



NEBI (Water): Connecting N'dakinna (Land), Bilowagizegad (Climate), and Alnobak (People)

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Project Abstract

This project provides Indigenous college students in New Hampshire with research opportunities that combine Indigenous knowledge of watersheds with empirically collected data from forested watersheds. Vital to life in N'dakinna (present-day northeastern United States) is access to clean and safe surface waters. For the Indigenous people of N'dakinna, the Abenaki and Pennacook, nebi (Abenaki for water) provides the interconnected web that organizes life, providing access to fish, clean drinking water, and a network of waterways for transportation, trade, and communication. The relationship to water throughout contemporary New Hampshire continues these relationships. Nebi is necessary for access to food and clean water and to support agriculture. One contemporary challenge for Indigenous communities and water resource managers alike is the uncertain effects of global change. Critical local effects of global change include rising temperatures, shorter winters, extreme flooding, and prolonged drought. Human population pressures also impact water resources through changes in land use and degraded water quality. This project, Project Nebi for short, engages Abenaki college students to develop 1) a virtual storyboard that preserves and shares Indigenous knowledge, language, and history about regional watersheds and 2) a unique research project using long-term surface water chemistry data to understand the effects of climate change on forested watersheds.

Progress in 2022

During this reporting period, our work has focused on the development of a conceptual framework that outlines an Indigenous ecological observatory. One shared interest among project leaders (Adam Wymore and Denise and Paul Pouliot) is the use of long-term ecological observatories to uniquely ask research questions and test hypotheses. For example, project conversations have centered around, and been inspired by, the research conducted at the Hubbard Brook Experimental Forest. These conversations have led us to ask questions about how a research team, comprised of Indigenous leaders and environmental scientists, would develop an Indigenous Ecological Observatory (IEO). We are conceptualizing an IEO to be a research platform that would support long-term investigations of how indigenous land management practices impact the environment. We are now working with geographers (Dr. Teresa Cohn and PhD student Kristen Green at UNH) who specialize in Indigenous perspectives on the environment to develop the concept of an IEO into a formal manuscript with the intention of submitting for peer-review. This manuscript provides the theoretical basis for an IEO and presents a series of questions that can be asked when considering this form of collaborative research. Example questions include: should the land used in the IEO be “decolonized” by removing current vegetation and replanted with native vegetation and how should IEO-based research incorporate contemporary climate change into the experimental design? We will use as a case study the Abenaki allowing us to demonstrate how an IEO can be leveraged for scientific discovery by federally non-recognized tribes.

PI Wymore worked with a team of UNH undergraduate students, graduate students, and post-doctoral scholars to draft a manuscript entitled, “The Environmental Responsibility Framework: a toolbox for recognizing and evaluating ecologically conscious research.” Drawing from existing legal frameworks for social, medical, and animal sciences (e.g., IRB, IACUC), the authors propose a framework for including human ethos (inspired by the Indigenous concept of reciprocity) into environmental research. The



Environmental Responsibility 5-R Framework (ER⁵F) is centered around 5-R's: Recognition, Refinement, Reduction, Replacement, and Restoration. ER⁵F starts with Recognizing that research can have environmental consequences, while each subsequent 'R' serves as an opportunity for evaluating the impact of research through a series of self-reflecting prompts.

Problems or Changes

The project's largest challenge is a continued back log of delayed or incomplete projects due to the COVID pandemic.

Plans for 2023

Plans for 2023 are focused on our major collaborative product, which is a manuscript describing the conceptual design of an IEO that uses the Abenaki and forested landscape of New Hampshire (N'dakinna) as a case study. We anticipate this to be an exciting manuscript that advances new collaborative multidisciplinary long-term research. It will combine Indigenous perspectives on the environment and land management with the data collection methods of environmental science. Also, undergraduate Researcher Isabel Cole will submit an abstract and present this work at an international conference, either SACNAS (Society for the Advancement of Chicano/Hispanic and Native Americans in Science) or AGU (the American Geophysical Union).

Collaboration

This project aligns with work of the USFS, especially the USFS network of experimental forests. Our goal is to demonstrate an approach to experimental forest research (where the USFS has a long history) that incorporates Indigenous perspectives, questions, research methods, and knowledge. We have begun collaborating with geographers who are based at the University of New Hampshire and have deep experience working with Indigenous communities and Indigenous perspectives regarding the environment and its management. This group of geographers (led by Associate Professor Teresa Cohn) is well-experienced in the legality and rights of Indigenous research and the use of more inclusive approaches to cartography. To further promote this collaboration, PI Wymore now sits on the PhD committee of Kristen Green, who is a graduate student in Dr. Cohn's lab with experience in treaty rights in the context of federally managed lands.

THE ENVIRONMENTAL RESPONSIBILITY FRAMEWORK

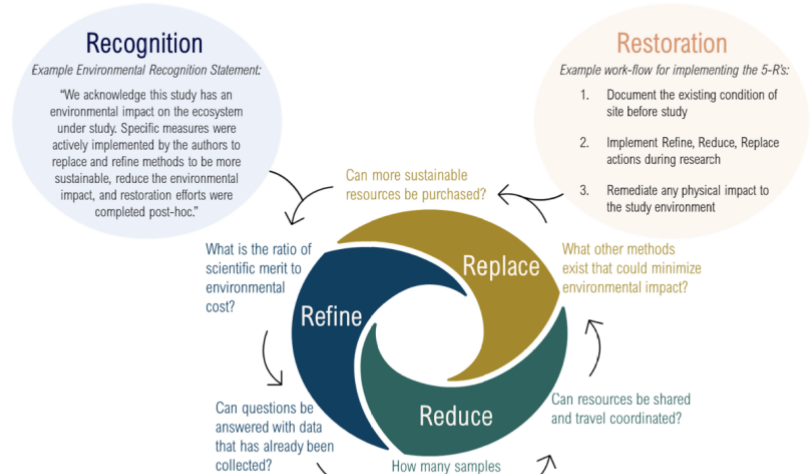
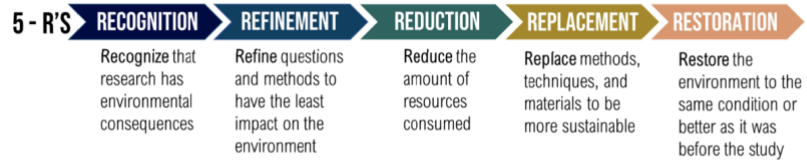


Figure from "The Environmental Responsibility Framework: a toolbox for recognizing and evaluating ecologically conscious research," a paper accepted for publication in the journal Earth's Future.