North American Seasonal Fire Assessment and Outlook

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

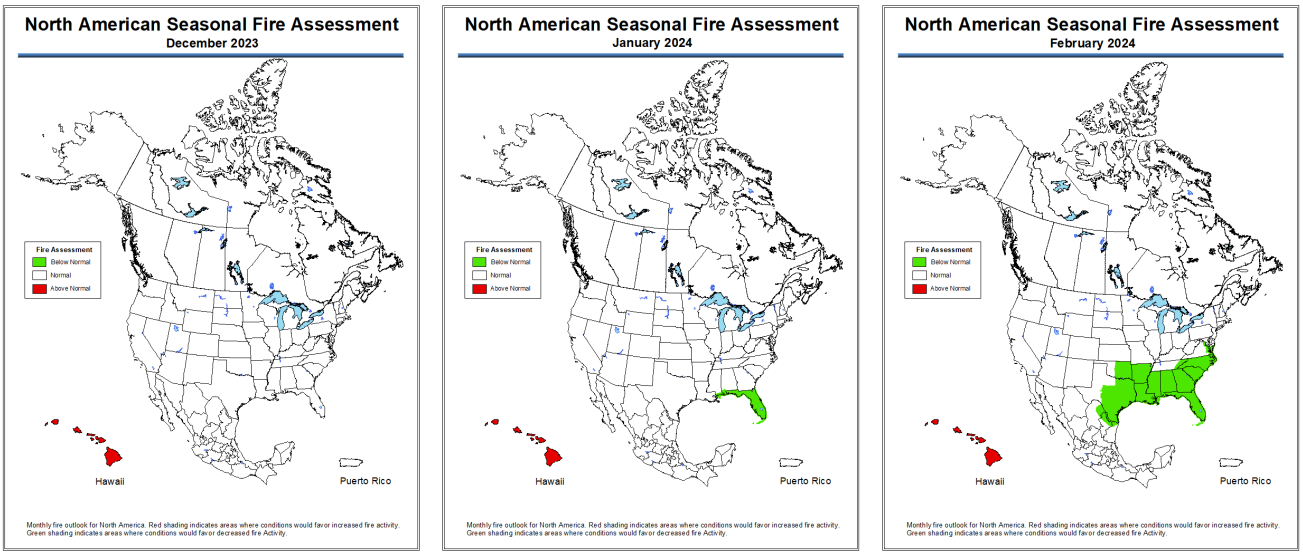
Outlook Period December 2023 through February 2024

Issued 13 December 2023

Executive Summary

Warm and dry weather continued in most of western Canada through November and early December, with some record high values set under strong Pacific ridges that have moved regularly inland. Snow that accumulated in southern regions in late October quickly melted. Central Alberta, which had plentiful summer rain, has been extremely dry this autumn, with only a slight amount of measurable precipitation in October and November.

While temperatures may currently be warmer than normal in many Canadian regions, snow cover is usually present in the Territories and northern regions of the provinces. With a warm winter, as with a strong El Niño, the area lacking snow or with thin snow cover covers a larger area. As of early December 2023, areas south of a line from northeastern British Columbia to the top 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 patches where lake squalls have left deep snow cover. The eastern Atlantic Provinces are also generally snow-free.



Monthly fire outlook for North America for December 2023 (left), January 2024 (middle), and February 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.*

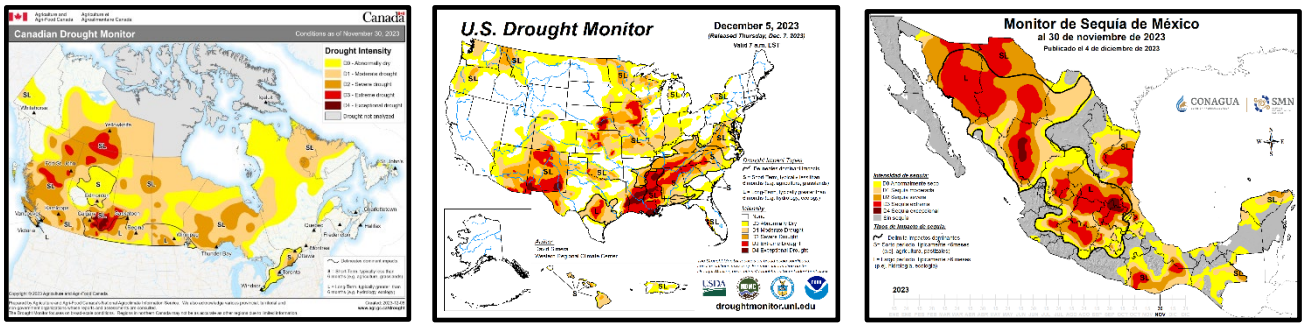
Fire activity in the US increased in Southern Area during November, with the geographic area increasing to preparedness level three in early November before returning to preparedness level two the last week of November. Large fires were reported in every state of Southern Area during the month and multiple complex incident management teams were assigned, with fire activity increasing in Eastern Area near the Southern Area boundary. Significant fire activity was minimal elsewhere across the US. Above normal significant fire potential is forecast across Hawai'i into February. Normal potential is forecast across the contiguous US in December, with below normal potential likely from the central Gulf Coast

into Florida in January expanding to encompass almost all of Southern Area in February, from Interstate-35 eastward to the Carolinas.

Forest fire activity will continue at low levels during the winter, due to increased humidity from cold fronts and the influence of the subtropical jet stream. For the December through February period, a warm and dry climate outlook is forecast. Mexico is likely to begin 2024 with a water deficit resulting in large areas of severe and extreme drought, with some areas of exceptional drought. However, the presence of a strong El Niño may change these conditions, causing a wet and cold season. In the northeastern part of the country, fire potential is expected to be lower than normal due to the influence of winter storm systems. As of November 30, a total of 7,493 forest fires have been recorded with 1,018,768 hectares burned, marking 2023 as the year with the largest burned area in Mexico's recorded history.

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. However, forecast guidance indicates this could shift more to the central equatorial Pacific Ocean in the coming weeks to months, and warming has already started to increase here. SSTs are consistent with a borderline strong El Niño, and the Climate Prediction Center (CPC) forecasts that a strong El Niño will likely develop, including a 55% chance of it persisting through the January – March period. CPC forecasts El Niño conditions continuing through spring, with a 62% chance it persists into 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, and Arctic Oscillation are likely to influence weather and climate during the outlook period, but El Niño will be the main driver.

Drought:

The largest expanse with minimal or absent drought 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 second large drought-free area extends from northwestern British Columbia through Yukon, except for a small area on the north side of the St. Elias Mountains. Improvement has occurred in central Yukon, where an abnormally dry region at the end of October is now drought-free. A few small drought-free patches also lie in west central Alberta, the northern Northwest Territories, and the far northwestern tip of Quebec's Ungava Peninsula.

The remainder of Canada remains in some level of drought, with the most intense area of exceptional drought still present east of Calgary in southern Alberta. Although this patch remains, it has broken up slightly, indicating some relief has occurred, likely in October when heavy precipitation fell. Here, October precipitation rarely approaches 50% of a late spring month; in 2023 some regions likely received 40mm or more, which is approximately 150% of a normal October amount, but not enough to significantly reduce drought. However, November returned to dry conditions.

Areas that had drought form or intensify during November include northern Manitoba and far northwestern Ontario, where abnormally dry or moderate drought categories completely cover the region. Improvement is apparent in parts of southern British Columbia, southern Saskatchewan, Manitoba, and around James Bay, but not as far east as the Labrador border, where a small patch of severe drought has appeared.

Near to above normal temperatures were observed across much of the West, Plains, Midwest, and Southeast in November, while below normal temperatures were in the Northeast and south Texas. Much of the CONUS had below normal precipitation during November, with the greatest anomalies on the northern Plains into the Midwest, Mid-Mississippi Valley, and portions of the southern and central High Plains into the Southwest. Portions of southwest and south Texas, the Florida Peninsula, central Plains, and Intermountain had near to above normal precipitation. Widespread wetting rain fell across much of Southern and Eastern Areas Thanksgiving Week, with more rain at the end of November to help significantly reduce fire activity and potential. Atmospheric rivers brought heavy precipitation to portions of the West Coast and northern Intermountain West in early November and at the end of November. The Hawai'ian Islands had multiple periods of enhanced trade winds with dry airmasses, including in early November when fire activity increased. However, a strong Kona Low brought widespread heavy rainfall to the islands the last week of November.

Drought improved in portions of the northwestern US and much of Texas. However, drought developed or worsened in portions of the Four Corners, Mississippi Valley, Midwest, and the southern and central Appalachians into the Mid-Atlantic. Extreme and exceptional drought still covers most of Louisiana and Mississippi. Areas of extreme and exceptional drought are also in portions of the Southwest, central Plains, and Mississippi Valley. California remains drought free, but drought persists on all the Hawaiian Islands.

During the second half of November 2023, above average rainfall was observed over northern, central, and southern Mexico, in addition to the Yucatan Peninsula. This precipitation was the result of several cold fronts and their interaction the subtropical and polar jet streams, and the first winter storm. This precipitation resulted in a reduction of drought areas in portions of Chihuahua, Durango, Coahuila, Zacatecas, Nuevo Leon, San Luis Potosi, Aguascalientes, Michoacan, Morelos, Puebla, Oaxaca, southern Veracruz, Tabasco, and the Yucatan Peninsula.

On the other hand, below-average rainfall was recorded in northwestern Mexico and in specific areas in the west, northeast and south of the country. Severe to extreme drought increased mainly in Sonora, the west of the states of Chihuahua and Durango, and the south of Tamaulipas. As of November 30, 2023, the percentage of areas with moderate to exceptional drought was nearly 54% of the country, slightly lower (1.84%) than November 15.

Fire Season Status:
Fires continue to be monitored in Alberta and British Columbia, and a few new fires started during November. Some grass fires occurred in dry regions in southern and central Alberta. One fire near Crossfield, north of Calgary, temporarily resulted in some evacuations. This 140-hectare fire was apparently caused by high winds downing a power line. Other grass fires appear to have been limited in size and severe impacts have not been reported.

Fire weather index calculations remain shut down in the majority of Canada, although calculations remain active in a few snow-free pockets of Alberta, southern British Columbia, and southern parts of the eastern provinces.

Significant fire activity in the US increased the first half of November across the Southern Area and the southern portions of Eastern Area. Widespread wetting rain fell across much of Southern and Eastern Areas Thanksgiving Week drastically reducing fire activity, with more rain falling across these areas the last week of November. Otherwise, fire activity remained below normal across the remainder of the US including southern California, despite periods of offshore, downslope winds. Year-to-date acres burned

for the US remains well below the 10-year average at just below 38%, with a near average number of fires as well.

So far this year in Mexico, 7,493 forest fires have occurred in 32 states resulting in 1,018,768 hectares burned. The vegetation burned corresponding to grass and brush layers was 97%, while timber was 3%. States with the highest number of fires were Jalisco, State of Mexico, Mexico City, Michoacan, Chihuahua, Chiapas, Durango, Puebla, Veracruz, and Guerrero, representing nearly 79% of the total fires. States with the largest area burned were Jalisco, Chihuahua, Nayarit, Durango, Guerrero, Sonora, Chiapas, Oaxaca, Sinaloa, and Michoacan, representing almost 83% of the national area burned. Out of the total fires, 1,083 (14%) occurred in fire-sensitive ecosystems, with a burned area of 114,653 hectares, which represents 11% of the total area burned.

Canada Discussion

December/January/February: No regions of Canada are expecting significantly above normal fire activity from December 2023 to February 2024. Some fire activity continues, and deep-burning fires from earlier in the season may continue smoldering even with snow cover.

A warm December is generally predicted for most of Canada. Above normal winter temperatures in much of the country do not translate into bare ground, as values often do not significantly exceed the freezing point, limiting snow melt. Thus, most of Canada should have no fire issues. However, dry conditions are expected in the southern interior rain shadows in British Columbia and the southern Prairies. Some minor fire activity could continue in these regions. Elsewhere, normal to heavy precipitation is expected in coastal areas and the Territories. Normal precipitation in eastern Canada is quite consistent throughout the year, so regions expecting normal or higher amounts should not experience fire issues.

Mixed temperature and precipitation signals make for a difficult January forecast. Warm and dry weather could continue the risk for grass fires in southwestern Canada, but a high degree of uncertainty and low forecast confidence exists, limiting accurate prediction of areas with potential fire activity.

February is one of the driest months on average in the southern Prairies. As it often does, El Niño could contribute to ongoing warm and dry conditions in this region, creating or continuing grass fire potential. Currently, not enough confidence exists in predicting above average fire activity in any region, so no areas are depicted as having above normal potential.

United States Discussion

December/January/February: Climate Prediction Center and Predictive Services December outlooks depict above normal temperatures for most of the US, with above normal precipitation for portions of the West Coast and Southeast into the Mid-Atlantic. The outlooks for January through February show a more classic El Niño pattern emerging, with near to below normal precipitation for the northwestern US and parts of the Great Lakes into the Northeast. However, above normal precipitation is forecast for California into the Southwest and across much of the Southeast extending into the Mid-Atlantic. The greatest likelihood of above normal precipitation will be across the Southeast this winter. Above normal temperatures are likely for the northern tier of the CONUS, while near to below normal temperatures are likely for the southern US.

Above normal significant fire potential is forecast across Hawai'i into February, but recent rainfall from a Kona Low will reduce fire potential through into mid-December. Normal significant fire potential is forecast across the contiguous US in December, with below normal potential likely starting in Florida for January. The below normal potential is forecast encompass most of Southern Area, from Interstate-35 eastward through the Carolinas, in February. Significant fire potential will be normal across Alaska through February, which is little to no activity as snow covers most of the state.

Mexico Discussion

December/January/February: According to the IRI Seasonal Climate Forecast, the probability of precipitation will be below normal in much of the country, except for the Yucatan Peninsula and northeastern Mexico, where none of the categories dominates. Minimum temperatures are forecast to be above normal across almost all of Mexico.

El Niño conditions in the central-eastern equatorial Pacific remain strong, with key oceanic and atmospheric variables consistent with an ongoing El Niño event, which is forecast to continue through the Northern Hemisphere spring. Given the recent temperature, precipitation, and drought trend across the country, along with the precipitation and temperature forecast, minimal forest fire activity is expected in Mexico through February, despite a warm and dry weather outlook. Fire potential in the northeastern part of the country will be below normal due to the potential for winter storms bringing sufficient precipitation.

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

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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