



National Oceanic and
Atmospheric Administration
U.S. Department of Commerce



NOAA Education Accomplishments Summary

ADVANCING NOAA'S MISSION THROUGH EDUCATION



FISCAL YEAR 2017

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Justin Holl, Office of National Marine Sanctuaries

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ON THE COVER

Top left: NOAA's Heather Ziel talks to middle schoolers about how NOAA scientists track marine mammals during the 2017 NOAA Science Camp in Seattle, Washington. (Jonathan McIntyre, NOAA Fisheries)

Top right: Children from the Hancock County Unit of the Boys and Girls Club conduct water quality testing on Magnolia Bayou, an important coastal stream that flows into the Bay of St. Louis in Mississippi. (Barbara Ambrose, Riverside Technology, Inc., NOAA National Centers for Environmental Information)

Bottom left: ReNEW Schaumburg and Sci Tech students dissect squid during a Gulf of Mexico Bay Watershed Education and Training grant-funded project. (Polly Burns)

Bottom right: Teacher at Sea participants go on a boat trip during a workshop. (NOAA Teacher at Sea Alumni Association)

LETTER FROM THE DIRECTOR

Partners and friends of NOAA Education,

On behalf of the NOAA Education community, I am pleased to present our 2017 Accomplishments Report. This report highlights the important role that NOAA educators played in meeting NOAA's mission of science, service, and stewardship this year.

This past year brought Earth science into the spotlight. An especially active hurricane season in the Atlantic fueled powerful storms, including Harvey, Irma, and Maria, which devastated many communities in the Gulf of Mexico, Atlantic, and Caribbean. Deadly wildfires in California destroyed thousands of homes and businesses. Drought, flooding, and tornadoes also inflicted heavy damage. NOAA plays a major role in helping our nation prepare for and respond to these environmental hazards, and our sympathies go out to those affected.

Events like these are turning points in people's lives. When I ask our scholarship recipients why they chose to study Earth science, many cite storms of the past—notably, Hurricanes Andrew, Katrina, and Sandy. It is a reminder that, out of tragic disasters, come young people ready to rise to a challenge. This is a testament to the innovation and tenacity of our country. We are proud of NOAA's role in educating the next generation of scientists, engineers, and experts who will help us prepare for these storms in the years to come.

Looking to the future, it's clear that educating the public about Earth science is essential. Whether we're preparing for disasters or managing coastal habitats, public engagement is key. Fortunately, NOAA's tools for studying Earth are now more capable than ever. GOES-16, our new Geostationary Operational Environmental Satellite, became our eyes in the sky, complementing NOAA's existing array of earth observing satellites and allowing us to see our planet in near real-time and stunning detail. NOAA probed the deep ocean with robotic vehicles, beaming data and videos live to researchers, students, and the public. We continued to take the pulse of the planet through a vast network of sensors on land, air, and sea. In this report, you will see examples of how education connects NOAA's assets—our people as well as our ships, labs, aircraft, buoys, data, satellites, and other tools—with the public we serve.

In 2017, we continued to improve our programs and reach diverse audiences. These strides would not have been possible without the help of our friends and partners. It is a true pleasure to work alongside such innovative organizations, talented students, and passionate educators. Thank you for the work that you do.

Sincerely,



Louisa Koch
Director of NOAA Education



INTRODUCTION

Advancing NOAA's mission through education

The [National Oceanic and Atmospheric Administration](#) (NOAA) is a scientific agency that observes and predicts conditions in our ocean and atmosphere. From daily weather forecasts to long-term climate monitoring and fisheries management to marine commerce, NOAA provides communities and decision makers with the reliable information they need when they need it.



Education is an important extension of NOAA's role in environmental research, forecasting, management, and protection. The complex task of improving economic and social well-being through Earth science would not be possible without an engaged public. It is not enough for NOAA to study the ocean and atmosphere; we must also educate so individuals can use our information to support healthy ecosystems, resilient communities, and robust economies.

NOAA takes an "all hands on deck" approach to education. Our educators and partners work in different offices, programs, states, and countries, covering topics that span from the surface of the sun to the depths of the ocean. And while NOAA educators are our front line in reaching the public, we also rely on our scientists who volunteer their time to share their expertise and passion for their work. NOAA education takes place both inside and outside the classroom, reaching people of all ages.

NOAA has continued to build a community of educators within the agency. The core of this community is the [NOAA Education Council](#), composed of representatives of education programs. It is our forum for coordinating efforts and developing new ideas. The Council provides leadership to the NOAA Education community, which includes the staff, partners, and friends who support education. Here, we share some of our success stories from fiscal year (FY) 2017. For more information, see our full [accomplishments report](#).

Students from Meridian Elementary School look for phytoplankton on a microscope projection as part of Great Lakes Education Program on Lake Erie with Michigan Sea Grant. (Justin Selden, Michigan State University)

NOAA Education by the numbers

58 million people visited informal education institutions hosting NOAA-supported exhibits or programs.

NOAA works with institutions to infuse NOAA science into exhibits and programs at science centers, zoos, aquariums, or other informal institutions. These institutions are our ambassadors, helping us reach many more people than we could alone.



450+ institutions increased educational capacity through NOAA-funded centers, exhibits, or programs.

NOAA partners with and funds educational and interpretive programs and exhibits at other organizations, including museums, science centers, after school programs, and nonprofits. By investing in these partners, we engage more people while building enduring relationships with organizations that share our mission.

2.5 million youth and adults participated in NOAA-supported informal education programs.

Both directly and through partners, NOAA supports interactive informal educational programs. Children, families, adults, and communities participate in programs that enhance stewardship and understanding of the natural world. Working in the informal education setting, NOAA extends educational opportunities outside the classroom and promotes lifelong learning.



450,000+ P-12 students participated in NOAA-supported formal education programs.

NOAA supports opportunities to work with students while they are at school, integrating NOAA science and resources into classrooms and the formal learning experience. Students therefore have the opportunity to learn about Earth science from the agency charged with understanding and predicting changes in climate, weather, ocean, and coasts.

25,000+ educators participated in NOAA-supported professional development programs.

NOAA supports and trains teachers and informal educators in Earth science and related topics. The state of the science is constantly changing as we discover more and develop new ways to gather environmental intelligence. Educator professional development programs provide direct conduits from NOAA experts to teachers and classrooms around the nation.



44 million visits were made to NOAA Education websites that support a broad spectrum of educational activities and provide critical information to the nation.

NOAA provides educational resources online. These resources include student opportunities, lesson plans, activities for children and families, and more.

4,400+ postsecondary students were trained in NOAA-related sciences through NOAA-funded higher education programs.

NOAA prepares undergraduate and graduate students for science, technology, engineering, and math (STEM) careers at NOAA and beyond. Students participate in research and career development opportunities, building skills and networks that will carry them into successful careers in Earth science, resource management, and other environmental fields.



790+ postsecondary degrees in NOAA-related disciplines were awarded to students supported by NOAA in higher education programs.

NOAA's scholarship programs support and train students as they complete bachelor's, master's, doctoral, and law degrees in NOAA-related fields. These programs support the best and the brightest students from diverse backgrounds to foster the next generation of NOAA scientists, engineers, lawyers, resource managers, and other experts.

GOAL 1

Science-Informed Society

An informed society has access to, interest in, and understanding of NOAA-related sciences and their implications for current and future events.



Kanesa Duncan Seraphin

OVERVIEW //

NOAA's education programs provide opportunities for students and the public to learn about science and engage in our mission. In Goal 1, we lay the groundwork for an informed and scientifically literate society. We work with a wide array of educators and partners who collectively reach millions of people. We aim to inspire students and the public, help educators incorporate NOAA resources into their classrooms, and build enduring relationships with partners whose expertise complements our own.

OBJECTIVES

- 1.1. Youth and adults from all backgrounds improve their understanding of NOAA-related sciences by participating in education and outreach opportunities.
- 1.2. Formal and informal educators integrate NOAA-related sciences into their curricula, practices, and programs.
- 1.3. Formal and informal education organizations integrate NOAA-related science content and collaborate with NOAA scientists on the development of exhibits, media, materials, and programs that support NOAA's mission.

FEATURED STORY //

NOAA supports STEM in after-school programs at 21st Century Community Learning Centers around the country

The Waterbury Public Schools District is one of the 30 lowest performing districts in Connecticut, and 72.5% of their students qualify for the free or reduced price lunch program. This summer, 75 Waterbury students from grades three to five and their teachers discovered watershed science and explored nearby Long Island Sound and Candlewood Lake with EdAdvance, an education provider that worked with the schools to present “WoW! The Wonders of Watersheds.” Academic enrichment activities like WOW that complement regular academic programs are a great asset for students in underserved schools. Thanks to a NOAA and Department of Education out-of-school pilot program, these students and over 1,500 others across the country had access to high-quality, watershed-focused STEM education in 2017.

Out-of-school programs encourage student interest in learning and engage students who might not otherwise have the opportunity to participate in STEM activities. The [U.S. Department of Education’s 21st Century Community Learning Centers](#) (21st CCLC) program is the largest out-of-school program in the nation, serving over 1.5 million students—particularly those who attend high-poverty and low-performing schools—in all 50 states. In 2017, the U.S. Department of Education invited NOAA to join a federal initiative to support STEM activities at these 21st CCLC sites. As a result, NOAA and the [National Marine Sanctuary Foundation](#) developed a pilot grant program to provide 21st CCLC sites with authentic STEM experiences using components of NOAA’s [Bay Watershed Education and Training \(B-WET\)](#) Meaningful Watershed Educational Experiences (MWEEs).

MWEEs are locally relevant, authentic experiential activities that include learning both outdoors and in the classroom, and they aim to increase the environmental literacy of all participants. Through this new collaboration, experienced B-WET MWEE providers worked with 21st CCLC sites to provide academic enrichment experiences to students and capacity-building to educators. NOAA resources were used to increase participants’ understanding and stewardship of watersheds and related ecosystems. By following the MWEE framework, STEM education was contextualized, emphasizing connections with students’ lives, choices, and communities.

In early 2017, the NOAA/21st CCLC pilot grant program awarded \$500,000 to 17 pilot projects, impacting 37 sites in 15 states and all seven B-WET regions. Over 1,600 youth and 184 21st CCLC educators and staff explored and investigated their local watersheds during out-of-school time. The evaluation indicated that projects excelled at making activities relevant to students’ lives and improved students’ understanding and awareness of the local watershed. Pilot grantees also forged strong collaborations with local 21st CCLC sites, establishing relationships that have the potential to be sustained beyond the pilot program funding.



Students from the Mountaineer Boys and Girls Club in West Virginia work with Friends of Deckers Creek to plant a raised wildflower garden at the Boys and Girls Club site. Students learn about native pollinators and habitat creation for local species as part of a 2017 NOAA-21st CCLC Watershed STEM Education Partnership Grant. (Friends of Deckers Creek)

FEATURED STORY //

Alumni workshops bring teachers together, building on NOAA's Teacher at Sea experience

NOAA's [Teacher at Sea](#) (TAS) Program provides a unique at-sea research experience for teachers, who often describe the opportunity as “transformational.” The program encourages teachers to engage with the TAS Alumni Association and connect with each other via regional workshops. Because research reveals a positive correlation between student achievement and teacher knowledge of science content and pedagogy, the Teacher at Sea Program structures these workshops to expand the teachers' science knowledge, introduce them to local NOAA resources and research, and solidify bonds between educators.

In FY 2017, the TAS Alumni Association collaborated with NOAA laboratory staff in the Pacific Northwest and Gulf of Mexico to host alumni workshops. Workshops included NOAA facility tours, presentations by scientists, hands-on educational activities, and lesson plan exchanges.

All of the participants of both workshops found them so useful that they planned to incorporate content, activities, and experiences from the workshop into their curricula, with some doing so the very next week.

Eighteen alumni from six Pacific Northwest states convened at NOAA's Western Regional Center in Seattle, Washington, in November 2016. Scientists from the Alaska and Northwest Fisheries Science Centers, the Pacific Marine Environmental Lab, and the local Weather Forecast Office gave presentations. Research topics included estimating marine mammal populations, mitigating polluted stormwater runoff, collecting environmental data through buoys and autonomous sail drones, and forecasting local weather and water conditions. The teachers also built miniature, underwater remotely operated vehicles.

“I found it very valuable to reconnect with my experience in TAS and all I learned from it,” wrote one Seattle workshop participant, “I'm excited to redesign my lessons and share them more thoroughly with the students and the community.”

Seventeen alumni from nine Gulf Coast and Southeast states then met at NOAA's Southeast Fisheries Science Center Laboratory in Pascagoula, Mississippi, in May 2017. Local NOAA scientists taught the teachers about sea turtle, groundfish, and larval fish studies, and a shark biologist led the teachers in hands-on shark dissections. On the second day, the teachers participated in a trawling demonstration aboard NOAA Research Vessel *Caretta* and went ashore to clean up a nearby barrier island.

Along with hands-on experience and learning directly from scientists just as they did at sea, Pascagoula workshop participants stated that “meeting the other teachers and NOAA personnel was most beneficial” and that “this type of networking is very valuable and somewhat rare for teachers.” By connecting with fellow alumni and staying engaged in scientific research, these educators are better able to pass that knowledge on to their students long after they return from sea.



NOAA Teacher at Sea alumni came together in Pascagoula, Mississippi, (upper) and Seattle, Washington, (lower) to learn about scientific research in the region, expand their STEM education network, and enhance their at-sea experience. (Teacher at Sea Alumni Association)

FEATURED STORY //

Educators in the Pacific connect new discoveries, traditional culture, and the deep ocean

It's not every day that a research vessel visits a remote island in the middle of the Pacific Ocean. Whenever the [NOAA Ship *Okeanos Explorer*](#) arrives in such a place, the team connects educators to the research taking place in their own deepwater backyards. From July 2015 through September 2017, NOAA's [Office of Ocean Exploration and Research](#) (OER) and partners conducted multiple ocean exploration expeditions in the Central and Western Pacific Ocean aboard the *Okeanos Explorer* as part of the three-year Campaign to Address Pacific monument Science, Technology, and Ocean Needs (CAPSTONE). Expeditions targeted marine national monuments and national marine sanctuaries. These unique places contain some of the last pristine marine ecosystems on the planet and harbor numerous protected species, undiscovered shipwrecks, and cultural landscapes sacred to the indigenous peoples of the Pacific.

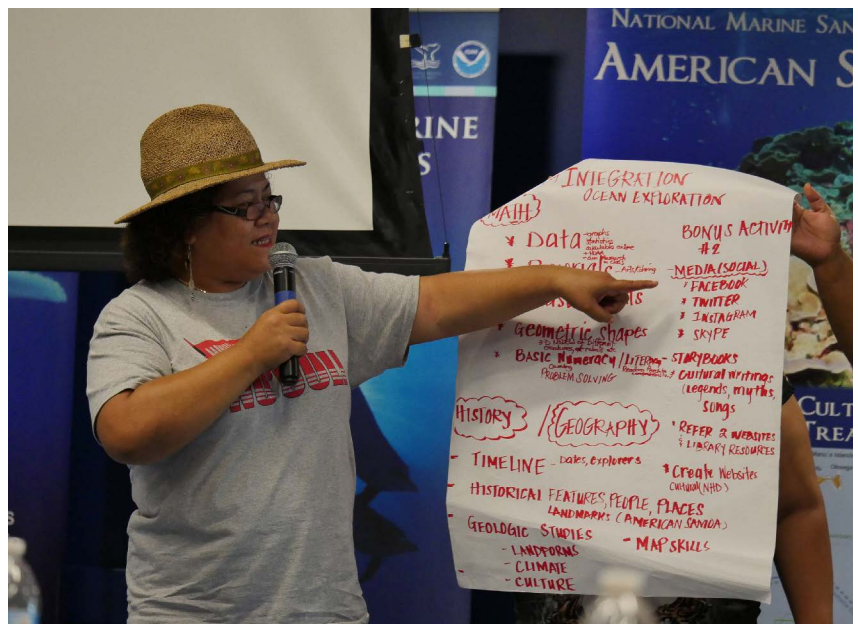
CAPSTONE was also an important opportunity to share ocean exploration results with Pacific Islanders. In April 2017, the *Okeanos Explorer* docked at Pago Pago, American Samoa, after expeditions focused on the National Marine Sanctuary of American Samoa and surrounding waters. Working closely with partners in the National Marine Sanctuary System, OER hosted events to share exploration results with the local community. These events included a professional development workshop and special tours of the ship for educators. OER provided educators with new lessons based on recent exploration results and other teaching resources tailored to American Samoa. The workshop was hosted by the National Marine Sanctuary of American Samoa at the Tauese P.F. Sunia Ocean Center in Pago Pago.

Forty-five public and private school educators from American Samoa participated in an exercise designed to teach their students creative communications skills to share ocean exploration discoveries with their village elders. Educators built short presentations that shared discoveries from the 2017 American Samoa Expedition, wrote stories and songs, and created new games to highlight recent findings and the excitement of exploring the deep ocean in the Central Pacific.

The participants also incorporated the importance of communicating Samoans' unique relationship with the sea based on the living tradition of *Fa'a Samoa* (the Samoan way). By maintaining the vibrant traditions, values, and legends that connect the Samoan people to the land and sea, the local community plays an integral role in protecting and preserving natural and cultural resources.

These activities expose educators in remote locations to NOAA and ocean exploration, increase their appreciation and understanding of the deep water ecosystems of their region, and help them share authentic, current ocean science with their students, creating a bridge between sacred traditions and modern ocean exploration.

“Thank you! This is by far the best activity/professional development. This will really help me in my Earth Science and Biology [instruction].”
- Workshop participant



An educator presents during a communication lesson in a 2017 professional development workshop at the Tauese P.F. Sunia Ocean Center in American Samoa. (Emily Narrow, Global Foundation for Ocean Exploration)

FEATURED STORY //

Students become ‘Estuary Explorers’ at the Elkhorn Slough National Estuarine Research Reserve

Elkhorn Elementary School in California serves a predominantly low-income, Hispanic community that resides within the Elkhorn Slough watershed. In 2014, the [Elkhorn Slough National Estuarine Research Reserve](#) received a [Bay Watershed Education and Training \(B-WET\)](#) grant to create the Estuary Explorers Club, an after-school program in partnership with Elkhorn Elementary School. This program provides a unique opportunity for local students to experience the Elkhorn Slough reserve.

The Estuary Explorers Club is a one-day-a-week after-school program that engages 80 to 100 second- through fifth-grade students in watershed-focused activities. In September, these local school children arrive at the gates of the Elkhorn Slough reserve ready to explore. This program immerses children in the environment through field-walks, hands-on activities, and direct interactions with scientists.

Over the past three years, the Explorers have conducted field studies and collected data through activities that take them into the field with reserve researchers and stewardship staff. Lessons addressed natural resource priorities in Elkhorn Slough: water quality and invasive species, marine and coastal habitat protection, coastal resilience, and climate change. Students gained skills working with water quality tools like the Secchi disk and salinity refractometers as they examined the Slough using the same tools NOAA scientists use.

The Explorers adopted two restoration sites that they visited several times throughout the year for weeding and planting. They learned about the value of restoring native plants to an area and saw the bounty of their work as the sites expanded. “I love dirt! I use[d] to be afraid, but now I want to roll in it!” said one participant.

At the end of each year, Estuary Explorers worked in teams to create posters that address the connections between the watershed, the estuarine ecosystem, and their own lives.

Estuary Explorers presented their projects at an evening event for family and friends. Parents were enthusiastic about the program. One parent commented, “She loves being an Estuary Explorer and coming to the reserve, she can’t talk enough about it!”

The true success of this program was watching the students return each year excited to take on the role of mentor. Students who participated in the first year of the program as second graders were fifth graders in 2017. They developed into passionate stewards for the reserve and confidently shared lessons they learned with younger students.

The long-term goal of the Elkhorn Slough education team is to provide ongoing estuarine education experiences for children to enrich their lives and ultimately benefit the health of the Elkhorn Slough and the surrounding coastal ecosystems. This is one of the many education efforts underway across the country that engage students and communities in the [National Estuarine Research Reserve System](#).

Estuary Explorers conduct field work at the Elkhorn Slough National Estuarine Research Reserve. (Virginia Guhin, Elkhorn Slough National Estuarine Research Reserve)



GOAL 2

Conservation & Stewardship

Individuals and communities are actively involved in stewardship behaviors and decisions that conserve, restore, and protect natural and cultural resources related to NOAA's mission.



Claire Fackler, Office of National Marine Sanctuaries

OVERVIEW //

Promoting awareness of conservation and stewardship is an important way to share NOAA's mission with students and the public. Our programs enable people to participate in habitat monitoring and restoration, everyday behaviors, and policy changes that help improve natural resource management. We are making progress by understanding how our education portfolio supports stewardship and by encouraging educators and institutions to integrate stewardship actions into their educational projects.

OBJECTIVES

- 2.1. Youth and adults from all backgrounds are knowledgeable about conservation and stewardship practices and skilled in applying them to address local, regional, national, and global issues related to NOAA's mission.
- 2.2. Formal and informal educators integrate NOAA-related conservation and stewardship concepts and activities into their curricula, practices, and programs.
- 2.3. Formal and informal education organizations establish guidance and provide support toward increasing participation of education audiences in conservation and stewardship activities related to NOAA's mission.

FEATURED STORY //

Stewardship grants help Florida students take action in their community and improve test scores

Rising sea levels and weather-driven storm surge threaten to inundate low-lying coastal communities and ecosystems. This is becoming increasingly problematic for people, property, and the economy. In Florida, unusually high tides and moderate to heavy rains routinely cause coastal flooding, costly disruptions to communities, and public health and water quality challenges. Teacher Chris Simoniello took action with local St. Petersburg K-12 students through a stewardship project funded by the [NOAA Climate Stewards Education Project](#).

Through NOAA Climate Stewards, educators can apply to join the stewardship community and receive funding to support activities that mitigate or adapt to the impacts of climate change. With funding during the 2016–2017 school year, Chris Simoniello led 60 students from Title I schools in 29 hands-on science lessons. Topics included natural and human contributions to global climate change, the role of coastal wetlands in the sequestration of carbon, and assessing vulnerability to inundation by looking at a variety of flood maps and models. The students developed plans for adaptation to rising sea levels and emergency preparedness plans for severe weather. They also learned about a variety of career options during their lessons, including biogeochemist, meteorologist, wetland ecologist, floodplain manager, and water quality manager. Partners included the University of South Florida, Weedon Island Preserve, Tampa Bay Watch, the City of St. Petersburg, Tampa Bay Estuary Program, and the Gulf of Mexico Coastal Ocean Observing System.

While learning the science behind global warming, sea level rise, and storm surge, the students put their knowledge into action. By changing their behaviors related to transportation, food choices, home energy use, and waste management, they reduced the amount of carbon they released into the atmosphere by 0.8 tons. The students also restored habitat at Bay Vista Park in St. Petersburg, Florida, planting 1,350 plugs of *Spartina* in wetlands, within an area of 2,293 square feet. These marsh grasses will sequester up to 35.77 tons of carbon dioxide annually.

In addition to restoring their local environment, the students gained science knowledge. These improvements were measured by pre- and post-testing, which demonstrated increases in knowledge and understanding ranging from 16% to 88%, respectively. In addition, state test scores of the students in the project exceeded the district and state averages, with 74% of the participants passing, whereas the school had a passing rate of less than 50% in the previous two years.

Over the past six years, the NOAA Climate Stewards funded over 125 educators to implement stewardship projects with their audiences. The program reaches well over a thousand teachers annually with professional development opportunities, such as monthly webinars as well as face-to-face and virtual conferences. In FY 2018, the NOAA Climate Stewards Education Project changed its name to the NOAA Planet Stewards Education Project. This change represents the expansion of the program's scope to include a wider range of NOAA topics related to understanding and protecting our environment, such as marine debris, natural resources, and severe weather events.



Students in the Lakewood High School Aquatic Management Systems and Environmental Technology career program help students at Bay Point Elementary School plant marsh grass in St. Petersburg, Florida. (Chris Simoniello)

FEATURED STORY //

Great Lakes elementary students recycle 68,000 plastic bags, win Pennsylvania Governor's Award

Single-use plastic bags are one of the most common items collected during freshwater and marine cleanups. During the 2016 International Coastal Cleanup, nearly a million plastic bags were collected. As plastic degrades, it affects wildlife health, impairs water quality, and affects shoreline aesthetics. With help from [Pennsylvania Sea Grant](#), students at Iroquois Elementary School in Erie, Pennsylvania, developed a recycling program that put a dent in the plastic bag problem and improved their Lake Erie community.

Iroquois Elementary strives to prepare students for a changing world and promotes responsible citizenship. Teachers encourage students to engage in projects that can affect change in their communities. Iroquois Elementary invited Pennsylvania Sea Grant to speak to students about marine debris and plastics in the environment and specifically, in Lake Erie. At the time, students were looking into environmental topics around which to develop a community-based project. Pennsylvania Sea Grant educators planted the seed, and after researching the consequences of plastic bags in the environment, students in fourth through sixth grade decided to embark on an outreach campaign to improve the recycling and reuse of plastic bags in their community. Pennsylvania Sea Grant supported their efforts by providing resources about plastics and water quality.

Students collected data on plastic bag use by observing and tallying customer use of reusable bags in a local grocery store. They also surveyed school district teachers to determine the percentage of teachers who recycle. Students discovered that the reason for the low rate of recycling plastic bags in their community was that, unlike other recyclables, plastic bags are not collected curbside; they must be taken to specific drop off locations, such as grocery stores.

The students launched a plastic bag recycling program at their school by installing recycling receptacles for plastic bags. The students hosted an assembly for the entire school to introduce the issue and created a competition between classrooms to recycle the most bags, with the winners receiving a pizza and ice cream party.

“The students leading this project made a strong effort to educate their peers and their community about the importance of plastic bag recycling,” said Sarah Skelton, teacher at Iroquois Elementary. “As they educated the students in the school, those students educated their families and neighbors, making this a community effort to recycle plastic bags.” In just two months, the entire school had recycled over 68,000 plastic bags, which were later converted into a park bench by the Trex Company, Inc. As a result, Iroquois Elementary students were awarded the Governor's Award for Environmental Excellence.

“One of the most inspiring aspects of this project is that it was initiated and implemented by a group of fourth- through sixth-grade students,” said Skelton. “They inspired change through education, created awareness, and became a part of the solution.”

“As they educated the students in the school, those students educated their families and neighbors, making this a community effort to recycle plastic bags.”
- Sarah Skelton, Iroquois Elementary School teacher



Iroquois Elementary School students won the Pennsylvania Governor's Award for the recycling program they developed with help from Pennsylvania Sea Grant. (Sarah Skelton, Iroquois Elementary)

FEATURED STORY //

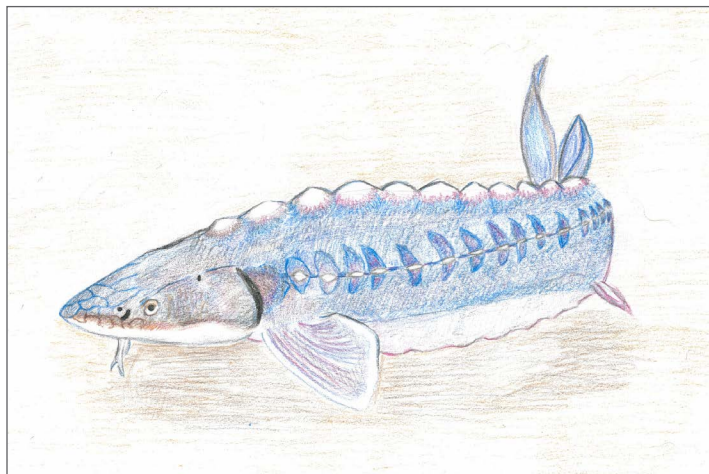
NOAA Fisheries' Endangered Species Day Art Contest inspires students in its seventh year

NOAA Fisheries' Greater Atlantic Fisheries Office (GARFO) coordinated its sixth annual Marine Endangered Species Art Contest in 2017. Endangered Species Day, always the third Friday in May, highlights plants and animals that face extinction, are endangered, or are at risk of becoming endangered. The annual celebration provides an opportunity for people to learn about endangered and threatened species and what we can do to help them.

GARFO's Marine Endangered Species Art Contest, initiated in 2012, raises awareness of protected marine species, including fish, marine mammals, and sea turtles in the Greater Atlantic area from Maine to Virginia, as well as awareness of the Endangered Species Act itself. Student submissions highlight one or more endangered or threatened, ocean-dwelling species in the Greater Atlantic area. The art projects increase awareness and understanding of these species and the role of NOAA Fisheries in their recovery.

What started as a local contest has expanded nationally and internationally, with an entry from Canada in 2016. In 2017, GARFO received 202 pieces of artwork from 13 schools, including those in the District of Columbia, New Jersey, Texas, and California, as well as one home-school submission. Since 2012, over 1,600 students have participated in the contest. NOAA Fisheries honored this year's winning students at an award ceremony on May 25, 2017, held at NOAA Fisheries' GARFO facilities in Gloucester, Massachusetts.

The contest has succeeded in raising and maintaining awareness about endangered species throughout the Greater Atlantic area. Submitted art is displayed for public viewing throughout the month of May in a gallery at GARFO, and the winning and honorable mention entries each year are featured in an online calendar. The winners' schools receive printed posters of their students' artwork, ensuring continued awareness of endangered species throughout the year. In addition, videos of the awards ceremony and artwork can



be seen on the GARFO website and Facebook page. One parent even asked for a photo of her child's submission so that she could surprise her daughter with a cake featuring the artwork! Continued participation in GARFO's Marine Endangered Species Art Contest will provide more opportunities for youth and adults to understand conservation policies and engage in stewardship actions.

NOAA Fisheries' Marine Endangered Species Art Contest winner, first grade: Turtle, by Maia U.



NOAA Fisheries' Marine Endangered Species Art Contest winner, ninth grade: Shortnose Sturgeon, by Isabel O.

GOAL 3

Safety & Preparedness

Individuals and communities are informed and actively involved in decisions and actions that improve preparedness, response, and resilience to challenges and impacts of hazardous weather, changes in climate, and other environmental threats monitored by NOAA.



Eric Workman

OVERVIEW //

NOAA is committed to building a nation that is resilient to environmental hazards. Our agency provides sound environmental science to protect lives and support a strong economy. Hazards come in many forms; therefore, so do the ways we communicate about them. Public awareness is a crucial aspect of safety and preparedness, so education is an important component of any comprehensive resilience effort.

OBJECTIVES

3.1. Youth and adults from all backgrounds are aware of, prepare for, and appropriately respond to environmental hazards that impact health, safety, and the economy in their communities.

3.2. Formal and informal educators use and produce education materials and programs that integrate and promote consistent science-based messaging on hazards, impacts, and societal challenges related to water, weather, and climate.

3.3. Formal and informal education institutions integrate water, weather, and climate hazard awareness, preparedness, and response information into curricula, exhibits, and programs that create learning opportunities for youth and adults.

FEATURED STORY //

Phoenix-area residents learn the science behind resilience to extreme heat and drought

In the southwest United States, drought and heat are commonplace. However, the severity and frequency of both have been increasing, underscoring the need for communities to adapt to these conditions. But how will communities prepare for future extremes? With support from NOAA's [Environmental Literacy Program](#), Arizona State University has been raising awareness and finding solutions through public forums that put community members in the roles of decision makers.

NOAA's Environmental Literacy Program builds on NOAA's understanding of extreme weather and other environmental hazards and helps Arizona's communities and others around the nation build the environmental literacy necessary to become more resilient to the hazards that they face. Arizona State University's Consortium for Science, Policy and Outcomes (CSPO), one of the program's Environmental Literacy Grant award recipients, created "Science Center Public Forums" around four major environmental hazards: extreme heat, drought, extreme precipitation, and sea level rise. A recent public forum, hosted by the Arizona Science Center, brought a group of Phoenix-area residents together to discuss community resilience strategies to address some of these hazards.

Participants learned about the hazards by using NOAA's products focused on heat and drought. Then, they worked through a variety of scenarios and "role played" as different stakeholders in fictional towns to build understanding of different perspectives that should be considered for possible resilience strategies. "The goal is to create replicable capacities at science museums in cities across the U.S. to help citizens, planners and experts to openly discuss science-informed solutions," explained Mahmud Farooque, Associate Director at the CSPO.

Phoenix's diverse communities were represented by sixty participants, selected from over 300 applicants. At the event's conclusion, participants made recommendations for increasing community resilience to extreme heat and drought. These recommendations will be shared with state and local government officials and other stakeholders. During the forum, participants had the opportunity to hear about their city's resiliency from Mark Hartman, Phoenix's Chief Sustainability Officer, and to share with him their thoughts on Phoenix's plans.

The forum increased participants' understanding and interest in these issues. Pre- and post-forum surveys showed that the number of participants who strongly agreed with the statement, "it is important for my local community to develop and implement a resilience plan," increased from 42% to 84%. Similarly, the percentage of participants who reported that they knew "a lot about the climate-related hazards that could affect their local community" increased from 18% to 65%.

This event exemplifies efforts to build resilience through education that are underway in 13 projects throughout the nation, supported by NOAA's Environmental Literacy Program. To date, these projects have served more than 90 communities in 24 states.



Arizona State University, an Environmental Literacy Program grantee, engages Phoenix, Arizona, residents in a public forum exploring how communities might adapt to extreme heat and drought. (Arizona State University)

FEATURED STORY //

Severe weather meteorology simulation puts people in ‘The HotSeat’

What’s it like to make high pressure warning decisions?

When the National Weather Service issues a tornado warning, people in homes and business may have only minutes to seek shelter. But what goes on behind the scenes during these life-and-death decisions? Now participants can find out for themselves in a simulated severe weather forecast scenario.

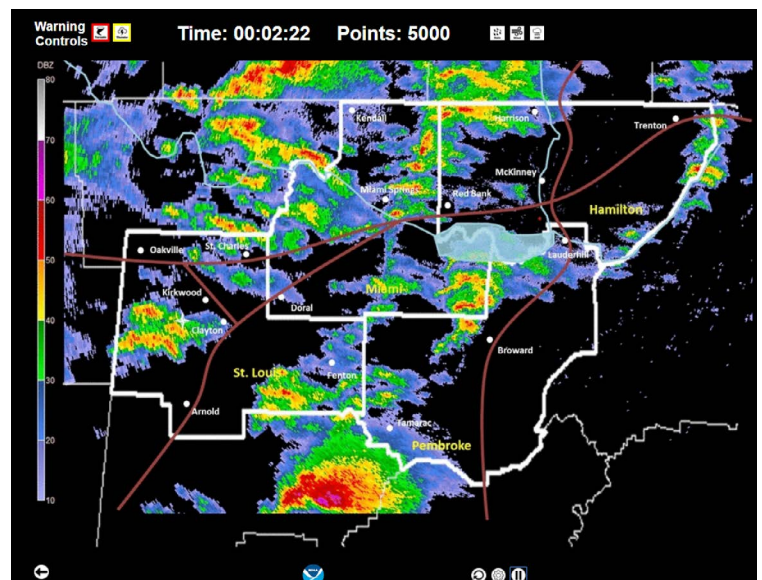
HotSeat is a science-based, personal computer simulator that gives the general public, educators, and students an appreciation of the meteorology of severe weather events and the decision-making processes that go into warnings at NOAA’s [National Weather Service](#) offices. The software was originally developed at the Weather Forecast Office in Peachtree City, Georgia, with continued development at NOAA’s National Severe Storms Laboratory. HotSeat uses archived Weather Surveillance Radar (WSR-88D) data, severe weather reports, and pictures of damage caused by actual storms in a displaced, real-time mode to capture the experience of issuing severe weather warnings in the National Weather Service. Upon completion of each event, the participant receives a score indicating his or her success in the simulation. Each simulation runs approximately 20 minutes.

The HotSeat simulator was first shared in 2006 at an American Meteorology Society WeatherFest in Atlanta, Georgia, and has been showcased at numerous other events across the United States. The National Severe Storms Laboratory made the program available online in 2017; since then, more than 1,800 visitors have tried it out. The use of the simulator in classroom settings can complement teachers’ weather units in science and may inspire future scientists. HotSeat can also be used to train emergency managers and other key officials. The National Weather Service hopes that HotSeat participants will become better users of severe weather warnings when they understand the process behind the forecast. Feedback from participants has been overwhelmingly positive. Many cannot believe how stressful the decision-making process is and how much information is presented in such a short period of time. All information has to be processed rapidly to make life-saving decisions!

WeatherFest participants test their skills at issuing severe weather warnings. (Lans Rothfus, National Severe Storms Laboratory)



HotSeat uses archived Weather Surveillance Radar (WSR-88D) data to simulate a forecast scenario. (NOAA)



FEATURED STORY //

Weather-Ready Nation Ambassador Care Model strengthens education

Minnesota is known for harsh winters, filled with snow storms and below-zero temperatures. When the snow melts and the ground thaws, dangerous thunderstorms can bring flooding, hail, and tornadoes. As a result, [National Weather Service](#) (NWS) meteorologists in Minnesota's Twin Cities need all the help they can get in spreading the word about weather safety. To meet this need, the Twin Cities Weather Forecast Office (WFO) developed a creative way of connecting with their partners through the Weather-Ready Nation Ambassadors (WRN) initiative. Their approach has been so successful that it is now being replicated in forecast offices across the country.

The NWS works with partner organizations through the Weather-Ready Nation Ambassador initiative. Through this program, organizations like schools, community organizations, government agencies, hospitals, the media, and a wide variety of private businesses get resources from the NWS and play a role in keeping their communities safe. As its ambassador program flourished and expanded, the Twin Cities office saw a growing need to diversify communication and education strategies. Staff in the Twin Cities WFO conducted needs assessments and listened to their ambassadors. The Ambassador Care Model (ACM) emerged out of their desire to enhance WRN Ambassador communication and education, revolutionizing their ability to connect with new ambassadors and strengthen relationships with existing ones.

The ACM outlines how to interact with WRN Ambassadors and is a ground-breaking way to provide service in today's NWS. Instead of communicating about weather hazards on a case-by-case basis, the NWS Twin Cities office now works with WRN Ambassadors year-round to empower them to become champions of weather safety and weather preparedness information. The Twin Cities office opened the line of communication to all their ambassadors, listened to their questions about weather preparedness, and gave them the tools they needed to get their employees, students, or clients weather-ready. Using the tools in the ACM, the Twin Cities WFO provides tool to guide effective life and property decision making. This guidance integrates hazard education with preparation, communication, and real-time weather information.

After implementing their Ambassador Care Model, the Twin Cities office saw a sharp rise in ambassadors sharing NWS safety content on social media and websites. More organizations and private businesses began displaying weather safety posters in their buildings or sharing weather safety information in publications. WFO staff have also been invited to outreach events that the office was unaware of before establishing the ACM.

The Ambassador Care Model has now been distributed to every weather forecast office in the nation, allowing individual WFOs to build long-term relationships with their ambassadors and to provide richer and more integrated community education experiences. With nearly 6,500 ambassadors and over 2,800 new ambassadors enrolled over the last year, the initiative has grown significantly.



Instead of creating a traditional gift basket for their annual holiday auction, these second-graders decided to prepare a weather-ready kit. (Michael Lewis, National Weather Service)

FEATURED STORY //

Resilience planners and climate educators put their heads together to keep communities safe

Cities, counties, and states are leading local responses to climate change and extreme weather. The need to act is increasingly urgent; in 2017, the United States experienced 16 separate billion-dollar weather and climate disasters. Communities are on the front line in dealing with climate impacts, and this challenge allows them to innovate and experiment with sustainable and resilient living. Currently, 18 states are using resilience and adaptation plans to prepare their communities for future environmental conditions. Additionally, cities and regions all around the country are tackling the same issues at the local level. In 2017, NOAA participated in two meetings that brought educators together with leaders of communities that seek to meet climate goals.

The Climate Education and Opportunities Collective Impact Summit was held in September 2017 in Sundance, Utah. City and county leaders from across the country met with climate change education professionals, including NOAA's [Climate Program Office](#), to explore how education can help communities meet their climate and resilience goals. Representatives from cities that are already experiencing the impacts of a changing climate shared their needs. Climate educators helped connect them to existing resources and best practices gleaned from a decade of climate education initiatives. Together, participants brainstormed about next steps. The community leaders and colleagues from the climate education community explored results from federal and philanthropic initiatives and concluded that these initiatives are key to supporting their communities' climate actions through effective education.

These findings were echoed at a separate workshop that NOAA hosted in September 2017. NOAA's [Office of Education](#) held the [Environmental Literacy Program](#) Resilience Education Grantee Workshop at the Museum of Science in Boston, Massachusetts. These grantees are using education to support community resilience to extreme weather events and other environmental hazards. NOAA supported projects that integrated city- and state-level resilience plans into their education efforts and collaborated with organizations involved in implementing those plans. A panel of city and state planners explained why they need an informed community to support their efforts. With 13 grantees at various stages of implementing their projects and testing different approaches to demonstrating how education can support resilience goals, the workshop provided a venue to explore challenges, opportunities, and best practices for this emerging field. Grantees began to build a community of practice, sharing what they are learning, how they are working with their local city planners, and how they are integrating resilience and climate adaptation plans.

Both workshops paved the way for increased collaboration among NOAA's education partners and grantees to better support cities and states in their resilience efforts. NOAA will continue to foster relationships with and among its partners to strengthen the collaborators' and grantees' work on climate and resilience education. At these workshops, participants concluded that education partnerships can support climate actions in communities while also preparing the new workforce and equipping citizens, professionals, and other influential leaders with the scientific foundation necessary to make informed decisions.

City leaders and climate educators discuss how education can support communities' climate actions over the coming decades at the Climate Education and Opportunities Collective Impact Summit. (Frank Niepold, NOAA)



GOAL 4

Future Workforce

A diverse and highly skilled future workforce pursues careers in disciplines that support NOAA's mission.



Tanya Rogers, National Science Foundation Graduate Research Internship Program

OVERVIEW //

Building and supporting a diverse and skilled future STEM workforce is critical. NOAA relies on a sustainable workforce pipeline that ranges from introducing young students to NOAA careers to preparing graduate students to be successful in the workforce. Stories in this section demonstrate how NOAA programs are inspiring and cultivating the next generation of scientists that resemble our diverse nation.

OBJECTIVES

- 4.1. Students, particularly from underrepresented groups, consider education and career pathways in disciplines that support NOAA's mission.
- 4.2. NOAA and partner institutions leverage federally funded assets to provide students, particularly those from underrepresented groups, with experiential learning, research, and scholarship opportunities.
- 4.3. Postsecondary students, particularly from underrepresented groups, pursue and complete degrees in disciplines critical to NOAA's mission.
- 4.4. Graduates completing NOAA-supported student opportunities continue education, enter the workforce, and advance in careers that support NOAA's mission.

FEATURED STORY //

NOAA Boulder hosts Tribal Colleges and Universities Science Day

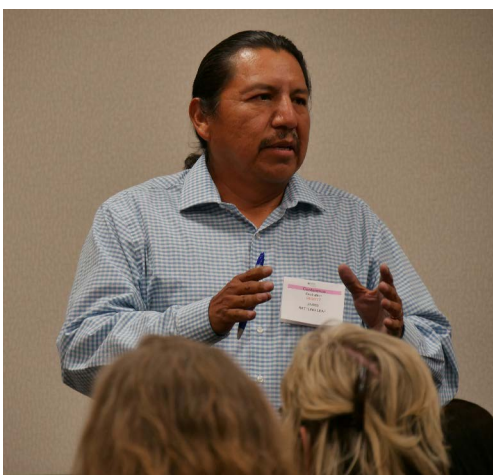
In the cultures and traditions of many indigenous peoples around the world, humans are deeply connected with nature. Because of this intimate relationship, Native groups are recognized as vital stewards of our environment. Tribal Colleges and Universities foster this indigenous knowledge, and NOAA is embracing their role as valuable partners in environmental research and management. In addition to serving as a bridge between indigenous knowledge and NOAA science, Tribal Colleges and Universities are resources for achieving a diverse and talented workforce at NOAA.

On September 20, 2017, the [NOAA office in Boulder, Colorado](#), hosted a Tribal Colleges and Universities Science Day in coordination with the 40th American Indian Science and Engineering Society annual conference held in Denver. The event brought together students from six Tribal Colleges and Universities: Fond du Lac in Wisconsin, Haskell in Kansas, Leech Lake in Minnesota, Northwest Indian College in Washington, Nueta Hidatsa Sahnish in North Dakota, and Sinte Gleska in South Dakota.



Students toured the NOAA facility and met with senior scientists to learn about NOAA science relating to extreme weather and the impacts of wildfires on climate. They also learned about student opportunities at NOAA, such as the Educational Partnership Program with Minority-Serving Institutions and NOAA Hollings Scholarship. In turn, NOAA learned about issues that need to be considered when developing long-term plans for recruiting and retaining tribal college students in NOAA careers. The students' barriers include cultural issues, such as leaving their home and community for a 10-week internship, and concerns about how students from lower-income universities might measure up to other applicants.

The NOAA office in Boulder, Colorado, hosted a Tribal Colleges and Universities Science Day in coordination with the 40th annual American Indian Science and Engineering Society conference. (NOAA)



Immediate feedback on the whole day was positive. Thayne Yazzie of the Northwest Indian College said, "Thank you so much for the wonderful opportunity to join in the NOAA Tribal Science Day! I had an absolute blast and look forward to future opportunities as well as integrating more students and tribal youth into your programs." Overall, NOAA hosts and their guests from Tribal Colleges and Universities alike came away with knowledge and connections as they joined forces to bring indigenous backgrounds and knowledge to bear on the environmental problems we all share.

James Rattling Leaf speaks at NOAA Tribal College and Universities Science Day in Boulder, Colorado. (NOAA)

FEATURED STORY //

NOAA scholars are making waves in the private sector

Over the past 12 years, the [NOAA Hollings](#) and [Educational Partnership Program with Minority-Serving Institutions](#) (EPP/MSI) undergraduate scholarships have supported over 1,300 students studying in STEM fields, social science, and education. The scholarships provide students with two years of financial support and valuable research experiences that may not otherwise be available at the undergraduate level. NOAA scholars spend 10 weeks in their summer internships gaining hands-on research and technological experience at NOAA labs and facilities. Nearly half of the alumni in the workforce are putting their skills to use in the private sector, working as environmental consultants, meteorologists, engineers, hydrologists, and more.

Many NOAA scholarship alumni are using their skills in the environmental consulting industry. Dr. Kersey Sturdivant, a 2005 EPP/MSI undergraduate scholarship alum and professor at Duke University in North Carolina, helped start a small business based on sediment profiling technology he worked on as a graduate student. His company, INSPIRE Environmental, performs rapid marine environmental assessments of the sea floor. He has worked with clients on off-shore wind and energy habitat assessments as well as monitoring the recovery of deep sea habitats after the Deepwater Horizon oil spill.

Kersey said that the mentorship he received during his NOAA scholarship experience was invaluable. Now he mentors students and advises that many science careers offer rewarding work, including opportunities in the private sector. In addition, scholarship alumni have built careers with environmental consulting firms such as AECOM, Closed Loop Advisors, and Environmental Resources Management.

Several NOAA scholarship alumni work as meteorologists in the private sector, including Abby Dyer, an on-air meteorologist for the local NBC/ABC affiliated television station in Missouri, KY3. As a 2009 Hollings Scholar, Abby created a program for Science On a Sphere® entitled, “Vog [smog or haze containing volcanic dust and gases] on the Island of Hawaii,” during her internship at the Imlilo Astronomy Center of Hawaii. She analyzed data from the Mauna Kea Observatory and local weather forecast office and created visuals to represent the data. In addition, she utilized her communication skills to write and record the script. The experience inspired her to pursue a broadcast career.

Today, Abby’s forecast reaches 42 counties in Missouri and Arkansas. Her job is to forecast the weather daily for her viewing area and effectively communicate watches and warnings issued by the region’s National Weather Service forecast offices. Abby mentors an intern every summer, and future meteorologists often shadow her on the job. She tells the students about the opportunities offered by NOAA undergraduate scholarships. Other NOAA scholarship alumni are putting their meteorology skills to work at companies including CNN International, Zurich, Weather Decision Technologies Inc., and Risk Management Solutions.

Both private and public sector organizations play critical roles in providing environmental information. NOAA undergraduate scholars develop transferable skills that set them up for success in any sector.

Dr. Kersey Sturdivant, an EPP/MSI alumnus, conducts an environmental assessment for the Block Island Wind Farm. (Kersey Sturdivant)



Hollings Scholarship alumna Abigail Dyer is a storm team meteorologist with NBC/ABC-affiliated television station KY3 in Missouri. (Abigail Dyer)

FEATURED STORY //

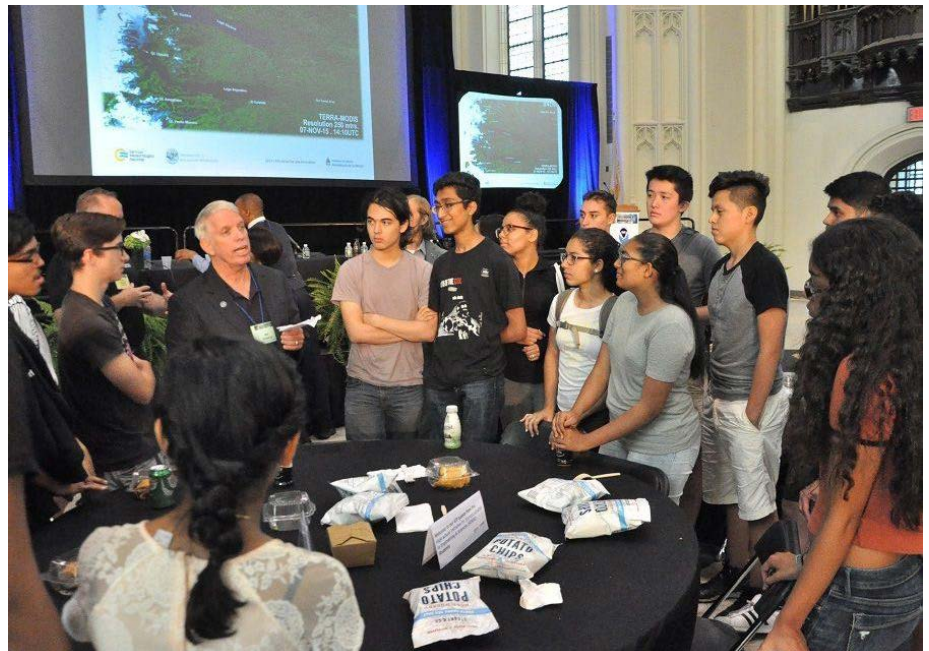
NOAA Satellite Conference launches careers for remote sensing experts

From detecting greenhouse gases to tracking harmful algal blooms and even monitoring natural resources, satellite technology allows NOAA to observe changes to Earth's surface and atmosphere. The National Research Council emphasized the importance of highly trained remote sensing technical staff for interpreting and translating these complex data for use by the public and private sectors. If the United States is to remain on the forefront of this technology, it is critical to train our next generation in remote sensing technology.

Conferences provide a unique opportunity for students, novice researchers, experts, and product developers to build relationships, present and learn about new ideas, and solve problems. However, there are a limited number of conferences that focus on remote sensing and even fewer that allow for specialized training for users at all levels on cutting-edge satellite data. The [2017 NOAA Satellite Conference](#) was able to fill this gap. The 2017 Conference focused on the theme, "A New Era of NOAA's Environmental Satellites." It was sponsored by NOAA's [Satellite and Information Service](#) and hosted by the NOAA [Center for Earth System Sciences and Remote Sensing Technologies](#) (CREST) at the City College of New York. In keeping with the theme, conference sessions focused on educating students and professionals about the capabilities of NOAA's new satellite systems that will launch or become operational in the near future, including the next-generation geostationary satellites known as the GOES series and JPSS-1, the first of NOAA's new polar-orbiters.

More than 390 participants from 40 countries attended the conference, including 220 students and young professionals. The main conference was held from July 17-20, 2017, preceded by a two-day workshop with more than 90 participants. CREST, in partnership with other institutions across the nation, is funded by NOAA's [Educational Partnership Program with Minority-Serving Institutions](#) and focuses on recruiting and retaining students from underrepresented groups. At the conference, students showcased the results of their collaborative research projects through posters and oral presentations. Organizers held training sessions geared toward students and introductory users on GOES and JPSS. The organizers sponsored a career fair during the conference, where students were able to gain career insights and potential job leads. Students were also matched with NOAA employees to gain one-on-one experience through mock interviews.

The conference engaged students from [NOAA Cooperative Science Centers](#) and City University of New York campuses, a diverse population that includes significant number of students from underrepresented minority communities. This conference provided the students and faculty an out-of-the-classroom educational and professional experience. The use of SLI.do, a tool designed to foster audience interaction, and social media helped conference organizers gain valuable insights and feedback from the participants. Twenty-seven percent of participants found the conference "relevant" to their jobs and 59% found it "very relevant."



Students and young professionals network with renowned scientists and experts from across the globe at the NOAA Satellite Conference. (NOAA)

Organizational Excellence

NOAA functions in a unified manner to support, plan, and deliver effective educational programs and partnerships that advance NOAA's mission.



NOAA

OVERVIEW //

NOAA has over 12,000 employees and a mission that spans from the surface of the sun to the ocean floor. Like other large organizations, we face the challenge of coordinating and communicating to help everyone stay on the same page. NOAA Education has made progress toward breaking down organizational silos, both within and across programs. The goal of organizational excellence drives us to enhance and measure performance to provide the best service to the public.

OBJECTIVES

5.1. Leaders internal and external to NOAA recognize and support education investments as a way to achieve agency mandates, mission, and goals.

5.2. The NOAA Education community develops implementation plans and establishes agency education priorities informed by stakeholder needs and national initiatives.

5.3. NOAA educators and partners collaborate at local, regional, and national levels to coordinate efforts, build capacity, and better serve educational audiences.

5.4. NOAA and partner organizations use effective evaluation, performance monitoring, and evidence-based approaches in the design and management of educational programs, products, and services.

5.5. NOAA develops and supports a coordinated portfolio of products, programs, and partnerships that improves education opportunities in NOAA-related content areas for underserved audiences.

GOAL HIGHLIGHTS //

Update on the FY 2016-2017 Implementation Plan

The NOAA Education Council developed a two-year implementation plan in 2016, which documented the steps we took to expand and improve our current set of programs. Here are some highlights from the Education Council working groups.

- ▶ The [Implementation Plan](#) outlined 29 high-priority actions, including the efforts of individual programs as well as collaborative working groups that involve educators from across NOAA. We completed 28 out of the 29 actions (a 96% success rate). For more information, see our full [accomplishments report](#).
- ▶ The **Diversity and Professional Advancement Working Group** (DPAWG) identified at least one champion from each line office to facilitate and support strategies to better prepare candidates for advancement, connect more effectively with other line offices, and encourage underrepresented groups to pursue leadership positions. The working group also increased membership from 17 members in 2014 to 36 in 2017 and expanded their membership to include social scientists and clerical and administrative personnel. In addition, the DPAWG developed and approved an official charter along with three supporting committees focusing on recruitment, retention, and advancement.
- ▶ The Education Council **Underserved Audiences Working Group** conducted an inventory of education programs at NOAA that target underserved groups. The working group received survey responses from 44 programs and conducted nine case studies. The working group is currently developing a report to summarize their findings. This information helps articulate how education supports NOAA's goals of diversity, inclusion, and reaching audiences from diverse backgrounds.
- ▶ The **Products, Programs, Development, and Delivery Working Group** (P2D2) developed an instructional resources review tool that can be used to determine how well NOAA and NOAA-partner resources fit three-dimensional learning, which includes Next Generation Science Standards. P2D2, in partnership with the Internal Professional Development Working Group, completed a needs assessment with NOAA educators to determine the needs for three-dimensional learning training and offered an introductory webinar and two-day workshop. Through these activities, the NOAA Education community is better able to create products that meet the needs of educators.
- ▶ The **Internal Professional Development Working Group** developed seven informational webinars to give an overview of NOAA Education. These webinars are easily accessible as a [new resource collection](#) on the NOAA Education website. The site was viewed 215 times, each video averaging 30 views, between February and October of 2017. This resource promotes better cross-agency coordination while demonstrating the connection between NOAA Education and the agency mission.
- ▶ While NOAA Education serves the entire nation, most education happens at state and local levels. The **Regional Collaboration Working Group** has coordinated three regional NOAA educator networks (Chesapeake Bay, Pacific Islands, and Alaska/Pacific Northwest). They identified regional priorities and are working to establish a new network in the Great Lakes. The working group created a self-assessment questionnaire, completed by each of the four pilot networks, and used the results of the questionnaire to document best practices, common strategies, and unique approaches in each network. By connecting NOAA educators and partners on the regional level, each can better meet the unique needs of the people they serve.

FEATURED STORY //

Promoting conservation and stewardship to diverse audiences through national marine sanctuaries

First-generation and low-income students are at major disadvantages when it comes to experiencing the outdoors and pursuing ocean conservation careers. The [NOAA Office of National Marine Sanctuaries](#) is working to make America's underwater treasures accessible to youth of all backgrounds. These learning opportunities encourage individuals and communities to be involved in stewardship behaviors and decisions that conserve, restore, and protect our underwater parks. They also prepare a diverse range of students for the workforce.

The [Ocean Guardian School Program](#) gives students from disadvantaged backgrounds opportunities to learn about the ocean, marine science careers, and stewardship. Starting in 2016, the program began targeting Title I schools to apply and receive funding by building capacity within the school community. Students learn new skills to implement a local stewardship project, giving them ownership of their community environment. This past school year, there were 35 Ocean Guardian Schools, 12 from low-income areas, reaching 6,689 students.

To reach other diverse communities, NOAA sanctuaries provided diversity and inclusion funding for new programs. Through this funding opportunity, more than 100 different activities targeted underserved audiences, reaching 2,942 K-12 students, teachers, and interested parties in [Monterey Bay](#), [Greater Farallones](#), [Channel Islands](#), and [Stellwagen Bank](#) National Marine Sanctuaries. In Stellwagen Bank National Marine Sanctuary, this funding supported a new program titled “Whale Ambassador—Every Kid in a Park.” Stellwagen Bank education staff connected with a Title I school in Boston, Massachusetts, for a three-week program that included a visit by the sanctuary's life-size inflatable whale, a trip to the New England Aquarium, and whale watching in the sanctuary. Staff also collaborated with the Hispanic Access Foundation and worked with the Dominican community in Lawrence, Massachusetts, and a Title I school summer program to raise awareness about the ocean, whales, and NOAA careers, culminating in a whale watch during Latino Conservation Week. Greater Farallones National Marine Sanctuary staff focused on bringing Title I schools in the San Francisco Bay area hands-on ocean science experiences. The programs varied by age and taught topics ranging from good seashore manners to changing ocean chemistry.

In addition, many programs incorporate traditional knowledge. For instance, at the [Moku-papapa Discovery Center](#) located in Hilo, Hawaii, the Navigating Change Program, an education and environmental stewardship program that incorporates traditional knowledge with western science to inspire the next generation of conservation leaders, worked with almost 1,682 Native Hawaiian students.

At the graduate level, the [Dr. Nancy Foster Scholarship Program](#) builds connections between underrepresented students and the ocean by recognizing outstanding scholarship and encouraging research, particularly by female and minority students. Recent changes to this scholarship program have helped ensure that underrepresented graduate students with the greatest financial need have a better chance of ranking higher in the application process.

Through these programs, sanctuaries are reaching new audiences and supporting communities from all backgrounds. In FY 2017, the National Marine Sanctuary System reached 22,903 underserved youth.



Elementary school students from an Ocean Guardian School in Santa Barbara, California, participate in a kayaking adventure. (Claire Fackler, Office of National Marine Sanctuaries)

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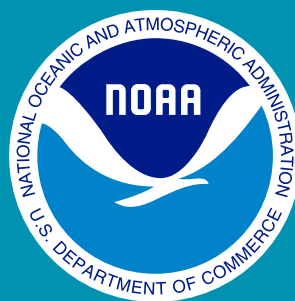
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