UH Sea Grant
Highlights from 2012
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### In this issue of *Ka Pili Kai*...

As I reflect on the year 2012, I am reminded once again how fortunate I am to be part of the University of Hawai‘i Sea Grant College Program and our extended ‘ohana. This year we had the good fortune to welcome six new talented and dynamic faculty members to our program through a strategic hiring initiative originated by the University of Hawai‘i at Mānoa Chancellor’s Office, and look forward to hiring the remaining open position in 2013. Through this groundbreaking initiative we now have an even greater opportunity to strengthen and expand on the many connections we have built throughout the university to engage more deeply and meaningfully with the coastal communities that we serve. In addition, several of the revolutionary projects that were started in previous years reached important milestones in 2012, which are described in greater detail in the upcoming pages. Please take a few moments to browse this issue and allow us to share some of our highlights from 2012.

Happy holidays and best wishes for a joyful new year,

Cindy Knapman  
Communications Leader

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The University of Hawai‘i was designated a Sea Grant College in 1972, following the National Sea Grant College and Program Act of 1966.

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On the Cover: Clouds cast shadows over a shimmering Maunalua Bay. Diamond Head and Waikiki appear in the distance. Photo: UH Sea Grant
In 2011, former University of Hawai‘i at Mānoa (UH Mānoa) Chancellor Virginia Hinshaw announced a university-wide strategic hiring initiative to increase capacity and expertise in teaching and research within disciplines directly related to sustainability. Out of 11 submitted proposals, the Chancellor awarded the initiative to the University of Hawai‘i Sea Grant College Program (UH Sea Grant) in support of the project titled “Integrating Marine Science, Economics, Engineering, Design and Policy for Sustainable Coastal Communities.” Led by UH Sea Grant, the initiative includes collaboration with the School of Ocean and Earth Science and Technology, the College of Engineering, the College of Social Sciences, and the School of Architecture. The remaining open position in the School of Architecture is expected to be filled in early 2013.

This pioneering initiative recognizes the excellence of Sea Grant research and outreach, its longstanding commitment to coastal sustainability, and the understanding that solving problems in the ocean and on the coast necessitates interdisciplinary solutions to problems associated with the impact of human activities on land. UH Sea Grant’s demonstrated record of collaboration throughout the university system was highly significant in its selection as was its diverse achievements and impacts. Modeled on the UH Sea Grant Centers of Excellence, the successful proposal focused on developing, engaging, and implementing wise and sustainable use of energy and water resources including adoption of renewable energy technologies. The value of the university’s investment in UH Sea Grant is estimated to exceed $50 million based on salaries alone, resulting in an unprecedented increase in capacity in the program’s more than 40 year history and providing an equally unmatched leveraging of federal investment.

These talented new faculty members will conduct research, education, and outreach while building on existing partnerships to integrate science, economics, planning, and design into decisions on public policy and sustainable development.

**Faculty Recruits**

Rosie Alegado  
Assistant Professor,  
Department of Oceanography and Center for Microbial Oceanography: Research and Education

Oceana Francis  
Assistant Professor,  
Department of Civil and Environmental Engineering

Craig Nelson  
Assistant Professor,  
Department of Oceanography and Center for Microbial Oceanography: Research and Education

Michael Roberts  
Associate Professor,  
Department of Economics

Daniele Spirandelli  
Assistant Professor,  
Coastal Policy and Community Development,  
Department of Urban Regional Planning

Mehana Vaughan  
Assistant Professor,  
Sustainable Watershed and Coastal Management,  
Department of Natural Resources and Environmental Management
**HIGHLIGHTS**

**Restoring and Rebuilding Waikīkī Beach** In 2011, UH Sea Grant partnered with the State of Hawai‘i Department of Land and Natural Resources and others to conduct a large-scale beach replenishment project on Waikīkī Beach. The $2.3 million project provided the opportunity to test various methods for beach maintenance and nourishment, and at its conclusion in 2012, 27,000 cubic yards of sand had been added to Waikīkī Beach. Due to the overall success of the project, local stakeholders requested that UH Sea Grant lead the development of a *Comprehensive Beach Management Plan for Waikiki* to prioritize, guide, and coordinate beach management projects in the coming decades.

**Incorporating Smart Growth Principles into New Developments** In partnership with the University of Hawai‘i at Mānoa School of Architecture, the U.S. Environmental Protection Agency, and the City and County of Honolulu, UH Sea Grant embarked on a unique partnership to find long-term solutions to the growing problems confronting Hawai‘i’s increasingly urbanized coastal communities. A nationally recognized team of experts in various aspects of smart growth was invited to specifically focus on the planned development of 15,000 new housing units in Kapolei, a planned city in West O‘ahu. Today, these efforts have led to a live-work-play coastal community that is designed to be transit-oriented, mixed use, socially and economically inclusive, and possess many design elements that greatly reduce its environmental impact compared with business as usual. This large project is valued at several billion dollars and was approved by the State Land Use Commission in 2012.

**Promoting Education and Stewardship at the Hanauma Bay Nature Preserve** For the past 22 years, UH Sea Grant has been administering and conducting the award-winning Hanauma Bay Education Program which educates over 800,000 visitors annually. Its weekly Thursday evening lecture series is also key to educating residents and visitors alike on Hawai‘i’s unique marine and coastal resources, and promoting strategies that encourage conservation and stewardship.

**Researching Seawater Air Conditioning (SWAC)** Seawater air conditioning (SWAC), which uses cold, deep ocean water to cool buildings, was invented by a UH Sea Grant researcher in 1983. Despite worldwide implementation this technology has not yet come into substantial

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Andrew Bohlander, Shoreline Specialist; Alyssa Gunderson, Fluid Earth Project Manager; Dolan Eversole, NOAA Sea Grant Coastal Storms Program Coordinator, Pacific Region; Matthew Gonser, Community Planning and Design Extension Agent; Kimberlee Harding, Fisheries Extension Agent; Dennis Hwang, Coastal Hazard Mitigation Specialist; Denise Konan, Director, Center for Sustainable Coastal Tourism; Jon Lilley, Postdoctoral Research Fellow; Elizabeth (Liz) Kumabe Maynard, Regional Environmental Education Specialist; Stephen Meder, Director, Center for Smart Building and Community Design; Eileen Peppard, Sustainability Specialist; Brad Romine, Coastal Management Specialist; Kanesa Seraphin, Director, Center for Marine Science Education.
Stephen Meder, Director, Center for Smart Building and Community Design; Eileen Peppard, Sustainability Specialist; Brad Romine, Coastal Management Specialist; Kanesa Seraphin, Director, Center for Marine Science Education.

UH Sea Grant Hanauma Bay Education Program staff: Shawn Carrier, Morgan Mamizuka, Gavin Iwai, and Anne Rosa.

use in Hawai‘i. Since high-density hotel development in Waikīkī makes it an ideal place to pilot a SWAC system, UH Sea Grant’s Center for Sustainable Coastal Tourism is partnering with other schools and departments throughout the university as well as Kyo-ya Hotels and Resorts, the largest hotel operator in Waikīkī, to provide a sustained, independent analysis of the economic, environmental, and societal value of implementing a district-wide SWAC system. It also is leading a public outreach program aimed at ensuring that decision-makers and the general community understand the implications of SWAC and to provide stakeholders an opportunity to participate in the decision making process.

Creating Sustainable, Hazard-Resilient Coastal Communities For the first time in Hawai‘i, UH Sea Grant hosted an issue-based training service, Coastal Community Planning and Development, conducted by the NOAA Coastal Service Center (CSC). Two free, two-day introductory courses were offered in the fall and were geared toward enabling participants to understand, plan, and guide efforts to implement alternative growth and development approaches in their communities. The courses also introduced the importance of building resilience to natural hazards. Participants included members of neighborhood boards and chambers of commerce, community non-profits, large landholders, and county and state agencies.

Campus Spatial Survey and Integrated Planning The UH Sea Grant Center for Smart Building and Community Design and the School of Architecture’s Environmental Research and Design Laboratory have been collaborating with the UH Mānoa Office of the Vice Chancellor for Administration, Finance, and Operations to inventory and virtually model facility space on the university’s flagship Mānoa campus. A campus-wide Building Information Model (BIM) was developed for 51 buildings at UH Mānoa and serves as the framework for the project, providing the basis for assembling, organizing, and linking information across databases. It has proven valuable in assessing space usage and optimization on campus and is expected to help reduce energy use.

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Establishing a New Aquaculture Industry in Hawai‘i Hawai‘i imports more than 80 percent of its seafood, including about 400,000 oysters monthly. Previously, this dependence on imported seafood was largely due to Hawai‘i being the only coastal state where bivalve shellfish culture was illegal due to the lack of a sanitation program for shellfish producers. Through the Center for Sustainable Aquaculture, UH Sea Grant extension agents based at University of Hawai‘i Maui College and the University of Hawai‘i at Hilo (UH Hilo) worked with the Department of Health to develop a new shellfish sanitation system. Additionally, they worked with non-profit groups managing traditional Hawaiian fishponds to test the biological feasibility of using these cultural resources to grow shellfish. Trials with oysters in these ponds showed that market sized oysters can be produced in 6-9 months, as compared to 2-3 years at mainland sites. The results of these two projects have opened the door to a new industry that will lessen Hawai‘i’s dependence on imports, and likely provide dozens of jobs.

Encouraging Stewardship of Marine Resources The ReefTalk, ReefTeach, and ReefWatch programs were developed by UH Sea Grant extension faculty on the rural island of Hawai‘i to promote conservation and stewardship of marine and coastal resources. ReefTalk has reached thousands of community members over the last 18 years with lectures on cutting-edge research projects and many other topics. ReefWatch trains volunteers to count fish and invertebrates in selected reef locations around the island, with special coral spawning and ‘opihī (Hawaiian limpet) monitoring projects. ReefTeach, started by UH Sea Grant in 2000, is an ongoing volunteer education program geared toward reducing damage to heavily trafficked reef areas. ReefTeach has become a part of the non-profit “Save the Bay” program, which has in turn expanded ReefTeach to include business participation and an annual fund raising “Bay Concert.”

Develop New Extension Faculty Position UH Sea Grant has partnered with the Pacific Aquaculture and Coastal Resources Center (PACRC) at UH Hilo to create a new position focusing on the diverse needs of coastal communities on Hawai‘i Island. The individual hired for the position will have an opportunity to create an innovative outreach and extension program that connects the many resources available at the university with the needs of the local communities. Based in West Hawai‘i, he or she will plan, organize, and conduct extension and education activities island-wide. These activities will encompass sustainable coastal development, coastal tourism, fisheries, coastal hazards, coastal ecosystem health, and other interrelated issues important to the health and vitality of Hawai‘i’s coastal resources and its people.
UH Sea Grant extension faculty on the island of Maui include:

Robert Howerton, Aquaculture Extension Specialist; Tara Owens, Coastal Processes Extension Agent.

HIGHLIGHTS

Restoring Sand Dunes in South Maui

Through a partnership with UH Sea Grant, the County of Maui, and Hoaloa ‘Āina (a local volunteer organization), large scale dune restoration projects have progressed on South Maui beaches. One project, spanning the shoreline area from Charley Young Park to Kama‘ole I beach park, involved removal of dense vegetation and other encroachments from approximately 1.5 acres of beach park to restore both public access and natural dune function. Revegetation is currently underway in a phased approach to complete the restoration.

Publishing Planning Recommendations for Sea-Level Rise

In culmination of a year-long project funded by the National Sea Grant Law Center, UH Sea Grant extension agents Tara Owens, Andy Bohlander, and Dennis Hwang partnered with Maui and Hawai‘i Island planners to develop county-level policy recommendations for regulating development in the shoreline area. These important recommendations are aimed at supporting adaptive planning for sea-level rise in the coming years and can be used as a model for other areas around the state. Final recommendations were published and released to local decision-makers in a report titled, “Facing our Future: Adaptive Planning for Sea-level Rise in Maui and Hawaii Counties,” with the intention of inciting further discussion of these topics within the Maui and Hawai‘i County Planning Departments and/or Planning Commissions, and inducing subsequent rule revisions or requests for research.

Increase Availability of Fresh Food with Backyard Aquaponics Systems

To help individual families, schools, and businesses supplement their income and ensure access to fresh and safe seafood, herbs, and vegetables, UH Sea Grant Aquaculture Extension Specialist Robert Howerton worked throughout the island to set-up low cost, small-scale, integrated backyard aquaculture-agriculture systems. There are now more than 15 new aquaponics systems on Maui, including those at The Maui Farm, King Kekaulike High School, and Kamehameha School, as well as three commercial aquaponics systems, and a new system installation is currently underway at Maui High School.
Assisting in the Development of Shoreline Setback Rules UH Sea Grant is working with Kaua‘i County to update the shoreline setback ordinance for the island. Currently, Kaua‘i has an ‘interim’ ordinance in place, which UH Sea Grant helped the Kaua‘i County Council develop. The amendments to the ordinance are expected to incorporate the final erosion data published by the UH Coastal Geology Group in 2010. It is anticipated that the new rules will lead to safer development along the coast, based on scientifically-based setbacks, while easing regulatory burdens for minor activities. The updated ordinance will likely go into effect by Spring 2013.

Assessing Sea-Level Rise Risk in Kaua‘i County A team of UH Sea Grant faculty, led by Ruby Pap, is collaborating to conduct a Kaua‘i Climate Change and Coastal Hazards Assessment (KCHA) for Kaua‘i County. Specific goals of the assessment are to complete a data inventory and gap analysis related to sea-level rise and other coastal hazards, which are intended to inform decision-makers in updating the County’s General Plan. Of note, the KCHA will analyze sea-level rise inundation maps generated for Kaua‘i by the UH Coastal Geology Group. The KCHA will analyze these maps, identify critical areas at highest risk and those in need of future study, identify major gaps in data and policy, and provide recommendations on how to fill those gaps.

Promoting Sustainability Adam Asquith has been focusing his efforts on addressing energy needs, greenhouse gas emissions, sustainable development, and sustainable food production for the island of Kaua‘i. Through a partnership with the University of Hawai‘i at Mānoa Center for Conservation Research and Training, he has initiated technological development and outreach on small scale gasification units where the locally produced units convert solid or liquid into a gas to produce clean gas for engine power. He has also established relationships with the seed corn industry on Kaua‘i and conducted research on the use of biochar as a sustainable soil amendment. In this process, the charcoal is incorporated as a soil amendment for farming to achieve permanent carbon sequestration and improve soil fertility and crop production.

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UH SEA GRANT
PUBLICATION HIGHLIGHTS

HOMEOWNER’S HANDBOOK TO PREPARE FOR NATURAL HAZARDS
-SECOND EDITION
by Dennis J. Hwang and Darren K. Okimoto

The second edition of the Homeowner’s Handbook to Prepare for Natural Hazards by Dennis J. Hwang and Darren K. Okimoto was published in the summer of 2011. This edition includes more options for homeowners to protect themselves from high wind events with window shutters and an important step-by-step guide on how most houses in the state can be strengthened with hurricane clips. In addition, there is new guidance for evacuation from a local tsunami and much more.

Dennis Hwang, UH Sea Grant faculty and attorney, and Dr. Darren Okimoto, UH Sea Grant Extension Leader, developed the Homeowner’s Handbook to Prepare for Natural Hazards. Similar books have been, or are in the process of being produced, for the Sea Grant programs in Mississippi-Alabama, Texas, Louisiana, and Delaware.

SNORKELER’S GUIDE TO THE FISHES OF HANAUMA BAY by John E. Randall

This 65-page waterproof fish guide provides full color photographs, names, and descriptions of the fishes most commonly viewed by snorkelers and swimmers at Hanauma Bay.

HAWAIIAN REEF PLANTS by John M. Huisman, Isabella A. Abbott, Celia M. Smith

Hawaiian Reef Plants is an easy-to-use yet comprehensive guide on nearly all species of marine plants present in Hawaii accompanied by stunning photographs and illustrations. Its 264 pages include keys, descriptions, introductory chapters, sections on Hawaiian use of seaweeds, and much more.

WAHINE’S CHANGING CLIMATE
by Charles (Chip) Fletcher

This briefing sheet describes what is known in answer to the question “How is global warming influencing the climate in Hawaii?” as published in peer-reviewed scientific journals and in government reports and websites.

REEF AND SHORE FISHES OF THE HAWAIIAN ISLANDS by John E. Randall

Containing 1007 illustrations, this 560-page volume covers the 612 species of fishes found in the Hawaiian Archipelago from the shore to 200 meters depth. The author regards this as his finest publication, the result of 47 years of study of Hawaiian fish fauna.

EMALAMA I NĀ ‘ĀINA KUMU WAI O MAUNALUA: A WATERSHED HANDBOOK FOR THE RESIDENTS OF MAUNALUA by Jolie R. Wanger

This handbook describes how local residents can take an active role in improving the health of the Maunalua watershed and also includes useful information and tips that are relevant to residents living in other regions throughout the state.

THE 3 ‘IO BROTHERS AND THE BIG BAD HURRICANE by Keri Kodama

This hardcover children’s book conveys the importance of hurricane preparedness to the reader in a fun and familiar storybook format. The 3 ‘Io Brothers will make a great addition to your family’s library!

For more information, please visit our website and click on Bookstore or call (808) 956-7410.
NOAA Sea Grant Coastal Storms Program

Facilitating Research in the Pacific The Pacific Islands Coastal Storms Program (CSP) is a regional partnership between the NOAA Coastal Storms Program and UH Sea Grant. Its purpose is to provide resources to U.S.-affiliated Pacific island coastal communities that help reduce and mitigate the impacts from coastal storms and other climate-related coastal hazards. UH Sea Grant is currently serving as the host agency for the CSP-Pacific Islands region.

In 2012, the CSP conducted a small grants proposal process to distribute $1 million in NOAA grant funds throughout the region. A total of seven projects were selected for funding with awards being distributed for projects in Hawai‘i, Guam, the Marshall Islands, and Micronesia. The projects’ areas of study include atmospheric and weather forecast modeling and observation, geospatial data hosting and serving, community resilience training, disaster recovery planning, and coastal hazard mitigation and education.

Preparing Communities for Climate Change and Hazard Resilience As NOAA Coastal Storms Program (CSP) Coordinator for the Pacific Islands region, Dolan Eversole serves as a liaison between the University of Hawai‘i and the Pacific communities, facilitating key projects and communicating relevant science and information throughout the region as well as assisting the communities that rely upon CSP outreach. In August 2012, Eversole led a NOAA climate adaptation training on Saipan using Hawai‘i’s climate adaptation efforts as a model. Currently, Saipan is assembling an intergovernmental task force to address the issues discussed during training. Also through the CSP partnership, community workshops are planned in Guam to provide hazard resilience training to island residents.

Mapping Sea-Level Rise in Hawai‘i and Guam Through funding from the NOAA Coastal Storms Program, the Pacific Islands Ocean Observing System (PacIOOS) has been able to provide support for Charles (Chip) Fletcher’s work in creating sea-level rise maps for Hawai‘i, Guam, and the Northern Mariana Islands. Such maps will be instrumental in planning for sea-level rise and for informing future construction and modification efforts near the coast. The maps will be housed by PacIOOS, and will also be included on the NOAA Digital Coasts Sea
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UH Sea Grant extension faculty and staff working in the Pacific region include:

Murray Ford, Coastal Processes Extension Specialist; Ephraim Temple, Aquaculture Extension Agent.

**AMERICAN SAMOA**

**Aquaculture Research and Education** In 2012, Aquaculture Extension Agent Ephraim Temple continued to work closely with the community and also the students at the American Samoa Community College (ASCC) to improve and maintain the aquaculture industry in American Samoa. One of his signature projects is the development and maintenance of the Center for Sustainable, Integrated Agriculture and Aquaculture (CSIAA), an aquaculture research and education center developed for the local community. This year he worked closely with the StarKist Samoa tuna cannery, which generously donates the fish meal, to conduct a year-long feeds production trial in an attempt to improve access to high-quality fish feeds. Using the donated fish meal and the feeds production equipment at CSIAA, the local farmers were able to increase overall feeds production by 25 times, generating over 5,000 pounds of tilapia feed where less than 200 pounds were produced in the previous twelve month period.

**Aquaculture for Small Businesses** The Center for Sustainable, Integrated Agriculture and Aquaculture sponsored an outreach workshop called “Aquaculture for Small Businesses” which was geared toward helping women in the community generate ideas for starting up their own small businesses.

**Marine Science Education** For the second year in a row, Temple conducted a week-long course called Quantitative Underwater Ecological Surveying Techniques (QUEST) at American Samoa Community College. In addition to learning a variety of surveying methods, safe scientific scuba diving practices, teamwork, and leadership skills, the students who completed the course were hired by the National Oceanic and Atmospheric Administration to assist in sedimentation monitoring in Faga’alu Bay.
If you have an interest in coastal management, marine resource economics, or helping to shape national ocean and coastal policy decisions, consider applying for a fellowship through UH Sea Grant. These are once-in-a-lifetime opportunities, and the application deadlines are fast approaching, so apply now!

For more information please visit:
http://seagrant.soest.hawaii.edu/fellowship-opportunities or call 956-7031