North American Seasonal Fire Assessment and Outlook

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

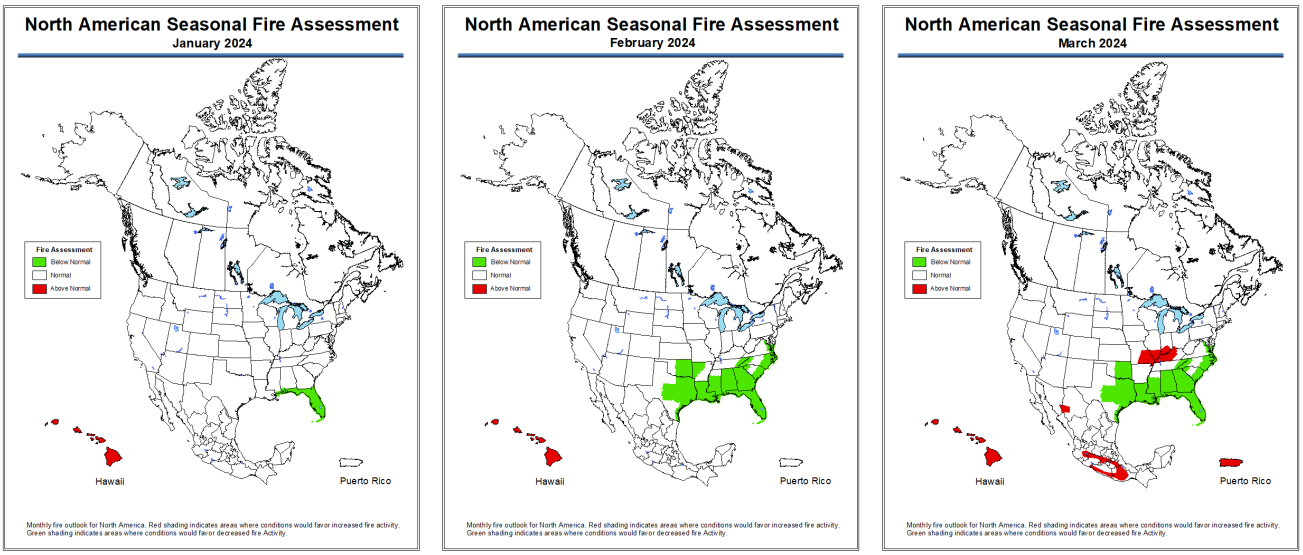
Outlook Period January through March 2024

Issued 16 January 2024

Executive Summary

Canada experienced above normal temperatures in all regions during December, with the greatest anomaly occurring from British Columbia's Peace River region east through most of the Prairie Provinces. This anomalous warmth also extended into the southern Northwest Territories and the Arctic islands. Some locations in Yukon and the Northwest Territories recorded the warmest year on record, with the second warmest year on record reported in parts of Nunavut.

Very dry conditions also continued in other regions. Drought has continued to expand in western regions, with most of Canada having some level of drought as of the end of December. Most southern parts of the provinces continued to have no snow cover or very shallow depths through the end of 2023. Northern parts of the provinces accumulated snow cover, but precipitation continued to run below normal. As of early January, areas in the southern interior of BC and south of a line from British Columbia's Peace River region to the bottom of Lake Winnipeg have absent or shallow snow cover, with deeper amounts north of that line. Snow cover is also light around the Great Lakes except for a few areas where lake squalls have left higher amounts. The eastern Atlantic Provinces are also generally snow-free, although snow slowly accumulated through December in much of Canada from Manitoba eastward. Despite the warm and dry conditions amid ongoing drought, no significant fire activity is anticipated through the outlook period. However, there is a potential for an early start to fire season in Canada in 2024 if trends continue.



Monthly fire outlook for North America for January 2024 (left), February 2024 (middle), and March 2024 (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.*

Fire activity continued to decrease throughout December across the US, continuing the trend from late November, with minimal fire activity recorded the last half of the month. Precipitation across the CONUS varied widely from well above normal to well below normal. Temperatures were generally above normal

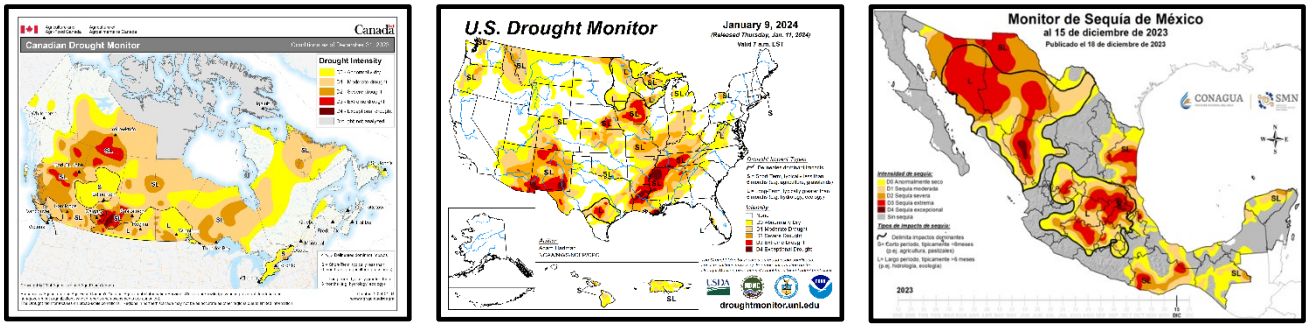
across most of the US, with the warmest anomalies from central and eastern Montana through the northern Plains into the Great Lakes. Periodic dry, offshore downslope winds occurred in southern California during the first week of December, while periods of enhanced trade winds amid dry airmasses resumed on the Hawai'ian Islands, with a gradual increase in fire activity at the end of the month.

Most climate outlooks depict an El Niño like pattern for the next few months, with generally near to above normal temperatures and near to below normal precipitation across the northern tier of the CONUS and the opposite across the southern tier. Below normal significant fire potential is forecast for Florida into the central Gulf Coast during January before expanding to central and eastern Oklahoma and Texas eastward into much of the Carolinas and southeast Virginia in February and March. Above normal significant fire potential is forecast across Hawai'i into March, with above normal fire potential also forecast for Puerto Rico and the US Virgin Islands for March.

During the October-December quarter, precipitation was slightly above normal for Mexico at national level. Temperatures in the same quarter were above normal in most of the country. According to 2023 data, wildfire season recorded a total of 7,611 fires and 1,047,493 hectares burned. The forest fire season begins in December with minimum potential, but increases gradually, reaching a maximum during the spring, in the dry and warm season, and a relative maximum in mid to late May. During the last three months, rainfall caused by various weather systems was within normal or slightly above normal, so that several drought regions were reduced, although areas with severe to extreme drought remain. The weather outlook for January through March is warm and dry for most of Mexico. In the northeastern part of the country, forest fire activity is expected to be normal or below normal due to a greater influence of winter systems. Wildfire activity this season has remained near normal, but over the past six years, wildfires have been above average, and acreage burned is nearly 100 percent above average.

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 migrating from the eastern Pacific to the central Pacific Ocean during the past month. Current forecast guidance indicates this shift will continue into the spring as El Niño is forecast to weaken. SSTs are consistent with a strong El Niño, and the Climate Prediction Center (CPC) forecasts El Niño will continue into early spring with a gradual weakening trend. CPC is now forecasting a 60% chance of neutral conditions for the April – June period. A lack of previous analogs exists due to this El Niño occurring coincident with other teleconnection patterns that do not normally happen. The Madden Julian Oscillation (MJO), Pacific Decadal Oscillation, Pacific-North American Pattern, Arctic Oscillation, and a potential sudden stratospheric warming event in January are likely to influence weather and climate during the outlook period, but El Niño will be the main driver.

Drought:

Although most of Canada is experiencing significant drought, two large expanses with minimal or absent drought were present at the end of December. One area continues to lie between Lake Huron and the Atlantic Provinces, although areas on the north shores of Lakes Erie and Ontario feature abnormally dry or moderate drought conditions. A small area of severe drought has developed midway along the shore of Lake Ontario. A second drought-free area extends from northwestern British Columbia through Yukon and the northern portion of the Northwest Territories, but small areas on the north side of the St. Elias Mountains still feature abnormally dry conditions. A drought-free patch has expanded to cover the western portion of Quebec's Ungava Peninsula, showing recent improvement in that area.

The remainder of Canada remains in some level of drought, with the most intense area – exceptional drought – still present in a broken area east of Calgary in southern Alberta. Extreme drought surrounds this region and extends into southwestern Saskatchewan. Extreme drought is also present in a broken band from central British Columbia to the Great Slave Lake area in the Northwest Territories. The remainder of the country consists of areas of abnormally dry through severe drought.

Above normal temperatures were observed across much of the contiguous US and Hawai'i, with temperatures well above normal from central and eastern Montana into the Great Lakes, where monthly temperature anomalies were as much as 14 degrees above normal. Above normal precipitation was recorded along the East and Gulf Coasts, Northwest, southern Arizona, and much of New Mexico, while well above normal precipitation fell from the Texas Panhandle into much of the central and northern Plains into Minnesota. Snowpack has had a slow start to the season across the West, with most basins reporting snowpack at 50-80% in early January, including much of the Sierra and Cascades where above normal temperatures has limited what precipitation as fallen as snow to the higher elevations. Snowpack near to slightly below normal is confined near and east of the Continental Divide in Colorado and New Mexico.

Drought improved in portions of the northwestern US and across portions of the Lower Mississippi and Tennessee Valleys, Mid-Atlantic, and Gulf Coast. However, drought worsened in portions Mid-Mississippi and Lower Ohio Valleys. Extreme and exceptional drought still covers portions of Louisiana and Mississippi, with areas of extreme and exceptional drought in portions of the Southwest, Kansas, Nebraska, and Iowa. California remains drought free, but drought persists on all the Hawai'ian Islands. Drought is forecast to improve across much of the Lower Mississippi Valley and Southeast, but drought development is likely across portions of the northern Rockies and through much of the Ohio Valley the rest of winter.

During the first half of December, above average rainfall was observed over northeast, central, and eastern portions of Mexico, in addition to the Yucatan Peninsula. This was due to the cold frontal passages, two of which caused northerly events, as well as the presence and interaction of low pressure system and subtropical and polar jet streams. These rains favored the reduction of drought areas in the states of Durango, Zacatecas, Nuevo Leon, Tamaulipas, San Luis Potosi, Aguascalientes, Jalisco, Guanajuato, Michoacan, State of Mexico, Puebla, Oaxaca, Veracruz, and the Yucatan Peninsula.

Below-average rainfall was registered mainly in the northwest, so severe to extreme drought (D2 to D3) remained unchanged in that region. Extreme drought (D3) persists in portions of the northeast Mexico, the central part of the country, and in Oaxaca. As of December 15, the percentage of areas with moderate to exceptional drought (D1 to D4) at the national level was 47.07%, lower (6.49%) that quantified as of November 30.

Fire Season Status:
Fires from 2023 continue to be monitored in Alberta, British Columbia, the Northwest Territories, and possibly other jurisdictions. An occasional new fire has been reported, but impacts have been minimal. Fire weather index calculations remain shut down in the majority of Canada, although calculations remained active in early January in a few snow-free pockets of Alberta, southern British Columbia, and southern parts of the eastern provinces. The current blast of Arctic air coupled with snowfall will likely continue to shut down calculations in many of these remaining regions.

A limited number of large fires burned briefly across the country, mainly in the Eastern, Southern, and Southwest Areas, although a large fire was recorded in southern California early in the month due to a Santa Ana wind event. Annual acres burned for the US in 2023 was well below the 10-year average at just over 37%, with slightly below average number of fires as well, at 95%.

For 2023, 7,611 forest fires have been registered in 32 states resulting in 1,047,493 hectares burned. The vegetation corresponding to herbaceous and shrub layers was 97%, while timber was 3%. States with the highest number of fires were Jalisco, State of Mexico, Mexico City, Michoacan, Chihuahua, Chiapas, Puebla, Durango, Guerrero, and Veracruz, representing nearly 79% of the total fires. States with the largest area burned were Jalisco, Chihuahua, Guerrero, Nayarit, Durango, Sonora, Chiapas, Oaxaca, Sinaloa, and Michoacan, representing almost 84% of the national area burned. Out of the total fires, 1,151 (15%) occurred in fire-sensitive ecosystems, with a burned area of 119,931 hectares, which represents 11% of the total area burned.

Canada Discussion

January/February/March: Deep-burning fires from the 2023 season may continue smoldering, even with snow cover, and an occasional new fire may still be reported. At this time, no regions of Canada are expected to have significantly above normal fire activity from January to March, thus no polygons have been produced depicting areas of expected above normal fire severity.

Record warm and dry weather has been temporarily interrupted in much of Canada as an Arctic air mass has invaded with record-setting cold temperatures. These very frigid air masses are hard to move, so cold conditions will likely continue through mid-month and possibly beyond. Maritime air bumping into and rising over this cold air mass will lead to periodic snow in some regions, thus no significant fire activity is expected in Canada in January.

February is one of the driest months on average in the southern Prairies. As if often does, El Niño could contribute to ongoing warm and dry conditions in this region. Current climate model predictions favor a warm February with varying precipitation trends. Due to the normal February dryness in western Canada, above normal warmth may erode snow cover in some areas leading to possible grass or brush fires, but confidence is low in predicting areas that could feature above normal fire activity. Part of the outcome depends on length of stay of the January Arctic air in Canada, and the amount of snow that falls with it. Climate models favor above normal precipitation in northern and Atlantic regions, but little confidence or consistency in other regions moving into March. Most models suggest warmer than normal conditions across much of Canada. This could continue contributing to early loss of snow cover, which could create early fire activity in some regions, although confidence is still too low to delineate specific areas for March.

United States Discussion

January/February/March: Climate Prediction Center and Predictive Services December outlooks depict above normal temperatures are likely for much of the West Coast and northern third of the US, while temperatures likely to be near to below normal across the Southwest, southern Plains, and Southeast. Precipitation is likely to be above normal across much of Arizona, southern California, and southern Nevada into early spring, with above normal precipitation also likely across much of the central and southern Plains into the Southeast. Precipitation is most likely to be above normal across south Georgia into Florida. Meanwhile, below normal precipitation is likely across the Northwest and northern Rockies, as well as portions of the Great Lakes into the Ohio Valley. The temperature and precipitation forecasts are consistent with a mature El Niño.

Above normal significant fire potential is forecast across Hawai'i through March, with above normal fire potential also forecast for Puerto Rico and the US Virgin Islands in March. Southern Area will see an

expansion of below normal significant fire potential across the northeast Gulf Coast and Florida in January to central and eastern Oklahoma and Texas eastward into much of the Carolinas and southeast Virginia. Below normal significant fire potential will continue for much of these areas in March, but western Arkansas will return to normal potential with above normal potential forecast for the Mid-Mississippi and Lower Ohio Valleys.

Mexico Discussion

January/February/March: El Niño conditions are observed, there is predicted to continue until at least March, with a gradual weakening of El Niño starting in January. The majority of the models indicate a neutral phase transition after MAM-2024 quarter. According to the IRI Seasonal Climate Forecast, the probability of precipitation will be below the normal in much of Mexico, except for the Yucatan Peninsula and northeastern Mexico, where none of the categories dominates. For temperature, the probability remains above the climatology in almost all the country.

Given the current conditions of temperature, precipitation, drought, and climatological analysis, it is forecast that forest fire activity for January through March will begin with minimum potential, but will gradually increase in the central, western, and southern states of the country, due to a warm and dry weather outlook. Forest fire activity in the northeastern part of the country will be near to below normal.

Additional Information

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

United States:
National Significant Wildland Fire Potential Outlook
https://www.nifc.gov/nicc-files/predictive/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.

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