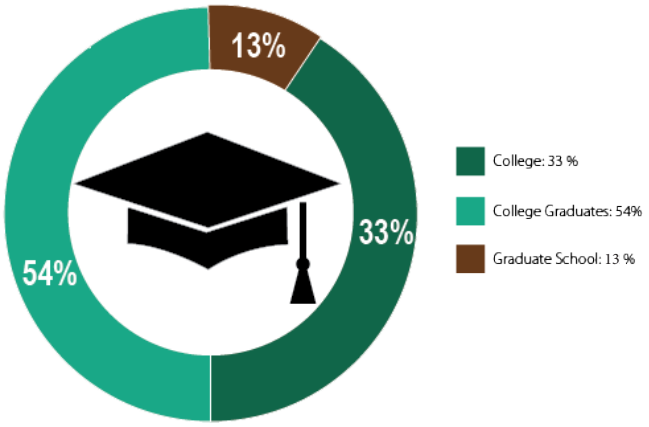
## INTERN AGES



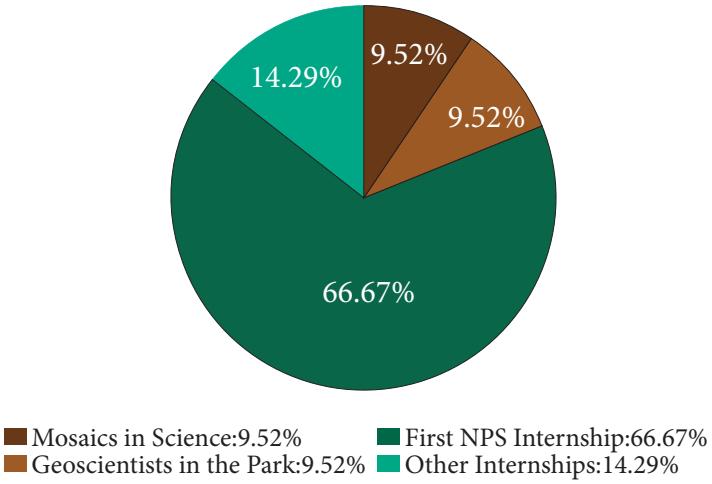

## ETHNICITY & GENDER



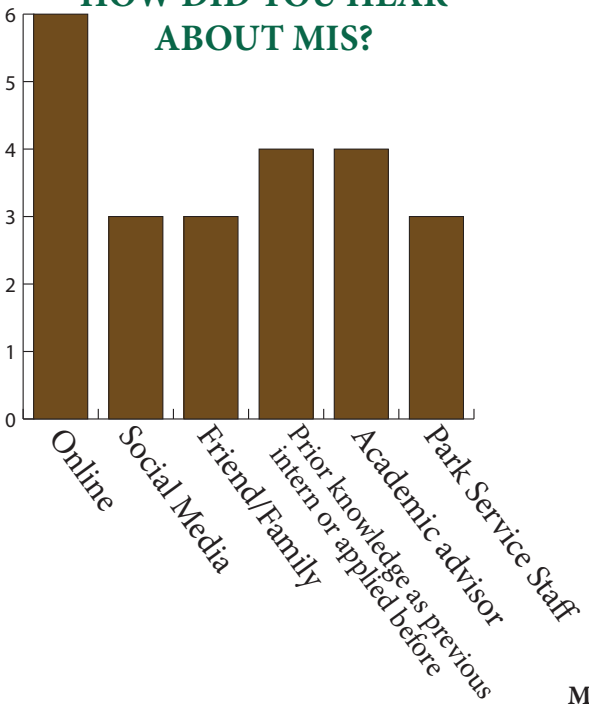

## LEVEL OF EDUCATION



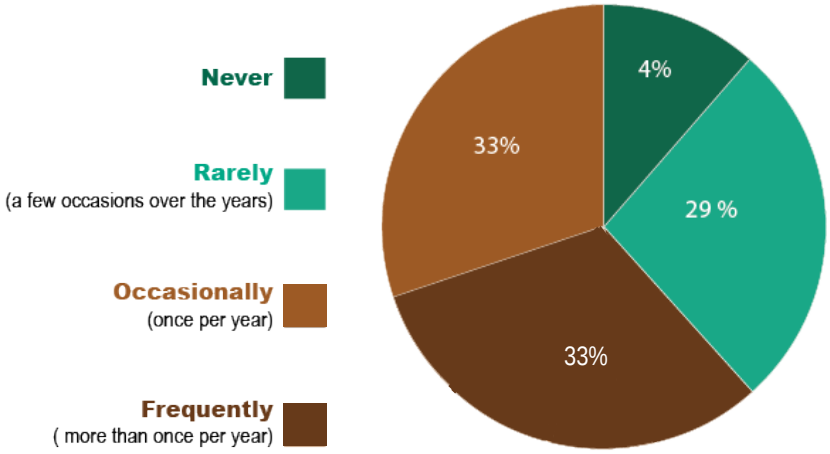

## HAVE YOU HAD AN INTERNSHIP WITH NPS BEFORE?




## HOW DID YOU HEAR ABOUT MIS?




## PRIOR TO THIS INTERNSHIP, HAVE YOU EVER VISITED A NATIONAL PARK?



## PROSITIONS BY REGION FOR FY 2017

| Region | # Positions | Park |
|---|---|---|
| Alaska Region | 1 | DENA |
| Intermountain Region | 5 | FLFO, GRYN (2), ROMO, TUMA |
| Midwest Region | 2 | CUVA, INDU |
| National Capital Region | 1 | MANA |
| Northeast Region | 2 | VAFO, BOHA |
| Pacific West Region | 9 | CABR, CRMO, GRBA, LABE, LAVO, LEWI, MORA, PORE, YOSE |
| Southeast Region | 4 | BUIS, GRSM, GULN, SFCN |

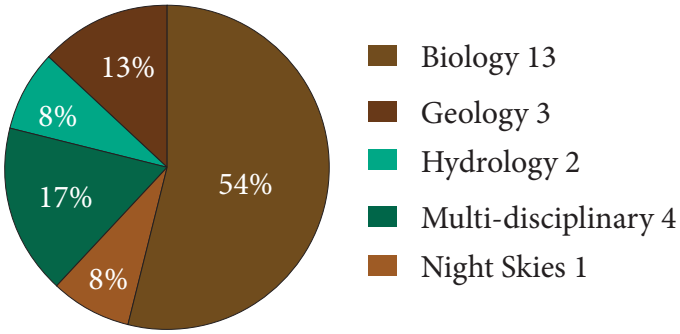
**IMPORTANT NOTE: The number of parks shown in the table may exceed the number of internships because some of the interns worked for more than one park or Inventory and Monitoring Network**

## PROJECT CATEGORY SUMMARY

| Projct Category | Count of Project Category |
|---|---|
| Interpretation/Education | 10 |
| Inventory and Monitoring | 6 |
| Multi-faceted | 5 |
| Research | 3 |

Sum of Count of Project Category:24

## PROJECT CATEGORY SUMMARY



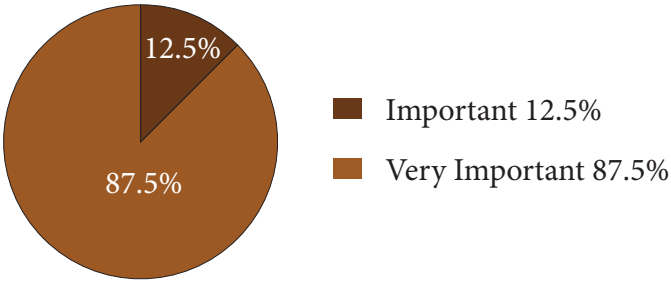

## WOULD YOU LIKE TO BE A MENTOR FOR FUTURE MOSAICS INTERNS?

| | |
|---|---|
| YES | 68.75% |
| NO | 0% |
| MAYBE | 31.25% |

## DID THIS INTERNSHIP INFLUENCE YOUR CAREER GOALS?

| | |
|---|---|
| YES | 66.67% |
| NO | 13.33% |
| MAYBE | 20.00% |

## HOW IMPORTANT WAS THE OPPORTUNITY TO MEET THE OTHER INTERNS IN PERSON DURING THE WORKSHOP?



## 2017 MOSAICS IN SCIENCE INTERNSHIPS

| NPS UNIT | POSITION | | PROGRAM PARTNER |
|---|---|---|---|
| | TITLE | TYPE | |
| 1. Boston Harbor Islands National Recreation Area (Massachusetts) | Next Generation Geologic Science Educator (Sophia Bass Werner) | DHA | GYF |
| 2. Buck Island Reef National Monument (Virgin Islands) | Biological Science Technician (Laura Palma) | | GYF |
| 3. Cabrillo National Monument (California) | Science Education and Communication Specialist (Nicole Ornelas) | | EFTA |
| 4. Craters of the Moon National Monument & Preserve (Idaho) | Interdisciplinary Natural Resources and Interpretive Intern (Mauro Hernandez) | | GYF |
| 5. Cuyahoga Valley National Park (Ohio) | River Use Planning Assistant (Christian Heggie) | | GYF |
| 6. Denali National Park & Preserve (Alaska) | Biology Technician (Evelin Preciado) | | EFTA |
| 7. Florissant Fossil Beds National Monument (Colorado) | Paleontology Research and Education Specialist (Ricardo Escobar) | DHA | EFTA |
| 8. Great Basin National Park (Nevada) | Astronomy Interpretation Intern (Brenna Rodriguez) | | GYF |
| 9. Great Smoky Mountains National Park (North Carolina, Tennessee) | Acoustical Technician (Laura Del Valle) | | GYF |
| 10. Greater Yellowstone Inventory and Monitoring Network (Montana, Wyoming, Idaho) | Biological Technician (Malik Robinson) | | GYF |
| 11. Greater Yellowstone Inventory and Monitoring Network (Montana, Wyoming, Idaho) | Biological Technician (Marquise White) | | GYF |
| 12. Gulf Coast Network (Louisiana, Texas, Florida, Mississippi, Alabama) | Biological Science Technician (Fabiane Barato-Speyrer) | DHA | GYF |
| 13. Indiana Dunes National Lakeshore (Indiana) | Pollinator Steward (Jacob Villalpondo) | | EFTA |
| 14. Lassen Volcanic National Park (California) | Biology Technician (Noelani Parker) | | EFTA |
| 15. Lava Beds National Monument (California) | Natural Resource Program Assistant (Dominique Ong) | DHA | EFTA |
| 16. Lewis and Clark (Oregon, Washington) | Biological Technician (Plants) (Kayla Fermin) | DHA | EFTA |
| 17. Manassas National Battlefield Park (Virginia) | Biological Technician (Grasslands Birds and Habitat Management) (Saba Rahman) | | GYF |
| 18. Mount Rainier National Park (Washington) | Cascade Butterfly Project Biologist (Tucker Grigsby) | | EFTA |
| 19. Point Reyes National Seashore (California) | Marine Ecology Internship (Gabriella Reyes) | | EFTA |
| 20. Rocky Mountain National Park (Colorado) | Science Education Internship (Sofia Petros-Gouin) | | EFTA |
| 21. South Florida Caribbean Network (Florida) | Herpetologist Biological Technician (Griselda Landa-Posas) | | EFTA |
| 22. Tumacacori National Historical Park (Arizona) | Santa Cruz River Education Intern (Jacobo Carrasco) | | EFTA |
| 23. Valley Forge National Historical Park (Pennsylvania) | Resource Conservation Conservation Assistant (Elizabeth Rico) | DHA | GYF |
| 24. Yosemite National Park (California) | Wildlife Biologist (Sidney Woodruff) | | GYF |

*The name of the participant is displayed in parentheses after the position title. DHA in the third column denotes the Direct Hire Authority Resource Assistant positions, and the last column shows which program partner managed the position with EFTA = Environment for the Americas and GYF = Greening Youth Foundation.*

## INTERN TRAINING

In 2017, Interns received training before, during, and after their programs. Before beginning their internships, participants attended webinars that provided basic information about Mosaics in Science, introduced them to the coordinating organizations, and helped them to understand their responsibilities and the expectations of the program. Each intern received a digital and print copy of an Intern Manual to serve as a guide to program logistics.

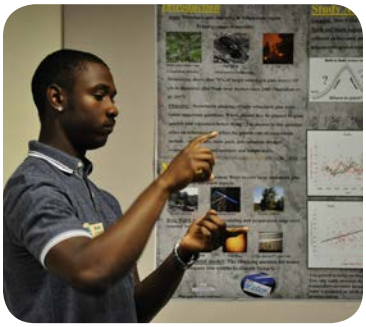
During the internship, the Mosacis in Science team offered weekly webinars to connect with participants, to provide additional training, and to answer any questions or concerns. Webinar topics included:

**Financial Literacy with Dominique Broadway**
- Microaggressions and How to Handle Them with NPS staff
- Non-Federal Resumes & Interviews with Gale Dunlap
- Graduate School: Applying & Loving It: Mariamar Gutierrez
- Pathways to the Park: Fernando Villalba (NPS)
- Preparing Your Federal Resume: Michelle Bratschun (NPS)
- Presenting Research Orally and by Poster: the Mosaics in Science Team
- Post-Internship Workshop in Colorado: Details and Logistics: the Mosaics in Science Team

**Mosaics in Science Career Workshop**
Upon completing their internships, participants traveled to Colorado for a three-night, four-day experience. During the first two days of the workshop, intern met in Lakewood, Colorado where they presented their research both orally and in poster presentations, met other National Park Service staff, and interacted with a panel of scientists. The workshop also provides the important opportunity for interns to meet face-to-face.

During the last two days, the Mosaics in Science crew traveled to Rocky Mountain National Park, where they learned about the inner workings of a large park during presentations by the park superintendent and park staff, gained more information about applying for federal jobs, and explored the park.

The workshop provides an important conclusion to the experience and culminates with comments and suggestions for improvement from the participants and an awards ceremony.



**How important was the opportunity to meet the other interns in person during the workshop?**

Important to Very Important:

**100%**

*A visit to Rocky Mountain National Park in Colorado was a highlight of the post-internship career workshop.*

**Sophia Bass Werner (DHA) - Boston Harbor Islands National & State Park**
Sophia created a new approach to engage Boston Public School students in STEM explorations that foster exchanges of information among students, teachers, scientists and public land managers. She co-lead "Ranger time" during The Summer Connections' program, as well as created a Story Map Blog that allowed students connect to their island and to access the information learned during the program. She was also a part of the STEAM team, a group created in the park in charge of gathering useful information for new citizen science programs, and helped to report on helpful tools that can be used to enhance existing programs.

**Fabiane Barato (DHA) - Gulf Coast Network**
Fabiane spent her summer radio tracking and monitoring Gopherus berlandieri, the smallest tortoise species in North America. She started the summer by developing a harness for a microGPS unit to attach to the tortoises. This tracker provided snapshots of the activities and locations of the tortoises, increasing their temporal information. Once in place, Fabiane and her team at GULN collected and analyzed data to determine the annual changes in species composition, patterns, and reproductive success of the parks.

**Dominique Ong- Lava Beds National Monument**
*Never have I seen a bat up close.* Until her internship at Lava Beds, Dominique's science experiences had never taken her into a cave or hands-on experiences with bats. Once at the park, she helped with bat monitoring, particularly with surveys of maternal colonies and mobile acoustic transects. She also developed a video to help people understand the impacts of white-nose syndrome. By the time she left the park, her video had received 2600 views and helped visitors understand the importance of cleaning their clothes and equipment to preventing the spread of the deadly disease.

**Ricardo Escobar (DHA) - Florissant Fossil Beds National Monument**
Ricardo was tasked with the job of developing a Geology/Paleontology camp curriculum for elementary students in Colorado. He researched existing education materials and state education standards, created complete lesson plans, and piloted activities with visiting school groups, scouts, and other youth. Ricardo's camp will be implemented in summer of 2018. After completing his Mosaics internship, Ricardo continued his experience at Florissant as a Geoscientist-in-the-Park.

## QUOTES FROM PARTICIPANTS

*Through the opportunities for networking that I was granted both in Great Basin National Park, and during the post-internship career conference in Denver and Estes Park, I have made positive connections with incredible peers and administrators that I intend to maintain in the years to come. I am infinitely grateful to Mosaics in Science, because through this program, I found my place in Great Basin National Park, where I have been kept on staff for a second internship through the Geoscientists-In-The-Parks program. I've gained a sense of community, both in my park and in my intern peer group, and I think that might be the element of this internship that I cherish the most.*
– Brenna Rodriguez

*I never would have thought I could see places so beautiful and jaw-dropping, as I did while experiencing the high country. Our trip to the east side was filled with June Lake swimming, Mammoth Mountain skiing, live music at the famous Mobil stop in Lee Vinings, and a great time with great people from the Aquatics crew. I'm so lucky to know these people that come from different parts of the country (and even world), but all have such a large passion for wildlife and habitat restoration at Yosemite. This internship has awarded me new skills, friends, experiences, and memories that I won't ever forget.*
– Sidney Woodruff

### 2017 PARTICIPATING PARKS

- Boston Harbor Islands National & State Park
- Buck Island Reef National Monument
- Craters of the Moon National Monument and Preserve
- Cuyahoga Valley National Park
- Great Basin National Park
- Great Smoky Mountains National Park
- Greater Yellowstone Inventory and Monitoring Network
- Gulf Coast Network
- Manassas National Battlefield Park
- Valley Forge National Historical Park
- Yosemite National Park
- Cabrillo National Monument
- Denali National Park and Preserve
- Florissant Fossil Beds National Monument
- Indiana Dunes National Lakeshore
- Lassen Volcanic National Park
- Lava Beds National Monument
- Lewis and Clark National Historical Park
- Mount Rainier National Park
- Point Reyes National Seashore
- Rocky Mountain National Park
- South Florida Caribbean I&M Network
- Tumacácori National Historical Park

**Dominique Ong**
***Lava Beds National Monument***
Dominique Ong created a video to guide visitors on cleaning their gear to prevent the spread of White-nose syndrome.
***https://www.facebook.com/LavaBedsNPS/videos/10154965147136799/***

**Tucker Grigsby**
***Mount Rainier National Park***
Tucker Grigsby studied the Cascades Butterfly in Mount Ranier National Park and was featured in the Seattle Times, the Omaha World-Herald, and
***https://www.seattletimes.com/life/outdoors/citizen-scientists-track-effects-of-climate-change-in-the-northwest/***
He was also featured in the 2017 Field Season newsletter.
***https://www.nps.gov/mora/learn/nature/upload/CBP_2017_14April2017.pdf***

Home (/)

# Musings From Craters Of The Moon National Monument And Preserve

Share / Save (https://www.addtoany.com/share#url=https%3A%2F%2Fwww.nationalparkstraveler.org%2F2017%2F07%2Fmusings-craters-moon-national-monument-and-preserve&title=Musings%20From%20Craters%20Of%20The%20Moon%20National%20Monument%20And%20Preserve)

By Lee Dalton (/users/lee-dalton) on July 5th, 2017

Climbing the Inferno Cone is a main activity at Craters of the Moon National Monument and Preserve/Lee Dalton

I headed up to Idaho to scout out a spot to watch the Great Total Eclipse of the Sun on August 21. Depending upon whom you talk to, there is either fear or anxious anticipation about that coming event. Speculation (probably well-founded) has it that millions of people will make a mass migration across the country and around the world as a band of blackness shoots across all of America from Oregon to Florida.

The expected band of totality will be about 70 miles wide. Within that narrow strip, day will turn to night. Stars will suddenly come out. Birds will fall silent, and night insects will make confused noises.

People who have witnessed a total eclipse say it's an absolutely awesome experience. And rare. The next total eclipse visible in North America will extend from Texas to Maine on April 8, 2024. The next total eclipse to touch Idaho won't be until 2169.

The visitor center and campground of Craters of the Moon National Monument and Preserve (http://www.nps.gov/crmo) will be just outside the band of totality, but the town of Arco — 20 miles north — will be under it. Towns, and their businesses, all along the eclipse path are planning for some big doings. Trouble is, no one knows just what to expect. Hotel rooms and campgrounds have been booked full for several years. Businesses and eateries are in quandary. Stock more supplies, food, souvenirs, gasoline — or not? Risk not having enough hamburgers or far too many?

Grand Teton National Park (http://www.nps.gov/grte)will be directly under the darkest darkness. They are bringing in more rangers from all over the country. County sheriffs are arranging for other counties to send help. Every portapotty in western Wyoming and most of Idaho has been reserved and will be migrating along with people to places where they might be even more important than the town's mayor. Cities and main highways are expected to become totally gridlocked. Or maybe not.

And so it seemed wise for me to come and locate the very best place in all of Idaho to guide my family. Craters of the Moon's campground was a good place for expedition headquarters. I spent my first day at CRMO out and on the prowl looking for a spot that will be just right.

I found it. But if you think I'm gonna tell anyone where it is, think again!

Yup. Just the right place. Or maybe not ....

Back to the Craters

There are parts of Craters of the Moon where jumbles of lava make travel so difficult it's likely that no human feet have ever stepped there. Until the early 1900s, it was largely a blank blob on maps. A blob nearly the size of Rhode Island. But people were intrigued and curiosity abounded. A few tentative explorations were made. An article in National Geographic drew international attention. Thus, in 1924, President Calvin Coolidge used the Antiquities Act to proclaim Craters of the Moon a national monument. Certainly the only such place to contain the word weird in its enabling proclamation — "a weird and scenic landscape, peculiar to itself."

Speaking of weird ... Craters of the Moon is on Donald's list of national monuments that Interior Secretary Ryan Zinke is supposed to "review." It seems that President Bill Clinton added some acreage that qualifies this monument for that exercise.

I found Craters to be filled with pleasant surprises. The first came when I actually found vacant campsites at nearly 8 in the evening. I understood when I noticed later that CRMO is pretty much a one-night stop for most visitors as they travel from one park to another. The campground pretty much empties every morning and — at least in early June — doesn't quite fill at night.

The place is clean as clean can be, and the campground was just rehabbed last summer. One of the volunteers told me that Craters is small enough that they are able to keep virtually all of their entrance fee money. If that is correct, it explains a lot about the fine condition of the park. It looks like they've been able to put it to very good use.

I noticed right off that summer interpretive program offerings seem to have something for everyone, with some extras for kids. Junior Ranger offerings are plentiful, and everyone under age 15 seems to have a Junior Ranger workbook in hand. Visitors receive a printed copy of 2017's summer programs when they arrive at the entrance station. When the entrance station is closed, an Iron Ranger takes over and collects entrance and campground fees.

But as has often been the case lately, it seems that Craters of the Moon, like so many of our parks, is staffed almost entirely by volunteers. For every green and grey uniform I've spotted at Craters, I bet I've seen three tan ones. Now I notice that many volunteers introduce themselves as "Ranger So-And-So." I have some serious grumblings with that. Even though every volunteer I've met obviously takes real interest and pride in their work, I have also noticed a very distinct dilution of interpretive activities. I can't help thinking that the title "Ranger" needs to be earned.

It's often very apparent that volunteer interpreters work not so much from thorough knowledge of the park, but from sets of canned spiels. Too often in several parks, I've seen volunteers who are stumped by questions that should be easily answered, and I've heard more than a few pieces of real misinformation being handed out. I'm certain that's a result of constant churning of volunteer helpers. It's not uncommon to hear them reciting a long list of parks in which they've volunteered. Some apparently work more than one park in a single summer's season, as if collecting volunteer slots is a game, with each park another trophy. It takes a lot of effort — and time — for anyone to become thoroughly familiar with all necessary information about any park.

Mauro Hernandez puts his education to work by teaching visitors about bats at Craters of the Moon/Lee Dalton

I'm sure a lot of paid staff time is required to try to train and supervise a nearly constant flow of new people. That staff time means a lot of money is going into supporting volunteer programs. Money that could certainly fund a seasonal ranger or two. And constant turnover precludes essential continuity in park operations. Can a park's permanent and long-term seasonal staff members handle the workload of constantly trying to train green volunteers?

There are certainly places where volunteers may provide valuable services to visitors and park resources. Campground hosts or volunteer help with some aspects of resource management such as invasive species control or catching up on curatorial tasks are some examples.

Now that I've taken a slam at volunteers, I need to turn around and offer a lot of praise. At Craters, I met at least three VIPs who say they are taking part in a cooperative effort between the NPS and the Geological Society of America. Laura Bader and "Ranger Jennifer" are two who are completing geologic internships. Ranger Jennifer explained it's an effort to recruit more geologists into Park Service positions. (But I wonder what good that does when so few paid vacancies exist?)

Volunteer Luxianna (pronounce that LU-zee-ANNA) Watkins presented a couple of excellent programs on microhabitats. Like some of the other volunteer interpreters, she is a college student specializing in the science she shares with visitors. In addition to interpretation, she also has some duties in resource management.

I can't forget Sam, the campground host who spent a lot of time and effort helping incoming campers find spots that were just right for whatever size and kind of equipment they had.

Then there was Mauro Hernandez. A student at University of California at Santa Cruz. He is specializing in bats. He'll be helping with some bat studies at Craters along with working to educate visitors about these vital and threatened critters. I tagged along on his very first guided walk and attended his first-ever evening program. His evening program — done the old-fashioned way because of computer problems — was simply outstanding. And no canned spiels for Mauro. He knows bats. He doesn't need anyone telling him what he should say.

Part of the "weird" landscape at Craters of the Moon/Lee Dalton

Mauro is working with some sound recording equipment that has been installed outside several of the park's lava tubes. It tries to record sounds of bats with hopes it will enable him to count bats and possibly identify individuals by specific sonic characteristics. He says he accidentally stumbled into his interest in our small, bug-bagging buddies when a professor suggested he write a thesis on them. He became fascinated and now must be one of the best friends a Fledermaus has ever had.

The first time I joined a group of visitors to listen to Mauro, he also explained that he's part of an effort to diversify our parks. He's Mexican-American, and it's hoped that he can open some doors and help others to follow. (But again, who can follow if there are no jobs?)

And Speaking of Bats

Managers of any place that has indigenous bat populations are very worried about white-nose syndrome. WNS is a fungus apparently imported from either Europe or Asia. It first appeared just a few years ago in a cave in New York state and has spread rapidly because North American bats have no immunity, as their overseas cousins have. Until last year, WNS seemed to be restricted to caves and bat populations east of the Mississippi.

But this year, it was detected in a cave bat population in Washington state. No one knows how or when it made this westward jump, but now this frightening and deadly disease is on both coasts. It literally threatens possible extinction of America's bats.

Bats are not critters regarded as cute and adorable by many people. In fact, they are often feared or hated because so many humans have no idea how vital they are to all of us. If you dislike mosquitoes and other insect pests, you should love bats. They need more friends like Mauro who can act as their public relations agents.

For years now, people entering caves anywhere in national and state parks have been asked to take precautions and try to decontaminate any clothing or equipment that has been previously taken into a cave or mine. But those precautions are not standardized in any way and almost certainly vary widely in effectiveness. The NPS has no standard, and each area with bats and caves have been left to do the best they can.

This has produced a hodgepodge of procedures. In some places, visitors are asked to wipe boots and cameras and other equipment with solutions of hydrogen peroxide or Clorox and not wear any clothing that could be contaminated. When I visited Oregon Caves last fall, I had a pretty young ranger cleaning my boots for me while I worked on my camera. In some places, visitors are simply asked to wipe their feet on a mat containing disinfectant.

When you stop to think of it, those cautions really fall short of any realistic preventive measures. It's very unlikely that if spores are present on one's boots, a wiping with peroxide or bleach will kill all of them. Think of all the tiny spaces where microscopic spores can be hiding.

Thus, Craters of the Moon has made a tough decision. They won't even try to use disinfecting procedures. If you have equipment that has been into another cave or into a mine, you simply may not take it into one of Craters of the Moon's lava tubes.

I have to admit that I was just a titch dismayed when I was told I couldn't enter any caves here because my boots had visited caves last fall. But after listening to Mauro's and others' explanations and horror stories of how rapidly our bat populations are dying, I changed my mind. Happily, I had a second pair with me that was clean. Mold spores may remain viable for centuries or longer.

As Mauro explained, perhaps the best way to try to protect our little buddies is to educate as many people as possible and gain their cooperation. Then we have to hope that everyone is honest and really does cooperate. The key to that is probably education and an attitude adjustment toward bats.

So by all means, visit one of the lava tube caves. Just come prepared to help protect the bats.

Despite the vast expanse of lava fields, Craters of the Moon has a surprising array of wildflowers/Lee Dalton

A Wildflower Riot

The west had a good wet winter, and now we're enjoying an explosion of wildflowers. There are places in Craters where you'd expect plants to be growing. Kipukas are places where lava flowed around, instead of over, some landscape. This has left islands of grass and trees where flowers abound. Yet even on jagged jumbles of a'a lava, on smooth stretches of pahoehoe lava, or on cinder cones where it looks as if nothing could possibly take root, wildflowers have found a way. In fact, 660 species of plants are known to exist within Craters of the Moon.

Throughout the park were acres and acres of white and red and yellow and a little blue here and there. Many of the varieties of flowers are miniatures because they live in such a harsh place. Dwarf monkey flowers, for example, look just like the monkey flowers so familiar in Yellowstone. But they are only about one-tenth the size. Yet they turn entire hillsides pink and purple.

Everywhere you looked in the park in mid-June, you'd find people standing, crouching, kneeling, lying flat, and peeking through cameras or phones seeking the most perfect wildflower photo the world has ever seen.

What's really neat about it is that I'll bet every one of us went home with at least one photo we all thought was absolutely perfect. It'd be hard not to when there are so many opportunities.

It's Kind Of A Shame

I'm afraid that a lot of people who wander into Craters of the Moon fail to recognize what the park really has to offer. After all, jumbles of black rock aren't what most people would call scenic. There's a 7-mile loop road with a couple of short sides. Hiking trails aren't very long but lead to some really interesting places. Split Top Butte, the Tree Molds area, Spatter Cones, Devil's Orchard, and North Crater all provide some fine and relatively short hikes. Climbing to the top of Inferno Cone is a bit tough on a very cold and windy day, but definitely worth the effort. Then there are four or five lava tubes open to visitation — if you qualify for a cave permit by certifying that your clothes and equipment are clean.

Most of the park is wilderness. Rough wilderness with little to no water and lava that will tear up a pair of boots in short order. It's a land much different than most park visitors have ever experienced before. So it's kind of a shame that so few visitors seem to spend much time exploring and thoroughly experiencing all Craters has to offer.

If I have any advice for anyone, it's this: Do your homework and then go planning to spend some time hiking, climbing, looking, listening, and just enjoying. One day — or a few hours — won't do justice to this weird and wild place. People who discover that it's not all jumbles of black rock can find some real treats.

There's a Disturbance in the Force

Now comes the hard part. I came away from Craters of the Moon with two terribly disturbing things to think about. I've been home for three weeks and have never stopped struggling with deciding if I should even try to write about them — and if I do, how can I try to pass them along to others.

I still haven't figured it out, but guess the only way is to dive in and try. So here goes .... I just hope I cause no harm to anyone.

Not long after arriving in the park, I began to notice an undercurrent of distress that was hard to pin down.

There are apparently a large number of vacant positions. This leaves remaining staff members trying to fill in and do the work of several. It means that some must try to cover areas in which they've had little training or experience. It means they are unable to do justice to what should be their primary duties. Permanent and seasonal ranger staff has been cut to the point where, in the words of one person, "We have only a skeleton crew." One symptom is an empty dorm that could house as many as 14 seasonals.

As I've visited other parks recently, I've become aware of some kind of special hiring authority that I do not understand. As near as I can figure out, it's some kind of administrative track that hires people specifically to become upper-level park managers without having first worked as rangers or in maintenance. They apparently jump directly into headquarters. Some folks feel that people who have come to manage our parks by that route lack certain knowledge and skills needed to fully understand how to best manage these places.

In some parks, the administrative offices have been moved outside the park to a nearby town. That can result from a couple of reasons. One may be simply a lack of facilities in the park to house offices or provide onsite housing. In some cases, it's been due to political pressures from local chambers of commerce or others to realize some sort of special gains. At CRMO, headquarters is still inside the park, but the superintendent and some other key staff live an hour or more away, outside the park.

I've long felt that it's vitally important for park staff members to actually live in their parks so they can develop the level of involvement — ownership, if you will — that gives them an intimate connection with the special place they are protecting for all of us. There's a big difference between tackling a job as just a job and seeing it as a very special calling.

Even beyond Craters of the Moon, there are universal pressures that seem bent upon diminishing our parks, if not destroying them. Earlier this year in another park, I met a seasonal whose work was simply outstanding. But she lamented, "I don't know how much longer I can continue. I have no real future in the Park Service. No matter how much I love what I'm doing, I have nothing lasting to show for it. No benefits. No retirement. No real chance for a permanent job." Then her voice broke and she turned away from me.

Junior Ranger badges can go to adults as well as youngsters!/Lee Dalton

Junior (and Senior) Rangers & Hope for the Future

Let's end on a note of optimism. There's certainly a lot of interest in Craters' Junior Ranger program. Practically every young one I saw was carrying a Junior Ranger booklet, and I think that every time I was in the visitor center, they were in the process of administering the Junior Ranger Pledge to one or two or three kids. Adults, too. I was especially moved when I saw a woman of perhaps 30 years hand in her booklet so she could receive a badge. The volunteer handed her the badge and then asked, jokingly I think, "Do you want to take the pledge?"

The lady looked a bit startled and then replied, "Well, yes. I think I would." So she raised her right hand and repeated the words.

Everyone in the big room watched and smiled as she did. Another time I watched as six parents and three children all raised their hands to become Junior Rangers. Every evening at the amphitheater, kids may bring their parents for a Junior Ranger activity. I tagged along one night and watched as Ranger Hester Mallonee capably met the challenge of keeping four little ones and four older ones engaged and interested. She did an awfully good job of keeping the 3- and 4-year-olds more or less on the job while still maintaining interest of the older ones. In some parks, Junior Rangers are divided into a couple of age groups with appropriate activities and materials for older and younger children. But that probably is limited by the number of interpreters available.

When Ranger Hester had finished, it was time for the whole mob to stand up and recite the pledge, despite some problems deciding which hand was left and which was right.

Personally, I think teaching Junior Rangers is one of the most important things park interpreters are doing these days. Anything that may attract, educate, and help gain continued interest in our parks is vital. This builds the future. I've noticed, too, that much of what's taught is aimed more at parents than their children.

What tickles me most, though, is the very obvious seriousness older kids bring when they make the solemn promise to protect the parks and all they contain. Most of those kids take it very seriously, and I have no doubt the memory will be a lasting one.

I also have no doubt we'll really need those kids someday.

- Craters of the Moon National Monument and Preserve (/park/craters-moon-national-monument-and-preserve)
- Exploring the Parks (/article-category/exploring-parks)
- Musings From the Parks (/article-category/musings-parks)

Featured Article

- Add new comment (/2017/07/musings-craters-moon-national-monument-and-preserve#comment-form)

## Comments

> Submitted by Rick B. (/users/rick-b) on July 5, 2017 - 1:19pm. (/comment/62707#comment-62707)
> Thanks, Lee, for your insights both hopeful and dreadful.

- reply (/comment/reply/15629/62707)

Submitted by Pedergraham on July 5, 2017 - 5:10pm. (/comment/62711#comment-62711)
I share Rick B's sentiment. I have a friend going to Craters this summer. I almost shared this with him, but as a recently retired GS employee, I figured he'd "been there, done that" regarding hiring, personnel, etc.

- reply (/comment/reply/15629/62711)

Submitted by m13cli@yahoo.com on July 5, 2017 - 8:09pm. (/comment/62715#comment-62715)

Paul Fritz left a unique legacy for the Park Service: IN MEMORIAM

Stephen Stuebner Jan. 29, 2001From the print edition

We have reached a time when many conservation legends of the 20th century are disappearing. David Brower, the environmental giant, is a recent example. Now we've lost a lesser-known but very influential conservationist. Paul Fritz died quite suddenly on Christmas Eve from an undiagnosed brain tumor. He was 71.

Fritz's generation possesses a pure conviction for preserving wild places, and a strong sense of duty to their country. They came of age on the heels of the Depression. They watched young friends and family members die from medical maladies that are easily treatable today. Many of them served in the military. They knew that life was precious, and they lived it with gusto.

"The young Americans of this time constituted a generation birth-marked for greatness," wrote Tom Brokaw in The Greatest Generation.

Fritz's fiery personality was a product of growing up in Yonkers, N.Y., where he was a street fighter and high school football player. Every once in a while in later years, Fritz's temper would emerge when a pro-development foe pushed him too far, and he'd threaten to grab the tire iron from the trunk of his car and take him on.

Fritz even looked like a thug - with his broad shoulders, thick neck, bald head and big piercing eyes. "He was like a bull charging through the woods," says Martin Litton, a Sierra Club national board member and Grand Canyon boatman.

He had a soft side, too, and a big heart.

Fritz was bitten by a zeal to protect wild places when he spent his college summers as a fire lookout at Yellowstone National Park. In his 20-year career with the Park Service, he had a major hand in protecting all kinds of parks and monuments in the West, including Redwood, Arches, Canyonlands and Crater Lake National Parks, Craters of the Moon National Monument, and many of Alaska's parks, monuments, refuges and wilderness areas.

Fritz was politically savvy. He hung out with environmentalists at parties. He contributed to the campaigns of moderate and powerful Republicans. He worked side by side with Ed Abbey at Arches National Park. He knew county commissioners, chamber of commerce directors and educators - all of the people it takes to build support for a park.

After Fritz retired from government service, he joined the boards of a number of grassroots environmental groups in the West, including the Alliance for the Wild Rockies, Hells Canyon Preservation Council and the advisory board of the Oregon Natural Desert Association. He gave money to many other groups, including the Southern Utah Wilderness Alliance and Greater Yellowstone Coalition.

Fritz received "The Sargent Award" from the GYC in the fall of 2000 for not only being a founder of the group, but also for the legacy he's left in his wake.

"Paul was one of a kind," says good friend Michael Frome, a widely published conservation writer. "He was independent and outspoken, shall we say, and he got away with it. He was a public servant who really served the public, above all."

- reply (/comment/reply/15629/62715)

Submitted by Lee Dalton (/users/lee-dalton) on July 5, 2017 - 11:33pm. (/comment/62718#comment-62718)
I'd never heard of Paul Fritz until right now. It sounds like we need a lot of folks just like him these days. Thanks for introducing us to him.

- reply (/comment/reply/15629/62718)

Submitted by Rebecca Latson ... (/users/rebecca-latson-photography) on July 6, 2017 - 7:37am. (/comment/62720#comment-62720)
Lee, what a wonderful article! and, I agree with your insights and about the title Ranger needing to be earned.

- reply (/comment/reply/15629/62720)

Submitted by m13cli@yahoo.com on July 6, 2017 - 9:12am. (/comment/62722#comment-62722)
Lee,

We knew Paul Fritz as an outstanding Landscape Architect at
Crater Lake NP: Several Memories: when traveling the south road
Hwy 62 from the Entrance Panhandle to Annie Springs, all the
curved pullouts including both Annie Falls, and Lodgepole, etc.
are there today because Fritz spared/saved them when the south
road was being rerouted; they were curvey sections from the earlier road.

Paul worked at Craters of the Moon once Director George Hartzog
asked him to be Superintendent; Paul was truly a 24/7 day workaholic:

"The idea of making Craters of the Moon a national park isn't new. Supporters of the idea point to Coolidge's words when he declared the monument -- "now Idaho has its own national park" -- as evidence that it was always the intended next step. Craters Superintendent Paul Fritz proposed it in 1969."

http://magicvalley.com/craters-park-advocates-hope-new-name-would-bring-... (http://magicvalley.com/craters-park-advocates-hope-new-name-would-bring-big-things/article_2f3414ca-531d-589f-bf95-4f8e6855e968.html)

Paul was Keyman for The Craters of the Moon Wilderness:

(where his cremated ashes may blow in the wind today)

"Designation of the 43,243 acre Craters of the Moon National Wilderness Area was signed into law on October 23, 1970. With that legislation lands within Craters of the Moon National Monument and Petrified Forest National Park became the first within the National Park System to be designated as wilderness."

https://www.nps.gov/crmo/planyourvisit/wilderness.htm (https://www.nps.gov/crmo/planyourvisit/wilderness.htm)

More Memories: We first knew Paul Fritz during the early years of Redwood NP
borne in Timber Industry Controversy and planned by NPS, Paul, among others,
Save-The-Redwoods League,
Sierra Club and The National Geographic Society locating Tall Trees Grove.
in the Lower Redwood Creek Watershed.
Paul proposed that the RNP Park HQ be placed near both Arcata and Humboldt
State University, but the land swept clean by the Crescent
City 1964 Alaskan Tsunami was donated by the City for Park HQ. Today, many staff
waste precious work hours as "driving yo-yos" on Hwy 101 traveling north and south.

- reply (/comment/reply/15629/62722)

Submitted by Don Scott on July 11, 2017 - 1:45pm. (/comment/62784#comment-62784)
Glad to see Craters of the Moon get showcased, since to me it's one of the best-managed parks I know, even with the financial and staffing issues. They've done some fine leveraging of NPS staff shortages by hiring volunteers like the ones described here - science-oriented people who work with the NPS in a win-win situation. The showcase project is one in which Craters partners with NASA - which will include intepretation during the eclipse by NASA people.

I'm also glad someone is raising some of the long-overdue staff concerns and budget concerns.

The promotion beyond ranks sounds like a variation of the old "Upward Mobility" program in place when I worked as an NPS ranger. Not a bad idea, but when it's imposed for political reasons it almost guarantees politicos will be the ones promoted. Eventually, it becomes an agency in which the Peter Principle rules, and managers are simply not competent. (One of the least-qualified people I ever worked with, who did nothing to earn it, is now a superintendent somewhere - if that's not the Peter Principle at work....) On the other hand, with promotion based on politics, ability and experience counted for little - I, too, left, even though I was Career-Conditional when it was clear that I had no future there - in spite of an MA in outdoor ed, teaching experience, and even a commendation for service above and beyond during the 1989 Quake. (In the pre-Nixon Civil Service days, you didn't even get in the door without a high score on tough exams and a challenging interview, and you didn't get promoted without high evaluations.) (I went to NASA, quadrupled my income, and became one of 40 national educators who worked much like good NPS interpreters, but in the field.)

This is not intended as sour grapes, but a personal example which illustrates the problem. The NPS is now exactly where the national parks were before TR, Lane, and - most of all - Mather, Albright, and company cleaned house. We need another Mather. But until one shows up, we need to return to Civil Service exams, build new and agressive pro-NPS campaigns to get money in and politics out, and make sure hiring and promotion don't encourage Peter and his Principle.

I've also worked as a volunteer for the NPS. I met some fine and dedicated volunteers. I met some deadwood. In parks where the managers were clearly upward mobility people and very political volunteers tended to be politicized deadwood. In parks where managers were talented and dedicated and field-experienced, volunteers worked professionally - and never called themselves "rangers." The truth, however, is that it costs as much to manage volunteers as to hire seasonals to do the same work. So one wonders if the vaunted Volunteer Program, a gift of the first Bush, is not in truth intended to water down the quality of the Rangers' work. Also, with volunteers, you often get what you pay for.

Again, thanks for a profile of a good park, well-managed, and for raising this important issue.

- reply (/comment/reply/15629/62784)

# INTERN PROFILES

Environment for the Americas

**The following internships were administered by Environment for the Americas staff**

### Jacobo Carrasco • University of Arizona South

***Tumacácori National Historical Park***

Jacobo graduated with a Masters of Education in Secondary Education in the spring of 2016. He was particularly interested in this Mosaics position because he was looking forward to connecting the park's resources to area school districts with the hope that he will inspire youth to become citizen scientists. As a local teacher, his work with the park will help to ensure a long-term relationship between schools and Tumacácori National Historical Park.

### Ricardo Escobar-Burciaga • Western Washington University

***Florissant Fossil Beds National Monument***

Ricardo has a strong passion for Science Education. As a graduate student, Ricardo prepared paleontology lab lectures and activities for undergraduate students. After graduate school, he held a position as a substitute teacher for the Long Beach Unified School District. Ricardo's future plans are to become a high school science teacher in a low-income neighborhood. At Florissant Fossil Beds National Monument, he will be developing a curriculum that will connect summer camp students to the fossils they will see in the park.

### Tucker Grigsby • University of California, Santa Barbara

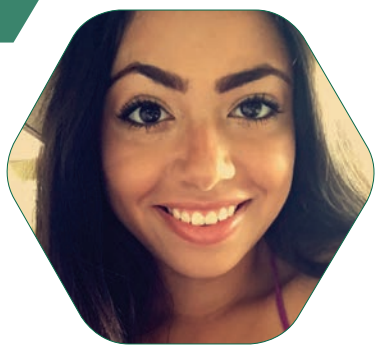
***Mount Rainier National Park***

Tucker graduated in June 2016 with a degree in Aquatic Biology. Given his past experience performing research-related tasks both in the lab and in the field, Tucker walked into this internship confident in his ability to collect data about wildlife. He is excited to work alongside National Park Service biologists who are part of the Cascades Butterfly Program, which monitors the distribution and abundance of subalpine butterflies. Tucker envisions himself in a biological research position in the future.

### Griselda Landa-Posas • Colorado State University

***South Florida / Caribbean Inventory & Monitoring Network***

As a senior at Colorado State University, Griselda is pursuing her degree in Fish, Wildlife, and Conservation Biology. She has a passion for all wild things, from a small Alaskan poppy to a large grizzly bear. In Florida, she will be applying her knowledge of acoustics to study the vocalizations of local frog communities. This will involve field work that will culminate in a presentation to a tri-park science and technical board. In addition to her involvment in conservation biology Griselda is also particularly interested in helping to immerse children from under-privileged communities in the natural world. This is her second year as a Mosaics intern.



**Kayla Fermin • Syracuse University**

***Lewis and Clark National Historical Park***

Kayla Fermin is a recent graduate with a Bachelors of Art in Geography. Kayla enjoys talking to people and educating them about the environment. She will work with scientists from Lewis and Clark National Historic Park and other organizations, such as National Oceanic and Atmospheric Administraton, to examine restoration activities. Her work will involve data entry and analysis, culminating in a technical report. Kayla's future goals include pursuing a Master of Science degree in GIS and working on environmental justice issues.

**Dominique Ong • University of Virginia**

***Lava Beds National Monument***

Dominique Ong is a senior pursuing a degree in Environmental Science and Global Studies. Dominique's ideal career would involve the design and management of citizen science outreach programs. Citizen science is valuable to her because it acts as a bridge connecting scientific research and the community. At Lava Beds, she will share information about caves and bats with park visitors and help with bat monitoring projects.

**Nicole Ornelas • University of California, Berkeley**

***Cabrillo National Monument***

With a major in Marine Science, Nicole Ornelas is no stranger to Cabrillo National Monument. As a part of the Natural Resources and Science Education team, Nicole has become very familiar with this coastal habitat and shares her knowledge with the public by administering science education programs for the park. She believes that the key to success is not in individual endeavors, but in collaborating as a community to address important challenges, such as climate change and the decline in biodiversity.

**Noelani Parker • California Polytechnic State University**

***Lassen Volcanic National Park***

Noelani Parker is a recent graduate with a B.S. in Environmental Management and Protection. She has a deep-rooted love for the environment and nature. She has held many positions as a lab, field, and research technician. Working with park biologists, she will help track the white pine blister rust in Lassen Volcanic National Park. This pathogen is a fungus that affects whitebark pine. It has been a long time dream of Noelani's to work for the National Park Service.

**Sofia Petros-Gouin • Columbia University**

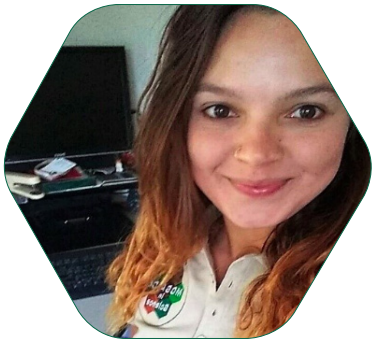
***Rocky Mountain National Park***

Sofia Petros-Gouin is a junior at Columbia University, majoring in American Studies and Sustainable Development with a special concentration in Education. Sofia is particularly interested in learning more about educating others, especially young people about the outdoors and environmental justice, protecting natural spaces, and how to make natural areas more welcoming to all people. She will hone her skills in the majestic Rocky Mountains, where she will develop interpretive educational programs.

**Evelin Preciado • Colorado State University**

***Denali National Park and Preserve***

Evelin has a major in Environmental Science and a minor in Environmental Affairs, she is constantly seeking experiences to learn about nature. Her academic goals include returning to school to pursue a Master's degree. In Alaska, Evelin will document the diversity, distribution, and phenology of several arthropod groups. This Mosaics project is ideal for Evelin as she has always found arthropods fascinating and beautiful.



**Gabriela (Bella) Reyes • University of Virginia**

***Point Reyes National Seashore***

With a major in Environmental Science, Bella Reyes has participated in studies involving forest biomass modelling, mangrove DNA extractions, tropical forest and coral reef monitoring. At Point Reyes, she will assist with science communication both online and through in-person education programs. She hopes to instill a sense of "call-to-action" in young, future scientists, while continuing to develop her own research questions. Bella wants to pursue a PhD in marine ecology, habitat restoration and conservation and ultimately become a professor.

**Jacob Villalpando • St, Joseph's College**

***Indiana Dunes National Seashore***

As he completes his undergraduate degree in Biology-Wildlife Ecology Track, Jacob is looking forward to his experience at Indiana Dunes and the opportunity to expand his knowledge of pollinators while sharing this knowledge with the public. He believes that pollinators are one of the most important groups of organisms in ecosystems, because they are responsible for pollinating flowers to produce seeds. Jacob hopes to become a conservation biologist.

**The following internships were administered by Greening Youth Foundation staff**

**Fabiane Barato • University of Louisiana, Lafayette**

***Gulf Coast Network Inventory and Monitoring Network***

Fabiane is pursuing a Master of Science degree in Geology at the University of Louisiana at Lafayette, evaluating the variability of the Chicot Aquifer in Louisiana. Fabiane's Mosaics in Science internship last summer involved preserving historical photos of the coastal geomorphology of Gulf Islands National Seashore. This summer she will be radio tracking Texas tortoises in Palo Alto Battlefield National Historical Park.

**Sophia Bass Werner • University of Massachusetts, Boston**

***Boston Harbor Island National & State Park***

Sophia is a recent graduate of the University of Massachusetts Boston, with a B.S. in Environmental Science and a minor in GIS. Sophia is originally from Santa Cruz de la Sierra, Bolivia. She has held a variety of positions with the National Park Service, as a biotech intern and a cartographer, and will be a Next Generation Geologic Science Educator intern at Boston Harbor this summer. Sophia is interested in expanding her knowledge of place-based and curriculum-based education.

**Laura Del Valle • University of Puerto Rico-Humacao**

***Great Smoky Mountains National Park***

Laura is currently finishing her Wildlife Management B.S. degree from University of Puerto Rico-Humacao. This summer Laura will be working as an acoustic biology technician at Great Smoky Mountains Natioal Park, where she'll learn how to "observe" the forest with other instincts and show park visitors how to do the same. She looks forward to gaining advanced skills while doing wildlife field work in the Smokies and learning how research and policy are combined.

**Christian Heggie • University of North Carolina, Greensboro**

***Cuyahoga Valley National Park***

Christian is a senior at the University of North Carolina at Greensboro, where she is majoring in Environmental Studies with a concentration in Sustainability. She loves being outdoors and is always looking for new opportunities to learn and explore new environments. This summer Christian will be interning as a River Use Planning Assistant, and her future career goals include working at a national park or on an organic farm.

**Mauro Hernandez • University of California, Santa Cruz**

***Craters of the Moon National Monument & Preserve***

Mauro completed his Bachelor's degree in Environmental Studies at the University of California, Santa Cruz in 2016. He is passionate about conservation, and hopes to focus on how species behavior can better inform and influence conservation efforts. This summer Mauro will be working as an interpretive ranger and bat ecologist at Craters of the Moon National Monument & Preserve.

**Laura Palma • Florida International University**

***Buck Island Reef National Monument***

Laura graduated from Florida International University in 2015 with a Bachelor of Science in Marine Biology. Passionate about conservation, she has spent the past two years closely involved with multiple coral reef research projects. This summer Laura will be assisting the park in studying the plant-herbivore interactions of green turtles and seagrasses at Buck Island Reef National Monument.

**Saba Rahman • University of Maryland**

***Manassas National Battlefield Park***

Saba is a recent graduate from the University of Maryland with a Bachelor of Science in Environmental Science and Policy with a concentration in wildlife ecology and management. Saba's love for nature and wildlife began while camping and visiting national parks in Virginia and Maryland growing up. She has always wanted to work with the National Park Service, and is excited about her internship this summer at Manassas as a biological technician.

**Elizabeth Rico • University of California, Berkeley**

***Valley Forge National Historical Park***

Elizabeth just finished her last semester at the University of California, Berkeley, with a B.S. in Conservation Resource Studies and a minor in Forestry. She loves being surrounded by nature. Elizabeth is still not sure what field in conservation she'd like to pursue, however she is excited to be interning this summer with the National Park Service as a Resource Conservation Assistant and learning about the many options available.

**Malik Robinson • North Carolina Agricultural and Technical State University**

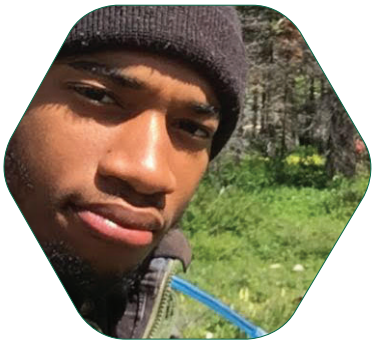
***Greater Yellowstone Inventory and Monitoring Network***

Malik is a junior at North Carolina Agricultural and Technical State University and is majoring in Agriculture and Environmental Systems with a concentration in Sustainable Land Management. This summer Malik will be working with natural resource professionals on a number of long-term monitoring programs. He loves the environment and hopes to find a job pertaining to soil science and the health of the natural world.

**Brenna Rodriguez • University of North Carolina at Charlotte**

***Great Basin National Park***

Brenna is a graduate of the University of North Carolina at Charlotte, where she studied geology and outdoor adventure leadership. She has a strong interest in astronomy, paleontology, and acoustics. This summer as an Astronomy Interpretation intern, Brenna hopes to gain a greater breadth of experience that would connect her academic pursuits with her interests in resource interpretation and public speaking.



**Marquise White • Frostburg State University**

***Greater Yellowstone Inventory and Monitoring Network***

Marquise is a senior at Frostburg State University pursuing a degree in Wildlife and Fisheries with a minor in Biology and French. Marquise has always been interested in the preservation and protection of the environment and its organisms, and hopes to have an occupation that embodies his interests. This summer he will be working with natural resource professionals on a number of long-term monitoring programs.

**Sidney Woodruff • University of Georgia**

***Yosemite National Park***

Sidney is a senior at the University of Georgia, completing a dual bachelor's degree program in Wildlife Sciences and Forestry. Upon graduation, she aspires to obtain a master's or doctorate degree in wildlife conservation and ecology. This summer, Sidney will be a Herpetological Conservation Intern at Yosemite National Park. She has always had a passion for the outdoors and is excited to continue this passion into her career and life.

**The National Oceanic and Atmospheric Administration partnered with the NPS in 2017 in order to create a program similar to Mosaics in Science. NOAA interns participated in the weekly career development webinars and the end-of-summer career workshop in Colorado.**

**Aleah Worthem • University of Maryland, College Park**

***Chart Adequacy Intern***

Aleah is a graduate student at the University of Maryland, College Park. In the fall, she will be entering her second and final year of her Master's program as an MPS GIS candidate.) Aleah received her B.S in Geological Science from New Mexico State University. Though she gained an immense amount of knowledge from her degree in geology, Aleah felt the need to be able to apply what she learned to applications that could be used by the public. This led her to the pursuit of her next degree, as well as the need to for on the job experiences. At the start of her internship with NOAA, the concept of a Nautical Chart Adequacy intern, a mouthful in itself, was a vague yet compelling concept, which she was willing to undertake. Throughout this internship, Aleah dove into the vast world of marine/nautical cartography and has learned concepts such as Satellite Derived Bathymetry, reading nautical RNC and ENC charts, International Hydrographic Standards, as well as the process of implementation chart adequacy. After the completion of this internship, Aleah hopes to pursue as full-time position at NOAA or within a federal capacity as a GIS analyst/cartographer.

**James Moy • University of Maryland, College Park**

***Source Area of Interest Intern***

James Moy is a recent graduate from the University of Maryland, College Park with both an M.S. and B.S. in Geospatial Information Systems (GIS). While earning his degrees, he also worked as a Teaching Assistant for several GIS courses. With his background, James is passionately interested in exploring the potential of GIS, its technology, and how it can be used to better society. While interning at NOAA, James has developed his GIS skills, gained practical work experience through analyzing data from various sources, and created Area-of-Interest data for a new NOAA Weekly Update webpage. This data primarily serves to inform mariners and the general public of all corrections to navigational products weekly. After this internship, James is looking forward to joining the workforce, and applying his knowledge of GIS for others.

**Nia Matsumoto • Ohio State University**

***Survey Priorities Communication Intern***

Nia is a senior finishing her B.S. at the Ohio State University pursing a degree in Geographic Information Science with a minor in Computer Information Science. This summer, she worked for NOAA as the Survey Priorities Communication Strategist intern. Nia was tasked with creating a plan of communication for the Office of Coast Survey's Hydrographic Survey Division. Her goal was to clearly and effectively communicate the purpose and results of a highly technical hydrographic model being developed. The audience varies greatly in terms of technical understanding and intended use of the new model, therefore Nia served an important role as the intermediate interpreter between users and scientists. In the future, Nia hopes to pursue a master's degree and find a career that combines her passion for the environment with her interest technology.

**Remy Phillip • Embry-Riddle Aeronautical University**

***Hydrographic Assistant Survey Technician Intern***

Remy is a rising senior at Embry-Riddle Aeronautical University currently working for a B.S in Civil Engineering. For the past 2 months, Remy has been stationed at NOAA's National Response Team #2 (NRT2), based in Fernandina Beach, FL. His job has been to assist his team leads in networking, soldering, hydrographic surveying, map cleaning, and general problem solving. Land surveying in itself is one of the backbones of Civil Engineering and is something Remy understands quite well, but doing it in the open water is something completely different and has been a challenge for the up and coming engineer. Without his teammates guiding him and explaining how each equipment works in gathering data, this internship would not have been as successful as it was. After the summer ends, Remy plans to finish his senior year with the hopes of being sponsored for an accelerated master's degree and from there, find a job that suites his steadily growing interests.

Pre-Internship Survey

**Please describe what you hope to gain from your MIS internship.**

I hope to build a professional toolbox that allows me, from at least an individual standpoint, to promote and research equity, inclusion, and diversity in STEM fields, public lands, and outdoor education. More immediately, I look forward to gaining a deeper understanding of the natural resources in Great Basin National Park, and organizing that knowledge into meaningful interpretive programs. Overall, I hope to use this internship to bring me closer to a job within the Department of the Interior or Department of Agriculture.

I hope to improve my data collection skills and methods in resource management and improve my presentation skills in interpretation.

I hope to gain a professional perspective on how to build a career by working on the field. I would like to obtain some knowledge on combining research with policy. Also, I hope to get more "expert" field techniques.

I hope to gain more field skills as well as gain a wider understanding of the procedure required to develop and conduct research projects. I would also like to learn more about the work that the monitoring and inventory division of NPS does. Also another important skill I hope to learn throughout this internship is how to better navigate the hiring process in the realm of government careers.

I hope to become more familiar about the conservation in practice, participate in long-term field campaigns, and understand how parks can better connect citizens/visitors to science.

I hope I can gain a better understanding of the development of long term monitoring of fauna and flora species. How the creation and the management of large databases are done to ensure data accessibility. I want to acquire more knowledge about the analysis and the review processes that goes into long term monitoring and how it is define that a project is been productive and it is worth to maintain. I'm interested in increase my geographic information system (GIS) skills and how that can be applied to species preservation.

**Please briefly describe your current views on stewardship, conservation, and/or preservation (2 - 3 sentences).**

I believe that environmental stewardship, conservation, and preservation are critical to the future of life on this planet. I also believe it is essential that the principles of those topics be conveyed to the public in such a way that individuals and organizations understand their impact and are inspired to become stewards of their environment.

These three elements are essential to keep on perspective when working either on the office or out in the field. They should be part the essence of the project, as one of the main goals of working on either education, field, administration for an Environmental related agency should be protecting the natural world and educating people. That way we learn and teach others sustainable practices that can be put applied on our hectic lifestyle and that way everyone gets to enjoy nature on every level and is able to enjoy and protect it.

I grew up in Aurora, Colorado but both my parents come from a rural community in Mexico so they began to install a love for all things natural and wild inside of me since I was a little toddler. As a young child I always craved being outdoors, and although I grew up in an urban setting my connection to the natural world was still a strong one. I remember as a small child how I would spend hours helping mom and dad in the garden and it is in part because of those moments that cherished that I first began to develop a love for nature and the land; a love that would develop into a passion for the conservation of all things wild, from something as small as lichen to something as large as a grizzly bear. I am deeply committed to helping create a healthier and kinder world in which both human-beings, as well as, all other living beings, from a lichen to a whale, have the chance to continue existing. Currently, the Earth's health seems to be deteriorating quite rapidly and I believe that the best way to tackle the environmental issues that we are presently facing is through both research and policy, as well as, community-outreach/educational programs. So it was my passion for research, the natural world and helping improve the quality of life of all human-beings that I felt compelled to pursue both a degree in Fish, Wildlife and Conservation Biology, and Ethnic Studies. I truly believe that environmental issues are deeply tied to social justice issues and I have found that it is usually the most vulnerable communities, often consisting of communities of color, that face the most repercussions as a result of environmental issues. Being a woman of color and coming from a low-income community has really allowed me to realize just how important and needed these educational programs are, especially for children who come from underrepresented communities. I am certain that these programs have the potential to have a big impact on these children's lives which is then bound to have an even bigger impact on the world.

I feel very passionately about these three words. It is my goal to establish a science career that focuses on the conservation and restoration aspects of research. Therefore, I am proud to be working with valiant stewards of the natural world such as the National Parks Service. I hope to be a significant figure in this realm of advocacy and research, specifically for coastal habitats.

I believe stewardship, conservation and preservation are the key to help society progress. The best way to inculcate this is by teaching the youth about the importance of the environment, and encourage their involvement in community based programs. The hope is to have these young stewards work towards a better future, one in which the environment is top priority.

What do you anticipate will be the biggest challenges of your LHIP internship?
The biggest challenge is adapting to the new landscape as I am from a city and not used to simple things I have taken for granted; for example, the lack of street lights or the quietness of the towns.

I anticipate the field work component of the internship as my greatest challenge. I have conducted field work for my classes for a few hours of the day but I have never spent the whole day out in the field in strenuous conditions (i.e. in bat caves).

I think the biggest challenge I will face will be using GIS effectively during my internship. I have taken courses on it but have not yet applied those skills in a job setting. I do have a solid foundation of understanding so I am excited to push myself to learn more!

Although I'm a quick learner, I would say the biggest challenge will be learning the mapping system we're using for the rivers.

**Did you have any barriers to overcome to be able to apply for Mosaics in Science (MIS) (e.g. concerns about being away from home/family, challenges preparing a resume, etc.). If so, please describe them.**

The greatest barrier I had to overcome was my anxiety over choosing between several different seasonal jobs/ positions for this summer. The other barrier was my concern about driving across the US by myself.

**Briefly describe how your internship is going so far.**

This internship has allowed me to have a much better understanding of the vital role that the Inventory & It has really been a great learning opportunity. I've really discovered the importance of beoing self-driven and using all the resources at your disposal to teach yourself.

Amazing, I learn a lot about NPS protocols for park projects. I'm just sad that its getting closer to the end.

I've been very busy but the experience is extremely rewarding.

Inspiring

My internship is going very well. I am learning so much from my park supervisors and am feeling very included in the work. The park service people at my park are super welcoming and they've even said they're learning things from me at the same time. I am loving my summer here.

**Have you learned something you didn't know before? If so, please describe.**

I have learned about integrated pest management, east coast plant identification, positions needed in order for a national park service to function, how to identify butterflies, GIS, water monitoring, and there is still more to learn!

Prior to this position my knowledge in paleontology was limited. Due to my involvement with the paleontology department at the monument, I am expanding my knowledge in the field of paleontology.

I've gained a lot of knowledge on how to use both Kaleidoscope and Rave Pro acoustical analysis software. I've also learned a lot about operating Automated Recording Devices created by Wildlife Acoustics, and the compatible configuration software.

Yes. I have learned a plethora of field techniques in the marine ecology realm. I am also gaining some baseline experience in R.

**What do you want senior officials in the National Park Service to know about your experience?**

I am so thankful for all the learning experiences I've had throughout my internship. I am so grateful for the opportunity to live in a National Park and experience the beauty of our land's natural areas on a daily basis. I am also appreciative for all the skills I've gained throughout my internship.

## What has been most interesting to you?

The most interesting thing I have experience here at the park is the work culture and environment. It makes such a difference working in an environment where everyone is proud of the work that they do.

I've enjoyed learning about the rationale behind interpretation. My evening interpretation programs are my favorite part of my internship so far.

I've really enjoyed learning about the different species of amphibians that reside in Everglades National Park and learning to identify them by their calls.

I really enjoy been able to create a harness to attach a microGPS to the tortoises my project works with. I was also able to go to a new environment, the Texas desert. It is super hot but beautiful at the same time.

My time working with the resource management department has been amazing as it is the most varied part of my week.

What kind of skills do you think you have developed or acquired?
leadership skills, being able to handle various tasks and not a day to day routine, interaction with visitors

I have become more knowledgeable in writing curriculum.

I've gained a lot of knowledge on how to use both Kaleidoscope and Rave Pro acoustical analysis software. I've also learned a lot about operating Automated Recording Devices created by Wildlife Acoustics, and the compatible configuration software.

I think I have developed skills in interpretation and video production. I've also become more comfortable with rigorous field work.

Throughout of this internship I was able to improve my technical writing skills. I gain knowledge on ArcMap Online, a tool that I haven't used before, I created and published my maps, which were used during our monthly surveys.

I have improved my presenting skills, plant identification, animal identification, and backpacking skills.

How to be a better facilitator & educator

Critical thinking and problem solving skills have been a large component of our work because there's always something that can or will go wrong during our work tours. Keeping a positive attitude through these moments is essential.

## Please tell us what interested you about this internship?

I was interested in being a part of a program that aimed to diversify the science work field. I appreciated this opportunity to dip my feet into the national park service while having support from staff and other like minded peers. From my specific internship, I was interested in the variety of tasks I was given the opportunity to participate in. Aside from the project I participated in, I really enjoyed leading weekly crayfish corps volunteers and teaching them about invasive species.

I found this internship interesting because I was hoping to gain field experience in order to move forward in my career in natural resource conservation. I have also always wanted to work for the National Park Service and was excited to gain field experience in a park.

What interested me the most was the location, the ability to be a part of a crew doing actual field work, and the career workshop at the end of the program. I was excited to meet other students of color that had similar interests with me.

## What were the highlights of your internship experience?

The highlights of my internship experience would be performing field work regularly, getting to use equipment I had not used before, getting guidance from my supervisor at the park, going to the Mosaics workshop, and meeting a lot of great people throughout the summer. I also love this internship specifically because I was able to participate in all aspects of my research project including bird surveys, habitat surveys, data analyses, map creation, and writing the final report.

I gained a much greater understanding of bat conservation and was able to assist in a variety of field projects that few get the opportunity to be a part of including pika research, search for an undiscovered beetle species, and bat transect work.

All of my field experience was awesome, including seal monitoring and crab monitoring. I also really enjoyed gaining experience in R. This will be incredibly helpful when applying to graduate school and furthering my career in the sciences. The workshop was also awesome. I really enjoyed getting to know the other interns. They were all remarkable. I know that they are now a support that I can count on, as well as the leadership staff of MIS. Getting to know the people that are pushing for change, inclusivity and diversity was wonderful.

Being able to make a difference in young women towards a career in science.

**Did you gain skills and experiences during this internship that may help you attain your long-term goals? Please elaborate.**

I learned about the extensive amounts of positions available through the national park. This helped me see the various options I have to form into a career. I gained experience in various field conservation aspects such as forestry, water quality monitoring, and working on managing & reducing invasive species. I also enhanced leadership skills and learned how to educate a broad age group.

Yes, the experience and skills I have gained here will help me with my career goals. I am hoping to move further into the natural resource conservation field and these field and data skills are extremely important to have. I have gained research experience as well as data entry and GIS experience.

Definitely! This may sound cliché, but I grew up on this internship. I became more aware of taking care of myself and others during my hiking fieldwork days. I appreciate more my surroundings while doing the sound recordings. Learned to say "Hello" to strangers without being awkward. All these little social skills has made look and act more professional and I know it will be useful when the time comes to commit to a graduate school program or new job. Everyday you learn something and is important to be open to that

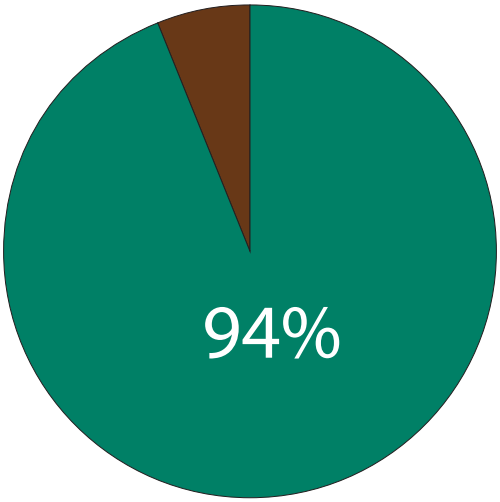
I enhanced many skills I had, but also learned completely new skills that I would otherwise be without. I also learned a great deal about myself through this experience.

**Why are the national parks important to you, or not important to you?**

National parks are important to me because I grew up visiting them and I believe many people's quality of life is improved by being able to visit these natural areas that are protected. These beautiful parts of the country are preserved and everyone has the chance to visit them and enjoy the value of nature. I believe it is beneficial for people to get out of cities and spend time outside regularly so it is important to me that people have these breathtaking places to visit where they can learn about the world around them.

National parks are important to me because they serve as a reminder that many millions of people believe, like myself, that natural and cultural resources have intrinsic value, and must be preserved and/or conserved.

They are so important to me because they preserve incredible land, coastal waters and indigenous people's culture that my have otherwise been forgotten. Although I believe there should me more emphasis on the indigenous people's of these lands, the NPS is a great start for sharing these stories and incredible cultures. In my opinion, there is so much that can be learned about ourselves by being in nature and by understanding how the indigenous peoples lived in harmony with it. It is humbling to be in these untouched lands and historical monuments. This is a unique, powerful, and incredibly important service for all sentient beings. I am also incredibly passionate about the NPS's mission of environmental conservation. I can't wait to be of further service to these lands and to the people who visit them.

They are the essence of freedom, liberty, and justice. Natural and cultural landscapes that hold our history and preserve the beauty of America.

**After this internship, I feel more prepared to apply for jobs with the federal government:**