



# MOSAICS IN SCIENCE

## Diversity Internship Program

2018

## Internship Program Report





## *A Special Thank You to Lisa Norby, National Park Service*

*Lisa Norby, Mosaics in Science Program Manager with the NPS, created Mosaics in Science (MIS) in 2013 with George McDonald, Chief of the NPS Youth Programs Division. Her passion for science, equity, and inclusion have helped to drive the successes of MIS and to motivate over 125 students as they pursue careers in science. In 2018, Lisa will retire after 25 years with the NPS. We thank her for her dedication and commitment to engaging youth in science through the Mosaics in Science Diversity Internship Program. Her efforts are an inspiration to us all!*



The intent of the MIS program is to increase diversity and inclusion in the federal workforce and to provide meaningful on-the-job natural resource, science training opportunities for college students and recent graduates. This multidisciplinary program provides interns with opportunities to work on projects emphasizing inventorying and monitoring, research, use of GIS and other technologies, interpretation, and education. After the internships, the interns participate in a career workshop at which they present the results of their work, are exposed to different science careers, meet high level DOI and NPS officials, and develop skills to apply for a federal job. During the 6 years of the program's existence, 135 talented students and recent graduates have participated in STEM projects in 78 national parks spanning all 7 regions with the National Park System. The program has been a life changing experience for the interns with four obtaining permanent employment, an additional four term appointments, and many others continuing in seasonal or other internship positions with the NPS, or deciding to return to school to obtain an advanced degree in a science field.



Lisa Norby holding the recognition plaque given to her by the Mosaics in Science Team during the career workshop at the YMCA of the Rockies

Lina Oliveros (NPS), Adrienne Byrd (GYF), Eboni Preston (GYF), Lisa Norby (NPS), Susan Bonfield (EFTA), Isabel Justiniano (EFTA), Limaris Soto (NPS)





# MOSAICS IN SCIENCE DIVERSITY INTERNSHIP PROGRAM REPORT 2018

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## INTRODUCTION

Greening Youth Foundation and Environment for the Americas collaborated for a third 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 mentorship, site visits, a career workshop a post-internship report and final evaluation of the program.

In 2018, we improved MIS by again increasing diversity of the participants, updating and improving our intern and supervisor manuals, and by adding an e-newsletter for interns and supervisors.

Our recruitment reached over 750 applicants, with 24 interns selected including both EFTA and GYF interns.

## STATEMENT OF PURPOSE



# MOSAICS in SCIENCE

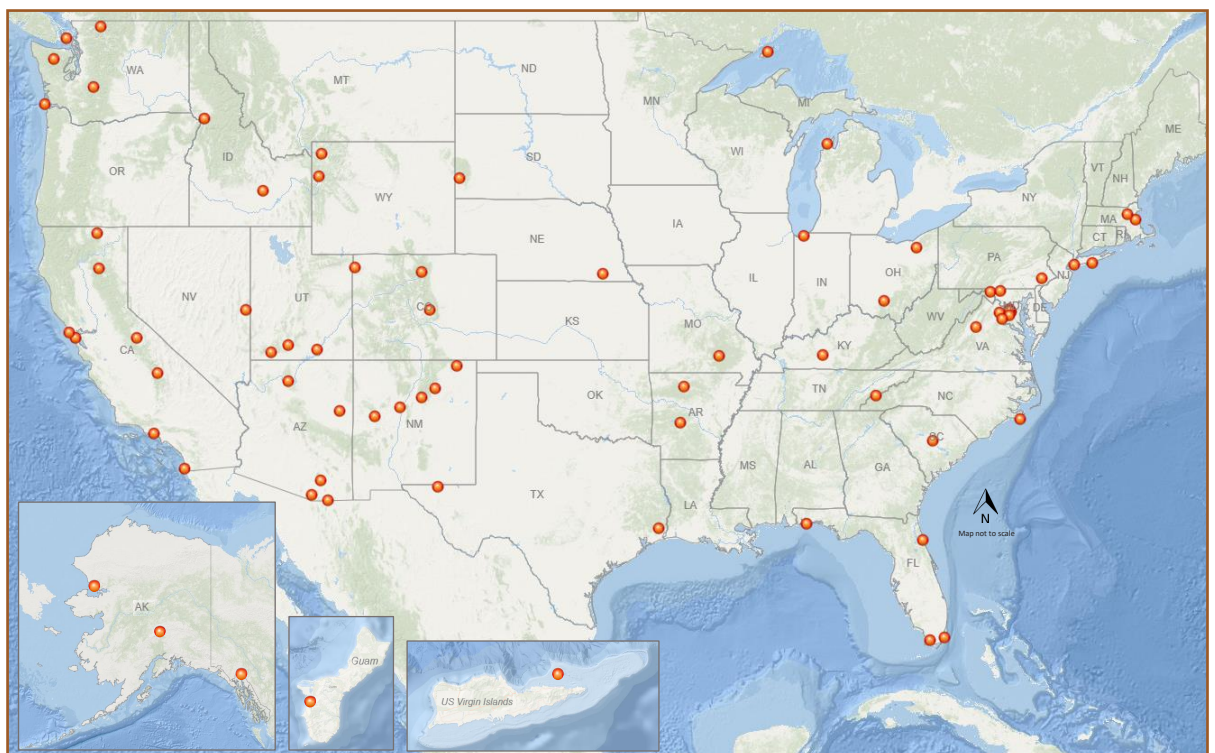
### Mosaics in Science Statement of Purpose

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 National Park Service (NPS) Geologic Resources and Youth Programs Divisions in partnership with Environment for the Americas (EFTA) and Greening Youth Foundation (GYF).

### 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 NPS, and
- Increase relevance, diversity, and inclusion in the NPS workplace.

### MIS Projects: 2013 - 2018



**135**  
MIS interns



**53,672**  
Hours of service



**78**  
NPS Parks,  
networks



## PROGRAM ALIGNMENT WITH DOI PRIORITIES

### PROGRAM ALIGNMENT WITH DEPARTMENT OF THE INTERIOR PRIORITIES

This program supports the following Department of the Interior 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, and Goal 3 – Foster partnerships to achieve balanced stewardship and use of our public lands. 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. 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 its decision-making and the results are provided to the public through reports, outreach materials, websites, and public interpretive and educational programs.

## 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.



**Lisa Norby**  
Mosaics in Science and  
Geoscientists-in-the-Parks  
Program Manager and  
Chief, Energy and Minerals Branch,  
Geologic Resources Division



**Ernestine White**  
National Youth Employment  
Coordinator (acting),  
Youth Programs Division

### NPS Team

**Limaris Soto**  
Geoscientists in the Parks and Mosaics in  
Science Program Assistant



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



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



### National Park Service, Geologic Resources Division

The Geologic Resources Division (GRD) 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.

[www.nps.gov/subjects/geology](http://www.nps.gov/subjects/geology)

### National Park Service, Youth Programs Division

The Youth Programs Division engages youth between the ages of 5 and 35 years old in various National Park Service (NPS) 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.

[www.nps.gov/subjects/youthprograms](http://www.nps.gov/subjects/youthprograms)



### Environment for the Americas

Environment for the Americas (EFTA) is a non-profit organization that connects people to bird conservation across the Western Hemisphere and works to diversify the field of natural resources. EFTA coordinates the largest hemispheric celebration of birds, World Migratory Bird Day, which strives to connect people to bird conservation. EFTA also mentors over 50 underserved youth each year through internships that introduce them to science, field research, preservation, and interpretation.

[www.environmentamericas.org](http://www.environmentamericas.org)



### Greening Youth Foundation

Greening Youth Foundation (GYF) is a federal nonprofit partner whose mission is to engage diverse youth and young adults in an effort to develop and nurture enthusiastic and responsible environmental stewards. With headquarters in Atlanta, GA, GYF offers service and internship opportunities across the country with the National Park Service, US Fish and Wildlife Service, US Forest Service, NOAA, Bureau of Reclamation, and the Bureau of Land Management, and expose them to careers in conservation.

[www.gyfoundation.org](http://www.gyfoundation.org)



## FUNDING OVERVIEW

The total National Park Service budget from the Youth Programs Division for the 2018 Mosaics in Science Internship Program was \$300,000 to support 24 interns. The budget was split equally between program partners EFTA and GYF, each receiving \$150,000 to administer half of the Mosaics in Science internships. Additionally, parks provided \$15,596 to extend the following six internships:

- Golden Gate National Recreation Area
- Shenandoah National Park
- Rocky Mountain National Park
- Great Smoky Mountains National Park
- Greater Yellowstone Network and Yellowstone National Park
- Klondike Gold Rush National Historical Park

## TYPES OF PROJECTS SUPPORTED

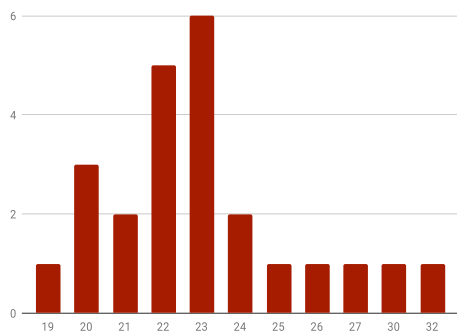
- Communication, outreach and education
- Interpretation and citizen science programs
- Creation of a witness tree story map using GIS mapping skills
- Stream restoration and habitat restoration
- Vegetation monitoring and invasive species removal
- Coral health monitoring and restoration
- Bat monitoring for white-nose syndrome and education
- Cave mapping using GIS
- Hummingbird banding and pollen sample collection
- Fish population monitoring, and habitat restoration mapping
- Unstable slope management project
- Monitoring nesting success of colonial birds
- Eastern box turtle demography and distribution
- Dragonfly mercury project
- Variety of species monitoring with inventory and monitoring networks



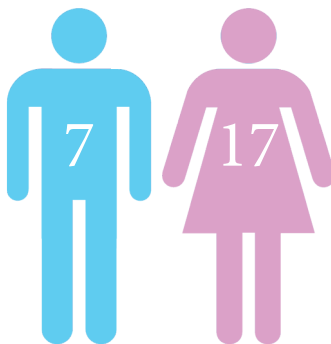
MIS interns at Rock Mountain National Park

# DEMOGRAPHIC INFORMATION

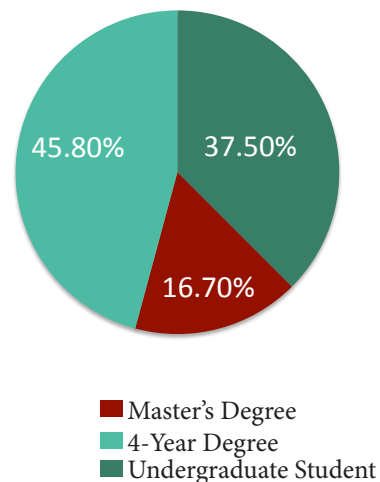
## INTERN AGES



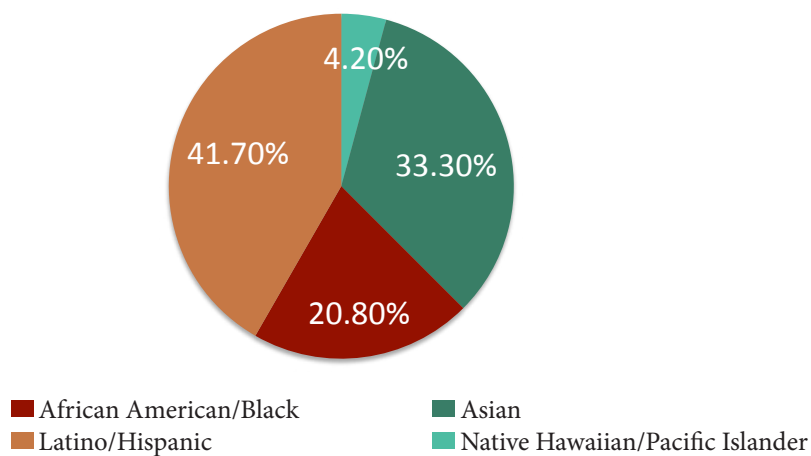
## GENDER



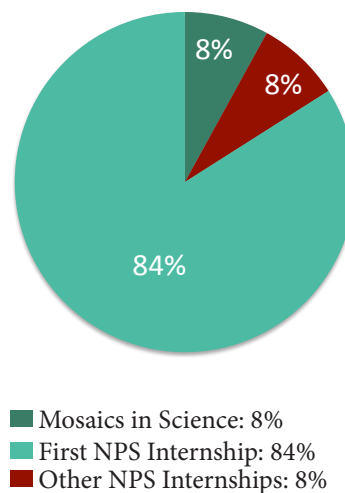
## LEVEL OF EDUCATION



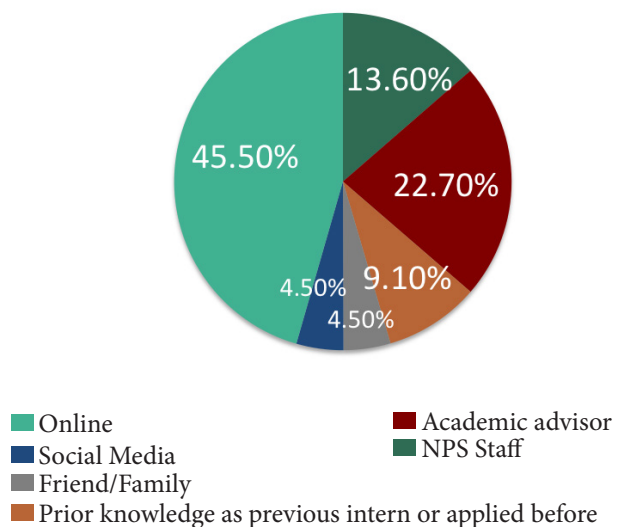
## ETHNICITY



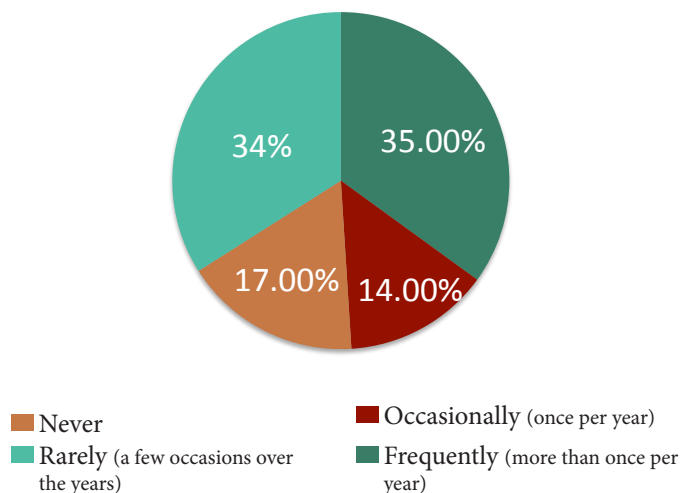
## HAVE YOU HAD AN INTERNSHIP WITH NPS BEFORE?



## HOW DID YOU HEAR ABOUT MIS?



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





## 2018 MOSAICS IN SCIENCE INTERNSHIPS

	NPS Unit	Position Title	Position Type	Partner
1	Biscayne National Park (BISC)	Coral Restoration Resource Assistant	DHA-RA	GYF
2	Capulin Volcano National Monument (CAVO)	Biology Technician	DHA-RA	EFTA
3	Congaree National Park (CONG)	Stream Assessment Specialist	DHA-RA	GYF
4	Continental Divide Research Learning Center (ROMO)	Science Communicator	MIS	EFTA
5	Coronado National Memorial (CORO)	Geoscience Technician	MIS	EFTA
6	Cuyahoga Valley National Park (CUVA)	Biology Technician	MIS	GYF
7	Denali National Park and Preserve (DENA)	Biology Technician	MIS	GYF
8	George Washington Memorial Parkway (GWMP)	GIS Specialist/Lands Planner	MIS	GYF
9	Glen Canyon National Recreation Area (GLCA)	Dragonfly Mercury Project Lead	MIS	GYF
10	Golden Gate National Recreation Area (GOGA)	Aquatic Ecology Intern	MIS	EFTA
11	Great Smoky Mountains National Park (GRSM)	Vegetation Monitoring Assistant	MIS	GYF
12	Greater Yellowstone Inventory and Monitoring Network and Yellowstone National Park (GRYN)	Biology Technician	MIS	GYF
13	Isle Royale National Park (ISRO)	Biology Technician	MIS	GYF
14	Jewel Cave National Monument (JECA)	Integrated Resource Management Assistant	MIS	EFTA
15	Klondike Gold Rush National Historical Park (KLGO)	Physical science and biological science assistant	MIS	GYF
16	Lava Beds National Monument (LABE)	Natural Resource Program Assistant	DHA-RA	EFTA
17	Minute Man National Historical Park (MIMA)	Biological Tech/GIS Specialist Intern/Resource Assistant	DHA-RA	GYF
18	Mount Rainier National Park (MORA)	Interpretive Intern	MIS	EFTA
19	Point Reyes National Seashore (PORE)	Fisheries Technician	MIS	EFTA
20	Rocky Mountain National Park (ROMO)	Ecology Technician	MIS	EFTA
21	Shenandoah National Park (SHEN)	Biological Science Technician - Rare Vegetation Monitoring	MIS	EFTA
22	South Florida / Caribbean Inventory and Monitoring Network (SFCN)	Assistant Avian Biologist	DHA-RA	EFTA
23	Valley Forge National Historical Park (VAFO)	Natural Resource Conservation Assistant	MIS	EFTA
24	Zion National Park (ZION)	Multidisciplinary Desert Tortoise Conservationist	MIS	GYF

*DHA-RA 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.*

## PROGRAM SUMMARY

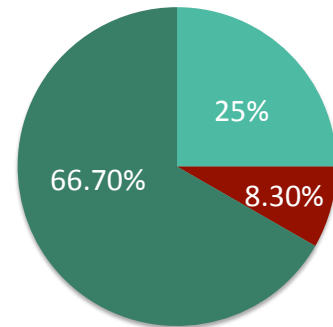
### POSITIONS BY REGION FOR FY 2018

Region	# Positions	Park
Alaska Region	2	DENA, KLGO
Intermountain Region	7	CAVO, CORO, GLCA, GRYN/YELL, ROMO (2), ZION
Midwest Region	3	CUVA, ISRO, JECA
National Capital	1	GWMP
Northeast Region	3	MIMA, SHEN, VAFO
Pacific West Region	4	GOGA, LABE, MORA, PORE
Southeast Region	4	BISC, CONG, GRSM, SFCN

### PROJECT CATEGORY SUMMARY

Project Category	Number of Projects
GIS and other technologies	1
Interpretation/Education	3
Inventory and Monitoring	9
Multi-faceted	8
Research	3

### PROJECT DISCIPLINE SUMMARY

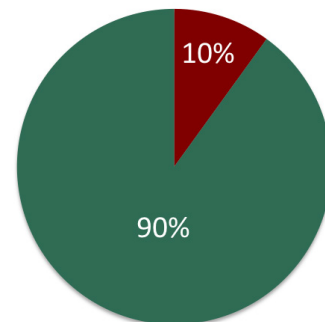


■ Multidisciplinary: 6 ■ Geological: 2 ■ Biological: 16

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

Yes	60%
No	20%
Maybe	20%

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



90% said YES !!

■ Yes: 90% ■ No: 10%

### DID THIS INTERNSHIP INFLUENCE YOUR CAREER GOALS?

Yes	70%
No	10%
Maybe	20%



## INTERN TRAINING

In 2018, interns received training before and during their participation in the program. 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:

- Welcome to the Mosaics in Science Program! (pre internship)
- Blogs, Social Media, Professionalism, (pre-internship)
- Workplace Harassment Overview for NPS Interns
- Financial Literacy w/ Dominique Broadway
- Stepping Stones to a Career in the NPS
- Microaggressions Overview and Discussion
- Intern Updates and Applying to Graduate School
- Workshop Preparations
- Workshop Details

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

### Career Workshop

Upon completing their internships, participants traveled to Colorado for a four-day workshop. During the first two days of the workshop interns met in Lakewood, Colorado 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 traveled to Rocky Mountain National Park where they learned about the management of a large park during presentations by the park superintendent, park staff, and two Mosaics interns, and were also fortunate to do a site visit of a portion of the park.

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?

Important to Very Important:

85 %



MIS interns and staff hiking in Red Rocks Park during the workshop in Colorado.



## PROJECT HIGHLIGHTS



**Sebastian Alvarez** - Sebastian worked on the Unstable Slope Management Project (USMP) at Coronado National Memorial. This project was designed to identify, measure, and assign a rating to the unstable slopes located along roads and trails of the park. Ratings were given using the USMP rating criteria, which required learning how to use GPS, a compass and a Laser Point Range Finder. The data that was collected was then uploaded into a central database. The data was processed using GIS to map out the slopes, imagery analysis, and landscape photography. This was a very important project not only because it will help prepare for any future hazards events, but it also served as a trial run to see if this technology and assessment system could be used in other national parks.



**Nina Trusso** - Nina's main project at Point Reyes National Seashore focused on the endangered Coho salmon. She worked on pre-construction monitoring for the Salmon Habitat Enhancement Project, as well as monitoring of Coho populations. This monitoring took place at Redwood Creek in Muir Woods National Monument. In order to determine the conditions of Redwood Creek, Nina examined the presence of large woody debris, rip rap, shallow/deep pools and rock size distribution. Examining all these components allowed her to create a map of the creek to be used for the enhancement project. The other part of the project was fish population monitoring, which was conducted through the electrofishing method. In this effort, she was joined by the Point Reyes crew, including fellow Mosaics intern Katlyn Fuentes. Once a fish is caught, it is measured, weighed and some are given a PIT (passive integrated transponder) tag to track the fish throughout its life.



**Yung Jones (DHA-RA)** - Yung assisted with an ongoing coral restoration and research project at Biscayne National Park. She maintained the coral nursery, collected coral fragments from the nursery and wild populations, outplanted coral fragments at different sites throughout the park, and collected coral gametes during spawning season. She also reared the coral gametes and larvae in the lab and outplanted the coral larvae.



## PROJECT HIGHLIGHTS



**Katherine Ko** - Katherine's main focus this summer at Glen Canyon National Recreation Area was the Dragonfly Mercury Project. This project is an ongoing study to assess the levels of mercury in our national parks. Over the past seven years, more than 90 NPS units and 3,000 citizen scientists have contributed to this project. She also scouted sites for sampling, promoted the project in the community, and took citizen scientists out into the park to sample dragonfly larvae.



MIS interns listening to workshop presentations in NPS Lakewood office



## QUOTES FROM PARTICIPANTS



“This summer has gone by in a the blink of an eye! As I come to my final days in the park, I have been reflecting on all I have learned and experienced in Yellowstone this summer. I gained knowledge and insight from everyone in the Greater Yellowstone I&M team and in the Yellowstone Center for Resources. I am very thankful for everyone who took the time to talk with me and teach me something new. Getting to work in America’s first national park has been such a privilege. From the sagebrush flats to the mountain tops, every day in Yellowstone was an adventure. The amount of wildlife and biodiversity I got to witness this summer was incredible. I was able to watch two alpha wolves hunt, see more than 40 bears, identify wildflower species, and the view from my bedroom window was of Mammoth Hot Springs. You couldn’t ask for a more Yellowstone experience! I will carry the memories and lessons I learned for the rest of my life. I will miss this park greatly but I know I will return.” — *Victoria Ibarra, Greater Yellowstone Network and Yellowstone National Park, WY*



“Last week I was invited to go on a mobile acoustic survey within the park. I went with the Cuyahoga Valley National Park biologist and a Cleveland Metroparks bat biologist. We first met in the southern end of the park and got our equipment ready. First we set up the microphone which suction cupped to the car and plugged it into the Anabat SD2 Active. Next was the GPS unit that magnetically stuck to the top of the car and that was also connected to the Anabat SD2 Active. Then we drove around the park on a predetermined route that was about 30 miles in length. We started around 8:45 pm and ended at 11:30 pm. We drove slowly to ensure we were detecting bats accurately. We picked up our expected species such as Big Brown, Hoary and Red bats but we also picked up a Northern Long-Eared bat which was an amazing discovery! Northern Long-Eared bats are a federally threatened species so it was good to see that they are in the park, even if it was only one bat. It was a lot of fun to ask them questions about what they have experienced and what they find useful for management and data analysis. It was another one of those experiences that I cannot wait to tell my friends about back home.”

— *Jaylin Solberg, Cuyahoga Valley National Park, OH*



MIS interns hiking at Rocky Mountain National Park during the workshop in Colorado

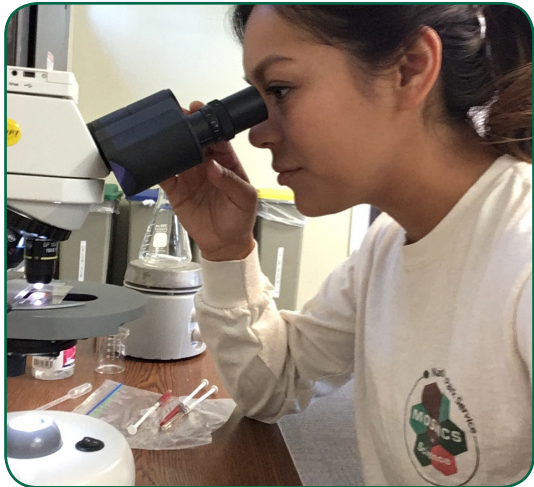


## QUOTES FROM PARTICIPANTS



“The overall purpose for this project was to get started on a 5+ year plan to predict how moose herbivory impacts vegetation on Isle Royale. Because of the limited amount of wolves currently on the island, the population cannot be controlled leading to strongly influenced changes in the vegetation due to browsing. Although moose are not the only herbivores on the island they are the creatures with the largest herbivory impact. Since our studies are based on surveys instead of experiments we do not have the typical “results” that one thinks about when sharing their findings. What we do have is information on what is typically browsed, problems we encountered and areas that are least and most susceptible to vegetation changes.”

— *Kennedy Mayfield-Smith, Isle Royale National Park, MI*



“Just when I think I am nearing the end of my pollen collection, we discover more flowering plants in less traveled areas of the park. One plant that I was particularly excited to see was *Ipomopsis aggregata* ssp. *Candida*, or scarlet gilia. Based on the Capulin plant species list I knew it had been found at the park in the past, but I had yet to see it myself. I had been on the lookout for it as it is a known favorite of hummingbirds, but had no luck. Fortunately, one of my coworkers saw a flower in the field that he thought I might be interested in. He took a photo and showed me upon his return, asking if I knew what it was. Scarlet gilia!! He took me back to where he found it, and I saw there was a whole patch of the beautifully colored, distinctive flower. The long red and pink corolla tubes filled with nectar are a hummingbird’s dream! I’m so lucky to be part of team that keeps my pollen project in mind when they are out doing fieldwork, thanks Ranger Tommy!”

— *Stephanie Rosas, Capulin Volcano National Monument, NM*



“One of the focal birds that I am working with on my project is the great white heron. Prior to this internship I wasn’t aware of this bird but it is quite interesting with his relationship to the great white heron. Debate on its taxonomic position has gone on for years and what was once considered its own species and then only a color morph, the Great White Heron is currently believed to be a subspecies of the great blue heron, although the debate continues on. The great white heron is unique to South Florida and the Florida Keys. Florida Bay is home to the largest number of breeding pairs (850). Because of its limited numbers, documentation of its presence in Biscayne Bay is important. Adding to the mix is the presence of the Wurdemann’s Heron which is an intermediate form produced by the hybridization between a great blue heron and great white heron, which exhibits as one would expect an intermediate plumage. Wherever the truth may lie, I find this absolutely fascinating.” — *Thomas Pham, South Florida/Carribean Inventory and Monitoring Network, FL*



## QUOTES FROM PARTICIPANTS

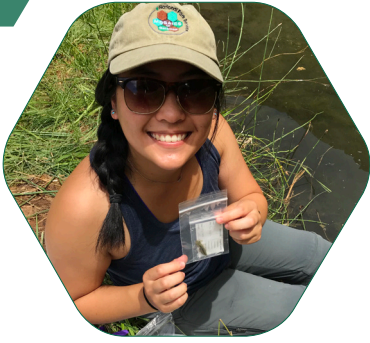


“Eleven weeks sure do fly by when you’re having fun. I swear I was just sitting in a room with 30 strangers learning about what the difference between a national park and monument was. Those strangers and I have since been seamlessly woven into the story quilt of Jewel Cave that will live on in the decades to come. But all jokes aside, I’m immensely honored to have taken part in this internship. I was able to develop professionally while serving my country by helping conserve one of its finest public lands. As a resource management intern, I learned how vital conservation work is. It’s not easy; decision-makers walk a thin line between preserving and making resources available to ensure the public gets the best experience. From simple maintenance to shaping the park’s short-term goals, many considerations must be made before a single action can be taken. As a geology intern, it was exactly the type of experience I was hoping for: working with a senior geologist, developing my abilities, learning new skills, and networking with some brilliant minds.” — *Maaz Fareedi, Jewel Cave National Monument, SD*



Intern Maaz Fareedi caving at Jewel Cave National Monument, SD





**Katherine Ko**

*Glen Canyon National Recreation Area, Utah*

Katherine submitted an article highlighting dragonfly mercury sampling efforts as part of her internship project at Glen Canyon. She submitted it for the Fall 2018 issue of Boatman's Quarterly Review <https://www.gcr.org/bqr.php>

Katherine's project was also featured in the Lake Powell Chronicle, about her engagement of girl scouts.

### Area girl scouts help park service biologists with science project

<https://lakepowellchronicle.com/article/area-girl-scouts-help-park-service-biologists-with-science-project>





# FEATURES

## Area girls scouts help park service biologists with science project

Story and photos  
by Krista Allen  
Lake Powell Chronicle

LEE'S FERRY and MARBLE CANYON, Ariz. — Six-year-old Kaia Pilkington wanted to ride with Katherine Ko and park ranger Grace Carpenter to Lee's Ferry where they would look for dragonfly larvae at a wetland near the Colorado River. And on the 54-minute drive, she talked about her kittens.

But Pilkington, along with her girl scout troop from Page, was excited to spend the morning at Lee's Ferry and look for dragonfly larvae, which are almost everywhere. There are countless larvae sites from Alaska to Maine and from California to Florida, and even in desert oases in the arid Southwest, according to Sarah J. Nelson, associate research professor in the School of Forest Resources at the University of Maine. She is also one of the principal investigators on the Dragonfly Mercury Project there.

Even though some of the girls complained about the heat and were a bit squeamish about hiking through the lush vegetation, Pilkington and her friends had a great time looking high and low for dragonfly larvae in a small wetland near the river.

"This has been going ... (for) eight years," said Ko, an intern in the National Park Service's Mosaics in Science Diversity Internship Program. Ko is originally from Westfield, New Jersey, and she is a senior at Vanderbilt University in Nashville, Tennessee. "And it (is a countrywide project) at multiple parks. So, every year it happens at different parks ... and this is the first year it's happening at Glen Canyon National Recreation Area. So, it's really exciting."

This is the Dragonfly Mercury Project, said Ko, who is leading the project in the Glen Canyon.

"We're looking at mercury levels in dragonfly larvae," Ko explained. "They're these tiny little creatures but they're predators and they eat a lot of small bugs in the water. And a lot of things prey on (the larvae as well)."

Scientists are keen on understanding mercury fluxes and quantifying mercury concentrations in the ecosystem for potential impacts to human and wildlife health.

And on the leading edge of this is the Dragonfly Mercury Project, a continental-scale, citizen science project to improve understanding of the spatial variation in baseline levels of mercury in the environment. It is a collaboration with Cornell University, the University of Maine, the U.S. Geological Survey, and the NPS.

Dragonfly larvae present a unique opportunity to track environmental mercury because they are long-lived as they spend nearly five years in the larval stage, during which they eat small insects and bioaccumulate mercury. And they are easier to sample than the fast-moving fish.

"That way we can look at how to manage that better in terms of bioaccumulation and magnification," Ko said, "... like if a fish eats (the larvae), (which) then gets more and more toxic (in the aquatic food web). So, hopefully we can look at it at the level of the dragonflies and kind of get a better idea of what's happening."

Connection with people and the community of Page is vital to this project, said Ko.

This project provides the ideal vehicle for connecting people with the park and using it as an outdoor laboratory.

"You get to build relationships with (people) and volunteer groups (like Pilkington and the girl scout troop) as much as it is for us to get information about mercury levels," Ko



Page Girl Scout troop, along with a couple of the troop moms, search high and low for dragonfly larvae at a wetland area near the Colorado River in Lee's Ferry. Only one dragonfly larvae, however, was found at this spot. At least 15 dragonfly larvae must be collected before it ships to the University of Maine for mercury analyses.

said. "It's also to educate the community and inspire kids to hopefully want to go out and do what we're doing."

And Ko enjoys taking people out to ponds, wetlands, and other dragonfly larvae sites in the Glen Canyon National Recreation Area to scout around for dragonfly larvae, which are collected and then shipped off to the University of Maine and the USGS for lab analyses.

"We get the results (around) the fall," Ko said. "They run specific tests to see how much mercury is in (these species). And it's interesting too. When we catch them, we try to identify them to its family."

Ko added that the Dragonfly Mercury Project is a great opportunity to not only integrate the community of Page but also get the youngsters out of the house and into science.

"We get to hike and get to spend time by the water and get our hands dirty," she added.

Kaia Pilkington is the daughter of Lonnie Pilkington, biologist for Glen Canyon and Rainbow Bridge.



NPS intern Katherine Ko, above, and ranger Ashley Haynes, below, assist girl scouts catch and identify bugs and larvae at Lees Ferry last week.





# INTERN



# PROFILES

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



**Sebastian Alvarez • University of North Carolina, Charlotte**

***Coronado National Memorial, Arizona***

I am going to be a Geoscience Technician at Coronado National Memorial in Arizona. I am originally from Chile and moved to North Carolina in 2006. I've lived here half my life and have loved the beautiful sights of the Appalachian Mountains to the barrier islands in North Carolina. I graduated from University of North Carolina at Charlotte with a Bachelor's in Geology, hence my love for rocks and the outdoors. With this internship I hope to learn more about the geologic sciences as well as GIS and to be able to work for the federal government or another state agency. My hobbies include watching movies, hiking, playing soccer, concerts, and dancing.



**Saba Asefa • Western Washington University**

***Continental Divide Research Learning Center, Colorado***

I am a Science Communication intern at Rocky Mountain National Park this summer. I am originally from Columbus, Ohio, and have had a love for geology and the outdoors since I was a child. I went to Vanderbilt University in Nashville, Tennessee for Earth and Environmental Sciences. Then I moved to Bellingham, Washington, for a Geology Master's program at Western Washington University. My thesis project focused on gauging air pollution using leaves as biomonitors in Seattle. I recently graduated this Spring! My career goal is to be an environmental geologist and this internship is helping me achieve this goal by exposing me to how environmental geology is utilized within the National Park Service as well as broadening my knowledge of natural resources besides geological ones. Some of my hobbies include karaoke, basketball, tennis, dancing, and trivia.



**Jesse Attias • University of Vermont**

***Valley Forge National Historical Park, Pennsylvania***

I will be working as a natural resource conservation assistant in Valley Forge National Historical Park. I'm a recent graduate of the University of Vermont with an Environmental Science degree (biology focus) alongside a minor in Philosophy. Raised in New York, with a deep appreciation and affection for all things in nature, I knew from the get-go that I would, at the very least, be working in the environmental science field as a way to repay the natural world. I would eventually like to conduct my own research with larger mammals in regard to how climate shifts alter their behavior. My internship, although having little to do with mammals, is showing me how to use various scientific tools for field work and analysis, as well as how to properly set up an observational study. My interests include hiking, kayaking, biking, playing piano, writing, and astronomy.



**Alisa Cloutier • Virginia Tech**

***Lava Beds National Monument, California, DHA-RA***

I'm going to be doing natural resource management work and science interpretation about bats and conservation at Lava Beds National Monument. I chose to study Natural Resources Conservation and Recreation Management at Virginia Tech. My goal after graduation is to work with a land management agency doing biology or wildlife work (preferably focusing on bats). This internship allows me to get experience in monitoring wildlife, specifically bats, as well as communicating to the public about resource programs in a large remote park. My hobbies are reading, hiking, cooking, bird watching, camping, and traveling.



### **Maaz Fareedi • Northeastern Illinois University**

#### ***Jewel Cave National Monument, South Dakota***

This summer I will be working at Jewel Cave National Monument as a Resource Management intern. I'm from the Chicago suburb of Vernon Hills, Illinois. This fall I'll be finishing up my B.S. in Geology from Northeastern Illinois University. Throughout my studies, I've been involved with depositional modelling and structural geology, which is similar to what I'll be doing. Specifically, I'll be mapping the local faults and strata on the surface, and relating them to what can be seen inside the caves. As a side project, I'll also be involved with bat acoustic monitoring. My main two goals for this internship are developing and refining my skills and networking. This internship allows me to work with a senior geologist to learn more about the field and how/where I can best apply myself in the short and long term. My interests include playing video games, cooking, rockhounding, hiking, and bouldering.



### **Katlyn Fuentes • University of Washington**

#### ***Point Reyes National Seashore, California***

I will be stationed at Point Reyes National Seashore as a Fisheries Technician intern. I was born and raised in Washington state. I am a current student at the University of Washington working on my B.S. in Aquatic & Fishery Sciences, and minoring in Anthropology. While attending university, I've focused my studies as much as possible on anything related to – you guessed it – fishes! Post-graduation I would like to find a career related to conservation and resource-management. This internship is helping me to achieve these goals by letting me explore a future career option as a Fisheries Technician for the National Park Service, as well as providing me networking opportunities and hands-on experience in the field. My hobbies are traveling to new places, hiking, yoga, reading, and music.



### **Alliyah Gifford • Colorado State University, Pueblo**

#### ***Rocky Mountain National Park, Colorado***

I am from Pueblo, Colorado, and I just received my Bachelor's degree in Biology from Colorado State University–Pueblo. The crazy fast changing weather makes each experience unique. I love to be outdoors exploring with my friends, and enjoy meeting new people along the way! I am very excited to have the opportunity to work as an Ecology Technician at Rocky Mountain National Park. I have not been many places so this is new to me, but I can't wait to explore and learn here. My career goals are to possibly work for the National Park Service and this internship has helped me gain new skills, experiences, and make connections with possible employers. I have been able to learn about what working for the National Park Service entails and I may have never been exposed to this if it were not for this internship. My interests include reading, hiking, and journaling.



### **Rhys Joaquin • University of Florida**

#### ***Mount Rainier National Park, Washington***

I am from a suburb of Jacksonville, Florida, called Orange Park. I am a senior studying for my B.A. in geology at the University of Florida, with a minor in soil and water science. I have made a long journey, driving 3,000 miles across the country to work as an interpretive intern at Mount Rainier National Park. This will be a unique experience because geological features found in Washington are much different from those found in Florida. My goal through this internship is to be more involved and influential in environmental policy, education, and outreach. This internship provides me a platform to work along like-minded individuals with an emphasis on program facilitation. The experience helps to identify strengths and opportunities as a prospective, future educator. Some of my hobbies are gardening, hiking, cooking, reading, spending time with friends and family, traveling, and exploring unfamiliar places.



### **Aliya Khan • University of British Columbia**

#### ***Shenandoah National Park, Virginia***

I am originally from Washington, DC and I'm a student at the University of British Columbia majoring in Natural Resource Conservation with an emphasis on science and management. This summer in Shenandoah National Park, I will be working on a botany crew on a sub-project monitoring rare plants in the Big Meadows wetlands. Following my graduation, I would like to further explore watershed ecology, wildlife biology and ecology, landscape ecology and botany. My vision for meaningful work involves working in the environmental science sector doing global research, internationally cooperative research and habitat restoration. My hobbies are hiking, reading, going on walks, and knitting.





**Stephanie Rosas • University of California, Santa Cruz**

***Capulin Volcano National Monument, New Mexico, DHA-RA***

I will be the Biology Technician intern at Capulin Volcano National Monument in New Mexico. I graduated from the University of California, Santa Cruz, with a degree in Ecology and Evolutionary Biology. I will be working with a hummingbird researcher to gather data on hummingbird migration and pollination, and how that is being affected by climate change. I would like to be a biologist with the National Park Service, participating in some type of active research. Ideally I will be a part of the advancement of science in some way, to improve the health of ecosystems and mitigate the effects of climate change and land use practices. This internship will give me the opportunity to learn many skills related to land management and maintenance, as well as experience doing research and biological monitoring of hummingbirds. My interests include birding, backpacking, reading, kayaking, and spending time with friends and family.



**Thomas Pham • University of Washington**

***South Florida/Caribbean Inventory and Monitoring Network, Florida, DHA-RA***

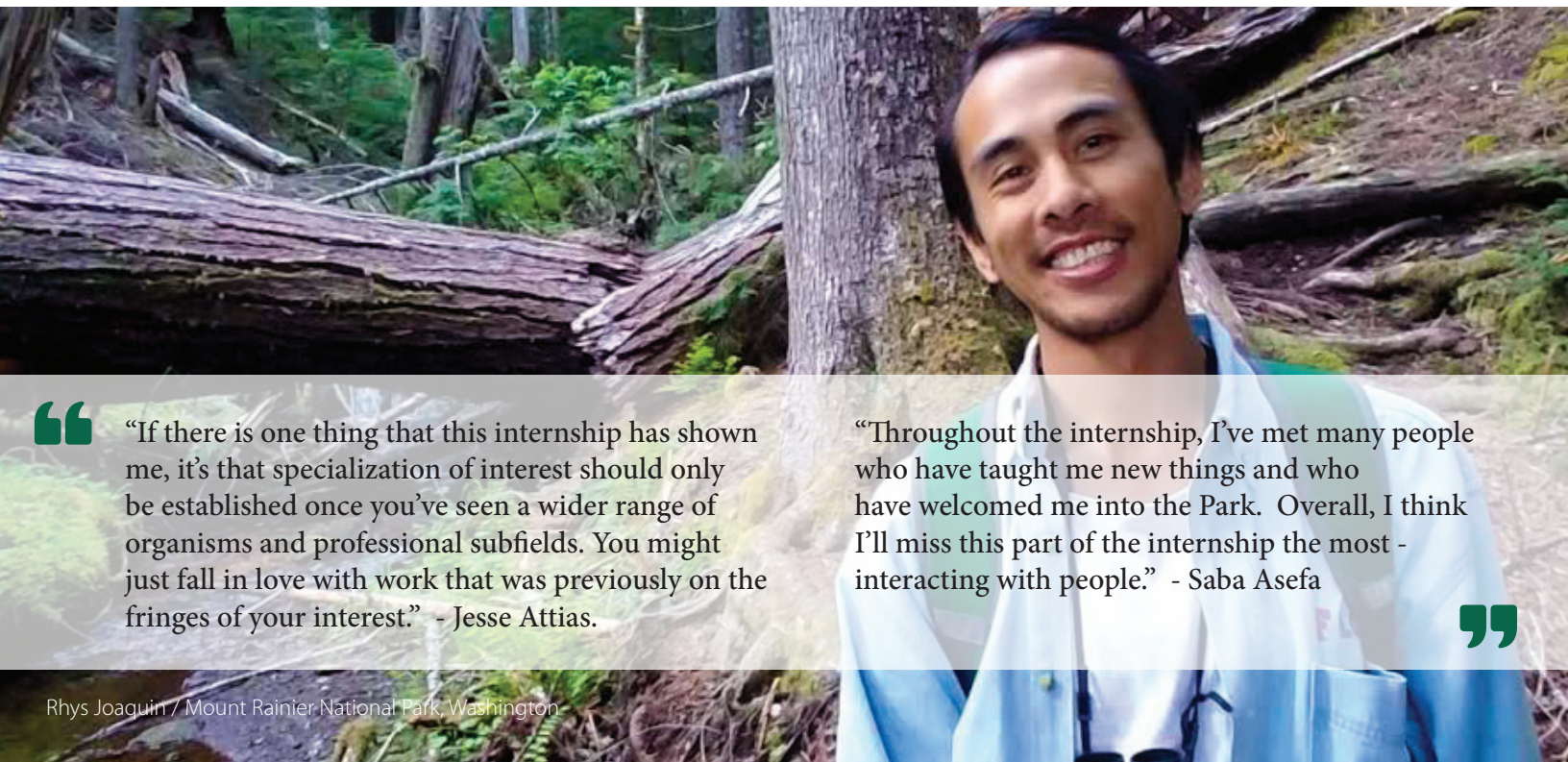
I will be working as an assistant avian biologist for the South Florida/Caribbean Inventory and Monitoring Network. I graduated from the University of Washington with a B.S. in Biology, with a focus in ecology, evolution, and conservation. This past year, I have gone back to school at the Portland Community College, to complete my GIS certificate. My career goal is to work for an organization that does meaningful natural resource management and hopefully be able to use GIS to solve problems. This internship is helping me achieve these goals by giving me experience working in a federal agency. It is also providing me an opportunity to network with park employees and gain insight to the inner workings of the NPS. My hobbies include hiking, photography, and cooking.



**Nina Trusso • University of San Francisco**

***Golden Gate National Recreation Area, California***

I will be working as an aquatic ecology intern at Golden Gate National Recreation Area. I'm an aspiring scientist, passionate conservationist, and California sunshine enthusiast. With my various field jobs I've gotten to know some real California natives like Southern Steelhead Trout, California Red-Legged Frogs, Western Pond Turtles, and San Francisco Garter Snakes. This summer I'm excited to catch up with these old friends and meet new ones in my new home in the Marin Headlands. I want to pursue a career in watershed management and restoration of natural hydrological processes in California's Bay Area. This internship is a great introduction to watershed restoration projects being done in this area as well as the people doing them. After this summer I will be starting my Master's degree in Environmental Management focused on hydrology at the University of San Francisco. My favorite hobby is ultimate frisbee!



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“If there is one thing that this internship has shown me, it's that specialization of interest should only be established once you've seen a wider range of organisms and professional subfields. You might just fall in love with work that was previously on the fringes of your interest.” - Jesse Attias.

“Throughout the internship, I've met many people who have taught me new things and who have welcomed me into the Park. Overall, I think I'll miss this part of the internship the most - interacting with people.” - Saba Asefa

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# INTERN



# PROFILES

The following internships were administered by Greening Youth Foundation staff



**Camille Burrus • Hampton University**

***Zion National Park, Utah***

I received my BS in Biology at Hampton University. This summer, I am interning at Zion National Park. My main focus this summer is the conservation of the desert tortoise, and I will be developing a video to be published. My career goal is pursue a profession as a Science Illustrator. Zion has provided a great opportunity to practice illustrations of scenes from around the park. I am eager to explore the environmental world of biology and environmental sciences, and this internship has given me essential tools to pursue my future goals. My hobbies include drawing, painting, being outdoors, and participating in extracurriculars at my school such as student recruitment team, mentoring, and peer counseling.



**Katherine Castrillon • Florida International University**

***Great Smoky Mountains National Park, Tennessee***

I graduated with a BA in Environmental Science from Florida International University. I have an interest in plant morphology, conservation and restoration, as well as wetland environments. However, my field work extends to other ecosystems found in Southern Florida such as Pine Rocklands, and Hardwood Hammocks. It will be interesting to see the differences and similarities in ecosystems, including flora and fauna, between what is experienced in South Florida versus a part of the Appalachian Mountains while interning at the Great Smoky Mountains.



**Victoria Ibarra • University of Texas, Austin**

***Greater Yellowstone Network and Yellowstone National Park, Wyoming***

I am a graduate student in the Energy and Earth Resources program at the University of Texas at Austin. This summer I am interning as a biology technician with the Greater Yellowstone Inventory and Monitoring Network and Yellowstone National Park. My long-term education and professional career goals would incorporate my love for the environment with the skills and knowledge I have gained in my undergraduate and graduate education. Ideally, I would like to work as a Resource Manager within the National Park Service, allowing me to continue to spend my time learning and understanding various aspects of the Earth, champion the most critical environmental causes we face, and help find solutions to the most pressing environmental challenges of our times. I enjoy hiking, climbing, backpacking, and running.



**Yung Jones • University of Miami**

***Biscayne National Park, Florida, DHA-RA***

I have a Master's of Professional Science in Marine Conservation from the University of Miami. I believe that healthy coral reefs are the foundation of healthy coastal marine environments. My interest in this internship position comes from my desire to work towards preparing our coral reefs for a sustainable future. I hope to have a career in marine conservation with an emphasis on research. This internship helped me get my foot in the door with the federal government and job scene. I enjoy hiking with my dog, polymer clay models, and scuba diving.



**Katherine Ko • Vanderbilt University**

***Glen Canyon National Recreation Area, Utah***

As an Ecology and Theatre double major at Vanderbilt University, I am passionate about conservation stewardship and environmental education. My main focus at Glen Canyon will be the Dragonfly Mercury Project, a large-scale, ongoing study that involves multiple NPS locations. I have loved being outdoors all my life, exploring unfamiliar places and having unpredictable adventures. I hope to have a career in outdoor education and environmental stewardship. Through this internship, I will have the opportunity to connect with people in this field and learn from their experiences, allowing me to gain both the hard and soft skills necessary for this career path. I enjoy singing, playing piano and ukulele, writing, painting, hiking, camping, photography, making jewelry, and knitting.



**Jeanie Lai • Clark University, Massachusetts**

***Minute Man National Historical Park, Massachusetts, DHA-RA***

I have a M.S. in Geographic Information Science for Development and Environment from Clark University and a B.S. in Environmental Science from University of Maryland, Baltimore County. I am interested in a career devoted to meaningful work serving the public and supporting natural resource conservation and cultural site preservation. This summer, I am thankful to be given this opportunity with MIS, which will allow me to learn about the U.S. National Park System and engage with the diverse mindsets and expertise of park managers, staff, interns visitors, and volunteers. In addition, I will be afforded GIS training opportunities in a federal-level work context to help me become familiar with federal GIS standards and operations. In my free time, I enjoy outdoor recreation, trying new cuisines from different cultures, road tripping, watching new Marvel movies, drawing, interior design and going to museums.



**Kennedy Mayfield-Smith • Tuskegee University**

***Isle Royale National Park, Michigan***

I recently graduated from Tuskegee University with a B.S. in Animal and Poultry Science. This summer I will be working at Isle Royale National Park. As an animal science graduate, I am excited to have the opportunity to branch out and explore wildlife and environmental and conservation science while participating in a major research project. I think fieldwork is an important part of animal science that people often overlook, and I love the opportunity to do so while solidifying my love for animal science and teaching others how to care for, connect with, and conserve wildlife. One day I hope to have a career in conservation education, bridging the gap between urban youth and the sciences. I enjoy reading and cooking.



**Amber Roberts • Stanford University**

***Denali National Park and Preserve, Alaska***

I have received my BS and MS degrees in Earth Systems from Stanford University. My project in Denali National Park and Preserve is to better understand arthropods by documenting the diversity, distribution, and phenology of pollinators across elevation gradients. This practical natural resource science-based work experience is invaluable knowledge that I could later on apply to the communities that I want to protect, serve, and give back to. This internship is a clear next step for me professionally, as I believe it can teach me how to be an effective and proactive natural resource manager. In my free time, I enjoy playing ukulele, drawing, taking photos of laughing friends, setting a volleyball, stuffing my face with food, and spending time on a beach!



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

***George Washington Memorial Parkway, Virginia***

I am currently majoring in Agriculture and Environmental systems with a concentration in Sustainable Land Management at the North Carolina Agricultural and Technical State University. I will be doing my internship in my hometown! As a GIS Specialist/Lands Planner I will be at George Washington Memorial Parkway in Washington D.C. This internship will give me an opportunity to learn much more about GIS and the trees of the parkway. My fascination of surveying land and trees began from my past internship at Yellowstone National Park where I learned how to tell the age of trees and how to plant more in selected areas where they are needed. Last summer I worked at Yellowstone National Park where I became 100% sure of what I want to do for a career: conservation and restoration. I enjoy working out and landscaping in my free time.





**Dominique Sanchez • James Madison University**

***Congaree National Park, South Carolina, DHA-RA***

I'm a recent graduate of James Madison University where I studied Biology and Ecology. I'm originally from Virginia and will be a Stream Assessment Specialist at Congaree National Park, South Carolina. As a Stream Assessment Specialist, I will be collecting data of the floodplain both in and around the park. I have always loved the outdoors and conducting fieldwork is one of my favorite parts of my studies in ecology. Long-term I want to work in the outdoors dealing with conservation and ecology. This internship has given me experience in organizing and implementing projects in the field, as well as learning to network and collaborate with other departments within the government. I enjoy hiking in the mountains, finding good food in new cities, visiting museums, paddling out on the water, and lifting heavy weights.



**Andres Santini Laabes • University of South Florida**

***Klondike Gold Rush National Historical Park, Alaska***

I recently graduated from the University of South Florida with a B.S. in Environmental Biology. This summer I will be working at the Klondike Gold Rush National Historical Park in Skagway, Alaska, on a variety of projects such as air and water contamination, amphibian monitoring surveys, and fish larval sampling. I would like a career in which I can actively work towards bridging the gap between the needs of people and the environment so that both can thrive and flourish. I would like to enter the fields of conservation and landscape ecology and work towards a relationship in which the increasing human activities can be accommodated without damaging the natural environment. This internship is providing me with a firsthand look at how the sciences are being used preserve natural and cultural resources while providing a source of entertainment and wonder for the public. I enjoy camping, hiking, cycling, and kayaking.



**Jaylin Solberg • University of North Dakota**

***Cuyahoga Valley National Park, Ohio***

I am now a Junior at the University of North Dakota where I study Fisheries and Wildlife Biology. When I got to the University of North Dakota, I dived into Zoology right away and tried to get experience in everything and anything related to zoology. I am currently at Cuyahoga Valley National Park and I am researching bats and white-nose syndrome and will be coming up with the best ways to effectively present my research. I am looking for a way to transfer my love for nature and conservation and my enjoyment of educating present and future generations to a position within natural resources! Long-term I am interested in working in the National Park Service. I enjoy hiking, fishing, camping, white water rafting, zip lining, archery, clay shooting, and horseback riding.



“It was not only an internship at Glen Canyon; it was 12 weeks of traveling, friendships, good food, and even better times. It was a time to challenge myself, push myself out of my comfort zone, and say yes to new adventures. It was a period of extreme growth, learning, and development.” – Katherine Ko

“Getting to work in America's first national park has been such a privilege. From the sagebrush flats to the mountain tops, every day in Yellowstone was an adventure.” – Victoria Ibarra



Jeanie Lai / Minute Man National Historical Park

## Internship Surveys

### Pre-Internship Survey

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

I would like increase my knowledge of hummingbirds and learn more about how climate change is affecting their migrations. I also want to network and meet other professionals in similar fields. With my DHA status I hope to find a permanent position at the end of my internship.

I hope to gain experience with utilizing GIS for natural resource management and ultimately to get a foot in the door as I seek a long term career in the federal government. I hope that I can make lasting connections with those in the park.

I hope to gain real world experience as a field scientist with regards to data collection and monitoring protocols as well as data management and professional scientific writing experience.

I hope to gain valuable work experience and training involving national park operations and a professional network of educator and conservation experts.

I hope to gain networking connections, as well as data analysis experience, experience with different research methods, and basic knowledge utilizing Geographical Information Systems.

A better understanding of what it's like to work for NPS, connections to people who have experience in this line of work, knowledge about the variety of jobs possible for someone with my interests/skill set

I think that this MIS internship provides a clear pathway for students from underrepresented minorities to succeed within NPS. I hope to gain more familiarity with the park system and how people of color fit into it - both as visitors and managers.

**Please briefly describe your current views on stewardship, conservation, and/or preservation.**

Conservation is an equal mix of scientific research and education. The research needs to be communicated to the general public in order to generate support for the science. This support through education should theoretically generate support on a governmental scale which will generate policies conducive to conservation.

Stewardship means doing what you can to support the greater biotic community - whether that means conserving core ecological functions or advocating for equal access to natural resources. To me, stewardship takes on two different roles: a social one and an environmental one, neither more important than the other.

It is incredibly important to protect our natural resources and educate future generations about stewardship as well. Even though humans have had too much control over the world around us, it is nevertheless up to us to right our wrongs and preserve what's left. I'm also interested in the intersectionality between conservation and politics, ethics, education, sociology, and anthropology.

Conservation is important to me and I have helped on different conservation projects, even here in Rocky Mountain National Park. I admire people working to save and care for important animals, plants, and land because it is no simple task. I believe if more people care about the impact we make on the environments around us we would be able to see the earth flourish.

I hold stewardship, conservation, and preservation of high importance. Coming from an urban city where people



may not be afforded easy access to stewardship, conservation, and/or preservation opportunities, I find myself very fortunate to have explored such opportunities in order to learn about our environment and engage the public about our environment. Stewardship, conservation, and preservation efforts are essential for ensuring that future generations can enjoy the benefits of natural resources, especially rare and endangered species, and cultural historical sites.

**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.). Please describe them.**

I was hesitant to accept the MIS internship as I have not visited the park at which I will be stationed at (Point Reyes National Seashore) and will therefore be immersed for a considerable length of time in an entirely new area to me. However, I am eager for the opportunity to personally grow from pushing myself out of my comfort zone!

My main concern was having enough personal funds to relocate myself 3 states away.

## Mid-Internship Survey

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

Great! I've enjoyed the environment of the mountains, getting to learn the plants, surveying, and hiking about.

My internship has gone very well so far. I have had a lot of different experiences and have worked with a lot of different groups in the park.

My internship is going well. I am making steady progress on my projects. I have finished sample collection for my most of projects so now I am processing the samples and entering data.

My internship is going great, the island is so much better than I thought it was going to be and i have made huge strides in my outdoor activity and vegetation experience.

My internship is going very well, and my project is right on time. I have had a great time here in the park, and have learned so many skills that are going to help in the future. I could say finally, I am professionally ready to enter the geoscience world.

**Have you learned something you didn't know before? Please describe.**

Among a long list of things I have learned, is the ability to differentiate between plant and animal species and properly identify them. Once knowing some general dichotomies between species, it becomes far easier to identify them.

Yes, I have learned different wildlife management techniques and different visitor resource challenges.

Yes, I have learned a lot about the park's history and cultural resources.

Yes! I've learned lots about what it's like to work for either NPS or other environmental agencies (some non-profit), and I've been trained in a variety of field-techniques that will definitely be helpful in future jobs!

Yes! desert ecosystems, camping, ecology, wildfire, lava/volcanology, tons about bats, bat science/management, conservation, etc.

I've learned how to lead a project and all the skills that come with working in a team. I learned about about working within a park service and all the needed tools that come with it.

I have learned a lot more about pollen and pollen identification techniques. I have also gotten more experience using a microscope and creating microscope slides.

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

It is enlightening to see the intricacies of how the National Park Service is run, and how research is conducted within such a system. If this is so for me, it would likely be even more eye-opening to someone who lives in a city and/or has little access to parks.

Internships like this are really important for both the park and the intern. A lot of this work wouldn't be done without interns, so it really benefits the parks. Interns are really benefited because there are not opportunities like this everywhere and it builds so much skill.

I want them to know that many young people would like to work for the National Park Service right out of college, but the opportunities don't seem to be there. I'd like to see more entry-level positions for recent graduates.

I have had a great time at my park, and everyone has been very welcoming and inclusive. However, diversity programs such as Mosaics in Science are essential in getting the National Park Service where it needs to be when it comes to being representative of our diverse country.

### **What has been most interesting to you?**

It has been interesting to see the flow of data collection to compilation and finally, analysis. When you run the show with your own research project, you get to see these inner workings and are able to make what seems like such an insular and arcane scientific process, more accessible.

Through this experience I've learned about the great white heron which interestingly is believed to be a subspecies of the great blue heron and its range is restricted to South Florida and the Keys.

An interesting point I have learned is how important invasive plant species management is to this park. There are many historical structures, monuments, and rare species in this park. However, without invasives management, invasives negatively impact the conditions of these features. Invasive plant management is a big aspect for effective preservation and conservation efforts.

The most interesting part of the internship has been working outside. Hiking to do work makes me feel great afterwards, and have loved every minute of being here. I have been able to travel all over the southwest and learn many new thing about the USA and Mexico.

Developing programs and getting visitors involved and excited about the park.



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

I was interested in this particular internship because it involved a project involving wading bird ecology and secondly because of it mentioned a pilot study using drones which I had just recently taken courses on.

I was interested in working for the National Park Service and getting experience in resource management.

I was interested in the vegetation monitoring/surveying work and in getting to learn the flora species that exist within the park, as well as, being able to see how the data collected is managed. The projects in which the inventory and monitoring vegetation monitoring are involved, and the surveying techniques utilized.

Two things: its focus on making the NPS community more diverse and providing a great on-the-job learning environment for minority students/recent grads within STEM.

### What were the highlights of your internship experience?

The main highlight was going to the workshop in Colorado. It was a great experience meeting the other interns, learning about not only their projects but their backgrounds. And of course, Rocky Mountain National Park was beautiful.

Some highlights include the networking aspect, getting to know people from the NPS, as well as other interns from different internships. I truly enjoyed having the opportunity to explore the park with this position that involved a lot of hiking around, likely something I wouldn't have done by myself or for myself. Also, being able to practice utilizing the ArcMaps GIS system.

Handling bats and learning how to do acoustic monitoring.

Leading a project in my own park, working alongside other Geoscientist interns and being able to learn something new everyday.

Caving for the first time in my life. Learning about the NPS. Feeling like a valued member of a team whose voice and ideas are considered, rather than a "cog in the machine". Getting cross-disciplinary skills and knowledge. Learning a LOT.


### Did you gain skills and experiences during this internship that may help you attain your long-term goals?

Yes, I believe the experience I received this summer gives me a greater chance at successfully pursuing my conservation career goals. Prior to this internship I did not know where to begin my job search or if I was even competitive enough for a position, however after this internship I am more confident about pursuing this career path.

Yes, I want a career in bat biology now for sure. This internship has solidified it. I know how to do almost everything bat related at least a little bit, and if not I feel comfortable reaching out to people to know more.

Yes. I worked for a senior geologist who gave me lots of tips and insights on where I could find myself in the future.

Yes, I developed skills identifying and differentiating vegetation specific to Rocky Mountain National Park. Learning the process to ID plants alone will help me when I do vegetative work at another park or even if I return to Rocky.



Experiencing field work alone has helped me decide that this is something I would enjoy doing as a career.

This internship allowed me to gain experience in completing an independent research project which is exactly what I wanted to do and is important in attaining long term goals of doing scientific research.

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

The national parks are important to me because they preserve iconic lands for the public. They show people the beauty of the outdoors and how our environment is important to us.

They're important to me because they provide an escape from the busy people-oriented world while also protecting species so future generations can enjoy it just like me.

The national parks are important to me because they preserve the natural habitat and ecosystems that many people can experience for generations on.

National Parks are our country's greatest assets. They protect large swathes of land from being developed and destroyed, while educating the public on why conservation of our environment is important.

### **If you could make one recommendation to the Director of the National Park Service on how the NPS can better connect with young people/adults and diverse communities what would you say?**

Reach out more through social media. Relate to their heritage and culture so that they feel welcome.

Try to reach diverse communities by actually becoming involved in those communities, places where they will actually be and be able to be engaged.

Start going out to schools in poverty struck communities where it is heavily diversified and give kids a option of seeing and doing something they never imagined they could do (ex. More volunteer opportunities, internships, summer jobs or trainings).



## SUCCESS STORY

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



Ricardo Escobar, 2017 Intern

Ricardo Escobar began his career with the National Park Service in the summer of 2017 as a Mosaics in Science intern at Florissant Fossil Beds National Monument (FLFO), Colorado. During his internship at FLFO, Ricardo worked with both the Paleontology and Interpretation divisions to develop a curriculum-based geology/paleontology summer camp for upper-elementary aged youth. It was through this internship that Ricardo earned the Direct Hire Authority (DHA) certificate and was able to secure a permanent position with Petrified Forest National Park (PEFO). Ricardo is responsible for directing the park's environmental education program, where he works primarily with youth from rural and Native American communities in northeastern Arizona. In addition to educational programming, Ricardo also serves as PEFO's community outreach coordinator, where his efforts are geared towards increasing visitor diversity to this National Park Service site. Ricardo earned his B.S. in Geology from California State University, Los Angeles and M.S. in Geology from Western Washington University.

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This summer Kühl outfitted the Mosaics in Science Diversity Internship's participants and staff. With their support, the program was able to provide gear to all of the interns to support their work in national parks across the country.

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!







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Mosaics in Science interns and program staff at Lily Lake, Rocky Mountain National Park