A Wildlife Biologist in the Making

The Mosaics in Science program brought Reina Galvan 2,000 miles from home and one step closer to her dream

Reina Galvan's first experiences with the National Parks were filled with both wonder and responsibility. As a teenager, Reina spent two summers on the staff of a National Park in Colorado called Black Canyon of The Gunnison. She weeded campgrounds, repaired picnic tables, and removed rocks and tripping hazards from trails. Meanwhile, birdcalls echoed off of the canyon walls, imprinting themselves on her memory.

While Reina and her sister—the only two women on the park's maintenance team—rubbed linseed oil into the log walls of the Visitor Center, the canyon's South Rim loomed just beyond, its metamorphic rock formations telling a story millions of years long.

"Every single day, even as maintenance" Reina says, "you'd wake up, you'd see deer all the time. You'd see beautiful sunrises. And the canyon was always just right there. So you're doing your work, but you're seeing the beauty of the canyon."

In Black Canyon, Reina developed a vision for her future. While she emptied the trash from park restrooms and refilled soap dispensers, she reflected on conversations she'd had with the park's natural resources team.

They'd told her about park science, and what she heard stoked her curiosity. Reina noticed, too, that the natural resources team expressed excitement about their work, which impressed her. She thought, "Man, it would be nice to be on the other side, to work for resource management. But," she says, "I didn't really know what it required."

That was five years ago. Now, mere months before Reina expects to graduate from Colorado State University with a degree in Fish, Wildlife, and Conservation Biology, she's again working with the National Park Service, getting invaluable hands-on experience that will help her reach her goal of becoming a wildlife biologist.

Reina is a Mosaics in Science program volunteer with the National Park Service's Northeast Coastal and Barrier Network (NCBN) this summer. In June, she joined NCBN scientists in the salt marshes of Fire Island National Seashore (FIIS) and Sagamore Hill National Historic Site (SAHI) in New York to assist with natural resource monitoring.

Reina uses a refractometer to measure salinity levels of water in pools and tidal ditches. Photo credit: Erika Nicosia, NPS.

Most mornings, Reina starts her day with biological science technicians Erica Brown and Michelle Blydenburgh, and Jessica Cressman, a graduate student from the University of Rhode Island. They eat a quick breakfast together, then put their waders on and load gear into a boat.

Maps, data sheets, pencils, rulers, a GPS unit, a thermometer, a pipette, a refractometer (to monitor salinity), nets, traps, and life jackets all get piled into the boat that they've nicknamed "Mud Turtle" for its comically sluggish motor and flat bottom, which allows them to maneuver, without hazard, through shallow marshes. At around 8 a.m., the four-woman team settles into Mud Turtle's seat-less hull to motor off to one of the salt marsh survey sites.

NCBN biologist Erika Nicosia trained everyone on the team. She has been in charge of collecting data on the variety, abundance, and habitat characteristics of nekton—free-swimming fish, shrimp, and crustaceans that live on the surface sediments of the seafloor—in FIIS and SAHI salt marsh survey sites since 2009. In addition to nekton, Nicosia and her NCBN colleagues monitor vegetation and surface elevation in the marshes to help scientists and park managers learn about trends and changes in this critical coastal ecosystem.

The benefits of NCBN's long-term salt marsh monitoring program, in all likelihood, will multiply with time. Powerful storms, like Hurricane Sandy, which slammed the U.S. East Coast in October of 2012, present park managers with challenging choices about how to mitigate devastating threats to natural, cultural, and structural resources.

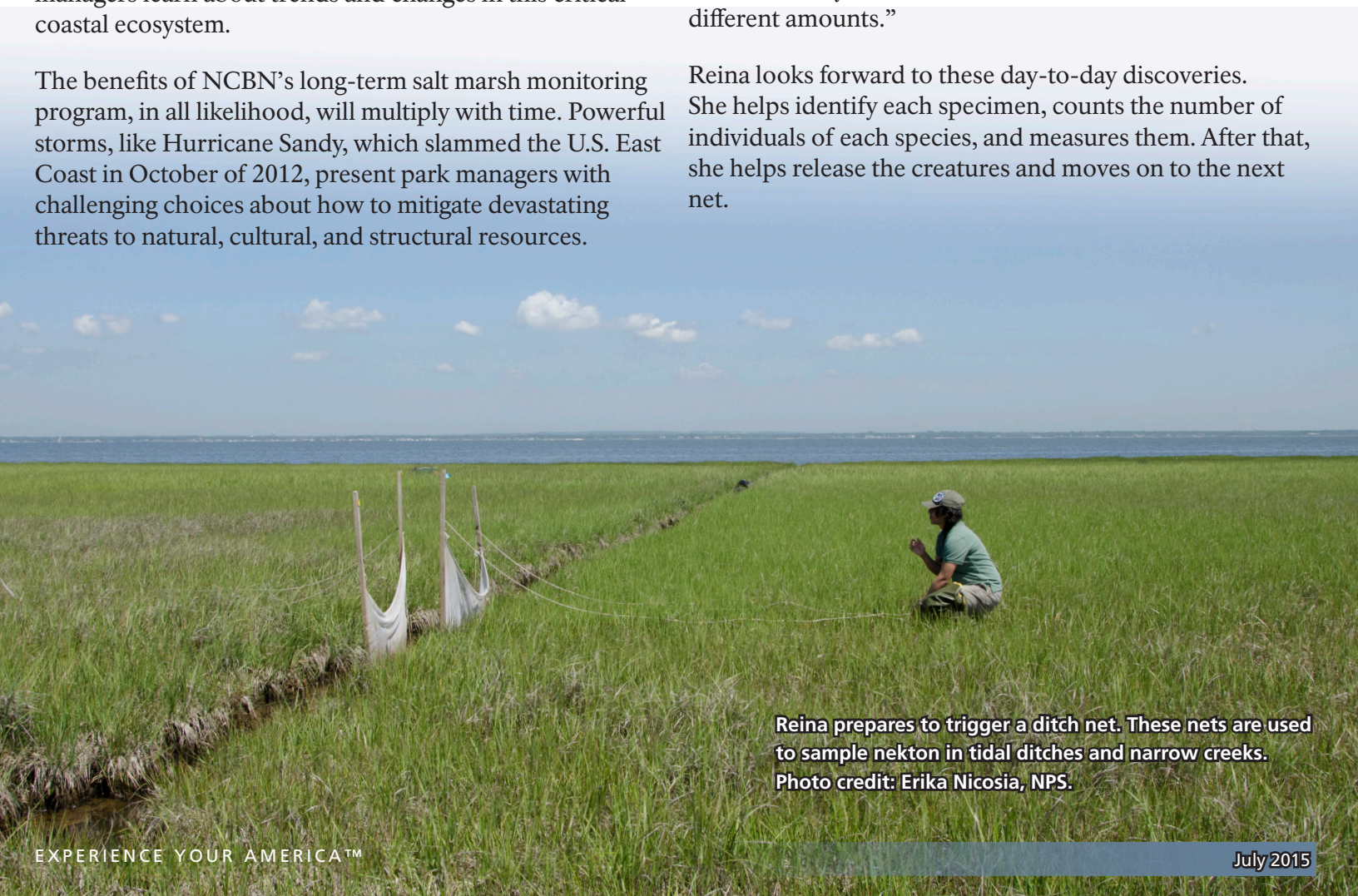
Climate science suggests that, in the future, coastal parks like FIIS and SAHI will confront intense, damaging storms more frequently. This forecast, combined with sea level rise and other climate change impacts, makes long-term monitoring particularly useful for tracking impacts and determining how management decisions could enhance the resilience of coastal natural resources.

As the monitoring team nears their survey site, the "Mud Turtle" slows to a putter. The team consults maps and GPS units to pinpoint their sampling locations, and once they've arrived, they step out of the boat and get to work in a mosquito ditch.

Along with the rest of the team, Reina secures a series of nets, positioning them at intervals through the shallow water that pools in the mosquito ditches. After thirty minutes, Reina returns to the first net with another member of the team and, together, they maneuver the specimens they've caught to the middle of the net so none scatter.

"The most exciting part is when you open it," Reina says. "We found mummichogs, minnows, and different kinds of killifish, and then we found silversides, shrimp, and a blue crab. We always find them in different combinations and different amounts."

Reina looks forward to these day-to-day discoveries. She helps identify each specimen, counts the number of individuals of each species, and measures them. After that, she helps release the creatures and moves on to the next net.



Reina prepares to trigger a ditch net. These nets are used to sample nekton in tidal ditches and narrow creeks. Photo credit: Erika Nicosia, NPS.

Reina tosses a throw trap into a salt marsh pool. Photo credit: Erika Nicosia, NPS.

Later, the team relocates from the mosquito ditches to nearby pools and creeks, where they forego nets for throw traps. Reina has learned the nuances of this method: how to execute an accurate throw so that the trap lands level and right side up, how to skim the bottom and coax the specimens off to a corner before examining what's inside. Again, Reina helps identify, count, measure, and release the catch in each trap.

It's precisely the kind of experience she wanted, Reina says: "Fieldwork is really where you gain the most experience, and you get a lot of different knowledge and skills."

The Mosaics in Science program is sponsored by the National Park Service in partnership with the Geological Society of America GeoCorps program and was designed specifically for young people like Reina. Its purpose is to introduce diverse young adults to careers in National Parks and to encourage them to pursue studies in science, technology, engineering, and mathematics (STEM) fields. Reina is Latina and is the first generation in her family to attend college. She says she needed support to gain exposure to professional opportunities in the sciences.

"I always knew I wanted to go into science," she says, "but as a first generation, I didn't know much other than the basic jobs that you read about, like doctor and lawyer, so I didn't know that wildlife biology was a profession." Reina's sense of wonder propelled her toward her goal of becoming a park scientist, but her experiences working with scientists in National Parks gave her access to people in the field and practical knowledge to help her realize her dream.

As a Mosaics in Science participant, Reina is one among only 24 students nationwide selected to work in parks across the U.S. this summer. In August, the program culminates in a career workshop in Washington, D.C., where Reina will give a poster presentation before an audience of National Park Service staff and managers about the natural resource monitoring work she did in the parks. "It's all about networking," Reina says, "and I'm pretty excited for it."

Reina's dream of becoming a wildlife biologist took shape in the first place because she had the chance to talk and work with scientists in the field, first at Black Canyon, and, later on, during a month-long trip to Tongass National Forest in Alaska with a professor and college classmates, where she worked alongside U.S. Forest Service scientists on salmon habitat restoration. Gradually, through her experience with the NCBN salt marsh monitoring team, and through the Mosaics in Science career workshop, her dream is morphing into reality.

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