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SEEING HOW SCIENTISTS SOLVE PROBLEMS IN THE FIELD WAS A VALUABLE LESSON FOR CARMINA RAMIREZ, ASSOCIATED CALEXICO TEACHERS (LEFT), WHO JOINED 37 OCEANOGRAPHERS FROM THE SCRIPPS INSTITUTION OF OCEANOGRAPHY ABOARD THE R/V MELVILLE FOR A SUMMER OF RESEARCH. READ MORE ON PAGE 12.

*Experiencing a Sea Change*

One teacher conquers her fear to gain a new perspective of STEM
That was the first line in my application for the Teacher at Sea program, which began my adventure in the Pacific this summer. I learned about this National Science Foundation-sponsored program for teachers when I attended a workshop at the Birch Aquarium at UC San Diego’s Scripps Institution of Oceanography in La Jolla.

The Teacher at Sea program provides an opportunity for educators to spend 30 days on a research vessel and participate in real-world, interdisciplinary research toward understanding and protecting the world’s oceans and resources.

When I received the news that I had been chosen as the Teacher at Sea, I felt incredibly lucky and horrified at the same time. I had nightmares of a giant octopus lifting the ship out of the water, as well as massive waves wiping out everyone on deck. Fortunately, none of that happened. Instead, I got to work with and learn from a group of incredibly knowledgeable human beings whose determination inspired me on a personal and professional level.

For one month, I was part of a team of 37 oceanographers and 23 crewmembers on board the R/V Melville. The team of researchers from California Current Ecosystem Long Term Ecological Research (CCE-LTER) was led by Mark Ohman, director of the CCE-LTER site, and cruise chief scientist Mike Landry, both from Scripps. Their research focus was on the effects of rising temperatures along the California coast, one of the most productive ecosystems in the world.

As the Teacher at Sea, my duty was to assist with the deployment and recovery of nets, as well as to maintain a bilingual blog about my experiences. I offered to write it in Spanish for the largely Spanish-speaking audience in the Imperial Valley and the city of Calexico, where I have worked as a science teacher for over a decade.

I was so excited to begin writing the blog and to get to know everyone, but during those first three days, the motion of the waves was very rough on me. My body kept trying to stay balanced while walking through the hallways of the vessel. Instead, I would bump into the walls while trying to hold on to the nearest chair or table to keep me from falling. In the restroom, I felt so thankful for all the bars that surrounded the walls, especially when I took a shower!

It was a lot to get used to, but before I knew it, my body had adjusted. I was no longer fighting the sensation of being on a waterbed when I tried to go to sleep. I even found it soothing. After being on the vessel for a few days, my fear of the ocean was gone. Its size was humbling, its motion mysterious, and I had no other way to feel but being part of it. I was ready to embrace the experience, and I did.

I carried with me a Canon DSLR, a GoPro video camera strapped around my chest, and a small notebook. Because I was prepared with my equipment, I was fortunate enough to capture some incredible images of sea life. One amazing sight was the day Kyra Rashid, graduate student, and I spotted a giant sunfish. I screamed when I saw it from deck while my left hand took over photographing. At that moment I realized that my camera had become an extension of myself. On another occasion, Dr. Ohman and I used the GoPro camera attached to a 15-foot pole to film remarkable gelatinous zooplankton called salps, as they drifted by underwater.

For those 30 days, I was surrounded by the most determined and adaptable individuals I have ever met. Research was happening 24 hours a day, and some scientists only slept three or four hours at a time. Every minute was very valuable, so I volunteered to help as much as I could, and I asked many questions to understand the methodology of the experiments and the questions behind the research that was taking place.

Many of the scientists came from other countries such as France, Spain, Colombia, Germany and...
Denmark. Plankton ecologists, geochemists, physical and biological oceanographers, microbial diversity experts, and seabird/marine mammal observers, as well as computer software engineers, worked in unison to solve problems. The expertise and knowledge on our ship was impressive, and I learned new things every day.

Seeing how scientists work and solve problems in the field was the most valuable lesson for me. I understood the importance of the interrelation of scientific silence and discussion. The silence allowed the translation of deep thought about a specific problem, and the discussion collected many people’s ideas, allowing them to solve problems together.

This gave me a new perspective of what STEM (science, technology, engineering and math) really means in the classroom. It was clear to me that students need to model what scientists do. It takes time to come up with good ideas, and it is imperative to work together to form solutions. Students must be exposed to real-life scenarios and be taught how to interpret data. Similarly, students need to know about the importance of long-term research and how we use it to make models that could help us prepare for changes in our environment.

Many times we teach students that science is a procedure that ends with a quick answer. But in reality, science is a process, and it may take months and even years to collect and analyze data.

The content knowledge that I have gained is invaluable to me. In many ways it surpasses the experiences I had at my university. I was taught by experts in their professional environment, and that gave great meaning to the journey. Out at sea, I observed a universe of life in a single drop of ocean water. I became determined to continue to teach about the ocean, its diversity, and the impacts that humans have in this marvelous world and resource.

Teachers can use the bilingual blog that I composed (cce.ternet.edu/blogs/2014) for science content in biology, Earth science, and environmental science. Other content areas such as English and Spanish may utilize the blogs for literacy purposes. Furthermore, there are science lessons and videos available through the CCE-LTER website composed by me, and all past participants of the Teacher at Sea program.