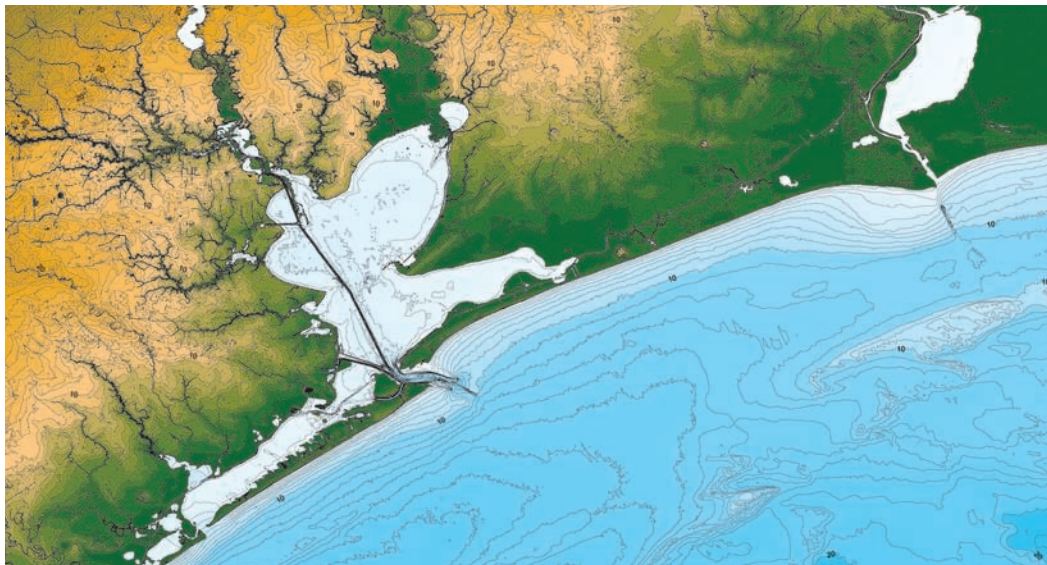


# Texas Sea Grant addressing coastal storm impact and coastal resiliency challenges

The Texas Sea Grant College Program, a component of the National Sea Grant College Program and part of the College of Geosciences at Texas A&M University, supports several activities and conducts a number of efforts to enhance coastal resiliency and mitigate coastal storm impacts.

In one Texas Sea Grant-funded project, researchers from Texas A&M University are building an online coastal communities planning atlas to provide an easily accessible, graphically represented, interactive database that will allow users to identify and visualize critical “hot spots” related to environmental degradation, natural hazard risks and significant changes in land use patterns. Users also will be able to query data and create custom maps based on multiple development scenarios. The researchers have already created a template website and collected several datasets. The project will include the 30 coastal counties at the Census block and block group level; in addition, Galveston County datasets will be refined down to parcel-level data. Communities will be able to use this educational tool to guide future decisions on growth in a sustainable manner so that the need for economic development is balanced with priorities associated with environmental protection and human health, safety and welfare. The system will also help address important research questions related to where future growth will occur in the Texas coastal zone, the impacts of this growth and the usefulness of WebGIS in facilitating sustainable planning.

Texas Sea Grant also is a partner in a project to develop storm surge prediction models for the Houston-Galveston region. The models will incorporate information from bathymetric maps created through several Texas Sea Grant-funded research projects from decades of available soundings



*Galveston Bay Area: Bathymetry/Topography of Continental Shelf and Coastal Zone, courtesy Troy Holcombe*

and multi-beam sonar of the Gulf of Mexico off Texas and Louisiana. The bathymetry has also been combined with data about the elevations of the land areas around the bays and along the coastline to create seamless coverage of the coastal areas above and below the water line to help predict the route of storm surge and pinpoint areas vulnerable to flooding.

At the same time, in collaboration with emergency management agencies, federal entities and other Sea Grant partners, Texas Sea Grant is working to link the Gulf of Mexico data into CI-FLOW, the Coastal and Inland Flood Observation and Warning Project developed by the North Carolina and South Carolina Sea Grant programs. CI-FLOW, which focuses on flooding and other impacts from heavy rainfall coupled with storm surge, has been demonstrated for areas in North Carolina; this would be the first test of the model for conditions in the Gulf of Mexico. Taken together, the two models will be used to predict the combined effects of storm surge inundation and flooding from heavy rainfall in the Galveston Bay area, as well as predicting runoff patterns that may contribute to water pollution.

Other partners in the project are the National Severe Storms Laboratory (NSSL) in Norman, Okla., and the University of Oklahoma. Funding has been requested for a

Sea Grant climate/weather extension specialist at OU who would work extensively with the NSSL on this project.

From its position on the Texas Coastal Coordination Council, the state's manager of the coastal zone, Texas Sea Grant also solicited a state-funded project from researchers at the Hazard Reduction and Recovery Center at Texas A&M University. The five-year, \$744,556 project, funded by the state's Coastal Management Program, will focus on an evaluation of the Texas Mitigation Plan's applicability to the coastal area, the effectiveness of the construction codes and other land use planning policies to mitigate potential impacts of coastal natural hazards, best practices and emerging technologies related to building code and land use planning that could further mitigate potential impacts of these hazards, and the local, state and federal resources available for mitigation, preparedness, response and recovery.

The project will also examine the geographic relationship between current coastal management program boundaries, weigh the physical and social vulnerabilities of coastal populations to facilitate planning and policy development related to hazard mitigation and response, and assess the adoption of hazard mitigation technologies, issues related to the adoption of these technologies and disaster planning by households and business. At the end of each phase of this project, with an overall conclusion in 2010, the Texas Sea Grant Extension Program will conduct outreach and education activities in support of the findings.

Texas Sea Grant and the Hazard Reduction and Recovery Center are also partners in the university-wide Sustainable Coastal Margins Program. The project is designed to foster collaboration and coordination across disciplines and units within the university to develop interdisciplinary research, joint degree programs in environmental studies/sciences, and promote links to external organizations with complementary missions.

Texas Sea Grant Extension Program staff members also organize "hurricane awareness and preparedness" workshops prior to the beginning of hurricane season each year, with major efforts led by agents in Brazoria and Matagorda counties.

Texas Sea Grant's coastal communities development specialist has undertaken a continuing program focused on educating stakeholders about the connection between urban development patterns and coastal hazards issues. His program comprises frequent lectures to community planners, local governments and citizen groups, widely circulated newspaper editorials, and in-depth analysis documents for think-tank organizations. Under contract from the Paris-based Organisation for Economic Co-operation and



*Surfside, Texas, photo by Stephan Myers*

Development (OECD), he recently completed a policy paper on the framework for adapting urban development, the so-called "built environment," to mitigate as much as possible the impacts of coastal natural hazards and climate change. He has been invited to deliver a presentation on his report at an OECD gathering in France in March 2007.

Staff members are also working with the Regional Gulf of Mexico Coastal Ocean Observing System Association to enhance the Gulf's system and thereby provide better data on storm characteristics while a hurricane or major tropical storm is still at sea. Texas Sea Grant also plays a role in outreach and education activities supporting GCOOS.

The program's other outreach efforts include the Marine Information Service's bilingual safety publication, "The Eye of the Storm: A Coastal Texan's Hurricane Survival Guide/*El Ojo del Huracán: Una Guía de Supervivencia de Huracanes para Tejanos de la Costa del Golfo,*" which is distributed free of charge. The booklet also will soon be available for download in printable PDF and HTML text formats on the Safety Information page of the Texas Sea Grant website.