IOOS® INTEGRATED OCEAN OBSERVING SYSTEM

IOOS® in Action: California

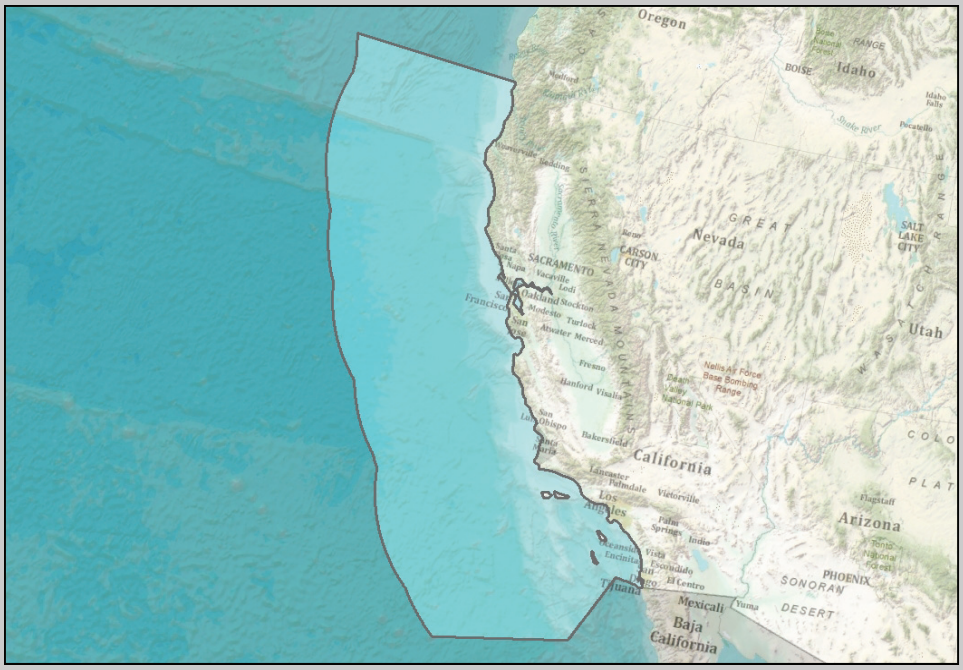
Improving Lives and Livelihoods in California

Overview:
Thousands of tools – from satellites above Earth to sensors below the water – continuously collect ocean and coastal data. The Integrated Ocean Observing System (IOOS) is expanding this network of data and making it easier to access and use.

Two IOOS regions address California's ocean and coastal data needs – the Central and Northern California Ocean Observing System (CeNCOOS) and the Southern California Coastal Ocean Observing System (SCCOOS).

As uses of our nation's oceans and coastal waters increase and become more diverse, the need for accurate and timely ocean information intensifies.

With 850 miles of coastline, California's beaches are integral to the economy, environment, and public health. Ocean observing systems provide the scientific data and information needed to better understand the changing conditions of the ocean and coast. With physical, chemical, and biological data, California's ocean observing systems inform both rapid decision-making and long-term assessment of the coastal ocean.



CeNCOOS spans the coastal ocean from the California/Oregon border south to Point Conception, while SCCOOS provides coverage from Point Conception to Mexico's border.

Oil Spills and Coastal Pollution:
Tracking hazardous spills and pollution are essential to managing and protecting coastal waters. California's ocean observing systems operate a statewide network of high-frequency radar stations that record the speed and direction of surface currents in near real time to inform emergency responders, water quality, and human health concerns.

Scientists incorporate surface currents into NOAA's official model for spill response and enable responders to predict the path of a spill. After rainfall, contaminated runoff from the Tijuana River can flow along the coast to nearby beaches. Water quality managers, lifeguards, and surfers use trajectory maps generated hourly by high-frequency radar, to predict when and where outflow from the Tijuana River will affect local beaches.

"The ocean observing system is a great tool to estimate where exactly the Tijuana River plume is impacting beach water quality," Benjamin McCue, WiLDCOAST.

Harmful Algal Blooms:
Have you ever wondered where Alfred Hitchcock got his inspiration for "The Birds"? Domoic acid poisoning from a harmful algal bloom may have caused hundreds of birds to get sick and die in Northern California, only a few miles from Hitchcock's home, in the summer of 1961. Harmful algal

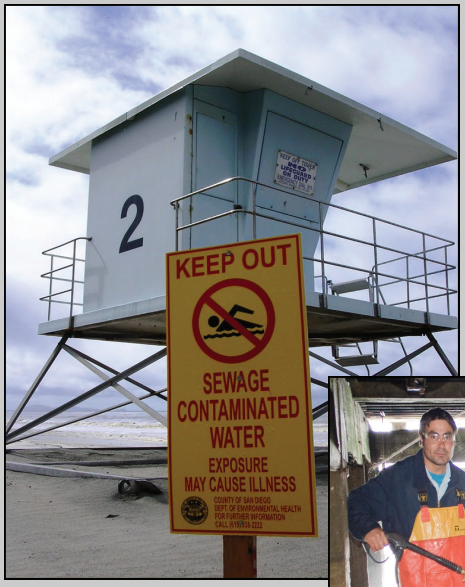
blooms can impact shellfish, seabirds, marine mammals, and human health. CeNCOOS and SCCOOS monitor harmful blooms at pier sites along the coastline. Weekly water samples measure domoic acid, water temperature, salinity, chlorophyll and abundance of algal species. Abalone farmers use this information on ocean conditions and algal blooms to protect their shellfish stocks. The ocean observing systems are, “a very important component of the security for our business operations,” stated Art Seavey of the Monterey Abalone Company.

Safe, Better Marine Operations: Timely and accurate information about ocean conditions is critical to the safe passage of ships and efficient harbor navigation.

The U.S. Coast Guard can now access surface currents measured by California’s high frequency radar network and use data for search and rescue applications through the agency’s Environmental Data Server. San Francisco Bar Pilots also need real-time information such as waves, winds and currents, to safely navigate large vessels through the bay and into port.

The San Francisco Bar buoy, "allows for safer transits, safer pilot boat operations, and efficiency for the shippers that call at San Francisco Bay," Captain Bill Greig.

Tsunami Detection: After Japan’s March 2011 tsunami, IOOS data supported the issuance of warnings to safeguard lives and property. CeNCOOS and SCCOOS experienced web traffic hikes as they captured the tsunami passage in real time from the deep ocean and near shore, displayed inflows and outflows via video cameras mounted on piers, and informed media and stakeholders.



LEFT: Both CeNCOOS and SCCOOS monitor water quality and other data—such as currents, waves, and weather—and issue information and warnings to decision makers, media, and the public. The information supports maritime safety and security, prevents business losses, and aids port operations.

Ocean observing data are used in models to improve search and rescue operations, spill response, and severe weather and event predictions, as well as to optimize shipping routes and plan civil defense response.

RIGHT: Abalone farmers rely on data provided by California’s ocean observing systems—including domoic acid, water temperature, salinity, chlorophyll and abundance of algal species—to protect shellfish stocks from harmful algal blooms.

Beach Erosion and Inundation: Coastal erosion and inundation can damage homes, cause highway closures and disrupt transportation.

With rising sea levels, storm surge, and El Niño winters, it is crucial that scientists develop a West Coast inundation model for future safety and protection of coastal communities.

The goal of the SCCOOS Coastal Hazards Project at Cardiff State Beach is to develop a field-validated, site-specific model for inundation and flooding.

The project included installation of ten buried pressure sensors to measure water levels along with surveys of beach sand levels.

Data will inform model validation and feed into real-time displays of wave and tidal inundation for the safety and protection of coastal communities.

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