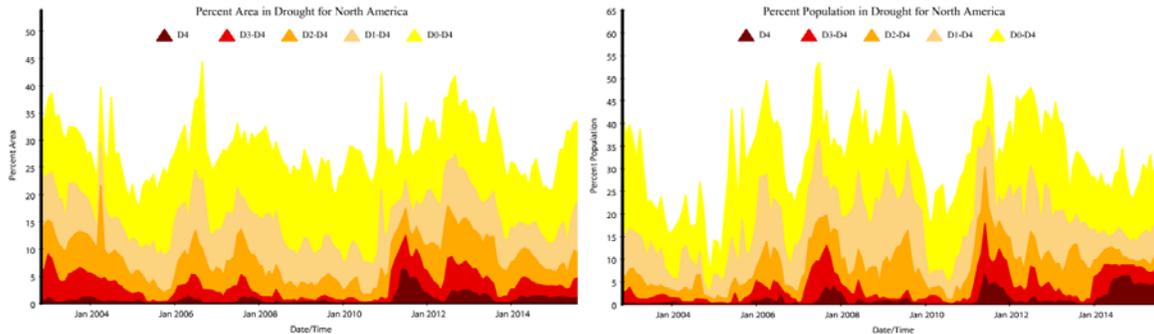


## North American Drought Monitor – August 2015

At the end of August 2015, moderate to exceptional drought (D1-D4) affected approximately 18.7% of the area and 23.7% of the population of North America. These percentages are an increase of 1.3% for area and 5.0% for population compared to the values for the end of July 2015.



**CANADA:** Drought continues to be a significant concern throughout much of British Columbia and Alberta. In parts of Western Canada, Environment Canada has stated that 2015 was the warmest summer on record for many regions and one of the top ten driest on record. In August, abnormally high temperatures throughout western Canada continued to desiccate crops and grasslands. Significant precipitation at the end of August improved soil moisture and reduced the drought extent and severity in some areas, including much of Saskatchewan, central Alberta, and portions of western regions of B.C. Approximately 22.5 percent of Canada's agricultural regions remained in drought at the end of August. This encompasses areas throughout the lower mainland of B.C., Vancouver Island, much of Alberta, and a portion of west-central Saskatchewan, and affects approximately 18,000 farms and 3.9 million head of cattle. Outside of the agricultural areas, reduced precipitation throughout northeastern Alberta and northwestern Saskatchewan has resulted in an expansion of the Moderate Drought (D1). Other regions of note include the expansion of Abnormal Dryness (D0) in the Atlantic, a small portion of southern Ontario, and southern Manitoba.

In British Columbia, warmer- and drier-than-normal conditions persisted through most of August. Record low stream flow continued through much of the month in many locations of western and southern British Columbia. A significant rainfall event late in the month improved the situation in parts of southwestern British Columbia, most notably in the lower mainland–Abbotsford area and the coastal mountains, where 50-90 mm of precipitation fell the last week of August. Drought conditions did not improve throughout the southern interior, as less than 20 mm of rainfall was received throughout, resulting in continued drought. There was an expansion of Severe Drought (D2) and Extreme Drought (D3) in the southern interior. Conversely, there was a reduction of the Extreme Drought (D3) and the Exceptional Drought (D4) for the northern half of Vancouver Island, and a reduction of the Extreme Drought (D3) in the central Interior, due to significant rainfall (> 115%) for the last 30 days, thus increasing streamflow and replenishing soil moisture.

For the Prairies, precipitation in August helped reduce the drought extent and severity for much of Saskatchewan and central Alberta. Central regions of Alberta received 90-125 mm of precipitation, 150 percent of normal in August, providing relief from drought and improving growing conditions. In these regions, there was a large reduction of the Extreme Drought (D3) area. However, Severe Drought (D2) remains due to the long-term precipitation deficits experienced throughout the entire growing season. Southern and northern regions of the province received much less rainfall and remained in Severe Drought (D2) and Extreme Drought (D3) classifications. Rainfall throughout Saskatchewan continued to improve soil moisture and reduce drought impacts. Drought is now limited to the extreme west of the province, with the exception of a small pocket of D1 in southeastern Saskatchewan. There was an emergence of a small pocket of Severe Drought (D2) east of Swan River in Manitoba due to reduced precipitation during the growing season—driest in the last 20 years according to province.

Livestock producers in Western Canada are experiencing feed shortages. Hay yields are expected to be only 50 to 70 percent of normal in British Columbia and parts of Alberta, and dry conditions have kept pastures from greening up and producing feed for grazing cattle. Some poor quality crops are being grazed or baled to help address the feed shortages. In the driest areas, only one cut of hay was harvested. Producers are being faced with the difficult choice to either purchase expensive replacement feed or sell off breeding stock.

In the northern areas around Hudson Bay, the Yukon and Northwest Territories, below-average snow packs have led to a significant portion of the area classified as Abnormally Dry (D0). For the pockets of Moderate Drought (D1) or Severe Drought (D2), these areas received below-average spring precipitation (50 percent of normal in some areas), and fire danger continued to be a concern heading into September.

Eastern and Atlantic Canada continue to receive adequate rainfall in most regions. Small pockets of Abnormal Dryness (D0) exist and are being monitored; however, there was little concern for drought in these regions.

**UNITED STATES:** During the 4-week period ending on September 1, 2015, contiguous U.S. drought coverage increased 3.30 percentage points to 30.43%. Large sections of the Great Plains, Midwest, and mid-South remained free of drought during August, but drought returned or intensified across parts of the South—mainly from eastern Texas and southeastern Oklahoma to Georgia and the Carolinas.

In August, statewide drought coverage increased from 34 to 81% in Louisiana; 1 to 25% in Mississippi; 5 to 25% in Texas; and 18 to 34% in North Carolina. In South Carolina, drought coverage remained steady at 64% during August. Meanwhile, drought coverage increased from none to 14% in Arkansas and 9% in Oklahoma. In contrast, slight improvement was noted during August in Georgia (from 34 to 27% drought coverage) and Alabama (18 to 11%).

During August, there was also an increase in drought coverage in portions of the northern Atlantic States. Between August 4 and September 1, drought coverage jumped from 0 to 17% in New Jersey and from 0 to 8% in New Hampshire. In New Jersey, the U.S. Department of Agriculture (USDA) rated topsoil moisture 53% very short to short on August 30.

Worsening Northwestern drought led to additional increases in the coverage of extreme to exceptional drought (D3 to D4) between August 4 and September 1 in Washington (from 32 to 68%); Oregon (48 to 67%); Idaho (22 to 29%); and Montana (14 to 19%). During the same 4-week period, California's D3/D4 coverage remained unchanged at 71%, while Nevada's coverage fell slightly from 40 to 38%. The Northwestern drought situation was exacerbated by persistent heat. During August, dozens of large wildfires charred hundreds of thousands of acres of vegetation from the Pacific Coast to the northern Rockies. One of the most destructive fires, Washington's Okanogan Complex, burned more than 130,000 acres (more than 50,000 hectares) and destroyed more than 150 structures, with containment reaching 50% by early September. Through August, U.S. wildfires had burned more than 8.4 million acres (about 3.4 million hectares) of vegetation—150% of the 10-year average—approaching the modern-day annual record of nearly 9.9 million acres (nearly 4.0 million hectares) set in 2006. (More than half of this year's total, about 5.1 million acres, or more than 2.0 million hectares, burned in June and July during a rash of Alaskan wildfires.)

Outside of the mainland U.S., drought coverage decreased during August in Alaska (from 20 to 18%) and Hawaii (26 to 24%), but increased in Puerto Rico (61 to 64%). Alaska's drought (and wildfire) situation continued to improve in August under a showery weather regime, while Hawaii's rainfall increased in part due to oceanic warmth associated with a strengthening El Niño. In fact, five hurricanes—Guillermo, Hilda, Kilo, Loke, and Ignacio—prowled the central Pacific Ocean in August, although none directly affected Hawaii. Meanwhile, much of eastern Puerto Rico remained mired in drought, despite some tropical showers that included a brush with Tropical Storm Erika.

**Historical Perspective:** According to preliminary information provided by the National Centers for Environmental Information, the contiguous U.S. experienced its 31st-hottest, 28th-driest August during the 121-year period of record. The nation's average temperature of 73.0°F (22.8°C) was 0.9°F (0.5°C) above the 1901-2000 mean, while the average rainfall of 2.36 inches (59.9 mm) was 90 percent of normal. For the Lower 48 States, it was the second-driest August in the last 15 years, ahead of only 2011—when an average of 2.34 inches (59.4 mm) fell.

State temperature rankings ranged from the 15th-coolest August on record in Kentucky, Missouri, and Tennessee to the fourth-hottest August in Rhode Island. Temperatures were also among the ten highest August values on record in Arizona, California, Connecticut, Massachusetts, Maine, and New Mexico. Meanwhile, state precipitation rankings ranged from the tenth-driest August on record in Louisiana to the 11th-wettest August in South Dakota.

**Agricultural and Hydrological Highlights:** By August 30, Washington led the nation with 68% of its rangeland and pastures rated very poor to poor, according to USDA, followed by Oregon (64%), and California (60%). On the same date, Oregon, Washington, and California also led the U.S. in topsoil (86, 80, and 73% very short to short, respectively) and subsoil (86, 85, and 82%) moisture shortages. In large part due to the Western drought, 20% of the U.S. hay production area and the U.S. cattle inventory were located in drought on September 1. Those numbers represented an increase from 14 and 16%, respectively, on August 4.

On September 1, drought covered a negligible portion (3%) of the U.S. corn and soybean production areas. As a result, 68 percent of the U.S. corn and 63 percent of the soybeans were rated in good to excellent condition by USDA by the end of August.

USDA rated topsoil moisture at least one-half very short to short on August 30 in several Southern States, including Texas (64% very short to short), Virginia (61%), Louisiana (59%), North Carolina (58%), South Carolina (55%), and Mississippi (53%). Also on August 30, Southern pastures were rated at least one-fifth very poor to poor in Louisiana (28%), Texas (28%), South Carolina (21%), Virginia (21%), Arkansas (20%), and Mississippi (20%).

At the end of August, below-average reservoir storage continued to plague several Western States, including Arizona, California, Nevada, New Mexico, and Oregon. California's cumulative reservoir storage remained at its second-lowest level on record, ahead of only 1977. Due to the lack of runoff associated with a poor snowpack, storage fell to more significantly below-average levels in Idaho and Washington. In the western U.S., above-average statewide reservoir storage was limited to Colorado, Montana, and Wyoming.

**MÉXICO:** The combination of a low-pressure system and moisture from the Pacific brought rainfall above the 1941-2014 mean to the northwest, the northeast, and center portions of the country in August 2015. In contrast, it was the third consecutive month with scarce precipitation in southern Mexico, resulting in a severe drought (D2) increase, in addition to a new extreme drought (D3) area. The Yucatan Peninsula received significant rainfall at mid-month that helped to reduce the severe drought (D2); however, dryness and moderate drought (D1) still covers the three states of that peninsula. According to statistics from the Mexican Weather Service (SMN), the precipitation at the national level in August 2015 of 107.7 mm was 31.3 mm below the 1941-2014 mean and was ranked as the tenth-driest August.

The decrease in summer rainfall aided drought development in the southern part of the country. Guerrero had its driest August and the fifth-driest June-August period; Oaxaca had its third-driest August and the second-driest June-August; while Chiapas saw its tenth-driest August and the driest June-August period. Another region with low precipitation was the Yucatan Peninsula, where Campeche and Yucatán recorded their ninth- and fifth-driest June-August, respectively, since 1941. On the other hand, Sinaloa and Baja California Sur, in the northwest, had their sixth- and eighth-wettest August, respectively, while Morelos (in central Mexico) had its seventh-wettest August.

The monthly mean temperature was warmer than normal in most of the country; the national mean of 26.4°C, was 3.2°C above the 1971-2000 normal, and was ranked as the warmest August since 1971. The statewide mean temperature classification placed 19 states plus the Federal District in the top-three warmest for August. Oaxaca and Tlaxcala had their third-warmest August. Nine states attained their second-warmest August, among them Hidalgo, Chihuahua and the Federal District had the highest anomalies at 2.9, 2.6, and 2.5°C above normal, respectively. Eight states (Baja California Sur, Campeche, Guerrero, Michoacan, Nayarit, Queretaro, Sonora, and Yucatan) noted their warmest August since records began in 1971.

High temperatures, minimal rainfall, and low soil moisture, mainly in southern and southeastern Mexico, resulted in 13.2% of the country being in moderate to extreme drought (D1-D3) at the end of August—an increase of 4.5% compared with the previous month. In August, the emergence of dryness was observed in the northeast, as well as the expansion of this category in the west, east and south of Mexico. Meanwhile, the long-term drought (D1-D3) located in northern Baja California declined slightly from 60.8% to 59.2%. In the south, moderate to severe drought (D1-D2) showed significant increases, covering 89.5% of Tabasco, 22.3% of Michoacán, 21.4% of Oaxaca, and 59.5% of Chiapas. Michoacán and Guerrero experienced a new area of extreme drought (D3)—the first time with D3 in Guerrero since July 2003. Drought reports regarding agriculture began in Guerrero, where the Secretariat of Rural Development in early August reported losses of 75% of corn crop in the Tierra Caliente region.

The Information Service for Agri-food and Fisheries (SIAP) reported that 11 million hectares were planted in the spring-summer season this year, 3% less than the previous year. The main planted crops were corn, beans, and sorghum, which together represent 78% of the sown area. Almost 1% of this sown area reported damage by drought, hail, or excess moisture. In relation to the perennial plantations, the main damage was due to diseases, excess moisture, and hail, with Oaxaca, San Luis Potosi, Guerrero, and Sinaloa reporting the main effects.

The National Water Commission (CONAGUA) reported 20 of the main 200 country's reservoirs with less than 50% of capacity as of September 1. This list includes Abelardo Rodriguez in Sonora at 8.1% and Emilio Lopez Zamora in Baja California at 2.7%. The National Forestry Commission (CONAFOR) noted this year the smallest area burned by forest fires from since 1998 for the January 1 - September 3 period. The greatest area burned was reported in Baja California, Oaxaca, Yucatan, Jalisco, Campeche, Quintana Roo, Guerrero, Chiapas, Chihuahua, and Baja California Sur. With the exception of Baja California Sur, all states cited are experiencing some level of drought.