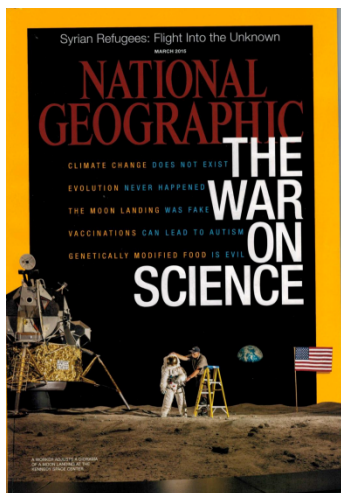


Letter from the Co-Chairs

JC Weber (Marine Biological Laboratory) & Suzanne Avtges (Mashpee High School)



Last month, National Geographic magazine ran a cover story entitled “The War on Science” which detailed the growing skepticism of science and the passionate polarization on issues spanning vitally important topics such as the existence of climate change, the fundamental process of evolution and misconceptions on the mechanisms and consequences of vaccinations. As individuals working in the fields of both scientific research and education, this article and the extent that science is being portrayed by some as a biased agenda instead of a fundamental foundation upon which to build enlightened policy (both personal and societal) caused a real moment of surprised reflection. It’s a topic of conversation that all of us as scientists and educators should not simply dismiss as fringe elements and has personally strengthened our conviction to not simply expand our scientific knowledge among our peers, but to truly embrace outreach efforts to educate and share our passion about science and what we can do as

individuals with the public, especially the next generation advancing through all levels of our educational system.

WHSTEP as a network that both promotes and enhances scientific education is only as strong and active as its members – both the scientific research institutions and the participating school districts. The statement that we’ve previously asserted that *all of you* are WHSTEP is very accurate. Our area is so unique having such a high number of varied research institutions and scientific businesses. This distinctive high density of individuals actively working to advance scientific knowledge and applications can be an incredible resource that enhances science education in our schools from the elementary to high school level and beyond. As scientists and educators, it’s our obligation to share our scientific knowledge and passion with the public – a process that can be incredibly rewarding as it is vital.

WHSTEP as a network is continually evolving to our strengths. The last couple of public meetings have been structured to have a featured speaker from one of the research institutions (typically the institution hosting the event) followed by a more applied education presentation highlighting science resources available for educators in the classroom now. The last meeting also saw the addition of student ambassadors to the audience, as we encouraged teachers to bring a few of their most enthusiastic students along with them to hear the talks and interact with the scientists, reporting back to their classmates. We have plans to try and alternate the locations of the public WHSTEP meetings between member research institutions (Winter Meeting) and school districts (Spring Meeting), giving each an opportunity to become more directly involved and to showcase and share their science assets with the community and other school districts. We also are continuing to explore avenues of increased involvement in WHSTEP by our area’s science and technology businesses.

It is truly an exciting and important time to be working in the fields of science and education!

WHSTEP Liaison Dinner: Climate Change Science & Education

- Abby Smith

On October 14, 2014, teachers and administrators affiliated with the WHSTEP network joined members of the Woods Hole scientific community at the Landfall Restaurant for the annual Liaison Dinner. This year's theme was Climate Change Science. Each science institution in the Falmouth area was represented at the dinner ([WHOI](#), [MBL](#), [WHRC](#), [WBNERR](#), [NOAA](#), [USGS](#)) as well as a member of "[Young Voices for the Planet](#)". (Young Voices for the planet is an initiative developed by Falmouth resident, Lynne Cherry, that produces videos to educate and inspire young people to take action against climate change.)

Each representative brought an informational and/or interactive display. Displays included current research projects and topics, short video clips, and outreach materials. Displays fostered in-depth discussion among teachers and other attendees about the important role climate change research has in today's society and methods for incorporating climate science into middle and high school science curricula.

Scott Doney, senior scientist and department chair of WHOI's Marine Chemistry & Geochemistry Department, introduced the event with a synopsis of his research and an overview of climate science today.



(above) Scott Doney's Introduction to Climate Change Science (Photo: Abby Smith)



(Above) Ann Giblin, MBL, sharing her research with WHSTEP members Patti Parker and Zander Nassikas (Photo: JC Weber)

WHSTEP would like to thank Don Estes, owner of the Landfall Restaurant, who donated use of the restaurant and refreshments for the event, to the scientists who set up displays and presentations, and to the institutions that provided educational materials and raffle prizes.

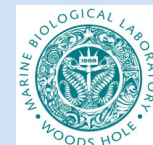
Scott Doney, WHOI
"Coastal Water Quality and Ocean Acidification"



Patrick Jantz, WHRC
"Mapping the Biomass Corridors for Climate and Biodiversity Co-Benefits in the Tropics"



Anne Giblin, MBL
"Are Marshes Keeping up with Sea Level Rise Now and in the Future?"



Joan Muller, WBNERR
"Bringing Wetlands to Market: Nitrogen and Coastal Blue Carbon Research Project"



Rob Thieler, USGS
"Changing Climate, Changing Coasts: USGS Web Portal Visualizes Past, Present, and Future Coastal Hazards"



Chris Pollini
"Young Voices on Climate Change"



Michael Fogarty, NOAA



WHSTEP Winter Meeting 2015 at the Marine Biological Laboratory's Ecosystems Center: Climate Change on the National & Local Scale

- JC Weber



On February 4th, the [Ecosystems Center at the Marine Biological Laboratory \(MBL\)](#) in Woods Hole hosted the Winter Meeting of WHSTEP. The theme focused

on climate change and its effects on both the national and local levels. The meeting was attended by members of the surrounding research institutions, teachers and administrators from the participating WHSTEP school districts representing elementary through high school education, and community supporters of science education. Students were also in attendance with local teachers encouraged to have a few of their most enthusiastic students accompany them and report back to their classmates. In addition to hearing the featured speakers, attendees had the opportunity to chat with Ecosystems Center scientists and browse the lobby displays highlighting current research efforts.

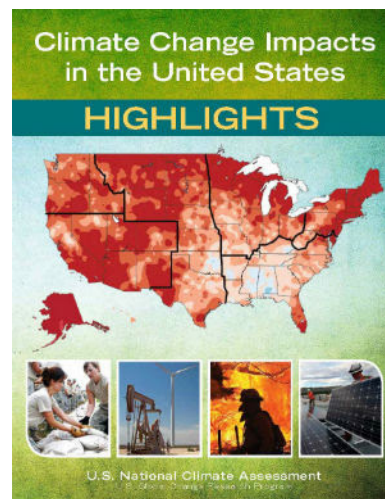
Jerry Melillo, a distinguished scientist at MBL's Ecosystem Center, began the featured presentations by discussing the National Climate Assessment, a report produced by a federal advisory committee on which he served as the chairman. The assessment, drawing upon the expertise of hundreds of researchers and carefully compiled over three years, detailed the current and future impacts of climate change on the United States. Dr. Melillo, a former high school educator himself, connected well with the packed auditorium of educators, students, and supporters of science education and very effectively shared highlights of the report and detailed how climate change is currently affecting the nation and the various regions, including the northeast, now and the impacts projected to come. You can find more detailed information from the National Climate Assessment at the website <http://nca2014.globalchange.gov/>.



The second presentation of the meeting featured the [Buzzards Bay Coalition \(BBC\)](#), a membership supported non-profit organization dedicated to the restoration, protection and sustainable use and enjoyment of Buzzards Bay and its watershed. Science director, Dr. Rachel Jakuba, gave an overview of how their organization is partnering with research institutions such as the MBL's Ecosystems Center & the Woods Hole Oceanographic Institution (WHOI) for analysis and interpretation of long-term data sets from citizen monitoring programs such as their [Baywatchers](#) program. Meghan Gahm gave a presentation highlighting details about the BBC's current outreach efforts in the local community including resources and programs available to both educators and students.



(above) Jerry Melillo discusses the National Climate Assessment (Photo: JC Weber)



(right) Copies of the Highlights booklet were made available to attendees of the Winter Meeting. Additional copies are available upon request at the nca2014.globalchange.gov website.

To learn more about local initiatives, go to savebuzzardsbay.org

Project Mentoring and Science Fairs 2015 - Abby Smith

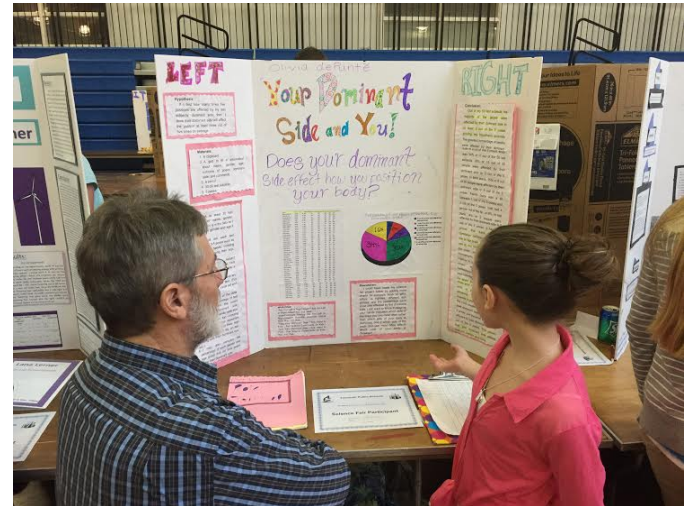
During the week of January 20- 23, WHSTEP hosted the 18th annual Mentoring Program at Lawrence School. The objective of this week is for 7th and 8th grade students to gain insight and expert advice on their science projects. Students interested in participating meet one-on-one with a scientist for upwards of 15-20 minutes. From conversations with various students, it was evident that the extra help and encouragement made quite a difference in both their project process and final product.



(above) WHSTEP Executive Committee member, Sara Bysse, mentoring 8th grade Lawrence Student (Photo: Abby Smith)

WHSTEP extends sincere thanks and appreciation to those scientists and engineers who volunteered their time and expertise. This tradition could not be made possible without you: Suzanne Thomas, MBL; Andreas Krupke, WHOI; Nancy Church, WBNERR; Jim Rassman, WBNERR; Camille Weinberg, Bill Waite, USGS; Jim Newman, WHMSI; JC Weber, MBL; Vicke Starczak, WHOI; Rob Reynolds, Zephyr Marine; Sara Bysse, WHSTEP; Lauren Mullineaux, WHOI; Joshua Moser, NOAA; Diana Franks, WHOI; Susan Mills, WHOI; Liese Siemann, Coonamessett Farm; Alice Carter, MBL; Mary Anne Alliegro, NOAA; Chris Sherwood, USGS; Brian Buczkowski, USGS; Francis Elder, WHOI;

Robin Littlefield, WHOI; Porter Hoagland, WHOI; Samuel Kelsey, MBL.



(above) Marshall Otter, MBL, judging Lawrence Student, Olivia dePunte, on her project titled, "Your Dominant Side and You!" (Photo: JC Weber)

The [Falmouth Science and Engineering Fair](#) was held on Saturday, February 28. This year's projects were creative and thoughtful. Some award winning project topics included: Analyzing the Music of Bach, What Bridge Design Can Support the Most Weight?, Ocean Acidification, GMOs Exposed, Algae: Harmful or Beneficial?, Learning in Color, Carbon Storage in Marshes, and more.

Many scientists and community members affiliated with WHSTEP attended this year's fair in support. WHSTEP extends thanks to those who brought an interactive and informational display highlighting their research and educational initiatives. Your efforts in supporting science and technology education are greatly appreciated!



The Annual Bourne Science Expo was held on March 2. Previously known as the Bourne Science Fair, it showcased science, technology, engineering, and mathematics related projects by Bourne Middle and High School students. Projects were judged by a panel of volunteer scientists and engineers from Falmouth scientific institutions such as WHOI and MBL.

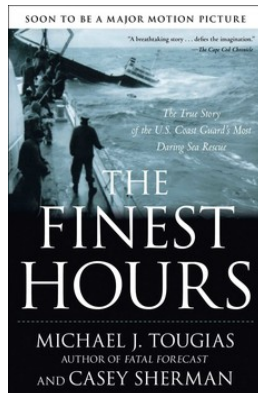
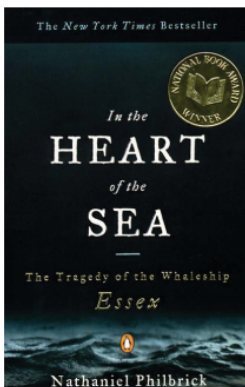
WHSTEP Mini-Grant Funded Projects (2014-2015)

- Abby Smith

WHSTEP received several mini-grant applications this year. Below are summaries of the four that were approved and awarded. Additional information about mini-grant funding criteria and applications can be found [here](#).

Maritime Literacy - Falmouth High School

WHSTEP funded 46 books to be used by students in Cheryl Milliken's Marine Ecology classes. Students were given the choice to read either *In the Heart of the Sea*, by Nathaniel Philbrick, or *The Finest Hours: The True Story of the U.S. Coast Guard's Most Daring Sea Rescue*, by Michael Tougias. Cheryl has developed various activities and assignments to supplement reading the book, all of which address goals of the Falmouth Public Schools' Literacy Action Plan to involve students in reading, speaking, listening, and writing about a literacy text in a science classroom.



Kinder-Garden Labyrinth of Learning - Teaticket School

Kindergarten teacher, Lynn Vendetta, was awarded WHSTEP funds to implement a project to construct an outdoor learning space for students. The space will include a labyrinth bordered by pavers depicting local plants, insects, animals, numbers and letters, an ABC garden and a Rainbow garden, an outdoor teaching and learning area, and nature inspired outdoor musical instruments. The final product will provide students with opportunities for hands-on, outdoor learning and will be available for all classes and grade levels to

experience. WHSTEP funds were used specifically in the construction of the cement pavers. (below: cement pavers & garden plans, photos: Lynn Vendetta)



Wet Lab - Bourne High School

As a part of Bourne High School's project to convert an unused classroom into an aquaponics/wet lab, Jeff Farrington sought WHSTEP funds to purchase fish genetics kits. The kits will support the genetics curriculum in high school biology classes and provide unique opportunities for advanced, long term studies focused around hydroponics, aquaculture, and bio-technology.

Water Bottle Greenhouse - Quashnet School

Fifth grade teacher, Coleen Blount, seeks to restore and rebuild the greenhouse at Quashnet School using recyclable materials. Upon successful completion of this project, students will be able to reassess the design of the current greenhouse (damaged by winter storms), repair the greenhouse, help sustain the Quashnet garden, and supply the plants for a proposed annual plant sale. WHSTEP funds are allocated for the building materials to restore the frame of the greenhouse.

WHSTEP

WOODS HOLE SCIENCE AND TECHNOLOGY EDUCATION PARTNERSHIP
P.O. Box 487, Woods Hole MA 02543

What does it mean to be a WHSTEP Liaison?

1. Connect with the network

The liaison network is the heart of WHSTEP. Liaisons make the connections that are vital to the functioning of the partnership. For example, a teacher looking for guest speakers, unused lab equipment, or an answer to a science question can talk to the WHSTEP liaison at the school. The school liaison then contacts the liaison at one of the partner science institutions to start the process of finding what is needed. Scientists or engineers who have resources to offer, or who want to consult with a teacher about the education component of a project can contact the WHSTEP liaison in their institution.

- **As liaison, you are the contact person for WHSTEP at your school or institution. It is important to make sure your colleagues and administration know that you are the WHSTEP liaison.**
- **School liaisons – Introduce WHSTEP at staff and department meetings, talk to new teachers about WHSTEP programs, find out from staff how WHSTEP can help support science, technology, and engineering education in your school.**
- **Institution liaisons - Talk to colleagues about broader impacts and outreach, describe WHSTEP programs and opportunities, and discuss how WHSTEP could be involved.**

2. Pass along information

The liaison acts as the point person for each member school and organization. WHSTEP sends information about resources, programs, and events to liaisons for dissemination. Liaisons then communicate with colleagues and administrators about the programs or make the resources available to the appropriate recipients.

- **As liaison, you are the only person that receives information and regular updates from WHSTEP. We rely on you to determine the best way to disseminate the information to others at your school or institution.**
- **School liaisons - Encourage colleagues to apply for WHSTEP mini-grants, promote WHSTEP Science and Math safaris, meetings and programs.**
- **Institution liaisons – Send the WHSTEP administrator information on lectures or workshops, new websites, cruise blogs, etc. that would be of interest to teachers and the community.**
- **Add a personal note when you send WHSTEP announcements to colleagues, encouraging them to attend or become involved – your note will really help to engage their interest.**

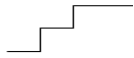
3. Provide feedback

WHSTEP is dependent on our liaisons to provide us with feedback about what your school or institution needs. Let us know what programming or initiatives would be useful to you.

For more information, visit <http://www.who.edu/whstep/> or contact Abigail Smith, WHSTEP Administrator @ abigailalice.smith@gmail.com,

WHSTEP Liaisons Quick Reference 2014 - 2015

WHSTEP Executive Committee	<p>Suzane Avtges, <i>WHSTEP Co-Chair, Mashpee HS</i> Sara Bysshe, <i>Community Representative</i> Don Estes, <i>Business Representative</i> Janet Fields, <i>WHOI</i> Judy Harbison, <i>Lawrence School</i> Bob Heller, <i>Lawrence School</i> Tom Hoppensteadt, <i>Mashpee HS</i> Lee Horner, <i>KC Coombs, Mashpee</i> Patti Parker, <i>Bourne PS</i> Lynn Parks, <i>Community Representative</i> Jane Perkoski, <i>Bourne HS</i> Kathleen Savage, <i>WHRC</i> Debbie Scanlon, <i>Community/Business Representative</i> Amy Siuda, <i>SEA</i> Ann Vachon, <i>Upper Cape Tech</i> J.C. Weber, <i>MBL, WHSTEP Co-Chair</i> Linda Werner, <i>Morse Pond</i> Abigail Smith, <i>WHSTEP Administrator</i></p>
Falmouth Public Schools	<p>Vacant, <i>Falmouth Academy</i> Chris Brothers, <i>Falmouth HS</i> Bob Porto, <i>Lawrence School</i> Carrie Fitzpatrick, <i>Lawrence School</i> Vacant, <i>Morse Pond Elementary</i> Wendy Scholes, <i>East Falmouth Elementary</i> Kate Skehill, <i>East Falmouth Elementary</i> Gordon Starr, <i>Mullen Hall School</i> Kathy Bowker, <i>North Falmouth Elementary</i> Debra McCurdy, <i>North Falmouth Elementary</i> Jody Kirincich, <i>Teaticket Elementary</i></p>
Mashpee Public Schools	<p>Mark Rosbach, <i>Mashpee Middle High School (7-8)</i> Robin Geggatt, <i>Quashnet School</i> Lee Horner, <i>K.C. Coombs School</i></p>
Bourne Public Schools	<p>Jane Perkoski, <i>Bourne High School</i> Robert Ruggiero, <i>Bourne Middle School</i> Eve Vidito, <i>Bourne Middle School</i> Lisa Green, <i>Bourne Dale Elementary</i> Kathleen Gausman, <i>Upper Cape Tech</i> Kim Colella, <i>Peebles Elementary</i></p>
Science Institutions & Business	<p>Joe Vineis, <i>MBL</i> Kate Morkeski, <i>MBL</i> George Liles, <i>NOAA</i> Jim Manning, <i>NOAA</i> Juliana Miller, <i>SEA</i> Ron Mack, <i>US Department of Agriculture</i> Claudia Flores, <i>USGS</i> Kate Ackerman, <i>USGS</i> Joan Muller, <i>WBNERR</i> Kate Madin, <i>WHOI</i> Kama Theiler, <i>WHOI</i> Joanne Tromp, <i>WHOI</i> Zander Nassikas, <i>WHRC</i></p>
Business/ Community Representatives	<p>Deb Coulombe Lee Anne Campbell Molly Cornell Judy Fenwick Pat Perry</p>



WHSTEP 2014 Highlights

WHSTEP's General Meeting was held on January 15 at the **Woods Hole Research Center**. Teachers and community members attended this meeting to hear of Dr. Glenn Bush, an assistant scientist and environmental economist at WHRC, present on about his work using an economic approach to reduce deforestation in African communities. Dr. Bush spoke about the **REDD** initiative of the United Nations Environmental Program. REDD creates an incentive for developing countries to protect their valuable forest resources as a means of helping reduce global carbon emissions and combat climate change.



For the past 17 years, WHSTEP has recruited many local science and engineering professionals to serve as mentors for the **science fair project mentoring program** at the Lawrence School in Falmouth. Members of the WHSTEP scientific community meet with 7th and 8th grade students and help them design their science projects. In 2014, mentoring took place in January and twenty-nine volunteers participated from MBL, WHOI, USGS, SEA, and WBNERR.

WHSTEP coordinated **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. 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.

On May 8, teachers attended a **WHSTEP Science Safari** at the **WHOI Geophysical Fluid Dynamics Lab**. Teachers had a rare opportunity to tour the lab and participate in a series of hands-on activities to teach basic concepts in physical oceanography and fluid dynamics. Teachers were also provided with ideas and suggestions on how to incorporate fluid dynamic topics into class curricula in a wide range of grade levels.

On May 14, the **WHSTEP Annual Meeting** was held at **Woods Hole Oceanographic Institution**. Keynote speaker, Dr. Ken Buesseler, is the direction of the WHOI Center for Marine and Environmental Radioactivity. A good crowd of participants turned out for this event to hear his presentation on his work compiling a comprehensive and up-to-date dataset on marine radiation levels in the aftermath of the 2011 Fukushima Daiichi Nuclear Power Plant disaster. Following his speech, there was an update by three teams who had carried out science education programs with the help of WHSTEP.



On September 24, WHSTEP sponsored a **Family Science Night** at Falmouth High School, "**Drone-a-palooza**". Community members and students were able to get a first hand view of drone design and technology and learn about the various applications in science or society. Eight different groups from local science institutions and technology businesses featured displays on their oceanic or atmospheric autonomous vehicles. The event concluded with a presentation by a group of Falmouth High School students sharing their "Algae Drone" project.

On October 15, the annual **WHSTEP Liaison Welcome Dinner** was held at the Landfall Restaurant in Woods Hole with over 40 attendees. This year representatives from five local science institutions (WHOI, MBL, NOAA, WHRC, & WBNERR) brought displays and talked with attendees about how their research on climate change. School and institutional liaisons, elementary, middle and high school teachers, school administrators, and scientists enjoyed an evening of networking, sharing ideas, and planning for WHSTEP annual events.

On-going projects:

- Through 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.
- WHSTEP awards mini-grants to support and enhance science, math and technology education in our member schools.
- "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.