



National Significant Wildland Fire Potential Outlook

Predictive Services
National Interagency Fire Center

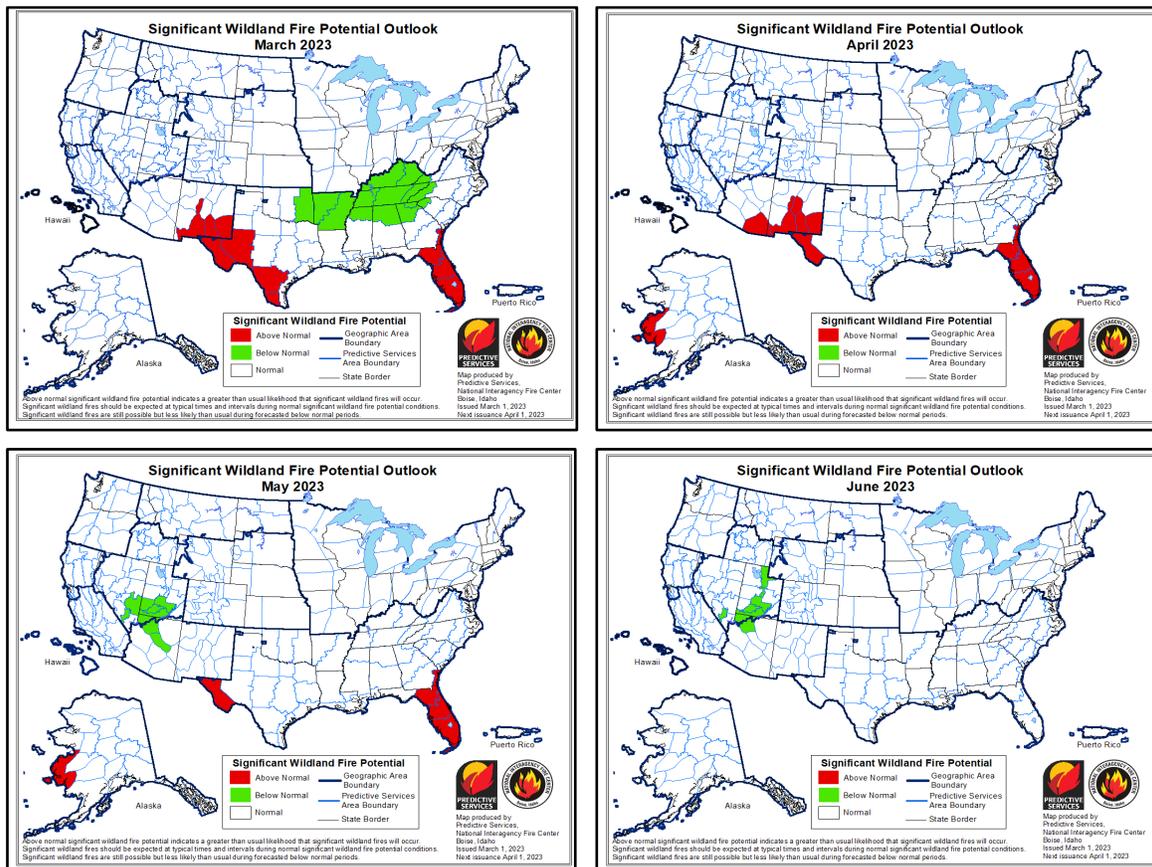


Issued: March 1, 2023
Next Issuance: April 1, 2023

Outlook Period – March through June 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 was minimal across much of the US during February as upper-level trough passages continued to bring timely periods of precipitation and limit significant fire potential. However, a small increase in significant fires occurred over portions of the Southwest and Southern Areas from eastern New Mexico to the Gulf Coast. The driest fuels continued across much of the southern High Plains into the Rio Grande Valley, with occasional critical fire weather conditions. Drying fuels were also noted along the Gulf Coast. Year-to-date acres burned for the US is 35% of the 10-year average, with a below average number of fires, near 87% of average.

Drought reduction continued through February across much of California into the Great Basin. However, drought continues across more than 40% of the country, with the most intense drought continuing on portions of the southern and central Plains. The southern High Plains and the Rio Grande Valley had another month of below normal precipitation, although locally above normal precipitation was observed in the Big Bend. Below normal precipitation was also observed across

the Gulf Coast, Florida Peninsula, Northwest, northern California, northern Great Basin, Mid-Atlantic, and Northeast. Near to above normal precipitation fell across southern California and portions of the Rockies and Appalachians. Above normal precipitation occurred from eastern Oklahoma into the Upper Mississippi Valley and Great Lakes as well.

Below normal temperatures are likely from Washington eastward into portions of the northern Plains through May. Above normal temperatures are forecast from the Southwest into the Appalachians, southern Plains, and Gulf and East Coasts, while equal chances of above or below normal temperatures are forecast from California extending northeast into the western Great Lakes. Above normal precipitation is most likely from the Great Lakes into the Mid-Mississippi Valley into the central and southern Appalachians and Mid-Atlantic. Below normal precipitation is most likely across the Southwest into the southern High Plains and on the Florida Peninsula. Drought is anticipated to expand into portions of Texas and the Florida Peninsula, but drought conditions will likely improve across the Northwest, northern California, northern Great Basin, Montana, northern Plains, and Michigan. Drought removal is likely in some portions of the improvement area as well.

Above normal significant fire potential is forecast for the Florida Peninsula and Georgia coast March through May before returning to normal potential in June. Above normal potential is also forecast for southern New Mexico in March and April. Portions of south and west Texas are forecast to have above normal potential in March, retreating to the west Texas mountains for April and May. Below normal significant fire potential is forecast for much of the northern tier of the Southern Area, from eastern Oklahoma into the southern Appalachians. Below normal potential is also forecast for the Mogollon Rim and southern Great Basin mountains in May, with below normal potential in northwest Arizona, central Utah, and the Spring Mountains of southern Nevada in June.

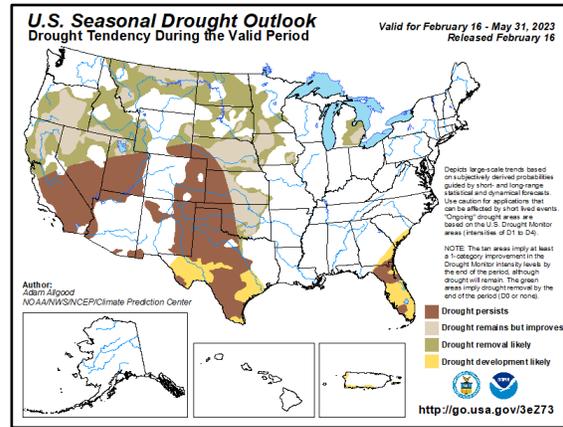
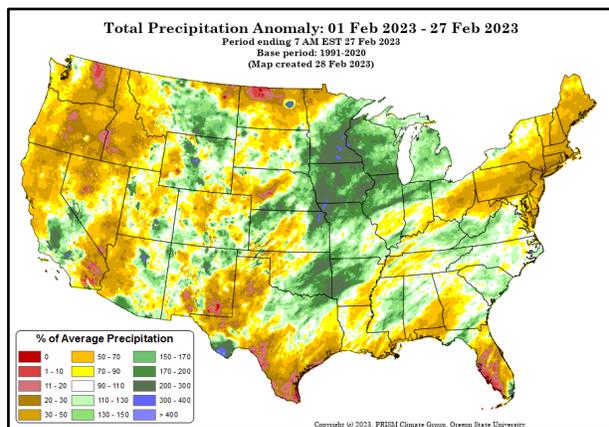
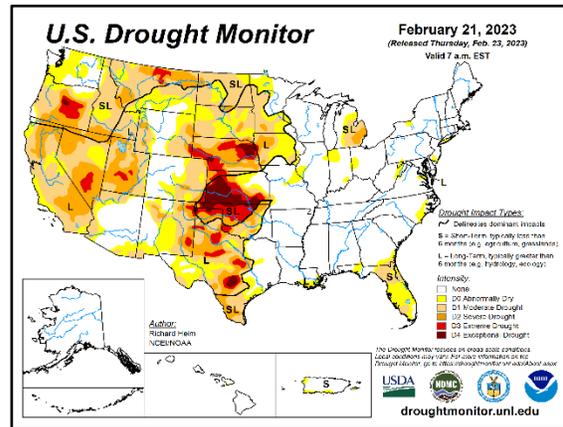
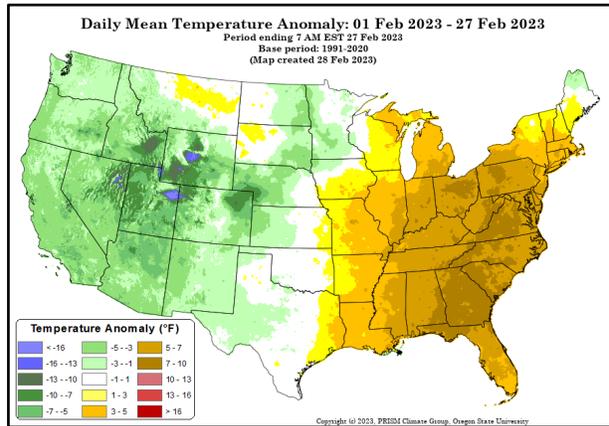
Past Weather and Drought

The pattern shifted at the beginning of February, with drier conditions across much of the West. Periodic upper-level troughs continued, but precipitation amounts were much less than observed earlier in winter. The troughs became wetter as they moved onto the Plains and towards the East Coast, with the heaviest precipitation recorded across eastern Oklahoma into the Tennessee Valley and southern Appalachians. Occasional wind events developed across the southern High Plains as well, with periods of elevated to critical fire weather conditions. During the last week of February, a deep trough developed along the West Coast, with heavy precipitation retuning to southern California and very low snow levels. Heavy snow fell across much of the West, with the first Blizzard Warning ever issued for the San Bernardino Mountains of southern California.

Snowpack is near to above normal across most of the West, except for portions of the southern Rockies, and some basins have received 200% or more of normal for snow water equivalent in the Sierra, southern Great Basin, and northern Arizona. However, isolated areas of below normal snowpack are noted in western Washington and southeast Colorado. Snowpack and snow cover are also near to above normal across much of Alaska. Overall, precipitation was above normal in southern California, portions of the Rockies, and from eastern Oklahoma into the Great Lakes. Below normal precipitation was observed in portions of the central and southern Plains, northwestern US, Gulf Coast, and Northeast.

Temperatures across the West were below normal for February, with the greatest departures from normal across portions of the northern Great Basin and Wyoming. Below normal temperatures also extended into portions of the Plains, particularly across portions of the central High Plains from northeast Colorado into western Nebraska where snowpack was more persistent than normal. Temperatures near and east of the Mississippi River were above normal in February, with values averaging 5-10°F above normal in the Southeast, Appalachians, and Mid-Atlantic.

Drought improvement was observed across California into portions of the Great Basin due to continued impacts from the numerous atmospheric river events during January, along with periodic, albeit light, precipitation. Drought improvement also occurred over portions of the Southeast coast due to above normal precipitation received at the beginning of February. However, drought continues in over 40% of the country, and drought expanded in portions of the Florida Peninsula, northwest Montana, and the Idaho Panhandle. The most intense drought remains on the portions of the central Plains, particularly western Kansas, with severe to extreme drought also in portions of Oregon, Nevada, Utah, Montana, and Texas.

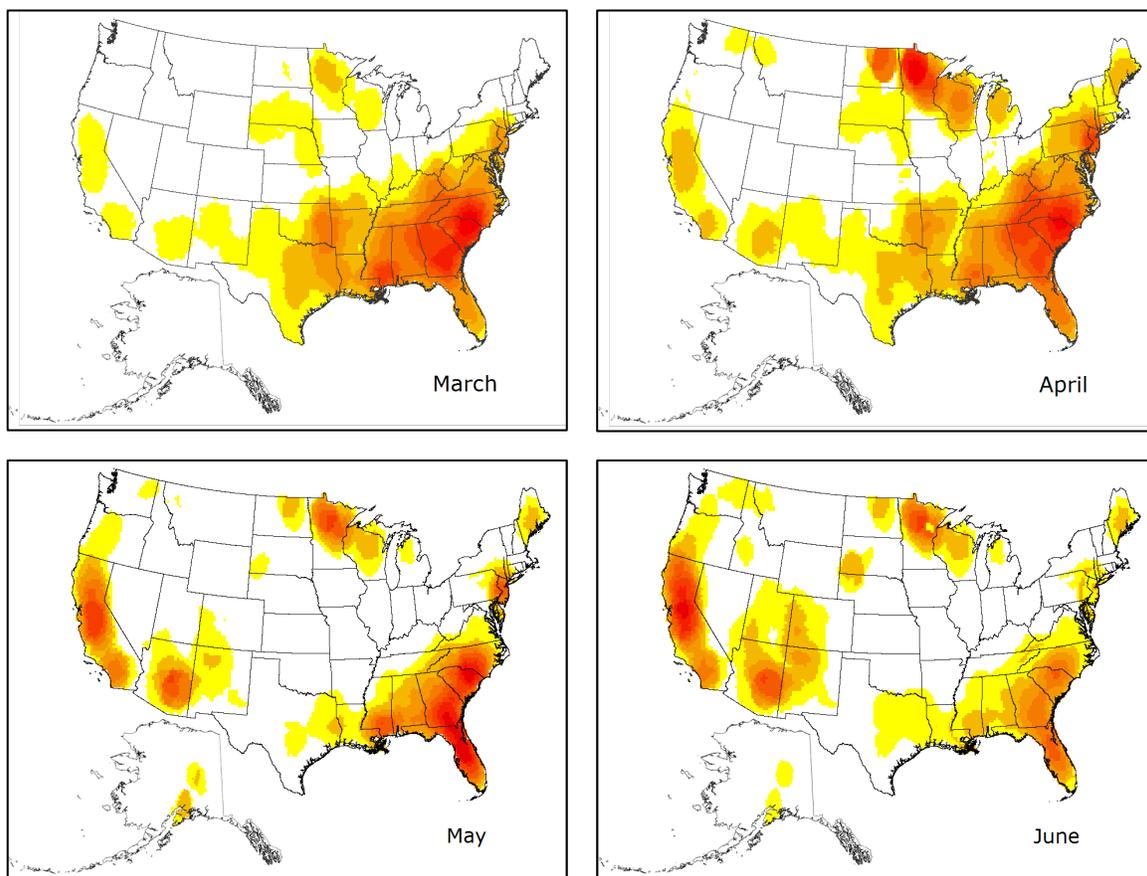


Left: Departure from Normal Temperature (top) and Percent of Normal Precipitation (bottom) (from PRISM Climate Group, Oregon State University). Right: U.S. Drought Monitor (top) and Drought Outlook (bottom) (from National Drought Mitigation Center and the Climate Prediction Center).

Weather and Climate Outlooks

La Niña continues to weaken over much of the equatorial Pacific Ocean with sea surface temperatures (SSTs) warming, but SSTs remain below average, consistent with La Niña. La Niña is forecast to weaken with a return to neutral El Niño-Southern Oscillation (ENSO) conditions by April. Many models are showing continued warming through spring into summer, with El Niño conditions possible if not likely by the end of summer. While some models are showing El Niño conditions by the end of spring, the Climate Prediction Center (CPC) and most models forecast neutral conditions to continue through early summer. Other teleconnection patterns, such as the Madden-Julian Oscillation (MJO), Pacific Decadal Oscillation, Pacific-North American Pattern, and Arctic Oscillation are likely to influence weather and climate during the outlook period. An active phase of the MJO is ongoing and will continue to influence the pattern through mid-March.

Geographic Area Forecasts



Normal fire season progression across the contiguous U.S. and Alaska shown by monthly fire density (number of fires per unit area). Fire size and fire severity cannot be inferred from this analysis. (Based on 1999-2010 FPA Data)

Alaska

Normal fire potential is expected in Alaska March through June, except for the Yukon-Kuskokwim Delta, where above normal potential exists in April and May. April will bring the first early-season human ignitions to low-lying areas of the state as the snowpack retreats. In May, the threat of more significant wildfires will increase toward the end of the month, and by June the season will be moving into the busiest part of the fire season, which is normal.

Ample precipitation has fallen across much of Alaska during the fall and early winter, and no areas of the state are in drought status as of late January. However, the Yukon-Kuskokwim Delta has a below normal snowpack as much of their winter precipitation has come in the form of rain instead of snow.

With no wildfire activity in the state, Alaska is out of fire season. Fuels across the state are snow-covered. Areas with little snow are generally coastal with cool and damp conditions, so fuel burnability is very low statewide.

Late winter and spring are typically dry across Alaska. The Climate Prediction Center calls for a slightly warmer and wetter spring for western Alaska, while the forecast for southeast Alaska includes a signal toward cooler and drier conditions. In the longer term, a potential transition from La Niña to El Niño by summer could increase wildfire potential for Alaska this year. More active fire seasons in Alaska are generally paired with El Niño summers, but this correlation is weak at best.

With the winter snowpack nearing its peak, Alaska is out of fire season through March. In April, the snow will begin to melt out at lower elevations, cured fine fuels from the previous season are exposed, and wind-driven grass fires become possible. By the end of May, the snowpack will retreat to the North Slope and the highest elevations of the Interior, setting the stage for mid-June to be the start of the busiest part of the fire season, which is normal for Alaska.

Much like last season, the low snowpack in the Yukon-Kuskokwim Delta may lead to increased potential for a busier early fire season there, with human starts the most likely source of new ignitions. However, early-season lightning may lead to ignitions in more remote areas of the far west, creating more challenging fire management considerations during the time of year that resources are still preparing. Overall, expect a normal fire season across Alaska through June, with the chance for above normal conditions in the Yukon-Kuskokwim Delta in April and May.

Northwest

All reporting areas are in normal (i.e., low) risk for significant fires, and normal significant fire potential will continue through June.

Despite a procession of frontal systems, precipitation accumulation in February lagged well behind normal everywhere in the geographic area except the northern Washington Cascades. The east slopes of the Washington Cascades and southeast Oregon were the driest regions during February. Temperatures across the geographic area were below average in February.

Most higher elevation snow reporting basins over the geographic area have tallied steady snowfall, which accumulated at or above normal by the end of February. Only coastal Washington and the east slopes of the Washington Cascades are lagging slightly behind normal accumulation.

For the last 90 days, precipitation across the Northwest Geographic Area has been below normal, particularly in central Oregon and southeastern Washington. Areas of abnormally dry conditions linger across sections of coastal and inland Washington. In Oregon, various severities of drought remain, with exceptional drought over central Oregon.

Wildfire activity was minimal through February. Prescribed fire projects continued at intervals on both sides of the Cascades.

Fire danger indices are not being reported in many areas due to snow or are too low for any noteworthy risk of large, costly fires. In drought designated areas, burn escapes may be possible on dry, windy days.

Climate outlooks suggest the Pacific Northwest will remain colder and wetter than typical through March. Beyond that, climate forecasters anticipate the potential for warmer-than-normal temperatures elevating through June, with no significant anomaly in rainfall accumulation foreseen.

Northern California and Hawai'i

Significant fire potential is projected to be normal through June. Historically during March through May, less than one large fire occurs in each Predictive Services Area (PSA). During June, between one and two large fires occur per PSA. Hawaii's significant fire potential is forecast to be normal from March through June.

The weather pattern during February was largely transitory during the first three weeks, with several trough and ridge passages providing short duration cool and moist or warm and dry periods, respectively. The pattern became more unsettled with an extended cool and wet period during the last week of the month. Precipitation was generally near to below normal despite all the system passage, and average temperatures were near to below normal. Portions of the North

Ops, especially west of the Sierra Crest, experienced between 10 to 15 days' worth of semi-dry northerly and easterly wind periods. Long term drought intensities did not change.

A solid herbaceous green-up remains below 2,500 to 3,000 feet and snowpack varied in elevation but was consistently found above 4,000 to 4,500 feet. Water equivalent within the snowpack had lowered from 180 to 220% of normal on January 25 to 140% to 175% on February 23 but increased at the end of the month as the pattern turned wet. The cooler temperatures kept the moisture loss lower than what it could have been. Live fuel moisture samples indicated a little more moistening as green-up became a bit more noticeable across the lowest elevations. Fire business was generally light with most days reporting three or less initial attack fires, although the trend was higher compared to what was observed in January. Conditions were dry enough to support large landscape burns during portions of the month, with pile burns the main prescribed burn type.

The weather outlook for March through June calls for mixed temperature and precipitation anomalies. Significant transitional changes are expected in the major teleconnection patterns like the Arctic Oscillation, Madden Julian Oscillation (MJO), and El Niño-Southern Oscillation (ENSO). There are mixed signals for March, but a more active storm track is expected for the earlier half of the month, with a drier trend likely during the latter half of the month. Confidence is high for a cooler than normal March. Near to below normal precipitation is anticipated for April and May. May and June are likely to support localized critical periods of dry live and dead fuels across the lower elevations, generally below 2,500 to 3,000 feet, although duration and spatial coverage should be a limiting factor. Herbaceous fuels across the lower elevations are likely to experience more noticeable curing from late April through early June, with a more cured state during June, while the middle elevations exhibit peak green-up conditions. Due to adequate sub-soil moisture, woody shrubs and canopies should trend toward above normal fuel moisture during the four-month outlook period. Snowpack across the upper elevations, especially above 7,000 to 8,000 feet, will keep fire danger levels on the lower during May and June. It is premature to forecast how quickly the snowpack erodes, but if a drier and warmer spring materializes and the snowpack erodes quickly then the middle elevations that are in a pre-green-up phase would be susceptible to large fire spread during gusty and dry wind events. Normal frequency of dry and gusty wind events is expected at this time through June, although March is likely to experience several north-northwesterly breezy to windy periods. Lightning ignitions are not anticipated to be a concern during the outlook period.

Sea surface temperature (SSTs) anomalies surrounding the Hawai'ian Islands are near to a little above normal. Average temperatures during February were generally near to above normal, with the warmest SST anomalies across the northern tier of islands. A few significant and extended precipitation events affected the state during February, and precipitation anomalies were generally near to above normal as a result. Due to robust stormy periods during the end of January and portions of February, any remaining areas of drought were eliminated. The four-month weather outlook calls for near to above normal temperatures and near to above normal precipitation. La Niña will continue to weaken during the next couple months with a transition to ENSO neutral likely by April. The weakening La Niña will also likely allow stronger MJO events, thus providing better chances for more organized precipitation events across the islands. Enhanced trade winds are likely to occur during the next couple of months as La Niña weakens but is not expected to align with critically dry fuels. Herbaceous green-up will also act as a barrier to fire spread, and significant fire potential is projected to be normal from March through June.

Southern California

In contrast to the previous two months, February was mostly dry. A high-pressure ridge extending from the central Pacific into Gulf of Alaska edged eastward toward the California coast in late January, which served to deflect most storms to the north and northeast of southern California.

Several cut-off, inside slider-type of storms moved into the Great Basin, resulting in light to moderate offshore winds. While it was quite windy at times, the winds were not accompanied by warm temperatures and maximum temperatures for February finished below normal again.

At the end of February, the ridge once again retreated westward, which opened the West Coast to several cold and strong storm systems. One especially strong storm arrived February 24-25, battering the geographic area with strong winds, heavy rain, and heavy high elevation snow. Rainfall from this storm ranged two to five inches from Fresno and San Luis Obispo County southward with amounts close to ten inches near the Ventura County Mountains. Snow was measured in feet above 4,500 feet in southern California, making this storm the biggest snow producer since 2019 for most of the local mountains.

The heavy precipitation occurring in December and January during the coldest part of the year allowed the moisture to penetrate soils very efficiently as evaporative demand was lower. The moisture allowed a robust grass crop to develop across lower elevations. The new grass is up to two to three feet high in warmer locations of southern California. Native brush and shrubs are exhibiting new growth and some flowering is visible in brush as well as seasonal smaller fuels. There was a bit of drying of some grasses on south aspects in open areas prior to the rains of late February. But the recent heavy, widespread rain should keep fuels from curing for at least another month.

Snowpack totals climbed to well above normal levels across the Sierra, with snow water equivalent (SWE) figures close to 150% over most watersheds of central California. There was some melting in the middle of February during a brief warm spell, but the strong storms centered on February 24 erased these losses quickly.

Drought conditions have been alleviated in many areas according to California Water Watch. Only the eastern deserts and lower elevations of the San Joaquin Valley and adjacent areas are seeing drought according to the 12-month Standardized Precipitation-Evapotranspiration Index.

Large fire potential is expected to remain near normal for the next several months. In the more immediate timeframe, recent rains should keep live fuels with well above normal fuel moisture. Dead fuels, especially larger diameter fuels, should retain moisture through the end of March.

Longer range weather and climate models are showing near normal amounts of precipitation for April and May. Thus, precipitation this spring should closely follow climatological trends with seasonal rainfall slowly decreasing in late March and early April. A "flash drought" following a rainy winter, as experienced a few years ago, is not expected this year.

The eastern Pacific is still in a La Niña condition, part of the ongoing three-year negative ENSO. But temperatures are trending warmer overall, including the Niño 3.4 region, which may lead to neutral ENSO indices by the late spring. It is a bit soon to place much confidence in the monsoon forecast, but most indications are that summer thunderstorms should begin at the usual time in late June to early July. A repeat of last year's very wet monsoon season is not expected.

Offshore wind events should occur at a near to perhaps a bit below normal rate this spring. The jet stream should be weaker this spring due to less temperature contrast in the Pacific compared to recent springs. This may keep the number of cold air intrusions east of South Ops fewer in number than usual, which would lessen the primary driving force of offshore winds.

There may be a spike in grass fire activity this year compared to recent seasons by late April or early May. There may be periods of moderate initial attack once this year's heavy seasonal grasses cure out, but with the expectation of less wind than usual, many of these fires should be handled by local resources. Little, if any, fire activity is expected above 7,000 feet throughout the spring due to the current above normal snowpack. Therefore, given these factors, large fire potential and resource demand should be near normal levels March through June.

Northern Rockies

Significant wildland fire potential in the Northern Rockies Geographic Area (NRGA) March through June is expected to be normal. Continued northwest flow aloft is expected well into March, which typically keeps below normal temperatures across the NRGA. This should delay the onset of any substantial drying. Moderate drought is still prevalent across a large portion of the NRGA, but the latter part of this outlook period is climatologically favored to receive moisture, so the drought is not expected to be a factor until the core of the summer months.

North Idaho and northwest Montana are seeing a subtle increase in moisture deficits as snowfall has been below normal the past few months. Snowpack is closer to 80 to 90 percent of normal and moderate drought has increased over the area. Precipitation anomalies for the past six months indicate less than 70 percent of normal precipitation has fallen in an area primarily near and including the Bitterroot National Forest.

Elsewhere there has been little change in drought indices, and snowpack is closer to normal. Snow cover has been persistent over eastern Montana and North Dakota, which should continue into mid-March at a minimum. Central Montana has seen snow cover retreat earlier in February, but it returned with the late month cold. Arctic air the latter half of February pushed average temperatures below normal. Below normal temperatures are expected to continue into mid-March.

Fuels are tracking near normal for the core of the winter months. As snow recedes in the eastern portion of the NRGA and lower elevations in the western portion of the NRGA, lighter fuels should provide opportunities for broadcast prescribed fire. The timing and rate of snow melt will influence the susceptibility of 100-hr and larger fuels to support consumption of these fuels during prescribed fires. Pile burning will continue throughout winter and into spring. For the western part of the NRGA, tracking 1000-hr fuel moisture and energy release components (ERCs) for northern Idaho, northwest Montana, and southwest Montana will be important. As spring commences, signs of increasing dryness will be monitored, with potential more active fire behavior than what is typically expected during spring prescribed burning.

Initial attack has been minimal over the winter. Continued opportunities for prescribed fire are expected in lower elevations, grass fuel, and open forest fuel types as snow melts and wind, temperature, and relative humidity fall within suitable windows for prescribed fire.

Normal fire activity is expected for the NRGA through June. This outlook takes strong consideration of the continued influence of northwest flow aloft, likely preventing a rapid warming and drying regime into mid-March. As this outlook covers the spring months, climatology favors increasing precipitation across the NRGA, which should continue seasonally low fire potential. This normal projection for the next four months is based on the little fire activity NRGA typically has into June.

Great Basin

Fire activity remains low across the Great Basin, which is normal for the time of year. Storms are expected to move across the Great Basin through March and target mainly the northern half to two-thirds of the Great Basin keeping fuel moisture higher and fire potential low. Drier and warmer conditions are expected in the far south, but fine fuels are of minimal concern, therefore, normal (i.e., low) significant fire potential is expected.

Temperatures over the last thirty days have been well below normal across much of the Great Basin. Precipitation over the last thirty days has been well below average, except for parts of far eastern Idaho that have been near normal. Despite the drier conditions over the last month, the snowpack remained well above normal due to colder temperatures, although values relative to normal decreased due to lack of additional precipitation. Snowpack ended February 150% to over

200% of normal across Nevada, Utah, and Arizona, with near normal snowpack farther north into Idaho and Wyoming. Low snow levels and heavy snow down to valley floors allowed snow to remain on the ground for extended periods throughout December and January across much of Nevada and Utah. Although the wetter conditions over the last six to nine months have improved drought conditions, moderate to severe drought continues across the Great Basin, with pockets of extreme drought in southern Nevada and Utah. The drought is expected to continue improving through the spring across the Great Basin, with drought possibly being removed across parts of the northern Great Basin.

Fuel moisture is above normal across the Great Basin due to consistent storms and heavy precipitation. Fine fuels were above normal last year across the Snake River Plain and parts of far northwest Nevada but were near or below normal elsewhere. The snowfall down to valley floors in December and January across much of Nevada and Utah likely has compacted any carryover fine fuels due to the extended period the snow remained on the ground. This is expected to decrease fine fuel loading in these areas heading into the spring. Significant new fine fuel growth is likely this year due to winter and spring precipitation, however, the carryover component is expected to be lower. The only exceptions are over far northwest Nevada into the Snake River Plain, where carryover may still exist as the lower elevation snowfall in these locations was not as significant as areas farther south and east. Fine fuel growth will be determined by weather and soil moisture heading into the germination period in April and May and will be closely monitored. Fire activity remains low across the Great Basin with no significant fires.

Normal significant fire potential is expected through April in all areas, which typically means low fire potential. Below normal fire potential is likely in some of the higher elevations of the southern Great Basin in May and June due to high snowpack. Small areas of the Ely District in Nevada may quickly return to normal or even above normal in June. This would be due to areas that have more significant grass growth due to higher precipitation at lower elevations. Areas farther north will continue at low fire potential in May and June, but that is considered normal for the time of year. We will continue to monitor spring fine fuel growth across the Great Basin, especially in Nevada, western Utah, and southern Idaho. Areas of above normal fire potential are likely in these areas by July and August. However, this potential will largely be determined by summer weather. The years the Great Basin starts emerging from 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 normal precipitation for that winter across the northern two-thirds of the Great Basin.

Southwest

Normal significant fire potential is anticipated for much of the geographic area through early summer. Areas of above normal significant fire potential are expected by early spring across the southeastern plains of New Mexico and across the south-central New Mexico mountains by April. Southern New Mexico could also see above normal potential by April. These areas are expected to return to normal significant fire potential by May due to a wetter weather pattern. Below normal significant fire potential is anticipated across most of northern Arizona late spring into early summer.

October through December was wetter than average for many areas, except for far western Arizona. High temperatures trended below normal overall during this period, with the coolest values compared to normal across the southern tier of Arizona into southwest New Mexico. This trend continued for January with below normal temperatures for the northwestern half of the geographic area, with many of these areas observing above normal precipitation. The eastern one-third of New Mexico was milder and had below average precipitation last month.

Snowpack is above to well above normal across the northwestern half of the geographic area, with below average snowpack values for the south-central mountains of New Mexico. Last

summer's above normal monsoon produced an abundance of fine fuel buildup across many areas, although across much of the northern Southwest Area, many of the fine fuels have been compacted by above normal snowfall. Farther south and east, these dead fuels are likely to be a factor this spring and become available to burn.

An active weather pattern will continue through the spring, with storm systems driving semi-frequently east-southeast producing areas of critical wind and low relative humidity focused across the southeastern part of the geographic area. With this pattern, wetter and cooler conditions focused on northwest portions of the geographic area and milder and drier conditions to the southeast are likely. With the combination of ongoing dryness across the Plains and eastern slopes of the New Mexico mountains, above normal significant fire potential is expected in these areas. Areas farther north and west in the geographic area will have normal significant fire potential overall, although below normal potential across northern Arizona in May and June are forecast due to the substantial snowpack and likely continued cooler conditions into spring.

A shift to ENSO-neutral over the next few months and perhaps into a weak El Niño by early to mid-summer could point towards a shift in the weather pattern by late April into May. Many uncertainties presently exist regarding this. If the weak La Niña deteriorates quickly, a more active and likely wetter pattern could ensue by late spring into early summer compliments of a deep, persistent mid-to-upper-level trough near or just off the coasts of southern California or Baja California. The summer monsoonal pattern will likely be wetter east of the Continental Divide and either near normal or drier farther west. The monsoon may arrive a bit late in Arizona due to the active and likely closer to normal spring pattern focused across the northwestern portion of the geographic area.

Rocky Mountain

Normal fire potential is expected across all Predictive Service Areas (PSAs) in the Rocky Mountain Area (RMA) for the outlook period. Historically, that means the pre-green up late winter and early spring period may have short-lived episodes of elevated fire potential in the lower elevations, especially along and east of the southern Front Range Foothills into southeast Colorado and western Kansas during dry and windy conditions. This would be due to long-term, persistent drought and exposed carry-over fuels from last season's growth. It also means that snow will continue to accumulate in the mountains through March into April, with low fire potential in the high country where heavy fuels are still covered by snow and high soil moisture, especially on north aspects.

So far this winter, the mountains have benefitted from frequent and high-quality snow accumulations that have been maintained due to generally colder-than-average temperatures and several outbreaks of cold, Arctic air since late December. A comparison of snow accumulation this year, with the past few seasons shows that this is the most substantial snow cover overall across the RMA since the 2019-2020 winter season. Even in the lower elevations of central and northeast Colorado, this winter has shown exceptional longevity for snow remaining on the ground where typically there is a more active freeze and thaw cycle. This is due to the cooler temperatures noted above, along with the low sun angles typical of winter and more persistent cloud cover than normal. The snow water equivalent (SWE) is 110 to 135 percent of average across the Rocky Mountain Area, except for the Arkansas River Basin in southeast Colorado where it is about 79 percent of average for the period 1991 to 2020.

Infrequent precipitation and lack of snow cover persists in southeast Colorado and western Kansas where moderate to severe drought and extreme to exceptional drought continues, respectively. The US Drought Monitor depicts little change elsewhere, but some categorical improvements were noted in Colorado. Recent and expected precipitation on the Plains is anticipated to bring noticeable improvements to the drought situation there, especially for the spring and summer months.

The latest satellite and snow depth analysis indicates that most of the RMA now retains a uniform and substantial snowpack that has compacted the fine fuels and eliminated any vertical arrangement of carry-over fuels for fire spread. Southeast Colorado and western Kansas remain snow-free but carry-over from last year's vegetation growth is not considered to contribute a substantial fuel-load. Nevertheless, fire danger is somewhat concerning in those fuel beds, especially when low relative humidity combines with warm, downslope wind events, or those associated with short-term cold frontal passages. During these periods, significant fire potential will be elevated, but not critical for long periods because humidity recovery has been adequate.

Progressing through spring, natural ignitions due to lightning will increase with convective storms, but considering that most fuels are not critically dry during the spring green-up period, most ignitions will be from human activity. Notably, the March-through-May period is climatologically the wettest and snowiest time of year in the Rocky Mountain Area, especially on eastern slopes and adjacent plains of the Front Range where most fuels are in the 1-hour to 10-hour size classes.

Favorable conditions continued to allow pile burning in many areas of Colorado, Wyoming, and the Black Hills of South Dakota. During a two-day period over Presidents' Day weekend, it was in the 90th percentile of hot, dry, and windy events in southeast Colorado and Kansas due to pre-cold frontal conditions. There were numerous fire starts in the Flint Hills of Kansas but none that required resource mobilization from the RMA.

For the first week of March, another polar vortex shift and associated Stratospheric Warming Event (SWE) are expected to bring yet another Arctic cold front through the RMA, which will favor a longer-lived snowpack for the Plains. From a large-scale climate perspective, a third consecutive La Niña winter is underway but has not brought the typical north-south split of temperature and precipitation characteristics that might be expected during the winter months. That is because of other atmospheric scale climate interactions including, an active phase of the Madden Julian Oscillation (MJO) and multiple shifts in the polar vortex that brought about cold, Arctic air outbreaks that extended into the southern Plains. The sea surface temperature observations that are indicators of El Niño-Southern Oscillation (ENSO) conditions continue to show signs of La Niña weakening toward a neutral state. The expectation is for that to continue this spring, followed by El Niño conditions likely developing during the summer months. In the short term there is considerable uncertainty about how abruptly that could occur because rare back-to-back ENSO events sometimes flip more quickly than climate models forecast. If this is the case, spring and early summer could be cooler and wetter than the official outlooks currently portray. That may favor a slower melt-off of the high-elevation snowpack with soil moistures benefitting at the root zone of the fuels. This would also be beneficial for a robust green-up in late spring.

The outlook for the RMA depicts normal significant fire potential across the geographic area for the remainder of winter and spring through June. Due to persistent drought across portions of the Plains, fire potential may be elevated at times during the outlook period, especially along and east of the Southern Front Range Foothills and across portions of southeast Colorado and western Kansas (PSA 27) during warm, dry, and windy weather events prior to green-up. Statistically, there is an increase in fire activity and large fire occurrence across the Plains prior to green-up in March and April, which is considered normal within the geographic area fire history. The rest of the RMA is anticipated to see normal green-up following the melt-off of the spring snowpack, which may be later than average.

Eastern Area

Near normal significant fire potential is forecast across the majority of the Eastern Area March into June.

Snowfall and precipitation were below normal across northwestern Minnesota January into February. Shorter term drying developed over the northeastern Mid-Atlantic states into parts of

New England. Longer term drought remained in place across parts of the Upper Mississippi Valley as well as the southeastern lower peninsula of Michigan towards the end of February. Thirty to 90-day soil moisture and precipitation anomalies were near to above normal across the remainder of Eastern Area.

According to the NOAA Climate Prediction Center and Predictive Service's long-term outlooks, near to above normal precipitation is forecast across the majority of the Eastern Area in March and across the Great Lakes in April. Drier than normal precipitation may develop over parts of the Upper Mississippi Valley in June. Below normal temperatures are expected over the Upper Mississippi Valley in March. Above normal temperatures are also expected across portions of the southern tier of the Eastern Area March into May, spreading northward into the Upper Mississippi Valley in June. Periods of below normal fuel moisture levels may occur over the drier portions of the Eastern Area into the spring if conditions do not improve.

Southern Area

Meteorological winter was very warm across the South, with many reporting stations experiencing a top five warmest winter. Anomalous warmth has only accelerated in recent weeks, and a plethora of February and wintertime high temperature records have been set in nearly every state. This has propelled our spring green-up well ahead of schedule, especially in areas that have seen above normal precipitation through the past few months and includes areas from eastern Texas and Oklahoma through much of the Mississippi Valley and Appalachians.

One major area of uncertainty in this outlook lies in the impacts from extremely cold temperatures experienced around Christmas. This abrupt cold snap in an otherwise warm winter may contribute to above normal fuel loading via dormant herbaceous fuels in areas that do not see freezes every winter, excess leaf litter from both native and invasive species, and potentially an increase in dead 10- to 100-hour fuels across the Southeast. It is possible the overlap of these very cold conditions with areas that experienced moderate to severe drought last fall could be especially prone to excess dead or damaged fuels, to include areas from the far southern Appalachians across northern and central Georgia, far southern Alabama into the Florida Panhandle, and over portions of the eastern coastal plain. Wet conditions through winter have resulted in little wildfire activity and delayed burns in these areas so far, but at least one prescribed fire on the Chattahoochee-Oconee NF reportedly burned considerably hotter than anticipated. Meanwhile, herbaceous fuel loading over the Plains remains normal to below normal in most areas due to the multi-year drought. However, last year's monsoon contributed to above normal grass loading in the Trans Pecos and both interior south Texas PSAs. Until appreciable wetting rain occurs in these areas adjacent to the Rio Grande, dormant grasses may contribute to large fire potential through spring.

Multiple sources of uncertainty lead to somewhat lower than normal confidence in what to expect this spring, including the potentially rapid transition from La Niña to El Niño, along with an ongoing Sudden Stratospheric Warming (SSW) event. Major SSW events often lead to a wavier jet stream configuration several weeks after they occur, which typically enables Arctic air masses to plunge into the South. A similarly timed SSW took place as recently as February 2018, which led to much colder trends in March and April that year over most of the geographic area. Interestingly, that February was the warmest on record over most of the Southeast, which may be topped by February 2023 in at least a few areas. Forecast guidance is continuing to suggest a turn towards colder conditions throughout the southern US as early as the second week of March, with strong support from tropical convective forcing (like the Madden-Julian Oscillation, or MJO). This MJO forcing suggests a continued wet pattern from eastern Texas and Oklahoma to the Appalachians the first week or two of March, with cooler and drier trends thereafter. While confidence is low in the duration of any potential Arctic air mass intrusions, it is increasingly likely that one or more will occur in March and possibly April, which could result in either shocked and re-cured vegetation or a paused green-up in some portions of the geographic area. Dry frontal passages may also increase in frequency given the source region for air masses would trend from the anomalously warm Gulf of Mexico in early March to the continent later in the month. While of extremely low

confidence, this SSW event could shift the focus for abundant rainfall from the Mid-Mississippi, Tennessee, and Ohio Valleys towards the Gulf states, East Coast, and Florida. Subsequent outlooks may change considerably if drought relief occurs, but it is worth noting that any improvement to the current situation may come at the cost of increasing lightning ignitions.

Given continued wetness in early March and the record early green-up, below normal significant fire potential is forecast for March in the mainly hardwood-dominant areas from eastern Texas and Oklahoma through Arkansas, Tennessee, Kentucky, northern Mississippi, northern Alabama, northern Georgia, and the Appalachians. The expected evolution of more wintry conditions for at least a couple of weeks adds confidence here, but there may be increasing risks towards the end of March and especially by April, especially if widespread hard freezes affect the fuelscape.

Drought has recently been expanding across Florida, but water levels in lakes and swamps are still elevated from Hurricanes Ian and Nicole. This may be enough to continue quelling wildfire activity in the short-term, but model guidance strongly supports warmer and drier than normal weather in Florida through late spring, which has the potential to affect the Florida Panhandle into southern Georgia as well. This implied excess evaporative demand combined with widespread Keetch-Byram Drought Indices (KBDIs) above 600 already in place, are expected to bring above normal significant fire potential to Florida and coastal Georgia in March and April, with above normal potential maintained there in May due to the typical increase in lightning ignitions experienced at the beginning of the convective season. The above normal potential may include some of the areas immediately adjacent, including from southern Alabama and the Florida Panhandle into south Georgia. Southwest Florida is a particularly concerning area given KBDIs above 700, debris left from Hurricane Ian, and the prevalence of salt-cured fuels associated with its historic surge. Despite limited wildfire activity so far in 2023, a rapid increase in risk appears probable the next few weeks. Expected fire-effective weather on Friday, March 3, may be a good test of conditions across the peninsula.

Recent dryness is also noteworthy across Puerto Rico and the Virgin Islands, where abnormal dryness and some moderate drought have developed in recent weeks. This is typical of their dry season during La Niña years, which climatologically runs through April. Given the expectation for El Niño later this year, any lingering dryness through March and April will be key to increasing risks later in 2023. The Caribbean's wet season, which runs May – November, is often much drier than normal during the El Niño base state.

The south Texas PSAs inland from the coast are forecast to see above normal significant fire potential in March due to worsening drought, the presence of above normal and still dormant grass loading, and forecasted above normal temperatures. In fact, triple-digit heat is likely several days during the first week of March, only exacerbating local dryness. Areas of long-term drought and similar fuel loading for the Trans Pecos, combined with increasing lightning ignition potential later in spring, are reason enough to maintain above normal significant fire potential from March through May. The West Texas PSA is forecast to have above normal potential in March, as this area has flirted with fire danger approaching the 90th percentile on a few occasions in recent weeks, and both dryness and warmth look to continue for at least the next couple of weeks. Despite multiple large fires that occurred in late February across the High Plains, large-scale fuel conditions point towards normal activity, but any extreme combination of winds, dryness and warm temperatures should be monitored closely.

Soil moisture data continues to show lingering dryness across North Carolina, where rain in recent weeks has alleviated some concerns. Confidence here is among the lowest of any part of the geographic area, given multiple mixed signals on drought stress, precipitation, and the forecast pattern through spring. Normal significant fire potential is forecast, but this may change quickly if March does not transpire as expected.

Southern Louisiana and adjacent portions of the Gulf Coast have trended drier in recent weeks, with expanding dryness and drought noted in recent drought monitor updates. Normal significant

wildfire potential is forecast for March along the middle Gulf Coast given a climatological max observed there, but if these areas continue to remain dry the next few months, flash drought development is possible across the Lower Mississippi Valley heading into late spring and summer. Analogs for transitions from La Niña to El Niño indicate a very dry signal in these areas, which may contribute to above normal potential, especially by June. Note that debris and slash from Hurricanes Laura and Ida would increasingly come into play across Louisiana in this scenario. Otherwise, in June, confidence in weather trends is highly uncertain, though the previous analogs and some forecast guidance currently suggest that some of the driest portions of the geographic area may see significant drought relief by summer.

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>