
“Operational Ecological Forecasting of Harmful Algal Blooms in the Pacific Northwest using an Environmental Sample Processor”

Shellfish contamination from harmful algal blooms (HABs) is both costly and a significant health risk to coastal communities. Blooms of *Pseudo-nitzschia*, the marine algae that can produce the neurotoxin domoic acid, have caused coast-wide, year-long closures of the razor clam fishery in Washington State resulting in an estimated \$24.4 million in annual lost expenditures. Additionally, toxic HABs may disproportionately impact coastal tribal communities because shellfish are an integrated part of the culture as well as being significant dietary items and income sources.

In an effort to improve our ability to reduce both the negative health and economic impacts of HABs on the Washington Coast, this project will place an autonomous, robotic marine biosensor developed by the Monterey Bay Research Institute (MBARI), the Environmental Sample Processor, or ESP, on a proven Applied Physics Laboratory-University of Washington/NANOOS subsurface mooring located 15 miles offshore of La Push, Washington within the Olympic Coast National Marine Sanctuary. The ESP will detect *Pseudo-nitzschia* cells and their associated toxin domoic acid escaping from the offshore Juan de Fuca eddy bloom initiation site and transmit that information in near real-time. The project is funded by IOOS to the University of Washington for anticipated three years.

The specific goals of this project are to:

- operationally deploy an ESP on an existing real-time offshore moored observatory in the Pacific Northwest;
- obtain reliable and quantitative observations of toxic *Pseudo-nitzschia* escaping from a bloom initiation site using the ESP;
- distribute observations to coastal shellfish managers and other users along with expert contextual interpretation to enable informed and timely management decisions;
- engage Tribal communities on seafood safety and advanced environmental monitoring through outreach, education, and training through workshops, internships, science camps, and the development of curriculum.

Project partners include the Northwest Indian College, Woods Hole Oceanographic Institution, MBARI, Spyglass Technologies, NOAA’s Northwest Fisheries Science Center and Center for Coastal Environmental Health and Biomolecular Research, UW Oceanography, APL/UW, and NANOOS. MSI awards are designed to allow academic, governmental, stakeholder, and sensor industry partners to bring sensors in development into operational use.

Year 1 funding for this effort is **\$600,000**.