

# Woods Hole Partnership Education Program

---

Founded 2009

A program hosted by the Woods Hole Diversity Initiative

Marine Biological Laboratory  
NOAA Northeast Fisheries Science Center  
Sea Education Association  
U. S. Geological Survey  
Woods Hole Oceanographic Institution  
Woods Hole Research Center  
University of Maryland Eastern Shore



# Woods Hole Partnership Education Program Model

## Key Design Elements

---

### Partnership Overview

**Participating Organizations.** The Partnership Education Program (PEP) is a social intervention designed to address a specific societal issue, that is, the underrepresentation of Blacks, Hispanics, Native (Indigenous) American and Asian Americans (hereafter referred to as underrepresented minorities (URM)) in the marine and ocean sciences. PEP is a project of the Woods Hole Diversity Initiative (DI), and a multi-institutional effort with the overarching goal to promote diversity in the Woods Hole Science Community, via a 2004 Memorandum of Agreement (MOU) signed by the six CEOs of participating institutions and recommitted in 2012.

**Eligibility.** PEP is designed primarily for college juniors and seniors. Prerequisite coursework includes oceanography, marine and/or environmental science, or some combination of biology, chemistry, geology, and physics. Applications are welcome from students from all backgrounds and especially students from groups underrepresented in the marine and environmental sciences. Housing, tuition, travel allowance, room and board, and a stipend are provided to students. A Student Contract is in place and includes language about adherence to organizational policies.

### Goals and Objectives

#### Diversity Initiative-Related Goals

- Be a resource that supports students in achieving their full potential within the Woods Hole research, learning, and work environment regardless of their race, religion, color, creed, gender, age, national origin, citizenship status, sexual orientation, physical or mental ability, socio-economic status, or veteran status.
- Cooperatively undertake recruitment, retention and mentoring programs that will result in a diverse group of students (and ultimately) employees and postdoctoral researchers in ocean sciences, biological sciences, geosciences, and ocean engineering and technology, marine and environmental policy activities undertaken by the Woods Hole scientific and educational organizations.

#### PEP-Specific Objectives

- Member Institutions develop outreach/mentoring/intern programs at and among the institutions by making a concerted effort to attract individuals from underrepresented groups and to offer them support (housing, board, and funding) to be in Woods Hole.
- Offer students from under-represented groups the opportunity to study, conduct research, and receive training in their areas of interest, working in labs with leading researchers in marine and environmental sciences.
- Provide a first-hand introduction to emerging issues and real-world training in the research skills students need to advance in science, either as graduate students or bachelors-level working scientists.

### Guiding Principles

**Selection Criteria.** PEP established selection criteria that broaden the diversity of the available pool of students for the ocean and marine sciences. PEP shifted from traditional quantifiable criteria such as GPA, test and broad scores to more expansive and holistic factors. The PEP selection process takes into account a broad array of factors that include the applicant's academic, educational, social, cultural, and personal background characteristics.

**Critical Mass.** Each summer, PEP brings 15 students to Woods Hole. This is consistent with our belief that to have meaningful impact and to effect change, a sufficient number of individuals from the requisite racial/ethnic and academic backgrounds must be introduced into the Woods Hole Community.

**Resource Availability.** PEP benefits from resources that are allocated from local institutions based from a specific formula. This aligns with our perspective that programs offering summer experiences must provide a level of financial support that is sufficient for efficient program operations and constantly be alert to funding prospects.

**Management and Administration.** Over its 10 years, PEP has stabilized its management and administration infrastructure to include personnel whose race/ethnic, academic and career/professional backgrounds are well aligned with student participants. PEP sees these synergistic affiliations as essential to its creation of an environment of support.

**Monitoring and Evaluation.** Continuous self-reflection and awareness coupled with responsive and strategic actions are a hallmark of PEP design, development, and sustainability planning. Thus informal and formal evaluative mechanisms have been in place since the program's inception.

**Diversity Training.** Diversity (and inclusion) are at the forefront of PEP's work. To ensure that the Woods Hole community has a fuller and PEP-aligned understanding of the tenets and underpinnings of diversity, annual trainings are provided.

## Program Components

PEP is an integrated program that includes two primary components as well as supplemental activities. The two primary components are an educational credit-bearing course and an experiential research internship. Supplemental activities include a variety of career, personal, and professional development

**Education.** PEP's educational component is a four-credit, four-week course (*Global Climate Change*) offered through the University of Maryland Eastern Shore (UMES). The course is organized as a series of modules, each of which addressed specific topics and pertinent issues related to global climate change. Each module includes lectures and labs led by scientists from DAC member organizations. The course description (content and structure) was submitted to the UMES Curriculum Committee for approval, course number, and credit assignment. Students can request transfer of credits from UMES to their own institution, added to their transcript and used to fulfill degree requirements in their respective institution. Course instructors come from the scientific ranks—as well as doctoral students at Woods Hole Oceanographic Institution—and each has responsibility for a specific module. In PEP's Year 10, the opportunity for a research cruise on the SEA-owned research vessel (*SSV Corwith Cramer*), presented itself and consequently changes were made to accommodate the ship's local availability.

**Research Internship.** The experiential learning component takes the form of a six-to-ten week mentored research internship in a lab in one of the partner research institutions. Each participating student is matched with a locally-based research scientist who submits a short description of the proposed project prior to student assignment. Projects are closely related to the scientists' primary interest and involve tasks that are a part of current work or that would guide future areas of research that respond to major scientific questions.

**Supplemental Activities.** Students are provided a variety of supplemental activities that leverage resources within the Woods Hole community, including Scientific Ethics, Writing, Public Speaking, and SUCCESS Workshops, as well as field trips to museums and New England sites related to science, fishing, and whaling.

## Results, Outcomes, and Lessons Learned

PEP is a seven-institution collaboration that includes Woods Hole institutions and UMES. In ten years (2009-2018), PEP has brought to Woods Hole 153 students from 92 colleges and universities, including 29 Minority Serving Institutions (MSIs), and public and private colleges and universities representing all geographic areas of the United States. Just over half (79) of the 153 PEP students are from MSIs. PEP graduates include 80 females and 51 males from groups underrepresented in science.

Ten years of PEP has underscored the unquestioned need for commitment. Dedication to the partnership's goals and objectives, and to the program's design elements has been the sustaining force. From this foundation, we look with optimism to PEP's next 10 years and the prospects and opportunities that lie ahead.

Contact: George Liles  
George.liles@noaa.gov

# 2018 Woods Hole Partnership Education Program (PEP)

---



The Partnership Education Program (PEP) completed its tenth summer in 2018, hosting a class of talented undergraduates who came to Woods Hole from colleges and universities throughout the United States and territories. The 2018 PEP class had a wide range of academic interests – marine and environmental sciences, of course, but also engineering, aquaculture, geographical sciences, microbiology, physics, and veterinary medicine. The PEP students immersed themselves in the usual PEP experience, completing the four-credit PEP course (“Ocean and Environmental Sciences: Global Climate Change”), conducting ten week research projects, participating in seminars and symposia, and taking field trips to New Bedford, Boston, Gloucester, and Marthas Vineyard.

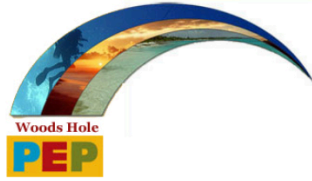
While sampling traditional PEP fare, the 2018 class also broke new ground, participating in a four-day research cruise aboard the Sea Education Association’s *SSV Corwith Cramer*. The voyage gave the students a taste of life at sea, where they learned to sail and

to gather oceanographic and biological data. Back on shore, they used the collected data in the SEA classroom to create and present scientific posters of their findings. The students and PEP staff felt the research cruise was a valuable experience, and PEP planners are hoping to build the cruise in as a regular feature of PEP. Given the variety of academic interests in the 2018 PEP cohort, the PEP staff expects this group of students to pursue a variety of careers, ranging from mechanical engineering to microbiology to environmental science.



There is reason to hope that many of the 2018 graduates will find their career path leads back to one or another Woods Hole institution – in fact, during the student presentations in the end-of-the-summer symposium, eleven of the students spoke of their desire to return to study and work in the village.

# PEP Symposium 2018



**Woods Hole  
Partnership Education  
Program**

The 2018 PEP students presented their summer research at the 10<sup>th</sup> annual PEP Symposium on August 10 in the Madden Center on the SEA campus.

Friday August 10, 2018  
Sea Education Association  
171 Woods Hole Road  
8:30 AM – 1 PM

Please join us to see the 2018 PEP class present their research.

<b>Name</b> <i>(Institution)</i>	<b>Presentation Title</b> <i>(advisor)</i>	<b>Time</b>
<b>Introductions – George Liles &amp; Ben Gutierrez</b>		8:30
<b>Marc A. Fontanez Ortiz</b> Univ. Puerto Rico, Humacao	<i>Subseafloor Life in the Cold Oxygenated Crustal Fluids of North Pond</i> <i>(Julie Huber, WHOI)</i>	8:35
<b>James Brown</b> Kentucky State University	<i>Xenopus Aquaculture</i> <i>(Sean McNamara, MBL)</i>	8:50
<b>Jehmia Williams</b> Bethune-Cookman University	<i>Repeatability of circadian rhythms in Nematostella vectensis</i> <i>(Anne Tarrant, WHOI)</i>	9:05
<b>Nakia Coit</b> Univ. of Maryland, Eastern Shore	<i>Xenopus: The Model Organism</i> <i>(Sean McNamara, MBL)</i>	9:20
<b>Anna Knochel</b> Rice University	<i>Visualizing Bacterial Biofilms on Marine Plastic Using CLASI-FISH</i> <i>(Jessica Mark-Welch &amp; Cathleen Schlundt, MBL)</i>	9:35
<b>Yoana Guzman</b> California State Univ., Chico	<i>Developing a CTD Winch Feedback Control System</i> <i>(Anna Michel, WHOI)</i>	9:50
<b>Ellis Lyles</b> Loyola University	<i>Monitoring the Health of Cape Cod Rivers</i> <i>(Max Holmes, WHRC)</i>	10:05
<b>Irene Duran</b> California State Univ., Chico	<i>Developing a small-sized, low power, inexpensive plankton imaging system</i> <i>(Heidi Sosik &amp; Stace Beaulieu, WHOI)</i>	10:20
<b>Break</b>		10:35
<b>Gabriel Duran</b> Univ. Maryland Baltimore County	<i>Water Quality Analysis of Little Pond in Falmouth, MA</i> <i>(Ken Foreman, MBL)</i>	10:45
<b>Antonia Ireland</b> North Carolina A&T	<i>Nutrients and Carbon Intake by a Kelp Farm</i> <i>(Hauke Kite-Powell, WHOI)</i>	11:00
<b>Myla Barker</b> North Carolina A&T	<i>Exploring Increased Seal Populations and Recreational Fishing Activity On Cape Cod</i> <i>(Tammy Murphy, NOAA-NMFS)</i>	11:15
<b>Cory Caddell</b> North Carolina Central Univ.	<i>Relationship Between Warm Core Rings and Northern Shortfin Squid (Illex illecebrosus)</i> <i>(Lisa Hendrickson, NOAA-NMFS)</i>	11:30
<b>George Manning</b> North Carolina Central University	<i>Evaluating Stock Structure of Red Hake (Urophycis chuss) based on Growth and Maturity and Consequences on stock Dynamics based on Simulation</i> <i>(Larry Alade, NOAA-NMFS)</i>	11:45
<b>Aris-Aja Horsey</b> Univ. of Maryland, Eastern Shore	<i>Age, Growth and Mortality of Sea Scallops</i> <i>(Dvora Hart, NOAA-NMFS)</i>	12:00
<b>Emma Wilkin</b> Howard University	<i>Pinniped Feeding Ecology: Comparing Harbor and Gray Seal Diets in the US Northwest Atlantic</i> <i>(Fred Wenzel, NOAA-NMFS)</i>	12:15
<b>Marci-Ann Smith</b> Univ. of Maryland, Eastern Shore	<i>Are increasing water temperatures leading to increased bycatch and discarding?</i> <i>(Geret DePiper, NOAA-NMFS)</i>	12:30

## **PEP Staff in 2018**

George Liles, Director  
Ambrose Jearld, Senior Advisor  
Benjamin Gutierrez, Program Advisor  
Benjamin Harden, Course Director  
Adrienne George (PEP 2009), Program Coordinator

The NEFSC's Kwanza Johnson (PEP 2016) provided organizational support.

The Woods Hole Diversity Initiative's Diversity Advisory Committee continues in the role of PEP Overseers.

## **2018 Diversity Advisory Committee**

Hauke Kite-Powel (WHOI), Chair  
Benjamin Gutierrez (USGS)  
Max Holmes (WHRC)  
Ambrose Jearld (NMFS, retired)  
Kwanza Johnson (NOAA NEFSC)  
George Liles (NOAA NEFSC)  
Sue Natali (USGS)  
Rae Nishi (MBL)  
Kathleen Savage (WHRC)  
William Waite (USGS)  
Nancy Wendlandt (SEA)

Dr. Harold Bibb (URI) continued to provide mentor training, and Dr. Emorcia Hill once again provided program evaluation.



## PEP Ten-Year Numbers

The 2018 PEP graduating cohort was drawn from 11 colleges or universities, four of which had not previously participated in PEP. The program has now attracted students from 92 colleges or universities, including 29 HBCUs or MSIs (full list below).

In ten years (2009-2018), 153 students have completed PEP. Just over half (79) of the 153 PEP alumni have come from MSIs. PEP graduates include 80 women and 51 men from minority groups under-represented in science. Additionally, PEP has provided career building opportunities for three graduate students (all African-American) who served as coordinators in 2010-2018.

PEP students' ethnic identities (as self-identified), 2009-2018: African (2), African-American/Black (72), Asian/Chinese/Thai (4), Bi-Racial/Mixed (11), Cape Verdean (1), Caucasian/White (14), Filipino (2), Hispanic (23), Indian (1), Japanese American (1), Latino (2), Mexican or Mexican-American (4), Native American (5), Native Hawaiian (1), Pacific Islander (2), Puerto Rican (1), West Indian (2), Declined to identify (5).





# Participating Colleges and Universities, 2009-2018

## Institutions (92) that have sent students to PEP:

(*Italic = Historically Black Colleges and Universities and/or MSI*)(29)

Amherst College	Rice University
Arkansas State University (2)	<i>San Jose State University</i>
Auburn University	<i>Savannah State University (4)</i>
Barry University	Skidmore College
<i>Bethune Cookman University (2)</i>	<i>South Carolina State University</i>
Boston College	Southwestern College
Bridgewater State University (2)	<i>Spelman College (2)</i>
Bowdoin College	St. Mary's College of Maryland
<i>Bowie State University (2)</i>	St. John's University
Brown University	SUNY Albany
California Polytechnic State University	SUNY Maritime College
California State University of Bakersfield	Syracuse University
California State University Chico (2)	Temple University
<i>Cheney State University</i>	<i>Tuskegee University (5)</i>
<i>City University of New York</i>	University of Arkansas, Fayetteville
Coastal Carolina University	University of California, Berkeley
College of William and Mary	University of California, San Diego (2)
Columbia University	University of California, Santa Cruz (2)
Cornell University (2)	University of Central Florida
<i>Delaware State University</i>	University of Delaware
DePaul University	University of Florida
<i>Dillard University</i>	University of Hawaii
East Carolina University	University of Maryland – Baltimore County
Eastern Michigan University	University of Maryland, College Park (2)
<i>Elizabeth City State University (2)</i>	<i>University of Maryland, Eastern Shore (12)</i>
<i>Fisk University</i>	University of Massachusetts, Amherst (2)
<i>Florida A&amp;M University (3)</i>	University of Massachusetts, Boston (2)
<i>Fort Valley State University</i>	University of New England (2)
Georgia State University	University of New Haven
Green Mountain College	University of North Carolina, Wilmington
Grinnell College	<i>University of Puerto Rico, Humaco (2)</i>
<i>Hampton University</i>	<i>University of Puerto Rico, Mayaguez (2)</i>
Harvard University	University of Rhode Island
<i>Howard University (2)</i>	University of Rochester
<i>Humbolt State University (13)</i>	University of San Francisco
<i>Juniata College</i>	University of South Carolina, Columbia
<i>Kentucky State University</i>	University of South Florida
Loyola University Chicago	University of Tampa
<i>Morehouse College (4)</i>	University of Texas, Arlington
<i>Morgan State University (2)</i>	University of Texas, Rio Grande Valley
New York City College of Technology	<i>University of the Virgin Islands (2)</i>
New York University, Abu Dhabi	University of Wisconsin, Stevens Point (2)
<i>North Carolina Agricultural and Technical State University(5)</i>	Virginia Commonwealth University
<i>North Carolina Central University (3)</i>	Wellesley College
Nova Southeastern University	West Virginia University
<i>Philander Smith College</i>	Western Washington University (2)

# PEP at Ten: How Are We Doing?

---

## What the Data Say about PEP's Success

George Liles  
25 June 2019

The Partnership Education Program (PEP) was established in 2009 with two ideas in mind: (1) providing a pathway for scientific talent from communities that rarely if ever participate in the Woods Hole scientific adventure; and (2) changing the Woods Hole science community – spurring that community become more welcoming and more inclusive.

PEP's success as a pathway is easily documented: before the current (2019) class arrived, PEP had already hosted students from 92 colleges or universities, including 29 HBCUs or Minority Serving Institutions (full list in the 2018 Annual Report). Our 2019 class brought students from eight colleges or universities new to the program, bringing the list of participating institutions to an even 100, more than 30 of which are MSIs.

In ten years (2009-2018), 153 students have completed PEP. Just over half (79) of the 153 PEP alumni have come from MSIs. PEP graduates include 80 women and 51 men from minority groups under-represented in science. Additionally, PEP has provided career building opportunities for three graduate students (all African-American) who served as coordinators in 2010-2018.

PEP students' ethnic identities (as self-identified) from 2009-2018 are: African (2), African-American/Black (72), Asian/Chinese/Thai (4), Bi-Racial/Mixed (11), Cape Verdean (1), Caucasian/White (14), Filipino (2), Hispanic (23), Indian (1), Japanese American (1), Latino (2), Mexican or Mexican-American (4), Native American (5), Native Hawaiian (1), Pacific Islander (2), Puerto Rican (1), West Indian (2), Declined to identify (5).

PEP has succeeded in recruiting talented students from a wide range of institutions that have not historically had a presence in Woods Hole. And the PEP staff knows from tracking graduates informally, and from a 2019 survey, that PEP graduates are:

- continuing in science, earning advanced degrees, doing post-PEP internships, and finding employment in STEM areas
- returning to Woods Hole for internships, advanced degree work, and employment (generally as lab technicians and as contractors)

While PEP graduates return to Woods Hole to study and work, few have been hired into fulltime employment (FTE) status at any of the Woods Hole partner institutions.

From the beginning, the PEP staff has been committed to evaluating the program's progress. PEP has been formally evaluated every year by an independent evaluator, Dr. Emorcia Hill. Her annual reports contain data, analysis, and recommendations for developing and strengthening PEP. The data from 2018 show, for instance, how the 2018 PEP students rated the skills they gained and how they rated the various features of the program.

Among the top skills gained:

- Networking (100%)
- Cultural understanding/competence (100%)
- Self-determination (100%)
- Self-confidence (100%)
- Leadership (100%)
  
- Managing your career (93%)
- Interpersonal (93%)
- Communication (93%)
- Teamwork (93%)

More specifically, features of the overall program rated most highly included:

- Interactions with mentors/other professionals (100%)
- Orientation activities (87%)
- Application process (87%)
- Food, individual (87%)
- Number and type of activities offered (87%)
- Stipend (87%)
- Personal support (87%)

Dr. Hill's annual evaluations provide a decade long view of the program. We know, for instance, that the first PEP cohort, the 2009 class, rated enrichment activities highest among the program components (4.43 on a scale of 5 to 1 with 5 = extremely useful and 1 = not at all), followed by research (4.13), and the course (4.06).

And we know that in 2019, on the issue of the transformative importance of PEP as a program that exposes the students to the Woods Hole Scientific Community, PEP students feel well served by the program. One question on the end-of program survey asked students to rank their knowledge of the Woods Hole Scientific Community pre- and post-program. Pre-PEP, only 18% of students (2 of 11 who answered this question) assigned an excellent or above average rating. However post-PEP, 91% of students (10 of 11) rated their knowledge as excellent or above average.

The annual evaluation report has been especially valuable because the evaluator gathers data and interviews participants including students, staff, faculty, mentors, and leadership at the sponsoring institutions. The annual report includes a set of recommendations that address all components of the program: the course; the experiential research internship; supplemental activities; and management and administration.

Through maintaining contact with program graduates, the staff knows that PEP graduates have gone on to earn advanced degrees, including dozens Masters of Science and at least several PhDs, one MD, and one DVM. More than 20 other PEP graduates are known to be working on PhDs and several dozen are enrolled in Masters programs. Others are known to be working as researchers and/or field biologists.

To gather additional data on career progress, the staff in April 2019 created an online survey to collect Outcomes information on the careers of PEP graduates. Fifty-six (37%) of the 153 graduates completed the survey. A summary of survey findings is appended.

Several findings are highlighted here:

- 69% reported that PEP influenced their choice of employment “a fair amount” or “a great deal”
- 71% said that PEP influenced their choice of career “a fair amount” or “a great deal”
- 70% reported that PEP provided skills for managing their career “a fair amount” or “a great deal”
- 100% (50 of the 50 who responded) would recommend PEP to another student

On degree status:

- 87% (49 graduates) have finished their undergraduate degrees: 41 B.S. and 8 B.A.
- 13% (7 graduates) are still working on undergraduate degrees
- 47% of the program graduates (23 individuals) who have finished their Bachelors have earned a Masters
- 22% of the program graduates (11 individuals) who have finished their Bachelors are working on Masters
- 1 graduate has completed an MD and 1 has completed a PhD
- 8 graduates are working on a doctorate; 2 on an MD; 1 on a DVM
- 27% of the PEP graduates who have finished their Bachelors have earned or are working on a PhD/MD/DVM

On career steps:

- 14 alumni are working in marine, ocean, environmental or geosciences
- 21 alumni are working in another STEM field
- 63% of the PEP graduates who responded are working in science
- 3 have worked for NOAA
- 1 has worked for NOAA Fisheries

- 12 graduates work or have worked in Woods Hole

While data speak to PEP's success at providing opportunities in research to a students from diverse backgrounds, it is harder to assess the second goal: helping to change the community into which we are trying to recruit talent. The PEP leadership believes the program has had a positive effect on the community, providing training sessions in mentoring and in cultural competency, creating mentoring opportunities, making us – for a portion of the year – a more diverse community, and serving year-round as a wedge to open discussions of diversity and inclusion throughout the community. PEP in 2019 stands as the flagship effort of the Woods Hole Diversity Initiative and the Diversity Advisory Committee. The fact that PEP exists, that it is highly visible, and that it is thriving – this inspires and energizes people in the community who care about diversity and inclusion.

PEP was envisioned as a program that would provide opportunities for talented students to join the Woods Hole community, and as of this writing, five PEP graduates are employed in Woods Hole; one other is a Town of Falmouth biologist; one is matriculated in the WHOI/MIT PhD program; and four are doing post-PEP internships in Woods Hole. Despite these career successes, we as a community are not yet making full use of the PEP talent pool: to date, no PEP graduate has been hired as a NOAA Northeast Fisheries Science Center FTE, and only one PEP graduate is an FTE at any of the six Woods Hole partner institutions.

## Appendix: Woods Hole Partnership in Education (PEP) Alumni Survey Findings, 2019

**Response Rate.** Fifty-three of 153 alumni responded, for a 37% response rate.

**Background.** Sixty-two percent (35) of alumni were female. Alumni came from various institutions around the country; most institutions were represented by 1-2 alumni. Eleven percent (6 alumni) were affiliated with Humboldt State University, and for Tuskegee University and University of Maryland, Eastern Shore, both had 5% or 3 alumni responding.

Sixteen percent of alumni (9) were in PEP during the summer of 2017, 14% (8 alumni) in 2009, and 12% (7 alumni) each in 2014 and 2015. The summer of 2018 had 3 alumni, or 5%. The remaining years between 2009-2018 were represented by 2-6 alumni or 3-11% each. Fifty percent of alumni (28) were rising seniors while in PEP, 27% (15) were rising juniors, 16% (9) had already graduated, and 7% (4 alumni) were rising sophomores.

The majority of alumni reported biology and environmental sciences as their major while in PEP (13 or 23% in each major.) An additional 20%, or 11 alumni, reported marine science as their major, with chemistry (9% or 5 alumni), geology (7% or 4 alumni) and engineering and Fisheries Science (5% or 3 alumni each) majors also being reported. Other majors with 1-2 alumni (2-4%) reporting them were mathematics, aquaculture, pre-med, pre-vet, ecology, microbiology and policy/resource management.

**Satisfaction with PEP.** Regarding alumni satisfaction with various aspects of PEP, Table 1 presents alumni's average rating of each aspect. These ratings are based on a scale of 1 to 5, where 1=very dissatisfied and 5=very satisfied.

**Post-PEP Activities.** The majority of alumni (75% or 42) continued enrollment in undergraduate course work post-PEP. Twenty-five percent (14 alumni) worked part-time, with 14%, or 8 alumni, working full-time. Twenty-five percent (14 alumni) enrolled in graduate/professional school, while 7% (4 alumni) enrolled in another educational program. Five percent (3 alumni) took a gap-year or traveled, and 4% (2 alumni) had a post-graduate internship. One alumnus engaged in a voluntary activity and 4% (2 alumni) continued doing PEP research.

All but 13% (7 alumni) completed their undergraduate degree. Forty-four percent (25 alumni) graduated in 2009-2014, and 43% (24 alumni) graduated between 2015-2018. The majority of those who graduated (84% or 41 alumni) received a B.S. degree; 16% or 8 alumni received a B.A degree.

**Table 1. Average level of satisfaction with PEP aspects**

PEP Aspect	Average Rating
Welcome information and materials	4.75
Graduation ceremony	4.73
Symposium (final oral presentations)	4.70
Village/Program lectures (Jearld, Juneteenth, etc.)	4.69
Transportation to and from PEP	4.67
Welcome activities (scavenger hunt, orientation, etc.)	4.64
Communication	4.61
Supplemental program activities (Woods Hole Parade, Talent Show, etc.)	4.56
Interaction with Woods Hole scientific community	4.56
Research experience	4.54
Global Climate Change course	4.44
Professional development (writing workshop, etc.)	4.35
Accommodations (housing)	4.32
Transportation during PEP	4.27
Other (unspecified)	4.25

**Current Educational Status.** Forty-nine percent of alumni (24) reported that they were currently pursuing an academic program. An additional 29% (14 alumni) were not currently pursuing an academic program, but did participate in one post-PEP. Eleven alumni (22%) did not pursue an academic program beyond their undergraduate program.

Of the 24 currently pursuing an academic program, half reported a major in marine, ocean or environmental sciences (50%, 12) and another 46% (11) reported another STEM field. Only one (4%) reported a non-STEM major. Forty-six percent (11) were pursuing a Master's degree, 33% (8 alumni) a Doctorate degree, with 8% (2) working on an M.D., 4% (1) working on a D.V.M. and 8% (2 alumni) working on some other unspecified degree. A third of these alumni (33%, 8) expect to graduate in 2019, with 25% (6 alumni) in 2021, 16% (4 alumni) each in 2020 and 2022, and 8% (2 alumni) in 2023.

Of the 37 not currently pursuing an academic program, 54% (20 alumni) reported a major in marine, ocean or environmental sciences, and another 43% (16) reported another STEM field. Only one (3%) reported a non-STEM major. Seventy-three percent (27 alumni) pursued a Master's degree, 11% (4) a Doctorate degree, with 3% (1 alumnus) each pursued an M.D. or a D.V.M. Four alumni (11%) reported working on some other unspecified degree. Regarding program completion, 76% (28) reported completing the program, while 14% (9) reported not completing the program. Five of these nine specifically noted that they were still in the program. The remaining 4 did not give reasons for non-completion.

**Current Employment Status.** Half of alumni reported currently working full-time (50%, 27) and another 26% (14) reported working and pursuing academic studies. Six percent (3) currently work part-time, 7% (4) do not work, but worked previously and 11% (6) are unemployed. Forty-nine percent (21 alumni) work in a STEM field, with another 33% (14) working in marine, ocean, environmental or geosciences. Fourteen percent (6) work in a non-STEM field. Two percent (1 alumnus) reported farming, and 2% (1) reported tutoring as their field.

Forty-three alumni described their current position. Forty-four percent (19) described their position as entry level – staff, with another 30% (13 alumni) describing it as mid-level – manager or coordinator. Twenty-one percent (9 alumni) are graduate student research assistants. Finally, 2% (1 alumnus) is senior level – assistant director, and another 2% (1 alumnus) is an owner.

Thirty-seven percent (16 alumni) reported their employment to be non-Federal, with 9% (4) being Federal. Sixty percent (26) reported full-time employment, with another 21% (9) being part-time. Thirty-five percent (15) have permanent positions; 5% (2) are temporary. Fourteen percent (6 alumni) reported their positions as being domestic; 2% (1) are foreign. Finally, 56% (24) of these positions are paid.

Of the four alumni who do not currently work, but worked previously, half (50%, 2) are in the marine, ocean, environmental or geosciences and half (50%, 2) are in non-STEM fields. Fifty percent (2) are entry level – staff, one (25%) is a research intern, and one (25%) is an undergraduate assistant. Half of the positions are part-time and 25% (1) is full-time. Two positions (50%) are reported as temporary, one (25%) as domestic and one (25%) as paid.

Twelve alumni (26%) worked at a Woods Hole Institution. Thirteen percent (6) reported working at Woods Hole Oceanographic Institution (WHOI), 4 percent (2 alumni) at any other line office or location of NOAA, and 2 percent each (1 alumnus) at NOAA Fisheries – Woods Hole, Marine Biological Laboratory (MBL), U.S. Geological Surveyor (USGS), University of Maryland – Eastern Shore (UMES) and some other Woods Hole Institution.

**PEP Influences.** Regarding the extent to which PEP influenced alumni choice of employment, 64% (30 alumni) responded that PEP influenced their choice of employment either “a fair amount” or “a great deal”. Twenty-one percent (10) responded that PEP influenced it “somewhat”, 2% (1) “a little”, and 13% (6) responded that PEP influenced their choice of employment “not at all”.

Regarding the extent to which PEP influenced alumni choice of career, 71% (33 alumni) responded either “a fair amount” or “a great deal”. Twenty percent (9) responded that PEP influenced it “somewhat”, 4% (2) “a little” and 4% (2) “not at all”.

**PEP-provided Skills.** Regarding the extent to which PEP provided alumni with various skills, Table 2 presents alumni’s average rating of each skill. These ratings are based on a scale where 1= “not at all” and 5= “a great deal”.



**Table 2. Extent to which PEP provided skills**

Skill	Average Rating
Networking	4.41
Interpersonal	4.38
Teamwork	4.36
Laboratory/research	4.36
Leadership	4.36
Self-confidence	4.34
Self-determination	4.34
Analytical/problem-solving	4.19
Cultural understanding/competency	4.06
Managing career	3.91
Negotiation	3.60

**Internship Status.** Fifty-four percent (28 alumni) were not currently participating in an internship but had done so post-PEP. Forty percent (21 alumni) never participated in an internship post-PEP. Six percent (3 alumni) were currently participating in an internship, two of them in a STEM field other than marine, ocean or environmental science, and one in a non-STEM field. All 3 were in paid positions, 1 as full-time.

Thirty-three percent (15 alumni) studied or interned at Woods Hole Institutions. Thirteen percent (6 alumni) worked at WHOI, 11 percent (5 alumni) at Sea Education Association (SEA), and 4 percent (2 alumni) each studied or interned at NOAA Fisheries – Woods Hole, USGS, a line office or location of NOAA, and UMES. One alumnus (2%) studied or interned at MBL.

Of the alumni not currently participating in an internship, 70% (19) were in marine, ocean, or environmental science, 25% (7 alumni) were in another STEM field, and 4% (1) was in a non-STEM field. Seventy-four percent (20 alumni) interned in non-Federal positions, while 63% (17) interned in Federal positions. (Alumni reported more than one internship). Eighty-five percent (23 alumni) were full-time; 22% (6 alumni) were part-time. Seventy percent (19 alumni) were in domestic positions, while 19% (5 alumni) were in foreign positions. Finally, 89% (24 alumni) were in paid positions while 26% (7 alumni) were unpaid.

**Awards, Honors and Professional Recognition.** Sixty-one percent (31 alumni) reported awards, honors or professional recognition for their scholarly work. Verbatim responses may be found on pages 76-78 of the survey printout provided under separate cover.

**Post-PEP Contacts.** Table 3 presents the average frequency with which alumni maintained contact with their PEP community members. The ratings are based on a scale where 1= “never” and 5= “always”.

**Table 3. Frequency of Alumni Maintaining Contact**

<b>PEP Community Member</b>	<b>Average Rating</b>
PEP peers (across any year)	3.16
PEP staff	3.00
Other contacts made within Woods Hole scientific community	2.45
PEP research mentors	2.41
PEP internship lab	1.88

**Challenges to Current Career Goals.** Table 4 presents the average extent to which alumni rated potential challenges to their current career goals. Ratings are based on a scale where 1= “never” and 5= “always”.

**Table 4. Frequency of Challenges to Current Career Goals**

<b>Challenge to Current Career Goals</b>	<b>Average Rating</b>
Limited knowledge of opportunities	2.86
Personal factors	2.72
Limited professional network	2.70
Lack of access to resources	2.54

**Overall Satisfaction with PEP.** On a scale where 1= “very dissatisfied” and 5= “very satisfied”, alumni rated their overall satisfaction with PEP as 4.72. All of the alumni responding to the question of recommendation to another student (100%, 50) responded that they would recommend PEP.

**Next Educational or Career Steps.** Forty-nine alumni listed their next educational or career steps. Verbatim responses may be found on pages 85-86 in survey printout provided under separate cover.

**Challenges to Next Educational or Career Steps.** Forty-eight alumni listed challenges to their next educational or career steps. Verbatim responses may be found on pages 87-88 in survey printout provided under separate cover.

**Mitigators to Challenges.** Forty-four alumni listed potential mitigators to the challenges to their next educational or career steps. Verbatim responses may be found on pages 89-90 in survey printout provided under separate cover.

**PEP Potential Aids to Next Steps.** Sixty-nine percent (34 alumni) reported that PEP could be helpful in providing information about job opportunities, while 65% (32) felt that PEP could help in facilitating networking and connections. Fifty-one percent (25 alumni) reported that PEP could be helpful in providing an opportunity to participate in the PEP alumni association, and

31% (15 alumni) in providing information about graduate/professional schools. Twenty-seven percent (13 alumni) reported PEP could be helpful in providing information about additional internships.

*Additional Comments.* Twelve alumni listed additional comments, which may be found on page 92 in survey printout provided under separate cover.

*Suggestions to Celebrate PEP Anniversary.* Twenty-six alumni offered suggestions, which may be found on pages 93-94 in survey printout provided under separate cover.

*Interest in Testimonial.* Fifty-nine percent (27 alumni) reported being interested in being contacted to provide a self-recorded testimonial about their experience with PEP.