Shellfish at Work – Nutrient Bioextraction Project

This project uses a combination of nutrient bioextraction principles to meet the goal of reducing nutrients in Budd Inlet. Over 300 four-foot nylon straps were affixed to existing dock structures at Swantown, Boston Harbor, Port of Olympia and West Bay Marinas to provide an attractive home for blue mussel larvae to settle upon and grow. Throughout the summer, these mussels filter phytoplankton from the inlet improving water clarity and incorporating nitrogen into their tissues. Pacific Shellfish Institute (PSI) biologists-- with assistance from New Market Skills Center and University of Washington Tacoma students-- have been keeping track of the mussels and water quality throughout the summer. In October, the mussels (and incorporated nutrients) will be harvested, tested for contaminants, and turned into rich compost.

Why Budd Inlet?

Similar to Hood Canal, Budd Inlet experiences low levels of dissolved oxygen (DO) in late summer and early fall. This condition is caused by eutrophication, or the manner in which a water body becomes enriched in dissolved nutrients (nitrates and phosphates) stimulating the growth of phytoplankton. As the algae settle to the bottom, they are decomposed by bacteria that utilize oxygen in the process. Low DO levels can be harmful to fish and other marine life, raising concerns about the overall health of the Puget Sound ecosystem. In fact, scientists have identified eutrophication as one of the most serious threats to coastal environments worldwide.

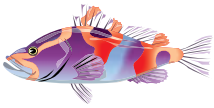
Where Do Nutrients Come From?

The nutrients that fuel phytoplankton growth in Budd Inlet come from a variety of sources: ocean inputs (coastal upwelling), sediments, the Deschutes River, smaller tributaries, and waste treatment facilities. In 1994, to address nutrient loading in southern Puget Sound, the LOTT Clean Water Alliance implemented state-of-the-art advanced nitrogen removal treatment. Still, ever-increasing growth pressure has resulted in many small, uncontrolled sources of nutrient pollution, largely from fertilizers, septic systems and animal waste that enter Budd Inlet via groundwater and storm water that flow into the Deschutes River and other tributaries.

Reducing sources of nutrients, or source control, has become a top priority for many jurisdictions. By decreasing nutrient loading, widespread problems with thick algae blooms and oxygen depletion can be prevented. Source control is a critical step-- but can nutrients be removed once they enter the marine environment? This project explores that question!

Nutrient Bioextraction

Nutrient bioextraction, or nutrient bioharvesting, is the practice of farming and harvesting shellfish and seaweed for the purpose of removing nitrogen and other suspended matter from natural water bodies.

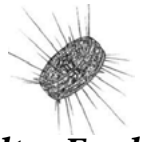


Citizen Monitoring

You're invited to participate in this research:

- **September 14 at 10:00am**
- **October 6 at 1:00pm**

Port of Olympia parking lot by Anthony's Hearthfire



Filter Feeding

Filter feeding reduces nutrients (e.g. nitrogen and phosphorus), silt, bacteria, and viruses, and improves water clarity, which enhances habitat for sea-grasses and other aquatic vegetation. In a day, a single mussel can filter *13 gallons* of water.

Learn More

Pacific Shellfish Institute
www.pacshell.org
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Fostering sustainable shellfish resources and a healthy marine environment through research and education