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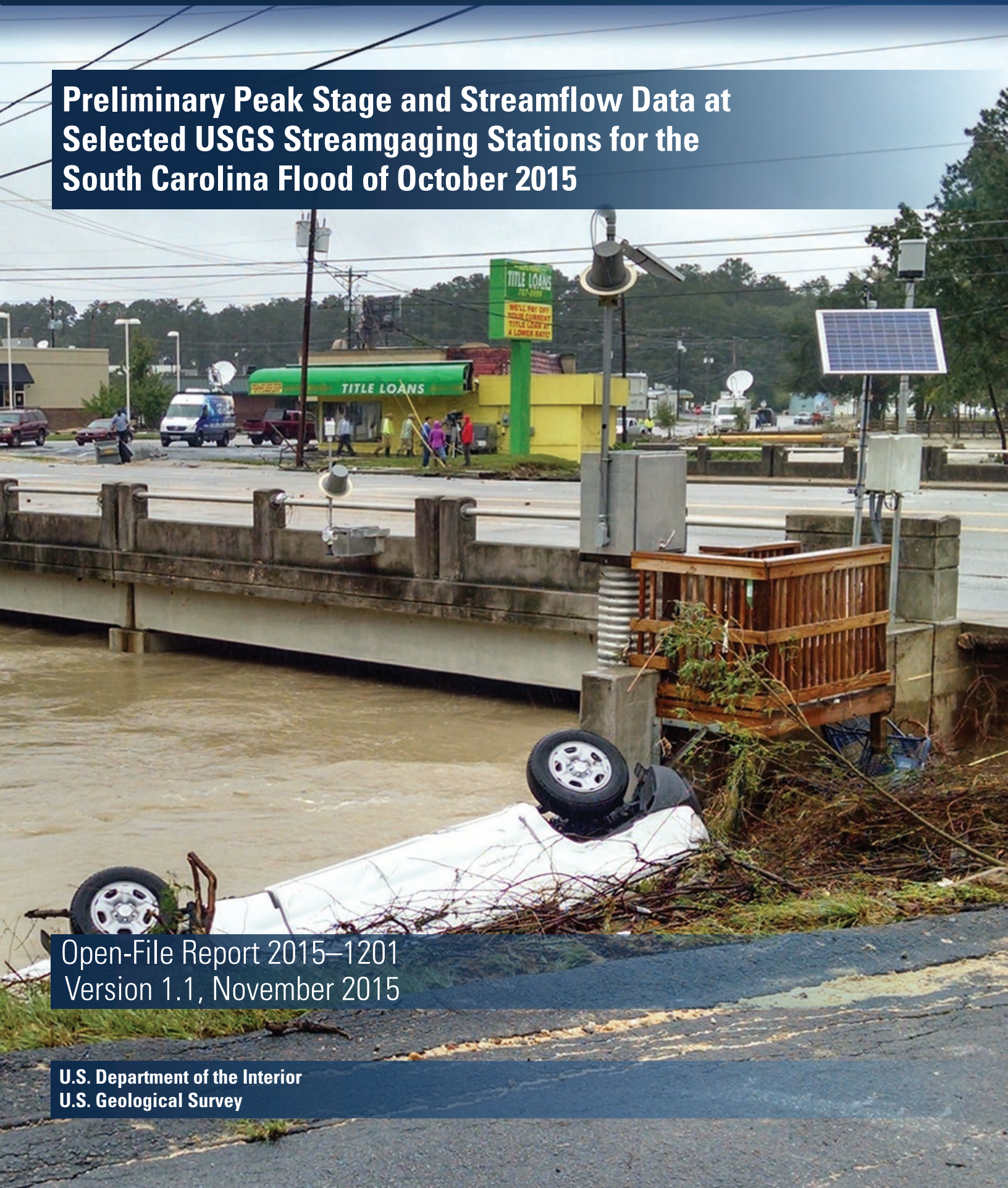
Preliminary Peak Stage and Streamflow Data at Selected USGS Streamgaging Stations for the South Carolina Flood of October 2015



Open-File Report 2015–1201
Version 1.1, November 2015

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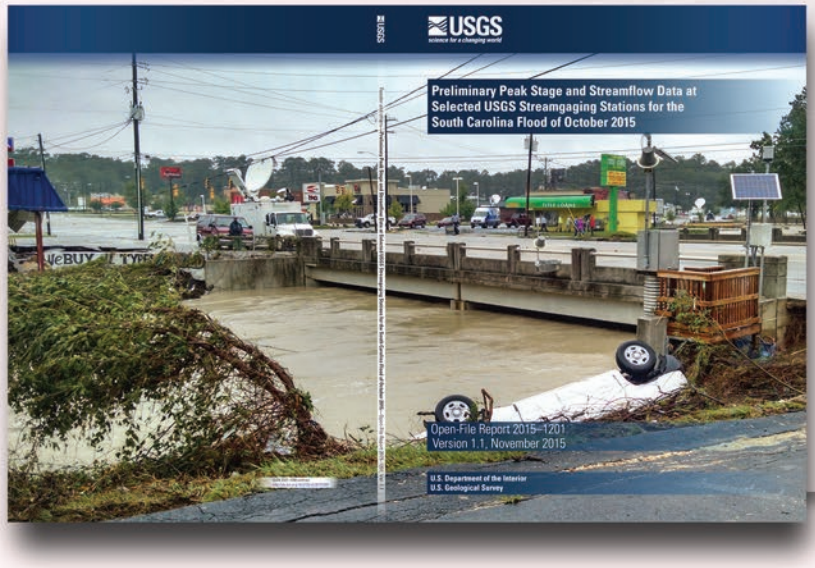

Cover: Left bank looking upstream toward U.S. Geological Survey station 02169570, Gills Creek at Columbia, S.C. Streamgaging station is located on the downstream side of the bridge on U.S. Highways 378 and 76 (Devine St.).

Photograph: Dale F. Skipper, U.S. Geological Survey, October 5, 2015

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U.S. Department of the Interior
SALLY JEWELL, Secretary

U.S. Geological Survey
Suzette M. Kimball, Acting Director

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Conversion Factors

Inch/Pound to SI

Multiply	By	To obtain
	Length	
foot (ft)	0.3048	meter (m)
mile (mi)	1.609	kilometer (km)
	Area	
square mile (mi^2)	259.0	hectare (ha)
square mile (mi^2)	2.590	square kilometer (km^2)
	Flow rate	
foot per second (ft/s)	0.3048	meter per second (m/s)
cubic foot per second (ft^3/s)	0.02832	cubic meter per second (m^3/s)

Preliminary Peak Stage and Streamflow Data at Selected USGS Streamgaging Stations for the South Carolina Flood of October 2015

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Abstract

Heavy rainfall occurred across South Carolina during October 1–5, 2015, as a result of an upper atmospheric low-pressure system that funneled tropical moisture from Hurricane Joaquin into the State. The storm caused major flooding from the central to the coastal areas of South Carolina. Almost 27 inches of rain fell near Mount Pleasant in Charleston County during this period. U.S. Geological Survey streamgages recorded peaks of record at 17 locations, and 15 other locations had peaks that ranked in the top 5 for the period of record. During the October 2015 flood event, U.S. Geological Survey personnel made about 140 streamflow measurements at 86 locations to verify, update, or extend existing rating curves, which are used to compute streamflow from monitored river stage.

Introduction

The presence of an upper atmospheric low-pressure system over the Southeast funneled tropical moisture from Hurricane Joaquin into South Carolina during the period October 1–5, 2015, causing historic rainfall amounts (http://www.weather.com/news/news/stunning-meteorological-images-october-2015-flooding, accessed October 8, 2015) (fig. 1). Widespread, heavy rainfall resulted in major flooding in areas from the central part of the State (fig. 2) to the coast (fig. 3). Some areas experienced more than 20 inches of rainfall over the period October 1–5, 2015 (fig. 4; National Weather Service, written commun., October 7, 2015). One USGS raingage at Black River at Kingstree, South Carolina (USGS station 02136000), recorded 22.89 inches of rain for the period October 1–5, 2015 (fig. 5). Flooding from

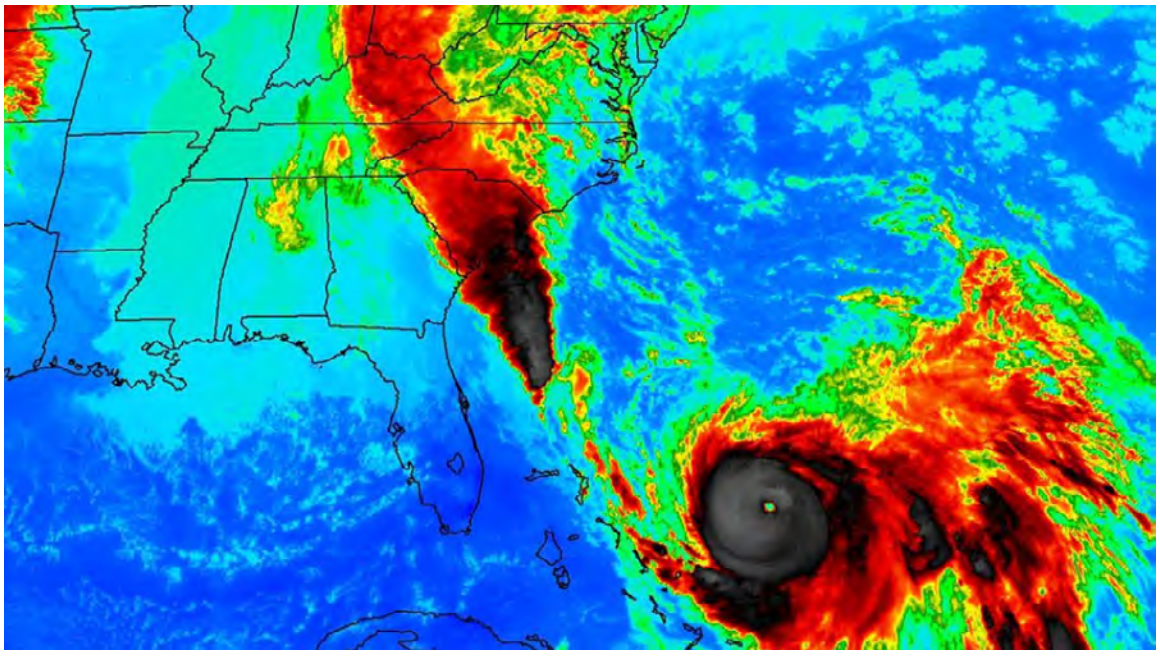

Figure 1. Infrared satellite image of the intense rainfall being funneled into South Carolina during the morning of October 3, 2015. (NASA)

Figure 2. Aerial photograph of flooding in Columbia, South Carolina, at the confluence of the Broad and Saluda Rivers, looking upstream. (Photograph by the South Carolina Army National Guard, October 5, 2015)

Figure 3. Aerial photograph of flooding in Charleston, South Carolina, and surrounding areas, October 5, 2015. (Photograph by Petty Officer 1st Class Stephen Lehmann, U.S. Coast Guard)

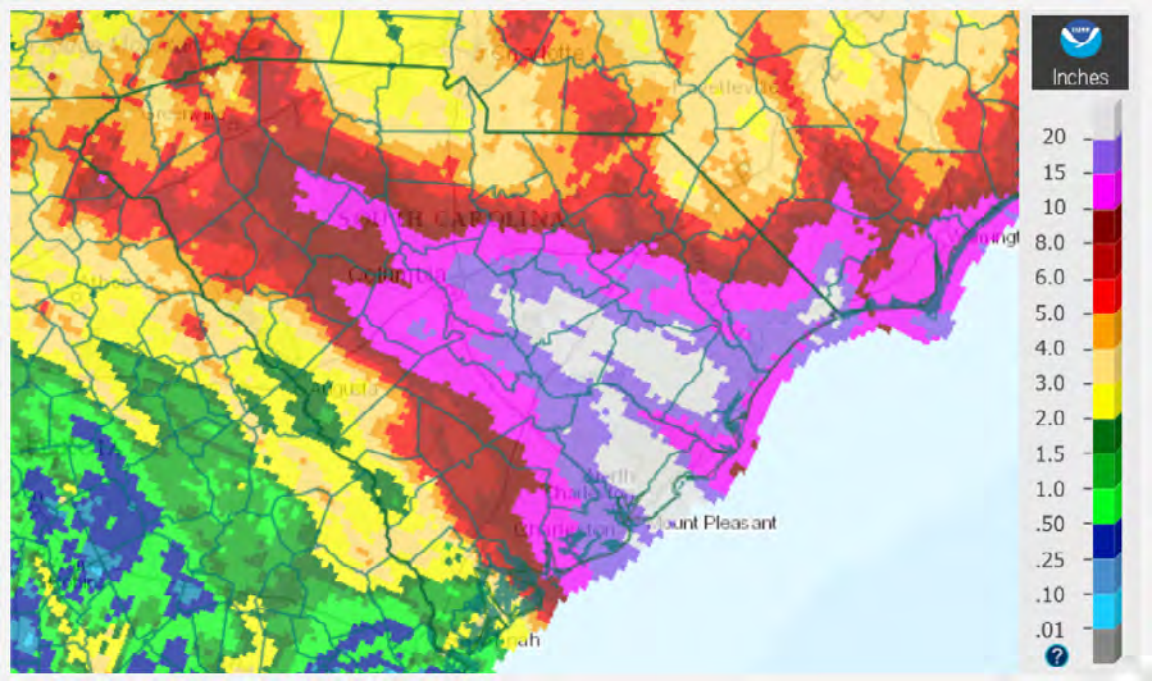

Figure 4. Preliminary National Weather Service rainfall totals for October 1–5, 2015. (National Weather Service)

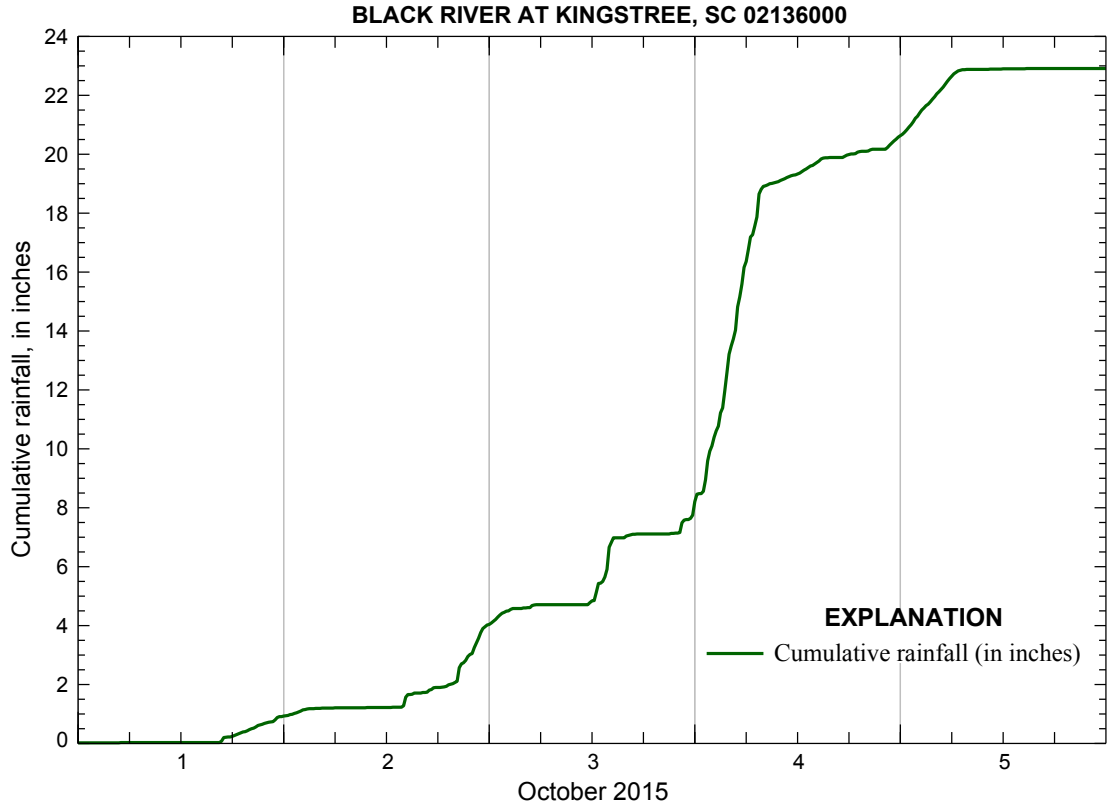

Figure 5. Black River at Kingstree, South Carolina (U.S. Geological Survey station 02136000), cumulative total rainfall for October 1–5, 2015.

this event resulted in at least 17 fatalities (http://www.reuters.com/article/2015/10/07/us-usa-weather-floods-idUSKCN0S11E720151007, accessed October 8, 2015). South Carolina officials have been quoted in media outlets as saying agricultural losses could conservatively be at least $300 million, with cleanup costs across the State that could top $1 billion (http://www.latimes.com/nation/la-na-south-carolina-postcards-20151008-htmlstory.html, accessed October 9, 2015).

The U.S. Geological Survey (USGS) collects and disseminates streamflow data at more than 9,800 streamgages nationwide. In South Carolina, the USGS operates about 170 real-time streamgages, in cooperation with numerous local, State, and Federal agencies, monitoring gage height, streamflow, reservoir elevations, and tidal flow (fig. 6; http://waterdata.usgs.gov/sc/nwis/current/?type=flow). Streamflow data collection serves a variety of purposes including providing information for flood forecasts and documenting flood extent and levels. Leading up to and during flooding, streamflow data are vital for flood warning, forecasting, and emergency management. The long-term, systematic streamflow data are used to assess risk and to mitigate flooding through flood-plain management and in the design or repair of infrastructure (for example, roads, bridges, reservoirs, and pipelines), houses, and buildings.

Purpose and Scope

The purpose of this report is to provide preliminary information documenting the peak streamflows and stages for those rivers and streams in South Carolina that are part of the USGS real-time streamgaging network impacted by the historic rainfall that occurred October 1–5, 2015. The 2015 flood peak flows are placed into context by ranking the October 2015 flood peaks with other annual flood peaks for the period of record at each streamgage as well as historic floods that might precede USGS systematic records. National Weather Service (NWS) flood stage information is also provided for sites where a NWS flood stage has been defined (table 1, at the back of the report).

Study Area

South Carolina is located on the South Atlantic slope adjacent to the Atlantic Ocean, has an area of 31,055 square miles, and is generally divided into three major physiographic provinces: Blue Ridge, Piedmont, and Coastal Plain (Cooke, 1936). The Blue Ridge is a mountainous region of steep terrain with some stream gradients greater than 250 feet (ft) per mile (Bloxham, 1979). Land-surface elevation ranges from 1,000 to more than 3,500 ft above sea level.

The Piedmont is characterized by rolling hills, elongated ridges, and moderately deep to shallow valleys. Piedmont land-surface elevations range from about 1,000 ft above sea level at the Blue Ridge foothills to about 400 ft above sea level at the Fall Line, which is the name given to the boundary between the Piedmont and Coastal Plain regions.

About two-thirds of the State is in the Coastal Plain region (Badr and others, 2004). In the Coastal Plain, bedrock is overlain by sediments, which thicken from just a few feet near the Fall Line to about 3,800 feet at the southernmost corner of the State. At the Fall Line, a narrow, hilly region, known as the Sand Hills, is located where the Piedmont descends to the Coastal Plain (National Oceanic and Atmospheric Administration, 2015). The Sand Hills region is about 30 to 40 miles wide with elevations ranging from about 500 to 200 feet. The lower part of the Coastal Plain consists of low-elevation, flat plains with many swamps, marshes, dunes, barrier islands, and beaches, which typically are lower, flatter, and more poorly drained than the upper part of the Coastal Plain (Omernik, 1987).

In South Carolina, precipitation is principally delivered by storms that move inward from the Gulf of Mexico, the Caribbean Sea, and the Atlantic Ocean (U.S. Geological Survey, 1985). Additionally, local and upwind land surfaces, as well as lakes and reservoirs, provide moisture to the atmosphere by evaporation. In a normal year, monthly precipitation is highest in the winter, reaching a maximum in early March and then decreasing sharply in April and May. Annual rainfall in South Carolina averages as much as 80 inches in the highest elevations of the Blue Ridge to less than 45 inches in parts of the upper portion of the Coastal Plain and Sand Hills regions (National Oceanic and Atmospheric Administration, 2015). In general, the Blue Ridge region receives an average of about 56 inches or more of annual rainfall, the upper portion of the Piedmont about 47 to 55 inches, the lower portion of the Piedmont about 45 to 48 inches, the upper portion of the Coastal Plain about 44 to 49 inches, and the lower portion of the Coastal Plain about 46 to 53 inches. Fall is typically a dry season (except in instances when tropical cyclones occur) with minimal statewide precipitation during October and November.

General Weather Conditions and Precipitation That Contributed to the October 2015 Flooding

The combination of a slow-moving, upper-level low over the Southeastern United States, an area of low pressure at the surface located along a stationary frontal boundary, and a persistent plume of tropical moisture associated with Hurricane Joaquin (fig. 1) produced historic rainfall over portions of South Carolina during the period October 1–5, 2015 (L. Vaughn, National Oceanic and Atmospheric Administration, written commun., October 8, 2015). This system caused significant widespread freshwater flooding throughout the State. Preliminary data show the highest rainfall total of 26.9 inches near Mount Pleasant, S.C. (Charleston County) (fig. 4). Preliminary data also show the Charleston Airport rainfall totals set new records for the

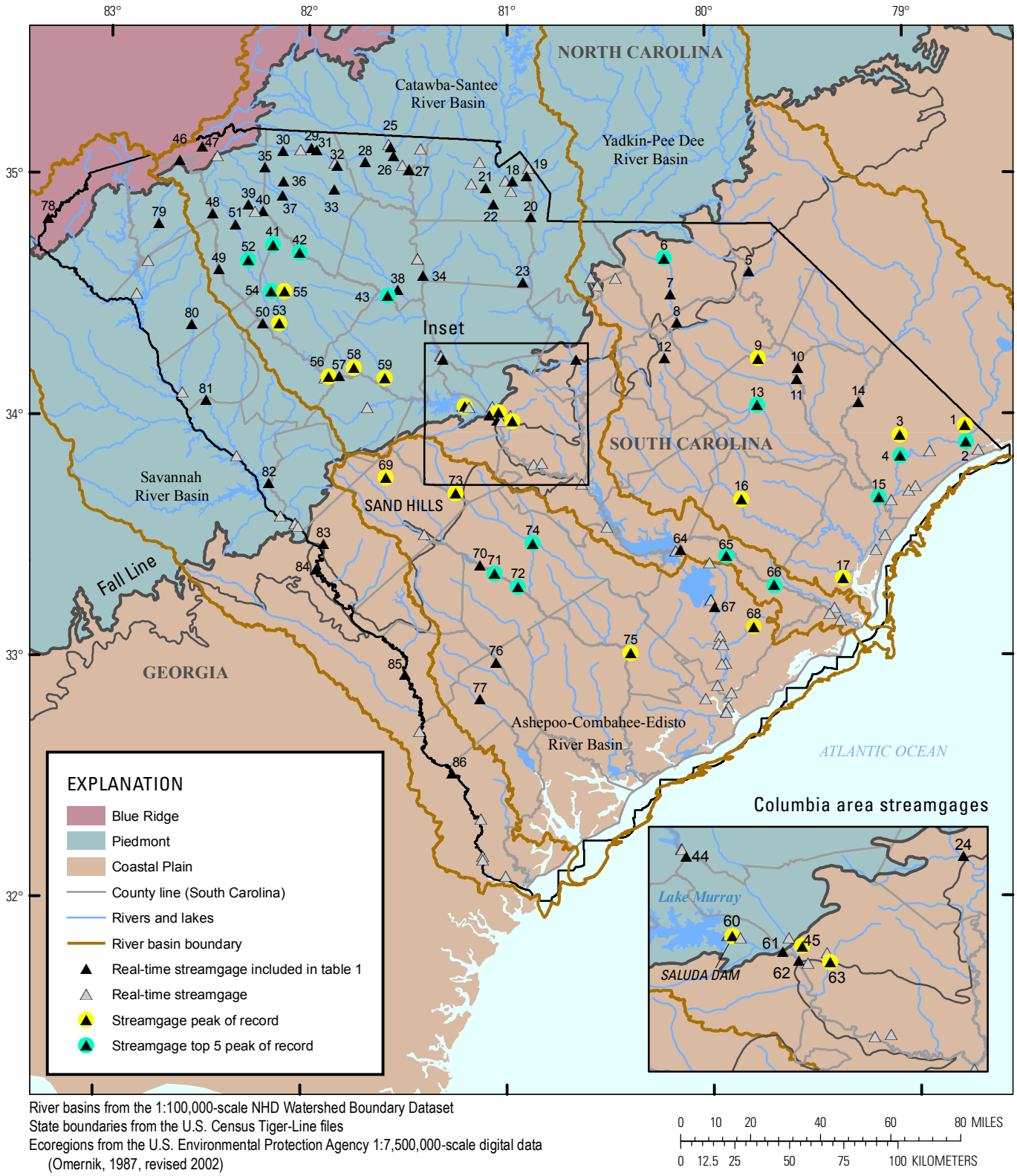

Figure 6. USGS real-time streamgages in South Carolina.

greatest 1-, 2-, 3-, and 4-day totals of 11.50, 14.31, 15.92, and 17.29 inches, respectively (National Weather Service, written commun., October 5, 2015). The previous record totals were 10.52 inches on September 21, 1998; 11.10 inches on June 10–11, 1973; 11.95 inches on June 9–11, 1973; and 16.56 inches on June 7–11, 1973. The downtown Charleston rainfall for October 3, 2015, was the third highest 1-day total rainfall of 9.25 inches with the highest 1-day total rainfall of 10.38 inches occurring on June 11, 1973; October 3–4, 2015, was tied for the highest 2-day total rainfall of 11.74 inches, which occurred on June 10–11, 1973; October 1–3, 2015, set a new record for the greatest 3-day total rainfall of 13.80 inches with the previous high being 12.39 inches on June 9–11, 1973; and October 1–4, 2015, set a record for the greatest 4-day total rainfall of 16.29 inches with the previous high being 13.80 inches on June 7–11, 1973. The Columbia Metropolitan Airport rainfall on October 4, 2015, set a new record for the greatest 1-day rainfall of 6.71 inches, breaking the previous record of 5.79 inches set on July 9, 1959. In addition, the October 3–4, 2015, rainfall set a new record for the greatest 2-day rainfall at the airport of 10.28 inches, breaking the previous record of 7.69 inches on August 16–17, 1949, (http://www.weather.gov/cae/HistoricFloodingOct2015.html, accessed October 13, 2015). The historic rainfall also resulted in moderate to major river flooding at selected NWS river forecast points across South Carolina. At least 20 NWS river forecast locations exceeded established NWS flood stages (table 1).

The impacts of this event were widespread across South Carolina. Approximately 410 roads or bridges were closed during the event including 74 miles of I-95 between I-26 and I-20 (U.S. Department of Interior Office of Emergency Management, written commun., October 8, 2015). At least 17 minor dam failures resulted from the rainfall event. Some major reservoirs, such as the Saluda Dam at Lake Murray, initiated flood control releases. South Carolina emergency management officials reported that more than 200 water rescues were conducted. In addition to flooding, saturated soils along with moderate to strong east/northeasterly winds contributed to the downing of trees and power lines across portions of South Carolina. As a result, about 50,000 residents lost power during the storm as of Monday, October 5, 2015 (L. Vaughn, National Oceanic and Atmospheric Administration, written commun., October 8, 2015).

Methods Used to Collect Streamflow Data

In this report, streamflow data refer to both stage or gage height (in feet) and volumetric streamflow (in cubic feet per second). These data were collected systematically at continuous record streamgages or from field measurements of stage in cases where the gage structure or equipment was damaged by flood waters.

U.S. Geological Survey streamgages operate autonomously by collecting data at regular time intervals (typically either 5 or 15 minutes) depending on watershed size and flashiness of the stream. Typically, streamgages automatically record stage data. The stage data are collected using a variety of methods (float, submersible pressure transducer, non-submersible pressure transducer, or non-contact radar). More information about how USGS streamgages work is available in Lurry (2011). Although stage data are important, streamflow data are often more important for such purposes as streamflow forecasting for flood warning, water-quality loading, flood-frequency analysis, and flood-mitigation planning. Computation of streamflow at a streamgage requires periodic measurements of streamflow over a range of stage. The relation defined between stage and measured streamflow is used to convert the stage data to streamflow. USGS personnel (fig. 7) measure stream velocity and stream depth onsite to determine near-instantaneous streamflow (Turnipseed and Sauer, 2010).

In most cases, the correlation is a simple stage-streamflow relation or rating curve. After construction of the rating curve, continued periodic measurements of streamflow are required at various stages to verify or support changes to a station rating curve. (fig. 8). During the October 2015 flood, USGS personnel made about 140 streamflow measurements at 86 locations in South Carolina to verify, update, or extend existing rating curves.

In some cases, direct measurements of streamflow during a flood are not possible or are impractical. In those instances, indirect measurement methods can be used (Benson and Dalrymple, 1967), whereby water-surface profiles determined by high-water marks and channel roughness and geometry are used in hydraulic equations based on the principles of conservation of energy, conservation of momentum, and continuity to compute the peak streamflow for that particular flood. The high-water marks and channel geometry are determined by

Figure 7. U.S. Geological Survey personnel making a streamflow measurement at station 02110701, Crabtree Swamp at Conway, South Carolina, using an acoustic Doppler current profiler.

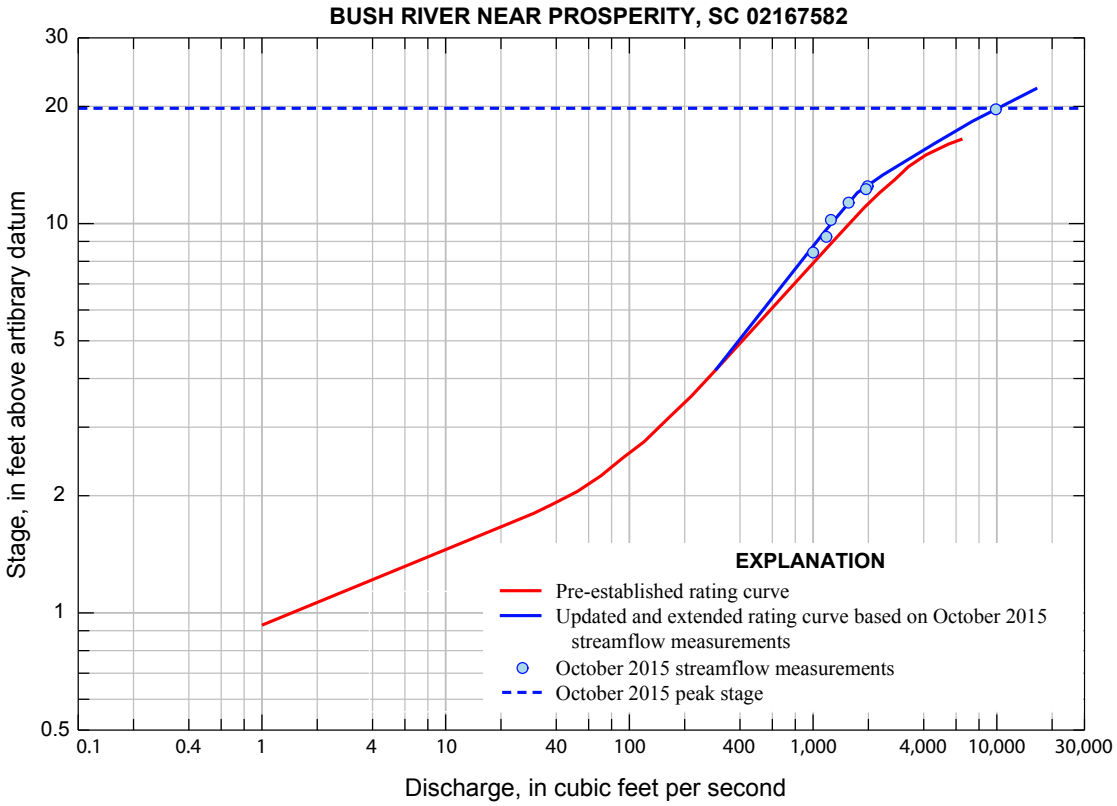

Figure 8. Rating curves developed for use before (red) and after (blue) the October 2015 flood for Bush River near Prosperity, South Carolina (U.S. Geological Survey station 02167582), showing streamflow measurements made during the event.

field survey. Roughness is subjectively determined on the basis of bed material, cross-section irregularities, depth of flow, vegetation, and channel alignment. The USGS assigns uncertainty/accuracy estimates to each indirect measurement on the basis of the hydraulic and geometry conditions found at each field site (Benson and Dalrymple, 1967; Dalrymple and others, 1967; Hulsing, 1967; Matthai, 1967; Bodhaine, 1968). In other cases, high-water marks are documented for the purpose of recording the depth of the flood waters (fig. 9).

Figure 9. U.S. Geological Survey field crews conducting surveys of high-water marks to document the depth of flood waters in Lexington County, South Carolina, for the October 2015 flood.

Peak Streamflow and Stage

Peak streamflow and stage during the October 2015 flood for 86 streamgages are listed in table 1 (at the back of the report), and their site locations are shown in figure 6. The streamgages included in table 1 were chosen because (1) both peak stage and peak streamflow for the October 2015 flood event were monitored at the site, and (2) historic streamflow and (or) stage data were available for comparison. Where the full period of record of peak streamflow is available, comparisons were made on peak streamflow. However, at some sites the peak stage for this event may be lower than a previous peak stage due to backwater conditions, datum changes, or change in the upper end of the rating curve.

The rank for the 2015 peak streamflow at selected streamgages for the period of record is presented in table 1. If for the previous maximum stage the maximum streamflow was undetermined, the rank was based on the peak stage comparison from the flood of October 2015 instead of the peak streamflow and is indicated as such in the Remarks column of table 1. Seventeen of the 86 streamgages had new peaks of record. Of the 61 stations with at least 20 years of record, eight had new peaks of record: 02136000, Black River at Kingstree (87 years) (fig. 10); 02136361, Turkey Creek near Maryville (21 years); 02162093, Smith Branch at North Main Street at Columbia (38 years); 02167450, Little River near Silverstreet (24 years); 02167582, Bush River near Prosperity (24 years); 02168504, Saluda River below Lake Murray Dam near Columbia (26 years); 02169570, Gills Creek at Columbia (50 years); and 02175000, Edisto River near Givhans (81 years).

Along with the 17 streamgages that had new peaks of record, an additional 15 streamgages recorded new peaks that ranked in the top 5 for the period of record. For stations with at least 20 years of record, 13 recorded peaks ranked in the top 5 for the period of record.

Comparison of the October 2015 Flood to Past Floods

In the Pee Dee River Basin, a new period of record peak occurred on October 6, 2015, for station 02136000, Black River at Kingstree, with a stage of 22.65 ft and corresponding streamflow of 83,700 cubic feet per second (ft^3/s) (fig. 10). This was the largest peak in 87 years; the previous maximum peak occurred on June 14, 1973. Annual maximum peak stage data contained in reports of the National Weather Service indicate the October 2015 peak is the largest since 1893. Although not the peak of record, the peak on October 6, 2015, at station 02132000, Lynches River at Effingham, was the third largest peak for the 88 years of record; the maximum peak of record occurred on September 22, 1945. Annual maximum peak stage data contained in reports of the National

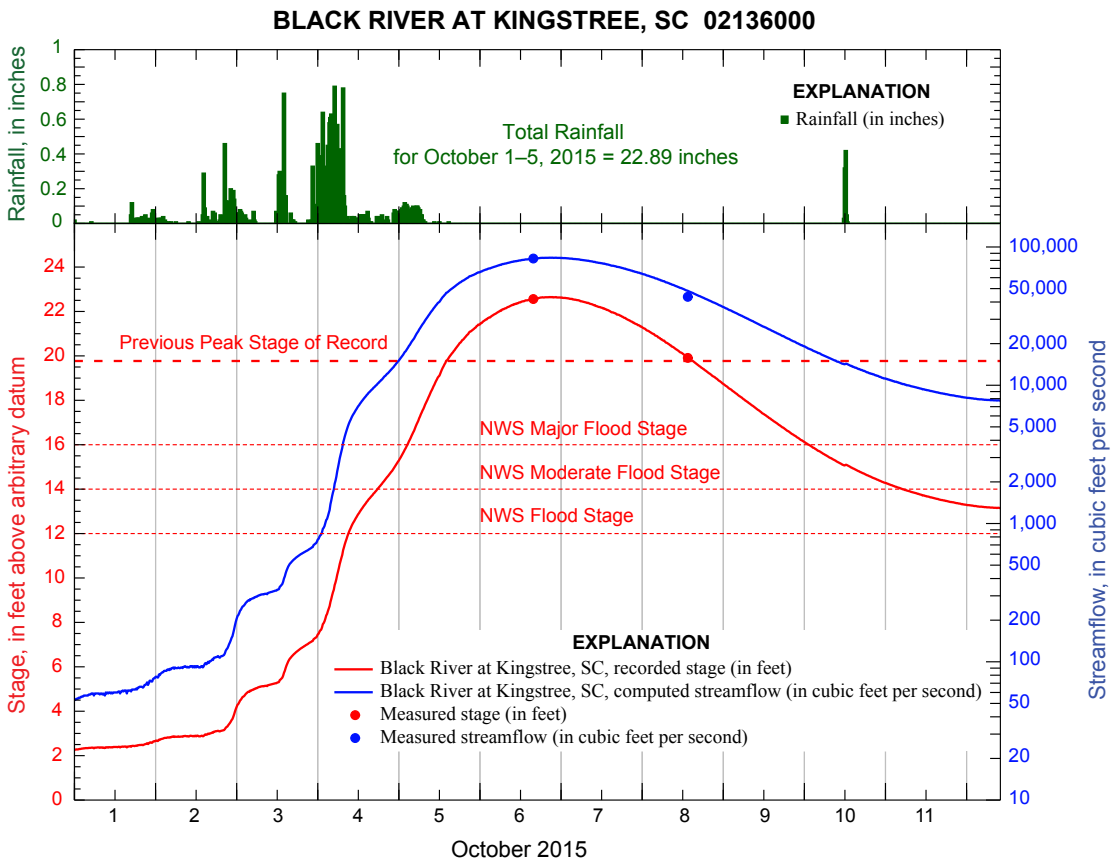

Figure 10. Black River at Kingstree, South Carolina (U.S. Geological Survey station 02136000) stage and streamflow hydrographs and associated rainfall for October 1–11, 2015.

Weather Service indicate the October 2015 peak is the third largest since 1892.

In the Waccamaw River Basin, annual peak stage and streamflow data have been collected at station 02110500, Waccamaw River near Longs, since 1951. For the 2015 flood, the peak occurred on October 6, 2015, and was the second largest peak in 64 years of record. The maximum peak of record occurred on September 22, 1999, and was associated with rainfall from the passage of Hurricane Floyd.

Station 02169500, Congaree River at Columbia, has one of the longest records of annual peak flows of the USGS streamgages in South Carolina, with systematic records of annual peak streamflow from 1892 to present. Additional information for a flood in 1852 is available; therefore, the site is of great value in placing the current flood in context to other historical floods. The Congaree River is formed by the convergence of the Saluda and Broad Rivers at Columbia, SC. The Saluda River is regulated by the Saluda Dam, which was completed in 1929 (Conrads and others, 2008). Low-head dams on the Broad River have regulated low streamflows since the late 1880s and early 1900s, but flood flows are essentially unregulated. The Broad River Basin accounts for approximately two-thirds of the drainage area for the Congaree River at Columbia station.

Conrads and others (2008) assessed the impact that the Saluda Dam has had on the flood frequency of flows on the Congaree River and concluded that the 1-percent chance flood (also referred to as the 100-year flood) is likely reduced by about 18 percent due to regulation on the Saluda River. Consequently, comparison of major floods that have occurred on the Congaree River after construction of the Saluda Dam with those prior to the construction of the Saluda Dam provides insightful information with respect to historical floods. The Congaree River at Columbia peaked at 185,000 ft^3/s at a peak stage of 31.8 ft on October 4, 2015. When compared to the historical flood record, this peak ranks eighth out of 123 years of record with the peak of record being 364,000 ft^3/s at a peak stage of 39.8 ft on August 27, 1908. The last flood to exceed the October 2015 peak at the Congaree River at Columbia site occurred on April 8, 1936, when the river peaked at 231,000 ft^3/s at a peak stage of 33.3 ft.

For a historical perspective on the floods caused by the heavy rainfall during October 1–5, 2015, a chronology of major floods in South Carolina since 1893 is presented in table 2 (at the back of the report) (U.S. Geological Survey, 1985; http://sc.water.usgs.gov/publications/pdf/SCFloodsandDroughts1893-2002.pdf; http://www.dnr.sc.gov/climate/sco/Tropics/hurricane_tracks_affecting_sc.php.)

Summary

During October 1–5, 2015, flooding on numerous streams and rivers from the central to the coastal areas of South Carolina resulted in at least 17 fatalities. South Carolina officials have been quoted in media outlets as saying agricultural losses could conservatively be at least $300 million, with cleanup costs across the State that could top $1 billion. The flooding was the result of large rainfall amounts, including nearly 27 inches of rain in Charleston County. On October 4, 2015, rainfall amounts at the Columbia Metropolitian Airport set a new record for the greatest 1-day rainfall of 6.71 inches, breaking the previous record of 5.79 inches set on July 9, 1959.

Preliminary peak streamflow and stage data, collected by the U.S. Geological Survey (USGS), are documented in this report. New peak streamflow records were set at 17 USGS streamgages, with an additional 15 USGS streamgages having October 2015 peaks that ranked them in the top 5 for the period of record. In the Pee Dee River Basin, a new peak of record was recorded on October 6, 2015, for station 02136000, Black River at Kingstree—the largest peak for the 87 years of record available. Annual maximum peak stage data contained in reports of the National Weather Service indicate the October 2015 peak is the largest since 1893. Although not the peak of record, the peak on October 6, 2015, at station 02132000, Lynches River at Effingham, was the third largest peak for the 88 years of record with the maximum peak of record occurring on September 22, 1945. Annual maximum peak stage data contained in reports of the National Weather Service indicate the October 2015 peak is the third largest since 1892. Peaks of record also were recorded near the city of Columbia at station 02162093, Smith Branch at North Main Street at Columbia, and station 02169570, Gills Creek at Columbia. During the October 2015 flood, U.S. Geological Survey personnel made about 140 streamflow measurements at 86 locations to verify, update, or extend existing rating curves.

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Table 1. Preliminary peak stage and streamflow data at selected streamgages in South Carolina for the flood of October 2015.

[mi², square miles; ft, feet; ft³/s, cubic feet per second; ---, data not available. Yellow shading indicates streamgages that recorded peaks of record for the October 2015 flood; green shading indicates streamgages that recorded peaks that ranked in the top 5 for the period of record; Period of record is given in water years, which is the period October 1–September 30 and is identified by the year in which the period ends; < in the Rank column indicates the peak flow for the October 2015 flood was less than the minimum annual peak flow of record]

Map site number (fig. 6)	Station number	Station name	Contributing drainage area (mi²)	Flood data								National Weather Service flood stage (ft)	Remarks
				Previous maximum streamflow			Beginning and ending water year for period of record	Flood of October 2015					
				Date of peak streamflow	Peak stage (ft)	Peak streamflow (ft³/s)		Rank / Number of annual peak streamflows in record	Date of peak streamflow	Peak stage (ft)	Peak streamflow (ft³/s)		
Yadkin-Pee Dee River Basin													
1	02110400	BUCK CREEK NEAR LONGS, SC	49.4	9/1/2006	14.15	1,540	2006-2013	1/8	10/5/2015	15.75	6,120	---	
2	02110500	WACCAMAW RIVER NEAR LONGS, SC	1,110	9/22/1999	17.94	28,200	1951-2014	2/64	10/6/2015	15.17	16,900	---	
3	02110701	CRABTREE SWAMP AT CONWAY, SC	17.8	5/14/2012	13.03	1,510	2006-2014	1/9	10/4/2015	20.2	3,120	---	Tidally influenced, which is overcome by basin runoff at high flows. Previous maximum stage of 16.53 ft occurred on 7/13/2013.
4	02110704	WACCAMAW RIVER AT CONWAY MARINA AT CONWAY, SC	1,440	9/25/1999	17.64	24,100	1995-2014	3/20	10/6/2015	15.93	14,500	11.0	Tidally influenced, which is overcome by basin runoff at high flows.
5	02130561	PEE DEE RIVER NR BENNETTSVILLE, SC	7,600	4/12/2003	89.94	124,000	1992-2014	16/23	10/5/2015	84.05	46,200	---	Regulated
6	02130840	BLACK CREEK BELOW CHESTERFIELD, SC	51.7	11/23/2006	10.07	1,480	2006-2014	4/9	10/3/2015	9.13	712	14.0	
7	02130900	BLACK CREEK NEAR MCBEE, SC	108	10/12/1990	13.07	4,500	1960-2014	16/55	10/4/2015	10.24	1,030	15.0	
8	02130910	BLACK CREEK NEAR HARTSVILLE, SC	173	10/13/1990	12.35	4,450	1961-2014	15/54	10/5/2015	8.75	971	---	
9	02130980	BLACK CREEK NEAR QUINBY, SC	438	9/9/2004	16.80	6,450	2002-2014	1/13	10/4/2015	16.81	6,530	10.0	
10	02131000	PEE DEE RIVER AT PEEDEE, SC	8,830	9/22/1945	33.30	220,000	1939-2014	55/76	10/8/2015	22.81	30,100	19.0	Regulated
11	02131010	PEE DEE RIVER BELOW PEE DEE, SC	8,850	4/16/2003	33.96	99,000	1997-2014	11/18	10/9/2015	29.28	28,100	---	Regulated
12	02131500	LYNCHES RIVER NEAR BISHOPVILLE, SC	675	9/19/1945	22.35	29,400	1943-2014	38/72	10/6/2015	14.59	5,890	---	
13	02132000	LYNCHES RIVER AT EFFINGHAM, SC	1,030	9/22/1945	21.21	25,000	1908, 1928-2014	3/88	10/6/2015	19.73	17,000	14.0	Annual maximum peak stage data contained in reports of the National Weather Service indicate the October 2015 peak is the third largest since 1892.
14	02135000	LITTLE PEE DEE RIVER AT GALIVANTS FERRY, SC	2,790	10/9/1964	13.01	27,600	1942-2014	53/74	10/11/2015	9.17	8,230	9.0	

Table 1. Preliminary peak stage and streamflow data at selected streamgages in South Carolina for the flood of October 2015.—Continued

[mi², square miles; ft, feet; ft³/s, cubic feet per second; ---, data not available. Yellow shading indicates streamgages that recorded peaks of record for the October 2015 flood; green shading indicates streamgages that recorded peaks that ranked in the top 5 for the period of record; Period of record is given in water years, which is the period October 1–September 30 and is identified by the year in which the period ends; < in the Rank column indicates the peak flow for the October 2015 flood was less than the minimum annual peak flow of record]

Map site number (fig. 6)	Station number	Station name	Contributing drainage area (mi²)	Flood data								National Weather Service flood stage (ft)	Remarks
				Previous maximum streamflow			Beginning and ending water year for period of record	Flood of October 2015					
				Date of peak streamflow	Peak stage (ft)	Peak streamflow (ft³/s)		Rank / Number of annual peak streamflows in record	Date of peak streamflow	Peak stage (ft)	Peak streamflow (ft³/s)		
15	02135200	PEE DEE RIVER AT HWY 701 NEAR BUCKSPORT, SC	14,100	4/21/2003	19.54	86,800	2003-2013	3/11	10/10/2015	18.26	56,400	---	Regulated; tidally influenced
16	02136000	BLACK RIVER AT KING-STREE, SC	1,252	6/14/1973	19.77	58,000	1928-2014	1/87	10/6/2015	22.65	83,700	12.0	Annual maximum peak stage data contained in reports of the National Weather Service indicate the October 2015 peak is the largest since 1893.
17	02136361	TURKEY CREEK NEAR MARYVILLE, SC	4.25	8/27/1995	4.56	---	1994-2014	1/21	10/4/2015	5.54	516	---	Rank based on stage due to undetermined annual peak streamflow for maximum annual peak stage of record.
Catawba-Santee River Basin													
18	02146000	CATAWBA RIVER NEAR ROCK HILL, SC	3,050	5/23/1901	24.15	151,000	1896-1903, 1942-2014	</81	10/3/2015	4.70	3,870	---	Regulated. Peak streamflow on 10/3/2015 was less than the minimum annual peak from period of record.
19	02146800	SUGAR CREEK NEAR FORT MILL, SC	262	8/27/2008	27.30	---	2007-2014	6/8	10/3/2015	18.74	7,660	---	Rank based on stage due to undetermined annual peak streamflow for maximum annual peak stage of record.
20	02147020	CATAWBA RIVER BELOW CATAWBA, SC	3,540	4/11/2003	22.69	54,700	1993-2014	</22	10/3/2015	9.74	10,700	---	Regulated. Peak streamflow on 10/3/2015 was less than the minimum annual peak from period of record. Maximum peak stage known since June 1906, 40.4 ft on 7/16/1916 at site and datum then in use, from records furnished by the National Weather Service.
21	021473426	TOOLS FORK CREEK NEAR ROCK HILL, SC	9.60	8/26/2008	10.85	---	1999-2014	</10	10/3/2015	4.21	68	---	Peak stage on 10/3/2015 was less than the minimum annual peak from period of record. Annual peak streamflow of record was undetermined for peak stage of record.
22	021473428	WILDCAT CREEK BELOW ROCK HILL, SC	29.7	3/21/2003	18.61	---	1999-2014	</15	10/3/2015	4.58	270	9.0	Peak stage on 10/3/2015 was less than the minimum annual peak from period of record. Annual peak streamflow of record was undetermined for peak stage of record.

Table 1. Preliminary peak stage and streamflow data at selected streamgages in South Carolina for the flood of October 2015.—Continued

[mi², square miles; ft, feet; ft³/s, cubic feet per second; ---, data not available. Yellow shading indicates streamgages that recorded peaks of record for the October 2015 flood; green shading indicates streamgages that recorded peaks that ranked in the top 5 for the period of record; Period of record is given in water years, which is the period October 1–September 30 and is identified by the year in which the period ends; < in the Rank column indicates the peak flow for the October 2015 flood was less than the minimum annual peak flow of record]

Map site number (fig. 6)	Station number	Station name	Contributing drainage area (mi²)	Flood data								National Weather Service flood stage (ft)	Remarks
				Previous maximum streamflow			Beginning and ending water year for period of record	Flood of October 2015					
				Date of peak streamflow	Peak stage (ft)	Peak streamflow (ft³/s)		Rank / Number of annual peak streamflows in record	Date of peak streamflow	Peak stage (ft)	Peak streamflow (ft³/s)		
23	02147500	ROCKY CREEK AT GREAT FALLS, SC	194	8/23/1967	18.82	31,300	1952-2014	55/58	10/4/2015	7.10	2,090	---	
24	02148000	WATEREE RIVER NEAR CAMDEN, SC	5,070	7/18/1916	40.40	400,000	1905-1910, 1916, 1930-2014	31/124	10/4/2015	29.31	50,900	27.0	Regulated since 1919
25	02153200	BROAD RIVER NEAR BLACKSBURG, SC	1,290	9/8/2004	21.92	---	1998-2014	14/17	10/4/2015	8.57	9,650	16.0	Rank based on stage due to undetermined annual peak streamflow for maximum annual peak stage of record.
26	02153500	BROAD RIVER NEAR GAFFNEY, SC	1,490	8/14/1940	19.78	119,000	1939-1978, 1980-1990, 2011-2014	54/58	10/4/2015	9.33	10,000	16.0	
27	02153551	BROAD RIVER BELOW NINETYNINE ISLAND RESERVOIR,SC	1,550	9/9/2004	40.43	---	1999-2014	</16	10/4/2015	29.14	10,300	45.0	Peak stage on 10/3/2015 was less than the minimum annual peak from period of record. Peak streamflow for peak stage of record was undetermined.
28	02153700	THICKETTY CREEK AT COUNTY ROAD 42 NEAR GAFFNEY, SC	25.0	8/1/2014	8.86	---	2007-2014	</8	10/3/2015	4.05	98	---	Peak stage on 10/3/2015 was less than the minimum annual peak from period of record. Peak streamflow for peak stage of record was undetermined.
29	02154500	NORTH PACOLET RIVER AT FINGERVILLE, SC	116	8/14/1940	27.13	12,500	1931-2014	61/84	10/3/2015	8.42	1,910	---	
30	02154790	SOUTH PACOLET RIVER NR CAMPOBELLO, SC	55.4	8/27/1995	11.33	5,170	1989-2014	14/26	10/3/2015	8.85	1,750	---	
31	02155500	PACOLET RIVER NEAR FINGERVILLE, SC	212	8/14/1940	22.43	22,800	1931-2014	41/83	10/3/2015	10.83	4,630	---	Flood of June 1903 reached a stage of 46 ft, from floodmark (streamflow not determined).
32	021556525	PACOLET RIVER BELOW LAKE BLALOCK NEAR COWPENS, SC	273	8/28/1995	17.10	22,900	1995-2014	12/20	10/3/2015	7.82	4,650	---	Regulated. Previous maximum peak stage of 17.10 ft also occurred on 5/23/2003.
33	02156300	LAWSONS FORK CREEK AT SPARTANBURG SC	74.7	10/12/1990	18.65	---	1967-1970, 1976-1993, 2013-2014	8/23	10/1/2015	13.76	2,980	---	Rank based on stage due to undetermined annual peak streamflow for maximum annual peak stage of record. Only peak stage available for 1976–1993 and 2013.

Table 1. Preliminary peak stage and streamflow data at selected streamgages in South Carolina for the flood of October 2015.—Continued

[mi², square miles; ft, feet; ft³/s, cubic feet per second; ---, data not available. Yellow shading indicates streamgages that recorded peaks of record for the October 2015 flood; green shading indicates streamgages that recorded peaks that ranked in the top 5 for the period of record; Period of record is given in water years, which is the period October 1–September 30 and is identified by the year in which the period ends; < in the Rank column indicates the peak flow for the October 2015 flood was less than the minimum annual peak flow of record]

Map site number (fig. 6)	Station number	Station name	Contributing drainage area (mi²)	Flood data								National Weather Service flood stage (ft)	Remarks
				Previous maximum streamflow			Beginning and ending water year for period of record	Flood of October 2015					
				Date of peak streamflow	Peak stage (ft)	Peak streamflow (ft³/s)		Rank / Number of annual peak streamflows in record	Date of peak streamflow	Peak stage (ft)	Peak streamflow (ft³/s)		
34	02156500	BROAD RIVER NEAR CARLISLE, SC	2,790	10/10/1976	31.51	123,000	1939-2014	68/75	10/4/2015	12.20	21,800	30.0	
35	02157470	MIDDLE TYGER RIVER NEAR GRAMLING, SC	34.7	1/25/2010	11.03	3,160	2003-2014	</12	10/4/2015	9.22	492	10.5	Peak streamflow on 10/4/2015 was less than the minimum annual peak from period of record.
36	02157510	MIDDLE TYGER RIVER NEAR LYMAN, SC	69.0	7/8/2005	8.12	---	2000-2014	11/15	10/4/2015	4.24	888	24.0	Rank based on stage due to undetermined annual peak streamflow for maximum annual peak stage of record.
37	02158408	SOUTH TYGER RIVER BELOW DUNCAN, SC	94.4	7/7/2005	16.68	5,360	2003-2014	9/13	10/4/2015	10.19	1,710	17.0	For previous maximum annual peak stage on 7/7/2005, the annual peak streamflow was greater than the indicated value.
38	02160105	TYGER RIVER NEAR DELTA, SC	759	10/11/1976	26.31	37,500	1974-2014	20/41	10/5/2015	16.76	9,800	---	
39	02160325	BRUSHY CREEK NEAR GREENVILLE, SC	9.05	8/27/1995	14.10	---	1986-2014	16/28	10/3/2015	8.43	982	10.0	Rank based on stage due to undetermined annual peak streamflow for maximum annual peak stage of record.
40	02160326	ENOREE RIVER AT PELHAM, SC	84.2	8/27/1995	22.98	11,300	1994-2014	11/21	10/4/2015	11.02	2,490	11.0	
41	02160381	DURBIN CREEK ABOVE FOUNTAIN INN, SC	14.0	8/27/1999	14.58	---	1995-2014	4/20	10/4/2015	8.54	1,570	---	Rank based on stage due to undetermined annual peak streamflow for maximum annual peak stage of record.
42	02160390	ENOREE RIVER NEAR WOODRUFF, SC	249	8/27/1995	29.9	52,200	1994-2014	3/21	10/4/2015	16.45	8,160	---	
43	02160700	ENOREE RIVER AT WHITMIRE, SC	444	8/28/1995	37.32	31,200	1974-2014	3/41	10/5/2015	29.08	18,400	25.0	
44	02161000	BROAD RIVER AT ALSTON, SC	4,790	6/7/1903	29.02	140,000	1897-1907, 1981-2014	13/45	10/4/2015	22.16	73,200	20.0	
45	02162093	SMITH BRANCH AT NORTH MAIN ST AT COLUMBIA, SC	5.67	7/21/2013	15.12	3,820	1977-2014	1/38	10/4/2015	18.87	---	9.0	The peak stage for 10/4/2015 was determined from high-water marks because the gage structure or equipment was damaged by flood waters. The 10/4/2015 maximum peak streamflow exceeded 4,180 ft³/s (for stage of 16.00 ft), which is the upper limit of the current rating curve.

Table 1. Preliminary peak stage and streamflow data at selected streamgages in South Carolina for the flood of October 2015.—Continued

[mi², square miles; ft, feet; ft³/s, cubic feet per second; ---, data not available. Yellow shading indicates streamgages that recorded peaks of record for the October 2015 flood; green shading indicates streamgages that recorded peaks that ranked in the top 5 for the period of record; Period of record is given in water years, which is the period October 1–September 30 and is identified by the year in which the period ends; < in the Rank column indicates the peak flow for the October 2015 flood was less than the minimum annual peak flow of record]

Map site number (fig. 6)	Station number	Station name	Contributing drainage area (mi²)	Flood data								National Weather Service flood stage (ft)	Remarks
				Previous maximum streamflow			Beginning and ending water year for period of record	Flood of October 2015					
				Date of peak streamflow	Peak stage (ft)	Peak streamflow (ft³/s)		Rank / Number of annual peak streamflows in record	Date of peak streamflow	Peak stage (ft)	Peak streamflow (ft³/s)		
46	02162290	SOUTH SALUDA RIVER NEAR CLEVELAND, SC	17.8	9/8/2004	9.58	3,720	2000-2005, 2013-2014	6/8	10/3/2015	3.10	86	9.0	
47	02162350	MIDDLE SALUDA RIVER NEAR CLEVELAND, SC	21.0	6/11/1986	11.21	5,190	1981-2014	31/32	10/3/2015	3.58	359	---	
48	02162500	SALUDA RIVER NEAR GREENVILLE, SC	298	10/7/1949	19.38	11,000	1942-2014	69/71	10/4/2015	4.69	1,660	9.5	
49	02163001	SALUDA RIVER NEAR WILLIAMSTON, SC	414	9/8/2004	14.12	12,410	1996-2014	12/19	10/4/2015	9.72	5,220	22.0	
50	02163500	SALUDA RIVER NEAR WARE SHOALS, SC	580	8/27/1995	22.95	20,900	1939-2014	20/76	10/4/2015	17.38	11,800	42.0	
51	02164000	REEDY RIVER NEAR GREENVILLE, SC	48.6	7/29/2004	11.21	5,830	1942-2014	31/63	10/4/2015	7.40	2,430	12.0	
52	02164110	REEDY RIVER ABOVE FORK SHOALS, SC	110	8/27/1995	21.77	8,200	1994-2014	2/21	10/4/2015	18.05	7,290	20.0	
53	021650905	REEDY RIVER NEAR WATERLOO, SC	251	1/26/2010	15.56	4,560	2005-2014	1/10	10/4/2015	17.29	6,160	30.0	
54	02165200	SOUTH RABON CREEK NEAR GRAY COURT, SC	29.5	9/14/1973	9.86	4,100	1968-1981, 1991-2014	5/38	10/4/2015	6.29	1,830	---	
55	021652801	NORTH RABON CREEK NEAR HICKORY TAVERN, SC	36.9	1/25/2010	10.34	---	2009-2014	1/6	10/4/2015	11.02	---	---	Rank based on stage due to undetermined annual peak streamflow for previous maximum annual peak stage of record. The 10/4/2015 maximum peak streamflow exceeded 1,060 ft³/s (for stage of 9.62 ft), which is the upper limit of the current rating curve.
56	02166501	LAKE GREENWOOD TAILRACE NEAR CHAPPELLS, SC	1,170	2/5/1998	28.46	18,400	1997-2014	1/18	10/4/2015	31.79	21,800	---	Regulated
57	02167000	SALUDA RIVER AT CHAPPELLS, SC	1,360	10/2/1929	31.50	63,700	1927-2014	8/110	10/5/2015	26.49	34,800	14.0	Regulated since 1940. The flood of 8/26/1908 reached a stage of 36.7 ft (present site and datum), from reports of National Weather Service.
58	02167450	LITTLE RIVER NEAR SILVERSTREET, SC	230	4/19/2003	15.73	8,760	1991-2014	1/24	10/5/2015	18.46	14,800	11.0	
59	02167582	BUSH RIVER NEAR PROSPERITY, SC	115	1/15/1995	16.06	5,570	1991-2014	1/24	10/4/2015	19.74	10,000	11.0	

Table 1. Preliminary peak stage and streamflow data at selected streamgages in South Carolina for the flood of October 2015.—Continued

[mi^2, square miles; ft, feet; ft^3/s, cubic feet per second; ---, data not available. Yellow shading indicates streamgages that recorded peaks of record for the October 2015 flood; green shading indicates streamgages that recorded peaks that ranked in the top 5 for the period of record; Period of record is given in water years, which is the period October 1–September 30 and is identified by the year in which the period ends; < in the Rank column indicates the peak flow for the October 2015 flood was less than the minimum annual peak flow of record]

Map site number (fig. 6)	Station number	Station name	Contributing drainage area (mi^2)	Flood data								National Weather Service flood stage (ft)	Remarks
				Previous maximum streamflow			Beginning and ending water year for period of record	Flood of October 2015					
				Date of peak streamflow	Peak stage (ft)	Peak streamflow (ft^3/s)		Rank / Number of annual peak streamflows in record	Date of peak streamflow	Peak stage (ft)	Peak streamflow (ft^3/s)		
60	02168504	SALUDA RIVER BELOW LAKE MURRAY DAM NEAR COLUMBIA, SC	2,420	3/9/1996	15.88	22,100	1989-2014	1/26	10/4/2015	27.5	---	---	Regulated. The peak stage for 10/4/2015 was determined from high-water marks because the gage structure or equipment was damaged by flood waters. The 10/4/2015 maximum peak streamflow exceeded 19,000 ft^3/s (for stage of 16.35 ft), which is the upper limit of the current rating curve. The rank is based on the peak stage on 10/4/2015.
61	02169000	SALUDA RIVER NEAR COLUMBIA, SC	2,520	10/2/1929	15.22	67,000	1926-2014	---/89	10/4/2015	14.26	---	---	Regulated since 1930. The peak stage for 10/4/2015 was determined from high-water marks because the gage structure or equipment was damaged by flood waters. The 10/4/2015 maximum peak streamflow exceeded 58,000 ft^3/s (for stage of 14.00 ft), which is the upper limit of the current rating curve.
62	02169500	CONGAREE RIVER AT COLUMBIA, SC	7,850	8/27/1908	39.80	364,000	1900-2014	8/123	10/4/2015	31.81	185,000	19.0	Regulation from the Saluda River since 1929.
63	02169570	GILLS CREEK AT COLUMBIA, SC	59.6	2/24/1979	8.66	2,880	1965-2014	1/50	10/4/2015	19.6	---	6.7	The peak stage for 10/4/2015 was determined from high-water marks because the gage structure or equipment was damaged by flood waters. The 10/4/2015 maximum peak streamflow exceeded 2,380 ft^3/s (for stage of 9.11 ft), which is the upper limit of the current rating curve. The rank is based on the peak stage on 10/6/2015.
64	02171500	SANTEE RIVER NEAR PINEVILLE, SC	14,700	9/23/1945	31.10	155,000	1943-2013	11/71	10/8/2015	27.98	83,400	---	Regulated
65	02171645	REDIVERSION CANAL AT SANTEE RIVER NEAR ST STEPHEN, SC	14,800	11/17/1989	28.00	31,200	1987-2014	4/28	10/11/2015	28.60	28,000	---	Regulated. Previous maximum streamflow is a maximum daily average. For flood of October 2015, peak stage was 29.6 ft and occurred on 10/10/2015.

Table 1. Preliminary peak stage and streamflow data at selected streamgages in South Carolina for the flood of October 2015.—Continued

[mi², square miles; ft, feet; ft³/s, cubic feet per second; ---, data not available. Yellow shading indicates streamgages that recorded peaks of record for the October 2015 flood; green shading indicates streamgages that recorded peaks that ranked in the top 5 for the period of record; Period of record is given in water years, which is the period October 1–September 30 and is identified by the year in which the period ends; < in the Rank column indicates the peak flow for the October 2015 flood was less than the minimum annual peak flow of record]

Map site number (fig. 6)	Station number	Station name	Contributing drainage area (mi²)	Flood data								National Weather Service flood stage (ft)	Remarks
				Previous maximum streamflow			Beginning and ending water year for period of record	Flood of October 2015					
				Date of peak streamflow	Peak stage (ft)	Peak streamflow (ft³/s)		Rank / Number of annual peak streamflows in record	Date of peak streamflow	Peak stage (ft)	Peak streamflow (ft³/s)		
66	02171700	SANTEE RIVER NEAR JAMESTOWN, SC	10,750	3/28/2003	22.84	102,000	1987-2000, 2002-2014	2/27	10/10/2015	22.13	96,600	10.0	Regulated. Tidally influenced, which is overcome by basin runoff at high flows.
67	02172002	LAKE MOULTRIE TAILRACE CANAL AT MONCKS CORNER, SC	14,800	2/27/2003	10.40	27,100	1986-1990, 2002-2014	12/18	10/4/2015	13.24	16,500	---	Regulated
68	02172035	TURKEY CREEK ABOVE HUGER, SC	22.7	10/25/2008	9.52	1,410	2006-2014	1/9	10/4/2015	13.4	---	---	The peak stage for 10/4/2015 was determined from high-water marks because the gage structure or equipment was damaged by flood waters. The 10/4/2015 maximum peak streamflow exceeded 1,910 ft³/s (for stage of 10.00 ft), which is the upper limit of the current rating curve. The rank is based on the peak stage for 10/4/2015.
Ashepoo-Combahee-Edisto River Basin													
69	02172300	MCTIER CREEK (RD 209) NEAR MONETTA, SC	15.6	3/7/1996	7.48	536	1996-1997, 2002-2014	1/15	10/4/2015	6.98	782	13.0	
70	02173000	SOUTH FORK EDISTO RIVER NEAR DENMARK, SC	720	Oct. 1929	11.7	17,100	1930, 1932-1979, 1981-2014	49/83	10/8/2015	7.94	2,110	11.0	
71	02173030	SOUTH FORK EDISTO RIVER NEAR COPE, SC	757	5/8/1998	10.86	7,610	1992-2014	4/23	10/6/2015	10.27	3,880	---	
72	02173051	SOUTH FORK EDISTO RIVER NEAR BAMBERG, SC	807	5/9/1998	13.71	8,640	1992-2014	4/23	10/6/2015	12.35	4,770	16.0	
73	02173212	CEDAR CREEK NEAR THOR, SC	44.1	12/25/2009	4.78	---	2009-2014	1/5	10/4/2015	7.15	193	10.0	Rank based on stage due to undetermined annual peak streamflow for previous maximum annual peak stage of record.
74	02173500	NORTH FORK EDISTO RIVER AT ORANGEBURG, SC	683	Sept. 1928	14.7	10,000	1928, 1939-1988, 1990-2014	3/77	10/5/2015	13.64	8,640	8.0	
75	02175000	EDISTO RIVER NEAR GIVHANS, SC	2,730	Feb. 1925	17.5	24,900	1925, 1928, 1939-2014	1/81	10/8/2015	16.06	25,600	10.0	
76	02175500	SALKEHATCHIE RIVER NEAR MILEY, SC	341	10/9/1992	5.79	4,360	1952-2014	7/63	10/7/2015	5.31	2,920	---	

Table 1. Preliminary peak stage and streamflow data at selected streamgages in South Carolina for the flood of October 2015.—Continued

[mi², square miles; ft, feet; ft³/s, cubic feet per second; ---, data not available. Yellow shading indicates streamgages that recorded peaks of record for the October 2015 flood; green shading indicates streamgages that recorded peaks that ranked in the top 5 for the period of record; Period of record is given in water years, which is the period October 1–September 30 and is identified by the year in which the period ends; < in the Rank column indicates the peak flow for the October 2015 flood was less than the minimum annual peak flow of record]

Map site number (fig. 6)	Station number	Station name	Contributing drainage area (mi²)	Flood data								National Weather Service flood stage (ft)	Remarks
				Previous maximum streamflow			Beginning and ending water year for period of record	Flood of October 2015					
				Date of peak streamflow	Peak stage (ft)	Peak streamflow (ft³/s)		Rank / Number of annual peak streamflows in record	Date of peak streamflow	Peak stage (ft)	Peak streamflow (ft³/s)		
77	02176500	COOSAWHATCHIE RIVER NEAR HAMPTON, SC	203	10/10/1992	7.92	8,910	1952-2014	63/63	10/6/2015	6.50	267	---	
Savannah River Basin													
78	02177000	CHATTOOGA RIVER NEAR CLAYTON, GA	207	9/17/2004	11.21	33,300	1915, 1917-1929, 1940-2014	88/89	10/4/2015	3.70	3,000	15.0	
79	02186000	TWELVEMILE CREEK NEAR LIBERTY, SC	106	6/27/2006	14.78	8,260	1955-1964, 1990-2014	29/35	10/4/2015	6.84	1,900	10.0	
80	02187910	ROCKY RIVER NEAR STARR, SC	111	4/18/1998	17.70	6,260	1989-2014	14/25	10/5/2015	11.45	1,560	---	
81	02192500	LITTLE RIVER NEAR MT. CARMEL, SC	217	8/14/1940	29.60	20,800	1940-2014	8/75	10/5/2015	22.73	9,040	---	
82	02196000	STEVENS CREEK NEAR MODOC, SC	545	8/14/1940	41.08	35,100	1931, 1940-1978, 1984-2014	18/71	10/5/2015	30.44	17,100	19.0	
83	02196690	HORSE CREEK AT CLEARWATER, SC	155	6/3/2013	15.85	---	2006-2014	</9	10/5/2015	12.73	429	17.0	Peak stage on 10/5/2015 was less than the minimum annual peak from period of record. Peak streamflow was undetermined for peak stage of record.
84	02197000	SAVANNAH RIVER AT AUGUSTA, GA	7,510	10/2/1929	45.10	350,000	1796, 1840, 1852, 1864-1865, 1875-2014	134/144	10/6/2015	110.82	21,000	117.5	Regulated since 1953
85	02197500	SAVANNAH RIVER AT BURTONS FERRY BRIDGE NEAR MILLHAVEN, GA	8,650	Oct. 1929	30.80	220,000	1929, 1940-1970, 1983-2014	57/63	10/8/2015	12.19	14,300	15.0	Regulated since 1953
86	02198500	SAVANNAH RIVER NEAR CLYO, GA	9,850	10/6/1929	29.70	270,000	1925-2014	87/90	10/10/2015	9.55	12,500	11.0	Regulated since 1953

Table 2. Chronology of major and other memorable floods in South Carolina since 1893.

[From U.S. Geological Survey, 1985; http://sc.water.usgs.gov/publications/pdf/SCFloodsandDroughts1893-2002.pdf; http://www.dnr.sc.gov/climate/sco/Tropics/hurricane_tracks_affecting_sc.php. mph, miles per hour]

Date	Area affected	Remarks
Aug. 27, 1893	Southern coast of South Carolina	North-northeast through South Carolina Midlands. Winds 96–120 mph; tremendous storm surge; major damage; moved north near Columbia, then northeast. Deaths, 2,000; damage, $10 million.
June 1903	Santee River Basin	Deaths, 50; damage, $3.5 million.
Aug. 26–30, 1908	Statewide	Most extensive flood in State; rainfall, 12 inches in 24 hours at Anderson.
July 18, 1916	Eastern two-thirds of State	Record rainfall, 13 inches in 24 hours at Effingham; damage, $10–11 million.
Aug. 15–17, 1928	Statewide	Bridges destroyed, roads and railways impassable.
Sept. 21–24, 1928	Lower Pee Dee River Basin and southern South Carolina	Flooding was severe. Rainfall 10–12 inches. Deaths, 5; damage, $4–6 million.
Oct. 2, 1929	Savannah and Santee River Basins	Entered Aiken as extratropical storm; intense rains on saturated soil caused severe flooding.
Aug. 11–19, 1940	Statewide	Hurricane related flooding. Deaths, about 34; property and crop damage, $10 million.
Sept. 17–23, 1945	Statewide	Hurricane related, severe flooding. Deaths, 1; damage, $6–7 million.
Oct. 15, 1954	Lower Pee Dee River Basin	Hurricane Hazel. One of most severe storms in State to date. Storm surge, 16.9 feet; western half of State having drought. Deaths, 1; damage, $27 million.
Sept. 29–30, 1959	Eastern, southern, and central South Carolina	Hurricane Gracie. Winds 140 mph at landfall. Six foot storm surge. Rainfall, 6–8 inches. Deaths, 7; Excessive property damage along the coast as well as heavy crop damage, $20 million.
Nov. 1, 1969	Coastal, northwest corner of the State	Rainfall, 13.6 inches on Edisto Island. Deaths, 1; flood damage to homes.
Sept. 14, 1973	Northwestern South Carolina, Savannah and Santee River Basins	Major flash flood in Laurens. Saluda River at Ware Shoals had highest crest since 1929 flood. Damage, $4–6 million.
Aug. 19, 1981	Lower Pee Dee River Basin	Hurricane Dennis, greater than 6 inches of rain caused significant flood damage in low-lying areas. Greatest flood on upper Waccamaw River since 1945.
Sept. 21, 1989	Eastern two-thirds of State	Hurricane Hugo made landfall at Isle of Palms, S.C. Winds 140 mph. Gusts 160 mph. Costliest storm in South Carolina's history. Deaths, 35; damage, more than $6 billion. Storm surge over 20 feet. Severe inland damage as winds gusted to 109 mph at Sumter, S.C.
Oct. 10–12, 1990	Central South Carolina	The remnants from tropical storms Klaus and Marco caused heavy rains and flooding; 10–11 inches rain reported in Spartanburg County; 120 dams failed statewide; 80 bridge failures. Deaths, 5.
Oct. 8–9, 1992	Southern South Carolina	Rainfall, 9 inches in 24 hours. Bridge failures; homes damaged; 90-car train derailed.
Aug. 25–29, 1995	Northwestern Piedmont South Carolina	Tropical Storm Jerry tracked through the upstate of South Carolina, causing flash floods and dumping 8–10 inches of rain in about an 8-hour period. Some rain totals exceeded 20 inches. Several large dams broke causing flooding across the State. Estimated $4–5 million worth of damage to roads and bridges.
Sept. 16, 1999	Waccamaw and Lower Pee Dee River Basins	Hurricane Floyd: Rainfall was heavy along coastal counties; 12 inches in Georgetown County; 18 inches in eastern Horry County. The heavy rains caused flooding to many roads and buildings. Waves were reported to be 15 feet at the pier at Cherry Grove where damage was the greatest.

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