Project: Field Sampling of Microbial Communities on Near Shore Areas of Kauai

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The Kauai High School marine science classes took part in a unit focusing on the study of marine microbes during the spring semester of 2010. Due to some limitations with water access, the teachers collected the near-shore samples from various sources in lieu of a multi-class excursion.

Our objectives were to determine what marine microbes are found in near shore areas of Kauai, collect data on our sampling, and study the inter-relationships with other marine life. Additionally, we had an objective to look at how technology such as remote sensing is also used to study microbial life.

The unit began with study on plankton classification. Students became familiar with terms such as zooplankton, phytoplankton, meroplankton, holoplankton, and biomass. Students used the text *The Living Ocean*, by the Curriculum Research and Development Group to study and become familiar with plankton prior to our lab.

Plankton was collected from three different near shore locations on Kauai. A plankton net obtained by our C-MORE Gems Grant funding was used for plankton collection. Students used microscopes funded through the C-MORE Gems Grant to observe, identify, and classify plankton. Textbooks and a color guide provided by Kimberley Weersing, our grant advisor, were used to help identify our plankton. Data collection sheets were used to log the findings for possible future analysis or comparison with our studies next year.

During the final section of the marine microbe unit, students observed remote sensing images of phytoplankton blooms on a number of websites, including NASA's Earth Observation (NEO) web page. Images show chlorophyll concentration by month and location. Other queries can be mapped such as sea surface temperature and salinity to look for patterns or relationships. Students were asked to theorize both the causes and effects of algal blooms in our oceans.

This was the first time teaching a marine microbes unit for both teachers, and many ideas for improving our lessons surfaced as we went along. The background knowledge and materials gained through the C-MORE program were critical to developing our lessons. We are looking forward to expanding upon the use and knowledge of these tools for many future lessons. We would like to include student plankton harvesting and create a "lab" setting in the field for immediate feedback. Another expansion is to go further with our remote sensing lessons, and have students create some of their own maps using satellite data and metadata. Finally, both teachers hope to participate in future C-MORE educational opportunities.