



# ONRC UPDATE

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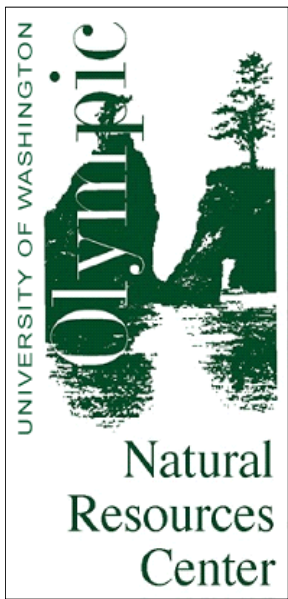
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*A Monthly Newsletter from UW Olympic Natural Resources Center*

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**UW**  
 College of Forest Resources  
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## DIRECTOR'S MESSAGE

At the core of the UW ONRC mission is the research program. It addresses the most pressing issues faced by land managers and communities as they strive to balance ecological and economic values in the management of natural resources. The quality, content, and usefulness of research conducted through UW ONRC are of critical importance. Applying the overarching values, so clearly articulated in the legislation that created UW ONRC, to current and future expectations will demand constant evaluation and review.

This year, UW ONRC will undergo a major research program review. Nearly ten years of funded research - growing in scope and complexity over time - has resulted in a significant body of work. We in-

tend to review research accomplishments, evaluate our performance through outside peer review of the program, and chart a course for improvement and relevance. Dr. Robert Lee, Professor, Sociology of Natural Resources, at UW College of Forest Resources and also a UW ONRC Science advisor will work with me to design and conduct the review and publish the findings.

The review will include the research community (scientists) but must also include UW ONRC constituents who may benefit from the research findings. Our Policy Advisory Board will be asked to participate by working with the peer review scientists to make critical suggestions for improvement and focus. We must continue to demonstrate that UW

ONRC can deliver quality research products which are important in managing today's challenges.

Over the last ten years, significant progress has been made in adopting conservation strategies to meet society's goals. We have learned a great deal, through scientific investigation, about what it will take to achieve our conservation goals. The challenge now is to verify the strategies employed through regulation and to develop tools to increase efficiency and cost effectiveness. We have learned that, unless the conservation strategies are cost effective as well as scientifically sound, they will not achieve either conservation or economic goals.



**John Calhoun**

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## Partnership for Understanding Domoic Acid Outbreaks in Razor Clams

**Miranda Wecker** / Marine Program Manager  
UW Olympic Natural Resources Center

The front pages of local newspapers around Western Washington have been trumpeting the opening of the clam season after a long bout of marine toxins kept clam fans off the beaches for over



WDFW DIGITAL IMAGE  
Pacific Razor Clam (*Siliqua patula*)

a year. To the joy of local residents and visitors, for three days in late September, the throngs addicted to the tasty bivalves were allowed to pursue their passion.

Still, the threat of future inter-

ruptions hangs over coastal communities. Since the early 1990s, when high levels of domoic acid were first detected in Washington's razor clams, the recreational openings and the Quinault Nation's commercial harvest have become a guessing game. Will the plankton that produces domoic acid — *Pseudo-nitzschia* — bloom in harmful numbers? Will domoic acid be produced in harmful quantities? Will the deadly toxin move to onshore waters? Will harmful levels of toxins be taken up by the shellfish?

The health hazards of domoic acid have been understood for over a decade. The first known human fatality occurred in Nova Scotia shortly before the toxin was found in Washington shellfish in 1991. Since that time, officials in Washington have become all too familiar with the threat posed by domoic acid. It has caused brain

damage in marine mammals and birds that have consumed small fish tainted with domoic acid.

Consumed in unsafe quantities by people, domoic acid causes a permanent and so far untreatable loss of short term memory. The condition is referred to as amnesiac shellfish poisoning and produces symptoms similar to Alzheimer's Disease.

Because of the importance of razor clam digging to the lifestyle and livelihoods of coastal communities, UW ONRC joined with partners across the region in 1998 to form the Olympic Regional Harmful Algal Bloom (ORHAB) working group. ORHAB's aim is to develop an understanding of the dynamics of the plankton blooms along our



**Miranda Wecker**

(Continued on page 3)

Olympic Region Harmful Algal Blooms

# ORHAB PARTNERSHIP

Battelle Marine Sciences Laboratory

Fisheries and Oceans Canada

Makah Tribe

National Centers for Coastal Ocean Science

Northwest Fisheries Science Center

Northwest Indian College

Olympic Coast National Marine Sanctuary

Pacific Shellfish Institute

Quinault Indian Nation

University of Washington Coastal Studies Group

University of Washington Olympic Natural Resources Center

University of Washington School of Oceanography

Washington Department of Ecology

Washington Department of Fish and Wildlife

Washington Department of Health

## Partnership for Understanding Domoic Acid Outbreaks in Razor Clams (continued)



PHOTO COURTESY OF QUINALT INDIAN NATION  
Clams dug on the Quinalt Reservation await cleaning and canning

(Continued from page 2)

coast that give rise to domoic acid. Among the broad questions being addressed are the following: what are the environmental conditions that trigger plankton blooms and toxin production? Where are the plankton blooms taking place? How does the domoic acid move along the coast? How long must blooms last for the shellfish to

blooms and a capacity to plan harvests to avoid toxin outbreaks. For the past three years, researchers have measured domoic acid levels in clam tissue and seawater. They have also gathered a



PHOTO COURTESY OF WDFW  
Harvesting Razor Clams on the Washington coast

take up the toxins?

The mission of the ORHAB partnership is to turn scientific information into an ability to predict harmful

shore areas and from far offshore. Satellite imagery has also been brought into the analysis.

So far, some fascinating patterns have begun to emerge. Data collected up and down the coast has provided state and tribal managers with a broad view of oceanic



PHOTO COURTESY OF QUINALT INDIAN NATION  
Tribal employees clean the razor clams after the September 2003 harvest on the Quinalt Reservation

comprehensive array of information on physical factors and dynamics that may induce blooms. Data on temperature, nutrients and plankton populations have been taken from the beach, from near

conditions that affect the occurrence of plankton blooms. This context of information has allowed responsible officials to open the recreational and commercial harvest with a high level of confidence that the clams are safe to consume.

A new law was passed by the Washington State congress this legislative session that implemented the addition of a \$3 per license surcharge to shellfish licenses. The first \$150,000 of the surcharge collected will help pay for ORHAB monitoring.

## Biocontrol Project Gets Help from Community to Track Weed-Eating Bugs

**Fritzi Grevstad** / Biocontrol Specialist  
UW Olympic Natural Resources Center

Finding a particular type of insect in tall dense vegetation and amid other look-alike insects takes a trained eye. On a sunny September Saturday, seventeen Wil-

apa Bay area residents took part in a laboratory and field workshop to learn how to identify *Prokelisia marginata*, the biocontrol agent being used to control the weedy grass *Spartina*, which is invading the mudflats of Willapa Bay, WA. The workshop was led by UW ONRC's Biocontrol Specialist Fritzi Grevstad and her assistant Carol O'Casey.



PHOTO COURTESY OF MARGIE COCHRANE  
Group looking for planthoppers at one of biocontrol release sites near Naselle River

age of the tiny delicate newborn planthoppers hatching from their eggs. At this stage of their growth, the nymphs are only about the size of the period at the end of this sentence, have big red eyes, and are very cute.

After the video, the participants toured the insectary greenhouse where the biocontrol agents are mass reared for release into Willapa Bay. Here they witnessed plants that were severely stressed and some even killed from *Prokelisia* feeding on them. They learned to identify this damage and viewed various stages under a microscope.

For the finale, the group went

to a nearby field where the insects have been re-released for the past two years. The volunteers put their new found entomological skills to work. The planthoppers were not hard to find at this site. In fact, there were a couple hundred per stem in some areas. Visible damage to the leaves of *Spartina* was also prevalent. As an exercise, we looked for planthoppers at a distance from the point of release. The prize for finding *Prokelisia* at the furthest distances was none other than 11-year-old Andy Zahn.

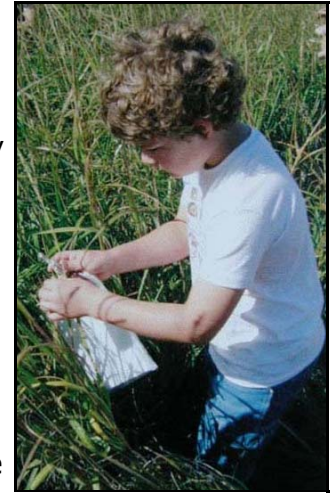


PHOTO COURTESY OF BEVERLY ARNOLDY  
Workshop participants view insects under a microscope inside biocontrol insectary greenhouse in Long Beach

to a nearby field where the insects have been re-released for the past two years.

The prize for finding *Prokelisia* at the furthest distances was none other than 11-year-old Andy Zahn.

The seventeen participants, many of whom live along the shores of Willapa Bay, will serve as scouts for detecting newly arising colonies of *Prokelisia*, resulting from dispersal from the original release sites. Their input will be invaluable in tracking the progress of the biocontrol program and integrating it with other methods of control.



Andy Zahn, age 11:  
Champion Bug Finder

PHOTO COURTESY OF MARGIE COCHRANE