National Significant Wildland Fire Potential Outlook

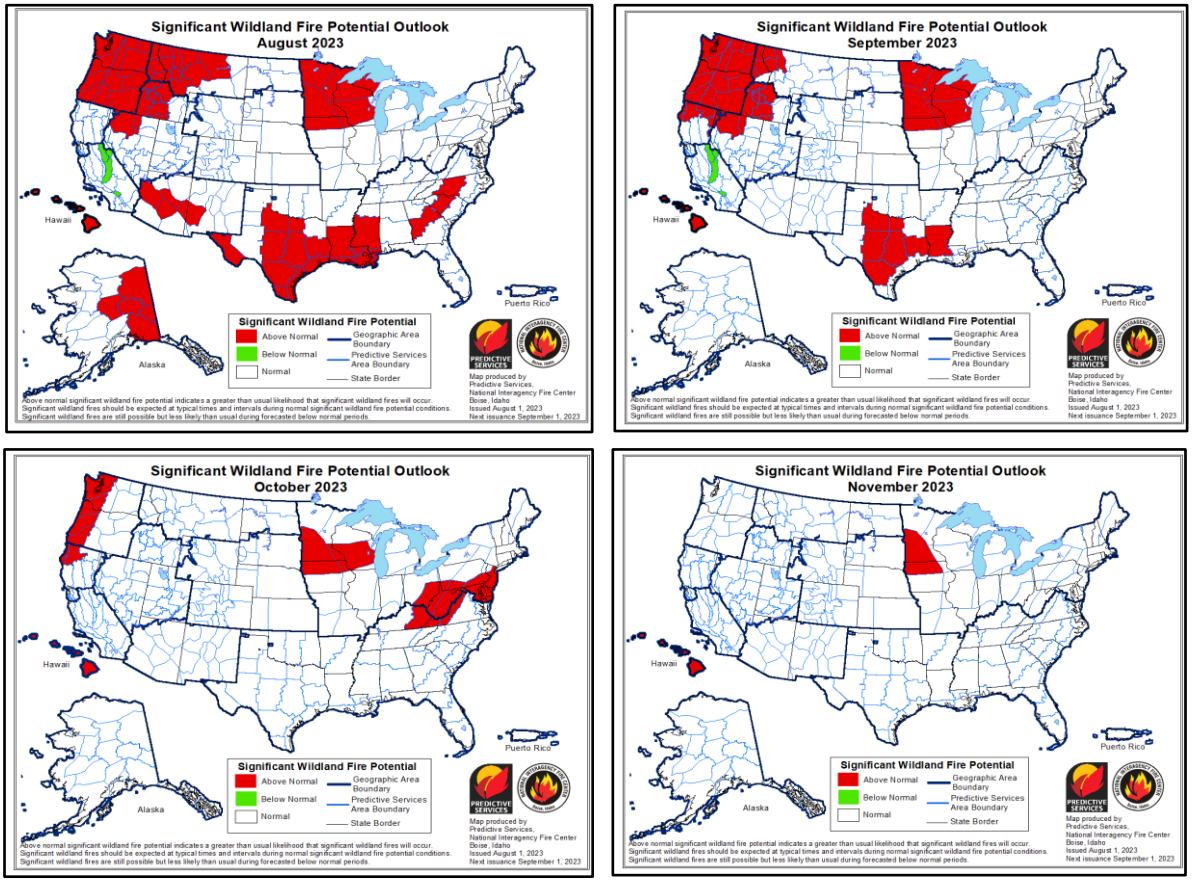
Predictive Services
National Interagency Fire Center

Issued: August 1, 2023
Next Issuance: September 1, 2023

Outlook Period – August through November 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 increased in July, especially during the latter half as the national preparedness levels increased from two to three (scale one to five) on July 21. Much of the significant fire activity was in the Southwest Geographic Area, but the Northern Rockies and Northwest Geographic Areas have multiple long-duration incident management team wildfires on the landscape. Initial attack increased across much of the West throughout July, including in Southern Area late in the month, with new large wildfires also emerging. Alaska had its slowest season on record until the last week of July when dozens of new wildfires, including several large wildfires, ignited due to prolific lightning and moderately receptive fuels. Year-to-date acres burned for the US is well below the 10-year average at 31%, with a below average number of fires as well, at about 89% of average.

Warmer and drier than normal conditions developed across the West in July, mostly due to the late arriving and weak North American Monsoon. Record breaking temperatures were observed

across the southwestern US into Texas as a prolonged heat wave lasted much of July. Abnormally dry and drought conditions developed and expanded from the Lower Mississippi Valley through the southwestern US, with intensifying and expanding drought across parts of the Northwest and northern Rockies. Localized drying was also observed on portions of the northern Plains into the Upper Midwest and western Great Lakes. However, above normal rainfall and mostly near to below normal temperatures ameliorated drought in portions of the southern and central Plains, Midwest, Ohio Valley, Mid-Atlantic, and Northeast.

Climate Prediction Center and Predictive Services monthly and seasonal outlooks depict likely above normal temperatures for the West, South, and East Coast into fall. Below normal precipitation is likely for the Southwest and likely into the broader Four Corners region as the North American Monsoon should continue to be below average this summer. Below normal precipitation is also forecast in portions of the Pacific Northwest, northern Rockies, and perhaps the 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 from eastern portions of the Plains into the Southeast and Ohio Valley late summer into fall.

Above normal significant fire potential is expected across the Northwest, Idaho, northwest Nevada, and western and central Montana through August. Above normal potential will retreat into northwest Montana in September, persist across the Northwest, most of Idaho, northwest Nevada, and expand into far northern California during 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. Below normal significant fire potential should continue in the southern Sierra and San Bernardino Mountains through September.

Areas along and near the Mogollon Rim from Arizona into west-central New Mexico will have above normal significant fire potential through August due to the weaker than normal monsoon. Areas of above normal may expand in August and continue into September across portions of the Southwest with the intermittent monsoon and excessive heat. Continued above normal temperatures and below normal rainfall leading to flash drought conditions will lead to above normal significant fire potential across wide swaths of Texas through the Lower Mississippi Valley into September. Above normal potential is also likely from central Georgia through the interior Carolinas in August.

Much of the western Great Lakes and Upper Midwest and Mississippi Valley are likely to have above normal significant fire potential through September with areas of above normal potential retained into November. Above normal potential is forecast for portions of the central Appalachians into Mid-Atlantic during October during their fall fire season window. Lee sides of Hawai'i are expected to have above normal potential through the period, with above normal potential expanding eventually to much of the island chain by fall. Alaska is forecast to have near normal significant fire potential, except August will have above normal activity in the eastern Interior and Copper Basin.

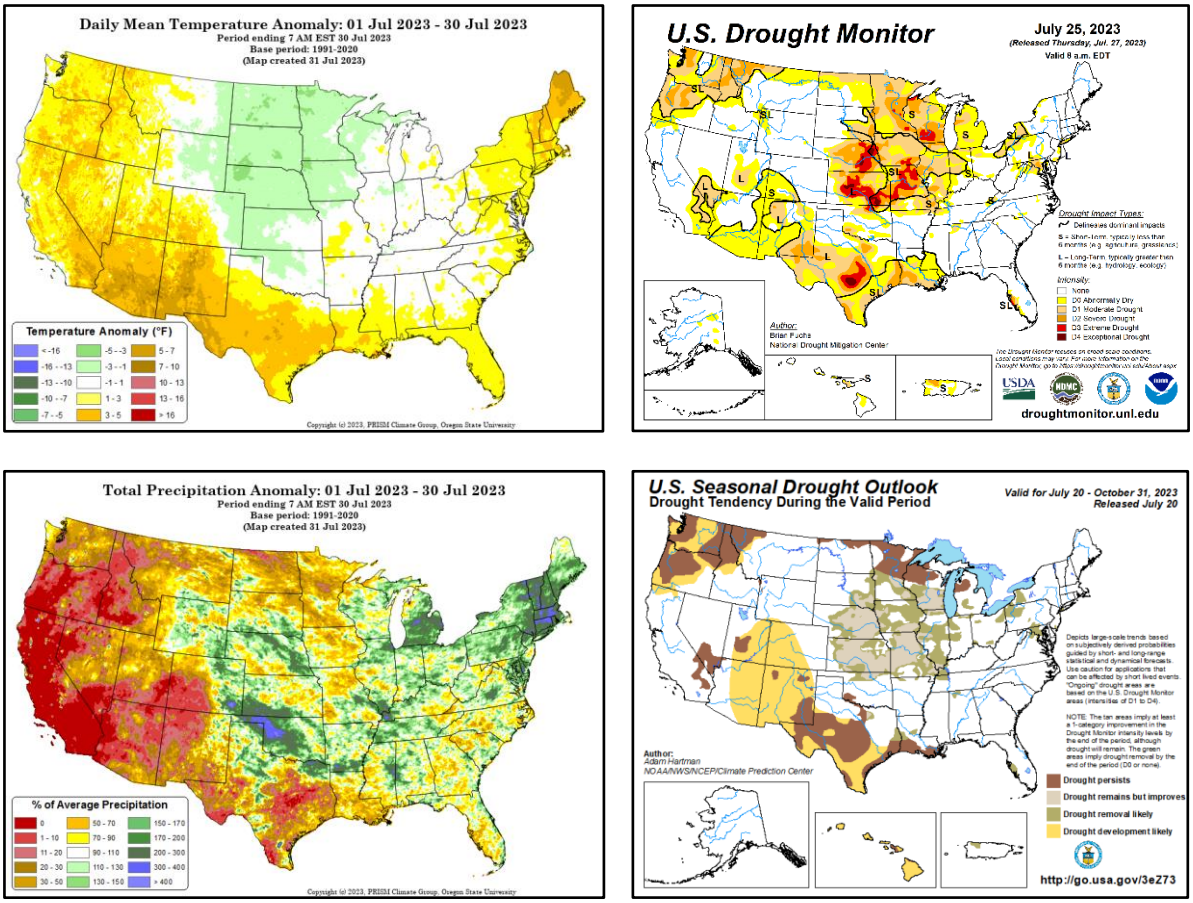
Past Weather and Drought

Record breaking heat continued over the southwestern US into Texas through July as the North American Monsoon has been delayed and weaker than normal. This led to near daily isolated to scattered mixed wet and dry thunderstorms across the Southwest, with occasional expansion through the Four Corners, Great Basin, and central Rockies. Upper low passages also produced occasional periods of isolated to scattered thunderstorms across the Inland Northwest through the northern Rockies, including multiple rounds of nocturnal thunderstorms. Precipitation was well below normal and temperatures above normal across most of the West. Record heat examples included El Paso having more than six consecutive weeks above 100°F, and Phoenix with 30 straight days over 110°F. Phoenix's July average temperature was nearly four degrees above the previous warmest month. Areas in the southwestern US received little to no precipitation marking

their driest July on record. The widespread warmer and drier than normal conditions across the West led to rapid curing of fuels by the end of July.

Mostly warmer than normal temperatures spread along the Gulf and East Coasts, with near to below normal temperatures across much of the Plains into the Midwest and Southeast. Above normal rainfall was observed across much of the southern and central Plains. Significant flooding affected the Lower Ohio Valley, especially western Kentucky, and across New England, especially in Vermont. Above normal rainfall was observed in much of Michigan, but mostly below normal rainfall was observed from the northern High Plains into the western Great Lakes and Upper Midwest. Parts of Texas into the Lower Mississippi Valley are nearing flash drought conditions, with accelerating drought in parts of south, west, and central Texas.

Alaska had a cool and wet start to July, but warming temperatures, less frequent rainfall periods, and widespread lightning led to dozens of new fires in late July across the Interior, including several large wildfires. Tropical Storm Calvin brought heavy rainfall to the Big Island, but overall, a warming and drying trend continues across the islands. Severe to extreme drought continues for the US Virgin Islands, but southern portions of Puerto Rico, most wildfire prone areas on the island, received above normal rainfall in July.



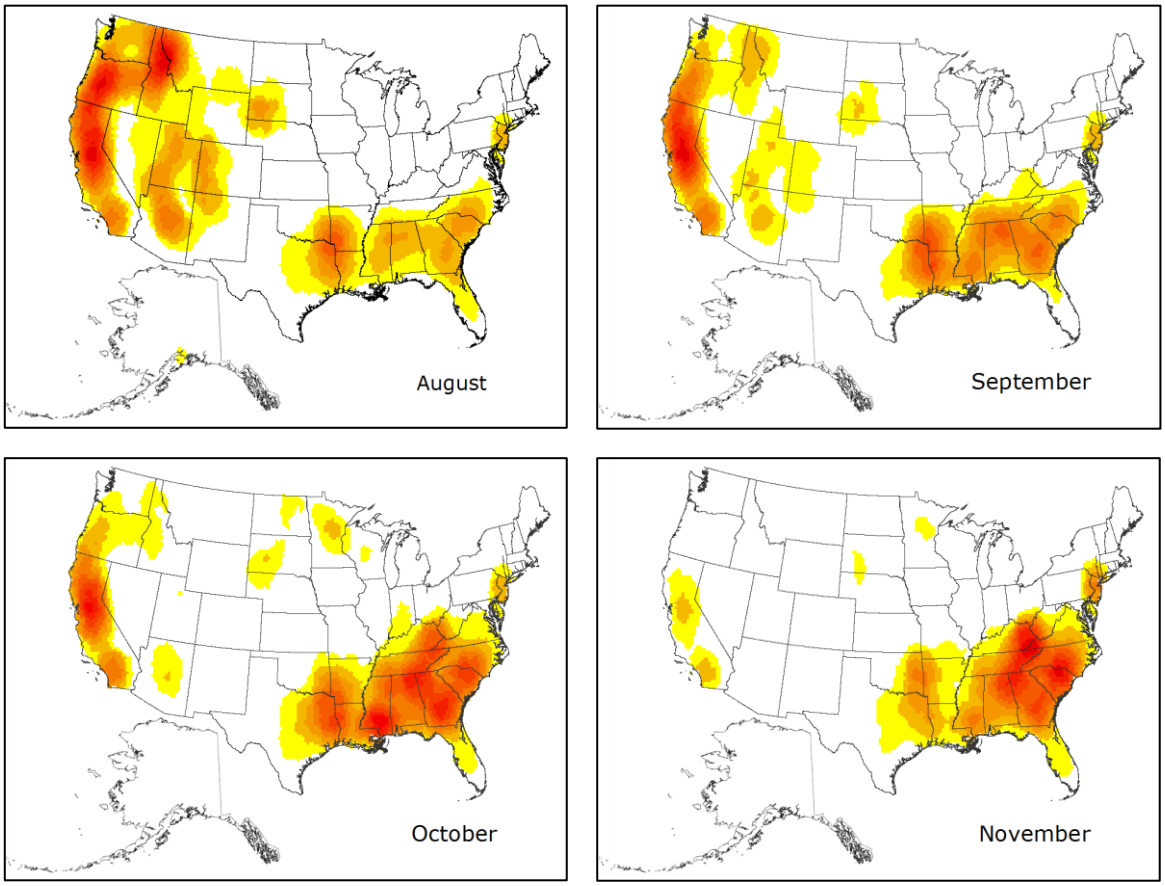
Left: Departure from Normal Temperature (top) and Percent of Normal Precipitation (bottom) *(from PRISM Climate Group, Oregon State University).* **Right: U.S. Drought Monitor (top) and Drought Outlook (bottom)** *(from National Drought Mitigation Center and the Climate Prediction Center).*

Weather and Climate Outlooks

El Niño continues in the equatorial Pacific Ocean, with warmest sea surface temperature (SST) anomalies in the eastern equatorial Pacific Ocean. SSTs are consistent with a weak El Niño, and atmosphere responses to El Niño are being observed. The Climate Prediction Center forecasts a greater than 90% chance of El Niño conditions continuing through winter, with about a 50/50 chance of a strong El Niño developing this fall. 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

Above normal wildfire potential is expected for Alaska in August as weather ramps up to the hottest and driest of the season, and fire activity responds accordingly, much later than normal. Conditions are expected to become normal for September through November as fire activity slows and Alaska moves out of fire season. The season usually ends in October with the establishment of the permanent winter snowpack.

The U.S. Drought Monitor shows local areas of abnormally dry conditions in the Upper Yukon Valley, Upper Tanana Valley, and Copper River Basin. The Canadian Forest Fire Danger Rating System (CFFDRS) Drought Code also indicates that deeper fuels are driest in these areas, though values are only close to average and not near historic highs. Ample rainfall from a combination of stratiform and convective events over the first half of the summer has prevented more significant drought from developing.

The El Niño now in place suggests a tendency for warmer than normal weather in August, in agreement with the Climate Prediction Center forecasting warmer than normal conditions. The signal regarding precipitation is less clear, and skill is notoriously poor for precipitation forecasts in Alaska beyond three days. Though early August usually brings widespread stratiform rains and cooler temperatures that effectively end wildfire season, the long-range models do not show this happening for at least the first half of the month. Currently, temperatures are forecast to be in the

upper 80s with little precipitation across eastern Alaska for the next two weeks. With delayed season ending rains, it is likely that fires will continue burning well into this month instead of slowing down as is typical in early August.

Until the last week of July, Alaska had functionally no fire season. The total area burned across the state through July 23 was less than 2,000 acres, by far the lowest tally observed since detailed mapping of wildfire perimeters began in 1993. A radical change arrived on July 24 and 25 as nearly 30,000 lightning strikes started more than 60 new fires across the Interior. The trend continued through the end of the month with more lightning causing over 100 new fires in a five-day period. With limited resources, many of these fires that normally would have been quickly caught are still burning uncontrolled. This starts August with a much bigger uncontrolled array of fires than in a normal season.

Record heat during late July has rapidly accelerated drying of sub-surface duff layer fuels. Buildup Index (BUI) has steadily climbed 4 to 5 points daily, moving much of the eastern Interior into conditions that will require more effort for control and mop-up. Though these BUIs are only near historic averages, but no rain in sight indicates that these values will continue to climb, and fuels will support more extensive and resistant fire activity.

With numerous new wildfires spread across the Interior at the end of July, the intensity of the season has increased from minimal to above normal activity for the start of August. It is likely that many lightning ignitions from this past week will present sporadic control challenges until the season ending rains stop activity. These rains generally arrive by mid-August to dampen fuels and stop fire spread. At this time, it is difficult to ascertain when those rains will arrive, but current models do not hint at that pattern change through the middle of the month.

From September through November, more typical wildfire activity is expected. As days shorten and the sun angle decreases, cooler weather brings freezing nighttime temperatures and an effective end to fire activity. The permanent winter snowpack is usually established in October and November, bringing an end to the fire season.

Northwest

The entire geographic area including Predictive Services Areas (PSAs) NW01 through NW12 are expected to have above normal significant fire potential in August and September.

July was hotter than average for the entire geographic area, although temperatures moderated in the last week of the month. Rainfall was well below average for most of the geographic area, especially western Oregon where monthly totals were quite low. Precipitation from thunderstorms brought spotty precipitation near monthly normal amounts to sections of central Oregon and central Washington. Drought designations are expanding in area and severity week by week in almost all of Washington, especially west of the Cascades. For Oregon, drought designations are increasing in western Oregon and northeastern Oregon while decreasing in southeastern Oregon.

The number of new fires in July has been below average. Over 600 new fires were reported with over 100,00 acres burned. Large grass and brush fires continued to occur in eastern Oregon and Washington in areas prone to wind, with the largest fire east of the Cascades being over 50,000 acres. West of the Cascades two long duration incidents started near the end of July. One is in southwest Oregon, which is currently over 20,000 acres. The second large fire is east of Eugene and is currently over 6,000 acres.

ERC values across the area are trending at or above seasonal averages for this time of year. Dead fuel moistures are also tracking at or below seasonal normals. Live fuels are fully cured at lower to mid elevations and when aligned with wind are producing rapid fire spread on the east side of the Cascades. West of the Cascades, live fuels are much drier than normal and are increasing potential for large fires in west side PSAs, which should last through summer.

NOAA and other outlooks for August indicate above average temperatures for the entire geographic area, but there is no anomaly foreseen for precipitation in August except southeastern Oregon where below normal precipitation is most likely. For September through November, temperatures are most likely to be above average and precipitation most likely to be below average for the entire geographic area.

Significant fire potential will be above average for the entire geographic area in August and September. In October, elevated risk of significant fires will shift west of the Cascades due to the likelihood of dry easterly winds in autumn. By November, significant fire risk will decrease back to normal (i.e., low) for the entire geographic area as cooler and wetter weather arrives.

Northern California and Hawai'i

Significant fire potential is projected to be normal for August and November and near to above average for September and October. Historically two to six large fires occur per Predictive Services Area (PSA) in August then lowers to one to three per PSA during September, with the exception being the Bay Area PSAs where less than one occurs. During October and November, all PSAs generally average one or less significant fire. Hawaii's significant fire potential is normal for August and above normal September through November, with expanding potential through the period.

The weather pattern during July was a mix of stronger upper-level ridging and weak upper-level troughing. Heat waves led to well above normal temperatures and low to very low humidity over two-to-three-day periods during the first three weeks of the month. A few record temperatures were broken during the latter two heat waves. Temperatures during July were near to above normal, especially in and around the Sacramento Valley, and precipitation was generally near to below normal. Dead fuel moisture values fluctuated, but a good portion of the month was unusually dry except for portions of the eastern North Ops until later in the month.

Critically dry values were observed across the near coastal PSAs with ERCs above the 90th percentile. Herbaceous fuels were both in a green-up and curing phase depending on elevation. Elevations below 3000 to 3500 feet became mostly cured west of the Cascade and Sierra Crests by the end of the month, with peak herbaceous green-up conditions found between 6000 to 7000 feet. Cheat grass became mostly cured across the more exposed mid elevations of the northeast and east. Woody shrubs and canopies continued to hold near to above normal moisture during July and were not as flammable. However, some species like chamise, oak, sage, and other brush became more flammable by the end of the month across the lower and some mid elevations. Snowpack by the end of the month was generally found in patches above 7500 feet.

Lightning observed through July 26 was substantially less compared to June with a total of 685 strikes. The average total for July is a little over 7500 cloud-to-ground lightning pulses based on the 2012 to 2022 period. One lightning event was noteworthy with nearly 200 strikes and less than 0.15" of rainfall but only resulted in one fire ignition. There were no dry gusty northerly and easterly wind events, but there were a handful of dry-gusty onshore wind events. Red Flag Warnings due to low humidity and gusty winds were issued on the on July 24 and July 26 across northeast California. The most notable fire through July 26, in terms of size, was the Wonder Fire located in Shasta County on July 24. It grew to a little over 150 acres in brush and timber. The average number of fire ignitions per day was around 20. Prescribed burning slowed down a little bit compared to the previous two months, but broadcast burn projects were completed across most elevations.

The weather outlook for August and September depicts a bit of everything with additional heat waves and Pacific trough impacts, including some enhanced dry and breezy onshore wind periods. Average temperatures should be near to above normal, while precipitation anomalies are expected to be mixed but mainly near to below normal. Some convective thunderstorm events should provide some localized above normal rainfall. Onshore winds will remain the dominant

wind flow during August and September, although a few weaker northerly wind events will be possible but should not be outside of the climatology. Lightning events will become more problematic during August and September as the live fuels become more flammable across a broader portion of North Ops. Forecast confidence is mixed for October, although a warmer and drier signal is more likely. It is too early to gauge the strength or frequency of the offshore wind events during October, but some will likely occur and could lead to rapid fire growth in areas west of the Cascade and Sierra Crests. A moderate to strong El Niño suggests an active cool and wet storm track during November.

Live woody fuels will continue to cure and aid in some extended critical alignment periods across the low and mid elevations August through October. The abundant cured out grasses will remain a concern during the next few months until widespread green-up occurs during November. The highest elevations are not expected to be critically aligned until perhaps October, although sun angles and daylight hours will be noticeably lower during the fall and the large fire footprints of the past three to five years will also act to limit fire spread. Drought conditions should return across the northern tier during the next two to three months and help to focus the above normal potential areas. The near coastal areas should experience enough marine intrusions to help ease fire danger levels at times during August and September but for how long is less discernible. The expected fire environment conditions suggest near average significant fire potential for August and coincides with the typical peak activity for the year. Near to above normal significant fire activity is expected for September and October since the numbers historically trend less, while flammable alignments and a few critical weather events are expected. Normal potential returns in November as the dry fuel environment should noticeably improve.

Sea surface temperature (SSTs) anomalies surrounding the Hawai'ian Islands were near normal and are expected to remain that way the next four months. Average temperatures during July were near to above normal. Precipitation was mixed with generally below normal across most of the islands, but portions of the Big Island received abundant amounts of rainfall due to Tropical Storm Calvin July 18-19. Calvin did provide some beneficial moisture, but since it was a glancing blow drought conditions were only eased in a few areas. El Niño will continue to strengthen and will likely peak late in the year, and there is a higher likelihood of it becoming strong during fall. Precipitation is likely to be below normal during the four-month period, with mixed signals possible in areas during the dry season due to tropical storm activity. Tropical cyclones can also bring a windy and dry conditions depending on how they approach the island chain and can exacerbate fire growth potential. Average temperatures should be near to slightly above normal. The previous wet season was unusually moist most areas and has led to abundant herbaceous growth and notable curing now exists across the leeside areas. Drought will likely expand and intensify during the coming months as the return of the wet season in the fall is expected to be drier than normal. The above normal signature will start out smaller during August and mainly be relegated to the leeside areas but expand further during September through November as the dryness expands and intensifies on more of the island chain.

Southern California

Significant fire potential will continue to run below normal at higher elevations through the remainder of summer and will be near normal elsewhere.

After a long stretch of cooler than average months dating back to last year, the first significant heat of the season arrived right at the start of July for southern California. From there, other than a brief cooldown after July 4, persistently warmer than average temperatures continued for the remainder of the month. The large-scale pattern became characterized by an anomalously strong ridge of high pressure, which mainly fluctuated from being centered in California, the Desert Southwest, and the Four Corners. The marine layer was near normal in depth early in the month, then became shallower than normal for most of the remainder of July. However, it did keep weather persistently much colder within 15 miles of the coast, with near to below normal temperatures at most coastal areas in July.

The monsoon has been slow to start. In fact, there was little hint of it at all for California until the third week of the month. And while there were a couple surges of monsoonal moisture during the second half of the month, there was well below average shower and thunderstorm activity across the region. Winds in July followed typical patterns, with little to no offshore flow and mostly typical breeziness through gaps, canyons, and desert passes during periods of stronger onshore gradients.

Moderate drought expanded slightly across the region in July, with the increase concentrated over the high desert. However, the vast majority of California is not in a drought status. The hot weather led to rapid drying of fuels in July. Below 3000 to 4000 feet, and away from the marine influence, the grass crop is now fully cured and had mostly cured by the middle of July. Field reports continue to confirm that fine fuel loading is very heavy this year, a result of the past winter precipitation. While rapid snowmelt continued across the higher elevations in July, and most areas are snow free, there remains some snow cover present at elevations above 8000 to 9000 feet.

All classes of dead fuel moisture saw noticeable downward movement thanks to the hot weather in July. 100-hr and 1000-hr dead fuel moisture are now running near or drier than normal in most areas after being well above normal most of this year. ERC values have significantly increased thanks to the hot weather and the drier fuels and are now more in line with typical peak fire season values, on either side of the 90th percentile. However, live fuel factors continue to play a major role in fire behavior. Despite the much drier dead fuels and higher ERCs, moist live fuels continue to greatly limit fire activity at elevations above 3000 to 4000 feet where non-grass fuel types are dominant. Fire activity was well below normal in July and what fires occurred were almost exclusively confined to light, flashy fuels.

El Niño conditions remain present in the equatorial Pacific. While the pace of warming has slowed, the sea surface temperature (SST) profile of the Pacific resembles that of a classic El Niño event. However, waters in the subtropical and middle latitudes off the West Coast of North America remain mostly colder than average, which is typically not favored in El Niño. All indications are that El Niño conditions will continue into the winter and will probably strengthen a little more.

Fuel drying will continue in August, although most fuel types will still run wetter than normal. With the grass fully cured, attention will be turning to shrub and brush species such as sage and chamise. Expect fuel moistures in these species to trend closer to normal due to the heat, but they will likely remain wetter than normal overall due to such a slow start to the drying season and will reach critical or near critical levels later than normal this year. The most pronounced differences from normal conditions continue to be at higher elevations, above 7000 feet, where the winter’s record snowpack continues to keep fuels and soils much wetter than normal.

Climate models and the current SST profile support an upper-level ridge-dominant pattern across the West in the coming months. However, the ridge center should trend more towards the Intermountain West and Four Corners in part due to lingering cold water off the West Coast. While it will be shallow, there should remain a persistent marine layer bringing much cooler weather within 15 miles of the coast through August, also due in part to those cold SSTs. Temperatures will likely run above normal the next few months due to the ridging, but not dramatically above normal. Expect an increase in monsoonal activity in August and continuing into September as the mean ridge center settles close to the Four Corners, bringing more southeast flow aloft. Thunderstorm activity, which has been well below normal so far, will likely be above normal in August and September, but not as active as in 2022. The monsoon will also likely continue later than normal, through most of September, as the seasons continue to show some lag compared to normal.

Lingering effects from winter will bring below normal fire activity at elevations above 7000 feet through summer. At lower elevations, the high fine fuel load and expectations of above normal temperatures will likely lead to near or a little above normal grass fire activity through the rest of

the summer. Above normal live fuel moisture in shrubs will continue to limit fire behavior in grass-shrub types through much of August, but fuel moistures will trend towards critical values by late August. This should allow mid-elevation fire activity to increase by later August and September, at least to levels closer to normal. Due to below normal activity in timber-dominated fuels, resource demand will likely remain below average for the geographic area.

This time of year, a focus becomes expectations for the coming transitional season, including Santa Ana winds for southern California. Currently, there are no strong indications on whether the timing or frequency of Santa Ana winds will differ notably compared to normal. With expectations for a later end to monsoon season, a ridge-dominated pattern across the Intermountain West, and the general trend in recent months of a “seasonal lag”, this may tilt the odds towards Santa Ana winds arriving later than normal. However, confidence is not high in this scenario. A wetter than normal winter remains likely, driven by El Niño. However, most modeling is favoring a delayed start to the rainy season, more late winter to spring, but still delivering a above normal precipitation. Once again, this would follow the recent trend of lagging seasonal transitions. As always, balancing the competing arrivals of the winds and the rains will be vital in dictating this fall’s fire potential.

Northern Rockies

Significant wildland fire potential is expected to be above normal for most of the western portion of the Northern Rockies Geographic Area (NRGA) for August. Above normal potential continues into September for northwest Montana and northern Idaho but more of the NRGA returns to normal potential. The area of above normal potential is where moderate to severe drought is expected to persist through summer, with above normal temperatures and normal to below normal precipitation. While hot and dry conditions are widespread in the NRGA, the remainder of the NRGA does not have strong signals that support a deviation from normal fire season forecasts.

In the last month, areas of drought and abnormal dryness in southern Montana and southern North Dakota have improved by one to two categories, leaving only a small area of drought surrounded by a small area of abnormal dryness in Yellowstone National Park and no further areas of drought in southern Montana and North Dakota. North Idaho, western and northern Montana, and northern North Dakota have seen continued or worsening drought conditions, with abnormal dryness to moderate drought now stretching across all the northern portion of the NRGA and areas of severe drought in north Idaho and northwest Montana. The Climate Prediction Center monthly outlook calls for no changes to the current drought situation in the NRGA, while the seasonal outlook calls for a slight expansion of the current drought in north Idaho and northwest Montana to the south and east with no other changes.

Temperatures have been uniformly above normal in the NRGA for the past month, with stronger above normal temperature anomalies over west-central Idaho near Lewiston and east-central Montana around the Missouri River Breaks. Above normal precipitation earlier this year has mitigated the effects of high temperatures around the Missouri Breaks. A combination of anomalously high temperatures and anomalously low precipitation has led to record high ERCs and fuel moistures below 3% in NR05 (Camas Prairie of Idaho) around Lewiston, Idaho.

Hot and dry conditions under strong high pressure for much of the last month have accelerated drying of dead fuels across the NRGA. While southwest and south-central PSAs in central Idaho and Montana are still just below 90th percentile ERCs (NR08, NR09, NR12, and NR14), the remaining PSAs in north Idaho and northern Montana are at or above 90th percentile, with NR05 above the 97th percentile. Similarly, PSAs in the southern portions of north Idaho and Montana are still slightly above the 10th percentile for 1000-hr fuels (NR06, NR08, NR09, NR11, NR12, and NR14), while the PSAs in the northern portions of north Idaho and Montana are at or below the 10th percentile, and NR05 is just below the 3rd percentile. Live fuels have continued to impede fire spread up to this point, but Growing Season Index charts indicate a rapid shift towards

dormancy and curing of live fuels in north Idaho and most of Montana. NR15-NR18 in North Dakota and far eastern Montana are currently near normal for ERCs and fuel moistures.

Minimal to light initial attack was reported for most days throughout the month of July. There are currently multiple large fires burning within the NRGA; the largest is Colt, near Seeley Lake in northwestern Montana with periods of active to extreme fire behavior. On July 25, a fire in southeast Montana showed rapid spread and grew over 3000 acres in one period.

PSAs 1-11, and 13 (nearly all the western NRGA) are expected to have above normal significant fire potential in August and PSAs 1-5 and 7 (north Idaho and northwest Montana) are expected to continue with above normal potential in September. Normal significant fire potential is expected for areas that were not mentioned in August and September. All PSAs are expected to have normal significant fire potential for October and November.

While the CPC outlooks for the next two weeks show above normal temperatures and precipitation for most of the NRGA, weeks three and four drop the precipitation to near normal while keeping the temperatures above normal. The seasonal outlook shows above normal temperatures with below normal to normal precipitation. This forecast supports the above normal fire significant fire potential outlook for northern and western PSAs in August and September.

Great Basin

Fire activity picked up across the Great Basin in July. Initial attack fires increased from near daily thunderstorms over central and eastern areas of the Great Basin. There have not been any issues with these fires yet due to the increase in relative humidity and some showers. However, fire activity has been increasing in central Idaho due to rapidly drying fuels and the lack of precipitation. Much warmer temperatures in July accelerated the curing process, and sagebrush live fuel moisture has been dropping across the Great Basin. The monsoon was significantly delayed this year, but there were pulses of moisture in July and more are expected heading into early August, especially across Utah, Arizona and at times, southern and eastern Nevada. Due to the moisture expected to push north, southern, and eastern areas of the Great Basin should see a return to normal fire potential. Parts of eastern or northeast Nevada, or even northern Utah may be on the fringes of this moisture and will still need to be monitored for above normal potential by mid-late August. Otherwise, above normal fire potential is expected in August and September across northwest Nevada into southern and central Idaho due to carryover fine fuels and new growth, along with rapidly drying fuels at all elevations heading into August. Fire activity may return to normal regionwide by October and November.

A record snowpack across the southern two-thirds of the Great Basin along with above normal winter precipitation significantly delayed the start of fire season across the Great Basin. Temperatures over the last 30 days have been near to above normal across the Great Basin, with temperatures near records at times in western Idaho and western Nevada. Precipitation in the last 30 days has been well below normal in the far southern Great Basin and over parts of northern Nevada into southern Idaho, but near normal in central and eastern Nevada and parts of central Idaho due to a more persistent periods of showers and thunderstorms earlier and later in the month. The wetter conditions over the last 6 to 12 months have improved drought conditions significantly, with most areas improving by one to two drought categories or more in the past several months. The only remaining drought is over southern Nevada and parts of southern Utah, where moderate to severe drought will likely continue. Otherwise, the rest of the Great Basin has no lingering drought conditions.

Curing of fuels was at least two to four weeks behind schedule in most areas, but grasses are drying rapidly. Due to hot and dry conditions in parts of the Great Basin in July, fuel moisture continues to rapidly dry in areas that have not seen recent thunderstorm activity, especially in the north and west. Heading into August, grasses are cured out on all aspects in the southern Great Basin, on most south and west facing slopes farther north, and in various states of curing even

farther north on north aspects. Sagebrush fuel moisture peaked a few weeks late and is now on the downward trend, with most areas near to just above normal. Some spots across the Great Basin are seeing live fuel moisture drop to just below normal. Fine fuel loading was above normal last year across the Snake River Plain and far northwest Nevada but was near or below normal elsewhere. The snowfall earlier this winter down to valley floors in much of Nevada and Utah compacted carryover fine fuels due to the extended period the snow remained on the ground. However, significant new fine fuel growth occurred this year due to winter and spring precipitation resulting in above normal fuel loading, despite the carryover component being lower in most areas. The only exceptions are over far northwest Nevada into southwest Idaho, where above normal carryover fine fuels exist as the lower elevation snowfall in these locations was not as significant as areas farther south. There are also multiple crops of cheat grass being reported in parts of Nevada and Utah, due to the return to wetter weather in late May and June, all of which has dried out through July. 100-hr and 1000-hr fuel moisture are near record lows in parts of central Idaho, far southern and eastern Utah that have not been receiving much of the recent moisture and are heading downward in western and northern Nevada. Fuel moisture will continue to drop heading into August. Soil moisture is above normal across the northern half of Nevada into northern Utah and southern Idaho, with the snowmelt and runoff, despite the recent drier weather in areas. Fuels will continue to dry out more rapidly through August as hot and dry weather continues along with a decrease in showers and thunderstorms by mid-month. Monsoon moisture will affect southern and eastern areas of the Great Basin at times, especially early in August, but farther north and west lesser moisture is expected.

Fire activity has increased in the last few weeks. Smaller fires occur daily, especially in areas of lightning. However, holdovers and human starts are also increasing. Larger fires recently in July have been most common across Idaho into northern Nevada where conditions have remained drier. Although initial attack fires have been increasing over the southern half of the Great Basin throughout July, these fires have remained small with increases in humidity and some showers. Fire activity will continue to increase throughout August as hot and drier weather continues most often across Idaho into northern and western Nevada.

Above normal fire potential will remain for August and September for northwest Nevada and southern Idaho and was expanded north to include central Idaho. We will continue to monitor conditions in eastern Nevada into northern Utah and eastern Idaho through August, as these areas may see an increase in fire potential by the middle of the month if moisture remains east and south. Otherwise, normal fire potential is expected over the southern and eastern half of the Great Basin due to increasing monsoon moisture heading into early August. Drier conditions for periods are certainly possible even through August over southern and eastern areas of the Great Basin, and this will be monitored as there could be an uptick in activity by mid-to-late August depending on when the next moisture surge arrives. Of note, years coming out of drought tend to lead to an increase of fires and acres burned in the lower elevations of Nevada and western Utah, especially when a very wet year follows an average or a wet winter the year before. The fall and winter of 2021-2022 had a wet October and December, which resulted in near normal precipitation across much of the northern two-thirds of the Great Basin that winter. The potential will exist this year, but the wetter weather pattern in June delayed the start of fire season. Therefore, fire season will start later, and either be shorter than normal, or extend later into September. Confidence is still low for the September to October period.

Southwest

Areas of above normal significant fire potential are expected during August for areas across western, central, and eastern Arizona into western and southwest New Mexico due to the continued variable nature of the monsoon combined with hot temperatures and rather widespread fine fuel availability and continuity. Other portions of western and northern Arizona and western and northern New Mexico could also remain unusually active in areas where fine fuel loading and continuity are significant and combine with above normal temperatures and prolonged periods of dryness.

The overall trend through most of the first six months of 2023 was for cooler and wetter than normal conditions focused along and west of the Continental Divide and across the northern tier of New Mexico. The southeast tier of New Mexico has been both warmer and drier than normal for most of 2023 so far. Over the past four or so weeks, drier conditions have established across much of the geographic area, with lengthy periods of above normal to record setting temperatures.

Last summer's above normal monsoon contributed to an abundance of fine fuel buildup across many areas of the geographic area. Despite an unusually moist May for portions of the Southwest Area (SWA) and near to slightly below normal temperatures through much of June focused along and west of the Divide, these dead fuels will continue to be available to burn this summer. The anomalous above normal precipitation across sections of the SWA this spring into early summer has played a large role with re-greening up of various fuel types. However, given the recent drying and prolonged heat, ignitions have recently become more of an issue as the more widespread finer fuels continue to dry out and have been a factor with the drier than normal thunderstorm activity that has been common so far this summer.

The ongoing El Niño conditions and likely further intensification over the next few months will likely continue to have a big influence on the weather and climate for the forecast period. Historically, this points towards a weaker than normal monsoon, with periods of lingering above normal temperatures. Some brief or relatively brief above normal monsoonal pulses could occur at times regionally into September. More areas of above normal significant fire potential could result during late summer due to the overall weak monsoonal flow and prolonged heat. Some other areas west of the Divide could be added to above normal significant fire potential in subsequent outlooks. In addition, above average heat and below normal precipitation are anticipated for the southeast one-third or so of New Mexico over the next month. Large fire season could be prolonged until sometime in late summer or early fall when moisture from the southeast arrives with vigor across eastern sections of the SWA as the upper-level high is suppressed back southward over Mexico.

Rocky Mountain

The Rocky Mountain Area (RMA) is expecting normal fire potential through the outlook period. The monsoon has been late to arrive, but monsoonal moisture will become more prevalent in early August. This will help to keep fire potential closer to normal. It should be noted that with El Niño conditions continuing, the monsoon could still be more intermittent than normal. Thus, brief periods of increased fire potential are possible. Year over year drought indicators continue to show improvement for nearly all the geographic area except for portions of Kansas and Nebraska. Long term outlooks are for above normal temperatures for the western half of the geographic area along with below normal to normal precipitation, due to the weaker monsoon. The rest of the geographic area will generally be normal for both temperature and precipitation.

The weather pattern over the last month has been mainly dominated a large upper high centered over the Four Corners, with upper-level ridging over much of the West. This high pressure resulted in temperatures that have been above normal for much of southern Colorado, generally running 1 to 4 degrees above normal. Grand Junction had one of its warmest Julys on record and one of its driest. These hot and dry conditions have started to extend into southwest Wyoming where last couple of weeks have been trending warmer than normal. However, under the high-pressure regime, winds have largely remained light, with no large-scale wind events. The hot and dry conditions have also introduced abnormally dry conditions. The rest of the geographic area was east of the high pressure and saw several lows and cold fronts move through. This led temperatures through July running 1 to 4 degrees below normal, with above normal precipitation. The precipitation helped reduce some of the drought conditions on the central Plains, but areas of extreme to exceptional drought have continued across parts of Kansas and eastern Nebraska.

Fuel moistures east of the Continental Divide are above normal, where temperatures were cooler and rainfall was more prevalent. These are areas that have seen much wetter conditions since

spring and have higher than normal fuel loading. Western Colorado into southwestern Wyoming have seen the fuels responding quickly to the hot and dry conditions, with most areas seeing fuel moistures dropping below normal and recently started exceeding minimum values. It should be noted that climatologically the monsoon normally would have already developed, bringing more moisture to the area. Thus, fuel moistures normally start to increase, and ERCs start to decrease. With the late arrival of the monsoon, most areas are currently showing trends that would be expected for late June into July.

While June ended with several large fires developing in southwest Colorado, much of the fire activity through July remained small. A few large fires sporadically developed but were able to be quickly managed. With a lack of wind events, new and existing fires have not seen significant growth.

Seasonal precipitation outlooks are normal for most of the RMA. Western Colorado is the one exception where the trend will still be little below normal for August. However, with signals for the onset of a more monsoonal pattern, this will likely give way to more normal conditions. Those drier conditions are expected to lead to drought development. 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.

The outlook for the RMA depicts normal significant fire potential across the geographic area through November. There may be periods of enhanced fire potential based on the potential for a weaker monsoon given the EL Niño pattern and local fuel conditions, but the larger scale picture favors normal significant fire potential.

Eastern Area

Near normal significant fire potential is forecast across the majority of the Eastern Area August into November. Above normal fire potential is expected across the western and central Great Lakes August into September. Above normal fire potential may develop over the southeastern Mid-Atlantic States heading into October.

Negative 30–90-day soil moisture and precipitation anomalies remained in place across much of the Mississippi Valley towards the end of July, with near to above normal conditions across the remainder of the Eastern Area. Longer term drought remained in place across the eastern Mid-Atlantic States and the Mid-Mississippi Valley.

The Predictive Services weather trend outlooks forecast below normal precipitation across portions of the Great Lakes and the eastern Mid-Atlantic States August into September, persisting over parts of the Great Lakes through fall. Above normal precipitation is forecast over portions of the Mid-Mississippi Valley through the rest of the summer heading into fall. According to the NOAA Climate Prediction Center long term outlooks, near to above normal precipitation trends are also forecast across the southwestern tier of the Eastern Area into early fall.

According to the Predictive Service temperatures trend outlooks, near to above normal temperatures are forecast over the Upper Mississippi Valley and Northeast through August, and much of the Eastern Area in September. Above normal temperatures are expected across the northeastern half of the Eastern Area through fall.

Above normal fire potential is forecast to persist across portions of the western and central Great Lakes August into the fall, despite an increase in precipitation frequency across parts of the Great Lakes as July progressed. This area still has 2-6” precipitation deficits for June and July, the wettest summer months, which has led to drought stress in live vegetation including trees. Even with forecasts for normal precipitation into fall, it will not be enough to reverse the current stress. Drought Codes from the Canadian Forest Fire Danger Rating System (CFFDRS) that represent

drying deep into the soil are 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. Typical summer precipitation in the form of showers and thunderstorms will increase chances for lightning caused fires and holdovers outside of the precipitation. Areas of sandy or rocky soils dry out quickly and are of concern. In agricultural areas, haying 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 this summer, increasing the potential for fires to start in areas of peat and organic layers.

Increasing significant fire potential is forecast across the southeastern tier of the Eastern Area progressing through fall. Warmer and drier than normal trends are forecast August into September over these areas according to the Predictive Services climate outlooks. Near normal significant fire potential is expected across the majority of the Eastern Area through summer into fall. Above normal fire potential is forecast across the western and central of the Great Lakes August into November and across the southeastern tier later this fall.

Southern Area

Relentless heat and persistent dryness have led to significant changes to the Southern Area outlook through the end of summer. Flash drought development across Texas that began in June accelerated through July, resulting in increasingly parched conditions across much of the state. Coverage of Keetch-Byram Drought Indices (KBDIs) trending above 700 along with 14-, 30- and 60-day rainfall anomalies below 25% of normal have increased markedly, including into portions of Louisiana and Mississippi. July has also been significantly drier than normal from portions of central Georgia into the interior Carolinas, where spring and early rainfall was mostly near to above normal. Meanwhile, portions of Puerto Rico continue to see moderate drought, while the U.S. Virgin Islands are experiencing severe to extreme drought. Well-timed tropical waves have produced plentiful rainfall over the typically drier portions of Puerto Rico in recent weeks.

The expansive ridge of high pressure aloft responsible for heat across the Desert Southwest into Texas shows no signs of letting up for at least the next few weeks. This heat dome is expected to occasionally expand across the rest of the southern US into August, resulting in widespread coverage of triple-digit high temperatures over the Southern Area. Most long-range outlooks and prior El Niño analogs favor anomalous heat and drier than normal conditions for the Southern Area's coastal states into September. There remains some question as to how much the warming of eastern tropical Pacific water temperatures has affected the pattern in recent months, but most climate experts expect this oceanic warmth associated with El Niño to increasingly couple with the atmosphere during late summer. How much our weather lines up with typical moderate to strong El Niño's the next few months is somewhat uncertain, especially due to the unusually cool water off the coast of Baja California and historic ocean warmth globally, including in the north Atlantic. It is also unclear how Atlantic tropical activity will be affected by these competing influences, which may go on to affect precipitation anywhere in the geographic area. The number of Atlantic tropical cyclones is forecast to be near to below normal in 2023, but this has no bearing on where they may occur.

Texas and western Louisiana are front and center in above normal significant fire potential during August. The start of the growing season featured widespread near to above normal rainfall, resulting in an increase in herbaceous fuel loading compared to the spring fire season. Areas with less than 25% of normal rainfall the past one to two months have largely seen these fuels cure out, while the persistent above normal evaporative demand has led to critical live fuel moisture levels in their volatile fuel types, as reported in sampling conducted by the Texas A&M Forest Service. Fire behavior and resistance to control has also recently lined up with NFDRSv4 100- and 1000-hour fuel moisture levels trending to and below the 10th percentile across southeast and portions of central Texas. The expected driest parts of Texas and Louisiana are included in above normal significant fire potential into September, which admittedly could carry over into October if the 2015 Super El Niño analog is any indication. Sea breezes and tropical disturbances

may gradually chip away at dryness for areas closer to the coast, and any decision to maintain these PSAs in above normal potential will be deferred to next month's outlook. It should be noted that any pattern that leads to increased thunderstorm activity across Texas and Louisiana the next few weeks may come at the cost of increased lightning ignitions given the state of fuels, as was observed during late July across southeast Texas.

Grass-dominant areas of the Plains may see curing in the coming weeks after a rather wet few months, but we are in a climatologically unfavorable time of year for high winds, which should limit activity farther northwest in Texas and in much of western Oklahoma. The Texas mountains continue to see ERC-Y above seasonal maxima, but occasional bouts of lightning have not yet led to anomalous fire activity for the Trans Pecos. The North American Monsoon does not show any signs of ramping up in a meaningful way, which should lead to a continuation of above normal ERCs that occasionally increase to or above the 90th percentile during extended hot and dry periods. While wind-driven fires are unlikely for the mountains, fuel dryness, continued heat, and the risk for lightning ignitions are reason enough to maintain above normal significant fire potential there. Portions of northeast Texas into Oklahoma, particularly near the Red River and in the pine-dominant areas of eastern Oklahoma, may see an uptick in activity if the very hot and dry pattern that starts August carries into mid- and late-month. Up until the past few weeks, it has been wet in these areas, but 14- and 30-day rainfall is beginning to trend below normal.

Fuel dryness across eastern Louisiana into portions of Mississippi is also expected to increase the next few weeks. Normal rainfall averages from 1-2" per week in these areas (highest near the coast) this time of year, and these amounts do not appear likely to occur through at least the middle of August. With KBDIs steadily increasing in recent weeks, no wetting rain in two to three weeks and above normal temperatures likely to persist, these areas have been included in above normal significant fire potential for August.

Areas experiencing a recent dry spell from central Georgia into portions of the interior Carolinas, including the Piedmont and Sandhills, are largely favored to remain drier than normal the next few weeks, while the heat dome will occasionally bring a risk for triple-digit high temperatures. Evaporative demand should be consistently highest across central Georgia, where KBDIs are already well above 500 and should easily surpass 600 on an increasing basis. ERC-Y is forecast to trend to and above the 90th percentile in early August across portions of the highlighted PSAs, while dead fuel moisture will approach critical values, as well. Lightning ignitions may increase heading into August in these areas, while climatology and long-range outlooks favor wetter conditions in the Appalachians and closer to the coast.

The Caribbean islands are of especially low confidence and were removed from the above normal significant potential depicted on July's outlook. Severe to extreme drought across the U.S. Virgin Islands is worrisome, especially given what should continue to be a hotter and drier than normal pattern throughout the Caribbean. That said, the southern portions of Puerto Rico most prone to wildfires have been wetter than normal the past 30 days.

The Southern Area's fall fire season is coming into view, but plenty of uncertainty remains. Above normal significant fire potential is maintained across the mountains of eastern Kentucky and western Virginia for October, where some wetter weather has occurred recently, but long-term dryness and drought persist. The National Drought Mitigation Center's long-term drought blend and NASA-GRACE root zone soil moisture both show significant dryness persisting across northern Virginia and small portions of eastern Kentucky. Unless wet weather sets in and persists or a tropical cyclone remnant affects the region, there is no reason to believe that this dryness will be alleviated. The increased forcing from El Niño also enhances the risk for early season freezes there, and long-term damage to fuels from the Hemlock wooly adelgid and last December's extreme cold may also come into play across portions of the Appalachians. Otherwise, a normal fall fire season is currently anticipated elsewhere in the Southern Area.

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