

IOOS and U.S. West Coast Water Quality

What does IOOS do?

IOOS (Integrated Ocean Observing System) is a **multidisciplinary** system designed to provide weather, climate, ocean, and coastal data in the formats, rates, and scales required for decision-making, based initially on the **integration** of existing private, federal, state, and local systems. Consisting of three major subsystems (see figure at right), IOOS will constantly evolve according to user needs. IOOS will focus initially on a series of high priorities. For example, IOOS information on surface currents is valuable to spill response, healthy beach assessment, search and rescue, and infrastructure risk management.

Currently, numerous ocean observation data acquisition systems useful to the West Coast Governors' Agreement on Ocean Health (WCGA) are maintained by scores of federal, state, and non-governmental agencies and organizations (see Table 1 for a few examples). IOOS is enabling integration of these useful but disparate or isolated data sources into regional systems, giving users ready access to all ocean-related data gathered by all possible sources. In addition, IOOS will allow any compilation of data specified by the user to be manipulated using myriad existing forecasting models, thereby turning raw numbers into actionable information relevant to the user's specific concerns. Finally, IOOS is seeking new research and enhancements to add to its already-extensive catalog of products. In this way, IOOS groups can quickly offer flexible, adaptable systems capable of keeping up with new developments while maintaining the reliable delivery of data, analyses, and forecasting results.

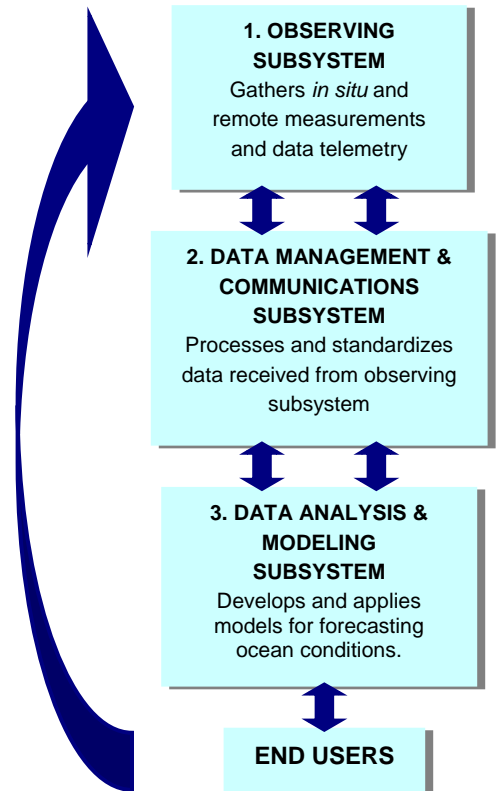


Table 1. Examples of already-existing data collection systems relevant to WCGA

Existing Data Source	Data Source Description	Representative Outcomes
Monterey Accelerated Research System (MARS) (http://www.mbari.org/mars)	32 miles of fiber-optic cable laid along the sea floor of Monterey Bay (CA). Provides researchers 24-hour access to instruments and experiments in the deep sea.	Extended research studies and ability to retrieve real-time data, development of new deep-sea monitoring tools and technologies. Education and outreach tool via the internet.
Land/Ocean Biogeochemical Observatory in Elkhorn Slough (LOBO)	Project in Elkhorn Slough, located on Monterey Bay, CA to serve as a pilot for how a real-time <i>in situ</i> nutrient sensor network can be developed and collect data.	Study of chemical fluxes into, within, and out of the slough. Potential to be used in other estuarine environments.

How Can IOOS Help with Water Quality?

The priority issues of WCGA most closely tied to water quality are “Ensuring clean coastal waters and beaches” and “Protecting and restoring healthy ocean and coastal habitats.” IOOS can achieve these WCGA priority issues related to water quality by providing an accumulation of valued products and services, developed through a network of Regional Associations (RAs).

One example of value derived from IOOS RAs is shown in the **Coastal Oceans Currents Monitoring Program (COCMP)**. This Program is a collaboration of many institutions and agencies whose focus is the integrated monitoring of currents in the coastal ocean. The Coastal Conservancy manages the COCMP program with observations available through two **IOOS RAs: the Southern California Ocean Observing System (SCCOOS) and Northern and Central California Ocean Observing System (CeNCOOS)**. The focus of the program is to make data available to agencies that are responsible for managing coastal water quality. A specific example of how the **coordination of IOOS RAs** assisted the coastal management community occurred in Santa Monica Bay in 2006:

- The City of Los Angeles needed to inspect its primary water treatment discharge pipe, since this pipe had not been internally inspected during its entire 50 years of use. The City was forced to divert its sewage to an alternate, shorter discharge pipe to allow diver inspection of their primary pipe.
- About 875 million gallons of treated sewage was discharged through the alternate pipe during the inspection period, which lasted from November 28-30, 2006.
- A monitoring program was established as this discharge was taking place. SCCOOS was able to **respond rapidly** and provide environmental data support including maps of surface currents, plume trajectories of the discharge, drifter data support, ocean color satellite remote sensing data, meteorological data, and surfzone wave height and current forecasts.
- SCCOOS provided **continuous real time data** to support this immediate and real world management issue, and reports were provided to the City of Los Angeles, the Regional Board, the county health officers, and NGO community.¹

Another example of the coordination of IOOS RAs addressing WCGA priority issues relating to water quality is the California State University (CSU) Center for Integrative Coastal Observation, Research and Education (CICORE). The CICORE project is networked applied coastal research center made up of several branches distributed throughout California. The project's mission is to provide information to the scientific community, resource managers, policy makers, and the public as a means of helping to ensure the **future sustainable use of the California coast**. Established in 2002 by NOAA, CICORE takes advantage of the wide distribution of CSU campuses along the California coastline to study a variety of ecosystems including estuaries, wetlands, and other critical coastal habitats. CICORE is part of both **CeNCOOS and SCCOOS**. CICORE applies high resolution bathymetry, *in-situ* monitoring, and optical remote sensing to provide solutions to coastal issues many communities are faced with. All of the above mentioned technologies can be used to identify ecological areas that need protection, to track changes in the environment due to any number of reasons, and to understand why these changes occur. CICORE is committed to making their data **available for integration** online at www.cicore.org.

What Can the West Coast States Do?

The value added from the integrating and sustaining power of IOOS can be realized with regional association **participation**. By coordinating participation between WCGA and RAs, such as in the ongoing series of WCGA public hearings, synergies will be achieved (see www.ocean.us/regional_associations). RAs are critical for engaging private and public user groups to identify regional data and information needs. Additionally, RAs can be high-value entry points for a user to get involved with specific IOOS pilot projects (many of which are happening right now) through which users help improve and refine IOOS. Pilot projects and RAs can facilitate data sharing, the cornerstone of IOOS, between previously unconnected parties. Even by sharing small amounts of data, users can reap significant benefits through invaluable forecasting results.

¹ SCCOOS Coastal Ocean Currents Monitoring Program 2006 Annual Report, Accessed April 18, 2007
http://www.sccoos.org/docs/COCMP_AnnualReport_2006_dra.pdf