# Modeling the metabolism of important planktonic species in Narragansett Bay

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**Project Location:**

University of Rhode Island

**Project Description:**

Microbial plankton communities in the Narragansett Bay (NB) play important roles in primary production, nutrient cycling, and interaction with eukaryotic hosts of the higher trophic levels. A large-scale modeling of the metabolic activity and function of these planktonic communities requires the identification of key functional species and the establishment of high-resolution models for these species. In this project, students will obtain trainings in metabolic pathway annotation, genome-scale modeling, and command-line bioinformatics tools. The students will first identify key functional species from the NB community based on 16S rRNA gene sequencing. Then, molecular pathway models will be constructed for individual species using our in-house software, PSAMM. The effects of changes in temperature and nutrient availability on the metabolism will then be investigated using thermodynamics-based flux analysis approaches to derive functional mechanisms of the organism under changing environmental conditions. The development and analysis of these models will be an important step forward in investigating ecological functions in the bay and how these functions may be affected by changes in temperature and nutrient availability.

*This project involves **primarily lab or computer work***

**Required/preferred skills for student applicant:**

Course preparations in microbiology, biochemistry, or related fields. Familiarity with using command line applications on the computer is preferred but not required.

**Student transportation needed for project?**

Yes

The student would require transportation to the main URI campus. There are RIPTA busses available that run throughout the day between the two campuses.