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Upwelling

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

Tsunami Debris Lands Marine 'Hitchhikers' on Oregon Coast

The Hatfield Marine Science Center made international news in June 2012 when a floating dock of Japanese origin appeared in Newport only a few miles from HMSC. As state agency personnel were discovering that the dock was from the northern city of Misawa in Japan, one of the communities devastated by the March 2011 tsunami, HMSC marine ecologist Jessica Miller and her husband Ed Backus wandered over to have a look. They were immediately surprised by the diversity, and quantity, of nearshore marine life still attached, in spite of 14 months in the open ocean.

Miller and other HMSC researchers, including invasive species expert John Chapman and seaweed taxonomist Gayle Hansen, returned the next morning to collect representative samples of the dock's rich flora and fauna. Several of the species present were quickly confirmed to be potentially invasive (including a brown algae, "wakame", known to be invasive in California). This prompted a rapid response from the Oregon Department of Fish and Wildlife's (ODFW) Marine Resources Program staff at HMSC, who scraped, then scorched the dock's surface and buried the foreign marine life high up on the beach to decompose.

Invasive marine species are already a problem on the West Coast without tsunami debris 'hitchhikers'. It is not yet known how much of a threat the dock's organisms present, but the thriving community on the dock's surface is providing an unprecedented opportunity to research the mechanisms of marine biological invasions and the life history characteristics of species that survived the trans-oceanic journey.

For Jessica Miller, however, as well as for many of the dock's thousands of visitors, its presence inspired sympathy for the tsunami victims and served as a stark reminder of a great human tragedy that is still unfolding. The dock has since been dismantled, but plans for part of it to be exhibited at HMSC are underway.

The floating dock hosted a diversity of nearshore species common in Japan, which are currently being identified by HMSC researchers, as well as species typical of the open ocean environment, such as gooseneck barnacles. For updated information on species identification, go to: http://blogs.oregonstate.edu/floatingdock/

Notes from the Director

Summer 2012 has been perhaps the busiest of my 11 summers here as director. On top of the usual education programs, growing internship programs, and youth and public education, a series of events came together that resulted in unusual activity at HMSC. One would have to have been hiding under a log or perhaps fly fishing in Alaska to miss the news about the Japanese dock washing ashore at Agate Beach. This quickly became the event of the year for this region, as described on page 1. While marine debris on our beaches is nothing new, this event was unique in at least three ways – first, it put a sharp point on the devastation from the Japanese tsunami; second, it brought nearly intact communities of fouling organisms to our shores after an 14 month "cruise" across the Pacific; and third, it made landfall near a great marine lab, with experts like Gayle Hansen, John Chapman, and Jessica Miller able to recognize the enormity of the event and take appropriate action along with a great response by ODFW staff at HMSC. The dock has since been cut apart and removed from the beach, but we are working with the City of Newport to develop an educational display using a large chunk of the dock outside the Visitor Center.

The Visitor Center has nearly completed the new wave tank exhibit along with all the new electronics throughout the facility, and the popularity with the public has been astounding. New developments on the ocean energy front and in ocean observing systems are also bringing great attention to Newport, and the number of scientific visits is increasing accordingly. HMSC really is a hub for marine science in the Pacific Northwest.

Dr. George Boehlert, HMSC Director

More good news for HMSC came this spring in the form of promotion and/or tenure for OSU faculty based in Newport. Promotion or tenure represent significant milestones in the career of a university professor, earned through recognition by peers and the University for scholarship including grants received, research published, students mentored, courses taught, and professional and community service. Congratulations to Scott Baker and Jessica Miller for being granted indefinite tenure and to Jessica and Rob Suryan for promotion to Associate Professor, all in OSU's Department of Fisheries and Wildlife. Other promotions include Itchung Cheung (to Senior Instructor in Biology) and Elizabeth Daly (Cooperative institute for Marine Resource Studies). Congratulations to all on these accomplishments!

Finally, some news from the Director's office. I am officially retiring from my position as Director at the end of September, but will be around to help out a bit until a replacement is here, as well as tying up a few loose ends. HMSC is a leading marine lab in the US, and it has been a real privilege to serve for just over 10 years as director and to call the OSU and agency staff here colleagues. I have also appreciated the help and support from the Lincoln County community and the many friends, donors, and volunteers who help make HMSC the wonderful and welcoming place that it is.

A Special Invitation for the Friends of HMSC

The OSU Hatfield Marine Science Center invites the Friends of the Hatfield Marine Science Center (our generous donors and volunteers) and their families to two exciting events!

Friday, September 28.

Afternoon opening for the Visitor Center's new Wave Energy exhibit (see page 3)! The 3-5pm opening will be followed by 'Science on Tap' at Rogue's Brewer's on the Bay in South Beach from 5:30-7:30pm. See hmsc.oregonstate.edu/visitor for additional activities on opening day.

Saturday, September 29.

Join us for an informal all-HMSC potluck picnic from 3-7pm on the HMSC campus. The picnic will celebrate HMSC's partnerships as well as the retirement of George Boehlert, HMSC Director since 2002.

All are welcome, no RSVP necessary.

Questions? Contact maryann.bozza@oregonstate.edu or 541-867-0234.

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/

Join us September 28th for an exhibit unveiling!

by Shawn Rowe, Free-Choice Learning Leader, Oregon Sea Grant

This summer we've been busy developing, installing, and testing three new interactive wave tanks for the Visitor Center. The tanks are part of a redesign of the old Chaos Wheel area of the Visitor Center to include a collection of exhibits on the physics of waves, wave energy extraction and development, coastal erosion and hazards, and ocean and coastal engineering. The three tanks allow visitors to build and test wave energy buoys, tsunami shelters, and experiment with methods for controlling beach erosion. The centerpiece of the exhibits is the large computer controlled flume that allows visitors to "dial up" any type of wave. New signage, video exhibits, and artifacts complement the interactive tanks. Visitor Center Lead Mark Farley explains that the new exhibit is a true partnership: " We've had great involvement from this summer's interns and free-choice learning graduate students who have designed and tested activities to make them bullet proof. We've also had a lot of support from OSU's Dan Cox in Engineering and Alicia Lyman-Holt from the Hinsdale Wave Lab as well as NNMREC, Sea Grant Extension, and volunteers to get this large exhibit off the ground."

The official exhibit opening will be September 28 from 3-5pm. Demonstrations and talks in the Visitor Center will be followed by a 'Science on Tap' event at Rogue Brewery! See page 2 for more information.

Meet our summer Visitor Center Sea Grant Scholars

Each year, Oregon Sea Grant employs several Summer Scholars as interns in the Visitor Center. The purpose of these internships is to introduce undergraduates to techniques for communicating science to informal audiences. Sea Grant Scholars in the Visitor Center work alongside volunteers as interpreters delivering daily public programming including the Estuary Walk and OceanQuest auditorium presentations. Scholars also work with HMSC scientists and Sea Grant faculty to develop activities, exhibits or curriculum. Some also carry out evaluation or research projects related to current or future exhibits. Each of our scholars comes with a different background.

Julie Nance is a student at Utah Valley University where she works on a BS in Biology Education. Julie is also working on an Environmental Science and Earth Science Endorsement to prepare her for teaching a broad variety of sciences.

Nicholas Pitz is an OSU Fisheries and Wildlife student who also volunteered in the Visitor Center during the fall of 2011 while taking coursework at HMSC.

Diana Roman just completed her BA in Biology at St. Mary's College in Maryland. She spent five months this past year studying marine biology abroad in Australia at James Cook University.

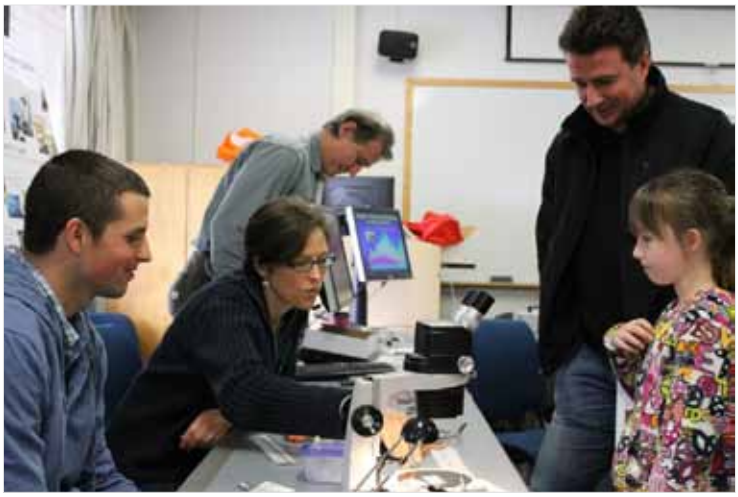
Brian Verwey is a Fisheries and Wildlife undergraduate student at OSU. He also spent part of last year studying abroad in Valdivia, Chile at the Universitdad de Austral. This was his second study abroad year and his second spent in Chile.

This summer the four scholars are helping to develop, test, and redesign activities for our new wave tank exhibits installed early this summer. This includes designing activities, running them with public audiences, finding out what works and doesn't, what breaks and doesn't, and what people learn from the activities. In addition, one of our scholars, Julie Nance, is carrying out front-end evaluation to learn what HMSC audiences believe about climate change and how they would interact with an exhibit that's in the works for next year.

MARINE SCIENCE DAY

First Annual Marine Science Day a Success!

HMSC launched the first annual Marine Science Day on Saturday, April 14, celebrating the innovation and synergy in marine science that makes the Hatfield Marine Science Center unique. As an open house for OSU and the six federal and state agencies co-located on the HMSC campus, as well as the Oregon Coast Aquarium and the new NOAA Marine Operations Center-Pacific, the day long event consisted of tours, displays, demonstrations, and presentations. Over 3500 visitors enjoyed 30 different exhibits presented by marine scientists and educators in 3 different buildings, in addition to regular and special Visitor Center activities. Mark your calendars now for the next Marine Science Day...on April 13, 2013!



Marine Science Day, designed to foster a direct connection between marine scientists and educators and visitors of all ages, offered an opportunity for one-on-one conversations with scientists on a broad range of topics reflecting the diversity of HMSC's marine research. ***Jessica Miller,*** *an OSU marine ecologist at HMSC, engages a young visitor on the use of salmon otoliths, or ear bones, to study mixing and migration.*

Young participants practice their field skills as they learn to weigh a seabird. ***Rob Suryan,*** *an OSU seabird ecologist at HMSC, demonstrated techniques for how you would handle, measure, and attach an electronic tracking device to a live seabird.*

Ensign ***Andrea Proie*** *of the NOAA Corps engages an excited young visitor in NOAA's exhibit on hydrographic research. Officers from the new NOAA Marine Operations Center -Pacific were on hand to introduce visitors to the shipboard science of the National Oceanic and Atmospheric Administration's Pacific research fleet, now homeported in Newport.*

*Oregon Sea Grant's **Bill Hanshumaker** offered up an unusual opportunity to observe a sea turtle dissection during Marine Science Day. The turtle had washed ashore in Oregon, where it likely succumbed to low sea temperatures out of its usual warm water range. The dissection in the Visitor Center was very well attended, and Bill and assistant **Erin Riley** earned an enthusiastic round of applause when they finally managed to penetrate the animal's thick shell. For video, see: http://hmsc.oregonstate.edu/marinescienceday.whtml*

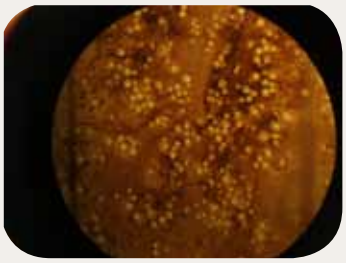
Volunteer Corner

HMSC Volunteers **Annie Thorp** and **Mike Courtney** (*left*) strike a classic pose during a weed pull they organized on the HMSC campus last year. They, along with fellow HMSC volunteer **Laura Neary** (*shown in the center of photo to the right*), spent a year planning and implementing Marine Science Day 2012 alongside HMSC staff. Volunteers **Kent Kroneman**, **Judy and Dick Brim** and many, many other Visitor Center Volunteers and HMSC staff contributed their time and talents in their usual "above and beyond" style to help make this event a success.

Spotlight on COSEE PP PRIME Interns: (That's the Centers for Ocean Sciences Education Excellence (COSEE) Pacific Partnerships (PP) Promoting Research Investigations in the Marine Environment (PRIME)…whew!)

Drew Hill's path is a wonderful example of the many efforts of HMSC's partners. Drew is a Portland Community College student who interned with Brett Dumbauld, a USDA scientist based at HMSC, in the COSEE PP PRIME program in 2011 mapping burrowing shrimp populations in the estuary. He liked his experience so much he applied to HMSC's Research Experience for Undergraduates (REU) internship program and was selected to conduct a diet analysis of forage fish. After returning from a 5-day cruise with his coworkers aboard the vessel *Miss Sue*, he's hooked --- bait, line and sinker! Drew's plans are to finish up this summer, participate in an additional cruise in September and pursue graduate studies in fisheries ecology at OSU.

Thomas Stinson is working with Kym Jacobson who focuses on one particular parasite, *Nanaphyetus salmincola,* that infects salmon and some mammals. This particular parasite is drawn to the posterior end of the kidney in the salmon, and Thomas, in his first research experience, is examining this kidney section for the parasite. A Rogue Community College student, Thomas is gaining research skills in clean dissection practices, microscopy, parasite identification, field seining, boat skills and interacting with researchers on a daily basis.



Michaela Semple, an Oregon Coast Community College (OCCC) student in the Aquarium Science program, moved to Newport in September 2011 from Iowa. She is the first OCCC student to be a COSEE PP PRIME intern. Michaela's research is on impacts of ocean acidification on Corallina algae. So far she has participated in one experiment with two types of Corallina algae, *Corallina vancouveriensis* and *Bossiella orbigniana.* They measured the recovery rate of the Corallina algae and a kelp, Saccharina spp. after varying exposure times under a metal halide light. In addition to running light exposure experiments, Michaela has been learning a lot about our coastal ecology, joining grad students from the PISCO- Partnership for Interdisciplinary Studies of Coastal Oceans lab on field surveys in Depoe Bay and collecting new samples of Corallina algae.

Jonathan Robertson is a Portland Community College student planning to transfer to OSU this Fall to pursue a degree in Biology with a marine focus. He has been gaining a wide range of field experience working with Vincent Politano in the Heppell lab at HMSC. Jonathan has gained experience in experimental design, presenting scientific data, design production of fish traps for collecting demersal fishes, website creation, and an introduction to ArcGIS and other data analysis software. Field skills acquired include safe boat operation, piloting a sea vessel, practical knot work, survival suit care and use, fish trapping and ID, shore seining, otter trawling, crabbing, and clamming.

What it means and how we use it: HMSC Markham Research Awards

by Itchung Cheung, HMSC Academic Coordinator

In this day and age where students are clambering more than ever to obtain research and lab experiences that are directly related and applicable to their career interests in marine science, HMSC's donors are meeting and supporting those needs. Every year a combined total of some $100K is awarded to bright, engaging and hopeful undergraduate and graduate students to conduct research, teach experiential courses and reach out to the public about the relevance of their science. These valuable awards from donors not only provide needed financial support for these students to continue their research but also a morale boost to recognize the value of their work - that what they are doing is important, valued and above all interesting! The traditional profile of undergraduates and graduates today in this challenging economic environment is changing. We have students ranging in age from 18 – 67, single, married, with kids and even grand kids. The reality is, a student pursuing science looks very different today and as a result provides wonderful diversity and perspective on our science that more closely represents our society. These different backgrounds also come with many challenges, and the Markham and other awards provide much needed support for HMSC students to pursue their research.

Interns and NOAA Fish Cutting Fiesta!

by Thomas Stinson, COSEE intern

Well the fish cutting party was a complete success. 1000 fish in two and a half days and nobody got hurt. In case you are curious what a "fish cutting party" is like here is a brief description.

With two rooms transformed into what looks a little like a field hospital, with an assortment of absorbent supplies and surgical tools like scalpels, tweezers picks and scissors, the next step is to set up and organize the labeled bags, vials and jars that will hold the various samples from the fish. Each vessel is labeled with a corresponding salmon ID number that was given to a fish upon collection and placed in a cup that will be delivered to the cutting station with the fish.

Fish are identified by species, weighed, measured and inspected for tags or markings either given to them by workers at the hatchery or from life in the wild. Some may have talon marks from birds or wounds from lamprey bites. Others may have a fin clipped or even a latex tattoo on the cheek under the eye. Each fish is run through a scanner. If there is a tag the scanner will produce a number code that can identify the fish, its point of origin and species. It may even have a point of release and a size. This type of information can be useful to scientists in figuring out where the fish are spending their time, over all fitness and migration habits.

Once the necessary information is recorded the fish are picked up from the staging area and brought to a station where they are meticulously dissected to remove key internal parts as well as a DNA sample and in some cases a bone from the ear called an otolith. All of these samples are carefully packaged and frozen for later analysis. Prizes were even handed out to those that found an internal tag or a surprise parasite.

The thing that impressed me the most about the fish cutting party was how well everyone worked together; people from every level working toward a single goal in a fast and efficient manner with no complaints. From the set up to the daily dish washing to the final take down everyone pitched in to make light work for the group.

It was a long two and a half days but in the end a lot of information was recorded and many samples were taken that will help us learn more about the fish at hand. Great job team!

Student Winners of the 2012 HMSC Markham Research Awards

Mamie L. Markham Endowment Award

Danielle Asson, Marine Resource Management (Advisor: Bill Hanshumaker)
Allison Barner, Zoology (Advisors: Sally Hacker and Bruce Menge)
Katelyn Bosley, Fisheries Science (Advisor: George Waldbusser)
Elizabeth Cerny-Chipman, Zoology (Advisor: Bruce Menge)
Nate Lewis, Marine Resource Management (Advisor: Sarah Henkel)
Amy Lindsley, Fisheries & Wildlife (Advisor: Scott Heppell)
Angela Sremba, Fisheries & Wildlife (Advisor: Scott Baker)
Amelia Whitcomb, Fisheries Science (Advisor: Kathleen O'Malley)
Noelle Yochum, Fisheries & Wildlife (Advisor: Scott Heppell)

HMSC Teaching Award

Renee Albertson, Fisheries & Wildlife (Advisor: Scott Baker)
Danielle Asson, Marine Resource Management (Advisor: Bill Hanshumaker)
Cheryl Horton, Wildlife Science (Advisor: Rob Suryan)

Fred and Joan Crebbin Memorial Fellowship

Michelle Fournet, Marine Resource Management (Advisor: Andrew Szabo)

Curtis and Isabella Holt Education Fund

Kathryn Stofer, Science & Math Education Free-Choice Learning (Advisor: Shawn Rowe)

Mamie L. Markham First Year Student Award

Erin Fedewa, Fisheries Science (Advisor: Jessica Miller)

Lillian Brucefield Reynolds Scholarship Fund

Renee Albertson, Fisheries & Wildlife (Advisor: Scott Baker)

Walter G. Jones Fisheries Development Award

Ryan Easton, Marine Resource Management (Advisor: Selina Heppell)

William Q. Wick Marine Fisheries Award

Charlene Hurst, Microbiology (Advisor: Jerri Bartholomew)

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SEE PAGE 2 FOR A SPECIAL INVITATION!

Innovations

What's new on the Oregon Coast? Wave energy!

In August 2012, OSU's mobile ocean test berth was anchored three nautical miles from shore, northwest of the Yaquina Head lighthouse in Newport. The test berth is designed to help wave energy device developers demonstrate, test, and advance their devices, which in turn helps speed and facilitate the complex process between research and development and commercialization. This test berth is the first mobile platform in U.S. open to private entities and joins only a handful of other sites worldwide. What is unique about the Oregon test berth is that extensive environmental baselines have been established, and will continually be monitored for any potential environmental or ecological changes.

The $1.5 million Ocean Sentinel will test the devices' ability to produce electricity in the punishing conditions of the open ocean. Designed and operated by the Northwest National Marine Renewable Energy Center, a partnership between Oregon State University and the University of Washington, it will provide access for any wave energy company to generate test data in a standard, comparable format. According to Sea Grant Extension agent Kaety Hildenbrand, "Experimental wave-energy generators vary in design, and can resemble buoys, snakes or clamshells. The test berth provides a level playing field for testing, regardless of the design." The first device tested will be the WET- NZ device designed by the company Wave Energy Technology New Zealand.

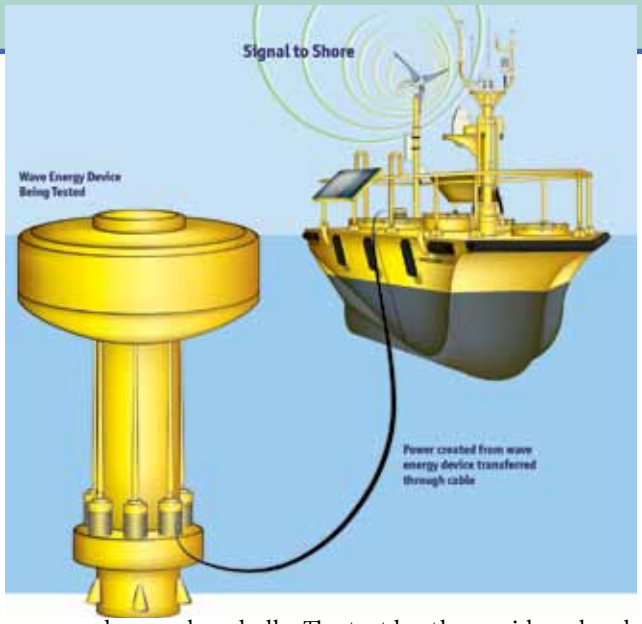

Diagram: NNMREC's Ocean Sentinel test berth was recently deployed 3 nautical miles offshore from Yaquina Head in Newport, Oregon for testing Wave Energy Converters in the open ocean. A new exhibit in the HMSC Visitor Center further describes the power inherent in ocean waves (see article, page 3). For more information: http://nnmrec.oregonstate.edu/