National Significant Wildland Fire Potential Outlook



Predictive Services National Interagency Fire Center

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# **Outlook Period – September through December 2022**

## **Executive Summary**

The significant wildland fire potential forecasts included in this outlook represent the cumulative forecasts of the ten Geographic Area Predictive Services units and the National Predictive Services unit.



Fire activity continued across much of Texas and Oklahoma through mid-August before a rapid decrease in activity due to heavy rainfall that occurred during the latter half of the month. Large fires emerged across California, Oregon, Washington, Idaho, and Montana and continued to burn at the end of the month. Year-to-date acres burned for the US is approximately 116% of the 10-year average, with over half of the total acres burned in Alaska alone.

Drought rapidly intensified and expanded across portions of the Northeast due to very dry conditions in August, with southern New England in severe to extreme drought. Drought improvement was noted in Utah, Colorado, New Mexico, and Arizona due to the North American Monsoon. Improvement or removal of drought also occurred in portions of Carolinas, east Texas, and the Lower Mississippi Valley. However, much of California, the Great Basin, Oregon, and central Montana remained in drought.

The monsoon will continue to wane the first half of September across the Southwest, but above normal precipitation is likely for portions of Arizona, as well as the Gulf Coast. The Climate Prediction Center (CPC) forecasts above normal temperatures across the West and Northeast in September, expanding across much of the country for the fall. Below normal precipitation is likely for the fall across much of the US from the Great Basin eastward into the Appalachians, with small areas of above normal precipitation forecast for portions of Florida and Washington. Drought improvement is anticipated across much of the Southwest into the southern Plains, mainly due to anticipated rain through mid-September before drier conditions prevail.

Above normal significant fire potential is forecast for much of the Northeast September through November due to ongoing drought. Above normal potential is also forecast for much of Oklahoma in September and October, expanding to include all of Oklahoma and Texas by December. Normal potential is forecast for the remainder of the Eastern and Southern Areas, as well as the Southwest and Rocky Mountain Areas through December.

Most of northern California, central and southwest Oregon, southeast Washington, Idaho, and far western Montana will have above normal potential in September. Most of these areas will return to normal potential in October except across portions of northern California prone to offshore winds. Northern California will return to normal potential for November and December. The Transverse and Peninsular Ranges of southern California to the coast, areas prone to Santa Ana winds, will have above normal potential October through December. Lee sides of the Hawai'ian Islands will continue to have above normal potential through November before returning to normal potential in December.

## Past Weather and Drought

The North American Monsoon continued across much of the greater Four Corners region in August but weakened the last few days of the month. Monsoon periodically moved into portions of California, the northern Great Basin, Northwest, and northern Rockies as well. The robust monsoon resulted in above normal precipitation for much of southern California, the Sierra, southeast Oregon, central and southern Great Basin, central Rockies, and Southwest. Below normal precipitation was observed across coastal California into much of the Northwest and northern Rockies. Below normal precipitation continued across much of the Plains, but central and south Texas received above normal precipitation, most of it falling the latter half of the month. Below normal precipitation was also observed across portions of the Mid-Atlantic and much of the Northeast.

Drought continues across more than two-thirds of the West and much of the central and southern Plains into the Ozarks. Portions of the Great Basin, California, southeast Oregon, and central and southern Plains remain in extreme to exceptional drought. Drought developed and intensified across portions of the Northeast, with severe to extreme drought in southern New England. Drought was removed in the coastal Carolinas, with significant improvement or removal of drought in Arizona, east Texas, and the Lower Mississippi Valley due to significant rainfall in August.

Fire activity continued across Texas and Oklahoma through mid-August before rapidly decreasing the latter half of the month due to heavy rainfall, especially across Texas. Significant fire activity continued to slowly increase across the West into mid-August, before remaining steady through the end of the month. Large fires were active across California, Oregon, Washington, Idaho, and Montana at the end of August.



Left: Departure from Normal Temperature (top) and Percent of Normal Precipitation (bottom) (from PRISM Climate Group, Oregon State University). Right: U.S. Drought Monitor (top) and Drought Outlook (bottom) (from National Drought Mitigation Center and the Climate Prediction Center)

#### Weather and Climate Outlooks

La Niña conditions continue, with below average sea surface temperatures (SSTs) over much of the equatorial Pacific Ocean. SSTs have remained generally steady for the past month, with La Niña conditions likely to continue through fall. CPC is forecasting an 86% chance of La Niña continuing through the fall, decreasing to a 60% chance of La Niña conditions continuing through the winter. This will be a rare "triple dip" La Niña.

#### Geographic Area Forecasts

<u>Alaska</u>: Normal fire potential is expected in Alaska during the tail of this year's wildfire season and into the first half of winter.

Ample rainfall over the last several weeks has eliminated drought conditions over almost all of Alaska.\_Typical precipitation patterns are likely through fall and into early winter, except for a signal of warmer temperatures over northwest Alaska and cooler temperatures over the Interior.

Wildfire activity in Alaska was minimal as of late August, with only one staffed fire. Fuels across the state are quite wet at the surface as well as through the deeper duff layers. There are isolated pockets of drier fuels in the Yukon Flats and the upper reaches of the Tanana River Valley, but for the most part the Alaskan landscape is not receptive to new fires.

Typical wildfire behavior is expected for Alaska in September as the last fires of the season persist but make minimal advances. The snowpack will begin building in October, first at higher elevations and over the northern Interior, then advancing to cover the entire state through November. Normal fire potential is forecast through the end of the year as the establishment of the snowpack brings the end of wildfire activity in Alaska.

**Northwest:** Potential for significant fires in the Pacific Northwest during September is above normal for central Oregon Predictive Services Areas (PSAs) NW06 and NW07, southwest Oregon PSA NW04, and central Washington PSAs NW05 and NW10. Elsewhere, the potential for significant fires is expected to be near normal, with all areas returning to normal potential October through December.

August began with a cooling trend that covered the geographic area following a hot spell in late July. However, temperatures subsequently climbed above normal for the month despite some short-lived cooling periods. A heat wave in the third week of the month and at the end of August drove temperatures to record values in some PSAs.

Rainfall was greater than normal in southeast and south-central Oregon as well as sections of eastern Washington due surges of subtropical moisture from the Great Basin and Southwest. The first surge occurred around August 10, with a second surge around August 19. Rainfall with strong thunderstorms over northeastern Washington on August 24-25 was heavy at times.









Normal fire season progression across the contiguous U.S. and Alaska shown by monthly fire density (number of fires per unit area). Fire size and fire severity cannot be inferred from this analysis. (Based on 1999-2010 FPA Data)

In the closing days of July three fires emerged that would become large fires through August. During August 25, more large fires emerged, with 28 fires burning a total of 102,610 acres. The daily number of fires in August has been very close to the 30-year average. Several lightning events occurred that were accompanied by rainfall. After each lightning event, temperatures decreased, and winds subsided to favor initial attack. Lightning occurrence has primarily been in northern Washington and northeast Oregon at higher elevations where fuel moistures have been above average. Holdover fires have been infrequent and small at high elevations.

Fire danger indices at the beginning of August were within the average range across the geographic area. Large fuel classes across much of the area were within average levels as well. Wet thunderstorms in August allowed heavy fuels to remain at average to slightly above average levels across the geographic area. Curing of fine fuels continued with the green belt east of the Cascades climbing to approximately 5,000 feet. Units east of the Cascades report the shrub component in timbered areas have retained moisture and are not contributing to fire behavior above 4,000 feet. Periodic hot and dry periods have been followed by bouts of moisture, especially in the north and northeast areas of Washington and Oregon. Fire danger indices at the end of August are within average ranges throughout the geographic area.

Climate outlooks for September suggest warmer and drier than normal conditions, especially east of the Cascades. For October through December wetter than typical weather is most likely for the geographic area. This will lead to areas of above normal significant fire potential from southwest Oregon into central and southeast Washington during September. Near normal potential is forecast for the geographic areas October through December.

**Northern California and Hawai'i:** Significant fire potential is projected to be above normal all elevations and areas excluding some near coastal areas of North Ops during September. A reduction in the above normal footprint should occur during October and includes west of the lower Cascade Range and Sierra Crest to the Pacific Ocean. November and December should have normal significant fire potential. Historically most Predictive Services Areas (PSAs) generally average between one to three large fires during September, with the exceptions including the Bay Area and Far Eastside PSAs where less than one is typically observed. During October, all PSAs observe 1 or less large fires while less than one occurs during November and December. Hawaii's significant fire potential is forecast to above normal September through November across all islands but especially the leeward sides. Normal significant fire potential is projected for December.

The weather pattern during August was diverse due to various monsoon moisture surges during the first half of the month mixed in with heat from atmospheric ridging. A few cool intrusions from weak troughing and accompanying deeper onshore flow occurred as well. Lightning was observed somewhere in the region consecutively August 1-9 and August 17-18. The weather pattern created a mosaic of above and below normal precipitation due to the thunderstorm activity with generally drier than normal results across western and most central portions of North Ops and wetter than normal across the far northern and eastern portions. Temperatures were generally near to above normal.

Dead fuel moistures varied and were generally near to above normal the first two weeks and near to below normal the last two weeks of August. Herbaceous fuels continued to cure during August with cured to mostly cured forbs and grasses below 5,500 feet by the end of the month and partly to mostly cured above 5,500 feet depending on whether the species was annual or perennial. Live shrub and tree canopy moisture levels within all species continued to lower, with critically low values in Chamise and Sage and mixed flammability in Manzanita, Ponderosa Pine, and Douglas Fir.

Several Red Flag Warnings were issued by National Weather Service due to either gusty wind and low humidity or lightning, but northern areas were especially favored for the warnings. The highest 24-hour lightning count period was centered on August 2 with nearly 1,500 strikes. A drier cell producing around 175 strikes ignited multiple large fires across the Six Rivers National Forest during the early morning hours of August 5. The busier initial attack days with over 30 ignitions per day were mostly related to heavier lightning periods during August 4-6 and August 18. Incident Management Teams (IMT) and National Incident Management Organizations (NIMO) were dispatched to manage the Six Rivers Lightning Complex. Minimal prescribed burning was conducted during August.

The weather outlook for September through December calls for mixed temperature and precipitation anomalies across North Ops. Most areas during the fall should experience near to above normal temperatures and near to below normal precipitation, while a better chance for wetter storm passages exists late fall or early winter as the upper-level jet strengthens over the Pacific Northwest. Timely moisture intrusions cannot be ruled out in September or October since similar oceanic-atmospheric teleconnections that occurred last fall will occur again this fall, but they are more likely to happen during November or December. The weather pattern during September is expected to be a mix of atmospheric ridging, weak trough passages, and cut off upper lows amid a weaker jet, which makes the precipitation and temperature forecast more uncertain. However, most areas are likely to experience warmer and drier than normal conditions.

The initial consensus is for normal numbers of dry, offshore wind events with a stronger likelihood that the frequency increases the latter half of September into the earlier half of October. Lightning that could cause larger numbers of ignitions will remain during September, especially if cut off lows develop. Lightning should be relegated to Pacific trough passages the rest of the outlook period and likely favor late fall or early winter.

Long-term drought is not expected to improve during the next one or two months and is likely to intensify somewhat. Low fuel moistures, in the live and dead fuel types, will likely occur in extended time frames across a broad area of the region during the earlier half of fall but should improve either late fall or by early winter as timely moisture intrusions increase and daylight hours decrease with a lowering sun angle. Near to above normal herbaceous fuel loading is found across the landscape and likely will not be altered until late fall or early winter. Other fuel wildcards that impact significant fire potential include large areas of blow-down with cured leaves and needles due to the intense December 2021 storms across portions of the Tahoe, Eldorado and Six Rivers National Forests as well as increased tree mortality that has returned in higher numbers compared to recent years due to the extended significant drought.

Sea surface temperature (SSTs) anomalies surrounding the Hawai'ian Islands are near to slightly above normal. Average temperatures were near to below normal during August. Mixed precipitation anomalies occurred during August, with wetter than normal areas across western portions of the Big Island and O'ahu as well as all of Moloka'i and Lana'i. A few Red Flag Warnings were issued by the Honolulu National Weather Service due to dry-gusty winds. A wildfire grew significantly on the leeward side of the Big Island on August 10 when a Red Flag Warning was in effect. The four-month weather outlook calls for near to below normal precipitation from September through December, with the wetter conditions likely to occur in December. Temperatures should be near to above normal from September through December with mixed SST anomalies and localized dry soils. Significant fire potential is projected to be above normal September through November, especially across the leeward sides of the islands, due to cured and curing herbaceous fuels, drought conditions, and periods of enhanced trade winds due to La Niña. December should return to normal as herbaceous green-up commences in areas as the wet season tries to ramp back up, although confidence is lower for this month.

<u>Southern California</u>: Significant fire potential will be near to a little below normal across the region in September. Significant fire potential will become above normal across southern California from the mountains westward and near normal elsewhere October through December.

Strong high pressure oscillating back and forth between the Four Corners region and the Great Basin influenced the weather over central and southern California most of August. Abundant sunshine and a lack of a consistent marine layer brought temperatures that were 2 to 4°F above normal to the coastal and valley areas, while abundant afternoon cloud cover brought temperatures that were 1 to 3°F below normal to the mountains and deserts. Southeast flow aloft around the strong area of high pressure brought isolated to scattered afternoon monsoonal showers and thunderstorms to the mountains and deserts most days during August. However, there were only a couple days when isolated shower and thunderstorm activity made it to the coastal and valley areas. Rainfall ended up well above normal across the mountain and desert areas and near to below normal across the coastal and valley areas for the month. Winds were light most of the month and primarily from the south or west.

All of central and southern California remain under drought conditions. Drought eased from extreme to severe over most mountain and desert locations in August due to the well above normal rainfall from the persistent monsoon flow. However, extreme to exceptional drought expanded a little across the San Joaquin Valley, while there was little change in the severe drought across the coastal areas and valleys of southern California. The only location with moderate drought remains over San Diego County. There was significant improvement in the 1000-hr and 100-hr dead fuel moisture over the mountains and deserts which were well above normal most of August. Across the lower elevations, the dead fuel moisture increased to above normal at the beginning of the month but has dropped off rapidly since with some areas now breaking record low levels. There was little change to the below normal live fuel moisture, and it remains between 50% and 80% across most of the region.

Sea surface temperatures (SSTs) remain above normal over the Gulf of Alaska and off the West Coast, with below normal SSTs over most of the Equatorial Pacific. Forecasts indicate there will be little change in SST anomalies through at least the end of the year. Thus, high pressure is likely to be the dominating weather influence over central and southern California through December. The area of high pressure that has been moving back and forth between the Four Corners region and the Great Basin will continue to do so through the middle of September. This will likely continue to bring near to above normal monsoonal showers and thunderstorms to the mountains and deserts. As the land cools late in September, the area of high pressure will become centered off the California coast where it will likely reside through the end of the year. This strong area of high pressure off the coast will bring well above normal temperatures and well below normal precipitation to South Ops from late September through December. Pacific storms will ride up and over the area of high pressure into the Pacific Northwest then move east over the northern tier of the US or drop into the Great Basin and Desert Southwest. Those systems that drop south are likely to cause Santa Ana wind events across southern California from the mountains westward. There will most likely be a near normal amount of Santa Ana wind events across southern California this fall. The expected warm and very dry conditions along with a near normal amount of Santa Ana wind events will result in above normal potential for significant fires to southern California away from the deserts from October through December. Even though central California is also expected to be much drier than normal from October through December, the potential for significant fires will be near normal due to cold nights and a lack of significant wind events.

**Northern Rockies:** The past month continued the trend that began in mid-July over north Idaho and Montana, which was a persistence of and amplification of warmer and drier than normal conditions. Many areas from central Montana westward, such as Helena and Missoula, are on track to record their hottestever August. Very strong upper ridging that extended north from the Great Basin was responsible for the heat. North Dakota was only slightly warmer than average over the western two-thirds of the state and near-average in the farther east.

Along with the warmth over north Idaho and Montana, much drier than average conditions also occurred, except for portions of central and eastern Montana and Yellowstone National Park. Most locations in north Idaho and western Montana have received 20-50% of their August precipitation averages, and some areas in northeast Montana and northwest North Dakota received only 5-25% of average. While August averages are low in these areas, the dryness, combined with the heat, meant rapid fuels curing occurred and persisted during most of the month. North Dakota was also significantly drier than average, with most of it receiving less than 50% of August averages.

What little precipitation occurred has been from scattered monsoonal moisture thunderstorms from central Montana westward and Plains moisture-driven thunderstorms farther east. Short-duration, high intensity precipitation provided only brief fuel moisture boosts. The latest US Drought Monitor maintains long-term moderate to severe drought conditions over north-central and northeast Montana, and an area of abnormally dry conditions has expanded over much of southwest, western, south-central, and southeast Montana. In addition, latest Climate Prediction Center (CPC) calculated soil moisture anomalies are drier than average over central and eastern Montana and North Dakota.

Fine fuels curing at the lower and middle elevations in the mountainous western predictive services areas (PSAs) has largely finished, with fine fuels curing in central and eastern Montana and far western North

Dakota as well. The eastern two-thirds of North Dakota remains greener, but fine fuels there are beginning to cure. Live fuel moistures in north Idaho and western and central Montana are generally near average, with significant drought stress not yet appearing. Dead fuel moistures, especially 100- and 1000-hour fuels, across all of north Idaho and Montana received boosts to slightly above average for this time of year towards the end of August, when a very slow-moving upper trough brought higher humidity and some wetting-rain.

Large fire activity increased during the first two weeks of August as fine fuels curing and dead fuel moistures decreased to below seasonal averages in north Idaho, and in central and eastern Montana. The most prominent and high-risk fires were in western and central Montana during this time, although there was only one type 2 incident management team deployment (Elmo Fire, near Flathead Lake). Several days of higher humidity and scattered precipitation late in the month helped raise fuel moistures and reduce fire potential and behavior. Effective initial attack occurred on lightning starts during this time due to somewhat cooler and wetter conditions in north Idaho and Montana.

Although dead fuel moistures have increased to near or above-average in the north Idaho and Montana PSAs during the past week, another extended heat wave is developing, focused west of the Divide. As strong upper ridging is forecast to become firmly established, with only minor fluctuations over the next ten days. Fuels will rapidly dry west of the Divide into portion of central and eastern Montana as a result. In addition, most of north Idaho and portions of western Montana received very little precipitation during the most recent event and will dry out more quickly. Additionally, the CPC weeks 3-4 outlook maintains above average temperature probabilities focused on the western half of the geographic area implying strong ridging to persist for the latter half of September.

For these reasons, above normal significant fire potential is forecast across north Idaho and western Montana in September, with normal significant fire potential for the rest of Montana and North Dakota PSAs. Usually, significant season-slowing or ending precipitation from stronger upper trough passages occurs by the end of September, or early October, at the latest in the western PSAs. Thus, a return to normal significant fire potential during October is likely. Seasonal CPC outlooks suggest near to slightly above-average temperatures, and near-average precipitation for all the geographic area for the September through November period.

A complicating factor east of the Divide will be the heavy fine fuel loading from the long, cool wet spring and early summer. If extended periods of warm, dry, and windy weather occur in September into October, significant fire potential will be higher into October in central and eastern Montana, possibly into western North Dakota. For now, these areas will be kept at normal significant fire potential for the duration of the outlook period. In November and December, it is exceedingly rare for any large fire activity to occur in the western PSAs, so these will be depicted as "normal". There can be significant fire activity on the Plains extending into November during warmer and windy years. For now, these eastern PSAs will be depicted as having normal significant fire potential in November and December, since any strong climatic signaling is lacking that would suggest otherwise.

<u>Great Basin:</u> Fire activity picked up in August in Idaho and northwest Nevada. Above normal fire potential is expected to continue into September in Idaho and in the higher elevations of the Sierra Front due to extended hot and dry weather possibly through the first half of September. Above normal potential is also forecast across far northwest Nevada in areas with above normal fine fuel growth. Additional moisture and thunderstorms may return from mid to late September, but this would likely increase initial attack and fire potential before fire danger substantially lowers. And confidence is still low on the overall amount of moisture that may affect western and northern portions of the geographic area. Normal fire potential is expected elsewhere in September, with all areas returning to normal October through December.

August saw prolonged warmth shift north and west into northwest Nevada and much of Idaho and Wyoming, where temperatures were well above normal. Precipitation over the last 30 days was below normal in parts of Idaho, but well above normal over eastern Idaho, Wyoming and much of Utah and Nevada, despite drying the last two weeks in August across western and northwest Nevada. Farther south, repeated monsoonal moisture surges pushed into the southern half of the Great Basin, with above average

precipitation and high humidity for most areas south of the I-80 corridor throughout August. Monsoon moisture is expected to return by mid-September for the southern and eastern areas of the Great Basin and may push north into Idaho once again. Severe to extreme drought continues across Nevada and Utah into southern Idaho, with moderate drought or abnormally dry conditions farther north into central Idaho.

Energy release components (ERCs) in Idaho and northern and western Nevada into northern Utah have risen to above normal for early September, and sagebrush and timber fuel moisture are down to critical levels. Central and southwest Idaho have missed most of the recent monsoonal moisture in August, and areas near the Idaho border and over central and western Nevada have remained mostly dry the last two weeks. The Snake River Plain of Idaho and far northwest Nevada have an above average grass crop that is fully cured. Farther south, ERCs were modified significantly by the monsoon moisture in August and remain below normal but will steadily increase with drier weather in early September. Live fuel moisture is critical over the northern half of the geographic area but remains higher over the southern half of the region. 100-hr fuel moisture is below normal in the northern and western portions of the geographic area and near record lows in parts of western and northern Nevada. All fuel moisture will continue to decrease through early September. Moisture is expected to return to parts of Nevada and Utah by mid-September, with fuel moisture increasing due to more consistent moisture. Farther north into Idaho and Wyoming, the return of moisture is not as certain. However, some moisture is likely from mid to late September, which may plateau fire danger indices or possibly decrease them.

Fire activity picked up in the central Idaho mountains in August, with extreme fire behavior observed on some fires. Fire activity also increased in far northwest Nevada in August, due to the above normal fine fuel growth earlier this year. Otherwise, surges of monsoon moisture have effectively decreased fire activity across the remainder of the southern and eastern halves of the Great Basin.

Above normal significant fire potential continues in southern and central Idaho, at higher elevations of the Sierra Front, and over far northwest Nevada in September. Otherwise, near normal potential is expected, including across all areas October through December.

<u>Southwest</u>: Normal significant fire potential is anticipated areawide for September, with the geographic area remaining having near normal potential for the rest of the fall into early winter. Localized areas of enhanced fire potential are possible during September for portions of the eastern plains.

The early arrival of the North American Monsoon in mid to late June ended the significant fire season in the Southwest Area. The monsoon season has been quite impressive overall regionally, with precipitation amounts 150% of normal or greater across most of the region over the past 90 days. In fact, portions of western and northwest New Mexico and much of western Arizona have experienced at least 300% of normal precipitation over the past three months. This has been one of the more robust monsoonal periods in recent history for many portions of the region.

Despite a drier start, September is expected to continue the above normal precipitation trend due to the combination more storm systems passing to the north and some periods of enhanced moist easterly flow. Near to below normal temperatures are forecast through September as well. Although widespread above normal significant fire potential is unlikely across the eastern plains of New Mexico during September, some local areas could be more active during drier than normal periods. The months of October into December will likely turn drier overall, with temperatures near to slightly above normal overall. This trend, although drier and milder than normal, is occurring in the wake of an impressive monsoonal period resulting in significant fire potential remaining normal areawide.

**Rocky Mountain:** Significant wildland fire potential has moderated over the Rocky Mountain Area (RMA) due to a combination of persistent monsoon flow into Colorado and precipitation associated with weak shortwaves moving into Wyoming and South Dakota from the west and northwest. There has continued to be a higher persistence of long-term drought in western portions of Nebraska and Kansas, and it is expected that for the fall months, there may be some periods of elevated fire potential in these areas. Overall, normal fire potential is expected across all the RMA for the outlook period.

According to the Climate Prediction Center (CPC), La Niña is expected to continue, before weakening toward neutral conditions early in 2023.

The position of the ridge of high pressure continued to support a steady influx of monsoon moisture streaming north from the subtropics, bringing timely and generous precipitation to Colorado and Wyoming since June. Burn scars in northern and central Colorado exhibited runoff on many occasions, with flash flooding occurring on the Cameron Peak burn scar. While periodic showers and thunderstorms with wetting rains occurred across central and eastern South Dakota and eastern Nebraska, greater precipitation deficits and dryness continued across most of Kansas.

Aside from convective thunderstorm activity, there were few wind episodes due to the position and strength of the polar jet stream. However, the northern branch of the jet started to strengthen, and a train of weak disturbances is expected to evolve across the northern half of the RMA into early September. Climatologically, this is a favored time of year for these weak low-pressure systems to begin to weaken the ridge of high pressure and suppress monsoon moisture south into New Mexico, allowing for stronger cold frontal passages.

The US Drought Monitor continues to show notable improvement in both the severity classification and aerial coverage of drought over the past several months across most of the RMA. However, moderate to severe drought remains in a swath from the Nebraska Panhandle through southwest Kansas where soil moisture anomalies reflect extreme dryness with very little change. The most favorable improvement in drought conditions have been noted in South Dakota and eastern Nebraska, even though the Evaporative Demand Drought Index (EDDI) continued to show significant deficits there with a lag in the beneficial soil moisture due to the prolonged and intense drought. The last two weeks of August brought a substantial improvement in the EDDI categories over the High Plains, while more general, steady improvements continued across the central Rockies.

Fuel moisture showed improvements across Colorado, Wyoming, and the Black Hills thanks to frequent precipitation events, and live fuel moisture in these same areas remained relatively steady as well. Fine fuels are cured and remained available to burn in the driest areas of northeast Wyoming, western South Dakota, and the Nebraska Panhandle where fuel loading is high.

During the core fire season months of late spring and summer, there have been considerably fewer than average large fires and acres burned across the RMA. Statistically, both the number fires and acres burned are about 10 percent of average for the season. Additionally, there were only a few Incident Management Team fires within the RMA, placing resource mobilization below average for this time of year as well.

For the outlook period from September through December, a third consecutive La Niña is anticipated, which will be a rare "triple dip" cycle. The monthly outlook from CPC favors a warmer and drier-than-normal September and October in Wyoming, South Dakota, and Nebraska, but relatively normal precipitation probabilities for Colorado and Kansas.

As the outlook period progresses into fall, November and December are anticipated to transition to more of a traditional La Niña split pattern of wetter and colder across the northern half of the geographic area and warmer across the south. An important consideration for the upcoming fall and winter season is the alignment of other climate signals that may reinforce a wetter pattern in terms of snowfall for the western United States, including the RMA. The above normal amounts of precipitation that fell across the mountains in the geographic area during the monsoon not only lessens the impacts of drought, but it also facilitates higher soil saturation and sets the stage for better snowpack and retention heading into the fall and winter months. The increased soil moisture will not only help replenish aquifers and ensure a healthy runoff efficiency with snowmelt in 2023, but it will also extend positive benefits to live fuels transitioning into dormancy and again during the growing season next spring.

The outlook for the RMA depicts normal significant fire potential across the geographic area for the period from September through December. The influence of La Niña on the weather patterns, lower sun angle, and shorter burning periods are expected to lower the potential.

One caveat is that the fall months typically bring a bi-modal resurgence of fire potential on the High Plains, and this will be somewhat elevated especially during windy periods and cold frontal passages. The ongoing drought conditions may exacerbate fire potential during these events in western Nebraska and western Kansas, but not critically so for long periods of time.

**Eastern Area**: Near normal significant fire potential is forecast across the majority of the Eastern Area September into December. Above normal fire potential is expected across the northeastern Mid-Atlantic States and much of New England into fall.

Thirty to 90-day soil moisture and precipitation anomalies were near to above normal across much of the Eastern Area towards the end of August. Drier than normal conditions were indicated across northeast Missouri, southeast Iowa, west-central Illinois, the northeastern Mid-Atlantic States, and the eastern tier of New England.

Slightly cooler than normal temperatures are expected over the majority of the Eastern Area in September except across northern New England where above normal temperatures are forecast. Above normal temperature trends are expected across the Eastern Area through the rest of fall.

Drier than normal conditions are forecast over parts of the Mid-Mississippi Valley into the far southeastern Great Lakes heading into September, with above normal precipitation expected over the eastern Mid-Atlantic States and southern New York. Drier than normal conditions are expected over the western and far eastern tiers of the Eastern Area moving into October, lingering over the far eastern tier in November.

Periods of below normal fuel moisture levels may develop in October into November over drier parts of the Eastern Area if the forecast warmer than normal temperature trends occur. Above normal fire potential is expected over the northeastern Mid-Atlantic States and much of New England into fall, with the forecast warmer and drier conditions.

**Southern Area:** August began with well above normal temperatures, generally west of the Mississippi, with many areas seeing highs above 100°F for multiple days. The second half of the month began to see some relief as frontal boundaries brought rain and a slightly cooler air mass to much of the geographic area. Kentucky, Tennessee, and Western Virginia received heavy rainfall, causing significant flooding during this time. The exceptions were central Texas and Oklahoma, which only received some relief from rainfall as many locations continued to receive less than average rainfall, but slight relief from the heat was noted. The third week of August saw significant rainfall from east Texas across Louisiana, Mississippi, and Alabama, where some areas received 10 to 20 inches of rain. South Carolina, Georgia, and Florida also received widespread wetting rain. Heavy rain bypassed Kentucky, Tennessee, Virginia, and North Carolina during the second half of the month, although some wetting rain did fall.

With severe to exceptional drought continuing for Oklahoma and no forecast significant rain in the forecast, central and eastern Oklahoma may continue to have above normal potential for significant fires. Texas and the Oklahoma Panhandle, while also still seeing severe to exceptional drought, has seen significant rainfall in most areas. The weather pattern also suggests some tropical moisture moving into the portions of Texas and the Oklahoma Panhandle, which may allow for additional relief for September and possibly October. Although there is still a chance for significant fires, the potential will be around normal. There is also uncertainty with any potential tropical systems, which could bring additional chances for rain for the Southern Area, especially anywhere along the Gulf Coast, southeast US coast, and Puerto Rico. Areas east of the Mississippi, as well as Arkansas and Louisiana, are forecast to see normal potential through October.

By November, climate models are showing drier and warmer than normal trends for much of the Southern Area west of the Mississippi River, with Texas and Oklahoma still showing KBDIs into the 700s currently. As a result, the significant fire potential is forecast to be above normal for much or Oklahoma and southwest Texas. This would be especially true if there is any fine fuel growth due to rain in September and October, which would likely dry and become available for the mid to late fall season.

December is very uncertain and will depend on the above-mentioned concerns. Current predictions are for a larger area of above normal temperatures and drier than normal conditions for the Southern Area. Much of Texas and Oklahoma are forecast to have above normal potential in December. Elsewhere, higher elevations may be out of season in the Appalachians, so there is too much uncertainty outside of Texas and Oklahoma to go above normal at this time. However, Florida and other areas east of the Mississippi may begin to trend towards above normal chances for significant fire if they do not continue to see the beneficial rainfall over the next two to three months.

## **Outlook Objectives**

The National Significant Wildland Fire Potential Outlook is intended as a decision support tool for wildland fire managers, providing an assessment of current weather and fuels conditions and how these will evolve in the next four months. The objective is to assist fire managers in making proactive decisions that will improve protection of life, property, and natural resources, increase fire fighter safety and effectiveness, and reduce firefighting costs.

### For questions about this outlook, please contact the National Interagency Fire Center at (208) 387-5050 or contact your local Geographic Area Predictive Services unit.

**Note:** Additional Geographic Area assessments may be available at the specific GACC websites. The GACC websites can also be accessed through the NICC webpage at: <a href="http://www.nifc.gov/nicc/predictive/outlooks/outlooks.htm">http://www.nifc.gov/nicc/predictive/outlooks/outlooks.htm</a>