

**CANADA:** In November, abundant precipitation throughout much of western Canada improved conditions significantly. Near-average precipitation throughout the southern prairies and the southern part of northwest Ontario resulted in little change from previous months' assessments. Although many of our indices indicate drier than normal conditions throughout eastern Canada, there are concerns about drought in the region at this time.

**British Columbia:** Extremely large amounts of precipitation fell over much of the province; more than 180 percent of normal monthly precipitation was recorded throughout much of southern British Columbia. The lower mainland region received some of the highest rainfall amounts, recording more than 350mm of precipitation during the 30-day period. Northern regions also received significant precipitation, mostly in the form of snow, resulting in accumulations of up to 90 cm. The significant precipitation throughout the province resulted in improved conditions and reduced the drought classification over much of the province.

Streams throughout the northern areas of the province are still recording extremely low flows. Most gauged rivers in the Peace and Fraser are currently experiencing very low flow, generally in the 10- to 20-year return period low-flow range. Northern agricultural regions remain dry. Water supplies for agricultural purposes continue to be at critical levels with many dugouts and wells unusable. The 6-month SPI values for this region range from -1.9 to 1.3. Some producers are being forced to sell off much of their breeding stock because they do not have funds to purchase feed and transport water. Stream flows for much of the province remain at record or near record low levels. Prolonged and significant precipitation inputs are needed to restore water levels and to provide adequate soil moisture and water supplies for agriculture in the spring.

**Alberta:** Significant precipitation fell throughout the majority of Alberta throughout November. Areas of central Alberta received more than 150 percent of normal precipitation throughout the month. Northern regions received less precipitation, but did receive enough to improve conditions slightly. Drought classifications throughout the northern regions have been reduced to an abnormally dry classification, with the exception of the western edge of the Peace River region, which still remains in a D1 or D2 classification. Southern regions remain largely unchanged from the previous month, but slight improvement can be noticed in the southwestern corner of the province. Stream flows throughout much of the province are less than average for this time of year.

**Saskatchewan:** Southern regions of Saskatchewan have remained largely unchanged for the past few months. Slight improvements were seen through much of the southern region, with above-average precipitation recorded over much of the region. The drought area was reduced slightly, but a considerable area is still classified as moderate to severe drought in both the southeast and southwest. Water supply conditions continue to be a real concern in these regions, with many dugouts and streams dry. Since much of the precipitation fell in the form of snow and will not be accessible for producers to utilize in the form of water until spring, water supply conditions will not likely improve.

**Manitoba:** Significant precipitation fell throughout the west central region of Manitoba in November, improving conditions in that region. Southern regions saw very little change from previous months, with below average to average precipitation being recorded through the region. The southeast remains the area of largest concern, receiving below average to well below average precipitation in November. Levels and flows of most rivers in southern Manitoba remain well below average.

**Ontario:** Northwest Ontario remains in a severe to extreme drought situation. Less than 60 percent of average precipitation fell over this area in November, resulting in continued drought conditions. Stream flows are at very low levels and water supplies are restricted. Substantial reductions in yields of both crops and forage have caused widespread concern throughout the region. Low water conditions have been identified by the province in a number of watersheds in the region: Dryden, Fort Frances and Wawa's Hornepayne, Oba, White River, White Lake Park, Pukaska and Lakehead.

**UNITED STATES:** November was generally warmer and wetter than normal for the month. Temperatures were 2-4 degrees Fahrenheit (1-2 degrees Celsius) above normal for most of the United States. The exception to this was in the southeast, where temperatures were 2-4 degrees Fahrenheit (1-2 degrees Celsius) below normal for the month. The Pacific Northwest and the eastern seaboard received the most precipitation while a significant winter storm brought ample precipitation across parts of the central United States. The southwest and parts of California and Nevada continued to be dry, along with much of the High Plains region. November ranked as the 13<sup>th</sup> warmest on record and the 31<sup>st</sup> wettest out of 112 years on record for the United States.

November started off with flooding rains in the Northwest during November 2-7, eliminating abnormal dryness from Washington, Oregon, northern and western Idaho, and northwestern Montana. Widespread flooding extended from northwestern Oregon into western Washington, where 5 to 15 inches (127-381 mm) of rain fell during the first week of November. The Washington governor declared a state of emergency in 18 counties. Locally heavy rainfall also caused some flooding in portions of northern Idaho and western Montana. In northern Texas, 1 to 3 inches (26-76 mm) of rain reduced the D3 drought area, although reservoirs in this region, including the Dallas-Fort Worth area, showed little response to the moisture. For example, Lake Lavon, a key reservoir east of Dallas, stood at just 36 percent of normal on November 6. Persistent dry weather in south Texas caused the D3 there to expand southward toward the Rio Grande. Heavy rainfall caused flooding in Hawaii during October 31 to November 2, resulting in removal of most of the lingering D0 and D1. Rainfall amounts were especially large along windward sections of Kauai and Oahu, with some locations reporting well over 15 inches (381mm). The only dryness remaining affected western portions of Maui.

Few changes in the drought depiction took place over the next two weeks for the United States. In Oklahoma, D4 was introduced, and D3 expanded, in the northern area of drought in response to continued dryness and poor agricultural conditions. In Texas the two areas of D3 were expanded. The northern area was extended northward into the Red River Basin, and the southern area was extended eastward. D0 was introduced into the

Central Valley of California; it is very early in the wet season, but this area is abnormally dry.

As November ended, a significant storm system moved across parts of the central United States. This major storm system left a swath of snow and ice from northern Texas through Oklahoma, Missouri, Illinois, Wisconsin, and Michigan. The low center tracked northward from Missouri into Michigan during November 30 to December 1. Snowfall amounts from 7 to 12 inches (18-31 cm) and greater were common near the storm's path. Heavy rains fell in the warmer air south and east of the storm. Cumulative melted precipitation of 2 to 5 inches (51-127 mm) brought significant improvement to dry and drought areas extending from northern Texas into western Illinois. A general one-category drought improvement took place, with 2 categories in some locations. As a result, drought was reduced across Missouri, southeast Iowa, and western Illinois, while drought diminished in southern and eastern Oklahoma and parts of northern Texas. D0H dryness lingered in parts of Missouri and in southeast Iowa because of long-term precipitation deficits and low pond levels. Dryness and drought levels from D0 to D4 were scaled back from the east in Oklahoma, and portions of the D3 retreated southward in northern Texas. In contrast, abnormally dry conditions (D0) extended eastward to the central Texas Gulf coast in response to continued below-normal rainfall. In California, rainfall this season continued well below normal across the south. Water supplies are in good shape thanks to last winter's storms, but soil moisture is low and, as a result, D0 dryness extended across southern California. In Riverside, rainfall since July has measured 0.05 inches (1mm), versus a normal of 1.60 inches (41mm). Downtown Los Angeles has seen 0.50 inches (13mm) versus a normal of 2.08 inches (53mm). The dry conditions have contributed to the high fire danger in southern California. D0 also expanded northward into southwestern Nevada, where the season is also off to a slow start. The Great Lakes basin continues to be very dry. At the end of November, Lake Superior was 17 inches (43 cm) below the long-term average, second lowest only to 1925 since the lake levels have been measured. Lakes Michigan and Huron are still at 19 inches (48 cm) below normal from dryness that started in the 1990s. Conservation efforts continue to help lake levels in the basin.

**MÉXICO:** November ended wetter and slightly warmer than normal for the month. National Meteorological Service of Mexico reported a national precipitation average of 42.7 mm (1.68 inches), compared with the historical average of 31.6 mm (1.24 inches), which is calculated for the years 1941-2005. The average maximum temperature registered last month was 26.5 degrees Celsius (79.7 degrees Fahrenheit); the historical value is 25.8 degrees Celsius (78.4 degrees Fahrenheit). The national average minimum temperature observed was 11.3 degrees Celsius (52.3 degrees Fahrenheit), compared to 10.4 degrees Celsius (50.7 degrees Fahrenheit) which is the national historical value. The central Mexican states of Michoacán, Morelos, Puebla, and Zacatecas experienced above-normal precipitation. No significant precipitation was observed for November on the Baja California Peninsula and northern, northwestern, and western Mexico. All of the Baja California State registered abnormally dry conditions (D0) to severe drought (D2) in the border region. Severe drought (D2) and extreme drought (D3) dominated over central and northern Coahuila and northeast Chihuahua. Dams in the northern and occidental

regions of Sonora were at 80 percent of capacity. In the Chihuahua State, dams were close to 90 percent of capacity, except for the Chihuahua and El Rejon regions, where the dam levels were 60 and 30 percent of capacity respectively. In the Coahuila State, dams are 50 percent below capacity. In spite of the positive dam situation in Chihuahua and Sonora, the water-bearings registered a deficit of water because precipitation related to Hurricanes Norman and Paul produced intensive runoff and low infiltration in this region. Abnormally dry conditions (D0) to moderate drought (D1) were observed in Sonora, Chihuahua, and northern Sinaloa states. The same problem of hydrological drought was observed in Sinaloa and Durango.

Cold fronts that occurred at the end of the month had a positive impact over the coastal region of the Gulf of Mexico and the Yucatán Peninsula. Wetter conditions were observed over coastal and southern Veracruz, Yucatán, and northern Quintana Roo. The dry conditions (D0) to moderate drought (D1) observed along the occidental side of Sierra Madre Oriental were extended toward coastal Tamaulipas and northern Veracruz. Additionally, abnormally dry conditions (D0) to moderate drought (D1) were observed in the Chiapas State.