



HMSC scientist honored as a Pew Fellow in Marine Conservation

The Hatfield Marine Science Center is proud to announce that Scott Baker, OSU-HMSC professor and researcher with the Marine Mammal Institute has been named one of four 2011 Pew Fellows in Marine Conservation! A conservation geneticist and cetacean specialist, and associate director of the OSU Marine Mammal

Institute, Baker conducts forensic work on whales and other cetaceans. The prestigious Pew Fellowship in Marine Conservation is awarded to “outstanding global leaders or teams who are working to preserve and protect the world’s

oceans and marine species”. As a Professor in the OSU Department of Fisheries and Wildlife and an adjunct professor at the University of Auckland in New Zealand, Baker oversees numerous research projects and teaches and mentors a cadre of international students. He chairs the executive committee of the South Pacific Whale Research Consortium, frequently testifies at meetings of the International



Whaling Commission, and edits the prominent Journal of Heredity, a publication of the American Genetic Association.

Baker’s research has gained international attention, documenting the under-reporting of fin whales in Japan, the threat to minke whales of commercial “bycatch” whaling, and the illegal sale of whale meat as sushi in restaurants in Seoul, South Korea and Los Angeles. His DNA identification of dolphin meat was featured in “The Cove,” where he was seen in a portable genetic laboratory working in a cramped Tokyo hotel room (see photo). The film documented the hunting of dolphins in the small Japanese fishing village of Taiji, and the high levels of mercury found in the dolphin meat sold for human consumption.

The Pew Fellowship program provides a three-year stipend for conservation projects addressing critical problems facing the world’s oceans, which Baker will use to study populations of dolphins around islands across a vast area of the South Pacific. The region has some of the largest protected marine areas in the world and Baker’s study will help determine if these are sufficient in scale to sustain local dolphin populations. For more information about Scott Baker’s research, see: <http://mmi.oregonstate.edu/ccgl>

Innovations

500-Year-Old Salmon

Were ancient Chinook salmon populations similar in size and migration behavior to those today? Recent research by HMSC marine ecologist Jessica Miller uses innovative techniques to answer these and other questions relevant to modern salmon management. Miller analyzed 250-500 year old salmon ear bones called “otoliths” from a former archaeological site just downriver from Grand Coulee Dam, which were made available through a partnership with the Confederated Tribes of the Colville in Washington.

“It’s pretty amazing that we can look at the otolith of a 500-year-old fish and determine which river it likely originated in and at what size it entered marine waters,” said Miller, an OSU assistant professor of fisheries and wildlife based at HMSC. Otoliths have growth rings, analogous to tree rings, and by measuring the ratio of two elements (strontium-to-calcium) along the growth axis, scientists can determine if a fish had been living in salt water or freshwater at the time the growth ring was deposited.

Although they examined only a handful of individuals, the Chinook salmon that reared in the upper stretches of the Columbia River watershed 250 to 500 years ago left the rivers and entered the estuary – and possibly even the Pacific Ocean

– when they were smaller and younger than most of their contemporary counterparts. When dams and other development shifted salmon rearing from streams to hatcheries, collection and release of fish took place during certain times of the year, which can contribute to loss of diversity in this species. “Chinook salmon have a more diverse portfolio than other salmon species, which may be one reason some of their populations are doing so well,” Miller said. “Managing the resource to retain that diversity seems like a logical strategy.”

How can genetic and behavioral diversity help salmon in the face of environmental change? “We know there are advantages for the salmon to reach a certain size before entering the ocean, especially in avoiding prey,” Miller pointed out. “But there may also be long-term advantages to having individuals that migrate at a diversity of sizes.”



Photo: Juvenile Chinook Salmon

Notes from the Director

Spring and summer are, as usual, busy times at HMSC. The 30th anniversary of the spring residential Marine Biology course was celebrated at a symposium showcasing the projects that students conducted under the guidance of HMSC's Sarah Henkel. Staff in the director's office at HMSC, led by Maryann Bozza and Randy Walker, worked to overhaul our emergency planning and evacuation procedures. HMSC's growing summer internship program is hosting 31 interns this year! The initial orientation for many interns was followed by the Markham Symposium, showcasing the research of graduate students funded under the diverse donor-based scholarships at HMSC. From the Markham and several other endowments, HMSC's competitive scholarships awarded annually to OSU students exceeded \$100,000 for the first time in 2011.

HMSC's faculty continue to make waves and receive recognition. Scott Baker, Associate Director of the Marine Mammal Institute, received a prestigious Pew Fellowship Award this spring in recognition of his many contributions. Jessica Miller's creative research examining characteristics of salmon populations from 500 years ago has shed light on human-induced changes to salmon populations in the Columbia River system. Clare Reimers of COAS is helping young scientists and faculty from around the country by organizing workshops at the HMSC to instruct on the "tricks of the trade" for proposing and operating scientific cruises on University National Oceanographic Laboratory vessels such as the *Wecoma*. And finally, congratulations to Bryan Black (College of Forestry) and Markus Horning (Fisheries and Wildlife) for their promotions to associate professor this year.

Across the street, the new NOAA Marine Operations Center - Pacific facility has been officially accepted by NOAA from the Port of Newport. HMSC has worked to welcome the new facility and staff by holding a speaker series, "Seagoing Partnerships" to improve the awareness of the NOAA MOC-P mission for people in the region. While the buildings and docks provide a new look on the South Beach Peninsula, the City of Newport has been hard at work making transportation improvements, including pedestrian paths, roads, streetlights and landscaping – and perhaps most dramatic is the roundabout at the entrance to HMSC. I hope you've all had an opportunity to come out to the HMSC recently and see the changes; if not, please stop in and, at the same time, check out the Visitor Center.



Dr. George Boehlert, HMSC Director

A handwritten signature in black ink, appearing to read "George".

Ecological balancing act: oysters and shrimp

Brett Dumbauld, an ecologist with the USDA's Agricultural Research Service, studies two mudflat dwellers whose fates cross paths in Oregon and Washington's vast bays and estuaries: the oyster and the mud shrimp. Based at the Hatfield Marine Science Center and serving as OSU courtesy faculty, Dumbauld (shown on the right in the photo below) has been at the forefront of efforts to find an environmentally acceptable solution to a pest control problem that has plagued west coast oyster growers for decades: the presence of two species of burrowing shrimp which undermine the sediments that oysters rest on and cause them to sink under the surface and die.

Oysters are a major product of the west coast shellfish culture industry, which at 100 million dollars in sales still does not meet current demand. Industry growth is hampered by several problems, one of which is lack of effective, environmentally sound pest control for the ghost shrimp, *Neotrypaea californiensis* and mud shrimp, *Upogebia pugettensis*, both native to the US west coast. The issue is complicated by the fact that, in spite of their negative effects on cultured oysters, both shrimp are ecologically important and mud shrimp are themselves under attack by an invasive parasite.

The shellfish industry has used the pesticide carbaryl to control the shrimp in Washington estuaries since the 1960's. Due to lawsuits and environmental concerns over the pesticide's effects however, carbaryl use was stopped in the mid 1980's in Oregon and its use must be discontinued and



alternative methods implemented by 2012 in Washington.

Dumbauld's research aims to help industry discover these alternative methods, in part by studying the ecology of the shrimp and their life cycle

with a focus on identifying critical stages that are vulnerable to control. The shrimp leave the estuary for the sea as pelagic larvae, and the post-larval stage where they reenter the estuary and settle to the mud flats as juveniles is one such vulnerable stage. Another important piece of the puzzle is mapping the intersection of these species – the oyster and the mud shrimp – in these estuaries. "Quantifying the scope of the problem and ecological interactions at the estuarine landscape scale is a critical component of integrated pest management which the growers and state and federal agencies involved have agreed to pursue," Dumbauld says. "We hope to assist the growers to control shrimp populations only when and where they cause problems, thus minimizing environmental concerns."

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/>

2011 Newport Schools Science Fair

The annual Newport Schools Science Fair represents a unique partnership between HMSC, the science community, and local elementary schools. This year, 15 teachers at Sam Case Primary School and 17 science mentors worked together for weeks to bring special science activities into K-3 classrooms. Students studied topics such as crab behavior, boat and car design, plankton, life cycles, decomposition, recycling, and plant growth. Then they presented their findings at a culminating Science Fair event on May 26th.

The 2011 Science Fair had a new twist this year... it was held in the HMSC Visitor Center! An estimated 375 people attended the event at HMSC, where 15 classroom projects and 12 independent projects from grades K-5 were on display. It was a treat for all to see the kids' science projects intermingled with exhibits featuring the work of adult scientists. Watch video coverage of the event: <http://newslincolncounty.com/?p=25318>

Co-coordinators Cait Goodwin (Oregon Sea Grant) and Ted DeWitt (EPA) recruited the volunteer science mentors,



most of whom were based at HMSC. Mentors hailed from a variety of institutions, including OSU, EPA, USGS, NOAA, and DOGAMI. Oregon Sea Grant sponsored the use of the

Visitor Center, arranged for Free-Choice Learning graduate students to provide additional hands-on activities, and additional HMSC volunteers jumped in to help with event set up and clean up. It was a true community effort! If you would like to volunteer to help with future Science Fairs, contact Cait at cait.goodwin@oregonstate.edu.

What's New in the Visitor Center?

by Amy Vandehey, OSU

Marine Reserves (MRs) and Marine Protected Areas (MPAs) are a hot topic in Oregon. The State is currently involved in an ongoing process to designate MRs and MPAs in Oregon's Territorial Sea. A survey I conducted as an OSU Marine Resource Management student at HMSC's SeaFest in 2008 showed that visitors to the coast were generally aware of and supported MRs, but wanted to know

more. With the help of the Curt and Isabella Holt Education Fund, I was able to design and build a prototype exhibit on this topic, which is now on display in the HMSC Visitor Center. The overall project goal was to raise awareness of this dynamic Oregon process by provid-



ing some basic information. A local illustrator, Dan Leventhal, and Oregon Sea Grant staff helped to provide guidance and develop the graphic elements of the exhibit.

There are three main panels, with the center and right panels displaying a beautiful underwater scene, showcasing animals and habitats that can be found within the first three miles off Oregon's shore. The text describes MRs and MPAs, including their differences and benefits, as well as how visitors can get involved in the Oregon process. The center panel also boasts a touch screen monitor where you can hear directly from stakeholders who are involved in the site recommendation process. You can see clips from Bob Eder (fisherman), Dick Vander Schaaf (conservation), Gus Gates (recreation), Terry Thompson (government and fisherman), Walter Chuck Jr. (fisherman), Selina Heppell (scientist), Scott McMullen (OPAC chair), and Ed Bowles (ODFW). The video interviews are also available online at <http://www.freechoicelearninglab.net/marinereserve/Main.html>. The left panel allows visitors to quickly visualize where the pilot and proposed MRs/MPAs are along the Oregon coast, and briefly describes the process of designation. Be sure to stop by the HMSC Visitor Center to see this new exhibit!

Aquarist's Notebook by Harrison Baker HMSC Student Aquarist

This summer looks to be a busy one. With a capable new group of summer interns and a lengthy to-do list, we hope to get the Visitor Center animal exhibits looking and flowing better than ever.

Our biggest summer life support project is a redesign of the Six-Tank Rack system, which features various small local species in 20-gallon glass tanks. We will replace the plumbing to maximize water flow to each tank.

As part of this process, we will attach fittings so additional life support processes can be added in the future. We will similarly refit several other systems to receive new life support processes, as well.



For my own part, I have transitioned from my previous role as an aquarist to a sort of exhibit and husbandry roustabout.

This involves undertaking the above projects, as well as routine aesthetic tank cleaning, work on the Visitor Center's Exhibit Catalog and, naturally, some animal husbandry.

The husbandry team has much to do, now and always, but we continually strive to meet new challenges and improve upon what we have. The manpower and resources we have this summer should allow us to maximize our potential.



In the photo, ONG and HMSC staff are standing at the edge of the 2007 revetment, as evidenced by the presence of cobble on the beach. The heavy cobble absorbs some of the wave energy that would either carry sand away, or bounce off of riprap only to cause erosion elsewhere. The dynamic revetment will protect half of the eroded beach, allowing scientists from HMSC and our partner agencies to compare how well the structure controls erosion and any effects it might have on use of the beach habitat by wildlife. Plans for restoring trail access will follow.

The HMSC Estuary Nature Trail, winding from the Visitor Center parking lot almost to the Oregon Coast Aquarium, serves as an essential outdoor classroom for HMSC educators and a place for the community to enjoy wildlife watching, exercising and relaxing. Unfortunately, the north end of the trail (by the Visitor Center parking lot) has been closed these past few months due to erosion. After much discussion among the many partners of HMSC, an innovative erosion control project is planned for November 2011. A 'dynamic cobble revetment' will be installed along the beach with help from the Oregon National Guard (ONG) as a training exercise through their Innovative Readiness Program. The revetment will be a continuation of a previous successful project in 2007, also installed with ONG's assistance.



Marine Biology turns 30! This spring marked the 30th offering of OSU's marine biology course for undergraduates at HMSC. Each year, twenty OSU undergraduate students spend the entire spring term immersed in a single comprehensive marine biology course. The course has an experiential focus, with lectures

in the classroom as well as field studies along the coast and laboratories in the wet labs. A June 3 celebration marked this milestone, with the fanciful marine-themed cake created by Laurie Errend, mother of student Melissa Errend.

Volunteer Corner



Visitor Center Volunteer Laura Neary organized a special showing at HMSC of the film *Home*, in celebration of Earth Day on April 22. This film is directed by Yann Arthus-Bertrand and uses aerial photography from over fifty countries to capture the Earth's most amazing landscapes, showcasing its incomparable beauty

while acknowledging its vulnerability. HMSC's showing was a great success with over 90 attendees and was a fitting choice to honor Earth Day, 2011. This event would not have happened without Laura's ideas and efforts every step of the way. If you missed the HMSC showing, you can find more information and a link to the film at: <http://www.homethemovie.org/>



On May 10, Marine Education Coordinator Tracy Crews led the **"ROV Design Challenge" class for HMSC Volunteers**. In this hands-on program, a discussion of Remotely Operated Vehicles (ROVs) took place, followed by a challenge to work in teams to design mini-ROVs that were used to complete an item retrieval mission. All participants had a great time designing and testing their ROVs. Additionally, each Volunteer designed ROV was operated successfully and all groups completed their mission!

Pop quiz: What are Change Wars and Soup Kitchens? Just a few more ways to raise money at HMSC, most recently organized by **HMSC's own Nikki Atkins**. In addition to her frequent theatre performances and day job with NOAA, Nikki serves as HMSC Team Captain for the 2011 American Cancer Society's Relay for Life.

The soup kitchens are a fun way for Hatfielders to donate to charitable causes while sharing food and recipes and taking a break from the usual 'brown bag' lunch. In stark contrast, the change wars are a full-on competition between HMSC buildings, where the usual collaborative spirit is trampled by sabotage and intrigue. Funds raised by the HMSC Team will support the American Cancer Society.



The South Beach Peninsula has a new look ... and new neighbors!

Been to South Beach lately? Visitors to HMSC, whether arriving by car, bike or foot, will find a new look and traffic pattern to Marine Science Drive. As the Port of Newport was planning the construction of the NOAA Marine Operations Center-Pacific (MOC-P), the City of Newport used the opportunity to create improvements including new bike trails, landscaping and a roundabout at the HMSC entrance. If you haven't been to the Hatfield Marine Science Visitor Center in a while, this might be a good time to catch up on new exhibits as well as these other developments...you might even catch a glimpse of a "big white ship" at the new NOAA dock.

To highlight the many connections in Newport's growing Marine Science Community, HMSC and MOC-P have jointly hosted a series of public presentations over the last few months introducing the ships and the science of NOAA's Pacific fleet. Speakers for the series, entitled "Seagoing Partnerships: Current

Ship-based Research in the Pacific Ocean" include scientists who rely on the NOAA ships to conduct their fisheries and oceanographic research. Patty Burke, Manager of the Groundfish Monitoring Program with NOAA Northwest Fisheries Science Center at HMSC recently presented "Fishing for the Future: NOAA Fisheries Groundfish Scientists at Sea." She described the research her group conducts using NOAA ships as well as boats from the local fishing fleet as research platforms.

Meanwhile, the MOC-P has quietly moved into their new facility, and operations are steadily ramping up as staff, ships and equipment arrive. Plans for a celebration are underway, however...with a chance for the public to get a peek at the new campus. The Port of Newport is partnering with NOAA MOC-P for a weekend of celebration on August 20-21, including a Dedication Ceremony for the new facility and public tours of the campus grounds.



Left & Below Right: First NOAA ship arrives at the new MOC-P pier. On June 17, the R/V *Bell M. Shimada*, a high-tech fisheries research platform, visited her new homeport. She left on June 23 for scheduled research cruises. Photo credits: Left - DAY CPM. Below Right - Harrison Aerial Photography)



Above Left: South Beach boasts a new roundabout on Marine Science Drive.



Right: Patty Burke from NOAA's Northwest Fisheries Science Center presented her group's groundfish research as part of the speaker series 'Seagoing Partnerships' hosted at HMSC.



Diversity of Undergraduate Research and Opportunities: Apprenticing Scientists

Research experiences and summer internships for undergraduates at the Hatfield Marine Science Center provides students with opportunities to contribute to original research, to gain first-hand experience in conducting research and to participate in a research focused community. Known for the many different co-located government research agencies and areas of marine research, Hatfield is also recognized for its unique and diverse undergraduate research opportunities that draw upon students from all over the country as well as OSU. These experiences help retain students in marine science disciplines to complete science degrees and pursue graduate study at higher rates.

Just a few highlights of these summer interns (30+ this year) and internship programs at HMSC are: Ashley Bulseco, an REU student from Hawaii is working with Chris Langdon (MBP) in studying the effects of ocean acidification exposure on Pacific Oyster larval development. Another REU student, Astrid Leitner from California is working with Waldo Wakefield (NOAA) and Richard Brodeur (NOAA) on the associations of benthic fish with the Astoria Submarine Canyon from analysis of high-resolution video transects. Working with Sarah Henkel (OSU), Caitlyn Clark, an OSU Beaver and REU intern, is conducting a preassessment of flatfish dietary conditions (gut content and



Interns Dylan McDowell & Sara Thoma

fullness) before the installment of wave energy device test sites off the Oregon Coast. From Iowa, Sara Thoma, an REU intern is studying the growth and production dynamics of the introduced parasitic Isopod *Orthonoe griffenis* with John Chapman (OSU) and Brett Dumbauld (USDA-ARS). Coty Krebs, a community college student from Linn-Benton Community College is a COSEE-PP PRIME intern working with Shawn Stephensen (USFWS) on a fireworks and seabird study on the Oregon coast. Additional undergraduate intern programs in marine research, education and outreach at HMSC include: HMSC Visitor Center, OSU PROMISE, NOAA Hollings Scholars, Oregon Sea Grant Undergraduate Scholars, EPA GRO, Marine Mammal Institute, BLM Yaquina Head Outstanding Natural Area and the NOAA MOC-P.

Congratulations to the 2011 HMSC Scholarships, Fellowships, and Award Recipients



Fred and Joan Crebbin Memorial Fellowship – Rebecca Hamner, Wildlife Science (Advisor: Scott Baker)
Curtis and Isabella Holt Education Fund – Rebecca Schiewe, Free Choice Learning (Advisor: Shawn Rowe) and Jediah Smith, Science & Math Education (Advisor: Shawn Rowe)
Mamie L. Markham First Year Student Award – Stephanie Labou, Marine Resource Management (Advisor: Sarah Henkel)

Lillian Brucefield Reynolds Scholarship Fund – Amanda Gladics, Marine Resource Management (Advisor: Rob Suryan)
Walter G. Jones Fisheries Development Award – Amelia Whitcomb, Fisheries Science (Advisor: Kathleen O'Malley)
William Q. Wick Marine Fisheries Award – Amanda Gladics, Marine Resource Management (Advisor: Rob Suryan)
Mamie L. Markham Endowment Award – Andrew Claiborne, Fisheries Science (Advisor: Jessica Miller); Sarah Close, Zoology (Advisor: Bruce Menge); Laura Dover, Free Choice Learning (Advisor: Shawn Rowe); Ryan Easton, Marine Resource Management (Advisor: Selina Heppell); Cheryl Horton, Wildlife Science (Advisor: Rob Suryan); Timothy Lee, Environmental Sciences (Advisor: Sarah Henkel); James Losee, Fisheries & Wildlife (Advisor: Jessica Miller); Chenchen Shen, Zoology (Advisor: Bruce Menge); Sheanna Steingass, Fisheries & Wildlife (Advisor: Markus Horning).

Water Balloons and Nerf Guns: OIMB and HMSC Graduate Student Scholar Exchange

by Alana Alexander, OSU Graduate Student

The Oregon Institute of Marine Biology (OIMB) students and the Hatfield Student Organization (HsO) carry out a yearly exchange, taking turns to host students from the other institution and compete for the coveted OIMB/HsO "Physical" challenge trophy. This year it was HsO's turn to host, with Hatfield students represented by Jose Marin Jarrin, Amanda Gladics, Cheryl Horton, Alana Alexander, Ryan Easton, Ruth DiMaria, and Mo Bancroft. The exchange began on Friday 6th May, with short research presentations from all of the students, followed by pizza, strawberries and ice-cream. After being refueled, HsO took out the first OIMB/HsO Physical Challenge: Marine Trivia Jeopardy.

The next day began with a breakfast kindly provided by COSEE-PP, before a workshop hosted by Shawn Rowe on communicating science. Useful and entertaining, this workshop gave students a number of tools to use when visualizing the most important messages to convey to general audiences. After a lunch of nachos, the final three Physical Challenges were held: the jellyfish toss (water balloons); marine mammal "biopsying" - tagging via Nerf guns; and finally a recycling challenge. OIMB carried out a clean sweep of these final three challenges, taking the trophy back to Charleston. We have no choice but to try and best them in the dragon's den next year...



OIMB Graduate Student Team holding the coveted Trophy

What do Fireworks and Mud Shrimp Have in Common? Community College Students in the Field

The Center for Ocean Science Education Excellence Pacific Partnerships Promoting Research Investigations in the Marine Environment, Oregon 2011 (COSEE-PP PRIME) is in its 4th year of the 5 year grant to increase access and opportunities in marine science for community colleges, faculty and students. For five community college students spending the summer at OIMB and HMSC conducting their first research experience, life couldn't be any better. You can check out the interesting projects these students are working on at the COSEE PP PRIME Blog: <http://coseppprime.blogspot.com/>



COSEE intern, Drew Hill

Oregon Coast Aquatic and Marine Science Partnership Take Three, Action in Lincoln County Schools! (OCAMP)

Not a movie set, but just as busy as one. As part of an Oregon Math-Science Partnership grant through the Oregon Department of Education, Lincoln County Teachers spent a week building wave energy extraction devices and other related projects as part of their OCAMP professional development summer workshop in June. Teachers participate in about 100 hours of ocean sciences professional development with HMSC scientists and informal educators annually in this program. The project is a collaboration of Lincoln County School District and scientists, informal science educators and science education faculty at several academic, non-profit and government science institutions to develop, implement, and evaluate teacher professional development and student learning experiences with a focus on Ocean Literacy and Aquatic and Marine Science. Mark your calendar for the Ocean Literacy Symposium on August 30. To learn more: <https://sites.google.com/site/ocampmsp/>



Your Marine Science Center: students make HMSC their home away from home



Student completing a plankton tow on Yaquina Bay, Newport.

A surge of students from many universities and colleges made HMSC their marine science center for course work and research this spring. Represented were: Treasure Valley Community College, Pacific University, University of Portland, Evergreen College, Chemeketa Community College, University of Wisconsin, University of Nevada – Reno and Washington State University.



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Upwelling is produced and distributed 3 times a year to the Friends of HMSC membership. Your feedback is welcome.
(email: maryann.bozza@oregonstate.edu)

OSU and NOAA researchers collaborate to record sounds of March 11 earthquake

By Pat Kight, Oregon Sea Grant

Earthquakes are felt more often than heard, but Oregon scientists say the sound of the March 11 Japan earthquake alone could help improve our ability to detect earthquakes and volcanic eruptions in the deep ocean.

Scientists with the NOAA Vents Program at Pacific Marine Environmental Laboratory captured the sounds of the earthquake using an underwater microphone near the Aleutian Islands – 900 miles from the quake epicenter.

“The Japan earthquake was the largest source of ocean sound ever recorded on our hydrophone arrays. This unique record gives us insight into the physics behind how sound is transmitted from the Earth’s crust into the ocean and then propagates through the Pacific Ocean basin,” says Bob Dziak, Ph.D., a scientist with HMSC’s Cooperative Institute

for Marine Resource Studies (CIMRS). CIMRS is a partnership between NOAA and Oregon State University. Dziak is also the

principal investigator of the Ocean Acoustic Project in the NOAA Vents Program, based in Newport.

Dziak’s team is one of many research projects taking advantage of a vast network of underwater acoustic devices (developed by the US Navy for surveillance purposes) to listen in on what’s going on deep beneath the surface of the sea. HMSC’s Marine

Mammal Institute has used the system, for instance, to record the voices of migrating whales as they travel around the Pacific.

For more information and to hear the audio recording of the March 11, 2011 earthquake, see: <http://www.pmel.noaa.gov/vents/acoustics/seismicity/pacific/japanmar2011.html>

