

2015 NOAA Coastal Management Fellowship Proposal

The Social Indicator Project: Integrating social science into ecosystem management for New Hampshire's estuaries

1. Background and Introduction

New Hampshire shares a 1000 square mile coastal zone containing two major estuaries: Great Bay and Hampton-Seabrook. These estuaries are recognized for their national importance as part of EPA's National Estuary Program and NOAA's Estuarine Research Reserve System. Unfortunately, Great Bay is nearing an ecological tipping point and Hampton-Seabrook could be dramatically altered by sea level rise. The state's estuaries and coasts are showing signs of stress resulting from significant population increases and intensifying weather events coupled with land use policies that are inadequate to manage the impacts of these stressors. The region has also been working to resolve conflict between the coastal communities, the State of New Hampshire Department of Environmental Services (NHDES), and the US Environmental Protection Agency (EPA) over requirements to reduce nitrogen levels in wastewater facility permits. As the management community endeavors to deal with the myriad ecological and social factors affecting the health of New Hampshire's estuaries and coastline, there is widespread recognition that we need to broaden the ways we measure the wellbeing of these valuable systems, enhance the indicators we use to set goals, and improve our approaches for affecting change.

The goal of this project is to establish a process to integrate social indicators into existing measures of the health of New Hampshire's estuaries. This project is fundamental to gathering, understanding, and linking social and behavioral data to regional environmental indicators so that we, as a management community, can be effective in targeting critical social and policy change to protect our coastal ecosystems. This project is a collaborative effort with leadership from coastal New Hampshire's primary regional organizations – New Hampshire Department of Environmental Services Coastal Program (NHCP), the Great Bay National Estuarine Research Reserve (GBNERR) and the Piscataqua Region Estuaries Partnership (PREP), an EPA National Estuary Program housed at the University of New Hampshire (UNH). The NOAA Coastal Management Fellow will be charged with managing the collaborative effort and will contribute unique skills and valuable capacity that will be critical to successfully integrating social indicators into existing management processes.

Overview of the Piscataqua Region estuaries and current monitoring efforts

Since inception in 1995, PREP has been monitoring a set of ecological and management indicators on the health of the estuaries. From the first *State of Our Estuaries (SOOE)* Report in 2000 to the most recent report in 2013 ([PREP, 2013](#)) PREP and its Technical Advisory Committee have provided the greater Piscataqua Region watershed, including the Great Bay and Hampton-Seabrook estuaries, with vital scientific data regarding water quality and overall environmental health. The data contained in the SOOE reports is an amalgam of over 50 different environmental indicators gathered by more than ten different organizations and entities, including GBNERR, the NHCP, UNH, the New Hampshire Department of Fish and Game (NHFG), The Nature Conservancy (TNC), and the Northeast Regional Association of Coastal and Ocean Observing Systems (NERACOOS). This data has been a key resource for decision making and goal-setting at the local, regional and state levels. Historically, the data has been primarily focused in the natural sciences, focused on indicators measurable by quantitative, ecological data collection.

The 2013 *SOOE Report* (PREP, 2013) published by PREP showed that 12 out of 16 environmental indicators are in a negative or cautionary state. Of particular concern are the increase in regional totals of impervious cover, the continued loss of eelgrass and oysters, rising nutrient concentrations and loads, and low levels of dissolved oxygen in tidal rivers. The major driver of these declining conditions is significant population growth (19% increase 1990-2010) and development in the coastal watershed. All indicators of concern are directly impacted by land use and have significant social and policy implications. Solutions to address these degrading conditions such as improved wastewater and stormwater infrastructure, low-impact development, and residential stormwater management practices are multi-faceted and rely on buy-in and behavior change from residents, taxpayers, and policy makers. To improve and extend the strategy employed by outreach partners in communicating to those who are going to implement solutions, an ongoing understanding of their knowledge, awareness, concern and political will is needed.

Opportunities to integrate social data in management

In 2011, the PREP Technical Advisory Committee and GBNERR's Research Advisory Board identified a top priority to establish a set of social indicators to be tracked alongside the environmental indicators in the region. These groups specifically laid out the following two social data needs:

- 1) Watershed residents' behaviors, attitudes, awareness, perceptions and values in regard to water resources and non-point source pollution.
- 2) Regional perceptions and values in regard to area water resources and willingness to build the necessary political will to protect them.

For this project, we will convene an Advisory Committee made up of members of these groups as well as other regional social science experts.

PREP, NHCP, GBNERR, and other partners understand that addressing non-point source pollution in the watershed requires both action to improve environmental conditions and coordinated communications to inform people about personal choices that impact the environment (i.e. reducing residential fertilizer use, which has been identified as a major source of non-point source pollution in the watershed). In order to understand those choices and the reasoning behind them, both qualitative and quantitative social data must be collected and analyzed alongside existing quantitative, ecological data.

As the state coastal program, NHCP officially stipulates that the management of New Hampshire's estuaries is guided by an informal Special Area Management Plan, the *2010 Piscataqua Region Comprehensive Conservation and Management Plan* (CCMP) ([PREP, 2010](#)). This is an updated 10-year plan developed through an extensive collaborative process with the input of over 157 stakeholders representing more than 82 organizations. The CCMP has seven goals, 35 objectives and 82 Action Plans categorized by critical theme areas including water resources, land use and habitat protection, living resources and habitat restoration, and watershed stewardship. These CCMP theme areas align with the high priority management objectives identified in the draft NHCP 309 Assessment and Strategy, a five-year plan that guides technical assistance and programmatic funding priorities, and the GBNERR Management Plan.

Of the 82 CCMP Action Plans, 76 contain some output related to outreach, advocacy and education to a general and/or specific audience and 34 of those actions are deemed "highest priority". As part of the implementation of these Action Plans, the partner organizations have committed to identifying and monitoring social indicators that will help to document progress towards non-point source water quality improvement goals—an approach that has also been endorsed by the U.S. EPA in other regions (e.g. Region 5) as an effective mode of documentation. The indicators will be used to monitor measures of water quality, to evaluate the potential effectiveness of proposed management strategies, and to monitor the impact of management strategies. The indicators will be incorporated into the 2018 *SOOE* report and incorporated into the next CCMP, slated to be published in 2020.

Given the heightened interest in improving estuarine water quality, the fellow and the project team will initially focus on social indicators directly related to water quality. The process for identifying indicators and establishing a plan for how they can inform management options can then be applied to other high priority coastal management issues in New Hampshire, including habitat protection as well as coastal risk and hazard resiliency. While focused on the Coastal Zone, this work will have broad implications for the entire State of New Hampshire. New Hampshire's Water Sustainability Commission recently completed the report *New Hampshire Lives on Water* (NHWSC, 2012), and one of the recommendations to ensure water sustainability was to gather social data. The fellow and project team will engage with the ongoing Water Sustainability work and the project outcomes will inform future statewide efforts.

Models of interest and existing social data in the region

Historically, investment in social science data has been minimal, both in our region but also across the nation in the environmental management community. It was not until the late 1990's that social indicators started to be discussed and assessed in natural resource management (Genskow and Prokopy, 2009).

The partner team has researched social indicator development processes conducted across the country and around the world (Biedenweg, et.al. 2014; Tipa and Nelson 2009; Genskow and Prokopy 2010; Donatuto, Satterfield, and Gregory

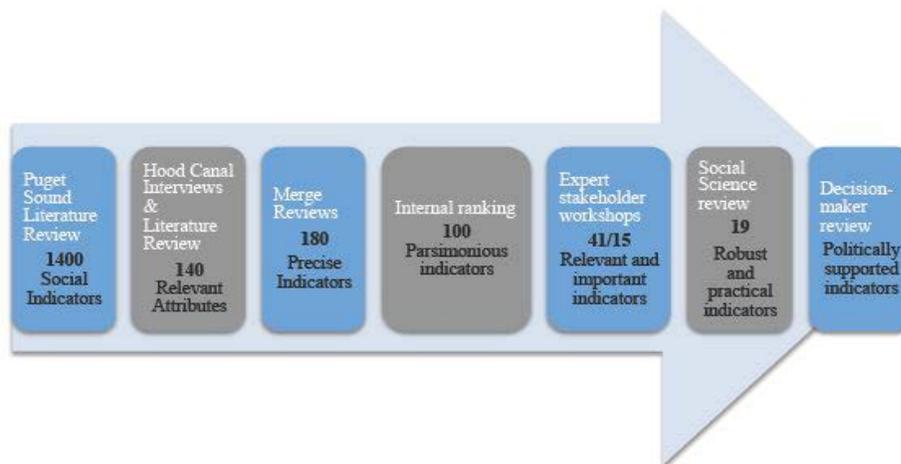
2011). Through this research, we have determined the most suitable model for the New Hampshire Coastal Watershed was developed in the Puget Sound of Washington State to understand human well-being indicators in the Hood Canal Watershed (Biedenweg, et.al. 2014). The Puget Sound model is a seven-step process that engages stakeholders, advisors, social scientists, and policy makers and uses rigorous modes of ranking, prioritizing, and refining. This model includes all four groups that are of interest and priority in New Hampshire: local stakeholders, resource managers, scientists, and policymakers. In addition, this model includes a robust public participation process as well as rigorous scientific engagement methods. The model also allows for an indicator development process that can be designed in a scaled approach allowing for phased implementation.

In 2013-2014, PREP partnered with Plymouth State University (PSU) and the New Hampshire Experimental Program to Stimulate Competitive Research (EPSCoR) supported by the National Science Foundation, to design and deploy a region and state-wide Water and Watershed Survey. The goal of the survey was to understand how New Hampshire residents, and especially those living in the coastal watershed, use and value water resources. The survey also aimed to identify residents’ behaviors and habits in relation to non-point source pollution sources (lawn fertilizer, residential stormwater management) and overall water quality and quantity, as well as willingness to pay and level of political will to implement policies to control pollution. Understanding residents’ behavior guides a more cost-effective targeting of outreach and education efforts and helps evaluate whether efforts to improve these behaviors are making a difference. This project will use the baseline understanding achieved through this survey to build the social indicator development process.

2. Project Description

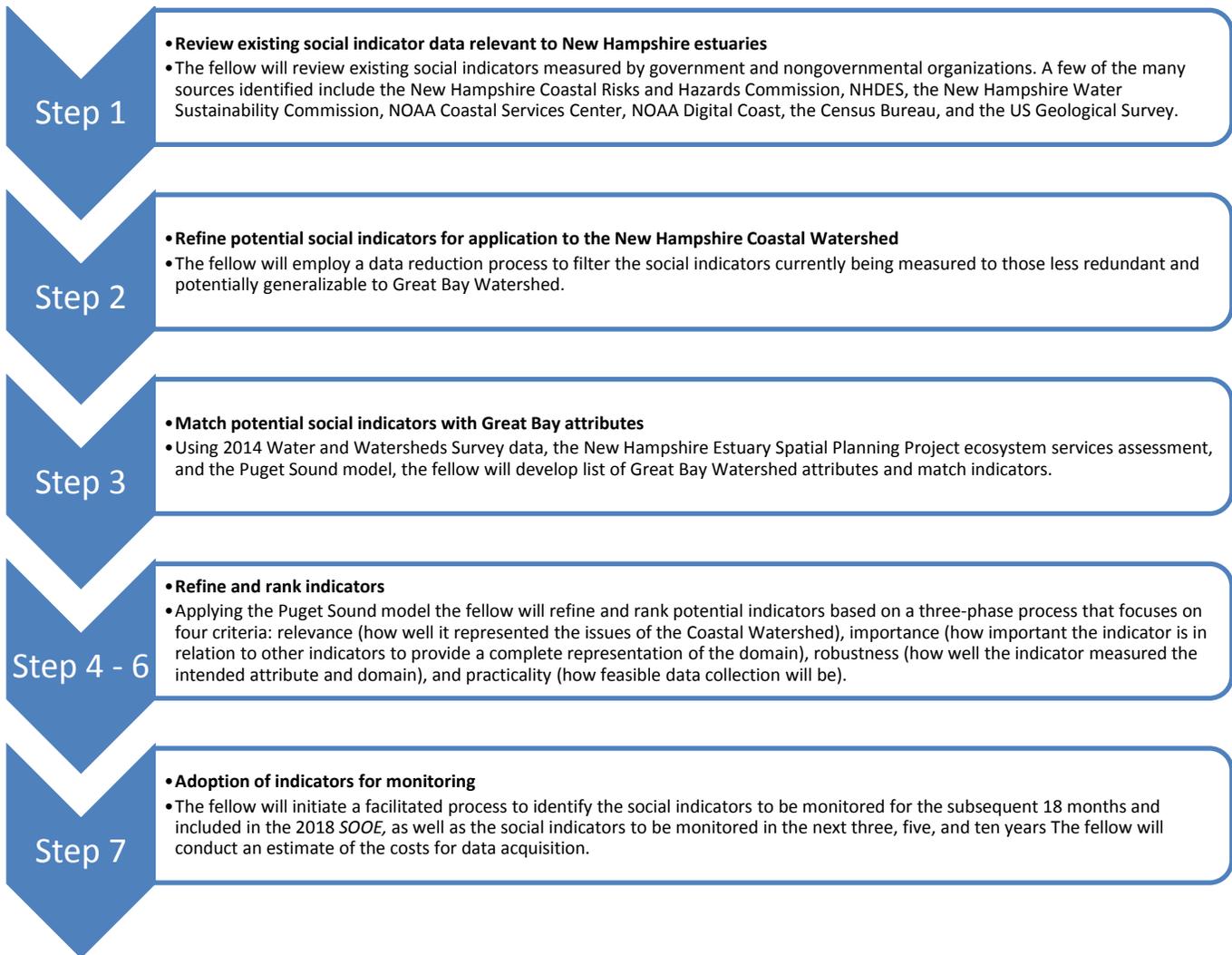
The purpose of this project is to establish a process to integrate social and economic indicators into natural resource management in the Piscataqua Region watershed. The indicators will help inform and evaluate integrated watershed strategies for key social impacts, as well as implementation of the ten-year Comprehensive Conservation and Management Plan (CCMP) for the New Hampshire estuaries in the Piscataqua River and coastal watershed. The fellow will work with the Advisory Committee to compile, create, rate, and refine potential social indicators that relate to the values of Great Bay Watershed residents and to the health of coastal and estuarine ecosystems. Based on the Puget Sound Vital Signs model (Puget Sound Partnership, 2014), this project will incorporate multiple perspectives and priorities across stakeholder sectors, using scientifically rigorous analysis and ranking tools and balancing public participation with scientific foundations. The information gleaned from monitoring these social indicators will help evaluate the effectiveness of proposed research, outreach, and management strategies as laid out in the CCMP, NHCP 309 Strategy, and GBNERR Management Plan.

This project aims to incorporate all four relevant operational sectors in the region: local stakeholders, resource managers, scientists, and policymakers. The project will employ both objective and subjective measures to select social indicators, using public participation processes and social scientist expertise (Gregory et al. 2012; Scott 2012).



(The seven steps of the Puget Sound Model. Source: Biedenweg et al., 2014)

The fellow will apply the pilot model from the Hood Canal in Puget Sound (Biedenweg et. al.2014) based on the following seven-step approach in New Hampshire:



3. Goals and Objectives

The fellow will serve as the primary lead on the project with assistance and support from a Steering Committee and broader Advisory Committee.

Goal 1: In two years, create a common vision for how coastal managers in New Hampshire want to use social indicators.

Objective 1.a. Gather managers, professionals, researchers and municipal officials to build a project Advisory Committee.

Objective 1.b. Hold a kickoff workshop to introduce the project and process and to identify social indicators already being gathered, existing information gaps, and opportunities for incorporation of social indicators into partner organization work plans and processes.

Objective 1.c. Finalize a work plan to apply the Puget Sound Model to New Hampshire's estuaries.

Objective 1.d. Iteratively gather and refine potential attributes and indicators, soliciting feedback from local and scientific experts in participatory, web-based, and one-on-one formats.

Goal 2: Develop a series of indicators, including a set of base indicators focused on water quality, coastal resilience, and ecosystem services.

Objective 2.a. Rank potential social indicators based on robustness, practicality, influence on environmental indicators, and organizational support.

Objective 2.b. Establish a set of **four** social indicators of water quality to be measured, quantified, and reported on in the 2018 *State of Our Estuaries Report*.

Objective 2.c. Develop a plan and cost analysis to scale up the number of indicators monitored over time, to be included in the 2023 *State of Our Estuaries Report* and subsequent reports.

Objective 2.d. Develop a social indicator data management plan in accordance with the NOAA Environmental Data Management Committee Data Sharing Policy.

Goal 3: Foster adoption and integration of social indicators into New Hampshire coastal managers' work plans, management plans and assessment metrics.

Objective 3.a. Work with partner organizations to identify opportunities, obtain commitments, and identify necessary steps to foster the integration of social indicators into work plans and decision making processes.

Objective 3.b. Develop useful tools and methods for indicator adoption into organizational plans, measurement metrics, and assessments.

Objective 3.c. Organize final workshop to introduce the new social indicators and engagement tools to coastal managers and other interested parties.

4. Milestones and Outcomes

The following table presents the project objectives along with proposed milestones/outcomes and target timeframes to indicate completion of the objectives. The project partners fully expect to work with the Fellow to adjust and fine tune this preliminary work plan based on the Fellow's perspectives about the project.

Objectives	Milestones/Outcomes	Timeframe
Objective 1.a. Gather managers, professionals, researchers and municipal officials to build the Advisory Committee.	<ul style="list-style-type: none"> Advisory Committee established 	<ul style="list-style-type: none"> Months 1-2
Objective 1b. Hold a kickoff workshop to introduce the project and process and to identify social indicators already being gathered, existing information gaps, and opportunities for incorporation of social indicators into partner organization work plans and processes.	<ul style="list-style-type: none"> Preliminary list of social indicators already being monitored produced Process established for feedback from Advisory Committee about social indicators being monitored and data gaps Kick-off workshop held 	<ul style="list-style-type: none"> Months 1-3
Objective 1.c. Finalize a work plan to apply the Puget Sound Model to New Hampshire's estuaries	<ul style="list-style-type: none"> Work plan to apply the Puget Sound Model Literature review on social indicator research and models completed 	<ul style="list-style-type: none"> Months 1-4 Months 4-6
Objective 1.d. Iteratively gather and refine potential attributes and indicators, soliciting feedback from local and scientific experts in participatory, web-based, and one-on-one formats.	<ul style="list-style-type: none"> Analysis of existing NH indicators completed Stakeholder interviews conducted Report containing literature review and the state of social indicator information in NH completed 	<ul style="list-style-type: none"> Month 6
Objective 2.a. Rank potential social indicators based on robustness, practicality, influence on environmental indicators, and organizational support.	<ul style="list-style-type: none"> Ranking process established Stakeholder workshops held to review and rank indicators Indicators ranked Social science and decision maker reviews 	<ul style="list-style-type: none"> Months 7-8 Months 8-10 Months 10-14 Months 14-18
Objective 2.b. Establish a set of four social indicators of water quality to be measured, quantified, and reported on in the 2018 SOOE Report.	<ul style="list-style-type: none"> Four indicators agreed upon by priority groups: stakeholders, managers, scientists, and municipal officials 	<ul style="list-style-type: none"> Month 19
Objective 2.c. Develop a plan and cost analysis to scale up the number of indicators monitored over time, to be included in the 2023 SOOE Report and subsequent reports.	<ul style="list-style-type: none"> Plan developed: potential indicators, data needs, cost analysis, timeline for implementation 	<ul style="list-style-type: none"> Months 19-22

Objective 2.d. Develop a social indicator data management plan in accordance with the NOAA Environmental Data Management Committee Data Sharing Policy.	<ul style="list-style-type: none"> ▪ Data management plan drafted ▪ Data incorporated on Data Discovery Center 	<ul style="list-style-type: none"> ▪ Ongoing
Objective 3.a. Work with partner organizations to identify opportunities, obtain commitments, and identify necessary steps to foster the integration of social indicators into work plans and decision making processes.	<ul style="list-style-type: none"> ▪ Organizational needs assessment interviews held with key program managers ▪ Opportunities for social indicator integration agreed upon ▪ Commitments for integration obtained ▪ Steps identified for implementation 	<ul style="list-style-type: none"> ▪ Months 1-4 ▪ Months 4-8 ▪ Months 12-24
Objective 3.b. Develop useful tools and methods for indicator adoption into organizational plans, measurement metrics and assessments.	<ul style="list-style-type: none"> ▪ Tools and outreach methods developed 	<ul style="list-style-type: none"> ▪ Months 19-22
Objective 3.c. Organize final workshop to introduce the new social indicators and engagement tools to coastal managers and other interested parties.	<ul style="list-style-type: none"> ▪ Final workshop held ▪ Final report and associated communications released 	<ul style="list-style-type: none"> ▪ Months 22-24 ▪ Month 24

5. Fellow Mentoring

This project is an excellent opportunity for a Fellow to gain experience in the developing field of using social indicators to affect positive environmental change while working with a multitude of partners. Experience with qualitative and quantitative analysis of social data is required, though technical support will be available from the Steering Committee and Advisory Committee members. The NHCP may also make technical training opportunities available to the Fellow through the state training program and the University of New Hampshire.

A. Mentor: The NHCP will serve as the day-to day supervisor and will include the fellow in all staff functions. The official mentor will be Steve Couture. Mr. Couture is a Senior Planner who has served with the agency for fifteen years and is currently the NHCP Manager. He is the NHCP's coordinator for this project. The Fellow will be provided with a work station and be a member of the NHCP team. The fellow will be provided with substantial skill development opportunities as the lead of The Social Indicator Project. Additionally, the fellow will be offered ample opportunities to engage in additional, related projects within the NHCP. Given the strong interest by the partners and their funding and technical support for the Fellow, this Fellowship will be an excellent opportunity for a natural resource professional entering the field.

B. Steering Committee: The Steering Committee will be the primary liaison between the Fellow and the Advisory Committee. The Steering Committee will include the core project partners: Steve Couture (NHCP), Jill Farrell (PREP), Cory Riley (GBNERR), and Shannon Rogers (PSU). This Steering Committee will help manage the Advisory Committee, coordinate work plan tasks, and design and facilitate meetings.

C. Advisory Committee: The Advisory Committee will assist the Fellow to 1) Understand the suite of existing and potential social indicators and data availability; 2) Develop the ranking and prioritization models to select social indicators; 3) Match indicators with existing baseline data and ecosystem service information; and 4) Prepare for all meetings, stakeholder input sessions and interviews. The Advisory Committee will include the Steering Committee members as well as Erika Washburn (Lake Superior National Estuarine Research Reserve) and Kelly Biedenweg (Puget Sound Institute). An early task for the Fellow will be to help identify and invite additional local stakeholders and experts to participate on the Advisory Committee.

6. Project Partners

This project is especially exciting because of the strong group of partner organizations committed to supporting the Fellow and integrating the project outcomes into their management plans and future work. The NHCP is partnering with PREP, GBNERR, and PSU on this project. Descriptions of the three partner organizations follow and letters of support are attached as appendices.

PREP: PREP is a bi-state National Estuary Program established by the EPA and housed at UNH in the School of Marine Science and Ocean Engineering. PREP's mandate is to monitor, protect and restore the health of the region's estuaries, which is done through annual monitoring, regular research, support of restoration activities and assistance to partners at all levels of local and state government as well as NGO partners in efforts towards healthy estuarine systems. As the data clearinghouse and producer of a regular *State of Our Estuaries* report, PREP integrates data from multiple partners to report on key ecological and management indicators. PREP recognizes an important need to better incorporate social data and to improve the understanding of how social data can influence our collective work towards achieving challenging goals. Community Impact Program Manager Jill Farrell will serve as the primary PREP partner.

GBNERR: Housed within the New Hampshire Department of Fish & Game, GBNERR works closely with the NHCP and PREP to understand the condition of Great Bay, the drivers of ecological change in the Bay, and solutions to address threats to coastal water quality and habitat loss. The Social Indicator Project directly aligns with the mission of the reserve, and will inform research questions, the GBNERR Coastal Training Program, and public outreach programming. The reserve has begun developing a new management plan and, in staff and stakeholder discussions, the gap in knowledge that came up most frequently was not a natural science question, but rather a series of linked social questions. Some of these questions included: "How do people think about and value Great Bay?" "Do people know how their behavior influences the natural environment and how the environment influences their behavior?" "What motivates people to change the way they act in regards to the Bay?" and "How can science play a role in influencing behavior change?" The National Estuarine Research Reserve System, made up of 28 reserve areas around the U.S., has experimented with using social science indicators, and is working on building social science and ecosystem valuation capacity, in addition to linking social science data with long term monitoring and research programs. The relationship between ecological indicators and social indicators is of great interest to GBNERR, and this project could be used as an excellent case study on how to help other reserves think about how to make progress on this topic, particularly in partnership with the five reserves that are co-located with National Estuaries Projects. Reserve Director Cory Riley will serve as the primary GBNERR partner.

PSU: Researchers at PSU and throughout the NH EPSCoR program are currently engaged in research focused on socio-ecological issues in Great Bay. PSU partnered with PREP to complete a coastal and statewide social data collection effort that will be leveraged for the Social Indicator Project. In addition to the NH Water & Watersheds Survey, researchers are trying to understand many of the issues related to nutrient pollution, including examining the role of the ecosystem service of nitrogen removal in the watershed. The Social Indicator Project will provide an excellent opportunity for PSU to apply social science methods to answer important management questions and ultimately improve ecosystem health in coastal New Hampshire and more broadly throughout the state. Assistant Professor and Ecological Economist Shannon Rogers, Ph.D., will serve as the primary PSU partner.

7. Cost Share

The Fellow will be based at the NHCP office in Portsmouth, New Hampshire. The Fellow will be provided with office equipment, supplies, specialized software, and hardware for the project. NHCP will also provide a state vehicle for travel (as available and needed) and training opportunities as budgets allow. Non-federal match funds to support the Fellow have been secured from PREP in the amount of \$15,000 over two years.

8. Strategic Focus Areas

This project addresses all three strategic focus areas of healthy coastal ecosystems, resilient coastal communities, and vibrant and sustainable coastal economies with more specific emphasis on the following elements:

- A. ***Build innovative natural and social science research capacity, products, and applications that reflect user-driven science, and synthesize, visualize, communicate, and transfer research results to strengthen policies and decisions, and effectively manage coastal and ocean resources.*** Through development of social indicators, this project will build new capacity for social science research and application of those findings in enhanced management approaches, policy-making, new areas for research, public education, and awareness for behavior change in a more coordinated and effective manner by state and regional partners. The long-term goal of integrating social indicators into monitoring efforts is to directly inform managers and policy makers as to how to best accomplish regional-scale behavior change by understanding what residents value and how they behave in accordance with those values;

behavior change with regard to personal practices and actions that will support healthy and resilient coastal resources (i.e. limiting personal fertilizer use, voting in support for municipal infrastructure improvement). Specifically, this project will inform development of a social science research agenda for our estuaries and watershed, thereby building capacity to engage researchers, stakeholders, and resource managers on an on-going basis. Using the *SOOE* as a primary tool for communicating indicator status, social data will be linked to water quality and habitat indicators and used by partners at the state, regional and local levels to influence management decisions. Social indicators will directly inform public outreach and interpretive emphasis in education programming, and training programs at GBNERR. As we develop and monitor social indicators, GBNERR will use the analysis to ask new questions and create research partnerships.

- B. ***Foster user-driven science and assessment efforts to enhance understanding of natural, social, and economic impacts of coastal hazards and climate change, and the approaches needed to adapt to and communicate about these threats.*** PREP and partners use a collaborative science approach to help ensure that research and science produced is driven in large part by users of that information to improve management and decision-making. This effort will be undertaken in the same manner, from crafting the management question, to how it links to a data set, how it rolls up into an indicator, and how that indicator helps to move discussion of critical issues and actions forward.
- C. ***Assist coastal decision makers in conserving active and passive recreational uses and in preparing for existing and emerging coastal and ocean uses by providing socioeconomic data, information, visualizations, technical assistance, funding, and tools.*** This project will help our community of managers and municipalities better understand the impact of demographic changes in the coastal communities as well as local preferences for resource protection and use so that they can plan accordingly and allocate resources where they are most needed and will have the greatest effect.

9. References

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Appendices-Letters of Support



October 15, 2014

Mr. Steven Couture
NHDES Coastal Program Manager
Pease District Office
222 International Drive, Suite 175
Portsmouth, NH 03801

Re: 2014 NOAA Coastal Fellow Program Proposal

Dear Mr. Couture,

On behalf of the Piscataqua Region Estuaries Partnership (PREP) Management Committee, please accept this letter in support of the 2014 NOAA Fellow proposal for the NHCP *Social Indicator Project: Integrating social science into ecosystem management for New Hampshire's Piscataqua Region estuaries*.

PREP is one of 28 US EPA designated National Estuary Programs, and is administered out of the School of Marine Science and Ocean Engineering at the University of New Hampshire. PREP's mission is to protect, restore, and monitor the health of the Great Bay and Hampton-Seabrook estuaries and their associated watersheds which encompass 42 municipalities in New Hampshire. Every three years PREP has issued the *State of Our Estuaries* report, which uses a number of water quality, ecological and management indicators to present findings on the health of the estuaries. The reports are used by state and federal agencies, NGO partners, the research community, the media and others to inform decision-making and policy development in the watershed. However, a major component to better understanding the estuaries and managing them more effectively has been missing from our monitoring program – the use of social indicators. To enhance our protection and restoration actions we need a sophisticated set of social indicators that encapsulate residents' behaviors, attitudes, awareness, perceptions and values towards the ecological, water quality and management indicators we currently monitor. *The Social Indicator Project* will effectively complement our current set of indicators and more completely fulfill our mission of monitoring the holistic health and conditions of the Great Bay and Hampton-Seabrook estuaries. The project directly addresses this critical gap in how resource managers and policy-makers link science with decision-making relative to improving water quality and maintaining healthy coastal ecosystems and resilient coastal communities. In partnership with the NHCP and the Great Bay National Estuarine Research Reserve, PREP is invested in overseeing this project by convening a steering and advisory team to assist the Fellow, being a consistent resource to support and guide the work over the 2-year period, and by providing financial support in the amount of \$15,000 of non-federal funds to cover the NOAA match.

Best regards,

A handwritten signature in black ink, appearing to read "R. Rouillard", is written in a cursive style.

Rachel Rouillard
Director



New Hampshire Fish and Game Department

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October 16, 2014

Dear Mr. Couture,

As the manager of the Great Bay National Estuarine Research Reserve (GBNERR), I eagerly look forward to working on the social indicators project proposed for the Coastal Management Fellow. The NH Coastal Program, GBNERR, and the Piscataqua Region Estuaries Partnership have worked together closely to coordinate monitoring, analysis and outreach related to improving Great Bay water quality over the past 15 years.

Data from the GBNERR System Wide Monitoring Program directly feeds NH Department of Environmental Services datasets, and in turn the PREP State of our Estuaries report. GBNERR staff have been a part of the Technical review of the PREP indicators, and have served consistently on the Management Committee that helps guide the analysis and roll out of the information. All three programs (GBNERR, PREP and NHCP) have also worked closely together throughout the years to coordinate outreach to communities and ensure that decision makers have consistent information; partnering on non-point pollution communication products and trainings. The directors of the Coastal Program, GBNERR, and PREP have been working closely over the past two years to think about how to use resources efficiently and create real change in Great Bay. One of the ideas we all expressed interest in was expanding the State of our Estuaries Report with social indicators, and working together to expand the use of coupled research that looks at both bio-physical and social science to address coastal management issues. We all believe that information about how and why people value our resources and make individual and community choices is critical to doing our work and ultimately improving the resource.

This project will directly inform local reserve educational messages and Coastal Training Program workshops. At a staff retreat to discuss our management plan update, understanding behaviors and attitudes was identified as a critical gap in our understanding of the estuary. In addition, current NERRS Science Collaborative Projects have been attempting to incorporate socio-economic data with bio-physical science both here in Great Bay and at other reserves around the system. This is of increasing interest to the NERRS as a system, and I see this project as an opportunity to explore how the reserves, NEPs and Coastal Programs can serve as sentinels not only for biophysical changes, but for attitudinal shifts as well. I am committed to serving on the steering committee for this project, and assisting to advance the project in any way I can. I will also help to ensure that the fellow has an excellent experience in NH.

Sincerely,

Cory Riley, Manager Great Bay NERR

REGION 1

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REGION 2

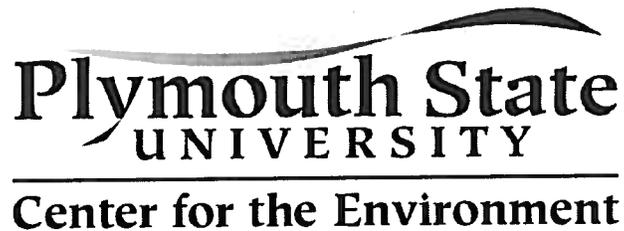
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REGION 3

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The logo for Plymouth State University features a stylized wave above the text "Plymouth State UNIVERSITY". Below this, a horizontal line separates the university name from the text "Center for the Environment".

Plymouth State
UNIVERSITY

Center for the Environment

October 15, 2014

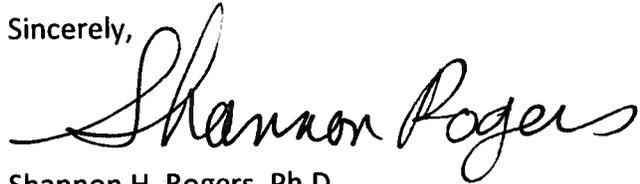
Dear Mr. Couture,

I am writing in my capacity as Ecological Economist at Plymouth State University's Center for the Environment as well as my position as one of the main researchers on the New Hampshire EPSCoR "Ecosystems & Society" Project. NH EPSCoR is supported by the National Science Foundation's Experimental Program to Stimulate Competitive Research (EPSCoR). I fully support the NOAA Coastal Fellowship Proposal from New Hampshire and its focus on developing social indicators of water as it builds upon research and outreach goals of both the Center and the Ecosystems and Society Project.

Since 2013 I have been working closely with the Piscataqua Region Estuaries Partnership to develop and implement a survey tool that assesses how New Hampshire's residents use and value water. Through this partnership (with funding from PSU, PREP, and NH EPSCoR) we were able to conduct a significant data collection effort for a random, representative sample of the State's population with an additional oversample in the Great Bay/Coastal Watershed. In the Spring of 2014 we released a preliminary public report on our findings. Overall, we found that NH residents are using water in many ways, including participating in over 30 different types of recreational/cultural activities on or near the water. Residents also indicated a high level of concern for the quality of our water bodies and a willingness to pay more to ensure we continue to have healthy water resources. New Hampshire's second largest industry is tourism and survey respondents seemed to indicate a strong understanding of the connection between water resources and the economic stability of their community. We are planning further analysis of this data and I am excited about leveraging our work to support the development of social indicators of water. Given Plymouth State's location in the Central part of New Hampshire, I'm also interested in helping to advise the Fellow on how Coastal and Statewide research can be complimentary and inform the development of indicators that address water issues near and far from the shore.

As a social scientist with an interdisciplinary environmental background, I understand the challenge and importance of connecting social data with biophysical data. Developing social indicators of water for the State of New Hampshire will have many positive impacts for the State and the region and will serve as a template for others attempting to evaluate complex socio-ecological systems.

Sincerely,

A handwritten signature in black ink that reads "Shannon Rogers". The signature is written in a cursive, flowing style.

Shannon H. Rogers, Ph.D
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