2024 Coastal and Marine Institute Lab Mentored Undergraduate Research Program

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The People

This summer I interned with the Coastal and Marine Institute Lab Mentored Undergraduate Research Program at San Diego State University. My mentor is Alyssa Duenas, a SDSU/UC Davis PhD student under Dr. Walt Oechel's Lab. I also work alongside another intern, Matilde Cerutti, an international SDSU biology undergraduate student from Italy.

The Project

We learned about Alyssa's research – she is studying the CO_2 fluxes in the coastal waters of San Diego using an eddy covariance system. She is also analyzing the water quality throughout areas of the San Diego Bay.

The Surveys

We took CO2 flux measurements using both a pier-based eddy covariance system and a boat-based eddy covariance system. This summer was the first time I learned of eddy covariance. The eddy covariance system consists of a sonic anemometer and infrared gas analyzer. Additionally, we used a water probe to take water quality measurements. The water quality measurements that are taken by the water probe include photosynthetically active radiation (PAR) (uMol), chlorophyl a (ug/l), pH, conductivity (uS/cm), turbidity (FNU), dissolved oxygen (%Sat, mg/l),

colored dissolved organic matter (CDOM) (ppb), salinity (PSU). The measurements are captured using a data logger.

The Data Processing

After taking measurements, data is processed using Eddy Pro and RStudio. Another important skill I learned about is doing statistical analysis using R. I have not taken biostatistics yet, so Alyssa did a pod meeting on basic R commands that are used in the overall R script we use for creating CO_2 flux graphs and ANOVA tests. We were also able to use ArcGIS to make new maps of the sonde points and areas of interests that could help us with inferences that can explain why certain areas of the bay are carbon sinks, carbon sources, or carbon neutral.

Workshops

In addition to Alyssa's fascinating projects, we also learned valuable information during the workshops. I learned the definitions of a hypothesis, observation, theory, and law. I also learned the different ways to model information, which was very helpful when the graphs of the measurements we took were created in R.

I enjoyed my time at CMIL so much, I asked if I could continue on next semester! I am so excited to learn about more of Alyssa's research and to see the final product!