Intertidal Tidings

Quarterly E-Newsletter

University of Washington Friday Harbor Laboratories

From the Director

Summer (?) at FHL

This summer continues the tradition of lots of activity, and productivity at FHL-- though it seems summer has not really arrived, even by late July. Except for a few weeks of sunny but brisk weather, we haven't really gotten there yet. Maybe in August. Through the fog and misty rain, I can see students busily engaged... continued on *Page 3.*

Highest Funding Priorities

We wish to share with you the plans we are developing to sustain FHL's programs in the emerging new economic paradigm. There are intermediate, and long-term strategies, but we are highlighting here the three goals in which you can participate immediately.

1. Attracting new resident researchers to FHL.
2. Supporting FHL Postdoctoral Fellows
3. Helping students attend FHL classes and conduct research.

These are the building blocks for strengthening our existing and new research centers which...continued on *Page 3*.

From Trish Morse, Chair of the FHL Advancement Board *Page 8*

FHL Science Outreach Program

Read about the completion of the 10th year of bringing exciting, hands-on, inquiry-based and relevant environmental science into San Juan Island Schools on *Page 7*

Happy Birthday Abel

Greetings to Abel Tasman Lehman born July 21st to Sharylyn Lehman and Adam Summers, FHL's Resident Assoc. Director.

Recent FHL Events:

- FHL Open House, May 14th *Page 8*
- Jazz at the Labs, June 4th *Page 9*

Mesocosm Experiments at FHL

James W. Murray, recounts the start-up research in FHL's newly opened Ocean Acidification (OA) Lab. FHL's OA research is enhanced with the sole in-water mesocosm facilitiy in the United States. More on *Page 4*.

Allen W. Schuetz, describes research on *Pisaster ochraceus,* and other species, concerning oocyte maturation processes on *Page 5.*

The Dean's Medalist

Ross Whippo was already a certified diver when excitement over the scientific diving course (being offered for the first time at FHL in Fall 2009) led him to apply to spend the entire quarter attending classes at Friday Harbor Labs. Read about Ross' rapid development as a scientist on *Page 5*.

Tiffany Stephens first came to FHL as an undergraduate to take the Zoobot program in the spring of 2008. That experience changed her life. Tiffany now has a full scholarship in a Ph.D program at Otago University in New Zealand. Read about her academic journey on *Page 6.*

Charles C. Lambert, Ph.D.,

Emeritus Professor of biological science at California State University Fullerton and ascidian biologist of international renown, died June 1 following a stroke. He had life-long roots at FHL. The *Charles Lambert Memorial Endowment* has been established which provides assistance to graduate students for research and/or coursework at FHL. We honor his life on *Page 6.*

Highlighting Alan W. Kohn on Page 9 is the fourth in a series featuring major figures in the development and growth of FHL. Alan's colleagues honor him with wonderful memories and stories out of the past.

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Summer (?) at FHL

Kenneth P. Sebens

This summer continues the tradition of lots of activity, and productivity, at FHL— though it seems summer has not really arrived, even by late July. Except for a few weeks of sunny but brisk weather, we haven't really gotten there yet— maybe in August. Through the fog and misty rain, I can see students busily engaged in their class activities and research projects. That is all as usual, and shows that this is a great place to work and study, no matter what the weather.

So, what's new this summer? We have our ocean acidification laboratory (Lab 7) and in-water mesocosms up and running (NSF FSML funding), with the first mesocosm experiments completed in July, and a five week graduate class on Ocean Acidification Methods in our first summer session (the first such in the country). These mesocosms make FHL one of the few marine labs at the forefront of ocean acidification science, with the only multi-user facilities of their kind in the United States. By working to advance knowledge of this threat to our oceans, we can generate the best science to inform the scientific community, policy makers, and citizens.

The new computer center is filled with students in the Marine Bioacoustics class, and the Marine Invertebrate Zoology class continues to be a favorite in the first summer session. In the second summer session, we will again offer our graduate classes in Marine Algae and Fish Swimming, plus Evolution and Development of the Metazoans. A new addition is an advanced undergraduate class in Marine Birds and Mammals, and what better place than FHL to offer a course on this topic!

Because we have expanded our classroom options, and added some housing, we can now offer more summer classes – the model for the future will be 4-5 classes in each summer session, mostly graduate level but with one larger undergraduate class in each session. Many thanks to those of you who contributed to our endowments, or chose to "Adopt-A-Student" this year— rising tuition and other costs makes such financial aid necessary for most of our students.

Another new addition to FHL will begin to appear in late summer— our next laboratory building (Lab 11) which will house the new research flume funded on our most recent NSF FSML grant, along with smaller flumes and related equipment. The racetrack flume that was housed in lab 7 is now situated between labs 4 and 5 under a recently constructed roof – it is working well and is still just right for certain research projects. The new flume is more compact and can produce higher flow speeds, such as those needed for fish swimming research. I am sure this new lab will see a lot of use by our resident and visiting researchers, and will be the locus of research apprenticeships and class projects. It should be completed some time this fall.

We also just heard that our long-standing request for new roofs has been approved by the University, so we expect that many of our aging and mossy roofs will be replaced with the metal variety over the next year. I know that 'green roofs' are the trend, but ours weren't designed for that, they just grew that way, and they leak. Visitors this year noticed nice new brown metal roofs on two of the dorm buildings, and there are more to come. Such improvements are much appreciated, but we also have a number of lab buildings that need internal renovation and modern equipment — another chance for someone to help FHL in a very concrete way.

Once the summer is over, if it every really arrives, we will be getting ready for the fall Marine Biology Quarter, now in its third year and with an expanded list of classes. We have our largest group of undergrads yet for the fall, and some of them will be taking part in the two Research Apprenticeships, on Spatial Ecology and Pelagic Ecosystems. So, despite the budget cuts that we (and many of you) are dealing with, life at FHL goes on at a good pace, and with continuing improvements. Now, about getting those anchor chains for the dock replaced…

Return to TOC

Highest Funding Priorities

We wish to share with you our plans to sustain FHL's programs under the emerging new economic paradigm. There are both intermediate and long-term strategies, but we are highlighting the three immediate goals:

1. Attracting new resident researchers to FHL
2. Supporting FHL Postdoctoral Fellows
3. Helping students attend FHL classes and conduct research

We are looking for the best new talent in resident researchers, which requires partial salary and start-up funds. When new researchers become established, they bring in research grants supporting themselves, operating expenses, postdocs and/or graduate student research assistants. These researchers populate and strengthen our existing and new research centers which, in turn, are platforms for research grants. This is a one-time cost per position and does not require an endowment. Lastly, these additional scientists serve as mentors for our student researchers.

The recent budget cuts mean there will not be funds to support the long-standing and very successful FHL Postdoc program in future years. We seek to create an endowment so these important career-developing opportunities remain in place. We also benefit in that these newly ordained Ph.D.s

Highest Funding Priorities (Continued)

keep us relevant with their fresh viewpoints, innovative ideas and new approaches to research. These postdocs also mentor our student researchers.

As we expand our resident research staff and continue to support our postdoc program, we can mentor and teach larger numbers of students.

And, that brings us to our third funding priority— helping students attend classes and conduct research at FHL. All students are challenged by the sizeable increases in tuition in all institutions of higher education. They need assistance to attend our summer programs. Please help via "Adopt-A-Student" and by contributing to any of the FHL endowments for student support.

Be our partner in sustaining and growing FHL's essential research and excellent teaching programs. Just as a donation is never too large, it is never too small either. You can log onto the website www.washington.edu/giving/make-a-gift and direct your contributions to one of our existing endowments/funds, or telephone 206-543-1484 and ask for Ken or Rachel to discuss how you can direct funding to your special interest.

Return to TOC

Mesocosm Experiments at FHL

James W. Murray,
U.W. School of Oceanography

Ocean Acidification (OA) is resulting because about 25% of the man made CO_2 is going into the ocean. There is an urgent need to understand the impacts of OA on ocean biology. To help achieve this goal, an Ocean Acidification Experimental Lab has been constructed at Friday Harbor Labs with support from NSF's Field Station and Marine Laboratories Program, the Educational Foundation of America and private donors. The facility has three parts: an indoor lab where experiments can be conducted using individual species or organisms, a mesocosm facility where the impacts on food web structure and community interactions can be examined, and a carbonate system analytical lab to provide precise analyses of the concentrations of carbonate system parameters (PCO_2, dissolved inorganic carbon or DIC, alkalinity and pH). Construction, assembly and testing of all these components were completed in late spring 2011, just in time for the first experiments and a summer course on ocean acidification.

The in-water mesocosm facility is of particular interest because it is the only one of its kind in the US. Existing water mesocosms at Bergen, Norway and Pohang, South Korea served as design inspirations. Its presence is highly visible

because it is situated on a new float extending from the permanent FHL dock.

Mesocosm experiments require a major effort for preparation and execution. A recent experiment at Bergen consisted of 50 principal investigators. We conducted our first FHL mesocosm experiment in June 2011. Our team was smaller but did include essential studies of microbiology (Bob Morris), phytoplankton (Robin Kodner), zooplankton (Evelyn Lessard) and chemistry (James Murray). The lead technician responsible for experimental setup was Evan Howard.

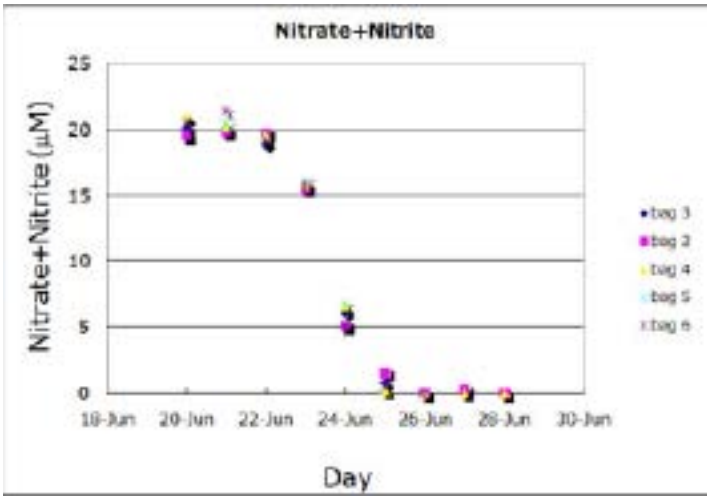
This first experiment was very much a trial run. The planned 21 day experiment ended up lasting only 7 days due to a delayed start, given the trials and tribulations at each step of the experimental set up. The dock has a capacity of 9 mesocosms and we planned 3 replicates at ambient PCO_2 (expected to be about the atmospheric value of 390 ppm) and 3 each at 780 ppm and 1170 ppm. The first surprise was when we discovered that the water at the dock that we were going to use to fill the mesocosm had 600 ppm PCO_2. It had a nitrate concentration of ~20 micromoles and we were expecting it to be close to zero. The water also was swarming with small jellyfish that we did not want in the experiment. Thus we had to come up with a new experimental protocol and new techniques for filling the mesocosms. To cap it off our initial design of the plastic bags for the mesocosm had leaks.

But finally, we fixed all these problems and an experiment was started with triplicate mesocosms with 600 ppm and 1200 ppm PCO_2, respectively. Within 1-2 days of the start of the experiment an intense bloom commenced, both in the mesocosms and at the dock. Nitrate decreased from 20 to 0 micromoles over about 3 days. PCO_2 decreased to ~100 ppm, DIC decreased, oxygen increased, chlorophyll increased and alkalinity increased (due to nitrate consumption). The rapid decrease in DIC was used to estimate a very high biological productivity of about 100 micromoles l-1 d-1. The apparent C/N uptake ratio was 14.9, which is more than twice the Redfield value of 6.6. More carbon was taken up than expected. There was no clear difference between the control and elevated CO_2 mesocosms.

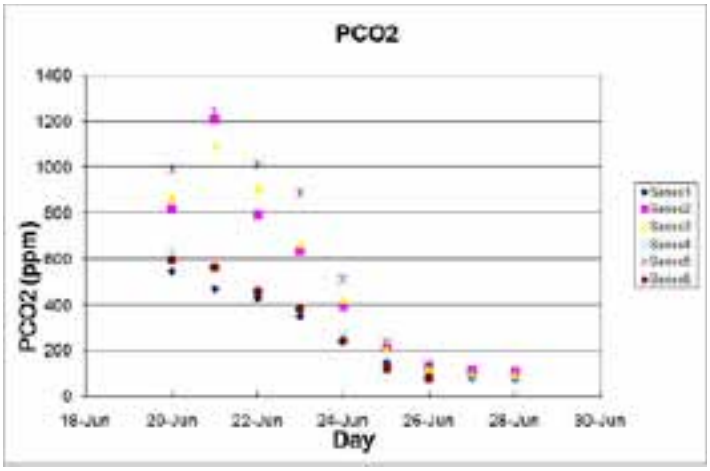
So in the end the experiment produced results that are still being examined, but which we have already found to be quite interesting and unexpected. We will use what we learned in

this trial run to modify the system and the techniques for our next set of experiments, and a more complete story will be told later. (See charts on next page.)

Nitrate concentrations in the mesocosms



PCO2 concentrations in the mesocosms



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Oocyte Maturation

Allen W. Schuetz
Johns Hopkins University (Retired)


Pisaster ochraceus

Extensive investigations using various starfish species have implicated follicle cells, which envelop each fully-grown oocyte within the ovary, as the cellular source of 1-methyladenine (1-MA). This hormone initiates the interruption of meiotic arrest, as evidenced by germinal vesicle breakdown, a necessary prerequisite for successful fertilization and embryogenesis.

A different hormonal factor, (RNF), isolated from the radial nerve, triggers 1-MA production. However, studies in the purple starfish, *Pisaster ochraceus* reveal that follicles, entities comprised of both oocytes and follicle cells, are insensitive to RNF. Furthermore, the *Pisaster* ovarian wall, following the removal of the entire follicular population containing immature fully-grown oocytes, remains responsive to RNF and induces oocyte maturation in co-cultured follicles. Interestingly, recent studies in sea cucumbers have also implicated the gonadal wall rather than the follicle cells in the mediation of similar hormonally initiated processes.

Research objectives are to elucidate the cellular and molecular mechanisms that mediate these oocyte maturation processes in *Pisaster* and other species.

Return to TOC

The Dean's Medalist, Ross Whippo

by Pema Kitaeff


Photo by Kathy Ballard

Ross Whippo was already a certified diver when excitement over the scientific diving course (being offered for the first time in Fall 2009) led him to apply to spend the entire quarter attending classes at Friday Harbor Labs. During the months he spent as an undergraduate student at FHL, Ross made a true home for himself among his peers and instructors. Like the fast-growing bull kelp that are so familiar around these islands, Ross's skill level as an underwater scientist shot up before our eyes. And as it turned out—like with so many other students before him— the end of the quarter was only the beginning of Ross's story at FHL.

Ross returned last fall, in 2010, as one of the TA's for the next iteration of the scientific diving course at FHL and a new cohort of students benefited from his enthusiasm, experience, and knowledge. Then, throughout the winter and spring of 2011, Ross continued to visit his home-away-from-home to complete data-collection dives for his Capstone project along with his advisor, Dr. Kevin Britton-Simmons. This project was born from ideas cultivated during Ross's original stay at FHL as a scientific diving student, and it is characteristic of Ross as a scientist to follow through with research concepts by making them become a reality.

The new College of the Environment has named Ross as an Undergraduate Dean's Medalist and he has decided to attend the University of British Columbia for graduate school in biology. It's certain that we'll see Ross back at FHL throughout his career as a graduate student and beyond. As we watch his career mature we'll always be proud for Ross to consider FHL his home and birthplace as a scientific diver and subtidal researcher.

Photo by Kathy Ballard

A Career Ignited at FHL

by David Duggins and Megan Dethier

Tiffany Stephens first came to the Friday Harbor Labs to take the Zoobot program in the spring of 2008. She grew up in Wenatchee, far from the ocean, and got little encouragement to attend college, but independently applied to UW. She had to work her way through her first 3 years. As she wrote later in her essays for graduate school, coming to Friday Harbor was a huge change from her previous life as a UW undergraduate: "I was allowed to immerse myself in scientific research and converse with professionals in the field, without outside employment. Enthralling." She was one of the best students in the Zoobot class, perpetually energetic and enthusiastic. She ultimately used her Zoobot research project as a starting point for capstone work leading to her SAFS degree, and gave a poster on it at the SICB meeting in Boston. This was the first time she had been at such a meeting or flown on an airplane.

She was dive-certified after her first FHL quarter and her instructor Pema described her as a "natural"— she took to diving like a true marine mammal. Tiffany then stayed on at FHL in the summer to work on eelgrass with Sandy Wyllie-Echeverria, and into the fall to take the Pelagic Ecosystem Functions apprenticeship. She was hooked. After finishing the campus coursework for her degree in 2009, she returned to FHL a Zoobot teaching assistant and then a research assistant for Megan Dethier. Following this, she took a position as an RA at the University of Alaska and later Georgia Tech (where she conducted field work in Florida and Fiji).

In the winter of 2011 she was offered a full scholarship in a Ph.D program at Otago University in New Zealand and then was awarded a coveted NSF Graduate Research Fellowship – which she ended up turning down so that she could go to New Zealand. Overall, she credits the courses, apprenticeships, and contacts made at Friday Harbor for really allowing her to mature as a scientist— and now she is flying!

Return to TOC

Remembering Charles C. Lambert

by Gretchen Lambert

Charles C. Lambert, Emeritus Professor of Biological Science at California State University Fullerton and ascidian biologist of international renown, died June 1 following a stroke; he was 76. He was born in Rockford, IL but grew up in La Jolla, CA. Following graduation from La Jolla High School, he served 4 years in the Navy as a musician, playing tuba in **Navy** bands around the world. He then earned his BA and MS degrees from San Diego State University and his Ph.D. from the University of Washington in 1970, where he carried out his NIH-funded doctoral research at the UW Friday Harbor Laboratories. His dissertation was *Genetic Transcription During the Development and Metamorphosis of the Tunicate Ascidia callosa*. Dr. Arthur Whiteley was his graduate advisor and remained a lifelong friend.

Dr. Lambert joined the Biological Science faculty at CSUF in 1970, where he taught for 28 years before retiring in 1998. Lambert excelled in engaging undergraduate and graduate students in projects that explored early developmental processes in marine invertebrates. Many led to student co-authored posters presented at professional meetings and peer-reviewed publications. He received the CSUF Outstanding Professor Award in 1986 and the Outstanding Health Sciences Professor Award in 1992. He returned most summers to the Friday Harbor Labs for research, and taught the comparative embryology of marine invertebrates course five times. He was widely respected internationally for his work on ascidians, a small group of marine organisms considered the ancestors of the chordates. Over the course of his career, he discovered important signaling pathways associated with the early events of fertilization in both sperm and egg cells from ascidians. His significant discovery during his first sabbatical leave, at Hopkins Marine Station, of early morphological changes that occur in the ascidian sperm cell, led to numerous grant awards for his research. After retirement he continued to travel to marine laboratories around the world to do research, teach workshops and give seminars on many aspects of ascidian biology.

Dr. Lambert organized a number of symposia on ascidian developmental biology and feeding biology and was co-organizer of the First Intl. Symposium on the Biology of Ascidians, Sapporo, Japan, 2000, and the 4th Intl. Symposium on the Molecular and Cell Biology of Egg- and Embryo-Coats, Ise-Shima, Japan, 2004. He was a longtime member of the Western Society. of Naturalists, serving as president in 1982, and also a member of American Society of Zoologists, Society for Developmental Biology, and American Soc. for Cell Biology.

He loved bicycling, and continued to play the tuba throughout his college and professional career. He was the tubist for the La Mirada Symphony for 16 years while at CSUF, and after retirement was a member of Brass Band NW for several years and the Seattle Symphonic Band for the past 13 years.

Dr. Lambert authored or co-authored 64 publications; the latest two are in press. A complete list can be seen at http://depts.washington.edu/ascidian/. He is survived by his wife Gretchen, also an ascidian biologist. The Lamberts published numerous papers together. Since 1975 they have

published the Ascidian News, an international newsletter on all aspects of ascidian biology. He is also survived by his brother Robert in Escondido, CA, and two daughters: Edie, a news anchor at KCRA TV in Sacramento, and Ilsa, a researcher at Fred Hutchinson Cancer Research Center in Seattle, and two grandchildren Alex and Alise.

Return to TOC

Spring Update – Friday Harbor Labs Science Outreach Program

By Jenny Roberts and Margo Thorp

Friday Harbor Labs Science Outreach Program (FHLSOP) staff are proud to announce the successful completion of their tenth year of bringing exciting, hands-on, inquiry-based and relevant environmental science into San Juan Island Schools. During this busy spring session, local students got involved with dynamic fieldwork and school projects as listed below. Please visit our website for detailed descriptions of these projects and to learn more about the program: *http://depts.washington.edu/fhlk12/*

Friday Harbor Elementary School (FHES):
- 2nd Grade -"Is it a Plant or an Animal?" Inquiry Lab
- 3rd Grade - Invasive Clam Dig
- 3rd Grade - "Diver for a Day" Activity
- 4th Grade - Eelgrass Beds & Beach Seine
- 5th Grade - Water Quality Sampling in Friday Harbor Marina
- 6th Grade - Soft Sediment and Rocky Shore Intertidal Ecosystem Surveys
- 8th Grade - Student Designed Marine Biology Inquiry & Field Experience Projects

Friday Harbor High (FHH):
- Electrophoresis Exploration Lab
- Neuroscience "Dennis Willows Research Discussion"

Griffin Bay High (GBH):
- "Watershed" Course

Below are highlighted spring programs including comments from classroom teachers:

3rd Grade - "Diver for a Day" Activity – FHES third grade students boarded the UW's research vessel Centennial to explore the underwater habitat and organisms found in Parks Bay. Students experienced the underwater world via video camera controlled by submerged scuba divers, with whom they could actually communicate during the dive.

Teacher Comment:

Everything has been outstanding! The students are inspired by all of you. For many, it is what captures their interest in learning during 3rd grade. They also get a feel for real scientific work while doing the clam dig. Most now want to become divers, or at least try it out after the RV Centennial trip. They all have a better understanding of the marine life in our waters and the need to protect all the organisms. Your program is truly a highlight in 3rd grade. Thank you so much.

Darlene Clarke
3rd Grade Teacher, FHES

6th Grade - Soft Sediment and Rocky Shore Intertidal Ecosystem Surveys - To prepare FHES sixth grade students for field surveys, FHLSOP staff invited FHL graduate students and scientists to share their expertise on marine organisms. With the lab scientists students observed live organisms during an activity referred to as "Expert Day". Students then went into the field with FHL scientist to survey, observe, compare and contrast a soft sediment intertidal ecosystem versus a rocky shore intertidal ecosystem.

Teacher Comment:

The hands on experiences that the FHLSOP provides are truly a highlight in the 6th grade science curriculum! The beach trips and interactions with the ZooBot students and researchers enhance and bring to life our marine studies unit! The FHLSOP provides students with ultimate experiences to learn and get excited about marine biology...students learn by seeing, touching and experiencing organisms and their habitats first hand while also gaining a respect for the diversity of organisms found in our local marine environment. I could go on and on and on and sing praises of the program!

Lisa Salisbury
6th Grade Math & Science Teacher, FHES

If you'd like to help support FHLSOP in its eleventh year please contact Rachel Anderson at 206-616-0760 or rachelea@uw.edu

Photos by Jenny Roberts and Margo Thorp

Return to TOC

From Trish Morse
Chair of the FHL Advancement Board

July 21

What a wonderful day. I listened to the UWFHL summer Acidification Class Projects. Taught (or should I say led) by Moose O'Donnell and Terrie Klinger, it is the first acidification class thinking about research in the future on organisms and the chemistry associated with these questions in the US.

Students were from all over the US although I noticed many were from along oceanic shores! Listening to the group presentations, I noticed how the teaching reflected all the activities that we know really work for an exciting learning environment: lots of collaboration, shared learning among students and faculty, faculty and TAs heavily into helping with research protocols and helping with presentations. The added wonder was the sense of great pride in the Profs and the TA's in the course as they listened to these reports. Additional experts were brought in along with other scientists at the labs and those in the San Juan Community to add expertise to the course. Wonderful to see Florence Harrison (from our AB) who worked with EPA and the Lawrence Livermore labs being thanked by the students for her input to the course.

There is nothing like hearing the students to realize how important our programs and the generosity of our large community has been in such activities as the yearly "Adopt A Student." It is so central to increasing the learning atmosphere by bring this diversity of students from different colleges and Universities and different countries to the labs. The costs are spiraling, but the students are still coming because of the support offered to them from endowments and other scholarships.

Then just after these presentations, I was part of a meeting with the University of Washington Vice President of External Affairs, Randy Hodgins, visiting the Friday Harbor Laboratories for the first time! He was meeting with students in the NSF REU and the Blinks fellows here this summer totally involved in research with faculty from all over the US who come here to do their research on organisms in the summer. He heard them note how much being here was adding to their ideas about areas of research and how exciting it was for them.

July 30

Finally the sun! A warm beautiful day for the FHL Advancement Board Beach Walk! Florence and Mel Harrison offered us their home with their front lawn of a spectacular rocky and sandy shore on the West side near Kanaka Bay. Many Board members and their friends came! Joann Otto with a large group of guides (various scientists currently at the labs) went down to the shore in boots, with poles ready to see the intertidal organisms on the low tide. And just as we were ready to go, the whales came and presented us with a show of breaching and tail slapping activities. And not to be left out, a large number of Great Blue Herons flew from the surrounding trees, especially when they saw a Bald Eagle visiting! This show was followed by a delicious brunch provided by Laurie Spaulding who heads the Dining Hall at FHL and was up at 4 am to make the quiches and baked goods! So despite our cold entry into the summer, it came just in time!

Photo by Trish Morse

As we move forward in these difficult financial times for the University, we are none-the-less establishing wonderful relationships with the College of the Environment. Our Dean has visited the laboratories, and numerous new associations with the scientists from the other groups in the College are collaborating with FHL scientists. Our FHL Advancement Coordinator, Rachel Anderson, is working with Cara Mathison, Senior Director for Advancement in the College of the Environment.

Friday Harbor Laboratories is an exciting place to be. And thanks to so many of you who have added to the many funds that bring us the amazing students; the Adopt-a-Student program, the endowed funds and other wonderful opportunities that you have supported make a big difference!

FHL Open House

Photo by Trish Morse

On May 14th, the Labs welcomed local residents and visitors to the island. Over 600 people took part in the annual FHL Open House. Visitors guided themselves through the research and teaching facilities. Scientists and students showcased their marine science research, answered questions and provided demonstrations. There was plenty to see, including posters, marine plants and animals, microscopes, plankton sampling and observations. There were also demonstrations of SCUBA equipment and SCUBA dives. Before the day was over, most visitors also found themselves onboard the Labs research vessel, *Centennial*. Many local families joined in the fun and they all seemed to learn a great deal in the process!

Return to TOC

Jazz at the Labs, June 4th
By Rachel Anderson

Jazz at the Labs is an annual fund raiser for the FHLSOP. This year's Jazz at the Labs was a fabulous occasion indeed! It marked the 10th anniversary of the Friday Harbor Labs Science Outreach Program. Because we wanted to make this an extra special celebration and raise a few extra dollars in the process, we included a mini live and silent auction. The auctions were both fun and successful.

San Juan Jazz Quintet
Photo by Trish Morse

What really made the evening was the phenomenal jazz. We were fortunate to have our two favorite bands return, the San Juan Jazz Quintet and Seattle's Jazz Coalescence. They were incredible. The Dining Hall and deck were filled with delighted guests. Music was in the air! Each band member is amazingly talented. That being said, you may recognize two names in particular. Dennis Willows, former FHL Director, is the drummer from San Juan Jazz Quintet. Chris Amemiya, Benaroya Research, is the trombonist and leader of the Jazz Coalescence.

Jazz Coalescence
Photo by Trish Morse

Dick Stein from KPLU's Midday Jazz joined us as our wonderful emcee, and Farhad Ghatan led a fabulous auction. We were so fortunate to have local sponsors support the event! This year our JATL Sponsors included:

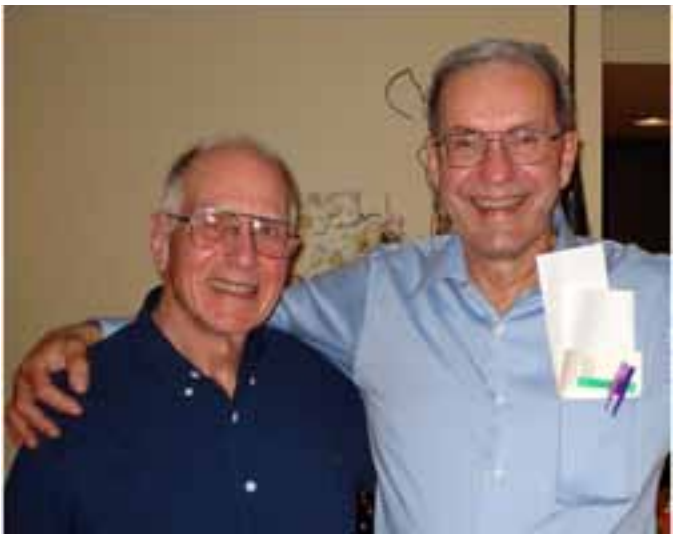
Charles Richardson
Friday Harbor Drug
Islanders Insurance
Island Petroleum Services
Roche Harbor Resort
San Juan Propane
San Juan Vineyards
Spring Street Dentistry / Dr. Susan Kiraly
Wells Fargo Bank

The local community gave very generously in support of the auctions. We are very appreciative! A very special thank you is offered to FHL Advancement Board Members, Don Pollard, Dave Ralston and Carolyn Haugen. And finally, we also thank Wells Fargo Foundation for their ongoing generous support of the FHLSOP.

The 2011 Jazz at the Labs was a great success and we will continue our fundraising efforts to support the extremely valuable Friday Harbor Labs Science Outreach Program.

Return to TOC

Highlighting: Alan W. Kohn



Alan Kohn and Richard Strathmann at Richard's retirement
Photo by Trish Morse

Richard Strathmann, Ph.D.
Friday Harbor Laboratories

Alan Kohn is an outstanding mentor. He once commented that he would advise any dissertation topic that he found interesting. Few advisors offer such freedom of choice and also provide adequate support and advice for the success of students. Advising any topic of interest could be recklessly bold, especially because Alan's interests are broad, but in his teaching and research Alan developed and maintained a truly remarkable breadth of knowledge. Alan fostered independence in his students to a degree that is unique in my experience.

*I*n his own broadly ranging research, centered on *Conus*, a genus of predatory marine snails with a remarkably large number of species, Alan developed and tested hypotheses on predator-prey relationships, community and life-history ecology, biogeography, paleobiology, evolutionary and functional morphology, and systematic biology. His studies have also led to exploration of a diverse array of neurotoxins that are produced by these snails. In order to carry out these diverse studies, Alan corrected centuries of taxonomic errors. Alan's breadth of interests and knowledge enabled him to advise students' dissertations in all these areas of biology and with animals of numerous phyla, from cnidarians to chordates. Because of the intellectual freedom that he gave them, his students and their students have initiated lines of research that continue to influence the direction of invertebrate and marine biology. Alan never took credit for others' research and indeed has taken less credit for his students' research than he deserved. He sets an example of clarity, logic, rigor, and good humor. His students' appreciation was expressed with enthusiasm at a symposium they organized for the Society of Integrative and Comparative Biology (SICB): "Excellence in Invertebrate Biology: A Tribute to Alan J. Kohn."

As I began my studies with Alan, he told me "If your research is on molluscs, you'll get more advice than if it isn't." He was remarkably patient as I considered and rejected numerous projects. Eventually ciliary feeding by echinoderm larvae caught my fancy. Alan agreed to the project despite the absence, at the time, of adequate theory or methods for studies of how cilia concentrate particles. Alan's advice was consistently excellent, directing me toward the most interesting questions and to definitive tests of hypotheses. Though my project was not on molluscs, Alan nevertheless guided me to key references. He delivered strong and necessary criticism ("This is the most preliminary of rough drafts") so calmly that one remained confident and encouraged. Alan's advice and aid ranged from leading me to theory based in engineering to arranging professional help in production of clear illustrations of complex phenomena. In the end, Alan's knowledge, patience, and trust allowed me to establish my own life-long interest in marine larvae. I also retain a life-long admiration for his ethics, generosity, and wit.

Bruno Pernet, Ph.D.
California State University, Long Beach
I spent about six years as a graduate student of Alan's at UW, and learned an immense amount about teaching and research and invertebrate biology from him. I particularly enjoyed working with him at FHL, where he is universally admired by students, largely because he so clearly genuinely loves teaching about animals— he is always the first person in the lab and last to leave, and is always up for discussing some peculiarity of a chiton heart or a larvacean house— but also because he is incredibly positive about each student, and works hard to make sure that they all get what they want out of a course. Once while teaching with him at FHL he taught me a lesson about that latter point that I still struggle to act on routinely. While preparing for a lab early one morning, I made some complaint about one of our students. Alan just looked at me and said something like "well, you know, each student brings something unique to the course." And that is exactly how he behaves as a teacher, valuing each student as an individual. That comment has since helped guide my behavior on more than a few occasions.

He is also well known as a being extremely playful with words, especially in the form of puns. I have a particularly fond memory of one such bit of wordplay. Alan had made the trip to FHL from Seattle to, among other things, read the draft of one of my thesis chapters and to tell me about how he thought I might improve it. In that chapter I reported on an analysis of the contents of fecal pellets of a polychaete worm (fecal pellet analysis, it should be noted, is something near and dear to his heart). When he handed me the marked-up draft, I noticed an uncharacteristically harsh comment scrawled at the top of the first page: "this is kind of shitty". Now, I think he was right— the draft wasn't very good. But really, that's not why it was there— he was just delighted with the opportunity for a double entendre, and couldn't let it pass by. It still makes me smile.

Past Presidents of the Society of Integrative and Comparative Zoology, Lynn Riddiford, John Wingfield, Alan Kohn
Photo by Trish Morse

Geerat J. Vermeij, Ph.D.
University of California at Davis
Alan Kohn occupies a critically important part of my life. In the autumn of 1967, he came to Princeton to give a seminar. As an undergraduate already deeply interested in molluscs, I was enthralled to listen to and meet Alan, and I managed to be invited to lunch. After peppering him with questions about cones— after all, he was and remains the Conus-sir of this group— Alan told me of a course he was going to teach along with three other malacologists in Hawaii the following summer. Not only did he urge me to apply, but once I had done so, he saw to it that I was accepted despite reservations by others about my blindness. This act was crucial in enabling me to pursue the career of my dreams.

Some eight years later, in 1976, Alan and I shared teaching duties at Friday Harbor. Puns flew thick and fast, and I learned a great deal from Alan as I had before. I greatly appreciated not only his humor— we do share the same mutation— but also his keen sense of natural history coupled with a broad scientific curiosity and a broad expertise. Science is often thought of as a cold, competitive enterprise, but when there are people like Alan Kohn exploring the natural world and teaching about it, one sees clearly that it is an enriching endeavor full of human warmth and kindness. All of us who have worked with Alan over the years are profoundly grateful to his humanity and to his science.

Shirley M. Malcom, Ph.D.
American Association for the Advancement of Science
Were it not for Alan I would not be where I am today. There are others who played critical roles in my life along the way—but Alan was there when I had to change my trip map entirely, affirming that I was worthy of joining the community of scientists. I had been aiming toward medical school since before high school. When I decided that I really didn't want to go in that direction (in my senior year of college, no less) Alan was there to point me toward graduate education, a decision I have never regretted. I respect him so much; his saying I was good enough meant more to me than anything.

I hadn't thought of myself as scientist material. I fit the profile not at all—there was no one in the department, no faculty member for any of my classes who looked like me. For a young African American woman from Birmingham, Alabama who had to run so far to even catch up, this was a frightening step out into the unknown. But with his encouragement I was willing to take that step.

I had gotten to know Alan better than one expects to know a faculty member. He was my advisor, once I moved into the departmental honors program. He was my professor for Natural History of Marine Invertebrates, which meant we were in the field together. There is nothing like slopping through mud flats or throwing up from seasickness to help folks get close. Alan drove the university van; I occupied the "catbird seat" (only way to keep from getting motion sick). For the most part Alan, his graduate assistant and I were the only ones who knew how to cook. That was my first experience with cooking for 25 to 30 people, however, and on Coleman stoves no less. I could go on with the stories (and there are hundreds of them) but I will spare you.

I wasn't surprised to learn that I was not an anomaly for Alan. He often helped people see the possibilities in themselves, whether a Black woman with no prior research or field experience, or a blind man who wanted to study mollusks or a poor kid who dreamed of an academic career or whomever. Alan stood with us, fought for us and affirmed us. But then again, that's Alan. He believed in giving people chances to succeed. And for that I am eternally grateful!

Miggie Lloyd Keuler, Ph.D.
Seattle
I worked for Alan Kohn as a research assistant/associate from 1966 to 1975. I mainly dissected *Conus* species, which Alan had collected from many tropical areas, to determine their prey. It was a great pleasure to work with him as he was always encouraging and had great insights. I have fond memories of joining his family with other grad students for summer gatherings at his house.

Although I was a University of Michigan graduate student, I did my thesis research at the Friday Harbor Labs. Alan was my only advisor and was always helpful and supportive. My Seattle hours were flexible, and I could take off for the Friday Harbor Labs as the tides required. I greatly appreciated him as my mentor. My only regret is that I was not able to continue with his research as I moved from Seattle.

Alan Kabat, Ph.D.
Partner, Bernabel & Wachtel, PLLC (Washington, DC)
Alan Kohn was and is a fine mentor to several generations of undergraduate and graduate students. I was fortunate to have him as a senior thesis advisor while an undergraduate at the UW. We collaborated on a paleoecological analysis of Pleistocene gastropods from Fiji that he collected while on sabbatical the previous year. Whether in a lab, in a classroom, or at a scientific meeting, he conveyed his contagious enthusiasm for mollusks and his interest in what other people were studying.

Once you got past his bad puns, it was obvious that he communicated with clarity and thoroughness based on his broad and deep knowledge— not just of mollusks but of invertebrates in general. Alan is a talented marine ecologist and paleoecologist, and he also had the patience to resolve seemingly intractable problems with the taxonomy of *Conus*. His taxonomic work made it much easier for other researchers to know exactly which species they were studying in the field or the lab, and his detective work in tracking down historical specimens helped those who were trying to resolve the taxonomy of other molluscan species.

Alan is probably the most widely-traveled zoologist I have ever met— thanks to field work across the Indian and Pacific Oceans, and to visiting numerous natural history museums and geological institutions— in addition to attending scientific meetings all over the world. Marian, his wife and an enthusiastic entomologist, was his devoted companion on many of these trips.

In 2002, Elizabeth Gladfelter interviewed Alan for her lively collection of biographical essays by field biologists (Agassiz's Legacy). Alan described how he repeatedly benefited from fortunate coincidences in meeting the right person in the right place, which led him from one interesting biological question to another, and considerably broadened his biological perspectives. But, Alan also had the talent to seize the opportunity and to recognize when it was worth trying out new approaches to old questions. He makes it look easy!

Susanne Miller, Ph.D.
Director Emeritus at Cabrillo Marine Aquarium
I had the good fortune of first getting to know Alan Kohn and his family within his scientific natural habitat, the tropical reefs of Hawaii. He and fellow biologists Vera Fretter and Martin Wells of England and Alison Kay of Hawaii taught a summer-long NSF-sponsored course on mollusks for a group of 24 graduate students from throughout the United States. This was my introduction to tropical diversity and to the cultural and culinary riches of the Pacific, and Alan and Marian Kohn contributed wonderfully to all aspects of these. I went on to complete my graduate studies under Alan. He encouraged his students to pursue their own interests, providing patient but firm guidance whenever needed or requested. He was a fine teacher, always good-humored but also rigorous and dedicated. He continues to be a wonderful example to us all—someone who truly enjoys his research and teaching but always balanced with a great family life. Alan and Marian's warm hospitality was unsurpassed; I remember with gratitude so many great barbecues with fellow students and colleagues at their home over the years.

Sally Woodin, Brian Clark, David Wethey and Alan Kohn on Illg Beach
Photo by Trish Morse

Sally Woodin, Ph.D.
University of South Carolina

As to why I think Alan is wonderful that is easy. At a time when there were very few female ecologists, Alan did not find it at all odd that I would want to do experimental field ecology. He encouraged me in every way, from finding grant monies to help support me, to assisting me in applying for an NSF Dissertation Award, etc. Alan had a routine and if you followed that routine, you could come every day and tell him your new brilliant idea during coffee time, have it eviscerated and then come back the next day with a new one. He was kind, patient, infinitely knowledgeable about literature that I should read (he is the reason I read all of old Ecology and Limnology and Oceanography which has served me well) and how it indicated that my new fabulous idea had giant holes in it.

My interactions with Alan have framed how I treat my students; I hope that I have done as well in leading them in interesting directions but allowing them to make mistakes and helping them recover when they realize the mistake. He also taught me about the importance of service to the profession and how to choose. On several occasions his advice has been crucial to my life. Alan is also a very nice person even if he does love puns.

A. Richard Palmer, Ph.D.
University of Alberta

Alan Kohn was not on my supervisory committee while I was a Ph.D. student at the University of Washington (1973-79), however throughout my program he generously gave me time and advice as if I had been one of his own students. I particularly remember and am grateful for the help, support and encouragement he gave me with drafts of my earliest papers. But, as is so often the case, his greatest gift was simply being the passionate, curious and dedicated invertebrate biologist that he was: someone to admire and to emulate as teacher, mentor and scientist. That's the gift of a lifetime.

Pam Roe, Ph.D.
California State University Stanislaus

Alan Kohn was my major professor during my graduate years at UW, and I have been eternally thankful for my good fortune. I learned so much about being a professor from him, and I have used what I learned from him many times since then. Alan was always interested in what students were doing. I distinctly remember him saying that he learned from us, and now that I have graduate students, I know what he meant, and I continue to learn much from them.

Marian Pettibone and Alan & Marian Kohn at US National Museum – Smithsonian
Photo by Trish Morse

Alan and his wife Marian shared his family often by inviting us to his house, for salmon feasts and other reasons, like someone's birthday, another example of his generosity, that made us grad students feel like we were part of his family. I still remember Alan getting down on all 4's on the floor and his son climbing up onto his back, and Alan then being the horse. What other professor would do that when there was company present? I also remember the time (when the grad students were at his house) that Alan decided that his son was getting too big for his horse rides. Needless to say, Alan won, but there was a bit of noise associated with the "growing up"! Being a part of Alan's family was one of the most important things I learned and treasure in all of my school years. People need to feel loved. I don't have parties for my former students and friends, but I try to remember them with birthday cards, and that is a direct result of the Kohn family while I was a graduate student.

Whether he was/is in Seattle or at Friday Harbor Labs, Alan Kohn has always been the same generous, interested, helpful and delightful person. The University of Washington and Friday Harbor Labs are very lucky that Alan Kohn has been a part of their communities.

Elizabeth Boulding, Ph.D.
University of Guelph.

Alan Kohn was an excellent Ph.D. advisor for me because he allowed me to do a thesis on the ecological quantitative

genetics of marine snails (*Littorina* spp.) at a time when most people were doing purely ecological theses. Alan's expertise in gastropod systematics was particularly helpful when it turned out that there were actually two species of direct-developing *Littorina* species and two species of planktotrophic species of *Littorina* in the Pacific Northwest instead of only one of each. He encouraged me to develop a collaborative rather than a competitive relationship with David Reid who is still the world expert on *Littorina* systematics. He also helped me find sources of funding for barcoding (using protein electrophoresis) the four putative species of *Littorina*.

Finally, Alan and Marian Kohn were wonderful and generous hosts and always invited Toby, Emma and me to dinner during American Thanksgiving. I enjoyed Marian's hospitality so much that I really enjoyed staying there whenever I had to travel from Friday Harbor to Seattle for committee meetings.

Gustav Paulay, Ph.D. and Bernadette Holthuis, Ph.D.
Florida Museum of Natural History, University of Florida, Gainesville
We were both graduate students of Alan's— Gustav starting in 1980 and Bern in '85. Alan has focused his life's research on one system, studying the biology of cone snails. With his thorough, detailed understanding of this single system (albeit one with >500 species), he has addressed broad questions in ecology and evolution. He has studied the nomenclature, diets, geography, and fossil history of cones to test the niche concept and theories of evolutionary diversification.

Alan has a tremendous ability to see "the big picture" and taught his students to do likewise. He is one of a dying breed among process-oriented biologists: he is also a naturalist. Not only can he tell a *Littorina plena* from a *Littorina subrotundata*, but he identified our warblers when he visited us in Florida. When we became too immersed in the literature, he'd always remind us to study nature, not books.

We both appreciated the fact that Alan gave us a tremendous amount of freedom as students, putting up with prolonged absences in the tropical Pacific as long as we periodically showed up for committee meetings.

And it's hard to talk about Alan without discussing his punniness (the state of being punny, or prone to puns). Surely we're not the only ones who have wondered if his lifelong study of cone shells wasn't at least partly inspired by the pun of it all. We'll never forget the delight he took in demonstrating the cone-shaped apparatus he devised for specimen photography: "Kohn's Cone Cone".

Renae Brodie, Ph.D.
Mt. Holyoke College
As a brand new graduate student, I was a little afraid of Alan— he was so impressive and I was in awe. Then one day when he reached down to pick up a jar of preserved specimens from a low shelf, I saw his Looney Toon socks. My fear abated, but my respect grew; only a man very comfortable with himself could wear those socks!

I am still in awe of Alan's encyclopedic knowledge of anything invertebrate and amused by his capacity for the irreverent, whether it be very bad puns or questionable fashion accents. I am ever grateful for the high standards that he held me to as a graduate student and know that he has had an immeasurable impact over the years as a mentor and friend.

Dianna K. Padilla, Ph.D.
State University of New York at Stony Brook
Many Professors at research universities have large impacts on graduate students, but Alan's impact on me and my career started when I was an undergraduate. I first met Alan Kohn when he was my Professor for Invertebrate Zoology (with Paul Illg, and TAs Megan Dethier and Esther Leise). As they say, that course changed my life. I discovered invertebrates, and decided to get a second bachelors degree in Zoology (my major was Oceanography). I had to work to support my education, and when Alan found out he and Paul set about trying to help me find a job that was more in line with my education (than serving food in the dorms). Eventually, Alan created a job in his lab for me. I identified polychaetes from Easter Island (favorite food of *Conus*), learned microscopy and about snail radulae, filed reprints and was a general apprentice. It was a fantastic experience. "My job" has since been held by a large number of women undergraduates, many of whom are now tenured professors at major universities. It has been a delight through the years to be introduced to those students who all have or have had "my job". As a result of my mentoring by Alan, I now create jobs in my lab for undergraduate women and underrepresented minority students. Alan has been a great mentor and role model for many. I would not be where I am today without his support and encouragement.

(Contributions brought together by Bruno Pernet, Sally Woodin and Trish Morse)

Editor's Note: We invite you to honor Alan by contributing to the ALAN J. KOHN ENDOWED FELLOWSHIP FUND which supports graduate students of invertebrate biology through research or course work at Friday Harbor Laboratories.

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Thank you,
A.O. Dennis Willows
Professor of Zoology and Director Emeritus FHL

P.S. Take a moment to think back and recall those people who have helped you along your way. And then remember that there were those who helped you who you didn't even know.

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With decreased state funding and increased tuition, now more than ever, we could use your help. If you are able to send a donation, or make a gift on-line, we would be very grateful. If you like more information about supporting FHL, please dont hesitate to contact us.

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