Bowdoin Scientific Station on Kent Island

Summer Research Information

_Spend Your Summer Doing Research, Art or Education on Kent Island in the Bay of Fundy_

Patricia Jones, Director
Ian Kyle, Assistant Director

Timeline

**Now:** touch base with the Kent Island Director, Professor Patricia Jones

**Before Feb 15:** Email a brief ‘intent to submit’ to the Director at pjones3@bowdoin.edu

**Feb 28 by noon:** Email your full application as a PDF to the Director

**Mar 15:** Decisions will be conveyed to students via email

How to Choose a Project

*Approach 1:* Choose a fellowship opportunity from the list below.

*Approach 2:* Rising Seniors Only: Work with the Director to develop your own idea that’s not on this list and will serve as part of your honors thesis your senior year.

Contact Info

**Director:** Professor Patricia Jones
Email: pjones3@bowdoin.edu

**Assistant Director:** Ian Kyle
Email: ikyle@bowdoin.edu

Fellowship Opportunities for Summer 2019

**Pollination of Wild Low-Bush Blueberry**

Kent Island is covered in low-bush blueberry which blooms from May into July. Kent Island is unusual in contrast to Maine’s wild and agricultural low-bush blueberry because there are no introduced honeybees or other managed pollinators on Kent Island. In addition, herbicides and insecticides have not been used on Kent Island for at least 60 years. This provides the opportunity to study the natural community of pollinators on blueberry, and the effectiveness of different pollinators for fruit production. The fellow will survey the pollinator community (requires behavioral observation in the field and learning to identify insects using keys and a microscope), and will measure pollen deposition to blueberry flowers through pollen staining. This research has applications for sustainable agriculture and bee conservation.

**Learning and Memory in Different Pollinator Groups**

Learning of colors and scents is important for many pollinators in the wild because it enables them to forage efficiently by learning which flowers provide the most or highest quality nectar. While it is known that honeybees and bumblebees are excellent learners, little is known about the learning abilities of other pollinators such as solitary bees, wasps, and hover flies (bee mimicking flies). This fellow will use a newly
developed method called “Free-Moving Proboscis Extension Response” to conduct non-lethal behavioral experiments on learning and memory abilities of wild pollinators. This fellowship will make an important contribution to research on the evolution of learning and memory in groups of pollinating insects.

Long-Term Population Monitoring Of The Leach’s Storm-Petrel: The Impacts Of Climate Change And Other Environmental Factors (2 fellows)

Leach’s storm-petrels are long-lived seabirds (the longest recorded on Kent Island lived to be 37 years old!) that forage far out to sea for fish and krill. They nest in burrows that they dig on offshore islands like Kent Island that do not have mammalian predators. The male and female share parental duties and raise just one chick per year. Storm-petrels are very vulnerable to climate change and environmental disturbance. The storm-petrel population on Kent Island has been monitored continuously since the 1950’s. This has created an extremely unique dataset on long-term trends in a wild animal population. The two fellows working on this project will monitor three Kent Island storm petrel population to collect the data for 2019. Population monitoring involves mapping burrow locations, searching burrows for actively nesting birds, and banding, measuring, and collecting blood samples (for sexing and determining relatedness) from any birds captured birds. Nests will be monitored over the entirety of the summer to determine hatch success of chicks and to weigh and measure chicks. These fellowships have important implications for studying the impacts of climate change on a animal that is an indicator for ecosystem health and productivity of fisheries.

Forest Regeneration and Health

Much of Kent Island is covered in spruce/fir forest. In the 1960’s snowshoe hares appeared on the island and until they were eradicated in 2008 they decimated seedling trees and prevented forest regeneration. In the time since 2008 the forests of Kent Island have begun to regenerate. This provides a unique opportunity to study forest regeneration in a habitat with minimal anthropogenic influences. This fellow will conduct an extensive tree survey of the island, measuring and tagging trees of all species and successional stages. In addition, the fellow will become proficient at GIS mapping of different forest and habitat types for the entire island. This project has important implications for understanding forest dynamics, ecosystem health, and how forests respond to release from herbivory.

Effects of Rockweed Harvesting on Intertidal Invertebrates and Algae

Commercial harvesting of intertidal rockweed, Ascophyllum nodosum, also called knotted wrack, is becoming an increasingly important industry and employer in the Gulf of Maine and the Bay of Fundy. At the same time, little is known about the consequences of rockweed harvesting for intertidal invertebrates and other algae, but rockweed is believed to provide important habitat for these species. No studies have examined the long-term effects of rockweed harvesting. This fellowship involves monitoring the intertidal invertebrates and algae in areas where rockweed has been harvested different numbers of years ago to determine the long-term consequences of rockweed harvesting. The fellow will use quadrats to survey intertidal invertebrates and algae which will require extensive identification of different algae and invertebrate species. This fellowship has important consequences for rockweed harvesting policy.

Population Dynamics in Savannah Sparrows

Savannah sparrows are a migratory songbird that have been studied on Kent Island since the 1980’s. They breed on Kent Island in the summer and migrate to the Southeastern US in the winter. The Kent Island population of savannah sparrows is high unusual in comparison to mainland populations in how faithful birds are in returning to Kent Island every summer. This fidelity allows researchers to study long-term population
dynamics, migration behavior, and song learning in this species. This fellow will work with researchers (both faculty and graduate students) from the University of Guelph and the University of Windsor to research the behavior of savannah sparrows. This research involves very early mornings (5 am start every day), and the fellow must be prepared to commit to this schedule. The fellow’s activities include searching for nests, recording birdsong, mistnetting for birds, and banding and bleeding captured adults and nestlings. This is a unique fellowship in the extent that it enables the fellow to work alongside faculty and graduate students from large research universities. This research has important implications for understanding the effects of a changing climate on migratory behavior, population dynamics, and for understanding the evolution of song learning.

**Bowdoin Scientific Station Artist in Residence**

Artists are a critical link between science and the non-science world, and their different perspective can directly impact and inform scientific research. The BSS Artist in Residence will focus on the intersection between art and science in the medium they choose (including but not limited to: drawing, painting, print-making, writing, poetry, music, film-making etc). The Artist in Residence will work alongside scientists for each ecological research project on Kent Island to explore how art can bring new perspectives and insights to understanding the natural world, and can be an important tool for communicating science and/or current environmental topics. The artist will spend time in the field with each of the research projects at the station, and will produce pieces of art inspired by each of the ongoing research projects. The Artist in Residence will be expected not only to bring a unique perspective but also to be a central member of the Kent Island community.

**Education & Research: Curriculum Development for Communities and Classrooms**

Classrooms from elementary school through high school increasingly are looking for real life datasets that students can use to learn math and science standards for the state of Maine including ecological and evolutionary concepts, and how to visualize, analyze, interpret and communicate data. The fellow will create curricula and resources for the grade-level of their choosing (K-12) based on the ecological research projects on the station. The fellow will work closely with scientific researchers on the station to create materials that can be used by teachers and other educators to communicate core concepts. This project is ideal for a student interested in a career in science education with the goal of creating curriculum that will be made accessible to science teachers and community educators in Maine and New Brunswick.