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Historic Flooding in Northern Georgia, September 16–22, 2009

A primary mission of the U.S. Geological Survey (USGS) is the measurement and documentation of the magnitude and extent of hydrologic hazards, such as floods, droughts, and hurricane storm surge. USGS personnel were deployed to document historic, widespread flooding that occurred throughout the Atlanta metropolitan area and northwestern Georgia in the early fall of 2009. The floods were created by prolonged rainfall that occurred during September 16–22, 2009, with an especially intense period of rainfall during the late evening of September 20. The National Weather Service (NWS) reported that the southeastern United States had above-normal precipitation from August into early September, resulting in saturated soil conditions making the region extremely flood prone. Precipitation totals were the sixth highest on record for the month of September for the region (National Weather Service, 2010).

Measuring Sweetwater Creek floodflow over Interstate 20 near Atlanta, Georgia. Photo by Alan M. Cressler, USGS.

Monetary losses reported from this flood were nearly $220 million in flood-damage claims, with 17 counties declared Federal disaster areas. Eleven fatalities were attributed to this flood, with many of them occurring during early morning hours when drivers attempted to cross flooded roads. Significant damage to hundreds of roads and bridges across the region also severely impacted traffic conditions for months after the event (National Weather Service, 2010).

The September 2009 flooding brought the highest levels ever recorded at many USGS streamgages across the region. Particularly hard hit was the Chattahoochee River Basin, west of Metropolitan Atlanta. At USGS gaging station 02336000 on the Chattahoochee River at Atlanta, Georgia, a peak flow of 40,900 cubic feet per second (ft^3/s) and a peak stage of 28.12 feet (ft) were recorded on September 21. This was the highest stage in 81 years of continuous record at the gage. The September 22 peak flow represented between a 1- and 0.5-percent annual exceedance probability (100- to 200-year) flood. Station 02337000 on Sweetwater Creek near Austell, Georgia, recorded a stage of 30.82 ft with a peak flow of 31,500 ft^3/s, which resulted in an exceedance probability much greater than the 0.2-percent (500-year) flood level and caused the closure of Interstate 20 for more than a day. Hardest hit was the Dog River Basin in Douglas County, where floodwaters rose 12 ft above USGS streamgage 02337410. The Dog River crested at a stage of 33.83 ft with a streamflow estimate of 59,900 ft^3/s, which was almost six times the 100-year flood. Upstream from Atlanta, Lake Sidney Lanier rose almost 4 ft in a 48-hour period following the storm and is credited for preventing record flood levels in Atlanta (James Hathorn, U.S. Army Corps of Engineers, oral commun., November 6, 2009).

Significant flooding occurred in the headwaters of the Altamaha River Basin to the east of Atlanta. At USGS station 02207120 on the Yellow River at GA 124, near Lithonia, Georgia, the highest ever peak stage determined from surveys was 27.47 ft on September 22, with a peak flow of 16,500 ft^3/s.

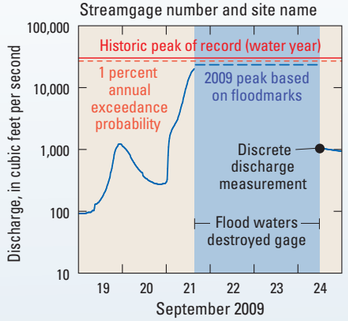
Water flowing over the road from Allatoona Creek at Stilesboro Road near Acworth, Cobb County, Georgia, September 21, 2009. Photo by Andrew E. Knaak, USGS.

U.S. Department of the Interior
U.S. Geological Survey

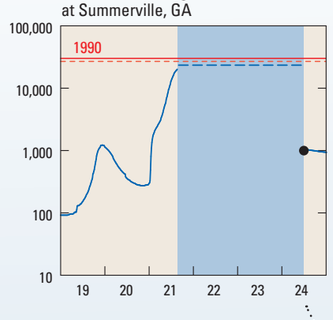
Fact Sheet 2010–3061
July 2010

EXPLANATION

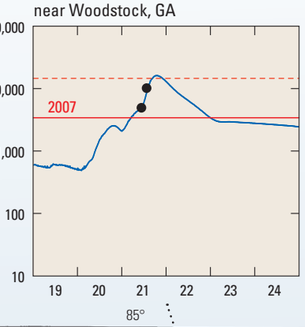
Streamgage number and site name



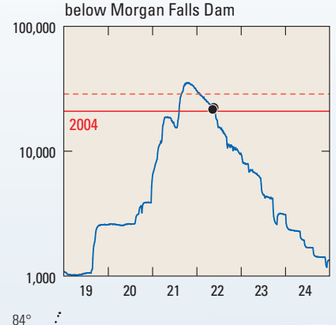
02398000 Chattooga River at Summerville, GA



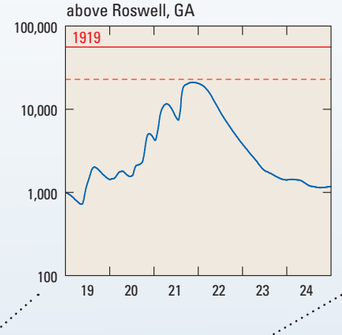
02392780 Little River at GA 5 near Woodstock, GA



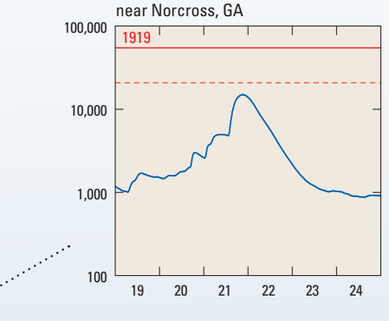
02335815 Chattahoochee River below Morgan Falls Dam



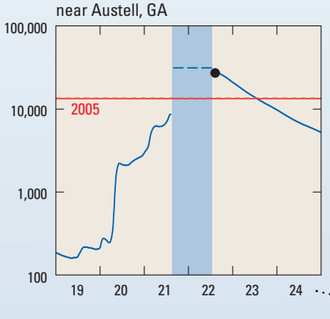
02335450 Chattahoochee River above Roswell, GA



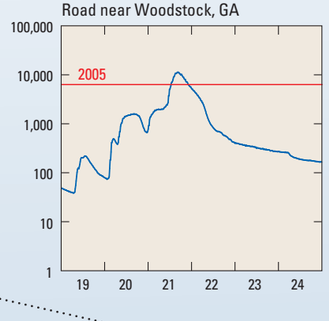
02335000 Chattahoochee River near Norcross, GA

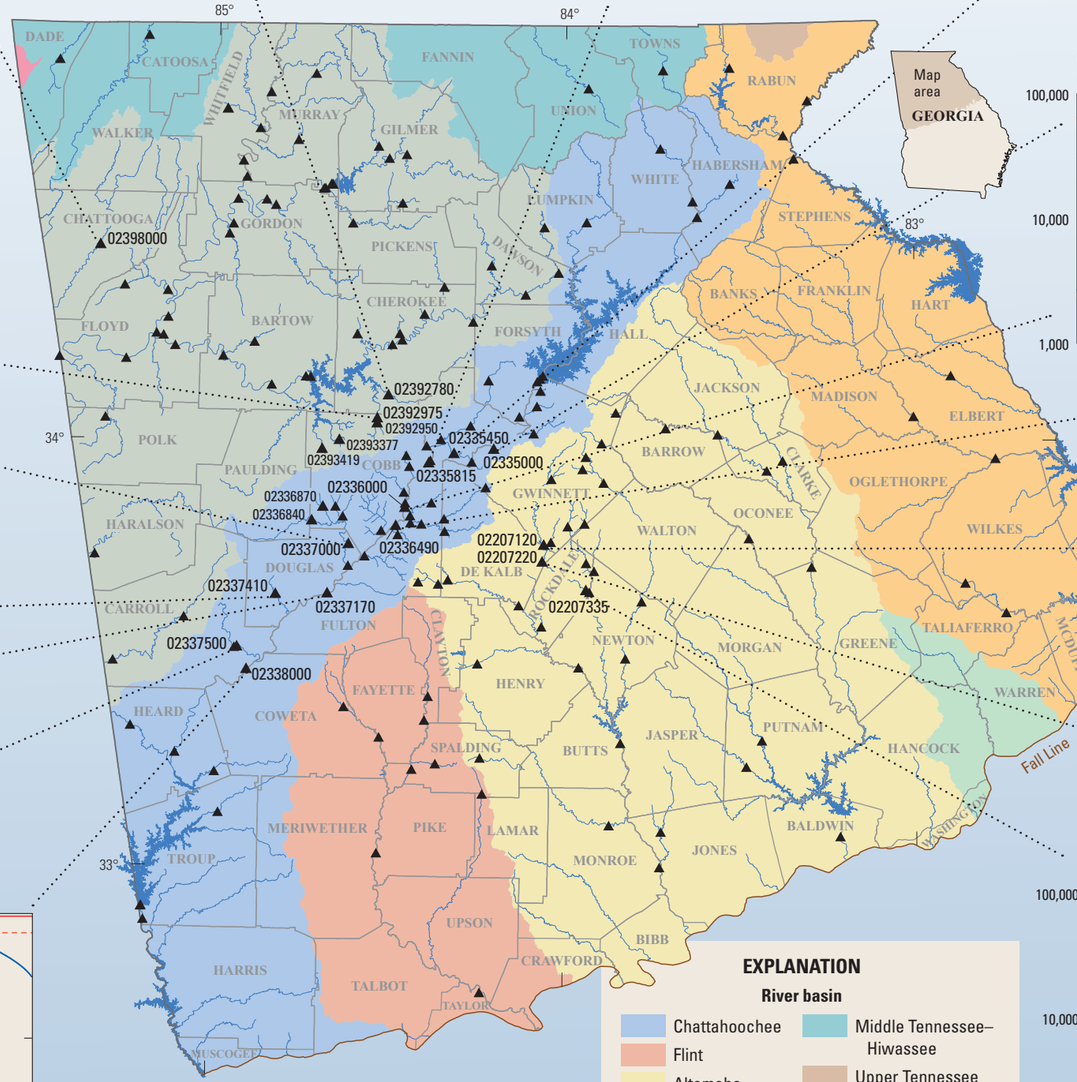


02337000 Sweetwater Creek near Austell, GA



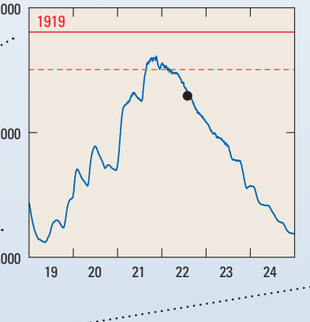
02392975 Noonday Creek at Shallowford Road near Woodstock, GA



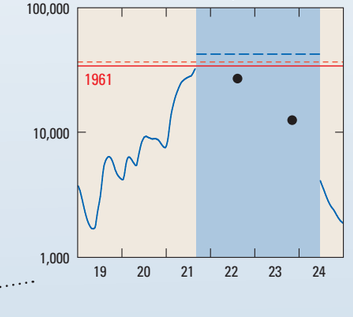


Map area

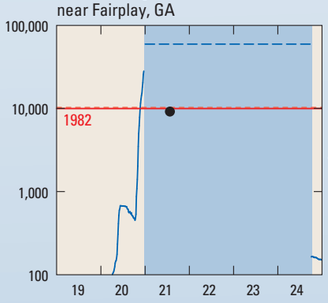
02336000 Chattahoochee River at Atlanta, GA



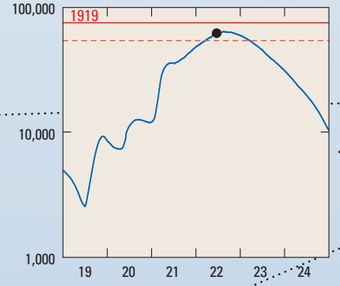
02336490 Chattahoochee River at GA 280 near Atlanta, GA



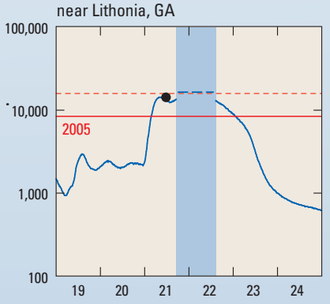
02337410 Dog River at GA 5 near Fairplay, GA



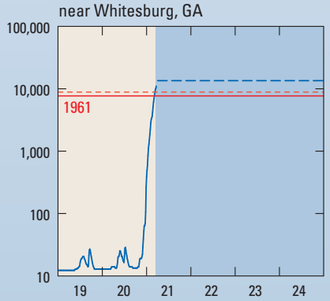
02337170 Chattahoochee River near Fairburn, GA



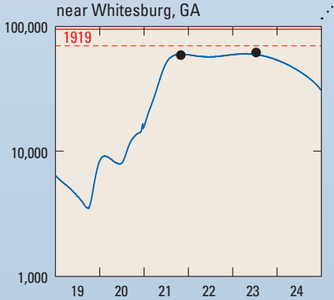
02207120 Yellow River at GA 124 near Lithonia, GA



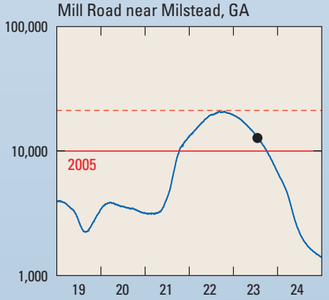
02337500 Snake Creek near Whitesburg, GA



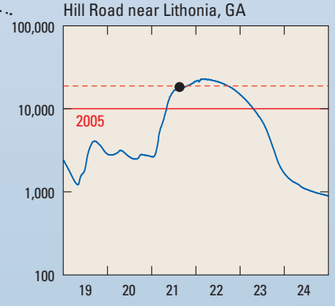
02338000 Chattahoochee River near Whitesburg, GA



02207335 Yellow River at Gees Mill Road near Milstead, GA



02207220 Yellow River at Pleasant Hill Road near Lithonia, GA



Fall Line

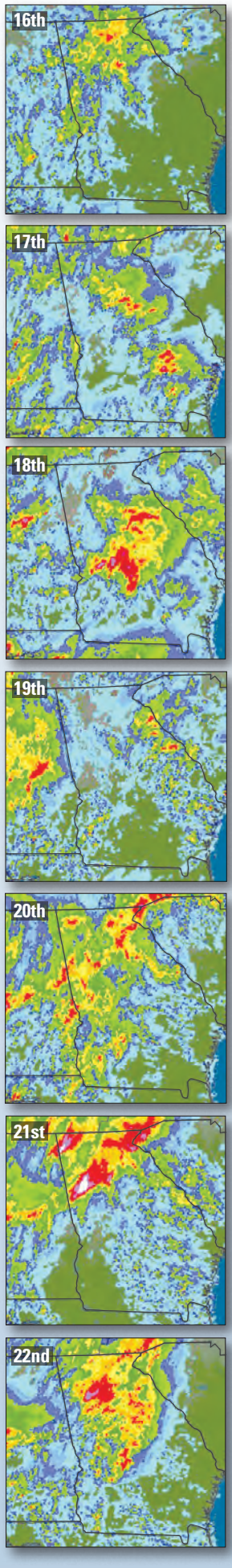
EXPLANATION

River basin

- Chattahoochee
- Flint
- Altamaha
- Savannah
- Ogeechee
- Middle Tennessee–Hiwassee
- Upper Tennessee
- Coosa–Tallapoosa
- Guntersville Lake

▲ **USGS streamgaging station**

Base modified from U.S. Geological Survey 1:100:000-scale digital files



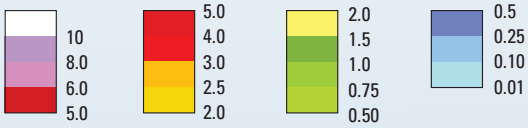
The Coosa and Tennessee River Basins also were flooded in many locations. The USGS streamgages on Allatoona, Noonday, and Butler Creeks—all tributaries to Allatoona Lake—recorded peak flows with magnitudes far greater than 0.2-percent (500-year) floods. Although these flows caused Allatoona Lake to rise to more than 13 ft above the full-pool level, the dam still saved the downstream community of Rome, Georgia (James Hathorn, U.S. Army Corps of Engineers, oral commun., November 6, 2009).

During this historic flood, more than 50 USGS streamgages throughout north Georgia recorded flows above the highest ever measured, and 20 USGS streamgages were knocked out of operation by floodwaters. USGS field personnel performed flood measurements to extend streamflow ratings that allowed for more accurate NWS forecasts. All 20 streamgages were restored to operational status within 5 days, however.

Lessons learned from this flood include the need for more effective communication of the latest river information by Federal agencies with flood-threatened communities. Communicating the flood threat in an easy, accessible manner would have helped emergency managers and the public greatly during this flood. In response, the USGS developed WaterAlert (*http://water.usgs.gov/wateralert*) to send notifications of flood events by way of text and e-mail. Also in development are real-time flood-inundation maps to give the hydrograph spatial context by way of a map-based product.

EXPLANATION

Observed daily precipitation, in inches



Daily precipitation images for September 2009 from the NWS (2009). USGS raingages provide ground verification and calibration for the NWS radar system. The radar imagery provides estimates of rainfall between the raingages to better characterize the total rainfall for a watershed.

References

National Weather Service, 2009, Advanced Hydrologic Prediction Service—Precipitation: U.S. Department of Commerce, National Oceanic and Atmospheric Administration, accessed in January 2010 at *http://water.weather.gov/precip/*.

National Weather Service, 2010, Service Assessments—Southeast United States Floods, September 18–23, 2009: Silver Spring, MD, U.S. Department of Commerce, National Oceanic and Atmospheric Administration, Office of Climate, Water, and Weather Services, accessed in May 2010 at *http://www.weather.gov/os/assessments/pdfs/se_floods10.pdf* .

Recorded flooding in September 2009 at selected USGS continuous-monitoring streamgages in northern Georgia.

Station identification	Station name	Date of peak (September 2009)	Peak flow (cubic feet per second)	Peak gage height	Annual exceedance probability (percent)
02207120	Yellow River at GA 124, near Lithonia, GA	22	16,500	27.47	1 to 0.5
02207220	Yellow River at Pleasant Hill Road, near Lithonia, GA	22	22,900	25.54	0.5 to 0.2
02207335	Yellow River at Gees Mill Road, near Milstead, GA	22	20,800	22.54	2 to 1
02335000	Chattahoochee River near Norcross, GA	21	14,900	14.51	Regulated
02335450	Chattahoochee River above Roswell, GA	21	21,100	11.96	Regulated
02335815	Chattahoochee River below Morgan Falls Dam, GA	21	35,500	827.01	Regulated
02336000	Chattahoochee River at Atlanta, GA	21	40,900	28.12	Regulated
02336490	Chattahoochee River at GA 280, near Atlanta, GA	21	42,300	35.98	Regulated
02336840	Sweetwater Creek at Brownsville Road, Powder Springs, GA	21	30,000	31.40	Exceeded 0.2
02336870	Powder Springs Creek near Powder Springs, GA	21	8,940	19.91	Exceeded 0.2
02337000	Sweetwater Creek near Austell, GA	22	31,500	30.82	Exceeded 0.2
02337170	Chattahoochee River near Fairburn, GA	22	63,900	30.65	1 to 0.5
02337410	Dog River at GA 5, near Fairplay, GA	21	59,900	33.83	Exceeded 0.2
02337500	Snake Creek near Whitesburg, GA	21	13,500	19.42	Exceeded 0.2
02338000	Chattahoochee River near Whitesburg, GA	23	60,600	29.74	Regulated
02392780	Little River at GA 5, near Woodstock, GA	21	16,100	20.80	1 to 0.5
02392950	Noonday Creek at Hawkins Store Rd, near Woodstock, GA	21	11,900	17.28	Exceeded 0.2
02392975	Noonday Creek at Shallowford Road, near Woodstock, GA	21	11,400	19.66	Exceeded 0.2
02393377	Butler Creek at Mack Dobbs Road, near Kennesaw, GA	21	6,760	14.27	Exceeded 0.2
02393419	Allatoona Creek at Stilesboro Rd, near Acworth, GA	21	16,600	23.90	Exceeded 0.2
02398000	Chattooga River at Summerville, GA	21	23,500	21.19	2

By Brian E. McCallum and Anthony J. Gotvald. For more information, contact the Georgia Water Science Center at 770-903-9100 or http://ga.water.usgs.gov.