The California Ocean Protection Council

DRAFT STRATEGIC ACTION PLAN
(2012-2017)

For Public Review

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DRAFT
California Ocean Protection Council
FIVE-YEAR STRATEGIC ACTION PLAN
2012 – 2017

I. INTRODUCTION

A. PURPOSE AND OUTLINE

The California Ocean Protection Council (OPC) is a cabinet-level body created in 2004 to help ensure that state and local actions are conducted in a manner that is consistent with the protection, conservation, maintenance of healthy coastal and ocean ecosystems and the economy they support. The OPC's overarching role is to coordinate and lead ocean management and protection in California in three primary ways: 1) by addressing cross-cutting ocean issues that do not fall neatly under the purview of one agency; 2) by developing forward-looking policy recommendations to advance new or refine existing laws and regulations; and 3) by coordinating across state institutions whose decisions affect coastal waters and the ocean environment.

To guide its first five years as a new organization, the OPC deliberately took a broad strategic approach that was responsive to emerging issues as they arose in a more generous fiscal climate. With this experience, the OPC is now well prepared for the bold and focused approaches it is now undertaking.

> ***The Challenge***
> Globally, there is broad recognition that various ocean stressors such as overfishing, physical disturbance, climate change effects, and polluted runoff are interacting *synergistically*—beyond their additive impacts—to negatively affect our oceans. Complex challenges are mounting, and consequences will be dire unless we take action.

The OPC made substantial investments and addressed many critical issues in its first five years. The OPC demonstrated rapid achievements and was effective at catalyzing initiatives by funding projects and working on important policy recommendations. Despite these successes, significant challenges remain and are made even more difficult by the State's economic and fiscal crises. With fewer dollars and a smaller workforce, California's agencies must manage coast and ocean resources as effectively and efficiently as possible.

After five years of undertaking large, cross-cutting projects and creating a foundation for comprehensive ocean resource management, ***the OPC has now developed a more focused action plan that identifies targeted areas where the OPC can be the most effective*** in this current challenging economic and fiscal climate. This second strategic action plan recognizes that the OPC will not be able to address every ocean issue facing the state of California. With this constraint in mind, this plan has been crafted to strategically guide the OPC's efforts so that they have maximal effect on the most important issues given the OPC's core competencies as well as funding and staffing limitations. The OPC will continue to provide leadership on key issues and

steward high priority initiatives begun during its first five years, but in a way consistent with this new strategic approach.

The plan focuses on four substantive areas that will comprise the core of the OPC's efforts over the next five years, including: 1) **climate change**, 2) **sustainable fisheries and marine ecosystems**, 3) **coastal and ocean impacts from land**, and 4) **industrial uses** of the ocean. The plan also identifies a fifth area—**improved use and sharing of scientific information to support ocean governance and management**—that cuts across all of these focal areas. Over the next five years, the OPC will focus its work on these issues and on the cross-cutting need to improve the use of scientific information in decision making.

The OPC is Necessary to Meet the Challenge

Meeting the challenges ahead requires foresight, leadership, scientific support, and a deepened commitment. The OPC is positioned to play the critical role of strategically deploying the state's assets, coordinating across sectors, and productively engaging the state's extraordinary scientific community to ensure that our strategies are informed by the best available information. California's leadership in ocean management is a model for other states, the nation, and the world.

This plan outlines specific goals, objectives, and actions that the OPC will implement in each area to better manage and protect California's ocean and coastal resources. It has been developed within the context of the National Ocean Policy adopted by President Obama in his July 2010 Executive Order No. 14547, and is consistent with the nine national priority objectives that were identified in the *Final Recommendations of the Interagency Ocean Policy Task Force.*[1]

To achieve these goals, the OPC will continue to take a leadership role and utilize the OPC's core competencies and unique function in state government by: recommending meaningful changes to state and federal policies and laws, coordinating and fostering collaboration among agencies, "seeding" and "catalyzing" projects by leveraging existing funding and identifying new funding sources, and improving and enhancing the use of science in decision making. The OPC will also work closely and in partnership with other state agencies responsible for managing ocean and coastal resources as well as federal, tribal, academic, non-governmental, and industry partners.

Plan Development and Outline

The OPC staff has developed this strategic action plan in cooperation and consultation with Ocean Protection Council members, the OPC Steering Committee, the OPC Science Advisory Team (OPC-SAT), relevant state and federal agencies, tribes, stakeholders, and the interested public. Public input was invited and received through a formal public comment period as well as three public workshops convened in August 2011 throughout the state. The plan has also been informed by an evaluation of the OPC's first five years. The strategic action plan was approved by the Council at its [xx date] meeting.

[1] *Final Recommendations of the Interagency Ocean Policy Task Force July 19, 2010 (The White House Council on Environmental Quality).* http://www.whitehouse.gov/files/documents/OPTF_FinalRecs.pdf.

The document contains five main sections:

- **Section I. Introduction** - Section I introduces the plan and describes the OPC's statutory purpose, guiding principles, and mission.
- **Section II. The First Five Years -** Section II describes major accomplishments and lessons learned under the first five-year strategic plan.
- **Section III. OPC's Strategic Approach –** Section III describes the OPC's strategic approach, introduces the key focal areas, and describes communications and outreach, funding, and staffing considerations.
- **Section IV. Five Year Action Plan –** Section IV contains the priority goals, objectives, actions, and performance metrics associated with four focal areas and one cross-cutting issue.
- **Section V. Appendices –** Section V contains the following appendices:
    - Appendix A is a comprehensive table summarizing goals, objectives, actions, metrics, and roles.
    - Appendix B is a summary of accomplishments under the first strategic plan.

B. CALIFORNIA'S OCEAN AND COASTAL RESOURCES

> *California's coastal and ocean resources are critical to the state's environmental and economic security and integral to the state's high quality of life and culture. A healthy ocean is part of the state's legacy, and is necessary to support the state's human and wildlife populations. Each generation of Californians has an obligation to be good stewards of the ocean, to pass the legacy on to their children. [COPA § 35505(a)]*

California's ocean and coast are among its most valuable assets. California is rich with productive and diverse ocean and coastal ecosystems. California also enjoys a unique and diverse 1,100-mile coastline that supports beaches, rocky cliffs, harbors, estuaries, and coastal communities. California coastal communities are diverse, including metropolitan cities and rural towns.

California's Ocean Protection Act (COPA) states that the ocean and coast are "critical" to a healthy environment, economic security, quality of life, culture, and human and wildlife populations. California's ocean and coast have benefited Californians and people across the nation in numerous ways. They provide a broad range of critical goods and services, including marine fisheries, healthy seafood, abundant wildlife, recreational opportunities, and vibrant coastal communities. For example, wetlands absorb nutrients or capture sediments from the land, thereby improving water quality and protecting important habitats. These ecosystems also serve as nursery and adult wildlife habitat, and they protect shore side communities from floods and storms.

California has the largest ocean economy in the United States, ranking number one overall for both employment and gross state product (GSP),[2] and a high percentage of California's citizens

[2] According to the National Ocean Economics Program's *California's Ocean Economy, 2005.* This report also states that $43 billion of gross state product attributed to coastal industries is attributed to the following sectors:

live in coastal counties.[3] Our ocean economy supports a vibrant tourism industry, a diverse fishing industry, international ports and other businesses, and California's ocean-dependent economy is estimated at between $43 billion[4] to $46 billion[5] per year. In 2010, California's coastal communities helped draw approximately 200 million visitors to California. Visitor spending directly supported jobs for approximately 873,000 Californians and resulted in $6.1 billion in direct state and local tax revenues[6].

Protecting the coastal marine environment and the coastal economies that are ocean dependent is critical for maintaining sustainable economic growth. The needs and challenges for each community are different; however, adapting to climate change and increasing job opportunities while simultaneously protecting the natural resources along the coast are a shared goal among all communities.

C. THE CALIFORNIA OCEAN PROTECTION ACT AND ESTABLISHMENT OF THE OPC

1. PURPOSE

The OPC was created on September 23, 2004 when Governor Schwarzenegger signed the California Ocean Protection Act (SB 1319, Burton)[7].

> *The Legislature finds and declares that the purpose of this division is to integrate and coordinate the state's laws and institutions responsible for protecting and conserving ocean resources, including coastal waters and ocean ecosystems… [COPA § 35515]*

The Act's **purpose** was to advance and refine the state's laws and regulations and coordinate institutions responsible for protecting and conserving ocean and coastal waters and ecosystems to accomplish the following objectives:

- Provide a set of guiding principles for all state agencies to follow, consistent with existing law, in protecting the state's coastal and ocean resources.

tourism and recreation, 58%; transportation, including ports, 34.5%; construction, minerals, ship and boat building, and harvesting of marine life, 7.5%. Tourism and recreation accounted for 76.8% of all coastal employment.

[3] This percentage was 77% in 2000, and is likely higher today.

[4] *California's Ocean Economy, 2005* report.

[5] See review of economic assessments of the value of beaches in Pendleton, Linwood, Philip King, Craig Mohn, D. G. Webster, Ryan K. Vaughn, and Peter Adams (2009), *Estimating the Potential Economic Impacts of Climate Change on Southern California Beaches*. PIER Research Report, CEC-500-2009-033-D, Sacramento, CA: California Energy Commission.

[6] California travel impacts by county, 1992-2009. 2010 preliminary regional estimates, April 2011. Prepared for the California travel and tourism commission by Dean Runyan and Associates. Page 1. Accessed at: http://www.deanrunyan.com/doc_library/CAImp.pdf

[7] Public Resources Code Section 35500 *et seq.*

- Encourage cooperative management with federal agencies, to protect and conserve representative coastal and ocean habitats and the ecological processes that support those habitats.
- Improve coordination and management of state efforts to protect and conserve the ocean.
- Use California's private and charitable resources more effectively in developing ocean protection and conservation strategies.
- Provide for public access to the ocean and ocean resources, including to marine protected areas, for recreational use, and aesthetic, educational, and scientific purposes, consistent with the sustainable long-term conservation of those resources.
- Identify scientific research and planning that is useful for the protection and conservation of coastal waters and ocean ecosystems, and coordinate and assist state agencies in addressing those needs.

2. GUIDING PRINCIPLES

The governance of ocean resources should be guided by principles of sustainability, ecosystem health, precaution, recognition of the interconnectedness between land and ocean, decisions informed by good science and improved understanding of coastal and ocean ecosystems, and public participation in decision making.
[COPA § 35505(c)]

California Ocean Protection Act provides the OPC with solid and specific **guiding principles** for governing, protecting, and conserving ocean and coastal resources. Per Section 35510, it is the state's policy that all public agencies consider the following principles:

(1) State decisions affecting coastal waters and the ocean environment should be designed and implemented to conserve the health and diversity of ocean life and ecosystems, allow and encourage those activities and uses that are sustainable, and recognize the importance of aesthetic, educational, and recreational uses.

(2) The ocean ecosystem is inextricably linked to activities on land and all public agencies should consider the impact of activities on land that may adversely affect the health of the coastal and ocean environment.

(3) It is the state's policy to incorporate ecosystem perspectives into the management of coastal and ocean resources, using sound science, with a priority of protecting, conserving, and restoring coastal and ocean ecosystems, rather than managing on a single species or single resource basis.

(4) A goal of all state actions shall be to improve monitoring and data gathering, and advance scientific understanding, to continually improve efforts to protect, conserve, restore, and manage coastal waters and ocean ecosystems.

(5) State and local actions that affect ocean waters or coastal or ocean resources should be conducted in a manner consistent with protection, conservation, and maintenance of healthy coastal and ocean ecosystems and restoration of degraded ocean ecosystems.

(6) Improving the quality of coastal waters and the health of fish in coastal waters should be a priority for the state.

3. THE OPC'S MISSION AND DUTIES

> *The mission of the California Ocean Protection Council is to ensure that California maintains healthy, resilient, and productive ocean and coastal ecosystems for the benefit of current and future generations.*

In carrying out this mission, the OPC will rely upon the provisions of the California Ocean Protection Act, which **requires that the OPC carry out the following duties and activities** (*COPA §*35615):

- Coordinate activities of state agencies to improve the effectiveness of state efforts to protect ocean and coastal resources.
- Establish policies to coordinate the collection and sharing of scientific data related to ocean and coastal resources.
- Identify and recommend to the Legislature changes in state law and policy needed to achieve the goals of COPA.
- Recommend to the Governor and the Legislature actions the State should take to encourage needed changes in federal law and policy.

II. THE FIRST FIVE YEARS

A. MAJOR ACCOMPLISHMENTS

The OPC has brought leadership to ocean management in California by elevating discussion of ocean issues to the cabinet level in state government and by raising awareness about ocean threats and potential solutions. The OPC has advanced policies at the national and state levels, promoted science-based decision making, brought agencies together to improve state efforts to protect ocean resources, and funded and led innovative projects to improve understanding of ocean ecosystems and resource management. The OPC has helped maintain and enhance California's role as a national leader in ocean policy. Major accomplishments in its first five years are summarized below and described more fully in Appendix B.

- **Advancing Policies.** At the state and national level, the OPC is seen as a leader because its resolutions and investments have effectively influenced policies on several key issues. The OPC has passed many policy resolutions that address issues that impact California (and other coastal states) such as once-through cooling (OTC), marine debris, climate change, and fisheries management policy. One of OPC's particularly successful resolutions was on reducing and preventing marine debris. It brought widespread attention to the problem of marine debris and spurred legislation and local government action to help reduce debris pollution.

- **Science-Based Decision-Making.** The OPC played a valuable role in articulating the importance of science, and set an example of how to use science in decision making through the partnership with the California Ocean Science Trust (OST), the designation of the OPC Science Advisor, and the establishment of the OPC Science Advisory Team (OPC-SAT), a group of internationally renowned experts that provide scientific input directly into OPC's decision making. The OST is the portal through which independent science is brought to the decision-making table, and the expertise of the OPC-SAT has and will continue to improve the quality of the OPC products and inform key decisions.

- **Leadership and Coordination**. As a cabinet-level body with a mandate to coordinate across state institutions, the OPC has effectively enhanced coordination and collaboration among state agencies in order to improve California's efforts to protect ocean resources, public health and safety, and coastal infrastructure and property. A key success of the OPC's coordination efforts is creating and leading the Coastal and Ocean Resources Working Group for the Climate Action Team (CO-CAT) to develop and implement the ocean and coast sector of the 2009 California Climate Adaptation Strategy. Another key success is the OPC's leadership and coordination of stakeholders and agencies in the development of an integrated statewide ocean observing system to improve the understanding and monitoring of our oceans. The OPC has also led significant collaborative efforts, including the collaboration to complete a statewide map of the seafloor and shoreline and convening and leading the Renewable Energy Working Group to explore solutions to offshore renewable energy siting and permitting challenges.

- **Strategic Funding of Projects to Advance Policies and Improve Resource Management**. The OPC funded projects that advanced high-priority ocean research, policy, and resource management issues. The OPC's large-scale funding efforts focused on catalytic projects that provided useful science-based information for multiple agencies and end-users. As an example, the OPC has funded the creation of the first comprehensive map of California's seafloor. This map will support effective management by improving climate change and circulation models, informing maritime safety planning, and allowing agencies and private industry to evaluate California's potential for producing ocean renewable energy. The OPC is also funding ecosystem-based monitoring of California's marine protected area (MPA) network, and other projects targeted toward providing state managers with information they need to make informed policy decisions. The OPC selected projects to generate data that capture the "big picture" of ocean health and trends. These major research and monitoring projects would not have been realized without the OPC.

Exhibit 1: Key OPC Accomplishments during First Five Years

- **Seafloor and Shoreline Mapping**
  Led efforts to complete a statewide map of the seafloor and develop a national model for seafloor mapping. The OPC leveraged the state's $15 million to bring in an additional $14.5 million for implementing the project and is now undertaking a shoreline mapping effort to create a seamless onshore-offshore high resolution elevation map of the state's 1,100-mile coastal zone.

- **Science Integration**
  Established a team of internationally renowned scientists to provide scientific expertise directly to OPC decision-making.

- **Climate Change and Sea Level Rise Adaptation**
  Led the development of the 2009 California Climate Adaptation Strategies for the ocean and coast and coordinates a statewide team to begin implementing these strategies.

- **Marine Debris**
  Brought widespread attention to the problem of marine debris and spurred legislation and local government action to reduce debris pollution.

- **Marine Protected Areas (MPAs)**
  Launched a cutting-edge monitoring program for the statewide MPA network.

- **Innovative Fisheries Management**
  Invested over $8 million in preserving California fisheries through community-based collaborations, innovative market approaches, and building capacity and data for improved fishery management.

- **Directed scientific studies and research**
  Funded objective technical reports to inform key state marine management issues such as offshore oil and gas, invasive species, and once-through cooling.

B. LESSONS LEARNED: ACCOUNTABILITY, ADAPTABILITY, AND CRITICAL REVIEW

To show the value of transparent and accountable governance, and to improve its own effectiveness in its mission, the OPC commissioned an independent evaluation[8] of its efforts over its first five years. The evaluation highlighted significant accomplishments as well as key lessons learned for how the OPC can become even more effective. It offered recommendations for how the OPC can more strategically and efficiently serve the state of California. **This strategic action plan explicitly builds on these lessons learned to guide the OPC's next five years.** Most notably, during the next five years, the OPC will:

- Strategically advance issues for which the OPC is uniquely or best suited to make a significant difference.
- Clearly define desired outcomes from the OPC actions and expenditures to track and communicate successes.
- Expand communication and outreach of the OPC activities to other agencies and partners to ensure transparency and accountability.
- Focus more on inter-agency coordination and collaboration, policy development, and seeking and providing initial funding investments to "seed" and "catalyze" key projects to advance policy.

[8] The OPC undertook a five-year evaluation entitled *Ocean Protection Council White Paper, "Towards Improving the California Ocean Protection Council"* (prepared for the OPC by NewPoint Group, October 2010).

III. OPC'S STRATEGIC APPROACH

The OPC is the "umbrella agency" providing a unified vision for ocean governance in California. The OPC harnesses the strength and inherent excellence of California's agencies responsible for managing ocean resources and combines it with the expertise of the scientific community to create comprehensive solutions for our oceans for years to come.

A. CORE STRENGTHS

For the next five years, the OPC will focus primarily on the following core roles as the most effective means by which it will implement effective solutions to ocean and coastal resource management:

- **Recommend Policy**: The OPC will continue to provide leadership in policy development at the national, regional, and state levels. At the national and regional levels, it will do so through coordination with key bodies like the National Ocean Council (NOC) and the West Coast Governors' Agreement on Ocean Health (WCGA). The OPC will strategically select issues and make policy recommendations that advance innovative approaches to improve resource protection and management.
- **Provide Leadership and Promote Agency Coordination**: The OPC will continue to provide leadership that improves marine ecosystem protection and resource management; effectively facilitate collaborative action and communication among public agencies and key partners; actively work with partners and constituents in an open, understanding, and inclusive manner; enhance efforts to formally and informally reach out to other multi-agency state bodies such as the Strategic Growth Council and the Biodiversity Council, key federal agencies (National Oceanic and Atmospheric Administration (NOAA), Department of the Interior, and the Environmental Protection Agency) and tribes to better coordinate efforts and resources to solve ocean resource problems; and maximize the efficiency with which limited public funds are expended.
- **Seek, Acquire, and Leverage Funding**: The OPC will continue to fund high priority projects to advance the goals in this plan. However, as the OPC's funds become more limited, its role will shift from funding projects to an increased emphasis on seeking, acquiring, and leveraging new funding for projects that will strategically advance specific goals.
- **Fund Innovative Projects:** The OPC will seek to fund innovative projects that improve how we manage our coast and ocean resources. The OPC will act as a catalyst for projects that can be self-sustaining and will not require long-term ongoing OPC funds or staffing commitments for success. The OPC will focus on projects that leverage previous investments. The OPC will continue to support specific projects that will result in significant, additional impact and improve efficiency and cost effectiveness.
- **Advance the Use of Science in Governmental Decision Making**: The OPC will continue to engage OST as a portal to science based information and partners to support the development of policy and to inform agency management decisions with independent

science. The OPC will continue to build on its productive partnership with OST by supporting innovative ways to integrate scientific expertise into its decisions, priorities, and opportunities.

The OPC is committed to accountability in its pursuit of these core roles. This strategic action plan contains a suite of effectiveness metrics associated with the individual objectives and actions identified. These metrics will be used to evaluate the extent to which the OPC is accomplishing these core roles.

B. FOCAL AREAS

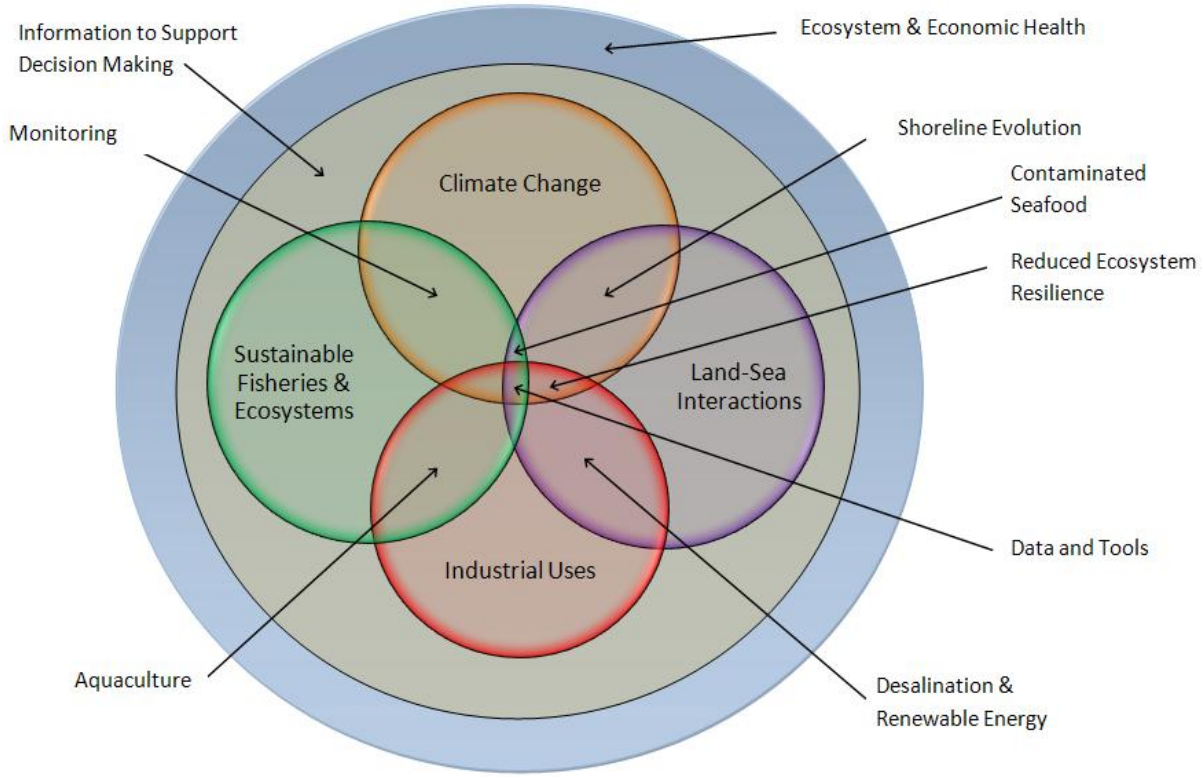
The plan focuses on four substantive areas that will comprise the core of the OPC's efforts over the next five years, including: 1) climate change, 2) fisheries and marine ecosystems, 3) coastal and ocean impacts from land, and 4) industrial uses of the ocean. The plan also identifies a fifth area— 5) improved use and sharing of scientific information to support ocean governance and management—that cuts across all of these focal areas. These five areas encompass critical ocean issues where the OPC's role of coordinating agencies, recommending policies, advancing science-based decision making, and funding projects is essential and will have high impact. While the OPC will focus on these five areas as the foundation of its efforts, it recognizes that it must remain agile and responsive to other emerging issues and innovative ideas and may pursue them as appropriate.

The above focal areas were selected by the OPC Management Team, Steering Committee, and Science Advisory Team using the following criteria:

- **Significance**—The issue has a significant effect on the condition and sustainability of coastal and ocean ecosystems and coastal communities.
- **Consistency**—Required actions fulfill the OPC goals and purpose and match the OPC core roles and statutory authorities.
- **Timeliness**—The issue has developed to a point where the OPC can leverage its core roles to advance the issue or resolve the problem.
- **Urgency**—Action in the near-term is critical to improve management and protection and reduce the threat to state resources.
- **Probable impacts**—The OPC can make a critical, tangible, and lasting difference. The cost-benefit ratio is high.
- **Need**—The OPC's core roles are required for effective state action.
- **Sound science**—The OPC's actions will be based on sound science, vetted by independent reviewers.

The focal areas are interdependent, as illustrated by the following diagram.

Exhibit 2: Areas of Overlap



The **objectives and actions** that appear in this strategic action plan were selected and evaluated against the criteria listed above as well as the additional criteria listed below:

- **Duration of the OPC's Investment** – The OPC will act as a catalyst for projects and programs and only fund initiatives that eventually will be self-sustaining and do not require long-term ongoing OPC funds or staffing commitments for success.
- **Leverage Past Investments** – In addition to funding new high priority initiatives, where appropriate, the OPC will focus on projects that leverage previous investments, build on previous resolutions, relationships, and information, and follow up on projects or actions that yielded the most effective results over the last five years. The OPC will continue engagement on specific projects or issues if ongoing work will result in significant, additional impact.

C. COMMUNICATIONS AND OUTREACH

Communications and outreach with stakeholders, agencies, scientists, tribes and the general public is a priority, and we have identified specific actions with associated metrics throughout this plan to ensure effective communication. The OPC is continuing to work to increase transparency in its decision making and improve its communication.

D. ASSUMPTIONS FOR THE NEXT FIVE YEARS

1. FUNDING

The COPA established the California Ocean Protection Trust Fund in the State Treasury, to be used for projects and activities authorized by the OPC. The largest source of funds to date has been from bonds, and the OPC has approximately $14.6M of Proposition 84 funds remaining as of December 2011. Potential additional sources of funding include new bond initiatives, mitigation funds, or other grant or private funds.

There are two basic financial scenarios for the next five years based on whether the OPC can obtain new stable and significant sources of funds. The actions in this plan are based upon the assumption that new sources of state or federal dollars will not become available within the next three to five years. However, OPC can expand its work plan while maintaining consistency with the state goals and objectives of this plan if additional funds become available. The OPC will continue to identify potential new sources of funding and leverage limited existing resources to their greatest impacts.

2. STAFFING

As provided in COPA, the Executive Officer of the State Coastal Conservancy acts as Secretary to the Council, administers its affairs, and provides the staff needed to carry out the OPC's work. The OPC is currently staffed by 5.5 full-time staff persons, a California Sea Grant fellow (who changes annually), and an Executive Director. It is not anticipated that this level of staffing will increase in the next three to five years; in fact, the Coastal Conservancy will need to comply with any additional requests for savings that may reduce available staff.

IV. FIVE YEAR ACTION PLAN

The OPC anticipates implementing the following objectives and actions over the next five years, and will engage its partner agencies and entities where appropriate.

A. CLIMATE CHANGE FOCAL AREA

There is scientific consensus that climate change is already causing adverse impacts to the California coast and ocean and poses a severe threat for the future. Sea-level rise (SLR) will lead to increased flooding and erosion from severe storms and will profoundly alter California's coast and bays in coming years. Ocean acidification and warming ocean temperatures are projected to result in substantial changes to ocean conditions and processes, and may fundamentally alter ocean ecosystems. In turn, these ecosystem changes are expected to impact productivity of our coastal waters, which will directly affect California's fisheries. In recognition of the broad-reaching influence of climate change on ocean and coastal resources, most of the focal areas for the OPC Strategic Action Plan include some consideration of this issue.

Scientific understanding of the risks posed by climate change will continue to improve as new information becomes available, creating the need for efficient review, translation, and communication to make information accessible in a manner that is credible and that enables action. California will require effective approaches for incorporating new information into decision making, as well as flexible and adaptive approaches to planning for and responding to changes.

Californians will need to work together to develop principles and criteria that can help guide the difficult decisions ahead and to develop plans for adaptation to climate change. It will be important to integrate this work with significant efforts already underway to mitigate climate change by changing the state's transportation and development patterns. The OPC will do so by incorporating consideration of climate change in resolutions, funding decisions, research priorities, and other OPC activities.

In addition to taking action to cope with the impacts from climate change, it is also important to help convey the urgency of taking quick action to reduce the causes of climate change, through improving understanding of the potential severity of impacts such as increased storminess, SLR, and ocean acidification, among others. Many barriers impede understanding, planning, and managing impacts from climate change. Overcoming these barriers will require changes at all levels of decision making and new ways of communicating and collaborating.

Goal: *Reduce, mitigate, and communicate the harmful impacts of climate change to public health and safety, the economy, coastal and ocean ecosystems, and public access to the coast and bays.*

ISSUE 1: STORM EVENTS, COASTAL FLOODING, AND SEA-LEVEL RISE

Important coastal resources are currently endangered during storms, tsunamis, and earthquakes. More frequent and intense storms combined with SLR are expected to increase the likelihood of damage in coastal counties, causing profound changes to California's coastal and bay communities, public health, infrastructure, and habitats. Unless action is taken, impacts from flooding, inundation, and erosion will endanger California's economy, which relies upon the ports, railroads, highways, airports, marinas, and other infrastructure, along with the public recreation and tourism that is based on California's coast and bays. It is estimated that within 100 years, close to half a million people, over $100 billion (in year 2000 dollars) in property, over 3,500 miles of roads and highways, 280 miles of railways, 28 wastewater treatment plants, 30 coastal power plants, and over 330 hazardous waste facilities or sites will be at risk from flooding and inundation due to coastal storms and SLR.

Governor's Executive Order S-13-08, the 2009 California Climate Adaptation Strategy, and the 2010 report by the California Adaptation Advisory Panel to the State of California identify storms and SLR as key issues requiring urgent action and all identify the OPC as an entity to provide leadership and scientific guidance. The OPC has served in a coordinating and leadership role regarding SLR during the first five years of its existence, writing the ocean and coastal resources section of the state adaptation strategy, and funding mapping, research, and scientific syntheses on SLR projections and impact assessment.

While there are many climate change impacts to ocean and coastal resources and communities, the OPC has prioritized taking action on SLR based on the urgency and need for action, ability to make a difference, consistency with the OPC's mandate, and past and recent commitments. The OPC will work to implement actions identified in the OPC SLR resolution adopted in March 2011, to support adaptation to SLR, and to highlight the need to reduce greenhouse gas emissions early in this century in order to limit future damage from SLR.

Objective 1.1: Improve state, regional, and local agency understanding of coastal flooding, inundation and shoreline change, and encourage development of adaptation strategies and mitigation measures.

Action 1.1.1: Provide up-to-date information and guidance, and recommendations on how to assess impacts and vulnerabilities, and develop adaptation and mitigation strategies through the Coastal and Ocean Working Group for the Climate Action Team (CO-CAT),

Metrics (measures of the OPC's actions):

- *Regular updates provided to the California SLR Guidance Document, per the schedule provided in the document.*
- *Coastal and Ocean Working Group convened regularly.*

- *Methodology developed to integrate assessment of local relative SLR, shoreline change, storm surge, flooding events, tsunamis and related climatic and oceanographic phenomena into planning decisions.*
- *Guidance documents developed to provide recommendations on how to implement adaptation and mitigation strategies.*
- *Targeted education and outreach initiatives implemented for local governments to improve understanding of climate change impacts on coastal flooding and erosion.*
- *Funding identified and funding leveraged to provide information and develop decision-making tools for coastal flooding and erosion.*

Metrics (measures of effectiveness):

- *State and local policy and planning documents revised to include consideration of climate impacts on coastal flooding and erosion.*
- *Local and/or regional assessments and adaptation and mitigation strategies developed that are based on OPC-led guidance.*
- *Decisions informed by new information and decision-making tools related to coastal flooding and erosion.*
- *Demonstrated public support for community level adaptation planning actions.*

Action 1.1.2: Improve mapping for SLR and storm surge hazard zones.

Metrics (measures of the OPC's actions):

- *Policy and technical process recommendations developed for creating hazard maps for coastal flooding due to SLR and storm surge that can inform land use decisions and real estate purchases.*
- *SLR and storm surge hazard maps periodically updated based upon latest science-based projections.*

Metrics (measures of effectiveness):

- *Land use decisions informed by SLR and storm surge hazard maps.*

Action 1.1.3: Promote standardization of data collection, data sharing, and monitoring related to coastal flooding impacts.

Metrics (measure of the OPC's actions):

- *State and federal working group convened.*

Objective 1.2: Reduce risk to public safety, public health, infrastructure, and other coastal development from long term impacts of storm events, coastal flooding, and sea level rise.

Action 1.2.1: Provide scientific syntheses of impacts and vulnerabilities to better inform decision making regarding adaptation options.

Metrics (measures of the OPC's actions):

- *Five-year update of the 2011 statewide vulnerability study conducted.*
- *Synthesis assessment prepared of the benefits and impacts (including socio-economic) of various shoreline protection methods and other adaptation options.*

Action 1.2.2: Provide information to decision-makers regarding policy and regulatory changes needed to reduce risk and protect public resources.

Metrics (measures of the OPC's actions):

- *OPC-led report produced on actions to reduce risks and protect public resources, including addressing habitat protection and sediment management.*
- *Policy resolution developed that recommends changes in laws, regulations, guidance documents, and processes to reduce risk and protect public resources.*

Metrics (measures of effectiveness):

- *Existing relevant laws and regulations fully implemented.*
- *Majority of relevant state agencies developed and implemented changes in laws, regulations, guidance documents, and decision-making processes.*
- *Relevant state agency leaders participated regularly in the CO-CAT to continue to build capacity, ensure consistent assessments of impacts, and implement changes to support institutional adaptation.*
- *State's approach to investing public resources to reduce risk revised to better take into account storm events, coastal flooding, and SLR.*
- *Local coastal program documents updated.*
- *Investments made in flexible, adaptable infrastructure.*

Action 1.2.3: Provide information to support inclusion of coastal flooding as part of the State Flood Control Plan (compendium to the State Water Plan).

Metrics (measures of the OPC's actions):

- *Scenarios for coastal flooding from extreme storm events and SLR developed and provided to the Department of Water Resources (DWR) for inclusion in the State Flood Control Plan.*

Metrics (measures of effectiveness):

- *Consideration of coastal flooding included in the State Flood Control Plan.*

ISSUE 2: ECOSYSTEM IMPACTS OF CLIMATE CHANGE

Climate change will alter the distribution and abundance of coastal and marine species in unprecedented ways. In drafting this strategic plan, we focused on issues such as ocean acidification and marine ecosystem changes, where the OPC can bring its core strengths to address issues that are not being addressed by other agencies. We decided not to address how tidal wetlands will evolve with SLR, since this issue is being addressed by other state agencies and regional collaboratives. We have focused on issues where there are needs that the OPC can

consider through statewide policy recommendations, providing scientific information to inform decision making, coordinating agencies, or leveraging funding.

The chemistry of the earth's oceans is changing in ways that will likely have profound implications for ocean ecosystems. Globally, ocean surface waters are now twenty-five percent more acidic than before the Industrial Revolution, and scientists predict that ocean acidification will continue to intensify due to emissions of greenhouse gases released into the atmosphere. Climate change is also affecting global ocean temperatures which will impact a wide range of ecosystem processes. Climate-related changes are likely to have major harmful impacts on the many benefits society derives from the oceans. These new conditions will result in altered species interactions, changes in food web dynamics, and together with climate-driven bio-invasions and extinctions, will result in altered community structures, undoubtedly impacting commercially harvested species and the fisheries that depend on them.

Previously, the OPC funded research on the effects of ocean acidification on red sea urchins, abalone, and oysters and supported OST in working with the OPC-SAT to summarize existing data and research needs. Current understanding of ocean acidification and its effects on California's coastal and marine species is quite limited, as is knowledge of what practical steps might be taken to plan for and adaptively manage marine resources as acidification intensifies. Acidification is a spatially and temporally complex phenomenon, and its impacts on marine species and ecosystems will be variable and potentially quite significant. The OPC will focus on actions to improve understanding of the potential impacts from ocean acidification, and to identify initial management responses to rising ocean acidity in the face of substantial uncertainty.

Objective 2.1: Improve understanding of ocean acidification and identify opportunities to adaptively manage its impacts.

Action 2.1.1: Promote exchange of information on changing ocean chemistry and impacts of ocean acidification.

Metrics (measures of the OPC's actions):

- *A suite of ocean acidification scenarios along the coast of California is developed.*
- *Data collection, data sharing, and monitoring efforts related to ocean acidification are standardized, toward providing a statewide 'baseline' understanding of pH trends.*
- *Partners, including state and federal agencies and academic institutions, convened as needed to improve understanding of ocean acidification.*

Action 2.1.2: Identify opportunities for management responses to ocean acidification.

Metrics (measures of the OPC's actions):

- *Report identifying management opportunities based on new ocean acidification information released by 2015.*

Objective 2.2: Increase understanding of climate change effects on marine ecosystems.

Action 2.2.1: Use the California MPA and areas of special biological significance (ASBS) networks as opportunities to detect climate change effects on marine ecosystems and marine fisheries.

Metrics (measures of the OPC's actions):

- *Targeted studies are implemented that augment MPA and ASBS monitoring data and detect climate change effects on marine ecosystems and marine fisheries.*

Action 2.2.2: Provide coordination and science support to improve understanding of impacts to marine ecosystems from climate change.

Metrics (measures of the OPC's actions):

- *A synthesis of relevant information on marine ecosystems and climate change provided by OST and the OPC-SAT.*
- *Relevant partners convened to identify management implications of changing marine ecosystems.*

B. SUSTAINABLE FISHERIES AND MARINE ECOSYSTEMS FOCAL AREA

The waters off California's coastline boast some of the most productive and diverse marine ecosystems in the world. However, California's marine ecosystems face numerous threats, including pollution, habitat destruction, historical overfishing, bio-accumulation of toxins, a lack of biological understanding, and climate change. It is imperative to understand these risks in order to protect these priceless resources for current and future generations.

The OPC is a non-regulatory body charged with, among other things: providing leadership and coordinating the activities of state agencies to improve the effectiveness of state efforts to protect ocean and coastal resources, and to help establish policies to coordinate the collection and sharing of scientific data related to ocean and coastal resources. The OPC strives to ensure sustainable marine resources by working with state, federal, and tribal organizations to improve coordination and provide resources and science based information to inform management decisions. As such, over the past five years, the OPC has partnered with the Department of Fish and Game (DFG) and the Fish and Game Commission (FGC) to improve approaches to fisheries management by providing data and resources. Given existing budget constraints it is important to identify efficiencies such as increased collaboration with partners and reallocation of existing resources to support the highest priority needs.

California's current fisheries management framework is a result of over 100 years of laws and regulations that were adopted on a piecemeal and ad hoc basis. There are recent examples of innovative approaches to management of California's fishery resources (e.g., the Marine Life Management Act of 1998 (MLMA) and the Marine Life Protection Act of 1999 (MLPA).

Assisting the regulatory bodies charged with implementation of these statutes is a high priority for the OPC.

Under the 1999 MLPA, California has initiated redesign and implementation of a statewide network of MPAs. The emerging statewide MPA network is unparalleled anywhere else in the nation. Moreover the goals of the MLPA are broad, including protection of marine life, habitats and ecosystems, rebuilding depleted populations, and providing educational and recreational opportunity, among others. Progress towards these broad goals offers significant opportunity to safeguard California's coastal economy which itself depends upon thriving marine ecosystems in coastal waters.

The OPC has invested in critically important and time-sensitive data collection to document baseline conditions in MPAs. This information provides a foundation for long-term MPA monitoring and can inform other management mandates including fisheries and water quality management. The OPC's continued involvement in effective implementation and adaptive management of the statewide network of MPAs is an important step toward recovery and protection of California's marine ecosystems.

Goal: *Ensure long-term sustainability of marine ecosystems, fisheries, and coastal communities that protect and enhance California's living marine resources for the enjoyment and use of current and future generations.*

ISSUE 3: SUSTAINABLE FISHERIES

Maintaining access to local seafood is important to Californians. Ensuring thriving coastal communities and marine ecosystems has many challenges, yet recent advances in innovative management practices show promise for overcoming these challenges. One approach for adding value to commercial fisheries while lowering overall volume, includes using market-based incentives (such as eco-labels) to promote more sustainable fishing practices. Some models have been shown to increase demand driven by consumers (mostly throughout the US and in Europe) who prefer seafood caught 'sustainably' and may be willing to pay a premium price for eco-labeled 'sustainable' seafood. Eco-labels provide economic incentives to fish more sustainably and add value to the fishery as many fisheries gain access to new markets they would not normally have had access to, including the European Union (EU) and other high end markets. Such market-based systems may help California fisheries shift effort from higher volume, lower profit to lower volume, higher profit fisheries and help to promote locally caught, sustainable seafood. Mandated by AB 1217 (Monning, 2009), the OPC will begin to implement a sustainable seafood program for California fisheries. This program is designed to increase local consumption of seafood and showcase California fishermen and fisheries throughout the world.

Over the past five years, the OPC has worked extensively with the fishing communities along the California coast. With support of projects such as the Central Coast Groundfish project, the San Francisco Community Fishing Association and California's fisheries fund, the OPC has been able to leverage funds that result in the development of improved access to fisheries and revitalization of coastal ports, while encouraging sustainable fishing. Many of these projects emphasize sustainable fishing practices that focus on working with the fishing community to transition to fishing practices that are less harmful to the ecosystem and to build markets to support sustainably caught seafood. The breadth of projects the OPC has tackled in the past five years demonstrates the OPC's ability to bring a variety of diverse stakeholders together in support of a common effort.

Objective 3.1: Improve the sustainability of fisheries through implementing innovative projects and policies that advance fishery management practices.

Action 3.1.1: Continue to implement the California Sustainable Seafood Initiative (CSSI; Assembly Bill 1217, Monning 2009).

Metrics (measures of the OPC's actions):

- *CSSI Logo is developed (by January 2013).*
- *Ten pre-assessments started (by July 2014).*
- *Plans for traceability and marketing programs completed (by December 2015).*
- *Three fisheries fully-certified (by July 2016).*

Metrics (measures of effectiveness):

- *Regional sustainable seafood distribution chains certified, which link together fishermen, processors, distributors, restaurants, and retailers.*
- *Higher value, lower volume fisheries.*

Action 3.1.2: Work with staff from the Office of Environmental Health Hazard and Assessment (OEHHA), the Department of Public Health (DPH), the DFG, the State Water Resources Control Board (SWRCB) and others to develop a program that meets the needs of the California sustainable seafood program as well as informs the public about seafood toxicity issues.

Metrics (measures of the OPC's actions):

- *Program implemented.*

Action 3.1.3: Support innovative projects that promote sustainable fisheries.

Metrics (measures of the OPC's actions):

- *Guidelines for Community Fishing Associations (CFAs) developed.*
- *Actions identified in the WCGA sustainable coastal communities section (for California) implemented.*

- *Number of jobs created by the fishing industry through a crew registry or other means documented.*

Metrics (measures of effectiveness):

- *Increased number of CFAs or Regional Fishing Associations (RFAs) along the state.*
- *Increased availability, demand, and sales of locally caught seafood at restaurants and markets throughout the state.*
- *Increased public awareness of sustainable seafood as measured by number of hits to a certain website, number of downloads for traceability/information applications on smart phones, etc.*
- *Continued or re-certification of fisheries with Marine Stewardship Council (MSC) after five years.*

ISSUE 4: SUPPORTING EFFECTIVE FISHERIES MANAGEMENT

In the past five years the OPC and its partners, have worked together to enhance the capacity to sustainably manage California's fishery and marine ecosystems. This has been accomplished through projects that increase collaboration and data availability to inform management decisions. Some of these projects include: creation of a collaborative fishery research organization (CFRO), support of monitoring efforts for California's new network of MPAs, the Central Coast Groundfish project, and the MLMA lessons learned study.

The state of California is currently at a turning point with how it manages its fisheries. Not only are new scientific tools being developed to help efficiently manage fisheries through the use of data poor assessment methods and integration of data collected for MPAs, but the relationships and interactions among fishermen, scientists, and managers are improving. Concepts of collaborative research and co-management[9], while still yet to be fully defined, are engaging fishermen, scientists, and managers in projects that leverage resources, increase communications, and strengthen relationships. In addition, the State of California is in the midst of a process to develop a Strategic Vision for California Fish and Wildlife. Passed in 2010, Assembly Bill 2376 requires the Secretary for Natural Resources to convene a committee to develop a strategic vision for the DFG and the FGC that will address, among other things, how to improve and enhance the capacity of the DFG and the FGC to protect and manage the state's fish and wildlife.

While there are numerous issues that affect California's fisheries and ecosystems, fiscal limitations currently weaken the ability of the DFG to fulfill its mandate. For example, a 2007 report[10] found that revenue generated from commercial fees accounted for less than 25% of the total costs required for management of commercial fisheries.

[9] Co-management refers to management by fisherman and government entities.

[10] The California Department of Fish and Game spends approximately $22.3 million on commercial fishing activities annually, while revenues to the Department total just $4.81 million; $1.13 million from landings tax revenue, and $3.68 million from permit fees. April 25, 2007, DFG Memorandum from Director L. Ryan Broddrick to John Carlson, Executive Director Fish and Game Commission.

Objective 4.1: Support science-based approaches to help inform fisheries management.

Action 4.1.1: Support the FGC and the DFG in developing data poor assessment methods and tools, and promote their integration into fisheries management.

Metrics (measures of the OPC's actions):

- *Data poor assessment methods and tools developed and integrated into fisheries management.*

Action 4.1.2: Support the FGC and DFG in updating data collection and reporting systems to better inform management decisions.

Metrics (measures of the OPC's actions):

- *Enhanced recreational fishing data collection and reporting program developed and implemented.*
- *Real-time and -location reporting of commercial and recreational catches developed and implemented.*

Metrics (measures of effectiveness):

- *Data collection and reporting formats standardized.*

Action 4.1.3: Improve management of anadromous fish by enhancing use of ocean data in modeling and decision making.

Metrics (measures of the OPC's actions):

- *Models and forecasts developed to assist with integration of physical and chemical data into management decisions.*

Action 4.1.4: Advance ecosystem-based fisheries management and consider how to incorporate climate change.

Metrics (measures of the OPC's actions):

- *Ecosystem-based fisheries management tools developed and used to inform management decisions.*
- *Guidance on emerging fishery issues developed.*

Metrics (measures of effectiveness):

- *Predicted impacts of climate change on California's fisheries and in nursery habitat better understood.*

Objective 4.2: Improve coordination and governance of California fisheries.

Action 4.2.1: Develop recommendations for changes to state laws and policies to remove ambiguities in state-managed fisheries, such as consolidating management authority.

Metrics (measures of effectiveness):

- *Updated definition of "sustainable", with regard to a marine fishery, in Fish and Game Code.*

Objective 4.3: Improve the State's capacity for sustainable fisheries management.

Action 4.3.1: Optimize use of funding and management resources by assisting the DFG and the FGC with evaluation of opportunities to increase capacity, such as through collaborations and co-management.

Metrics (measures of the OPC's actions):

- *Co-management approaches developed.*
- *Collaborative research better integrated into fisheries management.*
- *Assessment of the costs for managing California's fisheries conducted.*
- *Strategic vision for California fish and wildlife developed and implemented.*

Metrics (measures of effectiveness):

- *Increased long-term dedicated fisheries management capacity at the DFG and the FGC.*

ISSUE 5: LEVERAGING INVESTMENTS AND REALIZING BENEFITS OF THE STATE'S MARINE PROTECTED AREAS

California's network of MPAs is intended to, among other goals, protect and conserve marine life, habitat and ecosystems, and improve recreational, educational, and study opportunities provided by marine ecosystems that are subject to minimal human disturbance. In order to maximize these benefits, coordinated partnerships to effectively advance MPA management, enforcement, monitoring, education, and outreach are necessary among a broad range of public and private entities who are engaged in marine resource protection and restoration activities.

The OPC is mandated to establish policies to coordinate the collection and sharing of scientific information related to coastal and ocean resources among agencies[11]. To support adaptive management of MPAs, as required in the MLPA, the OPC invested in data collection to establish baseline conditions in newly implemented regional MPA networks. The OPC also participated in supporting the establishment of a new program—the MPA Monitoring Enterprise within OST—to develop and implement impartial, scientifically rigorous and cost-effective MPA monitoring to inform MPA management decisions.

[11]The California Ocean Protection Act: § 35615. Duties and activities of council: http://www.opc.ca.gov/webmaster/ftp/pdf/docs/Documents_Page/Noteworthy/PRC_26.5/COPA_Jan_2011.pdf

Supporting these activities that provide valuable information for multiple aspects of ocean resources management remains a high priority for the OPC. In addition to informing the adaptive management of MPAs, MPA monitoring offers a valuable opportunity to collect information that may be used to inform other priority resource management issues. If implemented thoughtfully and efficiently, MPA monitoring can inform fisheries management, alert to climate change effects on marine ecosystems, and provide test-case locations for examining water quality impacts on marine resources.

The OPC will draw upon its coordination strengths to facilitate effective implementation and adaptive management of MPAs among ocean-related agencies. The OPC has been identified as the lead agency in convening public and private entities to ensure effective implementation of the MPA network. The OPC's high-level leadership is important for advancing partnerships and developing coordination opportunities as well as for identifying funding for effective MPA management, such as mitigation fees.

Objective 5.1: Support effective implementation and management of MPAs consistent with MLPA through strategic partnerships.

Action 5.1.1: Support OST's MPA Monitoring Enterprise to develop and implement effective MPA monitoring; steward and share data and results; and deliver timely and meaningful information to inform adaptive MPA management.

Metrics (measures of effectiveness):

- *Periodic MPA management review informed by analysis and reporting of baseline data.*
- *A science-based, stakeholder supported monitoring plan adopted and implemented for each region.*
- *MPA management is informed by, and stakeholders, scientists, and decision-makers are engaged and informed through the use of communications tools.*

Action 5.1.2: Facilitate communication and collaboration among partners and determine a long-term funding strategy for MLPA implementation.

Metrics (measures of the OPC's actions):

- *Semi-annual meetings of MLPA implementation partners convened to discuss accomplishments, resolve challenges, and determine a long-term funding strategy.*

Metrics (measures of effectiveness):

- *Regional agreements adopted and implemented for cost-effective and collaborative management among MLPA implementation partners.*
- *Funding sources for long-term MLPA implementation identified, including potential funds from once-through cooling intake fees.*

Action 5.1.3: Support efforts to increase public awareness of MPAs by participating in a working group with the DFG, the State Parks, OST, appropriate local

entities, private foundations, and educators to facilitate development and implementation of a coordinated public education strategy about MPAs.

Metrics (measures of effectiveness):

- *MPA Public Awareness Working Group established, and education strategy designed and launched with partner support.*
- *Educational materials (maps, signage, etc.) developed and widely distributed at State Parks, nature centers, etc. in effective MPA regions.*
- *MPA information integrated into state-sponsored education curriculum.*
- *Increased visits to online resources about California's MPAs.*

Objective 5.2: Coordinate MLPA implementation with other ocean management policies to improve management effectiveness.

Action 5.2.1: Identify opportunities for integrated management of ocean resources through regional MPA implementation agreements, fisheries management plans, and the SWRCB's Ocean Plan update.

Metrics (measures of the OPC's actions):

- *Guidance to integrate fisheries and MPA management developed.*

Metrics (measures of effectiveness):

- *Fisheries management and water quality protection considerations addressed in regional MPA management plans.*
- *Regional implementation agreements developed that clearly identify partner roles for implementing cost-effective and collaborative management among potential MPA implementation partners.*
- *Data collected within MPAs are used to inform fisheries management*

Action 5.2.2: Identify opportunities to reduce pollution impacts to MPAs by working with the SWRCB and other appropriate entities.

Metrics (measures of effectiveness):

- *Consideration of MPAs incorporated into the SWRCB's Ocean Plan update.*
- *Reduced pollution levels detected by quantitative water quality measurements in MPAs.*

Action 5.2.3: Advance recommendations from OST's Aquatic Invasive Species (AIS) vector risk assessment research to inform strategies that reduce risk of AIS introduction into coastal and marine environments.

Metrics (measures of the OPC's actions):

- *Vector risk assessments results disseminated through California Agency Aquatic Invasive Species Team (CAAIST).*
- *Management strategies identified and considered.*

C. LAND-SEA INTERACTION FOCAL AREA

Land-sea interaction is a very broad issue area that could include everything from land-based pollution to physical and ecological processes along the coast. Broad water policy issues such as sources of water supply, water reuse, infiltration of runoff, groundwater, watershed management, and pollution control have enormous impact on the ocean. Most water pollution in California, from urban or agricultural runoff to municipal discharge, ends up in the ocean.

In drafting this strategic plan, we considered many potential issues: legacy toxic contaminants, contaminants of emerging concern, microbial contamination, nutrient pollution, harmful algal blooms (HABs), marine debris, urban runoff, hydromodification, sediment management and coastal erosion. Many of the issues mentioned are the primary responsibility of other agencies such as the SWRCB, the Regional Water Control Boards, the DWR, the Department of Toxic Substances Control (DTSC), and local governments; or they are being addressed by other organizations such as the Southern California Coastal Water Research Project (SCCWRP), the State's Northern, Central and Southern California Ocean Observing Systems, and the Coastal Sediment Management Workgroup (CSMW). In some instances, the OPC has made valuable investments that have furthered our understanding or management of these issues. For example, the OPC, through OST, partnered with NOAA and SCCWRP to initiate the California Harmful Algal Bloom Monitoring and Alert Program (HABMAP), statewide HAB alert network system for researchers and end user committees.

Addressing some of the aforementioned issues will require enormous infrastructure investments, while others require ongoing scientific research or monitoring; all of these investments are beyond the current resources of the OPC.

Therefore, in identifying objectives and strategic actions for the OPC over the next five years, we focused on issues where there is a clear role for the OPC and where there were opportunities to use our core strengths to achieve results and advance our mission of protecting and conserving ocean resources. We have focused on three issues where there are needs that the OPC can address through statewide policy recommendations, providing scientific information to inform decision making, coordinating agencies, or leveraging funding. These three issues include 1) Integrating Water Policy, 2) Marine Debris, and 3) Sediment Management.

Goal: *Reduce the negative impacts of terrestrial activities on marine ecosystems, public health, and the state's coastal and ocean economy*

ISSUE 6: INTEGRATING WATER POLICY

Many aspects of water management in California impact the ocean and its resources. The state needs integrated water policies that consider the connected issues of water supply, runoff, pollution, and ecosystem function. Promoting these policies should be a top priority of the OPC over the next five years. Such integrated policies must, by definition, be developed in partnership with other agencies, especially the DWR, the SWRCB, the coastal Regional Water Quality Control Boards (RWQCB), and DFG. The OPC should support its partner agencies and provide information about ocean and coastal resources to help advance integrated water policies in the forthcoming updates of the California Water Plan, SWRCB's Ocean Plan, and the RWQCB's Basin Plans. The OPC has a responsibility to ensure that the State's water policies are consistent with its goals of conserving marine ecosystems.

Objective 6.1: Advance integrated water policies that protect ocean resources.

Action 6.1.1: Provide information and recommendations to advance water quality policy development such as updating the California Water Plan, the SWRCB Ocean Plan, relevant Basin Plans, and other integrated water policies.

Metrics (measures of effectiveness):

- *Ocean resource issues adequately addressed in Water Plan, Ocean Plan, Basin Plans, and other relevant plans to support ecosystem restoration and protection.*
- *Best management practices for development identified.*

ISSUE 7: MARINE DEBRIS

Marine debris is persistent solid waste that ends up in the marine environment. Floating marine debris is moved by winds and ocean currents and can cross international boundaries. It impacts our beaches, degrades habitat, and entangles and poisons wildlife. In recent years, the accumulation of debris in convergence zones, such as the North Pacific Subtropical Gyre, has garnered much attention, resulting in public calls for actions to address this problem. The 2011 tsunami in Japan has also created a debris field that is purportedly moving across the Pacific and anticipated to reach California in two to three years. Although there are many sources and types of marine debris, reducing plastics is a top priority because plastic waste makes up a large percentage of all marine debris, and it persists in the environment causing long-term impacts.

Marine debris has been a priority issue for the OPC during its first five years. The OPC adopted two resolutions, funded two scientific studies, and coordinated the Marine Debris Steering Committee that helped develop the marine debris implementation strategy. The OPC has made significant accomplishments on this issue. However, much of the leadership on reducing plastic waste in the ocean has come from local governments, non-governmental organizations, and other agencies. Efforts at statewide marine debris legislation were unsuccessful and the OPC stopped convening the Marine Debris Steering Committee due to lack of staff.

This plan proposes that the OPC refocus staff resources on the issue of marine debris reduction, with particular emphasis on improving coordination and providing information to inform policy. The OPC can play a leadership role on this issue by helping coordinate the many agencies that have partial responsibility for reducing marine debris and by building off of the OPC funded scientific studies to improve policy and management. Finally, these objectives will support the marine debris reduction actions in the West Coast Governors' Agreement for Ocean Health.

Objective 7.1: Encourage agencies to work together on reducing marine debris.

Action 7.1.1: Reconvene the Marine Debris Steering Committee and expand membership.

Metrics (measures of the OPC's actions):

- *Marine Debris Steering Committee re-established with expanded membership.*
- *Specific policy recommendations produced related to high priority actions for reducing marine debris.*

Metrics (measures of effectiveness):

- *Priority actions of the marine debris implementation strategy completed.*

Objective 7.2: Provide information to support policy initiatives that will reduce marine debris.

Action 7.2.1: Provide targeted information to policy makers and the public about the costs and impacts of marine debris and about opportunities to reduce it.

Metrics (measures of the OPC's actions):

- *Economic costs of cleaning up marine debris analyzed.*

Action 7.2.2: Collaborate with the West Coast Governors' Agreement on Ocean Health Marine Debris Action Team and other stakeholders to generate new information needed to advance marine debris reduction policies.

Metrics (measures of effectiveness):

- *New studies on marine debris completed by 2015.*

Action 7.2.3: Support the SWRCB's adoption and implementation of a statewide trash policy.

Metrics (measures of effectiveness):

- *Marine debris reduced (i.e. tons collected on coastal cleanup day).*
- *Protective SWRCB trash policy adopted and implemented.*
- *Statewide and regional stormwater permits that include trash reduction metrics adopted and implemented*

Objective 7.3: Promote pollution prevention.

Action 7.3.1: Support collaborative efforts to work with a broad array of stakeholders including industry to proactively reduce packaging and other products that contribute to marine debris.

Metrics (measures of effectiveness):

- *Packaging from key industries reduced.*

ISSUE 8: SEDIMENT MANAGEMENT

Sediment management in upland watersheds, along the coast, and in the near shore environment has significant impacts on habitats and coastal resources. Modifications on land including dams, sand and gravel mining, and paving many coastal watersheds have all diminished sediment input into coastal areas. Sediment can act as a pollutant, carrying contaminants such as metals; it can also smother salmon and steelhead spawning habitat. However, sediment is also an essential resource needed to maintain various coastal environments such as beaches, wetlands, and dunes. Coastal sediment will be a critical resource as the state adapts to rising sea levels.

The Coastal Sediment Management Workgroup (CSMW) is a collaboration of state, federal, local, and regional entities working to implement regional sediment management to augment or restore natural processes. CSMW is the lead organization for sediment management and continues to work with regional entities to develop and implement coastal regional sediment management plans (CRSM Plans) to address sediment imbalance issues throughout the state in a holistic manner. The OPC should continue to participate as a member of this coalition. Given the OPC's past investments, and its leadership in responding to sea level rise, there are specific actions and opportunities for the OPC to help provide scientific information to promote beneficial re-use of sediment in a way that increases protection of near shore resources.

Objective 8.1: Improve policies and regulatory practices to better protect nearshore habitats while increasing opportunity for sediment reuse.

Action 8.1.1: Provide agencies, regulators, and decision makers with results from completed studies (such as the Tijuana Estuary Sediment Fate and Transport Study) and new models that have the potential to change sediment management regulatory standards.

Metrics (measures of effectiveness):

- *Sediment regulatory standards updated to incorporate latest information about sediment management.*

Action 8.1.2: Encourage implementation of pilot projects that demonstrate the efficacy of alternative regulatory standards.

Metrics (measures of effectiveness):

- *Sediment management policies updated.*
- *Pilot projects implemented.*

Objective 8.2: Provide management and planning entities with data and tools to enhance sediment-related planning decisions.

Action 8.2.1: Make tools available to agencies and other users to improve planning and decision making related to SLR and sediment disposal or reuse.

Metrics (measures of effectiveness):

- *California Coastal Mapping Project and the Bay Area Stanford Unstructured Nonhydrostatic Terrain-following Adaptive Navier-Stokes Simulator (SUNTANS) modeling project resources used in decision making.*

Objective 8.3: Restore natural sediment processes.

Action 8.3.1: Support other agencies' efforts to restore natural sediment processes, including consideration of dam removal

Metrics (measures of the OPC's actions):

- *Policy letters and resolutions produced by the OPC.*

D. INDUSTRIAL USES FOCAL AREA

The California economy is the 8th largest in the world, where approximately $46 billion is related to a healthy and thriving ocean and coastal environment. The state's marine environment currently hosts or has the potential to host a variety of industrial marine uses, such as shipping, fishing, energy production, desalination, and aquaculture. These industries are supported by the state's three major ports and a collection of smaller harbors, which provide the infrastructure necessary to convey goods to other parts of the state, the rest of the nation, and worldwide.

California's marine waters also host non-industrial marine uses that are important to society. For example, California has three coastal military bases which use the marine environment for military training, research, and security purposes. In addition, the state's coast and waters also provide significant recreational opportunities for coastal communities and visitors such as surfing, boating, swimming, and kayaking. As demand for the use of California's marine environment increases, the state recognizes the need to address the following issues:

Promoting science-based evaluation of and planning for emerging and future industrial uses of the ocean. Spatially explicit planning that addresses conflicts among users of the marine environment can be cost- and time-effective for all parties. The state should seek to:

- Increase the availability of scientific and geospatial information products and analysis tools useful for informing regulatory and siting decisions.
- Develop guidance on the early and proactive implementation of regulatory requirements, siting criteria, and performance standards.
- Identify proposed uses that may be compatible (or incompatible) with other existing and proposed uses.

Planning for and understanding cumulative impacts. Although a single activity or project may have insignificant impacts on the marine environment when considered in isolation, its interaction with other marine uses and natural phenomena may give cause for concern.

Recognizing the value of working waterfront infrastructure. Working harbors, ports, and waterfronts are essential to marine and coastal industries, contribute greatly to coastal economies, and are part of California's maritime heritage. As some traditional maritime industries have waned, maintaining waterfront infrastructure has become challenging. Yet, this infrastructure remains critical to attracting new maritime industries and economies, such as marine renewable energy development, and to preserving historic maritime uses that are culturally valuable to coastal communities.

In order to most efficiently use its resources, the OPC will focus on those industrial uses that are currently active or are under development, and will engage in other potential uses as they become more concrete. Industrial uses that the OPC will focus on include 1) desalination and once-through cooling, 2) marine renewable energy, and 3) aquaculture. There is an immediate role for the OPC to play regarding desalination as plants are up and running and more are being considered at this time. The OPC can also play a timely role in helping to determine the feasibility of marine renewable energy by supporting the development of guidance for test and pilot projects. The OPC can become more engaged in aquaculture if and when it becomes a more likely use, e.g., once there is a mechanism to enable leasing for commercial finfish operations.

Goal: *Ensure that industrial uses in California's ocean waters are planned and managed in a manner that balances their social and economic benefits with the long-term protection and sustainability of the state's marine and coastal resources.*

ISSUE 9: DESALINATION AND ONCE-THROUGH COOLING

As of December 2011,California has two desalination facilities that are currently operating and providing drinking water, two facilities that are permitted but not yet built, some pilot and test facilities, some small industrial facilities, and approximately a dozen more that are proposed. Desalination is viewed in some coastal areas as being able to provide a local and reliable source for a portion of an area's water portfolio. However, it currently has a relatively high cost and energy usage compared with other water sources. Efforts are underway to determine whether new technologies might lower costs and reduce impacts. The state's current recommendation is that desalination should be considered as a future water source where economically and

environmentally appropriate, and as an element of a balanced water supply portfolio that also includes conservation and water recycling to the maximum extent practicable.[12]

The DWR is currently updating the California Water Plan, and the 2013 update will be the first time coastal and marine elements will be incorporated. The Water Plan will address integrated water management, including water supply, water quality, environmental stewardship, and integrated flood management. The OPC will continue to work with DWR and other agencies over the next two years to assist with needed analyses and provide policy input. There is a particular opportunity to update the context for and shape recommendations about desalination, for example to provide statewide and regional analysis of water policy supply options that compare the costs and benefits of pursuing desalination with alternative water sources.

In addition, the state should identify and prioritize preferred siting and design considerations. Some current desalination technologies may have minimal adverse impact to the environment, such as use of beach-well intakes. The impacts of other conventional desalination technologies, however, include adverse effects on marine life due to open seawater intakes, brine discharges, and high energy usage and resulting GHG emissions. A major impact to the state's marine life would be caused by co-location of desalination plants with existing power plant once-through cooling (OTC) intakes. OTC causes adverse impacts through entrainment and impingement of marine organisms, which reduces species diversity, impacts threatened and endangered species, and causes other changes in system structure and function. Per the SWRCB's May 2010 policy to phase out OTC at most coastal power plants, most of these cooling systems are scheduled to be decommissioned over the next decade. Therefore, state guidance on siting and design considerations (e.g., alternative intake systems such as subsurface intake methods, improved screening methods, etc.) should be consistent with the SWRCB's May 2010 policy and should focus on technologies that can have minimal impact.

Objective 9.1: Work with all appropriate entities in the update of the California Water Plan to provide statewide and regional context for policy recommendations on desalination.

Action 9.1.1: Coordinate with DWR and other agencies and entities that have a role in setting policy and guidelines for desalination, including the Coastal Commission, State and Regional Water Boards, and others, to prepare scoping studies that will inform the California Water Plan Update.

Metrics (measures of the OPC's actions):

- *Regional contexts (costs and benefits of desalination compared with other water supply options; alternative water supply options) analyzed.*
- *Data gaps or necessary new policies and guidelines identified and incorporated into siting options and constraints.*

[12] *Water Desalination – Findings and Recommendations* (Department of Water Resources (DWR), 2003); *California Water Plan Update* (DWR, 2009).

- *Performance standards developed to determine siting options and constraints, based on existing criteria and guidelines, and supplemented by new data, policies, or guidelines where gaps existed.*
- *Mechanism in place for statewide policies and criteria to be reflected at local and regional levels.*

Metrics (measures of effectiveness):
- *OPC-led actions incorporated into the California Water Plan update.*

Objective 9.2: Bring together agencies and partners to better-define impacts from desalination facilities and determine appropriate siting and/or design criteria, building from existing criteria, policies, and guidelines.

Action 9.2.1: Take appropriate actions to underscore need for desalination facility intakes to be consistent with the SWRCB's May 2010 executive order and the OPC's 2006 Resolution to phase out OTC technology.

Metrics (measures of the OPC's actions):
- *OPC input into development of the SWRCB's pending desalination policy.*

Metrics (measures of effectiveness):
- *Position adopted of no open-ocean intakes for ocean desalination facilities, and no co-location of ocean desalination facilities with facilities using OTC.*
- *State's position reflected in the SWRCB's Desalination Policy.*

Action 9.2.2: Seek independent review of existing information about alternative intake systems designs that can replace open-ocean/OTC intakes and minimize damage to marine life.

Metrics (measures of the OPC's actions):
- *Agreed-upon review completed in time for input into the development and/or initial implementation of the SWRCB's pending desalination policy.*

Metrics (measures of effectiveness):
- *Results of reviews incorporated into SWRCB's desalination policy.*
- *Results of reviews used by regulatory agencies and others to inform decisions.*

Action 9.2.3: Identify existing siting and design criteria, and support development of any additionally-needed criteria.

Metrics (measures of the OPC's actions):
- *Existing and new information synthesized and developed in time to inform development and/or initial implementation of the SWRCB's pending desalination policy.*

Metrics (measures of effectiveness):

- *SWRCB's desalination policy incorporated results of reviews.*
- *Regulatory agencies and others used information to inform their decisions.*

Action 9.2.4: Work with the SWRCB and CCC to assess the effectiveness of interim mitigation projects proposed through the OTC Policy process to address impacts to the marine environment from OTC intake structures, where such projects are not mitigation in lieu of best technology available under Clean Water Act and related litigations.

Metrics (measures of the OPC's actions):

- *OPC participation in determining effective interim mitigation projects.*

Metrics (measures of effectiveness):

- *Projects to mitigate interim impacts effectively do so where such projects do not run counter to the requirements that mitigation not be used in lieu of best technology available.*

ISSUE 10: MARINE RENEWABLE ENERGY

California has robust goals for increasing renewable energy production and protecting the state's coastal and ocean resources. Marine renewable energy is an emerging industry that involves technologies that harvest wave, tidal, offshore wind, and ocean thermal energy for both small scale and commercial energy production. Over the last decade, an increasing number of these developments have been deployed around the world in efforts to advance these industries and their associated technologies. In California, these industries are still in a nascent development stage; however, manufacturers and developers have a strong interest in pursuing demonstration and larger scale marine renewable energy projects within and adjacent to state's waters.

As no single agency has primary responsibility for managing this industry, the OPC has played an important leadership role on this issue with the California Energy Commission (CEC). The two agencies co-funded an initial report evaluating potential impacts of this industry and established a California Marine Renewable Energy Working Group to facilitate a dialogue between state and federal agencies, developers, and stakeholders on siting, planning, and regulatory challenges related to this emerging industry. Through this working group, OPC also facilitated the development of a memorandum of understanding (MOU) with the Federal Energy Regulatory Commission (FERC) to promote early consultation and coordination on federal and state regulatory processes for wave and tidal energy projects.

Over the next five years, the OPC will continue to lead the California Marine Renewable Energy Working Group and focus on policy actions needed to address regulatory overlaps and inconsistencies both at the state and federal level, including the development of formal agreements, such as MOUs, when appropriate. The OPC will also improve access to geospatial data and other scientific information that is useful for reducing conflicts between existing uses of

the ocean and these emerging developments and evaluating cumulative impacts of siting and planning decisions and, as part of its efforts to implement AB 2125.

Objective 10.1: Address marine renewable energy development regulatory issues and information needs through the California Marine Renewable Energy Working Group and other coordination activities.

Action 10.1.1: **Lead the development of a white paper with the California Marine Renewable Energy Working Group that describes statewide regulatory guidance for pilot and test hydrokinetic developers.**

Metrics (measures of the OPC's actions):

- *White paper on test and pilot project guidance developed.*

Action 10.1.2: Continue to implement the MOU between California and FERC and facilitate other coordination strategies with the Bureau of Ocean Energy Management, Regulation and Enforcement (BOEMRE) and other federal entities, as appropriate.

Metrics (measures of the OPC's actions):

- *Coordinated activities led by state and its federal partners, such as co-facilitated public meetings, co-participation in project specific discussions, and co-sponsorship of workshops.*

Action 10.1.3: Improve access to information for marine renewable energy siting, planning, and regulatory processes.

Metrics (measures of the OPC's actions):

- *Information access needs identified and addressed through the existing California Coastal and Marine Geospatial Working Group.*
- *Policy recommendations developed, such as performance criteria or siting considerations, where appropriate.*

ISSUE 11: AQUACULTURE

Based on the Sustainable Oceans Act (SB 201), the state's mission and objectives with respect to aquaculture are to:

a. Provide for environmentally-safe aquaculture in state waters to augment food supplies, expand employment, promote economic activity, and increase native fish stocks while ensuring protection of public trust resources of the state;
b. Not unreasonably interfere with fishing or other uses or public trust values;
c. Not unreasonably disrupt wildlife and marine habitats, or unreasonably harm the ability of the marine environment to support ecologically-significant flora and fauna;
d. Minimize risk of introduction of non-permitted non-native or invasive species into state waters.

The state's current activities focus on commercial aquaculture, primarily shellfish (oysters, mussels, clams, and abalone), land-based marine aquaculture, and marine algae. As of December 2011there are no leasing provisions for commercial finfish production, and there are no active commercial finfish operations in state waters (although there are research or pilot-scale programs). The OPC is currently funding an aquaculture programmatic environmental impact report (PEIR), as required by SB 201 (Simitian, 2005), that consists of a new management framework that will govern leasing and permitting authorities over marine aquaculture, that will allow for finfish aquaculture, and that includes guidance on siting considerations, maintenance of existing regulatory controls, and leasing program requirements.

The state has an opportunity to work with federal agencies in their implementation of national aquaculture policies released June 2011. The OPC can play a leadership role in addressing potential issues to state waters and resources that may arise from operations in federal waters, and integrating aquaculture within an ecosystem framework consistent with SB 201. Specifically, there may be opportunities to coordinate around state-federal regulatory authority, regulatory and permit review, and/or implementation of pilot projects.

Objective 11.1: Coordinate state input on implementation of national aquaculture policies and actions, especially with regard to emerging aquaculture technologies.

Action 11.1.1: Assist state agencies in coordinating input on emerging aquaculture operations in adjacent federal waters.

Metrics (measures of the OPC's actions):

- *State agencies and working group coordinated with OPC to provide input on federal projects and actions.*

Metrics (measures of effectiveness):

- *Federal policies developed consistent with state's aquaculture mission and objectives.*

Action 11.1.2: Articulate state funding and research needs to federal agencies, and position California to receive federal funds should they become available.

Metrics (measures of effectiveness):

- *Federal funds received by California.*

E. SCIENCE-BASED DECISION-MAKING – CROSS-CUTTING AREA

Improving the use of scientific information in ocean and coastal resource decision making is one of the OPC's key goals as defined by COPA and AB 2125 Coastal Resources: Marine Spatial Planning Act (Ruskin, 2010). It is also a fundamental approach necessary to achieving all the goals and actions outlined throughout this strategic plan.

During its first five years, the OPC made enormous investments in data collection, including sea surface current and sea floor mapping, nearshore mapping, and initial baseline monitoring of the marine protected areas. During this time, the OPC also created a framework for integrating science into state decision making through its partnership with OST, its MPA Monitoring Enterprise, and the creation of the OPC-SAT.

Over the next five years, the OPC does not expect to have the resources to fund large-scale data collection or original research efforts. Instead, the OPC will focus on advancing the development of the tools and strategies necessary for ensuring that science is effectively incorporated into coastal and ocean management decisions. These efforts will include:

- Improving the management, use, and sharing of scientific and geospatial information, as outlined in AB 2125
- Facilitating management-driven research to continue to bridge the research conducted by the state's premier academic institutions with the information needs of the state's coast and ocean managers
- Linking past and future Sea Grant research projects to policy and management needs and
- Continuing and expanding the role of the OPC Science Advisory Team to provide objective scientific expertise on OPC issues and scientific strategies.

Goal: *Improve the use of science in ocean and coastal resource decision making through improved access to scientific and geospatial information, relevant decision support tools, and management-driven research.*

ISSUE 12: IMPROVING THE USE AND SHARING OF SCIENTIFIC AND GEOSPATIAL INFORMATION

With the state's sea surface current, seafloor and shoreline mapping investment and other extensive coastal and marine data collection efforts, California is now relatively data rich. Yet, institutional and technical barriers have prevented California's policy makers and resource managers from incorporating much of this information into decision making. California agencies lack a coordinated statewide system for sharing and accessing geospatial data that limits the ability of its agencies to use coastal and marine geospatial information (Geographic Information System (GIS), maps, and cadastral data). Geospatial information is essential for visualizing and analyzing complex ocean dynamics and potential human uses. Managers need tools for translating data into useful forms. Raw data files are often too large and unwieldy for most managers to use in daily applications; data must be converted into compatible formats in order to enable regulatory and planning analyses.

In 2010, the state legislature enacted AB 2125, which requires the OPC and state agencies to cooperate in promoting "state agencies' use and sharing of scientific and geospatial information

for coastal- and ocean-relevant decision making." In 2011, the OPC assessed the functional and technical needs of California's public agencies with respect to their abilities to gather, manage, use, and share information and decision-support tools relevant to ecosystem-based management in the coastal and ocean environment. Based on these findings, over the next five years, the OPC will carry out the implementation of AB 2125 and facilitate access to geospatial information and tools to ensure the effective use of scientific and geospatial information in management decisions by agencies and stakeholders. Multi-agency access to California's repository of geospatial data layers will also support efforts to efficiently respond to an oil spill emergency. This need was reinforced by the Gulf oil spill disaster.

The need for improved access to and integration of coastal and marine spatial data is also a primary directive of the Executive Order No. 14547 signed by President Obama (July 2010) that adopted the Final Recommendations of the Interagency Ocean Policy Task Force.[13] The Executive Order and Final Recommendations call for the development of coastal and marine spatial plans that build upon and improve existing federal, state, tribal, local, and regional decision-making and planning processes. The development of these regional plans will rely heavily on state and regional coastal and marine geospatial data.

Objective 12.1: Implement COPA and AB 2125 by promoting the use and sharing of scientific and geospatial information for coastal and ocean decision making.

Action 12.1.1: Compile and translate data into information products that can be easily accessed and applied by coastal and ocean decision-makers and stakeholders, such as the development of seamless onshore and offshore maps and digitization of historic data.

Metrics (measures of the OPC's actions):

- *Shoreline mapping data translated into products and formats useful for shoreline management, coastal predictive modeling, and resiliency planning.*
- *Management relevant tools developed from HF radar (sea surface current) mapping data*

Metrics (measures of effectiveness):

- *LiDAR data incorporated into the state's onshore-offshore map products.*
- *Seamless onshore and offshore geologic and elevation maps developed that allow better assessment of risks such as storm surge, tsunami, and earthquakes.*
- *Historical coastal and ocean data digitized.*

Action 12.1.2: Chair and facilitate the California Coastal and Marine Geospatial Working Group (CCMGWG) to identify and implement improvements for accessing

[13] *Final Recommendations of the Interagency Ocean Policy Task Force July 19, 2010 (The White House Council on Environmental Quality).* http://www.whitehouse.gov/files/documents/OPTF_FinalRecs.pdf.

and sharing geospatial data and to facilitate the development of a statewide geospatial data information system.

Metrics (measures of the OPC's actions):

- *High priority geospatial data system improvements and investments identified based on the 2011 Geospatial Data Scoping Study.*
- *Portals and decision-support tools identified that improve the management and sharing of scientific and geospatial information.*
- *Funding and implementation strategies developed for high priority geospatial data system improvements and decision-support tools.*
- *CCMGWG resolutions developed to advance the implementation of geospatial data system improvements at the state agencies and beyond.*

Metrics (measures of effectiveness):

- *Technical improvements outlined in the 2011 Geospatial scoping study implemented to advance the state's geospatial information system.*

Action 12.1.3: In coordination with the CCMGWG, the state's Geographic Information Officer, and the CalGIS Council, assess and increase agencies' technical expertise and use of geospatial information.

Metrics (measures of the OPC's actions):

- *CCMGWG led strategies, workshops and outreach activities developed to advance technical systems, staff capacity, and data and viewing tools.*

Metrics (measures of effectiveness):

- *Agencies' capacity to use and share data in planning and decision-making processes improved.*

Action 12.1.4: Develop financing strategies for long-term support of robust scientific information.

Metrics (measures of the OPC's actions):

- *Financing strategies and/or business plans developed.*
- *Potential incentives for private industries to provide funding to support state information networks developed.*
- *Public-private funding partnerships developed to support information systems and information access tools.*

Action 12.1.5: Seek out opportunities to demonstrate the efficacies of using geospatial information to support more coordinated, comprehensive, and place-based approaches for planning and managing activities in California waters.

Metrics (measures of effectiveness):

- *Increased use of geospatial data to inform coastal and marine planning.*

Action 12.1.6: Identify opportunities for collaborating with California's West Coast regional partners to meet common needs for collecting, managing, and sharing scientific and geospatial information and articulate California's role in the West Coast regional coastal and marine spatial planning body.

Metrics (measures of the OPC's actions):

- *Analysis of opportunities for regional collaboration and engagement produced.*

Metrics (measures of effectiveness):

- *California and West Coast interests achieved through participation in West Coast regional coastal and marine spatial planning body.*

ISSUE 13: IDENTIFYING HIGH PRIORITY MANAGEMENT INFORMATION NEEDS

OPC's leadership and facilitation role has, and can continue, to advance coastal and ocean science-based decision making by supporting management-driven research. OPC-led partnerships between academic institutions and agencies, such as the ones created to map the state's entire seafloor and provide for a network of sensors that capture sea surface currents, can help leverage funding for data collection that is fundamental to the coastal and ocean management needs of multiple agencies. OPC also plays a significant role in aligning research conducted by academic entities with the information needs of management agencies. Through its partnership with California Sea Grant Program, SWRCB's Areas of Special Biological Significance (ASBS) monitoring program, and OST with the abundant scientific partners it brings, among others the OPC helps to identify the priority information needs of coastal and ocean managers, and can inform research funding guidelines specifically tailored to encourage innovative and collaborative research to meet these needs.

Objective 13.1: Identify management information needs.

Action 13.1.1: Identify priority management information needs in partnership with the OST.

Metrics (measures of the OPC's actions):

- *A regularly updated list of priority statewide ocean and coastal information needs developed.*
- *Cross-cutting information syntheses that will inform management and policy development identified and supported.*

Action 13.1.2: Where appropriate, facilitate development of innovative and collaborative data collection partnerships, strategies, protocols, metadata standards, and data delivery formats to maximize the use of collected data.

Metrics (measures of the OPC's actions):

- *Data collection agreements and multi-partner strategies for data collection priorities, protocols, and data delivery formats developed.*
- *The 2011 scoping study recommendations implemented*

Metrics (measures of effectiveness):
- *Successful partnerships initiated.*
- *Shared data used to inform decision making.*

Action 13.1.3: Utilize the leadership role of the OPC and the OPC-SAT to target and leverage funding sources for innovative or high-impact research that is identified as critical for advancing management.

Metrics (measures of the OPC's actions):
- *OPC and SAT letters and resolutions developed, and workshops and panels convened, that raised visibility and fund opportunities for addressing critical research needs such as an economic assessment of non-consumptive uses along the coast.*

ISSUE 14: BUILDING INSTITUTIONAL CAPACITY WITHIN AGENCIES TO INCORPORATE SCIENTIFIC INFORMATION INTO MANAGEMENT DECISIONS

The OPC established a productive relationship with OST, a non-profit organization, to build and manage the OPC-SAT and act as a portal to numerous science-based partners such as the Southern California Coastal Water Research Project (SCCWRP), the Center for Ocean Solutions (COS), and the San Francisco Estuary Institute (SFEI). This relationship demonstrates the OPC's commitment to incorporating independent science in its decision making in an open and transparent manner. OST is outside of a government agency, thus uniquely positioned to act as an honest broker between policy-makers and managers and the scientific community. OST further benefits the state by leveraging private funding sources for supporting critical scientific research and initiatives, which is an essential strategy as many state and federal agencies respond to severe programmatic shortages.

In fulfillment of its mandate in the COPA, the OPC designated the OST Executive Director as the OPC Science Advisor and directed the Science Advisor to recommend members for an OPC-SAT to support the OPC's mission of science-informed decisions. ***The mission of the OPC-SAT is to ensure that the best available science is applied to OPC policy decisions.***

Based on these recommendations, the OPC appointed the team composed of 24 respected scientists with expertise in coastal and ocean issues from across disciplines. The OPC Science Advisor co-chairs the team and OST manages it. The OPC-SAT is a model approach for effectively tapping into the rich scientific expertise available in California and beyond. The OPC-SAT serves as a portal to high quality science and scientists throughout the country, and their dedication to the mission of the OPC and California is laudable.

As an independent body led by OST, the OPC-SAT provides objective, rigorous scientific expertise to support OPC decisions. With OST, they serve to support the peer-review process for OPC products and proposals and they provide insight into emerging issues. Their activities ensure the scientific credibility of the OPC and its decision making. The OPC-SAT serves to support the OPC mission in a variety of ways, including:

- Developing recommendations on scientific issues identified by the OPC
- Responding to information requests from the OPC
- Evaluating the technical merit of scientific and technical projects proposed to the OPC
- Providing technical advice on OPC agenda items and reports
- Participating in technical working groups and scientific forums to address critical management problems
- Assisting in ranking and refining annual research priorities
- Identifying critical emerging science issues that should be of concern to the OPC

Objective 14.1: Build the institutional support, capacity and leadership role of the OPC-SAT in order to harness the substantial scientific expertise within California to inform policy and management decisions.

Action 14.1.1: Continue to work with OST to increase the OPC-SAT's participation in all the OPC's projects and proposals with a scientific and technical component.

Metrics (measures of the OPC's actions):

- *Continued solicitation of peer reviews for any OPC proposal or product with a scientific or technical component.*
- *Semi-annual joint meetings of the OPC-SAT and OPC management team and staff convened.*
- *Expanded venues for OPC-SAT participation in OPC projects.*

Objective 14.2: Collaborate with OST to improve institutional support, capacity, and funding for data critical to evaluating management approaches, understanding ocean health, and monitoring climate change impacts.

Action 14.2.2: Seek increased federal funding for a sustained and integrated ocean observing system in California.

Metrics (measures of effectiveness):

- *Ocean observing systems in California funded.*
- *Ocean observing systems provided data to support ocean management decisions.*

Action 14.2.3: Develop sustainable strategies for managing and serving large statewide information products such as seafloor and shoreline maps and GIS information layers.

Metrics (measures of the OPC's actions):

- *Strategy document developed.*

Action 14.2.4: Establish cross-agency outreach and education on ocean issues in collaboration with OST.

Metrics (measures of the OPC's actions):

- *OPC/OST outreach and education strategy for state agencies developed.*

V. APPENDICES

A. SUMMARY OF GOALS, OBJECTIVES, ACTIONS, METRICS, AND ROLES (PLACEHOLDER)

B. SUMMARY OF ACCOMPLISHMENTS UNDER FIRST OPC STRATEGIC PLAN (PLACEHOLDER)