



Changing Tides With STEM by Kaitlin Gannon and Brooke Knapick

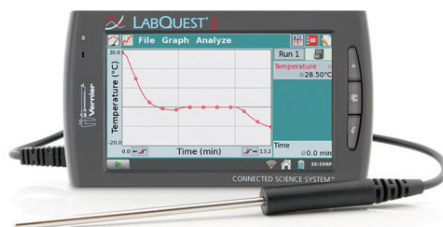
In spring 2015, the Education Department announced plans to introduce a new water quality module to the Science Education at Sea (SEAS) and Environmental Education Field Trip programs. It was our desire to have students test and analyze the physical and chemical properties of both bay and ocean water while incorporating scientific practices and instrumentation that are consistent with the methodology and technology scientists and engineers routinely employ in the laboratory and the field. We envisioned students using underwater remotely operated vehicles (ROVs) and scientific hand-held data collection devices to measure the unseen properties of water including temperature, pH, salinity, turbidity, and dissolved oxygen. By measuring and analyzing these parameters, students could draw connections between the quality of the water, the health and diversity of the organisms living in the water, and ultimately, the health of the ecosystem.



Underwater Remotely Operated Vehicle (ROV)

Well, we have great news! With generosity from the Davenport Family Foundation and PSEG, the Education Department has been able to fulfill these goals through the creation

of the Changing Tides with STEM module. Over the past few months, project leads purchased eight Vernier LabQuest2 digital data collection devices along with protective casings, portable battery chargers, two charging stations, and eight testing probes for each of the following water quality parameters: water temperature, dissolved oxygen, salinity, pH, and turbidity. Also purchased was a sophisticated underwater ROV which allows students to obtain water samples at different depths throughout the water column. The new OpenROV v2.8 features a refined control system and enhanced software, is durable and long lasting, and offers an enriching and well-rounded educational experience for the students.



Vernier LabQuest2 digital data collection devices

Following training and practice with the new water quality testing equipment, Education staff piloted equipment usage onboard a few select spring SEAS programs. This pilot usage allowed Education staff to observe how students react and handle the new devices, ultimately assisting staff in determining proper teaching methods and techniques for using the equipment. Initial student reactions were very positive. The devices feel familiar to them, much like many of the portable electronic devices they would use on a daily basis. Results of the pilot programs guided staff on how

to restructure programs to incorporate newly acquired water quality equipment into existing program formats to create the best possible learning experience for students.



Science Education at Sea (SEAS)

Development of new learning materials and resources to accompany the new teaching module are in final stages of review and edits. These materials include comprehensive water quality data collection and background information sheets, ROV background information resources, water resources based pre and post classroom activities and a website data sharing portal for shared information. The introduction of the Changing Tides with STEM module is strategically timed to coincide with the integration of the Next Generation Science Standards for grades 6-12 and we expect to have all equipment, educational materials, and resources ready to launch for the start of the 2016-2017 academic school year this September. We are very excited about the current and continued development of our Changing Tides with STEM module and look forward to seeing the program in action this autumn!

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Hours: September 6 - October 10, open
Daily 9:30 to 4:30. October 11 - April 30,
open Friday, Saturday and Sunday 9:30 to
4:30. Check our website for Holiday Hours.

General Admission: Members: Free.
Non-members: \$8 Adults, \$6 Children 3-12.

*Views From the Tower is the quarterly
newsletter of The Wetlands Institute
and can also be found on our website.*

Marsh Musings

by Dr. Lenore Tedesco, Executive Director

As another summer comes to a close, it's a great time to think about all the remarkable work our staff, volunteers, and interns have done and the impact it has had. As the summer season starts, our staffing ramps up with the addition of seasonal employees, more volunteers, and the arrival of our undergraduate interns. Front-desk staff and volunteers are here to greet visitors, get them booked in programs and excursions, and are ready to answer questions about programs, wildlife rescue, and our mission. The education teams are delivering summer nature programs, outreach events, and traveling education programs. The education interns are busy running visitor programs, coordinating Crabulous Crab Day and working hard on their independent projects that help enhance programming while giving them great experience. Our research and conservation department is



stretched thin managing the various research, monitoring and conservation projects that are all in full swing. Staff are out monitoring bird usage at Stone Harbor Point and Ring Island and stewarding the beaches so beach nesting birds can raise their young. They are documenting box turtle usage of the Stone Harbor Bird Sanctuary, and managing the intense pressure of Diamond-back Terrapin nesting season. From conducting road patrols, to protecting nests from predators, to retrieving eggs from mothers killed on roadways, working to rehabilitate injured terrapins, and working with all of you that bring injured terrapins to the Institute, it's a whirl wind of activity.

The research interns are also working on their individual research projects in the midst of all that is happening here as well.



It's a pretty remarkable time of year. It's also a great time to take stock. The *reTURN the Favor* Horseshoe Crab Rescue program tallied more than 500 volunteer walks that rescued more than 77,000 horseshoe crabs. The Terrapin Conservation Program saved more than 360 terrapins and helped 107 more that were injured. They handled more than 490 road killed females to harvest 776 eggs. The eggs have been hatching from our incubators since the end of July. They will be cared for until they can be released back into the marsh next summer.

People often ask me if our area is better off because the Institute is here. The answer is a resounding *yes!* Whether it's because we were able to provide a special connection to the marsh for our visitors, or because of the wildlife that got a second chance at life - the answer is *YES*. It takes a village to make a difference. All of you – our supporters – are part of that village. We can't do it without you!





2008 - Summer Internship (Tori on the right)



2016 - CCRP Coordinator

Coming Full Circle

by **Tori Musumeci, CCRP Coordinator**

I was in the lab, crowded around the lab table with the rest of the 4th grade campers, interns and research staff and I did not feel good. Unfamiliar black spots were swirling in front of my eyes and I was losing my hearing, next thing I know I'm waking up in my camp counselors arms. I fainted at the sight of my first eggectomy and that's how it all started for me at The Wetlands Institute. This did not deter me from attending Summer Nature Programs for multiple weeks for three years and returning as a junior volunteer for the next four years. My experience at TWI led me to study Marine Biology at Stockton University and return summer 2008 as a Coastal Conservation Research Program (CCRP) Intern. As an intern, I had one of the best summers of my life working with Terrapins, Ghost Crabs, community engagement and making friends that I have kept in touch with. During graduate school I worked for Stockton University raising headstarters and caring for injured adult female Terrapins. After graduation I worked in environmental consulting for 5 years and found that private industry was not my niche. My love of conservation work has once again brought me home to TWI for another fantastic summer as the CCRP Coordinator. I am truly enjoying working with the research interns and seeing how TWI has progressed and grown since my last summer here. The work at TWI has continued to resonate with me because of the long term dedication to research and how this positively influences community behavior and attitude. I am also, thankfully able to go through an eggectomy without fainting now.

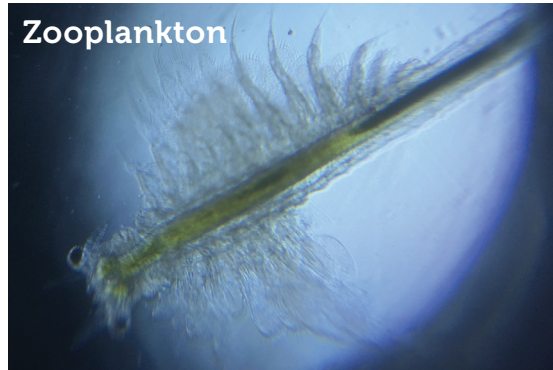
The Hidden World of Plankton Exposed - by Samantha Sorbello

Visitors to the aquarium will notice a new exhibit in The Secrets of the Salt Marsh - The Culture Corner. This exhibit invites guests to explore the microscopic world of plankton and learn more about the organisms that make up the base of marine food webs. Guests are encouraged to become plankton scientists, examining samples of both phytoplankton and zooplankton under a special microscope using the camera on their smartphones. Using this microscope, visitors can get an up-close look at living phytoplankton, the different life stages of brine shrimp, and even see what types of organisms they can identify in a sample of raw sea water – all while having the chance to take some really awesome pictures!

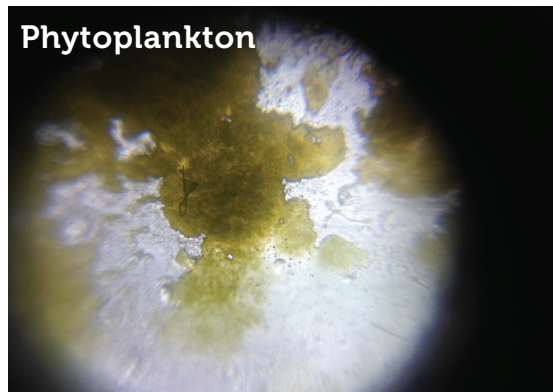
Featuring live cultures of phytoplankton and zooplankton, this new exhibit adds an interactive element to the saltmarsh display and provides more information about the microscopic organisms that make up such an important part of the ecosystem. This new exhibit is simple enough for young visitors to interact with, but also equally engaging and informative for older visitors, with information on harmful algal blooms and different types of zooplankton.

In addition to being a fun and educational addition to the aquarium, these cultures provide a wonderful treat of live brine shrimp to our resident seahorses and pipefish. Watching these animals actively hunting and chasing their treats around the tank is certainly a wonderful bonus to an already great and exciting addition to the aquarium!

Zooplankton



Phytoplankton



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Research & Conservation

Volunteers to the Rescue!

2016 was an extraordinary year for the *reTURN the Favor* program. Over 77,000 horseshoe crabs were rescued from bayshore beaches in New Jersey this season – surpassing the total from the first three years combined!

Volunteers and staff from partner organizations pitched in to lead over 500 walks, more than double the number of walks in any previous year. There is a lot of love for horseshoe crabs in New Jersey! Join us next spring for trainings, walks, and beach cleanups.

For more information on how you can support or participate in this program, visit returnthefavornj.org or look up our page on Facebook.



25 Years of Turtle Releases - by Roberta Dean

When reading The Wetlands newsletter this winter, I was drawn to the news about this year marking the 25th Anniversary of the Diamondback Terrapin Conservation Project. I immediately realized what that meant to me -- I would be preparing for my 25th turtle release with my kindergarten class at Stone Harbor Elementary School.

This June, Dr. Roger Wood attended the 25th turtle release and The Wetlands Institute presented me with the **2016 Citizen Conservation Award** honoring my 25 years helping the Diamondback Terrapin Conservation Project. As I prepared for this year's release, which is also my last since I am retiring, I figured out that I had probably made more than 11,000 turtle cookies (which we still sell for 25 cents each) and that we had given The Wetlands at least \$2,500 over the years which was matched by Sturdy Savings Bank -- \$100 each year. Together \$5,000 came from the kindergarten turtle cookie sale.

The turtle project was a fascinating and fulfilling classroom project which gave my kindergartners great joy every year. I estimate that 473 children participated in this project over the years. As I retire, I will take with me great memories of my 25 turtle releases. Thank you to everyone at The Wetlands for continuing this project with my class for so many years.



Summer Intern Projects

Coastal Conservation Research Program

Our Coastal Conservation Research Program Interns spent 10 weeks this summer immersed in our projects, and creating their own projects. After acclimating to life in the saltmarsh, nights on bayshore beaches, and days on terrapin road patrols, each intern crafted and conducted their own independent research project. In the process, they gained personal experience navigating the small victories and temporary setbacks of field work, contributed to our ongoing projects, experienced the amazing places, people, and wildlife of southern New Jersey, and made friends along the way. Quite a lot to fit into 10 short weeks!

Elliott Fackler (Bloomsburg University) compared egg viability of horseshoe crabs between saltmarsh and bayshore spawning locations. Aaron Mitchell (University of Southern Mississippi) examined the effect of species interactions on the behavior of American Oystercatchers during the breeding season. Lauren Seacrist (Lander University)



studied movements of American Oystercatchers between saltmarsh and barrier island locations. Adeline Schlusell (St. Mary's College of Maryland) investigated the response of diamondback terrapins and terrapin predators to the introduction of an artificial nesting site, or 'terrapin garden'. Wolfgang Trumbauer (Widener University) estimated hatchling sex ratios of diamondback terrapins by measuring temperature in nest cavities. Patrick Williams (Stockton University) captured diamondback terrapins in local marsh creeks to examine changes in the population structure.



This summer, Environmental Education Interns spent 12 weeks leading public education programs and interacting with visitors, while braving the mud, bugs, salt water and sun to create the best visitor experience possible. They worked hard and developed the skills they need to continue their careers in the environmental education field. Each year, interns develop and implement an education project that is personally and/or institutionally beneficial. The development of individual projects assists them in honing skill sets that

Environmental Education Program

are essential to creating fundamentally successful programs or initiatives within the field of environmental education.

Alexis Arnold (Lock Haven University) developed a three-part thematic education unit on plants for our Nature Education for Homeschool Students and Teachers (NEHST) program and piloted one of her lessons at our Summer Nature Program Kids Can Grow Farm Market. Anna Caputo (Green Mountain College) wrote, directed and edited a conservation education web series consisting of three complete episodes for The Wetlands Institute's You Tube channel. Emily Colombo (George Mason University) built and installed bat boxes on Institute grounds and created a complimentary set of educational materials to accompany the installation. Diana Moczula (Carleton University) conceptualized a new service learning program entitled Helping Hands and developed six related programs that will be incorporated into The Wetlands Institute's weekly summer general admission programs.

Marketing and Communications Program

The Marketing and Communications Department implemented a formal Internship program this summer. If you visited the Institute this summer, you might have had the opportunity to chat with our friendly Marketing and Communications Intern, Victoria Deever (Penn State University). Victoria spent her summer interviewing visitors about their experiences, where they are from and how they learned about the Institute. She is analyzing visitor demographic to help the Institute better target marketing and communications in the future.



summer CELEBRATION

Our 2nd annual Summer Celebration held at the Reeds on the evening of August 6 was a huge success! We want to thank all who came out to celebrate summer overlooking the marsh and to support our programs. Special thanks to our Sponsors!

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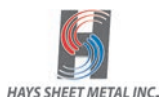


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Autumn Happenings

It is autumn in the marsh and The Wetlands Institute is open daily from September 6 - October 10, 2016! Unless otherwise stated, all activities are free with admission and occur onsite at The Wetlands Institute. Questions? Please call The Wetlands Institute at 609-368-1211.



Salt Marsh Safari

11am & 2pm Daily

Start by watching our award-winning film, *Secrets of the Salt Marsh*, then join us for an interpretive marsh walk along our elevated walkway and out onto the dock overlooking Scotch Bonnet creek!



Catch 'o the Day

12:30pm Wednesday

Get your feet wet (or wear waders!) as you discover what swims in the back bays. Help us drag a seine net through the water to find crabs, shrimp, fish and more.



Creature Feature

12:30pm Monday and Friday

During this live animal presentation, get up close with turtles, fish, crabs, sea stars and urchins, mollusks, horseshoe crabs, or the popular animals of *Finding Nemo*. After the presentation, create your very own take-home craft!



Seashell Sunday

12:30 pm Sunday

Seashells at the seashore! Join us to learn all about seashells, how to collect them without harming the environment and touch an assortment of live mollusks and cool artifacts.



Aquarium Feeding

12:30pm Tuesday, Thursday & Saturday

Help us feed the local marine life! We will open up feeding three times each week so you can see the octopus eating crabs and the horseshoe crab gobbling shrimp.

Winter hours and activities start October 11, 2016! Starting then, The Wetlands Institute will only be open Friday, Saturday and Sunday. Please check our website calendar for programming updates as we transition from autumn to winter hours!

Tidepool Shop

Our book and gift shop is open every day from 9:30am to 4:30pm until October 10, 2016. Starting October 11, we will only be open Friday, Saturday and Sunday from 9:30am to 4:30pm. Can't visit us? Call and purchase by phone. We will ship your purchase anywhere in the United States.



Monarch Themed Items

It's Monarch butterfly season! Check out our new ladies' v-neck T-shirts from Marsha's collection, Monarch gardening books, Monarch kids' books, toys, and more!

Migratory Bird Puppets

We are stocking up on bird puppets just in time for Fall Migration! These plush puppets by Folkmanis include information about the species represented to help young bird lovers learn about their new friend.



Children's Chirp Shirts

Inspired by a photo of a Piping Plover taken on the Stone Harbor beach, Chirp designed these great cotton T-shirts for kids. Also comes with a Red Knot illustration. Available in toddlers and children's sizes.

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Views from the Tower



FALL Migration FESTIVAL

**SEPTEMBER
17-18** 9:30am-4:30pm

For Friday 9/16 evening activities
visit wetlandsinstitute.org/FMF

Come witness an amazing spectacle of nature and see what makes the Cape May Peninsula one of the top birding destinations in the world!

- Live Butterfly Presentations and Tagging
- Guided Back-Bay Boat and Kayak Tours
- Fish, Sea Turtle, Butterfly and Bird Crafts
- Migration Themed Games and Activities
- Special Autumn Terrapin Release
- Guided Nature Walks
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2015 Annual Report now available!



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