University of Hawai‘i Sea Grant College Program

Strategic Plan

2009 - 2013

UH Sea Grant

The University of Hawai'i Sea Grant College Program (UH Sea Grant) supports an innovative program of research, education and extension services, directed to the improved understanding and stewardship of coastal and marine resources of the state, region, and nation.

UH Sea Grant is part of a national network of 32 university-based programs that promote better understanding, conservation, and use of coastal resources.

As part of the University of Hawai'i's prestigious School of Ocean and Earth Science and Technology (SOEST), we partner with the National Oceanic and Atmospheric Administration (NOAA) to provide links between academia, federal, state and local government, industry, and the local community.

Visit us online at: **www.soest.hawaii.edu/SEAGRANT**

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Preface

PREFACE

In early 2007, University of Hawai‘i Sea Grant College Program (UH Sea Grant) faculty and staff, with the help of our constituents, stakeholders, and other community members and partners, began work to update our strategic plan. This document is the result of those efforts and establishes a five-year work plan for UH Sea Grant and a reference for the community we serve, the people of Hawai‘i and the Pacific. While this document represents the next iteration of the UH Sea Grant Strategic Plan, we recognize it is a living document that will itself evolve as Hawai‘i’s future unfolds.

Introduction

INTRODUCTION

America's coasts are invaluable economic, cultural, and environmental assets at risk in this first decade of the 21st century. Increased rates of climate-related environmental changes have made coastal communities vulnerable in ways never before imagined. Overfishing and habitat degradation have contributed to declines in many U.S. fisheries. Heightened concerns about human health and safety are bringing greater attention to port security, coastal infrastructure deterioration, and seafood safety. As hundreds of thousands more Americans move to the coast every year, it is increasingly important that we find adequate ways to balance human social and economic activities. America must use its coastal land, water, energy, and other natural resources in ways that preserve the health and productivity of coastal ecosystems and optimize benefits to U.S. citizens now and in the future.

According to the U.S. Commission on Ocean Policy report, the U.S. coastal zone contributed $4.5 trillion to the U.S. economy in 2005. The challenges we face on our coasts clearly have significant implications for the Nation as a whole, not only for those who live and work in coastal communities. Leaders at all levels—national, state, and local—must work with citizens, private sector businesses, and various organizations to utilize our intelligence, ingenuity, and financial resources to turn a time of potential crisis into a time of opportunity. As individuals and as a Nation, we must take immediate steps to educate ourselves about the magnitude of the threats we face and respond to these in bold and creative ways.

The world around us is changing. Globalization of technology, people, finance, products, and decision-making means factors beyond our national borders are affecting the vitality of U.S. coastal communities and economies. Businesses are functioning in an increasingly competitive global economy and many policy decisions are taking place at an international level. The need for collaborative problem solving at the state, regional, national, and international levels has never been greater.

Severe challenges present the greatest opportunities for change, and Sea Grant is prepared to respond. One of the demonstrated strengths of state Sea Grant programs is the ability to rapidly mobilize universities and other partners to address challenges across the country and around the world. Likewise, one of the strengths of the Sea Grant network is the ability, through the organization's coordinated state and regional infrastructures, to implement the national goals of our parent organization, the National Oceanic and Atmospheric Administration (NOAA), at local, state, and regional levels.

At this time of great risk and opportunity, UH Sea Grant will address the goals set forth in this plan with innovation and creativity reflecting the particular needs of the people of Hawai'i and the insular Pacific.

National Planning

1.0 NATIONAL PLANNING CONTEXT

The goals and strategies outlined in this plan, while developed for regional and local execution, incorporate many NOAA national priorities: promoting the health of coastal ecosystems; increasing the accessibility and application of quality research to support wise decision-making; increasing the number of fish stocks managed at sustainable levels; and, expanding literacy about coastal ecosystems.

The urgent need for practical solutions to coastal problems requires coordination, cooperation, partnerships, and effective investment. Sea Grant provides NOAA with access to Sea Grant's university-based capabilities in order to achieve mutual goals. The National Marine Fisheries Service-Sea Grant Joint Graduate Fellowship, with its programs in population dynamics and marine resource economics, is just one example of the importance and effectiveness of this partnership. Sea Grant also works closely with National Ocean Service coastal programs to set national priorities for coastal management and to ensure closer coordination of coastal activities. Numerous partnerships exist between Sea Grant and the National Weather Service on subjects such as climate change, ocean and coastal observing, and rip currents.

UH Sea Grant, individually and via NOAA's National Sea Grant College Program, is working to integrate our efforts more effectively with NOAA's Coastal Services Center, the Office of Ocean and Coastal Resource Management, and the National Centers for Coastal Ocean Science, among others. The purpose of collaborative planning among these programs is to ensure that NOAA's coastal programs are focused on national priorities, and that their work is coordinated, outcome-oriented, and built around each program's strengths. Additional NOAA programs will be brought into this effort to create a more inclusive coastal enterprise. Two of the focus areas of this plan--sustainable coastal development and hazard resilience in coastal communities--are designed to immediately advance these integration efforts.

NATIONAL PLANNING PROCESS AND STRATEGIC APPROACH

The *NOAA National Sea Grant College Program Strategic Plan 2009-2013: Meeting the Challenge* establishes direction for the Sea Grant network to address critical national needs in coastal, ocean, and Great Lakes environments. The plan capitalizes on Sea Grant's unique capacities and strengths, allows for flexibility and creativity on the part of state Sea Grant programs, and supports many of the priorities in NOAA's strategic plan.

The collective Sea Grant network brought its wealth of experience to the task of creating this plan. The planning process began with a review of the U.S. Commission on Ocean Policy Report and the U.S. Ocean Action Plan, the NOAA Strategic Plan, the Ocean Research Priorities Plan and Implementation Strategy, the NOAA 5-Year Research Plan, Sea Grant state strategic plans, and other recent coastal/ocean plans and reports that set national, state, and regional priorities. To elicit input and guidance, a national stakeholders' workshop was convened in Washington, DC in July 2007, with representatives from NOAA programs, other federal agencies, and non-profit organizations that focus on coastal, ocean, and Great Lakes issues. In addition, to obtain the benefit of a wide range of stakeholder viewpoints, state Sea Grant programs were asked to share the outcomes of recent stakeholder meetings, surveys, and regional research agendas and initiatives, and to poll their advisory committees. The Sea Grant network convened for Sea Grant Week in San Diego, CA in October 2007 to identify priority goals and strategies for this strategic plan. This strategic plan provides a national guide for the work of the state Sea Grant programs, including Hawai'i. State Sea Grant program strategic plans contribute to the realization of national goals, while reflecting the specific needs and priorities of their states and regions.

2.0 HAWAI‘I PLANNING CONTEXT

The U.S. is facing ecological challenges and economic uncertainties that threaten stability today and for generations to come. This is particularly true at the Nation's coastal margins, with more than half of the U.S. population residing within 50 miles of the shoreline and with a concomitant concentration of economic activity (Rappaport and Sachs, 2001). In Hawai‘i, the Nation's only island state, the issues and challenges facing other coastal communities across the country are amplified. The lessons we learn from facing these challenges as a community are applicable to our sister coastal communities on the U.S. mainland.

Hawai‘i is the southernmost state in the Nation. Composed of seven inhabited islands and 129 smaller islands, Hawai‘i possesses one of the longest marine coastlines in the U.S. at approximately 750 miles. Our mid-ocean location, 2,500 miles from the nearest continental landmass, offers challenges in communications, access, and commerce that are particularly severe in light of increasing energy costs at home and abroad.

Of a total state population of 1.2 million, approximately 876,000 people or 72 percent live on O‘ahu, in the City and County of Honolulu. In contrast, 150,000 reside on the island of Hawai‘i, 58,500 on Kaua‘i, and a combined total of 128,000 for the islands of Maui, Moloka‘i, and Lāna‘i. Hawai‘i's coastal communities range from ultra-urban to decidedly rural. Hawai‘i's economy is based principally on tourism and military spending, with its visitor population averaging about 165,000 persons per day, half of which are on O‘ahu at any one time.

The challenges to our state are daunting and compounded by its geographical isolation. In an economy driven by tourism, the environment is the economy and great care is required to ensure that coastal development does not diminish this valuable resource. Clearly, this is an immense, vital task requiring commitment from users as well as partnerships across academia, government, and communities. The recent economic downturn and its ramifications in Hawai‘i argue for a sustainable and diversified economy that supports our people, protects our ecosystems, and leads to greater energy and food self-sufficiency.

UH Sea Grant has been serving the people of Hawai‘i for over 40 years in such a capacity through leadership in coastal and marine resource stewardship and research. Congress established a Sea Grant institutional program at the University of Hawai‘i in 1968 and in 1972 designated it as one of five founding Sea Grant College programs.

Rappaport, J. and J.D. Sachs. 2001. The U.S. as a coastal nation. Federal Reserve Bank of Kansas City, Research Division publication, RWP 01-11.

UH Sea Grant resides within the University's School of Ocean and Earth Science and Technology, a premier national marine sciences institution. UH Sea Grant serves the University of Hawai'i System supporting projects and students on the Mānoa campus, at UH Hilo, and at seven community colleges, as well as the American Samoa Community College, and the College of the Marshall Islands.

HAWAI'I PLANNING PROCESS AND STRATEGIC APPROACH

The UH Sea Grant 2009-2013 Strategic Plan establishes direction to specifically address critical needs and opportunities of the State of Hawai'i's coastal communities and the coastal and marine environments that sustain them. This plan capitalizes on Sea Grant's unique capacities and strengths, allows for flexibility and creativity on the part of UH Sea Grant, and aligns with and supports many of the priorities of our parent NOAA strategic plan.

The University of Hawai'i Sea Grant College Program was guided in its 2009-2013 strategic plan process by the University of Hawai'i at Mānoa Strategic Plan and the University of Hawai'i at Mānoa Institutional Proposal but informed by a diverse statewide constituency. The UH Sea Grant 2009-2013 Strategic Plan is thus a living roadmap resulting from the collective needs, opportunities, and wisdom of our coastal community constituents. The information included in the plan was derived from many sectors over several years using a variety of engagement models to ensure broad representation. UH Sea Grant extension and research faculty, administration, and staff all participated actively with our stakeholders and constituents to identify the most pressing challenges as well as the opportunities facing our island state. Formal and informal meetings were held to obtain input, and written comments and guidance were also solicited.

As described above, NOAA's National Sea Grant College Program embarked on a concurrent strategic planning exercise for 2009-2013. The parallel planning activities of NOAA's National Sea Grant College Program allowed UH Sea Grant to seamlessly align our efforts with those of NOAA's National Sea Grant Office. Our strategic plan focus areas are regional expressions of NOAA's National Sea Grant focus areas. In addition to the national focus areas, a fifth focus area, Sustainable Coastal Tourism, was included in this plan as a result of the unique role tourism plays in the State of Hawai'i.

Facilitated strategic planning meetings were conducted specifically addressing each of the five focus areas. These meetings were largely organized around UH Sea Grant Centers of Excellence which are the operational expression of focus areas.

Community-based strategic planning meetings helped identify critical issues and client needs. Meetings to develop the Safe and Sustainable Seafood Supply and Sustainable Coastal Development Focus Areas were held on November 13 and 14, 2007, respectively. A meeting focusing on Hazard Resilience in Coastal Communities was held on April 30, 2008 and followed by a May 1, 2008 meeting addressing Healthy Coastal Ecosystems. The Sustainable Coastal Tourism Focus Area was developed over the course of several smaller meetings, particularly those held on April 28, 2008 and May 2, 2008. We sought out and received guidance at these meetings from a diversity of individuals which included UH Sea Grant Advisory Council members, university faculty, representatives from federal, state and community government, elected officials, Hawai‘i business leaders, representatives of private foundations, and community members at large.

Lastly, the UH Sea Grant 2009-2013 Strategic Plan was informed by the Hawai‘i Ocean Resources Management Plan (ORMP). The ORMP is a statewide plan mandated by Chapter 205A of the Hawai‘i Revised Statutes. The scoping and participation conducted in the updating of the ORMP in 2006 involved extensive outreach and input gathering with participation of various stakeholder groups, government agencies, and the public over a period of 18 months. The ORMP is an integrated, place-based approach to management of ocean resources, based on land and sea links, the role of human activities, and improved collaboration in governance.

Mission and Vision

3.0 OUR MISSION AND VISION FOR 2013

NOAA's National Sea Grant College Program envisions a future where people live along our coasts in harmony with the natural resources that attracted and sustain them. This is a vision of coastal America where we use our natural resources in ways that capture the economic and recreational benefits they offer, while preserving their quality and abundance for future generations.

This vision reinforces the vision articulated in NOAA's 2006-2011 Strategic Plan: ". . . an informed society that uses a comprehensive understanding of the role of the oceans, coasts, and atmosphere in the global ecosystem to make the best social and economic decisions."

Sea Grant's mission is to provide integrated research, extension and education activities that increase citizens' understanding and responsible use of the Nation's ocean, coastal, and Great Lakes resources and support the informed personal, policy and management decisions that are integral to realizing this vision.

Sea Grant advances NOAA's mission ". . . to understand and predict changes in Earth's environment and conserve and manage coastal and marine resources to meet our Nation's economic, social, and environmental needs."

Focus Areas

4.0 FOCUS AREAS

Over the next five years, UH Sea Grant will concentrate effort in five areas: healthy coastal ecosystems, sustainable coastal development, safe and sustainable seafood supply, hazard resilience in coastal communities, and sustainable coastal tourism. These five interrelated focus areas emerged from the national and regional strategic planning process as areas of critical importance to the health and vitality of Hawai'i's coastal resources and communities. They respond to issues of major importance to NOAA, are consistent with the work of the NOAA coastal program integration effort, and are topical areas in which Sea Grant has made substantial contributions in the past and is positioned to make significant contributions in the future. In each of the five focus areas, Sea Grant has identified goals to pursue and strategies designed to take advantage of our strengths in integrated research, outreach, and education, and our established presence in coastal communities. Included in the focus area sections below are the expected outcomes of our activities and specific measurements that will indicate if we have achieved our goals in the shorter term. Overall performance measures and the targets we hope to reach are also included to ensure we remain on track toward the long view. Understanding relationships and synergies across focus areas is vital to achieving the focus area goals. Sea Grant is one of many partners working to address these complex and interrelated issues. Understanding how activities in one area can support and complement other activities, and using partnerships to accomplish shared goals, are strategies inherent to Sea Grant and will be central to achieving the goals outlined in this plan.

4.1 Healthy Coastal Ecosystems:



Goal: Sound scientific information to support ecosystem-based approaches to managing Hawai'i's coastal environment.

Strategies:

1) Conduct research on ecosystem processes, the relationships between coastal stressors--such as water quality degradation and altered biogeochemistry, contaminants, coastal processes and shoreline erosion, invasive species--and long-term human and ecosystem health (e.g., primary productivity, coral reefs, and fish pond biogeochemistry), and communicate this information to public and private planners, decision-makers, and managers.

2) Contribute to the development of baseline data, standards, or indicators to support ecosystem-based approaches, informed by the traditional Hawaiian ahupua'a system, to land use, water, fisheries, or other resource management topics by working with federal, state, or local programs including non-governmental organizations.

3) Utilize ecosystems' baseline data and indicators to support sustainable coastal community development decision-making and strategic planning.

Outcomes and Associated Measurable Objectives:

Short/Mid Term Outcome: Baseline data, standards, and indicators are developed by Sea Grant and partners to support ecosystem-based approaches informed by the traditional ahupua'a system of resource management.

Measurable Objective: By 2013, four new UH Sea Grant research or outreach projects will collect data relevant to ecosystem-based management and at least one will be an empirical test of ecosystem-based management approaches.

Long Term Outcome: Hawai'i residents, resource managers, businesses, and industries have access to sound scientific information to support ecosystem-based approaches to managing the coastal environment and restoration of degraded ecosystems.

Measurable Objective: By 2013, UH Sea Grant will have established five fully functioning Centers of Excellence* serving the information needs of island and coastal residents, resource managers, businesses, and industries throughout the State of Hawai'i that support ecosystem-based approaches to managing the coastal environment and restoration of degraded ecosystems.

**Smart Building and Community Design, Island Climate Adaptation and Policy, Sustainable Coastal Tourism, Marine Science Education, and Sustainable Aquaculture.*





Goal: Widespread use of ecosystem-based approaches to managing land, water and living resources in coastal areas informed by the traditional Hawaiian ahupua‘a model.

Strategies:

1) Work with partners inside and outside NOAA to develop data, models, and training activities that support ecosystem-based planning and management approaches, and share these with a wide variety of constituencies.

2) Support the development of Pacific coastal observation systems and other collaborative efforts that advance our capability to predict the effects of human activities and environmental changes on coastal resources in order to take steps to mitigate their effects in insular environments.

3) Provide life-long learning programs for people of all ages that enhance understanding of tropical ocean and coastal environments and promote stewardship of healthy ecosystems.

Outcomes and Associated Measurable Objectives:

Short/Mid Term Outcome: Planners know how to minimize impacts of land use, resource extraction, and other human activities on tropical insular ecosystems.

Measurable Objective: By 2010, a UH Sea Grant extension faculty member with expertise in the effects of human activities on ecosystems and emphasis on land use will be seconded to the planning units of every main Hawaiian Island county.

Short/Mid Term Outcome: Constituencies, including indigenous Pacific Islanders, have access to data, models, and training that support ecosystem-based planning and management approaches.

Measurable Objective: By 2011, UH Sea Grant will oversee the completion of four sustainability-based case studies based on the Harvard Business School model to include at least one case study on ecosystem-based fishery management in partnership with the NOAA National Marine Fisheries Service. The case studies will represent a review of the best available science (data, models, and training) and be made available to a diversity of constituencies through varied media (print, web, etc.).

Short/Mid Term Outcome: A multi-generational citizenry understand Hawai‘i’s unique coastal and marine environments and the need for stewardship of healthy ecosystems.

Measurable Objective: From 2009 to 2013, approximately 800,000 visitors and residents annually, of all ages, will receive coral reef ecosystem education from Sea Grant with an emphasis on ecosystem stewardship.

Goal: Restored function and productivity of degraded ecosystems.

Strategies:

1) Support research to improve the effectiveness of ecosystem restoration and identify promising new restoration approaches and technologies appropriate for island communities.

2) Invest in the development and dissemination of new information, policies, and methods to restore the function and productivity of degraded island ecosystems.

3) Provide technical support for citizens and businesses that need help with specific mitigation/restoration problems, giving them access to the latest information and techniques.

Outcomes and Associated Measurable Objectives:

Short/Mid Term Outcome: Hawai'i residents, resource managers, businesses, and industries have access to new approaches and technologies developed to improve the effectiveness of coastal ecosystem restoration.

Measurable Objective: By 2012, UH Sea Grant will formally establish and/or provide leadership to two collaborative efforts, targeting two significant ecosystems and/or watersheds, to include partners representing coastal residents, resource managers, businesses, and industries to improve the effectiveness of coastal ecosystem restoration through the use of new approaches and technologies.

Long Term Outcome: The function and productivity of Hawai'i's ecosystems are restored.

Measurable Objective: By 2016, six ecosystems' function and/or productivity will be improved in the State of Hawai'i as a result of UH Sea Grant activities.

Overall Performance Measures and Targets:

Number of ecosystems whose function and/or productivity are improved (restored to a greater level) as a result of UH Sea Grant activities; target six (6) ecosystems.

Number of coastal communities whose residents are actively engaged in organized ecosystem based stewardship as a result of UH Sea Grant activities; target twenty-six (26) communities.

4.2 Sustainable Coastal Development:



Goal: Healthy coastal economies on each Hawaiian Island that include an abundance of recreation and tourism opportunities and coastal access for all citizens.

Strategies:

1) Support research that provides communities in Hawai'i with information and techniques to achieve sustainable coastal economies without diminishing the long-term health of the natural coastal environment.

2) Use UH Sea Grant extension and education capabilities to engage coastal communities in planning processes that support the efforts of community leaders to identify and pursue sustainable economic development policies and programs state-wide.

Outcomes and Associated Measurable Objectives:

Short/Mid Term Outcome: State, county, and local decision-makers have the appropriate information, tools, and technologies to increase or preserve coastal access to Hawai'i's beaches and other coastlines.

Measurable Objective: By 2011, UH Sea Grant will have provided state, county, and local decision-makers with the information, tools, and technologies to increase or preserve public access to Hawai'i's beaches and other coastlines.

Short/Mid Term Outcome: Communities throughout the State of Hawai'i will have state-of-the art information and technology to adopt practices that increase their energy efficiency and decrease fossil fuel use.

Measurable Objective: By 2014, the UH Sea Grant Center for Smart Building and Community Design will have provided the information, tools, or technologies to communities on every main Hawaiian Island to enable adoption of practices that increase their energy efficiency and decrease use of fossil fuels.

Goal: Hawai'i communities that make efficient use of land, energy and water resources and protect the resources needed to sustain coastal ecosystems, and human quality of life.

Strategies:

1) Strengthen UH Sea Grant's research activities and extension capacity to help coastal communities determine ways to reduce their ecological footprint on land, water, and

other resources through resource assessments, scenario building, modeling, and other techniques.

2) Support innovative projects and activities on land-use practices and building designs for island environments that promote energy and water conservation, coastal-ocean related renewable energy technologies, and the creation of other tools to help communities grow in sustainable ways.

3) Work with federal, state, and local government, non-governmental organizations and other partners to help island communities evaluate their ecological footprints and grow in environmentally sustainable ways.

4) Support innovative activities and projects on land-use practices and building designs that promote energy efficiency and coastal-ocean related renewable energy technologies.

5) Help public and private decision-makers create and adopt policies, plans, and ordinances to increase energy efficiency and promote the development of renewable energy technologies suited to island environments.

Outcomes and Associated Measurable Objectives:

Short/Mid Term Outcome: Communities in all Hawai'i counties engage in visioning, resource inventories, analysis of development policies and education of community leaders and citizens.

Measurable Objective: By 2013, the UH Sea Grant Center for Smart Building and Community Design will have engaged communities in every county of the State of Hawai'i and assisted them in visioning, resource inventories, analysis of development policies, or education aimed at promoting sustainable coastal development.

Short/Mid Term Outcome: Communities throughout the State of Hawai'i use a variety of research results, tools, and technologies to improve community design and reduce their environmental footprint.

Measurable Objective: By 2012, coastal communities on every main Hawaiian Island will use a variety of research results, tools, and technologies to improve community design and reduce their environmental footprint as a result of UH Sea Grant activities.

Short/Mid Term Outcome: Growth plans, policies, and strategies are developed to protect Hawai'i's unique natural and cultural resources to serve future generations.

Measurable Objective: By 2013, the UH Sea Grant Center for Smart Building and Community Design will have provided the information, tools, or technologies to communities on each main Hawaiian Island enabling the development of growth plans, policies, and strategies to protect Hawai'i's unique natural and cultural resources to serve future generations.

Long Term Outcome: Alternative energy technologies (e.g., wave, thermal, current, wind, solar) are evaluated for their environmental and economic impacts and adopted where feasible and appropriate.





Measurable Objective: By 2014, the UH Sea Grant Center for Smart Building and Community Design will have provided the information, tools, or technologies to Hawai'i's communities to evaluate their alternative energy opportunities (e.g., wave, thermal, current, wind, solar) for their adoption where feasible and appropriate.

Long Term Outcome: Coastal community designs that improve energy efficiency and reduce carbon emissions appropriate to insular Pacific communities can be implemented.

Measurable Objective: By 2014, the UH Sea Grant Center for Smart Building and Community Design will have developed and/or identified designs appropriate and feasible for implementation in insular Pacific communities that improve energy efficiency and reduce carbon emissions.

Goal: Hawai'i's coastal citizens, community leaders, and industries that recognize the complex interrelated between social, economic and environmental values in coastal areas and work together to realize multiple uses and optimize environmental sustainability.

Strategies:

1) Work with NOAA's Ocean and Coastal Resource Management Program and Coastal Services Center, Environmental Protection Agency's Office of Smart Growth, and other federal, state, and local partners to disseminate assessment tools, model plans and ordinances, best management practices, alternative development approaches, and other techniques that will enable the citizens of Hawai'i to develop their coastal economies in environmentally sound ways.

2) Foster regional cooperation and partnerships among local government officials, community stakeholders, and regional planning organizations to promote sustainable growth plans and strategies that protect Hawai'i's unique natural resources so that they may be available to serve future generations.

Outcomes and Associated Measurable Objectives:

Long Term Outcome: Hawai'i's communities are aware of and actively engaged in promoting "green" building and "smart growth" community design to optimize land use and environmental sustainability.

Measurable Objective: By 2014, the UH Sea Grant Center for Smart Building and Community Design will have worked in partnership with the state, local government, and community leaders in promoting sustainable development and "green" building practices state-wide that optimize environmental sustainability.

Overall Performance Measures and Targets:

Number of coastal communities engaged in activities (e.g., visioning, resource inventories, analysis of development policies) or making informed development decisions that address the sustainability of economic or environmental resources; target six (6) communities (representing the four counties comprising the State of Hawai'i as well as the Republic of the Marshall Islands and American Samoa).

Number of coastal communities who have been provided the information, tools, or technologies to adopt/implement sustainable - economic or environmental - development practices or policies (e.g., land-use planning, working waterfronts, energy efficiency, alternative energy, climate change planning, smart growth measures, green infrastructure) as a result of Sea Grant activities; target six (6) communities (representing the four counties comprising the State of Hawai'i as well as the Republic of the Marshall Islands and American Samoa).

4.3 Safe and Sustainable Seafood Supply:



Goal: A sustainable supply of safe seafood to meet public demand.

Strategies:

1) Conduct integrated research, education, and outreach activities to support a viable aquaculture industry in Hawai‘i with acceptable environmental impacts, consistent with national objectives and building on the leadership role UH Sea Grant plays in this area.

Outcomes and Associated Measurable Objectives:

Short/Mid Term Outcome: A viable aquaculture industry with acceptable environmental impacts is supported in the State of Hawai‘i.

Measurable Objective: By 2013, UH Sea Grant will have provided information, tools, and/or technologies to aquaculture stakeholders that enable them to support a viable aquaculture industry with acceptable environmental impacts.

Short/Mid Term Outcome: Seafood availability and profitability increases in the State of Hawai‘i.

Measurable Objective: By 2013, UH Sea Grant will have provided information, tools and/or technologies to aquaculture stakeholders that enable them to increase the availability of seafood and profitability of the Hawai‘i aquaculture industry.

Long Term Outcome: Seafood supply from the Hawai‘i-based aquaculture industry is sustainable and safe.

Measurable Objective: By 2014, UH Sea Grant will have provided information, tools, and technologies to aquaculture stakeholders that enable them to produce seafood safely and sustainably.

Goal: A healthy Hawai‘i seafood industry that harvests, produces, processes, and markets seafood responsibly and efficiently.

Strategies:

1) Support research, development, and transfer of new technologies.

2) Work with the seafood industry to develop new products and innovative marketing approaches to increase seafood availability and profitability.

Outcomes and Associated Measurable Objectives:

Long Term Outcome: The Hawai‘i-based aquaculture industry produces seafood responsibly and efficiently.

Measurable Objective: By 2014, UH Sea Grant will have provided information, tools, and technologies to aquaculture stakeholders that enable them to produce seafood responsibly and efficiently.

Overall Performance Measures and Targets:

Number of aquaculture stakeholders (e.g., aquafarmers, businesses, educators, students, hobbyists, governmental agencies, non-profits, community organizations) who adopt and implement responsible, sustainable aquaculture practices; target one hundred (100).

Number of stakeholders trained in sustainable aquaculture practices; target three hundred (300).

4.4 Hazard Resilience in Coastal Communities:

Goal: Widespread understanding of the risks associated with living, working, and doing business along Hawai‘i’s coasts.

Strategies:

1) Conduct projects and activities to assess hazard-related risks in the Hawaiian Islands and increase the availability and usefulness of hazard-related information and forecasting for citizens, industries, and decision-makers in Hawai‘i’s coastal communities.

2) Work with state and local agencies to assess the risks associated with hurricanes, tsunamis, and other coastal hazard events, climate-related changes, and other impacts on critical transportation and supply infrastructure in the State of Hawai‘i.

3) Work with federal, state, and local agencies and other public and private sector partners to develop comprehensive education/literacy programs on the acute and long-term effects of climate-related changes, and other hazardous events, on human safety and property along the coast, and how to prepare for and survive them.

Outcomes and Associated Measurable Objectives:

Short/Mid Term Outcome: Coastal decision-makers in the State of Hawai‘i are aware of existing and available hazard-related data and resources (i.e., wave gauge, water level/tide gauge, weather station data, etc.).

Measurable Objective: By 2013, UH Sea Grant will have provided key coastal decision-makers in each Hawai‘i county with information, tools, and/or technologies that improve their awareness of existing and available hazard-related data and resources.

Long Term Outcome: Hawai‘i residents are aware of and understand the physical processes that produce hazards and climate change and the implications of those events for their communities.

Measurable Objective: By 2014, UH Sea Grant will have provided information and training to coastal residents statewide that educates them about the physical processes that produce hazards and climate change and the implications of those events on their communities.

Goal: Community capacity to prepare for and respond to hazardous events.

Strategies:

1) Help public and private decision-makers create and adopt policies, plans, and ordinances specific to Hawai'i's geographic, cultural, and social circumstances to reduce risks, manage catastrophic events, and speed recovery.

2) Conduct research and communicate information on how the use of Hawai'i's natural features and new technologies can help communities prepare for and mitigate the impacts of hazardous events in the islands.

Outcomes and Associated Measurable Objectives:

Short/Mid Term Outcome: Coastal decision-makers in the State of Hawai'i have the knowledge and skills to assess local risk vulnerability and respond with appropriate policies and regulations.

Measurable Objective: By 2013, Sea Grant will have provided key coastal decision-makers in each Hawai'i county information and training to gain knowledge and skills to assess local risk vulnerability and respond with appropriate policies and regulations.

Long Term Outcome: Vulnerable coastal communities in Hawai'i are provided with information, tools and technology to effectively respond to coastal catastrophes.

Measurable Objective: By 2014, the Center for Island Climate Adaptation and Policy will have provided information, tools and technologies to educate university faculty and students and coastal communities in new cutting-edge research and community projects related to hazard mitigation.

Goal: Effective state-wide response to coastal catastrophes.

Strategies:

1) Work with NOAA's National Weather Service and National Ocean Service, regional ocean observation systems, and other partners to make hazard-related data and data-derived products available and relevant to support decision-making during hazards mitigation planning and crisis events.

2) Make UH Sea Grant's local knowledge and contacts available to work with federal, state, regional, and local agencies, non-governmental organizations, and international partners that have hazardous event responsibilities, to facilitate the speed and quality of response to crises worldwide.





Outcomes and Associated Measurable Objectives:

Short/Mid Term Outcome: Coastal decision-makers in the State of Hawai'i have the capacity to apply data and resources to hazard planning and response.

Measurable Objective: By 2013, Sea Grant will have provided key coastal decision-makers in each Hawai'i county information and/or training that improves their capacity to apply data and resources to hazard planning and response.

Overall Performance Measures and Targets:

Number of coastal communities provided with information/training in local hazard resiliency, and hazard mitigation tools, techniques, and best practices; target twenty-five (25).

Number of coastal communities who adopt/implement hazard resiliency practices to prepare for and respond to/minimize coastal hazardous events; target twenty-five (25).

4.5 Sustainable Coastal Tourism:



Goal: Vibrant, attractive, and sustainable coastal tourism experiences which have the smallest environmental impact.

Strategies:

1) Work with the tourism industry and tourism agencies in the Pacific to promote and implement sustainable practices in tourism management and operations.

2) Assist the tourism industry, tourism agencies and organizations, and communities in the development of research and management innovations related to the condition, use, and conservation of the natural resources they depend on.

3) Undertake demonstration projects to showcase what is possible in the area of reducing resource consumption and impact on Hawai'i's coastal environment.

Outcomes and Associated Measurable Objectives:

Short/Mid Term Outcome: Projects are undertaken in Hawai'i that showcase possibilities for reducing resource consumption and environmental impacts associated with visitors.

Measurable Objective: By 2010, two major projects will be underway showcasing what is possible in the area of reducing visitor resource consumption.

Long Term Outcome: Sustainable practices in tourism management and operations are implemented in Hawai'i.

Measurable Objective: By 2014, UH Sea Grant will provide Hawai'i's primary tourist industry operators with information enabling the implementation of sustainable practices related to energy, water, and waste management.

Long Term Outcome: Tourism industries, agencies and organizations, as well as communities are engaged in the development of research, outreach, and management innovations related to the condition, use, and conservation of the natural resources they depend upon.

Measurable Objective: By 2014, major tourism agencies and organizations, as well as communities, in Hawai'i will partner with the UH Sea Grant Center for Sustainable Coastal Tourism in developing the research and outreach agenda related to the condition, use, and conservation of the natural resources they depend upon.





Goal: A financially competitive and environmentally responsible visitor industry.

Strategies:

1) Support research, development, and transfer of new technologies to keep Hawai'i's visitor industry financially competitive and environmentally responsible.

2) Collaborate in efforts to preserve the special cultural and social attributes that distinguish Hawai'i's coastal communities and provide their unique sense of place.

3) Contribute to the development of sustainable policies and best management practices and standards to aid the tourism industry in becoming more energy, water, and waste efficient in their operations.

Outcomes and Associated Measurable Objectives:

Short Term Outcome: New technologies and applicable research results are transferred to keep Hawai'i's visitor industry financially competitive and environmentally responsible.

Measurable Objective: By 2010, the UH Sea Grant Center for Sustainable Coastal Tourism will have functional multi-media portals for tourist industry operators to access tourism data for the state, as well as information on relevant operational technologies and university research results.

Long Term Outcome: Special historical, cultural and social attributes that distinguish coastal communities in Hawai'i and provide their sense of place are valued and incorporated in planning.

Measurable Objective: By 2013, major cultural organizations within the State of Hawai'i will be included in planning decisions related to tourism.

Goal: Work with the visitor industry to develop sustainable new products and innovative marketing approaches for these products to increase profitability and long-term industry viability.

Strategies:

1) Working with the national tourism industry and state and local tourism agencies to develop and promote the concept of sustainable coastal tourism through educational programs that can be delivered directly to tourists.

2) Developing opportunities within the university for faculty and graduate students to become involved in research and community projects directed at Pacific Rim tourism issues.

Outcomes and Associated Measurable Objectives:

Short/Mid Term Outcome: The concept of sustainable coastal tourism is promoted through programs delivered directly to tourists.

Measurable Objective: By 2011, three significant contact points (e.g., kiosks, information desk, etc.) for dissemination of sustainable coastal environmental information will be in full operation and reaching at least one-third of tourists visiting O‘ahu.

Long Term Outcome: Opportunities are in place within the university for faculty and graduate students to become involved in research and community projects directed at tourism issues.

Measurable Objective: By 2013, the UH Sea Grant Center for Sustainable Coastal Tourism will be sponsoring and involving ten faculty and students in new cutting-edge research and community projects related to sustainable coastal tourism.

Overall Performance Measures and Targets:

Number of major hotel and/or tourism operators adopting and implementing sustainable practices; target five (5).

Number of tourism organizations (government and private) statewide working directly with UH Sea Grant to address sustainability issues through research and outreach; target six (6).

Number of tourists and residents exposed/educated to Hawai‘i sustainability issues and practices; target approximately 800,000 individuals annually.

Cross-Cutting Goals

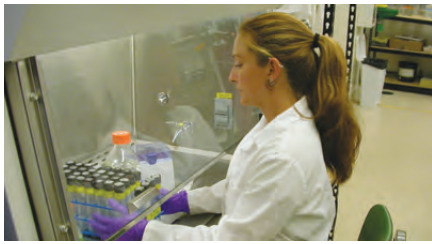
5.0 CROSS-CUTTING GOALS

Managing Hawai'i's natural resources in ways that benefit both human needs and environmental health requires progress in three fundamental areas:

- We need better information about how coastal, ocean, and marine ecosystems function and how human activities affect these habitats and associated living resources;
- We need citizens who understand the complexities of coastal environments and the interactions between human use and ecosystems health; and
- We need management and decision-making processes that are based on sound information, involve everyone who benefits from the beauty and bounty of Hawai'i's coastal resources, and include mechanisms to evaluate trade-offs between human and environmental needs.

To facilitate progress in these areas and to help Hawai'i understand, manage, and use its coastal, ocean, and marine resources wisely, we have embraced three NOAA National Sea Grant cross-cutting goals that complement and support the focus areas described above. Cross-cutting goals are central to all that Sea Grant does and reflect the value of Sea Grant's integrated approach to research, extension, and education. They provide the foundation of Sea Grant's work nationwide and are integral to the success of this five-year plan for Hawai'i. Cross-cutting goals and strategies are described below. Outcomes, measurable objectives, performance measures, and targets are not independently identified for cross-cutting goals as they are integrated within focus area metrics.

5.1 Sound Scientific Information:



Goal: Sound scientific information to advance understanding of the nature and value of our coastal, ocean, and marine resources; to identify new ways to conserve and use these resources; and to support evaluation of the environmental impacts and socio-economic trade-offs involved in coastal decision-making.

Strategies:

1) Support research to generate the scientific, technical, and legal information needed to increase understanding of coastal, ocean, and marine processes; support the development of new businesses, products, tools, and technologies; and answer the most pressing questions related to coastal and ocean resource conservation, use, and management at the state and regional levels.

2) Play a leadership role inside and outside the Sea Grant network in increasing the amount of socio-economic research available to help decision-makers evaluate socio-economic trade-offs and assess risks to the future health and productivity of coastal, ocean, and marine resources.

3) Integrate, translate, and disseminate research findings and technological discoveries to the citizens, industries, and leaders who need them to capitalize on opportunities and make wise management decisions.

5.2 An Informed Public:

Goal: An informed public that understands the value and vulnerability of coastal, ocean, and marine resources and demands informed science-based decisions about the conservation, use, and management of these resources, and a well-trained workforce that will make this a reality.

Strategies:

1) Advance ocean and coastal literacy through formal and informal learning opportunities in our schools, museums, aquariums, and other educational forums, such as the on-line, digital collections of the National Sea Grant Library.

2) Use UH Sea Grant's strong university partnerships to create new research and education opportunities in marine and aquatic science for undergraduate and graduate students and to develop information products and training opportunities that will help build the workforce capacity for coastal-related jobs and professions.

3) Collaborate within NOAA and with other partners to build public awareness about critical ocean and coastal issues, using the integrated research, extension, education, and communication capacities of the entire Sea Grant network.

5.3 Open and Informed Decision-Making:

Goal: Decision-making processes that involve the full-range of coastal interests, integrate efforts of public and private partners at the federal, regional, state, and local levels and provide mechanisms for establishing common understandings and generating outcomes that balance multiple interests.

Strategies:

1) Use UH Sea Grant's research, extension, and education capabilities to encourage and support the creation of public decision-making processes that minimize overlap, maximize effectiveness, and provide an integrated response to coastal problems and opportunities.

2) Build consensus on complex issues such as coastal land use, energy development, public access, invasive species control, and climate change impacts by supporting cutting-edge research, building broader understanding among various constituency groups, and convening diverse groups of stakeholders to work together to find common solutions.

3) Strengthen partnerships to promote national, regional, and issue-related collaboration among federal and state programs and other partners in order to support more effective and integrated coastal decision-making.

6.0 IMPLEMENTATION

6.1 The Center of Excellence Model:

Toward Implementation - a refined paradigm highlighting collaboration

UH Sea Grant continues to develop a refined paradigm to implement strategic priorities and goals: the Center of Excellence model. Centers of Excellence include researchers, extension professionals, state and local government representatives, industry and community members as well as "non-traditional" Sea Grant partners such as the U.S. Environmental Protection Agency and the American Institute of Architects. Centers build bridges among academics and those who can benefit from their scholarship. Centers conduct meetings of participants as necessary; while such meetings provide many services, a key component is linking researchers and users, and allowing researchers to hear firsthand from their community what questions need to be answered. These centers also provide for inter-college, -school and -department collaboration, something not encouraged by the traditional academic structure. The center model has been embraced by the University of Hawai'i administration which recognizes its value to the university at-large and which has increased support for UH Sea Grant as a result in the form of contributing salary funds for UH Sea Grant Center Directors.

The Centers of Excellence also provide a mechanism for regional collaboration. The success of such collaboration is evident by the Center for Smart Building and Community Design which has provided a dynamic and successful platform for collaborative activities among UH Sea Grant and Oregon Sea Grant, Texas Sea Grant, Maine Sea Grant, Rhode Island Sea Grant, and other network programs.

The Centers of Excellence are playing a critical role in our ongoing strategic planning activities.

The Centers of Excellence encompass the Sea Grant mission while providing the critical service of focusing program resources to optimize effectiveness. The Centers of Excellence include:

- **Center for Smart Building and Community Design**--creating and supporting economically viable, attractive communities that enhance their environment, economy, and culture; key partner, University of Hawai'i School of Architecture

- **Center for Sustainable Coastal Tourism**--conducting research and providing services to assist the state and the community in ameliorating visitor impact and diversifying targets for sustainable tourism growth; key partners, University of Hawai'i College of Social Sciences, Department of Economics, and School of Travel Industry Management

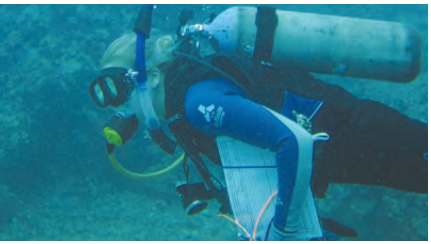
- **Center for Island Climate Adaptation and Policy**--committed to a sustainable, climate conscious future for island communities by delivering innovative interdisciplinary research and real-world solutions to decision-makers in the public and private sectors; key partners, University of Hawai'i William S. Richardson School of Law, College of Social Sciences, and School of Hawaiian Knowledge

- **Center for Marine Science Education**--providing leadership and support to formal and informal educational institutions and organizations to educate scientists, professionals, teachers and the public about the benefits of wise and sustainable stewardship of our region's coastal and ocean resources that incorporates cultural values; key partner, University of Hawai'i College of Education

- **Center for Sustainable Aquaculture**--providing science-based information and supporting efforts toward sustainable aquaculture development, supporting workforce development for the aquaculture industry, and stimulating demand for local aquaculture products; key partner, University of Hawai'i at Hilo Pacific Aquaculture and Coastal Resources Center

A Center of Excellence for Healthy Coastal Ecosystems is also being explored to evaluate how UH Sea Grant can best operationalize this focus area by recognizing, supporting and building upon both our ongoing work and that of our NOAA and non-NOAA partners.

6.2 Research Proposal Process:



The research component of UH Sea Grant represents a critical element of implementation as it generates the foundation of a significant core of extension activities in addition to its research value. The 2009-2012* research component was initiated by a Request for Preliminary Proposals (RFPP) announced on December 10, 2007 with a submission deadline of February 13, 2008. The request was sent to the University of Hawai'i System, University of Guam, Brigham Young University of Hawai'i, Chaminade University, and Hawai'i Pacific University as well as to colleges in the insular Pacific. The RFPP was also placed in the University of Hawai'i campus bulletin and sent to an extensive electronic listserv to achieve broad distribution throughout the region. Forty-two preliminary proposals were received in response to the RFPP.

Preproposal screening was undertaken by a science panel composed of University of Hawai'i and local ocean and coastal agency scientists who evaluated the scientific merits of the preliminary proposals. The panel was constituted with special care to ensure that panel members did not have conflicts of interest. In addition, on April 1, 2008, the University of Hawai'i Sea Grant Advisory Council met to advise UH Sea Grant on the relevance of the proposed work to our constituents and the community (Appendix A. Advisory Council membership). From these meetings, 34 preliminary proposals were recommended for development as full proposals. Twenty-eight full proposals were received by the June 20, 2008 deadline. These were distributed for ad hoc peer review in summer and early autumn of 2008.

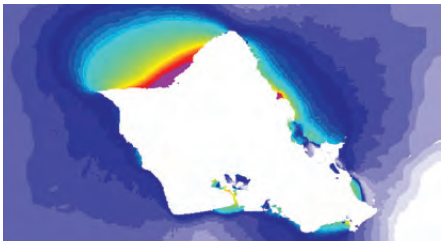
Based on the content of the proposals, an External Science Panel was formed to undertake final review and proposal selection for funding. Members of this panel are provided in Appendix B. This was the fourth UH Sea Grant proposal cycle to employ such a panel in the project review process and conforms to the rigorous methods of a National Science Foundation review panel. All panel members accessed proposals through a web-based

**UH Sea Grant customarily funds research projects on a biennial funding cycle. In 2009, the NOAA National Sea Grant Office mandated a synchronization of the funding cycles of the state Sea Grant Programs nationwide by 2012. As a result, the funding duration for the UH Sea Grant 2009-2011 research cycle was extended one year, resulting in a one-time, three year funding award (2009-2012). The subsequent three-year funding award will resume a biennial funding schedule (2012-2014).*

system. Each panel member was asked to review and lead the panel in a discussion as a primary reviewer for several proposals and to act as secondary reviewer and tertiary reviewer for several additional proposals. All panel members were asked to have a working knowledge of all full proposals submitted. Thus, each proposal was initially considered in a dialogue among the three assigned reviewers. Other panel members were invited to add to the discussion of each proposal once the assigned panel members had presented. The number of proposals assigned to each member of the panel varied depending on the number of proposals falling within their areas of expertise. The panel members were provided with the ad hoc peer reviews prior to their arrival in Hawai'i. The UH Sea Grant External Science Panel met on October 1-2, 2008 to evaluate full proposals and prioritize them for funding. Dr. James Murray, Deputy Director of the NOAA National Sea Grant Office, monitored the proposal review process. Dr. Murray attended all meetings associated with full proposal selection and officially endorsed the process.

The External Science Panel was unanimous in its recommendations for funding. Sufficient federal funds were available to award 14 project grants in the 2009-2012 research portfolio. Some principal investigators who submitted proposals in this cycle but were not awarded funding were invited to apply for program development funding to improve their concepts, data, or methods prior to the next biennium call for proposals.

6.3 Program Development:



Program development grants are extramural to the process described above and impart agility to the program to respond to opportunities and challenges that emerge outside of the realm addressed by the formal biennial research program. Program development funds are disbursed at the discretion of the UH Sea Grant Director when projects or actions are identified that will assist the program in serving its constituents and increasing its capacity. For example, program development grants may be awarded to attract new investigator participation in the program. Emphasis is placed on fostering proof of concept work or method validation with a relatively small amount of "seed" money that improves the project's competitiveness in the subsequent Sea Grant funding cycle. Program development grants may also be awarded to build specifically needed capacity within the university through training and other experiential opportunities.

Appendicies

APPENDICES

Appendix A. University of Hawai‘i Sea Grant College Program Advisory Council 2009-2012 Biennium

Dr. Bruce Anderson
Director
Health and Science Programs
Hawaii Pacific University

Mr. Geoffrey Anderson
President and CEO
Smart Growth America

Mr. George Atta
Executive Vice President
Group 70 International

Mr. Robin Bond
President
Friends of Hanauma Bay

Mr. John Corbin
Manager (retired)
Aquaculture Development Program
Hawai‘i Department of Agriculture

Mr. H. Mitchell D’Olier
President
Kāne‘ohe Ranch Company, Ltd.

Mr. Henry Eng
Director
Planning and Permitting
Department
City & County of Honolulu

Mr. Joseph Ferraro
Principal
Ferraro Choi and Associates, Ltd.

Mr. Neil Hannahs
Director
Land Assets Division, Endowment
Group
Kamehameha Schools

Dr. Kevin Hopkins
Interim Director
University of Hawai‘i at Hilo
Pacific Aquaculture and Coastal
Resources Center

The Honorable Harry Kim
Mayor (represented by)
Ms. Diane Ley
Deputy Director
County of Hawai‘i
Department of Research and
Development

Ms. Mary Leach
Manager (retired)
Transition Management Team
National Oceanic and Atmospheric
Administration

Mrs. Barbara Littenberg
Projects Coordinator
The Medical Foundation for the Study
of the Environment

Dr. Richard Littenberg
President and Chief Executive Officer
Honolulu Medical Group

The Honorable Hermina M. Morita
Legislature of the State of Hawai‘i
14th Representative District

Mrs. Marylyn Pauley
Board of Directors
Center for a Sustainable Future

Dr. Samuel Pooley
Director
National Marine Fisheries Service
Pacific Islands Fisheries Science Center

Dr. C. Barry Raleigh
Researcher
Hawai‘i Natural Energy Institute
University of Hawai‘i

Brian Schatz
Executive Director
Helping Hands Hawai‘i

Dr. Francis Schuler
Executive Director (retired)
National Sea Grant College Program

The Honorable Cynthia Thielen
Legislature of the State of Hawai‘i
Assistant Minority Floor Leader
50th Representative District

Ms. Laura Thielen
Chairperson
Department of Land and Natural Resources

Ms. Laura Thompson
Founder
Mālama Maunalua

Mr. David Waller
Vice President
Customer Solutions
Hawaiian Electric Company, Inc.

Mr. Ronald Weidenbach
President
Hawai‘i Aquaculture Association

Appendix B. University of Hawai'i Sea Grant College Program External Science Panel 2009-2012

Dr. Anders W. Andren
Director
Wisconsin Sea Grant
University of Wisconsin, Madison

Dr. Peggy Fong
Professor
Department of Ecology and
Evolutionary Biology
University of California Los Angeles

Dr. Margo Haygood
OGI Distinguished Professor in Marine
and Biomolecular Systems
Department of Environmental and
Biomolecular Systems
Oregon Health & Science University

Dr. Douglas Lipton
Sea Grant Extension Program Leader
Maryland Sea Grant Extension

Dr. Christopher S. Martens
William B. Aycock Professor
Department of Marine Sciences
The University of North Carolina
at Chapel Hill

Dr. James Murray (ex-officio)
Deputy Director (acting)
National Sea Grant Office

Dr. Carl B. Schreck
Oregon Cooperative Fish and Wildlife
Research Unit

Dr. David Secor
Chesapeake Biological Laboratory 1

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UNIVERSITY of HAWAI'I MANOA

UH Sea Grant
2525 Correa Road, HIG 238
Honolulu, HI 96822