

# Partnership

Winter 2012 Issue: Volume 22, No. 1

## Letter from the Chair

- Suzanne Avtges and Debbie Scanlon, WHSTEP Co-chairs

A recent New York Times article inquires “Why Science Majors Change Their Minds”. While the number of college freshmen interested in majoring in science, technology, engineering and mathematics (STEM) fields is on the rise, many end up switching their major to a non-STEM subject. There is also concern for the number of women entering the fields of engineering and computer science. (See graph)

Our society is in need of 21<sup>st</sup> century problem solvers. With global climate change causing a myriad of natural, political and economic crises, today’s youth are the pool of talent we will need to solve these problems.

The question for educators and scientists alike is how can we encourage and maintain an interest in science for our students? That’s where WHSTEP can help.

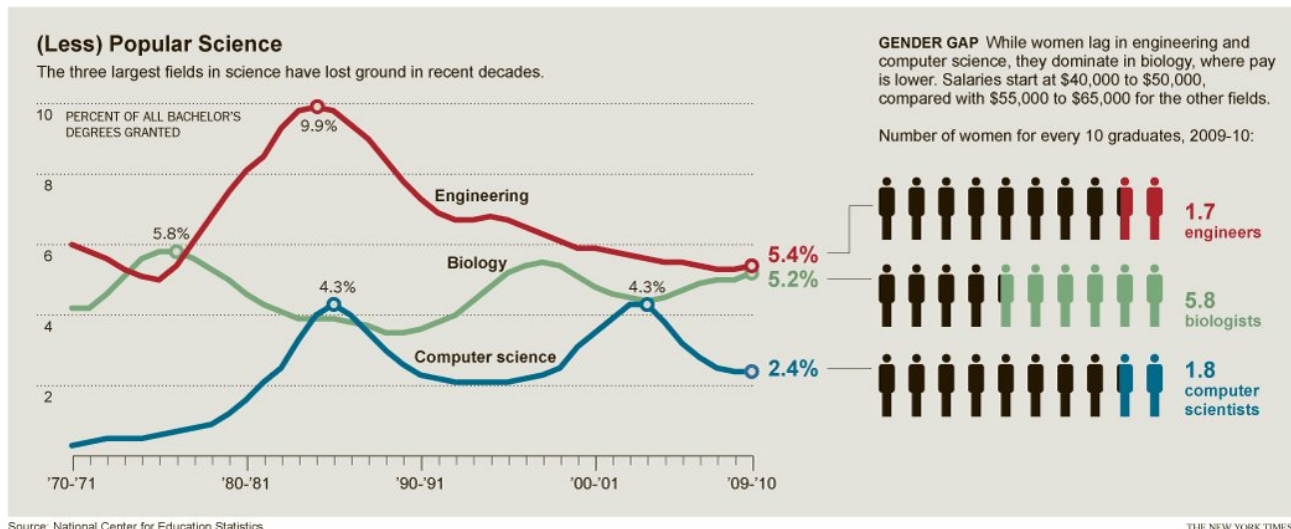
With our programs such as family science events, science and math safaris, courses and meetings, WHSTEP can bring real world science to teachers to bring back to their classrooms. The WHSTEP mini-grant program is an avenue that teachers may use to bring supplies and innovative activities to their students. And by encouraging scientists to judge science fairs and mentor students, WHSTEP is providing interaction between young people and scientists that will allow students to see the rewards of a career in science.



Debbie Scanlon

An undergraduate in the MBL Semester in Environmental Science describes his research to Lawrence School seventh and eighth grade science teachers during their visit to the MBL Ecosystems Center.

Have a conversation with your school liaison to learn about the resources available from WHSTEP. Together we can bring science back to the classroom and foster the interest that is needed for our future.



## ***WHSTEP 2011 Highlights***

For 14 years, WHSTEP has organized a science project mentoring program at the Lawrence School in Falmouth. Members of the WHSTEP scientific community volunteer their time to meet with 7<sup>th</sup> and 8<sup>th</sup> grade students and help them design and refine their science projects. This year, mentoring took place in late January-early February. Twenty-seven volunteers participated from MBL, WHOI, USGS, SEA and WBNERR.

WHSTEP arranged for science institution exhibits at the Falmouth District Science Fair in early March. Students and families enjoyed the informative and interactive displays from all of the WHSTEP member institutions, including a new poster on marine science careers contributed by Woods Hole Sea Grant. The Bourne Science Fair was held in mid-March at Bourne Middle School. WHOI, USGS, MBL, C-MORE and the Encyclopedia of Life exhibited at the Fair.

In April, WHSTEP hosted a Family Science Night, "The Engineering behind the *Titanic* Exploration," at the Falmouth Public Library for students in grades 3-8 and their parents and teachers. A panel of three scientists and engineers brought props and spoke about the search for the *Titanic* and the remotely-operated vehicles and camera systems that explored and documented the shipwreck. About 100 people attended, with more than 50 young students crowding the floor and eagerly questioning the panelists.

In May, the WHSTEP Annual Meeting was held at the Mashpee Public Library. Teachers, institution liaisons, and members of the public enjoyed an informative presentation, 'Jaws' Revisited: The Great White Shark in New England," by Greg Skomal, senior fisheries biologist with the Massachusetts Division of Marine Fisheries and head of the Massachusetts Shark Research Program. WHSTEP co-chair Suzanne Avtges described WHSTEP programming, introduced new executive committee members and honored Nancy Soderberg, retiring from USGS, for many years of service to WHSTEP.

In mid-October, the annual WHSTEP Liaison Welcome Dinner was held at the Landfall Restaurant in Woods Hole with almost 50 attendees. Outreach and education staff from the scientific institutions and local informal science programs presented classroom-ready activities and demonstrations. School and institution liaisons, elementary, middle and high school teachers, school administrators and scientists enjoyed an evening of networking and planning.

On-going projects:

- Through the Registry of Science Outreach Volunteers (WHSTEP ROV.) and our liaison network, WHSTEP links teachers with researchers and materials from the member scientific institutions, and links researchers with schools to fulfill their outreach goals. Some examples from 2011 include finding scientists to visit classrooms and collaborate on lesson plans, arranging field trips and lab tours in Woods Hole and supporting a NOAA Environmental Literacy Grant proposal.
- WHSTEP awards mini-grants to support and enhance science, math and technology education in our member schools. This year's funded projects were supplies for the Engineering Lab at the Lawrence School, and field guides and materials for the "Monitoring and Recording Life on Shiverick's Pond" project at Mullen-Hall School.
- "Partnership," the WHSTEP newsletter, is published biannually and distributed to a mailing list of over 400 people.
- WHSTEP administers an email listserv to publicize our programming and meetings, as well as relevant local workshops and lectures on topics of science, math and technology.

## WHSTEP Liaison Welcome Dinner

- Kama Thieler

On October 19, the annual WHSTEP Liaison Welcome Dinner was held at the Landfall Restaurant in Woods Hole with almost 50 attendees. Outreach and education staff from the scientific institutions and local informal science programs presented classroom-ready activities and demonstrations. School and institution liaisons, elementary, middle and high school teachers, school administrators and scientists enjoyed an evening of networking and planning.

Jeff Schell of SEA presented an ocean circulation demonstration and Amy Siuda, also of SEA, presented activities and experiments about plastics in the ocean. Kama Thieler, WHOI, presented a coastal water sampling program, part of the Global Learning and Observations to Benefit the Environment (GLOBE) Program. Karen Bolles and Amber York, WHOI, displayed seafloor educational activities based on images from the Habitat Mapping Camera system (HabCam). Rob Reynolds, Zephyr Education Foundation, and Jim Manning, NOAA, presented student-built, satellite-tracked drifter buoys. Joan Muller, WBNERR, presented the Teachers on the Estuary (TOTE) program and using data in the classroom from the National Estuarine Research Reserves.

Special thanks to Don Estes, owner of the Landfall Restaurant and member of the WHSTEP Executive Committee, who donated use of the restaurant for the event, and to the scientific institutions that provided literature, maps and other educational material for the teachers and raffle prizes.



*Debbie Scanlon*

Teachers and WHSTEP Liaisons enjoy pizza and networking at the Annual Liaison Dinner.



*Debbie Scanlon*

Amber York, WHOI, and Gordon Starr, Teaticket Elementary School, discuss seafloor educational activities based on images from the Habitat Mapping Camera System (HabCam).

### ***Liaison Dinner presenters and web resources:***

**Motion in the Ocean: Ocean Circulation Demonstration  
Plastic Marine Debris: Activities and Experiments**  
[www.sea.edu](http://www.sea.edu)

**Habitat Mapping Camera System (HabCam): Seafloor  
Educational Activities**  
<http://habcam.who.edu/>

**WHOI GLOBE Partnership: Students, Teachers and  
Scientists Investigating Coastal Ecosystems**  
[www.globe.gov](http://www.globe.gov)

**Data in the Classroom: Teachers on the Estuary  
Course (TOTE)**  
[www.waquoitbayreserve.org](http://www.waquoitbayreserve.org)

**Tracking Ocean Currents with Student-built Drifters**  
<http://www.nefsc.noaa.gov/drifter/>  
<http://www.zephyrmarine.net/>

## Lawrence School Teachers Visit the MBL Ecosystems Center

- Debbie Scanlon

Eight seventh and eighth grade science teachers from Lawrence School visited the MBL Ecosystems Center on December 6. Ecosystems Center WHSTEP liaison Kate Morkeski organized the tour after talking with Lawrence School science chair Bob Laquidara at the Liaison Dinner in October. Senior scientist Ed Rastetter greeted the group and gave them an overview of the scope of ecological research conducted at the center. He explained that a major component is through the National Science Foundation's Long-Term Ecological Research (LTER) program. Three of the 26 LTER sites - Arctic, Palmer and Plum Island Ecosystems, with locations ranging from Alaska to Antarctica to northeastern Massachusetts - have leadership based at the center. Researchers from Harvard Forest in central Massachusetts, another LTER site, also call the center home.

Kate then led the tour, stopping by several labs to give the teachers a casual snapshot of research at the center. Instead of hearing formal presentations, the teachers met the researchers in their labs and learned what information they were pursuing that day. Stable Isotope Lab manager Marshall Otter and postdoctoral fellow Jimmy Nelson explained how they use mass spectrometers to measure stable isotopes in environmental samples and how the resulting information is used to understand ecological food webs. Kate talked about her work analyzing nitrate concentrations in order to understand tidal balances of nitrate in Linda Deegan's salt marsh nutrient manipulation at Plum Island.

JC Weber, senior research assistant and a member of the WHSTEP executive board, talked about his lab's Oceanic Flux Program (OFP) time series, which measures and characterizes particle fluxes in the deep Sargasso Sea. The program, run by Maureen Conte, is the longest running time series of its kind. He also spoke about the serendipity of how samples collected as part of the OFP at Bermuda prompted exciting new questions that led JC and Maureen to a pristine rainforest in French Guiana to study carbon in plant waxes.



*Debbie Scanlon*

Judy Harbison and Bob Heller, Lawrence School, discuss ongoing research at the MBL Ecosystems Center with JC Weber.

In the lab, research assistant Lindsay Scott of the Harvard Forest LTER explained how she used a shotgun to obtain the leaves she was preparing in the lab to measure for stable isotopes of nitrogen and carbon. The samples were taken from the canopy of trees located in two plots, one where the soil has been warmed for nine years, and one where there has been no heating. The leaf samples combined with tree growth and various soil measurements, all taken yearly, help the group to understand how forested ecosystems respond to warming.

Finally, the teachers stopped by senior scientist Zoe Cardon's lab, where Bates College student Hansen Johnson, an undergraduate in MBL's Semester in Environmental Science, explained his research project analyzing the role of cyanobacteria in the nitrogen cycle.

After the tour, Bob Laquidara commented, "It was a very productive visit for my science teachers. We enjoy sharing experiences in local labs with our students. Often the projects have global implications but are based from labs right down the street from their school. Our students are just as impressed by that as we are."

## WHSTEP Liaison Reference 2011-12

### WHSTEP Executive Committee

**Suzanne Avtges, Co-Chair**  
Mashpee High School

**Deb Coulombe**  
Community

**Don Estes**  
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**Kate Madin**  
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**Patti Parker**  
Bourne High School

**Lynn Parks**  
Community  
Lawrence School (ret.)

**Patricia Perry**  
Community  
East Falmouth Elementary (ret.)

**Debbie Scanlon, Co-Chair**  
Marine Biological Laboratory

**Jeff Schell**  
Sea Education Association

**Amy Siuda**  
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**Ann Vachon**  
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**East Falmouth Elementary** (Falmouth; K-4)  
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Chris Brothers

**KC Coombs School** (Mashpee; K-2)  
Lee Horner

**Lawrence School** (Falmouth; 7-8)  
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Bob Laquidara

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Cheryl Belanger

**Mashpee Middle School** (Mashpee; 7-8)  
Mark Rosbach

**Morse Pond School** (Falmouth; 5-6)  
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Stephen Kapulka

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Trish Mara

**North Falmouth Elementary**  
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Kathy Bowker  
Debra McCurdy

**Peebles Elementary** (Bourne; K-4)  
Laura Gray-Shultz

**Quashnet School** (Mashpee; 3-6)  
Robin Geggatt

**Teaticket Elementary** (Falmouth; K-4)  
Gordon Starr

**Upper Cape Tech** (Bourne, 9-12)  
Ann Vachon  
Nolan Leroy

### WHSTEP Institution Contacts

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**MBL Ecosystems Center**  
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**National Marine Fisheries Service**  
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**Sea Education Association (SEA)**  
Mary Engels  
Emily Carruthers

**U.S. Department of Agriculture**  
(USDA)  
Ron Mack

**U.S. Geological Survey (USGS)**  
Claudia Flores  
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**Waquoit Bay National Estuarine Research Reserve (WBNERR)**  
Joan Muller

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Judy McDowell  
Janet Fields  
Joanne Tromp

**Woods Hole Research Center (WHRC)**  
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#### Useful Internet Addresses

MBL: [www.mbl.edu](http://www.mbl.edu)

USGS: <http://woodshole.er.usgs.gov>

NMFS: [www.nefsc.nmfs.gov](http://www.nefsc.nmfs.gov)

WBNERR: [www.waquoitbayreserve.org](http://www.waquoitbayreserve.org)

SEA: [www.sea.edu](http://www.sea.edu)

WHOI: [www.whoi.edu](http://www.whoi.edu)

Sea Grant: [www.whoi.edu/seagrant](http://www.whoi.edu/seagrant)

WHRC: [www.whrc.org](http://www.whrc.org)