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Focused Research and Outreach Initiative Priorities Ocean Protection Council and California Sea Grant College Program

This document provides guidance to research teams preparing research proposals to submit to California Sea Grant College Program for possible funding by the California Ocean Protection Council (OPC). This grant to the California Sea Grant program is part of the continuing grants made annually by the OPC for management-oriented coastal and ocean research.

Background

The California Ocean Protection Council (OPC) was established to improve the management and protection of ocean and coastal resources and ecosystems. One of the many ways the OPC achieves this purpose is by supporting innovative research that directly informs and improves the stewardship of ocean resources through a partnership with the two California Sea Grant programs. At its public meeting on November 21, 2008, the OPC continued this partnership by authorizing a fourth round of scientific research which will address current OPC priorities. The OPC may disburse up to \$1,000,000 to the California Sea Grant College (\$800,000) and University of Southern California (USC) Sea Grant (\$200,000) programs. The priorities below pertain only to the California Sea Grant College Program; details of the USC Sea Grant allocation are available through the USC Sea Grant Program.

This round of funding addresses priority issues derived from the OPC five-year strategic plan *A Vision for Our Ocean and Coast*,¹ and the OPC FY2008/2010 Program Priorities.²

Research Priority Issues (not in priority order)

The following research priority issues were developed by the OPC-Science Advisory Team and approved by the Ocean Protection Council at the November 21, 2008 meeting in San Pedro, CA.

- Climate Change
- Harmful Algal Blooms (HABs)
- Land Ocean Interactions and Water Quality
- Salmon-Ocean Conditions
- Wave and Tidal Energy

See priority issues descriptions below.

Focused Research and Outreach Initiatives

California's coastal environment is facing an increasing number of pressing environmental challenges. Experts agree that addressing these challenges will require coordinated, long-term, interdisciplinary research efforts across the state. Accordingly, the OPC seeks to develop a new approach to support interdisciplinary research and education.

The California Sea Grant College Program will allocate \$600,000 (not including up to three years of funding for two trainees) of OPC funding to a single research, application, and outreach initiative in an area relevant to state resource management needs (see description of priority issues below). This amount will be disbursed over a three-year period to one team of several researchers and manager(s).

Initiatives are envisioned as coherent and well-coordinated programs of applied interdisciplinary research and training focusing on one important priority issue. Linkages to complementary research priorities are encouraged (for example, HABs and climate change). Each proposal should describe a coordinated program of research, application, and training that will enable real-world improvements in how California addresses a key challenge to ocean health and sustainability.

By supporting a single initiative team comprised of multidisciplinary researchers, the OPC hopes to comprehensively address challenging issues and ensure that new data and ideas are incorporated into management. By examining a single issue from a multidisciplinary perspective and by directly linking the research to managers' needs and uses, the initiative should produce effective and applied outcomes.

Initiative Team

The initiative team must consist of a multidisciplinary assemblage of principle investigators (PIs) whose diverse backgrounds serve to benefit the goals of the initiative. Further, encouraging collaboration among researchers from diverse scientific backgrounds allows a comprehensive analysis of a single issue, including how state resource managers can apply their findings. In addition, each proposal should provide for recruiting at least two Sea Grant Trainees as part of the initiative team. Given the required diversity of participants, the OPC anticipates that proposals may include multiple institutions.

Proposed initiatives will only be considered for funding if they are comprised of a multidisciplinary research team that also includes a state resource manager or scientist.

Teams will also be required to:

- Synthesize the current state of the knowledge on their research topic into a series of policy papers
- Produce applied tools or products (such as useful indicators or predictive models)
- Disseminate their results to policy makers and other interested communities.

Current State of Knowledge

The chosen initiative must assess the current state of knowledge. The successful team will be required to write a synthesis of the current state of knowledge and information needs into a series of policy papers aimed at a broad audience that can be used by managers and others to quickly get up-to-speed on the initiative's focal issue.

Applied Tools and Products

The selected initiative will yield tangible results at the end of three years of funding by producing tools and products that will directly improve ocean resource management and establishing mechanisms for ensuring these tools and products reach key user groups.

Examples include:

- Identifying useful indicators
- Developing predictive models
- Developing metrics and methods for evaluating the impacts of alternative regulatory choices or management actions

Dissemination of Results

The selected initiative will work directly with resource managers to identify needs and deliver results that improve resource management practices. Because translation and dissemination of research results is a critical component of this process, the involvement of one or more Sea Grant advisors or individuals capable of providing an outreach or extension component to the initiative is recommended. The chosen initiative team will be required to collaborate with California Sea Grant's communication office to further disseminate initiative activities and outcomes.

Priority Issue Descriptions

Climate Change – Compelling evidence exists that the negative impacts to ocean and coastal resources from climate change will be substantial. Information and research is needed to understand how the climate is changing and how these changes will impact ocean processes, ecosystems, and ecosystem services, as well state and local economies in California. Managers need improved understanding of the impacts of climate change on California's ocean and coastal ecosystems.

Research areas include:

1. identifying interactions between climate change and other stressors that are the target of management efforts such as fishing, introduced species, and harmful algal blooms,
2. identifying characteristics or factors that determine ecosystem vulnerability and resilience to climate change.

3. identifying bellwether or critical indicators of ecosystem response to climate change,
4. evaluating effects of natural cycles (Pacific Decadal Oscillation (PDO), El Niño-Southern Oscillation (ENSO)) and those of anthropogenic change and identifying the interactions and synergisms between the two, and
5. predicting and forecasting likely impacts of climate change, including sea level rise, on beach loss, coastal flooding, and infrastructure (airports, highways, bridges, ports, etc).

Harmful Algal Blooms (HABs) – Harmful algal blooms (HABs) are a growing problem in California waters but research on the topic remains sporadic and uncoordinated. Research is needed to advance the understanding of and predictive capabilities for the anthropogenic and natural drivers that influence HABs. Successful proposers will identify ways to participate with other State-funded efforts in planning for a sustained, affordable, and integrated system for HAB monitoring and prediction.

Specific research needs include:

1. reviewing in situ and paleoclimate data to determine if HABs have occurred more frequently in the last decade,
2. collecting new in situ data that furthers analysis of where, when, and how HABs are initiated and how fast they are dispersed, and
3. producing improved predictive models of HABs.

Land-Ocean Interactions and Water Quality – Interactions between the land and ocean are complex and poorly understood. Coastal decision makers and managers currently face problems that require understanding biophysical as well as economic, political, social, and cultural interactions. Research is needed to advance the understanding of how pollutants (both biological and chemical) from land-based runoff impact human and ecosystem health.

Top research priorities include:

1. identifying chemical and biological metrics and methods for rapid, scientifically-valid water quality assessments and identifying best indicators of harmful water quality conditions, with an emphasis rocky intertidal and subtidal communities,
2. quantifying impacts on human and ecosystem health to help prioritize the most harmful pollutants,
3. evaluating the effectiveness of Low Impact Development (LID) and other techniques in reducing polluted runoff in coastal systems and examining the potential application of LID-type principles at local and regional scales, and
4. use of Marine Managed Areas (MPAs and ASBS), particularly those adjacent to Critical Coastal Areas, as natural laboratories to tease out the effects of land based pollutants in species and communities.

Salmon-Ocean Conditions – Protecting and enhancing wild populations of salmon has long been a goal of California state government through the enactment of multiple policies and laws. Even so, salmon stocks have declined to record lows throughout the Pacific Northwest and California. One of the biggest data gaps related to the decrease in salmonid populations is understanding the effects of changing ocean conditions on salmon populations and the interactions between oceanic, freshwater, and terrestrial stressors.

To address this data gap, priority research areas include:

1. analyzing (retrospectively and prospectively) salmon survival rates, particularly on prey availability for first year animals (smolts and juveniles),
2. modeling (statistical or numerical) the different effects of terrestrial, freshwater, and ocean stressors on salmon populations,
3. evaluating the resilience of the terrestrial, and ocean systems to support salmon populations,
4. analyzing retrospectively the relationship between ocean conditions and salmon trends, and
5. integrating forecasting and ocean observing for salmon management and integrating oceanographic information into predictive models.

Wave and Tidal Energy – Ocean energy technology, specifically wave and tidal energy conversion devices, is being considered as a viable contribution to California's renewable energy goals. At the same time, much uncertainty exists about the environmental and socioeconomic impacts of these emerging technologies. Research is needed to advance the understanding of the relative costs and benefits of wave and tidal energy technologies. The most valuable information will be that which can be used to maximize the potential for clean energy generation while minimizing the potential for negative environmental consequences. Successful proposers will identify ways to assess the performance and impacts of pilot projects including regional and local effects of the devices

To gather this data, research topics include:

1. developing comprehensive models that explore the interplay between physical and biological effects in benthic and pelagic communities and the impacts to sediment transport, and
2. evaluating the socioeconomic impacts of: a) conflicting uses and restricted access; and b) attenuating wave energy on coastal uses and risks of coastal and marine hazards.

OPC Funding Considerations

Proposals requesting OPC funds do not have restrictions on the source of the matching requirement, however, proposals have at least a 50% matching fund requirement. Federal sources and state resource manager salaries will be considered eligible as matching funds.

Research conducted with OPC funds must limit the indirect costs rate to 25% or less.

The grant award for the chosen OPC research and outreach initiative is contingent on fund availability. The OPC may choose not to award any grants for applications received through this RFP.

Review Process

Proposals will undergo the same review process as all other California Sea Grant proposal submissions, including review by the Resources Agency Sea Grant Advisory Panel (RASGAP), which will review proposals for OPC priorities. The OPC staff will be involved in all stages of the review process, including the technical review. At its discretion, OPC staff may request additional review by likely user groups of the research findings or suggest coordination of complimentary proposals. The OPC staff makes the decision on which project(s) to recommend for funding. Before funds are awarded, the OPC provides final approval for funding of the selected research project(s).

Proposal Submission

To submit to this solicitation, you must first contact Russ Moll or Shauna Oh at 858-534-4440 to discuss ideas and intent to submit. Once this has happened, a specific preliminary proposal submission form will be sent to you via email. Do not use the online form.

Proposal Elements

To successfully complete an OPC focused research and outreach initiative preliminary proposal, the following five elements must be addressed:

1. Initiative Team

List team members and provide information on the activities to be conducted by each team member. This section should demonstrate how the initiative is designed to effectively merge the unique attributes and knowledge of each PI to reach the initiative goal. The team must include at least one PI who is a California state resource manager or scientist. The team should also include at least 2 Sea Grant trainees.

2. Statement of Problem

Include a problem statement of the particular ocean issue of focus and why knowledge and management of this issue would benefit from a multidisciplinary approach.

3. Project Goals and Objectives

Discuss how the proposed research will advance applied ocean resource management. This should include specific hypotheses to be tested, objectives to be achieved (i.e., product and tool development), and how the objectives relate to OPC priority issue.

4. Intended Approach

Describe the approach to be used and the methodology involved in meeting the stated objectives. The approach must specify which resource managers will be involved in each step as the initiative progresses—from clarifying the problem statement to developing, testing, and disseminating tools and products.

5. Anticipated Results and Who Will Benefit

Identify uses and end users for the proposed data and tools. Describe how the initiative will directly improve the effectiveness of California state agencies in their efforts to manage, protect, conserve, or restore coastal or ocean resources. Each proposal must include one or more letters of support from end users (government or non-government) identifying the anticipated value and use of the project results to the public, research community, and/or state government.

6. Consistency with OPC Goals and Priorities

The proposed research must address the mandatory provisions of California Ocean Protection Act (California Public Resources Code § 35500 et seq.) and be consistent with the actions contained in the OPC five-year strategic plan.

Useful Websites

1. The OPC 5-year strategic plan A Vision for Our Ocean and Coast

http://resources.ca.gov/copc/docs/OPC_Strategic_Plan_2006.pdf

2. The OPC FY2008/2010 Program Priorities

http://www.resources.ca.gov/copc/docs/opc_program_priorities_2008_2010.pdf

