

## Special Feature:

# Monitoring California's Channel Islands



## About This Snapshot Report

This report highlights several monitoring projects being conducted by various agencies and organizations in marine ecosystems around the Channel Islands. Monitoring these islands complements the ten state-funded MPA baseline monitoring projects in the region to provide a more thorough understanding of South Coast marine environments.<sup>1</sup>

Snapshot Report Vol 7



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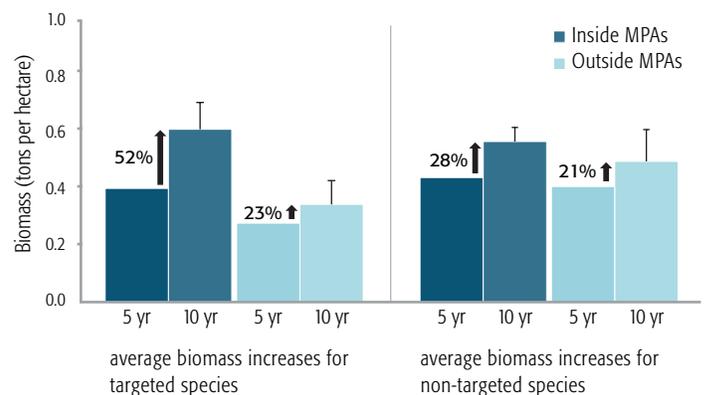
## A Special Place

Located off the highly populated southern California coast, the eight Channel Islands remain surprisingly wild and remote. In addition to their physical separation from the mainland, state marine protected areas (MPAs), federal MPAs, a National Park, and a National Marine Sanctuary on and around the Channel Islands help to make them “refugia” for wildlife, including seabirds, marine mammals, and ecologically and commercially important fishes and invertebrates. Reducing the impacts of human activity, like water pollution, also allows the islands’ ecosystems to be more resilient to changing ocean conditions—with fewer stressors, species may be better able to cope with or adapt to change.

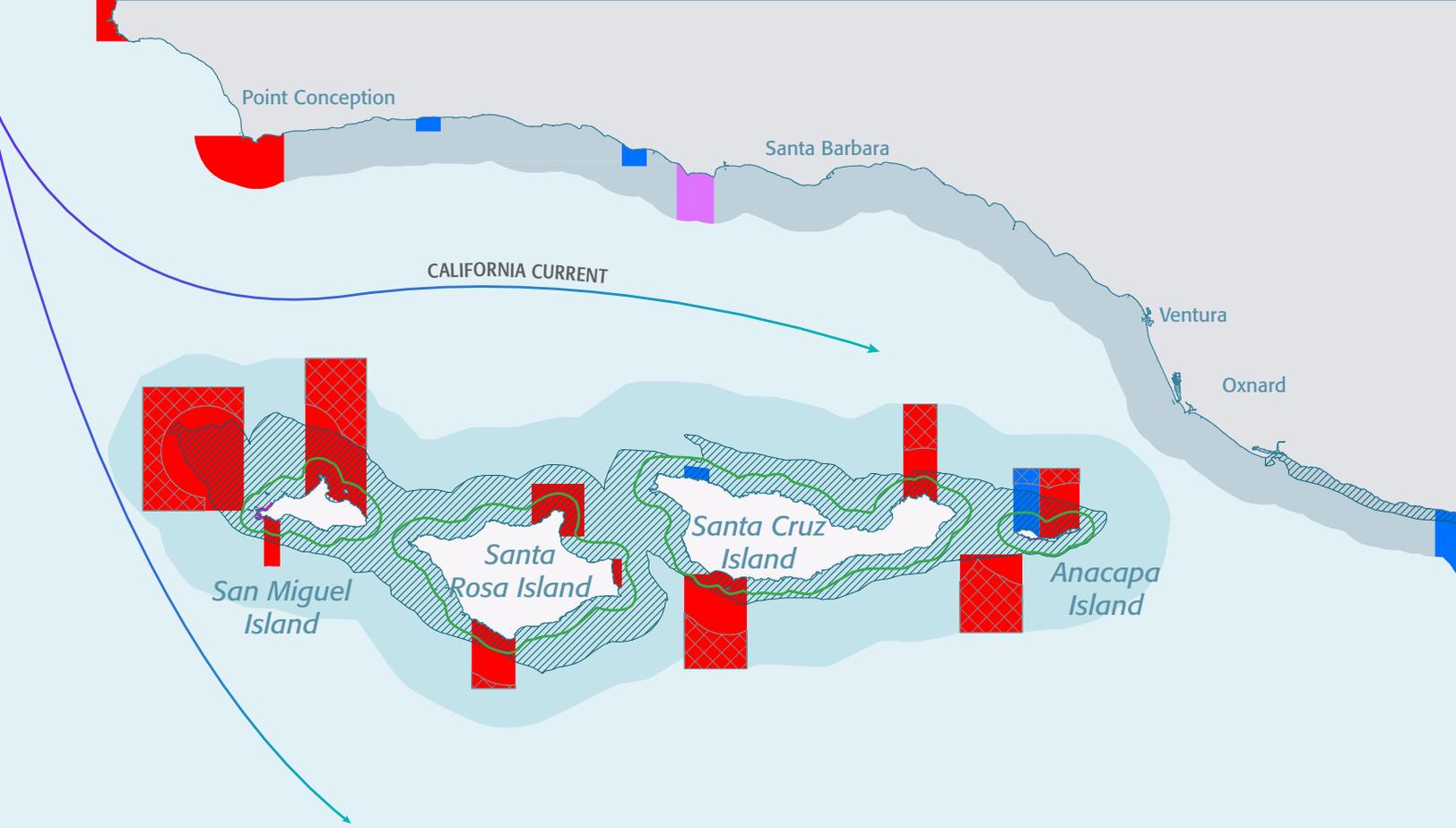
Despite their relative proximity to one another, the islands experience a range of physical conditions that mirror much of the California coast. The islands at the northwestern end of the chain, San Miguel and Santa Rosa, are heavily influenced by the cold waters of the California Current, while the southern islands, such as San Clemente and Santa Catalina, are bathed in the relatively warm waters of the California Countercurrent. Islands in the middle of the chain, such as Santa Cruz and Anacapa, experience intermediate and highly variable conditions. These temperature gradients are reflected in the particular communities of fishes, invertebrates, and algae found throughout the islands. For example, rockfishes tend to be more diverse and abundant in the colder, northern islands, while Kelp Bass, which are associated with warmer water, tend to be more abundant at the southern islands. Further detail on community structure throughout the Channel Islands and the entire South Coast can be found in the Rocky Intertidal Snapshot and Kelp and Shallow Rock Snapshot.<sup>2</sup>

## Signs of Success

Long-term monitoring by the Partnership for Interdisciplinary Studies of Coastal Oceans (PISCO),<sup>3</sup> Reef Check California,<sup>4</sup> and Channel Islands National Park is being used to evaluate the impacts of MPAs on kelp and rocky reef ecosystems at the northern Channel Islands, which includes Anacapa, Santa Cruz, Santa Rosa, and San Miguel Islands. PISCO studies have found increased biomass of targeted and non-targeted species inside and outside of northern Channel Island MPAs since implementation in 2003, though response varied across the islands.<sup>5</sup> Long-term monitoring will allow us to continue to track these changes over time and gain an understanding of the underlying causes.

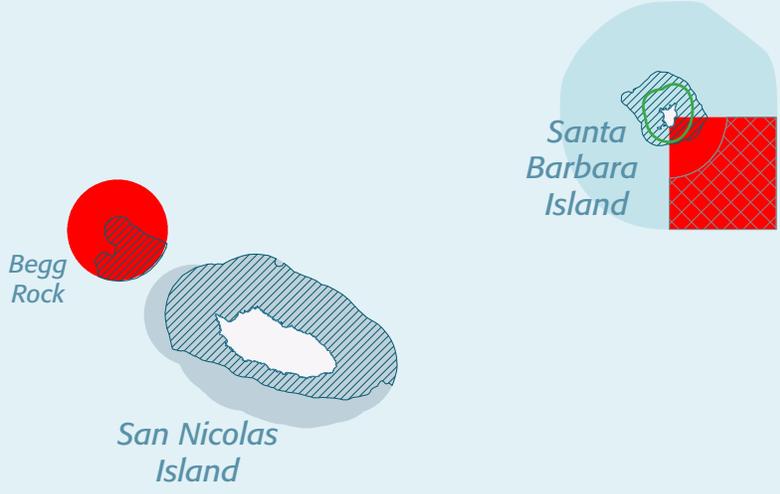


Average biomass increased inside and outside of MPAs, among both targeted (left) and non-targeted species (right), at northern Channel Islands 10 years after implementation. The greatest increases have been seen for targeted species inside MPAs. Source: PISCO.



LEGEND

-  State Marine Reserve (SMR)
-  Federal Marine Reserve (FMR)
-  State Marine Conservation Area (SMCA)
-  Federal Marine Conservation Area (FMCA)
-  State Marine Conservation Area (No-Take)
-  Special Closure
-  California State Waters
-  Channel Islands National Marine Sanctuary
-  Area of Special Biological Significance (ASBS)
-  Military Exclusion Zone
-  National Park



# Extensive Monitoring Grounded in Partnerships

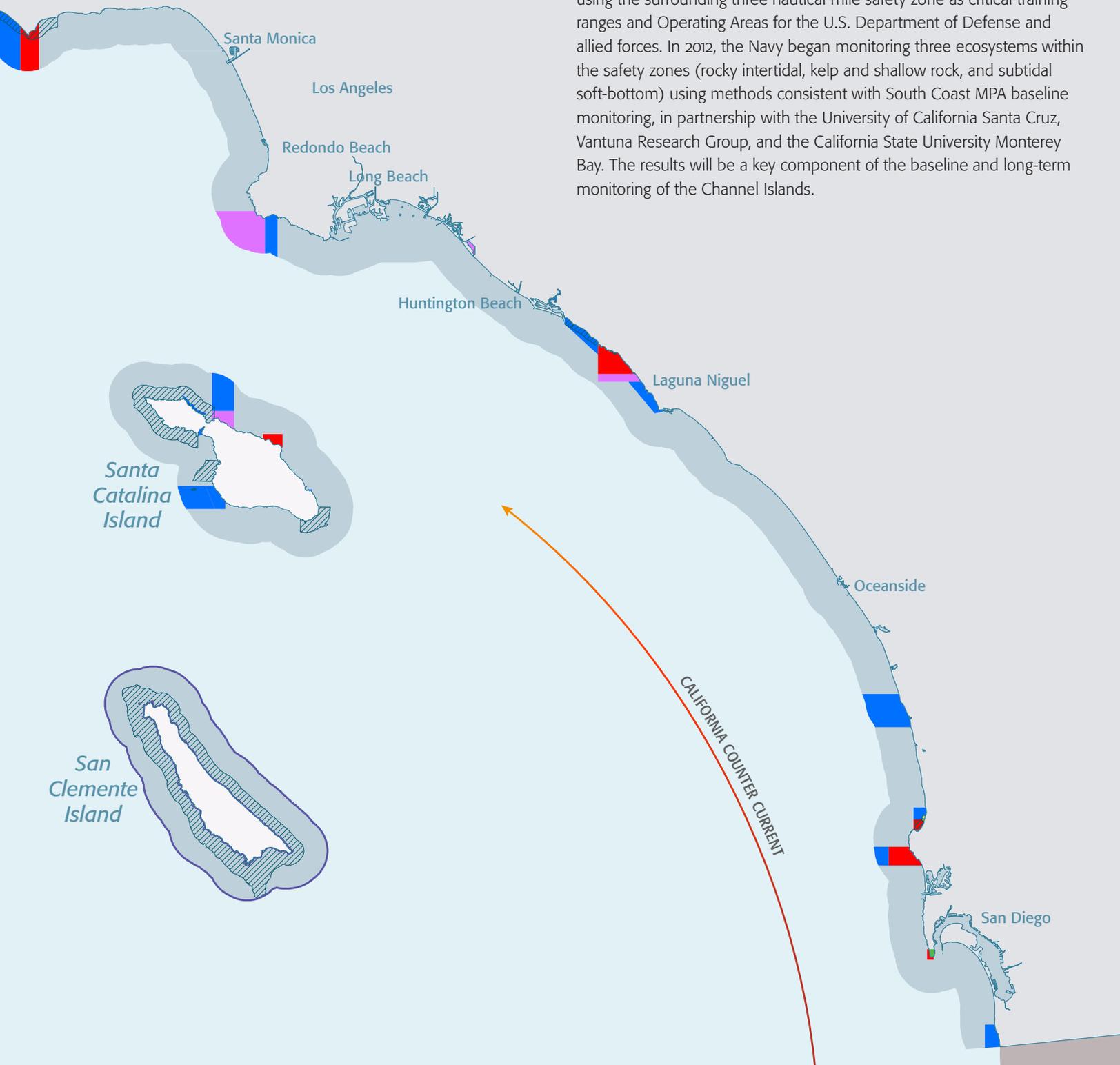
State and federal agencies responsible for the management of the Channel Islands are active participants in monitoring these marine ecosystems, in partnership with numerous universities and organizations.

**Channel Islands National Park (CINP)** includes the land and ocean environments out to one nautical mile around the NCI and Santa Barbara Island. Researchers at CINP have led a long-term ecological monitoring program in rocky intertidal and kelp forest ecosystems since 1982, and at sandy beach ecosystems on these islands since 1994. These data provide both an important baseline prior to the establishment of new, state MPAs, and insights on the impacts of protected areas on the ecology of these five Channel Islands.

The **California Department of Fish and Wildlife (CDFW)**<sup>6</sup> conducts abalone, sea urchin, and sea cucumber studies at the Channel Islands in partnership with CINP and PISCO, and finfish surveys with Reef Check California. These studies inform MPA and fisheries management.

The **Channel Islands National Marine Sanctuary (CINMS)** designated in 1980, encompasses federal waters around the NCI and Santa Barbara Island, out to six nautical miles offshore. Sanctuary staff work in partnership with CDFW, CINP, the U.S. Navy, PISCO, Multi-Agency Rocky Intertidal Network (MARINe), and others to support monitoring in federal and state protected waters around these islands. These collaborations often include sharing of staff expertise and operational support provided by research vessels.

The **United States Navy** owns and operates San Clemente Island, using the surrounding three nautical mile safety zone as critical training ranges and Operating Areas for the U.S. Department of Defense and allied forces. In 2012, the Navy began monitoring three ecosystems within the safety zones (rocky intertidal, kelp and shallow rock, and subtidal soft-bottom) using methods consistent with South Coast MPA baseline monitoring, in partnership with the University of California Santa Cruz, Vantuna Research Group, and the California State University Monterey Bay. The results will be a key component of the baseline and long-term monitoring of the Channel Islands.





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The **Multi-Agency Rocky Intertidal Network (MARINE)** is a partnership of agencies, universities, and private organizations who collaborate to study rocky shores along the U.S. West Coast, including the Channel Islands.<sup>7</sup> MARINE researchers monitor rocky shores across the Channel Islands and throughout the South Coast. For more than 30 years, they have conducted monitoring within the NCI, including as part of South Coast baseline monitoring.

The **Partnership for Interdisciplinary Studies of Coastal Oceans (PISCO)** is a long-term research and monitoring program designed to track changes in kelp forests, rocky shores, and coastal oceans along the entire U.S. West Coast. PISCO researchers have been monitoring kelp forests in and around the Santa Barbara Channel and the NCI since 1999. The resulting long-term data are being used to track the impacts of protected areas on the ecology of the region.

**Reef Check California** works with highly-trained volunteer divers to monitor shallow rocky reefs and kelp forests within and around the NCI and Santa Catalina MPAs since 2007, including as part of South Coast MPA baseline monitoring. In combination with its long-term monitoring data from other southern California sites, these data will be used to track the effects of MPAs in the region.

**Vantuna Research Group (VRG)** based at Occidental College, has monitored kelp forest, shallow rocky reef, and estuarine ecosystems in southern California, including the Channel Islands, since 1966.<sup>8</sup> The research program features the longest continual time series studies of rocky reefs in the world.

**MARE (Marine Applied Research and Exploration)** uses remotely operated vehicles to monitor mid-depth and deep ecosystems around the NCI, and Santa Barbara and Santa Catalina Islands.<sup>9</sup> Initial surveys were conducted in partnership with CDFW from 2004 to 2009, with return surveys conducted at ten of the historical sites in 2014 and 2015. MARE also convened an underwater researchers workshop to share information and track changes in the Channel Islands from scuba depths to deep water.

## About South Coast MPA Baseline Monitoring

California Ocean Science Trust, California Department of Fish and Wildlife (CDFW), California Ocean Protection Council (OPC), and California Sea Grant coordinated and collaborated in the implementation of baseline monitoring, which was funded by OPC. Results from this work will inform CDFW management recommendations to the California Fish and Game Commission from the first five years of MPA implementation in the region, anticipated in 2017. MPA monitoring results can also inform the management of fisheries, water quality, and climate change.

## Footnotes

1. To learn more about baseline monitoring, visit [oceanspaces.org/monitoring](http://oceanspaces.org/monitoring)
2. To view and download snapshot reports, visit [oceanspaces.org/scsotr/snapshot-reports](http://oceanspaces.org/scsotr/snapshot-reports)
3. Partnership for Interdisciplinary Study of Coastal Oceans: [oceanspaces.org/pisco](http://oceanspaces.org/pisco)
4. Reef Check California: [oceanspaces.org/reef-check](http://oceanspaces.org/reef-check)
5. Citation: Jennifer E. Caselle (Ed). 2015. A Decade of Protection: 10 years of change at the Channel Islands. PISCO. [goo.gl/00rjls](http://goo.gl/00rjls)
6. California Department of Fish and Wildlife: [wildlife.ca.gov](http://wildlife.ca.gov)
7. Multi Agency Rocky Intertidal Network: [oceanspaces.org/marine](http://oceanspaces.org/marine)
8. Vantuna Research Group: [oceanspaces.org/vantuna](http://oceanspaces.org/vantuna)
9. Marine Applied Research and Exploration: [oceanspaces.org/mare](http://oceanspaces.org/mare)