Southeastern Universities Research Association (SURA)
Coastal Ocean Observing and Prediction (SCOOP) Program

Advancing the science of environmental prediction and hazard planning for our nation's coasts.

Integrating and empowering a virtual community of scientists with the tools, resources, and ideas for discovery and practical application.

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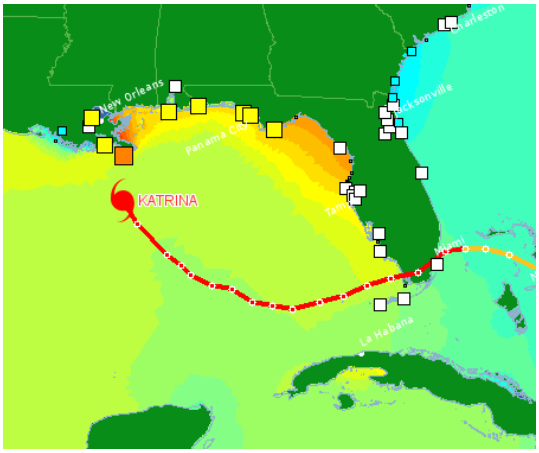

Predicted storm surge with observed water level as seen on OpenIOOS.org, a SCOOP portal, in advance of Katrina's landfall.

Meeting a National Need – Implementing the President's Ocean Action Plan
Hurricanes Katrina and Rita emphasize the need to improve our nation's ability to predict and mitigate the impact of coastal inundation. First, we must improve our ability to obtain timely and accurate forecasts of the storm surge, inundation and damaging waves. The SCOOP architecture implemented so far can provide such short term forecasts, integrate them with real-time observations and portray the results in forms that are readily accessed and interpreted (see illustration above). SCOOP partners in operational agencies (NOAA and the Navy) will benefit.

Enabling Environmental Prediction – A Problem in Probability and Statistics
Emergency response planners need advance information about potentially catastrophic events. Accurate predictions can mitigate the costs of disaster or prevent excessive costs if preparation turns out to be unnecessary. Providing such information is a High Performance Computing challenge because the associated ensemble-modeling techniques require that computer simulations must be run not once, but many thousands of times – once for each plausible outcome. The SCOOP program is enabling the use of these High Performance Computing (HPC) techniques for the prediction of storm-related coastal hazards.

SCOOP's Service-Oriented Architecture – Enabling Innovation of Operational Systems
Enterprise information systems employ a service-oriented architecture, that is, a collection of self-contained modules, each providing well-defined services and communicating with each other using standardized interfaces – modern systems rely heavily on Web-service interfaces. Such an architecture is the arguably the only way to implement a comprehensive "system of systems" for observing and predicting the oceans and earth. The SCOOP Program's distributed, service-oriented architecture solves a problem typical of many "operational" systems, namely, the inability to innovate. By modularizing components, standardizing their interfaces, and generally breaking down stovepipes, we enable continuous innovation and evolution of an operational infrastructure. The operational system can then become a focus for research. Development and testing occur in a companion development environment. The overall system evolves by migrating new and upgraded components to the stable and reliable production system.