

# Woods Hole Science & Technology Education Partnership



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## WHSTEP Family Science Night: Thinking Big and Looking Small

- JC Weber

On November 16<sup>th</sup> 2016, WHSTEP held a Family Science Night hosted by the Marine Biological Laboratory (MBL). The theme of the evening was “Thinking Big by Looking Small” and highlighted research at the molecular and microscopic level that helps us learn about larger scale issues and questions ranging from coral ecology to climate change.

The event was well attended by teachers and families across the regional school districts. A diverse interdisciplinary array of research was on display by enthusiastic researchers from the WHSTEP member institutions as well as from area science technology companies.



Up close with terrestrial and aquatic algae. (Photo: JC Weber)

Suzanne Thomas (The Ecosystems Center at MBL) shared her work with Zoe Cardon on aquatic and terrestrial algae including algae from the Provincetown

dunes. Their work with desert dwelling algae provides insight into adaptations leading to the leap of aquatic plants to land.

Also from MBL’s Ecosystem Center, Maureen Conte and I displayed an overview of our deep-ocean time-series, the Oceanic Flux Program, the longest running oceanographic time-series of its kind. Kids and interested adults looked at foraminifera, single cell amoeboid protists with shells, under the microscope and a slideshow of microphotographs of other particles and organisms collected in our samples over the past four decades.



Looking at microscopic deep sea foraminifera collected from the Oceanic Flux Program. (Photo: JC Weber)

MBL’s Louie Kerr, Rudolph Oldenbourg and Loretta Roberson exhibited Cape Cod corals. In addition to a polarized light demonstration, they displayed live colonies of the local hard coral, *Astrangia poculata*, with visitors peering through the microscope to see tentacles, skeleton, symbiotic dinoflagellates and their overall structure. This coral ranges from the Caribbean and Gulf of Mexico to all the way north here at Cape Cod in Woods Hole!



MBL's Louie Kerr demonstrates the use of polarized light in microscopic examination. (Photo: Debbie Scanlon)

Sarah Fuller of Sea Education Association (SEA) presented an overview of the microplastics, microscopic particles of plastic debris, found in the ocean. The widespread presence of these particles in all of our oceans is a growing problem and increasing risk to marine wildlife and ecosystems.

McLane Research Laboratories highlighted their Imaging Flow Cytobot (IFCB) with the draw of interacting with a "laser robot that finds killer algae!" The IFCB, an automated submersible that generates images of particles in-flow taken from the aquatic environment, was on display and actively imaging phytoplankton collected from neighboring Eel Pond. Laser induced fluorescence and light scattering from particles are measured and trigger targeted image acquisition which is transmitted ashore in real time.



Yuki Honjo & Jon Mogul of McLane Research demonstrate their CyBot. (Photo: JC Weber)

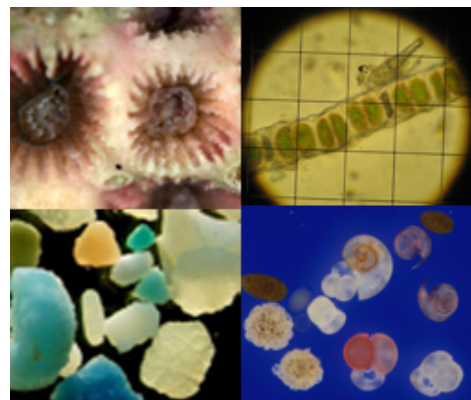
Phytoplankton cultures from Antarctica to the North Atlantic were on display by Luis Valentin-Alvarado of Mak Saito's laboratory at the Woods Hole Oceanographic Institution. These microscopic aquatic plants, despite their size, play an extremely important role in the ocean carbon cycle, oxygen production (thank them for the breath you take!) and the synthesis of

micronutrients (such as Vitamin B12) essential for oceanic life. Luis commented that the favorite phytoplankton of the kids in attendance was *Synechococcus* with its unique pink color. One of the kids called it the "super watermelon phytoplankton!"

Lizzie Wallace & Katie Castango, WHOI-MIT Joint Program students from Jeff Donnelly's Coastal Systems Group, spearheaded a display titled "2000 Years of Storms." Their work uses sediment records from coastal lakes, ponds, and marshes to determine frequency and intensity of major tropical cyclones and hurricanes over the past two millennia. The display included a sediment core from Oyster Pond (with deposits from the 1954, 1938 and 1635 hurricanes allowing kids to "touch a hurricane!") Their display also included a sediment coring demo where participants could practice a pared down version of their coring technique.



Traveling back through time using a local sediment core to "touch" major hurricanes. (Photo: Debbie Scanlon)



Clockwise: The coral *Astrangia poculata*; the algae *Klebsormidium* from a biological crust in Provincetown dunes; microplastics collected from the ocean; microplankton including the foraminifera *Globigerinoides ruber* pink (the red one!) collected at 3200m in the Sargasso Sea.

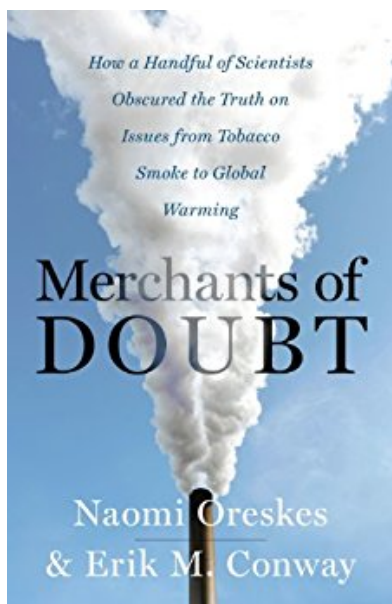


## WHSTEP Science Safari 2016

- Kathleen Savage

The Woods Hole Research Center held a screening of "Merchants of Doubt" as part of WHSTEP's Spring Teacher Science Safari. The documentary "Merchants of Doubt" details how lobbyist spin doctors spread misinformation and confusion among American citizens to delay progress on important issues; such as global climate change.

This was a timely topic for teachers to discuss, given the current climate of misinformation, confusion and mistrust among the public and our institutions. A post-viewing discussion, on ways teachers could use lessons from the documentary in their classroom, was led by WHSTEP board member and Mashpee teacher Tom Hoppensteadt.



## WHSTEP Spring Meeting 2016 at Bourne High School

- Jane Perkoski & Debbie Scanlon

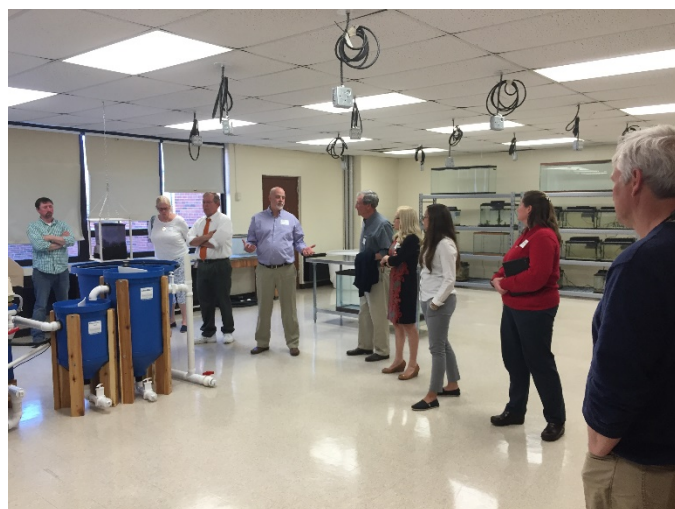
WHSTEP's spring 2016 meeting, "Aquaculture in the Classroom and Region," was held on May 11 at Bourne High School.

Speakers were BHS teacher Jeff Farrington and Hauke Kite-Powell of Woods Hole Oceanographic Institution. Mr. Farrington was a recipient of a WHSTEP mini-grant that helped provide seed

money to start Bourne's new aquaculture lab. Dr. Kite-Powell talked about shellfish aquaculture and its potential use as a sustainable food source.

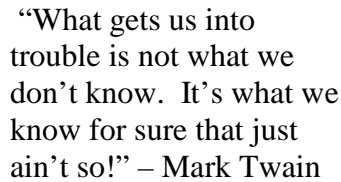


Mr. Farrington also gave a tour of the high school's new aquaponics set-up.



Mr. Farrington and STEAM Director Christine Borning wrote several grants to procure funding for the laboratory. With the funds, Mr. Farrington converted an unused science classroom at Bourne High into an aquaponics wet lab, providing all students in the high school's science courses with the opportunity to participate in long-term studies of aquaculture, advanced plant science, hydroponics and bio-technology. The WHSTEP mini grant helped to stock the lab with essential organisms and supplies such as Tilapia for the large tanks and smaller tanks for individual experiments.

- Bob Heller & JC Weber



Over the last year, we continued to strengthen our partnerships between the teachers in our regional schools and the diverse community of scientists in and around Woods Hole. Educators and members of the public interacted with scientists at WHSTEP events such as the annual Liaison Dinner, Family Science Night, Science Project Mentoring, the public Winter and Spring meetings and teacher safaris. These events provide opportunities for the communication of scientific facts and research to the public. They can also provide insight and tools for teachers developing their science education curriculums and real life examples of science in action that can inspire students. These events also provide the opportunity for teachers to earn Professional Development Points (PDPs) which are also required outside of their specialty.

Changes have also come to our organization over the past year. Our Administrator, Lindsay Scott, recently moved to the Woods Hole Research Center and stepped down to focus more on her career. With great thanks we wish her well, but not goodbye, as she has expressed a desire to continue her association with WHSTEP and attend events when possible. Our new Administrator search did not have to go far, as Scottie Mobley, Falmouth Academy teacher and past liaison quickly stepped up to fill the position. Scottie comes to us as a scientist, researcher, and enthusiastic educator with some serious administrative skills. We welcome her enthusiasm to the organization and are thankful to have such a local talented pool of dedicated individuals that strengthen our team and community. Looking ahead, it is shaping up to be a great year for science education.

To sign up for the WHSTEP list-serve, email [whstep-info@whoi.edu](mailto:whstep-info@whoi.edu) or visit <https://lists.mbl.edu/mailman/listinfo/whstep>

# **WHSTEP Liaison Dinner 2016: A Chance to Review Some of the Latest Science Happenings in Woods Hole and Our Schools**

- Tom Hoppensteadt

On October 18<sup>th</sup>, WHSTEP liaisons gathered for their Annual Meeting at the Landfall Restaurant in Woods Hole. Host, Don Estes, restaurant proprietor and member of WHSTEP's board of advisors, graciously opened up his doors to all of the WHSTEP institutions and schools which gather each year to celebrate science and the collaborative approach that WHSTEP fosters to ensure that our communities are informed and connected.

This year, along-side of outstanding exhibits, discussions and interactive displays from the Woods Hole area research community, students displayed some of their work that highlights the application of scientific methods and engineering designs. Mashpee High School's Advanced Placement environmental science students, created and presented informational posters summarizing their research into local soils. Additionally, Falmouth's Lawrence School brought their 3-D Printer and offered insights into how they are using it as a designing and creating tool in their classrooms. Another school display was from Bourne High School which provided attendees a nice peak into their Aquaponics lab and the organisms their students are cultivating.



In addition to the school displays, scientists from the research institutions provided engaging displays and discussions. Some particularly dynamic tables included embryonic development in fishes, educational trips around our oceans, and the use of digital tags and recorders when studying marine mammals. The research community was well represented and as always provided some enticing science and technology for all to enjoy. Overall, the displays and discussions were engaging, educational and impressive.



Following about an hour of mingling among the displays, liaisons and distinguished guests sat for a delightful meal and the first WHSTEP Science, Technology, Engineering, Arts and Mathematics (STEAM) trivia game. Largely orchestrated by Sea Education Association's Sarah Fuller, questions spanning a range of geographical, taxonomic and artistic topics were provided to each table of participants. Answers were debated and derived, through slightly competitive, yet completely friendly, discussions mixed with laughter and smiles. In the end, one table walked away with the most correct answers and a nice prize, but not until a tricky tie breaker question was solved. The event was a big success and left everyone in the room satisfied and a bit more knowledgeable.

The evening ended with awards and some prizes as well as the usual networking intricacies that accompany this event each year. Special thanks to Don Estes for his continued support of WHSTEP during this annual event!



## 2017 Science Fair Season

- Bob Heller & Jane Perkoski

Not long into the year, science fair season was upon us! Almost thirty scientists, engineers, and community volunteers were on hand for a week to mentor the Lawrence school students as they prepared their science projects for peer review. The overwhelming response and generous giving of time shows the community spirit in demonstrating the desire for quality science education. From a teacher's point of view, the quality of science fair and classroom projects certainly showed a deeper understanding of evidence based science. Many of our students continue to go on to the state and national competitions! Which is just another example of the quality of work being done by our students enhanced by mentoring. A special thanks to Deb Coulombe from Falmouth STEM Boosters for displaying the winning projects at the Falmouth Library. It was a wonderful way of showcasing our young talent and was met with many positive comments from the patrons! Again, many thanks to all who gave of time and talent to enhance scientific education in our community!



The Bourne Middle School and High School Science and Engineering Expo was held on March 1, 2017. There were a wide range of projects from bacteria in water bottles to synthetic limbs. Several of our students went on to the Regional and State Fairs and were recognized for their outstanding efforts. Thank you to representatives from the member institutions that donated their time and energies to help make this a success (MBL, WHOI, McLean Labs). Their support and mentoring has such a positive effect on students in our community!

### The List of Mentors and Institutions

JC Weber - Ecosystems Center @ MBL  
Jim Bramante - WHOI  
Zhixuan Feng - WHOI  
Ludda Ludwig - Woods Hole Research Center  
Jim Newman - Woods Hole Marine Systems, Inc  
Liese Siemann - Coonamesett Farm Foundation  
Kylan Solvik - Woods Hole Research Center  
Rachel Housego - WHOI  
Rob Reynolds - Zephyr Education Foundation  
Suzanne Thomas - Ecosystems Center @ MBL  
Samuel Kelsey - Ecosystems Center @ MBL  
Lindsay Scott - Formerly Ecosystems Center @ MBL, currently Woods Hole Research Center (WHRC)

Kate Ackerman - USGS  
Cleo Zani - McLane Laboratories, Inc  
Megan May - WHOI  
Margot McKlveen - Formerly Ecosystems Center @ MBL, currently WHRC  
Nancy Church - WBNERR  
Sara Sperber - WBNERR/ AmeriCorps  
Sara Bysshe - Community  
Bonnie Kwiatowski - Ecosystems Center @ MBL  
Chris Sherwood - USGS  
Heather Benway - WHOI  
Will Oestreich - WHOI  
Andrew Sealey - McLane Laboratories, Inc  
Millie Chapman - Woods Hole Research Center  
Luis Valentin - WHOI  
Jessica Donohue - Sea Education Association

## WHSTEP Winter Meeting 2017 at Upper Cape Cod Regional Technical School

- Marie Alvernaz

On March 6<sup>th</sup>, area teachers, community members and researchers from the Woods Hole scientific community filled the Canalside restaurant at Upper Cape Cod Regional Technical School for the WHSTEP Winter Meeting.

The meeting opened with a presentation from Dr. Sheri White, lead systems engineer, of the Coastal and Global Scales Nodes for the Ocean Observatories Initiative (OOI) Program at the Woods Hole Oceanographic Institution. The Ocean Observatories Initiative (OOI) is a major science infrastructure program, funded by the National Science Foundation (NSF), to provide sustained ocean measurements and to further the goal of understanding, predicting and managing the ocean environment. Four principle components comprise the OOI: Regional Scale Nodes, Coastal and Global Scale Nodes (CGSN), Cyberinfrastructure, and Education and Public Engagement.



Woods Hole Oceanographic Institution is responsible for the Coastal Pioneer Array and Global Array moorings and their autonomous vehicles. The Coastal Pioneer Array is located off the mid-Atlantic coast. Global Arrays includes four high latitude sites: Irminger Sea off Greenland, Argentine Basin off the coast of Argentina, Southern Ocean at 55°S, 90°W, and Ocean Station Papa in the Gulf of Alaska. The link below shows

drone and deck footage of the Neil Armstrong deploying/servicing instrumentation as part of the Ocean Observatories Initiative Global Array in the Irminger Sea.

<https://www.youtube.com/watch?v=av8xodnoHnU>

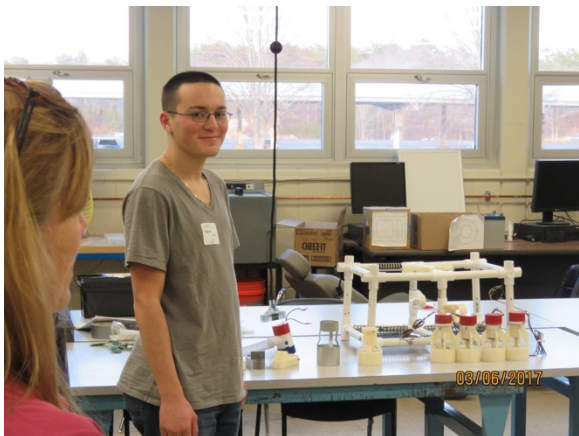


Following the seminar was a student led tour of the Engineering Technology and Environmental Science Technology programs at Upper Cape Tech. The Engineering Technology Program prepares students for employment and continuing education in the challenging field of engineering by developing both theoretical and technical skills. Theory is integrated with laboratory activities and projects using modern design, fabrication, testing, and measurement equipment. Many cross-disciplinary research and project opportunities in civil, mechanical, and electronic engineering areas are offered. Students are exposed to a broad curriculum covering many aspects of engineering and receive a solid foundation in mathematics, physics, and engineering theory.





Mr. Smith, Engineering teacher, and his students: Kieran Donovan, Maxwell Young and Baruch Candelero showed visitors around the engineering lab. The students displayed an ROV which they had designed and built.



The Environmental Science Program is a progressive, nationally recognized program which uses science, engineering, conservation, communication and economics to protect and enhance public health and the environment. Grade 11 and 12 students have the opportunity to earn up to nine college credits from the Environmental Technology Program curriculum. Natural resources, laboratory procedures, engineering design, aquaculture, energy efficiency, communication and presentation are emphasized in a project-based curriculum.



Throughout the program, students work on projects that provide authentic workplace experiences and develop skill sets used in a wide variety of environmental disciplines. Students are prepared to take the Massachusetts Water/Wastewater Operator Certification Tests. Students also receive certification in the Occupational Safety and Health Administration Hazardous Waste Operations and Emergency Response 40-hour training including CPR and First Aid certification.

Mrs. Gausman, Environmental Science teacher and her students: Davina Tolle, Tatyana Foskey, Jill Taylor, Joey Rotondo, Bailey Nance and Emma Rossetti introduced visitors to the Environmental Science Technology lab.



Students led the tour and shared their science fair projects. Joey Rotondo's project, "The Accuracy of Weather Applications" received an honorable mention at the Massachusetts State Science and Engineering Fair and was named an alternate for the UMass Lowell scholarship. Jill Taylor spoke about her project on the growth of plants in a hydroponic system.

The Annual Winter Meeting was a successful event that demonstrates WHSTEP is an active and important link joining the science and education communities on the Upper Cape.



## WHSTEP Science Safari 2017

- Scottie Mobley

McLane Research Laboratories hosted the WHSTEP Science Safari on March 30<sup>th</sup>, 2017. The objective of McLane Research Laboratories is to enable worldwide investigators to achieve their research and scientific goals by providing advanced, cost-effective instrumentation.



Photo credit: G. Lohmann – WHOI Coral Reef – Shamberger

After a short presentation by Yuki Honjo on McLane and their products, the group was led on an extensive tour of the facility.

Visitors got an up-close and personal view of McLane's 50ft test well and pressure testing tank along with many other products including a range of bio-geochemical/physical oceanography sampling and profiling instruments for use in oceanographic research and environmental monitoring.



Photo credit: Yuki Honjo - McLane Research Laboratories

## WHSTEP Mini-Grants

- Scottie Mobley

Each year in the spring and fall, teachers from member school systems have the opportunity to apply for a WHSTEP Mini-Grant. Projects that are chosen are awarded up to \$500. This past spring WHSTEP offered a grant to a teacher from Falmouth Academy.

### Falmouth Academy

Martha Borden, the Director of Technology at Falmouth Academy, won a WHSTEP Mini-Grant for her project titled, "Transitioning Programming from 2D to 3D".

This year, Martha introduced a brand new elective, the Introduction to Programming. This class is designed to build a student's computational and analytical thinking and reasoning.

The objective of her proposed project is for the newly introduced students to apply their creativity, imagination and knowledge of programming from a flat 2-dimensional computer screen to designing, building, and programming a 3-dimensional object that responds to inputs and external stimuli.

The WHSTEP Mini-Grant funds will be used to purchase Hummingbird integrated circuit boards and its components. These will provide the students the opportunity to apply their programming knowledge and challenge them to work in teams to design, build, and program a device that exists outside of the computer monitor.

For additional information on teacher mini-grants, please visit the WHSTEP website...

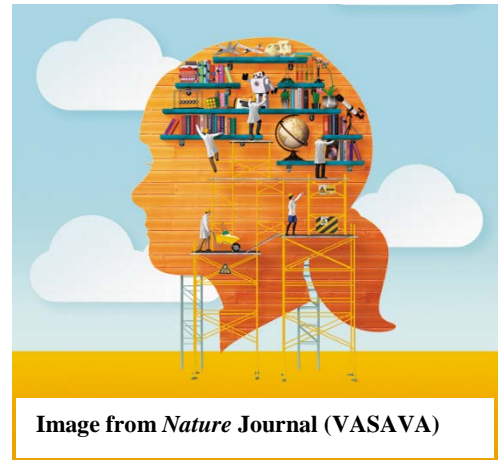
<http://www.whoi.edu/whstep/>

# Web Resources for Expanding Science

- Rut Pedrosa Pàmies

I am a Postdoctoral Researcher from Catalunya (Spain) and am working at the Ecosystems Center of the Marine Biological Laboratory (MBL). I am working with Dr. Maureen Conte and JC Weber on the [Oceanic Flux Program \(OFP\)](#), an on-going four-decade interdisciplinary time-series of deep ocean particle flux in the Sargasso Sea.

Since I started my research career, I have been very active within the scientific and academic world. I think that it is very important to bring science closer to society. Last November and April, I had the pleasure to volunteer at the WHSTEP Family Science Night and judge at the Falmouth Public School science fair, respectively. After attending these incredible events for the families and kids, I was thinking that I would love to contribute more to your very rich academic-scientific community. Therefore, I want to start by sharing with all of you a small compilation of website links with possible teaching resources (addressed to a wide range of ages). I have sorted them by topics. Maybe most of them you already know, but maybe some are new and could be useful!



## Climate change

- <http://edu-kit.sameworld.eu/?lang=ca>
- [http://ec.europa.eu/clima/sites/campaign/living\\_together/index.html](http://ec.europa.eu/clima/sites/campaign/living_together/index.html)
- <http://mediambient.gencat.cat/ca/detalls/Articles/Photo>
- <https://www.ecoliteracy.org/download/designing-resilient-community>
- <https://www.youtube.com/watch?v=sTAiyLEW7pg> (What is climate change adaptation?)
- <http://climatekids.nasa.gov/> (Climate kid's. NASA's eyes on the earth)
- <https://www3.epa.gov/climatechange/kids/>

## Water

- [https://www3.epa.gov/safewater/kids/flash/flash\\_watercycle.html](https://www3.epa.gov/safewater/kids/flash/flash_watercycle.html)
- <http://thewaterbrothers.ca/> (Eco-adventures serial TV)

## Atmosphere

- [https://www.airnow.gov/index.cfm?action=aqikids\\_home.index](https://www.airnow.gov/index.cfm?action=aqikids_home.index)

## Global footprint

- <http://www.footprintnetwork.org/>
- <https://www.lovefoodhatewaste.com/>

## Energy

- <https://www.youtube.com/watch?v=1-g73ty9v04>
- <http://www.energyquest.ca.gov/>
- <https://energy.gov/eere/education/education-homepage>



### **Waste management**

- <http://learnenglishkids.britishcouncil.org/en/games/clean-and-green>
- <https://www.epa.gov/students>
- <http://learnenglishkids.britishcouncil.org/en/games/how-green-are-you>
- <https://kids.niehs.nih.gov/>

### **Genetics**

- <https://www.dnalc.org/> (DNA learning center)
- <https://genographic.nationalgeographic.com/migratory-crossings/>

### **Biodiversity**

- <http://eol.org/discover> (Encyclopedia of Life)
- <http://www.iucnredlist.org/> (Read List of Threatened Species)

### **The scale of the Universe**

- <http://scaleofuniverse.com/>
- <http://popchassid.com/the-universe-is-huge-and-you-are-small-and-what-that-means/>

### **Some teaching ideas (and other)**

- <http://edtechteacher.org/tools/science/>
- <http://www.nclark.net/>
- <https://www.science4us.com/free-teacher-resources/>
- <https://www.acs.org/content/acs/en/education/resources/k-8.html>
- <http://www.teachingideas.co.uk/sports/walk-to-school-resources>
- <https://www.tes.com/articles/walk-school-week-teaching-resources>



## WHSTEP Liaisons Quick Reference 2017

WHSTEP Executive Committee	<p>Marie Alvernaz, <i>Upper Cape Tech</i>  Sara Bysshe, <i>Community Representative</i>  Don Estes, <i>Business Representative</i>  Janet Fields, <i>Woods Hole Oceanographic Institution</i>  Sarah Fuller, <i>Sea Education Association</i>  Bob Heller, WHSTEP Co-Chair, <i>Lawrence School</i>  Tom Hoppensteadt, <i>Mashpee HS</i>  Patti Parker, <i>Bourne PS</i>  Lynn Parks, <i>Community Representative</i>  Jane Perkoski, <i>Bourne HS</i>  Kathleen Savage, <i>Woods Hole Research Center</i>  Debbie Scanlon, <i>Community/Business Representative</i>  Scottie Mobley, WHSTEP Administrator, <i>Falmouth Academy</i>  J.C. Weber, WHSTEP Co-Chair, <i>Marine Biological Laboratory</i></p>
WHSTEP Advisory Board	<p>Suzanne Avtges, <i>Quashnet School</i>  Don Estes, <i>Business Representative</i>  Ann Vachon, <i>Upper Cape Tech, Retired</i></p>
Falmouth Academy	Scottie Mobley
Falmouth Public Schools	<p>Chris Brothers, <i>Falmouth High School</i>  Bob Porto &amp; Carrie Fitzpatrick, <i>Lawrence School</i>  Elliot King, <i>Morse Pond Elementary</i>  Wendy Scholes &amp; Kate Skehil, <i>East Falmouth Elementary</i>  Maureen Tichenor, <i>Mullen Hall School</i>  Kathy Bowker, <i>North Falmouth Elementary</i>  Jody Kirincich, <i>Teaticket Elementary</i></p>
Mashpee Public Schools	<p>Tom Hoppensteadt, <i>Mashpee High School</i>  Mark Rosbach &amp; Lon Dexter, <i>Mashpee Middle High School</i>  Robin Geggatt, <i>Quashnet School</i>  Katie Martin, <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>Bournedale Elementary</i>  Kim Colella, <i>Peebles Elementary</i></p>
Upper Cape Tech	<p>Kathleen Gausman  Michael Robinson</p>
Science Institutions & Businesses	<p>Joe Vineis, <i>Marine Biological Laboratory</i>  George Liles &amp; Jim Manning, <i>National Marine Fisheries Service</i>  Sarah Fuller, <i>Sea Education Association</i>  Claudia Flores &amp; Kate Ackerman, <i>US Geological Survey</i>  Joan Muller, <i>Waquoit Bay National Estuarine Research Reserve</i>  Kama Thieler &amp; Joanne Tromp, <i>Woods Hole Oceanographic Institution</i>  Zander Nassikas &amp; Kylen Solvik, <i>Woods Hole Research Center</i></p>



## WHSTEP 2016-2017 HIGHLIGHTS



The end of 2016 marked another administrative change as we welcomed a new WHSTEP administrator, Scottie Mobley. Scottie, being an active teacher at Falmouth Academy, provides exciting insight from the academic side of our organization. The last year also saw the successful return of the Family Science Night, an event that we hope will make an annual appearance on the WHSTEP calendar. As we moved into the Fall of 2016, WHSTEP also became an official independent 501c(3) non-profit organization. We would like to thank Bourne Science teacher & board member Jane Perkoski and her sister Maura Wheet for their time in organizing the filings and paperwork necessary for securing this financially beneficial status for WHSTEP.

In early January, WHSTEP co-Chair (& Lawrence science teacher) Bob Heller coordinated **the science fair mentoring program at the Lawrence School in Falmouth**. This yearly program connects middle school students with volunteers from the WHSTEP scientific community to help them refine and focus ideas for science fair projects. More than two dozen volunteers from the Marine Biological Laboratory (MBL), Woods Hole Oceanographic Institution (WHOI), United States Geological Survey (USGS), National Oceanic & Atmospheric Administration

(NOAA) and Waquoit Bay National Estuarine Research Reserve (WBNERR) volunteered their time. Many of the mentors later served as judges at the Falmouth Public School's Science & Engineering Fair, Falmouth Academy's Science Fair also at Bourne Public Schools' Science Expo.

**Science Safaris** for teachers returned in 2016 with a screening of the documentary "Merchants of Doubt" at the Woods Hole Research Center on April 6<sup>th</sup>. The documentary addressed and revealed the organized efforts by climate change deniers. A discussion, led by Mashpee science teacher & WHSTEP board member Tom Hoppenstaadt, on how to best use the revelations in the science classroom followed the presentation. The spring teacher safaris continued on March 30<sup>th</sup> of 2017 with a tour of McLane Research Laboratory in East Falmouth. The company highlighted their 50ft test and a range of oceanographic profiling and sampling instruments.

On May 11<sup>th</sup> 2016, Bourne High School hosted the public **WHSTEP Spring Meeting**. Hauke Kite-Powell from the Woods Hole Oceanographic Institution discussed shellfish aquaculture and its potential to limit nutrient pollution in coastal waters. The second featured presentation was by the Bourne High School teacher Jeff Farrington who discussed and gave a tour of the school's new aquaculture facility, funded in part with WHSTEP teacher mini-grants.

The annual **WHSTEP Liaison Dinner** was held on October 18<sup>th</sup> 2016 at the Landfall Restaurant and was a showcase of science at the member school districts and science institutions. Displays from some of the member school districts were present from Bourne and Mashpee High Schools and Lawrence School in Falmouth. Member institutions with displays included the Northeast Fisheries Science Center, Marine Biological Laboratory's Marine Resource Center, the Woods Hole Oceanographic Institution, Woods Hole Science Aquarium, Woods Hole Research Center and Sea Education Association. During the social hour before dinner, liaisons from the member science institutions and school districts as well as educators and administrators from the member districts viewed the displays. During dinner, a Science & Arts trivia competition was held with prizes donated by the member research institutions.

**Family Science Nights** returned on November 16<sup>th</sup> 2016 as the Marine Biological Laboratory hosted "Thinking Big by Looking Small." Families and kids of all ages in attendance saw interactive displays by researchers from the Marine Biological Laboratory, Woods Hole Oceanographic Institution, Sea Education Association and McLane Research Laboratories. The displays focused how science at the microscopic and molecular level can be used to address larger scale scientific questions.

On March 6<sup>th</sup> 2017, the public **WHSTEP Winter Meeting** was held at the Upper Cape Cod Regional Technical School. Sheri White, from the Woods Hole Oceanographic Institution was the featured speaker and gave a presentation on the Ocean Observatories Initiative Program. Following her presentation, the UCT students took the teachers, scientists and members of the public in attendance on a tour of their Environmental and Engineering Program and Facilities. The students presented

enthusiastic overviews of the diverse array of active science projects in which they are engaged.

Several **teacher mini-grants** were awarded. Educators from members schools apply for these grants, made possible by dues paid by member research institutions and school districts. Two grants were awarded in the Fall of 2016: "Lawrence School Vernal Pool: A Living Laboratory" (Christine Brothers, Falmouth Lawrence School) and "One Man's Trash is Another Man's Treasure" (Kristina Woods, Falmouth Lawrence School). One was awarded during the Spring of 2017: "Programing from 2D to 3D" (Martha Borden, Falmouth Academy).

**For more information about past WHSTEP Events and Programs, visit our website at [www.whoi.edu/whstep](http://www.whoi.edu/whstep) and look under our EVENTS & ANNOUNCEMENTS section**



## **WHSTEP COMING EVENTS**



**May 15, 2016... WHSTEP SPRING MEETING, 4-6pm.** “Vernal Pools in the Classroom and the Region.” Jay Cordeiro, the Spadefoot Toad Coordinator at Mass Audubon, will give a presentation about the ecological importance of vernal pools. Following his talk, teachers from Mashpee Public Schools, Falmouth Academy, Upper Cape Cod Regional Technical School, and Falmouth’s Lawrence School will give short presentations about how they use vernal pools as living laboratories in their science curriculum. A tour of Lawrence’s vernal pool site will immediately follow the presentations. Open to the WHSTEP institution & academic members as well as the public.

**August 2017... participation in the Woods Hole Science Stroll.** Saturday, Date and Time TBA. WHSTEP will likely have an information table at this public event highlighting the science of Woods Hole.

**Late September 2017... Family Science Night.** Topic, Location and Date TBA. A public event open to families and residents interested in science!

**October 2017... WHSTEP Liaison Dinner.** Landfall Restaurant, Woods Hole. Date and Theme TBA. Event open to WHSTEP liaisons and representatives from the area science businesses & academic administrations.

**January 2018... FALMOUTH LAWRENCE SCHOOL & BOURNE HIGH SCHOOL SCIENCE FAIR MENTORING,** Individuals from WHSTEP member science institutions and area science/technology businesses meet with middle school students at Falmouth’s Lawrence School and high school students at Bourne High School to help refine/focus their ideas for the upcoming Falmouth Public Schools Science Fair, and Bourne Science Expo.

**February 2018... BOURNE & FALMOUTH SCIENCE FAIR JUDGING.** Individuals from WHSTEP member science institutions and area science/technology businesses are encouraged to be among the volunteers at the area school science fairs. Bourne and Falmouth High Schools.