

2024 Summer Internship Program

Who We Are and What We Do

The Shaw Institute is a nonprofit 501(c)3 scientific research organization with a mission to discover and expose environmental health threats through innovative science and engage in strategic partnerships to improve human and ecological health. Current areas of focus include plastic and microplastic pollution, both within the environment and humans, persistent chemical pollutants, including flame retardants and PFAS compounds, marine mammals as sentinels, and impacts of climate change. Shaw Institute is based in beautiful Blue Hill, Maine, a unique coastal ecosystem featuring habitat for bald eagles, harbor seals, porpoises, crustaceans, and many other marine and terrestrial wildlife. The landscape is dotted with small fishing towns, boatyards, rolling hills and blueberry fields.

Summer interns will contribute to long-term field and lab research projects described below as well as an independent focus area of choice. Additionally, interns will be expected to assist with educational and outreach events aimed at children and adults.

Dates: June 10- August 16, 2024

Bacteria Fieldwork

Every summer, Shaw Institute staff collect water samples at some of the most frequented beaches in Blue Hill and nearby Surry. We're looking to identify spikes in a fecal bacteria called *Enterococcus*, which enters the ocean from land-based sources, through rivers and streams. These bacteria associate with other microbes that can cause a range of health complications, so we survey several beaches weekly to ensure they are safe for swimmers as well as local seafood consumption.

What you can expect: This work requires time out in the field. Each week, you will plan a sampling schedule based on tidal patterns and other obligations, then hop in our work truck and head out to the sampling locations where you will collect water samples, as well as a range of other environmental data. Water samples will be brought back to the institute for subsequent lab work that isolates and amplifies the bacteria.

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Phytoplankton Analysis

Another concern in our waters is the occasional presence of certain phytoplankton species that are associated with Harmful Algal Blooms (HABs) which can lead to severe disease if consumed. Therefore, we collect samples from a few locations each week to understand the species diversity of phytoplankton in our area. If we find one of two species of concern, this information is reported to the state to ensure proper safety for all.

What you can expect: This position involves both some field and heavy microscopy work for what can be hours at a time. There are many species of microorganisms in these samples, so it takes some time to learn how to identify the target species. You never know what you may find! Sometimes there are larval sea stars and other interesting species. If you enjoy identifying organisms under a microscope, this part of our research will be of interest.

Microplastics Analysis

To expand our long-running studies of microplastic pollution, the Shaw Institute purchased a Fourier-transform infrared spectrometer (FTIR) as well as a pyrolysis GC/MS. These instruments allow us to both identify plastic particles as well as extract them from various substrates, including human tissue. The institute has also recently partnered with various groups, such as NYU, to study the connections between these microplastics and environmental or human health, in collaboration with Colby College.

What you can expect: Students interested in this work can expect time to be divided up between using instruments for particle/polymer identification and working in our wet lab to extract microplastics from tissue or environmental samples. Samples may include local species such as shellfish, and surrounding substrates (water, soil, etc.), and possibly performing extractions from human tissues.

Climate Change Statistical Analysis

The monitoring of fecal bacteria and harmful algal bloom phytoplankton described above has been ongoing for many years. Other important data relating to surrounding conditions have also been collected including temperature, pH, salinity, precipitation and more. We are looking for a student with a particular interest in data analysis to assist with combing through years of data in order to examine relationships between these different components to potentially link the effects of climate change to our bacteria/phytoplankton counts.

What you can expect: Students working on this will be spending time going through data sets to gather all the necessary information to make correlations between these different factors. Some comfort with statistical analysis and experience with Excel, STATA or R is encouraged. Once progress has been made, students can then contribute to a potential manuscript chronicling the relationships found within the data sets.

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Community outreach - touch tank

The Shaw Institute has raised enough funds to purchase a touch tank. The purpose of the tank is to educate the public about local and invasive species of the Blue Hill Bay, but more importantly help them understand the threats to our environment and what they can do to help mitigate these threats.

What you can expect: Interns will be trained on local flora and fauna of the intertidal zone species and best handling practices. Interns will interact with guests and visitors of all ages twice a week; the exact time is still to be determined. Participating in this project will allow interns to develop their communication, educational and public speaking skills.

Typical Work Schedule

The Shaw Institute is expected to be open to the public certain days and times of the week. Schedules will vary greatly, but expect to work 25-40 hours per week with some weekend and evening events. Most weeks will consist of field sampling all around the Blue Hill Peninsula and a significant amount of lab work for those looking for bacteria, microorganisms, and microplastics.

Housing: Shaw provides free housing within walking distance of the Institute for all internship positions. While a car is not required, it is helpful for exploring the surrounding area on your own time. Public transportation is not available.

The wonderful chaos of science!

While we can predict much of our typical work week, many things pop up that we end up having to do here at the Shaw Institute.

Some of these include:

- Responding to seal/whale strandings
- Responding to rare animal sightings
- Conducting PFAS chemical testing around the area
- Participating in necropsies (dissections) of marine species *if available*
- Participating in public outreach activities or events
- Providing lab tours to kids and adults
- Helping set up our summer events

To apply, please send a cover letter outlining your interests and qualifications and a current resumé to [**drodriguez@shawinstitute.org**](mailto:drodriguez@shawinstitute.org).

Application window closes on February 16.