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Upwelling

Newsletter of the Friends of Hatfield Marine Science Center www.hmsc.oregonstate.edu/friends

Researchers and fishermen work to reduce bycatch

Researchers working at the HMSC campus have been at the forefront of the Pacific Northwest's research on Bycatch Reduction Devices (BRD), collaborating with fisherman, net makers, and management agencies to help advance sustainable fisheries. Fisheries that have benefitted from BRD research at HMSC include the Pacific whiting industry (reducing Chinook salmon and rockfish bycatch), Oregon pink shrimp industry (reducing habitat impacts and bycatch of eulachon and juvenile rockfish), and the groundfish bottom trawl fishery (reducing Pacific halibut bycatch).

In new research published recently in the journal *Fisheries Research*, HMSC researchers Mark Lomeli (Pacific States Marine Fisheries Commission) and Waldo Wakefield (NOAA Fisheries Northwest Fisheries Science Center) working with the groundfish fishing industry in the Pacific Northwest have tested a new "flexible sorting grid Pacific halibut excluder". This BRD shows promise to significantly reduce the incidental take of Pacific halibut from commercial bottom trawl fishermen seeking groundfishes. In a series of tests that included 30 tows off the Washington coast, commercial fishermen were able to reduce the number of halibut taken as bycatch by 57%, while retaining 84% of the targeted groundfishes.

Catch from one tow with a net equipped with a halibut excluder. Retention was 89% for target species and only 11% for halibut.

NOAA fisheries implemented a new management system for the West Coast groundfish trawl fishery known as a catch shares system. Under this system, fishermen in the trawl fleet no longer depend on a single, fleet-wide quota to determine how many fish they can harvest during any given year. This individual fishing quota program divides the total amount of annual allowable catch into shares controlled by individual fishermen or groups of fishermen (cooperatives). Because the catch share program holds fishermen accountable for their targeted catch as well as bycatch, bycatch reduction is receiving more attention.

"Fishermen are really engaged in the research because they are concerned about getting shut down if the weight of the halibut bycatch approaches a certain threshold, and they don't want to unnecessarily be killing halibut, salmon and other species," according to Wakefield. "The fishermen are not only engaged with the scientists, but they interact with each other and with the net-makers".

From the same tow, excluded fish caught in the recapture net. Escapement out the excluder was 61% for halibut (bottom of photo) and 39% for target species (top of photo).

Learn more about Bycatch and BRDs at Marine Science Day on April 13

Marine Science Day 2013 will feature bycatch research conducted at HMSC. Scientists from NOAA Fisheries, Oregon Department of Fish and Wildlife, Pacific States Marine Fisheries Commission, as well as Foulweather Trawl (a Newport netmaker), will be on hand with actual BRDs and video to show how fish are excluded or retained, depending on their size, swimming ability or other characteristic. Other research will highlight genetics or other tools used to distinguish between wanted and unwanted catch. Scientists will be on hand to answer questions and discuss their research. For more information on Marine Science day, turn to page 2!

Notes from the Interim Director

Janet Webster, HMSC Interim Director

It came ashore in the night. Rather than the beginning of a bad novel, it is the middle of an interesting saga. The concrete dock that washed ashore in June 2012 at Agate Beach was part of the infrastructure of the fishing port of Misawa, Japan that was wrenched from its moorings during the Tokohu Tsunami March 11, 2011. On March 12, 2013, we dedicated a new exhibit featuring a corner of the Misawa dock reminding us of the power of the ocean, the resilience of people and the need to be prepared. Over the past two years, we've worked to be able to respond scientifically and personally when an earthquake hits Newport and the tsunami follows.

They arrived by truck –red, blue, yellow, orange, green. This is not another bad beginning but the colors of the new chairs in Classroom 28 that has been transformed from frumpy to fun with great teaching technology. The renovation marks a physical beginning for how HMSC will respond to President Ray's suggestion that we play a bigger role in the OSU educational mission. Rob Suryan is leading an Education Needs Assessment project to explore how HMSC could grow its education programs to accommodate 250-500 students. Our focus will be on opportunities that exploit the experience of being at HMSC, utilize the incredible expertise of HMSC people and collaborate with community partners.

He came from Florida. This is the beginning of a new chapter at HMSC. Dr. Bob Cowen will be Director of the OSU Hatfield Marine Science Center starting in late July. He is currently the Robert C. Maytag Chair of Ichthyology at the University of Miami's Rosenstiel School of Marine and Atmospheric Science. You can learn more about Bob at http://bit.ly/WRHaNc. Meanwhile, I will continue serving as interim director of the center (as well as the director of the OSU Guin Library), a position I assumed when George Boehlert retired at the end of December.

The sun shone brightly. And of course it will when you, family and friends attend Marine Science Day on April 13th. In addition to our usual diversity of marine research, we'll be highlighting two research themes – wave energy and reducing fisheries bycatch. Please see below for the Schedule of Events.

Mark your calendar for Marine Science Day at the OSU Hatfield Marine Science Center!

Schedule of Events

Friday April 12

6pm: Science on Tap at Rogue Brewery

Waldo Wakefield (NOAA Northwest Fisheries Science Center) and Mark Lomeli (Pacific States Marine Fisheries Commission) will present their research on a Bycatch Reduction Device (BRD) designed to reduce the incidental take of Pacific halibut from commercial bottom trawl fishermen seeking groundfishes. The family-friendly event at the Rogue in South Beach is free and open to the public; doors open at 5:30. Food and drink available for purchase.

Saturday, April 13

10am-4pm: Get "Behind-the-Scenes" at HMSC!

HMSC's laboratories and classrooms will be open to the public, with interactive exhibits staffed by marine scientists. This self-guided tour includes special displays on wave energy (more on page 8) and will highlight fisheries research designed to reduce bycatch in Oregon's fisheries (more on page 1). Guided tours will include the ever-popular HMSC seawater system tour and the aquatic animal husbandry lab, or "Back Wing Tour". Don't miss the genetics lab, touch tank and other Visitor Center exhibits, as well as special activities just for kids!

Saturday, April 13

1pm: Octopus Feeding, in the Visitor Center

Learn about octopuses through HMSC's newest cephalopod ambassador, "Miss Oscar". Can't wait? Get a sneak peek with Octocam: http://hmsc.oregonstate.edu/visitor/octocam

3pm: Wave Energy Presentation, in the Visitor Center Auditorium

Sarah Henkel (OSU Department of Zoology and the Northwest National Marine Renewable Energy Center) will give an update of wave energy developments on the Oregon Coast and highlight research being conducted at HMSC that addresses interactions of wave energy devices with the marine environment.

Hosted by Oregon State University and the federal and state agencies of the Hatfield Marine Science Center, as well as the Oregon Coast Aquarium and the NOAA Marine Operations Center – Pacific. If you would like to volunteer for this event, please email Annie Thorp at marinescienceday@gmail.com. For more information, see hmsc.oregonstate.edu.

Thank you for your support. To become a member of the Friends of HMSC, or for more information, please see http://hmsc.oregonstate.edu/friends/

Dual necropsies mark a very special Shark Day

Shark Day on January 12 was a unique event this year with two necropsies. Bill Hanshumaker presented to an amazed crowd - performing a comparative necropsy of Salmon and Thresher Sharks. Midway through the event there was a dramatic blood-spraying tail flip as the animal was turned, much to the surprise of Shark Day visitors.

Fossil Fest

Fossil Fest, held Saturday, February 9, 2013 was a big hit. Described as the "antique roadshow of fossils", the annual event brought wonder and excitement as hundreds of fossils were brought in to be identified and aged by experts. In addition to fossil displays and special activities hosted by the North American Research Group, Dr. William Orr of the University of Oregon presented, "Oregon Geology; a decade of discovery."

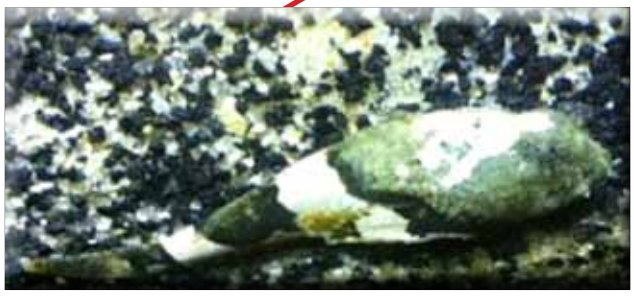
Aquarist Corner

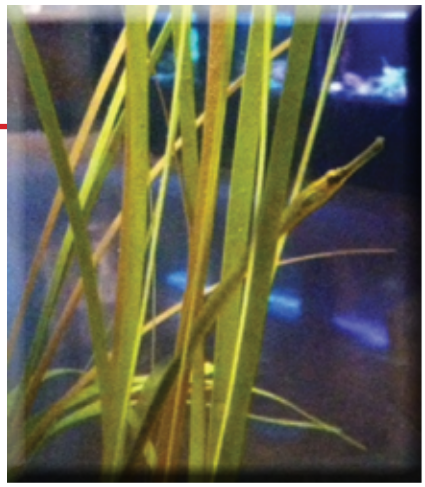
by Colleen Newberg, HMSC Senior Aquarist

It's time to take a closer look in the Visitor Center. The aquarists have been busy this month updating the Octopus Exhibit, Micro Exhibits, and the Six Rack Exhibits in the Visitor Center. Some of these updates include new and exciting, but easy to miss, animals unless you take a closer look! Check out these photos of

- a new sailfin sculpin
- a stout shrimp
- a juvenile buffalo sculpin
- and a bay pipefish

doing what they do best - blending in with their surroundings.





HMSC Briefs

Friends of HMSC Member Event - Using Ocean Indicators to Forecast Salmon Returns

A group of our generous HMSC supporters gathered in January for the annual Friends of HMSC Member Event! The action-packed evening featured NOAA scientist Dr. Bill Peterson and his OSU research colleagues Jay Peterson, Tracy Shaw and Jennifer Fisher, all part of the NOAA-OSU Cooperative Institute for Marine Resource Studies.

After an introductory presentation, participants were introduced to some of our smallest neighbors here in Yaquina Bay - a diverse array of plankton collected that morning off Newport's pier with a fine mesh net. Observation of these tiny creatures was made possible by HMSC's new donor-funded microscopes, set up in one of our wet lab classrooms.

As participants, each with their own microscope, adjusted to the microcosm that is a drop of seawater, the excitement grew. Bill and his team enthusiastically pointed out the different species and interpreted some of the behaviors observed (yes, 'pooping' was one of them!) Copepods – tiny shrimp-like animals - were the superstars of the event and are a big part of the team's research, which uses the physical and biological conditions of the coastal ocean to forecast salmon returns to the Columbia River.

The hands-on lab portion was followed by a reception in the HMSC staff lounge, where the scientists continued to field a dynamic mix of questions from guests. To learn more about the group's Ocean Indicators research, please see http://www.nwfsc.noaa.gov/oceanconditions

Volunteer Corner

Volunteer **Summer Meredith** works seasonally as a biologist onboard fishing vessels in the Bering Sea. When she's back on land, she spends time in Newport and has been volunteering at HMSC since winter of 2012. Summer has a BS in Marine Biology and is knowledgeable about marine life off of the Oregon Coast, the Gulf of Maine, and the Bering Sea. She is currently volunteering 40 hours a week, working in both interpretation in the Visitor Center and helping out the Animal Husbandry Team behind the scenes. We are very grateful that Summer is dedicating so much time and energy to volunteering and will miss her once duty calls again in Alaska!

This year's annual employee Soup Kitchen fundraiser for Lincoln County Food Share was bumped up a notch with the new "Most Attractive Pet" contest! The brainchild of **Candace Rogers**, Assistant to the Director, the contest pitted HMSC's pets against each other in a stuff-the-ballot-box, hallway lobbying-type competition for "Most Attractive". At a dollar or a can of food per vote, the competition was fierce, but it turned out to be a win-win for Hatfielders who enjoyed the fun and Lincoln County Food Share, a local non-profit that serves a critical need in our community.

Here are the stats:

Total Pets entered: 66

Total Votes cast: 427

Pet Contest total earned: $318 plus approximately 161 pounds of food

Total earned this year at HMSC for Lincoln County Food Share: $1140

The Story of the Tsunami Dock

After months of planning, preparation, and coordination, a piece of the Tsunami Dock that washed ashore in Newport in June 2012 is in place. The dock serves as a centerpiece for the Visitor Center's tsunami education exhibits - as well as the starting point for the new Tsunami Evacuation Interpretive Trail leading visitors to high ground from HMSC (bottom right).

The exhibit dedication took place on March 10th, marking the second anniversary of the massive earthquake. The quake rattled northern Japan and triggered a tsunami that killed thousands of people. Speakers represented HMSC, Oregon Sea Grant, Oregon Emergency Management and the City of Newport, the organizations that have been instrumental in developing the exhibit and increasing preparedness on the coast. Former Newport Mayor Mark McConnell and Japan's Counsel General, Hirofumi Murabayashi read the dedication plaque (below left) in English and in Japanese, respectively, and led visitors in a moment of silence to honor the victims.

The floating dock was one of four used by the fisherman of Misawa, Japan to offload their catch. The docks had dramatically improved the Misawa port's infrastructure, with time- and labor-saving equipment that allowed their fresh catch of surf clams and squid to reach the lucrative Tokyo markets more quickly. (see http://www.oregonquarterly.com/spring2013/feature2.php)

Photo at top of page: The dock drew thousands of visitors to the coast before it was removed, and captured the attention of biologists who rushed to examine the dozens of living organisms attached to the structure. These organisms were near shore species common to Japan, but most were not native to the Oregon coast, and some were potentially invasive.

Photo left: A piece of the dock was preserved for the exhibit. The HMSC Facilities team, lead by Jim Lewis, built a beautiful cement pad, with design elements inspired by the Yaquina Bay Bridge. Interpretive signage was designed by Oregon Sea Grant.

HMSC Academic Program News

Fall Weekend Experiential course on Marine Habitats

A full weekend of experiential learning recently introduced first and second year students to marine science topics and to educational and research opportunities at the Hatfield Marine Science Center. Part of a wildly popular series of weekend experiential courses for undergraduate students, two more on marine mammals and seabirds will be offered this spring term.

Diving? Dissecting? Dilemmas!

This summer HMSC will be piloting an 8-week summer instructional program in Marine and Environmental Sciences! HMSC has ramped up its summer offerings dramatically with short intensive courses from Biology and Conservation of Marine Mammals to Ecology of Marine and Estuarine Birds. According to Itchung Cheung, Academic Program Coordinator, the full 8-week summer session program will highlight "real hands-on experience, geared for students pursuing degrees in marine science related majors such as marine biology, oceanography, environmental sciences, etc." The diverse offerings highlighting research techniques used at a marine station or field site will include a marine mammal necropsy, rearticulating a seabird skeleton, scientific diving, and applying GIS to the marine environment.

HMSC support of student research leads to conference presentations and $1 million in grant funding

HMSC's commitment to mentoring undergraduate student research has again led to student participation in an international professional conference. Six interns from HMSC's 2012 Research Experience for Undergraduates (REU) program presented a poster or oral presentation at the annual Association for the Sciences of Limnology and Oceanography meeting in New Orleans, "Learning for the Future". The success of this program was recently recognized by the National Science Foundation and Department of Defense, which granted the program $1 million for five years of additional funding!

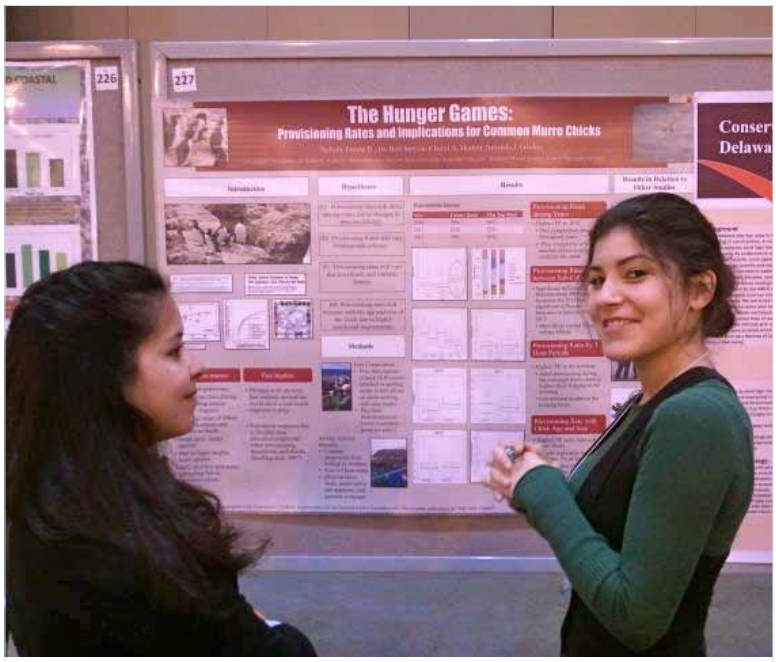


Photo right: HMSC REU Emma Nelson from the University of Massachussettes Amherst shown with her ASLO poster entitled The Hunger Games: Provisioning Rates and Implications for Common Murre (Uria aalge) Chicks.

OSU to lead the design of new Regional Class Research Vessels for oceangoing research

The National Science Foundation has chosen Oregon State University to lead the design and coordinate the construction of as many as three new coastal research vessels to bolster the marine science research capabilities of the United States.

The proposed 175-foot long Regional Class ships will be flexible multi-use laboratories that can be adapted for different scientific purposes. They will be ideal platforms for training early-career scientists and mariners and addressing the most pressing issues facing our oceans, including acidification, hypoxia, tsunami prediction, declining fisheries, and harmful algal blooms. Ships will be equipped with modern telecommunications technologies and sensors to be able to transmit a rich variety of observations to scientists, educators and the public ashore.

Clare Reimers, an oceanography professor with OSU College of Earth, Ocean and Atmospheric Sciences, and Demian Bailey, the university's marine superintendent, both based at the OSU Hatfield Marine Science Center, submitted the successful OSU proposal to the National Science Foundation. As part of that submission, OSU proposed to be the operator of the first vessel. The university now operates the R/V *Oceanus*, an older research vessel scheduled for retirement about the time the new research vessels will become available. If all three vessels are built, it is likely that one would be positioned on the East Coast, West Coast and Gulf Coast.

"The National Science Foundation hasn't authorized a multi-ship project since the 1970s," Bailey said, "and these are likely the only ships scheduled by NSF to be built during the next decade – so this is a big deal. The endurance and size of the new ships will be similar to that of *Oceanus* and (former OSU vessel) *Wecoma* but they will be much more efficient and have far greater scientific capacity and flexibility."

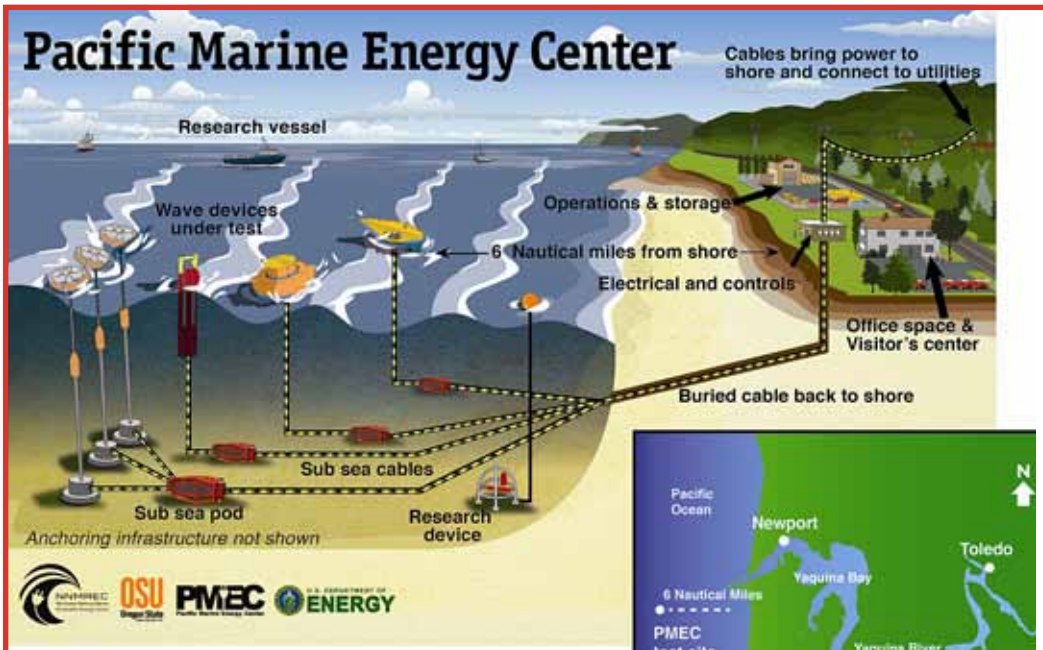
Bailey said the new vessels will have advanced dynamic positioning that will help them stay in place in the rugged Pacific Ocean. That is a benefit for launching and retrieving gliders and other autonomous or remotely operated vehicles, conducting precise seafloor mapping, and retrieving moorings and other instrumentation. They also will be much quieter, which will help researchers who use acoustics to study everything from endangered whales to undersea earthquakes and volcanoes.

Reimers said the first phase of the 10-year project will begin in early 2013 with the finalization of the vessel design. OSU initially will receive nearly $3 million to coordinate the design phase of the project – and if funds are appropriated for all three vessels, the total grant is projected to reach $290 million over 10 years.

An early concept rendition of the Regional Class Research Vessel design prepared by Glosten Associates is shown.

Save the Date! April 13 is Marine Science Day - See pages 1 & 2

Newport Selected as Home of Pacific Marine Energy Center



PMEC will test energy generation potential and the environmental impacts of wave energy devices at an ocean site about five miles from shore. Subsea cables will transmit energy from the wave energy devices to the local power grid, and data to scientists and engineers at on-shore facilities.

Newport was recently chosen as the future site of the first utility-scale, grid-connected wave energy test site in the United States – the Pacific Marine Energy Center (PMEC). The Northwest National Marine Renewable Energy Center (NNMREC), a partnership between Oregon State University and University of Washington, currently operates a non-grid connected wave energy testing facility in Newport north of Yaquina Head, and PMEC will complete the wave energy device test facilities. The development and operation of this facility is expected to provide jobs and other economic development as it attracts researchers and device developers to the Oregon coast from around the world. Learn more about wave energy at Marine Science Day on April 13!