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Discovering More than Science in a Tiny Village *New Woods Hole Program Encourages Diversity, Self-Discovery*

College students coming to Woods Hole to seek knowledge about the marine world and the environment are nothing new. The village has hosted researchers and those studying to be scientists since 1871, when the U.S. Commission of Fish and Fisheries, precursor to the National Oceanic and Atmospheric Administration's (NOAA's) National Marine Fisheries Service, established a research station on Little Harbor. Today the village is home to six major marine research laboratories and thousands of investigators who conduct research worldwide.

For students like James Shelton, Adrienne George, Christina Guidoboni and Zak Balmuth-Loris, coming to Woods Hole for a summer of study was an opportunity they couldn't pass up. The four were among a group of 16 students from 11 colleges and universities throughout the U.S. to enroll in a new program, the Woods Hole Partnership Education Program or PEP, focused on introducing underrepresented groups to the marine and environmental sciences.

"This was the first time I interacted directly with a research scientist," said Shelton, a chemistry major at Arkansas State University in Jonesboro. "I am from Pine Bluff, Ark., and had never been to Woods Hole. I learned a lot about both people and science."

The Woods Hole Partnership Education Program, or PEP, was designed to promote diversity in the Woods Hole science community through a summer science intern program. Aimed at college juniors and seniors who have had some course work in oceanography or marine and/or environmental sciences, PEP students took a four-week course, this year focused on global climate change, and then spent six-to-eight-weeks on individual research projects.

Participating PEP institutions are the Marine Biological Laboratory (MBL), Northeast Fisheries Science Center of NOAA's National Marine Fisheries Service (NOAA Fisheries), Sea Education Association (SEA), U.S. Geological Survey (USGS), Woods Hole Oceanographic Institution (WHOI), and the Woods Hole Research Center (WHRC). Course instructors and research mentors were investigators from these six science institutions.

Adrienne George, a recent environmental science graduate of Delaware State University who is attending the University of South Florida this fall majoring in biological oceanography, says the course helped her with the four core courses she will take in grad school. "I had no

idea what a hydrothermal vent was until I came to Woods Hole,” George said of her research experience working on larval ecology at deep-sea hydrothermal vents in the lab of WHOI biologist Lauren Mullineaux.

“I have worked in the field before, but this was my first experience working in a lab,” George said. “It helped me decide what I need in a project to love doing it. I realize I prefer working in the field to working with a microscope in the lab.”

Students earned four college credits for the program through the University of Maryland Eastern Shore. Each worked with a scientific mentor at one of the participating institutions and pursued a research project ranging from culturing scallop larvae under different levels of carbon dioxide to see how ocean acidification affects the development of their larval shell, to developing a model to estimate the economic effects of shoreline change from sea-level rise in coastal Massachusetts. Shelton, for example, worked on how environmental conditions affect soil respiration on Martha’s Vineyard in the lab of Jim Tang of MBL.

“Both the course and research aspects will help me not only further my education, but have made a lasting impression of what I want to pursue professionally as well as academically,” said Guidoboni, a marine biology major from the University of New England. Her research project involved developing new image analysis technology to measure the size of Atlantic Goosefish (*Lophius americanus*) eggs in the age and growth lab at NOAA Fisheries with mentor Jay Burnett.

“I have a better understanding of the marine science field,” said Zak Balmuth-Loris of Syracuse University, a biomedical engineering major who spent time at sea on Georges Bank towing an underwater camera system and identifying fish, scallops and other marine life on the bottom. He also studied the effects of internal waves in Panama through an underwater laboratory there linked to Woods Hole via satellite with research mentor Scott Gallager of WHOI.

“This experience is going to help me with networking, and has given me some new opportunities to pursue,” Balmuth-Loris said of the experience. He and other PEP participants meet and spoke informally with researchers from all over the world who visit or conduct research at the various institutions during the summer months or year-round.

“Woods Hole is different than any other place for many reasons,” said Ambrose Jearld, Jr., a fisheries biologist at the Woods Hole Lab of NOAA Fisheries Service and PEP program director. “We have an exhibit called “Little Village, Big Science” which really captures the opportunities as well as the challenges of this place: six very diverse research organizations: small to large, government and private nonprofit, marine and environmental, and all with their own internal cultures on top of a long community history.”

Jearld grew up on a farm in North Carolina, attended college in Maryland and graduate school in Oklahoma, and has worked in the village since 1976. As head of the advisory committee for the Woods Hole Scientific Community Diversity Initiative signed by the six organizations in 2004, Jearld has spent his career working to make the scientific community a more welcoming place to individuals with different backgrounds and experiences.

“We need a lot of different ideas and viewpoints, and we need to be recruiting young people into the field,” Jearld said of the diversity effort, noting that many scientific fields will face shortages of scientists in the future. “Expanding the opportunities for young people from

underrepresented segments of the population who are interested in science and may not realize the possibilities is what PEP is all about.”

George Liles, curator of the Woods Hole Science Aquarium at the NOAA Fisheries Lab, served as PEP program coordinator and co-chaired with Jearld a subcommittee that worked for a year to plan the pilot program. Ben Gutierrez of USGS recruited scientists and organized the course, which included lectures and assignments on a wide range of marine and environmental science topics.

The PEP course in June was followed by research internships in July and August in areas chosen by the students. They also participated in seminars, workshops, field trips, spent a day at sea aboard WHOI’s coastal vessel *Tioga*, and attended lectures at the various institutions. They took part in a writing seminar lead by Liles and gave oral presentations about their research projects to their colleagues and the scientists they worked with at the end of the program. They also had time to enjoy the beach, play soccer, sail and try new kinds of food.

“I was exposed to how a research project is planned, and I see how research is applied,” said Myrna Gatica, a geology major at City University of New York - Queens College. Her research project involved analyzing satellite imagery to study glacier-derived dust as an iron source to the Gulf of Alaska with John Crusius and Andrew Schroth of USGS. “I will have confidence now in approaching this field as a career.”

For the PEP organizers, that is the kind of reaction they had hoped for. “We think the program succeeded in providing opportunity for students, and we hope PEP succeeded in changing expectations on many levels,” said Jearld. “We still have a long way to go. PEP 2009 was one group of students, one summer. Diversity doesn’t come naturally, and we have to keep at it. It is worth the investment.”

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Related links:

Partnership Education Program (PEP): <http://www.woodsholediversity.org/pep/>