National Significant Wildland Fire Potential Outlook

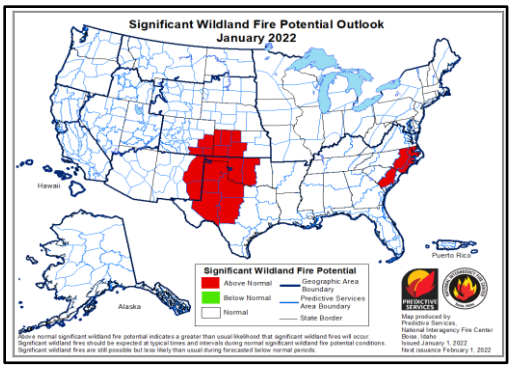
Predictive Services
National Interagency Fire Center

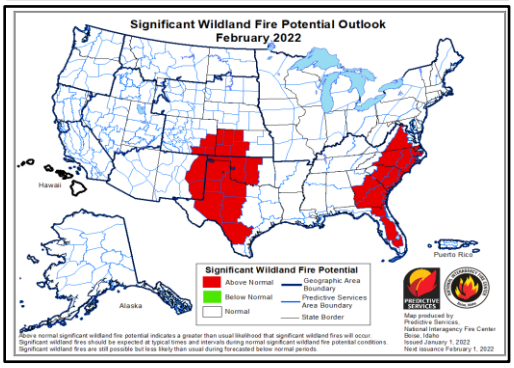
Issued: December 30, 2021
Next Issuance: February 1, 2022

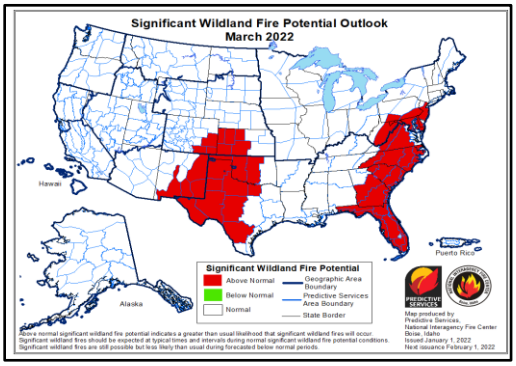
Outlook Period – January through April 2022

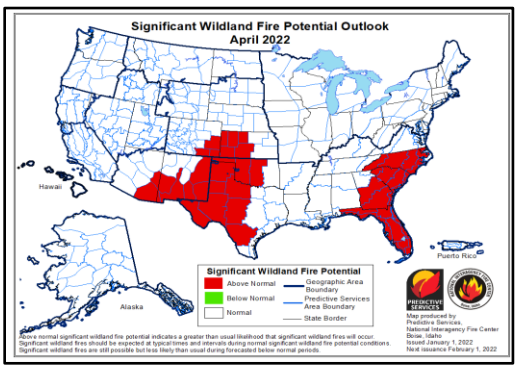
Executive Summary

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









Significant fire activity remained low in December and year-to-date number of fires and acres burned remain below their respective 10-year averages. Large fires were largely confined to Southern Area, except for a significant fire outbreak December 15 across Kansas, Oklahoma, and Texas. Active prescribed burning continued in all geographic areas during December. Critical fire weather conditions were observed periodically on the central and southern Plains including December 15 where winds gusted to 100 mph.

Nearly 90% of the West remains in drought, with a third of the West in the highest two categories of drought. Most of the eastern two-thirds of the CONUS observed below normal precipitation with portions of the central and southern Plains receiving no precipitation during December. Above normal precipitation was observed across much of the West into portions of the northern Plains and northern Great Lakes. Temperatures were above normal for most of the CONUS except along portions of the West Coast and Montana. Abnormally dry and drought conditions expanded across the southern Plains due to the prevalence of much above normal temperatures and little to no precipitation in December.

Climate outlooks for winter into early spring indicate above normal temperatures are likely along the southern tier of the CONUS, with the highest probabilities likely in the South. Below normal temperatures and above normal precipitation are expected across the Pacific Northwest into portions of the northern Rockies and northern Plains. The Great Lakes and Mid-Mississippi Valley are also likely to experience above normal precipitation through March. Below normal precipitation will likely accompany above normal temperatures across the southern third of the western US, through much of Texas, along the Gulf Coast, and into the Carolinas.

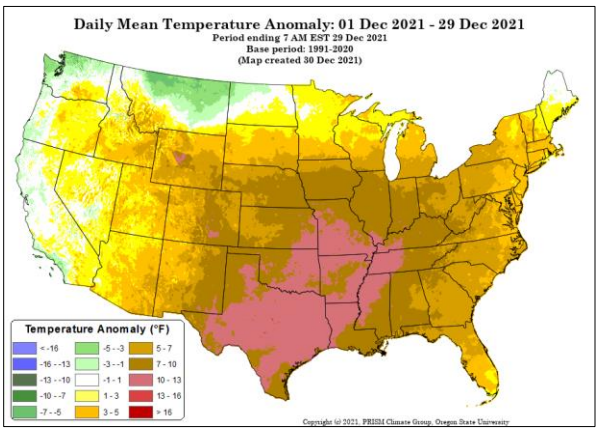
Above normal significant fire potential is forecast for much of the central and southern Plains January through April with several periods of critical conditions possible due to wind events. Above normal potential is forecast to expand into portions of south Texas in February then westward across far West Texas, southern New Mexico, and southeast Arizona March into April.

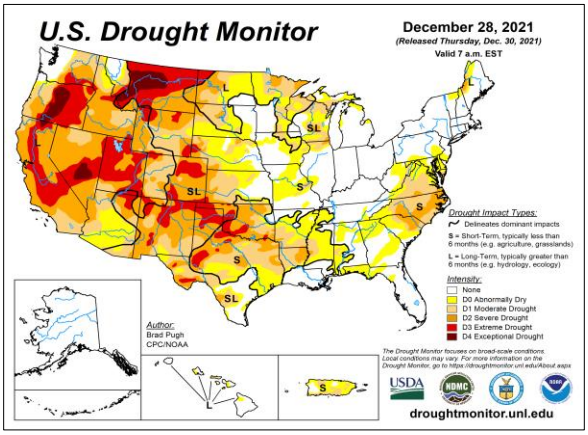
Above normal significant fire potential is expected to expand from the eastern Carolinas in January into the remainder of the Carolinas and much of Florida and Georgia February through April. Above normal potential is also forecast for portions of Virginia in February that will expand into eastern West Virginia and the Mid-Atlantic for March.

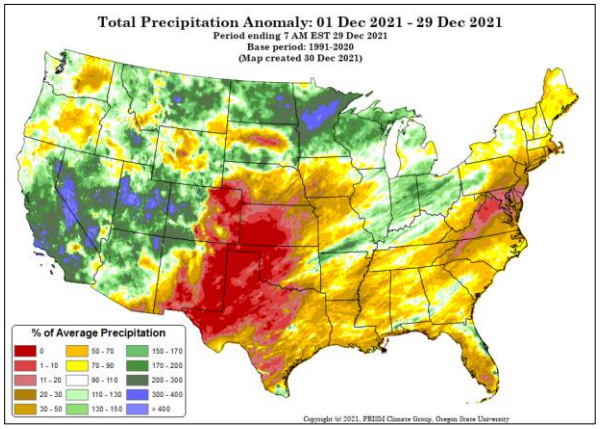
Past Weather and Drought

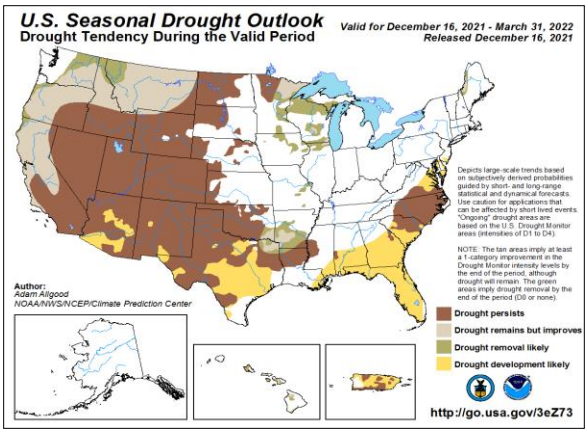
While nearly 90% of the West remains in drought, improvement was noted over portions of the Northwest and Northern Rockies as an active jet stream brought numerous winter storms into the West in December. Abundant rain and snow also occurred across California through the Great Basin and into portions of the central Rockies with a significant reduction in the area of extreme to exceptional drought. Abnormally dry and moderate to severe drought conditions expanded across much of the Carolinas and Virginia as well as portions of Georgia, Alabama, Florida, and the Lower Mississippi Valley, with below normal rainfall observed. Much of the High Plains remains in drought, with drought developing and intensifying across much of Kansas, Oklahoma, Texas, eastern Colorado, and eastern New Mexico where temperatures were much above normal for December. Overall, much of the eastern CONUS experienced below normal precipitation from the central and southern Plains through the Southeast and into the Mid-Atlantic. Precipitation was generally above normal for much of the West into the northern Plains and northern Great Lakes, although areas of below normal precipitation were noted over portions of the interior Northwest eastward into Wyoming.

Significant fire activity was low during December across the US, with the national preparedness level remaining at one. Large fires were reported in multiple geographic areas, but most of the large fire activity was confined to Southern Area. A strong downslope wind event in north-central Montana with gusts to 90 mph December 1 resulted in two significant fires and one, the West Wind Fire, burned through Denton, Montana. On December 15, west to southwest winds gusting to 100 mph and relative humidity as low as 2% resulted in numerous significant fires across Kansas, western Oklahoma, and the Texas Panhandle. The largest fires were in Kansas where over 100,000 acres burned, and two civilian fatalities occurred. Other critical wind events occurred over the southern Plains afterward through the end of the month, but few other significant fires emerged. Dry and breezy post-frontal conditions also occurred across portions of the South and Mid-Atlantic that led to conducive burning conditions. Prescribed burning was also active across all geographic areas.









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

Weather and Climate Outlooks

La Niña conditions are present with below average sea surface temperatures (SSTs) over much of the equatorial Pacific Ocean. The Climate Predicter Center (CPC) forecasts La Niña to continue this winter, which will continue to have a major impact on this winter's weather and climate. There is also a strongly negative Pacific Decadal Oscillation (PDO), that is impacting the large-scale pattern with cold, wet storms likely to continue along the West Coast into the first half of January. Other teleconnection influences, such as the Madden-Julian Oscillation and Arctic Oscillation may still have roles in shaping the weather and climate patterns, but La Niña followed by the negative PDO will likely remain dominant influences on the pattern.

Geographic Area Forecasts

Alaska: Normal fire potential is expected in Alaska through April 2022.

Snow is covering the entire state. Some coastal locations in south central and southeast Alaska have less snow cover, but this is normal due to their milder temperatures. The US Drought Monitor shows no drought in Alaska. The winter will continue to bring cold and snowy weather through mid-March. A normal melt-out in April is expected.

Fire activity in Alaska has been non-existent. Fuels are wet, frozen, or snow-covered statewide. Indices have been shut off for the winter months since they are not good indicators with snow-covered fuels.

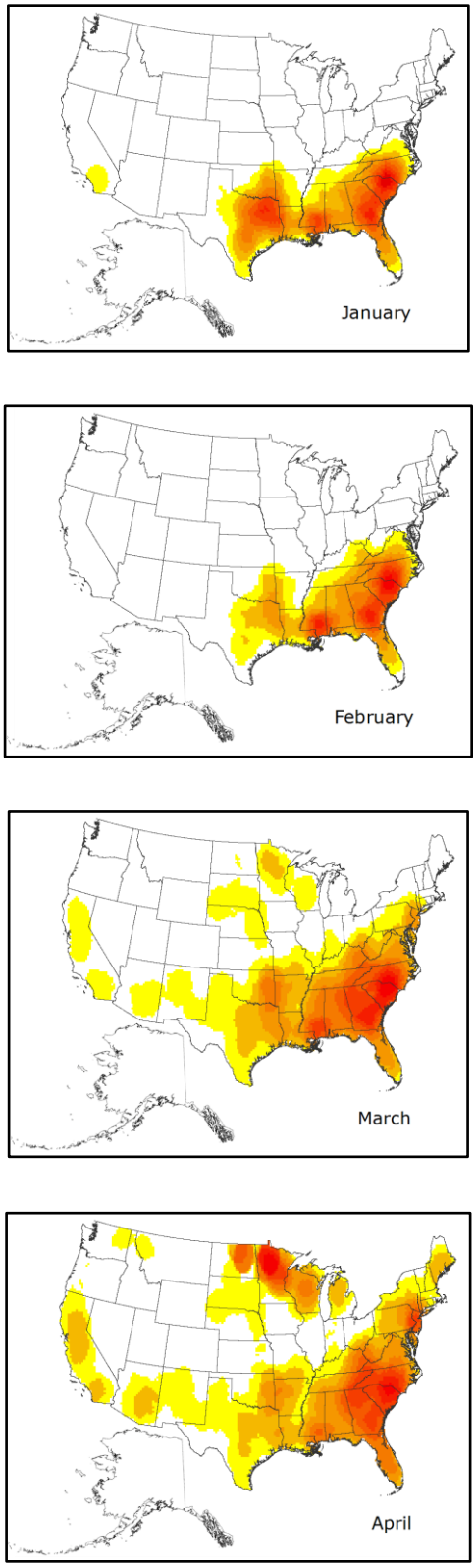
Fire potential will be normal for the next four months as Alaska is out of fire season with typical winter weather in the forecast. The snowpack will begin to melt in some parts of southern Alaska in late March and for the rest of the state during April. Currently, there is no indication for anything other than a normal winter snowpack, a normal spring melt, and a normal start to the 2022 Alaska Fire Season

Northwest: For the beginning of 2022, the potential for significant fires in the Pacific Northwest is normal (i.e. low to very low.)

December started with warmer than average temperatures for much of the Northwest, turning decidedly colder for the second half of the month. Much of the region received above normal precipitation during the month, but portions of Washington and Oregon east of the Cascades continue to have lower than normal precipitation amounts. Drought conditions showed improvement, particularly on the west side of the region, but drought persists across much of Oregon and Washington and is expected to linger through the winter.

As of December 28, snow accumulation is reported near or above average for almost all reporting basins in the region. Only the John Day and Middle Snake basins in eastern Oregon are below normal at 82% and 89% of normal accumulation reported, respectively.

The typical seasonal decline in initial attack continued through December. Only a handful of incidents were reported during the month with sizes averaging 0.10 acres. There were no control problems as spread potential was very low due to cool, wet conditions.



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)

Most PSAs in the region now enjoy average to above average moisture in large fuel classes. The exceptions being PSAs NW10 and NW11, where moistures are still below normal for the time of year. Westside PSA large fuels are at moisture levels that will limit pile burning potential. The east side PSA large fuels are still dry enough to support active pile burning activities. Agricultural, broadcast, and range burning activities are limited by shading, damp surface litter and high fine fuel moistures. Fine surface fuels will need time to dry before fire potential increases.

Long range outlooks from NOAA and other sources continue to predict winter 2021-2022 will be wetter and colder than normal for the Northwest Geographic Area. This implies fire danger will remain too low for significant fires through April 2022. The potential for significant fires is expected to remain at normal levels from January through April 2022. As we are out of fire season, normal implies very low risk.

Northern California and Hawai'i: All areas are forecast to have normal significant fire potential. Normal is defined as less than 1 large fire per PSA January to April. Normal significant fire potential is forecast for all of Hawai'i.

Conditions during December across northern California were transitional and generally moist due to frequent storm systems from the second week onward although the northwest quarter of the geographic area received below normal precipitation. Temperatures averaged near normal. The snowpack was well below normal the first week of December but trended back to near normal during the middle of the month before becoming above normal the end of the month with robust coverage across the mid and upper elevations. Dead fuel moisture during the beginning of the month was unusually low but trended much higher as the month progressed and was unusually moist by the end of the month. A robust herbaceous green-up continued below 2500 ft. Shrub moisture remained in a mixed state of flammability due to long term drought conditions despite the recent abundant precipitation. Gusty wind and low or marginally low humidity periods were localized and generally brief. All strong wind episodes were accompanied with precipitation and high humidity. Fire activity was limited with few wildfires reported. Prescribed burning, including some landscape burns, was plentiful the first week but was limited to pile burns after the first week.

The weather outlook from January through April is for near to below normal temperatures and near normal precipitation but trending towards drier and warmer anomalies by early spring. It will be hard for dead fuel moisture to fall to below normal for an extended period during the winter due the expected weather pattern, lower sun angle and shorter-day periods. Herbaceous fuels across the low elevations will also remain in a green-up state during winter with additional growth likely during early spring. Shrub or woody moisture readings will remain in a mixed flammability state due to long term drought conditions. A few brief gusty wind and low to marginally low relative humidity periods are possible but fire danger levels would be tempered due to the moist fuels.

Sea surface temperature (SSTs) anomalies surrounding the Hawai'ian Islands are currently mixed and average near normal. Temperatures throughout the region are expected to be near to above average from January through April due to forecast rising SST anomalies. Unusually dry conditions existed the first few days of December but trended quickly to saturated soils due to heavy rain and high elevation snow. Rainfall was above normal and excessive in most areas with the exception being Kauai. The 4-month weather outlook calls for above average precipitation January through April, especially along the windward side of the islands as the trade winds are typically enhanced during a La Niña. Significant fire potential is forecast to be normal during the outlook period.

Southern California: The significant fire potential will be near normal across the entire geographic area from January through April.

The strong upper-level area of high pressure that resided off the California Coast the last two weeks of November stayed in place through the first week of December bringing well above normal temperatures and dry conditions to central and southern California. This area of high pressure moved off to the west and a series of Pacific troughs moved inland over California from the Gulf of Alaska during the last three weeks of the month. These Pacific troughs were only separated by brief weak areas of high pressure.

Temperatures were below normal with the troughs and near normal with the weak ridges the last three weeks of the month. For the month, temperatures ended up below normal across the geographic area. Periods of showers moved across the region the last three weeks of the month. Precipitation was above normal across most of the geographic area for December, except for small areas of below normal precipitation across some desert locations. The snow level was mainly between 7,000 and 8,000 feet with the mid-December storms falling to below 5,000 feet at the end of the month. Winds were light offshore during the first week of the month with the strong upper-level area of high pressure off the coast. Otherwise, winds were mainly from the south to west the rest of the month with strong south to west wind events just ahead of the troughs over the wind prone mountain and desert areas. There was one weak Santa Ana wind event this month which occurred December 17-18.

Even with the above normal precipitation this month, there was little change in the drought across central and southern California with only slight improvement. It often takes several months of precipitation to see improvement in drought conditions. From Los Angeles County northward extreme to exceptional drought continues. East and south of Los Angeles County, moderate to severe drought remains. During the first week of the month, both the 1000-hr and 100-hr dead fuel moisture were at record dry levels but by the end of the month they were at or above normal across the geographic area. The live fuel moisture increased during the month and by the end of the month it was mainly between 60% and 80%.

Sea surface temperatures have cooled to a little below normal along the West Coast and sea surface temperatures in the Gulf of Alaska remain well below normal. Computer models show that these sea surface temperatures will remain below normal through the spring months. This will likely keep the area of high pressure further to the west and allow Pacific troughs from the Gulf of Alaska to keep moving inland into California. The sea surface temperatures in the Equatorial Pacific are well below normal associated with La Niña and will continue to be below normal through at least March with only slow warming. These sea surface temperatures are forecast to approach normal levels in April, but by this time much of the rainy season will have ended. With La Niña conditions in place, the Pacific troughs are not expected to entrain abundant amounts of sub-tropical moisture. Temperatures will likely remain below normal and precipitation will likely remain near to a little above normal from January through April. The snow level will likely drop to 5,000 feet or below at times in the January through April period. The number of Santa Ana wind events are expected to remain below normal through the winter and spring months

Northern Rockies: Significant wildland fire potential in the Northern Rockies Geographic Area is expected to be normal for January, with all zones out of season and prescribed burning mostly completed for the season. All the Northern Rockies are expected to remain with normal fire potential through April.

La Niña has brought changes to portions of the Northern Rockies Geographic Area. Areas west of the Divide have generally seen above normal precipitation and a building snowpack. However, east of the Divide, rain and snow showers have been less abundant and drought continues. However, snow cover, cold temperatures, and shorter days have ended the season east of the Divide. Much of northern Idaho and northwest Montana have seen significant improvement in drought, with portions of the area being reduced to abnormally dry to moderate drought. Portions of northern Montana east of the Divide have also seen improvement, with exceptional drought scaled back. Temperatures were above normal and precipitation below normal east of the Divide the first week of December with significant wildfires. By the second week, enough precipitation occurred east of the Divide, that they returned to normal activity, and went out of season by the third week of December as snow covered the landscape.

Eastern areas of the Northern Rockies Geographic Area have fuel moistures below average, but most live fuels are now covered with snow. Currently, no significant fire activity is occurring. Initial attack is periodic, but with most fires caught at less than an acre. There were two significant fires during the beginning of December; they were the West Wind Fire (10,644 acres) and the smaller Dump Road Fire (900 acres). The West Wind Fire was wind driven on December 1 and burned through Denton, Montana.

With La Niña forecast to continue into the spring, northern and central Idaho into Montana west of the Divide are forecast to have above normal precipitation through March. Cooler than average temperatures for are also forecast for most of the Northern Rockies. However, most of North Dakota is forecast to have

equal chances of above, near, or below temperatures and precipitation. Forecast uncertainty increases in April and will greatly depend on the snowpack and how quickly it melts.

Significant wildland fire potential in the Northern Rockies in January is forecast to be normal and out of season. Normal significant fire potential is forecast to continue through April.

Great Basin: An active weather pattern has brought above normal precipitation to much of the Great Basin during the month of December, especially over western Nevada and Utah. Temperatures have been average to above average during December as well. Snowpack is normal to above normal area wide. Despite the recent precipitation, long-term drought remains across the Great Basin with much of Utah and southern Nevada in extreme drought while a portion of southern Nevada remains in exceptional drought.

Temperatures are expected to be near normal across the geographic area January through April with above normal precipitation expected over Idaho through the winter. Aside from Idaho, precipitation January through April is expected to be near average, possibly trending below average across southern Utah and southern Nevada March into April.

The 2022 fire season in the Great Basin should see a normal start with large fire activity increasing in early June. Due to the forecast precipitation this winter into spring, near normal fire potential is forecast across the Great Basin from January through April 2022.

Southwest: Normal significant fire potential is anticipated across most of the geographic area January and February. Areas of above normal potential are expected in the plains during January and February that will continue through March and April with areas of above normal emerging across the southern tier of the region in March, continuing into April.

Wetter periods from late September into mid-October and from late November into late December have helped lower significant fire potential for portions of the region, (mainly along and west of the Divide). However, the eastern third of the region has experienced little to no significant precipitation over the past several months, especially the past sixty days, and the dryness has been accompanied by very mild temperatures. This is not unusual during a La Niña fall. The forecast for the remainder of the winter months is a continuation of this general trend through into early spring. In this pattern, eastern New Mexico will continue to be on the drier and milder side, on average, during the outlook period.

The eastern plains of New Mexico will likely experience brief periods of above normal potential during January and February. By March, it is expected that more of the eastern New Mexico plains will see significant fire potential rising further, and be of longer duration coincident with warmer temperatures, continued drier than normal conditions, and downslope wind periods. The above normal potential will be due to a frequent breezy to windy pattern, and dry fuels conditions that are typical during a La Niña winter across the eastern plains. By March, due the forecast dryness across the southern tier, areas from southern Arizona east northeastward across the southern half of New Mexico will also see above normal significant fire potential. Portions of southern Arizona will more than likely rise to above normal significant fire potential by mid-late spring. Areas along and north of Interstate 40 in Arizona into northwestern New Mexico will likely have the lowest potential regionally as spring arrives.

Rocky Mountain: Significant wildland fire potential across most of the Rocky Mountain Area (RMA) is expected to be normal from January through April 2022. The exception will be for portions of southeast Colorado and western Kansas where above normal significant wildland fire potential is expected due to the persistence of above normal temperatures and below normal precipitation during the outlook period that will keep fuels receptive and promote rapid spread during wind events.

Warmer than normal temperatures were observed across most of the RMA in October. The anomalous warmth continued and expanded east of the Front Range and across the Plains in November. The greatest above normal departures in the past 90-day period were observed across portions of the Plains, extending south from western South Dakota, through the Nebraska Panhandle, and across eastern Colorado into western Kansas. The warmer temperatures were exacerbated during downslope wind events as weather

disturbances moved over the region. However, a pattern change took place in early December that allowed troughs of low pressure to drift farther south in latitude and transition across the RMA. These troughs brought colder temperatures that gradually spread across the geographic area by the end of the month. The colder pattern is expected to persist across northern portions of the geographic area for the remainder of winter into early spring 2022.

Within the past thirty days, below normal precipitation anomalies have become more significant across south-central and eastern Colorado and all of Kansas and Nebraska. Areas of greater precipitation amounts remain focused across western Colorado and to a lesser extent across eastern Wyoming and the South Dakota-Nebraska state line. Even with improvements in drought noted across northwest Colorado, Wyoming, and portions of South Dakota, dry conditions have expanded and drought has intensified across the central Plains. The US Drought Monitor continues to portray severe to extreme drought across eastern Colorado into western Kansas and the Nebraska Panhandle. The very dry conditions are also reflected in calculated soil moisture anomalies that indicate a continued loss of soil moisture within the past ninety days, especially across Kansas, Nebraska, and eastern Colorado.

During the month of December, fire danger indices east of the Divide and across the Central Plains continued around the 90th percentile, with even higher values in and along the Front Range and Palmer Divide in Colorado. Fuels remain critically dry across the foothills and across the Plains, but adequate overnight recovery and shorter burning periods have mitigated fire danger in many areas from becoming critical overall except during strong downslope wind events and frontal passages.

Despite snow accumulating in the mountains where conditions are out of season, the anomalously warm, very dry, and breezy weather pattern east of the Divide continues to support minimal fire activity along the Front Range and foothills of Colorado over the last several weeks. A significant wind event was observed on the central and southern Plains December 15 with a winter storm. Widespread, strong and damaging winds with isolated gusts approaching 100 mph, impacted areas of critically dry fuels, and contributed to the rapid development of several large wind-driven fires that burned over 122,000 acres across western and central Kansas in less than a day.

For the winter and early spring 2022, La Niña is expected to split the Rocky Mountain Area from north to south. The warmest and driest conditions are forecast to remain across southern Colorado along with most of Nebraska and Kansas, while cooler and more moist weather should be confined to Wyoming, South Dakota, and portions of northern Colorado. Climate models also indicate a gradual weakening of La Niña to more neutral conditions by late March. This transition could bring the possibility of an earlier onset of a transitional weather pattern that could bring frequent frontal passages, strong winds, and attendant lightning across portions of the central Plains.

The northern half of the geographic area has benefitted from several wetter, colder storms since late November but the southern half has not seen appreciable moisture so far this winter. The outlook for the RMA is for normal significant fire potential across the north half of the area and western Colorado from January through April 2022.

While northern portions of the RMA and areas generally west of the Divide can expect normal significant wildland fire potential, above normal significant fire potential is forecast across portions of southeast Colorado and western Kansas. The above normal potential is due to the persistence of abnormally warm and dry conditions expected through early spring, combined with strong winds associated with the passage of low-pressure systems. The large fire history over the central Plains also points to a substantial increase in activity starting in February and persisting through April.

Eastern Area: Thirty to 90-day soil moisture and precipitation anomalies were below normal across portions of Mid-Mississippi Valley and the eastern Mid-Atlantic states at the end of December 2021. Longer term drought conditions were indicated across the south-central Great Lakes and far northern New England.

Warmer than normal temperatures are expected across portions of the southern tier of the Eastern Area January into March 2022. Cooler than normal temperatures are forecast across parts of the Upper Midwest and Mississippi Valley March into April of 2022. Near to above normal precipitation trends are expected over the majority of the Eastern Area through the rest of the winter into the early spring of 2022. Drier than normal trends may develop over the southeastern Mid-Atlantic states February into March.

Fuel moisture may remain below normal across portions of the Mid-Mississippi Valley and eastern Mid-Atlantic states if an increase in precipitation coverage and frequency do not occur.

The 2022 spring fire season may begin earlier than normal across the southeastern Mid-Atlantic states if drier than normal conditions develop in February and March. Near normal significant fire potential is forecast across the majority of the Eastern Area January into April 2022 except for above normal fire potential forecast across the southeastern Mid-Atlantic in March 2022.

Southern Area: Above normal significant fire potential is expected on the southern Plains of Oklahoma and Texas this winter into spring. Above normal potential is expected to expand across portions of west, south, and north Texas during the outlook period. In the eastern Carolinas, above normal significant potential is expected to continue into April, with above normal potential spreading across the Carolinas February through April. Portions of Virginia are also likely to have above normal significant fire potential along and east of the Appalachian Mountains. Much of Florida and central and southern Georgia are forecast to have above normal significant fire potential from late winter into spring as well.

A significant fire event transpired on the central and southern Plains during December 15, with multiple large, wind-driven fires burning tens of thousands of acres in west Texas and western Oklahoma. In November, North Carolina had the highest number of fires and second most acres burned in the last ten years per the North Carolina Forest Service. However, periodic, yet below average rainfall, limited fire activity during most of December in North Carolina. Fire activity in Florida has remained normal to below normal from late fall into winter.

All of Oklahoma and the northern half of Texas have freeze cured fuels, and ongoing extended periods without precipitation in western Oklahoma and west Texas have left fuels very dry. Additionally, swaths of west Texas and western and central Oklahoma have above normal fuel loading. Much of the Southeast has had below average rainfall during the last two to three months, with abnormally dry conditions across much of Georgia and abnormally dry to severe drought in the Carolinas and Virginia according to the US Drought Monitor. Much of the Florida Peninsula has also been drier than normal this fall into December. Drought encompasses the greater ArkLaTex region, but recent rainfall in portions of this region have helped ease deficits.

The ongoing La Niña, other teleconnection patterns, long-range forecast guidance, and analogs indicate that above normal temperatures and normal to below normal precipitation are expected across most if not all the Southern Area through winter. According to the Climate Prediction Center, drought is likely to expand and intensify across much of Oklahoma and Texas, the Carolinas, southern and central Georgia, and Florida into south Alabama through March. Forecast guidance indicates that portions of the ArkLaTex region, the Mid to Lower Mississippi Valley, and the Ohio and Tennessee Valleys are likely to have near to above normal precipitation by late February and continuing into April.

The drought or abnormally dry conditions and forecast warmer and drier than normal conditions east of the Appalachians in Southern Area are likely to be exacerbated by dry cold frontal passages, enhanced by downslope flow, and lingering dry and breezy post-frontal conditions through winter into spring. Fire activity typically increases late winter into spring across these areas, and an early and active start is anticipated. If consistent rainfall accompanies cold frontal passages across the Southeast into the Mid-Atlantic, this may contain significant fire potential to near normal for the outlook period, but most guidance suggests warmer and drier than normal conditions.

Long-term drought, above normal fuel loading, and forecast warmer and drier than normal conditions across west Texas and western Oklahoma will lead to above normal significant fire potential for this period.

The December 15 event signaled the potential that exists during very windy and dry conditions and La Niña and other teleconnections patterns suggest dry and windy conditions will be periodic to prevalent during winter and spring on the southern Plains. Above normal potential may spread farther south and east across Texas and east across Oklahoma, but enough forecast uncertainty precludes expanding the above normal potential. Similar fuel conditions and long-range forecasts have led to well above normal significant fire activity across Texas and Oklahoma in the past.

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