



## National Significant Wildland Fire Potential Outlook

Predictive Services  
National Interagency Fire Center

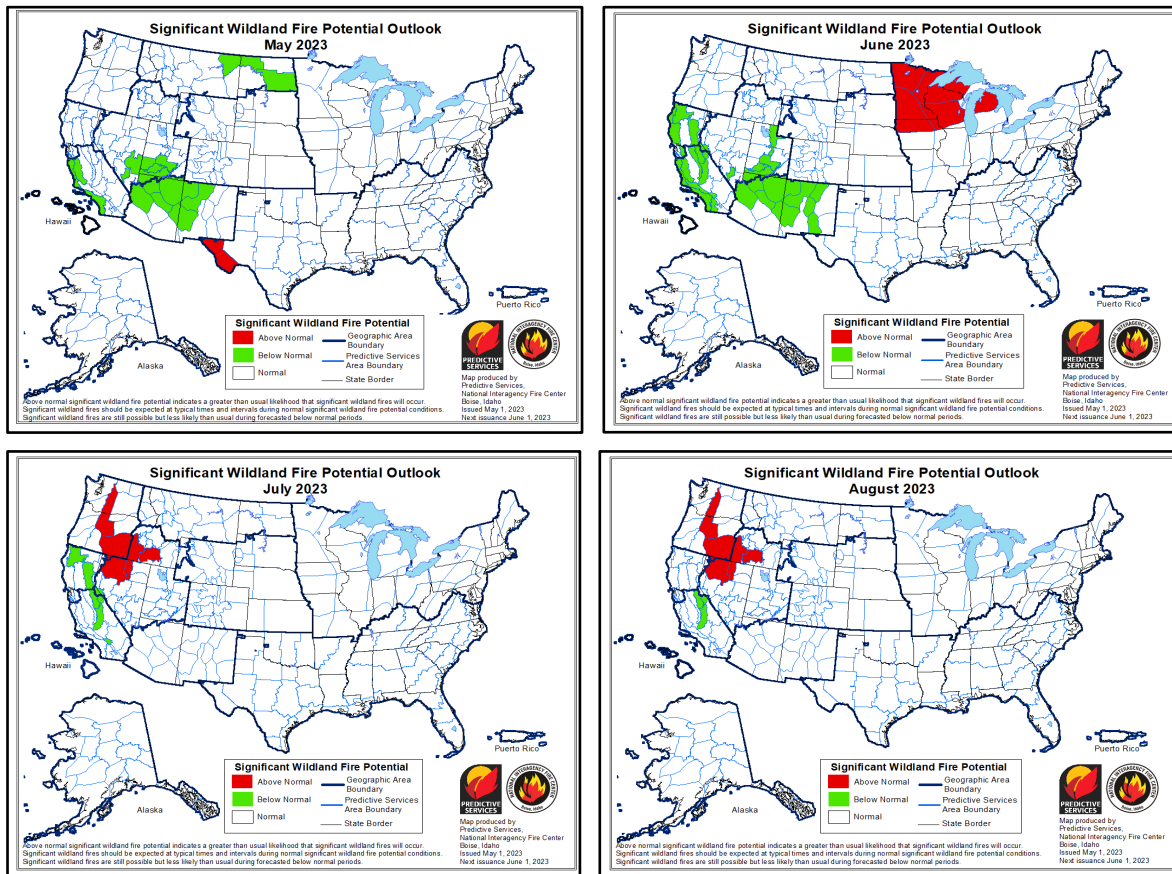


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Outlook Period – May through August 2023

### Executive Summary

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



Significant fire activity continued to increase across the Southern, Southwest, Rocky Mountain, and Eastern Areas in April, but a portion of the Southern Area observed a decrease in significant fire activity at the end of the month due to green-up. Significant fire activity remained minimal elsewhere across the West and Alaska. Green-up is well underway across much of the West, but fuel moistures are decreasing across the lower elevations of the Southwest and portions of southern California. Year-to-date acres burned for the US is 55% of the 10-year average, with a below average number of fires, nearly 83% of average.

Precipitation decreased significantly across much of the southwestern US in April, with below normal precipitation extending through the Mid-Mississippi Valley into the Mid-Atlantic. Above normal precipitation was confined to the Northwest, portions of the Texas coast, and Great Lakes. Below normal temperatures were widespread across the West, and despite the below average precipitation, little snowmelt occurred, with record or near record snow water equivalent (SWE) values remaining in the Sierra, Nevada, Utah, and Arizona. Temperatures were above normal in Florida and the Northeast. Drought continued to improve across most of the West, but drought emerged or worsened in Florida and the Mid-Atlantic into southern New England, while severe and extreme drought continued on portions of the southern and central Plains.

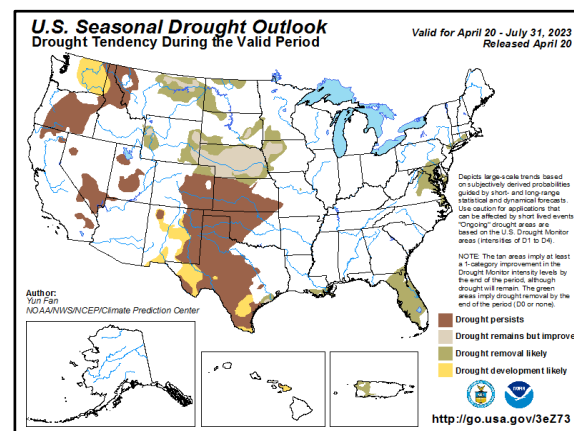
A pattern change is likely to transpire through the rest of spring into early summer, with near to below normal precipitation forecast for the West and near to above normal precipitation for much of the eastern US. Above normal temperatures are likely for the southern and eastern US, while near normal temperatures are forecast for most of the West, northern Plains, and into the Midwest. However, above normal temperatures are becoming more likely in the Northwest by early summer. Drought will likely increase in much of eastern Washington and portions of the Southwest, while continuing on much of the southern and central High Plains. However, drought improvement is likely across the rest of the Plains, in the Mid-Atlantic, and on the Florida Peninsula, and drought removal is also expected over many of these areas as well.

Above normal significant fire potential is expected across far west Texas in May before returning to normal in June. Above normal potential is also forecast across portions of the Upper Midwest and western Great Lakes in June, with above normal potential across portions of northern Nevada, southwest Idaho, eastern Oregon, and central Washington for July and August. Below normal significant fire potential is expected across portions of the northern Plains in May before returning to normal in June. Below normal potential is also forecast along near the southern California coast and much of northern New Mexico and Arizona into the southern Great Basin. In June, below normal potential is expected to expand into most mountains in California, the Wasatch Mountains of Utah, and the New Mexico central mountain chain, but a small area of east-central Nevada and west-central Utah will return to normal. For July, below normal potential will continue in the Sierra and northwest California mountains, but normal potential will return to the rest of California, Southwest, and southern Great Basin. Below normal significant fire potential will continue across the southern Sierra into August.

### ***Past Weather and Drought***

An active weather pattern continued over the CONUS in April as the Madden-Julian Oscillation (MJO) remained very active in the tropics. While consistent upper-level trough passages moved across the West, above normal precipitation was limited to the Northwest, while much of the rest of the West recorded below normal precipitation, with no precipitation recorded in April in portions of the Southwest and southern California. Much of the Plains had below normal precipitation with several wind events across the central and southern Plains, while portions of the northern Plains into the western Great Lakes observed near to above normal precipitation. Below normal precipitation also extended through the Mid-Mississippi Valley into the Mid-Atlantic and southern New England. Above normal precipitation occurred in much of south Texas and southeast Florida, with record daily rainfall over 25 inches recorded in Fort Lauderdale on April 13. Temperatures were generally below normal across the West and Plains into the Midwest, with above normal temperatures in the eastern Great Lakes, Northeast, Mid-Atlantic, and Florida.

Most of the fire activity was confined to the Southern, Southwest, Rocky Mountain, and Eastern Areas. Two significant wind events across the central and southern Plains on April 10-13 and April 17-18 resulted in spikes of significant fire activity across New Mexico, Colorado, Nebraska, Iowa, Kansas, and Oklahoma. Very dry and occasionally breezy winds contributed to elevated activity across the Mid-Atlantic into southern New England beginning April 12, with significant fires in Massachusetts, New York, New Jersey, Pennsylvania, and West Virginia. Very dry conditions in eastern North Carolina contributed to the Great Lakes Fire, resulting in the first Complex Incident Management Team deployment this year. Florida, Arizona, Michigan, and Wisconsin also had short-lived significant fires during the month.

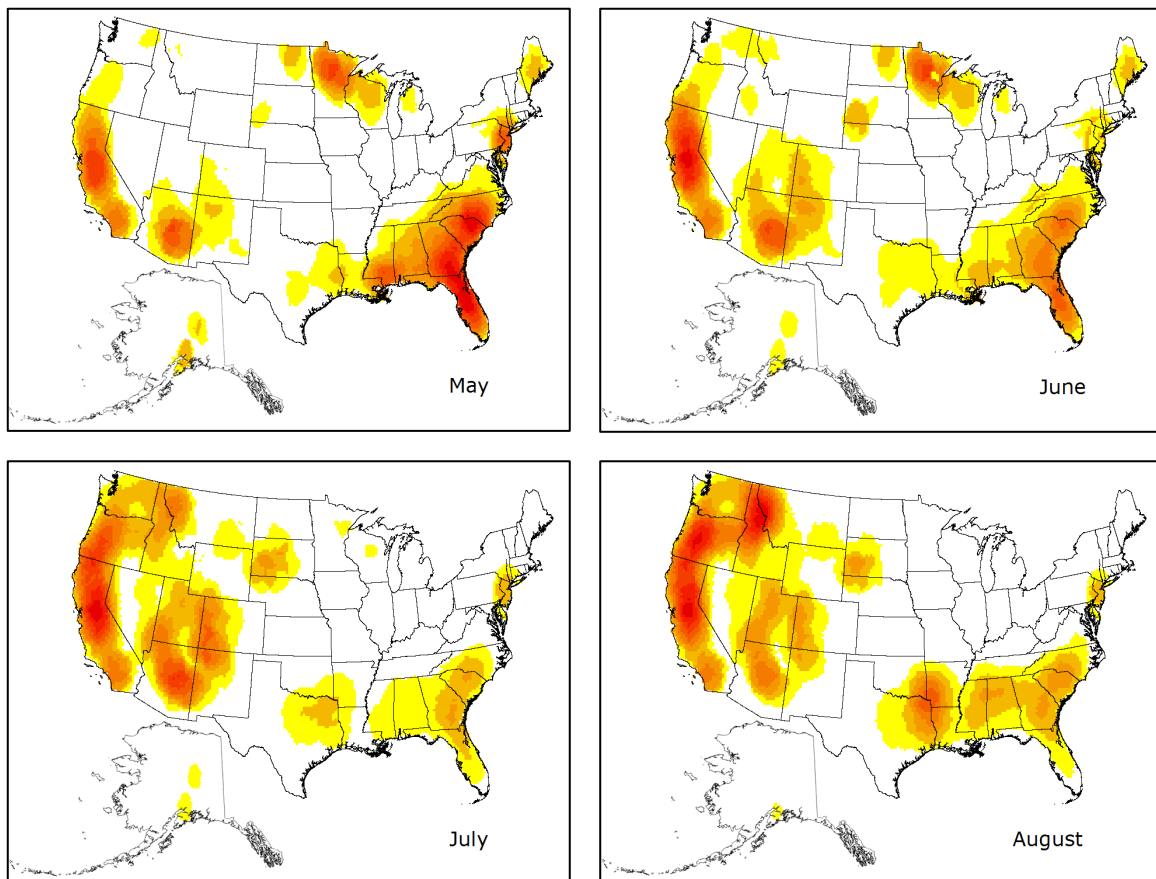


**Left: Departure from Normal Temperature (top) and Percent of Normal Precipitation (bottom)** (from PRISM Climate Group, Oregon State University). **Right: U.S. Drought Monitor (top) and Drought Outlook (bottom)** (from National Drought Mitigation Center and the Climate Prediction Center).

## ***Weather and Climate Outlooks***

El Niño Southern Oscillation (ENSO) neutral conditions continue in the equatorial Pacific Ocean. However, rapid warming continues in portions of the ENSO region, especially just off the northwest coast of South America, leading to above normal sea surface temperatures in the ENSO 3 and 1+2 regions. Most forecast guidance depicts continued warming through spring into summer, with El Niño conditions possible if not likely by the end of summer. The Climate Prediction Center (CPC) has issued an El Niño Watch, with a 62% chance of El Niño developing during the May through July period. Other teleconnection patterns, such as the Madden Julian Oscillation (MJO), Pacific Decadal Oscillation, and Pacific-North American Pattern are likely to influence weather and climate during the outlook period. The MJO has been very active over the winter into spring, including a very strong MJO in March, with another significant event ongoing. The MJO has significantly affected weather and climate across the US, especially the western US, and will likely continue to do so through May.

## ***Geographic Area Forecasts***



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**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)**

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## **Alaska**

Normal fire potential is expected in Alaska May through August. May will bring an increase in early-season human ignitions to low-lying areas of the state as the snowpack retreats and exposes dead fuels. We expect to see a rapid increase in fire activity in early May on the western Kenai Peninsula and the western side of the Susitna Valley. Other low-lying areas around the state will soon follow. By June, most areas will be snow-free, and the summer will be moving into the busiest part of the fire season, which is typical.

Spring has been wetter than normal for many parts of the state, and no areas are in drought status. Though the Yukon-Kuskokwim Delta was nearly snow-free in early March, it has received more snow recently and has returned to normal conditions. Currently, the snowpack is disappearing fastest on the western Kenai Peninsula, the western side of the Susitna Valley, and the north side of the Alaska Peninsula. The Panhandle is already snow-free at lower elevations, though it's been wet.

The Climate Prediction Center forecasts an increased likelihood for colder and wetter than normal conditions in southwest Alaska for the next two weeks. Then conditions change and warmer than normal conditions are likely for the rest of the summer statewide. Wetter than normal conditions may be likely in the west, though skill is low with precipitation forecasts more than a couple weeks out. Of more note, the transition from La Niña to El Niño by summer could increase wildfire potential for Alaska this year by bringing a warmer and drier pattern. More active fire seasons in Alaska are generally paired with El Niño summers, but this correlation is weak at best.

At this time, there has been little fire activity in the state, with just a few small human ignitions in parts of south-central Alaska where the snow has retreated. Expect this to change in the first half of May as areas of snow-free ground rapidly become larger and more numerous.

Fuels across most of the state are snow-covered as of the end of April. Fire danger indices are beginning to be generated as low lying areas of south-central and southeast Alaska become snow-free. Currently, most stations in the Panhandle are snow-free and have been calculating fire weather indices since early April. In addition, a few stations on the western Kenai and Susitna Valley are just beginning their fire weather index numbers. Expect to see many more stations around south-central Alaska begin calculating indices as they become snow-free by mid-May.

With a cold spring, snowmelt that normally occurs across Alaska during April is a bit delayed. However, temperatures are forecast to be into the 50s, which will quickly compact and melt the snow. Expect to see normal conditions during the next few months, with the snow melting out first at lower elevations, exposing cured fine fuels from the previous season, which lends to wind-driven grass fires. 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 typical for Alaska.

Though we know that some of Alaska's biggest fire seasons occur in El Niño years, this is by no means a strong correlation. The switch from La Niña to El Niño indicates that we could have a busier than normal fire season. However, there are no other indicators to tell us whether our season will be more active than normal. Overall, expect a normal fire season across Alaska through August.

## **Northwest**

A succession of Pacific weather systems continued to move into Oregon and Washington during April. Temperatures were cooler than average across the entire geographic area. Rainfall and snowfall were above average for most of the geographic area except for central Oregon and sections of southeast Oregon and southwest Oregon.

As a result of the unusually cool and wet weather, upper elevation snow reporting basins reported that snow water equivalent (SWE) values continued to accumulate to well above normal in both March and April. By the end of April almost every upper elevation reporting basin was well over 100% of normal. By the end of the month, melting was beginning to reduce the amount of snow at the reporting stations.

Drought designations diminished slightly in severity in central Oregon and remained mostly unchanged in Washington during April. Extreme drought continues to be a persistent feature in central Oregon since 2022, but it has diminished in size and intensity since late 2022.

Due to the predominantly cool and wet conditions, wildfire activity was limited and mainly east of the Cascades. Prescribed fires continue on both sides of the Cascades.

Fuels remain too moist to support elevated risk of significant fires and are historically likely to remain so until June. Many fire danger reporting stations remain under snow cover so specific information on fire danger is still limited. Timing and speed of snow melt will determine the flammability of fuels as fire season approaches. Curing of fuels in areas of higher grass production will increase potential for fire growth.

Outlooks through May and beyond continue to suggest a transition to warmer-than-usual conditions during fire season 2023.

Normal (i.e., very low) risk of significant fires is expected over the Northwest Geographic Area until July and August when areas of central and southeast Oregon are expected to be above average potential for significant fires.

## **Northern California and Hawai'i**

Significant fire potential is projected to be normal for May. Historically each Predictive Services Area (PSA) records less than one large fire during May, therefore limited significant fire activity occurs. Near to below normal significant fire activity is projected for June and July, with some of the mountain and near coastal PSAs in the below normal category, especially for June. During June, between one to two large fires occur per PSA. During July, one to three large fires occur per PSA, although the Bay Area is usually less than one. The August outlook calls for normal significant fire activity, which ranges between two to six fires per PSA excluding the Bay Area PSAs, which is less than one. Hawaii's significant fire potential will be normal from May through August.

The weather pattern during April was mixed with a combination of moist and cool trough passages followed by drier ridging. Despite periods of unsettledness, precipitation was generally near to below normal with a small area of above normal across the far northwest. Average temperatures were generally below normal. Dead fuel moisture experienced a gradual drying trend with near to above normal readings recorded at the end of the month and quite a change compared to the ultra-moist conditions observed during the end of March. A visible herbaceous green-up was generally found below 3,000 feet, although the cooler temperatures and occasional frosts and freezes provided some muted growth periods. Moisture found within the snowpack remained at well above to near record levels. Live fuel moisture samples were erratic to begin the moistening process, with frosts and freezing temperatures providing brief but significant interruptions to green-up across the lowlands, while dormancy remained across the mid and upper elevations.

Due to the cool winter and early spring, the significant portion of the growing season across the lowlands has been delayed by at least a couple of weeks. Lightning was limited to just a few days totaling nearly 360 cloud to ground strikes and well below the 2012 to 2022 April average of nearly 1,800 strikes. Dry to semi-dry breezy northerly and easterly wind flows were observed on eight days during the month but none were strong. Fire business steadily increased because of the drier conditions with several of the days reporting five or more initial attack fires and some days were in the double digits. However, all fires were small with none of the fires more than a few acres. Prescribed burning also increased, with some notable broadcast burns but lots of pile projects as well.

The weather outlook for May and most of June calls for timely cool and moist intrusions, while the potential for building heat anomalies from north to south are more likely for July and August. Due to the expected rapid transition towards El Niño plus the large arc of cooler than normal water off the North American Coast, intermittent cut off low pressure systems are expected to affect California during May and parts of June, providing timely moist and cool events. Precipitation anomalies are likely to be varied during this time frame and likely to be near if not a little above normal. Temperatures during May and June should be near to below normal. It is looking more like a quicker transition to El Niño conditions during the late spring to summer period. Therefore, a warmer scenario is more likely to develop during the summer months. The North American Monsoon is expected to develop later than normal and is expected to be weaker than normal, especially compared to the robust monsoons observed the previous two years. Lightning should accompany the cut off lows during the spring to early summer, while the monsoon intrusions into northern California should be muted, although they could lead to some intermittent drier storm-ignition scenarios. This is a very early look at the summer lightning season so projections remain uncertain.

Onshore flow should be the dominant wind flow during May and June, with near if not below normal amounts of dry northerly and easterly wind events. Many areas will have significant barriers to fire spread during May, with an unusually abundant snowpack across most sheltered mid and upper elevations while green-up will be peaking across most lower elevation areas. Transitional green-up will be moving up the slopes from late spring into the summer period while herbaceous curing will be noticeable across the lowlands. Live fuel moistures in the woody shrubs and canopies are expected to eventually trend above normal during most of the outlook period due to more than adequate soil moisture levels. The anticipated heat this summer should erode off the snowpack quicker across the higher elevations, but moist live fuel conditions should create a barrier resistant to fire spread. Critically dry dead fuel moistures should not come into play over a larger area and for an extended time frame until sometime during summer thus helping to promote an extended prescribed burn season. Long-term drought conditions will remain across the northern tier and could expand or intensify during the summer. Areas of extra laddering or fuel flammability will be found across the region due to blow-down and snow crush from the many atmospheric river events over the winter. Tree mortality was also significant across northern California during 2021 and 2022. Barriers to significant fire spread will be found across many of the large fire footprints of the past three to five years. Therefore, based on current and anticipated fire environment conditions, significant fire potential is projected to be normal for May, which means very little if any large fire activity, then transitioning to near to below normal for June and July before returning to normal during August.

Sea surface temperature (SST) anomalies surrounding the Hawai'ian Islands are near to a little above normal. Average temperatures during April were mixed but generally near to below normal across the northern and southern tier of the island chain, while near to above normal across central portions. There were significant precipitation events during April impacting various portions of the islands, thus most areas received above to well above normal rainfall. Just a little bit of moderate drought conditions persist across Maui as of the third week of April. ENSO neutral conditions are found across the eastern equatorial Pacific, but there is more evidence of a rapid transition towards El Niño conditions the rest of the spring into the summer. The four month weather outlook calls for near to above normal temperatures, with the better chance for near



normal temperatures across the Big Island. Precipitation should be near to above normal during May then departures should be more below normal June through August. Herbaceous fuels will initially act as a fire spread barrier but could provide some flammable fuel alignments along the leeward sides during July or August. Normal significant fire potential is projected from May through August.

### **Southern California**

Significant wildfire potential will tend to run below normal across South Ops during the outlook period, particularly through early summer and at higher elevations.

Southern California's historic 2022-2023 wet season came to an end in April. This is not unusual and did nothing to diminish the gravity of an exceptionally wet and snowy winter. The longwave pattern in April initially remained characterized by western US troughing, reinforced by anomalously cold sea surface temperatures (SSTs) off the West Coast and widespread snow cover over the adjacent land mass. This led to continued cooler than normal conditions. Only a modest northward and eastward shift in the axis of mean troughing occurred, typical per climatology, allowing for drier weather to prevail. Some warmer weather did build into the region during the last ten days of the month, likely caused by sub-seasonal forcings related to the Madden-Julian Oscillation (MJO) and a pattern change over the Atlantic Ocean. Winds were almost entirely onshore through the month as March into April marks the climatological end of offshore wind season. The frequent troughing across the West brought several periods of gusty onshore winds especially over the inland mountain ridges and desert passes.

Notable during April was the rapid trend away from the recent La Niña conditions across the equatorial Pacific and towards El Niño conditions. While it will be at least a few months before an El Niño could officially be declared, the recent trends and a comparison of observed SST values versus model guidance strongly suggest a developing El Niño event is underway. As of April 13, NOAA had officially issued an El Niño watch for this summer due to its growing likelihood. Due to its early stage of development and a tendency for there to be some lag effects in atmospheric-oceanic coupling, El Niño is not likely to be a major factor for California through midsummer when it does develop, but it may have major implications not far beyond this outlook period.

Various metrics continued to show drought improvement across the state as lagging hydrologic indicators continue to be accounted for in the wake of the winter precipitation. The vast majority of California is no longer in drought. Most major reservoirs, which were so depleted just a few months ago, are now at near or above normal levels, and in some cases are near capacity. Snowpack remained at historic highs especially over the central and southern portion of the state. Peak snow cover has now passed as the seasonal melt begins, but elevations above 7000 feet continue to have extensive snow cover. Snow depth values are commonly over six to ten feet at those elevations. Furthermore, snow-water equivalent (SWE) values remain a staggering three to seven feet as well, but recent warmth has resulted in an increase in melting rates. It should be emphasized that this process is still in its early stages over the Sierra, and there remains a significant risk of flooding in the event of a prolonged heat event or a late season rain event.

Dry weather in April allowed for some declines in 100-hr and 1000-hr dead fuel moisture, which are now running near normal overall after being well above normal most of the winter. However, the bigger story is the above normal live fuel moistures, with live fuels dominating the overall fuel load. Live fuel moistures are running 80% to 130% across the region, which are above normal, and are likely nearing their seasonal maximum in most fuel types. Numerous, widespread field reports confirm that fine fuel loading is extremely heavy in most areas this season, unsurprising considering the conditions observed this winter. While information is spottier across the desert regions, it does not appear that the deserts are seeing as much in the way of anomalously high fuel loading and that their fuel conditions are probably closer to normal.



Curing of fine fuels in lower elevations is likely to accelerate in May, initially favoring south and west aspects. Even in lower elevations, fine fuel curing is likely to run at least two to four weeks later than normal due to the lingering wet soils and expected below normal temperatures. In higher elevations, the record snowpack will continue to melt, but snow cover will be present much later than normal above 7000 feet this spring and summer. This will keep live fuel moisture and soil moisture above normal in higher elevations through most or all this outlook period.

Continued cold SST anomalies off the West Coast are likely to lead to cooler than average temperatures and a deeper than normal marine layer through at least June, if not into July. This is also likely to contribute to a later than normal start to the monsoon season due to the marine influence. The monsoon is expected to eventually reach near to slightly above normal strength by midsummer, aided by warm SSTs over the Gulf of Mexico and gradually warming waters off the West Coast. However, it may tend to have an overall eastward bias compared to normal throughout the warm season.

The widespread snow cover and high live fuel and soil moistures are likely to lead to a notably delayed start to fire activity and well below normal activity across the higher elevations above 7000 feet. Corresponding highlights have been included in the monthly outlook maps. At lower elevations, the picture is less clear. While the high fine fuel load raises the possibility of an active grass fire season, grass fire spread is correlated more heavily with wind than fuel load alone. Therefore, the presence of a strong grass crop does not guarantee an active grass fire year. Troughing is expected to remain prevalent over the West into the late spring, which could lead to windier than average conditions. However, grass-shrub fuel types may see fire spread hindered by higher live fuel moisture in shrubs. The deep marine layer will also likely help keep finer dead fuel moistures above normal especially across the South Coast. These competing combination of factors may lead to a delayed but ultimately near normal lower elevation fire season. However, such fires tend to be shorter in duration and less straining on resources than higher elevation fires involving heavy timber, the likes of which are expected to be below normal this year. Therefore resource demand within South Ops is likely to be below normal most of this summer.

It is too early to have much confidence in discussing conditions for next fall and winter, and that period is beyond the range of this outlook. However, it is now highly likely that the developing El Niño will play a major role in California's weather during that time. The probability of a moderate to strong El Niño has increased versus previous expectations, which normally correlates to wetter than normal winter conditions in California. The evolution of the coming El Niño should be closely watched in the months ahead due to its potential far-reaching climatic implications.

### **Northern Rockies**

Significant wildland fire potential in the Northern Rockies Geographic Area (NRGA) for May through August is expected to be normal except for portions of northeast Montana and western and central North Dakota where activity will be below normal through May. The area of below normal activity reflects the heavy winter snow cover and resultant moist soil. This reduces the chances of a pre-green-up fire season. The remainder of the NRGA does not have strong signals to support a deviation from normal fire season forecasts. Northwest Montana and north Idaho have been drier than normal recently, which could align with expected summer weather patterns to enhance fire potential, but May moisture could reduce this concern, resulting in a lack of confidence to move away from normal for this area.

The late April drought monitor shows moderate drought in most of northwest Montana extending into north central Idaho. A second area of moderate drought extends from north central Montana through northeast Montana into western North Dakota. The areas of drought east of the Continental Divide represent an improving trend and continued improvement is expected the next few months. The drought west of the Continental Divide is a more recent development and is expected to persist into the summer.

April mirrored the winter trend of much below normal temperatures through the month for most of the NRG. Precipitation patterns showed patches of substantially below normal precipitation in three key areas: northwest Montana, northern parts of north-central Montana, and southeast Montana into southwest North Dakota. Among these areas, northwest Montana is the greatest concern, as it is holding over the highest amount of drought from the fall.

Southwest Montana into north-central Idaho was an area of moisture improvement in April as storm tracks increased snowpack to above normal while retaining below normal temperatures. Northwest Montana is the one area with most stations reporting below normal snowpack.

A lack of snow cover has supported drying in the northwest portion of the NRG, but trends appear to be close to normal. East of the Continental Divide, data indicates little in the way of drying has occurred in the larger fuels so energy release component is tracking below seasonal normals. Snow cover has retreated in portions of northeast Montana and for most of North Dakota, but satellite root zone soil moisture data indicates the ground has retained much of the snowmelt.

Initial attack fires during the past month have been mostly five acres or less, though a few of these fires have seen reignition due to 1000-hour fuels smoldering. Prescribed fire has been ongoing though precipitation events, and high humidity has limited burning opportunities.

Normal fire activity is expected for most of the NRG for May through August with one exception. PSAs 15 and 18 are expected to have below normal fire activity through May, but normal for the rest of fire season. The northwestern portion of the NRG is an area of concern as drought has developed, but conditions are not extreme enough to warrant elevating the outlook. If May storms fail to deliver at least average precipitation to northwest portions of the NRG, there may be a need to elevate potential in the next outlook.

## **Great Basin**

A record snowpack across the southern two thirds of the Great Basin along with above normal winter precipitation will significantly delay fire season in the higher elevations of the southern Great Basin, as well as across the High Sierra. Above normal carry-over fuels across southwest Idaho into far northwest Nevada along with new fine fuel growth brings the threat of above normal fire potential by July. Above normal fire potential may need to be expanded farther south into Nevada and Utah, depending on the weather pattern July and August due to expected fine fuel growth.

Temperatures over the last thirty days have been below normal across the West, and well below normal across much of the eastern half of the Great Basin. Precipitation has been drier than normal across most of the geographic area, except for small portions of Idaho and northern Utah. The snowpack, setting new records across much of Nevada, Utah, and Arizona at the start of the month, has gradually decreased from the April peak due to the drier weather and recent warmer temperatures. However, the snowpack remains 200-300% of normal across Nevada, Utah, and Arizona, and 100-140% farther north into Idaho and Wyoming. The wetter conditions over the last six to nine months have improved drought conditions significantly, with most areas improving by one drought category or more in the past several months. The drought is expected to continue improving through the spring over the northern half of the geographic area and will likely persist at current levels over the southern half of the Great Basin.

Fuel moisture is above normal across the Great Basin due to consistent storms and heavy precipitation. Sagebrush has also begun the transition out of dormancy, therefore fuel moisture is increasing. Fine fuels were above normal last year across the Snake River Plain and far northwest Nevada but were near or below normal elsewhere. The snowfall earlier this winter down to valley floors in much of Nevada and Utah likely has compacted any carryover fine fuels due to the extended period snow remained on the ground. This is expected to decrease fine fuel load in these areas heading into the spring. However, significant new fine fuel growth is likely this year

due to winter and spring precipitation bringing above normal fuel loading, despite the carryover component being lower in most areas. The only exceptions are over far northwest Nevada into southwestern Idaho, where above normal carryover may still exist as the lower elevation snowfall in these locations was not as significant as areas farther south. Soil moisture is well above normal in many areas of the Great Basin for late April heading into May. These soil moistures, along with the drought improvements or removal in parts of Nevada, Utah, and southern Idaho should lay the groundwork for significant fine fuel growth through the growing season. Fine fuels have already started to cure over southern areas of the Great Basin due to the warmer and drier weather at the end of April. Farther north in Utah and Nevada, cheat grass is in various states of growth and curing at the same time. There could be multiple crops of cheat grass through May.

Fire activity remains low across the Great Basin with no significant fires. However, more smaller fires are starting to emerge in the lower elevations, which is normal for the time of year.

Below normal fire potential is expected at most of the higher elevations in the southern Great Basin in May and June due to high snowpack, as well as across the High Sierra in June and July. Some areas of the southern Ely District in Nevada or near Cedar City may have more significant grass growth in the lower elevations due to higher precipitation and that will continue to be monitored for increased fire potential by June or July. The weather pattern heading into June or even July may see more troughs moving through periodically giving the Great Basin off and on chances of wind, cooler temperatures, and showers. This could delay the start of the monsoon or make the monsoon weaker than normal, which could allow the fire season to continue longer or peak later in southern areas. Any windy days will be concerning with the potential for grass that could grow through the spring heading into fire season. Areas farther north will continue with normal fire potential into early summer. Above average carryover fuels across parts of southern Idaho into far northwest Nevada along with new growth raises the threat of above normal fire potential by July and August. This area of above normal fire potential may be expanded farther south and east depending on the summer weather pattern, and this will continue to be monitored. Of note, years coming out of drought tend to lead to an increase of fires and acres burned in the lower elevations of Nevada and western Utah, especially when a very wet year follows an average or a wet winter the year before. The fall and winter of 2021-2022 had a wet October and December resulting in normal precipitation across much of the northern two-thirds of the Great Basin that winter.

### **Southwest**

Below normal to normal significant fire potential is anticipated for the entire geographic area for the rest of the spring into the summer. Areas of above normal significant fire potential will be minimal and localized overall, but could arise for brief periods in areas where fine fuel loading and continuity are significant, such as across southeastern Arizona and south of the Mogollon Rim region. Areas of below normal significant fire potential are anticipated across many areas in May and June.

The overall trend for much of the late fall of 2022 through the first three months of 2023 has been for cooler temperatures and wetter than normal conditions focused along and west of the Divide, and drier and milder conditions generally focused along and east of the New Mexico central mountain chain. This pattern had deviated some recently, but the ramifications from it play a major role in shaping the significant fire potential forecast through the early summer as does the evolving ENSO situation.

Mountain snowpack has melted substantially over the past month, but snow water equivalent values are still above to well above normal at this time across the northwestern half of the geographic area, with below normal snow water equivalent values primarily limited to the south-central mountains of New Mexico. Last summer's above normal monsoon produced an abundance of fine fuel buildup across many areas, although fine fuels across northern areas have

been compacted by the above normal snowfall. These dead fuels will be available to burn this late spring into the summer.

Through the rest of the spring into early summer, the expectation is that an unusually active weather and meridional flow weather pattern will continue with slow, deep storm systems off the West Coast moving semi-frequently from west to east over the region. The recent arrival of El Niño Southern Oscillation (ENSO) neutral conditions and a likely tilt into at least weak El Niño conditions over the next few months is more than likely going to have a big influence on the weather and climate for the forecast period. Historically, this points towards weather systems arriving and digging unusually far south just off or near the southern California or Baja California region. Many of these systems tend to slow down or become cut off from the main jet stream. In addition, the subtropical jet stream can become quite active during this type of pattern setup. Normally this type of pattern keeps high temperatures close to or even below normal west of the Divide and has a tendency to spread moisture into the geographic area both from the west-southwest and into New Mexico from the Gulf of Mexico. This pattern is beginning to set up and will have a limiting potential on the severity of the significant fire potential for most areas this spring into early summer. These factors include frequent periods of near to below normal high temperatures, elevated relative humidity values, and periods of rain occurring during what is normally the driest time of year. Along with the increased moisture will be an increasing likelihood of lightning earlier than usual. This could lead to some fire starts, but often with elevated relative humidity values, areas of rainfall, and a tilt towards normal to below normal temperatures. This is not expected to be widespread or too significant overall.

The summer monsoonal pattern will likely be delayed this summer and will more than likely be wetter east of the divide and perhaps across the far northern tier of the geographic area. It could be close to normal but more likely will be drier than normal across the southern tier of Arizona and southwestern New Mexico. It is possible that some areas west of the Divide could see increasing significant fire potential by the mid to late summer associated with the weaker monsoonal flow.

### **Rocky Mountain**

Normal fire potential is expected across all Predictive Service Areas (PSAs) in the Rocky Mountain Area (RMA) for the outlook period. Recent weather events will mitigate the most drought impacted areas in southeast Colorado and western Kansas, and green-up should continue to lower fire potential. The robust mountain snowpack should melt at a normal or slower than normal pace preventing a sudden onset of fire season for the higher elevations. Green-up in eastern Wyoming and South Dakota has been delayed but is expected to arrive in early May. Long-term weather forecasts do not indicate any strong anomalies for the RMA, so normal activity is expected for the four months of this outlook.

The drought footprint in the RMA changed little during April. Near normal precipitation was reported over the mountains of Wyoming and Colorado maintaining the strong snowpack. Eastern Colorado and eastern Wyoming saw deficits of one to two inches of moisture, which maintained abnormally dry to moderate drought conditions. Greater precipitation deficits were noted in Nebraska and Kansas, but those areas were already reporting extreme to exceptional drought. South Dakota reported no change in drought conditions as temperatures remained cool for most of the month. The worst of the drought areas are forecast to receive the most moisture through the end of the month, so drought signatures are expected to show a minor improvement and support a transition into green-up.

Weather conditions supported large fire activity in portions of eastern Colorado, Nebraska, and Kansas, especially during two hot dry and windy episodes from April 10-13 and April 17-18. Single digit relative humidity and southwest wind gusts more than 35 mph aligned to bring multi-day critical conditions. This fire activity curtailed as prevailing winds trended to more southeasterly directions late in the month, pulling Gulf of Mexico moisture towards the region, and bringing

rainfall and elevated relative humidity. The forecasts into early May indicate this will be a favored weather pattern.

Record low 100- and 1000-hour fuel moistures for April were noted mid-month for PSAs in eastern Colorado, Nebraska, and Kansas. Predictive Service Area graphs indicated some of the stations reached the 3<sup>rd</sup> percentile of fuel moisture for any time of the year, not just April. Energy Release Components (ERC) exceeded the 97<sup>th</sup> percentile for these areas as well. Recent rainfall at the end of the month has brought improving conditions, but ERCs remained above normal for this time of year. Forecast weather will continue the improving trends.

Snowpack for higher elevations continues to run above normal. Western Colorado and southwest Wyoming have snowpack exceeding 150% of normal. Fuels in the mountains continue to be snow covered, with a transition to wet fuels due to May snowmelt. One area of high elevation concern is the Arkansas River Basin, which had most of the snow already melt, but late month precipitation did bring a minor amount of snow cover return.

Seasonal green-up across central and western Nebraska and Kansas was stalled due to the dry pattern early in the month but the eastern end of the states experienced green-up. The western areas, along with eastern Colorado, will see green-up happening during early May due to a favorable weather pattern change.

Western South Dakota is an area of lower confidence regarding green-up and the fuels state in the Black Hills. Cool temperatures have slowed drying, but also stalled green-up. ERCs are well above normal, but early May forecasts hint at normal to above normal moisture, which should help green-up.

Large fires were reported in portions of Nebraska, southeast Colorado, and Kansas in April due to multiple days of dry southwest winds. A few of these fires exceeded 5000 acres, but this activity has recently diminished with the change in the weather. Prescribed fire activity has been occurring when the weather is more favorable, but most of this activity is occurring at lower elevation sites. Snow cover in the mountains has been unfavorable for broadcast burning, but pile burning has continued.

There is high confidence that El Niño will become the dominant Pacific Ocean pattern in early summer, which historically supports warmer temperatures in the western CONUS though the effects are stronger in the fall. The overall impact through this outlook period is for normal temperatures in May to transition to above normal temperatures to the RMA for the summer, with near normal expectations for precipitation

Mountain snowpack for western Colorado and portions of Wyoming is robust for the end of April. It is expected that even with above normal temperatures, it will take an extended period for snow melt to occur so soils and fuels should retain higher than normal moisture into the early summer. The Southwest Monsoon could be weaker than normal this summer based on historical El Niño trends, so reinforcement of the moisture could be limited. Mountain fire potential looks normal based on the existing conditions and the expected weather

Lower elevations in eastern Colorado through Nebraska and Kansas are benefiting from a late month precipitation event, which is helping reverse strong drought signals. This will allow fuels to respond and become fully green. Normal precipitation forecasts through the late spring and early summer would support continued chances for shower and thunderstorm activity preventing a reverse back to strong drying. South Dakota should see green-up begin to mitigate most short-term fire concerns, and the four week drought monitor change indicates little change or one class improvement. Long-term forecasts do not indicate any significant anomalies for Wyoming or South Dakota so normal fire season is expected.

The outlook for the RMA depicts normal significant fire potential across the geographic area for the remainder of spring and into summer through August.

Long term weather forecasts do not indicate any strong anomaly patterns to be considered. Drought conditions continue in portions of Nebraska, Kansas, and eastern Colorado, but this area is entering its greener portion of the year and large fire activity becomes climatologically less likely. Snowpack in western portions of the RMA will be slow to melt, so there is not an expectation of rapid drying in the summer.

### **Eastern Area**

Near normal significant fire potential is forecast across the majority of the Eastern Area May into August. Above normal fire potential is expected to develop in late spring into early summer over portions of the Great Lakes.

Negative precipitation anomalies were indicated towards the end of April across portions of the western Mid-Mississippi Valley as well as the eastern tiers of the Mid-Atlantic states and New England. Longer term drought remained in place across the southeastern Mid-Atlantic states and the New England Metro. Thirty to 90-day soil moisture and precipitation anomalies were near to above normal across the remainder of the 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 eastern tier of the Eastern Area in May and across the southwestern tier June into July. Below normal precipitation is forecast over the Great Lakes May into June, lingering over the northern tier of this region into July. Near to above normal temperatures are expected over the Eastern Area through the summer of 2023. Periods of below normal fuel moisture levels may occur over portions of the Great Lakes through the first half of the summer if the forecast warmer and drier trends come to fruition.

Near normal significant fire potential is expected across the majority of the Eastern Area late spring through summer. Above normal fire potential is forecast over portions of the Great Lakes later in May into June.

### **Southern Area**

A vast majority of the Southern Area is now well into the growing season, with only the highest elevations of the Appalachians and Ozarks lagging lower elevations on green-up. Long-term drought across the Plains is contributing to lingering dormancy across west Texas, particularly over the mountains, where areas of above normal grass loading linger from 2022's robust monsoon. Green-up across Oklahoma is expected to occur rapidly with the excess rain that occurred in late April over most of the state, and at least a temporary reprieve from the long-term drought is likely. Meanwhile, some degradation in greenness has been noted over the past month across drier parts of the Florida peninsula, per VIIRS satellite data as observed via NASA-SPoRT. Nevertheless, much of the state has turned the corner with the development of a more active weather pattern in recent weeks. Water levels remain below normal over parts of western and northern Florida, coinciding with severe to extreme drought but are near or even above normal across increasing portions of the peninsula.

The forecast upper-level pattern heading into May suggests high wind events for the Plains will be unlikely, but the typical increase in dry thunderstorm potential may contribute to ignition sources across the Trans Pecos. When considering worsening recent drought along with above normal grass loading in the higher terrain, the Texas mountains are forecast to have above normal significant fire potential in May. Confidence dwindles thereafter due to uncertain impacts from the monsoonal circulation during meteorological summer, which may be less active than last year in the transition to El Niño conditions.

Given the recent turn to wetter weather across Florida and expectations for above normal precipitation during May, the potential for above normal significant wildfire activity appears to be dwindling. When considering that May and June are climatologically the most active months for large fires and initial attack across the peninsula due to increased lightning ignitions coming out of the dry season, all PSAs in the Sunshine State are forecast to see normal significant fire potential through the period. All of that said, please note that normal does not translate to quiet in Florida this time of year. Current data suggest activity may be concentrated over the western half of the peninsula heading into May.

A drier and warmer than normal summer is favored for the Caribbean islands due to the developing El Niño. Scattered portions of Puerto Rico and the U.S. Virgin Islands remain in drought, with Keetch-Byram Drought Indices (KBDIs) above 500, suggesting significant fire potential may increase during any longer stretches of dry conditions. For now, the Caribbean is forecast to see normal significant fire potential, with a potential upgrade on subsequent outlooks depending on observed trends in activity.

Prior year analogs during rapid transitions from La Niña to El Niño are suggestive that conditions favoring drought development are possible across nearly any portion of the Southern Area this summer, which is not necessarily in line with current long-range outlooks from the Climate Prediction Center. This leads to considerable uncertainty in where drought may persist, improve, or develop, but any of the long-term drought areas that do persist, including from Texas along the Gulf Coast to Florida and for eastern portions of the Carolinas into coastal Virginia, will have to be watched for growing season wildfire potential from June through August. Precipitation may be highly variable on spatial and temporal scales this summer, leading to low confidence in significant fire potential overall. Although above normal sea-surface temperatures surrounding the Southern Area could favor tropical cyclone development near the coasts this summer, El Niño typically leads to an increase in wind shear over the Atlantic basin, which portends a quieter than normal hurricane 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>**