

## JUST THE FACTS

## Measuring Levee Elevation Heights in North Louisiana

**Start Date:**

December 1, 2009

**Duration:**

12 months

**End Date:**

November 30, 2010

**Funding:**

State

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**PROBLEM**

The Louisiana Department of Transportation and Development (LADOTD) is seeking precise measurements of the existing levee heights in North Louisiana. Through this research, Louisiana Tech University will capture these measurements using survey grade GPS technology. The resulting output will provide LADOTD with accurate elevation information to aid in their flood control decisions.

**OBJECTIVES**

The primary goals of this research are to measure the elevation and centerline coordinates of the top of federal and local levees and to ensure that resulting GPS measurement data are within a precise interval of plus or minus 3/10ths of a foot vertically and 1/10th of a foot horizontally. The vertical datum used will be NAVD88, which uses one primary tidal

SPECIAL POINTS OF  
INTEREST:

- Problem Addressed
- Objectives of Research
- Methodology Used
- Implementation Potential

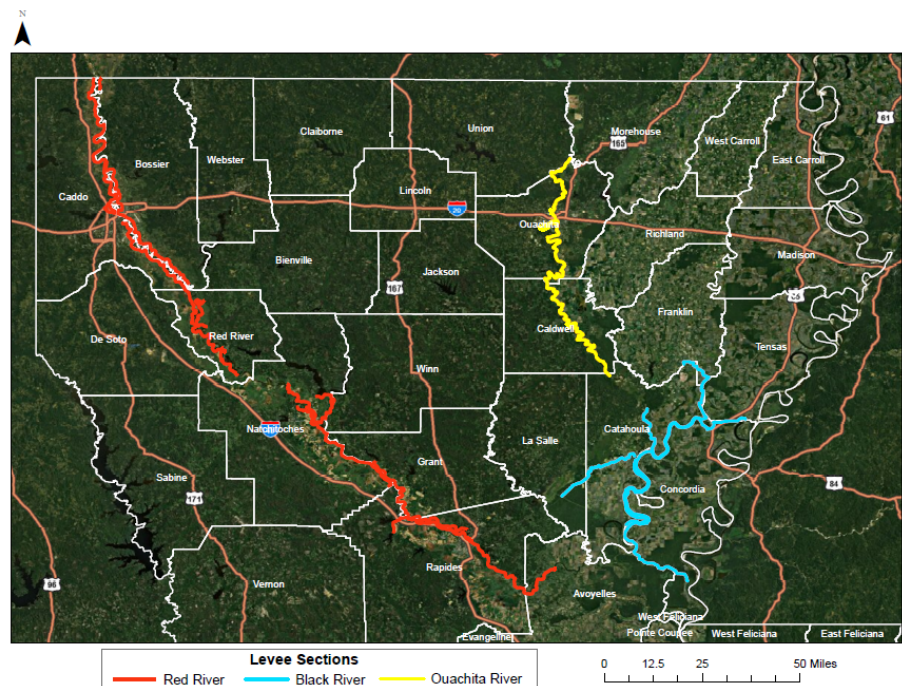


Figure 1

North Louisiana levees to be surveyed

bench mark at Father Point/Rimouski, Quebec, Canada as their zero point for the reference system. The horizontal datum will be NAD83, which is maintained by the National Geodetic Survey (NGS) and updated according to advancements in GPS reference technology.

## **METHODOLOGY**

The levees will be measured using a Trimble R8 GNSS receiver. The receiver will be calibrated by collecting positions at a known fixed monument examining the error. The elevations will be measured using single station real-time kinematic (RTK) methods with the base receiver referencing NGS monuments or post-processed observed control points. The rover receiver antenna will be fixed to the top of a 4-wheel drive vehicle. While traveling down the crest of the levee, the GPS receiver will collect positions at a distance interval of 100 feet from the last recorded position. Positions will be collected more frequently at major changes in the levee profile. When the topography and terrain of the levee does not allow for vehicle passage, the height measurements will be obtained on foot with the antenna mounted on a fixed height pole. LADOTD will assist Louisiana Tech University in obtaining access to levees and flood walls from local, state, and federal authorities. A final report will be generated at the completion of the study and submitted to LADOTD.

## **IMPLEMENTATION**

The resulting data collected in this study will provide LADOTD with a complete geographical inventory of levees in North Louisiana. Armed with the knowledge of precise levee height and location, LADOTD can make better informed decisions when dealing with flood control issues. The data will be presented to LADOTD in the form of an ESRI shapefile and a RINEX raw data format. The shapefile data format can then be integrated into existing Geographic Information Systems maintained by LADOTD and other governmental entities.

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