

# Sample science

Ocean explorers search for methane off the coast

By EDWARD STRATTON  
EO Media Group

After three weeks of scanning and sampling for methane seeping out along the Cascadia Subduction Zone, researchers aboard the Nautilus pulled into the Port of Astoria on Friday, June 29 with their findings.

The Nautilus, a converted 1960s East German research ship, is operated by the Ocean Exploration Trust.

The exploration and research nonprofit was started by Robert Ballard, a professor known for discovering the wreck of the RMS Titanic and the German battleship Bismarck.

On its way north from San Francisco, the Nautilus scanned more than 1,300 square miles along the subduction zone, a tectonic plate boundary running from Vancouver Island to Northern California. Researchers with Oregon State University and the National Oceanic and Atmospheric Administration have documented more than 1,000 methane seep sites in the zone caused by tectonic activity releasing hydrocarbon-rich fluids such as hydrogen sulfide and methane, a main component in natural gas.

Deep in the ocean, the methane often crystallizes into methane hydrate, an opaque or translucent ice.

"The most important thing right now is to get to know what is out there," said Tamara Baumberger, a researcher with the Cooperative Institute for Marine Resources Studies operated by Oregon State and NOAA at the Hatfield Marine Science Center in Newport. "Three years ago, we almost knew nothing. Now we're starting to get an idea of how many seeps we have. How much hydrate is still a big question."

At night, the Nautilus used a multibeam sonar to scan the zone for more vents, and a sub-bottom profiler that can pierce more than 160 feet into the seafloor to look at soil composition and for pockets of



Ocean Exploration Trust

Researchers onboard the research vessel Nautilus sampled for a wide variety of underwater life around methane seeps along the Cascadia Subduction Zone.



Ocean Exploration Trust

Up to three pilots in a control center onboard the Nautilus controlled the submersible, Hercules, as it sampled around methane seeps along the Cascadia Subduction Zone.

gas.

During the day, researchers used an onboard submersible, the Hercules, to collect samples of the gas, hydrates, seepwater, plants, animals, sediments and rocks around the seeps. The robot is connected via a tether to Argus, a smaller submersible that buffers the Hercules from movement in the line, and can descend 2.5 miles underwater.

The Hercules includes two arms for sampling and an array of cameras and acoustic sensors, but is designed to be outfitted with different tools for each expedition.

For the methane seep study, it was fitted to take airtight samples of both gas and hydrate crystals.

Studying the ratio of noble gases inside the methane can inform Baum-

berger whether they were once hydrates, and in turn what causes hydrates to turn into gases that contribute to global warming and ocean acidification, she said.

Hercules was also used to deploy a hydrophone — an underwater microphone that detects ocean sounds from all directions — to record the methane bubbles coming out of the earth's crust.

Robert Dziak, an acoustics scientist with NOAA, recently authored a study about how the pitch of methane bubbles can help scientists estimate the amount of methane in an underwater reservoir.

"Our ultimate goal is to use sound to estimate the volume and rate of methane gas exiting these seafloor fields," Dziak said in a recent news release about

the study.

The samples collected during the expedition were shipped back to the Hatfield Marine Science Center for analysis. The Nautilus left Sunday for the coast off the Olympic Peninsula, where it searched this week for fragments of a meteor that crashed down in March in the Olympic Coast National Marine Sanctuary.

Nicole Raineault, an expedition leader with the Ocean Exploration Trust, said the group was approached by Marc Fries, a research scientist at the Planetary Science Institute in Arizona, about looking for remnants of the meteor.

"Nobody's ever found a meteorite in the ocean, but this is just offshore of Washington," she said. "It's in just about 100 meters water depth, and he thinks that the fragments were fairly large and in a small enough area that we might be able to find it."

Afterward, the Nautilus will head for Canada to map northern sea mounts and help maintain the underwater cables connecting a network of observatories overseen by the University of Victoria, British Columbia. Several other mapping expeditions are planned around the Pacific Ocean through September.

• **Live feed:** The Ocean Exploration Trust provides a live feed of the ship and expeditions at [nautiluslive.org](http://nautiluslive.org)



AP Photo/Don Ryan, File

In this 2011 file photo, fishermen in motorboats form a "hog line" during the spring chinook salmon run on the Willamette River in Oregon City.

## Oregon Marine Board seeks higher boat fees

MEDFORD (AP) — The Oregon State Marine Board plans to ask the Legislature to increase registration fees paid by motorized boaters.

The *Mail Tribune* reports that the board expects to ask the Legislature in 2019 for a two-year budget of about \$33 million. The agency is funded by registrations, title fees and marine fuel taxes paid by motorized boaters. It receives no state general fund or Oregon Lottery money.

If approved by the 2019 Legislature, powerboat registration fees would rise from the current \$4.50 per foot to \$5.95 per foot.

The Marine Board governs Oregon waterways. The agency also pays for county marine law enforcement, oversees guides and outfitter programs and funds the invasive species program and check stations operated by the Oregon Department of Fish and Wildlife.

An increase to the powerboat registration fee is

one of eight "concepts" the agency plans to take to the Legislature in 2019, the *Mail Tribune* reported.

Another is a new waterways access permit to begin January 2020 that would cost \$5 a week, \$17 a year or \$30 for two years for non-motorized boats 10 feet and longer. It would replace the current \$5 annual Aquatic Invasive Species permit.

Like the current invasive species permits, the new permits would be transferable to other boats owned by permit holders, and the agency would expect to collectively sell about 58,000 of the three permit options annually, Marine Board spokeswoman Ashley Massey said.

The invasive species program would still get its \$1.65 million every two years from the new permit. The remaining money — estimated at \$1.3 million in its first full biennium — would go toward projects that improve access for kayakers and rafters.

## BLOOMIN' BLUES



Photo by Bruce Barnes

Timberline buttercup, *Ranunculus eschscholtzii*

## Build up this buttercup

By BRUCE BARNES  
For The East Oregonian

**Name:** Timberline buttercup

**Scientific name:** *Ranunculus eschscholtzii*

This is a small buttercup that flowers later than most of the other buttercup species due mainly to its preference for high elevations. I've seen it in the lake basin in the Wallaw Mountains around 7,000 feet high, and it should be blooming there about now. It is found from Alaska to British Columbia and Alberta, and south to California to Utah.

The common name "timberline" obviously refers to where it may be found. "Buttercup" describes the flowers themselves, which in nearly all species have bright, shiny-yellow petals which tend to curve upward at the tips to form a cup-shaped appearance. The genus name *Ranunculus* has been the Latin name for the genus since early Roman times, and comes from the Latin rama for frog, in reference to many species growing in water or wet soil. The species name

*eschscholtzii* is for the botanist Johann Eschscholtz, who was with the Romanoff expedition to the coast of California in 1816.

There are five varieties of Timberline buttercup; the only variety in our area is variety *trisetus*, a name which refers to the way its leaves are deeply split into 3 main lobes, and each lobe again split into 3 or 5 smaller lobes. There are about 28 species of buttercup in northeast Oregon, which one might assume would be confusing, but most of them are fairly distinctive in appearance.

The timberline buttercup flowers are about an inch across. The overall plant grows somewhat sprawled in mats up to a foot across on the ground, with stems curved upward. Many species of buttercup have been used for food, medicine and even for poison on arrows, depending on which plant was used. However, I have not found any reference to uses for this species.

• **Where to find:** You can find this buttercup at high elevations in wet mountain meadows and rocky slopes.

## BEES: Requires more physical labor than you think

Continued from 1C

Martin just got new eyeglasses and said for the first time does not need a magnifying glass to see the new eggs.

He joined the Oregon State Beekeepers Association and last year attended its conference. He has a beekeeping mentor, Jan Lohman, secretary of the state association. He also is taking the Oregon State University Extension Service's master beekeepers class. There's book-learning and online tests, he said, plus time in the field with bees and hives under the observant eyes of master beekeepers.

"It's all a learning thing," he said. "You ask 10 beekeepers how to do it, and you'll get 15 answers."

The learning and experimenting, he said, are big parts of why he enjoys the beekeeping. Early efforts without much education, for example, showed him why beekeepers wear white. While putting bees into a new hive, they cling to his blue jeans and dark shirt. He surmised the bees mistake the darker colors for tree bark. The bees don't cling to the white suit.

But they do seem to be able to hold a grudge.

He recalled one of his sons flicked a bee. The insect spun around and flew right at Martin. But it stopped



Staff photo by Kathy Aney

Bees cover a frame in one of beekeeper Ron Martin's beehives.

in mid-flight, turned and headed at this son, glancing off his cheek.

Martin said the bee must have realized he was not the flicker, but his son was — so it gave him a little warning.

Beekeeping also is "a lot more physical labor than you think there is," he said. Next year his hives should produce honey, and he wants to collect the golden, sweet substance that bonds bees and humans. That collecting is going to take work. Honey, he said, is heavy.

Martin also is looking to transport his bees to help pollinate crops locally and

afar. He said one son worked last year in San Francisco and talked with an almond grower who needed 3,500 more hives.

Martin said he didn't think of himself as the kind of guy who dives into the deep end right off, but he has a history of digging into projects, like when he got into homebrewing.

"I made a lot of beer," he said.

He also is a cancer survivor of more than six years. He plays guitar, sings and even runs karaoke at the Eagles Lodge in Pendleton. The guy counts the shopping

days until Christmas.

Maybe he and his sons will turn this into a small business and sell "Martin Honey." The Pendleton Farmers Market would be the obvious gateway. If the endeavor takes flight like that, Martin said his sons probably would have to handle it.

But now is too early to make that sort of buzz, Martin said, and he has much to learn about what all this could be.

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