2016 – 2017 Hershman Project Descriptions

Project: *Vibrio parahaemolyticus* Control Plan Analysis and Evaluation

Host and Mentor
Washington State Department of Health, Office of Environmental Health and Safety

- *Jerrod Davis*, Director, Office of Shellfish and Water Protection

Overview
Vibrio parahaemolyticus (*Vibrio*) is a naturally-occurring bacterium endemic to marine and estuarine waters in Washington State that thrives in the summer months. The bacterium can cause illness in humans, primarily due to the consumption of raw oysters. States with commercial shellfish harvesting where *Vibrio* illnesses regularly occur must have a Control Plan in place to reduce the risk of illness. The Department of Health (DOH) manages this risk with a Control Plan that outlines the number of allowable hours from the time when the oysters are no longer covered by water to the time when the oysters have an internal temperature that reaches 50°F as a *Vibrio* is a highly temperature-dependent bacterium.

DOH spent two years working with a *Vibrio* Advisory Committee comprised of tribes, industry members, local health jurisdictions and other interested parties to move towards a risk-based *Vibrio* management approach. The revised *Vibrio* Control Plan went into effect in May 2015. This plan calculates risk based on the number of illnesses historically associated with each growing area to establish controls for each growing area. The new plan also increases the stringency of temperature control requirements. These changes aim to reduce the post-harvest growth of *Vibrio* and restrict harvest when *Vibrio* levels are more likely to cause illness. Since the revised *Vibrio* Control Plan differs considerably from previous plans and plans elsewhere in the country, a three-year evaluation of the plan is necessary to analyze the effectiveness of the new controls. This review may lead to further revisions and improvements to the *Vibrio parahaemolyticus* Control Plan.

A previous Hershman Fellow developed a preliminary risk assessment model for *Vibrio* in Washington shellfish growing areas. We will have two years of data from the plan's implementation including illness investigations, oyster production numbers from every oyster-producing growing area, and environmental data. Additional data will be collected during the fellowship year. These data will be analyzed and incorporated into the risk assessment model.

Specific Tasks and Major Project Components

1. Analyze oyster production (harvest) data from the industry in growing areas with *Vibrio*-associated illnesses to provide risk per serving data for Washington growing areas.

2. Revise and update the risk assessment model for *Vibrio parahaemolyticus* to better inform the Control Plan and reduce the public health burden of *Vibrio* illnesses.

3. Present at *Vibrio* Advisory Committee meetings and provide recommendations for policy revisions based on data analysis and the updated risk assessment model.

4. Create a final summary report of data and present findings to partners and *Vibrio* Advisory Committee.

5. Initiate a pilot project in a historically higher risk growing area to provide additional *Vibrio* environmental growth pattern data. This will provide information on *Vibrio* presence and growth rates depending on factors controlled for during the study.

Interagency and Private Sector Connections

This study will provide the Hershman Fellow an opportunity to work with the Food and Drug Administration, National Oceanic and Atmospheric Administration, Northwest Indian Fisheries Commission, Point-No-Point Treaty Council, shellfish-harvesting Tribes, the shellfish industry, local health jurisdictions, Pacific Shellfish Institute, and Pacific Coast Shellfish Growers Association on an interdisciplinary project that has immediate regulatory and scientific relevance.

Project: Enhancing Coastal Community Resilience

Host and Mentor
Washington State Department of Ecology, Shorelands and Environmental Assistance

- Manager: *Brian Lynn*, Coastal Program Manager
- Project Mentor: *Bobbak Talebi*, Coastal Program Planner

Overview
Washington was the first state in the Nation to earn federal approval for its Coastal Zone Management Program (Coastal Program), established under the authority of the 1972 Coastal Zone Management Act (CZMA). The Coastal Program, housed within the Department of Ecology within the Shorelands and Environmental Assistance Program, is a collaborative program that strives for coordinated management to preserve and protect resources, balance uses, and support thriving, livable communities. Washington's Coastal Program helps 133 cities and counties implement their shoreline regulations, plan the future of our ocean, preserve important habitats, and enhance community resilience to coastal hazards.

While this year has a specific focus on enhancing coastal community resilience (outlined below), the Coastal Program values growth and development of fellows in all areas of coastal management. The fellow will have the opportunity to explore interests and build on important tools developed during graduate studies through practical application across the different scales of governance. The Coastal Program offers the forum to coordinate and collaborate within communities and among scientific and technical experts. The fellow will be supported by both a mentor and a range of coastal management experts, including ocean policy, shoreline management, coastal geology and engineering, floodplain management, wetlands and critical areas, and legislative engagement professionals.

The Fellow will also be encouraged to attend relevant coordination meetings, trainings or other opportunities to gain exposure and understanding of how government and non-governmental organizations work on regional coastal management. When opportunities arise, the Fellow will be encouraged to present work to a variety of regional audiences. This experience will connect the fellow to state, regional, and national partners and encourage coordinated participation in larger resilience conversations centered on fundamental and unified approaches to protecting resources, people, and systems.

Specific Tasks and Major Project Components
Since the inception of our program, we have partnered with communities to help them become better prepared for and less vulnerable to natural hazard damages that can come with living along the coast. We pursue this goal by taking steps to reduce risk before disasters occur, and working with our state and federal partners to coordinate program improvements and to leverage resources to better support community needs. Our core activities include generating and providing better data and information, offer guidance and planning assistance, and develop training to build skills and best practices. However, as climate and shoreline conditions change, our program has placed particular emphasis on coastal resilience initiatives given the existing impacts and projected future implications of hazards on economic, societal, and ecological dimensions.

One emerging project focuses on improving risk communication and leveraging existing programs in Washington State to build capacity and enhance resilience in coastal communities. Co-led with Washington Sea Grant under a NOAA Regional Coastal Resilience Grant, this project connects partnerships of state and local managers and scientists to enhance coastal community resilience through research to fill critical information gaps, community pilot projects, and revised state guidance and restoration project design. The work will increase understanding of coastal risks and impacts and improve existing planning tools, to ensure that new information and approaches are shared with coastal communities across the state. The 2016-2017 Ecology Coastal Program Fellow will play an active role in this progressive approach to improving the state and national best practices to improve community resilience.

Interagency and Private Sector Connections

- Washington Sea Grant
- Federal Emergency Management Agency
- Island County
- City of Tacoma
- University of Washington Climate Impacts Group
- Western Washington University
- Oregon State University
- Washington Floodplain Management
- Washington Department of Fish and Wildlife
- U.S. Geological Survey
- Washington Emergency Management Division
- Padilla Bay National Estuarine Research Reserve
- NOAA Office for Coastal Management
- Washington State Department of Transportation
- Department of Commerce
- The Nature Conservancy

Project: Implementation of Makah Ocean Policy and Climate Change Adaptation Planning

Host and Mentor
Makah Tribe

- *Chad Bowechop*, Manager, Office of Marine Affairs (OMA)
- *Katie Wrubel*, Natural Resource Policy Analyst, Fisheries Management

The Nature Conservancy, Washington Field Office (Seattle)

- *Jodie Toft*, Acting Director of Marine Conservation
- *Kara Cardinal*, Marine Projects Manager

Overview
The Makah Tribal Council is a trustee of coastal and marine resources that are critically important to our culture, economy, and the well-being of our people. The changes in the environment due to climate change present a threat to those resources and a challenge for the Tribal Council's ability to uphold its shared trust responsibilities with the federal government. The Makah Tribal Council has been drafting an ocean policy to facilitate coordination between natural resource managers as they work to deal with climate change and other ocean management issues. The 2016-2107 Makah Hershman Fellow will support the implementation plan associated with the Makah Ocean Policy and assist with associated planning efforts. This will require a wide breadth of engagement in the areas of climate change, community education and outreach, and partnership building. S/he will be exposed to ocean policy, the process of government-to-government consultation, traditional ecological knowledge perspectives as part of climate change adaptation, and marine planning. We are establishing this Fellowship in collaboration with The Nature Conservancy—an important partner in our ocean policy and resource management agenda—and the Fellow will be based in their Seattle office.

Specific Tasks and Major Project Components

1. Understand the impacts of climate change and changing ocean conditions on Makah treaty protected resources. Be a part of the Climate Change Adaptation Plan Core Team and work with policy and science staff in both the Office of Marine Affairs and the Makah Fisheries Department and contribute to the ongoing development of a climate change adaptation plan.
2. Contribute to work done supporting joint interests of TNC and OMA including oil spill prevention, vessel traffic safety, and climate change planning.
3. Support the Makah Tribe's engagement in state and regional marine planning and climate adaptation forums by:
    a. Providing staff support for planning activities such as information and training sessions, scientific and technical roundtables, and meetings with other engaged public and private entities.
    b. Fostering continual communication, information exchange and collaboration among tribal and non-tribal agencies, academic and stakeholder groups, and NGOs.
    c. Compiling and interpreting scientific analyses and/or policy papers that support strategies for creating a policy to guide Makah engagement and treaty right

protections in climate change conversations, state policies related to climate change and OA, and tribal adaptation plans.

d. Attend meetings, such as Marine Resources Advisory Committee or Regional Planning Body, to learn and track the state and regional progress in these areas.

4. Support the Makah's proposed Near Term Actions in the Puget Sound Partnership update to the Puget Sound Partnership's Action Agenda.
5. Collaborate with Makah Tribe and Nature Conservancy staff to produce grant proposals, reports, presentations, and outreach materials that support the above.

Interagency and Private Sector Connections

- Natural resource and fisheries agencies of treaty tribes in Washington State
- Federal and state agencies engaged in climate change adaptation and ocean policy, particularly those with jurisdiction on ocean and coastal waters: US EPA, Bureau of Indian Affairs, NOAA, USDA, Washington Department of Ecology, Puget Sound Partnership
- Non-governmental organizations, particularly The Nature Conservancy
- Regional partnerships, federal and state forums that address ocean health and planning potentially including the Regional Planning Body, the West Coast Ocean Partnership, the Marine Resources Advisory Committee, Washington Coastal Marine Advisory Council, Northwest Indian Fisheries Commission, and the Governance Coordinating Committee of the National Ocean Council
- Academic groups focused on climate change and ocean acidification such as the Climate Impacts Group and Washington Sea Grant

Project: Advancing Habitat Conservation and Community Resilience for Washington's Marine Waters

Host and Mentor
The Nature Conservancy, Washington Field Office (Seattle)

- *Jodie Toft*, Senior Marine Ecologist
- *Kara Cardinal*, Marine Projects Manager
- *Garrett Dalan*, Coast Conservation Coordinator

Overview
The Nature Conservancy engages in marine conservation strategies that sustain diverse marine life, abundant fisheries, and coastal economies and cultures. Our fundamental approach is to collaborate with communities, tribes, key industries, and policy makers on strategies to (i) develop innovative and sustainable fishing practices, (ii) identify and protect diverse and resilient habitats, and (iii) inspire policies and practices that reduce risks to the marine environment, particularly from oil spills and shoreside development. The 2016-17 Marc Hershman Marine Policy Fellow will have opportunities to participate in all or some of these strategies in line with their interests, knowledge, and skills.

Specific Tasks and Major Project Components

1. Understand, track, and contribute to the application of Marine Spatial Planning as means to protect marine habitats in Washington and adjacent federal waters, including their potential and actual impacts on policy and regulatory programs at various governmental levels (local, state, federal, tribal, regional).
2. Support finalization and adoption of Pacific and Grays Harbor Counties Shoreline Master Program (SMP) updates by:
    a. Synthesizing lessons learned from TNC engagement in SMP updates, including how scientific analyses and/or policy information from TNC has supported habitat conservation, and community resilience to coastal hazards and the impacts of climate change.
    b. Guiding TNC's participation in the SMP update approval processes to ensure final plans support TNC's goals of marine habitat conservation and coastal resiliency; includes fostering communication, information exchange and collaboration among coastal stakeholders, county planners, industry groups and NGOs.
3. Support Washington Coast Restoration Initiative (WCRI) through development of communications materials, generated by conducting outreach with current recipients of WCRI funding.
4. Collaborate with TNC Washington, Oregon, and California chapters, as well as fishermen and scientists, to develop innovative approaches to sustainable fishing and habitat protection.
5. Support development of workshops and meetings to improve United States and Canada trans-boundary vessel traffic safety and oil spill prevention.
6. Collaborate with TNC staff to produce grant proposals, reports, presentations, and outreach materials that support the above.

Interagency and Private Sector Connections

- Non-governmental organizations, particularly global and North American operating units of The Nature Conservancy, and the Surfrider Foundation
- Industry groups representing fishermen, shellfish growers, and marine transportation interests
- Coastal tribal governments
- Pacific County and Grays Harbor County Marine Resource Committees and county staff (shoreline planners, county contractors, and conservation districts)
- State policy advisory bodies, including the Washington Coast Marine Advisory Council and the Marine Resource Advisory Council
- State agencies, particularly:
    - Department of Ecology
    - Department of Natural Resources
    - Department of Fish and Wildlife
    - Washington Sea Grant
- Olympic Coast National Marine Sanctuary

Project: Human dimensions of Puget Sound recovery: Putting people into the picture of recovery efforts (tentative)

Agency Host and Mentor
Puget Sound Partnership

- *Kari Stiles,* Adaptive Management Scientist
- *Nathalie Hamel*, Monitoring Program Performance Analyst

Overview
The Puget Sound Partnership is responsible for coordinating the protection and recovery of the Puget Sound ecosystem in a way that supports healthy human populations and quality of life. Reliance on sound science to support strategic policy and management decisions is a pillar of the Partnership's mission. Science provides the rationale that explicitly links ecosystem recovery efforts to goals, and supports a framework for adaptive management.

The Partnership recognizes that Puget Sound represents a complex socio-ecological system, and that attention to social factors is critical for long-term success. Understanding this complexity and its relevance to Puget Sound protection and recovery is particularly important in many of our local, rural areas where livelihoods and ways of life are intimately tied to natural resources economies. Explicitly incorporating social science into recovery strategies and tracking indices of human well-being are vital to a comprehensive, progressive and effective recovery plan.

Specific Tasks and Major Project Components
Recent efforts have advanced the way the Partnership defines and approaches recovery goals and the development and evaluation of recovery strategies. We envision a fellow project that contributes to one, two, or all three of the following topics.

The first is the development of "Implementation Strategies" (IS) as a way to focus recovery efforts. As an improvement over past iterations of recovery strategies, IS are designed to explicitly define and document assumptions about pathways of effect linking actions to Puget Sound recovery goals, as defined by 2020 ecosystem recovery targets. For each recovery target, a complete IS will include a logic model depicting causal pathways and assumptions, effectiveness and status monitoring, and defined adaptive management processes.

Collaborative interdisciplinary teams (IDTs) are currently working to develop a subset of IS, utilizing the best available science to recommend causal pathways to recovery. IDTs will be convened for a small number of IS each year going forward to develop and adaptively manage the IS. To improve on past recovery strategies that focused heavily on ecological problems and addressed human dimensions separately, IDTs are working to explicitly incorporate social science into recovery strategies and adaptive management.

For this portion of the project, the tasks of the Fellow will include:

1. Encourage and facilitate effective communication between social and natural science experts to improve IS.
2. Incorporate social science into logic models for each IS and provide advice about incorporation in future IS.

3. Evaluate and assess how each IS – both achieving recovery goals and implementing management strategies - will affect human wellbeing.
4. Evaluate and describe how social factors will specifically affect progress toward achieving IS Recovery Targets in Puget Sound; assess at regional and local levels.
5. Ensure the incorporation of social sciences into logic models, identifying gaps and assumptions.
6. Engage with key local areas to integrate site-specific social dimensions into relevant IS.
7. Design and prescribe specific guidance for how social science will be incorporated into future IS's focused on recovery of ecological targets.

A second topic is the improved consideration of human wellbeing and social factors in the development of the 2018 revision of the Action Agenda. In summer of 2015, the Partnership adopted new and revised Human Health and Human Quality of Life Vital Signs. These were not incorporated in development of the 2016 Action Agenda due to their adoptions just prior to the Action Agenda solicitation. For the 2018 Action Agenda revision, the Fellow will assist the Partnership Planning Team to incorporate human wellbeing Vital Signs in the planning process, either as explicit goals of recovery actions, as criteria for evaluating the potential impact of recovery actions, or in other ways yet to be identified.

A third topic is the reporting and synthesis of indicators of human well-being for the State of the Sound report. The Puget Sound Partnership adopted a suite of human wellbeing indicators in summer 2015. These Vital Signs are used to monitor progress on the Partnership's Human Health and Quality of Life goals. The Partnership is currently working closely with the lead social scientist for human wellbeing to refine the indicators, identify data sources and compile data. We expect to be able to report at least on a subset of indicators in 2017.

For this portion of the project, the Fellow will work with the social scientist's academic team and lead the work to summarize data and findings across all indicators of human wellbeing for which data are available. This would require the Fellow to track the development of data and results for the indicators, and gain an understanding of the meaning of the indicators and their implications for recovery efforts. The Fellow, under guidance from the lead social scientist and Partnership staff, will prepare the synthesis report for inclusion in the State of the Sound. The Fellow will also communicate with partners about human wellbeing indicators how these can inform recovery.

Interagency and Private Sector Connections

This proposed project will involve significant connections to other agencies and institutions, especially close collaborations with scientists at Oregon State University and at UW-Tacoma's Puget Sound Institute and policy and technical staff at state agencies including: Ecology, Health, Fish & Wildlife, Natural Resources, and Commerce. Private sector connections are most likely to develop via the Fellow's engagement with IDTs for implementation strategies; most prominent among these connections will be the builders and developers, agriculture, shellfish aquaculture, and outdoor recreation.