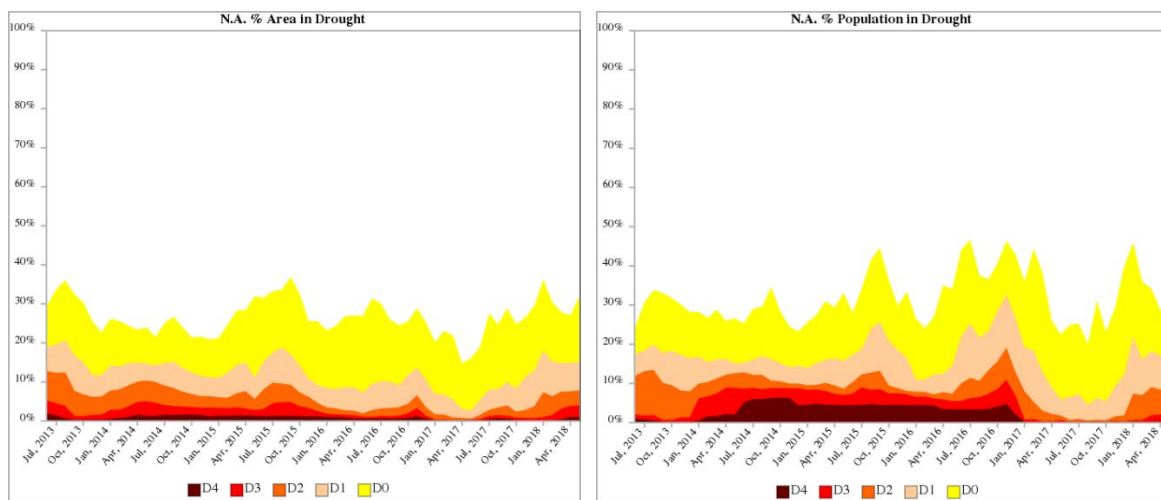


## North American Drought Monitor – May 2018

At the end of May 2018, moderate to exceptional drought (D1-D4) affected 15.0 percent of the area and 14.1 percent of the population of North America. The percent area value was 0.2 percent more than the value for the end of April 2018. The percent population value was 2.9 percent less than the value for the end of April. At the end of May, 9.8 percent of the Columbia River Basin and 51.9 percent of the Rio Grande/Bravo River Basin were in moderate to exceptional drought; 15.6 percent of the Great Lakes Basin was abnormally dry (D0) or experiencing moderate drought; and 34.9 percent of the North American Great Plains was in moderate to exceptional drought. The North American Great Plains extends across the United States and into adjacent parts of northeast Mexico and the southern Prairies of Canada. The percent area of drought in the Columbia Basin and abnormally dry to drought conditions in the Great Lakes Basin are larger than they were at the end of April. The percent area of drought in the Rio Grande/Bravo River Basin and Great Plains is less than at the end of April.



**CANADA:** Drought conditions continued to be centered in the southern prairies throughout the month of May. Above average temperatures and excessively low precipitation led to acceleration of drought across western Canada throughout the month. British Columbia's interior began to experience unexpectedly dry conditions early in the season, prompting several wildfires in the region. British Columbia experienced an abnormally dry May throughout the south west as well as the central interior resulting in a return of abnormally dry and drought conditions. Poor soil moisture across the southern Prairies led to the development of several drought pockets. Although much of the Central Region benefited from warm temperatures and a relief from excess moisture concerns, conditions in northern Ontario continued to deteriorate due to persisting dryness. Precipitation deficit and poor streamflow led to increased drought risk and wildfire concerns in Northern Canada. On the last day of May, a significant system moved in to Southern Saskatchewan and brought significant rain to the region which improved the conditions rapidly. For agricultural production the timing of this rainfall couldn't have

been better. With rapidly developing drought and the majority of seed in the ground, agricultural producers needed rain.

### **Pacific Region (BC)**

Warm temperatures and significant rainfall deficits increased the risk of wildfire across the Pacific region in May. Although parts of the southern interior saw relief from excess moisture levels, most of the province became very hot and dry. Many areas across the province received less than 10mm of rain throughout May, well below expected values for this time of year. As a result, Abnormally Dry (D0) conditions expanded to include much of the province. Significant precipitation deficits and poor soil moisture led to the development of Moderate Drought (D1) along the Yukon border and in the Peace region.

### **Prairie Region (AB, SK, MB)**

Similar to the Pacific, hot and dry conditions prompted rapid drought emergence in the Prairie Region, especially in Alberta and Manitoba. Abnormally Dry (D0) conditions expanded out to include a large portion of Alberta that received less than 15mm of rain throughout May. Satellite-derived data indicated that the Peace region, northeastern Alberta, and the southeast had received less than fifty percent of their average precipitation since March; thus two large Moderate Drought (D1) pockets emerged. Record-low precipitation surrounding Peace River throughout May resulted in the development of a Severe Drought (D2) pocket. Although saving rains at the end of the month improved agricultural conditions, moisture is required for germination to proceed. Southern Saskatchewan experienced significant improvement in May due to above average short-term precipitation. A large rainfall event on May 31 helped to alleviate long-term moisture concerns, and all drought conditions in the southeast improved, most significantly in areas east of Regina. D1 conditions persisted in parts of the southwest, where soil moisture deficits continued. Despite some relief to southeastern Manitoba, D2 conditions endured and expanded in the southern half of the province. Agricultural impacts across the prairies included decreased water supply, below normal slews, and decreased feed production.

### **Central Region (ON, QC)**

Conditions continued to improve in southern Ontario and Quebec while they degraded in northern Ontario. An Abnormally Dry (D0) pocket expanded in the northwest, and several pockets north of Lake Superior deteriorated into Moderate Drought (D1) due to enduring dryness and poor surface soil moisture. D0 conditions developed north of La Sarre in Quebec due to short-term precipitation deficits, leading to increased wildfire risk. A D0 pocket persisted along the Gulf of St. Lawrence in Quebec due to persisting moisture deficits.

### **Atlantic Region (NB, NS, PE, NL)**

In Atlantic Canada, May brought normal to above normal precipitation for most of the region and low temperatures across the regions. Excess moisture conditions across parts of the Atlantic have decreased. Due to adequate rainfall replenishing soil moisture, all lingering dryness concerns were alleviated.

### **Northern Region (YK, NT)**

Dryness concern in Northern Canada expanded throughout May due to reduced precipitation and increased wildfire risk. Satellite-derived data indicated that part of the southern Yukon Territory had received adequate precipitation since March; thus only a couple of small Moderate Drought (D1) pockets persisted. An Abnormally Dry (D0) pocket was expanded from the Yukon to the Northwest Territories due to poor streamflow and precipitation deficits throughout the month.

**UNITED STATES:** Consistent warmth and erratic rainfall highlighted an unusual May. In fact, 2018 featured the nation's warmest May on record. Unlike previous years, however, such as 1934, 1936, and 2012, when near-record to record-setting May warmth was accompanied by rapidly developing drought, sufficient rain fell in many areas during May 2018 to forestall major drought concerns.

Notable exceptions included the southern High Plains and the Southwest, where ongoing drought and hot conditions hastened winter wheat maturation and increased stress on rangeland, pastures, and rain-fed summer crops. May dryness was also noted in a few other regions, including much of New England, the western Gulf Coast region, portions of the mid-South, and a few Midwestern pockets.

In contrast, exceptionally wet weather prevailed in the middle and southern Atlantic States, hampering fieldwork and potentially reducing the quality of crops such as hay, fruits, and winter wheat. Elsewhere, above-normal May rainfall was also observed across the northern and central High Plains and the northern Intermountain West, generally benefiting winter grains and spring-sown crops.

The pervasive May warmth promoted a rapid pace of summer crop emergence and development, especially across the Plains and Midwest. More than two-thirds (68 percent) of the nation's soybean acreage had emerged by June 3—the quickest pace since 2012. In drier areas, such as Texas, the warmth also favored fieldwork. More than one-third (35 percent) of the Texas winter wheat crop had been harvested by June 3.

Contiguous U.S. drought (D1 or worse) coverage stood at 26.42% on May 29, down from 28.60% at the beginning of the month. However, a core drought area persisted across the nation's southwestern quadrant, leaving parts of seven states experiencing exceptional drought (D4). On May 29, D4 was observed in New Mexico, with 18% coverage, along with Arizona (16%), Colorado (8%), Oklahoma (7%), Utah (4%), Texas (2%), and Kansas (1%). Coverage of extreme to exceptional drought (D3 to D4) stretched across parts of eight Southwestern States, ranging from less than 3% in California to 74% in Arizona.

Outside of the contiguous U.S., neither dryness nor drought was noted during May in Puerto Rico. Abnormal dryness (D0) returned to some leeward sections of Hawaii, covering 21% of the state by May 29. Meanwhile in Alaska, coverage of abnormal dryness decreased from 11 to 2% during May, with small D0 areas lingering in the south-central and southeastern sections of the state.

**Historical Perspective:** According to preliminary data provided by the National Centers for Environmental Information, the contiguous U.S. experienced its warmest May during the 124-year period of record. The nation's average temperature of 65.4°F (18.6°C) was 5.2°F (2.9°C) above the 1901-2000 mean, erasing the May 1934 standard of 64.7°F (18.2°C). All of the Lower 48 States ranked within the upper (warmest) one-third of the historical distribution. Florida, the “coolest” state, noted its 36th-warmest May. In fact, it was the warmest May on record in eight states (Arkansas, Illinois, Indiana, Kentucky, Missouri, Ohio, Oklahoma, and Virginia) stretching from the southern Plains to the Mid-Atlantic Coast.

Meanwhile, precipitation was fairly close to the middle of the historical distribution, ranking as the 55th-wettest May since 1895. Precipitation across the contiguous U.S. averaged 2.97 inches (75.4 mm), 102 percent of normal. It was the driest May since 2014. State precipitation rankings ranged from the tenth-driest May in Louisiana to the wettest May on record in Maryland and Florida. Unusual dryness was also observed in New Hampshire (11th-driest May) and Washington (12th driest), while near-record to record-setting wetness plagued the middle and southern Atlantic States.

**Agricultural and Hydrological Highlights:** Agricultural impacts of drought across the southern High Plains and the Southwest remained apparent during May. By June 3, Arizona led the U.S. with 94% of its rangeland and pastures rated in very poor to poor condition, followed by New Mexico (68%), Colorado (40%), and Texas (37%). On the same date, developing drought in the western half of the Gulf Coast region left 30% of Louisiana's pastures in very poor to poor condition. Meanwhile, periodic May showers arrived too late across the southern High Plains to benefit drought-stressed winter wheat. On June 3, more than one-third (35%) of the U.S. winter wheat crop was rated in very poor to poor condition. Oklahoma led the nation with nearly two-thirds (63%) of its winter wheat rated very poor to poor, followed by Texas (58%) and Kansas (49%). The southern Plains' summer crops were also starting to show signs of stress by June 3, with nearly one-quarter (23%) of the Texas cotton crop rated very poor to poor.

According to the U.S. Department of Agriculture, 34% of the U.S. winter wheat production area was in drought (D1 or worse) on May 29, down slightly from 37% at the beginning of the month. Meanwhile, 24% of the U.S. cattle inventory was in drought at month's end, unchanged from May 1. As the month ended, approximately, one-tenth of the U.S. corn and soybean production areas were in drought.

On June 3, topsoil moisture was rated at least one-half very short to short in numerous states, including Texas (77%), California (75%), Louisiana (73%), New Mexico (71%), New Hampshire (70%), Oregon (56%), and Massachusetts (55%). Meanwhile, several large wildfires were actively burning in the Southwest in late May and early June. Specifically, the Buzzard and Ute Park fires in New Mexico had each charred more than 35,000 acres (more than 14,000 hectares) of timber, brush, and grass by early June. Nationally, wildfires had burned nearly 1.8 million acres (about 720,000 hectares) by early June, more than 125% of the 10-year average.

On June 1, statewide reservoir storage as a percent of average for the date was mostly near or above normal in the Western States. New Mexico, with significantly below-average storage, was a notable exception. During May, warm weather resulted in substantial melting of high-elevation snow in many Northwestern basins. As a result, storage was not optimized in several basins as some reservoirs quickly filled, necessitating water releases due to accelerated snow melt.

**MEXICO:** With only a frontal system and with no tropical waves that would have brought rain, May's weather pattern in Mexico was influenced by a high-pressure system that favored hot and dry conditions for most of the country, resulting in an end-of-month heat wave in central regions. A dry line caused significant rainfall in central-west and the frontal system in the northeast. At the end of the month, subtropical storm Alberto brought considerable precipitation in Quintana Roo and Yucatan. With this disturbance, the total rainfall in May was close to average, with 39.0 mm (1.5 inches) that represented 3.8 percent below the 1941-2017 average and was classified as the 43rd driest May, in the middle range of historical data. Contrastingly, high temperatures dominated in the north, west and central regions. The national mean temperature of 25.4°C (77.7°F) was 1.8°C (3.2°F) above average and was ranked as the warmest May since 1971.

With the Intertropical Convergence Zone (ITCZ) shifting further south than usual for this time of the year and without tropical waves near the country, local precipitation fell in the central-west because a dry line and the South Pacific Mexican received less than 50% of normal throughout the month. The absence of rainfall and high temperatures maintained medium fire risk potential in Chihuahua, Jalisco, Michoacan, Mexico City, Tlaxcala, Puebla and Chiapas, in addition to high risk in the State of Mexico. The national drought footprint continued similar to the previous month, with a slight drought and dryness conditions recovery in Yucatan, and between Michoacan-Jalisco. Drought areas from moderate to extreme (D1-D3) stood at 29.1 percent on May 31, a slight decrease from 34.7 percent on April 30, and an increase of 18.5 percentage points respect to the coverage (D1-D3) on January 15, 2018 when this amount was only at 10.5 percent.

The rainfall classification on a state level varied from the driest May in Baja California Sur to the fourth wettest May in Michoacán and Morelos; however, twelve states ended the month within their normal values, including Querétaro (39th wettest May) and Oaxaca (38th driest May). Dryness over the last three months became evident in Baja California, Sonora, and Coahuila, which had their fifth, fourth and third driest period from March to May, respectively. On the contrary, Campeche and Morelos had their seventh and second wettest March-May period. The long-term dryness left Mexico City and San Luis Potosí under the ninth driest June-May (12-month) period and the driest June-May period for Baja California.

Temperatures increased in the second half of the month due to the intensification of a high-pressure system in the Pacific. This high dominated from the central region to the northern part of the country. The daily averages of mean and maximum temperatures exceeded the threshold of the mean plus two standard deviations, being more evident in the last week of

the month due to a wide heat wave that significantly impacted Mexico City and most of the central portion of the country. Monthly temperatures were warmer than normal in the west and northern country, with departures greater than 5°C (9°F) above average in Baja California, Chihuahua and Durango, as well as the coast of Oaxaca. More than 25 days with a maximum temperature above 40°C were observed in the limits of Sonora, Chihuahua and Sinaloa, northern Chihuahua, the limits of Nayarit and Jalisco, the area of the Balsas Depression (between Guerrero and Michoacán) and southern Oaxaca. Departures of 1 to 2°C (1.8-3.6°F) colder than normal were located in a corridor between Guerrero-Puebla and the central portion of Veracruz. Eighteen states had average May temperatures in the top ten warmest for the month including Baja California Sur and Querétaro as the third warmest May; with Coahuila, Chihuahua, Jalisco and Nayarit as their second warmest May; and Colima, Durango and Sinaloa reaching their warmest May, according to data since 1971. Contrastingly, Yucatan had their 13th coldest May. May 2018 was classified as the warmest according to data from 1971 at the national level, while the period from January-May 2018 with an average of 21.0°C (69.8°F) and 1.1°C (2°F) above average has become as the third warmest, after the same period between January and May in 2017 and in 2006.