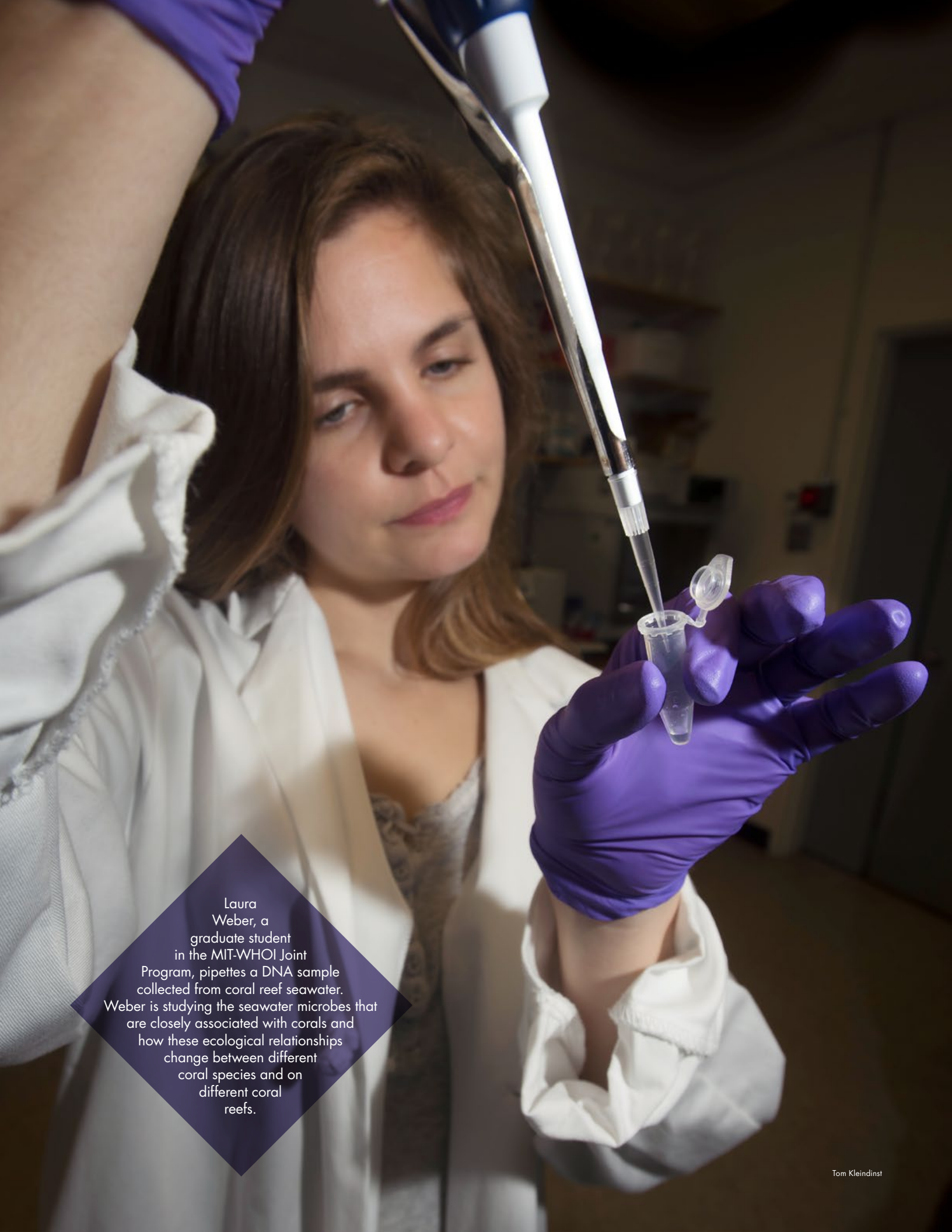


# NEXTWAVE

RECOGNIZING EXCELLENCE IN EDUCATION



2016 Academic Programs  
Woods Hole Oceanographic Institution



Laura Weber, a graduate student in the MIT-WHOI Joint Program, pipettes a DNA sample collected from coral reef seawater. Weber is studying the seawater microbes that are closely associated with corals and how these ecological relationships change between different coral species and on different coral reefs.

A letter from the

# Vice President for Academic Programs & Dean



Christine Charette, WHOI

The WHOI education program had a busy and productive year in 2016. In June, we celebrated a major milestone when the MIT/WHOI Joint Program (JP) conferred its 1000th degree. Frank Bohlen, the first JP degree recipient, was on hand to help celebrate the program's milestone and congratulate this year's graduates, including Becca Jackson, the 1000th degree recipient.

Bohlen received his PhD in 1968 and is now Emeritus Professor of Marine Sciences at the University of Connecticut.

WHOI successfully completed the accreditation review process in 2016, and we were re-accredited for 10 years. The Oceanographer of the Navy also gave us a very favorable review of the JP Navy officer program and we were given the green light to increase the size of the program up to 6 new officers each year.

The JP continues to attract excellent applicants, and we could make many more offers than our funding will allow. Nineteen students enrolled in the JP in 2016 (12 women, 7 men) chosen from more than 250 applicants. Our graduates continue to find interesting positions following their time here. For example, the most recent alums have accepted postdoc positions at Scripps, Princeton/Rutgers, University of Southern California, University of Delaware, University of Washington, University of Western Australia, Harvard University, University of British Columbia, one of the Max Planck Institutes, and Aarhus University in Denmark. In addition two recent graduates are Knauss Fellows in Washington D.C., another has a fellowship working in the U.S. Department of State, and a JP student soon to defend her thesis will be joining the oceanography faculty at the U.S. Naval Academy this summer.

Our JP students make significant contributions to WHOI's research programs publishing 62 first-authored scientific manuscripts in 2016. Many of our students also receive fellowships to support their respective Ph.D. programs, including highly competitive fellowships awarded by the National Science Foundation and the Department of Defense. JP student awards and recognition in 2016 included the Carl-

Gustaf Rossby Award (2 JP awardees) given for the best PhD thesis completed within MIT's Program in Atmospheres, Oceans and Climate (PAOC); Fulbright Scholarship; MIT Martin Fellowship; and outstanding student paper awards at the 17th International Conference on Harmful Algae, International Offshore and Polar Engineering Conference, and the fall, 2016, meeting of the American Geophysical Union.

WHOI has one of the largest and most prestigious postdoctoral programs in the geosciences with 65 postdocs in residence. It is a diverse group which includes many from Canada, Europe, Asia, South America and the Middle East. They contribute even more than the JP students to our research productivity, and many are partially supported on their own research grants. Our postdocs have always been an important source of new hires for the scientific staff. The ten fellows chosen for the summer geophysical dynamics program are also an eclectic and international group. The program is approaching its 60th anniversary, and its alums include the current President of AAAS.

Our new Semester-At-WHOI program for undergraduates (<http://www.whoi.edu/semester-at-whoi/>) enrolled 5 undergraduates this past fall. For those of you at universities, please make your students aware of this opportunity to spend a semester earning course and research credits from WHOI.

The undergraduate summer fellows are our most lively group! As with our other programs, it is a highly competitive program with only about 10% of the applicants receiving an award. The summer fellows are also our most ethnically diverse group. Program participants having Hispanic heritage, in particular, have increased dramatically over the past 10 years. Many continue on in graduate school, and there are always several former summer fellows in our entering class of JP graduate students.

It is becoming increasingly difficult to sustain funding for our education and postdoc programs whose participants and graduates contribute so much to the Institution and to ocean sciences in general. We appreciate your support over the years and hope that you encourage your friends and associates also to participate in the fundraising efforts we need to keep training the best and brightest in the ocean sciences.

Most sincerely,

A handwritten signature in dark ink, appearing to read 'James A. Yoder'. The signature is fluid and cursive.

James A. Yoder  
Vice President for Academic Programs and Dean

# Joint Program Publications

- Alpert, A. E.,** Cohen, A. L., Oppo, D. W., **DeCarlo, T. M.,** Gove, J. M., & Young, C. W. (2016). Comparison of equatorial Pacific sea surface temperature variability and trends with Sr/Ca records from multiple corals. *Paleoceanography*, 31(2), 252-265. doi:10.1002/2015PA002897.
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Of the one hundred and five publications listed here, an impressive sixty-two were first-authored by Joint Program students.

Photo courtesy of Alice Alpert

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MIT-WHOI Joint Program student Alice Alpert steers the sailboat *Sea Dragon*, owned by Pangaea Explorations, towards Jarvis Island in the equatorial Pacific. Alpert and a research team sampled coral skeletons to learn corals' responses to ocean and climate conditions.

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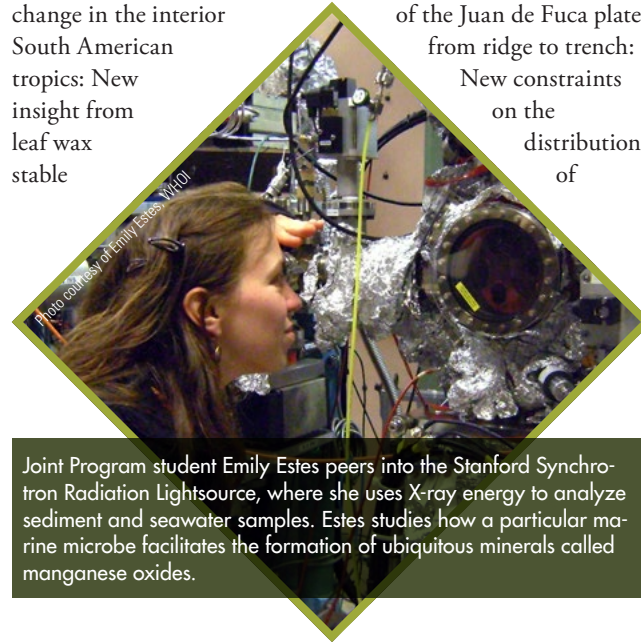
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Joint Program student Emily Estes peers into the Stanford Synchrotron Radiation Lightsource, where she uses X-ray energy to analyze sediment and seawater samples. Estes studies how a particular marine microbe facilitates the formation of ubiquitous minerals called manganese oxides.

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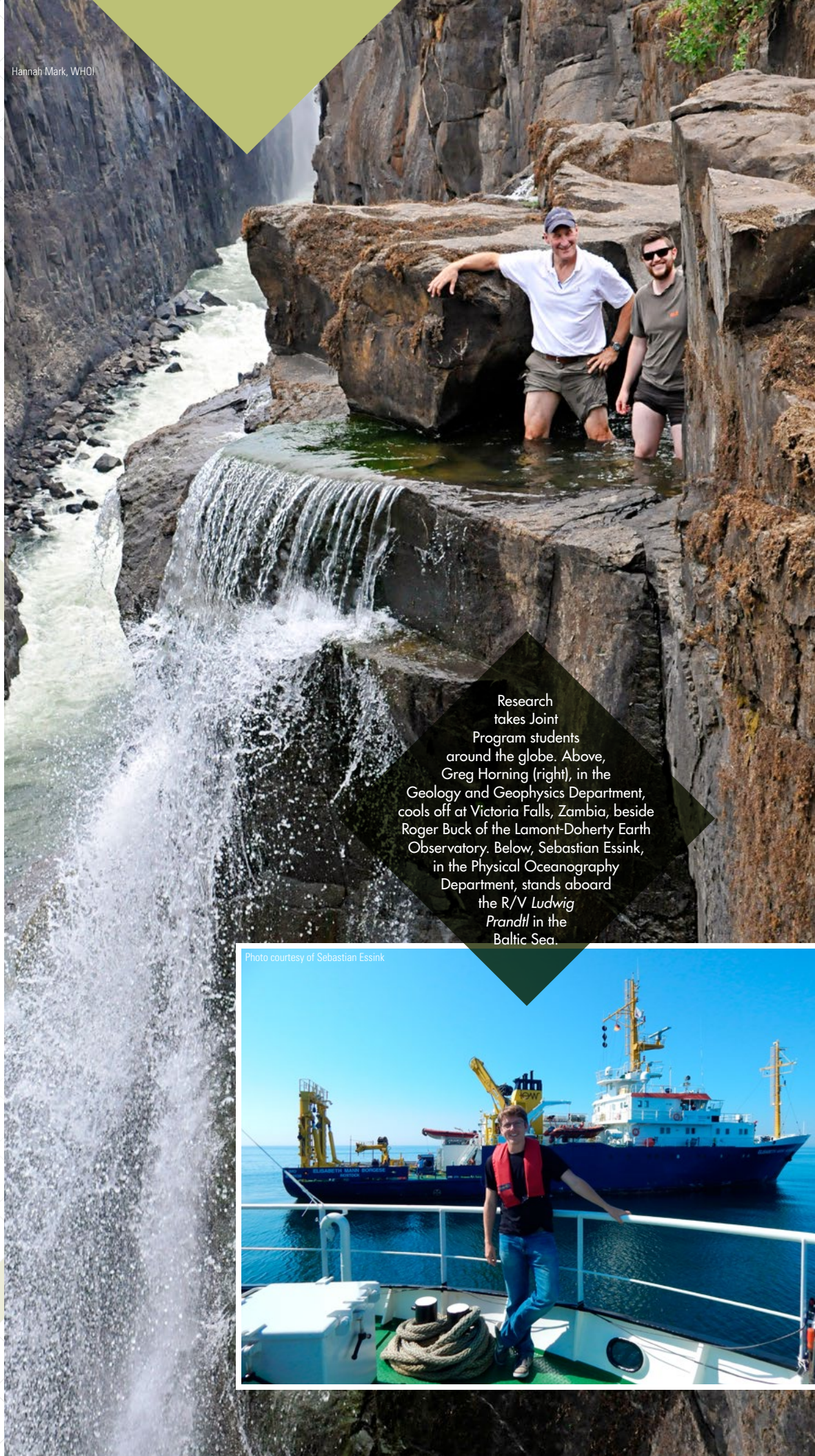
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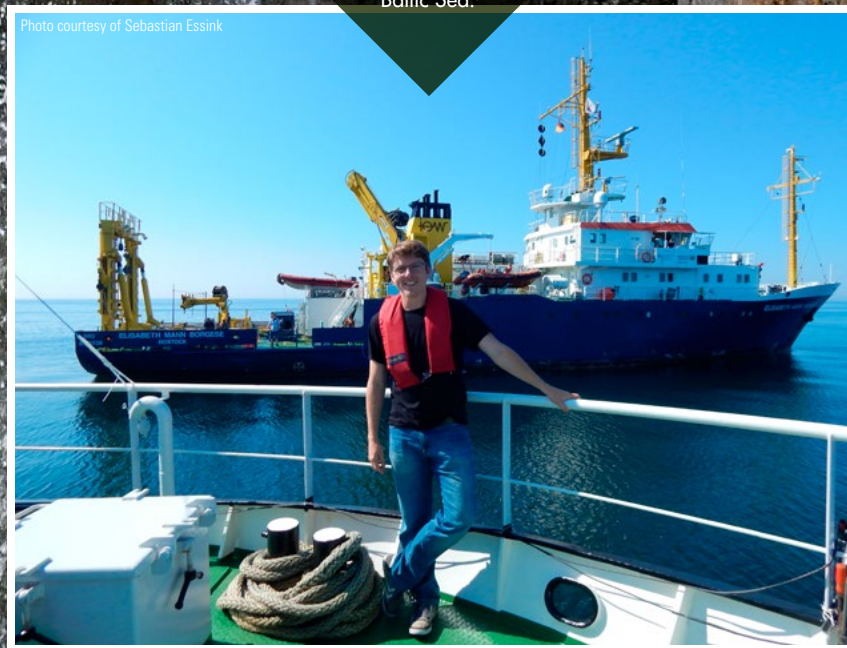
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Research takes Joint Program students around the globe. Above, Greg Horning (right), in the Geology and Geophysics Department, cools off at Victoria Falls, Zambia, beside Roger Buck of the Lamont-Doherty Earth Observatory. Below, Sebastian Essink, in the Physical Oceanography Department, stands aboard the R/V *Ludwig Prandtl* in the Baltic Sea.

Photo courtesy of Sebastian Essink



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On a cool spring day, students Sebastian Essink (left) and Jesse McNichol participated in a field trip to a nearby beach to observe intertidal invertebrates, and their habitats.

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Sean P. Whelan, WHOI

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Tom Kleindinst, WHOI

Jim Yoder and new PhD Sophia Merrifield at the 2016 Graduate Reception, celebrating the 1,000<sup>th</sup> JP degree.

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Joint Program Student Laura Stevens (left) and another participant at the Turkey Trot race in Antarctica, from McMurdo Station (U.S.) to Ross Station (New Zealand), about 1.5 km (1 mile).

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Stephanie Madsen, WHOI

Joint Program student Katie Castagno (standing, right) and Michelle O'Donnell (orange shirt) demonstrate coring for students from the Wampanoag Tribe.

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Veronique LaCapra, WHOI



Hannah Mark, WHOI



Tom Kleindirist, WHOI

In the lab, JP student Laura Weber uses genomics techniques to study coral-associated microbes from samples taken on reefs.

Joint Program students Sophie Chu submerging a water intake unit and Taylor Sehein returning plankton to the ocean from R/V Tioga

# Awards, Fellowships, Grants, & News

**Lydia Babcock-Adams**, National Science Foundation Graduate Research Fellowship

**Camrin Braun**, NASA Earth and Space Science Fellowship 2016

2016-2018 NOAA Fisheries/SeaGrant Fellowship in Population Dynamics, NMFS

2016 Steven Berkeley Marine Conservation Fellowship (runner-up), American Fisheries Society

**Joern Callies** PhD '16, the Carl-Gustaf Rossby Award, given for the best PhD thesis completed within MIT's Program in Atmospheres, Oceans and Climate (PAOC).

**James Collins**, Student Fellow (Data Stewardship Cluster), Federation of Earth Science Information Partners (ESIP)

**Henri Drake**, MIT Presidential Fellowship Award

**Alexis Fischer**, Best Student Oral Presentation Award, "Quantifying the chilling requirement for germinability of natural *Alexandrium fundyense* resting cysts", 17th International Conference on Harmful Algae, Florianopolis, Brazil.

**Genevieve Flaspohler**, National Science Foundation Graduate Research Fellowship

**Laura Fleming**, National Science Foundation Graduate Research Fellowship

**Mara Freilich**, Fulbright Scholarship

**Maja Haji**, Best Student Paper Award, "Uranium extraction from seawater using adsorbent shell enclosures via a symbiotic offshore wind turbine device", ISOPE Conference.

**Ian Jones**, National Science Foundation Graduate Research Fellowship

**Meghan Jones**, National Defense Science and Engineering Graduate Fellowship

**Jennifer Kenyon**, National Science Foundation Graduate Research Fellowship

**Hannah Mark**, Outstanding Student Paper Award, AGU Fall Meeting 2016, San Francisco, "Seismic coupling at divergent plate boundaries from rate-and-state friction models"

**Megan May**, MIT Martin Fellowship Award

**Jill McDermott** PhD '15, the Carl-Gustaf Rossby Award, given for the best PhD thesis completed within MIT's Program in Atmospheres, Oceans and Climate (PAOC).

**Craig McLean**, National Science Foundation Graduate Research Fellowship

**Rose Palermo**, National Science Foundation Graduate Research Fellowship

**Kristen Railey**, National Defense Science and Engineering Graduate Fellowship

2016 Draper Labs Fellowship

2016 Tomorrow's Engineering Leaders: The 20 Twenties Award, American Institute of Aeronautics & Astronautics

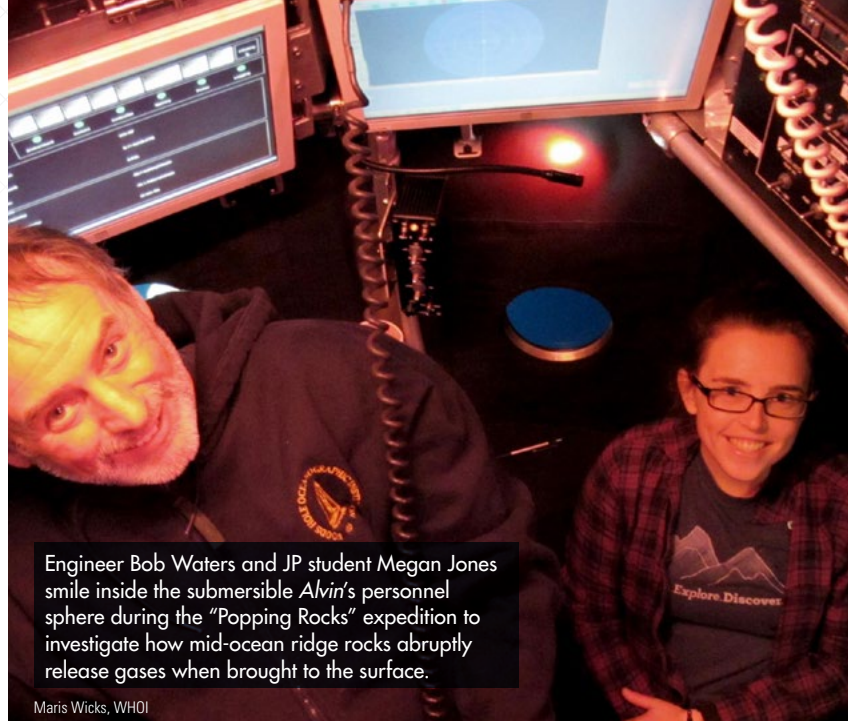
**Taylor Sehein**, National Science Foundation Graduate Research Fellowship

**Paris Smalls**, MIT Diversity Initiative Fellowship Award



Scientist Lou St. Laurent of the Physical Oceanography Department (left) and new Ph.D. recipient Jamie Collins celebrate at the June, 2016 Graduate Reception at WHOI. St. Laurent's red "1,000-degree" shirt signifies the 1,000th degree awarded in the MIT-WHOI Joint Program in Oceanography/ Applied Ocean Science & Engineering, begun in 1968.

Tom Kleindinst, WHOI



Engineer Bob Waters and JP student Megan Jones smile inside the submersible *Alvin's* personnel sphere during the "Popping Rocks" expedition to investigate how mid-ocean ridge rocks abruptly release gases when brought to the surface.

Maris Wicks, WHOI



Joint Program student Camrin Braun sits in a skiff in the rain, waiting for sharks to take the bait so he can carefully tag them with transmitting tags and later follow their movements.

Sam Payet, WHOI



Joint Program student Paris Smalls holds an autonomous vehicle during "dunk tests" and reflected that "at the moment it is YOUR JOB to lay in the sun next to Yellowstone Lake!" The work was completed under an authorized Yellowstone Research Permit.

Rob Sohn, WHOI

# Joint Program Degree Recipients

## 2016 Master of Science

### Rohith Vilasur Swaminathan

Vortices in Sinusoidal Shear with Applications to Jupiter

## 2016 Doctor of Philosophy

### Harriet Alexander

Defining the Ecological and Physiological Traits of Phytoplankton Across Marine Ecosystems

### Alice Alpert

Little Ice Age Climate in the Western Tropical Atlantic Inferred from Coral Geochemical Proxies

### Daniel Amrhein

Inferring Ocean Circulation During the Last Glacial Maximum and Last Deglaciation Using Data and Models

### Hannah Barkley

A Scientific Framework for Evaluating Coral Reef Resilience to Climate Change

### Rene Boiteau

Molecular Determination of Marine Iron Ligands by Mass Spectrometry

### Claire Bucholz

Chemical, Isotopic, and Temporal Variations During Crustal Differentiation: Insights from the Dariv Igneous Complex, Western Mongolia

### Jörn Callies

Submesoscale Turbulence in the Upper Ocean

### Deepak Cherian

When an Eddy Encounters Shelf-Slope Topography

### Bethanie Edwards

The Biogeochemistry of Lipid Derived Infochemical Signals in the Ocean

### Helen Feng

Seismic Constraints on the Processes and Consequences of Secondary Igneous Evolution of Pacific Oceanic Lithosphere

### Kyrstin Fornace

Late Quaternary Climate Variability and Terrestrial Carbon Cycling in Tropical South America

### Rebecca Jackson

Dynamics of Greenland's Glacial Fjords

### Benjamin Linhoff

Seasonal and Interannual Variability in the Hydrology and Geochemistry of an Outlet Glacier of the Greenland Ice Sheet

### Nicholas Macfarlane

The Choreography of Belonging: Toothed Whale Spatial Cohesion and Acoustic Communication

### Jesse McNichol

Productivity, Metabolism and Physiology of Free-Living Chemoautotrophic Epsilonproteobacteria

### Sophia Merrifield

Mechanisms for Enhanced Turbulence in the Drake Passage Region of the Southern Ocean

### Emily Moberg

Optimal Bioeconomic Management of Changing Marine Resources

### Melissa Moulton

Hydrodynamic and Morphodynamic Responses to Surfzone Seafloor Perturbations

### Jaap Nienhuis

Plan-View Evolution of Wave-Dominated Deltas

### Kathleen Pitz

Phenotypic Diversity Within Two Toxic Dinoflagellate Genera: Environmental and Transcriptomic Studies of Species Diversity in *Alexandrium* and *Gambierdiscus*

### Oscar Sosa

Microbial Cycling of Marine High Molecular Weight Dissolved Organic Matter

### Jeanette Wheeler

Behavioral Responses of Invertebrate Larvae to Water Column Cues

### Atulya Yellepeddi

Graphical Model Driven Methods in Adaptive System Identification

Tom Kleindinst, WHOI



Harriet Alexander (second from left) and Melissa Moulton (far right) celebrate receiving their Ph.D. degrees with current graduate students Ellie Bors and Laura Stevens.



Joint Program students Alejandra Ortiz and Helen Feng and Mike Toomey, of the U.S. Geological Survey take a break during the 2016 Geodynamics Program's Study Tour in Iceland.

Bernhard Peucker-Ehrenbrink, WHOI



Summer Student Fellow Elaine Luo and JP student Jeanette Wheeler prepare to view oyster larvae swimming behavior in a tank with infrared light, which they do not react to.

Tom Kleindinst, WHOI

Joint Program student Nicholas Macfarlane aims an antenna from a boat operated by CIRCE (Conservación, Información y Estudio sobre cetáceos) in the Strait of Gibraltar, hunting for a digital recording tag (DTAG) from a pilot whale. The non-invasive tags record a whale's position, movement, and sound for up to a day before releasing.



Frants Jensen, WHOI

# Postdoctoral Program

## Postdoctoral Scholars and Fellows, 2016

### Amalia Aruda Almada

Biology, MIT/WHOI Joint Program, Dean John A. Knauss Marine Policy Fellow

### Kevin W. Becker

Marine Chemistry & Geochemistry, University of Bremen, Germany, United States Geological Survey Postdoctoral Scholar

### Roxanne A. Beinart

Geology & Geophysics, Harvard University, Coastal Ocean Institute Postdoctoral Scholar / National Science Foundation Postdoctoral Research Fellow

### Alec Bogdanoff

Biology, MIT/WHOI Joint Program, Dean John A. Knauss Marine Policy Fellow

### Andrea L. Bogomolni

Biology, University of Connecticut, Morris Animal Foundation Postdoctoral Fellow

### Annie Bourbonnais

Marine Chemistry & Geochemistry, University of Victoria, Canada, National Science Foundation GO-SHIP Postdoctoral Fellowship

### Kristina A. Brown

Marine Chemistry & Geochemistry, University of British Columbia, Canada, Coastal Ocean Institute Postdoctoral Scholar

### Carolyn Buchwald

Marine Chemistry & Geochemistry, MIT/WHOI Joint Program, Center for Dark Energy Biosphere Investigations Postdoctoral Fellow

### Randelle M. Bundy

Marine Chemistry & Geochemistry, University of California, San Diego - Scripps Institution of Oceanography, Postdoctoral Scholar / Simons Foundation Postdoctoral Fellow

### Mattias R. Cape

Physical Oceanography, University of California, San Diego - Scripps Institution of Oceanography, Weston Howland Jr. Postdoctoral Scholar

### Tiago Castro Alves Oliveira

Applied Ocean Physics & Engineering, Polytechnic University of Catalonia, Spain, University of Haifa - Woods Hole Oceanographic Institution Postdoctoral Fellow

### Zhen Cheng

Applied Ocean Physics & Engineering, University of Delaware, Postdoctoral Scholar

### Laurel B. Childress

Marine Chemistry & Geochemistry, Northwestern University, National Ocean Sciences Accelerator Mass Spectrometry Facility Postdoctoral Scholar

### Brian C. Claus

Applied Ocean Physics & Engineering, Memorial University of Newfoundland, Canada, Weston Howland Jr. Postdoctoral Scholar

### Cassidy C. D'Aloia

Biology, Boston University, Weston Howland Jr. Postdoctoral Scholar

WHOI is  
consistently ranked  
among the best Postdoc  
programs in North  
America.





The Lake Titicaca basin has harbored ancient civilizations including the Tiwanaku and Incan empires, and the Uros, who have lived for centuries on a network of human-built floating islands made of totora reeds and travel in distinctive reed boats. The basin collects sediment carried by monsoon precipitation and river runoff from surrounding hills, where it accumulates on the lake bottom. Joint Program student Kyrstin Fornace (inset) analyzed leaf waxes preserved in lake sediments to reconstruct past climate and trace the path of carbon from the air to plants to decomposed plant matter in sediments.

Jayne Doucette, WHOI

Kyrstin Fornace, WHOI



WHOI post-doctoral scholar Andrea Bogomolni leads a group of Ocean Science Journalism Fellows up the stairway after a day aboard the seal touring vessel *Rip Ryder*, off Chatham, Mass. Inset: Aboard, Fellows talked with Bogomolni about her seal research. From left, Madison Kahn, Dinsa Sachan, Sujata Gupta, Brian Owens, Bobby Bascomb, and Bogolmoni.

Jayne Doucette, WHOI



Left, a snapping shrimp in close-up. Snapping shrimp make distinctive loud crackling sounds underwater. Right, postdoc Ashlee Lillis keeps shrimp in containers in the lab, and studies how the shrimps' behavior changes with factors such as time of day, temperature, and proximity of other shrimp.



Tom Kleindinst, WHOI



Postdoc Frants Jensen poses with a pilot whale passing beside his boat. Jensen uses digital recording tags to record and study different kinds of acoustic communication used by deep-diving pilot whales.

Frants Jensen, WHOI



Postdoc Julia Gauglitz and her spouse Steffen Gauglitz at the WHOI Trustees Meeting. A postdoctoral fellow in the Marine Chemistry and Geochemistry Department, Gauglitz studies connections between marine microbes and metals.

Jayne Doucette, WHOI

**Ann G. Dunlea**

Geology & Geophysics,  
Boston University, Ocean  
and Climate Change Institute  
Postdoctoral Scholar

**Kyrstin Fornace**

Biology, MIT/WHOI Joint  
Program, Dean John A.  
Knauss Marine Policy Fellow

**Katherine French**

Marine Chemistry &  
Geochemistry, MIT/WHOI  
Joint Program, Agouron  
Institute Geobiology  
Postdoctoral Fellow

**Changgui Gao**

Geology & Geophysics, China  
University of Geosciences,  
PR China, China Municipal  
Commission Postdoctoral  
Fellow

**Julia M. Gauglitz**

Marine Chemistry &  
Geochemistry, University of  
California, Santa Barbara,  
National Science Foundation  
Ocean Sciences Postdoctoral  
Research Fellowship Scholar

**Yogesh A. Girdhar**

Applied Ocean Physics  
& Engineering, McGill  
University, Canada,  
Postdoctoral Scholar

**Dalton S. Hardisty**

Geology & Geophysics,  
University of California,  
Riverside, Doherty  
Postdoctoral Scholar

**Tristan J. Horner**

Marine Chemistry &  
Geochemistry, University of  
Oxford, United Kingdom,  
Doherty Postdoctoral  
Scholar / Agouron Institute  
Geobiology Postdoctoral  
Fellow

Tom Kleindinst, WHOI



Postdoc  
Kirstin Meyer  
pulls up settlement  
plates from the WHOI  
dock, checking for larval settle-  
ment. Meyer studies factors that attract  
marine invertebrate larvae to settle on and  
colonize underwater surfaces and  
what effect the first settlers have  
on the kinds of larvae that  
settle later, in a process  
called succes-  
sion.

**Frants Jensen**

Biology, Aarhus University,  
Denmark, Danish Council  
for Independent Research,  
Natural Sciences Postdoctoral  
Fellow / Carlsberg Foundation  
Postdoctoral Fellowship at  
Princeton University

**Erika D. Johnson**

Applied Ocean Physics  
& Engineering, Cornell  
University, United  
States Geological Survey  
Postdoctoral Scholar

**Andrew W. Jones**

Biology, Yale University,  
Cooperative Institute for  
the North Atlantic Region  
Postdoctoral Scholar

**Wouter M. Kranenburg**

Applied Ocean Physics &  
Engineering, University of  
Twente, The Netherlands,  
United States Geological  
Survey Postdoctoral Scholar

**Kristina Kville**

Biology, University of  
Oslo, Norway, John H.  
Steele Postdoctoral Scholar

**Laifang Li**

Physical Oceanography,  
Duke University, Ocean and  
Climate Change Institute  
Postdoctoral Scholar

**Yizhen Li**

Applied Ocean Physics &  
Engineering, North Carolina  
State University, Postdoctoral  
Scholar

**Ashlee Lillis**

Biology, North Carolina State  
University, Coastal Ocean  
Institute Postdoctoral Scholar

**Kate E. Lowry**

Physical Oceanography,  
Stanford University, Weston  
Howland Jr. Postdoctoral  
Scholar

**Kirstin S. Meyer**

Biology, University of  
Oregon, Ocean Life Institute  
Postdoctoral Scholar

**Carolyn A. Miller**

Marine Chemistry &  
Geochemistry, Boston  
University, Marine Mammal  
Center / Devonshire  
Postdoctoral Scholar

**Holly V. Moeller**

Biology, Stanford University,  
National Science Foundation  
Postdoctoral Research  
Fellowship Scholar

Many of  
our Postdocs go  
on to faculty and other  
academic and research positions  
around the world,  
including those at  
WHOI.

**Samuel E. Munoz**  
Geology & Geophysics,  
University of Wisconsin,  
Madison, Weston Howland Jr.  
Postdoctoral Scholar

**Hilary I. Palevsky**  
Marine Chemistry &  
Geochemistry, University  
of Washington, Weston  
Howland Jr. Postdoctoral  
Scholar

**Daniel Paranhos Zitterbart**  
Applied Ocean Physics  
& Engineering, Friedrich  
Alexander Universität,  
Erlangen, Nürnberg, Doherty  
Postdoctoral Scholar

**Rhys Parfitt**  
Physical Oceanography,  
Imperial College London,  
United Kingdom, Weston  
Howland Jr. Postdoctoral  
Scholar

**Serdar Sakinan**  
Biology, Middle East  
Technical University,  
Mersin, Turkey, Scientific  
and Technological Research  
Council of Turkey  
Postdoctoral Fellow

**Virginie Sanial**  
Marine Chemistry &  
Geochemistry, Université Paul  
Sabatier, France, Center for  
Marine and Environmental  
Radioactivity Postdoctoral  
Scholar

**Chenguang Sun**  
Geology & Geophysics,  
Brown University, Devonshire  
Postdoctoral Scholar

**Miao Tian**  
Physical Oceanography,  
University of Florida,  
University of Haifa - Woods  
Hole Oceanographic  
Institution Postdoctoral  
Fellow

**Luke D. Trusel**  
Geology & Geophysics,  
Clark University, Doherty  
Postdoctoral Scholar

**Guangyu Xu**  
Geology & Geophysics,  
Rutgers University,  
Postdoctoral Scholar

**Jian Zhao**  
Physical Oceanography,  
University of Miami, Ocean  
and Climate Change Institute  
Postdoctoral Scholar

**Prosper K. Zigah**  
Geology & Geophysics,  
University of Minnesota,  
National Ocean Sciences  
Accelerator Mass  
Spectrometry Facility  
Postdoctoral Scholar

Ning Zhao (right), a postdoctoral investigator in the Geology and Geophysics Department, does seafloor coring work aboard the USCGC Healy out of Barrow, Alaska.

Christopher Griner, WHOI



WHOI postdoc Andy Jones (blue shirt, right) of the Biology Department and guest student Justin Suca (now a Joint Program graduate student) talk to the public about river herring, at a WHOI outreach event in summer 2015. River herring populations in the Northeast have declined, and Jones, in the lab of WHOI biologist Joel Llopiz, is investigating the fishes' growth rates.

Ray Schmitt, WHOI

Tom Kleindinst, WHOI



WHOI wears red for International Women's Day: Standing, from left, Stephanie Madsen, Diana Wickman, Stephanie Petillo, Jeane Hand, Sheri White. Seated, from left, Andrea Harvey, Hilary Palevsky, Rebekka Travis.



Tom Kleindinst, WHOI

Above, Joint Program student Cara Manning (left), in the Marine Chemistry and Geochemistry Department, and Postdoc Investigator, Isabela Le Bras, in the Physical Oceanography Department. Below, from left, postdoc Julie Van der Hoop, Biology Department; and Joint Program students Nick Hawco and Winn Johnson, of the Marine Chemistry and Geochemistry Department, at the 2016 Graduate Reception.



Tom Kleindinst, WHOI

**Postdoctoral Investigators 2016**

**Dhruv Balwada**  
Physical Oceanography,  
Florida State University

**Hannah Barkley**  
Geology & Geophysics, MIT/  
WHOI Joint Program

**Nicholas L. Beard**  
Physical Oceanography,  
University of Washington

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**Michael L. Brosnahan**  
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**Jia-Lin Chen**  
Applied Ocean Physics &  
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**Ke Chen**  
Physical Oceanography, North  
Carolina State University

**Deepak Cherian**  
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WHOI Joint Program

**Shannon Davis**  
Physical Oceanography,  
University of New Hampshire

**Marine C. Desprez**  
Biology, Macquarie  
University, Australia

**Bethanie Edwards**  
Marine Chemistry &  
Geochemistry, MIT/WHOI  
Joint Program

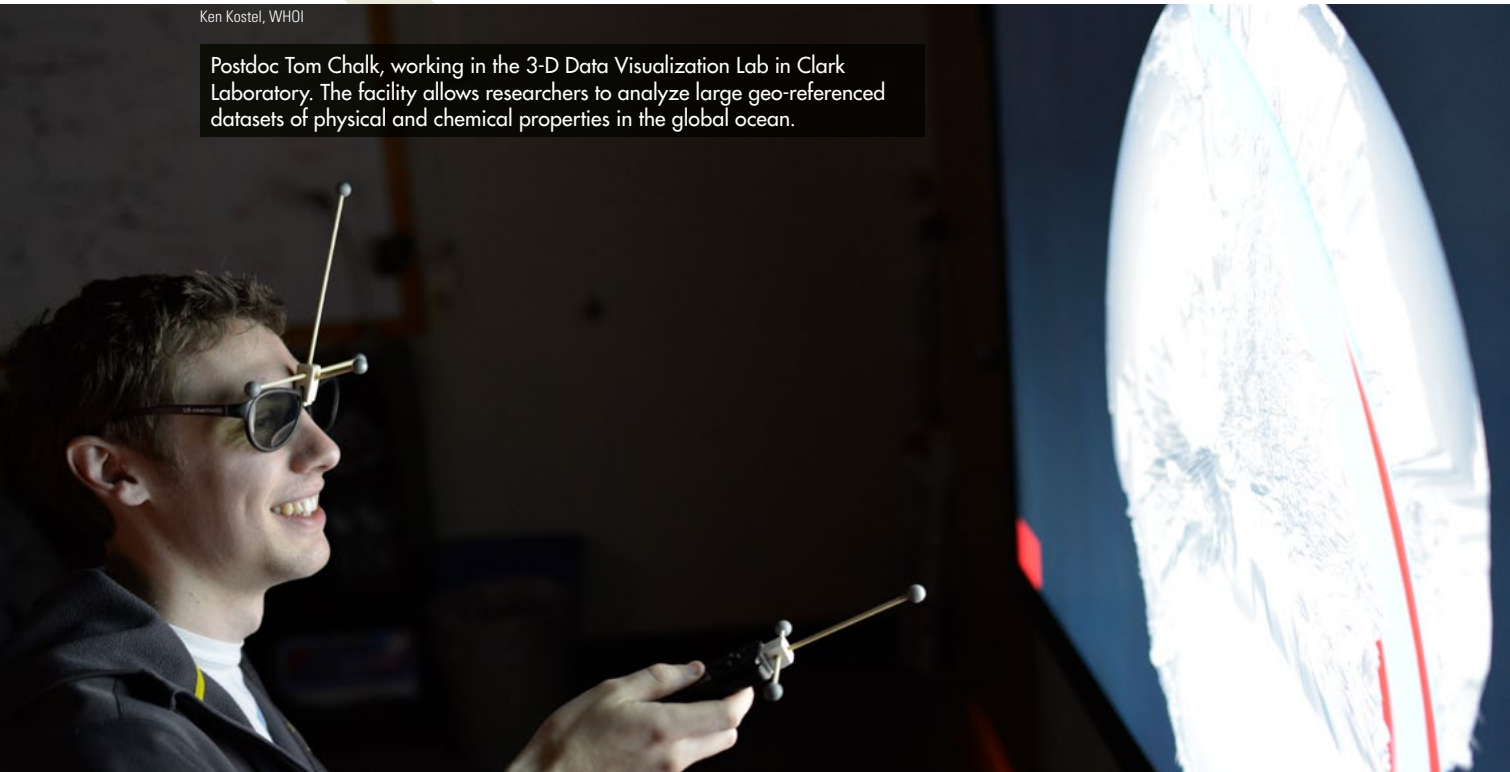
**Zhixuan Feng**  
Biology, University of Miami

**Cara L. Fiore**  
Marine Chemistry &  
Geochemistry, University of  
New Hampshire

**Fatma Goma**  
Geology & Geophysics,  
University of Neuchatel,  
Switzerland

Ken Kostel, WHOI

Postdoc Tom Chalk, working in the 3-D Data Visualization Lab in Clark Laboratory. The facility allows researchers to analyze large geo-referenced datasets of physical and chemical properties in the global ocean.



**Benjamin E. Harden**  
Physical Oceanography,  
University of East Anglia,  
United Kingdom

**Ute Hausmann**  
Applied Ocean Physics &  
Engineering, Imperial College  
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**Rebecca Helm**  
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**Isabela Le Bras**  
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WHOI Joint Program

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Biology, University of  
Maryland, College Park

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Geochemistry, University of  
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**Viviane V. Menezes**  
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University of Tasmania,  
Australia

**Holly V. Moeller**  
Biology, Stanford University

**Francisco Mora-Zamorano**  
Biology, University of  
Wisconsin, Milwaukee

**David Nieves**  
Physical Oceanography,  
University of Colorado,  
Boulder



New  
Ph.D. Mara  
Orescanin, receiv-  
ing her graduation gift  
from WHOI Associ-  
ate Dean Meg  
Tivey.

**Mara Orescanin**  
Applied Ocean Physics &  
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Joint Program

**Ross E. Parnell-Turner**  
Geology & Geophysics,  
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United Kingdom

**Maria D. Perez-Hernandez**  
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Universidad de Las Palmas de  
Gran Canaria, Spain

**Kathleen Pitz**  
Biology, MIT/WHOI Joint  
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**Matthew Salanga**  
Biology, The University of  
Arizona

**Chenguang Sun**  
Geology & Geophysics,  
Brown University

**Luke D. Trusel**  
Physical Oceanography, Clark  
University

**Julie van der Hoop**  
Biology, MIT/WHOI Joint  
Program

**Colin Ward**  
Marine Chemistry &  
Geochemistry, University of  
Michigan

**Prosper K. Zigah**  
Geology & Geophysics,  
University of Minnesota

Erin Koenig, WHOI



Left: Senior  
Scientist Matt  
Charette and Postdoc  
Erika Johnson discuss a  
survey Johnson is conducting of the  
Coonamessett River using a low-flying  
drone carrying a thermal imager to identify  
groundwater springs. Right: Joint Program student  
and doctoral candidate Hannah Barkley  
(now a Postdoctoral Investigator)  
answers audience questions  
after presenting her  
thesis research and  
results.



# Summer Student Fellows

**Cynthia Becker**

Ithaca College  
Effect of PCB153 on  
Genes Involved in Glucose  
Metabolism and Homeostasis  
in *Fundulus heteroclitis*  
(Atlantic killifish)  
Advisors: Mark Hahn and  
John Stegeman, BIO

**Rebecka Bence**

Washington State University  
Oysters as a Sustainable  
Solution: Geochemistry and  
microbial community analysis  
at aquaculture sites in Little  
Pond, MA  
Advisor: Ginny Edgcomb, G&G

**Julia Chavarry**

Johns Hopkins University  
Modeling Commercial  
Fisheries with Different  
Diseases  
Advisor: Michael Neubert, BIO

**Arina Favilla**

University of Miami  
Differences in Diverse Coral  
and Habitat Assemblages  
among Northeast Deep-Sea  
Canyons  
Advisor: Tim Shank, BIO

**Stacey Felgate**

Scottish Association of Marine  
Science, University of the  
Highlands and Islands  
Assessing the Resilience  
of a Blue Carbon Store:  
Characterizing the Lateral  
Flux of DIC from an East  
Coast U.S. Saltmarsh using  
 $\Delta^{14}\text{C}$  and  $\delta^{13}\text{C}$   
Advisors: Meagan Gonneea,  
USGS and Aleck Wang,  
MC&G

**Calvin Fok**

Humboldt State University  
Salt Marsh Restoration:  
Changes in Plant Biomass and  
Gas Flux  
Advisor: Jim Tang, MBL

**Victoria Garefino**

University of South Carolina  
Effect of Hypoxia on  
DNA Methylation during  
Embryonic Development in  
Fish Embryos  
Advisor: Neel Aluru, BIO

**Benjamin Geyman**

Bowdoin College  
Isotopic distribution of  
barium in the North  
Pacific: Modern profile  
and prospects for Ba-based  
paleoceanographic studies  
Advisor: Tristan Horner,  
MC&G

**Kimberly Gottschalk**

Portland State University  
Investigating the Sources  
of Decadal-Scale Property  
Changes in Antarctic Bottom  
Water in the Southeast Indian  
Ocean (80-90°E)  
Advisor: Alison Macdonald, PO

**Lily Hahn**

Yale University  
Increasing Greenland Melt  
and Blocking in Recent  
Decades Modulated by  
Large-Scale and Regional  
Circulation Changes  
Advisors: Fiamma Straneo and  
Caroline Ummenhofer, PO

**Erin Houlihan**

Bowdoin College  
The Effects of Ocean  
Acidification on Larval Oyster  
Swimming Responses to a  
Settlement Cue  
Advisor: Lauren Mullineaux, BIO

**Walter Hutcheson**

New York University  
Estimating the Economic  
Value of Environmental  
Education in the Hudson  
River Estuary  
Advisor: Porter Hoagland, MPC

**Stefani Johnson**

St. John's University  
Assessing the Annual  
Biogeochemical Dynamics of  
the Lower Mississippi River  
and its Tributaries  
Advisor: Bernhard Peucker-  
Ehrenbrink, MC&G

**Ulrich Kakou**

University of Massachusetts,  
Amherst  
Are Saltmarshes Susceptible  
to Carbon Loss following N  
Loading?  
Advisor: Jonathan Sanderman,  
Woods Hole Research Center

**Colette Kelly**

Barnard College  
Drivers of Seasonal and  
Interannual Variations in  
Waquoit Bay Carbonate  
Chemistry  
Advisor: Dan McCorkle,  
G&G and Scott Doney,  
MC&G

**Miranda Kotidis**

Massachusetts Institute of  
Technology  
Rechargeable battery packs for  
a Slocum Glider  
Advisor: Rich Camilli, AOPe

**Nicolas Lavoie**

North Carolina State  
University  
Western tropical Atlantic  
hydrology during Marine  
Isotope Stage 5  
Advisor: Delia Oppo, G&G

Jayne Doucette, WHOI

Summer Student Fellows  
Rebecka Bence and Arina  
Favilla listen to instructor  
Phil Alatalo (out of view),  
on a day trip aboard  
R/V *Toga* learning about  
oceanography.

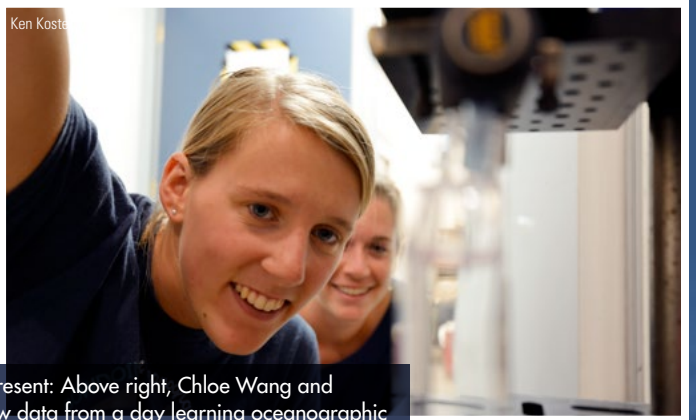




Jayne Doucette, WHOI

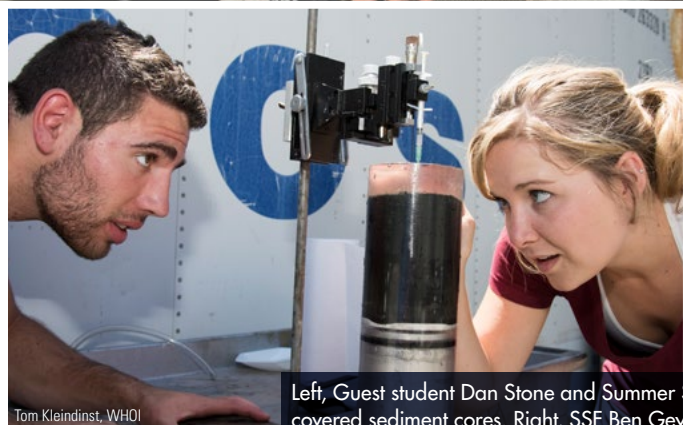


Ken Kostel



Summer Student Fellows learn, research, and present: Above right, Chloe Wang and instructor Phil Alatalo, aboard R/V *Tioga*, review data from a day learning oceanographic techniques. Above left, Erin Houlihan and Colette Kelly in the Shore Lab. Below, Senior Scientist Bernhard Peucker-Ehrenbrink and Stefani Johnson discuss her results at the final poster session.

Tom Kleindinst, WHOI



Tom Kleindinst, WHOI

Matthew Barton, WHOI



Tom Kleindinst, WHOI

Left, Guest student Dan Stone and Summer Student Fellow (SSF) Rebecka Bence process recovered sediment cores. Right, SSF Ben Geyman works in the clean lab for WHOI scientist Tristan Horner. Below, SSFs Victoria Garefino and Cynthia Becker get wet on a summer day, collecting killifish in Scorton Creek in Sandwich, Mass.



**Tianjia Liu**

Columbia University  
Global salinity predictors of  
western United States rainfall  
Advisor: Ray Schmitt, PO

**Kendra Lynn**

Portland State University  
Drivers of Submesoscale  
Dynamics in the Coastal  
Ocean: A Study Using  
High-Frequency Radar  
Observations  
Advisors: Amala Mahadevan  
and Anthony Kirincich, PO

**Lisa MacKenzie**

Bowdoin College  
Feasibility of a Prototype  
Portable Hatchery  
Advisor: Hauke Kite-Powell,  
MPC

**Stephen Maldonado**

Ohio State University  
Dynamics of the Tokar Gap Jet  
Advisor: Larry Pratt, PO

**Sarah McGrath**

College of Wooster  
Western Tropical Atlantic  
hydrology changes during  
abrupt climate events in the  
last glacial interval  
Advisor: Delia Oppo, G&G

**Gabriela Negrete**

University of Wisconsin-  
Madison  
Impacts of Water Quality and  
Ocean Acidification along  
Buzzards Bay  
Advisors: Scott Doney and  
David Glover, MC&G

**Julia Paine**

University of Miami  
Sediment Sources and Transport  
in the Fraser River, BC  
Advisor: Bernhard Peucker-  
Ehrenbrink, MC&G

**Jacob Partida**

Humboldt State University  
Subsurface Exchange of Water  
Masses at the Mid-Atlantic  
Bight Shelf Break  
Advisor: Gordon Zhang, AOPE

**Channing Prend**

Columbia University  
Impact of freshwater plumes  
on intraseasonal upper ocean  
variability from moored  
observations in the Bay of  
Bengal  
Advisor: Hyodae Seo, PO

**Ellin Rittler**

University of San Francisco  
Investigating the Potential of  
Macroalgae to Remediate the  
Effects of Ocean Acidification  
on New England Oyster Farms  
Advisor: Hauke Kite-Powell,  
MPC

**Mark Saddler**

University of Chicago  
Characterizing Chilean blue  
whale (*Balaenoptera musculus*)  
acoustic behavior using  
DTAGs: a test of using tag  
accelerometers to identify calls  
from the tagged whale  
Advisor: Laela Sayigh, BIO

**Justin Snook**

Bridgewater State University  
The Kinetics of  $\text{NO}_3^-$   
Reduction by Aqueous  $\text{H}_2\text{S}$   
During Subsurface Mixing  
in Submarine Hydrothermal  
Systems  
Advisor: Jeffrey Seewald,  
MC&G

**Alyssa Soucy**

University of Massachusetts  
Lowell  
Reconstructing Tropical  
Atlantic SSTs during the Last  
Interglacial  
Advisor: Anne Cohen, G&G

**Rebecca Sugrue**

Massachusetts Institute of  
Technology  
Autonomous Greenhouse Gas  
Analyzing with a Jetpak  
Advisors: Anna Michel, AOPE  
and David Nicholson, MC&G

**Chloe Wang**

Haverford College  
Microbial Colonization  
of Metal Sulfides at a  
Hydrothermal Vent  
Advisors: Colleen Hansel,  
MC&G and Stefan Sievert, BIO



Jayne Doucette, WHOI

Aboard R/V *Tioga*, instructor Nancy Copley (left) provides hands-on experience measuring dissolved oxygen in seawater to Alexander Linares of the Partnership Education Program and SSFs Gabriela Negrete and Walter Hutcheson.

# Semester at WHOI Research Projects

## Cynthia Becker

Ithaca College  
Localized impact of  
aquaculture effluent on Red  
Sea coral reef water nutrients  
and microorganisms  
Advisor: Amy Apprill, Marine  
Chemistry and Geochemistry

## Laura Chrobak

University of California,  
Berkeley  
Design of an Imaging System  
for a Glider  
Advisors: James Kinsey and  
Brian Klaus, Applied Ocean  
Physics and Engineering

## Lauren Dana

Bryn Mawr College  
Wind wave production on a  
gently sloping tidal flat  
Advisor: Britt Raubenheimer,  
Applied Ocean Physics and  
Engineering

## Patrick Orenstein

Brown University  
Observing the Atlantic  
Meridional Mode (AMM) in  
simulations of North Atlantic  
hurricanes  
Advisor: Jeff Donnelly,  
Geology and Geophysics

## Mary Caroline Regan

Wake Forest University  
Tracking ocean productivity  
through stable carbon isotope  
analysis in meso and bathy  
pelagic fishes of the North  
Atlantic  
Advisor: Simon Thorrold,  
Biology

From the  
Semester at  
WHOI program:  
SAW student Cynthia  
Becker and Guest student Paul  
Caiger in the Virgin Islands. Right, SAW  
student Patrick Orenstein and scientist Anthony  
Kirincich deploy a sediment grab sampler;  
SAW students Orenstein, Becker,  
Laura Chrobak and Mary  
Caroline Regan in front  
of the R/V *Neil Armstrong*.



Hannah Mark, WHOI



Kama Thiele, WHOI



Amy Apprill, WHOI

## Endowed Funds

# Supporting WHOI's Education Activities

*We thank our donors for their generous contributions to WHOI's academic programs.*

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The Henry L. and Grace Doherty Professor of Oceanography

The Doherty Postdoctoral Scholars

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The Edward and Erla Schwarm Family Fund

The Virginia Walker Smith Fund

The Seth Sprague Educational and Charitable Foundation Fund

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The H. Burr Steinbach Fund

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The Vera M. Wallach Scholarship Fund

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On the cover: MIT-WHOI graduate student Camrin Braun attaches satellite tags to sharks to track their unknown movements in the ocean. When he and colleagues find a shark, they have only a few minutes to take blood samples and body measurements, attach tags to the sharks, and release them. Photo courtesy of Tane Sinclair-Taylor.