N.H. Sea Grant Research Project Post Completion Report
For time period 2/1/13 – 1/31/14

Today's date: 4/10/14

Project number: R/CE-137

Project title: Microbial Interactions Influencing the Emergence of Pathogenic Vibrios in Oysters

Project initiation date: 2/1/2008

Project completion date: 2/1/2011

Principal investigator: Cheryl Whistler, Vaughn Cooper

Affiliation: UNH - Dept. of Molecular, Cellular and Biomedical Sciences

Accomplishments during 2/1/13 – 1/31/14 (Accomplishments are the key actions, activities or products resulting from Sea Grant research projects. They are distinct from impacts in that they reflect ongoing activities or key results that may not yet have had a significant economic, societal and/or environmental benefit but lay the foundation for such a benefit. Accomplishments may evolve into impacts in the future.)

Our preliminary dataset generated as part of this study was used to develop an analysis pipeline for oyster metagenomic research that is ongoing. The unique typing methods developed as part of this study are currently in use for analysis of environmental and clinical samples from the region, including ME, NH, MA and CT. Data generated as part of this study is under analysis for correlations for vibrio abundance and strain distribution in response to changing ecology. Accomplishments through our many presentations in the region include: adoption of approach by CT and MA state shellfish programs for 2014 monitoring, providing insight to MA & ME Depts. of Public Health about the emergence of pathogens in their shellfish use, use of our data by the NH Shellfish Program and FDA to help formulate a preliminary Vp Control Plan for NH commercial shellfish industry, and to inform NH oyster farmers of harvest practices to minimize Vibrio diseases

Impacts during 2/1/13 – 1/31/14 (Impacts are significant economic, societal and/or environmental benefits of research.):

NOTE: Include quantitative data to validate the impact, if possible.

The impacts of our work are an increased awareness of the potential risks from shellfish and appropriate measures that reduce risk and protect shellfish industry. We have identified components of climate change that alter microbial communities in oysters, and presented these in several venues to the public, to growers, and to regulators to assist in the formulation of control plans.

Economic benefits realized during 2/1/13 – 1/31/14 (businesses retained or created, jobs retained or created, market and non-market economic benefits):

NOTE: Please quantify and provide supporting data if possible.

Unknown

Tools, technologies or information services resulting from this project that were developed or used during 2/1/13 – 1/31/14 to improve ecosystem-based management (e.g., that reduce contaminants that harm
coastal ecosystems and seafood consumers; that track changes in ecosystem processes, biological responses and conditions):

Important technologies include strain typing methods and metagenetic sequencing methods that will improve pathogen identification, discrimination and sensitive detection.

**Related grants and contracts** (Other grants and contracts that funded this research or that were obtained as a result of this research.):

Sea Grant R/SSS-2 (Cooper, PI), NIH R15 (Cooper PI) $139,785, NH AES Hatch (Whistler PI) $36,000

**Publications to date received by N.H. Sea Grant:**


**Presentations during 2/1/13 – 1/31/14, with published abstract citation if applicable:**

NOTE: For presentations to civic groups, etc. (i.e., to the public rather than a scientific conference), please include number of attendees.

Science Café talk at Portsmouth Brewery, May 8th 2013 (approximately 30 community members); CT Vibrio Research Collaboration teleconference meeting. October 16, 2013 (15 shellfish and public health managers). Endemicity of pathogenic lineages of Vibrio parahaemolyticus in New England shellfish. MA Department of Marine Fisheries, Gloucester MA, Oct. 22nd 2013, (approximately 40 shellfish managers); Challenges for identifying Pathogenic strains of Vibrio...
parahaemolyticus for shellfish harvest management. CT Department of Agriculture-Bureau of Aquaculture and Laboratory: required industry end of season meeting, Bridgeport, CT Dec 13, 2013 (approximately 150 growers and distributors)

**Students Supported** (see next page)
## Students Supported

<table>
<thead>
<tr>
<th>Student Name</th>
<th>Continued or New for 2013?</th>
<th>Where is he/she now?</th>
<th>Institution/Department</th>
<th>Duration of support</th>
<th>Type of support (stipend, travel, supplies, etc.)</th>
<th>Type of degree: Undergrad Master’s PhD</th>
<th>Year degree awarded</th>
<th>Title of thesis if supported by N.H. Sea Grant</th>
</tr>
</thead>
<tbody>
<tr>
<td>Megan Striplin</td>
<td>Click here to enter text.</td>
<td>FDA</td>
<td>Microbiology, UNH</td>
<td>1 sem., 2 summers</td>
<td>Stipend, supplies, travel</td>
<td>M.S.</td>
<td>2014</td>
<td>Not expected to finish. Distribution of Vibrio species in the Great Bay estuary of New Hampshire.</td>
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<tr>
<td>Jenny Mahoney</td>
<td>Click here to enter text.</td>
<td>N.H. Dept. of Public Health</td>
<td>Microbiology, UNH</td>
<td>Summer</td>
<td>Some summer salary, supplies, travel</td>
<td>PhD</td>
<td>2011</td>
<td>Existing regulatory circuitries govern backbone and acquired host association factors in the human pathogen Vibrio parahamolyticus</td>
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<tr>
<td>Brian Schuster</td>
<td>Click here to enter text.</td>
<td>Harvard School of Public Health</td>
<td>Microbiology, UNH</td>
<td>1 sem. summer</td>
<td>Stipend, supplies</td>
<td>M.S.</td>
<td>2010</td>
<td>Microbial interactions with oysters from the Great Bay Estuary: characterization of the endemic Vibrio cholerae and oyster metagenetics</td>
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<tr>
<td>Jong Yu</td>
<td>Click here to enter text.</td>
<td>UNH Research Technician</td>
<td>Microbiology, UNH</td>
<td>Summer</td>
<td>Summer stipend, supplies</td>
<td>M.S.</td>
<td>2011</td>
<td>Incidence, abundance, postharvest processing and population diversity of pathogenic vibrios in oysters from the Great Bay Estuary</td>
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<td>Crystal N. Ellis</td>
<td>Click here to enter text.</td>
<td>Click here to enter text.</td>
<td>Genetics, UNH</td>
<td>Summer</td>
<td>Supplies</td>
<td>PhD</td>
<td>Click here to enter text.</td>
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<td>Tucker Noyes</td>
<td>Click here to enter text.</td>
<td>Click here to enter text.</td>
<td>Microbiology, UNH</td>
<td>Summer hourly</td>
<td>Salary and supplies</td>
<td>Undergrad</td>
<td>2011</td>
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<td>Anna Tyzik</td>
<td>Click here to enter text.</td>
<td>Click here to enter text.</td>
<td>Medical Laboratory Sciences, UNH</td>
<td>Summer</td>
<td>Salary and supplies</td>
<td>Undergrad</td>
<td>2011</td>
<td>n/a</td>
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<td>Nicole Lefebvre</td>
<td>Click here to enter text.</td>
<td>Click here to enter text.</td>
<td>Biology, UNH</td>
<td>Click here to enter text.</td>
<td>Click here to enter text.</td>
<td>Click here to enter text.</td>
<td>2008</td>
<td>n/a</td>
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<tr>
<td>Freddie Ta</td>
<td>Click here to enter text.</td>
<td>Click here to enter text.</td>
<td>Microbiology, UNH</td>
<td>Click here to enter text.</td>
<td>Supplies</td>
<td>Undergrad</td>
<td>2010</td>
<td>n/a</td>
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<td>Matt Gerding</td>
<td>Click here to enter text.</td>
<td>Click here to enter text.</td>
<td>Microbiology, UNH</td>
<td>Click here to enter text.</td>
<td>Salary and supplies</td>
<td>Undergrad</td>
<td>2012</td>
<td>n/a</td>
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<td>Rachel Donner</td>
<td>Click here to enter text.</td>
<td>Click here to enter text.</td>
<td>Microbiology, UNH</td>
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<td>Salary and supplies</td>
<td>Undergrad</td>
<td>2011</td>
<td>n/a</td>
</tr>
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