National Park Service
MOSAICS in Science

2019
Program Accomplishments Report
MOSAICS IN SCIENCE
Diversity Internship Program

Environment for the Americas

NATIONAL PARK SERVICE

Greening Youth FOUNDATION

Mosaics in Science Diversity Internship Program
Program Accomplishments Report
Fiscal Year 2019

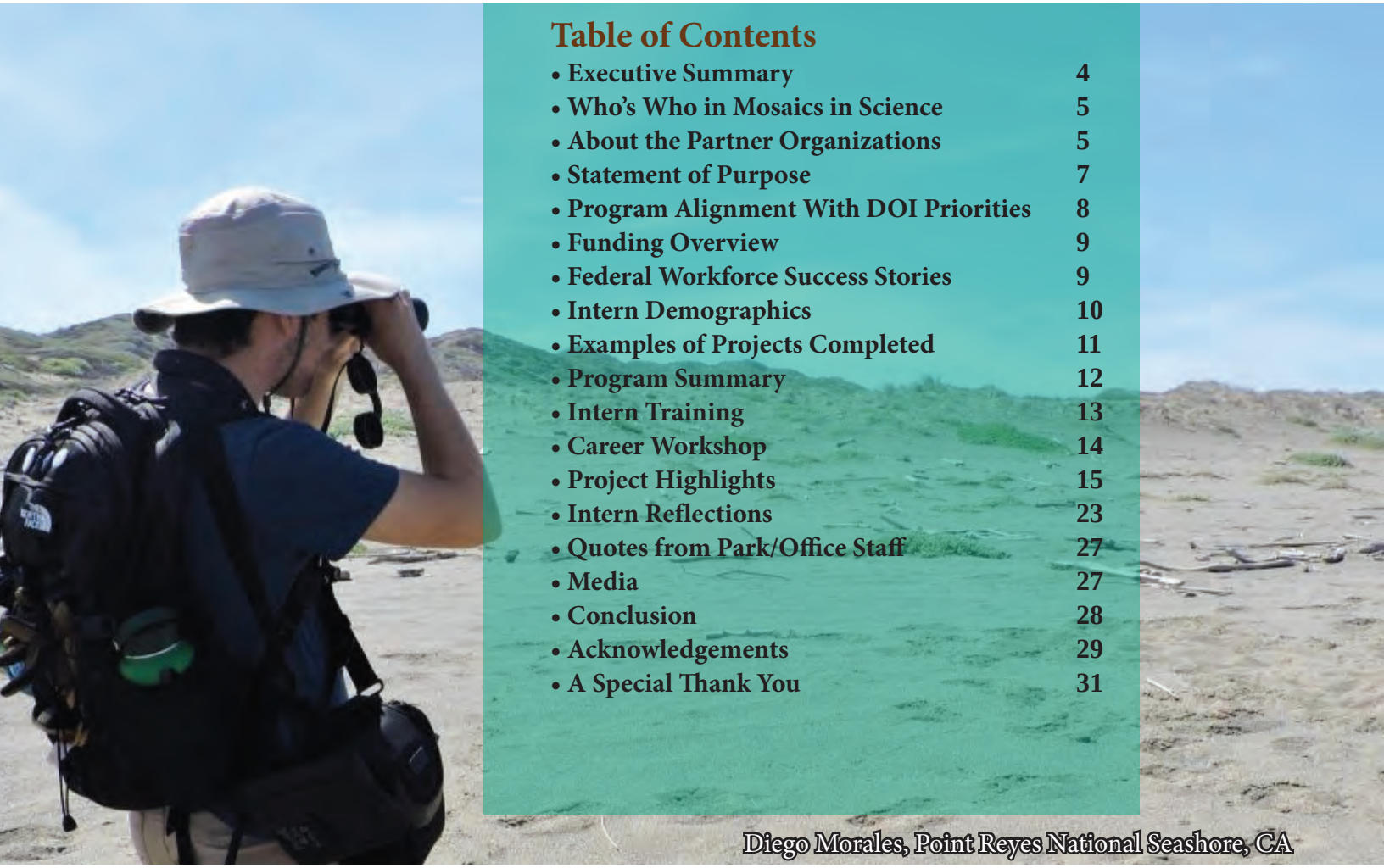
Greening Youth Foundation
Environment for the Americas
National Park Service

Front Cover Photos
Top left: Estefanía Vicens monitoring slopes at the Southeast Arizona Group (SEAZ), AZ.
Middle: Cory Zaller-Edmonds and Patricia Alquiza at the career workshop in Washington, D.C.
Right: Christine Louis-Jacques and Christian Knutson at Badlands National Park, SD.

Back Cover Photo
The 2019 Mosaics in Science interns at the Department of the Interior in Washington, D.C.

MOSAICS IN SCIENCE DIVERSITY INTERNSHIP PROGRAM ACCOMPLISHMENTS REPORT

2019



Diego Morales, Point Reyes National Seashore, CA

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EXECUTIVE SUMMARY

In 2019, the Mosaics in Science (MIS) Diversity Internship Program successfully completed its 6th year and placed 24 interns in 23 parks in ten of the 12 Unified Regions of the Department of the Interior (DOI) and three inventory and monitoring networks. These talented college students and recent graduates supported the NPS mission by completing important natural resource science projects, gaining on-the-ground work experience, and obtaining an understanding of the importance of conservation and resource stewardship on public lands.

Projects ranged from inventory and monitoring, to research, and developing and presenting educational and interpretive programs. The 2019 MIS interns' work contributed 10,368 service hours or the equivalent of 5 years of full time work doing critical science projects for the NPS.

In 2019, the Mosaics in Science Diversity Internship Program accomplished the following:

- Received over 800 applications for the program
- Recruited first Native American participant to the program
- Returned to Washington, D. C. for Career Workshop
- Presented intern work to colleagues and staff at DOI
- Conducted 12 site visits

Direct Hire Authority (DHA) interns meet at the career workshop in Washington, D.C.

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 by the NPS and partner organizations. 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 places in the United States.

ABOUT THE PARTNER ORGANIZATIONS

National Park Service, Geologic Resources Division ***www.nps.gov/subjects/geology***
The NPS Geologic Resources Division (GRD), within the Natural Resource Stewardship and Science Directorate, provides Service-wide leadership in the understanding and management of geologic resources, processes, and energy and mineral development activities. GRD has a strong commitment to providing science-based, on-the-ground youth career development opportunities through the management of the Mosaics in Science Diversity Internship Program (created in 2013) and the long-standing Geoscientists-in-the-Parks (GIP) Internship Program (created in 1996).

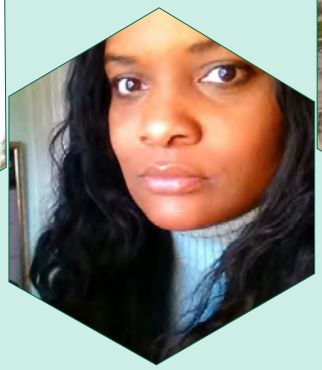
National Park Service, Youth Programs Division ***www.nps.gov/subjects/youthprograms***
The NPS Youth Programs Division engages youth between the ages of 5 and 35 years old in various National Park Service programs to develop a life-long commitment to support our national parks and protect our natural 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 is committed to providing environmental education opportunities and materials throughout the Western Hemisphere, with the primary goal of improving public understanding of shared resources and their conservation. EFTA believes providing opportunities for youth to become involved in science and natural resource careers is key to ensuring the protection and future existence of quality public lands and wildlife habitat. EFTA is committed to increasing participation in environmental education and outdoor recreation across all demographics and has conducted research and efforts to reduce barriers to participation since 2009.

Greening Youth Foundation ***www.gyfoundation.org***
Greening Youth Foundation (GYF) has a mission to work with diverse, under served and under-represented children, youth and young adults in an effort to develop and nurture enthusiastic and responsible environmental stewards. GYF's culturally-based environmental education programing engages youth from local communities and exposes them to healthy lifestyle choices in order to create an overall healthy community. GYF believes that youth and young adults from diverse backgrounds can greatly benefit from the career opportunities presented within the state and federal land management sectors. Accordingly, GYF continues to develop and strengthen partnerships with land management agencies to provide service and internship opportunities for youth and young adults thereby creating pathways to conservation careers.

NPS Team

George McDonald
Division Chief
Youth Programs Division



Ernestine White
National Youth Employment Coordinator
Youth Programs Division

Limaris Soto
Mosaics in Science
Program Manager
Geologic Resources Division

Paige Lambert
Mosaics in Science
Program Assistant
Geologic Resources Division

Lina Oliveros
Program Analyst
Youth Programs Division

EFTA Team

Susan Bonfield
Executive Director

Sheylda Díaz-Méndez
Program Coordinator

Stephen Poblete
Assistant Coordinator

Chu Yu Lin
Graphic Designer

GYF Team

Angelou Ezeilo
Founder & CEO

Eboni Preston
Director of Programs

Adrienne Byrd
Director of Finance

Christine Louis-Jacques
Program Manager

STATEMENT OF PURPOSE

MOSAICS in SCIENCE

Mosaics in Science Statement of Purpose

The Mosaics in Science Diversity Internship Program provides diverse youth who 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 students and recent graduates to work on inventory and monitoring, research, GIS and other technologies, and interpretation and education projects. The Mosaics in Science Diversity Internship 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 National Park Service Geologic Resources and Youth Programs Divisions in partnership with Environment for the Americas and Greening Youth Foundation.

Program Objectives

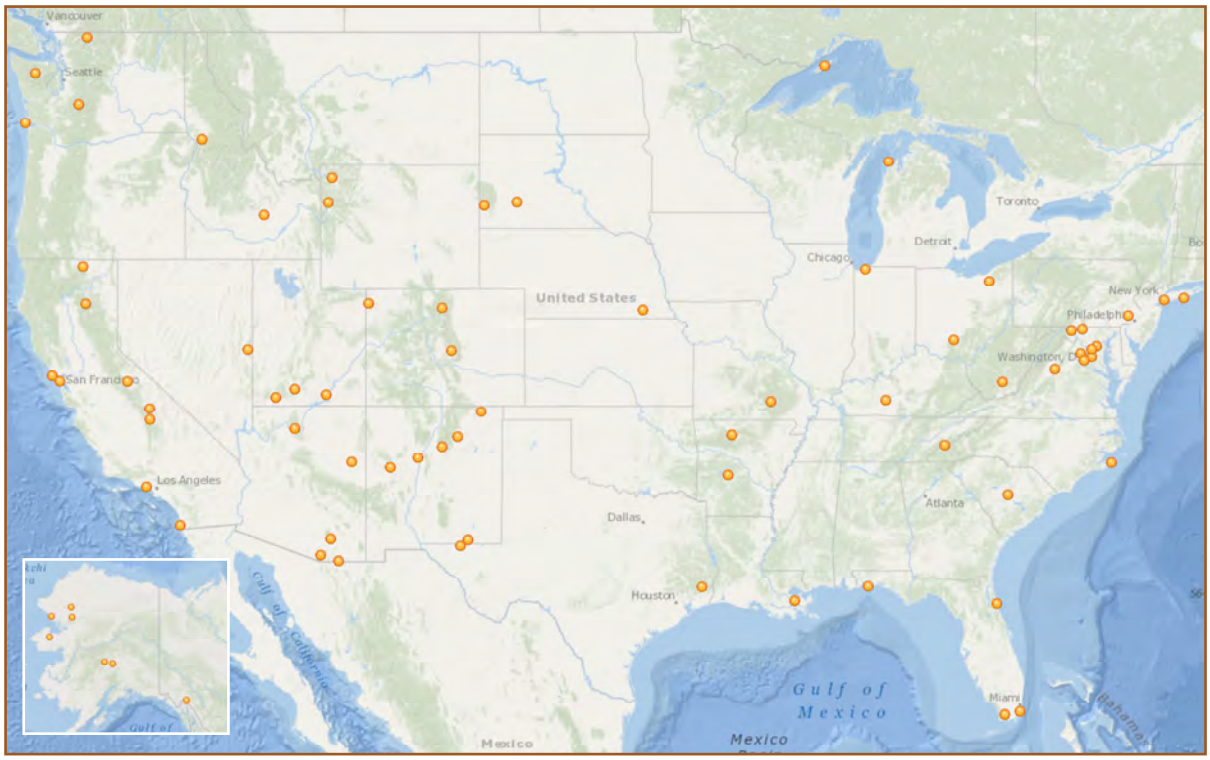
- Provide meaningful and relevant science-based internships for racially and ethnically diverse undergraduate/graduate students and recent graduates allowing the NPS to increase relevancy, diversity and inclusion
- Support high priority resource management and visitor education and interpretation projects in national parks
- Promote the National Park Service mission

146
MIS interns

66,030
Hours of service

83
NPS Units

Mosaics in Science Diversity Internship Sites: 2013 - 2019



Sources: Esri, GEBCO, NOAA, National Geographic, Garmin, HERE, Geonames.org, and c

PROGRAM ALIGNMENT WITH DOI PRIORITIES

This program supports the following U.S. Department of the Interior (DOI) priorities and objectives outlined in the DOI Strategic Plan for Fiscal Years 2018 – 2022:

Mission Area #1 – Conserving our Lands and Water
Goal 1 – Utilize science in land, water, species, and habitat management supporting decisions and activities.
Cory Zaller-Edmonds worked as part of Mount Rainier National Park's wildlife crew to support the bat monitoring and white-nose syndrome (WNS) surveillance program.

Goal 3 – Foster partnerships to achieve balanced stewardship and use of our public lands.
Diego Morales developed bilingual programs that brought Latino participants to Point Reyes National Seashore to hike, birdwatch, and learn about the park's mission and resources.

Completion of high priority STEM projects in parks in partnership with conservation organizations and the use of interns substantially helps the NPS achieve its resource management stewardship goals.

Mission Area #3 – Expanding Outdoor Recreation and Access
Goal 2 – Enhance public satisfaction at DOI sites.
Crystal Zhao utilized citizen science techniques to engage park visitors in trail accessibility monitoring so people of all abilities can enjoy Cuyahoga Valley National Park.

Sonia Meyer conducted carbon dioxide monitoring in Carlsbad Caverns National Park to ensure visitor safety at the park.

The Mosaics in Science Program directly supports this DOI priority by developing and providing science education programs and activities to park neighbors and the public and building stewards and supporters of our national parks.

The Mosaics in Science Program also closely aligns with recently released DOI Secretarial Order 3369 - Promoting Open Science (issued 9/28/18). This order requires DOI bureaus to "....base its decisions on the best available science and provide the American people with enough information to thoughtfully and substantively evaluate the data, methodology, and analysis used by the Department to inform its decisions." Science projects completed in this program are intended to provide sound science for parks to use in decision-making and the results are provided to the public through reports, outreach materials, websites, and public interpretive and educational programs.

"Words cannot adequately describe how thankful I am for this opportunity of a lifetime. I will forever remain grateful for having had the chance to participate in such an amazing program like the Mosaics in Science Diversity Internship."
- Katlyn Fuentes
Klondike Gold Rush National Historical Park, Skagway, AK

FUNDING OVERVIEW

The total National Park Service budget from the NPS Youth Programs Division for the 2019 Mosaics in Science Diversity Internship Program was $320,000 to support 24 interns. The budget was split equally between program partners EFTA and GYF, each receiving $160,000 to administer half of the Mosaics in Science internships. Additionally, two parks provided funds to extend the positions of Estefanía Vicens at Southeast Arizona Group (SEAZ) and Alyssa Canova at the Greater Yellowstone Inventory & Monitoring Network and Yellowstone National Park. Additional funds for these extensions totaled $8,992.00.

FEDERAL WORKFORCE SUCCESS STORIES

Mosaics in Science tracks the success of its interns specifically if they find positions with the National Park Service, other federal agencies, and non-governmental organizations. Since 2016, nine Mosaics in Science interns have been hired into permanent positions with the National Park Service or other federal agencies. Five of these interns earned the Direct Hire Authority as part of their internship.

Ricardo Escobar
Petrified Forest National Park, AZ

Brenna Rodriguez
White Sands National Monument, NM

Richard Duenas
U.S. Census Bureau, Washington, D.C.

Gabriela Dunn
Golden Gate National Recreation Area, CA

Kayla Fermin
Lewis and Clark National Historical Park, WA

Sophia Bass -Werner
Boston Harbor Islands National Recreation Area, MA

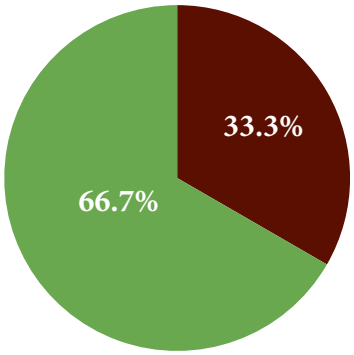
Elizabeth Rico
Big South Fork National River & Recreation Area, KY

Fabiane Barato Speyrer
Gulf Coast Inventory & Monitoring Network, Gulf Coast states

Laura Del Valle
Sequoia & Kings Canyon National Parks, CA

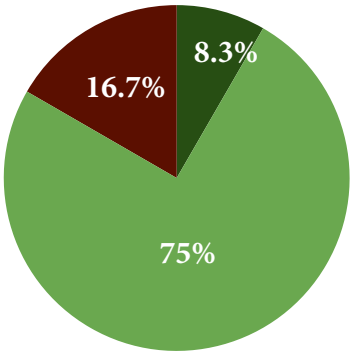
INTERN DEMOGRAPHICS

GENDER



Male Female

INTERN AGES



18 19 - 25 26 - 35

LEVEL OF EDUCATION

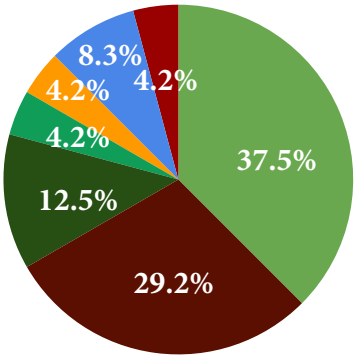
Master's Degree

4.2 %

Bachelor's Degree

95.8 %

RACE / ETHNICITY



Latino: 9 Asian: 7 African American: 3

Middle Eastern: 1 White: 1

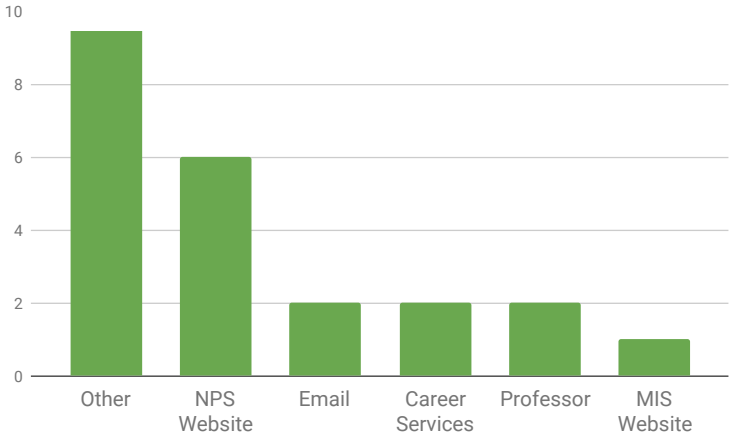
White, Black: 2 Native American: 1

HAVE YOU HAD AN INTERNSHIP WITH THE NPS BEFORE?

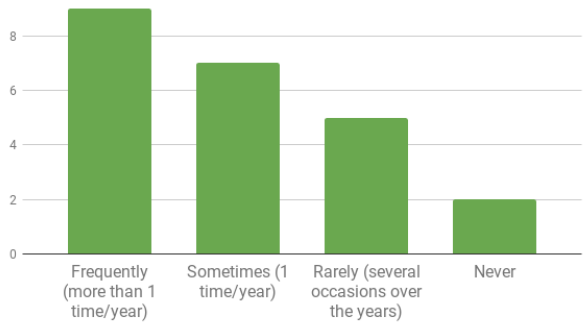
26.1 %

73.9 %

HOW DID YOU HEAR ABOUT MIS?



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



EXAMPLES OF PROJECTS COMPLETED

Research

- Examining reef-fish visual census and data analyses for series of targeted species, Biscayne National Park, FL
- Hummingbird banding and pollen sample collection, Capulin Volcano National Monument, NM
- Bat monitoring for white-nose syndrome and education, Mount Rainier National Park, WA

Inventory and Monitoring

- Orthoptera surveys, climate stations, macro photography, and citizen science assistance, Greater Yellowstone Inventory & Monitoring Network/Yellowstone National Park, WY, ID, MT
- Citizen science and development of phenology program, Northern Great Plains Inventory & Monitoring Network/Badlands National Park, SD
- Monitoring nesting success of colonial birds, Klondike Gold Rush National Historical Park, AK
- Species monitoring with inventory and monitoring networks, San Juan Island National Historical Park, WA
- Inventory and monitoring of cormorant breeding colonies, South Florida/Caribbean Inventory & Monitoring Network, FL
- Inventory and monitoring of unstable slopes on trails and roads to reduce risk and deterioration of park infrastructure, Southeast Arizona Group (SEAZ) - Coronado National Memorial, AZ
- Collected sound and carbon dioxide data to establish a baseline for the ongoing visitor use management study, Carlsbad Caverns National Park, NM

GIS and other technologies

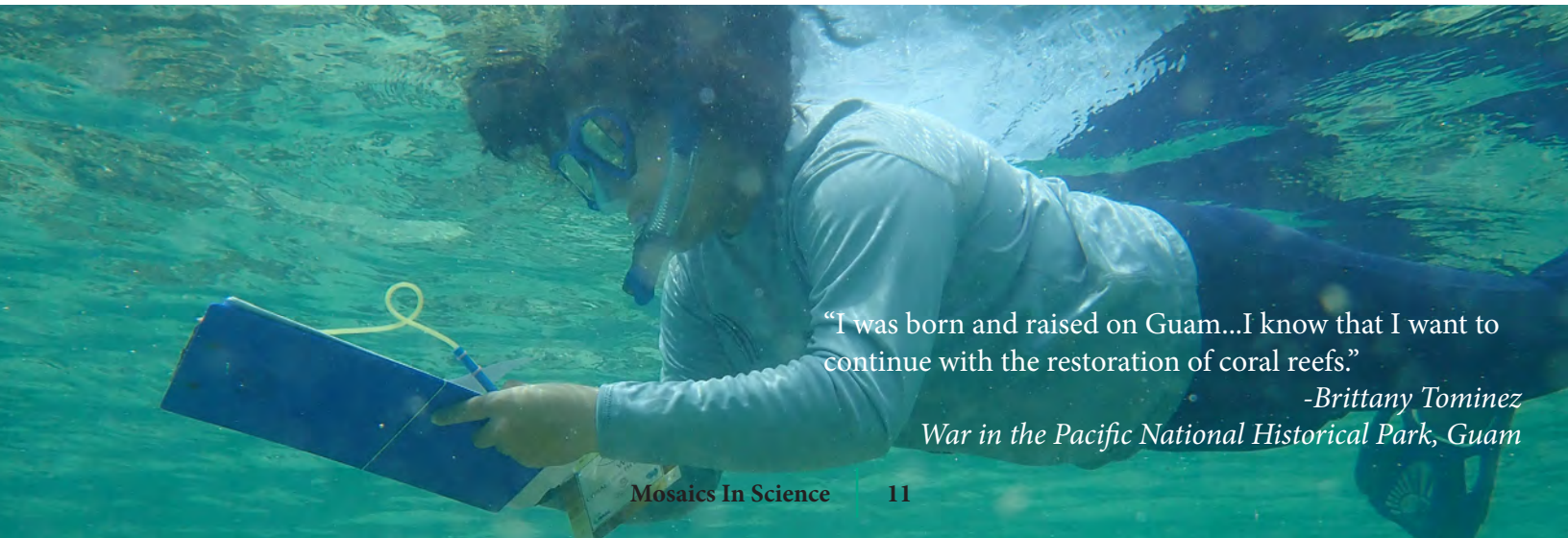
- Assessment of wetland health & GIS mapping, Minute Man National Historical Park, MA

Education / Interpretation

- Curriculum development and programming assistance, Hawai'i Volcanoes National Park, HI
- Interpretation and citizen science programs, Point Reyes National Seashore, CA
- Interpretation assistance, citizen science and curriculum development, New River Gorge National River, WV
- Night Skies education programs, Sequoia and Kings Canyon National Parks, CA

Multi-faceted

- Trail monitoring and citizen science, Cuyahoga Valley National Park, OH
- Organization of fossil collection and inventory and database recording, Dinosaur National Monument, CO and UT
- Acoustic monitoring and data collection, Saguaro National Park, AZ
- Coral reef health monitoring, research and programming assistance, War in the Pacific National Historical Park, GU
- Pollinator education project, Indiana Dunes National Park, IN
- Communication, outreach and education, Lava Beds National Monument, CA



"I was born and raised on Guam...I know that I want to continue with the restoration of coral reefs."

-Brittany Tominez

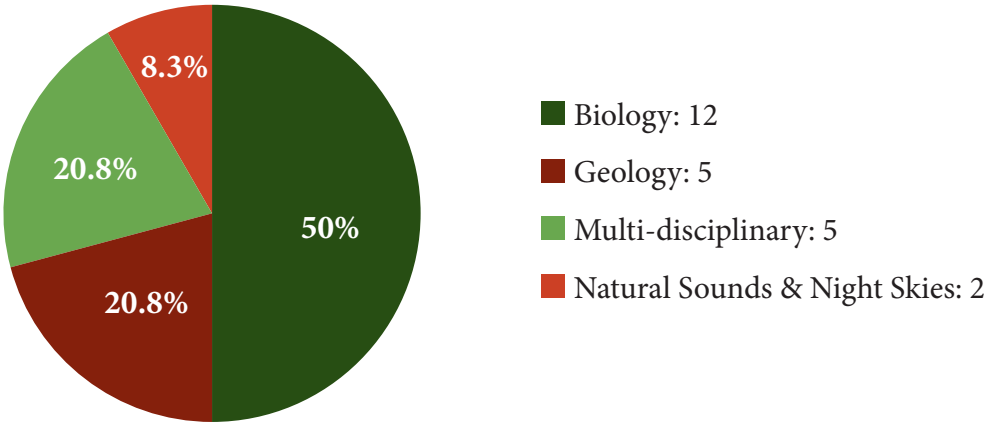
War in the Pacific National Historical Park, Guam

PROGRAM SUMMARY

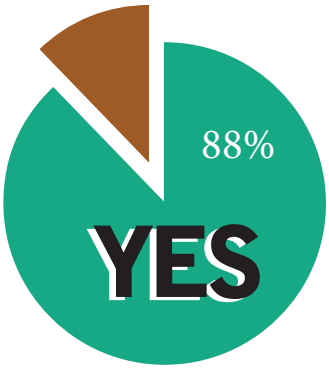
The National Park Service is organized by 12 Unified Regions. In 2019, MIS interns held positions in 10 of these regions.

Region	NPS Unit
North Atlantic-Appalachian Region 1	Manassas National Battlefield Park
	Minute Man National Historical Park (DHA)
	New River Gorge National River
South Atlantic-Gulf Region 2	South Florida/Caribbean Inventory & Monitoring Network (DHA)
	Biscayne National Park (DHA)
Great Lakes Region 3	Cuyahoga Valley National Park
	Indiana Dunes National Park (DHA)
Missouri Basin Region 5	Northern Great Plains Inventory & Monitoring Network / Bandlands National Park
Upper Colorado Basin Region 7	Capulin Volcano National Monument
	Carlsbad Caverns National Park
	Dinosaur National Monument
	Greater Yellowstone Inventory & Monitoring Network / Yellowstone National Park
	Rocky Mountain National Park
Lower Colorado Basin Region 8	Petrified Forest National Park
	Saguaro National Park
	Southeast Arizona Group
Columbia-Pacific Northwest Region 9	Mount Rainier National Park (DHA)
	San Juan Island National Historical Park
California-Great Basin Region 10	Lava Beds National Monument (DHA)
	Point Reyes National Seashore
	Sequoia and Kings Canyon National Parks
Alaska Region 11	Klondike Gold Rush National Historical Park
Pacific Islands Region 12	Hawai'i Volcanoes National Park
	War in the Pacific National Historical Park

PROJECT CATEGORY SUMMARY



DID THIS INTERNSHIP INFLUENCE YOUR CAREER GOALS?



AFTER THIS INTERNSHIP, I FEEL MORE PREPARED TO APPLY FOR JOBS WITH THE FEDERAL GOVERNMENT:

INTERN TRAINING

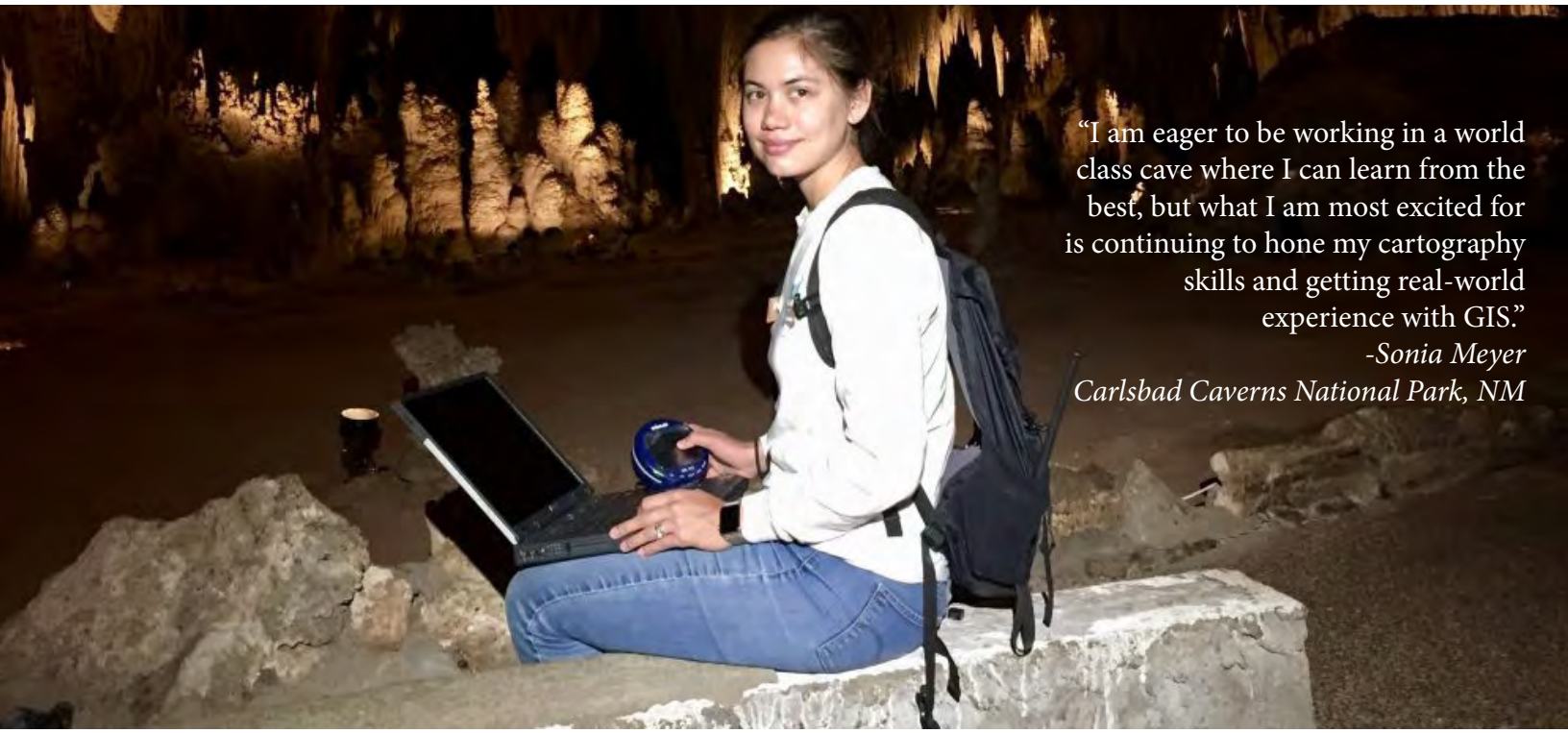
Before beginning their internships, participants attended webinars that provided basic information about Mosaics in Science, introduced them to the partner organizations, and helped them to understand their responsibilities and the expectations of the program. Each intern received a digital and print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

Webinars

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

Date	Time	Topic
5/7/19	2:00 PM (MT)	Welcome to the Mosaics in Science Program! (pre internship)
5/14/19	2:00 PM (MT)	Blogs, Social Media, Professionalism (pre internship)
5/21/19	2:00 PM (MT)	Workplace Harassment Overview for NPS Interns
5/28/19	2:00 PM (MT)	Financial Literacy Getting Out of College Debt
6/4/19	2:00 PM (MT)	Resumes and Navigating USA Jobs
6/11/19	2:00 PM (MT)	Emotional Intelligence: Diversity, Equality, and Inclusion in the workplace
6/18/19	2:00 PM (MT)	Stepping Stones to a Career in the NPS
6/25/19	2:00 PM (MT)	Being Green
7/2/19		Holiday Week - No Webinar
7/9/19	2:00 PM (MT)	Applying to Graduate School
7/16/19	2:00 PM (MT)	Intern Updates
7/23/19	2:00 PM (MT)	Workshop Preparations (presentation how tos) Poster / Oral
7/30/19	2:00 PM (MT)	Workshop Details

Additional webinars were offered by the Office of Personal Management covering topics such as USA Jobs, Interviewing Techniques, and Federal Resumés.



"I am eager to be working in a world class cave where I can learn from the best, but what I am most excited for is continuing to hone my cartography skills and getting real-world experience with GIS."
-Sonia Meyer
Carlsbad Caverns National Park, NM

CAREER WORKSHOP

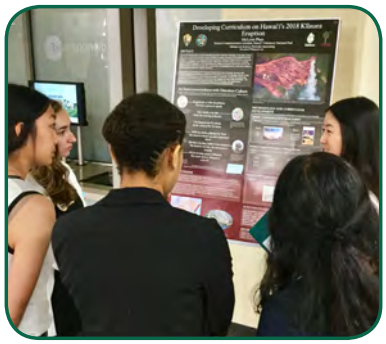
Upon completing their internships, participants traveled to Washington, D.C. for a four-day workshop. During the first two days of the workshop interns met at the Department of the Interior, where they presented their projects orally or in a poster presentation, met other National Park Service staff, interacted with a panel of scientists, and had a facilitated discussion on diversity and inclusion. The workshop also provided the important opportunity for interns to meet each other face-to-face.

During the last two days of the workshop the interns were able to tour some of the National Park Service National Mall and Memorial Parks and learned about the African American culture and explored this history through interactive exhibitions. We wanted to provide the interns with an opportunity to see how diversity shaped stories, the history, and our cultures.

The workshop provided an important conclusion to the internship experience, and culminated with comments and suggestions for improvement from the participants and an awards ceremony for the interns.

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

Very Important: 95%



PROJECT HIGHLIGHTS

Estefanía Vicens

Southeast Arizona Group, AZ
Geomorphology Assistant

Estefanía worked on the Unstable Slope Management Program (USMP) in the National Park Service's Southeast Arizona Group (SEAZ). Estefanía identified, categorized, and rated unstable slopes along the trails and roads of Chiricahua National Monument using the USMP-rating criteria. The work Estefanía completed over the summer helps reduce risk and deterioration of infrastructure in the park.

Ansley Watkins

Indiana Dunes National Park, IN
Biology Assistant, DHA

Ansley assisted in developing best management practices and other pollinator education materials for Great Lakes park units and collecting updated data on native bee diversity and abundance at Indiana Dunes National Park. The maps and other visitor resources Ansley completed show areas of priority for pollinators, including which habitats to conserve and explanations of different factors such as bee species, habitat type and county within the Great Lakes Basin. The project, which is part of the Great Lakes Restoration Initiative, is an effort to better understand the native pollinator community at Indiana Dunes. Ansley also organized a citizen science "Bee Blitz" activity to assist U.S. Fish and Wildlife Service efforts for locating populations of the endangered rusty patched bumblebee. The activity and resources created by Ansley help to educate the public on how native bees benefit the surrounding ecosystem and how they can support native pollinators.

Xavier Rivera

Capulin Volcano National Monument, NM
Biology Assistant

Xavier's main focuses at Capulin Volcano National Monument were hummingbird banding, plant and pollen identification, restoration techniques and greenhouse management. He helped to prepare approximately 4,000 trays of native grass sod, which were cultivated in a specific growing area using reclaimed water from his living area before being planted in desired areas around the volcano. His work aided in providing more native plants for native pollinators in the area. In addition to helping provide plants native pollinators need, he was able to learn about hummingbird banding station protocol and collect data while learning to band hummingbirds. The research Xavier completed will be used to study the changing phenology of hummingbirds and flora in the face of climate change.

Cory Zaller-Edmonds

Mount Rainier National Park, WA
Biology Assistant, DHA

Cory worked as a key member of the Mount Rainier wildlife crew to support the bat monitoring and white-nose syndrome (WNS) surveillance program. He completed field-based surveys for bats by conducting emergence counts at bat colonies, assisting with bat captures to screen for WNS, and using acoustic detectors to process bat calls. Cory also established a research project in collaboration with Oregon State University evaluating bat guano as a tool for surveillance and early detection of the pathogen that causes WNS in order to prevent the disease. His research helps future scientists to better understand WNS and protect bat populations. Aside from bat research, Cory also partook in bird banding and data collection for avian population surveys.

Brittany Tominez

War in the Pacific National Historical Park, GU
Natural Resource Interpretive Assistant

This past summer, Brittany's projects were focused on scientific approaches and technologies for monitoring and managing coral reef, snorkeling surveys for the threat of coral bleaching, and assisting park staff with the planning and implementation of youth activities and general environmental outreach education programming at the War in the Pacific National Historical Park in Guam. Several of the coral reefs are under serious threats caused by marine environmental changes and stressful historical events from the past. Brittany supported Reef Ranger activities by training high school and college youth volunteers to do snorkeling surveys toward increasing their knowledge of coral bleaching, reef organism abundance, and the frequency of giant clams' health using monitoring equipment. The work Brittany completed this summer played a vital role in monitoring overall coral health and growth within the park, which is home to the highest diversity of marine species among other national parks.

Patricia Alquiza

Biscayne National Park, FL
Natural Resource Management Assistant, DHA

Patricia spent this summer completing an in-depth analysis of Biscayne's reef-fish data that spans from 1999 to 2018. Her work examined the spatial and temporal trends in fish populations within the park using a pre-established database and the R software program. Patricia analyzed data for 10 fish family groups with a total of 62 individual species, and managed an extensive data system with protocols. She also created a how-to guide to ensure that future years' analyses can continue uninterrupted.

Hannah Gershone

Saguaro National Park, AZ
Acoustic (Natural Sounds) Assistant

Hannah's work was mainly centered on monitoring Mexican Spotted Owls (MSO) at Saguaro National Park in the Rincon Mountains. Her role with acoustic monitoring was especially instrumental in learning more about changes to the MSO population and presence within the park as well as noticing any changes to Saguaro's soundscape. Through the use of modified MP3 players, Hannah collected data, recorded, and analyzed the call frequencies of the owls. The work that Hannah completed over the course of the summer helped to obtain a better understanding of where the owls are moving within their protected areas and if they are showing up in new locations.

Christian Knutson

Northern Great Plains Inventory & Monitoring Network/ Badlands National Park, SD Biology Assistant

Christian worked to understand the changing patterns in the timing of events in the prairie plants of Badlands National Park. He laid the foundation for a robust citizen science project focused on prairie phenology, and told the local history of the natives that inhabited the land. His interpretive wildflower walk took visitors on popular trails, and introduced them to native flowers and their traditional uses. He also assisted vegetation, archaeology, wildlife, and geology crews with data collection and interpretation. The work that Christian did showcased the natural resources at the park while memorializing the local history and narratives of Native American communities.

INTERN REFLECTIONS

Sonia Meyer
Carlsbad Caverns National Park, NM

"During my orientation, I had the opportunity to shadow rangers for a day to learn about the park and the visitor's experience. This was a fantastic opportunity for me to learn about the National Park Service (NPS) through the eyes of interpretative rangers and learning about the different career paths in NPS. I learned lessons in patience and working within the boundaries of the resources currently available to me. Working on this project without internet or computer access for most of my internship was a challenge, but it made me resourceful. I had opportunities to work with scientific equipment such as data loggers, and to complete fieldwork, both of which are invaluable experiences for anyone applying for cave management positions and graduate school, which is a next step for me."

Sebastian Alvarez
Petrified Forest National Park, AZ

"I got to travel to St. Johns, Arizona where I hosted an education program for the public library. The activity I conducted consisted of teaching the students about the Earth's layers and they were very excited to build an Earth of their own. As soon as I got the play modeling clay out, they were very joyful and started rapidly putting their earth together. It was truly one of my happiest moments as an interpreter seeing little kids take after my program and smiling at the fact that they were learning. Working as an interpretative assistant has taught me how important our role is in the park and how without interpretation programs the park's resources and research would not be as important to the public. It is a great responsibility. I am glad this year to be working in interpretation which has shown me how all divisions of the Park Service work in order to run a park efficiently."

Vishva Nalamalapu
Rocky Mountain National Park, CO

"I didn't know much about the Park Service before. It's fun to learn about the network of people that are so passionate. They jump from park to park and love their jobs. It's not that much money, financially, but they're all working towards a collective mission. Like with the research I did on glaciers – people have been working on it for centuries. Rocky Mountain National Park was founded because of its glaciers and seeing the way it all weaves together from people building off of the previous work is really cool. And now that I have completed my internship, I have a better understanding of where I want to go after I graduate next year."

Caprice Phillips
Sequoia and Kings Canyon National Parks, CA

"Generally, when people envision Sequoia National Park, they picture the giant majestic namesake Sequoia trees. I was personally awe-struck by rapid rivers that transformed into waterfalls, the lush greenery and various mountain peaks. One of the most shocking things I have discovered is that some of the mountains still have snow on them, parts of the park still have knee-high snow, and the surrounding lakes are still completely frozen in June! But one of the aspects of the park I really enjoy is the quiet and stillness that surrounds me; it is incredibly peaceful and calming. When I wasn't researching, developing and presenting daily interpretive programming on the importance of naturally dark skies, I loved exploring the nature trails the park offers and taking in the sight of the night sky since Mineral King, CA has almost no light pollution."

Diego Morales
Point Reyes National Seashore, CA

"An unexpected adventure of my summer internship was tagging along with Taylor Ellis, a park wildlife technician, for a Northern Spotted Owl (Strix occidentalis caurina) survey. At the first site, the search for Northern Spotted Owls took us far off-trail with the most intense bushwhacking I had ever experienced. We scaled down a ravine, over a creek, and clambered back up the other side chasing the hoot of an owl in the distance. Luckily poison oak was absent here, but the thorns of blackberry bushes created some uncomfortable situations. After 90 minutes of crunching branches and weaving through shrubs, we reached them: two Northern Spotted Owl adults! The birds were magnificent, and we spent some time watching their behavior and taking down data. Also, Kevin García López and I developed and provided programming for a YMCA summer camp group visiting the park. Kevin taught the Kindergarten through 2nd grade children how to use binoculars, and I took them on a hike to learn about earthquakes. The programming ended with a Junior Seashore Ranger ceremony for all the campers, and all of their smiles receiving their patches was an amazing experience."

Camilo Acosta
San Juan Island National Historical Park, WA

"The thing that most interested me about the project description at this site was the focus on a conservation effort for a single insect species. Bee conservation programs are usually all that is seen in regards to insect conservation, which is what makes the Island Marble Butterfly (IMB) program unique. Even though the attention the public gives this program might be because of the beauty of the butterfly itself, I still think this is a major win for insect conservation. I think of pollinators like honey bees and butterflies as being the pandas, or killer whales, of insect conservation. Now, specifically my job at San Juan Island National Historical Park involves the captive rearing of IMB caterpillars and surveying the presence of flying adults at seven sites throughout the park. Our "lab" is a repurposed maintenance shed tucked away on the road leading to visitor center. Every day we come down to the lab and record data on 80-100 caterpillars who live on sprigs of their host plant from our nursery. It's really interesting to study them each day."

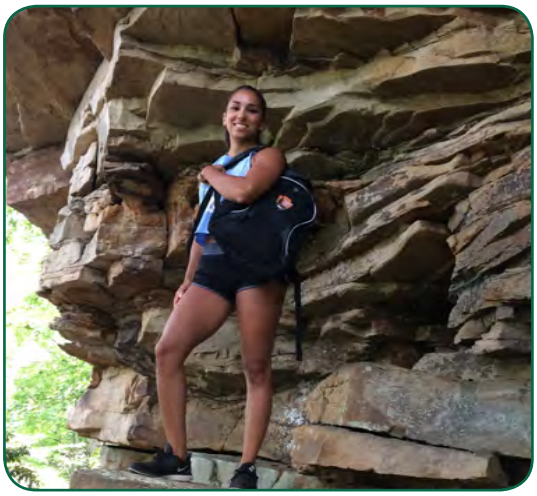
Christian Knutson
Northern Great Plains Inventory & Monitoring Network/ Badlands National Park, SD

"My summer has been a long summer of new experiences. I started the program with never setting foot within the park that bordered my home. I hardly left the homeland of my people and I knew close to nothing about the National Park Service. I did not have the slightest idea that there were such things as Inventory and Monitoring Networks. I did not realize how many jobs and workers it took to run a national park. I never considered that there were differences between national parks, monuments, historical sites and battlefields. I could never have imagined the type of work and projects that the National Park Service supports. But now thanks to the Mosaics program and the Northern Great Plains Inventory and Monitoring Network I have a new view on the Parks Service and I want to be a part of it more than ever."

Alyssa Canova
Greater Yellowstone Inventory & Monitoring Network/Yellowstone National Park, WY, ID, MT

"Thanks to the Mosaics in Science Diversity Internship Program, I have a greater sense of respect and admiration for the National Park Service. Working with scientists in both the Greater Yellowstone Inventory and Monitoring Network and the Yellowstone Center for Resources has inspired me immensely. As a first generation college student, it has been difficult for me to settle on a career path after completing college. However, the mentoring that I received from the Yellowstone National Park scientists continues to steer me in the right direction. The career possibilities with the National Park Service exceed my wildest expectations; I can do fieldwork, write papers, and provide citizen science opportunities all in the same job! Before this internship, I had never realized the importance of citizen science. I now see that citizen science initiatives help bridge the gap between science and the public all while sparking public interest in what scientists are doing. I highly recommend applying for this program and others like it. It is safe to say that this program has changed my life."

Site visit to Mount Rainier National Park. Pictured above from left to right are Sheylda Diaz (EFTA), Paige Lambert (NPS), HBCUI intern Najee Shahid, and MIS intern Cory Zaller-Edmonds and their supervisor, Dr. Tara Chestnut.



Nicole Esch
New River Gorge National River, WV

"My project this summer was not only fulfilling and meaningful, it was fun. Good, real, wake up excited fun. I really enjoyed the thought puzzles of putting together a field trip that was connected enough to flow well but not so connected that each activity was fully dependent on the last. I appreciated the creative freedom to structure the program the way I wanted and come up with ways to make the learning experience fun for students."

Donna Molfetto
South Florida/Caribbean Inventory & Monitoring Network, FL

"Eleven weeks later and here I am, smarter and tougher with more skills and a larger network. This internship certainly lived up to my expectations and even surpassed them in some areas. Back when I applied, I thought of this internship as a mini-test run of what my future career might look like as a federal biologist with a PhD. I learned that I am capable of taking a dataset I am completely unfamiliar with, finding the story it tells, and hammering that into a manuscript for publication. There is some hype about my work among local ecologists working on different aspects of Biscayne Bay restoration, which is exciting, but my work was just the first analysis of these data. Hopefully, it will inspire more investigations into these birds going forward."

MyLynn Phan
Hawai'i Volcanoes National Park, HI

"Volcanic life is exciting. It's grandiose and spectacular. Every morning, I feel grateful to walk outside and witness a true phenomenon, seeing how these islands that I am walking on have been born of fire, born of the sea."

QUOTES FROM PARK/OFFICE STAFF

Ricardo Escobar / *Education Specialist, Petrified Forest National Park*

"Having gone from a Mosaics in Science intern (2017) to an intern supervisor (2019), I have seen many positive changes made to not just the program itself, but the career workshop as well. The quality of intern projects just keeps getting better and better. The cultural and ethnic backgrounds of presenters and panelists in the workshop are now much more reflective of our nation's evolving demographics. I look forward to seeing the continual growth of the Mosaics in Science program."

Tara Chestnut, PhD / *Ecologist, Mount Rainier National Park*

"I am happy we could implement an 11 week program with meaningful content and provide an opportunity to decide if this is what you want to do as your career.

ReBecca Hunt-Foster / *Park Paleontologist, Dinosaur National Monument*

"Tut was wonderful. He was a great self starter, wonderful at speaking with the public and willing to learn new things. I would be thrilled to have him work with us again in the future and would recommend his skills to any park in need of a capable, enthusiastic paleontologist."

MEDIA

Nicole Esch created an introduction video for the self-guided Grandview Citizen Science Program at New River Gorge National River.
https://www.nps.gov/media/video/view.htm?id=06E2D519-F762-BAE7-ADF7D18C0D529CBF

CONCLUSION

The 2019 Mosaics in Science (MIS) Diversity Internship Program successfully completed its sixth year. The program recruited 24 talented youth who worked across the country to complete high priority natural resource projects on inventory and monitoring, research, GIS and other technologies, and science interpretation and education. Since the program's inception, 146 interns have completed 66,030 hours of critical work in 83 national parks. The MIS interns gained valuable on-the-ground training, personal and professional development skills, and an increased awareness of conservation and environmental stewardship.

The program partners contributed innovative ideas that improved the program by providing additional training opportunities, mentorship, and assistance with subsequent job searches. The unique attributes of MIS enable NPS to successfully achieve its goals of relevancy, diversity, and inclusion. With nine MIS interns hired into federal agencies, eight into the NPS, we continue to make progress to diversify the federal workforce. We look forward to continuing this successful initiative in 2020.

Mosaics interns toured the National Mall during their career workshop.

ACKNOWLEDGEMENTS

The National Park Service Youth Programs and the Geological Resources Division would like to express their sincere gratitude to both partners Environment for the Americas and Greening Youth Foundation for their invaluable work and guidance to the interns throughout the course of the MIS program. We would especially like to thank the interns for the critical science they contributed to parks and the education and outreach they provided for the public.

We would also like to thank the supervisors for mentoring and motivating the interns throughout their experiences and in their project and the colleges and universities that support these outstanding participants.

National Park Sites

- Biscayne National Park
- Capulin Volcano National Monument
- Carlsbad Caverns National Park
- Cuyahoga Valley National Park
- Dinosaur National Monument
- Indiana Dunes National Park, Great Lakes Research and Education Center
- Hawai`i Volcanoes National Park
- Klondike Gold Rush National Historical Park
- Lava Beds National Monument
- Manassas National Battlefield Park
- Minute Man National Historical Park
- Mount Rainier National Park
- New River Gorge National River
- Northern Great Plains Inventory & Monitoring Network / Badlands National Park
- Petrified Forest National Park
- Point Reyes National Seashore
- Rocky Mountain National Park, Continental Divide Research Learning Center
- Saguaro National Park
- San Juan Island National Historical Park
- Sequoia and Kings Canyon National Parks
- South Florida/Caribbean Inventory & Monitoring Network
- Southeast Arizona Group (SEAZ)
- War in the Pacific National Historical Park
- Greater Yellowstone Inventory & Monitoring Network / Yellowstone National Park

"Thanks to the Mosaics in Science Diversity Internship Program, I have a greater sense of respect and admiration for the National Park Service. Working with scientists in both the Greater Yellowstone Inventory and Monitoring Network and the Yellowstone Center for Resources has inspired me immensely."

-Alyssa Canova
Greater Yellowstone Inventory & Monitoring Network /Yellowstone National Park

Schools Attended by MIS Interns

- Black Hills State University
- Chaminade University of Honolulu
- Cleveland State University
- Cornell University
- Emory University
- Florida International University
- Grinnell College
- Hiram College
- Johns Hopkins University
- Mount Holyoke College
- Penn State University
- The Ohio State University
- University of British Columbia
- University of California, Berkeley
- University of California, Riverside
- University of California, San Diego
- University of Notre Dame
- University of North Carolina, Chapel Hill
- University of North Carolina, Charlotte
- University of Puerto Rico, Mayagüez
- University of Texas, Austin
- University of Washington
- University of Washington, Bothell
- University Park, Hawaii

This summer Kuhl, an outdoor apparel company, helped to outfit the Mosaics in Science Diversity Internship's participants and staff. With their support, the program was able to provide field shirts to interns.

Thank you for the support and commitment given to the program, environment, and the next generation of scientists. We are proud to call you a partner!

Cory Zaller-Edmonds, Mount Rainier National Park, WA

A Special Thank You
Lisa Norby

In December 2018, former MIS Diversity Internship Program Manager Lisa Norby retired after 26 years of federal service. During that time, Lisa was, and continues to be, a champion for students and early career professionals in natural resource sciences, and for increasing diversity in the NPS workforce.

Lisa's 26 year career with the NPS has spanned many different programs and projects including park planning, petroleum geology, and overseeing youth programs. In her most recent role in the NPS Geologic Resources Division, Lisa managed two Service-wide natural resource science internship programs - Geoscientists-in-the-Parks and Mosaics in Science Diversity Internship Program, in addition to serving as the Branch Chief for the Energy and Minerals Branch, which oversees energy and minerals projects in all National Parks.

In 2007, Lisa assumed leadership of the GIP Program and through her tireless efforts and close coordination with partners, she grew the program steadily from an average of about 50 GIPs per year in 2007 to 180 in 2018.

2010-11 Lisa completed a detail that established the George Melendez Wright Initiative for Young Leaders, a program that supported paid internships to highly accomplished undergraduate and graduate students and recent graduates to work in national parks for approximately 12 weeks on projects in scientific research, interpretation, park operations, policy development, and other fields.

2012 Lisa won the prestigious Geological Society of America (GSA) Distinguished Service Award, which recognizes individuals for exceptional service to the Society and to the geosciences. Lisa received this award due to her dedication to providing STEM opportunities, particularly in the geosciences, to diverse youth.

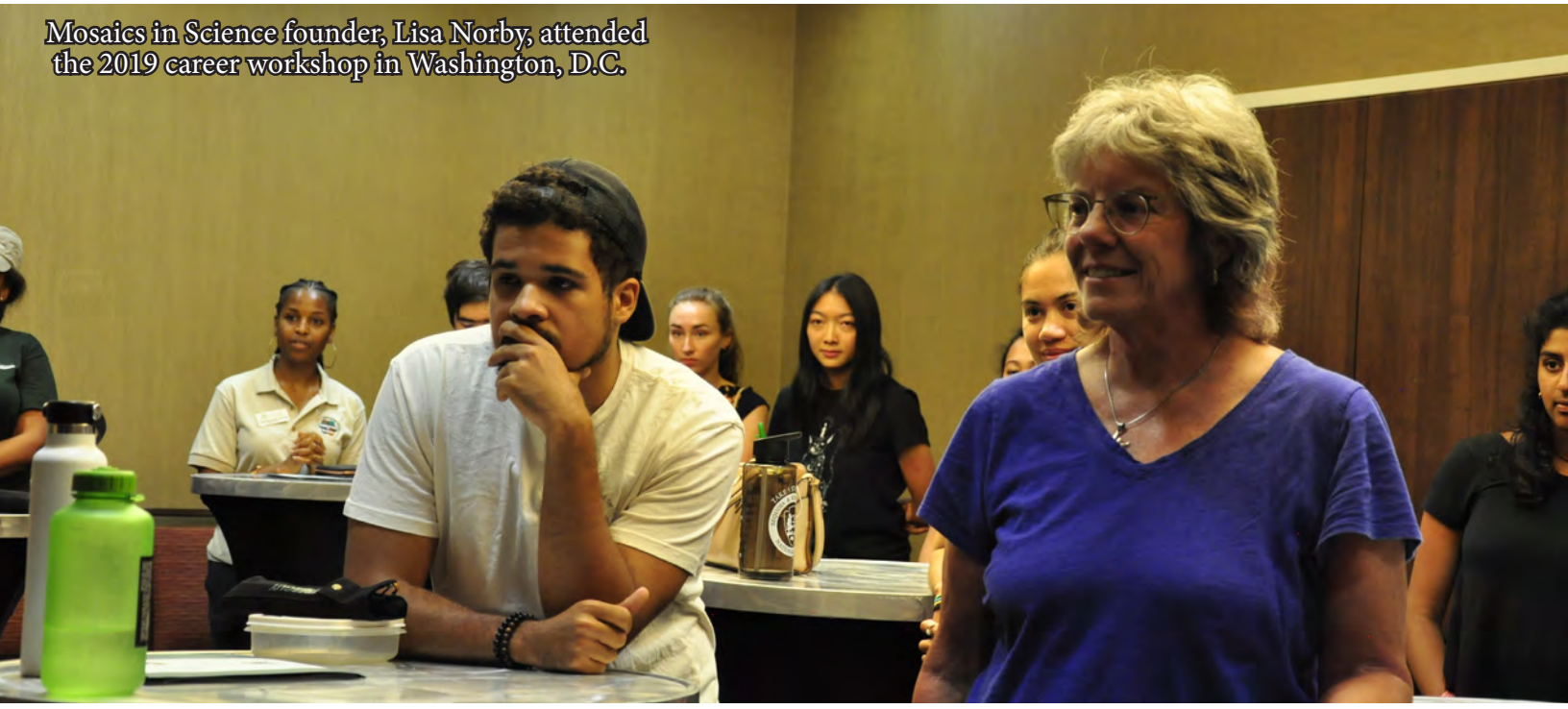
2013 Lisa created the Mosaics in Science Diversity Internship Program with George McDonald, Chief of the NPS Youth Programs Division. Mosaics in Science is funded by the NPS and is managed in partnership with Environment for the Americas and Greening Youth Foundation.

2018 Lisa was awarded the Superior Service Award for career employees of the Department who have made significant achievements and/or performed acts, or services that materially aid the mission of the Department of the Interior (DOI).

2019 Lisa was named the 21st Century Conservation Service Corps (21CSC) Champion of the Year. This Award recognizes individuals from agencies and organizations that partner with 21CSC programs to help engage the next generation of conservation and community leaders in service, education and training.

Lisa is recognized as a national leader in engaging the next generation of conservationists on public lands because of her hard work, dedication, and lifelong passion for youth programming. As the Energy and Minerals Branch Chief, she took the lead of two large natural resources science internship programs designed for young adult engagement, while simultaneously juggling her primary responsibilities. Lisa has been a dedicated and enthusiastic advocate for youth programming for decades, and the partnerships developed through her ingenious creativity and efforts have provided priceless experiences for young adults and helped preserve precious public lands.

Thank you so much for all of your contributions!



Mosaics in Science founder, Lisa Norby, attended the 2019 career workshop in Washington, D.C.

National Park Service
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www.mosaicsinscience.org • go.nps.gov/mosaics

Environment for the Americas

Greening Youth Foundation

National Park Service