

A network of schools, science institutions and agencies, businesses and community members “to support, promote and enhance science education, and science literacy in the participating communities.”

The Partnership

WHSTEP 2019-2020 Newsletter: Volume 29, Number 1

WHSTEP Future Events

Pandemic response: WHSTEP in the time of COVID-19

The recent pandemic has affected every aspect of our lives. WHSTEP has always valued the “face to face” connection and sharing of resources. Although most every gathering, including our 30th Anniversary celebration, has been cancelled or postponed, we hope to see you all as soon as we can safely gather again.

WHSTEP can serve as a resource during these difficult times. We know teachers are working hard to deliver lessons and engage students online. In an effort to provide some locally relevant resources in a variety of STEM topics, we are posting an annotated set of web connections, including

- Short videos about recent research at Woods Hole science institutions
- Special collections of resources especially for educators and students
- Reliable sources of science-based information about COVID-19 and other high profile topics

As a teacher preparing for the end of this year or the beginning of next, perhaps there is a specific standard or topic you need covered for your teaching goals. We encourage you to email a specific request to WHSTEP at whstep-info@whoi.edu and we will send you a reply as soon as possible. If it is of wide interest, we will post the resources on the web page. WHSTEP can also help connect you with a scientist/engineer/specialist who can respond to student’s questions and provide a more interactive experience.

As we navigate these uncharted waters, WHSTEP will continue to be a resource for education and a voice for using science to understand and solve problems.

Visit WHSTEP's website and sign up on WHSTEP's email list for details about future events.

<https://web.whoi.edu/whstep/>

<http://mailman.whoi.edu/mailman/listinfo/whstep-news>

WHSTEP WINTER MEETING 2019: Climate Change in the Arctic

JC Weber, WHSTEP Executive Committee (MBL)

Local educators, scientists, and the public crowded the conference center at the Marine Biological Laboratory for the 2019 WHSTEP Winter Meeting to learn about climate change in the arctic. A pair of Falmouth teachers also shared stories of their experience in the Alaskan arctic and how they brought it back to their classrooms.

Dr. Ed Rastetter, a senior scientist at MBL's Ecosystems Center and head of the Arctic Long Term Ecological Research (LTER) program, began the meeting with a presentation on the Arctic's rapid thaw focusing on the consequences for its ecosystems and the plants and animals that depend upon them. The Arctic region at the top of our planet is warming at a rate twice as fast as the rest of the world. Dr. Rastetter shared that while the ecosystems have been fairly resilient to these changes on a short time scale, unusual events related to the warming such as thunderstorms (once rare in the Arctic) and thawing of the upper permafrost can have dramatic effects on the ecosystem and its inhabitants. Thawing permafrost can cause the



(above) MBL scientist Ed Rastetter and Falmouth Lawrence School teacher Celeste Cruse on the tundra at Toolik Field Station in Alaska in the summer of 2017

overlying soil and vegetation to literally flow down slope as well as release greenhouse gases that had been locked in the frozen soil. The researchers of the Arctic LTER conduct long-term research experiments and observations at Toolik Field Station on the north slope of Alaska and surrounding area to gain insight into the implications of a warming Arctic.

Local educators Celeste Cruse and Maureen Tichenor shared their experiences working alongside researchers at Toolik in 2017 and 2018, respectively. Over the last 11 years, the Arctic LTER has provided funding through their Schoolyard Program to give 39 K-12 teachers to



date the opportunity to participate in hands-on research in the arctic and bring that experience, both in knowledge and enthusiasm, back to their classrooms.

(left) Mullen-Hall School teacher Maureen Tichenor works alongside researcher Yamina Pressler at the Toolik Field Station in the summer of 2018

the MBL for her participation.

Celeste Cruse was able to bring the research experience back to her middle school students by recreating some of the laboratory activities and field experiments from the arctic right here in Falmouth with her students. Maureen Tichenor, a kindergarten teacher at Falmouth's Mullen-Hall school, applied the experience to create a Powerpoint presentation for her young students using a "Tools of the Mind" curriculum (<https://toolsofthemind.org>). The group now includes Maureen's Powerpoint as part of their Arctic themed instructional resources. Maureen shared that it "focuses on nature's delicate balance and how climate change can affect the timing and availability of resources" to the ecosystem inhabitants.

For more information on educational opportunities, visit <https://arc-lter.ecosystems.mbl.edu/educational-opportunities>. To stay informed of upcoming WHSTEP meetings that are open to educators, scientists and the general public, subscribe to our WHSTEP-News email list at <http://mailman.who.edu/mailman/listinfo/whstep-news>.

WHSTEP Spring 2019 Meeting: Penikese Island

Tom Hoppensteadt, WHSTEP Executive Committee (Mashpee PS)

On May 21 more than 50 scientists and teachers gathered at the [Quashnet School](#) in Mashpee to learn about the rich cultural, scientific, and educational history of Penikese Island. The Executive Board of the WHSTEP orchestrated the event around one of our regular Spring Meetings where we bring together wonderful groups of people, which in this case had the pleasure of learning about this island from David Kooharian and Pam Polloni.

Pam, a Research Assistant III at WHOI, has been working for decades cataloging and preserving native plant species from the island. She described some of the details of the floral collection and herbarium that is available for study through WHOI. You can learn more about this collection at: <https://www.mblwhoilibrary.org/collections/mblwhoilibrary-herbarium>

David spends his time as Program Director for Penikese Island Retreats and works closely with schools and research groups to coordinate activities, including overnight visits and day trips, and ensures that the natural and historical character of the site remains unspoiled. Together, the two professionals offered enticing details about the native flora, fauna, geology and historic uses of this jewel of the Elizabeth Island chain.



*(left) Penikese Island Retreats
(right) Pam Polloni at the herbarium
by Steven Withrow/Enterprise*



As in the past, WHSTEP offered participating teachers the opportunity to earn professional development points, and provided information about field trip opportunities and long term studies on the island. The speakers' colorful presentations spanned topics including how Native Americans once used the land, descriptions of decades of botanical research, and how the many historic uses of the island led to conditions and facilities there today. Today, people in the community can get involved by contacting the WHOI Herbarium or getting in touch with David Kooharian through Penikese Island Retreats. Visitation to the island is regulated by the State of Massachusetts and its managerial partners, but interested parties should contact David as the island's chief steward to gain access and learn about specific activities. To learn more about the Penikese Island visit: <https://www.penikese.org/>

Chairman Report

Bob Heller, WHSTEP Co-Chair & Sarah Fuller, WHSTEP Co-Chair (WHOI)

In 1989 a small group of scientists and educators gathered in a local establishment and floated the idea that the local science institutions and the schools should have a way to connect scientists and teachers, a resource to bring science right into the science classroom. For the next three decades, **Woods Hole Science, Technology, and Education Partnership** has been a growing and valuable part of the community. Still a volunteer group, with the exception

of our part-time administrator position, we continue to provide opportunities for teachers to connect with local institutions and with each other, and provide a resource for information.

Our dues help us to give back to the community in the form of mini grants for teachers to enhance their classrooms and curriculum. Teachers volunteer their time to present their mini grant projects at WHSTEP meetings. They also exchange ideas and make valuable contacts. Scientists and engineers from various institutions volunteer their time to coach students with science projects, which has a positive impact on both students and coaches. In some cases, mentoring can lead to internships which help the local institutions by providing passionate workers. A variety of people volunteer at our Family Science nights. A local restaurant offers a harborside dining room for our annual meeting of liaisons. WHSTEP is a broad-based effort that helps to strengthen our community, and ultimately spreads throughout society. As we enter into a new decade, let's continue working towards the goal of having a positive impact on the scientific and technological education of our students, so very much needed today and for our future.

For more information about past WHSTEP Events and Programs, visit our website at www.who.edu/whstep and look under our EVENTS section

Woods Hole Science Stroll

Pat Harcourt, WHSTEP Executive Committee

The little village of Woods Hole hosts a wealth of amazing research and creative engineering projects. On Saturday 10 August 2019, Woods Hole institutions hosted a festive [Science Stroll](#) with displays and stations where people could learn about research, try out activities, and meet professional scientists and engineers from all the local institutions. WHSTEP members Bob Heller, Jane Perkosi, and Pat Harcourt collaborated [with Barnstable County Beekeepers Association](#) and chemistry teacher Miguel Zamora to staff a booth with a pollinators theme. The weather was warm and breezy, the booth was ideally located looking over the Water Street seawall, and we had a steady



(above) Honey bees from the Barnstable County Beekeepers Association

stream of families, Gen-Xers, senior citizens, and graduate students visit the booth throughout the day.

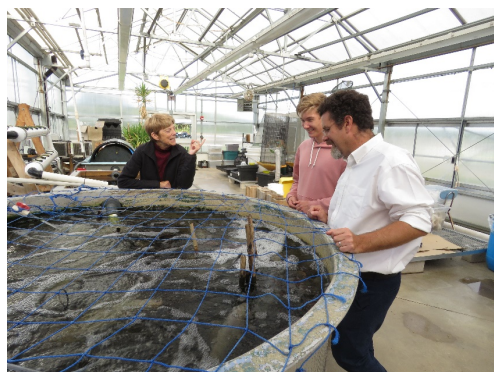
The WHSTEP display table welcomed visitors with information about our Partnership and programs, and invited them to color and decorate a paper cup, then fill it with potting soil and a couple of sunflower seeds, and add a bit of water to prepare it for transfer to a sunny location at home. The coloring and planting were especially popular with younger visitors, but plenty of adults tried their hand at decorating, and everyone walked away with a little cup. Miguel Zamora's dramatic displays of beekeeping, honeycombs, and bee biology attracted everyone who passed, and his knowledgeable answers to questions gave everyone a new appreciation for pollinators.

Although the 2020 Science Stroll has been cancelled, we look forward to taking part in this great outreach event with a WHSTEP booth in 2021.

WHSTEP Family Science Night 2019: Chemical Contamination

Marie Alvernaz, WHSTEP Executive Committee (UCT)

According to the well-known quotation from Benjamin Franklin, "Tell me and I forget. Teach me and I remember. Involve me and I learn." This approach was the inspiration for the design of Family Science Night at Upper Cape Cod Regional Technical High School (UCT). Our focus was to involve all participants through stimulating hands-on investigations. As with science investigations during class, the emphasis was not on simply telling or teaching, but making science come to life for families. Our objective was to generate enthusiasm among students and families for the science programs at UCT and science fairs by giving families a chance to



explore science together. At this fun event, families came to learn about the effects of natural and man-made pollutants on marine organisms. [Dr. Jed Goldstone](#), a Research Specialist at the Woods Hole Oceanographic Institution, former chair and nine-year member of the Falmouth Board of Health, gave a talk on chemical contamination. Attendees were led on a tour of UCT's Wastewater Treatment Facility and there were also many child friendly activity stations led by current students.

(above) Tour of UCT facilities (Bob Heller)

The shared enjoyment between parents and children exploring together was on display as they investigated the exciting educational stations. As guides and teachers, the students of UCT gained a sense responsibility and school community outside school hours. The students of the [Environmental Science and Technology](#)

program at UCT participate in a progressive, nationally recognized program that uses science, engineering, conservation, communication and economics to protect and enhance public health and the environment. Natural resources, laboratory procedures, engineering design, aquaculture, energy efficiency, communication and presentation are emphasized in a project-based curriculum. The students who talked with families to share their knowledge about environmental science received many compliments from visitors.



(above) UCT student leading an activity (Bob Heller)

At one station which turned out to be especially relevant, children had an opportunity to build a virus-model, bacteriophage, to demonstrate scientific principles. Children gained a better understanding of how viruses get inside our cells and make us ill. Children learned that scientists conduct research into viruses that cause human and animal diseases. Families also participated in a water quality investigation. Participants learned how to follow correct procedures to test for pH, dissolved oxygen, nitrates and phosphates in water samples. Older children learned to interpret and evaluate the water quality data to look for evidence of the source of pollutants. Children

became aware of how chemistry concepts can be used with a real-world application pertaining to water quality. They also realized the importance of being good stewards for our waterways.

Fall 2019 Teacher Safari: Long Pond Water Treatment Plant

Bob Heller, WHSTEP Co-Chair



(left) Long Pond Water Treatment Plant in Falmouth, MA (Methuen Construction)

Teachers from the Falmouth Public Schools, Falmouth Academy, and Bourne Public Schools, as well as some interested citizens were treated to a tour of the new [Water Department](#) station on Gifford Street. Mike Righitto, a 2013 graduate of MMA was our tour guide through a clean and organized environment.



Long Pond Water Treatment Plant in Falmouth, MA (Bob Heller)

Covering several acres, the facility supplies Falmouth residents an average 2.5 million gallons per day during the winter and leaps to over 12 million gallons per day in the summer. The water, pumped in from Long Pond, (where there is no swimming, boating, or fishing), goes through straining, skimming, filtering, disinfecting, refiltering, more disinfecting then off to your faucets. The filtering system can be described as a really big Britta filter. The whole process is quality controlled from start to finish using high tech computer monitoring as well as familiar chemical test kits found in local school science labs.



The tour culminated with the “back purging” of the intake pipes. 120 psi of air is sent through the pipes to clean out debris that collects on the intake filters daily. It reminded me of “Godzilla” rising from Tokyo Bay.

2019 Liaison Dinner: WHSTEP Mini-Grants

Jane Perkoski, WHSTEP Executive Committee (Bourne PS)

WHSTEP’s annual liaison dinner was held November 6th at [The Landfall](#) restaurant in Woods Hole. The liaison dinner is a chance for teacher and administrative representatives from member school districts to meet with each other and members of the Woods Hole science community.

Last fall we were lucky to have teacher recipients of [WHSTEP Mini-Grants](#) present their funded projects and speak to attendees during the social hour. Amanda Hough (2019 MA STEM Teacher of the year) and Mairead Mayen from Mashpee described their “[Sea Perch](#) Rover Collaborative Project.” Amy Fish from Bourne presented how students have used “[Arduino](#) Microcontrollers Across the Curriculum”. Cheryl Milliken from Falmouth presented her project on “Maritime Literacy and [Remotely Controlled Vehicles](#)” and Martha Borden from Falmouth Academy presented “Transition [Programming](#) form 2D to 3D.”



(above) Mashpee Sea Perch trials (Colleen Terrill)

Science Fair Coaches 2020

Bob Heller, WHSTEP Co-Chair

The 2019-2020 Science Fair season continued as scientists from local institutions and community members volunteered their time and talents to coach seventh and eighth grade Lawrence School students with their science projects. This annual experience allows students the opportunity to meet with professionals, scientists, and engineers and explain their experimental design, not with a text, email, or tweet, but sitting down at a table with a pencil and some paper. A valuable experience for students of any age, but particularly at the middle school, both teachers and students expressed their most heartfelt and sincerest thanks. About a dozen volunteers signed up for two hour slots throughout the week of January 13-17. The slots were filled quickly and with some volunteers who gladly “stayed for just one more”, they wrapped it up Thursday with Friday morning for any make ups. Many thanks to all for your help and see you again next year!

(below) Falmouth Science Fair mentors with students (Bob Heller)



WHSTEP WINTER MEETING 2020: Makers

Scottie Mobley, WHSTEP Administrator (FA)

The WHSTEP Winter Meeting was held on March 4th at the Lawrence School. This year's theme was “Makers” and featured teachers from member school districts presenting projects highlighting: Coding, Engineering, & Maker Spaces. In these projects and spaces students are given hands on opportunities to collaborate, explore, create, learn, tinker, play, and imagine often while utilizing high tech tools. Amy Fish, showcased her work as the [Innovation Studio](#) Facilitator at Bourne High School. Amanda Hough, MA STEM teacher of the year & the [Technology/Engineering](#) teacher at Mashpee Middle-High School, highlighted her student projects. Lastly, Lynn O’Connell talked about her work with students as the [Technology/Coding](#) teacher at Lawrence School.



(above) Amanda Hough's presentation (Bob Heller)
(left) Bourne Innovation Studio (CC STEM Network)

Mini-Grants Awarded

Sarah Lavoie & Eve Vidito (2019) BMS: “Magnetic Forces” – This project will enhance instruction of magnetic forces with hands on materials for inquiry learning experiences.

Laishona Vitelli (2020) MMHS: “Morse Code Communication” - In this hands-on activity, students will learn to use M/C (Morse Code) sounder boards to create a telegraph system across the classroom and send a message to a student on the other side of the room.

Amanda Hough (2020) MMHS: “Drones: Delivering Relevant Opportunities to Navigate Engagement in Students” - This project will bring Drones to Mashpee Middle High School where students in both Robotics and Introduction to Computer Science will be able to use the drones through engaging and relevant opportunities including Drone Racing Competitions and honing their programming skills in both block and python programming.

WHSTEP Liaison Quick Reference 2019-2020

WHSTEP Executive Committee	Marie Alvernaz, <i>Upper Cape Cod Regional Technical School</i>
	Jessica Donohue, <i>Sea Education Association</i>
	Janet Fields, <i>Woods Hole Oceanographic Institution</i>
	Sarah Fuller, <i>WHSTEP Co-Chair, Woods Hole Oceanographic Institution</i>
	Pat Harcourt, <i>Community Representative</i>
	Bob Heller, <i>WHSTEP Co-Chair, Retired Lawrence School</i>
	Tom Hoppensteadt, <i>Mashpee MHS</i>
	Scottie Mobley, <i>WHSTEP Administrator, Falmouth Academy</i>
	Patti Parker, <i>Bourne HS</i>
	Lynn Parks, <i>Community Representative</i>
	Jane Perkosi, <i>Bourne HS</i>
	Hillary Sullivan, <i>Woods Hole Research Center</i>
	J.C. Weber, <i>Marine Biological Laboratory</i>
WHSTEP Advisory Board	Kathleen Savage, <i>Woods Hole Research Center</i>
	Debbie Scanlon, <i>Community/Business Representative</i>
	Suzanne Avtges, <i>Quashnet School</i>
	Don Estes, <i>Business Representative</i>
	Ann Vachon, <i>Retired Upper Cape Cod Regional Technical School</i>
Barnstable Public Schools	Jennifer Caron, <i>Barnstable Intermediate School and Barnstable High School</i>
Bourne Public Schools	Jane Perkosi, <i>Bourne High School</i>
	Eve Vidito, <i>Bourne Middle School</i>
	Lisa Green, <i>Bournedale Elementary</i>
	Kim Colella, <i>Peebles Elementary</i>
Falmouth Academy	Scottie Mobley
Falmouth Public Schools	Chris Brothers & Carrie Fitzpatrick, <i>Falmouth Public Schools</i>
	OPEN , <i>Lawrence School</i>
	Ann Goulart, <i>Morse Pond Elementary</i>
	Matt Kinsella & Kate Skehill, <i>East Falmouth Elementary</i>
	Maureen Tichenor, <i>Mullen Hall School</i>
	Cheryl Giardi, <i>North Falmouth Elementary</i>
Mashpee Public Schools	Jody Kirincich, <i>Teaticket Elementary</i>
	Tom Hoppensteadt and Dan Leader, <i>Mashpee Middle High School</i>
	Robin Geggatt, <i>Quashnet School</i>
Upper Cape Tech	Katie Martin, <i>K.C. Coombs School</i>
	Kathleen Gausman
Science Institutions & Businesses	Marie Alvernaz
	J.C. Weber, <i>Marine Biological Laboratory</i>
	Jim Manning & Nicole Bartlett, <i>National Marine Fisheries Service</i>
	Liz Maloney & Maia Theophanis, <i>Sea Education Association</i>
	Kate Ackerman, <i>US Geological Survey</i>
	Joan Muller, <i>Waquoit Bay National Estuarine Research Reserve</i>
	Janet Fields, Deb Rogers, Kama Thieler & Joanne Tromp, <i>Woods Hole Oceanographic Institution</i>
	Amanda Poston, <i>Woods Hole Research Center</i>