Examining the dynamics of diatom population dynamics and diatom species that cause harmful algal blooms in Narragansett Bay

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Project Location:
University of Rhode Island

Project Description:

In Narragansett Bay, we're interested in members of a group of floating unicelluar algae (phytoplankton) called diatoms. Some members of this group in the genus *Pseudo-nitzschia*, can produce a potent neurotoxin called domoic acid that causes harmful algal blooms when it bioaccumulates in small animals is transferred up the food chain or in shellfish eaten by humans. To learn more about the dynamics of this harmful species we are also comparing it to dynamics of non-harmful bloom forming species and environmental factors in Narragansett Bay such as nutrient concentrations and temperature. This SURF project will involve active field sampling and collection of water samples and accompanying metadata from several sites in Narragansett Bay. In the laboratory, water samples will be filtered for DNA analysis in order to examine the species composition of diatoms including *Pseudo-nitzschia*, and isolating *Pseudo-nitzschia* and establishing laboratory cultures for lab experiments. The cultures of isolates growing in the lab will be identified through molecular techniques such as Sanger sequencing. The student will examine the sequencing results and phylogenic relationships between the diatoms and cultured representatives.

Responsibilities will include: Water sample collection and accompanying metadata in the field, water sample processing in the laboratory, DNA extraction, sequence analysis to identify phytoplankton and bacteria cultures, sterile media preparation, dissecting scope work to isolate single cells, phytoplankton cultivation and growth monitoring, experimental design and testing (hypothesis, control/treatment, etc.), research notebook maintenance.

This project involves **both field and lab work**

Required/preferred skills for student applicant:
- Required qualifications include familiarity with basic data analysis skills (e.g. electronic data recording, graphing data)
- Preferred qualifications include basic microbiology and aseptic laboratory technique experience, some command line computational skills, familiarity with R.
- No prior field experience required, but student should be aware some water sample collections may occur while on a small boat offshore and involve moving 10 L carboys of water.

Student transportation needed for project?
Not a requirement, but might be helpful