

Informing Continued MPA Monitoring in the Central Coast: Summary of Key Themes -- Central Coast Community Gatherings

January 13, Morro Bay | January 15, Pacific Grove | January 16, Santa Cruz

BACKGROUND AND PURPOSE

California Ocean Science Trust (OST), in collaboration with the California Department of Fish and Wildlife (CDFW), held a series of community gatherings throughout the Central Coast to learn about local interests and priorities for continued marine protected area (MPA) monitoring in the region. Members of the Central Coast ocean community were invited to gather in an informal setting to: share suggestions of species, fisheries, habitats, ecosystems, and/or socioeconomic information to incorporate into data collection and analysis; explore opportunities for partnerships and collaborations to support continued MPA monitoring; and exchange ideas, concerns, and questions about designing a program to guide monitoring over the coming years. Input received will help OST and CDFW update the Central Coast MPA Monitoring Plan, which will guide continued MPA monitoring in the region.

Community gatherings were hosted in Morro Bay, Pacific Grove, and Santa Cruz the week of January 13, 2014. Over 180 community members representing a wide variety of ocean users, interests, and perspectives participated in the conversations.

This document is a summary of key themes expressed by those who attended the community gatherings, as well as input received during informal, small group discussions that OST team members held with a number of Central Coast tribes and commercial and recreational fishermen. These community gatherings and small group discussions allowed OST staff to interact with community members in a variety of settings. Additional input was received in the form of written input forms, emails, and online input forms; this input is also reflected in this key themes summary. Many of the questions and concerns identified by community members and listed in this document are addressed in the Key Resources provided on page 9.

This document has been made available on the [Central Coast Monitoring Community](#) page at [OceanSpaces.org](#) and has been circulated to OST's Central Coast email list. The Central Coast Monitoring Community page includes additional information about MPA monitoring in the Central Coast, including informational handouts, answers to frequently asked questions, and program announcements, and it will be updated throughout the process to build and launch a monitoring program in the region.

This input provided by the Central Coast ocean community is organized into the following sections:

- Key Themes
 - General Community Ideas, Concerns, and Recommendations
- Specific Input
 - Monitoring Priorities and Questions
 - Central Coast Partnership Opportunities and Existing Monitoring Programs

KEY THEMES

General Community Ideas, Concerns, and Recommendations

Monitoring Approach and Design

At community gatherings and small-group meetings, individual Central Coast ocean community members expressed:

- Broad support for the production of reliable, unbiased, and rigorous scientific information to inform adaptive management of local MPAs. Academic institutions should be involved in monitoring activities, and monitoring should be peer reviewed by trusted academic experts.
 - There was interest in the ways in which anecdotal information might be appropriately used in MPA monitoring.
 - There was concern about the credibility, reliability, and usefulness of anecdotal information in a management context.
- That monitoring should focus on areas where there are gaps in data (e.g., deep water habitats, inshore), including areas that are of high priority and value to the Central Coast ocean community (e.g., nearshore habitats and species). Socioeconomic metrics are as important as ecological metrics when considering MPA monitoring priorities.
- That some monitoring should continue in the same locations as Central Coast MPA baseline monitoring to ensure that long-term datasets are available.
- The desire that MPA monitoring produce tangible results that can inform decision making and management of MPAs.
- The importance of keeping fishermen involved in these monitoring discussions.
- That input from fishermen is vital to understanding the impacts of MPAs and to effectively manage MPAs. Community members emphasized that:
 - MPAs have caused displacement, compaction, and increased pressure on areas that are accessible to commercial and/or recreational fishing.
 - Just because fishermen have adapted their businesses in response to MPAs does not mean that they aren't negatively affected by MPAs. Fishermen's ability to adapt and diversify in response to MPAs is limited.
 - Establishing increased trust with fishermen is key to gathering reliable socioeconomic data about the impacts of MPAs on commercial and recreational fishermen.
- Support for a holistic approach to monitoring that considers evaluation of both ecosystem-based management and fisheries management questions.
- That MPA monitoring will be most useful if questions are designed to consider and inform fisheries management data needs, including stock assessments of commercially and recreationally important species (e.g., rockfish).
- That MPA monitoring needs to consider the layers of regulations and management restrictions that exist in state waters (e.g., fisheries management).

- Desire for issues that may not be specific to MPAs, but which do have an impact on overall ocean health (e.g., water quality, climate change, ocean acidification), to be integrated into MPA monitoring and used to understand the many potential drivers of change inside of MPAs.
- The value of funding fewer monitoring projects that involve more intensive data collection over a longer timespan, rather than a higher quantity of projects that collect data over a shorter timespan.
- Support for stronger coordination of monitoring and management efforts at state, federal, and local agencies.
 - Community members recommended developing direct channels to share monitoring data with resource conservation districts, the California Coastal Commission and other planning commissions to help inform local decision-making.
- That engaging local experts and existing citizen science programs in the Central Coast is essential to the successful implementation of MPA monitoring. Community members also suggested that citizen science groups involved in monitoring should be held to the same standards as academic science and ideally performed under the direct supervision of researchers as part of formal scientific research projects to ensure scientific rigor.
- That MPA monitoring should be coordinated to help support other efforts to develop valuations of ocean resources. This information is very useful to economists.
- That, when considering traditional ecological knowledge as part of continued monitoring, it is imperative to involve Central Coast tribes in each step – from initial planning and resource allocation, to design, implementation, analysis and reporting.

5-Year Review and Baseline Program

At community and small-group gatherings, individual Central Coast ocean community members expressed:

- That adaptive management of MPAs should be informed by sound science. There was some confusion around the meaning of “adaptive management” and how the process to adaptively manage MPAs is intended to function.
- That they were unaware that baseline data had been collected in the Central Coast, and that the results from baseline monitoring were shared with the public at the State of the California Central Coast Symposium in February 2013 and with the California Fish and Game Commission in November 2013. Some community members expressed confusion around the meaning of baseline monitoring. Others expressed the desire to have the 5 -year review become more widely accessible to the Central Coast community.
 - Community members recommended that a summary of key findings would be helpful to build local understanding of the results of the baseline program. This type of streamlined report would also be helpful for decision makers, who are typically not scientists and require interpretation of data to be provided.
 - Community members were also interested to see how the results of the 5-year review will be translated into direct actions taken by CDFW and other agencies.

Other Input

At community and small-group gatherings, individual Central Coast ocean community members expressed:

- Support for many citizen science programs in the Central Coast region. These programs are listed below in “Central Coast Partnership Opportunities and Existing Monitoring Programs.”
 - Community members also highlighted the importance of ensuring that data produced by citizen science groups is scientifically rigorous. This helps to ensure the credibility and reliability of the data.
- Some distrust of the validity of monitoring data (including ecological and socioeconomic information), and doubt that the information gathered will inform effective adaptive management of Central Coast MPAs.
- That there is too much redundancy, repetition, and inefficiency in existing monitoring and not enough coordination.
 - Community members are interested in having all Central Coast monitoring data readily available from a central location, which will help with access and transparency as well as help to reduce redundancy in future data and monitoring programs.
- The importance of communicating monitoring findings back to the Central Coast community in any monitoring program. Community members noted that having scientific researchers who are also able to communicate well is key to effective information sharing and education. More education about MPAs, including in schools, is needed.
- That submerged tribal artifacts need to be respected by those who come into contact with them. There is an opportunity to conduct education and awareness trainings with dive clubs, citizen science groups, etc.
- That new research is indicating that fishing activity increased in some MPAs since their establishment, which impacts the ability to interpret the data.
- That some types of monitoring require longer-term consistency in data collection, and that inconsistent funding could place some monitoring data at risk.
- The desire for monitoring to result in a harvest report of fish caught, just like game animals on the CDFW website.
- That a key to the success of the Central Coast MPA monitoring program is to keep the public (especially the fishing public) informed about current research and monitoring programs. Community members added that when people are uninformed, they tend to become skeptical and fearful and thus draw their own conclusions.

SPECIFIC INPUT

Monitoring Priorities and Questions

The following is a summary of monitoring methods, metrics, questions, and data sources identified by Central Coast ocean community members (the specific input is listed in no particular order).

Individual Central Coast ocean community members expressed support for monitoring projects and methods that:

- Consider a number of different techniques and protocols that are peer reviewed and have a proven track record.
- Build strategically on research and monitoring conducted to date.
- Take place both inside and outside of MPAs.
- Include contextual information that is important for interpreting MPA monitoring data, such as oceanographic conditions (e.g. temperature, waves).
- Evaluate fish populations relative to distance from MPAs.
- Include visual studies, such as those conducted using remotely operated vehicles (ROVs) or deep water divers (up to 150 ft.), that are important for examining biomass in deep water habitats (beyond 100 ft.).
- Include modeling, which can serve as a valuable tool to evaluate monitoring.
- Make use of scientifically rigorous collaborative fisheries research and surveys of anglers.

Potential monitoring metrics identified by individual Central Coast ocean community members include:

- Ecosystems/habitats
 - Tide pools
 - Beaches
 - Estuaries
 - Deep water (e.g., greater than 100 ft., canyons)
 - Nearshore waters (including nearshore pelagic)
- Invertebrates
 - Clams (e.g., Pismo, bent-nosed, and razor clams)
 - California mussel
 - Snails (e.g., black turban and Olivella snails)
 - Red abalone
 - Sea urchins
 - Innkeeper Worm (e.g., abundance)
 - Mud Shrimp (e.g., abundance and size frequency)
 - Sand dollar (e.g., abundance and size frequency)
- Fishes
 - Yelloweye, blue, and canary rockfish
 - Juvenile rockfish (e.g., abundance)
 - Lingcod

- Boccaccio
- Petrale sole
- Transitory species that impact resident species
- Forage fish (e.g., anchovies)
- Bay ray (e.g., abundance)
- Steelhead smolt (e.g., abundance)
- Flatfish (e.g., abundance and size frequency)
- Swordfish
- Seabirds (e.g., coastal breeding patterns as an indicator of greater oceanographic processes)
 - Shorebirds (e.g., richness and abundance, or pick a few indicator species)
 - Black Brant (e.g., abundance)
- Keystone species (e.g., top predators)
- Marine mammals
 - Sea otters (e.g., abundance)
 - Pinnipeds (e.g., harbor seals)
 - Marine mammals (e.g., whales and otters)
 - Impacts of marine mammals on ecosystems, specifically fisheries
- Biogenic habitat:
 - Marsh (e.g., extent, elevation, plant richness and abundance)
 - Submerged aquatic vegetation (e.g., extent)
 - Eelgrass (e.g., shoot density)
 - Algae (e.g., seaweed, kelp cover)
- Socioeconomics
 - Relationship between MPAs and fisheries and coastal communities (e.g., shift from fishing to tourist economies)
 - How fishermen are adjusting to being displaced from traditional fishing locations (e.g., accessing more distant locations, foregoing trips)
 - Impacts of cumulative effects of fisheries regulations
 - Visitor use (could use annual revenue from kayak shops, point count of kayakers and paddleboarders, or number of campsites full from State Park campground)
 - Revenue from tourism
- Human uses (e.g., distribution of fishing effort, safety impacts of MPAs, impacts of sportfishing on nearshore habitats, impacts of non-consumptive uses such as kayaking and paddleboarding)
- Oceanographic conditions
 - Ocean acidification
 - Dissolved oxygen
 - Currents
 - Wave action
 - Temperature
 - Upwelling
- Environmental conditions
 - Climate change
 - Impacts of Fukushima
 - Seismic testing
 - Wave energy
 - Ocean plastics

- Diablo Canyon nuclear plant
- Effects of local fracking activities
- Species richness measures
 - Species dependent on eelgrass
- Indicator clusters (to monitor suites of related species)
- Water quality (e.g., nitrates, bacteria)
- Invasive species (e.g., Morro Bay)
- Marine acoustics
- Marine debris
- Soil chemistry (e.g., sulfate levels)

Monitoring questions identified by individual Central Coast ocean community members include:

- What are the effects of MPAs on larval transport, size and population structure of fish?
- What role do deep-water habitats play in larval transport?
- What is the behavior and ecology of certain high-valued rockfish species (i.e., canary rockfish)?
- How are the Central Coast MPAs functioning as a network?
- How do MPAs affect the resiliency of marine ecosystems? Is there a relationship between resiliency and MPAs? How do specific species of fish interact? How do other marine species interact, especially top predators? How are these interactions impacted by MPAs?
- How does large-scale coastal infrastructure impact ocean health (e.g., Diablo Canyon nuclear plant)?
- What is the relationship between MPAs and the displacement, compaction, and concentration of nearshore fishing efforts? Has the safety of commercial fishing changed since MPA implementation?
- Were the criteria used by the MLPA Initiative Science Advisory Team (SAT) appropriate for MPA design?
- How are climate change and ocean acidification affecting species, especially invertebrates?
- What can the Areas of Special Biological Diversity, set up by the water boards, tell us about the intersection of water quality and MPAs on ocean health?

Monitoring design questions identified by Central Coast ocean community members include:

- How can anecdotal information from local experts be standardized and scientifically rigorous to inform MPA monitoring?
- Are there opportunities to evaluate human use data in a way that helps to inform enforcement of MPAs? How has compliance changed/evolved over the past five years?
- Is there a way to better define ocean uses and ocean users relative to MPA monitoring?
- What are the metrics to determine the success of Central Coast MPAs, individually and as a network? How is success defined?
- How can the loss of cultural identity resulting from MPAs be monitored and/or evaluated?

Data sources identified by individual Central Coast ocean community members that could help supplement or inform planning for MPA monitoring include:

- California Environmental Data Exchange Network (CEDEN) and Surface Water Ambient Monitoring Program (SWAMP) programs for water quality data
- Central and Northern California Ocean Observing System (CeNCOOS)
- Collaborative Fisheries Research Project (CCFRP)
- Environment in the Public Interest Crowdsourcing 805 (EPIC805)
- Morro Bay National Estuary Program
- National Marine Fisheries Service (NMFS) trawl surveys
- Tenera's Report on Point Pinos Tidelands
- The Nature Conservancy's rockfish closure area data
- The Sea Otter Database
- Tim Estes' work on keystone species

Central Coast Partnership Opportunities and Existing Monitoring Programs

Central Coast ocean community members identified a number of local organizations interested in assisting and/or already involved in Central Coast MPA monitoring during the community gatherings, including:

- Alliance of Communities for Sustainable Fisheries
- Audubon California
- Bureau of Land Management National Conservation Lands (NCL) Program, Coastal Monument
- California Collaborative Fisheries Research Program (CCFRP)
- California Department of Public Health (works with oyster farmers)
- California Native Plant Society
- California Ocean Communicators Alliance
- Center for Blue Economy
- Central and Northern California Ocean Observing System (CeNCOOS)
- Central Coast Regional Water Quality Control Board
- City of Morro Bay
- Classes at Cal Poly San Luis Obispo
- Coast Guard
- Coastal Ocean Mammal and Bird Education and Research Surveys (Beach COMBERS)
- Coastal Watershed Council – Snapshot Day
- Collaborative Fisheries Research West (CFR West)
- Elkhorn Slough National Estuarine Research Reserve (NERR)
- iNaturalist
- Independent researchers (e.g., John Rosier, Mark Carr, Dean Wendt, and Rick Starr)
- LightHawk
- Long-term Monitoring Program and Experiential Training for Students (LiMPETS)
- Marine Consortium
- Monterey Bay Aquarium
- Monterey Bay National Marine Sanctuary
- Morro Bay National Estuary Program
- MPA Watch
- Other academic research programs (e.g., University of California, California State University, Stanford)

- Otter Project
- Pacific Wildlife Care
- Partnership for Interdisciplinary Studies of Coastal Oceans (PISCO)
- Reef Check
- San Luis Obispo County (ground water quality)
- Save our Shores
- Surfrider
- University of California Natural Reserve System

KEY RESOURCES

The following key resources are provided for community members to learn more about Central Coast MPA monitoring and to stay connected with OST:

- OceanSpaces – An online community designed to bring together those who want to stay informed about MPA monitoring projects and results:
www.oceanspaces.org
- *State of the California Central Coast: Results from Baseline Monitoring of Marine Protected Areas 2007-2012*, a summary report that shares results from the Central Coast MPA Baseline Monitoring Program:
<http://oceanspaces.org/learn/monitoring-results>
- Proceedings summary and videos from the State of the California Central Coast Symposium, a public symposium that offered resource managers, policy makers, stakeholders, and scientists an opportunity to reflect on the first five years of Central Coast MPA monitoring:
<http://oceanspaces.org/learn/state-california-central-coast-symposium>
- Data collected as part of the Central Coast MPA Baseline Monitoring Program:
<http://oceanspaces.org/data/central-coast/ecosystem-feature?pid=3594>
- Central Coast Monitoring Community, a place to stay informed about and involved in planning efforts for Central Coast MPA monitoring:
<http://oceanspaces.org/organization/central-coast-monitoring-community>
- The OST monthly electronic newsletter, *The Pulse*, which provides monthly updates about OST's work, including notices of meetings and opportunities for public comment:
www.monitoringenterprise.org/signup.php
- California Department of Fish and Wildlife, Central Coast MPA website:
http://www.dfg.ca.gov/marine/mpa/ccmpas_list.asp