State of the Climate
National Overview
July 2011
National Oceanic and Atmospheric Administration
National Climatic Data Center

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National Overview:

Climate Highlights - July

- The average U.S. temperature in July was 77.0 degrees F (25.0 degrees C), which is 2.7 degrees F (1.5 degrees C) above the long-term (1901-2000) average, resulting the fourth warmest July and the fourth warmest month on record. Precipitation, averaged across the nation, was 2.46 inches (62.5 mm). This was 0.32 inch (8.1 mm) below the long-term average, with large variability between regions.

- Both Oklahoma and Texas had their warmest months on record, with monthly statewide average temperatures of 88.9 degrees F (31.6 degrees C) and 87.1 degrees F (30.6 degrees C), respectively. Oklahoma's statewide average temperature was the warmest monthly statewide average temperature on record for any state during any month. The previous warmest monthly statewide average temperature was also in Oklahoma, during July 1954, at 88.1 degrees F (31.2 degrees C).

- Only seven of the lower 48 states — all west of the Rockies — experienced a July average temperature near or below the 20th century average. The other 41 had a

above-normal, much-above-normal, or record warmest July.

- Regionally, the South climate region, which includes Arkansas, Kansas, Louisiana, Mississippi, Oklahoma, and Texas, had its warmest single calendar month for any climate region since records began in 1895. The average temperature of 86.1 degrees F (30.1 degrees C), bested the previous all-time record of 85.9 degrees F (29.0 degrees C) set in July 1980 in the South climate region.

- Dallas exceeded 100 degrees F (37.8 degrees C) on 30 of the 31 days during July. In Oklahoma City, July was the warmest single calendar month with an average temperature of 89.2 degrees F (31.8 degrees C), besting the previous record of 88.7 degrees F (31.5 degrees C) set in August 1936. Further east, Washington DC (National AP) also had its warmest single calendar month on record. The average temperature of 84.5 degrees F (29.2 degrees C) smashed the previous record of 83.1 degrees F (28.4 degrees C) set in July 2010 and July 1993. Other selected monthly and daily records can be viewed here: July 2011 Climate Extremes

- Precipitation during July was variable across the country. Wetter-than-normal conditions occurred along parts of the Gulf Coast, all of the Pacific Coast, and much of the upper Midwest. Dry anomalies prevailed in most other locations. July offered no relief to the parched soils of Texas and Oklahoma where it was the second (tied) and ninth driest July on record, respectively. Additionally, Texas has had five straight months in which average precipitation ranked in the bottom ten driest. Meanwhile, it was the eighth wettest July on record for California — this during a month which is typically quite dry for most of the state.

- Winds ahead of monsoonal thunderstorms produced an expansive dust storm which stretched for nearly 100 miles and quickly moved through a large area of Arizona on July 5. The dust storm traveled approximately 150 miles picking up dust as it traveled across the extemely dry desert lands. The infrastructure in the densley populated city of Phoenix was directly impacted, limiting the movement of automobiles and air traffic.

- The largest national footprint of D4 ("exceptional drought") in the 12-year history of the U.S. Drought Monitor occurred in July. In Texas "exceptional drought" covers more than 75 percent (201,436 sq mi) of the state. This area is larger than the entire Northeast climate region (196,224 sq mi). Drought conditions are so harsh in some locations that it would take as much as 20 inches of precipitation in one month to end the drought. Conditions in Oklahoma are also dire, with 100 percent of the state suffering from D1-D4 (Moderate-Exceptional) drought. At the beginning of the water year (9/28/2010), drought conditions (D1-D4) covered only four percent of the state.

- The July Climate Extremes Index for the CONUS was 37 percent. This is the highest July value in the CEI record (since 1910). The culprits were, in order of impact: Extreme warm minimum temperatures (60 percent of the country, easily the largest on record), extreme wet PDSI (soaked northern plains & western great lakes), extreme warm maximum temperatures, and extreme dry PDSI (south-central U.S. through Gulf Coast). According to the Regional CEI, the South and Southeast had their 1st- and 2nd-most extreme July's on record, respectively

- For all locations that report daily temperature data, 1.5 percent of station reports tied or broke a daily high maximum temperature record during the month, while 3.4 percent of station reports tied or broke a daily high minimum temperature record. For

July, 78 U.S. locations tied or broke daily all-time maximum high temperature records while 213 locations tied or broke an all-time daily warm low temperature record (warm nighttime temperatures). Notables included:

- Record High Maximums
  - Newark, NJ (108 degrees F or 42 degrees C, July 22)
  - Washington/Dulles (105 degrees F or 40 degrees C, July 22)
  - Portland, ME (100 degrees F or 38 degrees C, July 22)
  - Shamrock, TX (117 degrees F or 47 degrees C, July 12 - previous record was set June 27, 2011)
- Record High Minimums
  - Richmond, VA (81 degrees F or 27 degrees C, July 12)
  - Washington/Reagan (84 degrees F or 29 degrees C, July 23 and July 24)
  - Dallas/DFW, TX (85 degrees F or 29 degrees C, July 25)
  - Dallas/DFW, TX (86 degrees F or 30 degrees C, July 26)
  - Ponca City, OK (91 degrees F or 33 degrees C, July 26)

Climate Highlights - 3 - 12 - Month and Year-to-Date Periods

- During the three month period (May-July), a persistent trough/ridge weather pattern set up across the U.S., bringing below normal temperatures to the western third of the country and above normal temperatures to the eastern half. This pattern resulted in Washington State having its coolest such period on record, while the Northwest climate region had its second coolest (tied). The West climate region had its tenth coolest such period.

- Oklahoma had its warmest May-July period, while 18 other states had a top ten warmest three months. The South climate region had its second warmest May-July and the Northeast and Southeast both had a top ten warmest such period.

- The trough/ridge pattern during the past three months also affected precipitation patterns across the U.S. The persistent flow of moisture from the West coast to the upper Midwest resulted in the fifth wettest May-July period for the Northern High Plains area. Meanwhile, the ridging in the south generally prevented organized precipitation systems in the area, resulting in the second and seventh driest such period for the South and Southeast, respectively.

- At the statewide level, it was the second driest May-July period for Texas and New Mexico, fourth driest for Oklahoma, and the sixth driest for Georgia. Conversely, both Montana and North Dakota had their fourth wettest such period. It was also anomalously wet for California which tied for its fifth wettest May-July. Other states that were abnormally wet included: Utah (6th wettest), Wyoming (9th), and South Dakota (10th).

- The six-month (February-July) and the year-to-date (January-July) periods were record dry for Texas, New Mexico and the South climate region. Conversely, across the Northern half of the country, most states experienced much above normal precipitation. Three states had record precipitation amounts for the February-July period: Kentucky, Ohio, and Michigan.

- Flooding along the Missouri River Basin was associated with a record amount of precipitation during the rolling 12-month period (August 2010-July 2011) in Montana, North Dakota, and Minnesota. The previous records for statewide precipitation during this period were last established in 1901 and 1907 in North Dakota and Montana, respectively.

- Regionally, much drier-than-normal conditions have been persistent through the 12-month period for the South and Southeast climate regions. It was the third driest such period for the South and the eighth driest for the Southeast.

Alaska Temperature and Precipitation:

- Alaska had its 36th coolest July on record, with a temperature 0.2°F (0.7°C) below the 1971–2000 average.
- Alaska had its 27th warmest May-July on record, with a temperature 0.4°F (0.2°C) above the 1971–2000 average.
- Alaska had its 40th warmest year-to-date period on record, with a temperature near the 1971–2000 average.
- Alaska had its 46th wettest July since records began in 1918, with an anomaly that was 5.0 percent above the 1971–2000 average.
- Alaska had its 43rd driest May-July on record, with an anomaly that was 2.6 percent below the 1971–2000 average.
- Alaska had its 25th driest year-to-date period on record, with an anomaly that was 3.3 percent below the 1971–2000 average.

For additional details about recent temperatures and precipitation across the U.S., see the Regional Highlights section below and visit the Climate Summary page. For information on local temperature and precipitation records during the month, please visit NCDC's Records page. For details and graphics on weather *events* across the U.S. and the globe please visit NCDC's Global Hazards page.

Regional Highlights:

These regional summaries were provided by the six Regional Climate Centers and reflect conditions in their respective regions. These six regions differ spatially from the nine climatic regions of the National Climatic Data Center.

Northeast | Midwest | Southeast | High Plains | Southern | Western

Northeast Region: *(Information provided by the Northeast Regional Climate Center)*

- July 2011 was hot and dry in the Northeast. Eleven of the states in the region had temperature averages that placed in the top 15 warmest since 1895, with Delaware

having its warmest July in 117 years. Out of the top 15, but still much warmer than normal, Maine placed 24th warmest since 1895. State departures ranged from +1.8 degrees F (1.0 degrees C) in Connecticut to +3.8 degrees F (2.1 degrees C) in Delaware. On average, the Northeast's temperature was 72.8 degrees F (22.7 degrees C), which was 2.9 degrees F (1.6 degrees C) warmer than normal and the 7th warmest since 1895. The persistent ridge that had the central US in a serious heat wave moved east during the third week of the month. The mercury soared into the upper 90's and low 100's (32-40 degrees C), establishing new temperature records throughout the Northeast. On the 22nd, the mercury reached 104 degrees F (40 degrees C) at Central Park, NY, 106 degrees F (41.1 degrees C) at Baltimore, MD, and 108 degrees F (42.2 degrees C) at Newark, NJ. Interestingly, the previous high for the date at all of these three locations was 101 degrees F (38.3 degrees C) on July 22, 1957. The highs of 103 degrees F (39.4 degrees C) at Bridgeport, CT and 105 degrees F (40.6 degrees C) at Washington Dulles on the 22nd were all-time highs for those locations. Also notable were the many daily high minimum temperature records that were broken during the month. With minimum temperatures of 77 degrees F (25 degrees C) to 84 degrees F (28.9 degrees C), Binghamton and Central Park, NY, Scranton, PA, and Washington National, DC tied or established new all-time high minimum temperature records on the 22nd or 23rd. New monthly average temperature records were set at seven first order stations, including Atlantic City, NJ, Washington National, DC, and Baltimore, MD. The previous warmest July at these three locations was just last year.

- The Northeast's average rainfall total of 2.98 inches (75.7mm) made this month the 13th driest July since 1895. It was also the 13th driest July in New Hampshire and New York; Connecticut saw its 14th driest July in 117 years. State departures ranged from 50 percent of normal in Connecticut to 88 percent of normal in Delaware. The Northeast averaged 70 percent of its typical July rainfall amount. Hot and dry weather during July resulted in moderate drought conditions in most of Delaware and Maryland, western New York and central and northwestern Pennsylvania. The southeastern shore of Maryland was experiencing severe drought conditions according to the US Drought Monitor issued on the 2nd of August. Reports of dry pastures and crop stress were received from the agricultural communities in these locations. In addition, some municipalities in Pennsylvania and New Hampshire issued water conservation advisories. While the month of July was dry, precipitation during the previous six months was plentiful enough that eight of the Northeast states averaged above normal for the period January through July. In fact, the period was the 3rd wettest since 1895 in Pennsylvania, the 7th wettest in New York and Vermont and the 8th wettest in the Northeast.

- The region had its share of severe weather during July. Seventeen days out of the month saw reports of wind damage, hail and/or intense rain somewhere in the region. Lightning strikes on the 22nd injured at least 5 people, four at a campsite in Aroostook County, ME, and one in Charleston, WV. Lightning also caused house fires on the 23rd in Massachusetts and Rhode Island. A particularly strong line of storms on the 29th resulted in the formation of tornados and downbursts in northeastern Pennsylvania, and central and southeastern New York. Wind speeds ranged from 65 to 120 mph (29 to 54 m/s). Trees were snapped or uprooted and several structures damaged, including a barn that was blown off its foundation in Otsego County, NY. A downburst near Scranton, PA left one person injured.

For more information, please go to the Northeast Regional Climate Center Home Page.

Midwest Region: *(Information provided by the Midwest Regional Climate Center)*

- Hot and humid weather held sway across the Midwest for most of the month of July as the result of a persistent upper level ridge over the central United States. Average daily temperatures ranged from 3 degrees F to 6 degrees F above normal during the month, with the greatest departures found in southwestern and western Missouri. For all nine Midwestern states this July ranks in the top seven warmest Julys, based on preliminary data. The hot weather was accompanied by very humid air, with dew points frequently remaining in the 70s F (21 to 26 degrees C) and even reaching the low 80s (28 degrees C) in some locations. The combination of high temperatures and dew points produced heat indices frequently in excess of 110 degrees F (43 degrees C). The peak of the heat wave occurred during the third week of July. Daily average maximum temperatures ranged from as much as 8 degrees F (4.4 degrees C) above normal in southwestern Missouri to near normal in Kentucky. Maximum temperatures in an area encompassing eastern Indiana into western Ohio experienced were 5 degrees F to 6 degrees F (2.8 degrees to 3.3 degrees C) above normal. The humid air mass prevented overnight temperatures from falling enough to provide relief from the oppressive conditions. Daily average minimum temperatures were generally 4 degrees F to 6 degrees F (2.2 degrees to 3.3 degrees C) above normal, except south of the Ohio River and in far northern Minnesota. It was the high minimum temperatures that helped push rankings for this July into the top seven for the Midwestern states. Preliminary data show that 1,581 record high minimum temperatures were tied or set in the Midwest during July, with 920 occurring in the five-day period from July 18-23. In contrast, there were only 528 record high temperatures tied or set during the entire month.

- A large portion of the Midwest saw far less than normal rainfall in July. The most persistent and heaviest rains fell on the periphery of the large upper ridge, where a boundary between the hot humid air south and slight cooler air to the north often stalled out. Rainfall was 150 percent to more than 200 percent of normal from west-central Minnesota east-southeast across southern Lower Michigan. Rainfall was also well above normal across southern Illinois. There were a number of significant heavy rain events during the month in these areas, and record daily precipitation amounts were set in several locations the last two weeks of July. More than seven inches (178 mm) of rain fell in the Chicago area July 22-23, and more than four inches (102 mm) fell in northeastern Ohio, causing extensive flash flooding in both areas. On July 28th more than 15 inches (381 mm) of rain accumulated in a relatively small portion extreme eastern Iowa and northwestern Illinois, causing extensive damages from flash floods and one fatality. Dubuque, Iowa received 16.01 inches (407 mm) of rain in July, but that total was swollen by a record 24-hour rainfall of 10.62 inches (270 mm) on the night of July 27th. Their July total was the highest for any month at that location among 158 years of records (old record 15.46 inches (393 mm) in September 1965).

- Severe weather occurred in all nine states in July, but was concentrated from Minnesota through Wisconsin, northern Illinois, and eastward into northern Ohio. Most of the reports were for severe thunderstorm winds. The most significant event was a long-lived derecho that developed in Nebraska on July 10th and swept across central Iowa, southern Wisconsin, northern Illinois and Indiana, and much of Ohio late on the

10th and July 11th. Measured wind gusts to 80 miles per hour were reported, and winds were estimated as high as 110 miles per hour near Dysart, Iowa (Tama County).

For details on the weather and climate events of the Midwest, see the weekly summaries in the MRCC Midwest Climate Watch page.

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

- Mean temperatures in July were above normal across the Southeast region. The greatest departures (4 to 5 degrees F (2.2 to 2.8 degrees C)) extended from central North Carolina to northern Virginia, while the southern tier of the region was 1 to 2 degrees F (0.5 to 1.1 degrees C) above normal for the month. Mean temperatures were slightly below normal across Puerto Rico and the U.S. Virgin Islands. July ranked as the all-time warmest month in Washington D.C., exceeding the previous record set in July 1993 and July 2010 by almost 1.5 degrees F (0.8 degrees C). Cape Hatteras, NC tied its warmest month ever in a record extending back to 1898. Additionally, several locations recorded one of their top 3 warmest July's on record, including Raleigh-Durham, NC (warmest on record), Asheville, NC, Greensboro, NC, Tampa, FL, Columbia, SC, Greenville-Spartanburg, SC, Roanoke, VA, and Richmond, VA. On the 12th of the month, Richmond set an all-time record high minimum temperature of 81 degrees F (27.2 degrees C), breaking the old record of 79 degrees F (26.1 degrees C) last set in 2010. The West Palm Beach, FL area tied an all-time record high minimum temperature of 85 degrees F (29.4 degrees C) on the 28th and 29th of the month. As in June, the persistence of warm temperatures was record-breaking in some cases. Savannah, GA set a record for consecutive number of days of 90 degree F (32.2 degrees C) or higher temperatures with 46 (from May 20th to July 4th), breaking the old record of 44 set back in 1993. Raleigh-Durham, NC recorded five consecutive days of 100 degree F (37.8 degrees C) and higher temperatures from the 20th to the 24th of the month, breaking the previous record of four consecutive days last set in June 2008.

- Monthly precipitation varied considerably across the Southeast in July. The wettest locations (150 to 200 percent of normal) were found across southern Alabama, northwest Florida, central North Carolina, and the Tidewater region of Virginia. Williamsburg, VA recorded 5.24 inches (133.1 mm) of rainfall on the 8th of the month, which broke the previous 24-hr record rainfall total in July of 4.64 inches (117.9 mm). Norfolk, VA recorded 10.89 inches (276.6 mm) of rainfall for the month, which was nearly 6 inches (152.4 mm) above normal. Miami Beach, FL recorded 10.18 inches (258.6 mm) for the month, or 280 percent of normal. July was also an exceptionally wet month across Puerto Rico, especially along the northern and southern slopes where precipitation was more than 300 percent of normal. Guayama, PR recorded 18.4 inches (467.4 mm) of rainfall for the month, making it the wettest July in a record extending back to 1933. In contrast, the driest locations (less than 50 percent of normal) were found across northern Virginia and eastern North Carolina. The latter has been particularly dry over the past three months. New Bern, NC and Morehead City, NC recorded their driest May-July periods in records extending back to 1948, while the Wilmington, NC area recorded its third driest May-July period in a record extending back to 1874.

- There were 622 reports of severe weather across the Southeast in July, with at least

one report on 25 of the 31 days. Only one tornado was reported. On the 7th of the month, an EF-0 tornado touched down in Pasco County, FL north of the Tampa Bay area, causing minor roof damage to several mobile homes. Also in Florida, on the 26th of the month a man was injured after being struck by lightning on his roof in Orange Beach, FL.

- The Southeast saw some improvement in drought conditions in July; however, more than 50 percent of the region was still classified in moderate drought (D1) or greater by the end of the month. The most notable improvement was a reduction from exceptional (D4) to extreme (D3) conditions across southern portions of Alabama, Georgia, Florida, as well as the Florida Panhandle, where monthly rainfall totals were greatest. The beneficial rains helped improve pastures and increase hay production, but also increased disease pressures, prompting some farmers to begin applying fungicide. Many field crops, particularly corn and peanuts, continued to lag behind historical figures, though farmers in western and central Virginia reported a bumper crop for many fruits and vegetables. The persistence of hot weather and poor pasture conditions early in the season contributed to weight loss in cattle and several livestock deaths.

For more information, please go to the Southeast Regional Climate Center Home Page.

High Plains Region: *(Information provided by the High Plains Regional Climate Center)*

- July 2011 temperatures were higher than normal across the High Plains Region. Average monthly temperatures ranged from near normal to 10.0 degrees F (5.6 degrees C) above normal. The largest departures occurred in central and southern Kansas, where temperatures ranged from 6-10 degrees F (3.3-5.6 degrees C) above normal. The hot temperatures caused many locations to be ranked in the top 10 warmest Julys. Dodge City, Kansas continued to experience extreme temperatures this month and racked up a record 23 days at or above 100 degrees F (37.8 degrees C). In a typical year, Dodge City will have 10.5 days at or above 100 degrees F (37.8 degrees C) and by the end of July, this year's total already stood at 35. These hot days helped Dodge City set its 3rd hottest July on record with an average temperature of 86.9 degrees F (30.5 degrees C). The record of 87.3 degrees F (30.7 degrees C) was set in 1934 (period of record 1874-2011). The hot and humid weather had various impacts on crops and livestock this month. In Kansas, the near record heat coupled with ongoing drought conditions caused crop conditions to decline throughout the month. However, in the Dakotas, the hot and humid conditions helped push along row crop development, but severely stressed livestock. According to the Aberdeen American News, over a thousand cattle died in South Dakota due to the high heat and humidity.

- Precipitation was highly variable this month. Unfortunately, drought stricken areas of southern Kansas and southern Colorado missed out on most of the precipitation. The majority of Wyoming also missed out on the precipitation and most of the northern half of the state had precipitation totals which were at most 50 percent of normal. One location which received little precipitation this month was Dodge City, Kansas which only received 19 percent of normal precipitation. While this was not low enough to break July records, the year-to-date precipitation was the lowest on record (period of record 1874-2011). So far this year, Dodge City has only received 3.95 inches (100 mm) of precipitation. The second driest January-July occurred in 2002, when 5.71

inches (145 mm) of precipitation fell.

- July 2011 was not a dry month for the entire Region as some areas did receive above normal precipitation. Northern Colorado, portions of northern Kansas, a large part of the Nebraska panhandle, eastern South Dakota, and central North Dakota all had precipitation totals which were at least 150 percent of normal. A few locations even broke monthly precipitation records. Walden, Colorado, located in the north central part of the state, had its wettest July on record with 3.21 inches (82 mm) of precipitation. The old record of 3.06 inches (78 mm) was set in 1952 (period of record 1897-2011). Cheyenne, Wyoming had its second wettest July on record with 5.63 inches (143 mm). On July 12, severe storms brought heavy rain and large hail (up to 2 inches in diameter) to the Cheyenne area, and nearly half of the monthly precipitation total occurred that day. This set a new daily rainfall record for July 12 in Cheyenne with 2.43 inches (62 mm). The old record of 1.69 inches (43 mm) occurred in 1981 (period of record 1871-2011).

- The U.S. Drought Monitor had both improvements and degradations this month. Heavy precipitation was able to alleviate abnormally dry conditions (D0) in southern Nebraska, northern Kansas, and northern Colorado. The areas which were designated as moderate (D1), severe (D2), and extreme (D3) drought remained largely the same. However, extreme heat coupled with dry conditions led to an expansion of exceptional drought conditions (D4) not only in southern and central Kansas, but also in south central Colorado. By the end of the month, North Dakota, South Dakota, and Wyoming remained drought free. According to the U.S. Seasonal Drought Outlook released July 21st drought conditions in Colorado and most of Kansas were expected to improve. Only the most southern portions of the drought conditions in Kansas were expected to persist.

- Severe weather was an everyday occurrence across the Region this month as either tornadoes, hail, or high winds were reported somewhere in the Region each day. Some of the larger events happened on July 10, 12, 13, and 17. On July 10, tornadoes, high winds, and hail were reported across southern North Dakota. According to the National Weather Service in Bismarck, North Dakota, the highest winds were estimated at 125 mph (201 km/hr) in Dickey County. Damage occurred to homes, grain bins, power poles, and trees. A 200 foot radio station tower and a large portion of the Oakes Municipal Airport were also destroyed. In addition, the high winds and hail destroyed thousands of acres of crops. On July 12, large hail damaged aircraft at the Sky Harbor Air Service in Cheyenne, Wyoming. According to the Wyoming Tribune Eagle, the hail was 2-3 inches deep in some places. On July 13, large hail damaged aircraft at the Denver International Airport and caused numerous delays and cancellations. According to the Denver Post, this hail storm caused $164.8 million in damages. On July 17, an EF3 tornado in La Moure County, North Dakota caused significant damage to homes, outbuildings, power poles, and trees. According to the National Weather Service in Bismarck, North Dakota, only 1 injury was reported, however many farm animals were killed.

For more information, please go to the High Plains Regional Climate Center Home Page.

Southern Region: *(Information provided by the Southern Regional Climate Center)*

- As was the case in the previous month, July was again a very warm month for the Southern Region. The region as a whole averaged a temperature of 85.80 degrees F (29.89 degrees C). This is the warmest July on record (1895-2011) for the Southern Region. This is not surprising given that the majority of stations in the region averaged between 2 to 6 degrees F (1.11 to 3.33 degrees C) above monthly normals. The highest anomalies were observed in Oklahoma and northern Texas, where average temperatures ranged between 6 to 10 degrees F (3.33 to 5.56 degrees C) above expected values. Both Oklahoma and Texas experienced their warmest July on record (1895-2011), with state average temperatures of 88.90 and 87.10 degrees F (31.61 and 30.61 degrees C), respectively. Arkansas had a state average temperature of 84.50 degrees F (29.17 degrees C), which was the fourth warmest July on record (1895-2011). With a state average temperature of 83.80 degrees F (28.78 degrees C), Louisiana experienced its fifth warmest July on record (1895-2011). In Mississippi, it was the twelfth warmest July on record (1895-2011). The state average temperature there was 82.60 degrees F (28.11 degrees C). Tennessee averaged 80.00 degrees F (26.67 degrees C) and it was the tenth warmest July on record (1895-2011).

- With the exception of southern Louisiana, southern and central Mississippi, the month of July was very dry across the Southern Region. In Texas, most stations received less than 25 percent of normal precipitation, while stations in the central portion of the state received less than five percent of expected values. Some stations did not see a drop of rain in the entire month. With a state average precipitation total of just 0.72 inches (18.28 mm), it was the driest July on record (1895-2011) for the state. Similar conditions occurred throughout most of Oklahoma and western Arkansas, where the majority of stations received less than one quarter of normal precipitation. Oklahoma averaged only 0.9 inches (22.86 mm)of precipitation for the month, which was the ninth driest July on record (1895-2011). Arkansas averaged 2.20 inches (55.88 mm), or its eighteenth driest July on record (1895-2011). In Tennessee, precipitation totals ranged from twenty-five to ninety percent of normal. The state averaged 3.67 inches (93.22 mm) of precipitation and it was the twenty-seventh driest July on record (1895-2011) there. Southern Louisiana and much of Mississippi did experience normal to above normal precipitation. Precipitation totals in those areas ranged from one hundred to two hundred percent of normal. Louisiana averaged 6.28 inches (159.51 mm) of precipitation for the month, while Mississippi averaged 6.69 inches (169.93 mm). For Mississippi it was the twentieth wettest July on record (1895-2011), while for Louisiana it was the thirty-seventh wettest on record (1895-2011).

- Another month of anomalously high temperatures and anomalously low precipitation totals has led to expansion and worsening of drought conditions in Arkansas, Texas and Oklahoma. In Arkansas, the western half of the state is now experiencing severe drought, which last month was mostly drought-free. Central Oklahoma has been downgraded to exceptional drought, while eastern portions of the state are now seeing the introduction of extreme drought. There has also been some expansion of exceptional drought in central Texas. Some improvements in drought conditions have occurred in southern Louisiana, where precipitation has been plentiful. The southwest saw a one category improvement to extreme drought, while the southeast saw a two category improvement to severe drought. This is also the case for southern Mississippi, most of which is now upgraded to moderate and severe drought conditions. As was the case in the previous month, Tennessee remains drought free. In total, 47.32 percent of the Southern Region is in exceptional drought or worse, with 79.33 percent experiencing severe drought conditions or worse.

- In Texas, numerous cities were privy to triple digit high temperatures for more than half of the month, and some places already have broken their record of 100+ degrees F (37.78+ degrees C) days for a year. (Information provided by the Texas Office of State Climatology)

- Since the beginning of wildfire season in November, Texas has seen 16,368 fires and close to 3.5 million acres (14,163.99 square kms) have been burned. Among the properties destroyed, 2,300 structures and 601 were lost in the fires this season. By the end of July, 248 out of 254 counties had issued a burn ban. The remaining six counties were located in far South Texas and along the coast near Louisiana in areas that are least affected by the drought. For many, Independence Day fireworks were out of the question because of the burn bans. (Information provided by the Texas Office of State Climatology)

- Ranchers' herds had been reduced to minimal populations and some had been depleted completely. A few individuals had continued to enforce supplemental feeding, but water was scarce to be found. The drought hit Texas with such a ferocity that the entire state was declared a natural disaster zone. Over $1.5 billion in agriculture losses were estimated, and the economic impacts were expected to increase across the state. Texas closed in on the $4.1 billion record set in 2006, and was predicted to surpass it. Tropical Storm Don ignited the hopes of many for potential relief, but it only left traces of precipitation behind in South Texas and it fizzled out after making landfall. (Information provided by the Texas Office of State Climatology).

For more information, please go to the Southern Regional Climate Center Home Page.

Western Region: *(Information provided by the Western Regional Climate Center)*

- July of 2011 saw a continuation of much below normal temperatures in the Pacific Northwest, and much above average temperatures in New Mexico. Precipitation was above average in the coastal Northwest, and in parts of the Southwest, and below average in a broad swath from California through Montana and Wyoming. The Southwest monsoon began about on schedule and brought a mixed precipitation response.

- Temperatures were slightly below normal throughout the coastal West, with record lows set or tied throughout Oregon, Washington, and Utah. Seattle saw four record-breaking daily lows during the month. The most significant were lows of 50 degrees F (10 degrees C) on July 9th and 23rd, below former records of 53 degrees F (12 degrees C). They did see one record high of 79 degrees F (26 degrees C) on the 6th, above the former record of 77 degrees F (25 degrees C). During this cool month Meacham, Oregon fell to a daily record 31 degrees F (-0.6 degrees C) the 23rd, over a period that begins in 1929. Many daily records for coolest high temperature were also set throughout the Pacific Northwest in July. Temperatures were slightly to well above normal in New Mexico, Colorado, Wyoming and southeast Montana.

- The Pacific Northwest also experienced several rainfall records during what is normally the driest month of the year. On the 18th downtown Portland, Oregon received 0.82 inches (20.8 mm), exceeding the previous record of 0.53 inches (13.5 mm) set in 1974. The next day Medford, Oregon topped its previous daily record of 0.36 inch (9.1 mm) with 0.48inches (12.2 mm). The Southwest remained generally

drier than normal, though monsoon activity began this month, bringing scattered relief from drought conditions.

- Four Lake Tahoe area ski resorts were open for the 4th of July weekend for the first time since the mid 1990's. Other resorts were also open for holiday skiing in Oregon, Colorado, and Utah.

- Monsoon activity began in Arizona this week following a period of drought. Strong thunderstorm downdrafts kicked up dry, loose sand forming a dust storm 5,000 feet (1500 m) deep moving at up 50 mph (80 kph) and 100 mi (161 km) long on its leading edge. The dust storm traveled 150 to 200 miles (241 to 322 km) from Tucson to Phoenix. Visibility was reduced to between 0 and 5 feet (1.5 m) causing flight delays and interrupting ground travel. Trees and power lines were knocked down but no injuries were reported. Numerous videos captured this visually arresting event.

- Heavy rains associated with thunderstorms and arrival of a moist air mass combined with rapid snowmelt to produce flooding in the Western two-thirds of Utah. Many streams and rivers along the south aspect of the Uinta Mountains, notably the Duchesne River, remained at or above flood level for several days. Near Tabiona, Utah, a portion of State Highway 35 a washout during the night caused two vehicles to drive into a gulch, and led to a fatality.

- The Las Conchas Fire near Los Alamos began on June 26, and continued to burn throughout the month of July. The fire consumed 156,593 acres and destroyed 63 residences. Smoke from the fire has caused poor air quality in surrounding areas throughout the month. As of July 31, the fire was 99 percent contained. Flash flooding occurred in burned areas July 21 and 22 as a result of monsoon activity in the area. Two weather stations in Valles Caldera recorded the passage of the flame front, but escaped major damage because of low vegetation.

- The Southwest experienced moderate to exceptional drought during the month of July. In New Mexico sixteen counties declared a natural disaster due to exceptional drought. Wildfires and severe water shortages were experienced across the state. Twelve counties in Colorado received similar declarations, and disaster status is sought after for six additional counties. Low crop yields are expected for Colorado farmers, and livestock production is becoming expensive due to lack of grasses and supplemental feeding.

See NCDC's Monthly Records web-page for weather and climate records for the most recent month. For additional national, regional, and statewide data and graphics from 1895-present, for any period, please visit the Climate at a Glance page.

PLEASE NOTE: All of the temperature and precipitation ranks and values are based on preliminary data. The ranks will change when the final data are processed, but will not be replaced on these pages. Graphics based on final data are provided on the Temperature and Precipitation Maps page and the Climate at a Glance page as they become available.

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