

Rivers to Reef Teachers' Workshop by Linda Rule

I was excited to be invited to participate in a Rivers to Reef teachers' workshop. I was even more excited to find out this was no ordinary training. I spent the day on the research vessel Savannah participating in a variety of activities. These hands-on activities and the experiences gave me so much more insight into the connection of our watersheds, waterways, and the ocean. I was not only provided with basic facts about the estuary off the coast of Georgia, but I, and the other teacher participants, were able to see and use many research tools.

The first piece of research equipment we were introduced to was the CTD (Conductivity Temperature and Depth). We helped cast it into the water and then used an onboard computer to control the depth at which the sample was taken and then the CTD was brought back up. Each time the CTD was deployed, different teacher volunteers cast it, worked on the computer, and got it back on board. Seeing firsthand the size of the CTD and experiencing how it is maneuvered on and off the ship makes me more fully appreciate what scientists in the field deal with daily.

Next, we conducted a benthic grab. Our first sample was of Georgia red clay. It did not look like the red clay I saw growing up in Marietta, and it certainly did not smell like it. This clay was dark black, but it still felt like the clay I grew up playing with. Through erosion, the clay had made it to the coast. Cathy Sakas brought out some clay she had collected from a previous trip. She had formed and fired it, and, sure enough, with oxygen added back to it, the clay was red again. Each time we collected benthic material it looked and felt different. After examining the red clay substrate, we examined various degrees of sandy and muddy sediments along with the animals that live there. Being able to examine unadulterated samples is one of the greatest benefits to hands-on activities done in the field. When samples get used over and over again, which, unfortunately but necessarily, is quite common in classrooms with limited resources, they tend to become tainted. There is so much to be gained by participating in the process as well as having access to the fresh sample. Indeed, even if our schools are fortunate enough to purchase new materials, there is quite a bit lost in transit, simply because of what is involved with packaging and shipping. For example, the smell of the first sample surprised many of us – that is something we won't forget – and we will each be able to share that experience with our students.



First and third benthic grabs.

The otter trawl was deployed twice. We had it follow behind the Savannah for about 15 minutes each time gathering aquatic life. We were able to examine its diverse contents. We learned about various fish as we picked them up and examined the shape of their mouths to determine what level of the water they lived on. We learned about different types of starfish, crabs, shrimp, and jelly fish. It is one thing to hear that these species live together, but it is something else to see them all pulled out of the water at the same time.

The bongo nets were used next. They gathered very small organisms. I did not find these as fascinating as the larger creatures that the otter nets captured. I was glad to see that no particles of plastic were captured.

This hands-on training opportunity provided me with a better understanding of our watersheds and the impact that pesticides, fertilizers, and other contaminants have on the estuarine ecology. When I picked up a large shrimp and was told it has black lungs (a disease in the shrimp due to contaminants in the water), I was quite surprised. Sadly, I was able to see that most of the shrimp we had collected had the same disease. This really hit home. I stopped purchasing shrimp from overseas farms a few years ago, and I was relieved to hear that the shrimp I was examining were safe to eat. This was such a unique opportunity to learn about marine organisms and how they interact in the environment. Not only did this training provide the material outlined in the description of the program, but I learned so much more. For example, during the emergency scenarios/safety briefing, I learned about emergency wetsuits and different emergency escape breathing devices. I learned so much being immersed in the environment instead of just looking on as a bystander, or, even more removed, via just videos and textbooks.



Catches from the otter trawls.

Thank you, Dr. Marc Frischer and the National Science Foundation for providing this hands-on training opportunity to me and other teachers. Thank you also to Jody Patterson, Cathy Sakas, the research team and crew aboard the R/V Savannah. This was such a wonderful and rewarding experience.