PRAIRIES and HIGH PLAINS

Weather and Climate Highlights and Impacts, September to November 2024
Climate Outlook, January to March 2025

Environment and Climate Change Canada | Environnement et Changement climatique Canada

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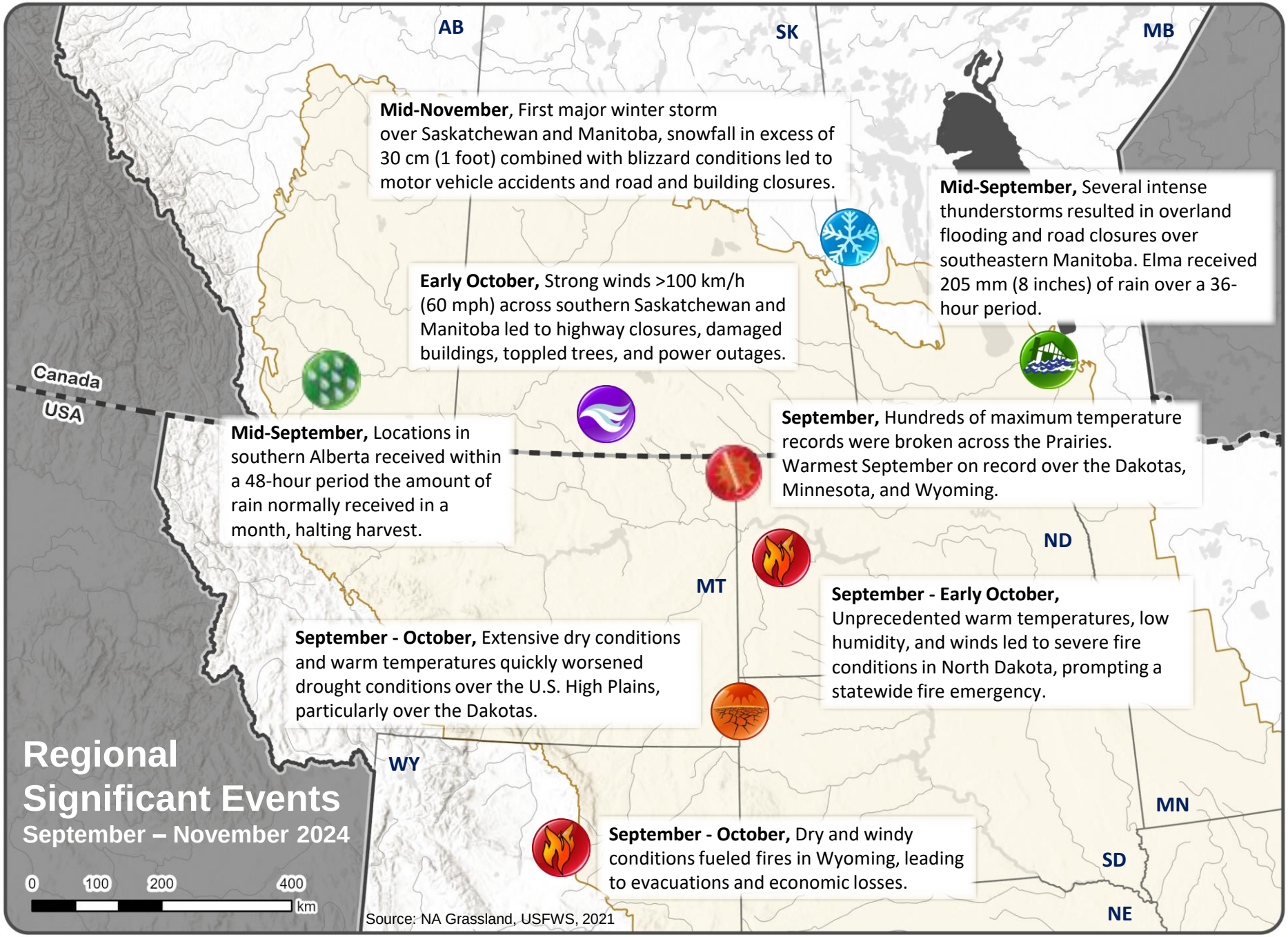


Mid-November, First major winter storm over Saskatchewan and Manitoba, snowfall in excess of 30 cm (1 foot) combined with blizzard conditions led to motor vehicle accidents and road and building closures.

Mid-September, Several intense thunderstorms resulted in overland flooding and road closures over southeastern Manitoba. Elma received 205 mm (8 inches) of rain over a 36-hour period.

Early October, Strong winds >100 km/h (60 mph) across southern Saskatchewan and Manitoba led to highway closures, damaged buildings, toppled trees, and power outages.

Mid-September, Locations in southern Alberta received within a 48-hour period the amount of rain normally received in a month, halting harvest.

September, Hundreds of maximum temperature records were broken across the Prairies. Warmest September on record over the Dakotas, Minnesota, and Wyoming.

September - Early October, Unprecedented warm temperatures, low humidity, and winds led to severe fire conditions in North Dakota, prompting a statewide fire emergency.

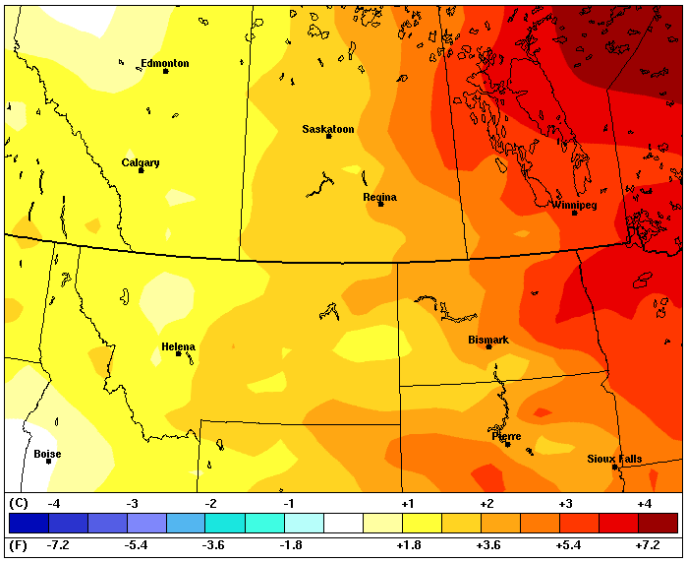
September - October, Extensive dry conditions and warm temperatures quickly worsened drought conditions over the U.S. High Plains, particularly over the Dakotas.

September - October, Dry and windy conditions fueled fires in Wyoming, leading to evacuations and economic losses.

Regional Climate Overview

September – November 2024

Departure from Normal Temperature (°C/°F)

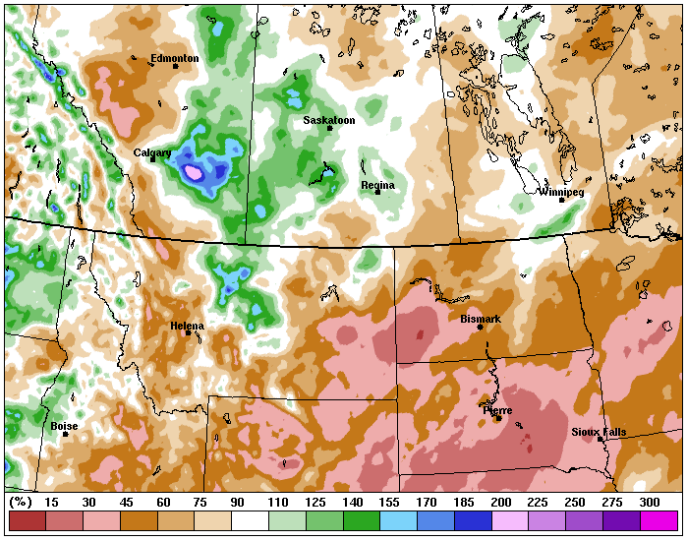


Source: ECCC Climate Archive and USHCN v 2.5
Reference period: 1991-2020

Temperature

The Prairies and High Plains experienced an abnormally warm fall, with the warmest temperatures observed in the eastern part of the region, particularly over eastern Saskatchewan, Manitoba, North Dakota, and Minnesota. September was the hottest on record over the Dakotas, Minnesota, and Wyoming, with Montana in the top three. Numerous locations in Manitoba experienced their hottest September on record.

Percent of Normal Precipitation (%)

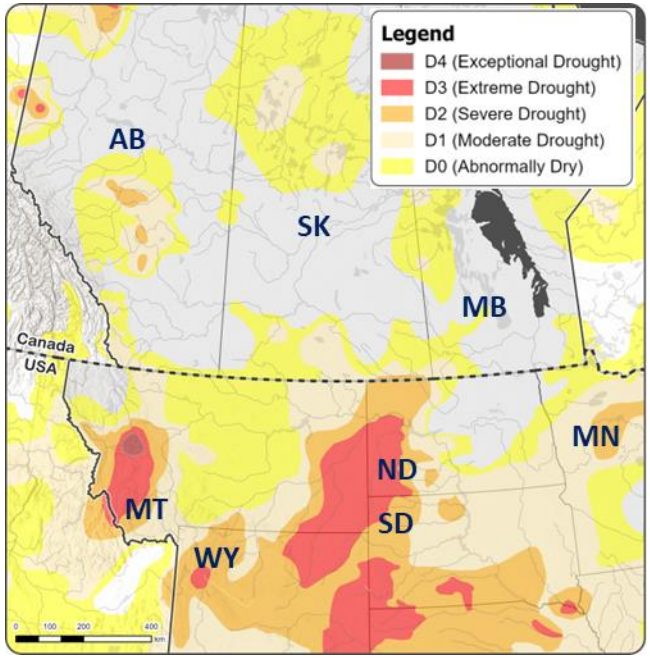


Source: Canadian Precipitation Analysis (CaPA)
Reference period: 1991-2020

Precipitation

Fall saw a shift from the summer season with increased precipitation over eastern Alberta, western Saskatchewan, and northern parts of Montana. Near normal precipitation was observed over portions of Saskatchewan and southern Manitoba. Dry conditions experienced during the summer continued over the majority of the High Plains and expanded eastward into the Dakotas and Minnesota this fall.

Drought Monitor



Source: North American Drought Monitor

Drought Conditions as of November 30, 2024

Drought conditions across the High Plains and Prairie region degraded throughout September and October, however much of the region saw improvement in November. Several heavy wet snow events in mid to late November alleviated much of the short-term drought conditions that were established this fall, also improving some of the longer-term precipitation deficits and related impacts. November's improvements were especially pronounced in eastern Saskatchewan and northeastern Montana and across much of Manitoba and North Dakota. Going into winter, severe to extreme drought remains in east central portions of Montana and western North Dakota, while abnormally dry or moderate drought conditions persist in the southern Prairies and across much of the High Plains.

Warm and Dry Conditions Lead to Fire and Agricultural Impacts

The fall of 2024 was unseasonably hot over the Prairies and High Plains, with hundreds of daily records broken over the region. September ranked as the warmest on record over many states, including North Dakota, South Dakota, Minnesota, and Wyoming, with surrounding states within the top 10 warmest. Many locations in the Prairies, particularly in Manitoba, had their hottest September on record, or within the top three. On top of the heat, the region experienced overall dry conditions, particularly in October. Portions of the Prairies received well above normal amounts by the end of the season due to storms in September and November, however, the High Plains overall remained below normal. These abnormally dry conditions, while also observed in parts of the region during the summer, spread east and south across the High Plains, with Minnesota experiencing its driest September on record. Dry conditions continued into October and would have ranked as the driest on record if not for the precipitation observed on the last day of the month.

This unprecedented heat and dry weather over the High Plains ripened the conditions for wildfires, many of which broke out over Wyoming and the Dakotas over the season. The Governor of North Dakota declared a statewide fire emergency as of October 3 to invoke additional resources ahead of expected increased wildland fire activity. These wildfires led to two fatalities and several injuries, loss of livestock, a halt to oil and gas production, damage to utilities and infrastructure, and over 100,000 acres of land burned. These historic fires are expected to result in an economic loss of over $8 million USD as declared by the Governor of North Dakota. Meanwhile in Wyoming, several large wildfires in September and October led to evacuation orders, loss of homes and livelihoods, as well as public closures in portions of Bighorn and Bridger-Teton National Forests, where nearly 190,000 acres (76,890 hectares) of land burned. Looking back at 2024 in total, over 810,000 acres burned in Wyoming.

Another consequence of the fires, in combination with on-going drought over much of the High Plains, was the largest cattle sale in a decade at the Torrington Livestock market in eastern Wyoming. Without standing forage in burned winter pastures, ranchers either have to truck livestock to areas with more forage (see the Grass-Cast map for the Great Plains), buy extra hay, or sell animals. Crop producers were also impacted by the on-going drought. In South Dakota, winter wheat struggled this fall: only 86% had emerged by November 24 (well behind the five-year average of 98% for this time of year), and only 24% was rated in good to excellent condition (below the five-year average of 52%). That said, harvest was ahead of schedule in South Dakota for sorghum and sunflowers, thanks to the record warmth. Farther north on the Prairies, despite frequent rain events and high winds during stretches of the fall, harvest was completed with overall good yields and quality.

Harvest season fire in a soybean field in northern South Dakota, September 2024. Photo credit: Bridget Edwards

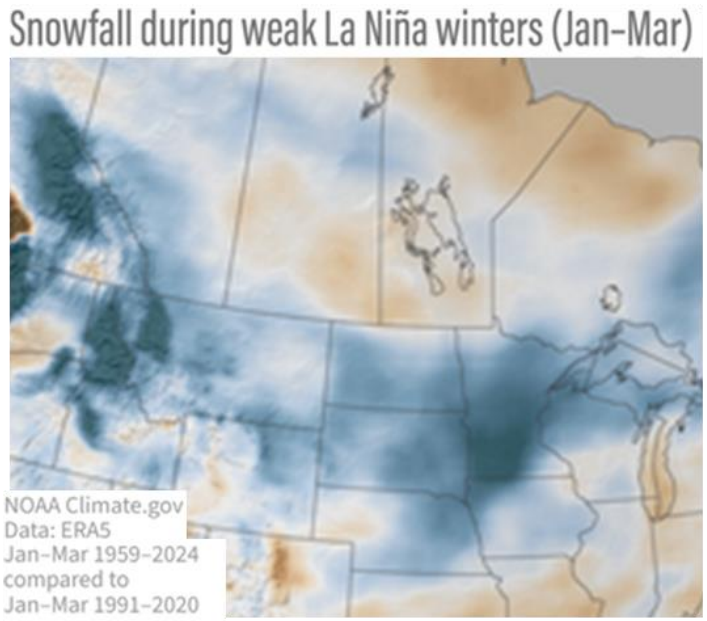
Rangeland cattle gather for a cool drink
Photo credit: Dannele Peck

Temperature and Precipitation Outlook

January – March 2025

The winter temperature outlook from the American and Canadian models agree on an enhanced chance of below normal temperatures near the continental divide; further east, the Canadian model forecasts an equal chance for below or above normal temperatures while the American forecast favors below normal. The precipitation outlook for both show an enhanced chance of above normal precipitation for western sections (Alberta and Montana) with an equal chance for below or above normal over eastern sections.

ENSO Outlook for Prairies and High Plains – The current conditions remain ENSO-neutral with an Oceanic Niño Index (ONI) of -0.2 from September – November. The ENSO advisory issued by the NOAA Climate Prediction Center, expects a transition into a weak La Niña by December – January that will switch back to ENSO-neutral by March – May 2025. A typical La Niña atmospheric setup nudges the jet stream northward over the Gulf of Alaska and back south into the Prairies and High Plains, bringing cooler than normal temperatures with it.



Map: January – March snowfall amounts during nine weak La Niña seasons from 1959-2024 compared to January - March average snowfall amounts from 1991-2020. Credit: ENSO blog

Historically, weak La Niña winters (January – March) have still observed conventional La Niña impacts over the Prairies and High Plains such as cooler than normal temperatures. A recent analysis found that of the past nine weak La Niña winters, most have resulted in higher than average snowfall over Alberta and the High Plains and less than average snowfall over Saskatchewan and Manitoba.

Overall, the American and Canadian seasonal outlooks are in favor of above normal precipitation amounts in the western portion of the Prairies and High Plains.

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Contacts and Partners

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

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