



## Project Summary

The LSU Center for River Studies, a collaborative partnership between CPRA and LSU, is an unprecedented effort to showcase Louisiana's working delta, Louisiana's coastal program, and research dedicated to coastal restoration and river management. The primary focus of the Center is to operate the Lower Mississippi River Physical Model, a 90 ft. x 120 ft. movable bed physical model, one of the largest of its kind in the world. The model will produce qualitative land building results associated with sediment diversions in the lower river, and serve as a complementary planning tool to computer models currently utilized.

The Lower Mississippi River Physical Model is based on exact parameters of the river's physical and dynamic properties. The model will flow water and sediment across the model's 14,000 square mile section of Southeast Louisiana including Terrebonne, Barataria, Breton Sound, and Pontchartrain Basins. Designed to simulate the Mississippi River's depth, sediment, and flow, the model will be used by researchers, scientists, and engineers to improve our understanding of the lowermost Mississippi River and to study how it responds to modification. Twenty high resolution projectors are mounted above the model bed to project aerial photographs, project project features, diversion outputs, and other simulations/animations.

The model is not only a tool for research for Louisiana, but will also develop coastal knowledge that can be exported to other coastal communities around the world. Additionally, the Center will be used for outreach, engagement and advocacy. A state-of-the-art 10,000 sf exhibit area offers several distinct themes with illustrations and interactive features to help visualize and communicate the importance of the Mississippi River Delta, the ongoing coastal land-loss crisis, and CPRA's comprehensive Coastal Master Plan restoration and risk reduction program.

## LSU Center for River Studies: Facility and Model Overview

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### *THE RIVER MODEL*

- The primary focus of the LSU Center for River Studies is to operate the Lower Mississippi River Physical Model, a 90 ft. x 120 ft. movable bed physical model which is one of the largest of its kind in the world.
- Model consists of 216 high-density foam panels that each measure 5 ft. x 10 ft. x 1 ft., and weigh 700lbs. each. The model's weight is compatible to a loaded 737 jet.
- Each panel took approximately 18-24 hours to route using a highly accurate Computer Numerical Controlled (CNC) Router; router is fed with 3D CAD files derived from 20 different sources of survey data collected throughout the real-world domain the model depicts.
- The model represents the 179 mile stretch of the Mississippi River running from Donaldsonville to the Gulf of Mexico, representative of a 14,000 square mile section of Southeast Louisiana including Terrebonne, Barataria, Breton Sound, and Pontchartrain Basins.
- 20 high resolution digital projectors bring the pure white model to life as they project imagery onto the model: the coastal landscape, aerial photographs, project features, diversion outputs, and other simulations/animations.
- This model is a major improvement over its precursor, the Small Scale Physical Model constructed which was used 2002-2009 by CPRA and LSU. Improvements include:
  - Old Model Domain: 4,600 square miles

- New Model Domain: 14,000 square miles
- Old Model Geometric Scale: Horizontal = 1:12,000; Vertical = 1:500
- New Model Geometric Scale: Horizontal = 1: 6,000; Vertical = 1:400
- The New Model is made of more durable materials and was constructed using more accurate fabrication, construction and calibration techniques.

## **THE FACILITY**

- Key design features were incorporated into the Center to facilitate the unique model and interactive exhibit areas, such as the Center's foundation, overhead Gantry crane, walk-bridge, interior drainage, electrical system, and data infrastructure were specifically designed to facilitate the model and exhibit
- The building's concrete slab is 20 inches thick and sits on (202) 50 ft. concrete piles.
- Building Size = 45,568 SF total
- Model Area = 25,110 SF (includes second level observation deck)
- A state-of-the-art 10,000 sq. ft. exhibit area includes 7 distinct areas and themes; themes range from Controlling the Mississippi to CPRA's processes for implementing projects.
- Additional Lab Space = 4,013 SF
- Office/Meeting Space = 6,537 SF

## **OPERATIONS AND RESEARCH**

- One hour of model testing time equals one year of natural river time; a 100-year project scenario will take approximately 100 hours on the model.
- The Lower Mississippi River Physical Model has over 18 acoustic sensors installed to monitor water levels along the model. Each sensor on the model coincides with the location of a sensor station along the actual Mississippi River.
- Water levels can be raised or lowered to represent sea level change and subsidence.
- The sediment used on the Lower Mississippi River Physical Model is a ground plastic material manufactured in France. Its density and particle size are specifically designed to replicate the behavior and settling properties of real Mississippi River sand.

## **ADDITIONAL INFORMATION**

- CPRA scoped, funded, and managed 100% of the design and construction of the LSU Center for River Studies and Lower Mississippi River Physical Model. LSU's involvement has primarily pertained to the future operations of the model.
- Nearly 70% of the consultants, contractors, and subcontractors that designed and constructed the LSU Center for River Studies are Louisiana companies.
- The facility is owned and operated by LSU.
- The LSU Center for River Studies is one of the first completed buildings constructed on The Water Campus, touted as a world-class research and engineering epicenter in Baton Rouge, Louisiana. The Water Campus will serve as a focal point for public, private, and non-profit collaboration to develop innovative environmental solutions for the challenges facing coastal communities in Louisiana and all over the world.

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