

Southeast Region: (Information provided by the Southeast Regional Climate Center)

- Temperatures were near average across much of the Southeast region during September. Over 85 percent of the 182 long-term (i.e., period of record equaling or exceeding 50 years) stations within the region observed September mean temperatures that were ranked outside their ten warmest or coolest values on record. However, well-above-average temperatures (driven primarily by extremely warm minimum temperatures) continued across portions of central and southern Florida, as well as Puerto Rico. Several long-term stations in Florida observed or tied their warmest or second warmest September mean temperature on record, including Miami (1896–2017; warmest on record), Melbourne (1937–2017; tied for warmest), Tampa (1890–2017; second warmest), West Palm Beach (1888–2017; second warmest), and Fort Lauderdale (1913–2017; tied for second warmest). With warmer-than-normal sea surface temperatures measured offshore, a few stations along the coastline of southeastern Florida and northern Puerto Rico observed their highest count of September days with a minimum temperature of at least 75 degrees F (23.9 degrees C), such as West Palm Beach, FL (30 days) and Stuart, FL (1936–2017; 28 days), or 80 degrees F (26.7 degrees C), such as Miami, FL (14 days) and San Juan, PR (1899–2017; 14 days). On the 8th, Miami tied its highest minimum temperature for any month on record, at 84 degrees F (28.9 degrees C). Across the Southeast, the warmest weather of the month occurred from the 20th through the 22nd and the 26th through the 28th, as unseasonably warm and humid air masses stagnated over the region. Daytime maximum temperatures ranged from 85 to more than 95 degrees F (29.4 to more than 35 degrees C) across much of the region, while nighttime minimum temperatures remained above 60 degrees F (15.6 degrees C). In contrast, the coolest weather of the month occurred from the 7th through the 9th, as a continental high pressure system ushered in unusually cool air from the northwest. Daily minimum temperatures fell below 60 degrees F across much of the region north of Florida, with elevated portions of western North Carolina and Virginia reaching the middle 30s F to the middle 40s F (1.7 to 7.2 degrees C). From the 10th through the 13th, cloud cover and rainfall associated with Hurricane Irma produced record low daily maximum temperatures across every state in the region. On the 11th, several long-term stations observed or tied their lowest maximum temperature on record for September, including Sylacauga 4 NE, AL (1955–2017; 59 degrees F, 15 degrees C), Greenville, AL (1927–2017; 62 degrees F, 16.7 degrees C), Chipley, FL (1939–2017; 65 degrees F, 18.3 degrees C), and Tallahassee, FL (1892–2017; 65 degrees F).
- Precipitation was highly variable across the Southeast region during September, with several wet extremes recorded. Unusual dryness was found in portions of Virginia, central and coastal North Carolina, west-central and southwestern Alabama, and the western tip of the Florida Panhandle, where monthly precipitation totals were 50 to less than 25 percent of normal. Several locations in these areas recorded at least 14 consecutive days with no measurable rainfall, including Raleigh, NC (18 days), Charlotte, NC (18 days), Washington, D.C. (17 days), Richmond, VA (17 days), and Tuscaloosa, AL (14 days). In contrast, the wettest locations were found

primarily across broad portions of the Florida Peninsula, southeastern Georgia, central and southern South Carolina, Puerto Rico, and the U.S. Virgin Islands. Monthly precipitation totals ranged from 150 to more than 300 percent of normal in these areas. Several long-term stations in Florida observed September precipitation totals that were ranked within their five highest values on record, including the Fort Pierce COOP station (1901–2017; 25.71 inches, 653 mm), the Melbourne WFO station (1937–2017; 23.84 inches, 606 mm), Gainesville (1890–2017; 15.28 inches, 388 mm), and Orlando (1892–2017; 14.09 inches, 358 mm). The COOP station in Fort Pierce observed its wettest month on record and the ninth highest September precipitation total on record for the state of Florida. The Melbourne WFO station observed its second wettest month on record, trailing only August 2008 (26.87 inches; 682 mm). Much of the monthly rainfall totals in these areas was associated with Hurricane Irma, which made landfall at Cudjoe Key in southern Florida as a Category 4 hurricane on the 10th and then made a second landfall at Marco Island as a Category 3 hurricane about 6.5 hours later. From the 8th through the 12th, Irma produced 5 to more than 15 inches (127 to more than 381 mm) of rainfall across nearly all of the Florida Peninsula, as well as broad portions of southeastern Georgia and the southern half of South Carolina. In Florida, the Fort Pierce COOP station, the Sanford COOP station (1948–2017), and Melbourne (1937–2017) observed their wettest day for any month on record, with 13.85, 11.50, and 10.23 inches (352, 292, and 260 mm) of precipitation, respectively. Irma also produced heavy rainfall across northern portions of Puerto Rico and the U.S. Virgin Islands from the 5th through the 7th, with some of the greatest 2-day precipitation totals including 15.96 inches (405 mm) on St. Thomas, USVI, 13.01 inches (330 mm) in Bayamón, PR, and 10.27 inches (261 mm) in Ciales, PR. A combination of torrential rainfall and storm surge produced exceptional flooding in Miami, FL, Jacksonville, FL, and Charleston, SC, with more than 350 water rescues performed in Jacksonville. The St. Johns River crested at 5.57 feet in downtown Jacksonville, which surpassed the previous record of 4.12 feet that occurred during the landfall of Hurricane Dora in September 1964. In addition, Charleston, SC observed its third largest storm tide (i.e., water level rise due to the combination of storm surge and the astronomical tide) of 7 feet above mean sea level, trailing only Hurricane Hugo in September 1989 (9.6 feet) and an unnamed Category 2 hurricane in August 1940 (7.31 feet). On the 20th, Hurricane Maria made landfall near Yabucoa, Puerto Rico as a Category 4 hurricane with maximum sustained winds of 155 mph. From the 19th through the 21st, Maria produced 10 to more than 25 inches (254 to more than 635 mm) of rainfall across much of the island, with some of the highest 2-day precipitation totals including 37.90 inches (963 mm) near G. L. García, 27.82 inches (707 mm) near Villalba, and 22.79 inches (579 mm) near Aibonito. Broad portions of eastern and northwestern Puerto Rico observed maximum 12-hour rainfall totals with an average recurrence interval of at least 1,000 years. Widespread river flooding occurred across Puerto Rico, as 30 of the 65 USGS streamflow gages on the island exceeded major flood stage and 13 reached or exceeded their highest crest on record.

- There were 139 severe weather reports across the Southeast during September, which is 139 percent of the median monthly frequency of 100 reports during 2000–

2016. At least one severe weather report was recorded on 15 days during the month, but over half (74 of 139) of the reports were recorded on just two of these days (1st and 5th). On the 1st, severe thunderstorms produced large hail and damaging winds across portions of central and eastern North Carolina, with three reports of 2.75-inch (baseball-sized) hail in southern Wake and northern Harnett Counties. Significant hail damage occurred in the town of Fuquay-Varina, where dozens of homes sustained broken windows and damaged siding. In addition, potentially hundreds of vehicles experienced major hail damage, including shattered windshields and large exterior dents. Multiple thunderstorm microbursts with estimated wind gusts of 80 to 90 mph occurred in Sanford, NC, with two commercial buildings sustaining roof and exterior wall damage. A total of 27 tornadoes (3 unrated, 8 EF-0s, 13 EF-1s, 3 EF-2s), with all but one spawned by Hurricane Irma, were confirmed in Florida and South Carolina during the month, which is nearly 2.5 times the median frequency of 11 tornadoes observed during September. Lightning was responsible for 1 fatality and 6 injuries across the region. On the 5th, a lightning strike killed a 63-year-old fisherman and injured three others in Juana Díaz, PR, as they were anchoring their boat prior to the arrival of Hurricane Irma. This was the first reported lightning fatality in Puerto Rico since June 2009. The broad extent of tropical storm and hurricane force winds associated with Hurricanes Irma and Maria produced widespread wind damage along their tracks, particularly in Florida, Georgia, Puerto Rico, and the U.S. Virgin Islands. Some of the highest recorded wind gusts from Hurricane Irma included 142 mph at Naples Municipal Airport, FL, 137 mph on Buck Island in the U.S. Virgin Islands, 130 mph on Marco Island, FL, 120 mph on Big Pine Key, FL, 101 mph on Virginia Key near Miami, FL, 86 mph at Jacksonville International Airport, FL, and 64 mph at Hartsfield-Jackson International Airport in Atlanta, GA. About one-fourth of over 50,000 homes in the Florida Keys were destroyed, while 65 percent sustained major damage. Catastrophic damage also occurred on St. Thomas and St. John in the U.S. Virgin Islands, where collapsed homes and buildings as well as downed trees and power lines produced uninhabitable conditions across much of these islands. At least 90 fatalities (75 in FL, 4 in SC, 4 in USVI, 3 in GA, 3 in PR, 1 in NC) were caused by Irma, including 13 people who died from carbon monoxide poisoning and 12 nursing home residents in Hollywood, FL who died from heat exhaustion due to a lack of air conditioning after the storm. Approximately 17 million people across the Southeast region (including an estimated 15 million residents in Florida) lost power for less than a day to more than one week, which is the greatest number of power outages in the United States caused by any hurricane on record. Hurricane Maria was the strongest hurricane to strike Puerto Rico since the Category 5 landfall of the San Felipe Segundo hurricane in September 1928, and it was also the tenth most intense hurricane on record in the Atlantic basin, with a minimum central pressure of 908 mb. On the 20th, several wind gusts exceeding 100 mph were recorded as Maria tracked near St. Croix and over Puerto Rico, including 137 mph at Sandy Point National Wildlife Refuge on St. Croix, 120 mph in Gurabo, PR, 116 mph at Yabucoa Harbor, PR, 113 mph in San Juan, PR, and 112 mph in Arecibo, PR. A preliminary total of 34 fatalities (potentially in the hundreds) were confirmed in Puerto Rico, which sustained catastrophic damage and a total loss of electricity.

- With the removal of moderate (D1) drought in southwestern Puerto Rico at the beginning of September, drought conditions (D1 and greater) were not observed across the Southeast region during the remainder of the month. On the 11th and 12th, heavy rainfall from Tropical Storm Irma eliminated abnormally dry (D0) conditions in Georgia and South Carolina. However, well-below-average precipitation during the month caused abnormally dry conditions to persist and expand across broad portions of North Carolina and Virginia, with additional development occurring in localized areas of western Alabama. Indeed, the unusual dryness stunted the growth of pastures and hay fields in areas of northern and western Virginia, with a few livestock producers having to haul water to their herds. During the second half of the month, a persistence of dry weather across much of the region was generally favorable for crop and hay harvesting. Numerous agricultural and livestock impacts were reported across the southern portion of the region following Hurricane Irma. Citrus fruit losses ranged from less than 5 percent to as much as 70 percent in groves across central and southern Florida, with the extent of damage varying by the quantity of fruit that dropped from the trees due to high winds. In addition, many citrus trees were uprooted, while standing floodwater in groves could produce long-term tree damage and increased disease pressure. Some growers were temporarily unable to pump excess water out of their groves due to a lack of electricity. Dairy farms in Florida were forced to dump milk at a significant cost per day, as power outages prevented consumers from storing it. With the loss of electrical cooling fans, the dairy cows were stressed by the return of heat and humidity following Irma's departure. Approximately 30 percent of the pecan crop was lost in Georgia, as wind gusts exceeding 50 mph stripped off immature nuts and blew down thousands of pecan trees in central and southern parts of the state. At least 10 percent of the cotton crop in Georgia was lost near the time of harvest, as Irma's strong winds blew lint off the bolls and caused many plants to become bent and tangled. Hurricane Maria destroyed about 80 percent of the crop production in Puerto Rico, resulting in an estimated \$780 million in agricultural losses. Plantain, banana, and coffee plantations sustained major damage or destruction, while dairy barns and industrial chicken coops were demolished.