

# Sequim Marine Research Operations at a Glance

The Sequim Marine Research Operations (MRO) provides research and development to meet national needs. Located at the mouth of Sequim Bay in Washington State, Sequim MRO is ideally suited to conduct research on the marine environment. Approximately 100 researchers and support staff work at the Sequim facility, including internationally recognized experts in analytical chemistry, wetland and coastal ecology, ecotoxicology, marine biology, modeling and remote sensing.

The facility at Sequim is part of the U.S. Department of Energy's Pacific Northwest National Laboratory (PNNL) operated by Battelle Memorial Institute. Battelle has a unique contract with DOE, which allows it to conduct research for both government and private clients.



The Sequim Marine Research Operations site encompasses 150 acres of uplands and tidelands, about 7.5 acres of which has been developed for research operations

## RESEARCH CONDUCTED AT SEQUIM

The Marine Sciences Laboratory (MSL) conducts advanced research aimed at preserving and protecting the coastal and marine environment. The current research emphasis in MSL is broadly identified as coastal restoration and marine biotechnology.

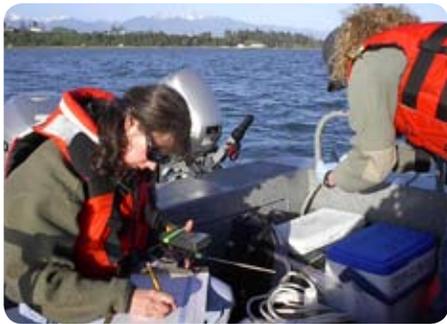
The Coastal Security Institute (CSI) specializes in providing innovative and practical solutions to the protection of coastlines and other topics of interest to national security. CSI research provides clients with innovative solutions via the combined expertise in environmental security, remote sensing, characterization, electronics, sensors and integration capabilities.

### Sequim MRO helps clients

- ▶ understand the effects of pollutants on marine and freshwater organisms
- ▶ measure trace substances (organic chemicals and metals) in the marine environment
- ▶ develop tests to determine safe levels of trace substances
- ▶ use advanced mathematical models to assess and restore marine and coastal habitats
- ▶ use satellite information and other remote sensing techniques to map, measure and model ocean activities. The information aids environmental cleanup and informs surveys of natural resources, coastal security and emergency response
- ▶ develop new sources of bioenergy from marine algae
- ▶ protect coastlines through development of novel sensors for pathogens and chemical agents.

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The diversity of scientific talent at Sequim allows researchers to use an integrated, multidisciplinary approach to address complex environmental issues of regional, national and international significance. Researchers at MRO have expertise in fields such as marine ecology, ecotoxicology, analytical chemistry, statistics, electrical engineering, bioengineering, molecular biology, and microbiology. Collaboration with scientists and engineers at the parent research facility in Richland, WA, provides additional expertise and instrumental capabilities for research programs at the Sequim facility.

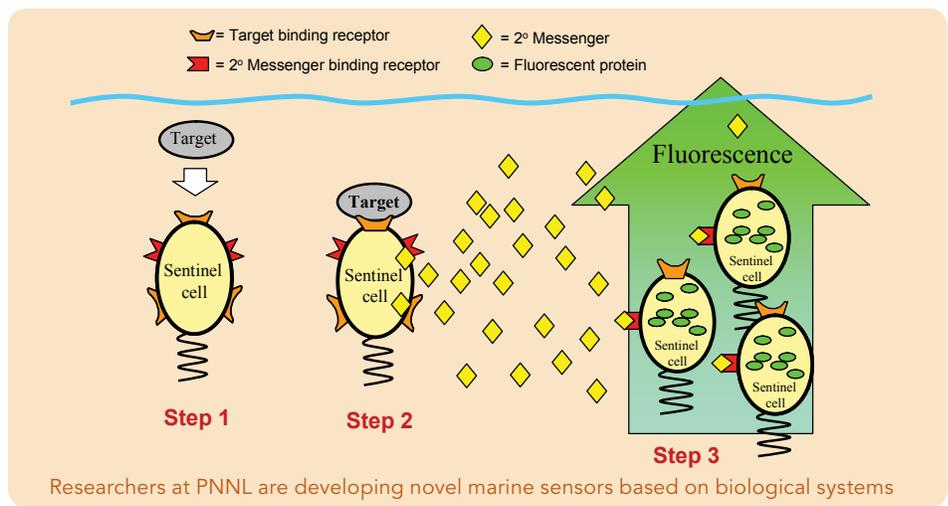


Researchers are collecting water from Dungeness Bay for the microbial-source-tracking study

Research conducted at Sequim has addressed issues related to

- ▶ conservation biology and ecotoxicology of Puget Sound and the Columbia River
- ▶ effects of oil exploration in the Gulf of Mexico
- ▶ migration of salmon in Northwest inland rivers
- ▶ endocrine disruption in fish
- ▶ protection of coastlines from pathogens and chemical agents
- ▶ harmful algal blooms
- ▶ harnessing biohydrogen from microalgae as an alternative energy source.

Expansion into the field of marine biotechnology is enabling the laboratory to bring to bear advancements in the molecular biosciences to topics related to the environment and technology development.



In line with national priorities, Sequim also is developing a new generation of sensors and technologies to detect signs of chemical and biological agents of concern. For example, researchers are developing biosensors to detect the presence of such agents in coastal waterways, beaches and estuaries.

## FACILITIES AND EQUIPMENT AVAILABLE AT SEQUIM

The Sequim MRO includes more than 6000 sq. ft. of analytical and general-purpose lab space and approximately 5300 sq. ft. of wet/bioassay laboratory space supplied with heated and cooled freshwater, seawater and filtered seawater. The MRO has facilities for microbial, molecular and trace chemical analysis of environmental samples, including water, sediment and biological source materials.

Facilities for biotechnology at Sequim include laboratories for working with pathogenic and non-pathogenic organisms, invasive species and recombinant DNA. A new molecular biology laboratory—housing a light microscopy suite, fermentation laboratory and dedicated molecular biology workspace—will be used to conduct basic and applied research in bioenergy, biomaterials development, bioremediation, environmental biomarkers, biosensors, harmful algal blooms and coastal security.

## COMMUNITY COMMITMENT

Battelle has a strong corporate commitment to supporting the communities in which it operates. Battelle has provided millions of dollars of philanthropic support to the Puget Sound and coastal regions. Locally, Battelle has supported a variety of organizations including United Way, Peninsula College and the Low Tide Fest. Staff members donate time to the community and serve as adjunct instructors at Peninsula College, Western Washington University, Huxley College and the University of Washington.

## VISITING SEQUIM MRO

Visits to the Sequim facility are by appointment only; all approved visitors must be badged and escorted.

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