CALIFORNIA OCEAN PROTECTION COUNCIL

Staff Recommendation
June 24-25, 2010

California Sea Grant Research to Support Improved Management of Ocean and Coastal Resources

File No.: 10-003-01
File No.: 10-004-01
Project Manager: Pam Rittelmeyer

RECOMMENDED ACTION: Authorize disbursement of up to $912,000 to the California Sea Grant Program and University of Southern California (USC) Sea Grant Program to fund ocean research projects that fulfill the Ocean Protection Council research priorities.

LOCATION: Statewide

STRATEGIC PLAN OBJECTIVE: Research and Monitoring

EXHIBITS

Exhibit 1: 2009 Ocean Protection Council Focused Research and Outreach Initiative Priorities for Sea Grant Research Proposals

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RESOLUTION AND FINDINGS:

Staff recommends that the Ocean Protection Council (OPC) adopt the following resolution pursuant to Sections 35500 *et seq.* of the Public Resources Code:

"The Ocean Protection Council here by authorizes the disbursement of an amount not to exceed $912,000 to the two California Sea Grant College Programs, consisting of $792,000 to the Regents of the University of California, California Sea Grant College Program and $120,000 to the University of Southern California, USC Sea Grant Program, to fund research projects that fulfill the OPC research priorities."

Staff further recommends that the Council adopt the following findings:

"Based on the accompanying staff report and attached exhibits, the Council hereby finds that:

1. The proposed project is consistent with the purposes of Division 26.5 of the Public Resources Code, the California Ocean Protection Act (COPA).
2. The proposed is consistent with the current Ocean Protection Council's Grant Program Funding Guidelines."

PROJECT SUMMARY:

In 2008, the council adopted the 2009 Ocean Protection Council Research Priorities, which were developed in coordination with the OPC Science Advisor and the OPC Science Advisory Team (OPC-SAT). These priorities reflect a suite of topics that have broad applications for the health and management of California's coastal and ocean resources. These priorities guide OPC research funding and define the scope of projects conducted in partnership with the University of California Sea Grant College Program (California Sea Grant) and the University of Southern California Sea Grant Program (USC Sea Grant). No new research priorities have been developed or adopted by the OPC since these priorities were adopted. These research priorities remain relevant and formed the basis for evaluating the 2009 round of grant proposals submitted to the California Sea Grant College Program and the USC Sea Grant Program.

The OPC has worked with both Sea Grant programs since 2005 to promote research projects that benefit state management needs and help inform policy development at the state level. The new authorization will continue these partnerships and disburse the following amounts: $792,000 to California Sea Grant, and $120,000 to USC Sea Grant. These funds will be used to fund research projects that inform and improve management decisions affecting California's ocean and coastal environment.

Proposition 84 bond funds to support these programs were frozen in 2009. Due to these budgetary constraints, there was not a request for proposals for new OPC-funded Sea Grant Research projects for 2010. However, in past years these two Sea Grant programs received more excellent proposals than could be funded. If the OPC approves the recommended projects, staff will authorize the Sea Grant programs to fund projects that were received for consideration and scored well in the review process in 2009. The two Sea Grant programs will administer the grants on behalf of the OPC and provide annual reports to OPC staff on the progress of the research projects. The OPC Science Advisor will coordinate with grant recipients to improve the translation of their research results to products that are useful to resource managers and policy makers.

PROJECT DESCRIPTION:

Project Background:

Formulating Science Priorities

The Ocean Protection Council Science Advisory Team (OPC-SAT), coordinated by the California Ocean Science Trust (Cal-OST), set specific research priorities for each Sea Grant Program to address critical management problems. The priorities for each Sea Grant Program are summarized below and detailed in Exhibit 1.

Priorities for the California Sea Grant College Program

The research project must satisfy one of following to be awarded grant funding:

Land-Ocean Interactions and Water Quality
Harmful Algal Blooms (HABs)

Salmon-Ocean Conditions
Wave and Tidal Energy
Climate Change

Priority for the USC Sea Grant College Program

The USC program focuses on urban water quality. This research directive seeks proposals that aim to understand how pollutants (both biological and chemical) from land-based runoff impact human and ecosystem health.

Proposal Review Process for Both Programs

Proposals have undergone the same review process as all other California Sea Grant proposal submissions, including review by the Resources Agency Sea Grant Advisory Panel (RASGAP), which looks for consistency with OPC priorities and relevance to state management. RASGAP was formed in 1997 (AB 271) to give the state a role in the review of scientific proposals submitted to Sea Grant and to determine their benefit to the management of the state's ocean and coastal resources. RASGAP is chaired by the Assistant Secretary for Ocean and Coastal Policy and consists of representatives from state government, the state legislature, state universities, and industries related to the ocean and coastal environment. OPC staff is involved in all stages of the review process, including the technical review and final decision-making.

Each Sea Grant program provides all post-award grant administration, including reporting and financial accounting on the grants. The final work products are provided to the OPC at the end of the grant.

Recommended Projects:

University of California Sea Grant College Program (California Sea Grant)

Pursuant to the council's authorization in late February 2009, the California Sea Grant Program released a request for proposals (RFP) soliciting preliminary proposals. The RFP required the multidisciplinary teams to focus on a single issue and discuss how they would synthesize the current state of knowledge for that research topic in a series of policy papers, produce applied tools or products (such as indicators or predictive models), and disseminate their results to policy makers and other interested communities.

RASGAP reviewed all proposals for their relevance to state needs and the Sea Grant technical review committees reviewed the proposals for scientific validity. Three projects were selected to submit full proposals. The selected research teams were provided extensive comments from the reviewers; OPC staff and the OPC Science Advisor also provided guidance for improvements and modifications. Each final proposal was again reviewed by both RASGAP and technical reviewers, including outside peer-reviewers who submitted extensive written comments on each of the research proposals.

Due to the uncertainty of funds, the RFP process for OPC-funded California Sea Grant Research projects was not initiated for 2010. For the continuity of this Sea Grant Research Program, OPC staff recommends funding projects that went through the RASGAP review in 2009.

OPC staff recommends funding the project titled, ***Forecasts and Projections of Environmental and Anthropogenic Impacts on Harmful Algal Blooms in Coastal Ecosystems*.**

Project Team

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Harmful algal blooms (HABs) have negative impacts on human and ocean health, and on coastal economies (aquaculture, fisheries and tourism), due to production of toxins that can cause illness and mortality in humans and wildlife, degrade water quality, and disrupt the food chain. HABs and the resulting shellfish toxin loads are increasing in frequency worldwide at significant costs to human and ecosystem health. These trends have encouraged the development of localized HAB forecasting tools in recent years. There is a need for comparative studies within and between ecosystems to understand the complex interplay of direct and indirect mechanisms controlling HABs. This will facilitate differentiation between the varying effects of natural (such as upwelling) vs. anthropogenic (such as polluted runoff) factors. The objective of this project is to develop a robust tool to predict HAB events and improve response across the varied California coast.

This project is a facet of the California Harmful Algal Bloom Monitoring and Alert Program (Cal-HABMAP), which includes representatives from local, state, and federal research groups, academia, and NGOs. Cal-HABMAP was established to coordinate researchers, managers, and end users working on HAB issues specific to California. There are existing habitat models that use statistical analysis to evaluate the environmental variables that cause HAB events. This project will build on these models by applying them repeatedly over time and monitoring the results. This is a crucial step in validating their accuracy. In addition, since the existing models were created on a local scale, they will need to be fine tuned in order to expand their scope to cover the entire State of California. In a final step, this project will develop a web site to illustrate and distribute HAB probability not only to researchers and decision makers, but also the general public. A predictive modeling system for HABs will aid managers in the protection of human and ecosystem health, and will better inform management strategies to mitigate HABs before they impact the coastal economy.

OPC staff envisions the work from this proposal supporting broader water quality goals of the OPC Strategic Plan as well as the research goals of improving our understanding water quality and HABs. Improving coastal and ocean water quality is one of the primary objectives identified

in the Strategic Plan, including reducing beach closures. The project will provide knowledge and new tools to accomplish this goal and our understanding of HABs.

The University of Southern California Sea Grant Program

The University of Southern California (USC) Sea Grant released an RFP in February 2009 specifying urban water quality as the highest priority. The review process for these proposals was the same as with California Sea Grant, with each being reviewed by RASGAP and technical reviewers.

OPC staff recommends funding the project titled, ***Maternal Offloading of Accumulated Organochlorine Contaminants in the Round Stingray*****.** This recommendation is based on RASGAP and Sea Grant rankings and deliberation among the Sea Grant staff, OPC staff, and the OPC Science Advisor. This project addresses problems related to persistent organic pollutants in Southern California. Council staff and the OPC Science Advisor were involved in each step of the review process to provide review panel members with guidance on OPC research priorities, previously funded projects, and the OPC's strategic plan.

Project Team

Christopher Lowe, California State University, Long Beach
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The worldwide occurrence of persistent organic pollutants (POPs), such as DDT and PCBs has been well documented. It is estimated that from the 1930s through the 1970s millions of tons of these contaminants were discharged through wastewater outfalls into the marine environment off the Palos Verdes Peninsula in southern California making it one of the largest known contaminated locations in the world. While regulation of the disposal of these contaminants has greatly reduced their deposition, many compounds remain in the environment. These contaminants move from one population to the next through the food chain, biomagnifying as they move to higher trophic levels. Top-level predators including sharks, birds, and marine mammals have been found to acquire harmful levels of these contaminants.

The concept of maternal offloading of contaminants, where the mothers pass along contaminants to their offspring, has been primarily studied in marine mammals because of their production of large, well-developed young and then post-partum nursing. However, elasmobranchs, a class of fishes including sharks, rays, and skates, may provide a comparable model to marine mammals in terms of their ability to pass contaminants to their offspring. Elasmobranchs have large lipid-rich livers used for buoyancy and energy storage, feed at high trophic levels, and can therefore accumulate these lipophilic contaminants. Females from many species of elasmobranchs produce large, lipid-rich ova and a variety of supplemental nutrition sources for their offspring. This supplemental nutrition enables embryos to achieve large sizes at birth, but may also significantly increase the means by which females can offload their contaminants to their offspring.

Recent studies have documented high levels of DDT and PCBs in elasmobranchs and their eggs; however, none of these studies have been conducted in southern California or have studied

maternal offloading. The locally abundant round stingray (*Urobatis halleri*) provides an excellent model to quantify maternal offloading in elasmobranchs because of their large population size, reproductive mode, mobility, and foraging in heavily contaminated areas. This study will analyze the concentration of POPs in a sample of stingrays including mature males and females, subadult males and females, and pregnant females and their embryos. The researchers have conducted studies in the past on stingrays' movements and habitat use. The addition of this new data to their existing knowledge will allow them to create demographic-based models to estimate the amount of contaminants that the round stingray population may be redistributing throughout coastal habitats.

Government agencies, nonprofits, and other conservation organizations will gain valuable information regarding reproductive transfer within a species and how this influences the flow of contaminants through coastal communities. This may be especially important because the round stingrays are highly mobile and have the potential to transport large amounts of contaminants from one habitat to another when they die. One of Sea Grant's objectives is to accurately identify and eliminate the influx of non point source pollution. This project can identify if round stingrays are serving as significant sources of contamination in the areas they inhabit, which will allow agencies and organizations to better manage, regulate, and assess the health of coastal communities.

PROJECT GRANTEE:

The two Sea Grant programs are natural partners for this endeavor because they have an established, well-respected process for evaluating, prioritizing, and administering research grants related to coastal and ocean resources. Nationally, the Sea Grant College Network consists of 30 university-based programs funded primarily by the National Oceanic and Atmospheric Administration (NOAA) and is dedicated to the understanding, conservation and sustainable use of coastal and marine resources. The California Sea Grant College Program is the largest of the 30 Sea Grant programs. It is administered by the University of California and is based at Scripps Institution of Oceanography in San Diego. The USC Sea Grant Program is administered by the University of Southern California and focuses primarily on the state's southern coastal metropolitan region, with particular emphasis on topics related to the interface between urban areas and the ocean.

PROJECT HISTORY:

For the past four years, the OPC approved grants of $1 million per year to the state's two Sea Grant programs. The shared priorities and existing relationship between Sea Grant and the council make coordinating OPC research projects with the Sea Grant review process practical and cost effective. A 2010 RFP for OPC-funded Sea Grant Research projects was not conducted due to the uncertainty of funds. With funding now available, continuing this partnership with previously vetted projects for a fifth cycle of research grants provides the ability to collaboratively tackle issues deemed a priority for the OPC and Sea Grant.

PROJECT FINANCING

Ocean Protection Council to California Sea Grant College Program $792,000	
Ocean Protection Council to USC Sea Grant Program	$120,000
Total Project Cost	**$912,000**

The anticipated source of funds will be the fiscal year FY 08/09 appropriation from the Safe Drinking Water, Water Quality and Supply, Flood Control, River and Coastal Protection Bond Act of 2006 (Proposition 84). Proposition 84 authorizes the use of these funds for the protection of beaches, bays coastal waters and watersheds consistent with Section 35650 of the Public Resources Code, establishing the California Ocean Protection Trust Fund (Pub. Res. Code § 75060(g)). Under Section 35650(b), Ocean Protection Trust Fund monies may be expended for projects authorized by the OPC that are identified as appropriate Trust Fund purposes. The projects are consistent with the Trust Fund purposes as discussed in the following section.

These projects are also appropriate for prioritization under the selection criteria set forth in Section 75060(g). Section 75060(g) identifies as a priority for Proposition 84 funding projects which develop scientific data needed to adaptively manage the marine resources and reserves of the state.

In past years $800,000 has been allocated to the California Sea Grant Program. This amount includes administrative costs for the RASGAP process of proposal review. Since this process has already been completed, $8000 has been subtracted, thus an amount of $792,000 is proposed.

In past years $200,000 has been allocated to the USC Sea Grant Research Program. Since this funding round was delayed due to the bond freeze, OPC staff has selected a project that is ready to start in a timely manner. However, since this project only requires $120,000 of OPC funding, OPC staff recommends holding the additional $80,000 and adding it to the next funding round for the USC Sea Grant Research Program.

OPC research proposals funded through this partnership require a 50 percent match in funding from other sources, pursuant to the 2009 Ocean Protection Council Focused Research and Outreach Initiative Priorities for Sea Grant Research Proposals. In addition, the agreements with the Sea Grant program will place a cap of 25 percent on university overhead for proposed projects.

CONSISTENCY WITH CALIFORNIA OCEAN PROTECTION ACT:

These recommended projects are consistent with the Ocean Protection Act, Division 26.5 of the Public Resources Code, in the following respects:

The California Ocean Protection Act identifies trust fund allowable projects in PRC Section 35650 (b)(2)(F), as including projects that “improve management, conservation, and protection

of coastal waters and ocean ecosystems," and Section 35650 (b)(2)(G), as including projects that "provide monitoring and scientific data to improve state efforts to protect and conserve ocean resources."

Research funded through the Sea Grant programs will meet these directives because the projects chosen directly focus on collecting and disseminating information that will fill current data gaps and assist in the management and protection of ocean resources. Consistent with the goals of Section 35615, the U.C. Sea Grant proposal will support the work of Cal-HABMAP by coordinating the work of researchers, managers, and end users working on HAB issues specific to California.

CONSISTENCY WITH THE OPC'S STRATEGIC PLAN:

The recommended projects are consistent with the OPC Strategic Plan for Research and Monitoring, Objective 1b: "Work with the California Sea Grant Programs to review and award grants that meet the OPC guidelines and priorities. Support or collaborate with the research activities by agencies, universities, and programs that seek to provide a better scientific understanding of impacts to ocean and coastal ecosystems."

CONSISTENCY WITH THE OPC'S GRANT PROGRAM FUNDING GUIDELINES:

The proposed projects are consistent with the OPC's Grant Program Funding Guidelines adopted November 20 2008, in the following respects:

Required Criteria

1. **Directly relate to the ocean, coast, associated estuaries, or coastal-draining watersheds:** These research projects will improve the State's understanding of ocean and coastal resources and may lead to improved ocean and coastal resource management.
2. **Support of the public:** Public support of the Sea Grant Research Program can be determined by the broad representation in the review panel. RASGAP consists of representatives from the Department of Boating and Waterways, the Department of Conservation, the Department of Fish and Game, the fishing industry, the aquaculture industry, the ocean engineering industry, the University of California, the California State University, a private California institution of higher education that is participating in the National Sea Grant Program, the State Lands Commission, the Office of Environmental Health Hazard Assessment, the State Water Resources Control Board, the Office of Oil Spill Prevention and Response in the Department of Fish and Game, and the Executive Director of the California Coastal Commission. Additionally, Californians supplied more than 1,500 comments during the public comment period (May 2007 – January 2008) to the Sea Grant Regional Marine Research and Information Plan for the California Current Large Marine Ecosystem (CCLME), a collaborative project among the four West Coast Sea Grant programs (California – 2, Oregon and Washington – 1 each).
3. **Greater-than-local interest:** Project results will be applicable statewide and the findings will likely have statewide implications.

Additional Criteria

4. **Innovation:** Addressing research and management challenges will require coordinated, long-term, interdisciplinary research efforts across the state. By design, OPC research projects are innovative because they require researchers to directly link their work to management issues. In particular, California Sea Grant again will fund a coordinated initiative team that requires scientists to organize themselves, include a resource manager/scientist in the project, and synthesize existing and new data into reports that policymakers can understand.

7. **Leverage:** The chosen researchers will be required to provide 50 percent matching funds to support these projects.

9. **Coordination:** The Sea Grant program is a unique collaboration between the University of California, University of Southern California, the national Sea Grant College Network, the State Resources Agency, the OPC and other state resource managers. The Sea Grant program allows the OPC to play a critical role in building bridges between scientific research, responsive policy development, and public education. Links are necessary between university natural and social scientists, state resource managers and policy makers to ensure that research informs long-term policies that support the recovery and sustainability of the state's coastal resources. The Sea Grant programs work closely with the grantees throughout the project. This allows the selected researchers access to Sea Grant outreach mechanisms as well as the Sea Grant Advisor network throughout the state.

CONSISTENCY WITH THE OPC'S PROGRAM PRIORITIES FOR 2009 THROUGH 2010:

The proposed research priorities fulfill the following topic areas identified in the 2009/2010 Funding Priorities. The Funding Priorities emphasize specific subjects and encourage research partnerships.

Management-Driven Research

Funds will be used to satisfy the highest priority and most useful research for state management needs, as determined by the Science Advisor to the OPC. All research projects will be California-focused to ensure that state needs are addressed and that there is consistency with this funding priority.

Polluted Runoff

The USC Sea Grant program in particular focuses on the "Urban Ocean" making projects selected by it consistent with this funding priority. The USC proposed research focuses exclusively on improving our general knowledge of water quality from land-based sources and providing specific solutions to current water quality problems in California.

Harmful Algal Blooms

Better understanding of the cause and spread of HABs may provide the basis for future policy actions related to coastal water quality and reductions in HABs. OPC staff will work with resource managers, researchers, and the regional ocean observing systems to develop a pilot HAB alert system to provide bloom forecasts and facilitate information exchange between HAB researchers, managers, and the public to reduce response time and the risks to human health. This pilot program, if successful, can be expanded region-wide as called for in the West Coast Governors' Agreement on Ocean Health.

COMPLIANCE WITH CEQA:

The proposed authorization is categorically exempt from review under the California Environmental Quality Act (CEQA) pursuant to 14 CA Code of Regulations Section 15306 because it involves funding only data collection, research and resource evaluation activities that will not result in a serious or major disturbance to an environmental resource. Although the recommended USC Sea Grant project will cause injury to some individual animals in order to develop the data, it will not have a significant impact on the population of round stingrays in southern California or the environment. While the research funded by this authorization may result in follow-up actions by public agencies, those actions, if any, have not yet been approved, adopted or funded. Staff will file a Notice of Exemption upon approval by the council.