Report for CMOS

Project Ocean 2023

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Overview

This year I was selected by the Canadian Meteorological and Oceanographic Society as the Canadian participant of Project Ocean. Project Ocean is a Summer Teacher's Workshop offered by the American Meteorological Society at St. Mary's College of Maryland. The program consists of 1 week of virtual study to get us ready for the intense 1 week in person in Maryland. There were several pre and post workshop coursework modules including lesson seeds we had to glean from the content of the course and the 2 sessions for sharing this information beyond the course with peers.

As an alumnus of this workshop, I am prepared to present training sessions for teachers within my scope of influence based on the activities we learned during this program.

Twenty-one teachers from all over the US and one Canadian (me) participated in this professional development workshop designed for us to teach Ocean content to students from K-12. The workshop was held in St. Mary's Maryland where we had access to many of their oceanic resources - The campus of St. Mary's College including their waterfront as part of Chesapeake Bay, the Patuxent River Naval Air Station and the University of Maryland Center of Environmental Science Chesapeake Biological Laboratory. Having the workshop in this rich learning environment allowed us to have access to a large assortment of labs as well as to see first-hand the community group actions being done to help the health of the bays and ocean shorelines of the area.

Before the workshop

During the pre-workshop coursework, I was exposed to the Ocean Basics:
1. The physical, chemical, and biological processes of oceans
2. The features of oceans – including basic divisions and subregions
3. The properties of sea water.

Although these modules were extremely difficult for a "land locked' individual such as myself, I learned a lot of oceanic properties, terms and concepts that were invaluable for the workshop itself as well as for applications in teaching them later.

We also had exposure to 3 MET labs on

1. Introduction to the world's oceans
2. Ocean currents
3. Ocean tides

These three modules were very self-explanatory, well thought-out for K-12 students and I could see using them in my day-to-day teaching. I was glad to invest the time in these before I got to the in-person section as they helped me keep pace with all the on-site labs.

On-Site Workshop – St Mary's College of Maryland

During the week on-site workshops, we learned from experts in the field, were taught ocean properties and concepts by professors, and were given modules to apply the knowledge in the classroom.

Topics such as physical oceanography and ocean structure, seawater density, wind driven circulation, gyres coastal upwelling and general circulation, density driven circulation, ocean water masses and the great ocean conveyor belt tides and sediment transport were addressed by experts in their fields.

The first afternoon of the week, we had the privilege to assist in a community service-learning project on the bay building reef balls and deploying oyster spat. Well, it was hot and there were a lot of cages [500] full of oyster shells and various other small creatures who were out hopefully in a spot to help reestablish the reef system and clean up the water. It was the best way to get to know the class – sweating and dumping oysters back into the bay together.

The second afternoon, we were off to the Patuxent River Naval Air station. A warning to other Canadians in the future – as a non-patriot [CDN] there were many steps you must take to be allowed to enter the site. I had several security checks and had an escort with me the entire time. It was worth it to see the technology and how optics and sounds are being used in ocean research. Sadly no notes or pictures could be taken but it was still a great experience.

The fourth afternoon, we had a field trip to Chesapeake Biological Laboratory to launch a ROV and discuss sampling techniques of unmanned systems. We learned from the front-line scientists how data was collected and all the innovative ways that systems are studied in response to climate and how to move learning forward to solutions. The next day when we were able to take the raw data collected by the all the devices and analyze it.

Throughout the week we had many impressive presentations by notable individuals:

- Dr. Janet Varner – education specialist
- Dr Randy Larsen – water density labs and ocean specialist
- Dr Theresa Schafer Director of Engineering, Education and Research partnerships – Naval air war Centre Aircraft division.
- Dr Linda Mullen – Ocean Optics
- Dr Esov Velazquez – Ocean Acoustics
- BOBS – Shelly and Norm O'Foran and Dorothy Birch – A community group working with students on ocean Buoys taking data in the area.
- Dr. Emil Petrincio – Energy moving in the ocean, Waves and Tides and Climate Change

All the presenters were extremely passionate about what they do and seemed very knowledgeable about in their domain. Their presentations were engaging and highly professional.

My favourite parts of the week were all the hands-on activities (modules) that we were introduced to. These activities were specifically designed for K-12 students and could be adapted for any grade level - I could see myself (and any of the science teachers) using these activities directly in classrooms.

For instance, while we learned about ocean currents, the story of the crate of rubber ducks going overboard came up and the places they ended up. What a great way to show currents and the tides effect on transporting items. I have modified this for the grade 2 classes I will be working with for part of next year as a game they can do. They will re-enact the current and transport the ducks following the oceans and Coriolis effect as we learn where things go in the ocean currents.

The learning, resources and lifelong colleagues that Project Ocean exposed me to make this one of the richest PD experiences of my career. I am very grateful for this opportunity that the Canadian Meteorological and Oceanographic Society provided! I would recommend this program to any teaching professional who wants to gain more experiences to enhance their teaching practice.

Post Workshop Presentations

I will be presenting at STAO [Science Teachers Association of Ontario] on August 16th, 2023.
I will also be presenting at COEO [Council of Outdoor Educators of Ontario] on September 23rd, 2023.

I have created lessons and games for an experiential representation of what I have learned and will share the process if others are interested in going on this type of learning experience as well.