FY2009: Regional Integrated Ocean Observing System Development

NOAA continued a merit-based funding process in 2009 to enhance regional coastal ocean observing systems (RCOOS) and achieve three long-term outcomes: establishing coordinated regional observing and data management infrastructures, developing applications and products for regional stakeholders, and crafting regional and national data management and communications protocols. In addition, regional associations received planning grant awards designed to assist them in stakeholder engagement, education and outreach, and long-range planning activities.

PACIFIC ISLANDS REGION

The Pacific Islands Region is defined as the State of Hawaii, Commonwealth and Territories of the United States in the Pacific, and the Freely Associated States in the Pacific. The 2009 RCOOS award to this region is $1,869,134 for a demonstration project focused on the south shore of Oahu, Hawaii. The 2009 Regional Association Planning Grant award to this region is $398,802.

Project Title:

Developing the Hawaii-Pacific Ocean Observing and Information System

Recipient/ Lead Principal Investigator:

University of Hawaii/ Dr. Brian Taylor (*taylorb@hawaii.edu*)

Cost:

Funded: FY 2007 (Year 1) - $1,700,000
FY 2008 (Year 2) - $1,700,000
FY 2009 (Year 3) - $1,869,134

Performance:

The objective of this project is to integrate and expand ocean observing and forecasting first in the Hawaiian Islands, and later among the Pacific Islands as part of a larger Pacific Islands Ocean Observing System (PacIOOS). Investigators will begin with four integrated “catalyst” projects focused initially on waters along the southern shore of Oahu, Hawaii's most populous island. These catalyst projects support one another to enhance community capabilities and respond to the needs of a diverse constituency of stakeholders are: (1) coastal ocean-state and forecast; (2) coastal resiliency; (3) automated water quality sensing, and; (4) marine ecosystem stewardship. Resultant products will contribute to near-shore and offshore safety, shipping and marine commerce, water quality assessments, marine ecosystem indicators, and marine inundation forecasts.

For the coastal ocean-state and forecast project, investigators will utilize an array of high frequency Doppler radios, along with gliders, wave buoys, coastal cameras, and numerical models. This project will monitor, model, and predict channel and near-shore circulation, waves, coastal run-up, and water levels. Observations and model output will feed into a dynamic, web-based coastal ocean atlas providing interpretive products such as most efficient inter-island shipping lanes, hazardous conditions at beaches and in harbors, pollutant dispersion, and high water levels in vulnerable communities. The coastal resiliency project products will include: frequently updated maps of specific beach safety conditions; coastal inundation and erosion alerts, and; vulnerability projections related to sea-level rise, chronic erosion, and high wave and water level events. The automated water quality sensing project efforts will expand and implement modifications of existing coastal water quality monitoring. The proposed system, when combined with circulation models, will provide early

(over)

warning of impending water quality problems, improve prediction of affected areas, and decrease response time for mitigation efforts. The marine ecosystem stewardship project team will focus on expanding existing cetacean monitoring arrays. Stewardship products will include fishing and marine mammal forecasts to help interpret impacts of long-term climate change on living marine resources.

Schedule:

1. Year 1
    - Deploy one glider.
    - Bring key data and products on-line (glider subsurface temp/salinity, sea level heights/trends, wave state, NLOM/NCOM ocean state products, autonomous underwater vehicle (AUV) survey products, surface winds)
    - Deploy observation equipment (Koko Head and Barbers Point Coastal Radars, nearshore water quality stations, directional wave buoys, Ecological Acoustic Recorders (EAR) at Kilo Nau, yellow fin tuna transmitters)
    - Deploy AUV surveys and event surveys
    - Conduct topographic LIDAR surveys
    - Operate circulation models (RSM/MSM atmospheric model, Regional Ocean Modeling System (ROMS) model, regional wave model)
    - Develop software for real time detection of cetacean sounds
    - Develop database and web system
    - Deploy beach cameras and near-shore sensor packages

2. Year 2
    - Deploy 1-2 gliders continuously
    - Deploy additional observation equipment (Barbers Point water level/seiche stations, deep EAR sensor, Waikiki beach cameras)
    - Operate priority models (weather research and forecast (WRF), atmospheric model, Hybrid Coordinate Ocean Model/Pacific Ocean Model (HYCOM/POM), Oahu south shore model, ecosystem model)
    - Continue development of database and web system
    - Bring additional key products on-line (radar surface current maps, water quality products, inundation products, HYCOM/POM products)

3. Year 3
    - Bring additional products/data on-line (marine mammal occurrence, biological activity, vessel traffic, inundation products, run-up products)
    - Continue development of database and web system
    - Assimilate data into WRF and ROMS models

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