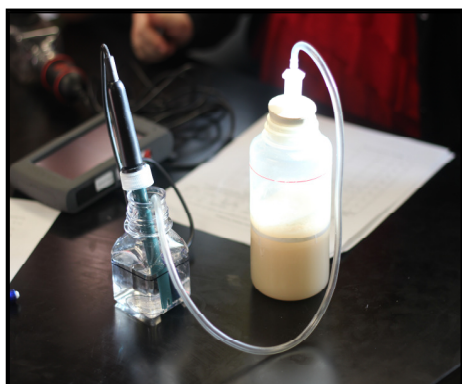


## Ocean Acidification: Connecting the Land to the Sea \$1,500 GEMs grant to Snohomish Conservation District, Lake Stevens, WA

New scientific challenges can quickly become educational opportunities for environmental educators.

Thanks to C-MORE's GEMs grant program, the relatively new challenge of ocean acidification (OA) quickly became an opportunity for the environmental education program offered by the Snohomish Conservation District. Our District's purpose is to encourage conservation and the wise use of natural resources. In order to help accomplish our purpose we have for many years offered a variety of environ-



C-MORE's GEMs grant helped fund the purchase of laboratory equipment for a new ocean acidification class.

mental education programs focused primarily on how human actions on the land affect the water quality in our rivers, lakes, and streams, and, ultimately, in the marine waters that form the western border of our district. Our classroom programs are offered free to any school throughout our district and are very well received. In the fall of 2012 a panel of experts appointed by Washington's governor released a report identifying actions that should be taken to mitigate ocean acidification.

Action item 8.2.1 to "Develop, adapt, and use curricula on ocean acidification in K-12 schools and higher education" was the opportunity we needed to expand and update our education program by offering a new class on ocean acidification. Subsequent research into OA curricula led us to C-MORE's OA lesson plan and lab experiment.

We knew that no other organization was offering an OA lesson in our region and we knew that if we could use C-MORE's OA classroom material we would have a lesson plan/lab devel-

oped and tested by experts that could be classroom ready with little modification and in much less time than it would take us to develop a lesson.

C-MORE staff quickly provided the written lesson materials and just as quickly Jim Foley, our C-MORE advisor, recommended that we apply for a GEMs grant to help purchase the lab equipment. Our grant request was approved and in addition to partially funding the handheld computers C-MORE provided miscellaneous equipment that helped reduce the overall equipment cost.

After making minor changes to the curriculum to reflect local marine conditions we began offering the OA lesson free to any high school in our district in November of 2013. In the first three months that the OA lesson has been available it was presented to 283 students in four high schools. We have also presented the lesson to one adult community organization and we have been invited to present the lesson at a statewide conservation district's conference in June, 2014.

Beginning with the 2014-15 school year we will greatly expand the reach of this lesson by offering it to any high school in western Washington. Because of C-MORE's financial support and willingness of C-MORE staff to share their infor-



In addition to funding equipment with a GEMs grant, C-MORE donated miscellaneous lab equipment including ten 375 ml bottles. Without C-MORE's support our organization could not offer an ocean acidification class.

mation, time, and materials our organization will be able to continue to present a science-based lesson that shows students and adults how their individual actions affect the global ocean ecosystem. We appreciate the time required to develop the ocean acidification lesson and we thank C-MORE for sponsoring the GEMs grants that made our OA lesson possible.

# District Offers Ocean Acidification Class

by Roger Kelley, Conservation District Educator

Scientists know it's happening, they know it's harming the environment and they know everyone contributes to it. "It" is ocean acidification, and scientists also know that more education is needed to explain how and why it's happening, and what can be done about it.



Port Susan, a portion of Puget Sound near Stanwood.

In a nutshell, the acidity level in the ocean has increased to an unnaturally high amount that is killing coral colonies in tropical waters, and shellfish in our marine waters. Scientists have found that the cause is a hard one-two punch: an increase in carbon dioxide in the atmosphere (released from burning fossil fuels) that dissolves into our oceans, rivers and lakes - combined with the pollution in stormwater runoff that increases its acidic content as it flows through storm drains and eventually empties into marine waters.

While the ocean and its inhabitants need a certain amount of carbon dioxide to survive, the recent higher amounts of carbon dioxide have been forming more carbonic acid, making the ocean more acidic. This acid is dissolving the calcium carbonate shells of shellfish, plankton and other organisms that are the foundation of the ocean's food chain. Ocean acidification has been identified as the reason why billions of Washington oyster larvae have been dying, since as early as 2005.

Thanks to a grant from the University of Hawaii's Center for Microbial Oceanography: Research and Education (C-MORE), combined with Snohomish Conservation District education funds, the District is one of the first organizations in the state to offer an ocean acidification class to high school students. The funds were used to purchase lab equipment and adapt the C-MORE class to ocean acidification's affect on Washington's marine waters and organisms.

The class has been modified by District educators to reflect Washington State concerns and is based on a report issued last November by the Washington State Blue Ribbon Panel on Ocean Acidification. The report highlights the serious impacts that this condition is having on Washington's \$270 million shellfish industry as well as the more than 3,000 people working in the industry. Education is one of the recommended actions to address ocean acidification.

The District's class emphasizes the affect on shellfish and plankton species that are an important part of the food chain for our salmon species and orca whales, and includes a lab experiment that shows carbon dioxide's affect on saltwater. The District is one of only six organizations nationwide that worked with the University of Hawaii to offer this up-to-date information. The 90-minute class is free and available to any high school in Snohomish County and on Camano Island. For more information, please contact Roger Kelley at 425-335-5634 or roger@snohomishcd.org.

# Back to School for Conservation District Educators

by Roger Kelley, Conservation District Educator

School's in session again, not only for students but for Snohomish Conservation District educators, too. That's because the District provides more than 200 free watershed education classes throughout the county each school year, in partnership with the Snohomish County Public Works' Surface Water Management Division.

The Surface Water Management Division of Public Works is responsible for protecting and improving water quality and aquatic habitat in all County lakes, rivers and streams, and for minimizing damage from floods.

Thanks to this successful Public Works/District partnership, classes are available to almost any Snohomish County and Camano Island school - public, private and home school. Most classes are funded by Surface Water Management fees (paid annually by property owners in unincorporated Snohomish County), and are limited to three classes per teacher per school year. Because these classes are funded by ratepayers, they're restricted to schools where 25 percent or more of the students attending live in unincorporated Snohomish County.

Classes are available on a variety of 'clean water-related' subjects including salmon, water quality, watersheds, native plants and a new pet waste/disposal class. Most classes are 45 minutes to one-hour long and include a hands-on activity. All materials are provided. These classes are quite popular, so teachers are highly encouraged to register as soon as possible - even if they want to schedule a class much later in the school year.

In addition to the school classes, the County's Surface Water Management Division also provides teacher workshops on a variety of water-related topics, and offers grants to fund water-related fieldtrips.

The District is also working with the City of Lake Stevens and Lake Stevens High School biology teachers to develop a new Advanced Placement phosphorus class (with a lab) that will examine how and why phosphorus is affecting Lake Stevens. It will be taught for the first time in Spring 2014 for Lake Stevens High School only.

For the list of student classes and teacher workshops, to register for a class or workshop (online registration only), and to obtain fieldtrip grant information, go to the Surface Water Management Division's education webpage at [www1.co.snohomish.wa.us/Departments/Public\\_Works/Divisions/SWM/Ed](http://www1.co.snohomish.wa.us/Departments/Public_Works/Divisions/SWM/Ed). For more information please call Roger Kelley at 425-335-5634.



Roger Kelley teaching students at North Creek Park near Bothell.



Water testing equipment for labs.

# Get Ready for the 2014 Plant Sale

Date of the Sale - March 1, 2014

**Pre-Orders Open**  
November 4, 2013

**New plants for 2014**

**Bear Grass**

**Marsh Violet**

**Red Elderberry**

**Big Leaf Lupine**

**Cascade Penstemon**

**Goatsbeard**

**Youth on Age**

This year, the Conservation District plant sale brochures will arrive in your email or mail during the last week of October with presales starting on November 4th.

There are several new plants for the 2014 sale including Red Elderberry, Black Hawthorne, Goatsbeard, Pacific Aster, Bigleaf Lupine, Cascade, Penstemon, Piggyback plant, Marsh Violet, and Beargrass.

These new plants, along with our standard suite of plants, will be available for presale and at our general sale. Check out our website and watch for the online store, opening soon. [www.snohomishcd.org/plant-sale](http://www.snohomishcd.org/plant-sale)

## Go Paperless

Each year we try to make improvements to reduce the environmental impact of the plant sale. This year we offer a paperless plant sale brochure. To receive the email version, follow this link: <http://bit.ly/scdplant>.



Big Leaf Lupine



Red Elderberry



Marsh Violet



Cascade Penstemon