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EDUCATION

Dry ice, a pH indicator, and water can be used in the classroom to demonstrate the acidifying effects of carbon dioxide in ocean water. This simple, but effective demonstration is one engaging tool that was provided to attendees at the NOAA/NSTA climate change symposium March 2010.

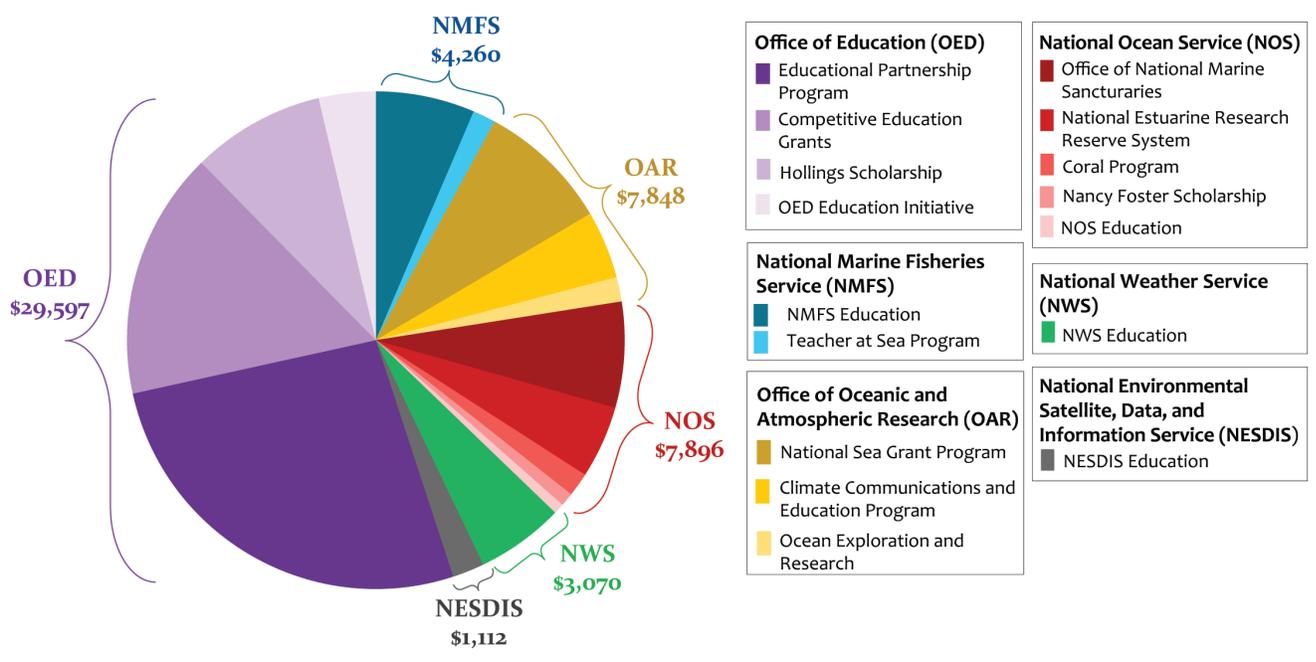
CREDIT NOAA/CRCP

NOAA'S EDUCATION MISSION

NOAA's education mission is "to advance environmental literacy and promote a diverse workforce in ocean, coastal, Great Lakes, weather, and climate sciences, encouraging stewardship and increasing informed decision making for the Nation."¹³ In FY 2011, NOAA's investment in education was \$53.7 million, 1.2% of the total NOAA enacted FY 2011 budget.

In FY 2013, NOAA estimates an investment of approximately \$42.1 million in education funding, of which \$11,266 thousand is for the Office of Education through the "Competitive Educational Grants and Programs" budget line.

NOAA Education Investment by Program for FY 2011, in \$1,000s
 Total Education Investment for FY 2011 = \$53.8 Million



¹³ The America COMPETES Reauthorization Act, 2010 (P.L. 111-358) gives NOAA broad authority for educational activities. With this statutory authority and other program-specific education mandates, the NOAA education community works collaboratively to advance the priorities outlined in NOAA's Education Strategic Plan.

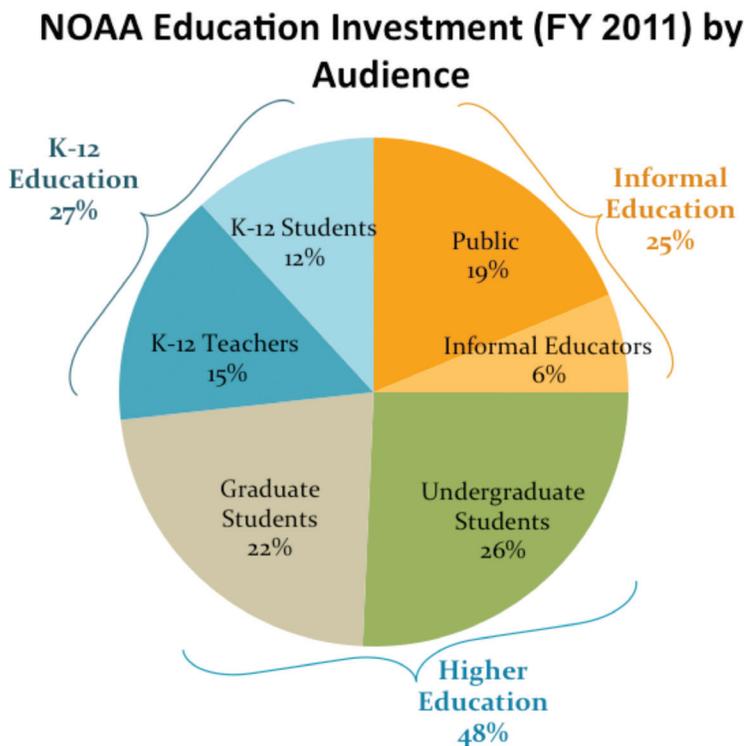


This request includes \$10 million for the Educational Partnership Program and \$1.3 million to pay for salaries and administrative costs. The balance of the estimated FY 2013 request is within each line office.

WHO WE SERVE

NOAA's education activities connect NOAA-related sciences, places, products, and services with the public, students (K-12 through post-graduate) and educators across the country. NOAA education activities promote environmental literacy and help to create a future workforce that reflects the diversity of the Nation. NOAA's programs support a wide range of Science, Technology, Engineering and Math (STEM) fields, including ocean, atmospheric, climate, and environmental sciences. These programs invest resources in education activities as required by legislation and as a means of meeting their broader program mission. These education investments are a vital component of NOAA's science, service and stewardship functions and combined, they form a robust education portfolio that is unique within the federal government. The agency's education portfolio also leverages external capabilities through a wide array of partnerships with academic and other education institutions, and other federal, state and local agencies, to reach our target audiences across the Nation.

Highlights of NOAA's FY 2011 education accomplishments by program follow.





2011-2013 Undergraduate EPP Scholars

EDUCATIONAL PARTNERSHIP PROGRAM

The Educational Partnership Program (EPP) with Minority Serving Institutions provides financial support to academic institutions through competitive processes. The program's goal is to increase the number of students from underrepresented communities who are trained and graduate with degrees in STEM fields directly related to the NOAA. In FY 2011, 11 undergraduate scholarship students were recruited by EPP; five student trainees became NOAA employees; 366 students were supported by EPP's Cooperative Science Centers (CSCs) and 93 graduated with degrees in STEM fields. Since EPP started in 2001, NOAA has hired 102 CSC students. <http://www.epp.noaa.gov>



Students explore stream ecology in the Great Smoky Mountains through a grant from NOAA's Office of Education.

The Environmental Literacy Grants (ELG) program provides funding for formal and informal education projects implemented on regional to national scales, with the goal of increasing environmental stewardship and informed decision-making among public and K-12 audiences. In FY 2011, ELG awards supported 14 aquariums and museums that reach over 15 million people per year. <http://www.oesd.noaa.gov/ELG/>. No funds are being requested in the FY 2013 President's Budget for this program.

The Bay Watershed Education and Training (B-WET) Program provides grants to promote locally relevant environmental education for K-12 students and related professional development for educators. B-WET serves California, Chesapeake Bay, Great Lakes, Gulf of Mexico, Hawaii, New England, and the Pacific Northwest. In FY 2011, B-WET reached over 45,000 students and 1,500 teachers. <http://www.oesd.noaa.gov/BWET/>. No funds are requested in the FY 2013 President's Budget for this program.

COMPETITIVE EDUCATION GRANTS



Hollings undergraduates participating in the 2011 NOAA Restoration Day on the Potomac River in Accokeek, Maryland.

ERNEST F. HOLLINGS UNDERGRADUATE SCHOLARSHIP PROGRAM

The Ernest F. Hollings Scholarship provides successful undergraduate applicants with academic assistance, and a 10-week NOAA internship that provides “hands-on” experiences in NOAA-mission science, technology, and educational activities. The Program’s goals are: to increase undergraduate training in oceanic and atmospheric science, technology, and education; recruit and prepare students for careers with NOAA and natural resource and science agencies; recruit and prepare students for careers as educators in oceanic and atmospheric sciences; and, improve scientific and environmental education in the U.S. In FY 2011 103 students from 44 states and territories received this scholarship. http://www.oesd.noaa.gov/Hollings_info.html



High school students in the Pribiloff Islands observe and record Northern fur seal behavior.

The National Marine Fisheries Service (NMFS) education program promotes stewardship of living marine resources and environmental literacy. NMFS' staff develops learning tools, provides science experiences for classrooms and families, and professional development opportunities for teachers. In FY 2011, NMFS produced and tested the first Northern Fur Seal Curriculum which integrates NOAA science into the classroom and can be applied to students' curriculum in Alaska and the Pacific Northwest. <http://www.nmfs.noaa.gov>

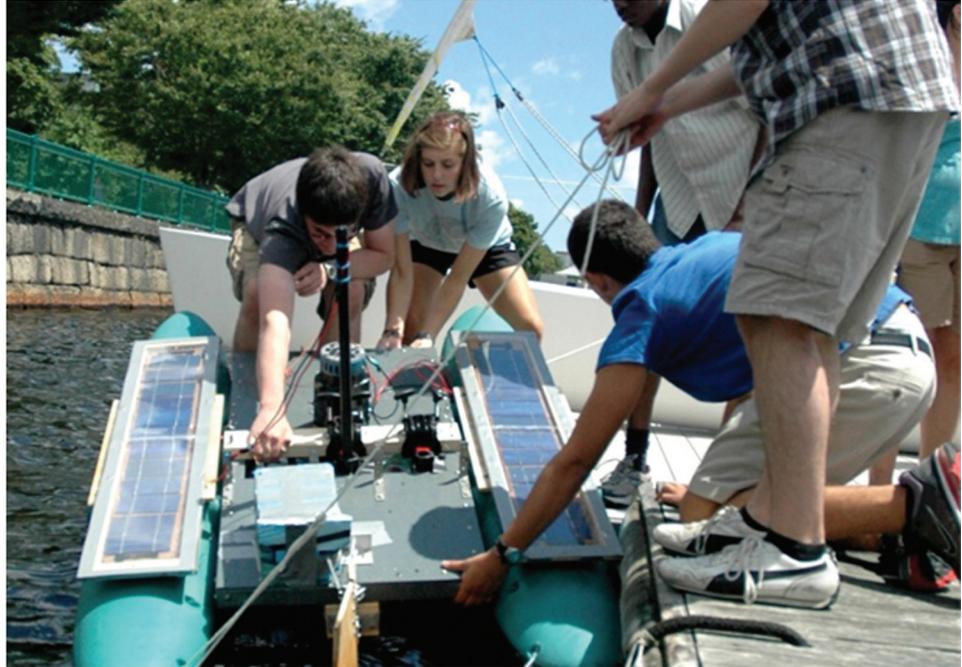
NATIONAL MARINE FISHERIES SERVICE EDUCATION



NOAA Teacher at Sea, Channa Comer from New York, sailed aboard Research Vessel *Hugh R. Sharp* during a sea scallop survey. Here she displays a section of the iron rings that are used in the construction of the scallop dredge.

TEACHER AT SEA PROGRAM

Since 1990, NOAA's Teacher at Sea Program has provided authentic research experiences to teachers aboard NOAA ships working throughout the Nation's waters. In FY 2011, 34 teachers completed research cruises, 10 conducted research in laboratories and field operations, and over 600 alumni from every state are using NOAA science and data in the classroom, reaching thousands of students each year. One 2011 teacher summed up her participation in the program by saying that "working alongside scientists who are passionate about their impact on the ocean was inspiring," another said her research experience gave her "more confidence to teach science". <http://teacheratsea.noaa.gov>



MIT Sea Grant's 2011 Ocean Engineering Experience students test their vehicle design off of the MIT Sailing Pavilion.

The National Sea Grant College Program's Sea Grant Education Network (SGEN) consists of professional educators working at universities across the Nation to further NOAA's education goals of advancing environmental stewardship and workforce development. SGEN provides multidisciplinary marine and aquatic science education for the formal and informal education sectors through teacher trainings, free-choice learning experiences, student opportunities, and much more. In FY 2011, the SGEN conducted inquiry-based instruction for 19,356 teachers and 7,706 informal educators, and directly and indirectly reached 377,918 in a continuing effort to enhance marine and aquatic literacy.

NATIONAL SEA GRANT COLLEGE PROGRAM

For more information on the SGEN: <http://www.seagranted.net>

For Sea Grant-sponsored teacher resources: <http://web.vims.edu/bridge/>



Teachers learn how to identify forest land cover types as it relates to climate; a project supported by NOAA's Climate Communications and Education Program in partnership with the GLOBE Program.

CLIMATE COMMUNICATIONS AND EDUCATION PROGRAM

The NOAA Climate Communications and Education Program improves public climate science literacy and raises public awareness and understanding of, and engagement with, NOAA's climate science and services programs. In FY 2011, this program expanded the Climate Services Portal prototype (www.climate.gov) and the climate and energy educational collection (<http://www.cleanet.org/>), and partnered with informal education institutions to reach 13.5 million visitors. <http://www.climate.noaa.gov/education/>



Students learn how wavelengths of light travel to various depths in the deep ocean using special mask filters in an activity called "Light in the Deep Dark Ocean."

NOAA's Office of Ocean Exploration and Research is committed to engaging educators and students in near-real time ocean exploration to raise America's environmental literacy and interest in ocean sciences and advanced technologies used to explore the ocean. The program offers onsite and online professional development to educators to learn about ocean exploration and how they can use science content associated with exploring the ocean in classrooms. In FY 2011, program offerings focused on the first federally-dedicated ship for ocean exploration, the NOAA Ship Okeanos Explorer, through new inquiry-based teaching materials entitled *Why Do We Explore?* and *How Do We Explore?* <http://oceanexplorer.noaa.gov/okeanos/edu/welcome.html>

OCEAN EXPLORATION AND RESEARCH PROGRAM



Students show their support for the NOAA Ocean Guardian School Program..

OFFICE OF NATIONAL MARINE SANCTUARIES

Since 1972, the NOAA Office of National Marine Sanctuaries (ONMS) has been federally mandated to promote ocean science education through 13 national marine sanctuaries and one marine national monument. A highlight for FY 2011 was the NOAA Ocean Guardian School program, a program that works with schools to implement a stewardship project to protect local watersheds, the world's ocean, and special ocean areas, like national marine sanctuaries. Last year, the program resulted in thousands of pounds of trash removed from local beaches, latex balloons banned at school and community functions, and hundreds of students learning how small, community actions can provide large environmental benefits. <http://sanctuaries.noaa.gov/education>



Teachers on the Estuary educators 'gain hands-on experience in field-based science at the Narragansett Bay NERR, Rhode Island.

The National Estuarine Research Reserves System (NERRS) provides educational opportunities that advance environmental literacy and engage educators, students and the general public in coastal stewardship. In FY 2011, 83,275 students participated in experiential activities where they learned about estuaries, the scientific method, how to collect and analyze scientific data, and how to restore and protect estuaries. Also in FY 2011, NERRS trained community members who in return contributed over 25,256 hours of volunteer service. in their local estuaries. <http://nerrs.noaa.gov/Education.aspx> &

NATIONAL ESTUARINE RESEARCH RESERVE SYSTEM



Teachers in the ocean acidification workshop learning about a coral nursery at the National Coral Reef Institute in Ft. Lauderdale, Florida

CORAL REEF CONSERVATION PROGRAM

The Coral Reef Conservation Program (CRCP) works closely with states and U.S. territories to address climate change, adverse impacts of fishing, and land-based sources of pollution that damage reef ecosystems. During FY 2011, CRCP completed the development of the Ocean Acidification Data-in-the-Classroom educational module, available nationally, and trained and evaluated over 100 educators in the use of data to teach coral-related science. The CRCP also funded the Coral Reef Management Fellowship, placing recent graduates in Florida, US Virgin Islands, Puerto Rico, Hawaii, CNMI, Guam, and American Samoa. <http://coralreef.noaa.gov/education/>



Shannon Lyday, a 2011 Nancy Foster scholar, on a research cruise.

The Dr. Nancy Foster Scholarship Program makes awards to outstanding scholars in marine biology, oceanography, or maritime archaeology, particularly to women and minorities, and encourages independent graduate-level research by providing financial support, through competitive processes, for graduate studies in those fields. Of the 50 Dr. Nancy Foster Scholarships awarded since the program began in 2000, 45 have been awarded to women. In FY 2011, 3 new scholarships were awarded. This program was authorized by Congress through the National Marine Sanctuaries Amendments Act of 2000 (Pub. L. 106-513) soon after Dr. Foster's death in June 2000, as a means of honoring her life's work and contribution to the nation. <http://fosterscholars.noaa.gov/aboutscholarship.html>

DR. NANCY FOSTER SCHOLARSHIP PROGRAM



Elementary school students use math and language skills as they measure plant growth rates and determine reduced carbon footprints in a school vegetable garden, part of the Climate Stewards project.

NATIONAL OCEAN SERVICE EDUCATION

NOAA's National Ocean Service (NOS) education activities serve educators and students through web sites and projects that promote environmental literacy using ocean, coastal, and climate science. Tools and resources are posted at <http://oceanservice.noaa.gov/education> and <http://games.noaa.gov/>. In FY 2011, NOS education reached over 28,000 educators through workshops, conference presentations and web based professional development opportunities. In FY 2011 over 1,000,000 unique visitors accessed NOS online educational content. Specifically, The Climate Stewards project provided ongoing professional development and an online collaborative learning community to formal and informal educators to increase their understanding of climate science.



A big part of the NWS education program is teaching the public and K-12 students about emergency preparedness

A goal of National Weather Service (NWS) education is to inform students, teachers and the general public about how to minimize fatalities and injuries and protect property from severe weather. A partnership between The American Meteorological Society and NWS has trained over 900 science teachers in weather forecasting, hydrology, and climate, helping them to bring NOAA science to their classrooms. In addition, NWS and emergency managers educate the citizens of local communities through StormReady and TsunamiReady programs. NWS partners with the Plan!T NOW organization to develop innovative, digital severe weather awareness games/activities for all ages. In FY 2011, NWS conducted 2,500 school visits educating students about weather and safety preparedness. <http://www.weather.gov/>

NATIONAL WEATHER SERVICE EDUCATION



Nina Jackson of NOAA NESDIS explains the Satellite educational resources and outreach materials available to the public at the American Meteorological Society Weather Fest in Seattle, Washington, January 23, 2011.

NATIONAL ENVIRONMENTAL SATELLITE, DATA AND INFORMATION SERVICE EDUCATION

NESDIS supports Science, Technology, Engineering and Math (STEM) related educational efforts in three main areas: 1) students and educators of remote sensing and atmospheric sciences through cooperative partnerships such as The Federation of Earth Science Information Partners (ESIP) and Sally Ride Educator Workshops; 2) applied professional development for meteorologists and remote sensing professionals at 14 universities; and 3) applied community and location-specific public education activities.. In FY 2011, NESDIS supported the Sally Ride Science Festival, which introduced remote sensing and space science to almost 200 elementary school students, supported educator workshops in 3 locations serving almost 200 teachers, and provided NOAA-specific educational programming to thousands of elementary-school students through programs at the American Meteorological Society and American Geophysical Union annual conferences. www.nesdis.noaa.gov

