

**Faculty:** Lenore Cowen, Professor, Department of Computer Science, School of Engineering

**Project Locations:** Medford, MA and St. George, Bermuda

**Dates:** June – August 2020

**Project Title:** Bioinformatics of *Porites astreoides*, a Deep Sea Coral Not Affected by Climate Change

**Project Details:** This project is in collaboration with the Hollie Putnam lab, at the University of Rhode Island, on a new NSF funded Ideas Lab project. Dr. Cowen's portion of the project involves taking a data science approach to understanding diversity of coral reefs, and what makes different species more or less resilient to climate change. The student would have the opportunity to help the team from the Putnam lab collect measurements and samples onsite at the Bermuda Institute of Ocean Sciences (BIOS), a US funded non-profit in Bermuda during June, and then come analyze transcriptomic and genomic data with Dr. Cowen at Tufts in July and August from the deep sea coral *Porites astreoides*, which is native to the area, and less affected by climate change than the corals that live in shallower waters. Coral reef bleaching is an urgent, international emergency, and we are hoping that interdisciplinary approaches, including understanding different coral holobiont genomes, will help suggest new mitigating strategies and approaches.

**Tasks and Responsibilities of Research Assistant:** In Bermuda, the student would support the divers on the boats, which includes physically hauling and sorting materials. They would also assist in the lab in coral husbandry, maintaining experimental aquaria conditions, measuring metabolic rates of adult corals and their larvae, monitoring coral reproduction, collecting and sampling brooded coral larvae, and settling the larvae onto given substrates to form new recruits (juvenile corals). At Tufts, student would write programs and do data analysis with Dr. Cowen.

**Qualifications:** Diving certification is not needed, but swimming ability would be helpful. Comfort and facility in some programming language, either R or Python is preferred. Preference will be given to Computer Science majors.

**Description of Field Site:** Since 1932, BIOS has resided in Ferry Reach, St. George's on the east end of Bermuda. Located in the middle of the North Atlantic Ocean, Bermuda is uniquely situated to serve as a base for research on a variety of inland, coastal, and deep water issues of both local/national and global interest. From here, BIOS scientists can easily venture into the surrounding Sargasso Sea, one of the world's most diverse open-ocean ecosystems. Bermuda is also home to some of the world's most northern coral reefs, allowing researchers from around the globe an opportunity to study corals outside tropical waters.

**Housing in Bermuda:**

The student will most likely be living in a dorm-style accommodation with 3 meals provided each day by the chefs at BIOS (Bermuda Institute of Ocean Sciences <http://www.bios.edu>). Chefs can accommodate dietary restrictions and food allergies.