Marine Protected Area Long-term Monitoring Program

Integrated Ocean Observing Systems

across California's MPA Network

Photo: James R. Wilkinson

MPA Monitoring

California's Marine Protected Area (MPA) Network is approaching its first-ever 10-year review. California will lean heavily on its MPA monitoring program to show progress towards meeting the goals of the Marine Life Protection Act, the founding legislation of the MPA Network. Researchers and community scientists have been tracking California's marine ecosystems since MPA implementation, in some cases as far back as 2007. Learn more about this MPA monitoring program below and read the full technical report on California Sea Grant's website.

Program Overview

This project uses satellite data and other ocean observing systems to develop data products for analyzing relationships between large-scale oceanographic phenomena and conditions at MPA sites statewide. Researchers on this project are working with the other researchers conducting long-term MPA monitoring projects to integrate physical data (e.g., temperature, pH) with habitat data into data products referenced above. The research team created a new California MPA Dashboard, which streamlines complex data to help researchers, managers, and decision makers assess MPAs from regional to statewide scales.

Partner Institutions

Monterey Bay Aquarium Research Institute, Scripps Institution of Oceanography, UC San Diego, UC Santa Cruz, Axiom Data Science, National Oceanic and Atmospheric Administration-Southwest Fisheries

Access all of California's MPA data: California MPA Monitoring Portal.

Program Highlights

The California MPA Dashboard App

- creates a **curated** and **current** snapshot of ocean physics, biogeochemistry, biology, and ecology, and models **future** scenarios.
- incorporates environmental and biological data derived from **satellites** and **advanced remote sensing tools** like moorings, buoys, radar, and sensors.
- features **up-to-date** datasets to help resource managers make **informed decisions** based on a confluence of the latest research and historical data.

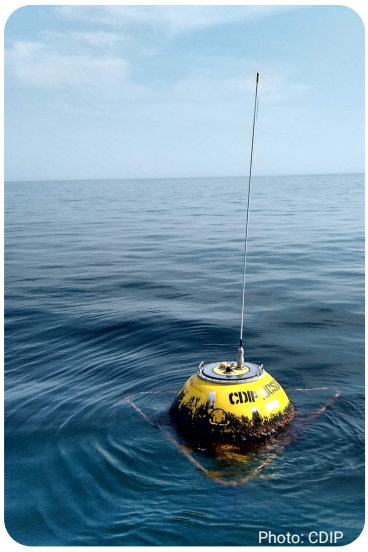


Photo: CDIP

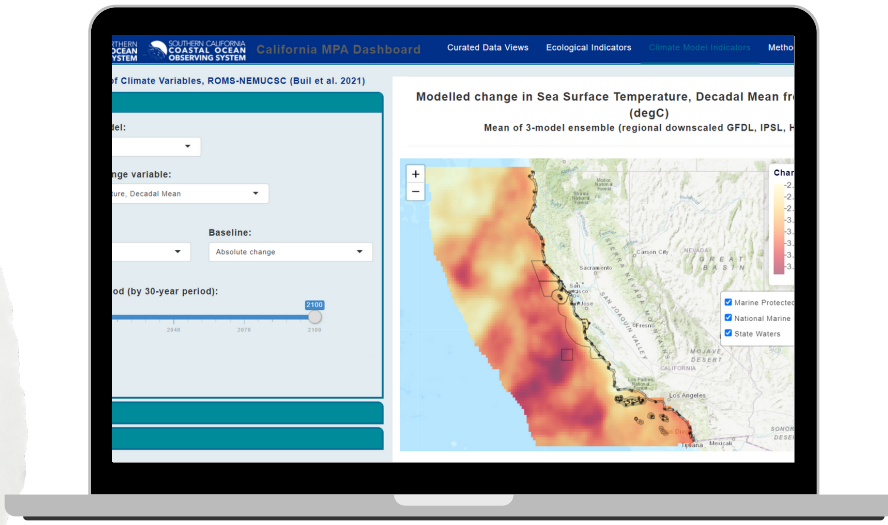
CALIFORNIA MARINE PROTECTED AREAS

Key Findings from MPA Monitoring

Integrated Ocean Observing Systems

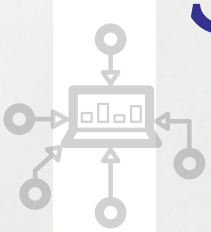
1 Accessible Data

The project team developed a **California MPA Dashboard application** that provides **easy access** and **visualizations** of multiple integrated MPA-targeted datasets and data digests that are relevant to MPA managers and researchers. Data can be easily **explored**, **visualized**, and **downloaded** through a public website interface. Researchers, managers, and other stakeholders can easily locate and explore data relevant to MPA assessments and research questions.



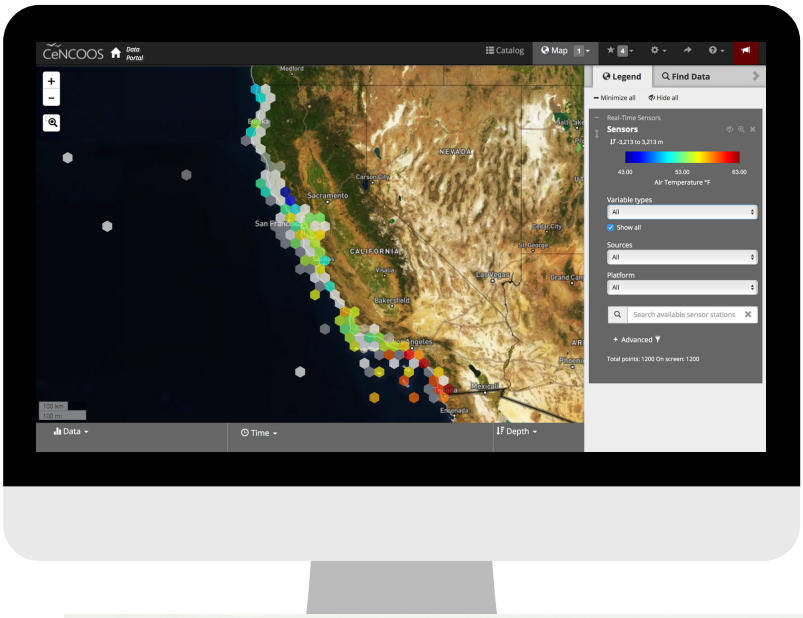
2 Increased HABs

The EcoCast and California-Harmful Algae Risk Mapping (C-HARM) risk maps show that the **frequency**, **persistence** and **spatial extent** of **harmful algal blooms** (HABs) have **increased** over recent years and that these areas coincide with ecologically important migrating species.



3 Climate Protections

To understand the role that MPAs may play in supporting **ecosystem resilience** in the face of **climate change**, the project team assessed the projected change in MPAs and bioregions in oceanographic variables (e.g. sea surface temperature, dissolved oxygen). Results showed that California MPAs **protected higher percentages** of potential 'climate refugia' from 1980-2099 compared to overall state waters, but refugia were often not spatially persistent.



4 High Connectivity between MPAs

On a monthly basis, the project team calculated **connectivity** of **virtual larvae** between MPAs in Monterey Bay. Most MPAs in the region were **well-connected** during the study period, especially when moving from southern to northern MPAs. Modeled adult fish **spillover** from MPAs to other non-MPA nearshore regions was also **high**.

For more information about MPA long-term monitoring and the Decadal Management Review, please visit:

- Integrated Ocean Observing Systems technical report
- California Sea Grant website to access all 7 MPA long-term technical reports
- CDFW's MPA Decadal Management Review webpage