



# THE WATER INSTITUTE OF THE GULF®

## FIELD INVESTIGATIONS

The Water Institute of the Gulf has capabilities to undertake a wide range of boat-based and fixed station observational studies of riverine, deltaic, coastal, and continental shelf environments, as well as a range of ecological measurements in emergent marsh and submerged habitats. This requires a diverse suite of instrumentation, boats, and tow vehicles to work in these complex and highly dynamic environments. Using a variety of sampling techniques and investigative tools, our team performs river channel surveys of bathymetry, hydrodynamics, and sediment dynamics. Ecological measures include water quality and plant nutrients, fish communities and a wide range of measures of plant and animal communities. We also have technology that enables us to conduct sub-bottom acoustic surveys, perform geological measurements, characterize wetland

vegetation and soil, and collect data in complex and rugged coastlines.

In addition to examining modern changes in coastal environments and historical (sediment core) records of past changes, these surveys and monitoring efforts are vital for developing and improving predictive modeling capabilities—by providing data to setup and calibrate models, and an understanding of what critical natural processes need to be simulated in the final model. A coupled observational-modeling approach is a cornerstone of the Institute's applied research program and is widely applicable for planning and designing coastal restoration and protection projects and supporting adaptive management efforts.

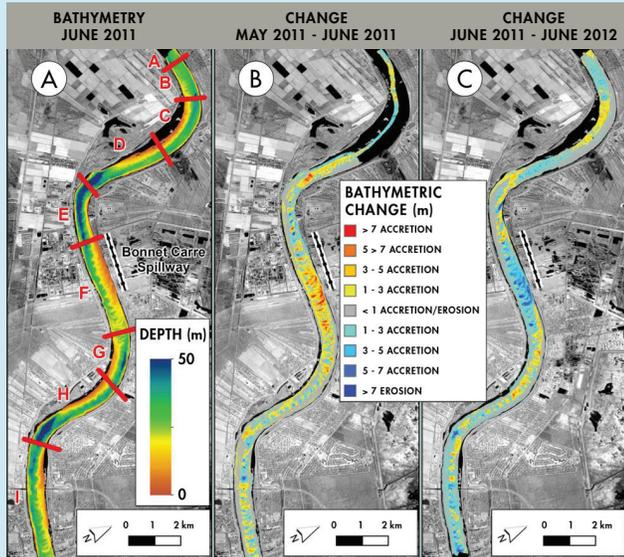
### OBSERVATIONAL CAPABILITIES

- » River, lake, estuarine and marine surveys of bathymetry, hydrodynamics and sediment dynamics
- » Seamless LIDAR-bathymetric mapping of subaerial-intertidal-subaqueous environments
- » Sediment coring and stratigraphic reconstruction in a wide range of modern sedimentary settings
- » High-resolution side-scan sonar and sub-bottom acoustic surveys
- » Calibration of remote sensing data in coastal settings
- » Fixed-shoreline monitoring stations and bottom tripods to measure fluid and flow conditions, sediment transport, and water quality
- » Boat-based, wire-deployed and towed instrument arrays to measure water column properties
- » Sedimentological, geochronological, geotechnical, and geochemical laboratory analysis of sediment cores and in situ substrates (subaerial and submerged)
- » Environmental tracer experiments to examine hydrodynamics and sediment dynamics in aqueous environments
- » Shallow benthic surveys of primary and secondary producers, including benthic micro-algae
- » Sampling for nutrient content and stable isotope surveys
- » Use of fish traps and suction samplers for assessing shallow faunal communities
- » Measurement of light and water quality

*Because life happens at the water's edge*



Above: the Institute teamed with the Army Corps of Engineers to combine mobile SEDFLUME measurements of sediment erodibility with a number of the Institute's field measurements of sediment strength in Fort St. Philip.



These maps represent depict changes to the Mississippi River due to the opening of the Bonnet Carré Spillway during the flood of 2011. Multiple surveys were utilized to examine bathymetric change in the channel caused by the diversion before and after the opening (B) and one year later (C).

## LET'S WORK TOGETHER

We look forward to the chance to work with you. By leveraging the knowledge and tools of the Institute, government, business, and industry interests can thoughtfully plan for sustainable infrastructure, ecosystems, economies, and emergency preparedness. We welcome the opportunity to apply our expertise with new partners to face new challenges.

## The Institute uses a broad array of equipment and technologies for a variety of observational purposes:

- » A fleet of towed research vessels for working in inland and coastal settings
- » Reson 7101 and Datasonics 2020 multibeam bathymetric systems
- » Applanix POS/MV and Oxford inertial motion sensors
- » MDL Dynascan S250 LiDAR deployable from boat or vehicle
- » Nortek Aquadopp, RD Instruments ADCP and H-ADCP, Sontek PC-ADP and ADV units for measuring waves and currents
- » YSI and RBR multiparameter water quality sensors
- » Isokinetic water samplers and Teledyne Isco automated samplers
- » Diverse coring devices for aqueous and subaerial settings
- » Recording soil penetrometers and vane shear apparatus
- » Gamma and alpha spectrometers for measuring natural and bomb-produced radiotracers for sediment accumulation and mixing studies (e.g., 210Pb, 137Cs, 7Be, 234Th, etc.)
- » Laboratory analytical capabilities for measuring sediment grain and bulk properties and organic characteristics
- » Li-Cor LI-193 spherical underwater quantum sensor
- » 1m\*1m throw trap for juvenile fish and invertebrates
- » Suction sampler for shallow water infauna sampling
- » Laboratory analytical capacity for measuring chlorophyll a, infauna and juvenile fish identification, plant biomass and primary processing for nutrient and stable isotope analysis
- » Licensing and expertise in a wide range of data collection, post-processing, GIS, and analytical software in support of data collection

For more information about the Institute's research capabilities and how they can benefit your organization, visit [www.thewaterinstitute.org](http://www.thewaterinstitute.org) or contact [info@thewaterinstitute.org](mailto:info@thewaterinstitute.org).

