National Significant Wildland Fire Potential Outlook

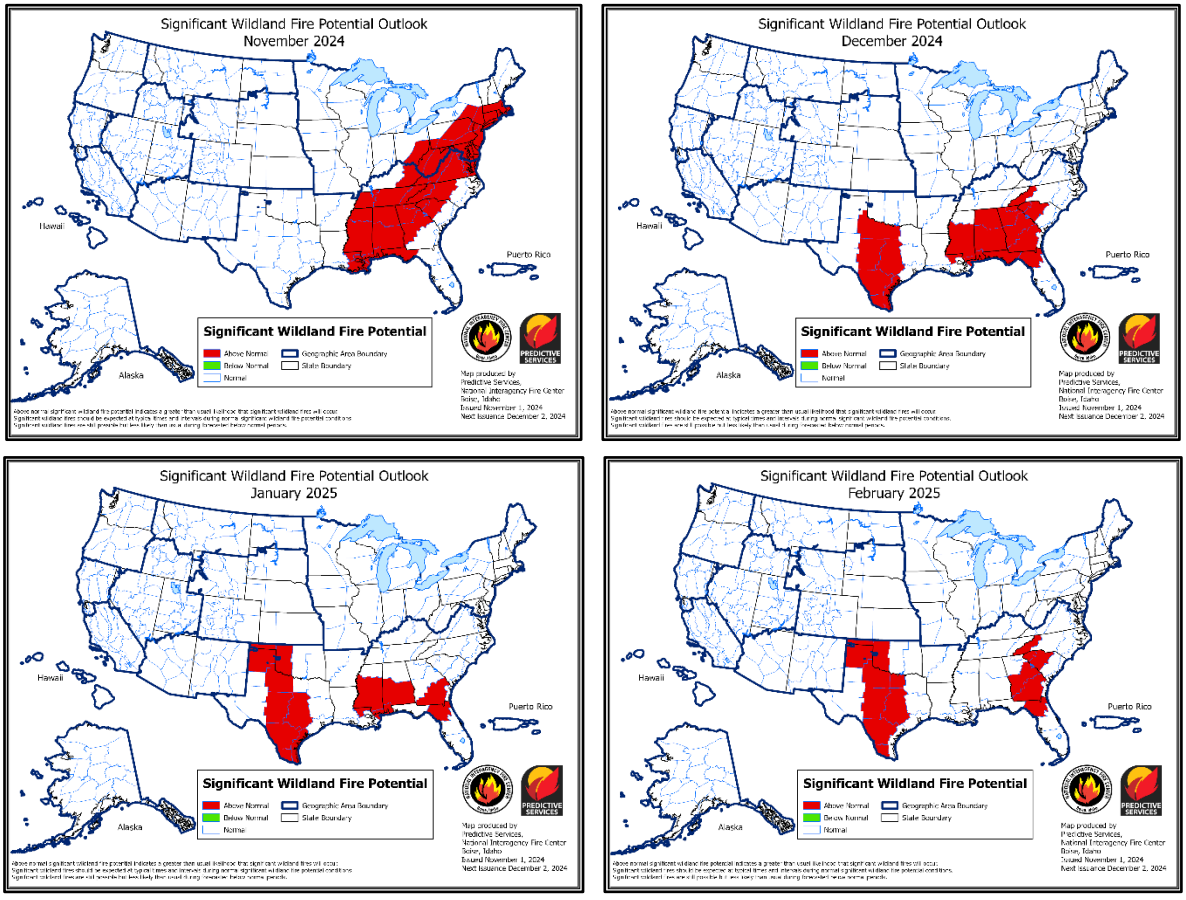
Predictive Services
National Interagency Fire Center

Issued: November 1, 2024
Next Issuance: December 2, 2024

Outlook Period – November 2024 through February 2025

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.



After fire activity decreased the latter half of September, another increase in fire activity occurred the first half of October, as the National Preparedness Level rose from three (on a scale of 1-5) at the beginning of the month to five October 8. This escalation back to five represented the first time the National Preparedness Level increased to five on three separate occasions in the same fire year. Fire activity then greatly moderated the latter half of October, with the National Preparedness Level decreasing to four October 18, three October 22, and two October 29. While most geographic areas followed this overall trend in activity, the Southern and Eastern Areas remained moderately active through the end of October. Year-to-date annual acres burned for the US is above the 10-year average at 124% of normal, but the national year-to-date tally of wildfires remains below average, near 93%.

Precipitation across the US was below normal for much of the country in October, with exceptionally dry conditions from the Lower Mississippi Valley into the Southeast and Mid-Atlantic.

Much of the Plains into the Great Lakes recorded well below normal precipitation as well, until a storm at the end of the month eased the extreme deficits. Areas of above normal precipitation were confined to northeast New Mexico, southeast Colorado, and central Florida. Near normal precipitation was observed across portions of the central Rockies, northwest Nevada, and far northeast California. Temperatures in October were above normal from the West Coast to the Appalachians, with the most extreme anomalies in California, the Intermountain West, and Plains. Drought expanded or intensified across much of the US in October, with 87% of the US at least abnormally dry, the greatest ever recorded by the US Drought Monitor. The greatest expansion of drought was observed across the Plains to the Mississippi Valley and Great Lakes, with significant expansion also noted in the Appalachians, Mid-Atlantic, and New England, as well as the Lower Colorado River Valley. Drought improvement was limited to small areas of southeast Colorado, northeast New Mexico, southeast Oregon, northwest Nevada, and northeast California.

Climate Prediction Center and Predictive Services outlooks issued in late October depict above normal temperatures are likely from the Plains to East Coast in November. Precipitation in November is likely to be above normal in the Plains, Mid-Mississippi Valley, Great Lakes, and northwestern US. Below normal precipitation is likely in southern Louisiana and along the Mid-Atlantic and Northeast coasts. For December through February, above normal temperatures and below normal precipitation are likely in the southern third of the US. Below normal temperatures are likely from the Northwest to the northern Plains, with above normal temperatures likely in the Northeast. Above normal precipitation is likely in the northwestern US and the Great Lakes.

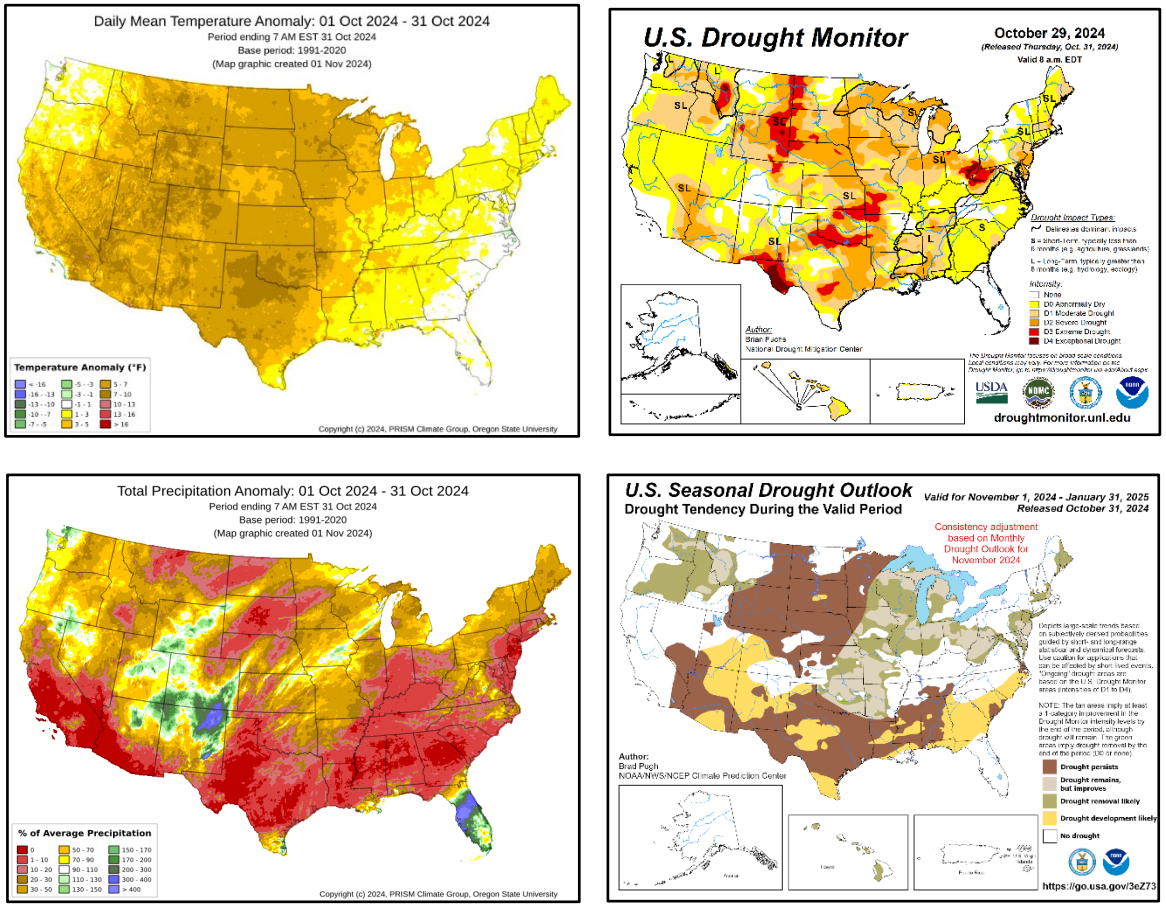
In November, above normal significant fire potential is forecast from the northern Gulf Coast into the Tennessee Valley, Appalachians, Mid-Atlantic, and southern New England. Above normal potential is forecast to continue in much of the Southeast into December, while normal potential returns to the central Appalachians, Mid-Atlantic, and New England. Above normal potential is forecast across central and south Texas in December, expanding into the Texas Panhandle and western Oklahoma for January and February. Above normal potential will continue across portions of the Southeast into January and February, as well.

Past Weather and Drought

Well above normal temperatures were observed across California into the Intermountain West and Plains, especially across the Southwest the first half of the month. Phoenix, Arizona reached 113°F October 6, the latest it has ever been that hot, while the streak of consecutive daily record high temperatures was extended to 21, ending October 14. This streak represents the longest such streak ever recorded in the US. Temperatures were also well above normal across the southern Plains the latter half of the month, with portions of Oklahoma and Kansas exceeding 95°F October 28, the latest such readings for each state. Temperatures closer to normal were observed in portions of the Northwest, and from the Appalachians to the East Coast. Temperatures in Alaska were close to normal, with above normal temperatures observed in Hawai'i.

Below normal precipitation was observed across much of the US in October, with exceptionally dry conditions from the Lower Mississippi Valley into the Appalachians, and Mid-Atlantic. Atlanta, Georgia and Philadelphia, Pennsylvania had their driest calendar month ever recorded with only a trace of precipitation falling in October. New York, New York also recorded its driest month ever with 0.01" of precipitation. Precipitation was well below normal across much of the Plains into the Great Lakes until late in the month, as well, but a significant rainfall event at the end of October mitigated the most extreme deficits. The only areas of above normal precipitation observed across the contiguous US in October were in central Florida due to Hurricane Milton, northern New Mexico, and southern Colorado. Small areas of near normal precipitation were observed in portions of the central Rockies, northwest Nevada, northeast California, southeast Oregon, and western Washington. Below normal precipitation was observed in Hawai'i and Alaska, except for above normal precipitation in Interior Alaska.

While fewer new large fires occurred in October, the hot and dry conditions in the West the first half of October resulted in a significant increase in activity on many ongoing fires in the West. A strong wind event occurred October 4-5 in the northern half of the West into the northern Plains, with the Red Rock Fire near Salmon, Idaho making a 15-mile run. Numerous new large fires emerged in North Dakota during this event, as well. The Shoe Fire in northern California also emerged early in the month due to the hot and dry conditions. After this spike in activity early in the month, a strong fall storm brought widespread wetting precipitation to the northern two-thirds of the West October 17-19 resulting in a rapid decrease in activity the rest of the month in the West. However, the very dry conditions in the Southern and Eastern Areas continued fire activity at moderate levels, with a significant number of large fires emerging in Oklahoma October 28-29 under strong southerly winds.



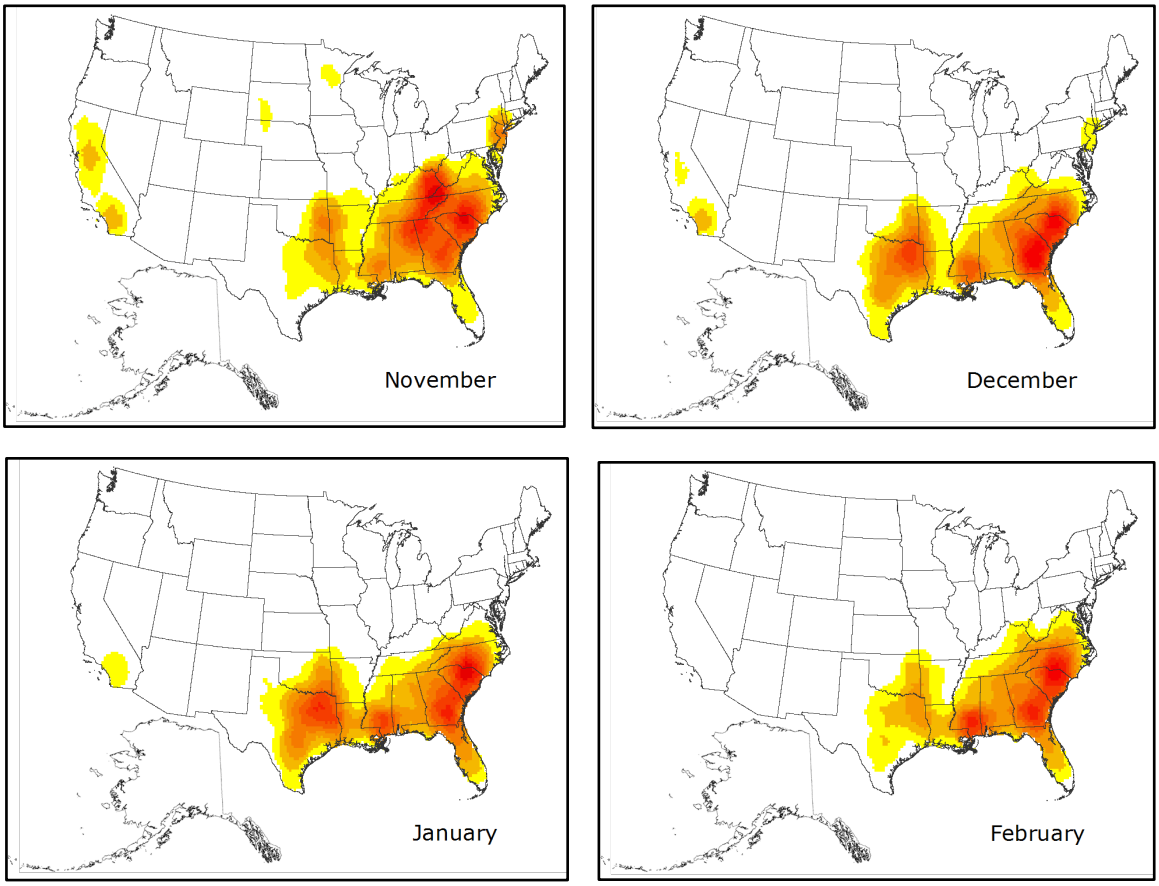
Left: Departure from Normal Temperature (top) and Percent of Normal Precipitation (bottom) *(from PRISM Climate Group, Oregon State University).* **Right: U.S. Drought Monitor (top) and Seasonal Drought Outlook (bottom)** *(from National Drought Mitigation Center and the Climate Prediction Center).*

Drought expanded and intensified across much of the US in October, with 54% of the country now in drought and 87% of the country at least abnormally dry. The greatest expansion and intensification of drought was observed across the Plains into the Mississippi Valley and Great Lakes. Drought also intensified in the Colorado River Valley, with expansion of drought into the Appalachians, Mid-Atlantic, and southern New England. Very small areas of drought improvement were noted in northwest Nevada, southeast Oregon, northeast California, southeast Colorado, and northeast New Mexico. Areas of extreme to exceptional drought are noted across portions of western Montana, the northern High Plains, southeast New Mexico, west Texas, central and north Texas, Oklahoma, northwest Arkansas, southwest Missouri, southeast Ohio, and northern West Virginia.

Weather and Climate Outlooks

El Niño-Southern Oscillation (ENSO) neutral conditions persist in the equatorial Pacific Ocean. Sea surface temperature (SST) anomalies in the central equatorial Pacific are near to slightly below average and continue to gradually trend cooler, with SSTs slightly below average along the South American coast. A transition to La Niña is still forecast into the fall, with the Climate Prediction Center forecasting La Niña developing over the next month, with La Niña expected to persist through the winter. A negative phase of the Pacific Decadal Oscillation (PDO) is also expected to persist into the winter. The Madden-Julian Oscillation (MJO) has increased in activity the past two weeks, with a strong pulse moving through the western Pacific at the end of October. The MJO is expected to remain active through mid-November, with impacts possibly lasting through much of the month. From December through February, the developing La Niña and negative PDO are expected to be the main drivers of this outlook. Active MJO periods remain possible through the winter, but their location and intensity are difficult to forecast more than two to three weeks in advance.

Geographic Area Forecasts



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)

Alaska

Alaska will be out of season November through February. Alaska continues to be free of drought, although the US Drought Monitor classifies the central portion of the southeast panhandle as abnormally dry.

Through February, the Climate Prediction Center shows a slight signal for warmer and wetter weather for the northern third of Alaska, a slight signal for cooler and drier weather across the southern third of Alaska, and equal chances for both temperatures and precipitation over Alaska's midsection.

No meaningful wildfire activity is in place as of late October. Surface fuels statewide are generally cool and wet. The deeper duff layers are mainly wet and cool as well, with three notable exceptions: the Yukon Flats, the Upper Tanana Valley, and the Copper River Basins are all much drier in the duff.

The permanent winter snowpack now covers all the burnable areas of Alaska. A quiet winter is ahead.

Northwest

Fire danger decreased sufficiently in October that the risk of new significant fires requiring costly activation of incident management teams is back to its normal low level for the last half of autumn. Normal or low significant fire potential is forecast November through February.

A series of weather systems moved into the Northwest Geographic Area at intervals throughout October. These weather systems caused temporary dips in temperature that tended to affect Washington more than Oregon. Overall, the first two weeks of October were warmer than normal, especially in southern and eastern Oregon. Accumulation of precipitation during the first half of October was much less than normal across the region, especially in southern Oregon and east of the Cascades in both Oregon and Washington.

A stronger cold front arrived in the middle of the month, which ended the persistent warmth and was followed by additional weather systems. These systems dropped temperature variations closer to normal for the remainder of the month. Accumulation of precipitation from these systems increased monthly totals to average or slightly above average for western Washington and extreme southeastern Oregon. Elsewhere, monthly rainfall totals were less than average, especially in central Washington and central Oregon.

Regional drought conditions changed little from late September over the Northwest Geographic Area. Moderate drought continued over much of southern and eastern Oregon as well as eastern Washington. Limited areas of severe drought cover sections of central Washington and extreme southeast Oregon.

October, like September, began with a spike in fire activity. Two fires, one a holdover on the Willamette National Forest and one east of the Cascades, ordered complex incident management teams near the beginning of the month. Long duration fires that have been on the landscape west of the Cascades most of the fire season, continued to be suppressed and were being readily contained. Fires in grass and brush east of the Cascades continue to burn mainly for one burn period and showed moderate resistance to control. When rangeland fuels, topography and wind align east of the Cascades rapid growth was still occurring. The Pine Fire burned almost 7,000 acres in one burn period under windy conditions.

Energy Release Component (ERC) east of the Cascades began October near or above daily record values. West of the Cascades, ERCs were well above average in southwest Oregon ranging to near average in western Washington. The arrival of a cold front in the middle of the month brought enough cooling and moisture to push ERCs back to average or below average west of the Cascades. East of the Cascades, ERC values fell significantly. However, they still averaged above normal until the last few days of the month.

Outlooks from a variety of sources for November through February suggest colder and wetter than normal conditions over most of the Pacific Northwest. La Niña conditions are still favored to

develop in the Pacific Basin before Christmas. However, the Climate Prediction Center has downgraded the likelihood of a weak La Niña to around 60%. Colder and wetter weather than normal is usually commonplace for the geographic area under weak La Niña conditions.

Northern California and Hawai'i

Significant fire potential in northern California is projected to be normal from November through February. Historically, average occurrence of large fires is less than one per Predictive Services Area (PSA) November through February. Hawaii's significant fire potential is also projected to be normal November through February.

Warmer and drier ridging was the dominant weather pattern during the earlier half of October. The pattern began to change during the latter half of the month due to progressive cooler and moister trough passages. Large areas of northern California received wetting precipitation from October 15-17 and 27-28. Most of the region received below normal amounts of precipitation although an area of near to above normal precipitation occurred across northeast California. Average temperatures were generally near to above normal and well above normal across the Sacramento Valley. A widespread frost/freeze event was observed across most of the mountain areas October 18. A little under 250 lightning strikes were recorded, falling short of the 2012-2022 October average of a little over 600 strikes. There was one dry and gusty onshore wind event during the month, which prompted National Weather Service Red Flag Warnings on the east side. A few dry and gusty northerly and easterly wind events occurred with the strongest October 17-19 which produced additional Red Flag Warnings.

Dead fuels were critically flammable during the first eleven days of the month with energy release component (ERC) values at or near record highs. The Bay-Marine PSA broke its all-time maximum ERC value of the past 23 years on October 7. Wetting precipitation events and increased nighttime humidity during the latter half of the month lowered the flammability of the dead fuels, with a return to near average fuel moisture levels by the end of the month. Moisture in live woody vegetation reached its peak lowest values during September and October, resulting in flammable to critically flammable levels across most of the area. Most of the mid and upper elevation woody fuels trended towards dormancy during October due to longer nights and freezing periods. Herbaceous fuels were generally in a cured state across all elevations, although a minor flush of green-up remained prevalent across some the northwest and upper Sacramento Valley locations. The ratio of dead versus live herbaceous fuels remained heavily tilted towards the dead side during October, thus maintaining an overabundance of standing dead fine fuels. Drought conditions changed very little during the month, with small patches of moderate drought designated across the far north and east. On the other hand, one-month Evaporative Demand Drought Index (EDDI) values indicated elevated stress levels through October 25, especially across the southern tier.

Fire business was steady during October with a mix of both wildfire and prescribed burns. The average number of fires reported per day was ten, which was down slightly from 13 during September. A total of four large fires were reported during the first three weeks of the month. The most notable was the Shoe Fire located northeast of Redding in timber and brush. The Shoe Fire required a complex incident management team to help manage the suppression efforts. Larger prescribed burn projects increased during the latter half of the month due to less critically flammable fuel alignments brought on by periods of moisture.

A heavier degree of uncertainty remains for the predicted weather patterns the next four months. There is a lack of solid analog years due to various and changing teleconnections plus there are some differences within the dynamic model outputs. Overall, temperatures are expected to be near to above normal during November with mixed precipitation anomalies but generally on a wetter tilt for most of the area. Near to above normal temperatures are expected the rest of the outlook period with continued mixed precipitation signals, but with growing support for a drier

December. Alternating northerly and onshore westerly wind events should continue. Such events will be of most concern in grass and brush fuel types, where short periods of critical alignment between wind and dry fuels are possible prior to significant lowland green-up.

Based on the current fuel state and future weather predictions, normal significant fire potential is projected for the entire area November through February. Historically, this is a period with minimal large fire occurrence. Wetting moisture intrusions due to more active jet stream periods will aid in lowland herbaceous green-up and add snow cover across the upper elevations. The long nighttime hours and low sun angle will also help fuel conditions from becoming critically flammable for any great length of time. Conditions are likely to be present to support larger prescribed burn projects during the next one to two months, although some northern areas may be too wet at times.

Sea surface temperature (SST) anomalies surrounding the Hawai'ian Islands were near to slightly above normal during October. Temperature anomalies were generally near to above normal. Precipitation was generally below normal, although a low-pressure system combined with tropical moisture brought heavy rain and upper elevation snow October 25-28, thus providing localized above normal readings across the Big Island and Maui. Drought severity and coverage increased between late September to the third week of October across the island chain. A Red Flag Warning was issued on October 16 due to locally strong trade winds, low humidity, and dry fuels. Thermal satellite imagery indicates that fire activity was intermittent across the island chain throughout most of the month, with most heat detections occurring on Kauai and O'ahu.

A transition to a weak La Niña is expected during the earlier part of the wet season. Average temperatures in Hawai'i during the next four months should generally be above normal. Precipitation should generally be above normal across the windward sides due to enhanced trade wind periods. Leeside areas are likely to experience mixed anomalies, but sufficient moisture should fall across most of the leeside areas, resulting in herbaceous green-up and lessening drought stress during the outlook period. Normal significant fire potential is expected from November through February although some fire activity could continue into November.

Southern California

The first half of October featured exceptional warmth across the southwestern US including much of central and southern California. The second half of the month was more variable, but for the month, temperatures still averaged an impressive 3 to 8ºF above normal in most areas. Precipitation was limited in October. Areas from Yosemite National Park northward received a quarter to half inch of rain during the middle of the month. There was also localized wetting rain over some of the southern California mountains October 28-29. However, some portions of the region have received less than a quarter inch of rain since last spring, and precipitation for the past three months is well below normal**.**

Southern California experienced just one moderate Santa Ana wind event in October, October 18-19, and it followed a period of cool and moist weather.

Sea surface temperature (SST) trends in the equatorial Pacific continue to consolidate around colder than normal values. This is a sign of the continued gradual transition towards expected La Niña this winter. Other notable SST features include a strong warm pool east of Japan, and cold anomalies in the Gulf of Alaska. There also remains a persistent sliver of colder than normal waters off the California coast. This feature has been in place for many months now and has contributed to coastal California, particularly the south coast, frequently experiencing the coolest temperatures relative to normal for the state, including October.

The latest US Drought Monitor shows an increase in abnormally dry conditions to moderate drought across California**,** with areas of severe drought in the eastern deserts. While the summer and early fall months are commonly dry across California, this expansion of drought and abnormal

dryness is primarily a result of a weaker than average monsoon along with recent above normal temperatures.

Historically hot and dry weather brought record low dead fuel moisture and record high Energy Release Component for the first half of October. The more variable weather since has brought periods of moderated conditions, including a cooler period that is ongoing at the end of October and is significantly improving short term fire danger metrics.

The long duration of hot and dry weather this summer and fall has driven live fuel moistures to near to below normal levels in many species, with critical values now being observed in many cases. This is notable as live fuel moistures have been running above to much above normal in most areas since late 2022 thanks to back-to-back very wet winters.

Recent SST trends and climate model projections suggest the development of La Niña, which will likely peak at weak to at most moderate strength this winter. This results in a tilt towards a warmer and drier than normal winter season, supported by model projections. An active Pacific jet stream pattern has been observed this fall and may continue for much of the winter, leading to regions of above normal precipitation in western North America. However, the current forecast favors these above normal areas remaining north of central and southern California, which is supported by most climate model projections. Nonetheless, while below normal precipitation is favored, it is not expected that this will be an exceptionally dry winter like some in the past fifteen years. Drought conditions will likely change little or expand slightly over the next few months, with little in the way of severe drought or worse expected.

Fire potential in the coming months will be contingent on the occurrence, or lack thereof, of offshore wind and precipitation events. Fuel loading remains above normal in the low and mid elevations, and live fuel moisture is near critical levels. Dead fuel moistures will continue to fluctuate but will likely average drier than normal overall. Given this, and trends in fire activity from this summer, there is still meaningful fire potential on the landscape as of the end of October, and the region would have a high vulnerability to any significant offshore wind events that arise before significant precipitation occurs. However, short term model guidance is in good agreement on a potential significant rain event occurring in early November. Areas of wetting rain also occurred in the Southern California mountains in late October. As a result, above normal fire potential that was forecast in earlier outlooks for November and December has been removed with this outlook. Even though a warmer and drier than normal outlook period is forecast, the predicted wetting rain is likely to induce green-up and greatly reduce fire potential. However, should early November rainfall fall short of the forecasted amount, duration, and coverage there may still be some potential for fire activity over southern California.

Northern Rockies

Significant wildland fire potential in the Northern Rockies Geographic Area (NRGA) for November through February is expected to be normal. Long range forecasts for the start of November indicate multiple storm systems will keep cool weather over the NRGA with multiple precipitation chances for north Idaho and western and southern Montana. The northern plains of Montana look to maintain dry conditions, but this area always is dependent on wind events to drive fire activity in the late fall, so this should be considered normal potential. As the winter months arrive, La Niña global weather patterns favor above normal moisture and below normal temperatures.

Drought indices continue to reflect lingering drought in the NRGA, but soil moisture analytics indicate precipitation events in September and October have provided a buffer against significant wildland fire activity. Severe to extreme drought is present over the southern half of western Montana and along the Montana - North Dakota border. North Idaho has moderate to severe drought. Elsewhere, especially in central Montana and over most of North Dakota, no drought or abnormally dry conditions are reported. Current satellite soil moisture data shows most of North Dakota should be considered critically dry.

A notable cold front crossed the region from west to east October 4-5. This front produced 70 to 90 mph winds across central and eastern Montana, yet no new large fires developed in Montana despite numerous power lines being brought down. However, large fires emerged in in North Dakota.

Through the first half of the month weak fronts generated prefrontal warming events, which included nights with poor recovery that drove extended burn periods and kept the remaining large fires on the landscape active. When a notable precipitation event arrived October 16-20, the precipitation along with prolonged humidity reduced fire activity to sufficiently reduce the preparedness level to two (on a scale of 1-5) for the NRGA.

The Northern Rockies is commencing the fall season with some areas of deep dryness, including the following Predictive Service Areas (PSA): Northern Idaho (PSA NR-01), West Central Montana (PSA NR-11), Southwest Montana (PSA NR-09), and the border between Montana and North Dakota (PSAs NR-15, NR-16). Many of these locations are currently setting new maximums for Energy Release Component (ERC), with 1000-hr dead fuel moisture hovering between 13-14%. Eastern Montana and western North Dakota are vulnerable to wind driven range fires and will be areas to watch until enough snow cover arrives to help the fuels lay down and become less prone to horizontal movement. Portions of northwest, north, and central Montana have enough moisture and colder temperatures to markedly lower ERC. Until significant snowfall occurs, there will be opportunities for prescribed fires with good consumption of large, downed woody fuels.

Existing large fires that had carried over from the summer continued to be active through the third week of October. Most of this activity occurred after multiple nights of poor recovery followed by a day of pre-cold front southwest winds and unstable conditions.

Seven new large fires occurred in October. Four of these fires occurred in North Dakota, igniting on October 4 in the wake of a very strong cold front, then rapidly expanded on October 5 during a day of very low relative humidity and wind gusts to 70 mph. The largest new fire in October in Montana was the Meridian Fire, which ignited in the Beaverhead-Deerlodge National Forest on October 8 and saw significant growth during one operational period reaching 3,900 acres. No new large fires were reported in Idaho in October.

Significant wildland fire potential will be normal for the NRGA November through February. Upcoming early November storms will continue to bring moisture to north Idaho and western and southern Montana. The northern plains of Montana through North Dakota will remain drier for an extended period into November, but fires in November and December for these areas are wind driven and existing dryness alone does not generate above normal potential. As winter arrives, wet and cold trends associated with La Niña are forecast to persist through February, which should prevent any pre-green-up fire activity until after the outlook period.

Great Basin

Fire activity decreased steadily across the Great Basin the last half of October due to cold fronts bringing colder temperatures, precipitation, and snowfall to Idaho, Wyoming, and Utah. The active weather pattern expected throughout November will continue to bring periods of cooler temperatures, breezy winds, and precipitation. Fuel moisture will continue trending upwards through November, and grasses will be transitioning to dormancy. The fire season continues to wind down, with normal or low fire potential expected from November through February. Carryover fine fuels and new fine fuel growth from this past spring will still be present and above normal in many areas of southern Idaho, northern Nevada, and northwest Utah. Fires may still ignite and spread in these areas through the next few months after prolonged dry periods on windy days.

Temperatures over the last 30 days have been well above normal across the Great Basin due to strong ridges of high pressure. Precipitation was near to just above normal in western Nevada and central and eastern Utah due to cold fronts bringing precipitation the last half of October. However, all other areas of the Great Basin saw below or well below normal precipitation. Drought has been developing over the last few months due to the very warm and drier than normal summer weather in most areas of the Great Basin. Abnormally dry conditions expanded across much of the region, and areas of moderate to severe drought have expanded in parts of central and eastern Idaho, Wyoming, southern Nevada, and southwest Utah. A small area extreme drought developed in western Wyoming where larger wildfires occurred in September and October. Drought may intensify in portions of southern Nevada, Utah, and Wyoming, but may improve over central and southwest Idaho into northwest Nevada as precipitation through the fall is forecast to increase in the northern Great Basin.

Energy Release Component (ERC) dropped below normal or below the 50th to 70th percentile across the Great Basin the last two weeks of October. Fuel moisture also increased significantly and is expected to gradually increase through November. Dried grasses will still be abundant over southern Idaho, northern Nevada, and northwest Utah. Fuels will gradually go into dormancy by November and December, creating a fire concern for a given burning period if there are ignitions after longer dry periods on windy days.

Fire activity decreased steadily across the Great Basin the last half of October due to cold fronts bringing colder temperatures, precipitation, and snowfall to Idaho, Wyoming, and Utah. These conditions have not fully extinguished some of the wildfires that ignited over the summer. However, most activity has been reduced to smoldering and limited interior burning. To end October, a few large fires were prioritized in Idaho, Wyoming, and northern Utah. However, containment continues to increase, and these fires will become less of a concern in November.

Normal fire potential is expected across the Great Basin from November through February. However, fire potential may occasionally increase for a burning period through December or January in areas of northern Nevada, southern Idaho, and northwest Utah if there are ignitions during windy days after prolonged warm and dry weather, primarily in areas where fine fuel loading is above normal.

Southwest

Normal significant fire potential is expected for the entire Southwest Area for November through February. Some localized areas of above normal significant fire potential are possible across portions of the region, especially far east as mid-winter arrives, but overall, the forecast is that significant fire potential will remain normal for the time of year.

After a very mild and generally dry September and October, the weather pattern is expected to become increasingly more active as November arrives as the Madden Julian Oscillation (MJO) begins to have a prominent impact. Much of the month of November will likely be wetter and cooler, especially the first ten or so days of the month as the MJO moves from the western Pacific into the western Hemisphere. This will act to bring an active jet stream to much of the western US, including much of the Southwest Area, bringing several significant periods of cooler and wetter weather to the region. As a result, the Southwest Area will end the fall and approach the winter period in a much better position overall compared to the past three months.

Beyond the shorter term MJO influence, a slight to moderate shift in the equatorial Pacific sea surface temperatures (SSTs) will likely have at least some impact on the weather pattern for the upcoming winter months. Ongoing neutral ENSO is expected to transition into a weak La Niña some time over the next month, although this shift has been slower than expected thus far. It does appear as if the transition is starting to take shape, however, and this points towards a less active overall weather pattern for the bulk of the upcoming winter period. A La Niña Modoki is most likely to evolve over the next few months, which is characterized by cooler than normal SSTs in the central tropical Pacific with warmer waters across both the eastern and western portions of the

equatorial Pacific oceanic basins. This leads to generally a drier than normal weather pattern for the Southwest Area, although some uncertainty exists due to both the slow evolution and overall weak signal for this potential La Niña event.

Despite the overall mild and dry fall so far for much of the region, active November weather is expected to significantly change the scenario for much of the Southwest Area to end the fall. A change to a cooler and frequently wetter than usual pattern the first half of November will help make up precipitation deficits that developed over the past several months. Even though the primary winter months are expected to be drier and milder than usual, the Southwest Area should continue to exhibit normal significant fire potential as this time of year is typically the least active period on an annual basis. The recent slowly evolving La Niña for the winter will likely shift the region to a drier and warmer pattern for much of the wintertime period, although models suggest than it will weaken rapidly by early to mid-spring of 2025. This would allow some more active periods of wetter conditions beginning as early as March for the Southwest Area.

Rocky Mountain

October saw a change in the weather pattern that is finally lowering fire potential and increasing fuel moisture. The month started warm and dry, but by mid-month the upper-level ridge that had dominated the weather pattern broke down, with the area picking up some precipitation, with snow in some of the high elevations. Despite this one round of precipitation, drought conditions continued to increase some across much of the Rocky Mountain Area. For the rest of the fall and into the winter, La Niña is still expected to develop, though it will likely be weak. This will result in normal significant fire potential, but wind events could produce short periods of elevated potential.

October largely started out like the last several months, with above normal temperatures and below normal precipitation. This was all associated with a persistent ridge of high pressure across the Great Basin and Rocky Mountains. There were a couple of weak storms that came through that resulted in conditions closer to normal as the ridge briefly weakened. This ridge pattern finally started to change around the middle of the month as a more significant storm system moved through that broke the ridge down. This storm system brought some much-needed moisture to much of the Rocky Mountain Area. Overall, October remained below normal for precipitation, but much of the area saw lesser precipitation deficits as previous months. Additionally, temperatures remained 5 to 10 degrees above normal for most of the area in October. With the continued warm and dry weather, drought conditions continued to worsen across much of the area, with southwest Colorado being the one area that largely remains out of drought conditions.

Fuels were very dry at the beginning of October, with many areas outside of southwest Colorado above the 90th percentile for fire danger indices. The Front Range, eastern Wyoming, and the Black Hills well exceeded the seasonal maximums. These conditions were very similar to or worse than conditions seen in August. The wetter weather and cooler temperatures helped bring down the indices, but many areas ended October with indices still running above the average for the time of year.

Most new fire activity occurred in the first half of October before the pattern shifted. Fires typically remained small and were contained in one operational period. Fires that grew larger and remained active for multiple operational periods were in grassy fuels. The Elk Fire in the Bighorn National Forest from late September also remained active into October, especially on days with stronger winds associated with frontal passages.

Overall, for the remainder of the fall and into the winter, a weak La Niña pattern is expected to develop. As expected with a La Niña winter, the northern third of the Rocky Mountain Area will likely see cooler and wetter than normal conditions. Southwest Colorado is more likely to see warmer and drier than normal conditions. The rest of the area will likely see more seasonal conditions, but there still could be extended warm, dry periods mixed with cooler and wetter weather. Additionally, a La Niña pattern may slightly favor more wind events during the winter

months, but these types of events are hard to predict, and will be most impactful following periods of warm, dry weather.

Given the recent weather pattern shift, November is expected to have normal significant fire potential. Going into the winter, normal fire potential will continue. However, there will be periods of increased fire potential during wind events for a couple of days, especially following warm, dry periods.

Eastern Area

Normal fire potential is forecast across the majority of the Eastern Area through February. The greatest 30-to-60-day negative precipitation anomalies towards the end of October were across the northeastern tier of the Great Lakes, much of the Mississippi Valley, the eastern Mid-Atlantic States, and the New England Metro. The driest and warmest conditions heading into November are expected across the southern and eastern Mid-Atlantic States into the New England Metro. These areas will likely experience periods of above normal fire potential in November if the forecast warmer and drier trends persist. Longer term extreme or exceptional drought levels remained across much of Ohio and West Virginia as well as southwestern Missouri toward the end October. Moderate to severe drought was indicated along the East Coast as well as much of the Great Lakes and Mississippi Valley. Precipitation events were expected to increase over the western and northern tiers of the Eastern Area into early November, which should help curtail= these drought levels as well as late fall fire potential.

Neutral El Niño Southern Oscillation (ENSO) conditions remained in place over the central Pacific towards the end of October. A transition to La Niña is still forecast through the rest of this year, persisting into early 2025, with moderate to high confidence. Other sea surface temperature regimes also contribute to global weather patterns adding to some uncertainty in long term weather forecasts. Near to above normal temperature trends overall are forecast over much the Eastern Area through the late fall into the winter, with precipitation forecasts more uncertain.

The Predictive Services precipitation outlook for November forecasts below normal precipitation over the western Mid-Mississippi Valley and the eastern tier of the Eastern Area. Wetter than normal precipitation is likely over the Upper Mississippi and Ohio Valleys in November. Drier than normal conditions are forecast over the Mississippi Valley and the eastern tier of the Eastern Area in December. Below normal precipitation is forecast over the Great Lakes in January.

Above normal temperatures are forecast over much of the Eastern Area in November and mainly the southern tier heading into December. Above normal temperatures return to much of the Eastern Area in January, and across the eastern tier of the Eastern Area in February.

According to the latest Climate Prediction Center's November outlook, above normal temperatures are projected over the much of the Eastern Area with below normal precipitation across the southern tier of the Mississippi Valley. The seasonal outlook into January projects warmer than normal temperatures over much of the Eastern area along with near normal precipitation.

The northern tier of the Great Lakes has received enough rainfall by the end of October to lower significant fire potential to normal levels, and predicted normal to above normal precipitation in November is expected to keep the area at that level. The Canadian Forest Fire Danger System (CFFDRS) indices still show drying deep into the soil in several areas, so if a fire is allowed to burn into those layers it will likely still require extended mop up. With the northern tier of the Eastern Area having had hard frosts and freezes, most surface fuels have cured significantly, and leaf fall is well under way, if not fully complete. With the available surface fuels amid hunting season, harvesting, and fall activities, potential will occasionally increase ignitions and fire activity to above normal with any dry and windy conditions. Any fires that do start, combined with warmer temperatures, lower relative humidity, and windy conditions, still have the potential to spread. The

eastern tiers of the Northeast and Mid-Atlantic Compacts have been experiencing significant drought conditions and fire activity in areas with above normal values for the Keetch-Byrum Drought Index (KBDI). Since the forecasted precipitation for November is below normal, it is expected that fire activity will remain at above normal levels for November. Leaf fall, dry available surface fuels, and human activities will continue to create significant potential for ignitions and larger fires until a soaking rain or series of frequent precipitation events can reduce potential to normal fall levels. The southern tier of Eastern Area has been rebounding back to above normal indices through October, and a return to above normal fire activity will continue due to forecasted above normal temperatures and potentially below normal precipitation combined with available surface fuels. For all Eastern Area, fall curing of grasses and shrubs combined with leaf fall will increase available fuels so that any prolonged dry periods and days with persistent winds will increase potential for fire activity during the outlook period, unless snow is on the ground.

Moderate to significant precipitation deficits developed through the latter half of the summer season through October across much of the Eastern Area. Toward the end of October, the greatest deficits were indicated over much of the Great Lakes, western Mid-Mississippi Valley, New England Metro, and the eastern Mid-Atlantic States. Below normal precipitation and above normal temperatures are expected across the New England Metro and the southern and eastern tiers of the Mid-Atlantic States in November, resulting in above normal significant fire potential in November, but reverting to normal for December. The remainder of the Eastern Area should experience near normal fire potential through the rest of the fall into the winter season outside of any warm, dry, and windy periods.

Southern Area

A pattern change in late October interrupted an otherwise historically dry month across the Southern Area. Large swaths of the region did not observe any measurable rain after Hurricanes Helene and Milton departed, and that dry streak may continue in parts of the Southeast and Gulf Coast well into the month of November. Meanwhile, unusual wildfire activity for October was noteworthy in Oklahoma due to worsening drought and record high vapor pressure deficits that are more typical of August. Similar weather conditions also affected much of Texas into portions of the Lower Mississippi Valley, prior to the turn towards wetter or more humid conditions late in the month. This resurgence of dryness aligned with tree mortality from last year's drought and following beetle kill, resulting in increased fire occurrence during October over parts of Mississippi and Alabama, as well.

Tree destruction behind Hurricane Helene's 80-100+ mph wind gusts will have long-lasting impacts to the fire environment, extending from its landfall along the Florida Big Bend through southern and eastern Georgia, the western Carolinas and smaller portions of southwest Virginia, southeast Kentucky, and northeast Tennessee. This damage appears to be most concentrated on southeast-facing ridges and through mountain gaps. Smaller diameter fuels and leaf litter will dry out rapidly in these areas when weather allows, while newly fallen trees may not be cured enough to burn until next year. Washed out roads and trails, slope destabilization and large stands of fallen trees are expected to result in safety issues and difficulties accessing some fires through the outlook period. This alone may increase the probability of significant fires in the most heavily impacted areas. Debris burning will also become common, enhancing human-caused ignition risks over the coming months, especially during any lengthy periods of low precipitation, abundant sunshine, and poor overnight relative humidity recovery. Farther south, from the Florida Big Bend into southern Georgia, multiple hurricanes the last two years have resulted in concentrated tree damage that will also factor into this and subsequent outlooks. These areas will likely maintain high water levels into the winter, so swamps and other waterways extending south through the Florida peninsula should generally see lower than normal fire risks until perhaps next spring.

For the Appalachian states, there are key differences in the fire environment this fall as compared to 2016 (when the devastating Chimney Tops Fire burned in the Great Smoky Mountains), namely in measures of drought that account for longer-term dryness. Helene's historic rainfall resulted in

the removal of drought conditions and a bottoming out of Keetch-Byram Drought Index values, but other measures of dryness are comparable to late 2016's noteworthy lack of rainfall. Persistent high pressure looks to be established over the eastern U.S. well into November, which should act to block heavy rain and drought relief in the Plains from making it into most of the Southeast. A key measure of risk will be whether or not wetting rain occurs after hardwoods lose their leaves in the next few weeks. Leaf drop is accelerating in the higher elevations of the Appalachians but is variable at lower elevations due to drought earlier this year, some re-greening behind tropical activity and minimal frost so far. One major wildcard in November is a likely burst of Atlantic tropical cyclone activity. In most years, development would be limited this late in the season, with any tropical storms or hurricanes more likely to stay in the Caribbean or track out to sea. With continued near-record sea surface temperatures over the Caribbean, an Madden-Julian Oscillation pulse passing through the Atlantic, and a pattern trending more conducive for storms to track northward, there is an outsized risk for a landfalling tropical system capable of producing abundant rainfall in the Southeast in November. Because of this, confidence in dry weather continuing along the Southeast Coast is lower than areas farther to the west.

For the rest of the outlook period, a weak La Niña is expected to drive an overall warm and dry pattern for most of the geographic area. Colder periods are certainly expected and will be key to curing out grasses across the Plains and herbaceous fuels elsewhere in the Southeast. Grass loading is near to above normal over a broad area of the Plains states, and La Niña should increase the probability for abnormally warm, dry, and windy conditions through the dormant season. Heading into late winter, storm systems should bring increasing rainfall to the Mississippi Valley, which could extend into the eastern Plains and portions of the Appalachian states at times. Confidence is highest in a dry and warm winter for the coastal Southeast and Texas into western Oklahoma.

A broad area of above normal significant fire potential is forecast from the Lower Mississippi Valley to the Appalachians and Mid-Atlantic in November, due to expectations of a lengthening dry spell, drought- and hurricane-impacted fuels, and periods of well above normal temperatures. Activity may pick up in earnest the second and third weeks of the month as a pattern favoring drier air masses and dry cold fronts returns. Some rain will likely affect western and northern areas from Louisiana into Mississippi, west Tennessee, Kentucky, and Virginia early in November, but this may not be enough to quell concerns as conditions dry out later in the month. Meanwhile, flooding rainfall in Oklahoma and adjacent northern Texas into western Arkansas will initially result in a rapid decrease in fire potential there, but drier conditions could allow for normal conditions to return later in November, especially if leaves in hardwood-dominant forests do not fully drop until later in the month.

Above normal significant fire potential is forecast to continue from the mountains of North Carolina into the Southeast in December, with an expansion into areas impacted by Hurricanes Idalia, Debby, and Helene over southern Georgia and northeast Florida. These areas may be removed until later next year if another tropical disturbance passes through during November. Assuming freezes cure grasses across the Plains, above normal significant fire potential will return to much of Texas by December and likely continue through the dormant season. This is especially the case in areas of above normal grass loading, which is more common in the Hill Country, South Texas, and parts of Oklahoma. The exact placement of highest risks will likely change across the Plains, since not all La Niña winters there are dry and warm from beginning to end.

Wet weather may eventually return to Louisiana, Mississippi, and Alabama by February, but areas farther east with the most severe damage from Helene will likely see an uptick in activity as longer days and warmer temperatures arrive. Increased fuel availability is expected to be a major player, and larger down and dead trees may be more burnable by then. Drought will likely develop farther south in Florida as the winter goes on, but high water levels in most areas should keep near normal significant fire potential through this forecast period.

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:
http://www.nifc.gov/nicc/predictive/outlooks/outlooks.htm