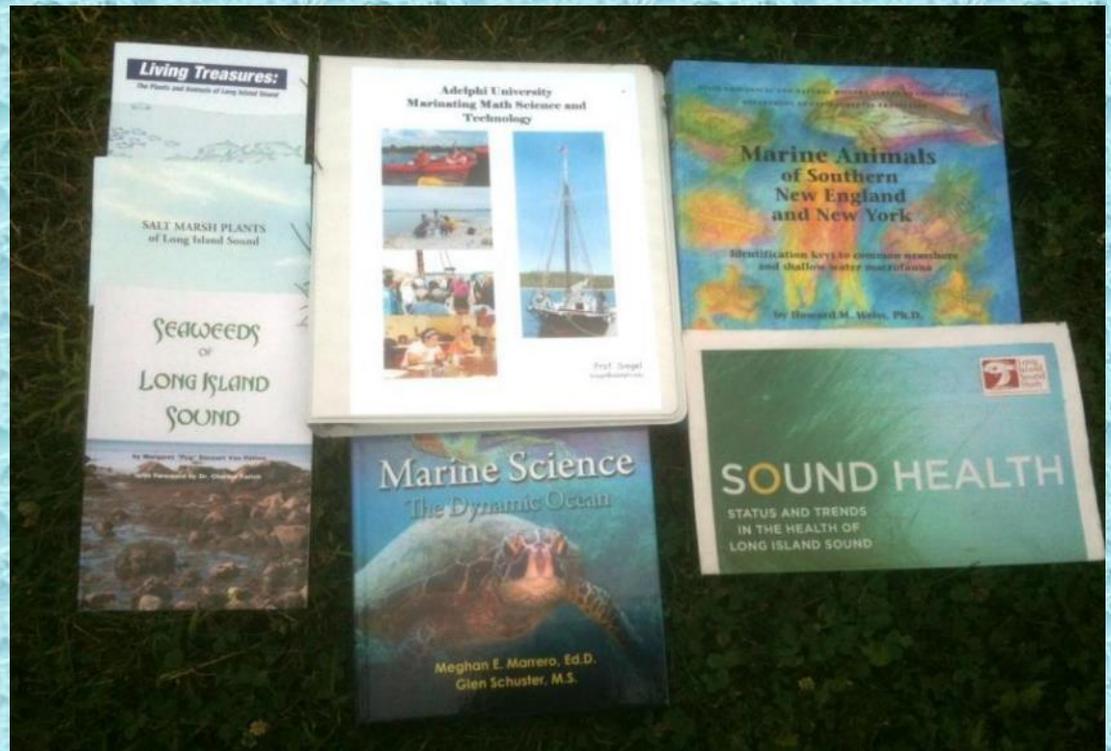


**Adelphi University
Noyce – SEA Program
Marinating MST
July 2013**

Adjunct Associate Prof. Lou Siegel

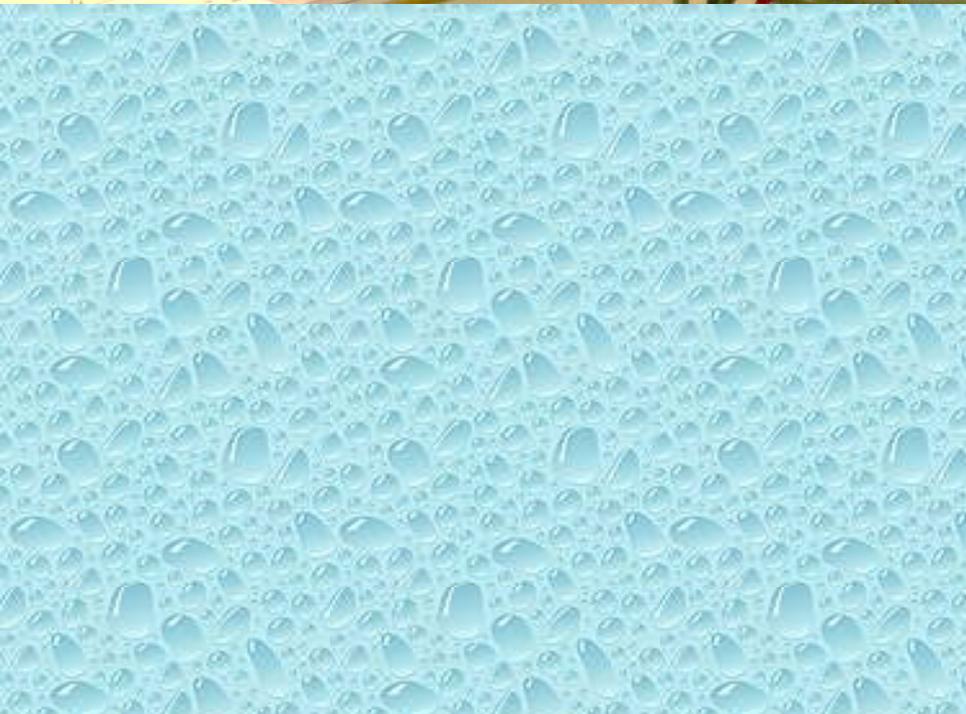
- **Day One -**

- The day began with personal introductions and several powerpoint presentations to orient the students to the work ahead.
- Students received the materials to be used in the course
- including copies of the Text book, and associated DVD, *Marine Science, The Dynamic Ocean* by Marrero and Schuster which was provided by Pearson Publishing. And several books from the Long Island Sound Study.



The students then practiced with the the instrumentation which we would be using during the course.







Day Two, Morning

Began with a tour of the Town of Hempstead Oyster and Clam Nursery at Point Lookout.

The building is independent of the grid, producing its own power from solar and wind collectors.



Tom Landi, project manager for the town met the group and gave us an orientation to the facility. The FLUPSY (Floating Upwelling System) barge being readied for the season can be seen in the background.



The FLUPSY barge, like the rest of the facility is powered by solar radiation. The collectors can be seen overhead. The round structure behind Tom is one of the floats and the square box like structure houses the towers, one of which can be seen on the left,

in which the clams are kept. In the background are clam shells which are being aged for later use as a substrate upon which oyster larvae will settle.



The central channel of the barge into which water is drawn from the outside boxes containing the clams and oysters. The water flow is provided by a unique paddlewheel system (not shown in this image.) This is the heart of the FLUPSY system which keeps food rich water flowing over the organisms, promoting their growth. One of the advantages of the barge is that it can be moved to areas with optimal conditions for organism growth.

In these pictures of the barge in the water from last year, the paddle wheel can clearly be seen as well as the solar collectors and the towers in which the mollusks are held. In the slide on the bottom, right, the central channel can be seen, flooded with seawater.





Tom describes the process as students are able to observe the tanks and organisms in the nursery.



The students heard about the labor intensive process needed to successfully grow out the clams and oysters to a size where they can be released to the bay.





Tom describes the engineering involved in the collection, storage and conversion of the electricity for use. The facility actually produces an excess of power which is sent back to the grid. On the right is a heater used to manipulate water temperature to facilitate reproduction of the oysters and clams.



The class also had the opportunity to observe commercial boating operations for clams and other species along Woodcleft Canal. The clams shown here are large surf clams fished in the nearby ocean.



We also visited a local fish market which displaying local and imported species.



At the docks we met with Captain Don Harris, Education Director for the environmental group SPLASH. He took the class out to explore the waterways between Jones Inlet and Freeport. Here the students are recording data.



While on the water we sampled chemical and physical characteristics of the air and water using a variety of testing methods which the students had learned on the first day.



A biological dredge was used to sample bottom dwelling organisms



We then examined and classified the various specimens collected in the different locations.



The picturesque bay houses located on the bay islands look like the idyllic way to enjoy the summer.



However closer examination reveals the devastation caused by Sandy. Docks with missing or heavily damage homes were evident. Many of the bay houses in the Town of Hempstead were carried away or severely damaged by the storm.



Professor Siegel demonstrated the proper techniques for collecting organisms using a beach seine.



Once again this activity provided data for the students as they collected, identified and recorded the number and size and type of the organisms collected.



The seining and exploring the mudflats produced many organisms to examine including several young horseshoe crabs.



Operation SPLASH is a successful environmental group with 6 boats, like this one which we passed on our trip. Manned by volunteers, each boat makes one or two trips every day to clean debris from the waterways of the south shore of Long Island. They also have a strong educational component to spread the conservation and clean up message which allowed them to assign a boat to our class on this day.

Day Three - Morning

The enthusiastic crew met for an outing at Empire Kayaks in Island Park. We used double, sit-on-top kayaks which are very stable and easy to learn how to use.





Kayaks are wonderful in that you are so close to the water you can see and experience things in a unique manner. As you travel over the shallows fish, crabs and shrimp can be seen moving below. You can also observe many species of birds such as these ospreys on their nest.



After exploring the area we then rafted the boats up to conduct measurements of the physical and chemical parameters for comparison to our other test sites. At one point we approached the outfall of the LIPA electrical generating plant and were able to show a slight increase in the water temperature due to the cooling water from the plant. This difference is much more pronounced in the cooler months.

Day Three - Afternoon



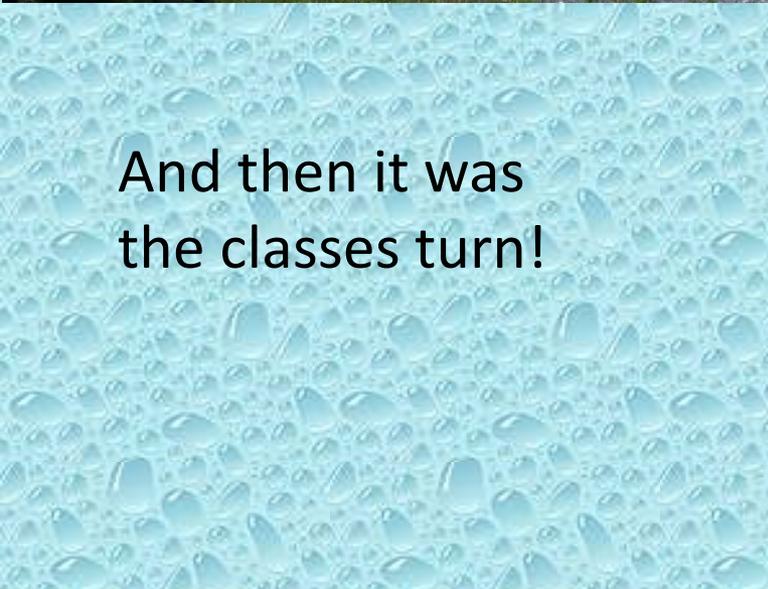
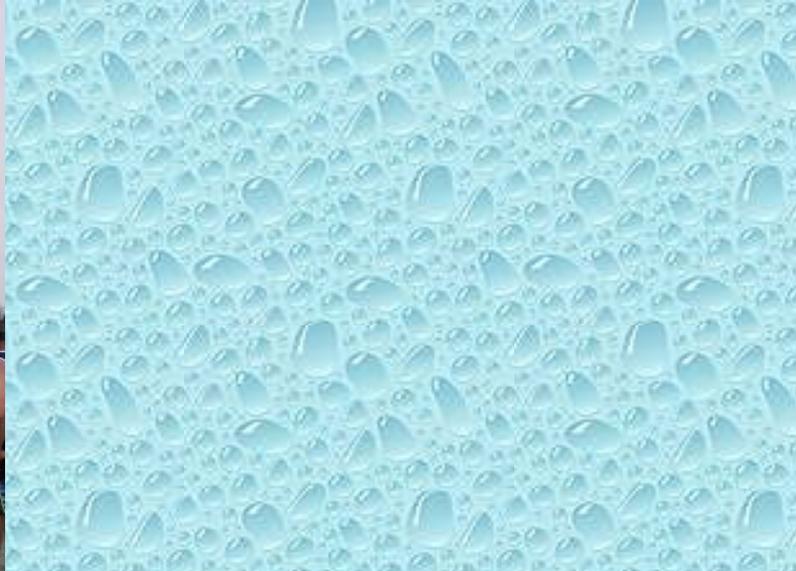
The group met for the afternoon at the Town of Hempstead Marine Nature Study Area. Mike Farina, naturalist and photographer was our guide for the day. The Study Area was opened on the first Earthday (1970.) It was an area set aside (see earlier map,) to preserve and study the waterfront environment in the then, fast growing suburbia.



Mike distributed trail guides and discussed the zonation easily observable at the preserve. Here the class is looking at the instrumentation used for the GLOBE program measurements. The GLOBE program is international, synoptic readings taken by schools and other groups to assist scientists in ground truthing their remote measurements taken with more sophisticated instrumentation. It also provides a great learning experience for the observers.

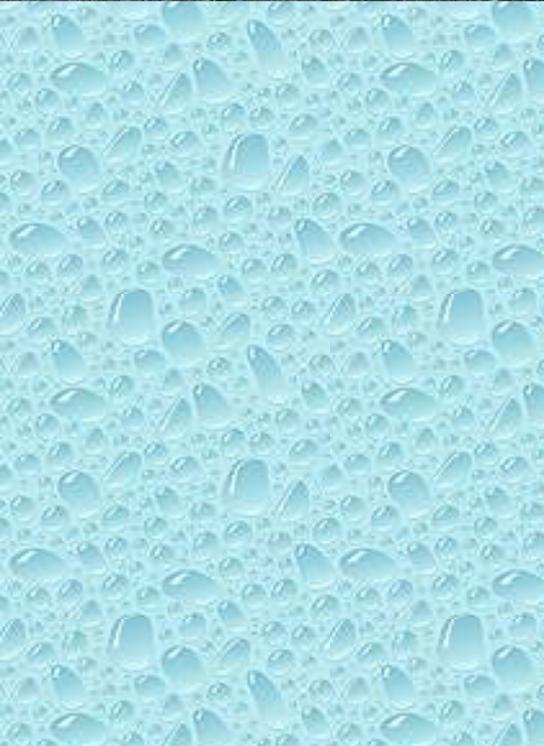


Mike gave the class a short demonstration on the use of the cast net. This is an historic type of fishing found in many cultures around the world which is still widely used today.



And then it was
the classes turn!







Unfortunately, lightning, thunder and a rain shower prompted us to make a hasty retreat. In the past we would have gone into the classrooms in the building, unfortunately they were both destroyed by Sandy. The Town has applied for several grants to rebuild a modern, more resilient structure. We all agreed to return in the future.

Day Four



The class met at Reis Landing, Rockaway, Queens within Gateway National Recreation Area. We were going out on the *American Princess* to document whales and dolphins within The New York Bight (The triangle area formed by the shorelines on Long Island and New Jersey.)



Reis Landing is at the entrance of Jamaica Bay. We discussed the colorful history of Jamaica Bay including the extensive dredging, originally to enable the freighter ships to reach a planned dock facility at Canarsie (that was never realized.) Later the dredging continued. First to provide landfill and then to enable oil tankers to fuel Kennedy Airport planes. The class then deployed to collect specimens and artifacts washed up in the intertidal zone



The Gil Hodges Bridge at the entrance of Jamaica Bay and the American Princess can be seen in the background as the students return with their collections. We found many common specimens but one very unusual..



(The tool pictured measures 8" from tip to tip.)

Skull.. of what was later identified by scientists at the Museum of Natural History as a mammalian cow head. It had evidently been underwater for some time judging by the extensive marine growth. In this view we can see the obvious horns and the opening through which the spinal cord exits the skull.



After having found a terrestrial mammal skull on the beach we were primed to view some marine mammals. Paul Sieswerda, the naturalist onboard gave a short presentation discussing the local marine environment and the evolution and classification of marine mammals.



Part of the presentation included the opportunity to examine samples of baleen and the whale tooth shown here.



But the main part of the trip consisted of working the bulkheads gazing out to the horizon looking for marine mammals.



As soon as we left the shelter of the bay, within sight of the Rockaway Jetty, we saw pods of bottlenose dolphins.



About thirty to fifty of these toothed marine mammals entertained us for over an hour. We then began moving further out looking for the whales that had been seen the previous day.



As we moved out into deeper water we saw several of the many vessels moving in and out of the Port of New York. This is a tanker. We could tell that it was nearly empty because of the high water line.



This is a container ship – the new method of transporting the majority of materials around the world. Each container is the truck body we see on the highways every day. They carry cars, refrigerators, dishes, paper towels, shoes, stationary and just about everything else that we purchase.



So lets see. Count the number of containers that you see across the width of the stern (back) of the boat. Now count the number of containers going forward to the bow. (Do some estimating!) How many containers are on the boat? If each one weighs 10,000 lbs, how much weight is the boat holding? Now add to it the weight of the boat itself. And it all floats!! How is this possible???

Sounds like the beginnings of a great lesson.



We didn't get to see any whales but the dolphins were a great sighting and the crew had another great day on the water.



Oh yes, the *American Princess* is still out there with its tourists and naturalists documenting New York's marine mammals. This picture was taken the week after we went out on July 19th. This lunge feeding baleen, humpback whale is devouring the menhaden herring (bunker,) that we had observed in abundance the previous week. Check out their Facebook page for more pictures and schedule.

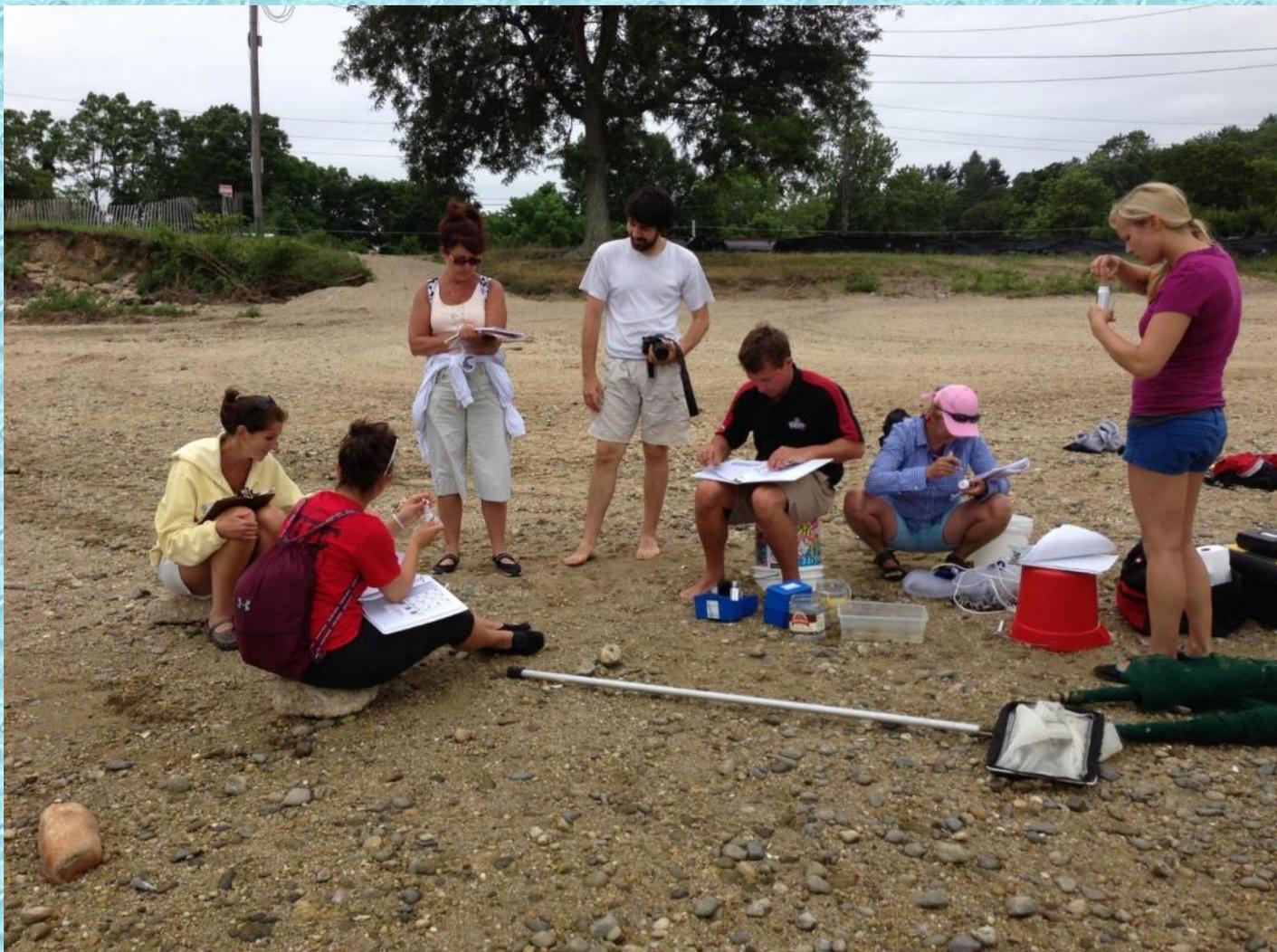
Day Five – The Waterfront Center in Oyster Bay



We began our visit to the Waterfront Center in Oyster Bay on the north shore of Long Island by observing one of their summer camp groups on the beach. We noted the dynamics of the group, the number and actions of the councilors and the safety precautions which were taken. This established facility is a model for waterfront activities including marine biology, sailing and kayaking.



And then it was our turn. We seined for fish and used a dip net in the nearby outfall of a stream. The kids had caught a mature eel a few minutes earlier and we were able to catch a larval eel in the same spot. A discussion of the unique life cycle of the eel followed.



The group then got to work sampling the chemical and physical parameters. Note a special dispensation was given to the two team members that did not bring their water shoes. This wouldn't have happened for the Waterfront Center students.



We sampled the bay water and the water just emerging from the stream as a comparison. Here the difference in the depth of color of the two oxygen samples is indicative of a difference in level.



Students worked in groups to improve the accuracy of the measurements. The recorded data is then collected and recorded by everyone for their own interpretation. Data from today was compared to previous measurements made at the other locations.



The beach in front of the Waterfront Center was a beautiful location to gather our measurements- but we had to hurry because of the incoming tide. Larger tidal ranges are one of the big differences between the north and south shores of Long Island.



After lunch we motored out to the Christeen which was at anchor in the cove. After a short presentation on the history of the vessel and a safety check we worked the port and starboard halyards to raise The large gaff rigged mainsail. The Christeen, built in 1883 is on the National Registry of Historic Vessels as the oldest oyster sloop in the U.S. It has been completely restored by the volunteer crew at the Waterfront Center.



We stepped up again when it was time to raise the jib.



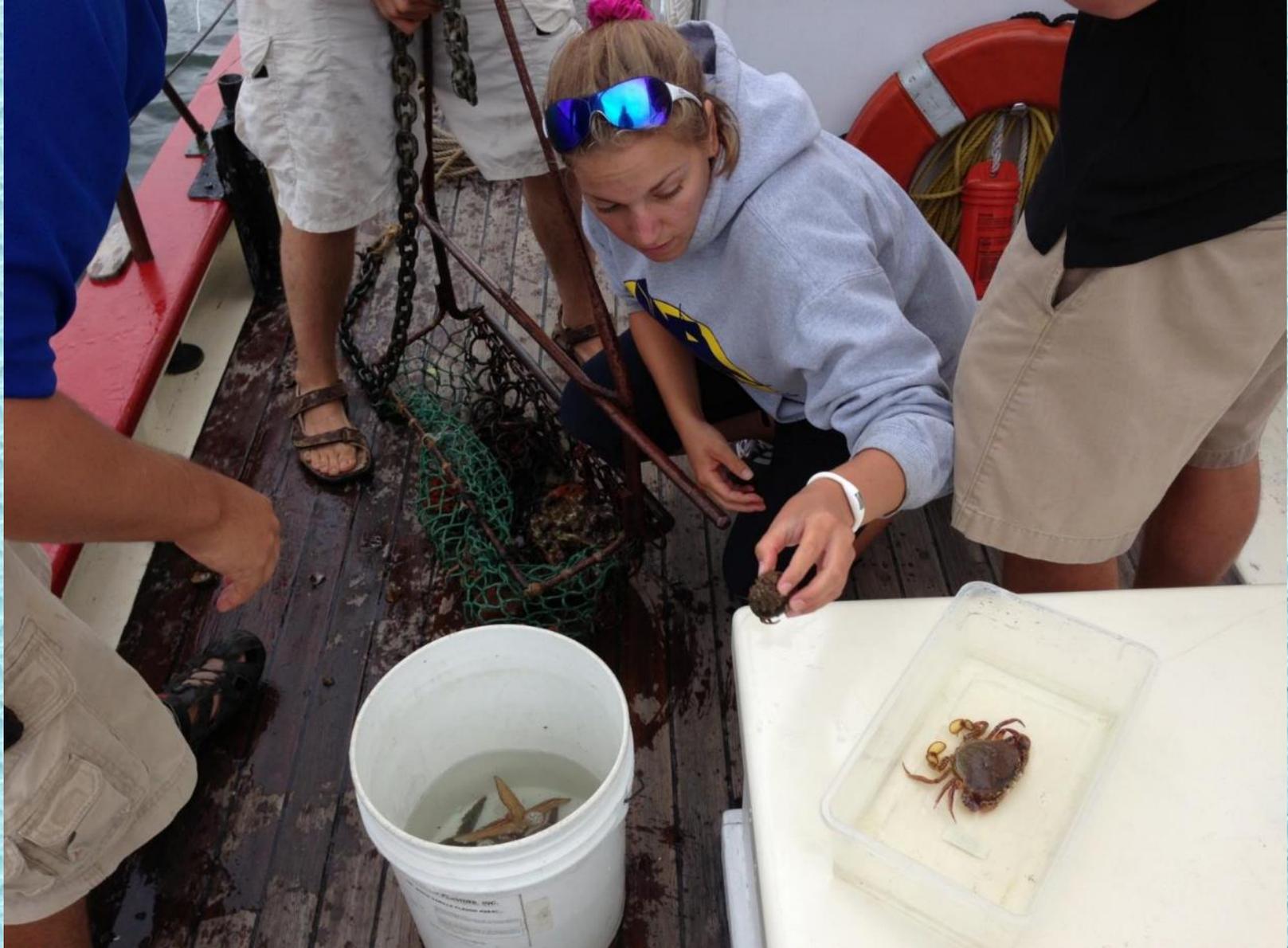
The historic vessel, Christeen is on the right and a modern dredger, (a converted ferry,) is on the left. More than just a visual difference, the modern dredger is much more efficient and with it comes the increased danger of overfishing and collapse of the fishery as has occurred in other areas.



While we were out we discussed the basics of sailing and had the opportunity to observe many types of old and new boats. This is a new sloop which carries two sails on one mast just like the Christeen.



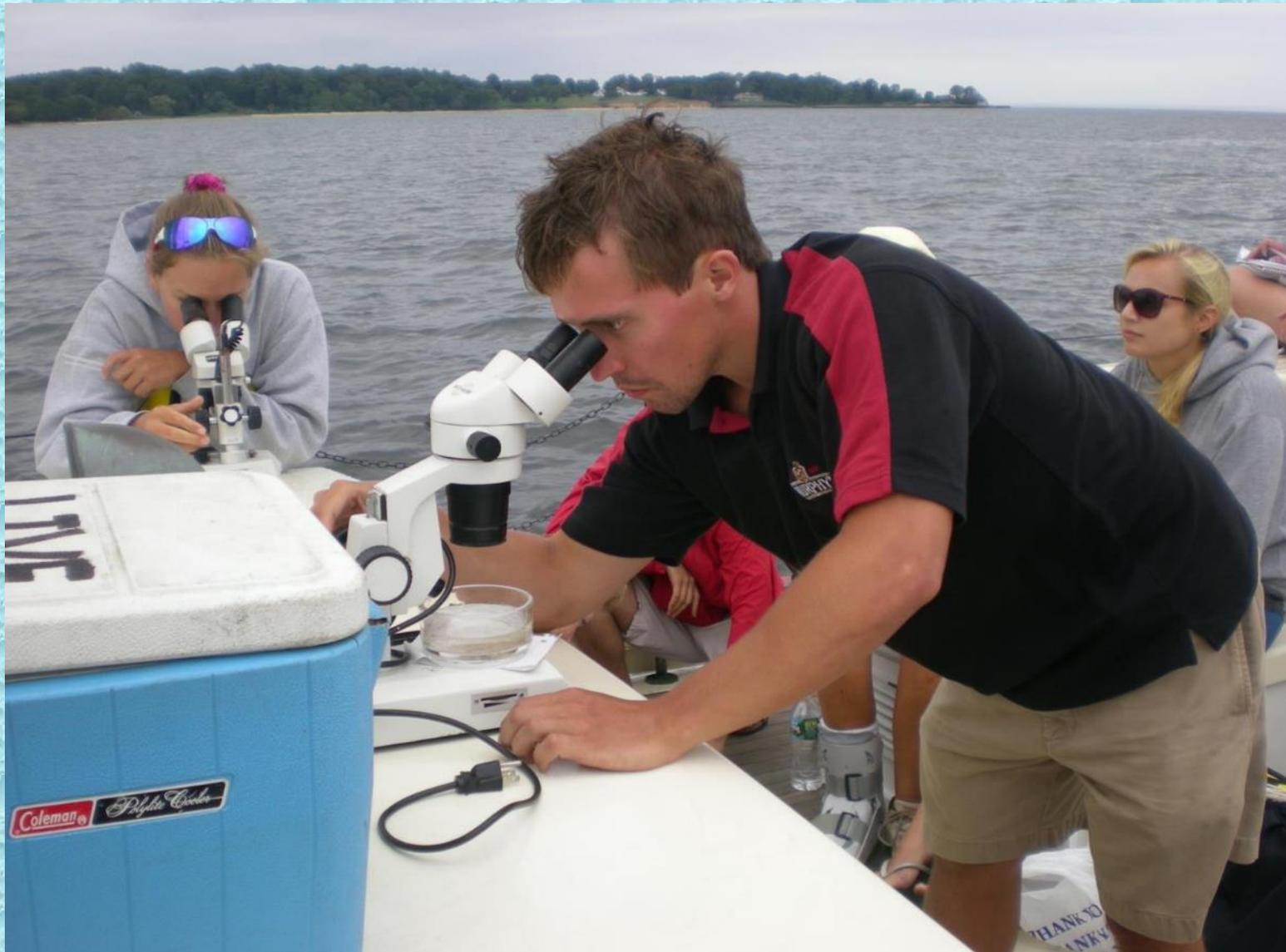
Onboard the Christeen a “scallop” dredge is used to sample the benthic organisms.



Students collected and classified the organisms brought up in the dredge for the lists they were compiling.



It was fascinating to see the types of organisms caught in the net.



A Plankton sample was also collected and examined by the students using microscopes onboard.



The naturalist onboard confirmed our identifications and discussed the life histories of each.



And so we ended our week on the water. Now to write up our experiences!

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