

# PRAIRIES and HIGH PLAINS

Weather and Climate Highlights and Impacts, June to August 2023  
Climate Outlook, October to December 2023



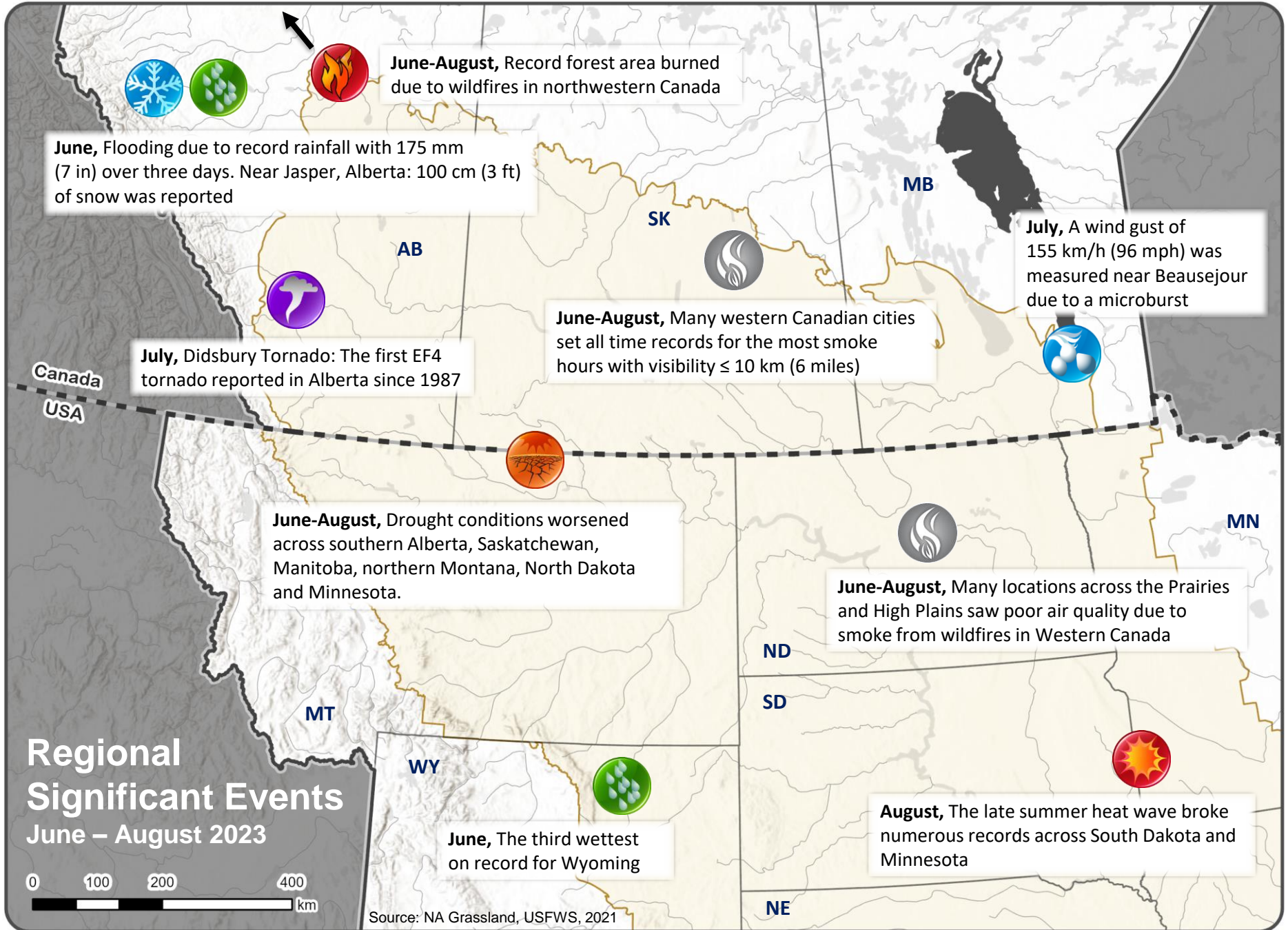
Environment and  
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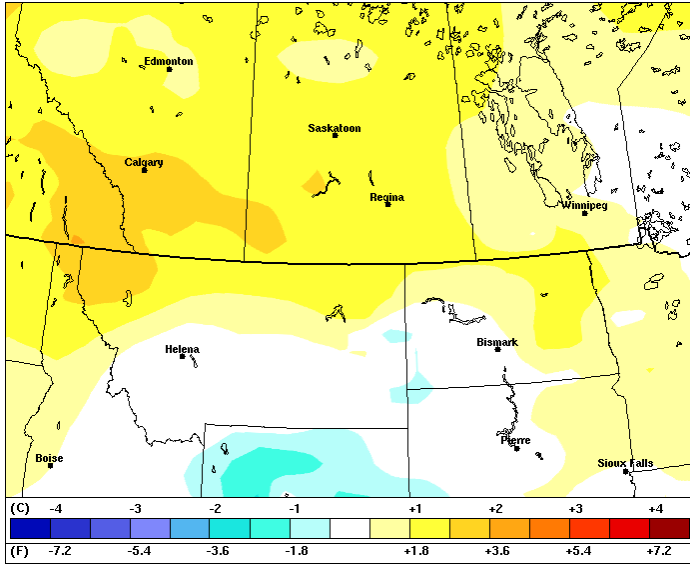
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# Regional Climate Overview

June – August 2023

## Departure from Normal Temperature (°C/°F)

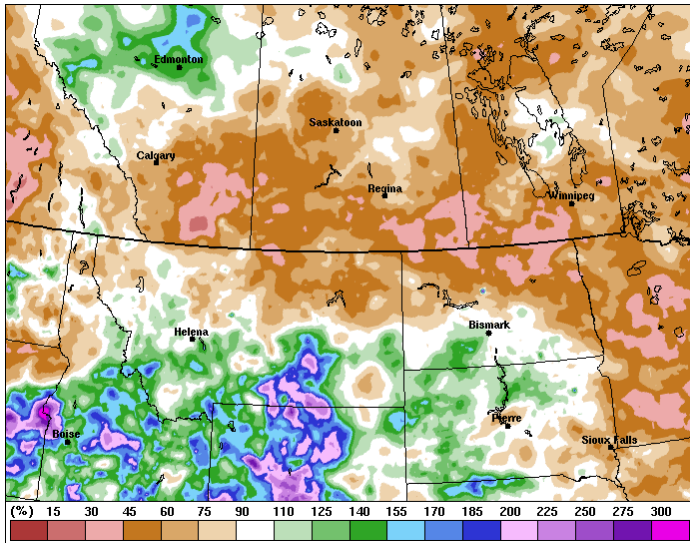


Source: ECCC Climate Archive and USHCN v 2.5  
Reference period: 1991-2020

## Temperature

While much of the Prairies and High Plains saw warmer than normal conditions, the southwestern region remained cooler than normal. Overall, summer brought warmer temperatures to the northern and eastern regions in June, followed by a shift to cooler temperatures in July before returning to slightly warmer conditions in August.

## Percent of Normal Precipitation (%)

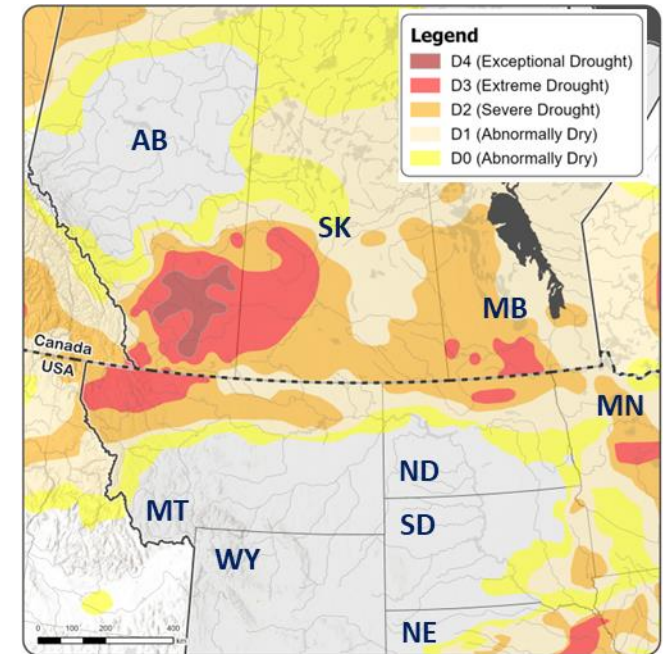


Source: ECCC Climate Archive and USHCN v 2.5  
Reference period: 1991-2020

## Precipitation

Much drier than normal conditions were observed across regions along the international border, with the dry spell extending further inland which impacted regions within Saskatchewan, Manitoba and Minnesota. In contrast, the southwestern corner of the region, spanning much of Wyoming and parts of southern Montana, received well above-normal precipitation amounts.

# Drought Monitor



Source: North American Drought Monitor

## Drought Conditions as of August 31, 2023

Summer 2023 brought dry and drought conditions to Western Canada and the northern High Plains, as drought severity deepened throughout June, July and into August. Even though exceptionally high amounts of precipitation fell across central Alberta this summer, the remaining parts of the region missed out on any significant precipitation. In June, southern Alberta saw the greatest degree of drought degradation, while parts of west-central Alberta saw improvement. July was characterized by exceptionally dry conditions dominating much of Western Canada and into northern parts of the High Plains leading to further degradation to both drought extent and severity. Exceptional Drought (D4) developed in July across southern Alberta due to both short- and long-term precipitation deficits, above-normal temperatures and significant impacts. This trend continued into August, as D4 slightly expanded across southern Alberta and Extreme Drought (D3) conditions emerged in southern Manitoba, northwestern Montana and northeastern North Dakota.



# Regional Impacts

June – August 2023



## Drought and Agricultural Impacts

Conditions in the Special Areas, which cover more than 5 million acres in east-central Alberta, are shown in this photo

Photo Credit: Alberta Special Areas Board

**Location:** Alberta, Saskatchewan, North Dakota, and Montana

An abnormally dry and hot summer across Western Canada and the northern High Plains resulted in significant drought impacts across the region, including pasture deterioration, moisture-stressed crops, water supply concerns and wildfires. In Alberta and Saskatchewan, several municipalities declared agricultural disasters due to drought conditions. Since early June, the drought continued to expand in size and severity, especially in areas that have experienced multiple years of well below-average precipitation, leading to significant drought-related pest infestations. Cereal crops that could not be harvested due to dry conditions and [grasshopper damage](#) were being salvaged for livestock feed to support neighboring livestock producers. Crops in southern and central Alberta and western Saskatchewan, including durum wheat and lentils, were in particularly rough shape, due to this season's drought. In North Dakota, the extreme heat followed by rain activated [anthrax spores resulting in over 100 cattle deaths](#).



## Persistent Smoke from Wildfires

Sunset over mountains through thick wildfire smoke

Photo Credit: Environment and Climate Change Canada

**Location:** Prairies and High Plains

Hot, dry conditions in Western and Northern Canada fueled a record number of wildfires, creating large plumes of smoke which moved southward and impacted the southern Prairies and High Plains. Very poor air quality was recorded across the region for long stretches of time, including a widespread, long-lasting event from June 13 to 16, although each month has had its share of poor air quality. Poor air quality in the high risk category was recorded from Alberta to Minnesota for multiple days. [Minneapolis recorded their worst air quality day](#) in the history of measurements (since 1980). Although no events were canceled at the famed [Calgary Stampede](#), the smoke and air quality were front and center for decision makers, each day.

## Severe Weather in the Prairies



EF4 tornado at Didsbury, Alberta  
Photo Credit: Justin Patten

**Location:** Didsbury, Alberta

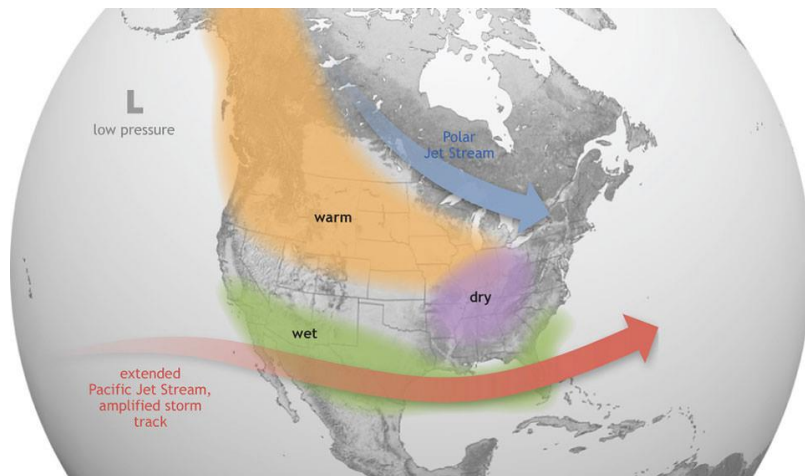
On Canada Day, July 1, 2023, an EF4 tornado passed just south of Didsbury, Alberta. This was the first EF4 tornado in Alberta since 1987 and the strongest tornado in Canada since 2018. This tornado passed through sparsely populated farm country, damaging 12 houses and numerous outbuildings. Fortunately, no human lives were lost. Many livestock were lost either during or shortly after the tornado struck.

# Temperature and Precipitation Outlook

October – December 2023

The Fall temperature outlooks from both [American](#) and [Canadian](#) models show an enhanced chance of above-normal temperatures near the continental divide; further east, the forecast is for near-normal. The precipitation outlook suggests near-normal precipitation over much of the Prairies and High Plains, except for western Montana and southern Alberta, where drier than normal conditions are expected.

**ENSO Outlook for Prairies and High Plains** – The El Niño Southern Oscillation (ENSO) is an interannual variation in low level winds and sea surface temperatures over the tropical eastern Pacific Ocean. The warming phase of ENSO is known as El Niño and the cooling phase as La Niña. ENSO is one of the most important climate phenomena, able to change the global atmospheric circulation and influence temperature and precipitation across North America and other parts of the world.



El Niño causes the Pacific jet stream to move south and spread further east. During winter, this leads to wetter conditions than usual in the Southern U.S. and warmer and drier conditions in the North.

Diagram Credit:  
[National Oceanic and Atmospheric Administration](#)

Currently, a developing El Niño is anticipated to continue through the Northern Hemisphere winter. Typically, during El Niño, a strong and amplified Pacific jet stream extends across the southern US in association with a polar jet stream shifting further north into Canada during late fall through early spring. The corresponding pressure pattern is an anomalous low centered over the North Pacific and an anomalous high located to the east of the Canadian Rockies, which **favors above-normal temperatures and below-normal precipitation in the Prairies and High Plains**. These ENSO signals are consistent with the current seasonal outlooks based on the [American](#) and [Canadian](#) climate models.

## PRAIRIES and HIGH PLAINS

### Contacts and Partners

- **Environment and Climate Change Canada**  
[www.canada.ca/en/services/environment](http://www.canada.ca/en/services/environment)
- **Agriculture and Agri-Food Canada**  
[www.agr.gc.ca/drought](http://www.agr.gc.ca/drought)
- **National Drought Mitigation Center**  
<http://drought.unl.edu/>
- **NOAA NIDIS**  
[www.drought.gov](http://www.drought.gov)
- **US State Climatologist**  
<https://stateclimate.org/>
- **NOAA NCEI**  
[www.ncei.noaa.gov](http://www.ncei.noaa.gov)
- **USDA Climate Hub**  
[www.climatehubs.usda.gov](http://www.climatehubs.usda.gov)
- **NOAA NWS Climate Prediction Center**  
[www.cpc.ncep.noaa.gov](http://www.cpc.ncep.noaa.gov)
- **High Plains Regional Climate Center**  
[www.hprcc.unl.edu](http://www.hprcc.unl.edu)
- **NOAA NWS Missouri Basin River Forecast Center**  
[www.weather.gov/mbrfc](http://www.weather.gov/mbrfc)
- **USDA Natural Resources Conservation Service**  
[www.nrcs.usda.gov](http://www.nrcs.usda.gov)



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