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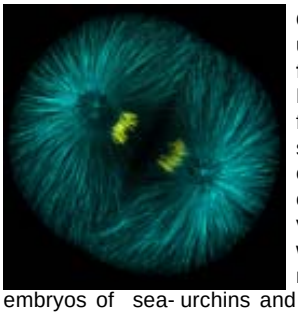
Currents

Alumni Newsletter of the
Oregon Institute of Marine Biology

http://www.uoregon.edu/~oimb/

The Research Enterprise at OIMB

Despite the challenges of the worldwide economy, OIMB faculty are experiencing unprecedented success in obtaining research funds from the federal government. Currently, our small faculty hold approximately 7 million dollars in government grants. Here are a some details of just a few of the exciting research activities currently underway:



Cytokinetic pattern formation in sea urchin embryos; Motor-driven pattern formation in cell division. George von Dassow has been funded with two grants from the National Science Foundation to study how cells know where to create the cleavage furrows during mitosis. His work combines mathematical modeling with advanced fluorescence microscopy to test whether microtubules (photo at left) carry messages to the cell membrane. He uses embryos of sea- urchins and other invertebrates as experimental systems. Collaborators include Bill Bement at the University of Wisconsin, Madison and Garry Odell and Linda Wordeman at Friday Harbor Laboratories, Washington.

Larval supplies and settlement as critical early life-history issues during restoration of native Olympia oysters. Native oysters virtually disappeared from the Coos Bay and South Slough Estuaries early in the 20th century and were essentially replaced by the large Japanese oysters that are cultured for the seafood trade. This grant, funded by NOAA and led by Steve Rumrill (right), uses OIMB's considerable expertise in life-history biology to explore how oysters might best be restored. Richard Emlet, Alan Shanks and Craig Young are collaborators, working on settlement, dispersal and reproductive processes, respectively.

Connectivity in western Atlantic seep populations: oceanographic and life-history processes underlying genetic structure. For the next four years, Craig Young and Svetlana Maslakova will collaborate with colleagues at Duke University and North Carolina State University in a large NSF-funded project to assess how larvae disperse among known deep-sea methane seeps (e.g., picture below) off Barbados, North Carolina, and the Gulf of Mexico. The OIMB team, which will include numerous students, will collect deep-water larvae with moored traps and MOCNESS plankton nets. The Maslakova lab will use molecular methods to match the larvae with known genetic sequences from adults. The Duke team, led by Cindy Van Dover and Cliff Cunningham, will study the genetics of benthic populations, and the North Carolina State team, led by Roy He and David Eggleston, will contribute physical oceanographic and dispersal models. The project will be accomplished with 6 oceanographic cruises, including at least one (off Barbados) with the newly rebuilt Alvin submersible.

Ballasting at Jordan Cove: What will be the take of plankton? A controversial liquid natural gas terminal has been proposed for the upper reaches of Coos Bay. Alan Shanks has been funded to explore one aspect of the potential environmental impact: the plankton that might be removed when the large LNG ships take on ballast water. For the past year, Alan and his students (e.g., Stepanie Schroeder at right) have been conducting monthly 24-hour sampling of plankton near the proposed gas terminal, using the OIMB research vessel Pluteus.

Learning leading to action: connecting Coos and Curry teachers to the ocean. A grant from the Oregon Community Foundation is supporting OIMB efforts to provide in-service science education training for teachers in local school districts. Trish Mace and Jan Hodder lead the project.

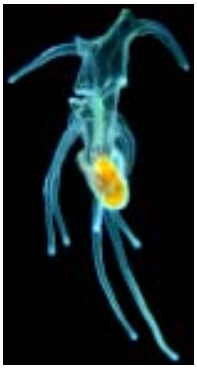
New ROV will provide sea-floor access to OIMB students and researchers

The National Science Foundation has recently awarded $175,000 in funding to OIMB for the purchase of a remotely operated vehicle (ROV) that will be used for research and teaching activities in offshore habitats. SCUBA diving near Charleston presents numerous challenges, including strong currents, big waves, poor visibility and sharks. Thus, although OIMB personnel are equipped for diving, there has been very little diving activity for the past decade. The ROV, which is expected to arrive in winter term of 2011,will largely obviate the need to place people in the water. Operating on the end of a long tether that delivers power to the vehicle and two-way communication with the surface, the ROV will be able to examine the ocean floor with video and retrieve specimens by means of a mechanical manipulator arm. Although the purchase has not yet been completed, we expect that the vehicle will be similar to the Phantom ROV pictured below.

The new vehicle will be used to collect specimens in a safe and environmentally sensitive manner, to deploy and recover underwater experiments, and to survey the sea floor, including sites that are slated for protection in Oregon's proposed system of marine reserves. A new course in subtidal and deep-sea ecology will use the tool extensively for student learning activities and research projects.

OIMB's Research Enterprise (continued from page 1)

Does coupling between inner shelf and surf zone regulate larval supply to intertidal populations? In an NSF-funded collaboration with Steven Morgan at Bodega Marine Laboratory in California, Ad Reneirs from the University of Miami, and Jamie MacMahan of the Naval Postgraduate School, Alan Shanks and his students (below) are providing some of the first quantitative data for biological and physical processes in the hard-to-sample surf zone. Last summer, Alan's team began this work in Pacific Grove, California on one type of beach. Next summer will take them to Carmel, to repeat experiments on a steeper beach. Their work will demonstrate the potential for larval exchange between shelf waters and the shore.



Marine invertebrate larvae as grazers in the midwater microbial loop. Now in its final year, this collaborative grant explores the distribution and feeding of deep-sea larval forms in the Bahamas and the Gulf of Mexico. P.I.'s Craig Young, Richard Emlet and Michelle Wood working with Will Jaeckle of Illinois Wesleyan University have reared the larvae of a number of deep-sea animals (e.g., a long-lived starfish larva, left, photographed by Richard Emlet) and used these larvae to investigate the sources of food that larvae consume in deep water. As reported in previous newsletters, students at OIMB have participated in 3 deep-sea cruises associated with this grant.

Evaluating interaction intensity between seelings of five salt marsh species and existing emergent vegetation. Holly Keammerer (below), a Ph.D. student working in Richard Emlet's lab, has research funding from NOAA's National Estuarine Research Reserve system for her work on the ecology of salt marsh plants in OIMB's beautiful Metcalf Marsh at the mouth of the South Slough Estuary. Holly was awarded the "best student paper" award at the annual meeting of the Pacific Estuarine Research Society.

Atlantic deep-water canyons. Sandra Brooke and Craig Young have been awarded a 3-year contract from the Minerals Management Service to work on the biology of hard-bottom communities, including deep-sea corals, in submarine canyons off Maryland and Virginia. The project is led by Continental Shelf Associates in Florida and includes numerous collaborators from the east coast and abroad.

We're proud of our graduates:

Four graduate students completed their degrees during 2009:

Erin Cooper (Ph.D., Shanks Lab) studied the population ecology of a common intertidal snail, *Chlorostoma funebralis,* exploring the factors in all life-history stages that influence size distributions. Her sampling covered the entire coast, from Washington to Baja and included experimental work as well as molecular genetic analyses. Ezzy currently holds an Oregon Seagrant Postdoctoral Fellowship in Newport.

Maya Wolf-Watts (Ph.D., Young Lab) studied bizarre parasitic copepods (inset, right) that reside in the body cavities of intertidal nudibranchs. She characterized the demography and developmental features of both parasite and host, and discovered previously unknown life-history stages in parasitic copepods. After teaching Marine Biology in Eugene during winter term, Maya will return as a postdoc to work on Atlantic Canyons under Dr. Sandra Brooke.

Zair Burris (M.S., Shanks lab) investigated the biology of pycnogonids (sea spiders) living in the intertidal zone. Zair found more species of these diminutive animals than anyone previously imagined and unraveled many aspects of their biology, including mating, male brooding of the embryos, and morphology of the protonymphon larvae (right inset). Zair is seeking an opportunity to work on a Ph.D.

Josh Lord (M.S., Shanks lab) worked on the ecology and reproduction of giant gumboot chitons, *Cryptochiton stelleri*, in the intertidal zone. His work provided insights on the growth of these large animals in the field and laboratory, and in all life-history stages. He also reared the embryos and larvae of gumboot chitons to the settlement stage. Josh is applying to Ph.D. programs.

OIMB expands. In a partnership with the South Slough National Estuarine Research Reserve and with assistance from the Vice President for Research and the Dean of Arts and Sciences at UO, OIMB has acquired the 3.5 acres of property immediately south of the main campus formerly belonging to Pat and Hugo Hatzel. Pat, now deceased, was once the OIMB office assistant. Long-term planning for the property is underway.

We thank these individuals and organizations for their generous donations of money and time:

Mary Asson-Batres '82 and Salvador Batres
Martin Bailkey '87
Lynne Bonnett '69
Tammy and James Brazil '83
JoAnn '74 and John Brehm
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Charlotte and William Cary '69
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Christine Fisher
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Flossie and Bob Frank
Laurie Christensen
Naomi Clancy '95
Robert Fitchko
Scott Franke '82

Some Alumni News

Dr. George Dersham (Ph.D., 1970) dropped by OIMB recently to see how things had changed since he was here in the 1960's and 70's. George finished his Ph.D. at University of Oregon under Graham Hoyle and spent time at OIMB when it was being directed by Colin Nicol. He taught the OIMB physiology course in 1971. We enjoyed his recollections of the old buildings, the early seawater system, and some of the personalities of those days. A neurobiologist, Dr. Dersham has served on the faculty of University of Massachusetts Amherst and Albany Medical College, and held a fellowship at the Henry Ford Hospital in Detroit. His career has been devoted to the study of cardiac arrhythmias.

Kyle Krumsick (2009) is working on a masters degree at Memorial University in Newfoundland.

Matthew Kay (M.S., 2001) is a Ph.D. student at the Bren School of Environmental Science and Management at the University of California, Santa Barbara. He was recently awarded the 2010-2011 Michael J. Connell Memorial Fund Fellowship.

Dr. Shawn Arellano (Ph.D., 2008) completed a two-year postdoctoral fellowship at the Hong Kong University of Science and Technology. She is now a postdoctoral fellow at Woods Hole Oceanographic Institution in Massachusetts.

Amy Earhart (1984) is a physician specializing in geriatrics at the VA hospital in Portland.

Jessica Bliss (2006) completed a Peace Corp assignment in Niger and is now in grad school at Cornell studying International Nutrition.

Terra Hiebert (2004), OIMB's first graduate with an official Marine Biology major, has completed a masters degree at the Shannon Point Marine Laboratory of Western Washington University.

Louise "Weezie" Mead (1984) is the education project director for the National Center for Science Education in California.

Mike Holmes (M.S., 2007) has taught community college in California for the past 3 years. He is now enrolled in a Ph.D. program at U.C. Berkeley.

Help Support OIMB Students, Projects, Programs and the new Marine Life Center!

Gifts of any size are appreciated and needed. If you would be interested in discussing tax implications or other aspects of charitable giving, please call the director at 541-888-2581 ext. 299. He will put you in touch with a professional who can advise you.

To donate to one of the following funds, please provide the following information with your check made out to OIMB.

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This newsletter reminds us time and again that OIMB has a special strength in the biology of early life-history stages, including invertebrate larval forms. This year, 4 OIMB faculty served as guest editors of a special volume on larvae for a venerable journal, The Biological Bulletin. The cover was a collage of larval pictures taken through the microscope by lead editor Richard Emlet. Amazingly, work by OIMB scientists has been featured recently on four Biological Bulletin covers and on the cover of Journal of Cell Biology. This must certainly be some sort of record! The most recent described a new kind of larva from a deep-sea snail living at hydrothermal vents in the Western Pacific. My personal nvolvement in this project, which included collaborators from Japan, Moss Landing Marine Laboratory, and the Smithsonian Institution, was a career highlight. The first new larval form to be described in the Mollusca since the mid-19th century was first recognized as such on the scanning electron microscope at OIMB!

We hoped last year that the Charleston Marine Life Center would be open by this time, but the project was slowed a bit by a number of administrative and engineering challenges. These are now behind us and construction is proceeding. The project has received wonderful support from many foundations, companies and individuals, but funds are still needed, especially to support the development of high-quality exhibits. Please join us in the home stretch by making a generous donation today! Thanks very much for your interest and support.

Craig Young, OIMB Director

Visitors, Volunteers, and Kind Neighbors

Dr. Lionel Jaffe, a pioneering biologist well known for his work on calcium waves in embryos, spent half of the year in residence at OIMB. Lionel is based at the Marine Biological Laboratory, Woods Hole. In Charleston, he has worked on review papers and conducted experiments to determine mechanisms by which fucoid algal embryos germinate toward adult thalli.

Dr. Henrique Queiroga, another of our numerous visiting scientists this year, visited from the University of Aveiro, Portugal, to consult with OIMB faculty on larval connectivity through the Straits of Gibraltar.

Quirky story on squid surgery captures national media attention. When three accomplished plastic surgeons (Drs. Ernie Manders, Christine Fisher and Gayle Wachtman from the University of Pittsburg Medical School) volunteered to repair a long rift in the mantle of our giant pacific squid (slated for display in the Charleston Marine Life Center), reporter Nate Traylor and photographer Lew Sennett (above in background) from the Coos Bay World wrote a front-page article entitled "Reconstructive Sushi" that was picked up by Associated Press and appeared on television and in newspapers all around the country, including the Wall Street Journal!

A day of service. Graduate students at OIMB (right) recently volunteered some of their valuable time to help Larry Draper sand the bottom of the RV Pluteus, which is currently out of the water for routine maintenance and for the installation of a generator that will power the new ROV. We hope this will be the first of many volunteer days in which students and faculty work together on short-term projects that will benefit the institute. Students in Eugene have a similar opportunity each year.

A big gift for the Marine Life Center. When local commercial fisherman Matt Cunningham snagged the remains of a humback whale while trawling off Charleston with his vessel, FV Sundad, he removed the skull and brought it to OIMB. With the help of our neighbors at Pacific Seafood, the 13-foot long specimen was hoisted from the ship and taken by forklift to OIMB, where it will occupy a prominent place in the Charleston Marine Life Center. Thanks, Matt!