The Coastal Waters Consortium Presents:
Project Spotlight

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What is the topic of your research within the CWC?
My research involves the history of diatoms, a phytoplankton group living on sediment surfaces in the marsh. Differences in diatoms, before and after the *Deepwater Horizon* event, are examined from sediment cores in Terrebonne Bay and Barataria Bay (east and west locations). These communities will be compared against oil components (polycyclic aromatic hydrocarbons) for signals of oiling effects. The hydrocarbon signals from the core tubes should provide evidence for differences in diatoms over time in acute, chronic or non-chronic exposure to oil.

What methods are you using to answer your questions?
From the core tubes I collect a small amount of sediment at 1-cm intervals down the core (i.e., through time), preserve in 10% HCl, and later examine them for types of diatoms. Preservation in weak acid prevents the shattering of the diatom frustules (valves, or shells) compared to freezing which shatters the frustules. Identification of the diatoms under the microscope considers structures, form, length, width, to the micro-analysis of the number of striae (rows) inside the diatom frustule. It is time consuming work with multiple samples and multiple diatom types.

What results have you gotten thus far?
The identification process is beginning on the types of diatoms in the sediments. The first step is to develop a species index catalog of characteristics to identify a unique species. I determine the species identification on at least 1000 diatoms on a microscope slide, which can take a few days. Later the counting will be accelerated with the species index catalog. I will also determine the proportion of each type of diatom by adding known numbers of "microspheres" that are counted on subsamples of the slides along with the diatoms.

Did any of these results surprise you?
My research is in its initial phase, but I presented early data at the GoMRI conference in early 2016. I will present a poster at the February 2017 conference. Initial results from one core indicate that the richness of species decreased with depth (time) in the core. Similarity among the diatom communities differed with depth, which tells me that this line of study is worth pursuing.

What are the next steps in your research?
I'm on an uphill challenge right now. I need to analyze the diatom communities in several sediment cores, determine the differences, and relate the diatoms to changes in the hydrocarbon signal over a period of time.

What are the "big picture" implications of your study?
Diatoms, such as those that I am identifying in sediment cores, can be used for indicators of multiple environmental impacts and multiple stressors in specific habitats.

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