

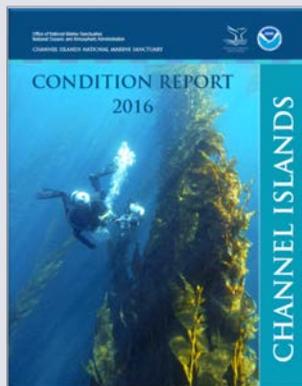
2016 Sanctuary Condition Report Highlights



Photo: Robert Schwemmer/NOAA

Marine Protected Areas

According to research in the sanctuary, no-take and restricted-take marine protected areas established in Channel Islands National Marine Sanctuary in 2004 and 2007 have had measurable benefits to fish populations and habitats. Monitoring in kelp forest and mid-depth seafloor habitats have shown that biomass and abundance of some species are increasing at a higher rate in marine reserves than in areas that are open to fishing. This “reserve effect” is more pronounced for species subject to fishing pressure such as lobster, sea cucumber, and sheephead. Unfished and lightly fished species showed no consistent pattern relative to protection.



Channel Islands National Marine Sanctuary has released a new condition report for 2016, an update of the first report from 2009.

The new report describes how sanctuary resources are doing, including status and trends in water quality, habitats, animals and plants, shipwrecks, and more. In addition to providing an assessment of the sanctuary’s general condition, the report also identifies pressures on resources and gaps in research and monitoring. These assessments will help to inform NOAA and members of the public participating in the revision of the sanctuary’s management plan.

Overall, the report found that sanctuary habitats and living resources are in good condition. The sanctuary’s remote, isolated position at the confluence of two major ocean currents supports remarkable biodiversity and productivity. The sanctuary is also a special place for historic shipwrecks and other maritime heritage artifacts. Many valuable commercial and recreational activities, such as fishing, shipping, and tourism, occur in the sanctuary. Some human uses are stressors on sanctuary resources. Climate change and ocean acidification are significant areas of concern, with their impacts observable across various habitats and communities.

Many sanctuary resources are doing well overall

According to the condition report:

- Nutrient pollution from the mainland rarely reaches the sanctuary.
- Water quality in the sanctuary is relatively good compared to coastal areas and supports safe swimming and recreation with no known health impacts.
- Shoreline and seafloor physical habitat have experienced measurable, but not severe, losses.
- Native species richness, a measure of biodiversity, is unchanged, with no new local extinctions.
- Many kelp forest and seafloor fish populations appear to be stable or increasing slightly, especially within marine protected areas.
- Submerged archeological resources (shipwrecks) are in stable condition with little disturbance or looting.

Cause for concern

The following pressures and trends are cause for concern:

- Climate change, marine heat waves, and related impacts (see box on next page).



Marine Heatwaves and Climate Change

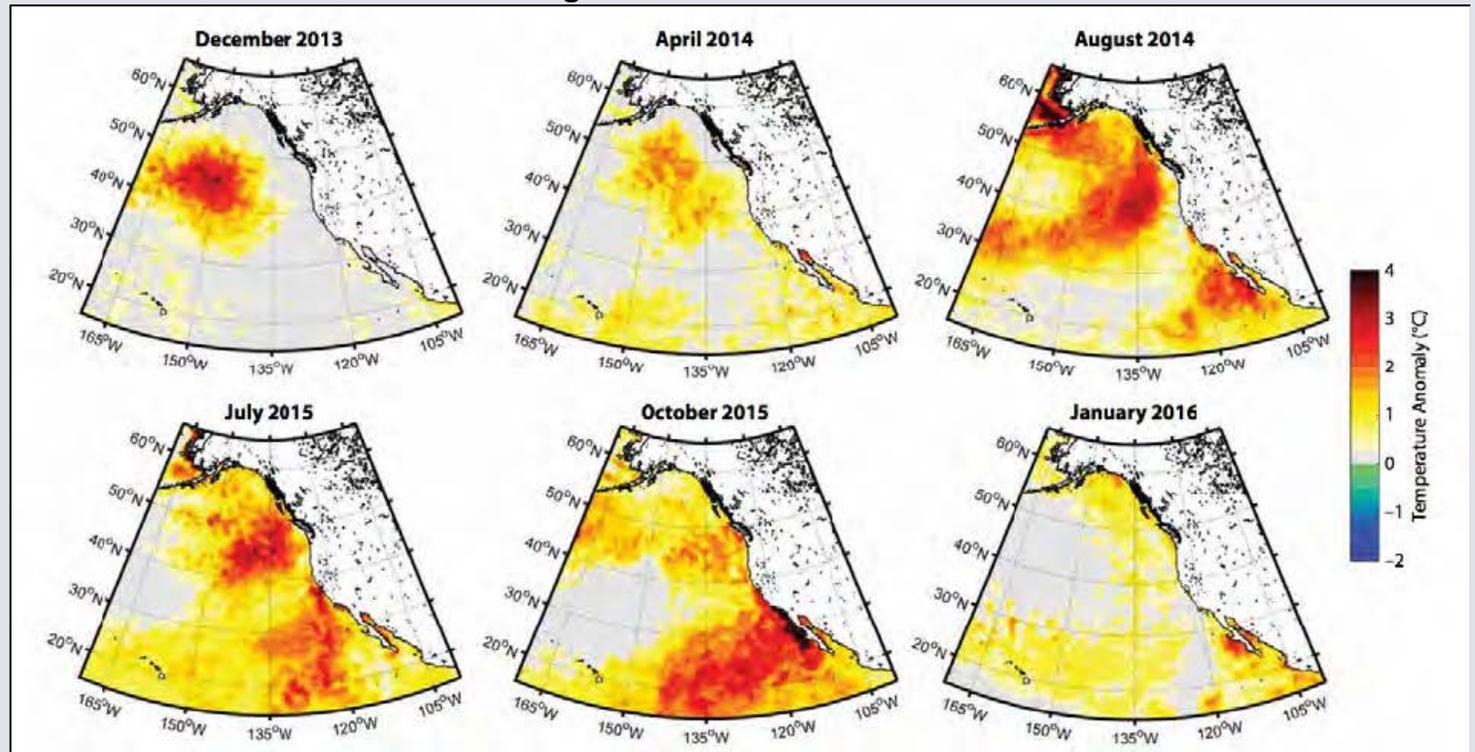


Figure: Cavole et al. 2016. Figure can be found on page 101 of the 2016 Channel Islands National Marine Sanctuary Condition Report.

The figure above highlights sea surface temperature (°C) anomalies showing the progression of two regions of unusually warm water, known as a marine heatwave. This marine heatwave, commonly known as “the Blob,” was observed in the northeast Pacific Ocean from December 2013 through January 2016. Temperature data were obtained from the National Oceanic and Atmospheric Administration Visualize High-Resolution Blended Analysis Data. <http://www.esrl.noaa.gov/psd>.

During “the Blob,” the Southern California Bight experienced a prolonged period of unusually warm surface waters. As the mixing of water layers and levels of surface nutrients decreased, impacts reverberated through regional food webs. The event was linked to blooms of harmful algae that closed fisheries and substantial die-offs of marine mammals and seabirds. As of September 2019, NOAA was monitoring the emergence of another heatwave off the coast, from Alaska to California. Studies in other areas suggest that such events are related to climate change.

- Harmful algal blooms and their impacts on top predators (seabirds, mammals) and seafood safety.
 - Habitat-forming species: some species with reduced abundance (eelgrass beds, mussels) or health (deep sea coral, large kelp).
 - Invasive/nonnative macroalgae (e.g., *Sargassum* and *Undaria*).
 - Reduced abundance of sea stars, which are important keystone predators, due to wasting syndrome.
 - Marine debris accumulation in the water column and on the seafloor with impacts to some species.
 - Some contaminants may have increased in bottom sediments.
 - Overall fishing gear interactions with seafloor habitats have been reduced; however, lobster trap loss within the sanctuary is a concern.
 - Impacts from vessel activities, including whale strikes, noise, pollution, and groundings.
- Information gaps warrant further study**
- The condition report identifies the following topics as needing further research and monitoring:
- Status of beaches and soft-bottom habitats and communities.
 - Characterization and monitoring in deeper habitats.
 - Human activities: What are the activity levels and what are the impacts?
 - Biodiversity: What are the best metrics for tracking biodiversity?
 - Global Climate Change (see box).
 - Marine debris: How much, where, and what are the impacts to sanctuary resources?
 - Noise and soundscape: What are the sources, levels, and potential impacts of ocean noise?
 - Contaminants and non-point source pollutants.