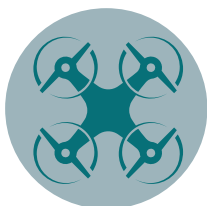


NOAA FISHERIES

Next generation technologies and techniques:



MULTI-FREQUENCY ACOUSTIC SYSTEMS



UNCREWED SYSTEMS



REMOTELY OPERATED CAMERAS



GENETICS AND GENOMICS

Southwest Surveys

The Southwest Fisheries Science Center conducts several large-scale surveys focused primarily on the California Current Large Marine Ecosystem. Extending from Canada to Mexico, this ecosystem supports valuable commercial, tribal, and recreational fisheries for species like salmon, anchovy, tuna, rockfish, and hake. It's also important for gray whales, sea turtles, sturgeon, abalone, and other protected species. The data we collect is critical to maintaining the health of this diverse marine ecosystem, as well as the industries and communities that rely on it.

Our surveys are designed from an ecosystem perspective to place observations of target species in a broader ecological and historical context. They incorporate industry partnerships and advances in sampling technologies. The widespread use of survey data in stock assessments, ecosystem status determinations, and climate impact studies reflects the value of long-term datasets.

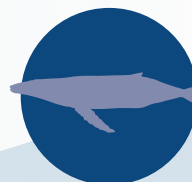
SURVEYS SUPPORT: NOAA Fisheries research surveys provide data critical to the stewardship of our nation's ocean resources and their habitat.



56,000 JOBS
FROM RECREATIONAL FISHING AND THE SEAFOOD INDUSTRY*



\$4.9 BILLION
IN SALES FROM RECREATIONAL FISHING AND THE SEAFOOD INDUSTRY*



PROTECTION OF ENDANGERED WHALES



Credit: Saildrone

*Fisheries Economics of the United States, 2019. Numbers are for California, Oregon, and Washington.

California Cooperative Oceanic Fisheries Investigations

First survey conducted: 1949

Frequency: Every spring, summer, fall, and winter

Species: More than 500 fish species, including rockfish and open ocean fish like sardines

What we do: We quantify species reproduction numbers and investigate how the young are dispersed by ocean currents. We do this by assessing egg and larval abundance in the water column using continuous monitoring devices and plankton tows.

Partners: Federal and state institutions

Data uses and benefits: We use the survey data to produce annual reviews of the health of the ecosystem and its ability to support fishing, whale watching, ocean tourism, and other marine enterprises worth a total of several billion dollars a year. One of CalCOFI's earlier contributions was the discovery that a 2-year warm anomaly in the 1950s was representative of a much larger ocean-wide phenomenon now known as the El Niño-Southern Oscillation cycle. CalCOFI surveys continue to provide important scientific insights on the impact of changing ocean conditions on marine life, which helps us identify actions to increase resilience.

Coastal Pelagic Species Surveys

First survey conducted: 2005

Frequency: Annually

Species: Forage species like northern anchovy, sardine, Pacific and jack mackerels, market squid, and krill. These species are sensitive to environmental changes, play an important role in the food web, and are a leading indicator for the health of the California Current ecosystem.

What we do: We collect information using state-of-the-art acoustic sensors and trawls deployed on NOAA survey

vessels, surface drones, and commercial purse seine vessels. This allows us to cover multiple habitats at the same time.

Partners: Instrument developers, autonomous platform operators, and the fishing industry

Data uses and benefits: These surveys support economically and culturally important fisheries. We use the data to set sustainable catch limits and understand how ecosystems are impacted by a changing ocean.

Marine Mammal and Turtle Surveys

First survey conducted: Mid-1970s

Species: More than 40 species of whales, dolphins, porpoises, seals, sea lions, and marine turtles

What we do: We conduct research on population distribution, abundance, and trends primarily in the eastern North Pacific. We work from NOAA survey vessels, shore-based stations, and planes using a diversity of state-of-the-art tools, including passive acoustic monitoring, uncrewed aerial systems, and eDNA.

Data uses and benefits: Our ship-based surveys pioneered methods of surveying marine mammal populations that are

now used throughout the world. The data provides a baseline for determining allowable bycatch rates for fishing operations, evaluating the effectiveness of endangered species recovery plans, investigating the causes of unusual mortality events, predicting areas of interactions with human activities, and estimating the prey demand and ecological impact of marine mammals.

Read more about science in the Southwest:
www.fisheries.noaa.gov/region/west-coast/southwest-science

