

Developing the Pacific Islands Ocean Observing System (PacIOOS)

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LONG-TERM GOALS

The primary goal of our NOPP-supported work is to continue the development of an operational ocean monitoring and forecasting system that provides integrated, customized, and timely products that enable an ocean-literate and well-informed public and policy makers. PacIOOS has focused initial development on water quality sensing, ocean-state and forecasting, the provision of marine ecosystem information, prediction of coastal hazards, and the development of integrated data visualization capabilities to inform marine spatial planning, operations, commerce, and recreation. Through this NOPP support, PacIOOS will enhance development of observing and product suites in each of the aforementioned focus areas and will continue to engage users, stakeholders, and system partners in the use, extension, education, and outreach of technical capacity, data visualization, and ocean information.

OBJECTIVES

The work supported by this award continues to strengthen and integrate Federal and non-Federal observing assets within the PacIOOS region with other regional associations into the national Integrated Ocean Observing System (IOOS). An iterative, participatory process of engagement, outreach, and extension of PacIOOS capacity and data products has led to clearly defined stakeholder needs for additional customized and integrated data and information products in both Hawaii and the Insular Pacific region. To that end, PacIOOS continues to develop the observing, modeling, data management, and outreach components of the system to generate products that help ensure a safe, clean, and productive ocean and resilient coastal zone for the U.S. Pacific Islands.

APPROACH AND WORK PLAN

In separate short paragraphs, Please: 1) describe your proposed scientific and/or technical approach including data quality requirements as applicable, 2) identify the key individuals participating in this work at your own or other organizations and the roles they play and 3) describe your work plans for the upcoming year (if applicable).

RESULTS & WORK COMPLETED

MILESTONES (start of work delayed until Q1, FY12): Text in **blue** denotes equipment deployment, **red** denotes product/data development, and black denotes modeling development.

FY12 Q1	FY12 Q2	FY12 Q3	FY12 Q4
2 3-month glider missions per year.			
Glider data assimilated by numerical ocean models			
			Kaena HFR Installed
HFR surface currents online			
8 Waverider buoys in operation in Hawaii, Guam, and the Marshall Islands			
2 Coastal cameras operational in Hawaii			
Real-time wave data and forecasts online			
High-water level forecasts available online			
Coastal camera imagery available online			
AUV survey data on-line			
Water quality data and products online			
Water quality indices on-line			
Sea level heights/trend products on-line			
ROM circulation model in operation for Hawaii			
WRF atmospheric model in operation for Hawaii			
Regional WWIII wave model in operation			
			SCUD circulation model for Pacific basin developed
Model data and products on-line			
Vessel traffic on-line			
Route forecasting and ocean condition products online			
Transmitting tags deployed on pelagics throughout year			
Service acoustic receivers throughout year			
Collate and prepare biological results for integration/model forecasting			
Integration of biological data into data management system ongoing			

All ongoing operations proposed under our FY12 revised workplan continue as planned (glider missions, HF radar operation, real-time wave data, coastal cameras, high water level forecasts, water quality data and products, water level products, operational models (wave, wind, circulation), vessel traffic, and biological tagging/tracking). All data and products are available on the PacIOOS website (www.pacioos.org) which has registered over **64,000 visits and 163,000 pages viewed during the present reporting period.**

The status of three activities scheduled to be completed during the past performance period are detailed below.

HFR at Kaena Point—The installation of a HFR system at Kaena point has been largely completed, though the system has not yet been turned on and data is not yet streaming. The system was installed in February of 2012. Pending the final delivery of key computer hardware, the system will be operational towards the end of 2012.

Development of Pacific Basin Circulation Model—The development and deployment of an operational forecast model for upper ocean circulation for the Pacific Basin has been completed. The SCUD (surface currents using drifters) model provides a daily forecast of upper ocean velocity over the whole PacIOOS region. An example forecast can be seen at:

<http://goo.gl/H4ceZ>

Water Quality system in American Samoa—A SBE 16v2+ has been purchased for deployment within the PacIOOS region. We are presently evaluating sites in American Samoa, and elsewhere in the region to determine the best location to install the system. We have had persistent technical challenges that have prevented the ideal operation of our existing water quality system deployed in American Samoa, which has led to the aforementioned evaluation prior to an additional deployment of equipment in the Territory.

IMPACT AND APPLICATIONS

The impacts of PacIOOS are varied and most persist beyond single fiscal years. As such, we will use this space to describe impacts and applications in a different thematic area each year.

Quality of Life

Lifeguards throughout the state of Hawaii have partnered with SOEST and PacIOOS in the development of the Hawaii Beach Safety website (hawaiibeachsafety.org) which is now operated and maintained by PacIOOS. Daily public forecasts are provided of near-shore beach conditions based on local knowledge of hazards and offshore oceanographic (wave, wind) data. These forecasts are widely available to residents and visitors and can be updated in real-time by lifeguards as conditions change at beaches statewide.

The 14th District of the US Coast Guard is responsible for at-sea search and rescue in the waters of the US Pacific Islands. In Hawaii, PacIOOS has deployed operational high-frequency radar systems to measure surface currents (reported hourly) as well as developed numerical models for nowcast/forecast of ocean circulation, waves, and atmospheric forcing (wind). These model and observational data have been requested by the USCG and are fed directly into their operational search and rescue planning system (SAROPS) for use in planning SAR missions. Data from HFR, as well as models, dramatically decreases the search areas in SAR cases, by 66% in some cases (data from mid-Atlantic study of HFR and USCG). This reduction in search area leads to increased likelihood of successful rescue/recovery, in shorter time frame, and a significantly reduced cost.

RELATED PROJECTS

Closely related to aspects of the PacIOOS operational mission are activities being undertaken by the Department of Homeland Security funded Center for Island, Maritime, and Extreme Environment Security (CIMES) at the University of Hawaii at Manoa. CIMES is focused on the development of new HF-radar technology, acoustic monitoring of coastal waters, satellite acquisition of maritime data (for Maritime Domain Awareness), and data fusion. PacIOOS and CIMES work closely on the development and deployment of HF-radar technology in the region. More information on CIMES can be found at <http://www.cimes.hawaii.edu>.

OUTREACH MATERIALS

Outreach materials for the PacIOOS program are available online at www.pacioos.org/outreach.