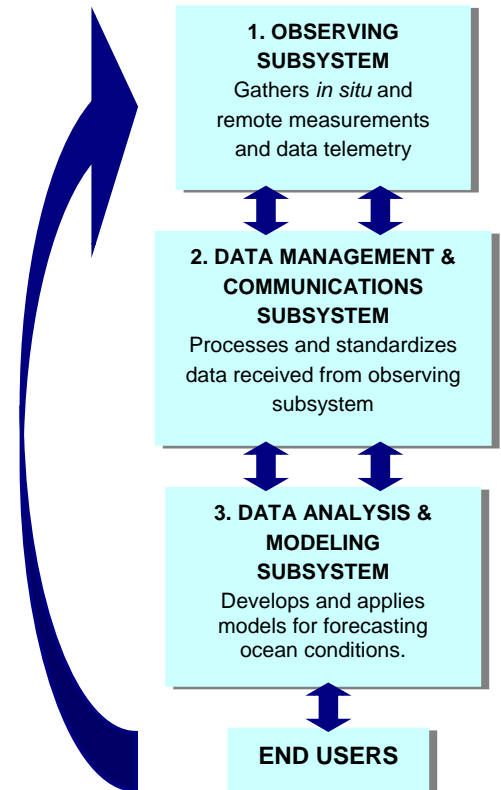


# IOOS and U.S. West Coast Fisheries

## 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 system 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
Bodega Ocean Observing Node (BOON)	A coastal ocean observing system centered at Bodega Bay, CA that is managed by Bodega Marine Lab (BML). Includes meteorological sensors, high frequency (HF) radar and an oceanographic mooring offshore of BML. BOON is linked to Central and Northern California Ocean Observing System.	Data from BOON are being used to study salmon populations between Bodega Bay and Salt Point. Researchers at BML are using surface current data measured with high-frequency radar to study how currents affect movements of young fish.
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 Fisheries?

The priority issues of WCGA most closely tied to fisheries are “Ensuring clean coastal waters and beaches” and “Protecting and restoring healthy ocean and coastal habitats.” Of specific concern for commercial fisheries are the adverse impacts of Harmful Algal Blooms (HABs). Nationwide studies

conservatively estimate average annual losses of nearly \$50M to 475M due to the impact of HABs on commercial fisheries, public health, recreation and tourism, and monitoring.<sup>1,2</sup> IOOS can help achieve the WCGA priority issues related to fisheries by providing an accumulation of valued products and services, developed through a network of Regional Associations (RAs). The following are examples of IOOS support for healthy and sustained operation of fisheries:

- **Reconciling Coastal Topography with VDatum.** IOOS groups are collaborating to address vertical datum (VDatum) referencing, which is of utmost importance in order to allow the range of hydrologic and geomorphic observations to be fully interoperable. Among other benefits, the VDatum service will enable reliable **monitoring of shellfish habitats**. NOAA and the USGS have numerous VDatum projects underway (including in Puget Sound and northern, central and southern CA) to help transform past coastal elevation and bathymetry surveys into a single coverage with common units.
- **Coastal Storms Program (CSP).** Awareness of near-shore conditions and navigation hazards is crucial to mariners and fishermen. Likewise, awareness of the sources of contaminated storm runoff and its impacts on commercial species, such as salmon, is important to fishermen. To respond to this need and other needs related to impacts of coastal storms, NOAA began the Coastal Storms Program (CSP) Pacific Northwest pilot in 2003. The CSP develops products that will provide better data and improved forecast models to address storm related issues that are important to the community. The tools included in this pilot include the Lower Columbia River Circulation Model, improved oceanographic and meteorological observations, improved prediction of coastal waves, ecological assessment of storm impacts, and an on-line coastal inundation tool. IOOS RAs provide information on real-time conditions that are critical for all of these tools.
- **Oregon Coastal Ocean Observing System (OrCOOS).** The Oregon Coastal Ocean Observing System (OrCOOS) was recently established to support the efforts of developing the IOOS program. OrCOOS is establishing an observing system that will contribute to the preservation of Oregon's coastal ocean as well as enhance its safe and sustained use. OrCOOS is focused on the fishing community and port liaisons as its primary stakeholders. These stakeholders are important to the economic base of the West Coast region. Systems like these can enhance safe and efficient commercial navigation. OrCOOS is committed to collaborating with its stakeholders and partners to expand on existing ocean observing systems and determine useful ocean products for the future.

## **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](http://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.

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<sup>1</sup> Anderson, D.M., Kaoru, Y., and A. White. 2000. Estimated Annual Economic Impacts from Harmful Algal Blooms (HABs) in the United States. WHOI 2000 11. Technical Report.

<sup>2</sup> Hoagland, P. and S. Scatasta. 2006. The economic effects of harmful Algal blooms. *In* E. Graneli and J. Turner, eds., *Ecology of Harmful Algae*. Ecology Studies Series. Dordrecht, The Netherlands: Springer-Verlag, Chap. 29.