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LSU receives $1.35 Million to Develop the Coastal Hazards Collaboratory in the Northern Gulf Coast

Researchers in Louisiana, Mississippi, and Alabama are leveraging their unique partnerships, proximity, and significant prior investments in cyberinfrastructure to advance science and engineering of coastal hazards of the northern Gulf Coast.

Funded by the NSF (National Science Foundation), this consortium, called the Northern Gulf Coastal Hazards Collaboratory or NG-CHC, has recently formed to: advance economic opportunities for our citizens by reducing risks to coastal vulnerabilities; catalyze collaborative research via enhanced cyberinfrastructure that will potentially address problems such as engineering design, coastal system response, and risk management of coastal hazards; and enhance the research competitiveness of the Gulf region.

The northern Gulf Coast is essential to the sustainability of economically important coastal fisheries, marine transportation, energy development, and national defense. The NG-CHC has the opportunity to capitalize on strong cyberinfrastructure and current coastal hazards research infrastructure to address issues of national importance regarding the sustainability of the Gulf Coast. The challenge is to develop a framework and strategies for organizing the region's resources in a manner that transcends state line boundaries.

Current investments include high-bandwidth optical networks, HPC systems, large data storage, data archives, middleware, visualization resources, and connections to national research networks including the National LambdaRail and Internet2. The NG-CHC will broaden and strengthen these cyberinfrastructure resources to include training for the next generation of researchers.

More specifically, cyberinfrastructure tools and services need to work with computationally demanding models and vast observational data sets. The new collaboratory will create cyberinfrastructure tools and services and demonstrate three modeling environments that allow scientists to access and use data from observational data systems located at university, government, and private industry in the northern Gulf Coast.

For example, one of the grand challenges for earth system science is to characterize dynamic environmental processes at appropriate space and time scales with integrated observation networks and models. Even with the current high-capacity cyberinfrastructure, this region lacks a system to integrate these data inventories into information and knowledge that will reduce risks to coastal hazards. The challenge includes the ability to couple models, invoke dynamic algorithms based on streams of sensor and satellite data, locate appropriate data and computational resources, create necessary workflows associated with different simulation demands, and provide visualization tools for analysis of results.

“LSU has played the leading role in the development of this Coastal Hazards Collaboratory, a consortium of 10 universities in the Gulf region,” said Q. Jim Chen, LSU associate professor of LSU's Department of Civil & Environmental Engineering and the Center for Computation & Technology. “Close collaborations among civil engineers, earth system scientists, and computer scientists are the key to the success of this project.”

“With these planned investments, the existing computational and research capabilities of Louisiana will significantly improve, and the ability to collaborate with other researchers in the Gulf Region will be enhanced”, said Honggao Liu, deputy director of LSU's Center for Computation & Technology and director of LSU's High Performance Computing. “It’s so vitally important for our state--protecting the coast means protecting Louisiana’s economy and national economic output.”
The LSU consortium members are Qin Jim Chen; Honggao Liu; Patrick Hesp, professor of LSU's Department of Geography & Anthropology; and Steven Brandt, research consultant, Center for Computation & Technology.

For more information on the LSU Center for Computation & Technology’s research projects, visit: www.cct.lsu.edu

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