SCIENCE BELOW THE SURFACE

MONITORING THE EFFECTS OF

Marine Protected Areas

Forests of Giant Kelp (*Macrocystis pyrifera*) provide important food and habitat for marine species.

Marine Protected Areas (MPAs) are areas in the ocean where consumptive human activity is restricted to preserve the biodiversity of marine organisms and ecosystem function.

The Santa Barbara Channel contains a total of 18 MPAs, both on the coast of the mainland and in the Channel Islands. In this network of MPAs, recreational activities such as kayaking and diving is allowed, but fishing is restricted.

By providing a refuge for fish and invertebrates that are typically targeted for fishing, many species have grown larger and more abundant within MPAs.

A research diver swims along a transect line and records her observations on waterproof paper.

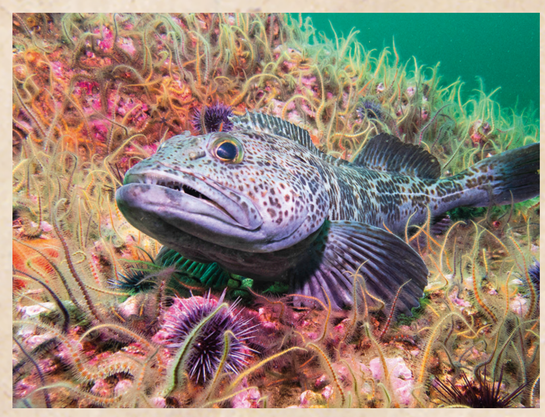
Scientists monitor the effectiveness of marine protected areas by counting and estimating the size of the marine species at the same sites each year.

These long-term studies allowed a team of scientists from University of California Santa Barbara to observe how the density and abundance of fish in the Channel Islands differs inside and outside of MPAs.

PHOTOS: KATIE (DAVIS) KOEHN

EXAMPLES OF SPECIES LOCALLY TARGETED FOR COMMERCIAL AND RECREATIONAL FISHING

California Sheephead
Semicossyphus pulcher



Lingcod
Ophiodon elongatus

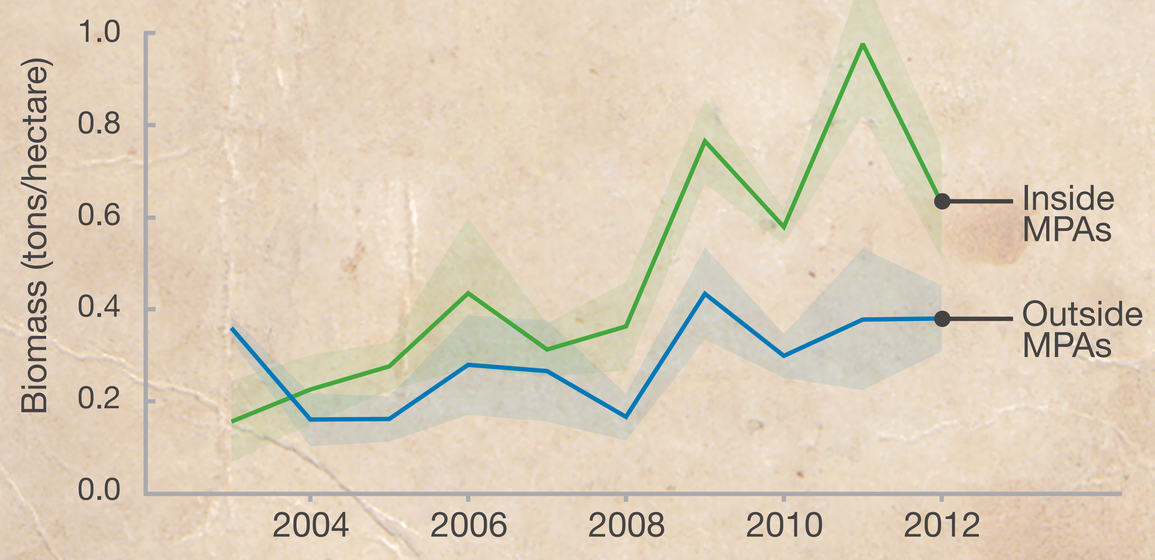
California Spiny Lobster
Panulirus interruptus

Kelp Rockfish
Sebastes atrovirens

COMPARISON OF FISH BIOMASS INSIDE AND OUTSIDE MPAS

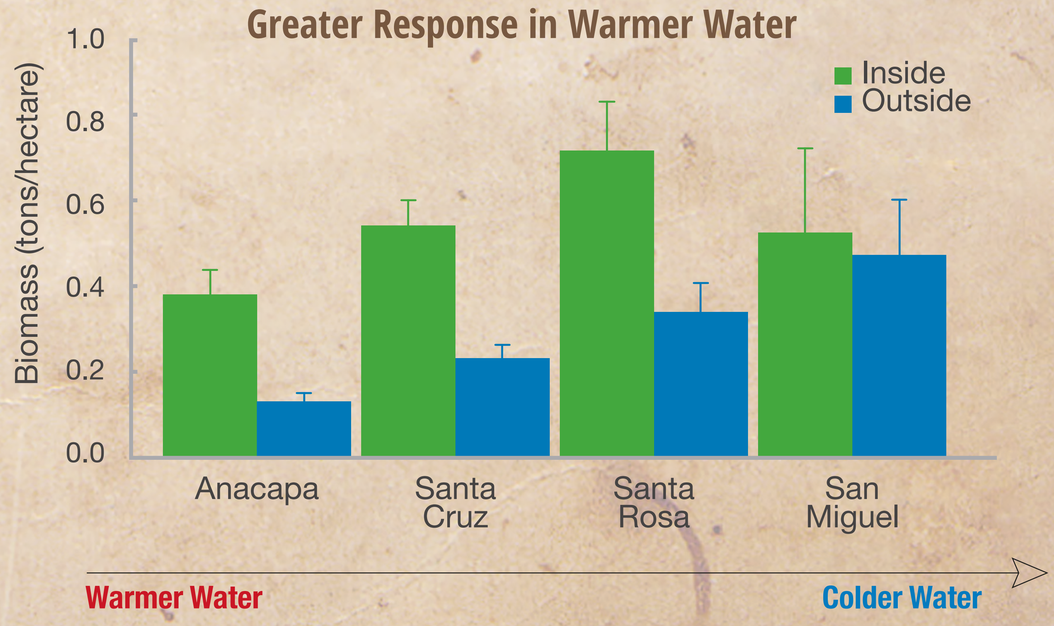
FIRST DECADE OF MONITORING IN THE CHANNEL ISLANDS

Biomass of Targeted Species



Fish populations increased 4 times faster inside of MPAs than outside of MPAs. Biomass increased outside of protected areas too – just not as quickly. Thus, the shift in fishing pressure did not deplete fish populations outside of MPAS.

Biomass of Targeted Species Shows Greater Response in Warmer Water



The overall fish biomass was higher inside of MPAs. This effect was observed at all four islands in the study.

(Caselle et al. 2015)