

IOOS® in Action: The U.S. Pacific Islands

Improving Lives and Livelihoods in the U.S. Pacific Islands

Overview:

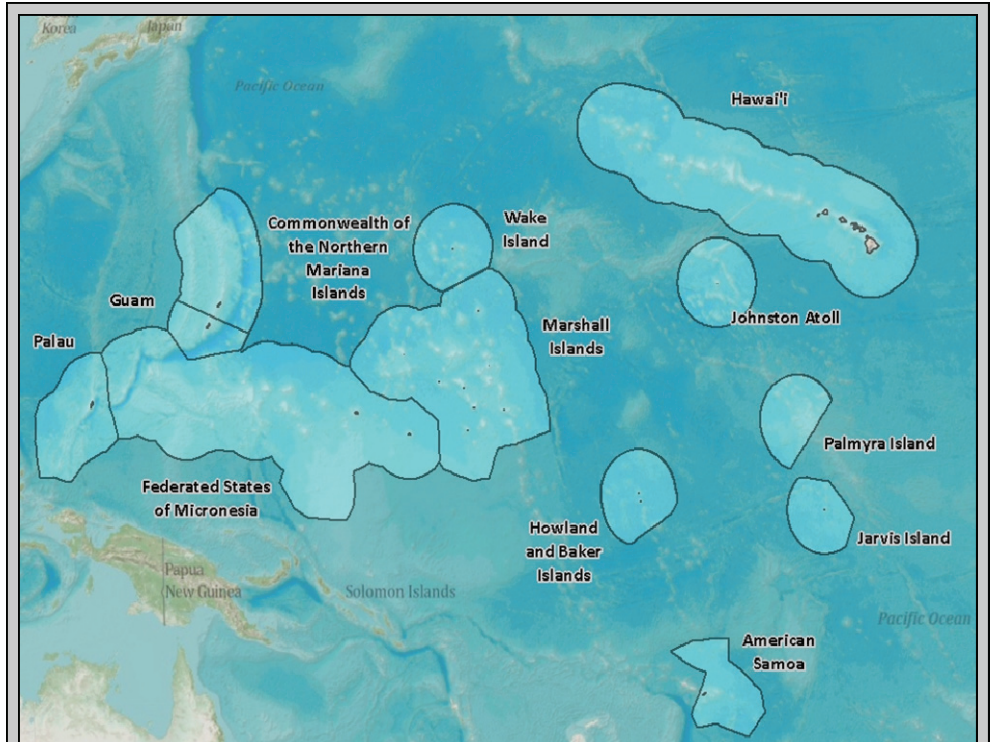
Thousands of tools – from satellites above Earth to sensors below the water – continuously collect ocean and coastal data. The Integrated Ocean Observing System (IOOS) is expanding this network of data and making it easier to access and use.

The Pacific Islands Ocean Observing System (PacIOOS) addresses ocean data needs in Hawaii, Guam, American Samoa, the Northern Mariana Islands, Micronesia, Palau, and the Marshall Islands.

This partnership of data providers and users enhances ocean observations. Regional partners also develop, disseminate, and apply ocean data and information products designed to address the needs of people who call the Pacific Islands home. System information focuses on:

- Coastal hazards resilience
- Maritime safety and security
- Coastal water quality
- Ocean planning and management, and
- Education and outreach.

PacIOOS is expanding and integrating observations and forecasts, starting in Oahu, Hawaii.



The Pacific Islands region includes a state (Hawaii), territories (Guam and American Samoa), a commonwealth (Northern Mariana Islands), and freely associated island nations (Federated States of Micronesia, Palau, and Marshall Islands).

Coastal Hazards Resilience: Pacific islands are vulnerable to hazards including sea level rise, coastal erosion, and high wave events - such as tsunami and storm surge. These events pose an imminent threat to lives, property, and economic well-being.

PacIOOS provides high water level and flooding predictions by developing maps of coastline change, identifying vulnerable areas, and providing beach condition forecasts. The region is also developing tools to improve predictions of hazardous events, thus creating a better prepared and more resilient coastal community.

For example, IOOS members in the region and the University of Hawaii School of Ocean and Earth Science and Technology worked with state, county and local partners to develop a beach hazard rating system and information website for the State of Hawaii.

Scientists use wave predictions and real-time wind observations from the National Weather Service and lifeguards to update hazard ratings three times a day. Divers, swimmers, paddlers, and others use this information to decide when the water is safe. Since its launch in May 2007, about 5,000-10,000 users visit the site each month.

Maritime Safety and Security:

Government, industry, and recreational users all require reliable real-time information on harbor and ocean conditions – such as currents, waves, and weather. IOOS members rely on current meters, shore-based radar systems, wave buoys, sea level gauges, and underwater vehicles to collect these data. Scientists use this information 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.

One example is a regional IOOS effort with the University of Hawaii. The partners operate and maintain four wave buoys around the Hawaiian Islands. IOOS data delivered from one wave buoy located outside the main harbor of Lanai, Hawaii - Kaunapali Harbor – significantly improved oil transport operations to the island.

Prior to the buoy’s placement, barge companies returned 2-3 barges a year to Honolulu still full of fuel because ocean conditions in the harbor were too rough to safely discharge. This cost companies about \$22,000 each time. Since the buoy deployment in 2007, barge companies know ahead of time when they can safely make the drop off and have not had to return a single barge. In addition to cost savings, the information improves crew safety and reduces threats of barge damage or oil spills.

Coastal Water Quality:

Though Hawaii’s residents and visitors enjoy excellent year-round water quality, various events can still cause negative impacts. One of the main water concerns on Oahu’s south shore is pollution. Large rain storms or sewage spills, for example, can carry land-based

Beach Hazard Forecasts
www.hawaii.gov/hawaiiemergency

North Shore
Wind: From the Northeast at 5 MPH
SURF ALONG NORTH FACING SHORES WILL BE 2 TO 3 FEET THROUGH WEDNESDAY

West Shore
Wind: From the Northeast at 5 MPH
SURF ALONG WEST FACING SHORES WILL BE 2 TO 3 FEET THROUGH WEDNESDAY

South Shore
Wind: From the Northeast at 5 MPH
SURF ALONG SOUTH FACING SHORES WILL BE 4 TO 7 FEET THROUGH WEDNESDAY
TO HEIGHTS OF 3 FEET THROUGH WEDNESDAY

Beach Safety:
The Beach Safety Website (left) displays map-based visualizations of beach and offshore hazard warnings for the Hawaiian Islands. Oahu is shown here. Credit: www.pacioos.org

Water Quality: In partnership with NOAA’s Pacific Marine Environmental Laboratory, PacIOOS maintains and operates this water quality buoy (right). The buoy has sensors that provide high resolution time-series measurements of atmospheric CO₂ and surface water CO₂ as well as surface water oxygen, temperature, salinity, chlorophyll, turbidity, pH, and nitrate. Credit: R. David Beales, University of Hawaii Creative Services

pollutants to sea. Regional IOOS members use a variety of chemical and biological sensors, underwater vehicles, and nutrient samples to monitor near-shore water quality. Scientists supply real-time observations that improve our understanding of ocean acidification, more effectively protect healthy coastal marine ecosystems, and enhance understanding of and response to marine events that impact human health.

Ocean Planning & Management:

IOOS members in the region are integrating information for effective coastal and marine spatial planning – a science-based process that allows society to determine sustainable uses of our marine environments.

To do this, IOOS is measuring and modeling parameters necessary for development of climate change mitigation and adaptation plans. Researchers are also collecting and serving necessary information

for renewable energy development.

Specifically, the IOOS region developed an interactive mapping program that allows users to view various marine spatial data layers.

For More Information:

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