USGS MONITORING EFFORTS AND LESSONS LEARNED FROM THE HISTORIC 2009 GEORGIA FLOODS

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Abstract. In 2009, the State of Georgia endured two historic flood events, causing widespread damage and significant loss of life. The southeastern coastal plain, in particular south-central Georgia including the City of Valdosta, experienced a significant flood from late March to early April that caused more than $60 million in damages and killed two persons. In September, an extreme amount of precipitation caused epic flooding in north Georgia, especially in the Metropolitan Atlanta area. More than $300 million in damages occurred and 10 persons lost their lives during this event in Georgia. Both events rewrote the streamflow record books in their respective regions.

This paper will review how the U.S. Geological Survey (USGS) real-time streamflow monitoring efforts aided in the warning, response, and documentation for these events, and provide some lessons learned in how flood information was collected and disseminated during and after these historic floods.

SOUTH GEORGIA MARCH AND APRIL 2009 FLOODS

The March and April 2009 floods in south Georgia were smaller in magnitude than the September floods but still caused significant damage (Fig. 1). No lives were lost in this flood. Approximately $60 million in public infrastructure damage occurred to roads, culverts, bridges and a water treatment facility (Joseph T. McKinney, Federal Emergency Management Agency, written commun., July 2009). Flow at the Satilla River near Waycross, exceeded the 0.5-percent (200-year) flood. Flows at seven other stations in South Georgia exceeded the 1-percent (100-year) flood.

METROPOLITAN ATLANTA SEPTEMBER 2009 FLOODS

The epic floods experienced in the Atlanta area in September 2009 were extremely rare (Fig. 1). Eighteen streamgages in the Metropolitan Atlanta area had flood magnitudes much greater than the estimated 0.2-percent (500-year) annual exceedance probability. The Federal Emergency Management Agency reported that 23 counties in Georgia were declared disaster areas due to this flood and that 16,981 homes and 3,482 businesses were affected by floodwaters. Ten lives were lost in the flood. The total estimated damages exceed $193 million (H.E. Longenecker, Federal Emergency Management Agency, written commun., November 2009).

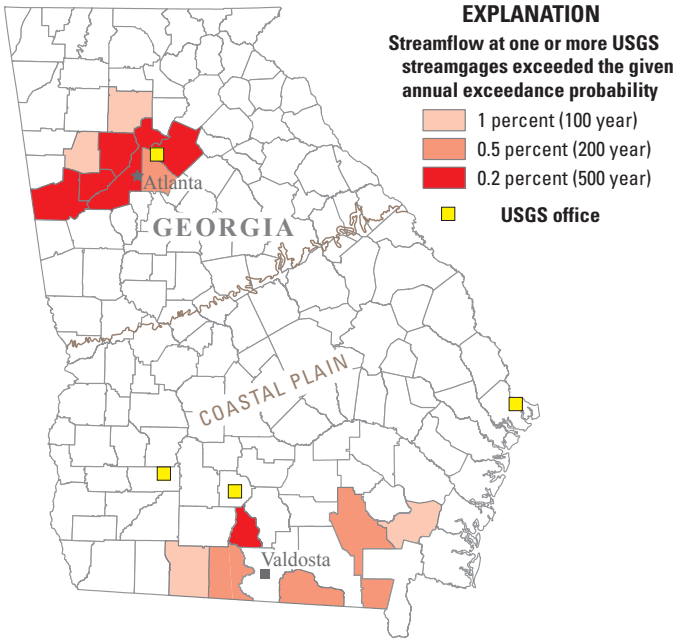

Figure 1. Affected counties with historic streamflows during the floods of 2009.

On Sweetwater Creek near Austell, GA, just north of Interstate 20, the peak stage was more than 6 feet higher than the estimated peak stage of the 0.2-percent (500-year) flood. Flood magnitudes in Cobb County on Sweetwater, Butler, and Powder Springs Creeks greatly exceeded the estimated 0.2-percent (500-year) floods for these streams. In Douglas County, the Dog River at GA Highway 5 near Fairplay had a peak stage nearly 20 feet higher than the estimated peak stage of the 0.2-percent (500-year) flood. On the Chattahoochee River, the USGS gage at Vinings reached the highest level recorded in the past 81 years. Gwinnett, De Kalb, Fulton, and Rockdale Counties also had record flooding.

LESSONS LEARNED

Several lessons were learned from these historic events. First, the real-time streamgaging network did its job in providing accurate hydrologic information so that National Weather Service (NWS) officials could send out warnings of the impending disaster. Second, the value of the long-term operations of these streamgages is critical in order to put events like these into proper historical perspective related their magnitude. Third, the continued investment in the network by the USGS and its cooperators meant that there were more streamgages present than a decade earlier, and that all streamgages were transmitting this data in real time to forecasters and emergency management officials. Finally, it was realized that even with this advanced hydrologic warning network in place, there was still a need for better communication of flood risk.

The first step was to quickly release the data collected in fact sheets and press releases, such as the USGS Fact Sheet 2010–3107 "Epic Flooding in Georgia, 2009," from which the data for this paper has been referenced. Additionally, the USGS has created two new tools for better conveying the risk from floods. The first is WaterAlert (*http://water.usgs.gov/wateralert*), a new service that allows users to set any threshold they are interested in at a nearby streamgage so that they get e-mail or text notifications when the conditions at the streamgage exceed their threshold. The second new tool is real-time flood inundation mapping (*http://water.usgs.gov/osw/flood_inundation*), which ties a USGS streamgage and NWS flood forecast to an inundated area as the flood is occurring. These new tools can now relate a real-time streamgage reading to a homeowner's front step.

REFERENCES

Gotvald, A.J., and McCallum, B.E., 2010, Epic flooding in Georgia, 2009: U.S. Geological Survey Fact Sheet 2010–3107, 2 p.