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## Enhancing Coastal Resilience through Trans-disciplinary Collaboration

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# Enhancing Coastal Resilience through Trans-disciplinary Collaboration

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## 1. Introduction

SURA's new coastal resilience initiative aims to promote and facilitate collaboration among member universities, and enhances the capability of universities to undertake significant, transformative resilience research projects, that no single institution or small consortium can carry out independently. SURA supports coastal resilience efforts that promote the integration of the social and natural sciences in anticipation of future threats from environmental and socioeconomic change. The desired outcome is to improve and protect people's lives and communities and interconnected ecosystems. The ongoing workshop series represents the initial steps in identifying the most urgent questions and potential research teams.

SURA has extensive experience in leading collaborative research projects conducted by investigators from different disciplines to create new conceptual, theoretical, methodological, and translational innovations that address complex coastal problems by integration. With funding from the U.S. Integrated Ocean Observing System Program (IOOS<sup>®</sup>) of the National Oceanic and Atmospheric Administration (NOAA), SURA has facilitated strategic collaborations to build and guide the Coastal and Ocean Modeling Testbed (COMT). The initial, \$4 million grant to support the vision of distributed, open-access, community science was awarded in 2010, with renewal funding ever since. The resulting COMT is now one of 11 official NOAA testbeds. The overarching goal of the COMT is to accelerate the transfer of research results to improve operational coastal ocean modeling and forecasting skill. SURA has advanced the COMT to evaluate the readiness of coastal and marine forecasts of low dissolved oxygen, flooding from storm surge and wave conditions.

## 2. Methods

Coastal resilience research helps federal, state, and local governments to achieve a wide range of environment-focused missions through the transition of trans-disciplinary research results to operational predictive models. The recently implemented SURA coastal resilience workshop series is committed to helping coastal communities prepare for, and recover from, increasing risks from extreme weather events, climate hazards, and changing ocean conditions.

Strong and strategic collaborations among experts from academia have been forged to help federal operational centers and industry advance viable resilience strategies in their plans for land and ocean use, disaster preparedness, environmental restoration, hazard mitigation, or other regional, state, or community plans. SURA has coordinated its effort with agencies such as NOAA, National Institute of Standards and Technology,

U.S. Army Corps of Engineers, and the Economic Development Administration. In order to support the many stakeholders and to help others leverage resources, SURA has proposed resilience workshops in very different types of coasts and the publication of a coastal resilience monograph. The resultant work will survey the state of knowledge in coastal resilience and provide a source for others to leverage primary research and original scholarship.

## 3. Results

The ultimate success of SURA's programs is measured by advances in knowledge, skills, behaviors, and attitudes. Progress in these areas may be gauged through scientific reporting and the transition of basic research to operations. Three examples provide an indication of small successes. First, SURA's previous coastal resilience workshop, which is described online [1], defined the topic and the need for social and natural scientists to collaborate to advance resilience research. Attendees recommended the development of a scenario-based workshop in Broward County, Florida. Second, the COMT project, which directly supports the U.S. IOOS<sup>®</sup>, has transitioned scientific and technical advances in coastal ocean modeling to NOAA for improved operational ocean products and services [2]. COMT advances shed light on estuarine hypoxia, shelf hypoxia, and coastal inundation. Lastly, SURA has created a Science and Requirements Advisory Committee (SRAC) to supplement coastal resilience knowledge by providing up-to-date information on the state of the field, performing specialized policy-informing functions to facilitate governmental and industry response to rapid coastal zone changes and to identify situations requiring policy attention. The SRAC will provide key inputs to the planning and execution of future workshops and the publication of a coastal resilience monograph.

## 4. References

[1] SURA Coastal and Environmental Research Committee, 2014. Understanding and Modeling Risk and Resilience in Complex Coastal Systems. Available online. URL: [http://scholarworks.uno.edu/resilience/SURA\\_final\\_report.pdf](http://scholarworks.uno.edu/resilience/SURA_final_report.pdf). Accessed on August 21, 2015.

[2] Luettich, Richard A, Jr., L. Donelson Wright, Richard Signell, Carl Friedrichs, Marjy Friedrichs, John Harding, Katja Fennel, Eoin Howlett, Sara Graves, Elizabeth Smith, Gary Crane and Rebecca Baltas. 2013. Introduction to special section on The U.S. IOOS Coastal and Ocean Modeling Testbed. *Journal of Geophysical Research: Oceans*, Vol. 118, pp. 6319-6328.