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The 2011 Floods in Louisiana

The Response Efforts of the USGS Louisiana Water Science Center

Introduction

The flood response by the USGS Louisiana Water Science Center was a total team effort. Every field scientist, every boat, every vehicle, and every available piece of equipment were deployed to collect critical flood information. USGS crews worked seven days a week as long as necessary to ensure that flood managers and first responders had the information they needed to make the best decisions possible. The 27 regular real-time USGS streamgages monitoring the Mississippi and Atchafalaya Basins were supplemented with roughly 50 non-real time gages. Also, two real-time cameras were installed at the Morganza Spillway and Baton Rouge to allow the public and policy-makers to see up-to-date conditions on the Mississippi River. Two rapid-deployment real-time gages were installed upstream and downstream of the Morganza spillway and one downstream in the floodway to provide additional real-time water elevations in the floodway. In addition, the USGS Louisiana Water Science Center worked closely with the USGS National Wetlands Research Center, based in Lafayette, to monitor environmental effects of the flooding. Field crews from the USGS Arkansas and Missouri Water Science Centers also lent their efforts to ensure total coverage.

Atchafalaya Basin & River

In May, water levels in the Atchafalaya Basin began reaching flood stage. USGS crews spent the next three months canvassing the entire Basin, from Simmesport in the North, down both the East and West Sides, to Wax Lake and Morgan City in the South. USGS scientists measured streamflow, as well as water quality, suspended sediment and dissolved oxygen.

USGS also coordinated a coalition of scientists at USGS, the Louisiana Department of Wildlife & Fisheries, Louisiana State University, Tulane University, and Virginia Tech to collect and analyze water samples throughout the Atchafalaya Basin.

Mississippi River

Water levels in the Mississippi River reached levels not seen since the 1927 floods. To assist with water management decisions, USGS crews deployed daily at sites up and down the Mississippi River to collect streamflow measurements, as well as collecting water-quality and sediment samples weekly at many locations along the River.

The Spillways

Bonnet Carré Spillway: On May 9, the U.S. Army Corps of Engineers made the decision to open the Bonnet Carré Spillway after USGS streamgages at Baton Rouge registered more than 1.25 million cubic feet of water coming down the Mississippi River each second. Once the Spillway was opened, millions of gallons of water flowed from the Mississippi River into Lake Pontchartrain, avoiding potential flooding in New Orleans.

USGS immediately began measuring streamflow and at Bonnet Carré at the request of the Army Corps to provide up-to-date information on flow conditions for its river management decisions. Also, suspended sediment samples were collected with each flow measurement. In addition, USGS crews began collecting water-quality samples in Lake Pontchartrain near the Spillway's entrance point on the West Side and also at the Rigolets on the East Side, where Lake Pontchartrain empties into the Gulf of Mexico.

Morganza Spillway: By May 12, the USGS streamgage at Baton Rouge began reading close to 1.5 million cubic feet of water moving through the Mississippi River each second. With these types of flow conditions, the Army Corps decided to open the Morganza Spillway, located approximately 50 miles north of Baton Rouge, which had only been opened once before, in 1973.

As soon as water began flowing through the Spillway, USGS crews began measuring and monitoring its streamflow, tracking the floodwaters as they moved south into the Atchafalaya Basin. Approximately 50 temporary gages were deployed to monitor water levels in the Morganza Floodway caused by the opening of the Spillway. Two rapid-deployment real-time gages were installed upstream and downstream of the Morganza spillway and one downstream in the floodway to provide additional real-time water elevations in the floodway. Also, suspended sediment samples were collected with each flow measurement.

Partners

Army Corps of Engineers: USGS streamgage and streamflow information was vital to the U.S. Army Corps of Engineers in making river management decisions. The Corps used measurements made by USGS to help manage the operations of both the Bonnet Carré and Morganza Spillways.

National Weather Service: USGS data was also crucial for the National Weather Service to make accurate flooding forecasts throughout Louisiana and especially on the Mississippi and Atchafalaya Rivers.

Louisiana Department of Wildlife & Fisheries: USGS and the Louisiana Department of Wildlife and Fisheries worked closely to monitor and measure water levels in the Atchafalaya Basin during the flooding and especially once the Morganza Spillway water arrived.

Satellite Images Show Extent of Mississippi River Sediment