

Intertidal Tidings

Newsletter for the UW Friday Harbor Laboratories • Autumn 2012 • Volume 24

Do Kelp Beds Feed Other Habitats?

Food webs are a fundamental concept in ecology. In marine systems it has long been dogma that phytoplankton are the most important primary producers fueling benthic and pelagic food webs. However, in coastal habitats, benthic macrophytes (seaweeds, seagrass, salt marsh plants) and organic detritus exported from terrestrial sources represent huge potential pools of biomass that may enter the food web as detritus – these could make significant energetic contributions to shallow or even deep nearshore food webs. This hypothesis is strengthened by the fact that during much of the year phytoplankton is virtually absent from marine waters.

The National Science Foundation has awarded a substantial grant to FHL researchers David Duggins, Si Simenstad, Megan Dethier, Ken Sebens and Jim Eckman to examine food webs in shallow and deep water habitats in an attempt to determine the relative importance to nearshore food webs of the region's benthic primary producers. This research effort is augmented by the efforts of lab manager Alex Lowe, graduate students Aaron Galloway and Beth Sosik, and an army of talented undergraduate students supported as REU Fellows and laboratory technicians. High school teachers and students have also made significant contributions.

FHL has proven to be the ideal location for this research. The diving program, including availability of Nitrox for deep dives, and the fleet of small boats make the extensive required diving feasible. The lab resources including cold rooms and running sea water allow the key controlled feeding experiments. And the topography of the islands and channels create deep and shallow waters in close proximity, meaning that differences among depths are not confounded with differences among sites.

Using sophisticated biochemical techniques, unique “biomarkers” have been identified for the full range of potential primary producers. These markers (stable isotopes and fatty acids) are passed up through the food web and can be identified and quantified in a wide range of consumers, providing evidence of the ultimate food sources for those organisms. The biochemical techniques are coupled with laboratory and field experiments examining the relationship between benthic production and diverse benthic and pelagic consumers. The biomarkers of kelp have been found abundantly in deep water consumers ranging from barnacles to crabs, showing that this biomass is exported far from where it is produced and helps fuel diverse ecosystems. Detached kelp plants floating on the surface or sinking into deep water constitute “islands” of food and habitat that attract many small consumers, which

in turn attract fishes. Ultimately this research program should provide marine scientists and managers with the information needed to identify and understand the underlying foundation of food webs in the nearshore marine ecosystem, including animals of direct concern to humans such as commercially important species and valued icons such as orcas.

Top Photo:
Divers (Aaron Galloway and Wendel Raymond) record the drift algae captured by a red urchin.

Photo by Breck McCollum

Bottom Photo:
The bull kelp *Nereocystis* is one of the most abundant and productive local algae. When detached in fall storms, it forms floating ‘islands’ that attract other organisms.

Photo by Kevin Turner



FHL Fundraising and Student Support

For sixteen years the Friday Harbor Laboratories **Advancement Board** (AB) has enthusiastically supported promotion of excellence in marine science, education, and research. The thirty-seven (37) member board brings together business and community leaders, scientists and educators, all of whom share interest and vision for the Labs' unique role in its over 100 years of having its waters' edge be the "cutting edge" of marine science. As we look forward, the AB supports new directions for the Labs. (See Director Ken Sebens' article that highlights funding priorities and critical needs.)

The challenges before the AB are two-fold:

- Seeking financial aid for students to make the match between a world-class experience and an exceptional mind
- Growing a strong and enduring community of support for future development of FHL

The AB gratefully acknowledges all of the generous donors whose contributions have helped to ensure Friday Harbor Labs' continued excellence. We invite you to visit the Labs and meet the students and researchers who are making the discoveries for tomorrow.

FHL Advancement Board

M. Patricia Morse (Chair), Barbara Cable, Tom Cable, William H. Calvin, Cathryn Campbell, Katherine Graubard, Charles Greene, Florence Harrison, Catherine Drew Harvell, Carolyn Haugen, Scott Jones, Mimi Koehl, Alvin Kwiram, Gretchen Lambert, Jeffrey Levinton, Laura Long, Florence McAlary, Robbie Macfarlane, Chita Miller, Lesley Nilsson, Joann Otto, Donald Peek, Alan Pierrot, Charles Richardson, Véronique Robigou, Gordon Robillard, Kevin Schofield, Alex Shapiro, Megumi Strathmann, Richard Strathmann, Susan Swindells, Barbara Von Gehr, George Von Gehr, Rick Vosburgh, Henry Wendt, George Willoughby, Dennis Willows

For information on how you can participate in the FHL

Adopt-a-Student Program

please contact
Rachel Anderson at
(360) 378-2165 Ext. 2
rachelea@uw.edu

Adopt-a-Student

by Carolyn Haugen

Lunchtime at the Friday Harbor Laboratories Dining Hall is always abuzz with lively interchange between students and their professors. Talk of research both in the field and in the labs makes the Dining Hall a happening place. It was certainly true at my table. Seated around the two round tables were four graduate students who were part of the FHL Adopt-a-Student Program, their sponsors and Rachel Anderson, coordinator of the Adopt-a-Student Program. Our talk was lively and while much of the conversation was between student and his/her sponsor there was general excitement and mutual sharing. My "student," Jamie Sziklay, a graduate student from the University of Hawaii at Manoa, enrolled specifically in the FHL Summer Session B in order to take Ecology of Infectious Marine Disease taught by Drew Harvell, Carolyn Friedman and Steven Roberts. Since this class is not widely available, Jamie considered this offering a rare opportunity. Listening to Jamie share her summer work and her interesting research focus in UH-Manoa, it was I who was treated to a rare opportunity!

Friday Harbor Labs Adopt-a-Student Program highlights a key goal to provide financial support for students to attend FHL classes and conduct research. The students at lunch represented diverse interests and graduate institutions – Jamie from UH-Manoa; Ruth McDowell, University of Alabama; Amy Henry, University of Chicago; and Erik Berg, Brown University. They represented a cross-section of excellence. To me, after

participating as a program sponsor for two years, it is a moot question as to who has the greater gain – the student who furthers his/her research or the sponsor who is energized by the student's passion for contributing to our understanding of environmental issues and desire to make a difference.

As Summer session B ended, Jamie sent this reflection to Rachel Anderson. "My experience at Friday Harbor Labs has had profound effects on my career, allowing me to learn technical skills in my field of research and to

develop professional contacts (who have become good friends) that will only strengthen over the years. This opportunity would not have been possible without the support of my Adopt-a-Student sponsor."

Please consider becoming a FHL "Adopt-a-Student" sponsor and share in making a rare opportunity happen each summer.



Spotlight: Two FHL Research Apprenticeships

Friday Harbor Labs Research Apprenticeships offer undergraduate and post-baccalaureate students the chance to access the natural laboratory of the San Juan Islands and capitalize on a world-class opportunity to immerse themselves in real scientific research. Below we highlight two of the 2012 Research Apprenticeships.

Marine Sedimentary Processes Research Apprenticeship, Spring 2012

The largest dam removal project in U.S. history began in September 2011 on the Elwha River, and is expected to generate several million tons of sediment input to the Strait of Juan de Fuca. Last spring a group of seven UW undergraduates participated in a hands-on research apprenticeship at Friday Harbor Labs which focused on these marine sedimentary impacts. Throughout the 11-week course, students participated in classroom, laboratory, and field training in geology, marine science, and research techniques. The course included two research/sampling cruises to the Elwha delta, field trips around San Juan Island to study local geology, and a hiking trip to the Elwha watershed to see the dam removal activities first-hand. Students worked as a team to analyze samples and also planned and executed individual research projects on geologic processes and environmental impacts related to the dam removal. This apprenticeship, taught by Dr. Andrea Ogston and Dr. Charles Nittrouer of the UW Oceanography Sediment Dynamics Group, will be offered again Spring 2013; interested students are encouraged to apply (see <http://depts.washington.edu/fhl/studentSpring2013.html>).

Pelagic Ecosystem Function in the San Juan Archipelago Research Apprenticeship, Autumn 2012

Eleven research apprentices took to the sea this fall on the R/V Centennial in the eighth year of the Pelagic Ecosystem Function Research Apprenticeship. The first two cruises were under sunny skies with balmy air temperatures. The apprentices found dense blooms of diatoms in concentrations higher than found in any previous year. They investigated how the long stretch of late summer sunshine had affected the rest of the ecosystem. Breck Tyler (UC Santa Cruz), Jan Newton (UW) and Matt Baker (NOAA) were the instructional team. Matt mentored apprentices on sand lance and other fish-related projects. Breck oversaw studies of marine mammals and seabirds. Jan advised students focusing on plankton and oceanography. Collectively, they investigated how tides, weather, and many other factors and interactions shape the patterns we see in the pelagic ecosystem. This research apprenticeship's eight year database plus data from the FHL weather and seawater monitoring station are available through NANOOS (<http://www.nanoos.org>).



Marine Sedimentary Processes field trip, photo by T.A., Emily Eidam

2013 FHL COURSES

Spring Quarter (April 1 - June 7)

- I. **The ZOO-BOT QUARTER:**
Integrated Courses • Students Choose
 - Marine Zoology
 - Marine Botany
 - Developmental Biology Lab
 - Nearshore Ecology Research Experience
 - Marine Genomics Research Experience
- II. **Ocean Acidification Research Apprenticeship**
- III. **Marine Sedimentary Processes Research Apprenticeship**
- IV. **Three Seas Program (March 25 - May 17)**

Summer Session A (June 17 - July 19)

- I. **Marine Invertebrate Zoology**
- II. **Sensory Biology and Behavior of Fishes**
- III. **Marine Algae**
- IV. **Comparative Invertebrate Embryology**

Summer Term B (July 22 - Aug. 23)

- I. **Ecology & Conservation of Marine Birds and Mammals**
- II. **Ocean Acidification**
- III. **Fish Swimming**
- IV. **Marine Bioacoustics Workshop**
(4 week, non-credit, 7/22 - 8/16)
Scientific Diving (non-credit, Aug. 18 - 31)
Blinks/NSF REU/BEACON Research Internships
(8-12 weeks) Includes financial support

Autumn Quarter (Sept. 25 - Dec. 6)

- I. **MARINE BIOLOGY QUARTER (MBQ)**
(MBQ students enroll in a combination of courses):
 - Marine Biology
 - Ichthyology
 - Ocean Circulation
 - Reading and Writing the Marine Environment
 - Creative Writing Lab
 - Marine Environmental Research Experience
- II. **Pelagic Ecosystem Function in the San Juan Archipelago Research Apprenticeship**

Please visit our website for a final listing of courses, course numbers and online application.

<http://depts.washington.edu/fhl>

Research at FHL

FHL's OAEL is Bubbling with Activity

One of FHL's newest facilities, the Ocean Acidification Environmental Laboratory (OAEL), has been operating full swing in 2012. Construction of the 1500 sq. ft. laboratory was completed just last year, with funding from the National Science Foundation, University of Washington, private donors, and individual awards to Emily Carrington (FHL, OAEL Director) and James W. Murray (UW Oceanography). This state-of-the-art multi-user ocean acidification facility offers unique research and instructional opportunities for experimental manipulations with on-site monitoring of carbonate system parameters. Additionally, the analytical chemistry laboratory is available to run samples on a recharge basis.

A complete description of services can be found at the OAEL website (<http://depts.washington.edu/fhl/oael.html>). The OAEL currently includes: an analytical chemistry laboratory with total alkalinity, total DIC, spectrophotometric pH and pCO₂ capabilities, indoor mesocosms (over 100 3.5L aquaria) fed by a custom seawater-CO₂ blending system for short term organismal experiments with controlled pH, temperature, light and food. In spring and summer, nine 2000 L in-water mesocosms, ideal for monitoring short term responses of natural plankton communities to OA, are deployed off the FHL dock.

This year's OAEL users hail from UW (FHL and Seattle) and other institutions from the US and abroad (SUNY Stony Brook, NOAA, UBC, Queen's University Belfast). Research topics included oyster maturation and larval development, mussel byssal attachment, phytoplankton community dynamics, coralline algal growth, chiton metabolic scaling, coastal water chemistry, limpet tooth formation, and macroalgal spore stickiness. OAEL also supported several FHL teaching endeavors, including a spring Research Experience in Ocean Acidification and summer Biomechanics graduate course. The Research Apprenticeship will be offered again by Jim Murray (UW, Oceanography) in Spring 2013, and the second offering of the Ocean Acidification Techniques course is slated for summer 2013.



Graduate Research

Laura Newcomb is a doctoral student in the UW Biology Department, and she spends nearly half her time at Friday Harbor Labs. She is also an iPOC fellow, participating in a new UW program funded by a National Science Foundation IGERT (Integrative Graduate Education and Research

Traineeship) award. The aim of the \$3M iPOC program is to train 30 of the most promising Ph.D. students in the study of ocean change.



Laura, originally from New Jersey, received her undergraduate degree in biology from Bowdoin College in Brunswick, Maine. She quickly focused her life-long passion for science on the marine environment.

Laura moved west to FHL in the summer of 2011 to join Emily Carrington's lab and has been strongly influenced by two FHL summer courses: Ocean Acidification Methods and Biomechanics. For her dissertation, Laura is focused on the effects of ocean acidification and warming on mussel attachment, with a keen interest in transferring the knowledge she gains to the mussel aquaculture industry.

Laura recently presented her second paper at the Western Society of Naturalists meeting in Monterey, CA. Her talk, "Effects of short-term exposure to elevated temperature and pCO₂ on mussel byssal thread strength," was based on research conducted in indoor mesocosms in the new OAEL at FHL. Laura also has an interest in the effects of ocean acidification on calcified macroalgae and this summer developed a new collaboration with FHL's 2012 Illg Lecturer, Dr. Jason Hall-Spencer. This work will take Laura to Italy in 2013 to study volcanic vent communities in the Mediterranean, a natural laboratory to study ocean acidification.

When Laura is not busy shucking mussels or running tensile tests, presenting papers at national meetings, serving as a TA in Biology courses on main campus, or joining other IGERT fellows for seminars and workshops, she can be seen running the length of San Juan Island. Among the many feathers in Laura's cap, she distinguished herself with local runners by winning the 8.8K race in this year's San Juan County Fair. We are thrilled to have Laura at the Labs and to witness her exciting scientific career unfold!

Grant Supported Research

NEW Grants

Biological Impacts of Shoreline Armoring in Northern Puget Sound

PI: Megan Dethier
Skagit River System Cooperative, 2012-2014

More than 30% of Puget Sound's shorelines are armored with bulkheads and similar structures, with an additional 1-2 miles of armoring added each year. Armoring can alter sediment dynamics and thus presumably impact habitat and biota, and is thought to be critical to the health of the Sound. For this reason, legislative changes to armoring regulations in the state are being considered. While impacts of shoreline armoring have been demonstrated elsewhere in the world, especially on high-energy sand beaches, few studies quantitatively document armoring impacts in Puget Sound or in other areas with mixed-substrate beaches. This research builds on ongoing research funded by Washington Sea Grant, which has been conducted to date only in central Puget Sound. The current effort focuses on armored and unarmored beaches in the northern part of the Puget Trough, especially the Whidbey basin. The UW portion is quantifying biological impacts of armoring; cooperating organizations (including tribes and state and federal agencies) are studying geomorphic changes caused by armoring on a variety of spatial and temporal scales (including decadal).

Sticky Fishes

PI: Adam Summers
Seaver Institute, 2012 - 2013

The Seaver Institute awarded a grant to Adam Summers to investigate the unusual ability of clingfish to stick to rocks. These small fishes are common in the intertidal of the San Juans and they sport a prominent sucker disk on their belly. This disk, made up of pelvic and pectoral fin elements, allows the fish to adhere strongly to the fouled, rough surfaces that characterize the nearshore environment. Clingfish adhere so strongly that they launch predatory attacks that dislodge the archetypal attached gastropod, the limpet. Working with summer fish class and REU students, the biomechanics lab has already established that these fishes stick equally well to a wide range of abrasive grits. Though they seem handicapped on a glass surface, a typical clingfish can attach with 150 times its body weight to surfaces with grit sizes up to 1mm.

The list to the right features numerous ongoing grants and illustrates the broad range of externally funded research being carried out by UW faculty working at FHL.

This is only a partial list of FHL research, since there are many visiting researchers funded by grants through their own universities.

Ongoing Grants to Faculty at FHL

Andersen, Robert, PI, NSF. Evolutionary relationships among heterokont algae. 2009-2012.

Carrington, Emily, PI, NSF. Effects of temperature on ecological processes in a rocky intertidal community. 2008-2012.

Carrington, Emily, PI, NSF. Effects of ocean acidification on coastal organisms: an ecomaterials perspective. 2010-2013.

Dethier, Megan, PI, Sea Grant. Physical and biological impacts of shoreline armoring. 2010-2012. (Collaboration with UW SAFS, School of Oceanography, and Washington Dept. of Natural Resources.)

Dethier, Megan, PI, U.S. Geological Survey. Benthic biological analysis of seafloor video. 2012-2013.

Dethier, Megan, PI, Dept. of Natural Resources. Long-term monitoring and focus studies in shoreline biota in Puget Sound: 2011- 2012 Data Analysis and 2012-2013 Data Collection. 2011-2013.

Duggins, David, PI; Co-PIs: Kenneth Sebens, Charles Simenstad, Megan Dethier, James Eckman, NSF. Spatial subsidy and trophic connectivity between nearshore macrophyte production and subtidal food webs. 2009-2013.

Foe, Victoria, PI, Seaver Institute. Does replication fork collision with Pol 2 activate downstream gene expression? 2011-2014.

Greene, H. Gary, PI; Co-PI: Sandy Wyllie-Echeverria, National Parks Service. Marine benthic habitat mapping of the San Juan Island National Historical Park. 2010-2012.

Greene, H. Gary, PI, Dept. of Natural Resources. Mapping the white zone. 2011-2013.

Hanson, Bradley; Sebens, Kenneth, PIs, NOAA. Marine mammal research: R/V Centennial. 2008-2012.

Klinger, Terrie, PI; Co-PIs: Kenneth Sebens, James W. Murray, Thomas Leschine, NSF. IGERT Award: Integrative Graduate Training in Ocean Change. 2011-2016.

Murray, James W., PI; Educational Foundation of America. Ocean Acidification Mesocosms Experiments. 2011-2016

O'Kelly, Charles, PI; California Sea Grant. Molecular identity of gonyaulacoid dinoflagellates associated with mortalities of abalone, urchins and other marine invertebrates in Sonoma County. 2011-2012.

Sebens, Kenneth, PI, NSF. Effects of marine preserves and nonindigenous species on rocky subtidal communities: indirect interactions, disturbance and community dynamics. 2009-2013.

Sebens, Kenneth, PI, NSF OACIS. GK-12: UW graduate students with K-12 Teachers. Ocean and Coastal Interdisciplinary Science. 2008-2013.

Summers, Adam, PI; Co-PI: Sophie George, NSF. Research Experiences for Undergraduates: Integrative Biology and Ecology of Marine Organisms. 2010-2013.

Summers, Adam, PI; Co-PI: Greene, H. Gary, North Pacific Research Board. Spatial associations of Pacific sand lance. 2012-2013.

Swalla, Billie, NSF. BEACON "Bio/Computational Evolution in Action Consortium." Fosters interactions between computer scientists, engineers and evolutionary biologists to solve contemporary problems 2011-2013.

Wordeman, Linda, PI; Co-PI: Garrett Odell, NSF. Collaborative research proposal. Motor driven pattern formation during cell division. 2010-2013.

Wyllie-Echeverria, Sandy, PI, National Park Service. Water quality assessment of Garrison Bay (English Camp) and Griffin Bay American Camp. 2010-2012.

Wyllie-Echeverria, Sandy, PI; EPA, USGS, DNR and Washington Sea Grant. "Seagrasses in Changing Climate" meeting at FHL in January 2013.

FHL Outreach

FHLSOP

Friday Harbor Labs Science Outreach Program staff, Jenny Roberts and Kari Koski, are looking forward to the program's twelfth year getting local K-12 students from San Juan Island School District and Spring Street International School involved in the process of science through dynamic fieldwork and relevant hands-on classroom projects.

Highlighted below are just two of our favorite projects:

The Invasive Mussel Project. This fall, three biology classes from Friday Harbor High School will participate in a nine-day lab to assess the spread of a non-native farmed mussel in the wild population of mussels in Westcott Bay, San Juan Island. To accomplish this, students extract, purify, isolate, amplify, separate by electrophoresis and stain mussel DNA. CSI in the classroom! The end result will be that students are able to identify native mussels from non-native farmed mussels by looking at their DNA fingerprint. This lab is a great experience because it not only involves the students in a real conservation monitoring project but also introduces them to biotechnology equipment and procedures.

Student comments from previous years' Invasive Mussel Project:

"The lab was so fun! I love the hands-on experience with the lab. Actually, doing the work is so much better than just looking at a book. I felt like a real scientist!"

"I thought this was an amazing lab. Getting to do this "wet" lab with all the tools and chemicals has been awesome and I can't wait for the next one. It was fun to succeed at our real-life science project."

Diver for a Day Activity is a Friday Harbor Elementary School third grade class field trip aboard the UW Research Vessel, Centennial. Since 2009, and again this spring, students will explore the underwater habitat and organisms found in Parks Bay off Shaw Island. Before entering the frigid Salish Sea, divers demonstrate the diving equipment necessary to survive this feat. Students then experience the underwater world via video camera controlled by submerged scuba divers, with whom they communicate during the dive. In addition, students learn about Salish Sea's water dynamics and get to touch a few collected invertebrates as they learn about their natural history.

Trips on the R/V Centennial are an invaluable component of Friday Harbor Labs Science Outreach Program for developing student interest, passion, concern and understanding of their surrounding marine environment.

To learn about all of our projects, please visit our website at: <http://depts.washington.edu/fhik12>.



Photo by Jenny Roberts

GK12

For the 2012-2013 school year (the last year of our NSF GK-12 program funding), we have two FHL graduate students working in San Juan Island schools. Derek Smith is once again in the Friday Harbor High School, working with Biology teacher Jesse Visciglia in Oceanography and AP Biology classes. Derek is planning many of the lessons for Oceanography, and has found that he can almost always keep students' attention when food is involved – e.g. "atmos'mores" that illustrate layers of the atmosphere in graham crackers, chocolate, and marshmallows! In October Derek took all students out onto local waters in small groups in after-school trips using FHL boats to collect plankton and oceanographic information.

Aaron Galloway is breaking new ground for our program by working in the Spring Street International School in Friday Harbor. He teaches in biology classes with two different teachers, Sharon Massey (younger students) and Tim Dwyer (older students). Tim is also an FHL employee! Aaron and Tim did a dive demonstration off the FHL dock for both classes, using special SCUBA masks and video gear to show and talk to the students about what they were seeing underwater. Both classes have spent a lot of time outdoors this fall, doing a project at Jakle's Lagoon comparing species found there to surveys in the 1960s.

Whiteley Scholars

and doing a tree study on the fire trail in the FHL Preserve. All students are learning how to graph, analyze, and interpret data. The older students are also learning about writing and critiquing scientific papers.

All of this year's GK12 teachers and fellows (3 partnerships in the Seattle school district, 2 in Friday Harbor) spent 4 days at FHL in August for a workshop where they heard science talks, learned about online teaching resources, planned syllabi for the coming year, and went out on a Centennial trip to help collect bivalves for one of Aaron's experiments.



Photo by Darrek Smith

**Support the Friday Harbor Labs
Science Outreach Program
FHLSOP online at**

http://depts.washington.edu/fhl/help_endowments.html

**Save the Date
June 1 2013
Jazz at the Labs
Fundraiser
for the
FHL K-12
Science Outreach
Program (FHLSOP)**

The Helen Riaboff Whiteley Center at FHL

provides a quiet retreat for scholars of all fields so they may reflect, study, write and create in a beautiful setting.

Over two hundred Whiteley Scholars were hosted in 2012. Some examples of the broad topics of their work include:

Barry Ache, Univ. of Florida. Grant application to NIH to support laboratory's ongoing research on olfactory signaling.

Beth Brainerd, Brown University. Edited book, "The Great Transformations: Major Events in the History of Vertebrate Life" while interacting with students from FHL's Morphology of Marine Fishes course.

Kathleen Eisenhardt, Stanford University. Book writing project on heuristics (the rules-of-thumb that people often use to simplify complex situations).

Lyanda Haupt, New book focusing on issues facing urban wildlife, and how the human relationship with close-to-home wildlife shapes wider ecological and conservation efforts.

Michael Honey, Univ. of Washington, Tacoma. New book, "John Handcox, the African-American tradition and the Southern Tenant Farmers Union."

Stephen Kajiura, Florida Atlantic University. Collaborator: Joseph Sisneros. NSF grant proposal on seasonal modulation of electrosensory sensitivity in elasmobranch fishes. Independently, worked on review of sensory biology of hammerhead sharks.

Kannan Krishnan, Univ. of Washington. Book entitled "Fundamentals and applications of magnetic materials" to be published by Oxford University Press in 2013.

Christopher G. Lowe, California State Univ., Long Beach. Book about the myths and misconceptions about sharks.

Tom Mertes, Univ. of California, LA. Research and writing on domestic dissent and governmental transparency in the U.S. in the 20th and 21st centuries.

Laurie Mischley, Bastyr University. Prepared presentation on "CDP-Choline in Parkinson's Disease" for international conference.

James W. Murray, Univ. of Washington. New book titled, "Peak Energy, the Global Economy and Climate Change."

Maresi Nerad, Univ. of Washington. Edited conference papers from 3rd CIRGE (Center for Innovation and Research in Graduate Education) international research synthesis workshop for publication.

Mary Pinard, Babson College. New poems for manuscript that examines historical, cultural, botanical and artistic explorations of the prairie.

Jennifer Sawchuck, NOAA. Drafted paper on recovering endangered rockfish in Puget Sound and San Juan Islands.

Jasna Strus, Univ. of Ljubljana. As independent investigator, established contacts with biologists working on specific projects related to littoral animals.

Ron Sharar, Hebrew Univ. of Jerusalem. Established foundation for collaborative research with Adam Summers and Mason Dean.

William Talbot, Univ. of Washington. Book, "Learning from Experience: The Difference between Rational and Irrational Belief."

Lynn Thomas, Univ. of Washington. Book project, "Race, Skin Lighteners, and Transnational Commerce."

John N. Thompson, Univ. of California, Santa Cruz. Book focused on the pace of evolution, changing environments and the ecological processes that fuel evolutionary change.

Lissa Wadewitz, Linfield College. Project on the transnational marine history of the Pacific Ocean.

Congratulations

Update: Postdocs at FHL

Over the past twenty years, FHL has supported a unique program of postdoctoral researchers. FHL postdocs have had the opportunity to collaborate with both FHL and visiting scientists. They have had the independence to design their own research program while utilizing the resources of FHL and of individual faculty laboratories. The postdoc position is thought of as a key transitional phase in the training of new scientists – being mentored as they launch their career, and mentoring others that are coming along.

In 2012, we said goodbye and good luck to two FHL postdocs and a National Science Foundation grant funded postdoc.

FHL Postdocs:

Chris Neufeld is now a Life Science Faculty member (professor) at Quest University Canada. He teaches Ecology, Evolution and Behaviour, and is continuing his research into the ecology and evolution of animals in new or changing environments.

Robin Kodner is an Assistant Professor at Western Washington University in Bellingham, Washington and was hired as a “quantitative marine biologist.” In Fall 2012, she taught Biometrics, and is slated to teach an upper division course on Environmental Genomics in the winter quarter. Robin will teach Marine Algae at the Shannon Point Marine Labs in the Spring quarter, while participating in the spring FHL Ocean Acidification Research Apprenticeship.

NSF Supported Postdoc (Carrington Lab):

Dawn Vaughn has taken a position as Assistant Professor at California State University Northridge where she is teaching Principles of Biology and Marine Biology. Dawn is continuing her research on the interactions between predator and prey in marine planktonic and benthic habitats, and during larval and adult stages.

Congratulations Chris, Robin and Dawn!

“ I’m fairly certain I’ll look back upon my summer at Friday Harbor as a key moment in my life, one that helped me cement my desire to pursue a career in science. It was a pleasure to be around so many inspired and creative instructors, researchers, students and staff. The setting on San Juan Island was equally exhilarating. All this adds up to the perfect environment in which young aspiring investigators can develop and learn. ”

Graduate student, summer 2012

FHL Funds, Endowments and Scholarships

Adopt-A-Student Program Fund

Supports FHL students with tuition, housing, food and travel costs.

Alan J. Kohn Endowed Fellowship Fund

Supports graduate study of invertebrate biology through research or course work at FHL.

Anne Hof Blinks Fellowship Endowment

Supports students, including those of diverse under-represented backgrounds in their studies in Marine Ecology at FHL.

Brooks and Suzanne Ragen FHL Endowed Scholarship

Provides financial assistance to graduate and undergraduate students at FHL to conduct research or to be enrolled for a class or workshop in marine sciences.

Emily Carrington Endowed Student Travel Support Fund

Supports undergraduate and graduate students with travel related expenses

Charles Lambert Memorial Endowment

Provides assistance to graduate students for research and/or coursework at FHL that includes cell or developmental biology of marine invertebrates or ascidian biology.

Christopher G. Reed Endowed Fund

Offers scholarships to undergraduates for study of marine sciences at FHL.

Dennis Willows Director’s Endowed Professorship

Enhances the UW’s ability to attract and retain a distinguished FHL Director by providing discretionary funds to the Director for unbudgeted needs including student assistance.

Ellie Dorsey Memorial Fund

Generates funds for an annual gift to a scholarly student in memory of Ellie Dorsey.

Ellis Preserves Fund

Supports activities in research and education connected to the Ellis Preserves on Shaw Island in honor of Marilyn and Frederick Ellis.

E. S. Morse Institute

Fosters international scholarly exchange between Friday Harbor and Japanese marine labs to enhance collaborative research and participation in classes.

FHL Discretionary Fund For Excellence

Provides funds for student aid and encourages diverse initiatives that benefit FHL.

FHL Research Fellowship Endowment

Provides graduate student support to students and post-docs involved in marine science studies and research at FHL.

Research Apprenticeship Program Endowment

Supports the Research Apprenticeship Program, which pairs undergraduate researchers with faculty mentors for unparalleled, intensive learning about the nature of research.

FHL Research Apprenticeship Program Annual Fund

Supports FHL students in the Research Apprenticeship Program with tuition, housing, food and travel costs.

FHL Science Outreach Program

Supports staff, equipment, supplies and research vessel Centennial use connected with educational outreach for local (K-12) school partners.

FHL Graduate Research Fellowship Endowment

Provides graduate student support to students and postdocs involved in marine science studies and research.

Karel F. Liem Fish Biology Endowment

In honor of the prominent ichthyologist and member of the FHL teaching and research community, this fund supports research on fishes.

Larry McEdward Memorial Fund

Supports graduate study or coursework in invertebrates, embryology, evolution or development of marine organisms.

Marine Field Equipment Endowment

Provides support for FHL to support and maintain marine field equipment.

Marine Life Endowment

Supports FHL fundamental courses: Marine Invertebrate Zoology, Marine Algae/ Botany, Comparative Invertebrate Embryology and Marine Fish Biology.

Marine Science Fund

Supports students entering the Marine Science field through programs at FHL.

Mellon Mentors Endowment

Enhances UW’s ability to attract, retain, and provide opportunities for professional development for FHL faculty who will mentor underrepresented minority students.

Paul Illg Distinguished Lectureship Endowment

Brings specialists to present lectures on invertebrate biology.

Patricia L. Dudley Endowment For FHL

Supports research and scholarships for the study of systematics and structure of organisms and marine ecology.

Richard and Megumi Strathmann Endowed Fellowship

Supports graduate students’ studies and research of the organisms, physical environment, or geology of the San Juan Archipelago and adjacent regions in the NE Pacific Ocean.

Robert F. Fernald Fellowship Endowment

Provides support for graduate students of comparative invertebrate embryology.

Seagrass Conservation Project

Supports ongoing seagrass conservation studies by Dr. Sandy Wyllie-Echeverria.

Kenneth P. Sebens Endowed Student Support Fund

Provides support for undergraduate and graduate students at FHL.

Stephen and Ruth Wainwright Fellowship Endowment

Provides fellowships to graduate students studying form and function of organisms.

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THANK YOU

From the Director's Office

Chairs, Centers and FHL by Ken Sebens



The future of FHL depends on two things – having a core group of researchers with strong funded programs, and having a loyal and engaged group of visiting researchers and students who want to work at FHL. Right now we are very fortunate to have both. However, we also have to consider ways to improve our research and funding capabilities for the near future. The establishment and continuation of

research centers, headed by world-class researchers, is the direction we are pursuing over the next several years. This will be a major focus of the FHL Advancement Board, with much help from the College of the Environment.

What is a research center? A center brings together scientists with diverse training in new technologies, with interdisciplinary skills, and with a dedication to preparing the next generation of scientists. FHL has seen the formation of two such research centers in the past decade. The Center for Cell Dynamics had excellent funding from NIH for eight years, gave us a new modern laboratory with excellent instrumentation, and their work continues with NSF and private funding. Two years ago, 23 faculty from UW and other universities started the Center for the Ecology of Changing Oceans, which now includes the Ocean Acidification Experimental Laboratory at FHL. It is the leadership of these, and future, centers that needs our attention. We propose to provide such leadership by establishing endowed chairs (professorships with salary), and to improve the physical plant in support of those centers.

Why endowed chairs? While many marine labs have a core of budget-funded faculty level positions, FHL has only two, the Director and the Associate Director. All other faculty who have grants through FHL are either on soft money (most), or have salary from departments at UW. Other marine labs, and many departments, have established endowed chairs to meet this need. One or more endowed chairs at FHL would immensely improve the prospects for research funding by increasing the core group of resident scientists, and would also expand the graduate student and postdoc populations at FHL. A new world-class marine scientist with a resident research group at FHL would greatly enhance FHL's reputation in the national and international arenas.

An established researcher filling the endowed chair would have high potential for major research funding for many decades and would form a nucleus for visiting researchers at all levels, who would come to FHL to collaborate with our resident faculty and postdocs. Once we have funding from the Marine Life Endowment for our summer courses, it would also be ideal if we had more resident faculty to teach at least some of these courses on a regular basis. Such faculty would also attract excellent colleagues to co-teach the courses, which leads to the next generation of faculty who can teach similar courses at FHL and elsewhere.

The College of the Environment gives FHL a most important platform to make these changes happen. Their leadership within the State of Washington, paired with the need to solve worldwide problems related to the health of our environment, means that we will have strong support in our effort to fund our centers, and increase our research faculty. If you can help in any way, or provide leads to others who can, please contact us.

Your support is appreciated!

If you'd like more information about supporting FHL, please don't hesitate to contact us.

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Sarah Friedman
FHL Marine Biology Quarter 2012
R/V Centennial field trip
Photo by Lindsay Hart



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