

# North American Seasonal Fire Assessment and Outlook

National Interagency Fire Center • Natural Resources Canada • Servicio Meteorológico Nacional  
United States Canada Mexico

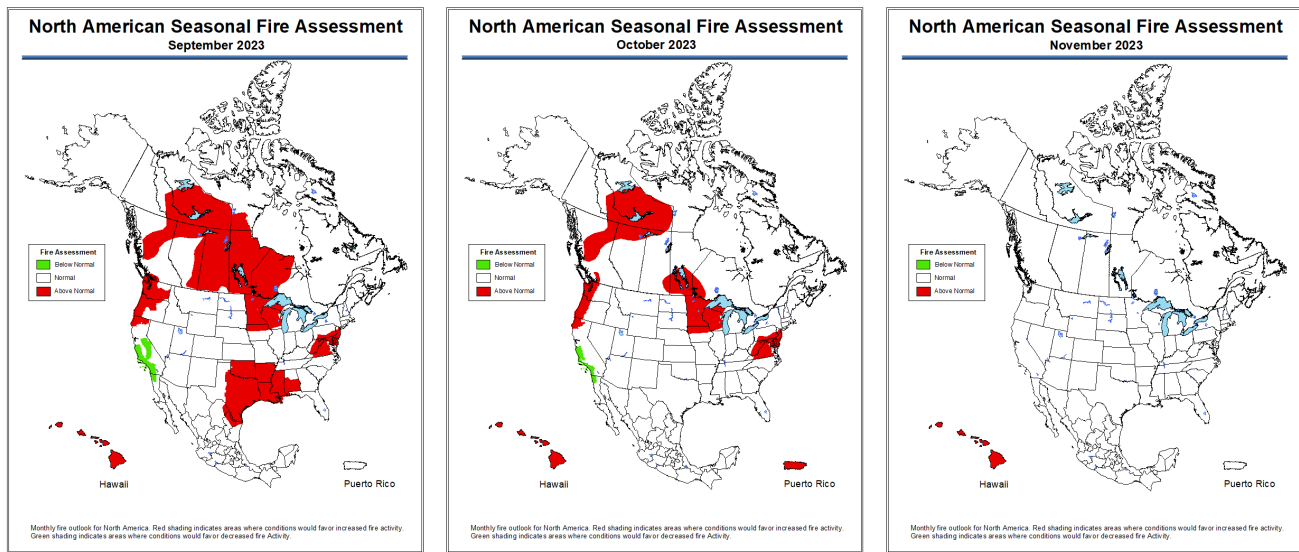
## Outlook Period September through November 2023

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### Executive Summary

Ongoing drought and above normal temperatures in much of Canada during August contributed to the record area burned, which is now close to 17 million hectares and more than double the previous record of about 7.6 million hectares recorded in 1989. Most of the recent increase in fire activity is in western Canada. Eastern Canada remained quiet through August with regular rainfall events, although large fires burning near James Bay continued to show active periods as conditions remained drier than normal north of the St. Lawrence Valley.

Lightning strikes triggered many fires during August, including during August 4-7 when numerous fires began in British Columbia and the Territories. During mid-month, another round of fires began in dry areas of central and northeastern British Columbia, northern Alberta, northwestern Saskatchewan, and the southern Northwest Territories, with strong winds leading to rapid fire growth. Another round of lightning fire activity occurred in the last week of August, and strong winds during the first two days of September drove rapid fire growth close to 60°N as a low pressure area rapidly moved across the central Northwest Territories. Wind events about a week apart appear likely for much of September and will likely continue to drive fire growth in the early part of autumn.



Monthly fire outlook for North America for September 2023 (left), October 2023 (middle), and November 2023 (right). Red shading indicates areas where conditions would favor increased fire activity. Green shading indicates areas where conditions would favor decreased fire activity. *Click on each image to see larger versions.*

Much of western Canada remained warm and dry in August. Extreme drought extends from central and northeast British Columbia, northern Alberta, and southern Northwest Territories, and this large area coincides with the largest number of active wildfires currently. Drought has affected all provinces and territories at some point during 2023 and is a driving factor in the large Canadian area burned.

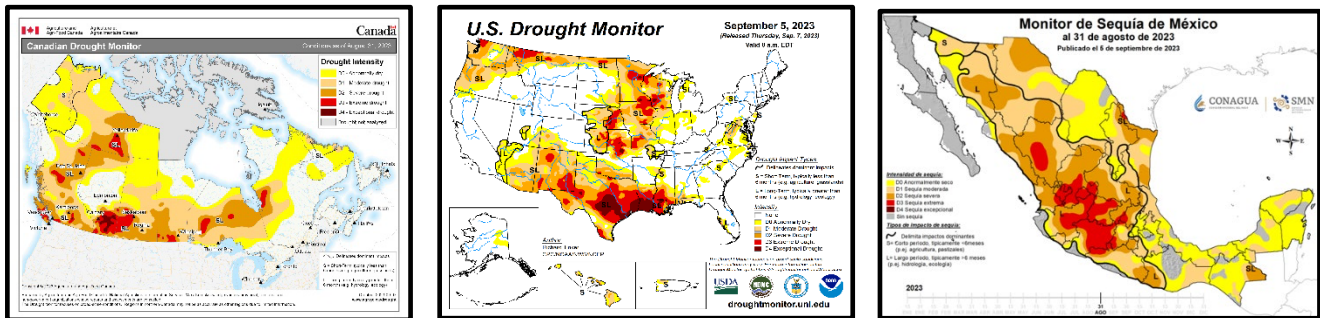
Significant fire activity continued to increase through August, with the national preparedness level increasing from three to four (scale one to five) on August 17. Significant fire activity increased across most geographic areas in August, including the Southern Area, but decreased in the Southwest Area, with decreased activity across the Great Basin, Rocky Mountain, and Northern Rockies Geographic Areas towards the end of the month. Hawai'i was very active in August as well, including the Lahaina Fire that burned thousands of acres and over 2,000 structures, with 115 deaths reported thus far.

Above normal significant fire potential is expected across the portions of the Northwest and northern California and from Oklahoma and central Texas eastward through the Lower Mississippi Valley in September. These areas are forecast to return to near normal potential in October, except along and west of the Cascades. Above normal potential is forecast across Hawai'i through November, especially the lee sides, and above normal potential is forecast across the Upper Midwest September into October. Below normal significant fire potential is forecast for much of southern and central California in September, with below normal potential forecast for the central and southern California coasts in October.

Fire activity remains at low levels in Mexico due to the rainy season. However, rainfall has been below the normal nationally and areas of extreme drought increased in the few months. Therefore, above normal fire potential cannot be ruled out over Coahuila, Nuevo León, and Tamaulipas due to the dry and warm conditions on the northeast border of Mexico. Precipitation in northwest Mexico caused by upper-level trough passages and Hurricane Hilary has increased the fuel moisture, so fire potential is expected to be below the normal for September and October. Through summer, fire activity has been below normal, but for the year, 2023 has burned the second most acres on record at 900,824 ha.

**Critical Factors**

The critical factors influencing significant fire potential for this outlook period are:



**Left:** Canadian Drought Monitor from *Agriculture and Agri-Food Canada*. **Middle:** United States Drought Monitor. **Right:** Mexican Drought Monitor from *CONAGUA-Servicio Meteorológico Nacional*.

**El Niño-Southern Oscillation (ENSO):**

El Niño continues in the equatorial Pacific Ocean, with the warmest sea surface temperature (SST) anomalies in the eastern equatorial Pacific Ocean. SSTs are consistent with a moderate El Niño, and atmosphere responses to El Niño are being observed. The Climate Prediction Center forecasts El Niño conditions continuing through winter, with a 66% chance of a strong El Niño developing this fall and early winter. Other teleconnection patterns, such as the Madden Julian Oscillation (MJO), Pacific Decadal Oscillation, and Pacific-North American Pattern may influence weather and climate during the outlook period, but El Niño will be the main driver through the outlook period.

**Drought:**

Drought is affecting most of Canada. The largest drought-free expanse lies between southern Ontario and the Atlantic Provinces, although most of Labrador has drought. A few small drought-free areas lie in northwestern British Columbia, parts of southeastern and western Yukon, central Alberta, northeastern Manitoba, northwestern Ontario, and far northwestern Quebec.

Drought areas branch off an area in British Columbia that comprises all categories, with a small area of exceptional drought southeast of Kamloops. The northern branch includes patches of extreme drought in central and northeastern British Columbia, extreme northern Alberta, and the southern Northwest Territories between Yellowknife and Fort Smith. Drought information is not yet provided for Nunavut, but the drought area likely crosses the Northwest Territories/Nunavut border. The southern branch of the main drought area crosses the Rocky Mountains near Calgary, with a large area of exceptional drought just to the east and south of the city. Crop failures, water shortages, and difficulties feeding livestock have been reported, even though irrigation is widespread. East of this area, extreme drought continues into southwestern Saskatchewan before breaking into smaller areas scattered across southern Manitoba, northern Ontario, and ending east of James Bay in Quebec. This band features a near-continuous swath of severe drought. East of James Bay, abnormally dry or moderate Drought is present to the Atlantic coast of Labrador.

Record breaking heat continued over much of Texas through August and spread into the Lower Mississippi Valley and central Gulf Coast. Flash drought conditions developed in the Lower Mississippi Valley. Drier than normal conditions were observed across Florida into the Carolinas before Hurricane Idalia moved through Florida, southern Georgia, and the Carolinas at the end of the month. Drier than normal conditions also persisted across the Mid-Atlantic and western Great Lakes. Overall, drought expanded and intensified across much of Texas, Oklahoma, the Lower Mississippi Valley, and central Gulf Coast, with drought continuing across the central Plains into the western Great Lakes.

After a hot start to August, the delayed North American Monsoon began in the Southwest and greater Four Corners to bring relief from the hot and dry conditions. Above normal temperatures and periods of isolated thunderstorms were widespread across the rest of the West through mid-August before the remnants of Hurricane Hilary combined with a monsoon moisture surge to bring well above normal rainfall from southern California into the Great Basin, eastern Oregon, and northern Rockies. However, above normal temperatures and dry conditions continued for northwest California and western Oregon and Washington, with two significant nocturnal dry thunderstorm events August 14-15 and August 24-25. Precipitation ended August well above normal across southern California, the Great Basin, northeast California, eastern Oregon, southern Montana, and Wyoming along with near to below normal temperatures. Drought continued across the northwestern US, with development over much of the southwest US due to the weak North American Monsoon.

In the first half of August, above normal precipitation was observed in scattered regions of central, western, and southern portions of Mexico, as well as the Yucatan Peninsula. This rainfall was associated with tropical cyclones Dora and Eugene, the presence of four other tropical waves, and the humidity incoming from both basins. This activity helped to reduce moderate drought (D1) areas in Yucatán, Puebla and the shores of Jalisco, Michoacán, and Guerrero. However, during August a high pressure system over northern Mexico maintained high temperatures in the region, increasing the moderate to severe drought (D1 to D2) in Sonora, Chihuahua, Sinaloa, Durango, and Nuevo León. The severe to extreme drought (D2 to D3) also increased across the north-central region of Mexico. Through August 31, moderate to extreme drought area (D1 to D3) was 60.98% nationally, about 12% higher than July 31 of this year.

### **Fire Season Status:**

The record-setting area burned in Canada continues to grow, although at a slower pace than earlier in the season. The approach of autumn, with lower lightning activity and cooler nights, is helping retain moisture in soil and vegetation and is gradually slowing the increase in fires and area burned, although wind events are contributing to rapid growth on many fires. As of September 8, area burned stood at about 16.8 million hectares (about 41.5 million acres), about 6.2 times normal for the time of year. By this date, the number of fires is 6194, about 118% of the 10-year average to date (5259 fires). Although 10-year averages are used in this comparison, future comparisons may use a different statistic or use a longer-term period, since the 2023 area burned will skew the shorter period statistics – for example the ten-year average area burned would nearly double, resulting in normally busy years appearing quieter than normal.

In addition to the national record area burned, new provincial/territorial records have also been set in Alberta, British Columbia, Northwest Territories, Quebec, and Nova Scotia. Many large fires are still burning, and some will likely continue through the autumn and possibly into the winter. Canada has recorded two fires of more than a million hectares in size, the first year with more than one that size. The Bathurst Inlet, Nunavut area (roughly 108°W, 66.8°N) recorded an August tundra fire, suggesting drought extends across the Northwest Territories/Nunavut border east of Great Bear Lake.

Canada's National Preparedness Level reached 5 in early May and has finally been dropped to 4 as of September 8. Provincial/territorial preparedness levels are gradually dropping, with British Columbia at 4, down from 5 through most of August. The Northwest Territories level is at 3, down from 5 in mid-August, and evacuees are returning to Yellowknife. As of September 8, over 29,000 people in British Columbia, almost 28,000 from the Northwest Territories, and about 200 from Alberta remained evacuated. Numbers from the Northwest Territories are fluid in early September as residents began returning Yellowknife. To date this season, 284 total evacuation events have resulted in approximately 232,000 evacuees.

Significant fire activity continued to increase through August, with the national preparedness level increasing from three to four (scale one to five) on August 17. Significant fire activity increased across most geographic areas in August, including the Southern Area, but decreased in the Southwest Area. A significant rainfall event August 20-23 due to remnants of Hurricane Hilary resulted in decreased activity across the Great Basin, Rocky Mountain, and Northern Rockies Geographic Areas for the end of the month. Large wildfires with incident management teams assigned continue in northwest California through western Oregon, but rainfall and moderating fire weather conditions decreased activity on these fires by the end of August. Timely precipitation across the West and the lack of prolonged heat wave mitigated multiple dry lightning events in August as well. Alaska continued with elevated activity through mid-month before decreasing rapidly at the end of the month, while Hawai'i was very active in August, including the devastating Lahaina Fire. Year-to-date acres burned for the US is well below the 10-year average at 38%, with a slightly below average number of fires as well, about 96% of average.

So far this year 6,938 forest fires have been registered in 32 states resulting in 900,842 hectares burned. Grass and shrub layers represented 97% of the total, while timber was 3%. States with the highest number of fires were Jalisco, State of Mexico, Mexico City, Michoacán, Chihuahua, Chiapas, Puebla, Durango, Veracruz and Guerrero, representing nearly 80% of the total fires. States with the largest area burned were Jalisco, Chihuahua, Nayarit, Durango, Guerrero, Sonora, Chiapas, Oaxaca, Sinaloa, and Zacatecas, representing almost 84% of the national area burned. Out of the total fires, 988 (14%) occurred in fire-sensitive ecosystems, with a burned area of 89,139 hectares, which represents 10% of the total area burned.

## Canada Discussion

**September/October/November:** The current drought level and expectations of warm temperatures and lack of widespread precipitation in many areas during September suggests the area indicated by elevated fire potential will still cover much of central Canada. This region stretches from eastern Alberta to central Ontario. This may not be as dramatic as it looks because September fire levels usually taper off, so an above normal amount may not result in many fire starts. Large existing fires will likely continue in many regions, potentially burning well into the autumn or over the winter in central and northeastern British Columbia, the southern Northwest Territories, and northern Alberta and Saskatchewan. While large fires in the James Bay area may continue, September is normally a wetter month in that region, so activity may be curtailed as autumn progresses.

Warm and dry conditions may continue in southern Canada, and existing large fires in many regions can often continue through October and beyond, but with few new starts. With intense drought in the south, the potential for grass fires increases as vegetation cures due to dryness or freezing as overnight temperatures drop. Small amounts of precipitation at this time of year can reduce or eliminate fire

potential, thus only areas are depicted with expected above normal potential in southwestern British Columbia and southeastern Saskatchewan to extreme southwestern Ontario.

A question for November is whether El Niño at the current stage of development allows warm weather to persist in western Canada through the month. Often during El Niño events developing over the winter, the autumn months can be cold and wet, with warm and dry weather occurring mid-winter through the following spring. A warm and dry November would normally increase the risk of grass fires in the southern Prairies, but uncertainty in modeled temperature trends is resulting in no areas shown with above normal fire potential, although existing large fires may still be active.

## United States Discussion

**September/October/November:** Climate Prediction Center and Predictive Services monthly and seasonal outlooks depict likely above normal temperatures for the Intermountain West and Northwest coast, South, and East Coast into fall. Below normal precipitation is likely for the Southwest during the fall, focused September to mid-October. Below normal precipitation is also forecast in portions of the Pacific Northwest, northern Rockies, western Great Lakes, and Upper Midwest. Short-term below normal rainfall is likely for portions of the Southeast and Texas, but above normal rainfall is forecast for the Southeast and southern Mid-Atlantic states this fall.

Above normal significant fire potential is expected across along and west of the Cascades from Washington through northwest California through October due to continued warmer and drier than normal conditions coinciding with offshore wind season. Above normal potential is forecast from central Washington and north-central Oregon through the Columbia Gorge and Basin during September due to continued dry fine fuels and expected warmer, drier, and breezy conditions. Above normal potential is forecast across Hawai'i through November, especially the lee sides, due to long-term drought and periods of enhanced trade winds. Above normal potential is forecast across the Upper Midwest September into October due to long-term drought and potential early leaf drop as well as periodic forecast dry and breezy conditions.

Most of Oklahoma and the eastern half to two-thirds of Texas through the Lower Mississippi Valley onto the central Gulf Coast will have above normal significant fire potential in September as hot and dry conditions continue with drought stressed fuels. Portions of West Virginia, Virginia, and the Mid-Atlantic are forecast to have above normal potential into October due to worsening drought conditions and periods of warmer and drier than normal conditions.

The mountains and foothills of southern and central California will have below normal significant fire potential through September, with the Coast Ranges likely to retain below normal potential in October. All the US is forecast to have near normal significant fire potential in November, except for Hawaii.

## Mexico Discussion

**September/October/November:** Below normal precipitation is expected for much of Mexico through November. However, portions of Chiapas and Quintana Roo are likely to have near to above normal precipitation in September and November, while above normal precipitation is likely in portions of Chihuahua, Coahuila, Durango, Guanajuato, Sate de Mexico, and Sinaloa during October. Portions of Baja California, Campeche, Tabasco, and Yucatán are likely to have near to above normal potential in November as well. Temperatures will be mostly above normal through November, although near to below normal temperatures are forecast in portions of Sonora, Durango, Sinaloa, and Veracruz.

Given the recent temperature, precipitation, and drought trends across the country, along with the precipitation and temperature forecast, the fire potential is expected to be near to below the normal through November. However, portions of Coahuila, Nuevo León, and Tamaulipas along the Mexico-US

border are likely to have above normal potential during September due to the recent and forecast dry and warm conditions.

### **Additional Information**

Additional and supplemental information for this outlook can be obtained at:

United States:

National Significant Wildland Fire Potential Outlook

[http://www.predictiveservices.nifc.gov/outlooks/monthly\\_seasonal\\_outlook.pdf](http://www.predictiveservices.nifc.gov/outlooks/monthly_seasonal_outlook.pdf)

Canada:

Canadian Wildland Fire Information System

<http://cwfis.cfs.nrcan.gc.ca/home>

Mexico:

Servicio Meteorológico Nacional

<https://smn.conagua.gob.mx/es/observando-el-tiempo/monitoreo-atmosferico-ambiental>

### **Outlook Objective**

The North American Seasonal Fire Assessment and Outlook is a general discussion of conditions that will affect the occurrence of wildland fires across Canada, the United States, and Mexico. Wildland fire is a natural part of many ecosystems across North America. This document provides a broad assessment of those factors that will contribute to an increase or decrease of seasonal fire activity. The objective is to assist wildland fire managers prepare for the potential variations in a typical fire season. It is not intended as a prediction of where and when wildland fires will occur nor is it intended to suggest any area is safe from the hazards of wildfire.

### **Acknowledgements**

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