

How Integrated Ocean Observations Matter for Mariners



submitted by
Jennie Lyons
U.S. IOOS Program
Communications
Specialist

You use charts to navigate. You check the weather forecast to know when conditions are safe.

about the stage of the tide, or obtain sea surface temperature before heading out on the water or into port. No matter what sector of the maritime industry you are in, you rely on ocean and coastal data and information.

The U.S. Integrated Ocean Observing System (IOOS®) is expanding the amount of ocean observing data available in our nation's waters, testing and making new technologies operational, creating standards and protocols so different types of data are compatible, and then turning all that data into useful tools and products that we as a maritime community need every day.

For starters, ocean and coastal data are turned into the tools and products that are critical for the safe passage of vessels and efficient harbor navigation for port managers and the maritime community. For example, IOOS paired currents data collected by radar systems with existing wave data to create a user-friendly website providing vessels with up-to-date sea conditions as they approach the Port of Long Beach, California. This information can reduce the risk of accidents in high-traffic areas. Knowing the latest sea conditions will become more important as climate change increases the number and severity of coastal storms and as

You may visit a website to find out what ocean currents are doing, learn

larger ships with deeper drafts approach ports.

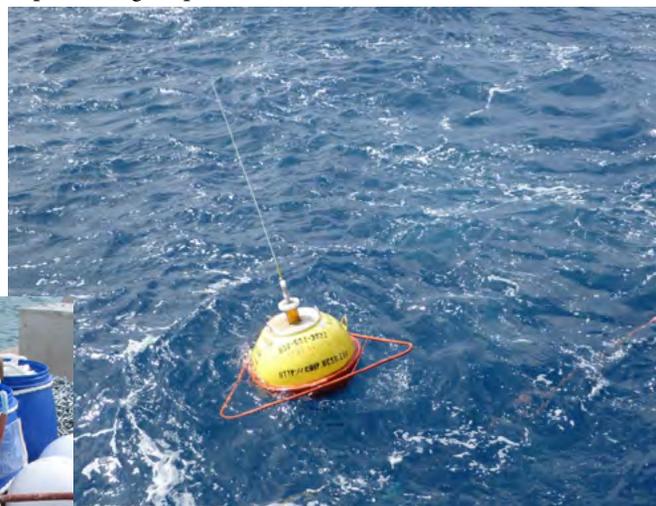
Another example comes out of Hawai'i, where IOOS data delivered from a buoy located outside Kaunapali Harbor, the main harbor of Lāna'i, is saving mariners time and money. The Kaunapali Harbor is the most exposed harbor in the State of Hawai'i. The Lanai Oil Company authorized fuel barges to enter the harbor to discharge 24 hours prior to arrival (Young Brothers, Limited now owns the delivery portion of the company). Knowing expected surge con-



ditions in the harbor for the barge's arrival is critical. In years past, 2–3 fully-laden barges per year returned to Honolulu because ocean conditions were too rough for the barge to safely enter the Harbor to discharge. Each time a full barge returned to Honolulu, it cost about \$22,000, a large expense to the small fuel

operator and the people of Lāna'i.

In response, the Pacific Islands Ocean Observing System (PacIOOS, an IOOS region) and the University of Hawai'i deployed a wave buoy just outside the harbor in 2007. Since the deployment, barge operators know ahead of time



PHOTOS: COURTESY THE PACIFIC ISLANDS OCEAN OBSERVING SYSTEM

PacIOOS wave buoy pre and post deployment off Lāna'i Island in Hawai'i.

when they can safely make the trip and no barges have returned without making the drop-off. In addition to saving the barge companies money and time, there is the benefit of increased safety and efficiency and reduced threats of damage to the barge and risk of oil spill.

IOOS data is also serving mariners in the Arctic. One good example is a new weather sensor on Portland Island. The Marine Exchange of Alaska recently installed the sensor in support of an

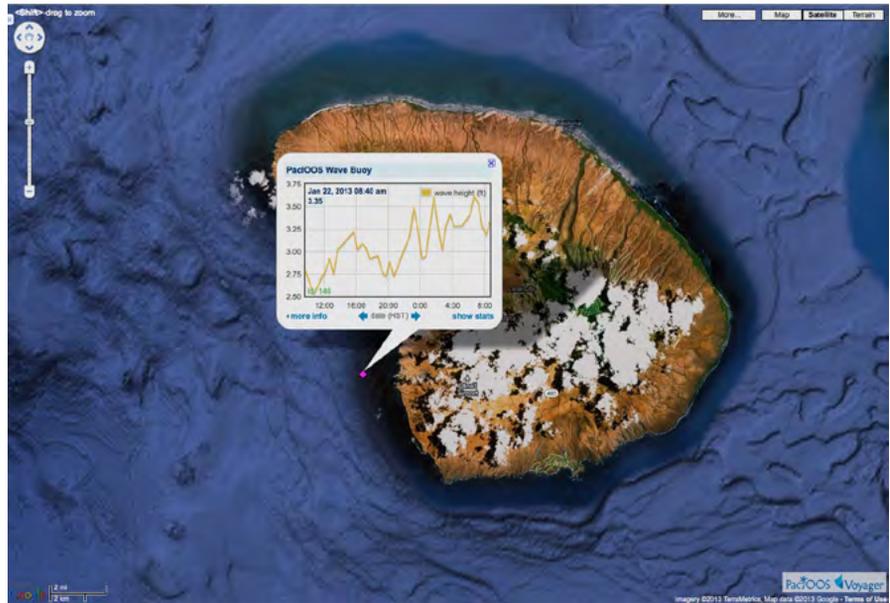


Alaska Ocean Observing System (an IOOS region) initiative to expand weather sensors and enhance the dissemination of weather data to mariners using the Alaska Automatic Identification System. The new weather station, located in the vicinity of Juneau, is the fourth such weather station installed in support of the initiative. The others are located at Homer, Mary Island, and Marmion Island. The weather data feeds to the National Weather Service network. Mariners can access the data to decide when conditions are safe to head out on the water.

The U.S. IOOS is a coordinated national, international, regional and local network of observations, modeling, data management and communications. IOOS may not be a word in your everyday vocabulary. But we are providing the knowledge society needs to protect life and property, sustain a growing economy, safeguard ecosystems, and advance quality of life for all people.

The range of ocean data products has dramatically increased and they are available through informative portals customized to meet user needs, such as those from the IOOS Regions. These portals provide access to thousands of coastal and ocean data sources and regularly experience up to tenfold increases in site visits during extreme events, such as Hurricane Sandy, demonstrating they are now trusted sources of ocean, coastal, and Great Lakes information.

The Gulf of Mexico Coastal Ocean Observing System (an IOOS region), for example, recently repackaged real-time data into a website that includes seven-day oceanographic and meteorological conditions and forecasts. The product concept emerged during stakeholder workshops targeting boating and fishing communities. Incorporating information from GCOOS data providers and several NOAA offices, the suite of information offered includes near real-time weather radar, satellite cloud coverage, sea surface and air temperature, wind speed and direction, surface current speed and direction, and water depth.



PACIOOS wave buoy data.

Users can select map layers to show nautical charts, marine hazard warnings, and habitat maps such as Essential Fish Habitat and Marine Protected Areas. The site addresses a request from the community to provide this information in one place, helping users plan safe, productive, and efficient voyages.

Another example comes from the Central and Northern California Ocean Observing System (an IOOS region), where scientists added more than a dozen upgrades to a mobile data portal last year. Changes include locations and links to real-time data for 32 high-frequency radar stations that measure ocean surface currents from the shoreline, four new National Weather Service wind stations, and a link to the data portal's mobile iPhone and Android apps. Visitors can obtain regularly updating views of the coast from six mapped webcams, utilize a new graphing system with quicker data plots and depth measurements, and differentiate among real-time (within 24 hours), inactive, and non-real-time data. Users can also apply two new map filter drop-down menus or a new option to display the name, measurements, and organization responsible for an asset. The portal provides easy access to information data users need to

make decisions to improve safety, economic performance, and environmental protections.

Before, during, and after Hurricane Sandy, U.S. IOOS partners — including NOAA's National Data Buoy Center, U.S. Army Corps of Engineers, NASA, and the IOOS Regional Associations — provided vital information to help coastal authorities prepare for, mitigate, and respond to storm tides and coastal flooding. During the storm, IOOS sensors recorded near real-time information by both land and sea, monitoring the Hurricane to deliver the latest information on surface conditions via a new website.

No matter what part of the maritime industry you are in, you rely on the ocean and coastal data collected from our nation's waters for safe navigation and to inform your business operations. IOOS is working to collect more information to develop additional tools and products specifically geared towards your needs. Help us make IOOS work for you by getting in touch with your local IOOS region and getting involved. Find out more on our website at www.ioos.gov. ☆