



2023 Doyle Fellowship Proposed Projects

Green Crab Business Development

Overview: Work with NH Sea Grant staff and local partners to support development of a fishery and markets for the invasive green crab.

Background: The NH Green Crab Project has been researching a number of topics related to the development of a fishery for the invasive green crab, including timing of when green crabs molt in order to explore the feasibility of a soft-shell crab market (similar to blue crabs), development of culturally relevant seafood products, market analysis, and more.

Fellow role: The student selected for this role will have the opportunity to work with NH Sea Grant staff and interested members of the NH Seacoast community to explore development of culturally relevant seafood products, conduct market analysis, and/or contribute to research and monitoring of crab life history characteristics related to development of a fishery.

Position requirements: Previous experience with fieldwork and a car are encouraged.

Primary position location: This position is a combination of fieldwork and work on campus in Durham.

More information: <https://seagrants.unh.edu/our-work/invasive-species/nh-green-crab-project>

Seabird and Fisheries Research

Overview: Work with UNH researchers to better understand Common tern foraging and prey selection.

Background: Common Terns use islands along the Northeastern U.S. coast to nest and raise chicks during the summer. During this critical period, terns primarily forage for small and juvenile fishes, some of which will recruit to valuable fisheries in future years. As a sampler of these early years in fish life histories, the Common Tern may serve as an important indicator for fishery management. To investigate the use of Common Terns for fish population monitoring, we combine observational data of terns provisioning fish to their chicks on the Isles of Shoals (1999-present), satellite telemetry data useful for identifying important foraging locations, net-based and eDNA data describing the fish community at GPS-identified foraging locations and historical fisheries datasets from the region.

Fellow role: The student selected for this role will have the opportunity to work with NH Sea Grant funded graduate student Aliya Caldwell to support data collection to better understand prey selection by Common Terns. This includes boat-based fish sampling (primarily purse seining) and collection of water samples for eDNA analysis, as well as optional visits to the Isles of Shoals tern colony to help with GPS tagging of seabirds and collection of fecal samples for DNA analysis. Additional opportunities to learn about the role of this data in ecosystem-based management and/or to support community outreach depending on student interests.



Position requirements: Ability to work comfortably on small boats for 4-6hrs at a time. A car is required for traveling to and from field sites.

Primary position location: This position is based on the UNH campus in Durham with significant fieldwork in the NH Seacoast (field work operations out of UNH's Coastal Marine Lab and Jackson Lab)

More information: <https://fishmovementecolab.wixsite.com/fureyfmelab>

IMTA/AquaFort Aquaculture Business Plan

Overview: Work with NH Sea Grant and UNH Marine School researchers and extension professionals to develop a business plan for the long-term viability of the Integrated Multi-tropic Aquaculture (IMTA) platform.

Background: New Hampshire Sea Grant's AquaFort serves as an offshore aquaculture training platform and research site. The AquaFort research program recruited local fishermen and farmers from NH, ME, and MA to participate in workshops and daily operations of an offshore aquaculture farm. During this period (2018-2020) the AquaFort was constructed and deployed, and two seasonal grow-out trials were conducted.

Fellow role: The student selected for this role will have the opportunity to work with NH Sea Grant staff to develop a business plan for the IMTA platform

Position requirements: Interest in aquaculture and coursework in business development and/or economics

Primary position location: This position is based on the UNH campus in Durham with time spent at the UNH facilities in New Castle, NH as well.

More information: <https://seagrant.unh.edu/our-work/aquaculture/aquafort-imta>

Marine Education and Appledore Cruise Fellow

Overview: Work with NH Sea Grant staff and volunteers to conduct marine education with community members of all ages in the NH Seacoast and throughout the state.

Background: In the summer of 2022 the UNH Marine Docent Program was integral in providing library-based, hands-on activities and marine education as part of the Check Out UNH Program (<https://seagrant.unh.edu/education/k-12-programs/summer-library-program>). We will continue these summer library programs during the summer of 2023. The UNH Marine Docents also lead public cruises on Appledore Island to explore the natural and cultural history of the island. Other cruise opportunities may also be available during the summer.

Fellow role: The student selected for this role will have the opportunity to work with NH Sea Grant staff and the Marine Docent Volunteers to prepare, supply, and execute library programs throughout the



state. Fellow will also participate in the organization and execution of Appledore Island cruises from the UNH Pier.

Position requirements: Must have general knowledge of marine biology, interest in marine education, and enjoy interacting with the public. This position primarily focuses on outreach and engagement with community members of all ages. Access to a vehicle is highly encouraged but can arrange carpooling with other staff and volunteers.

Primary position location: NH Sea Grant Office, Lee, NH with travel to program libraries throughout NH and the UNH Pier in New Castle, NH

More information: <https://seagrants.unh.edu/education/k-12-programs/summer-library-program> and <https://seagrants.unh.edu/events/public-programs/cruises>

Coastal Neighbors Technical Assistance Program

Overview: Work with NH Sea Grant staff and community partners to support a resident-engaged project building coastal resilience at a neighborhood scale in the NH Seacoast.

Background: The new Coastal Neighbors Technical Assistance Program (NTAP) is a new program that seeks to provide coastal flood risk information and technical assistance to a variety of New Hampshire neighborhoods to help them better understand their flood risks and restoration opportunities, work with them to identify neighborhood goals and strategies to meet those goals, and identify how those options can be implemented to enhance the resilience of their properties, neighborhoods, and community.

Fellow role: The student selected for this role will have the opportunity to work with NH Sea Grant staff and partners to support a range of project elements including resident conversations and potential education opportunities, technical assistance related to flooding and erosion, program evaluation, and more.

Position requirements: Access to a vehicle is highly encouraged, but can arrange carpooling with other staff.

Primary position location: NH Sea Grant Office, Lee, NH or UNH campus in Durham with travel to partner communities.

Ocean Acidification Impacts on Shellfish in New Hampshire

Overview: Work with NH Sea Grant staff and partners to support ocean acidification research and management applications.

Background: Ongoing research is exploring ocean acidification impacts on shellfish health and the potential for increased toxic metal accumulation in mussels, with public and ecosystem health implications. In this project, the team interacts with NOAA, UNH and local agency researchers, as well



as NOAA administrators, NH Shellfish Program, NH Fish and Game and oyster/mussel farmers who would benefit from the results of the research.

Fellow role: The student selected for this role will have the opportunity to work with NH Sea Grant staff and other researchers to support data collection and analysis related to ocean acidification impacts on shellfish in NH.

Position requirements: Access to a vehicle is highly encouraged, but can arrange carpooling with other students.

Primary position location: UNH Jackson Estuarine Laboratory, Adams Point, Durham, NH

More information: <https://coastalscience.noaa.gov/project/assessing-ocean-acidification-as-a-driver-for-enhanced-metals-uptake-by-blue-mussels/>

Aquaculture Research and Development

Overview: Work with NH Sea Grant staff and other researchers to support aquaculture research.

Background: Aquaculture has the potential to sustainably produce seafood while helping fishing and coastal communities build resilience to environmental and economic change. NH Sea Grant has been developing, educating and training individuals in responsible aquaculture methods. Current projects include an integrated multi-trophic aquaculture (IMTA) demonstration project as well as [research on kelp, mussels, oysters, shrimp, steelhead trout, and striped bass](#).

Fellow role: The student selected for this role will have the opportunity to work with NH Sea Grant staff and other researchers to support a range of research, monitoring, and outreach projects.

Position requirements: Access to a vehicle is encouraged, but can arrange carpooling with others.

Primary position location: This position is based on the UNH campus in Durham.

More information: <https://seagrant.unh.edu/our-work/aquaculture> and <https://www.rargom.org/> (see bottom of page for Bryson Torgovitsky presentation)

Estuarine Education & Outreach Landscape Analysis

Overview: Work with NH Sea Grant staff and partners to develop an inventory and summary of education and outreach programming in the Great Bay watershed to help inform program recommendations and development of new partnerships.

Background: Many organizations in the Great Bay watershed conduct outreach and education programming. With additional planned resources, there is an opportunity to coordinate across efforts more deliberately, starting first with awareness of the range of efforts.

Fellow role: The student selected for this role will have the opportunity to work with NH Sea Grant staff and partners to synthesize available information on the range of our education and outreach



programming in the Great Bay watershed to support the development of new partnerships and outreach opportunities.

Position requirements: Familiarity with estuaries and interest in community engagement and outreach

Primary position location: NH Sea Grant Office, Lee, NH or UNH campus in Durham.

Great Bay Estuary Bottom Habitat (Tier 2) Habitat Monitoring Project

Overview: Work with Piscataqua Region Estuaries Partnership (PREP) staff and partners to support habitat monitoring for use in watershed management.

Background: The Piscataqua Region Estuaries Partnership (PREP) is a National Estuary Program tasked with protecting, monitoring, and improving the water quality and overall health of the Great Bay and Hampton-Seabrook Estuaries in NH. PREP achieves this by working closely with local partner organizations, agencies, and municipalities to carry out the actions in our Comprehensive Conservation & Management Plan. On an annual basis, PREP is working with the University of New Hampshire's Jackson Estuarine Laboratory to monitor 25 sites throughout the Great Bay Estuary, characterizing seagrass, seaweed and sediment, as well as some water quality parameters.

Fellow role: Work with Lara Martin of the Jackson Lab to manage the processing of seagrass, seaweed and sediment samples.

Position requirements: Must have a detail-oriented personality that enjoys lab work. The primary function of this position is to ensure the collection of accurate data so the candidate needs to be comfortable with indoor work requiring significant focus. Access to a vehicle is highly encouraged, but can arrange carpooling with other students.

Primary position location: UNH Jackson Estuarine Laboratory, Adams Point, Durham, NH

More information: <https://prepestuaries.org/>

Great Bay Estuary Oyster & Eelgrass Restoration Project

Overview: Work with Piscataqua Region Estuaries Partnership (PREP) staff and partners to support a multi-habitat restoration project in Great Bay

Background: The Piscataqua Region Estuaries Partnership (PREP) is a National Estuary Program tasked with protecting, monitoring, and improving the water quality and overall health of the Great Bay and Hampton-Seabrook Estuaries in NH. PREP achieves this by working closely with local partner organizations, agencies, and municipalities to carry out the actions in our Comprehensive Conservation & Management Plan. In 2023 and 2024, PREP is working with the University of New Hampshire's Jackson Estuarine Laboratory on a habitat restoration project that will include 1 acre of new oyster habitat and ½ acre of new eelgrass habitat in the Great Bay Estuary.



Fellow role: Support the implementation and monitoring of a multi-habitat oyster and eelgrass restoration project in the Great Bay Estuary. Activities would include in-water harvesting and transplanting of adult eelgrass shoots and installing adult oysters per a planting plan, as well as collecting and working with monitoring data, supporting project volunteers in the field, and more.

Position requirements: Must be comfortable swimming and working in the water. Required gear includes a wetsuit with diving boots and a snorkel (a diving hood is recommended). A boating license to operate small craft is preferred. A car is required for traveling to and from the laboratory.

Primary position location: UNH Jackson Estuarine Laboratory, Adams Point, Durham, NH

More information: <https://preestuaries.org/>

Great Bay Aquaculture Oysters & Green Crab Studies

Overview: Work with UNH researchers to better understand predator-prey relationships between invasive green crabs and aquaculture oysters.

Background: (general project/program overview): This project is part of a larger research program and includes deploying oyster condos at 5 oyster farms with different size green crabs with different size oysters to gain a better understanding of the limitations green crabs have getting into different size oysters. It is a predator-prey study between green crabs and oysters while working closely with our NH Oyster Farmers in Great Bay Estuary.

Fellow role: The student selected for this role will have the opportunity to work with NH Sea Grant funded graduate student Kelsey Meyer to contribute to research on predator-prey relationships between invasive green crabs and aquaculture oysters. This includes significant boat-based fieldwork and other data collection and analysis opportunities.

Position requirements: Car suggested and preferred (if need be can pickup/drop off on campus), Boat/field type clothing needed

Primary position location: This position is based on the UNH campus in Durham with significant fieldwork in the Great Bay estuary.

More information: <http://bonnie-brown-egl.squarespace.com/>

Human Dimensions of Fisheries Management

Overview: Work with NH Sea Grant staff and partners to advance research and analysis related to the human dimensions of fisheries management.

Background: Fisheries management in coastal and marine systems occurs at the state, regional and federal levels and is designed to be based on the best available science and significant public engagement. Historically, it has been challenging to incorporate human dimensions research findings into marine fisheries management processes, but significant opportunities exist to evolve practices.



Fellow role: The student selected for this role will have the opportunity to work with NH Sea Grant staff to design a policy research project related to incorporation of human dimensions research into fisheries management processes in New England.

Position requirements: Interest in fisheries management topics

Primary position location: This position is based on the UNH campus in Durham.