



University of Southern California Sea Grant Strategic Plan 2009 - 2013

Introduction

The impacts of cities on human and ecosystem health in the coastal zone have become national and international issues. Sustaining and conserving the nation's coastal and marine environments creates an array of challenges that require both technological innovation and active collaboration among scientists, policymakers, resource managers and a variety of coastal constituents. The dependence of urban areas on these natural coastal resources is just beginning to be understood.

The 1,100-mile California coastline is approximately the same length as the U.S. east coast from Norfolk, Virginia to the northern border of Maine, and the character of coastal terrain varies greatly from north to south. Northern California, with the exception of the San Francisco Bay area, has a more rural character. The region known as the Southern California Bight, which stretches from Point Concepción in the north to south of Tijuana, Mexico, is highly developed – an urbanized coast characterized by nearly uninterrupted commercial and residential development. There are 17 million residents who live in the counties that comprise the Southern California urban watershed – the region served by the University of Southern California (USC) Sea Grant program. With 75% of California's population living within coastal communities it is critical to address the ever-increasing challenges to coastal cities and ecosystems such as sea level rise and other threats from climate change.

As the largest coastal urban center on the west coast, and the second largest in the nation, the city of Los Angeles is a prime location to study the effects of urbanization on our coastlines, especially in the Southern California culture of

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“endless summer” that places such a unique value on its beaches and coastal ocean. Recreational environmental amenities drew over \$4.3 billion dollars in International tourism in the Los Angeles area in 2007.

Los Angeles County is the largest manufacturing area in the nation and is home to the busiest port complex in the United States. The ports of Long Beach and Los Angeles pose the challenge of balancing between economy and ecology. Trade is an important driver, with \$356 billion dollars worth of cargo that moved through the port complex in 2008 in turn providing 946,000 jobs within the region.

While water quality today in the Southern California Bight is the healthiest it has been in decades, there continues to be tremendous influence from concrete rivers and channels that rapidly deliver massive amounts of urban contaminants to recreational beaches and marine habitats. Shorelines also face pressures from erosion, climate change impacts (e.g. sea level rise), and storm influences. The University of Southern California’s location in the middle of Los Angeles has made the Sea Grant Program at USC an important regional resource, concentrating on issues arising out of the necessity of managing people and resources in an intensely developed coastline. For this reason, in the 1980s the USC Sea Grant program adopted as its programmatic theme the “Urban Ocean.”

The problems found in the “Urban Ocean” environment of Southern California are not unique to the region. In addressing the range of issues found here, we hope to provide information and develop models that will serve other urban coastal regions in the U.S. and around the world. We consider Los Angeles the city of the future and treat it as an Urban Ocean laboratory. Our dedication to the Urban Ocean theme is reflected in our calls for proposals, in our planning documents, in our project evaluation process, and in our philosophies of science program management. We fund research on the critical issues associated with the influence of massive cities on the sea, promote connections between scientists and the policy-makers who must craft solutions, and broadly distribute information to the electorate through public education outreach efforts.

USC Sea Grant’s primary responsibility is to contribute to solving the problems of the Urban Ocean, while recognizing the opportunities for coastal commerce, recreation and improving the quality of life in coastal regions such as Southern California. Through our extension and outreach programs results

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of research are disseminated back to the user community by providing unbiased science-based information; promoting the health of coastal ecosystems; increasing accessibility and application of quality research to support wise decision-making, expanding literacy about coastal ecosystems and sustainable development] and responding to ocean risks and hazards such as impacts from climate change.

Supporting the development of a workforce of scientists and managers to conduct research and to guide responsible use and conservation of our nation's coastal and ocean resources is fundamental to our future success. USC Sea Grant works to build strategic alliances with coastal and marine industries and other interested groups to advance our collective understanding of the opportunities and problems facing our urban coasts. Throughout our history as a neutral broker and partner in numerous regional activities the USC Sea Grant Program has worked with stakeholders, citizens, government and academia to help navigate this ever-changing landscape.

Using a network of scientists, government agency personnel and advisors, USC Sea Grant is able to anticipate research needs in a relatively short time frame. Strategic Plan Goals for 2009-2013 reflect America's most urgent coastal and ocean needs, NOAA priorities and National Sea Grant's goals, strengths, and core values while addressing the specific needs and priorities of the state and region.

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Sea Grant at USC

The University of Southern California, one of the largest private universities in the United States, has participated in the National Sea Grant College Program for over 30 years and has more than a 100-year history of marine science research in Southern California. USC's facilities, research and curricula make it the principal university in the Los Angeles region for ocean studies, and it has demonstrated excellence in marine research and education from the beginning of the 20th Century. The establishment of the Wrigley Institute for Environmental Studies (WIES) in 1995 to connect to USC's environmental science community makes it an optimum site for a Sea Grant program. The WIES operates on the USC campus and at the Wrigley Marine Science Center on Catalina Island and is growing rapidly.

The USC Sea Grant Program continues to be enriched through its ties to developing and established programs that share its concern for rational management of coastal and marine resources. Regionally, this enrichment comes from such programs as the Southern California Marine Institute (SCMI), a consortium of the seven California State Universities located in Southern California, Occidental College, and USC. At USC, a close relationship with researchers at WIES and in Marine Environmental Biology, Earth Sciences, and the School of Policy, Planning, and Development ensures that Sea Grant coordinates with ongoing research in the marine and social sciences, and has an interdisciplinary approach to marine-related research. Our education partnership with NSF funded COSEE West enables a more in depth approach to ocean literacy at the state, regional, and national levels.

The USC Sea Grant Program is staffed by six professionals, an information technology specialist and a financial and administrative coordinator. Sea Grant is housed in the Allan Hancock Foundation building on USC's main campus, which also houses faculty and labs in the Marine Environmental Biology program and the Wrigley Institute for Environmental Studies. The Hancock Building is in the center of USC, and has been the historic home for marine biology laboratories and offices since it was constructed in 1932. In 2008, the Sea Grant staff offices were relocated to the Hancock Director's Suite, so that all professional and administrative staff is co-located.

Our small staff size allows close cohesion of the various program elements and the invaluable cross-fertilization of ideas, plans and programming. Research administration, planning and extension and communications efforts

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combine seamlessly to provide Southern California, state and national constituencies with information and services that are naturally interdisciplinary and coordinated.

Sea Grant Director Dr. Linda Duguay also serves as the Director of Research for the Wrigley Institute for Environmental Studies, enabling a close connection to research scientists and teaching programs at graduate and undergraduate levels. She is a leader in the national Centers for Ocean Science Education Excellence (COSEE), an NSF-funded program aimed at linking top research scientists with K-12 and informal educators. Dr. Duguay's links with respected scientists around the U.S. and internationally, keep Sea Grant knowledgeable about the advancing edge of science and the emergence of new issues.

Phyllis Grifman, Associate Director, also serves as the program's research coordinator and its communications director, and she manages the extension and outreach program. She is an active partner in numerous state and national activities, serving to link Sea Grant with the research and information networks in such areas as national marine sanctuaries, state marine protected areas, and other scientific, communications and education endeavors. Phyllis maintains close contact with current and former Sea Grant scientists, and develops Sea Grant's new research capabilities.

Jim Fawcett is the Extension Leader and, as a well-known expert in ports and maritime transportation, provides key liaisons with the Ports of Long Beach and Los Angeles. A planner by training, Jim holds an adjunct faculty position in the School of Policy, Planning and Development, and teaches in that school as well as in the Environmental Studies Program at USC.

Dr. Juliette Finzi Hart is Sea Grant's most recent staff member; she holds a Research Professor position in Marine Environmental Biology. She led USC Sea Grant's participation in the formation of the West Coast Regional Research and Information Needs Plan and works with state staff on the West Coast Governor's Agreement on Ocean Health. Juliette also leads Sea Grant's projects related to climate change. In addition, Juliette worked with the Catalina Island Conservancy to develop a visitor use plan that enhances environmental tourism while protecting fragile island ecosystems.

Charlotte Stevenson has recently begun a contract as Sea Grant's Science Communications Specialist. She has a Masters of Science in Marine Biology

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in the field of toxicology and was a Knauss National Sea Grant Fellow in 2006. Charlotte writes Sea Grant's quarterly newsletter, the *Urban Mariner*, is helping to redesign Sea Grant's website, and contributes writing and design skills to other ongoing Sea Grant projects.

The Sea Grant education program is managed by Sea Grant Education Coordinator Linda Chilton, formerly a longtime informal science educator at the Los Angeles City's Cabrillo Aquarium. Linda is known throughout the region for her knowledge of marine science and her ability to translate that knowledge into education programs that fascinate schoolchildren and adults alike. Lynn Whitley, Sea Grant's former Education Coordinator, still plays an active role as a leader of Sea Grant's Education Program. She now serves as the Director of COSEE West and directs K-12 education at the USC Wrigley Institute for Environmental Studies. Lynn is a well-respected educator whose leadership in the National Marine Education Association and the Sea Grant Education network has raised the visibility of both enterprises.

USC provides much of Sea Grant's matching funds in the form of salary support for the director, associate director, and extension and education staff. As a private institution, USC has been able to maintain stable support for the program. In addition, Sea Grant has had the fortune to garner modest leveraged funding through a variety of sources – the U.S. Fish and Wildlife Service, California Coastal Commission, National Science Foundation (COSEE), the Annenberg Foundation, among other sources.

USC Sea Grant's budget, like those of other programs in the National Sea Grant College Program, has not had the opportunity to increase commensurate with the work it has undertaken over the last 20 years. Resources remain static, and it is only through the benefit of some leveraged funding that staff has been permitted to develop. Therefore, not all of the elements of this strategic plan will be equally capable of fulfilling their long-term goals without growth in the program. In particular, although we have been able to nurture the program in Coastal Hazard Resilience through partnerships and collaborations, much of the work remains unfunded.

The gap between what Sea Grant can do now and what we hope to accomplish in the future is our remaining challenge. We are a small program that is made large through the relationships and partnerships vital to our mission to provide the Southern California coastal region with high quality science, responsive outreach and education, and creative solutions to seemingly

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intractable environmental issues.

PLAN DEVELOPMENT

How This Plan Was Developed

In 2009, as we updated USC Sea Grant's strategic direction, we found that much is still to be learned about the issues and problems of the Urban Ocean. We continue our efforts to develop innovative research to help find solutions for pressing coastal management problems, and to demand that the science truly help resolve issues of greatest ecological and social importance. USC Sea Grant fosters the public's understanding of the science so that it motivates better decisions, and continues to bring decision makers and scientists together to inform each of the ways that their roles complement and strengthen the other's. We continue to find and implement new and innovative curricular programs that reach children in both formal and informal settings, so that the next generation of citizens is able to handle a more sophisticated science agenda than any before. Some of this leadership comes from the direct funding of projects. Some of this leadership comes from the larger role of facilitating the connections between the broad array of players that already exist. Some of this leadership emerges as the University of Southern California continues the unprecedented increase in its capabilities in the marine arena through the hiring of new faculty and the growth of the Wrigley Institute for Environmental Studies.

USC Sea Grant developed this Strategic Plan in 2008 and 2009, relying on input from the range of interests at both national and state levels and in the Southern California region. The USC Sea Grant Strategic Plan for 2009-2013 is broad in scope and vision, but with a recognition of the boundaries attendant upon limited resources. We continue to prioritize the elements of our research and outreach portfolio in order to focus on the most pressing concerns of the greater Southern California region. USC Sea Grant looked to both the national and state perspectives for assistance in determining these priorities.

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National Perspectives – NOAA And National Sea Grant Strategic Plans

The National Sea Grant College Program Strategic Plan for 2009-1013 states as its mission “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.” This follows closely upon the broad goal of the National Oceanic and Atmospheric Administration (NOAA), which envisions “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.” Our intent is to contribute to implementing those twin visions in the context of urban Southern California.

Both the NOAA and Sea Grant Network Plans thus provide the primary context for USC Sea Grant’s plan. For the suite of challenges presented in the Southern California coastal region, the USC Sea Grant plan refocuses those priorities, continuing our major emphasis on water quality and coastal ecosystem health, coastal community development, coastal hazards, and a robust education effort. As part of our sustainable coastal communities emphasis, we continue work on land use planning and marine transportation and ports, both of which are particularly important as economic drivers in the Southern California metropolitan region.

The new plan follows the structure of the USC Sea Grant Strategic Plan for 2003-2008, which provided the framework for the research and outreach accomplished during that time. We first considered whether our four thematic areas were still relevant, related closely to the National Sea Grant Strategic Plan, and how the goals and objectives were met. The earlier plan was developed using a number of focus groups, in addition to input from our Advisory Council and Academic Coordinators, and the California Resources Agency Sea Grant Advisory Panel (RASGAP). An analysis of this ambitious plan found that the four focus areas were still important and relevant to the Southern California coastal region, and that, while many of our objectives were achieved, there was still much work to do.

We carefully aligned our program plans and objectives with the National Sea Grant Strategic Plan, finding that our focus areas coordinated with and complemented those of the national program. We have a relatively new focus

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on Safe and Sustainable Seafood, the only area of the national plan where formerly we did not play an active role in research, but did endeavor to provide educational materials for the safe consumption of seafood. Recent developments in California related to designation of marine protected areas, research findings on the importance of seafood to healthy diets, and advances in aquaculture technology have fostered interest among our constituents and stakeholders. It is important to address the issues accompanying advances in aquaculture and interest in potential developments in Southern California. We have therefore amended this plan to reflect that interest in that focus area.

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State and Regional Perspectives

In 2007, the California, Washington and Oregon Sea Grant Programs conducted a large-scale scoping project to determine the research and information needs for the Large California Current Marine Ecosystem that spans the West Coast of the United States. In California, four scoping meetings were held, with like numbers in the other states. One of those meetings took place in Southern California, attracting over 100 people active in marine resource planning, management and research. For this plan, we looked especially hard at the input provided in the Southern California meeting, but our new plan reflects the research and information needs of the region as a whole as well, as reported in "West Coast Regional Marine Research and Information Needs," published by Oregon Sea Grant in 2009.

Additional state priorities for research are the analysis of beneficial uses of marine waters, including quantitative analysis of the impacts of storm water runoff and sediment contamination, examination of pathogens and bacterial indicators of water quality, and the development of tools for efficiently identifying human viruses. The state's interest in shoreline processes focuses on determining the physical, biological and economic effects of coastal and nearshore erosion and analysis of the roles of natural and artificial shoreline structures, beach nourishment, and impacts from El Nino and severe storms. The state recognizes the importance of marine education in its call for the development of unique and cost-effective programs to education people of all ages about the ocean and its needs.

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Advisory Councils and Regional Activities

At the local level, there are several advisory bodies that are regularly consulted for guidance and strategic planning advice. These are councils on academic research, local, state and regional research and outreach needs, and educational initiatives. All were consulted in the development of this Strategic Plan and regularly contribute ideas and insight to USC Sea Grant.

USC Sea Grant has an active and interested Advisory Council (Appendix I) whose input we solicited to review the national alignment materials I and II. Our strategic planning meeting with the Sea Grant Advisory Council was held June 2, 2009. The alignment materials were provided to the council members in advance of the meeting, and the meeting was structured as a round table discussion of our future goals and objectives. Council members concurred with our continuation of thematic areas, and provided their insights to refine research and outreach initiatives, and also to offer their assistance in continuing or establishing partnerships with managers, research entities and other organizations. We work to keep our Council informed about our research and outreach progress, and to consult with members in a timely manner.

USC Sea Grant's Academic Coordinators (Appendix 2) represent different academic departments at USC, helping to ensure that a range of scientific disciplines are represented. A member from the Southern California Marine Institute, a consortium of USC, California State University campuses in Southern California, and Occidental College contribute to the development of Sea Grant's strategic planning and research solicitations, and review preliminary proposals, as well as providing input on external research opportunities and other programs.

In California there are two important organizations that help provide direction as well as funding for Sea Grant. The first, the RASGAP mentioned above, comprised of the major agencies within California's Natural Resources Agency (Appendix 3), reviews proposals at both the preliminary and final stages, and provides input from each department on research and information they require. The California Ocean Protection Council (OPC) guides much of California's ocean policy initiatives, provides funding for Sea Grant, and annually provides input for our solicitation of research proposals. Sea Grant staff attend most meetings of the OPC in order to stay abreast of new policy directions and to get input on the research and outreach Sea Grant can

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contribute to state management efforts.

USC Sea Grant's "K-Grey" marine education program works closely with the COSEE-West education initiative, an education grant to USC and UCLA funded through the National Science Foundation (Centers for Ocean Science Education Excellence). The COSEE-West Advisory Board (Appendix 4) provides guidance on K-12 education programs for both formal (classroom) and informal audiences reaching both local constituents and international participants through an on-line presence.

Finally, strategic and implementation planning are ongoing enterprises for USC Sea Grant. All extension and administrative staff are members of multiple committees, boards, technical and advisory panels, and continuously engage in discussions of planning and management for Southern California. A list of those organizations is included in Appendix 5, along with brief descriptions of the purpose of those entities, and the role that Sea Grant plays. It is through the ongoing and enthusiastic participation of USC Sea Grant's representatives to the Southern California region that we make our most important and meaningful contributions to the wise use and conservation of our region's coastal and marine lands, waters and resources.

CROSS-CUTTING GOALS

CROSS-CUTTING GOALS

Sea Grant has a long history of providing a neutral, scientific basis for addressing existing and emerging issues critical for sustainable coastal management. Conducting scientific studies, linking them to policymakers, managers and decisionmakers, makes Sea Grant unique among scientific research organizations. Providing methods for formal and informal educators to help the public understand coastal and ocean science—including its applications—helps to foster a sense of stewardship in our society. Moreover, training new generations in science and policy means that the lessons we learn in science and the lessons we teach in the classroom, in aquariums and in museums will continue to help society cope with difficult environmental problems.

Cross cutting goals reflect important issues or opportunities that are addressed throughout Sea Grant's four thematic focus areas. Developing strategies for adapting to and mitigating the impacts of our changing climate is an important cross-cutting goal, since even small climate variations may mean potentially huge impacts on coastal ecosystems, coastal communities, and seafood availability.

Our history of developing successful approaches to educate students and adults about important and emerging coastal and ocean issues informs all of the theme areas throughout this Strategic Plan. Providing the scientific and technical information to inform the development of classroom curricula and informal education content has long been an important goal of USC Sea Grant's marine science education program.

GOAL

Sound scientific information to advance understanding of the nature and value of our coastal and ocean resources; to identify 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.

Sea Grant has a long history of generating cutting-edge research and supporting technological innovations for using coastal and ocean resources. By bringing an unbiased and well-researched view to decision makers, Sea

CROSS-CUTTING GOALS

Grant enables partners to look at all sides of an issue where economics as well as long-term social and environmental issues must be considered. Sea Grant partners with SCOOS network institutions to determine the patterns and causes of changes in coastal populations in response to regime shifts and naturally occurring events such as El Nino Southern Oscillation (ENSO).

STRATEGIES

- Support observations and studies of long-term trends and effects of oceanic events associated with climate change, such as sea surface warming, sea level rise, ocean acidification and anthropogenic activities such as introduction of invasive species.
- Develop outreach products and education initiatives about research findings that address long-term trends and the effects of oceanic events associated with climate change -- sea surface warming, sea level rise and anthropogenic activities, such as the introduction of exotic species.

GOAL

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

Ocean literacy is an understanding of the ocean's influence on you and your influence on the ocean. Educators must be supported to develop creative methods that ensure not just learning but application of knowledge for all audiences including those who are underserved. Helping learners to develop the critical thinking skills to make wise decisions and engage as citizen volunteers for meaningful stewardship experiences are essential to achieving literacy.

STRATEGIES

- Ocean science researchers and educators develop marine and aquatic science education and ocean literacy strategies as a prominent part of the regional and national education agenda

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- Provide direct education and support to formal and informal educators in lifelong programs that enhance the understanding of healthy coastal ecosystems, promote stewardship and provide resources to make informed decisions about these environments.
- Conduct integrated research, education and outreach activities for urban citizens, educators and students with special emphasis on underserved urban populations to understand the most effective education methods to enhance their understanding of healthy coastal ecosystems and aquatic careers.
- Conduct integrated research, education and outreach activities for urban citizens, educators and students with special emphasis on underserved urban populations to understand the most effective education methods to enhance their understanding of healthy coastal ecosystems and aquatic careers.
- Provide resources and connections among scientists and K-12 educators to access the most effective methodologies to integrate ocean observing systems data and climate research through NSF-funded COSEE West partnership and through other regional and national partnerships.
- Support educators in using scientific data as an educational tool and enable teachers to create and implement standards-based marine science lessons.
- Link university students with formal and informal institutions to support healthy coastal ecosystems education and raise awareness about ocean systems and climate.
- Expand the understanding of university students in the coastal management process such that they are capable of becoming competent resource managers.
- Provide training and support for educators and youth to learn about stewardship and monitoring to reduce recreation-induced damage to coastal ecosystems.
- Provide widely available public education on the balance between

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economic development and environmental protection, focusing on the coast and its various uses.

GOAL

Decision-making processes that involve the full range of coastal interest, 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.

USC Sea Grant is one of the partners establishing a West Coast Regional Plan that integrates the concerns, priorities and expertise of all interests and sectors. This plan identifies priorities and fosters collaboration among a full range of regional information providers and end users.

STRATEGIES

- Partner with Sea Grant programs and other entities to develop data management systems that consolidate data necessary for ecosystem based planning and management.
- Improve the understanding of the content, fate and effect of point and non-point source discharges in urban watersheds.
- Develop regional strategies for managing the effects of hydromodification on natural arid streams.
- Leverage local and state partnerships to make progress in Southern California municipalities for implementing alternative storm water management practices (e.g. low impact development, green infrastructure).
- Provide expert advice in port planning and environmental management to US and Asian ship owners and logistics experts whose vessels impact air and water resources in US ports.
- Provide graduate student's opportunities to pursue research and career

CROSS-CUTTING GOALS

goals in marine science and policy.

- Increase understanding of marine and environmental science and links with policies for students of all ages including engaging the public in the development of Marine Life Protected Areas.
- Support analysis and development of plans for a major marine laboratory and outreach center on the waterfront in the Port of Los Angeles.”

HEALTHY COASTAL ECOSYSTEMS

USC Sea Grant is focused on the complex of problems and opportunities presented in our Urban Ocean environment. The Southern California region, representing one on the three “megacities” in the United States poses considerable challenges for maintaining and conserving coastal and ocean resources while acknowledging the many pressures upon their uses. USC Sea Grant’s vision is for a healthier urban environment, reflected by cleaner coastal waters that afford better opportunities for recreation and commerce and the protection of human and ecosystem health.

USC Sea Grant collaborated with California, Oregon and Washington Sea Grant to develop a Regional Research and Information Needs plan that resulted in a collection of approximately 5,000 stakeholder comments on research and information needs for the west coast region. The analysis using social science methodologies to identify a suite of critical research needs range from improving standards and indicators for water quality impairment to studies on the readiness of coastal communities to respond to coastal hazards to improved data accessibility for decision and policy makers. Together research priorities have been established and efforts to coordinate information and technology transfer are underway. Regional collaborations that are illustrative of this effective partnership include addressing invasive species.

GOAL

Sound scientific information to support ecosystem-based approaches to managing the coastal environment

Pollution problems in this region can be severe. Not only is public health at risk but also the health of marine ecosystems because intense urban development, runoff from streets and surfaces transports untreated contaminants directly into the ocean severely impacting the health of the near shore and coastal ecosystem. Potential hazards to public and ecosystem health from non-point sources of pollutants continue to be difficult to manage and present a wide range of unknown problems for both ecosystem and public health. In addition, the Southern California region has one of the largest sewage

FOCUS AREA – HEALTHY COASTAL ECOSYSTEMS

effluent systems in the country contributing more than 1 billion gallons of treated wastewater to the ocean daily. Standard bacterial monitoring tests are used as the best indicators of public health risk, yet scientists and managers need to find timely methods to assess which pathogens are most likely to cause illness and ecosystem damage and tests that can be implemented in a cost effective manner by coastal municipalities.

STRATEGIES

- Identify and determine the effects of contaminants and biological agents of concern to human health and health of marine organisms; develop better rapid water quality indicators and source tracking tools; develop effective bio-indicators of contamination.
- Research to determine source contributions and effective methods to reduce contaminate loading for identification of water quality standards, to improve information availability on water quality and coastal ecosystem health for local municipal and state policy decision makers.
- Create outreach products and educational initiatives that present research findings addressing the effects of contaminants and biological agents of concern, rapid water quality indicators and effective bio-indicators of contamination.
- Determine responses of marine organisms to contaminants and pathogens and develop effective bio-indicators of contamination.
- Develop tools to inform the public about health risks related to coastal recreation in areas of poor water quality.
- Leverage statewide partnerships to progress toward assessing the health of rocky intertidal ecosystems.

GOAL

Widespread use of ecosystem-based approaches to manage land, water and living resources in coastal areas

FOCUS AREA – HEALTHY COASTAL ECOSYSTEMS

Studies of effective practices have moved beyond single species management to long-term ecosystem-level research to better understand the complex interaction among factors critical to healthy ecosystems and restoration of degraded habitats. USC Sea Grant provides leadership and leverages resources to bring to the discussion the best readily available science to redesign Marine Life Protected Areas in Southern California incorporating the advice and assistance of scientists, resource managers, experts, stakeholders and members of the public.

STRATEGIES

- Represent the neutral science-based perspective and facilitate wide involvement in the constituent community in the federal process for developing, maintaining and evaluating the Channel Islands National Marine Sanctuary.
- Represent the neutral science-based perspective, ensure open communication with the scientific community and facilitate stakeholder involvement in the California process for developing a coordinated network of marine life protected areas (MLPAs).
- Support research to determine the effects and effectiveness of marine protected areas, including socio-economic effects, and develop methods and approaches for MLPA evaluation.
- Support educators to provide students and families with content and process knowledge to become involved and be supportive of the marine life protected area process.
- Establish a means to observe and study long-term trends and effects of oceanic events such as sea surface warming, sea level rise and anthropogenic activities such as introduction of exotic species.
- Support research to improve access and management of data.
- Develop data management systems to assist in ecosystem-based planning and management as part of the Regional Research and Information Needs Plan in coordination with the three other West Coast

FOCUS AREA – HEALTHY COASTAL ECOSYSTEMS

Sea Grant programs and other partners.

- Create outreach products and education initiatives about research findings that address improving data access and management.
- Solicit and initiate research that examines ways to reduce recreation-induced damage to coastal ecosystems (e.g. tidepool trampling) and studies methods for determining the utility of “no-take” zones or other methods of reducing human impact.
- Develop outreach products and education initiatives to convey research findings about ways to reduce recreation-induced damage to coastal ecosystems (e.g. tidepool trampling) and study methods to study “no-take” zones or other methods of reducing human impact.
- Develop educational resources for coastal urban residents on environmental stewardship.
- Provide training and support for educators and youth to learn about stewardship and monitor recreation-induced damage to coastal ecosystems.
- Increase understanding of marine and environmental science through learning opportunities for underserved students and adults from diverse socio-economic and ethnic backgrounds particularly urban populations.

GOAL

Restored function and productivity of degraded ecosystems and increased understanding of the need for stewardship

USC Sea Grant serves a vital role in identifying and assessing impaired ecosystems that have been affected by generations of use. Policies and technologies are used to promote restoration in ways that balance human needs with the needs of the natural environment, promoting restored function to coastal ecosystems. Sea Grant leverages current science to address pressing issues and fosters educational endeavors to enhance the role of the public in reducing its influence on the coastal ecosystems while working to restore function to these coastal environments.

FOCUS AREA – HEALTHY COASTAL ECOSYSTEMS

STRATEGIES

- Establish national and international partnerships to research, monitor and investigate potential pathways and develop policies and tools to prevent the introduction and spread of non-native aquatic species.
- Invest in the development and dissemination of effective outreach and education methods, resources and technical assistance to reduce the sale and potential spread of marine invasive species.
- Create and distribute resource materials to educate and prevent the introduction of non-native invasive organisms.
- Support research to acquire predictive understanding of massive algal accumulations, develop methods to establish whether they are noxious or truly toxic and provide a template that coastal municipalities might employ in managing HABS in shallow coastal embayments.
- Link research, education and outreach initiatives to the role of restored wetlands in supporting healthy ecosystems.
- Provide life-long intergenerational learning programs that enhance the understanding of urban coastal ecosystems and promote healthy coastal ecosystems in partnership with community based organizations and agencies.
- Conduct integrated research, education and outreach activities to promote an understanding of healthy coastal ecosystems and aquatic careers for urban citizens, educators and students.

SUSTAINABLE COASTAL DEVELOPMENT

Almost a decade into the 21st century, California’s coastal cities continue to face unprecedented population growth and associated development pressures placing demands upon coastal marine ecosystems, water supply and vibrant diverse communities. While we have developed a better understanding of the dependence of urban areas on natural coastal resources, we are still exploring strategies to limit the negative effects of the growing pressures of urbanization. As the largest urban center on the West Coast and the second largest in the nation, the city of Los Angeles is recognized as a “megacity” and is at the heart of the debate about the effects of urbanization on our coastlines. The University of Southern California’s location in the middle of Los Angeles has made the Sea Grant Program at USC an important regional resource, concentrating on issues rising out of the necessity of managing people and resources in an intensely developed coastline. USC Sea Grant works to support a balance between the robust economic opportunities of the ocean including seaports, with safeguards to ensure the continued sustainability of marine resources.

The twin ports at Los Angeles and Long Beach constitute the busiest seaport complex in the U.S. and close to 45% of all marine freight entering the country enters through these ports. The movement of these goods to the region and throughout the nation cause tremendous environmental impacts upon the coast and upon coastal residents. USC Sea Grant brings science and policy research to address these challenges in assisting the public and its policy makers in finding an optimal balance between economic development and environmental protection. Sea Grant provides analytic skills to facilitating the ports as they move forwards with sustainable coastal development

GOAL

Healthy coastal economies that include working waterfronts, an abundance of recreation and tourism opportunities, and coastal access for all citizens

California has the strongest ocean economy in the nation. Its urban ports and harbors are a central component of the region's economy and continue to accommodate the demand for goods and expanding international trade. The impact of port growth affects air quality, water quality, transportation and

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thus the area's population through both increased traffic and pollution. Changing development patterns along the coast threaten to displace traditional water-dependent industries and cut off coastal access to California visitors and residents. USC Sea Grant's long-standing relationships with coastal communities and industries make it ideally suited to provide information, tools and techniques to support working waterfronts, responsible energy development and the development of accessible recreation and tourism activities.

STRATEGIES

- Support the port community by providing leadership and guidance to explore port growth in the context of environmental considerations (for example: port related storage, transport of goods, green technologies, etc.).
- Provide widely available public education on the balance between economic development of seaports and environmental protection, focusing on the coast and its various uses.
- Support and disseminate information on the importance of the ocean environment to ocean commerce and coastal planning for public safety, security, tourism and other emerging port issues
- Increase scientific and educational information available to the public about seaport resources in San Pedro Bay.
- Involve the public in planning scientific and educational uses of port facilities.
- Expand the understanding of university students in the coastal management process so that they can become competent resource managers.

GOAL

Support analysis and development of plans for a major marine laboratory and outreach center on the waterfront in the Port of Los Angeles.

FOCUS AREA – SUSTAINABLE COASTAL DEVELOPMENT

Coastal communities need to understand what their carrying capacity is, how it can be altered to achieve healthy ecosystems, and what will be needed for generations to come so they can respond to the challenges of growth at the local and regional level. Communities are looking for ways to use land and water, generate energy and dispose of waste that will preserve environmental health and economic vitality. Determining the amount of land, water and other natural resources needed to sustain healthy communities is an essential first step in establishing sustainable policies and growth practices. Sea Grant and its university partners are in a unique position to conduct research and develop models and forecasts that will help communities with this process.

STRATEGIES

- Provide expert advice to coastal planners and port officials in developing sustainable port practices and ensuring port security.
- Provide accurate scientific information to reduce conflicts over proposed multiple uses of coastal spaces and to increase efficient land use practices.
- Partner with local entities to help them better manage the natural resources and determine the sustainable carrying capacity in their area.
- Facilitate and coordinate the development of planning documents that ensure appropriate and sustainable use of natural resources.

GOAL

Coastal citizens, community leaders and industries that recognize the complex inter-relationships among social, economic and environmental values in coastal areas and work together to balance multiple uses and optimize environmental sustainability.

The pressures on our oceans and coasts continue to increase with population growth. Citizens and decision-makers have an urgent need for tools to use in their policy and management decisions that will help them evaluate the implications of land-use changes, coastal development pressures and increased resource use. Regional cooperation, and coordinated land-use and

FOCUS AREA – SUSTAINABLE COASTAL DEVELOPMENT

watershed planning are essential. Sea Grant's well established role as a trusted broker among a wide range of interests makes it a key player in providing sound information for decision-makers, convening stakeholders to seek common ground and facilitating the development and implementation of new coastal policies, plans and management approaches and consensus building strategies.

STRATEGIES

- Partner with Sea Grant programs and other entities to exchange information and policies on coastal management.
- Help develop regional strategies for managing the effects of hydromodification on natural arid streams.
- Provide local entities with accurate scientific information to better manage the natural resources, to reduce conflicts over proposed multiple uses of coastal space and determine the sustainable carrying capacity in their area.
- Support the development of ordinances or policies addressing water quality/quantity and/or impervious surfaces.
- Leverage statewide and local partnerships to make progress in municipalities implementing alternative stormwater management practices (e.g. low impact development, green infrastructure).

FOCUS AREA – SAFE AND SUSTAINABLE SEAFOOD SUPPLY

Safe and Sustainable Seafood Supply

Southern California has witnessed the decline of fisheries over several decades. This is of particular concern in the LA region's urban ocean where environmental impacts from increased runoff and pollution, as well as increased recreational fishing, negatively impact fish stocks, such as in the case of the spotted sand bass. Protecting ecosystems by designating marine protected areas through the California Marine Life Protected Act (MLPA) will abet some commercial and recreational fisheries management tools.

Developing well-designed aquaculture projects will also help to mediate recreational and commercial fishing pressure on local fishery stocks. USC Sea Grant participates in this focus area through soliciting and funding applied research on the viability of coastal and open ocean aquaculture and its potential environmental impacts, providing a leadership role by working with stakeholders to establish marine protected areas for southern California, and by developing educational resources and curriculum that focus on sustainable fishing and aquaculture. Moreover, USC Sea Grant is instrumental in connecting schools and the public in learning about restoring fisheries through the MLPA. USC Sea Grant is uniquely positioned to assess different coastal and open ocean aquaculture techniques at two environmentally disparate sites, within the Port of Los Angeles and in the more pristine deep waters off of Catalina Island.

Increased attention to the safety of domestic and international seafood has created an urgent need for certification programs and standards for domestic and international seafood products so that consumers will have reliable information to guide their buying decisions. Educating consumers about the importance of restoring and protecting healthy ecosystems and managing areas to ensure recreational and commercial fisheries along the shore can survive allows residents to make informed decisions. Creating educational materials related to seafood safety, quality and security, and making them available to consumers is a first step in guiding the public to make safe seafood choices.

GOAL

Development of environmentally sustainable coastal and open ocean aquaculture to sustain regional fisheries important for recreational and consumptive uses.

FOCUS AREA – SAFE AND SUSTAINABLE SEAFOOD SUPPLY

Sustainable aquaculture is currently an important societal need that will continue to grow in the future. With collapsing fish stocks and an increasing national demand for seafood, it is clear that natural fish stocks will not be able to sustain the fisheries markets. Although some methods for protecting natural fisheries stocks are already in place, such as designating marine protected areas that prohibit or limit fishing, aquaculture will be necessary in the future to avoid larger foreign imports of seafood. Sustainable aquaculture will help to relieve the pressure on natural stocks, thus helping to allow regional fisheries resources to rebound and become viable once again.

STRATEGIES

- Solicit and initiate research on the viability of coastal and open ocean aquaculture with the goal of sustaining local fish stocks important to urban recreational activities and as local food source.
- Solicit and initiate research on the potential environmental impacts of coastal and open ocean aquaculture.
- Develop educational tools and curriculum that support educators in teaching about fisheries management.

GOAL

Informed consumers who understand the importance of ecosystem health and sustainable harvesting practices to the future of our domestic fisheries, who appreciate the health benefits of seafood consumption and who understand how to evaluate the safety of seafood products they buy.

Consumers who comprehend the importance of maintaining ecosystem health will make better choices in purchasing seafood products, and this in turn will allow natural fisheries stocks to rebuild by discouraging unsustainable fishing practices. Enlightened consumers will make wiser choices about buying domestic products, versus imported ones that may not be harvested in sustainable ways. Moreover, those who understand the seafood markets and production practices will be better able to make healthy choices not only about the food they eat, but the manner in which it is produced, harvested, and processed.

STRATEGIES

- Develop education resources for the urban public so they understand principles of safe seafood consumption in the context of cultural practices.
- Engage recreational anglers, consumers and harvesters in the development of education strategies to increase conservation of the natural resources they rely upon through the MLPA process.

FOCUS AREA – HAZARD RESILIENCE IN COASTAL COMMUNITIES

HAZARD RESILIENCE IN COASTAL COMMUNITIES

Natural and human hazards including sea level rise, threats of oil spills, and more put coastal communities at risk. These risks have major implications for both economic and environmental impacts. It is essential that residents of coastal communities understand these risks and learn what they can do to reduce their vulnerability. USC Sea Grant plays a major role in partnering with decision-makers, citizens and industries by helping develop plans to reduce risks and to maximize implementation of plans to respond to hazards.

GOAL

Widespread understanding of the risks associated with living, working and doing business along the nation's coasts.

Sea Grant's vision is to provide a safer coastal environment through better understanding of coastal processes, the impacts of urbanization on the coastline, and mitigating impacts to protect life, property and ecosystems.

STRATEGIES

- Solicit research and initiate outreach and education initiatives that enhance personal safety, reduce property and ecosystem damage and protect economic stability.
- Provide local and regional governments with information and tools to better understand and predict individual and cumulative natural coastal hazards and guide the community in developing resilience to hazards.
- Increase public education and awareness of impacts of coastal development to promote better land management and usage and provide for greater public safety.

GOAL

Community capacity to prepare for and respond to hazardous events

FOCUS AREA – HAZARD RESILIENCE IN COASTAL COMMUNITIES

As communities gain a broader understanding of their vulnerabilities, they must act on their knowledge and become more resilient. Sea Grant assists individuals, businesses and communities in developing emergency preparedness and response plans that increase resiliency and enable them to respond effectively. By effectively communicating best management practices and improving forecasting capabilities, Sea Grant helps reduce vulnerability of people, buildings and businesses to coastal hazards.

STRATEGIES

- Update and disseminate coastal community information on multi-hazard concerns of climate change impacts, climatic patterns such as El Nino and La Nina and ocean literacy principles
- Develop partnerships to consider Tsunami risks in local coastal planning processes
- Support partners in considering sea level rise risks in local coastal planning processes
- Provide hazard related data and resources to coastal decision makers

FOCUS AREA – OCEAN EDUCATION AND ENVIRONMENTAL LITERACY

OCEAN EDUCATION AND ENVIRONMENTAL LITERACY

Three local and state level programs are our partners in marine science education: the Wrigley Institute for Environmental Studies at USC, the joint USC-UCLA COSEE West program funded by NSF and the California Education and Environment Initiative. California state law mandates the incorporation of environmental education concepts in standards based curriculum. On a national level USC Sea Grant is involved with COSEE, National Marine Education Association, Sea Grant Education Network and the NOAA Sanctuary Program to develop standards and benchmarks for marine science.

GOAL

Establish ocean literacy implementation in California and the nation by making marine science content accessible to diverse audiences.

Through our partnership in NSF funded COSEE West, we serve as a center for compilation and dissemination of marine science information and educational opportunities for teachers, students, underrepresented and intergenerational audiences and the general public. We ensure that education is provided in the context of individual interests and experiences and that incorporated throughout is the development of critical thinking skills for wise decision making. USC Sea Grants program is both a cross cutting element that incorporates our research and outreach themes and a stand-alone science literacy program.

STRATEGIES

- Ocean science researchers and educators develop marine and aquatic science education and ocean literacy strategies as a prominent part of the state, regional, and national education agenda
- Determine which elements of education and learning are most effective in developing ocean literacy skills and fostering behavior change.
- Assess the effectiveness of cross-generational learning to build connections among teachers, students and parents and in developing marine and environmental science literacy.

FOCUS AREA – OCEAN EDUCATION AND ENVIRONMENTAL LITERACY

- Create opportunities for citizen science and ocean stewardship for personal growth and career development.

APPENDIX 1

APPENDIX 1: Advisory Council

Mr. Gary Bane
Nauticos, Ocellus Productions Division

Dr. John Dorsey
Loyola Marymount

Mr. Dennis Eschen
Department of Parks, Rec & Marine
City of Long Beach

Dr. Guang-yu Wang
Santa Monica Bay Restoration Commission

Dr. Stephen Weisberg
Southern California Coastal Water Research Project

Dr. Norman Bartoo
National Marine Fisheries Service, NOAA

Mark Helvey
NOAA/NMFS/SWRO
State Water Resources Control Board

Dominic Gregorio
Ocean Unit, Div of Water Quality

Ms. Melinda Bartlett
Dept. of Environmental Affairs

Bob Kanter
Port of Long Beach

Dr. Fred Piltz
Minerals Management Service
Pacific OCS Region

Mark Gold
Heal The Bay

Ms. Lesley Ewing
California Coastal Commission

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Victor Omelczenko
Internal Revenue Service

Jonathan T. Phinney Ph.D.
Southwest Fisheries Science Center
NOAA-National Marine Fisheries Service

Craig A. Moyer
Manatt, Phelps & Phillips, LLP

Dr. Jerry Schubel
Aquarium of the Pacific

Michael Lyons
Regional Water Quality Control Board

Dr. Charles D. Kopczak
California Science Center

Dr. Ralph Apply
Port of Los Angeles

CAPT Richard B. McKenna
Deputy Executive Director
Marine Exchange of So. California

Ms. Dani Lipski
Channel Islands National Marine Sanctuary

APPENDIX 2

APPENDIX 2: Academic Coordinators

Costas Synolakis
Professor, Department Civil/ Environmental Engineering Division
Viterbi School of Engineering

Kenneth Nealson
Wrigley Professor of Giobiology
Department of Earth Sciences

Dr. Rick Pieper
Calif State University, Long Beach

Suzanne Edmands
Associate Professor
Department of Biological Sciences

APPENDIX 3

APPENDIX 3: RASGAP Member Listing

Deanna Spehn
39th State Senate District

Ron Flick
CA Dept of Boating & Waterways

Deborah Orril
CA Dept of Conservation

Debbie Aseltine-Nielson
Southwest Fisheries Science Center

Mark Johnsson
California Coastal Commission

Don Disraeli
Kanaloa Seafood

Peter Struffenegger
Sterling Caviar LLC

Dirk Rosen
Marine Applied Research & Exploration

Gary Cherr
Bodega Marine Laboratory

Kenneth Coale
Moss Landing Marine Laboratories

Jim Moffett
University of Southern California

Marina Brand
California State Lands Commission

Margy Gassell
Office of Environmental Health Hazard Assessment

Dominic Gregorio
State Water Resources Control Board

APPENDIX 4

APPENDIX 4: COSEE-West Advisory Board Listing

Paula Arvedsen
California State University, Los Angeles

Dave Bader
Aquarium of the Pacific

Steve Bay
So. California Coastal Water Research Project

Julie Bursek
Channel Islands National Marine Sanctuary

Amy Cox-Petersen
California State University, Fullerton

Rachel Espinoza
Hollenbeck Middle School

Lesley Ewing
California Coastal Commission

Dean Gilbert
LA County Office of Education

Robert Grove
Southern California Edison

Jim Kisiel
California State University, Long Beach

Maria Madrigal
SeaLab

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Appendix 5: USC Sea Grant Staff – External Activities

Linda Duguay, Director

Director of Research, USC Wrigley Institute for Environmental Studies. The Wrigley Institute is an organized research unit within the College of Letters, Arts and Sciences at USC and coordinates environmental science, education and outreach both on the main campus and at the Phillip K. Wrigley Marine Science Center on Santa Catalina Island.

Lead PI, NSF-funded COSEE-West (Centers for Ocean Science Education Excellence) program. COSEE-West is a collaborative with UCLA, The College of Exploration (Arlington, VA), local school districts including Los Angeles Unified School District, and several informal science centers and aquaria. COSEE-West integrates ongoing research in ocean sciences with K-12 educators and outreach specialists and has created a network of oceanographic researchers, K-12 educators, informal education centers and the general public.

Chair-elect, National COSEE Council and will serve as Chair 2010-2011. The National COSEE Council coordinates the activities of the 12 COSEE Centers around the country with the assistance of the COSEE Coordinating Office at the University of Rhode Island.

Member, SGA Program Management Committee (PMC)

Member, Southern California Coastal Ocean Observing System (SCCOOS) Strategic Advisory Committee (SAC).

Member, Informal Education Committee, American Society of Limnology and Oceanography (ASLO).

Alternate, USC Council Member to the Consortium for Ocean Leadership as well as the National Association of Marine Laboratories.

Phyllis Grifman, Associate Director

Member, South Coast Regional Stakeholder Group, California Marine Life Protection Act (MLPA). The MLPA mandates the establishment of a network of marine protected areas along the entire California coast. As a member,

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responsibilities include representing academic research interests in a multi-disciplinary, multi-stakeholder negotiation environment.

Secretary, and Member at Large, Channel Islands National Marine Sanctuary Advisory Council. The Advisory Council provides input and advice to the Superintendent of the Channel Islands National Marine Sanctuary. As a member of the Executive Committee, oversees meeting agendas, Sanctuary Advisory Council subject areas and guest speakers, in addition to providing direct links between the sanctuary and academic scientists, and the general public as Member at Large.

Board of Directors, California Shore and Beach Preservation Association (CSBPA). The CSBPA is the California chapter of the American Shore and Beach Preservation Association. In California, the association's interests are primarily in the areas of sediment management, coastal hazard identification and study, and coastal processes, including water quality. Annual sponsor of the Headwaters to Oceans conference, which convenes panels on a range of state issues.

Advisory Committee, Los Angeles County Fire Department, Lifeguard Division. Advisor to the Lifeguard Division's Coastal Monitoring Network, "Watch the Water." A network of beach cameras, facilities information, safety education and public information, watchthewater.org provides lifeguards and the public with real time information about Los Angeles County beaches.

James A. Fawcett, Ph.D., Marine Transportation/Seaport Specialist, Marine Outreach Coordinator

Past International President, Lambda Alpha International (honorary land economics society): Lambda Alpha International has 2,500 members in the UK, Canada, US, Japan and India. Formed at Northwestern University in 1930, the honorary society brings together senior experts in fields related to land use research and praxis. Its focus is upon wise use of land resources, especially those in and around large cities, many of which are coastal with all the problems attendant

Vice-chair, Marina Affairs Committee, LAX Coastal Chamber of Commerce: The Marina Affairs Committee represents the interests of businesses and the

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10,000 residents of Marina del Rey. The Marina is the largest man-made marina in the world, hosting over 5,500 slips for recreational and fishing vessels. Issues in the Marina include harbor safety, pollution, sea level rise, tsunami risk and sustainability.

Affiliate, Los Angeles-Long Beach Harbor Safety Committee: The LA-LB Harbor Safety Committee (HSC) supervises safe navigation practices in the Ports of Los Angeles and Long Beach, the busiest seaport complex in the United States. I provide outreach on harbor safety issues and work with committee members, bringing research from the campus to assist with navigation issues in the two ports.

Advisor to the Board of Directors, Southern California Marine Institute: Serve as SCMI's advisor as the Institute seeks a new facility in the Port of Los Angeles. Conducted a major study on research needs in a new facility, interviewed faculty, negotiated with the Port of Los Angeles, secured pro bono design work from two architecture firms and continue to help the Executive Director and the Board of Directors in developing both a design and funding for a new marine laboratory to replace the existing, obsolescent facility.

Co-Chair, 2008 Coastal Society Annual National Conference: Served as the co-chair of the Coastal Society's 2008 annual conference in southern California including supervising all aspects of the conference: organizing facilities, program development, publicity, fund raising and operations.

Juliette Hart, Ph.D., Regional Research and Planning Specialist

USC Coordinator, West Coast Sea Grant Regional Research and Information Needs Plan Working Group. The four West Coast Sea Grant programs worked together to develop a Regional Research and Information Needs Plan for the California Current Large Marine Ecosystem. Worked with other working group members to analyze stakeholder comments to develop the West Coast Regional Marine Research and Information Needs Report.

Project Coordinator, Visitor Management Framework (VMF) for Catalina Island. The Catalina Island Conservancy, which owns and manages 88% of Santa Catalina Island, off the coast of Los Angeles, is in the process of developing a VMF to protect the natural resources on the island, while

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maintaining a high quality visitor experience. Worked with the Conservancy along with other key island stakeholders to develop the VMF, which included characterizing current island recreation activities, identifying appropriate standards and indicators, and developing a monitoring plan.

Project Coordinator, Catalina Island Integrated Island Management Plan. The Catalina Island Conservancy is also developing an Integrated Island Management Plan with the goal of identifying all the current management activities on the island in order to better coordinate research, management, education and recreation activities. Worked with the executive team and staff of the Conservancy to develop the Integrated Island Management Plan.

Lyndell Whitley, Director of Education, Wrigley Institute for Environmental Studies and Sea Grant

Member, Network Executive Committee of Sea Grant Education (SGEN). Handle the day to day business of the SGEN, promote collaborative projects, share resources and programming, and guide future planning for the network. The Executive Committee provides input into each of these areas, share tasks, oversight for activities, and interact with the larger SG organization and networks as appropriate.

Member, Centers for Ocean Sciences Education Excellence(COSEE) Ad Hoc Committee on Diversity. Committee expands and enhances outreach and connections with members from underrepresented and underserved groups. Reviews current efforts among the COSEE centers, reviews prior work in this area, plans and implements actions that will help us reach the desired audience.

Member, Centers for Ocean Sciences Education Excellence (COSEE) Ad Hoc Committee on Teacher Professional Development. Coordinates and shares successful teacher professional development techniques, programs, and best practices. Contributes data and ideas of current professional development efforts, networks with others in the group to promote programs and works to create a best practices document.

Member, Santa Monica Pier Aquarium Advisory Board. Guide the Santa Monica Pier Aquarium education programs and outreach activities. Provide feedback on proposed activities, suggest funding sources and potential

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resources, and volunteer at events.

Member, USC Community Relations Council. The Council focuses on outreach between the university and local community. Provide input on new planning, share successful programs, and give feedback on new directions for the Council.

Board member, Southwest Marine and Aquatic Educators Association Board (SWMEA). SWMEA is a network of formal and informal ocean and aquatic science educators throughout the Southwest. Maintain the working functions of the organization and advise and assist on organizational planning.

Representative, Science Curriculum Framework and Evaluation Criteria Committees (CFCCs). Review the California Science Framework and make recommendations on the revised Science Framework for California Public Schools. (Due to cuts in California's budget signed in July 2009, the committee was suspended until 2012.)

Review Panel Member, National Science Foundation CAREER, November 2009. Review the education, public outreach, and broader impacts parts of specific NSF CAREER proposals and make recommendations on award selections. Award is to assist in the career development of outstanding young professors and investigators in the ocean sciences.

Linda Chilton, Education Programs Coordinator

Advisory Board member. Greater Los Angeles Science Teachers Association (GLATSA) Instrumental in helping restructure and re-establishing this regional chapter to support science teachers and science education in the greater Los Angeles Area.

Member, Channel Islands National Marine Sanctuary Advisory Team Education Subcommittee, provide a connection with teachers through COSEE West, and informal science education centers to address education issues of concern.

Member, Informal Science Institution and California State University Partnership (ISI-CSU) Advisory Council, supporting the development and implementation for professional development for informal science educators

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in Southern California.

Member, Think Watershed Advisory Council, partnering with LA County Office of Education to develop curriculum and work with agencies to find funding for integrating watershed education experiences for students within Los Angeles County Schools.

Member, Santa Monica Pier Aquarium Advisory Board. Guide the Santa Monica Pier Aquarium education programs and outreach activities. Provide feedback on proposed activities, suggest funding sources and potential resources, and volunteer at events.

Member, USC Community Relations Council. Focuses on outreach between the university and local community. Provide input on new planning, share successful programs, and give feedback on new directions for the Council.