Executive Summary

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

Fire activity increased significantly across the West during June. Most of the significant fire activity was in the Southwest, Colorado, Utah, and Montana through mid-June with increasing fire activity across portions of California in mid to late June. The national preparedness level increased to four on June 22, the second earliest occurrence since 1990.

Drought expanded and intensified over the West with more than 90% of the West now in drought. More than half of the West is in the highest two categories of drought. Numerous all-time record high temperatures were set in the Pacific Northwest, northern Great Basin, and Northern Rockies at the end of June as part of a historical heat wave. The first surge of monsoonal moisture arrived in the Southwest, Colorado, and southern Great Basin during the last few days of June.

Climate outlooks indicate warmer than normal conditions are likely for much of the CONUS, especially the West, through summer. Much of the Rockies and the northern half of the West are also likely to have drier than normal conditions through September. Near normal precipitation is likely with the Southwest Monsoon in July, which should help alleviate drought conditions and significant fire activity, but drought is likely to expand and intensify across much of the West through the summer.

Much of Southern Area is likely to have below normal significant fire potential through the summer with mostly near normal significant fire potential in Eastern Area and Alaska into fall. Above normal significant fire potential is likely to remain in portions of northern Minnesota into August.

Above normal significant fire potential will expand northward into the Great Basin and Rocky Mountain Geographic Areas through August with areas closer to the monsoon likely returning to near normal significant fire potential in July and August. Most of the Pacific Northwest, Northern Rockies, and northern Great Basin are expected to have above normal significant fire potential in July and August with areas beginning to return to normal significant fire potential in September and October. Most of the mountains and foothills in California are forecast to have above normal significant fire potential through September with areas prone to offshore winds retaining above normal potential through October. Leeside locations, saddles, and divides in Hawaii are likely to have above normal significant fire potential into October.
Past Weather and Drought

More than 90% of the West is in drought with over half the region in extreme to exceptional drought. This represents the most expansive and intense drought for the West this century according to the US Drought Monitor. Drought continues to intensify in California and parts of the Pacific Northwest and Northern Rockies while persisting in the Great Basin and Southwest except for small reductions in New Mexico. Drought expanded in the Great Lakes and New England but improved in Texas and the Carolinas.

Temperatures were above normal across the West, northern Plains, Great Lakes, and Northeast in June. Mostly near normal temperatures were observed across the southern Plains and Southeast. Much of the southern Plains, Southwest, and southern portions of the Midwest received near to above average precipitation with much of the West receiving below average precipitation except for portions of New Mexico and some areas in the Mojave and Sonoran Deserts. Much of the Interior of Alaska experienced normal to above normal temperatures with below normal precipitation.

Lightning activity increased dramatically across much of the West, including Alaska, during multiple episodes in June. Lightning episodes were also preceded and followed by very hot and dry weather, including a heat wave across the broader Desert Southwest around mid-month and a historic heat wave across the Pacific Northwest, Northern Rockies, and northern Great Basin in late June. Portland reached 116°F, SeaTac 108°F, and Quillayute 110°F, which broke its previous all time record high temperature by 11°F. Dallesport, WA and Hermiston, OR set state records for high temperatures at 118°. Widespread temperatures above 100°F, including many stations above 105-110°F, were observed across these areas. These record setting temperatures were possible due to an anomalously strong upper high over the Pacific Northwest, which helped bring moisture into the Southwest, Colorado, and southern Great Basin. Wet thunderstorms developed over these areas with widespread wetting rain in New Mexico, especially along and east of the Continental Divide, during the last few days of June.
Weather and Climate Outlooks

ENSO-neutral conditions are present with near-to-below average sea surface temperatures (SSTs) over much of the equatorial Pacific Ocean. Other teleconnection patterns, like the Madden-Julian Oscillation, are likely to play bigger roles in shaping the weather and climate patterns during ENSO-neutral conditions. The Climate Prediction Center (CPC) forecasts a 78% chance that ENSO neutral conditions continue through summer with a 50% chance of continuing through fall. A return to La Niña later this year is possible, but there remains forecast uncertainty with this scenario.

Geographic Area Forecasts

Alaska: Normal fire potential is expected in Alaska for the remainder of the summer and into the fall.

Weather over Alaska through the end of June has not featured any serious bouts of heat and drought necessary to facilitate extreme wildfire behavior. Precipitation over the southeast panhandle of Alaska has been particularly heavy. Alaska’s North Slope is categorized as abnormally dry by the US Drought Monitor, but no areas are under legitimate drought conditions. Western and south-central Alaska have a chance for above-normal rainfall in July, but this signal fades by fall.

Fuels over Alaska’s Interior have been drier and more available for fire spread through June, but potential remains near normal. Wildfire activity has been near to below average through the end of June.

The Climate Prediction Center calls for temperatures in July to be above normal over the southern mainland of Alaska, with no signal elsewhere. Above average temperatures are possible statewide continues into the fall.

Normal significant fire potential is expected across Alaska through the remainder of the summer. Deeper fuels typically continue to dry and warm through July before the season-ending rains arrive in August. Snow will begin to accumulate at higher elevations by mid-September. The permanent snowpack for the winter is generally established at all lower elevations in Alaska during October, effectively precluding any significant fire activity.

Northwest: Almost all the Northwest geographic area is expected to experience significant fire potential that is above average into September before returning to normal by October.

Weather conditions varied widely in June. The month began with a warm and dry spell that was quickly replaced by cool and moist weather, which provided rain for much of the West-Side through the middle of the month. The last half of June saw a return to warming and drying that culminated in a record-setting heat wave in the last week of the month. Despite the cool and wet spell during much of the first half of June, temperatures ended up above average for the geographic area on both sides of the Cascades. Despite rainfall, drought conditions worsened slightly across the region with more areas added to the “exceptional drought designation during June.
Several significant fires were observed in June in central Oregon (PSAs NW06 and NW07) and northeastern Oregon (PSA NW11). Most days are seeing 15 to 20 fires a day with spikes over 40 during lightning events. Over 10,000 acres burned in June, with most of the acres coming from grass fires in Washington. The fires in central and south-central Oregon have required Type 3 and Type 2 incident management teams to be activated to meet objectives. Owing to quick detection and decent humidity recovery following lightning events, most ignitions have been kept small. Recently fires in NW10 are burning several thousand acres in one operational period with steady winds, but absent strong winds, the fires are still being kept small in this PSA. These large grass fires display the potential for problems ahead with the grass, sage, and pine interface of fuel types. Fire behavior is accelerating and anticipated to transition quickly in the days ahead due to the intense temperatures stressing and curing vegetation.

Heavy dead fuel moisture was well below average for most PSAs early in June, with some record low values reached. However, rainfall moderated heavy dead fuel moisture significantly in PSAs NW01 – NW06 by the middle of the month. However, the hot and dry trend late in the month brought record setting indices with heavy fuels losing moisture at an accelerated rate. The 100-hour fuels have recently dipped to all time low levels in some areas or tied minimums. To a lesser extent, the 1000-hour fuels are becoming anomalous as well. The implications of these large fuel classes dipping to such low levels, below 10% for the 100-hour fuels and below 15% for the 1000-hour fuels, indicate ignitions in the timber are likely to spread requiring a concentration of resources to manage these fires.

Units reported lower elevation fine fuels have cured east of the Cascades. For the whole area, fuel production is reported as being less than typical. Most live fuel moisture values are more typical of July. The implications are that the middle and higher elevation large fire potential is building to occur earlier in July.

Climate Prediction Center outlooks indicate that weather conditions are most likely to be hotter and drier than usual for July through September 2021 over the northwest geographic area. The potential for significant fires is expected to be above average through September for the entire northwest geographic area except northwest Washington (NW01), which should return to normal in August, and northeast Washington (NW09) and southeast Oregon (NW12), which are expected to return to normal in September. After September, significant fire potential is expected to drop to average and remain there through autumn 2021.

**Northern California and Hawai‘i:** Above normal significant fire potential is expected across much of the mid and upper elevations of the North Ops geographic area through August before expanding across all of North Ops except for northeast California in September and October. Significant fire potential is forecast to be above normal for all lee sides, saddles, and divides on the Hawaiian Islands through October.

Except for an area along the far northern California coast, precipitation was below average in June, and this continues the trend of overall below average precipitation since last fall. Temperatures were above average almost everywhere in June. The low elevation grass crop is cured below 3000 ft., and fuel loading among low elevation brush and grasses is near to below average. The high elevation snowpack has melted off, and although dead fuels are quite dry, live fuels still retain some moisture and greenness as June ends. The overall outlook for the North Ops region is for drier and warmer than average for the four-month period from July through October. Fire activity is expected to continue to increase in July as warm summer weather becomes predominant. Most mid and upper elevation areas have above normal significant fire potential from July through October except for some coastal areas through August and far eastern areas of North Ops. Lower elevations remain at normal through August because strong downslope wind patterns are unusual during summer months and fuel loading is lighter than in recent years, but these areas will move to above normal in September – October due to the onset of north-northeast and offshore wind season. The Far Eastside PSA is forecast in the normal category due to a light and less continuous fuel bed. Mountain areas near the coast remain at normal through August because nearby sea surface temperatures (SSTs) are cooler than average and more onshore flow is expected.
Sea surface temperatures (SSTs) surrounding the Hawai’ian Islands range from slightly warmer than normal in the northwest to slightly cooler than normal near the Big Island. Temperatures throughout the region are expected to reflect these SST trends through October. Dry weather since April has led to increasing drought throughout the region, especially on the lee sides, divides, and saddles of the islands. The four-month outlook calls for below average precipitation. Fuel loading increased in the heavy rainfall in March, and these fuels are drying out and becoming vulnerable to fire spread, especially on lee sides, divides, and saddles, and will occasionally become locally critically dry on windward sides during periods of dry weather. Significant fire potential is above normal throughout the islands on the lee sides, divides, and saddles from July through October. Significant fire potential is normal on windward sides, although some local spots may see periods of above normal conditions during dry spells.

**Southern California:** The significant fire potential will be above normal across most of the region July through September. However, the San Joaquin Valley and the deserts will continue to have near normal significant fire potential. In October, the significant fire potential will remain above normal across Southern California from the mountains westward, but the rest of the region will have near normal significant fire potential.

Similar to May, the weather pattern was progressive in June with a series of upper-level troughs and ridges moving inland over the West Coast from the Pacific Ocean. Inland locations observed above normal temperatures for the month while coastal areas observed near normal temperatures. This disparity was due to morning low clouds and fog from the marine layer over the coastal areas. An exceptionally strong upper high brought record breaking heat to interior parts of the region during the middle part of the month. There was little in the way of rainfall in June, except for a few days of isolated afternoon showers and thunderstorms over the Sierra and deserts, which is typical for June. Isolated showers also occurred across southern California from the coastal mountain slopes westward when the marine layer became exceptionally deep. However, most of the region received no rainfall in June. Winds were westerly across the area all month and became stronger across the mountains and deserts as troughs approached and moved inland.

The drought continued to worsen in June with most of the area now under extreme drought to exceptional drought. Exceptional drought remains across the deserts bordering Nevada and Arizona but has now spread to most of the Sierra and the southern San Joaquin Valley. Similar to May, both the 1000-hr and 100-hr dead fuel moistures are below the third percentile and broke many record low values away from the coastal areas in June. The live fuel moisture continues to slowly dry out and is around a month and a half ahead of where it should be for this time of year. Most live fuel moisture values at the end of the June were between 60% and 90%. However, isolated old growth fuel moistures were between 50% and 60%.

Sea surface temperatures (SSTs) have warmed across much of the Pacific Ocean including the Gulf of Alaska, the West Coast, and the Equatorial Pacific in June. Warming waters off the California Coast will cause the marine layer to become less deep across coastal areas and above average temperatures are likely for all South Ops July through October. The trough pattern over the northern tier of states looks less likely now during the summer months as the Pacific waters warm. The sub-tropical high will likely meander between the Four Corners Area and the Great Basin, which is where it usually is located during the summer months. Therefore, expect a near normal monsoon from July through September, but some guidance indicates a potentially an early end to the monsoon later this summer. Much of central and southern California will have above normal significant fire potential from July to September due to the expected above normal temperatures and the very dry fuel conditions. In October, central California will have near normal significant fire potential as temperatures cool. Above normal significant fire potential will continue across southern California from the mountains westward in October as very dry conditions are expected to continue along with the start of the Santa Ana wind season.

**Northern Rockies:** Significant wildland fire potential for much of the Northern Rockies Geographical Area is expected to be above normal in July and expand to include all of the geographic area in August. In September, there will still be some areas in central Idaho and southern Montana with above average potential where there are heavier fuels but by October significant fire potential is expected to return to normal overall.
The latest US Drought Monitor published in late June depicts extreme (D3) to exceptional (D4) drought over most of North Dakota. Adjacent to that, northeast Montana remains in extreme drought (D3). Farther west of the Continental Divide, there has been a trend toward developing drought as well with a dry spring, especially in northern Idaho and northwest Montana. During what is one of the wettest months of the year in the Northern Rockies it remained very dry overall, though there were some notable thunderstorm days and localized areas of heavy precipitation. Two areas that stand out as seeing beneficial short-term rain are: 1) along the Rocky Mountain Front from Glacier National Park to Helena (PSAs 07, 10, and 11) and 2) central and eastern North Dakota (PSAs 17 and 18). These short-term inputs improved the surface soil moistures and have lessened the effects of the drought there somewhat.

Comparison of the US Drought Monitor over the past month shows improvement in those areas but worsening conditions elsewhere, especially in southern Montana and north-central Idaho where there is now moderate-to-severe drought. The overall picture in the Northern Rockies is still one that depicts the effects of long-term drought interspersed with areas of short-term relief. In terms of temperatures, the past month has brought widespread warmth to the western U.S., including the Northern Rockies where overall it has been 3 to 5 degrees warmer than average. Southern Montana has been the most extreme – similar to the Great Basin and Wyoming – with temperatures 6 to 8°F above average in June. That is because of a pattern with high pressure ridging events that were more typical of summer than late spring. Mid-June brought a heatwave with record-breaking temperatures east of the Continental Divide in the 90s and low 100s. During this short-lived event, the Hot-Dry-Windy Index indicated that these conditions exceeded the 95th percentile of events for the Northern Rockies.

With green-up still transitioning through the growing season in most areas of the Northern Rockies, an overall shift toward less extreme fire danger indices has continued compared with the extreme values during the rest of the spring, but ERC values are still running well-above average in most PSAs, along with very low to extreme fuel moistures in the heavier fuel classes. Fuels are most extreme in the Custer-Gallatin National Forest and in the eastern Montana and North Dakota BLM lands. The drought conditions have discouraged new growth this spring, but there is still plentiful carryover fuel from last season in many areas where there wasn’t enough snowpack to compress it. This heavier fuel loading is expected to be a major contributor to fire potential this year in areas east of the Divide.

The Northern Rockies Geographical Area saw another increase in fire activity over the past month with a combination of lightning and human-caused large fires. Notably, the Deep Creek Canyon (~4,500 acres), Crooked Creek (~4,000 acres), and Robertson Draw (30,000 acres) fires in Montana grew significantly during the extreme hot, dry, and windy episode in mid-June and were relatively long-lived with incident management team assignments. Wetting rain fell on all those incidents during the third week in June, but the expectation is that warmer and drier conditions will resume for the foreseeable future. Another large fire called, “Little Pine” in the Idaho Panhandle has also been active and historically hot weather is anticipated there in the last days of June and early July.

Although recent thunderstorms continued to provide some significant relief and encourage green-up of fuels in the Northern Rockies, there is still a persistent underlying drought concern for the longer term. The monthly and three-month seasonal temperature and precipitation outlooks from NOAA’s Climate Prediction Center for July and August suggest a continuation of warmer and drier than average conditions across the geographic area for the “core” fire season months, particularly along and west of the Continental Divide in Idaho and western Montana. A combination of greening up of fuels and the transient benefits of recent precipitation are expected to continue to subdue the fire potential somewhat in early-mid July along the Rocky Mountain Front and in central and eastern North Dakota, but elsewhere, fire potential is anticipated to be above normal for the rest of the PSAs.

The projected expansion of drought coverage and magnitude across the Northern Rockies combined with the amount of carryover fuels will bring above normal fire potential to the eastern PSAs as fuels cure out and become available in August. This is somewhat earlier than the climatological fall-period of the bi-modal fire seasons on the Plains due to the drought impacts and feedback loops of the drier soil moistures along with the outlook for warmer and drier than average conditions this summer.
There has been consistency with the model forecasts for the ENSO outlook in bringing about a secondary weak La Niña period this fall. It is reflected in the September and October outlooks with less of a signal toward warmer and drier than was previously depicted by the CPC in earlier outlooks for the same period. Thus, the expectation is for fire potential returning to normal for some PSAs east of the Divide in September while remaining above normal elsewhere. In October, significant fire potential is expected to be normal across the geographic area.

**Great Basin:** Significant wildfire potential is expected to increase through August from south to north, especially across the eastern Great Basin in July before monsoon moisture moves north, then over the northern half of the Great Basin in August, possibly lasting into September. Mid and higher elevations of the Sierra Front are forecast to have above normal fire potential from July through September due to lower than normal snowpack and significant long-term severe to exceptional drought. Some areas of southern and eastern Nevada into western Utah and the Arizona Strip have carryover fine fuels that will bring above normal potential to lower elevations. Fire potential is expected to decrease throughout July in the far southern Great Basin as the monsoon develops and in August over at least the southern half of the Great Basin due to anticipated expansion of monsoon moisture. Monsoon moisture may diminish early this year with warmer and drier conditions reemerging keeping above normal fire potential across Idaho, Wyoming, far northern and western Nevada, northern Utah, and the Sierra Front into September. Lower confidence exists toward the end of the outlook period.

Temperatures over the last 30 days have been well above normal, with three periods of very hot or record-breaking heat throughout June. Precipitation was well below normal, with most areas only seeing spotty precipitation from thunderstorms. One exception was over western Idaho, where a storm earlier in June brought a period of longer duration wetting rains. Thunderstorms late in June also produced a few days of localized wetting rains across Utah, which briefly lowered fire potential.

The recent wetness in some areas has not alleviated the long-term drought. The drought remains extreme to exceptional across much of Nevada, Utah, and the Arizona Strip. The precipitation we have seen over the last few months has brought some much-needed moisture to these areas, but precipitation is still well below normal for the water year. Moderate to severe drought also continues farther north over northern Nevada, Idaho, and Wyoming. These drought areas are expected to persist through the summer.

Green-up is complete across the Great Basin, and fuels in most areas over the southern two-thirds of the region are completely cured. One exception is in the higher terrain sagebrush in parts of central Idaho and Wyoming, where the sagebrush has peaked near to below normal and is still trending downward. The timber fuels, however, have significantly dried out. Low elevation snowfall that remained on the ground for several days to over a week in late January and February compacted much of the fine fuel carryover from recent years across western and northern Nevada into far northern Utah. This compaction, in combination with low spring precipitation and a less robust new grass crop due to the drought, should lessen the overall fuel loading and large fire potential threat in these lower elevations going into the summer months. May rains did bring some additional fine fuel growth in Idaho and northern Nevada, but the grass is short and continuity is variable. Some exceptions to fine fuel loading will be over parts of eastern and southern Nevada into western Utah that still have carryover fuels, since they did not have lower elevation snowfall to compact them. New fine fuel growth in these areas remained very low. Heavy dead fuel moisture is below average across the geographic area and at record lows in many areas over the southern half of the region, despite a recent uptick in fuel moisture from thunderstorms at the end of June. Pinyon-Juniper die off has been a major concern across Utah into eastern and southern Nevada due to the long-term drought. These fuel conditions will be a concern for mid to upper elevations across southern and eastern Nevada, Utah, the Arizona Strip, and parts of the Sierra Front throughout the fire season.

Overall, fire activity increased significantly in June, especially across Utah. There were a few large fires in Idaho and several in Nevada, while Utah had over ten large fires. Some of the largest fires reached 12,000-15,000 acres in the higher elevations. A Fuels and Fire Behavior Advisory was issued early in June for Utah, the Arizona Strip, and southern and eastern Nevada. This advisory was expanded into central and northeast Nevada later in the month. Great Basin elevated to PL3.
The forecasts are calling for warm and dry conditions in July over the northern half of the Great Basin, with the monsoon beginning to push moisture north into southern Utah, southern Nevada, and the Arizona Strip. Lightning will still be an issue in the southern Great Basin until moisture takes hold, however, it does look like moisture in early and mid-July in the south should be enough to lower fire potential through July. Deeper moisture will likely not be as continuous farther north, with the main threat being drier lightning over the northern half of the Great Basin. A possible return of La Niña by the fall could also bring an earlier end to monsoon moisture, but confidence remains low later in the fire season. This may allow areas of southern Utah and Nevada to increase in fire activity later in August or September, and this will continue to be monitored. Western Nevada into western Idaho will likely remain on the drier edge of monsoon moisture and could see more potential dry lightning, along with breezier winds as low-pressure troughs move into the West Coast.

Fire activity typically decreases over southern portions of the Great Basin throughout July with a peak in activity over northern and western areas in July and August. This year appears to follow those trends in July into early August. Hot and dry conditions in June significantly dried out fuels at all elevations over the northern and western half of the Great Basin. Fire potential will continue to increase in those areas, especially as pulses of moisture occur, increasing lightning potential. The highest concerns are in the mid and upper elevations of the Sierra Front and across Idaho and Wyoming due to low soil moisture, lower than average spring snowpack, rapid drying in June, and below normal fuel moisture in all fuel types. Fire potential may remain elevated in northern and western portions of the geographic area into September, but confidence is lower toward the end of the outlook period. Drought stricken areas of Utah and Nevada will continued to be monitored if drier weather materializes towards August or September.

**Southwest:** Normal significant fire potential is anticipated across the region during July through October.

The summer monsoonal pattern has begun recently across the Southwest Area via deep easterly flow as the strong upper-level anticyclone built over the Pacific Northwest. Expect the typical variations of the mid-upper-level high center over the next few weeks into August, but the anticipation is that both relative humidity values and precipitation will be significant enough to end the large fire season across the region. Per normal, wet and dry periods will vary across the Southwest during the monsoon.

It does appear more than likely that the month of July could be quite active and wet from the Continental Divide eastward as several climate models indicate this trend. Drier and warmer conditions could arrive by September or October for much of the region. Overall, forecast guidance indicates the possibility that both western and northern Arizona into northwest New Mexico could receive slightly below normal precipitation from July through September with near normal amounts farther south and east across the geographic area.

**Rocky Mountain:** Above normal significant fire potential is predicted in July – August across west-northwest and north-central Colorado through Wyoming, central and western South Dakota, and northwest Nebraska. Expectations in September and October are for a return to normal significant fire potential across the geographic area, except for persisting above normal significant fire potential in September across north-central and northwest Colorado, Wyoming, southwest South Dakota, and northwest Nebraska.

Above normal temperatures expanded in April – May from southwest Colorado through western Colorado and southwest Wyoming, then over most the Rocky Mountain Area (RMA) in June, especially northern portions of the RMA into western Colorado. June was driest across northern portions of the RMA, with the wettest conditions in central to eastern Colorado. The last 60 days were drier than normal in western Colorado through southwest Wyoming, northeast Wyoming, central and eastern South Dakota, and northeast Nebraska. Precipitation amounts were above average most extensively across central to eastern Colorado. The US Drought Monitor portrays extreme to exceptional drought in western Colorado, with severe to extreme in northeast Wyoming and northern and eastern South Dakota.
Above normal significant fire activity occurred in June across northwest Colorado, northeast Wyoming, and to lesser extent southwest Colorado. Late June precipitation and moderating fire weather conditions resulted in a decrease in new significant fire activity as well as decreasing growth on existing team fires.

Late June precipitation and moderating fire weather conditions resulted in a corresponding increase in fuel moisture across a large portion of the geographic area. Most ERC values as of late June were below the 50th percentiles, except between the 50th and 70th percentiles over western Colorado and northwest Wyoming, and a few stations above the 80th across central to eastern South Dakota. Heavy dead fuel moistures (1000-hour) have also risen but remain below 10% in many locations from western and north-central Colorado into south-central and southwest Wyoming and in portions of South Dakota.

Moisture with upper-level disturbances from the northeast is forecast to keep periodic showers and thunderstorms in the forecast over the RMA through the first week of July. By the second week of the month, drier upper-level west-southwest flow is projected to scour out the moisture, especially over Wyoming into north-central and northwest Colorado with forecast westerly flow. Towards mid-July, monsoon moisture is predicted to expand mainly in southern portions of the RMA, with drier and breezy conditions most prevalent across Wyoming. The CPC forecast for July indicates drier than normal conditions over central to northern Wyoming into western South Dakota, but with more extensive drying later in the summer into fall from Wyoming through central and northern Colorado and the High Plains.

Beneficial rain occurred over much of the RMA during the second half of June to help slow an overall drying trend. However, extreme to exceptional drought remains in place over western Colorado with severe to extreme expanding in northeast Wyoming and northern and eastern South Dakota. Short term model forecasts indicate dry and windy conditions developing by the second week of July across Wyoming into northwest and north-central Colorado, with dry and breezy conditions most prevalent across Wyoming in mid-July as well. Monsoon moisture, which has already begun to develop and propagate northward, is forecast to keep the southern portions of the RMA at near normal significant fire potential through the remainder of the summer. Above normal significant fire potential is predicted July – August across west-northwest and north-central Colorado through Wyoming, central and western South Dakota, and northwest Nebraska. Expectations in September and October are for a return to normal significant fire potential across the geographic area, except for persisting above normal significant fire potential in September across north-central and northwest Colorado, Wyoming, southwest South Dakota, and northwest Nebraska.

**Eastern Area**: Soil and precipitation anomalies for the last 30 to 90 days were below normal across parts of the western Great Lakes and northern New England towards the end of June. Longer range drought conditions were indicated across portions of the Great Lakes and northern New England. Warmer than normal temperatures are forecast over portions of the western tier of the Eastern Area in July and October and across the eastern tier in September. Near normal temperature trends are expected over most of the Eastern Areas through the rest of the summer through the early fall season. Fuel moisture levels may remain below normal across portions of the northwestern Great Lakes into the summer season if precipitation coverage and frequency do not increase.

Drier than normal conditions are forecast over parts of the western Mississippi Valley into August and across the Mid-Atlantic States in October. Above normal precipitation is expected across the Lower Ohio Valley in July. The summer fire season will likely persist longer than normal across drier portions of the northwestern Great Lakes if the forecast near normal precipitation trends do not develop heading into July.

Near normal fire potential is forecast across the majority of the Eastern Area July into October of 2021. However, if precipitation coverage and frequency do not increase over drier portions of the northwestern Great Lakes, periods of above normal fire potential are likely over drier portions of this area through the early summer season. Below normal fire potential is expected over the southern tier of the Eastern Area into July. Drier than normal trends are possible over Mid-Atlantic states in October, which may create elevated fire potential.
**Southern Area:** Below normal significant fire potential is forecast across much of the Southern Area in July and August before returning to normal by October.

The Tropical Pacific continues to exhibit a neutral signature with respect to La Niña or El Niño. There are anomalously cool waters that extend from Baja California southwestward to Hawaii and additional cool anomalies are present south of the Equator. The equatorial region from Ecuador to the Philippines has a mixture of warm and cool temperature anomalies.

The conditions in the Tropical Pacific will continue to produce a progressive weather pattern across the Southeast during July and August. Humid conditions will prevail as high pressure in the Atlantic provides a very humid return flow out of the Gulf of Mexico into the southern United States. Frontal passages are generally expected to occur every four to seven days, with periods of drier conditions in their wake. Afternoon heating will combine with to provide scattered showers and thunderstorms. Showers will become more numerous as fronts approach and move through an area. Significant fire potential will remain low across most of the Southeast. The driest conditions will persist across west Texas where triple digit heat will help cure fuels. The curing may be offset by occasional rain, but the frequency of rain events in west Texas is likely to be one or two events per month. Consistent rain events are expected across the Southern Area through summer.

It is also important to note that soils across much of the Southern Area are quite moist, and stream flows are (in some cases) 1000-1600% above normal for this time of year. Reservoirs in eastern Texas are near capacity resulting emergency spillways being activated to release water. Mississippi and eastern Arkansas are also very saturated as well as Alabama and Georgia where Tropical Storm Claudette produced heavy rainfall. It will take some time for the saturated conditions to either evaporate off the landscape or to percolate into the water table. In the meantime, the moist ground, and very green conditions, along with excellent humidity recovery at night, will greatly attenuate fire risk.

Two events stand out from June. One was an 8-12-inch rain event that occurred across eastern Arkansas and northern Mississippi early in the month. This event provided almost daily rain to the Appalachian Mountains, Tennessee, and Kentucky. While the highest totals occurred in Mississippi, many areas were deeply saturated with rain by this event.

The second event that stands out from June 2021 is Tropical Storm Claudette, which came ashore in Louisiana, then tracked northeast across Mississippi, Alabama, and Georgia, then across central and eastern North Carolina. Claudette's rains saturated areas from Louisiana to North Carolina and the outer bands also provided rain to Florida. Claudette produced 10-14 inches of rain in southeast Louisiana and southern Mississippi and widespread 1-4-inch totals along the rest of her path. The Appalachian Mountains missed out on Claudette's rainfall, but many areas of Florida and the Atlantic Seaboard benefitted greatly from it. Claudette was followed quickly by a frontal passage on June 20-22. The front provided widespread rain to a large portion of the Southern Area, including the Appalachian Mountains.

The drought that exists at the end of June is mainly restricted to far west Texas and the Trans Pecos. While dry areas were present during the middle of June in North Carolina, Virginia, and Florida; these were largely mitigated by Claudette and the frontal rains that followed. Tropical easterlies have developed in Florida and that will help mitigate fire risk there. Drought is not expected to develop, but areas of western Oklahoma and western Texas may see some increase in drought if rain frequencies become greatly spaced in time. Conversely, some drought improvement would occur in western Texas if rain frequencies increase.

June saw rather light fire activity overall. There were incidents in Florida, southern Georgia, and the Carolinas, but these were mostly of short duration. The lone exception was the Fort Mudge Fire near Waycross, GA. It began May 25 and was finally contained during the week of June 21. The final size was 1225 acres. Fire activity is expected to remain at fairly low levels across most of the Southern Area during July and August with mainly humid conditions, fairly frequent rain, vigorous green vegetation, excellent humidity recovery at night, and saturated soils. Any tropical land falling event would tend to dampen fire activity for 21-30 days, especially if the area affected receives more than six inches of rain.
Fuel moisture values of the 1000-hour fuels are generally above 20% and are unavailable to be included in any fires that occur. The 100-hour fuel moisture values are also quite high across the southeastern United States. Lightning fires are rare in July and August, and if they occur, they are usually in Florida where lightning tends to be more frequent during the summer months. The lowest fuel moisture values in both the 100- and 1000-hour size classes exist across western Oklahoma and west Texas where values are generally below 12-15%. Fine fuels can be briefly available between rain events, but the desert areas of western Oklahoma and western Texas are the most likely areas to see fine fuels exhibit some temporary curing, only to green-up again with moisture or rainfall.

Persistent neutral conditions in the tropical Pacific will continue to bring the Southeast periodic frontal passages providing rain to many areas. As fronts move into the Southern Area they tend to stall out either just west of the Appalachian Mountains or along the Atlantic and Gulf Coasts. These fronts act in tandem with moisture surging northward from the Gulf of Mexico to produce showers and thunderstorms, and it is often a daily occurrence for areas along and south of the boundary. The Madden-Julian Oscillation along with the expected fluctuations of the Southern Oscillation Index will be the main drivers of wet weather. When the Southern Oscillation Index spikes sharply negative it is almost always an indication of a large rain event (in terms of areal coverage) for the Southeast. When the Madden-Julian Oscillation is in a favorable phase, the rain is amplified in both amounts received and coverage.

As we move from August into September, fire risks should generally trend toward average or seasonal levels. If neutral conditions persist into the fall, periodic frontal passages will provide some moisture to help attenuate fire potential.

The fall fire potential is dependent upon the rainfall frequency, and to a much lesser extent, the amount of rainfall. If rainfall frequencies are greater than every three to four days, almost no fire will occur. Rainfall frequencies that extend between four and seven days will allow for some fire activity to occur, but fires will generally be small and short lived. Rainfall frequencies of seven to ten days will be associated with some short-lived incidents, while frequencies that extend as high as 14 days can require resources from outside the local unit to manage. When rainfall frequencies extend beyond 21 days, long-lived incidents and resource demands are likely to take place. As leaves begin to fall off the trees in October, a high rain frequency allows a very moist duff layer to build up that helps suppress surface fires. A low rain frequency allows the upper duff layer to be very dry and re-burn fires can occur as leaves continue to fall from the trees into November.

Tropical activity complicates the fall fire season in the Southeast. If La Niña conditions exist, tropical activity can greatly attenuate fire potential for the areas affected with heavy rain. Tropical rains will typically eliminate fire for 21-30 days following the event. In contrast, areas that lie to the west of the rainfall typically see subsidence that can exacerbate fires and increase the drying of fuels significantly. If dry conditions are present before the tropical event occurs, drying is exacerbated west of the rainfall and fire incidents can be prolonged by several days. The 2021 tropical season is expected to be quite active, although not as active as the 2020 season was. If La Niña does develop, the tropical activity would likely increase during the latter half of the tropical 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