



National Significant Wildland Fire Potential Outlook

Predictive Services
National Interagency Fire Center

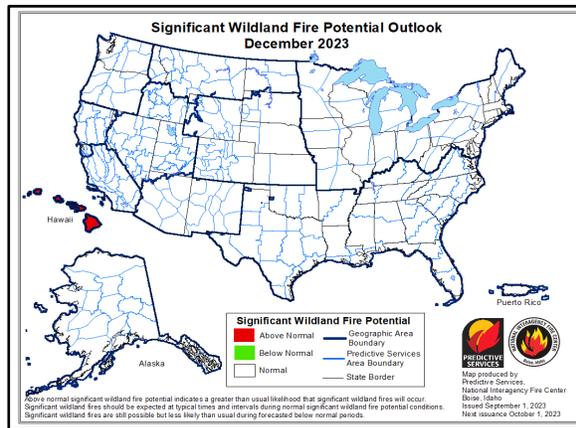
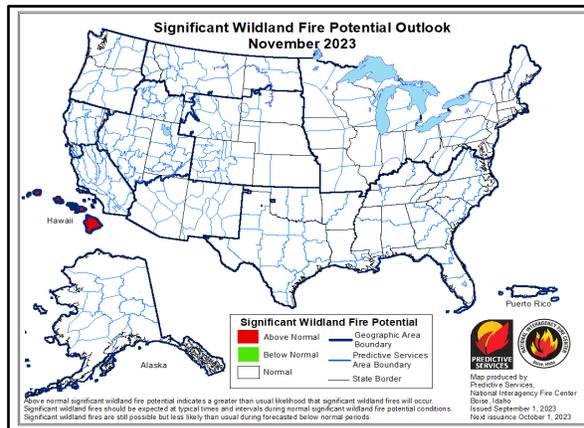
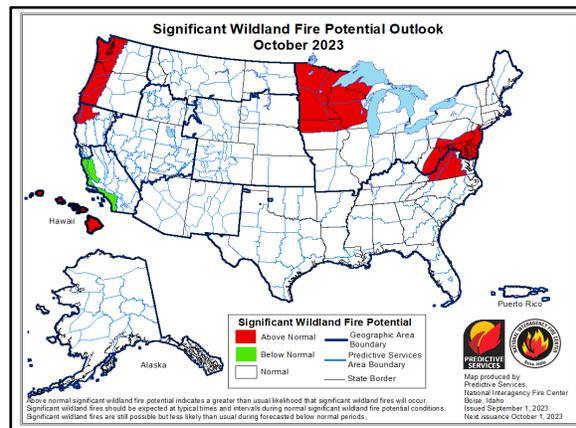
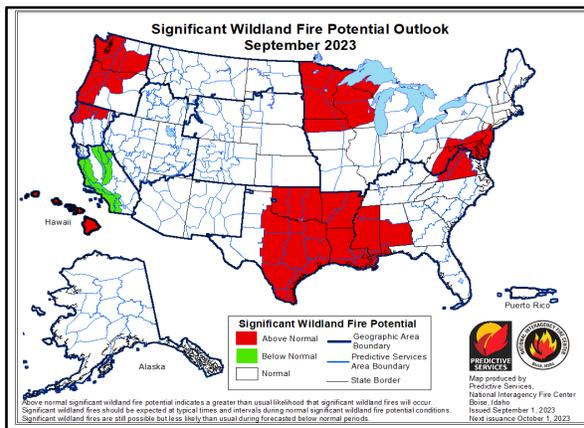


Issued: September 1, 2023
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Outlook Period – September through December 2023

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.



Significant fire activity continued to increase through August, with the national preparedness level increasing from three to four (scale one to five) on August 17. Significant fire activity increased across most geographic areas in August, including the Southern Area, but decreased in the Southwest Area. A significant rainfall event August 20-23 resulted in decreased activity across the Great Basin, Rocky Mountain, and Northern Rockies Geographic Areas for the end of the month. Alaska continued with elevated activity through mid-month before decreasing rapidly at the end of the month while Hawai'i was very active in August as well, including the Lahaina Fire. Year-to-date acres burned for the US is well below the 10-year average at 38%, with a slightly below average number of fires as well, about 96% of average.

Warmer and drier than normal conditions were prevalent near and west of the Cascades in August, while a significant rainfall event August 20-23 due to the remnants of Hurricane Hilary resulted in well above normal precipitation from southern California through the Great Basin into

the northern Rockies. Temperatures were also near average in this area. While the North American Monsoon brought welcome rainfall to the Southwest and Colorado, temperatures were above normal with precipitation below normal for August, with an expansion of drought. Record breaking temperatures were observed across Texas, the Lower Mississippi Valley, and Gulf Coast as a prolonged heat wave lasted much of August. Flash drought conditions resulted with much of east Texas and Louisiana in extreme to exceptional drought. Meanwhile, drought continued on the central Plains into the Upper Midwest, with drought expanding across northern Montana into northern North Dakota. Drought expanded across much of the Hawaiian Islands as well. Drought improvement was limited to small areas in the Mojave Desert, Carolinas, and Lower Michigan.

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

Above normal significant fire potential is expected across the portions of the Northwest and northern California in September. These areas are forecast to return to near normal potential in October, except along and west of the Cascades when offshore wind season coincides with continued warmer and drier than normal conditions. Above normal potential is forecast across Hawai'i through December, especially the lee sides, due to long-term drought and periods of enhanced trade winds. Above normal potential is forecast across the Upper Midwest September into October due to long-term drought as well as hot and dry conditions forecast through the first week of September, further drying fuels.

Much of the Southern Area from Oklahoma and central Texas eastward through the Lower Mississippi Valley into southern Alabama will have above normal significant fire potential in September before returning to normal potential in October. Above normal potential is also forecast for portions of the Mid-Atlantic, Virginia, and West Virginia in September and October due to long term dryness and the potential for early leaf drop due to drought stressed hardwoods. Below normal significant fire potential is forecast for much of southern and central California in September, with below normal potential forecast for the central and southern California coasts in October. The entire contiguous US is forecast to have normal significant fire potential for November and December.

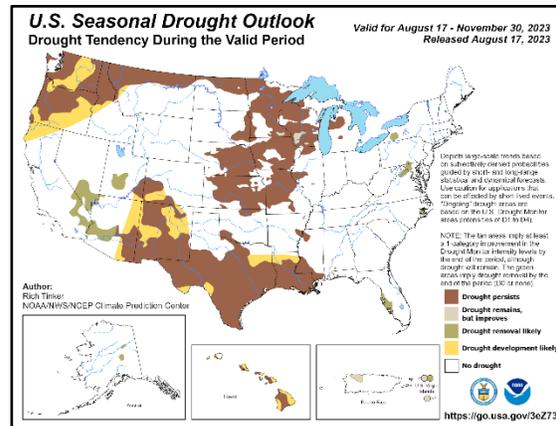
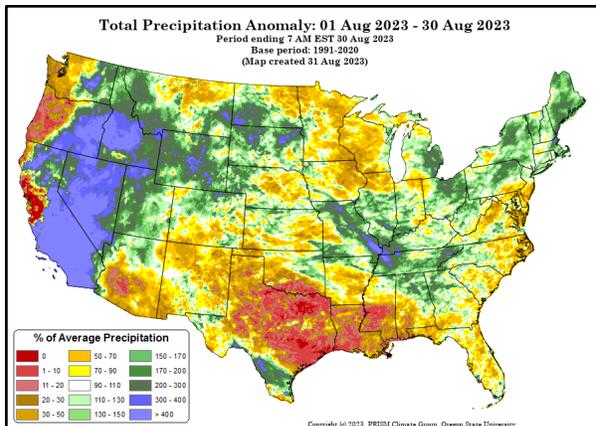
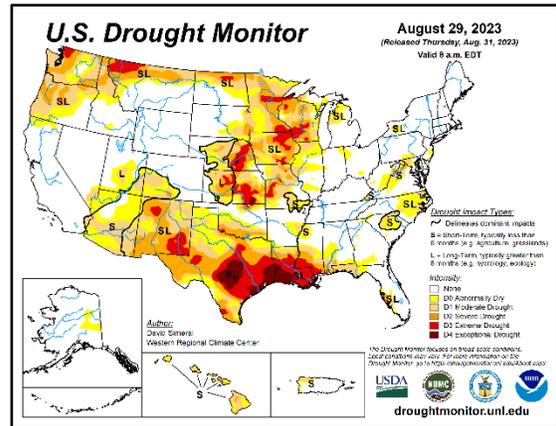
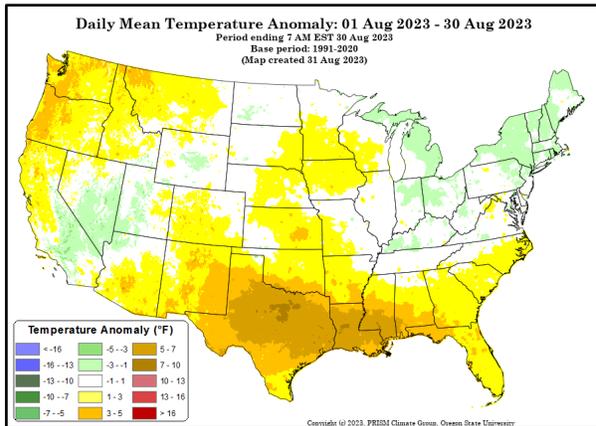
Past Weather and Drought

Record breaking heat continued over much of Texas through August and spread into the Lower Mississippi Valley and central Gulf Coast. Flash drought conditions developed in the Lower Mississippi Valley. While scattered thunderstorms developed over portions of east Texas and the Lower Mississippi Valley at the end of August, any relief was temporary and localized. Drier than normal conditions were observed across Florida into the Carolinas before Hurricane Idalia moved through Florida, South Georgia, and the Carolinas at the end of the month. Drier than normal conditions also persisted across the Mid-Atlantic and western Great Lakes. Meanwhile, above normal precipitation fell from the Mid-Mississippi Valley through the Ohio Valley into the Northeast with near normal temperatures. Overall, drought expanded and intensified across much of Texas, Oklahoma, the Lower Mississippi Valley, and central Gulf Coast, with drought continuing across the central Plains into the western Great Lakes.

After a hot start to August, the delayed North American Monsoon began in the Southwest and greater Four Corners to bring relief from the hot and dry conditions. Above normal temperatures and periods of isolated thunderstorms were widespread across the rest of the West through mid-August before the remnants of Hurricane Hilary combined with a monsoon moisture surge to bring well above normal rainfall from southern California into the Great Basin, eastern Oregon, and

northern Rockies. However, above normal temperatures and dry conditions continued for northwest California and western Oregon and Washington, with two significant nocturnal dry thunderstorm events August 14-15 and August 24-25. Precipitation ended August well above normal across southern California, the Great Basin, northeast California, eastern Oregon, southern Montana, and Wyoming along with near to below normal temperatures. Despite the increase in monsoon moisture, much of the Southwest and southern Colorado were warmer and drier than normal for August. Drought continued across the northwestern US, with development over much of the Southwest due to the weak North American Monsoon.

Alaska continued to be warm and dry through mid-August before persistent southwest flow brought cool and wet conditions in late August. Drought continues to expand across Hawai'i, with a very strong, dry downslope wind event on the lee sides of the islands August 7-9 as Hurricane Dora passed to the south. The Lahaina and Upcountry Fires burned thousands of acres and over 2,000 structures, with at least 115 deaths thus far.

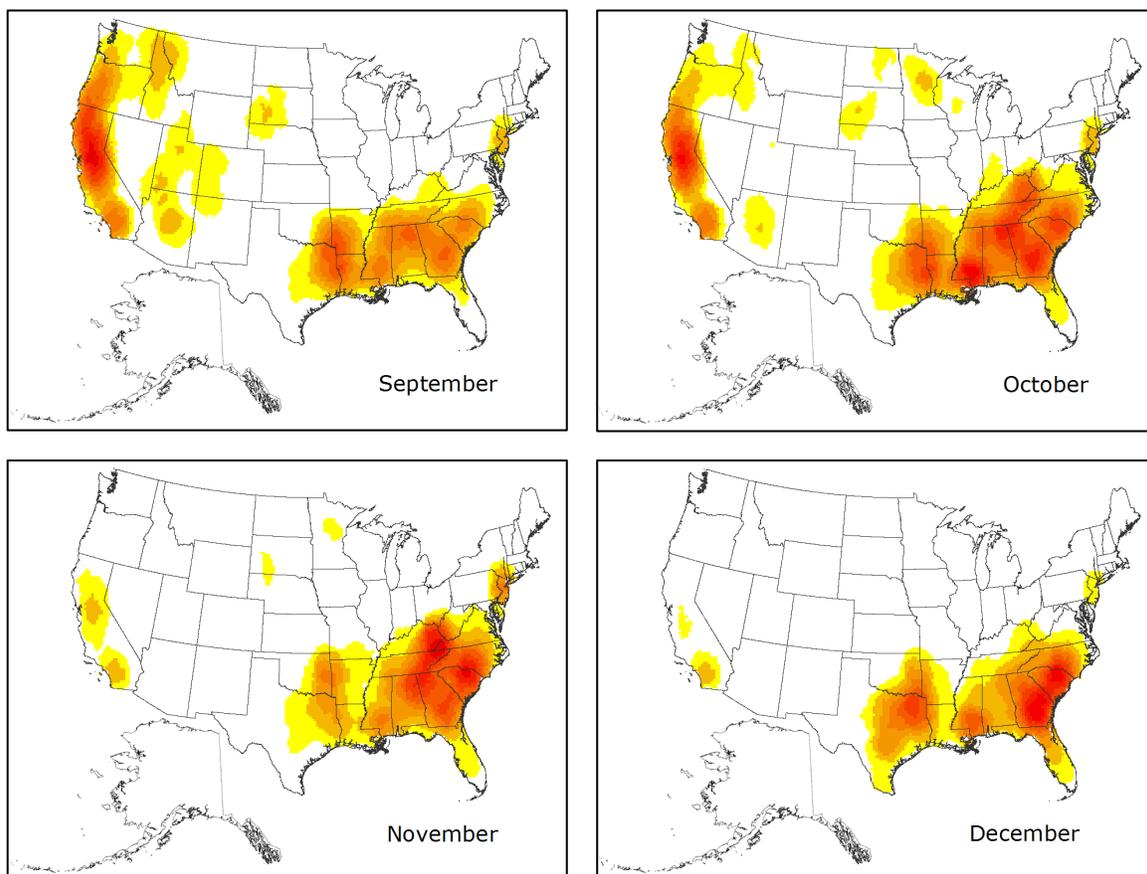


Left: Departure from Normal Temperature (top) and Percent of Normal Precipitation (bottom) (from PRISM Climate Group, Oregon State University). Right: U.S. Drought Monitor (top) and Drought Outlook (bottom) (from National Drought Mitigation Center and the Climate Prediction Center).

Weather and Climate Outlooks

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

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

Normal significant wildfire potential is expected for Alaska in September as fire activity and summer weather wind down for the season. October through December will see Alaska move out of fire season, with establishment of the permanent winter snowpack.

The US Drought Monitor shows abnormally dry conditions in the Yukon Flats and Tanana Valley. In addition, a small area of moderate drought is present just downriver from Ft. Yukon. The Canadian Fire Danger Rating System Drought Code (DC) indicates that deeper fuels are dry in these areas, though values are generally close to normal conditions for late summer. The exception is the area from the Tanana Valley southeast of Fairbanks to Dot Lake. That area has near record DC values at many stations, indicating extremely dry deep fuels due to the lack of rainfall this summer.

Fire activity has slowed to near zero. The last weekend of August saw a strong wind event in the Tanana Valley that toppled trees onto powerlines. Fortunately, the 12 reported fires were easily caught by local crews. Six large project fires are still staffed, but efforts are generally towards rehab of forest fuels, equipment recovery, and mop-up. Fire spread has been minimal over the past week, despite periods of warmer and windier conditions.

Fuels in western and southern Alaska are extremely wet, while in the eastern Interior, there are still some dry areas. The Yukon Flats has dry deeper fuels, but surface fuels have picked up enough rain to minimize spread potential. In the Upper Tanana Valley, the stretch from Salcha to Dot Lake is extremely dry, having received very little rain in the last two months. This has driven the DC to historically high values at many stations in that area. Fortunately, the upper-level fuels,

though dry, have not been particularly receptive to new ignitions. It is suspected that the larger fires in the Tanana Valley may overwinter and give rise to holdovers next spring due to the dry conditions in the deep duff.

The El Niño now in place suggests a tendency for warmer and wetter than normal weather in Alaska, and this is reflected in the Climate Prediction Center's forecast for the upcoming months. End-of-season rains arrived later than normal but have effectively locked the weather into a cool and damp pattern for the mainland for the first half of September. The only area of concern is the Upper Tanana Valley, which has remained quite dry and has yet to receive season-ending rains. At this point, there is no wet weather forecast for that area of the state.

With minimal fire activity, fire season is on its way out for Alaska. There are still a few areas in the eastern Interior that remain drier, and activity may increase for short periods when warmer and drier weather appears, but fires will be relatively easy to manage. As days shorten and the sun angle decreases, cooler weather brings freezing nighttime temperatures and an effective end to fire activity by mid-October. The permanent winter snowpack is usually established in October and November, which helps end fire season. It is expected that September through December will exhibit normal fire potential in Alaska this year.

Northwest

Aside from the first week, most of the geographic area is expected to remain at above average risk of significant fires through September. Predictive Service Areas (PSAs) from the Cascade Crest westward will continue above average into October. Recent heavy rain from the remnants of Hurricane Hilary have dropped PSAs NW07, NW08, NW09, NW11, and NW12 back to a normal risk for the remainder of the season.

The Cascades westward were several degrees above normal for August due to a couple of heat waves, while the remaining portions of eastern Oregon and Washington hovered around normal. South-central Oregon through northeast Oregon as well as the eastern quarter of Washington had well above normal rainfall, largely from Hurricane Hilary, which pushed moisture north across the Pacific Northwest around mid-August. Most of north-central and western Oregon received less than 25% of normal rainfall, while a little more rain fell across the Washington Cascades and western Washington, but still below normal. The overall drought status changed very little over the last 30 days with most of the geographic area, except southeast Oregon, remaining designated in moderate to severe drought.

The number of new fires in August continued to be below average except for two lightning events, one in the beginning of the month and one that began on August 24. As of August 25, over 800 new fires were reported for August and over 60,000 acres burned. Fire activity in timber increased on the west side of the Cascades in August, with many long duration fires ongoing in western Oregon. Eastern Washington experienced two large wind-driven fires in mid-August near Spokane that grew to just over 20,000 acres combined and destroyed approximately 360 primary residences.

Energy release component (ERC) values in western PSAs NW01, NW02, and NW03 continued to trend above average for most of the month. NW02 surpassed all time high values by mid-August. Live and dead fuel moistures are also tracking at or below seasonal normal west of the Cascades. Critically low live fuel moistures in combination with low 1000-hour moistures will help keep fire potential elevated for the western part of the geographic area. Fuels in eastern Oregon were affected by Hilary and ERCs dropped to record low values and continue to trend below average.

NOAA outlooks covering the Pacific Northwest for September do not indicate any strong signals pointing toward above or below normal temperatures or precipitation. As such, short-term swings toward extremes remain plausible and is, perhaps, expected. Looking further into fall, a

strengthening El Niño signal points toward chances for above normal temperatures accompanied by below normal precipitation October through December.

The anticipated weather could indicate a delay to the end of fire season, particularly from the Cascades westward, as Pacific winter storms are likely to be delayed and infrequent. A lack of fall rain will keep fuels receptive for burning longer into the fall season than normal if this occurs. This also increases concern for significant fire growth when dry, easterly winds arrive, which is typically in September and early October. Significant fire risk returns to normal for the entire geographic area later in October and through December as cooler and wetter weather arrives.

Northern California and Hawai'i

Significant fire potential is projected to be near to above average for September and October and normal for November and December. During September, historically one to three large fires occur per Predictive Service Area (PSA) with the exception being the Bay Area PSAs where less than one occurs. During October all PSAs average one or less and less than one for November and December. Hawaii's significant fire potential is forecast to be above normal through December.

The weather pattern during August was highly variable with a mix of ridging, low-pressure, and tropical influences. High temperatures were generally above normal except near to a little below normal was found across the far east. Precipitation was generally above normal across northern and eastern portions of North Ops, while pockets of much drier conditions occurred across the greater Bay Area and North Coast. Drizzle due to low clouds occurred intermittently near the coast but was limited overall. A multi-day heat wave with above to well above normal temperatures impacted portions of the region August 13-17 and drove dead fuel moistures down to critically dry levels. Remnants of Hurricane Hilary provided significant moistening, especially impacting central and eastern portions of North Ops, during August 20-21. Woody shrubs were in a curing process below 5000-5500 feet and sampled values were generally near to a little above normal. Herbaceous fuels became partly to mostly cured below 6000 feet, although cheat grass was mostly cured farther up the slopes across eastern portions of North Ops. Peak green-up conditions by the end of the month were found above 7500-8000 feet thus the typical August curing had overspread most of North Ops. Flammable fuel alignments between the dead and live components were generally found below 5000 to 5500 feet. A moderate drought classification returned to the northwest California early in the month.

Fire business increased substantially during August due to a mix of monsoon and tropical moisture surges that created over 200 lightning ignitions throughout the month. The most impactful lightning ignition period occurred during August 14-15. This event resulted in dozens of ignitions and several large fires, including five incident management team deployments to the Coast Range. Lightning was observed on 17 separate days and amounted to a little over 13,700 strikes. Typically, a little over 6500 strikes occur during August based on a 2012 to 2022 average. Most of the Red Flag Warning and high-risk issuances revolved around lightning ignitions and outflow winds, but some moderately gusty dry northerly and easterly winds impacted smaller portions of North Ops during the month. Prescribed burning, including broadcast burning, was still prevalent during the first half of the month but became very limited the latter half of the month due to increased resource commitments to the existing large fires.

Lots of variable weather patterns should impact the region during the next four months due to several moderate to strong oceanic-atmospheric teleconnections. This makes it tougher to project the critical weather and fuel alignments, although drought is likely to remain across the far north. The weather outlook for September is for near normal temperatures and near normal precipitation with some areas of above and others below. Lightning is expected to remain a problem during September, with a continued mix of low pressure, monsoon, and tropical flow related influences. There is a possibility for a little higher frequency of moderately gusty and dry northerly wind events during September, which could provide some issues to the ongoing large fires across northwest California. October is expected to be warmer than normal with mixed precipitation signals but

likely near to below normal. There is less certainty in the strength or frequency of the offshore wind events that typically peak during October so normal is forecast currently. There is a better chance for widespread wetting rain events during November with cooling, which should lead to a gradual demise to a significant portion of the fire season. Above normal significant fire potential is in place for portions of the north during September where moderately dry-gusty winds and lightning plus flammable fuels line up the most. The focus shifts to west of the Cascade-Sierra Crest during October with the primary focus across the North Coast and Northwest Mountain PSAs where above normal is designated. Normal significant fire potential is projected for November and December.

Sea surface temperature (SST) anomalies surrounding the Hawai'ian Islands were mixed with near to slightly below normal across the southern tier and near to slightly above normal across the northern tier. In a general sense, near average SST anomalies are expected to remain the next four months, with a warmer signal across the north. Average temperatures were near to above normal during August with warmer readings found across the northern tier. Precipitation was below to well below normal and aided in the expansion of more widespread drought across the island chain. A significant fire growth event with strong to very strong winds and low humidity impacted most of the islands, but particularly leeward portions of Maui and the Big Island, during August 7-9. Red Flag Warnings were issued for the August 7-9 event and an additional set were issued for August 31 due to enhanced trade winds combined with low humidity.

El Niño will continue to strengthen during the outlook period and likely peak late in the year. There is a higher likelihood of it becoming strong during fall. Precipitation is likely to be below normal during the next four months across the entire island chain, although tropical cyclones during the next month or two could create some variability. Tropical cyclones can also bring a gusty and dry wind envelope depending on their approach and can help to create fire growth conditions. Temperatures should be near to slightly above normal. Several fire growth enhancing ingredients will impact the island chain during the outlook period. These include cured and abundant herbaceous fuels grown during the previous wet season, widespread drought conditions initially favoring the leeward areas but expanding into the windward areas with time, and a heavy dead and down component induced by the August 7-9 windstorm event. Therefore, above normal significant fire potential is forecast for the island chain September through December.

Southern California

Below normal significant fire potential is expected through September in the Coast Ranges and Sierra of southern California. Below normal potential is forecast along the southern California Coast in October, and near normal significant fire potential is forecast across southern California in November and December.

A cooler and significantly wetter than average August was observed across southern California. This trend was largely due to an upper-level trough over the eastern Pacific and an upper-level ridge over New Mexico and north and west Texas, which helped steer Tropical Storm Hilary along the Baja coast and into southern California. The monsoon has been slow to start this season. However, there was a surge of monsoonal moisture August 9-10, which gave most locations at least a trace of rain.

El Niño conditions continue to intensify in the eastern equatorial Pacific. The current type of El Niño is a traditional east Pacific El Niño rather than a central Pacific El Niño Modoki, meaning the core of the warmest water is off the coast of South America, rather than in the central equatorial Pacific. Waters off the southern California coast remain slightly cooler than normal. All indications show El Niño conditions continuing through fall and winter.

The excessive rainfall from Tropical Storm Hilary ended the moderate drought across the eastern portions of southern California. This excessive rainfall significantly increased dead fuel moisture across all PSAs in southern California, with 100-hr and 1000-hr dead fuel moisture values

significantly above normal. Live fuel moisture continues to remain well above normal across Southern California as well.

Fuels are likely to remain wetter than normal this fall, but it is likely there will be periods where the fuel moisture will drop below normal during dry spells. The highest probability for dry periods will be in November, given that is the month with the greatest probability of having high pressure to the north.

Climate models suggest the current sea surface temperature (SST) pattern to remain consistent through December. There is a higher degree of uncertainty on what this means for the upper-level pattern as climate model guidance contradicts the pattern of cooler and wetter conditions seen in similar analog years. Forecast confidence is higher with respect to the fire potential forecast due to the abnormally wet fuels and abundance of live fuels at higher elevations. The probability of a large campaign fire remains low for the fall season. November has the highest probability of Santa Ana wind events out of the September-December period based on climatology and current climate forecast guidance identifies November as the most likely month this year as well. Areas that will have the largest fire potential during this time are low-lying areas dominated by fine fuels. However, the overall probability of a significant fire remains low as cooler and wetter than normal conditions are favored during the outlook period.

Northern Rockies

Significant wildland fire potential in the Northern Rockies Geographic Area (NRGA) for September through December is expected to be normal. Multiple periods of wetting rain in north Idaho and western Montana in August over the most drought prone portion of the geographic area have pushed fire danger indices to below normal for late August. Short term outlooks favor near to above normal precipitation and below normal temperatures for the western half of the NRGA. Longer term outlooks favor warmer and drier conditions than normal, but normal fire season activity decreases quickly during the month of September. Drought has emerged over north-central Montana and North Dakota, but seasonal outlooks indicate this area will see near normal moisture September through November.

Two short periods of hot weather were followed by breakdowns of the upper-level ridge, which produced escalated periods of fire activity. The strongest of these heatwaves, August 15-18, was followed by an infusion of monsoon moisture combined with the remnants of Hurricane Hilary. Overnight relative humidity recovery throughout the month generally stayed moderate to good, limiting fuel stress in the region.

The remnants of Hilary and additional significant late August rainfall events are beginning to change the drought depiction on the landscape. Northwest Montana and north Idaho were showing areas of severe to extreme drought based on data ending the morning of August 22, but rainfall events on August 22-23 produced near record rainfall for areas in northwest Montana and north Idaho. Predictive Service Areas (PSAs) NR01-NR04 all showed a zone average of 0.50 inches of rainfall during the 3-day period of August 21-23. Additional significant rainfall August 29-30 will support continued improvement in drought trends.

North-central and northeast Montana showed an increase of severe drought and late month rainfall is not sufficient to change these categories. The remainder of Montana was showing either abnormally dry or no drought conditions. North Dakota has seen moderate to severe drought expand over the northern and eastern sections of the state.

1000-hour dead fuel moistures are uniformly more than 15% across the western half of the NRGA and seasonal trend analyses indicate they will stay moister than normal into early September. The eastern half of the NRGA is beginning to see longer term drying trends and some areas are beginning to see below normal moisture in the 1000-hour fuels for the first time this fire season, and these drier trends will continue into September.

Live fuels are going through seasonal curing, but overnight recoveries are continually moderate to good most nights, which decreases the window of fine fuel availability. Energy release component (ERC) values for larger fuels in western Montana and north Idaho are likely to track at or below normal for most areas for the foreseeable future, which means the fire season has significantly slowed if not ended for this area.

Large fire growth has been observed in one-to-two-day periods during ridge breakdowns on August 3 and August 17, with both events followed by wetting rain. The River Road East fire was the most significant, reaching 15,000 acres in 2 burn periods, which was the first significant fire in the NRGAs to exceed 10,000 acres this year. On most days growth on large fires was less than 150 acres. Initial attack has been largely successful in catching lightning ignited fires.

All PSAs are expected to have normal significant wildland fire potential for September through December. Rainfall events in August have targeted the most drought prone portion of the NRGAs and additional moisture is possible into early September. Seasonal outlooks indicate the western end of the NRGAs has potential for a dry and warm fall, but short-term forecasts indicate precipitation will fall in these areas through early September, reducing potential. This expected moisture should bring an end to most current fire activity, and this slowdown should persist as longer nights result in more moisture retention.

Great Basin

There was increased fire activity during early to mid-August across much of the Great Basin, but diminished by late August due to several widespread, long-duration rain events. Cool and moist conditions are expected for early September before any prolonged drying takes place.

Temperatures over the last 30 days have been near normal across much of the Great Basin, while precipitation has been 150-300% of average across most of the geographic area except for parts of southeast Utah where precipitation was near or slightly below normal. The Evaporative Demand Drought Index Flash Drought Monitor shows no drought conditions for the past month and the longer-term US Drought Monitor has also improved. Only a small area in southern Utah and far southern Nevada remains in moderate drought, while over 90% of the region is drought free.

Fuel moisture is above normal across the entire Great Basin due to several pushes of monsoon moisture, including a heavy, long duration precipitation event in late August due to the remnants of Hurricane Hilary. Many desert areas in Nevada received more than their normal summer precipitation amounts in just three days during that late August event. Before this heavy rain event, live fuel moisture in the sage was running near or slightly above normal, and it's likely these levels will increase somewhat by the start of September when new measurements come in. Fire activity remains low across the Great Basin, with minimal growth on current large incidents, and few new significant fires.

Normal significant fire potential is expected through the rest of the traditional fire season and into the normal dormant periods of November and December. Despite areas of significant carry-over fuels in parts of northwest Nevada and southern Idaho, the prolonged wet and cool weather of August is expected to continue into early September. In far southern areas, the above normal monsoon activity of the past month combined with statistically reduced chances of large fires late in the season and rapidly shortening daylight hours are likely to result in the end of fire season.

Southwest

Normal significant fire potential is expected for both September and the remainder of the fall and early winter months for the Southwest Area (SWA). Some localized areas of above normal

significant fire potential could arise across parts of Arizona and southeastern New Mexico during September but are still expected to be closer to normal overall.

The overall trend through most of the first six months of 2023 was for cooler temperatures nearly areawide and wetter than normal conditions focused along and west of the Divide and across the northern tier of New Mexico. During May through July precipitation was below normal for much of the SWA except for northeastern New Mexico. This trend continued for the month of July, with above normal precipitation relegated to northeastern sections of New Mexico and the remainder of the SWA below to well below normal. The drier than normal conditions have continued regionally through August so far with only far western and northern Arizona seeing above normal precipitation as well as parts of southwestern New Mexico. The forecast of a weaker than normal monsoon this summer with above normal temperatures has occurred.

The ongoing El Niño conditions and further intensification through the fall months will likely continue to have a big influence on the weather and climate for the forecast period. Unfortunately, this means that some lingering dry areas could result during early to mid-fall due to the weak monsoon period. In addition, continued above normal warmth could result from periods of strong ridging aloft lingering into mid-September. Although presently expected to be near normal, some localized areas of above normal potential could result over the next month, especially west of the Divide, coincident with expected drier than normal conditions and above normal temperatures. In addition, above average heat and below normal precipitation is anticipated for the southeastern one-third of New Mexico over the next month.

Although the weather pattern will continue to be variable, a western US upper-level trough is expected for fall and early winter. This dictates a move towards periodic breezy conditions and near to below normal temperatures for the northwestern half of the SWA, with above normal temperatures most likely to be focused across the southeastern half. Precipitation is expected to be close to normal overall with some above normal areas for southwestern and northern New Mexico during September and likely more for areas west of the Divide as fall continues. As late fall and early winter arrive, an overall cooler and wetter weather pattern is anticipated associated with the approach of the mature phase of the ongoing El Niño with some to normal to slightly below normal precipitation areas farther south and east.

Rocky Mountain

The Rocky Mountain Area (RMA) is expecting normal significant fire potential through the outlook period. With more monsoonal moisture arriving in the area in August, fuels have seen conditions returning towards more average conditions. Weather outlooks through the period are trending towards normal precipitation amounts. However, temperatures will continue to run above normal through the outlook period across Colorado and Wyoming that will somewhat offset the normal precipitation.

The last month still had persistent high pressure as the main weather influence across the Rocky Mountain Area. However, unlike the previous few months, the high pressure was not largely stagnant over the Four Corners. This allowed more moisture to move into the area, bringing some much needed rain. While there was more monsoon activity, it was still weaker and more sporadic than a normal year given the influence of El Niño. A couple of tropical storms did help to increase the available moisture moving into the area, but the amount of rain was varied across the RMA. Wyoming and South Dakota saw few systems that brought above normal rain, while the rest of the area generally the rain became a little more scattered with a mix of above and below normal. Much of South Dakota saw over 2 inches of rain this month, with some areas even seeing 5 to 10 inches. The rest of the Rocky Mountain Area saw less, generally 1 to 2 inches, while a few areas saw up to 5 inches. Temperatures continued generally above normal for much of the area seeing temperatures 2 to 4 degrees above normal. There was a five-to-seven-day period in mid to late August that saw much of the RMA east of the mountains with highs in the mid-90s to 105°F. Largely, drought conditions did not change much across the RMA, but southwest Colorado did

see more moderate drought develop, while parts of Nebraska and Kansas had a reduction in exceptional drought.

Fuel moisture generally trended towards more average values. The areas on the West Slope of Colorado that had fuel moisture well below normal increased towards more seasonal values as the heightened monsoonal activity moved in. On the eastern plains where a wet spring led to above normal fuel moisture, fuels began to rapidly dry out when the high pressure shifted into the central Plains, bringing the very hot and dry conditions. As fuels have been returning towards average, ERCs are now below the 90th percentile, and well away from historical maximum values for this time of year.

A few fires early in the month remained on the landscape for much of the month, but most fire activity was initial attack lightning ignitions. A few fires in the sage and grass of Wyoming were able to quickly grow into large fires, but equally as quickly were able to be contained. A wind event the second week of August did see a significant increase in the initial attack, but as more moisture moved in this activity quickly died down.

Seasonal precipitation outlooks are normal for the RMA. While the overall trend through December is for around normal precipitation, there will continue to be periods that may be drier for a more extended period. Temperatures will continue to be above normal through the outlook period for Wyoming and Colorado, while the central Plains will generally be around normal. These trends are consistent with an El Niño pattern continuing through the fall and into the northern hemisphere winter. One thing to keep in mind is that for Wyoming and Colorado, the above normal temperatures through the outlook will likely lead to more evapotranspiration, which will reduce effects of normal precipitation in the fuels, with drought conditions likely to remain as is or further develop.

Eastern Area

Near normal significant fire potential is forecast across the majority of the Eastern Area September into December, but above normal fire potential is expected across the Upper Mississippi Valley and central Great Lakes September into October. Above normal fire potential is expected to continue increasing over the southeastern Mid-Atlantic states September into October.

Two-week negative precipitation anomalies were indicated towards the end of August across much of Mississippi Valley as well as the southeastern Mid-Atlantic states. Longer term drought remained in place across the western Mississippi Valley and central Great Lakes. This is a result of warmer than normal temperatures, below normal precipitation, and widespread low relative humidity levels, which affected these areas earlier in the summer.

The El Niño Southern Oscillation (ENSO) transitioned from a three-year episode of La Niña conditions to increasingly warmer than normal sea surface temperatures depicting an El Niño regime through the spring into the summer. This transition has led to some uncertainty in the longer-term model forecasts for the fall and early winter. Historical or analog climate trend comparisons are also limited to very few similar ENSO transitions on record, making longer term weather trend forecasts challenging. Other sea surface temperature regimes also contribute to global weather patterns adding to the uncertainty in long term weather forecasts.

The Predictive Services precipitation outlooks forecast above normal precipitation across much of the Mississippi and Lower Ohio Valleys in September, possibly persisting into October. Below normal precipitation is forecast across the eastern tier of the Eastern Area September into October. According to the NOAA Climate Prediction Center long term outlooks, below normal precipitation is forecast across portions of the Great Lakes this fall, with above normal precipitation across the southern Mid-Atlantic states through fall.

According to the Predictive Service temperature outlooks, near to above normal temperatures are forecast over the southern two-thirds of the Eastern Area in September and across the Upper Mississippi Valley in October. The Climate Prediction Center forecasts above normal temperatures across the eastern tier of the Eastern Area from September through November.

Normal to above normal significant fire potential is forecast to persist across portions of the western and central Great Lakes September into October, despite an increase in precipitation frequency across parts of the Great Lakes as August progressed. Most the area remains significantly drier than normal for the past three months, which continues to lead to drought stress in live vegetation including trees. Even with forecasts for normal to above normal precipitation into fall, it will not be enough to reverse the current stress, with the area now showing signs of early color change and leaf drop. Drought Codes from the Canadian Forest Fire Danger Rating System (CFFDRS) that represent drying deep into the soil are still showing high to extreme leading to potential for extended mop up, burning of peat, and persistent deep-burning fires where surface fuel moisture is lacking, and fuels are capable of ignition. The increase in frequency of showers and thunderstorms across the area have increased surface fuel moisture and decrease fire occurrence, but a series of hot, dry, and windy days will increase the potential, especially in the western more grassy and open woodland Predictive Services Areas. In agricultural areas, harvesting season is ongoing bringing increased potential for equipment fires, especially with wind alignment. Current drought has allowed for typically wet and boggy lowland grass to be available for hay this summer, increasing the potential for fires to start in areas of peat and organic layers.

Longer term drought and negative soil moisture anomalies were in place across much of the Upper Mississippi Valley and the central Great Lakes towards the end of August. Due to uncertainty in the longer-term weather outlooks for this fall, above normal fire potential is forecast across these areas into October. The southeastern Mid-Atlantic states are also expected to experience periods of above normal fire potential September into October if precipitation events do not increase in frequency. Near normal fire potential is expected across the remainder of the Eastern Area through the fall and early winter.

Southern Area

Unprecedented conditions have expanded across the Southern Area in recent weeks, driven by the hottest meteorological summer and August on record along and inland from the Gulf Coast. Flash drought that began early in the summer over Texas has now encompassed the Lower Mississippi Valley and central Gulf Coast, where recent scattered rainfall is expected to only pause extreme fire danger temporarily and on a mostly localized basis. Areas farther north from central and southern Oklahoma into northeast Texas and southern Arkansas have rapidly dried out in recent weeks. Tropical Storm Harold brought significant rainfall to parts of south and west Texas in August, while Hurricane Idalia drenched much of Florida, Georgia, and the Carolinas at the end of the month. The National Drought Mitigation Center's long-term drought continues to show unusually dry conditions for northern Virginia, where 30-day rainfall is also below 25% of normal in some areas.

Wildfire activity in the Southern Area is typically correlated with La Niña conditions in the tropical Pacific, but this year's developing El Niño amid a warming planet is not following this template. Following Idalia's departure off the East Coast, a generally hot and dry pattern is likely to resume through at least mid-September over most of the geographic area. It is perhaps appropriate to expect the unexpected this year more than ever, but if more traditional El Niño forcing does take hold heading into autumn, wetter weather is likely to develop in the areas that need it most. Tropical cyclone activity is always a double-edged sword, with improving conditions and flooding rainfall possible wherever storms make landfall, along with heightened fire danger on their periphery. The recent period of development may decrease temporarily as the Madden-Julian Oscillation favors tropical cyclone activity elsewhere globally, but an exceptionally warm Gulf of Mexico, Caribbean, and Atlantic have already shown what is possible. Meanwhile, every transition period from hot and dry conditions to increased thunderstorm activity has proven problematic in

high-risk pine-dominant and oak-juniper fuels through July and especially August. Provided no widespread drought-busting rain occurs, thunderstorms are likely to increase initial attack response and significant wildfire potential where conditions remain historically dry.

Without any clear signs of widespread relief and growing concern in states neighboring those with significant activity, an expansive area of above normal significant fire potential is depicted across portions of Texas, Oklahoma, Arkansas, Louisiana, Mississippi, and Alabama for September. There is too much uncertainty to maintain above normal significant fire potential in these areas the remainder of the period, but shorter days should result in less anomalous heat, while an overwhelming majority of El Niño years favor wet weather on an increasingly widespread basis heading into October, November, and December. There is recent precedent, such as the Super El Niño of 2015, for maintaining above normal potential across Texas and adjacent states in October, but this decision will be deferred until the next update.

Northern Virginia's long-term dryness and recent drought expansion have increased the level of concern enough to include portions of the state in above normal significant fire potential for both September and October. Drought stress and the record early spring leaf-on have the potential to contribute to hardwoods dropping leaves earlier than normal, which has been the case even in areas that have been wetter this summer farther to the south in portions of the Southeast. A small pocket of abnormal dryness and moderate drought continues from far eastern Kentucky into western Virginia, but these areas were removed from the previous outlook's above normal potential given improving conditions and expectations for wetter than normal weather heading into autumn. The southern Appalachians are currently of lower concern than farther north due to recent heavy rainfall, but conditions the next one to two months will have to be watched closely in these areas given the region's history, increased wildland-urban interface, and hemlock damage from the woolly adelgid.

The High Plains of northwest Texas and western Oklahoma were considered for above normal potential in September, and large fires are possible, but wind-driven fires in grass-dominant areas are uncommon this time of year. The far western Florida Panhandle largely missed out on Idalia's rainfall, but risks for the area should be lower than in late August given most of the area saw substantial improvement. These and all other remaining Southern Area Predictive Services Areas are forecast to see normal significant wildfire potential heading into the fall fire season.

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>