

Volatile 2022 Wildfire Season Ahead As Drought, Above-Average Temperatures Stoke Destructive Early-Season Fires



Authors: Josh Strongin, *Regional Analyst – North America*
Alisha Jovanovic, *Senior Lead Intelligence Analyst*
Contact: Josh.Strongin@everbridge.com

EXECUTIVE SUMMARY

The 2022 wildfire season in North America is underway and, like each of the past few years, has been more active than normal. Persisting drought conditions, above-average temperatures, and multiple wind events have helped to create conditions conducive for active wildfires, particularly in the Southwest and the Great Plains. According to the National Interagency Fire Center (NIFC), over 24,000 fires have burned approximately 1.3 million acres this year, including 17 fires burning over 486,000 acres as of this writing. Much of the current fire activity revolves around a combined fire in New Mexico that has consumed over 300,000 acres and forced the evacuations of thousands of residents.

The NIFC has predicted an above-average risk of fires through at least August for much of the western and central United States, and the Risk Intelligence Monitoring Center (RIMC) has already reported at least 149 wildfires across the country in the past 90 days alone. The heightened wildfire risk can be attributed in large part to increasingly worsening drought conditions that have largely carried over from last year, drying vegetation and increasing the chances of large, expansive, and potentially destructive wildfires. The ongoing drought conditions are also causing river and reservoir water levels to drop across the West, prompting a multitude of restrictions and concerns about hydroelectric power capacity. Residents and businesses in the central and western U.S. should prepare for wildfire-related impacts, including evacuations, power outages, road closures, supply-chain interruptions, production stoppages, degraded air quality conditions, and other potential disruptions.

KEY JUDGEMENTS

- An early and active start to the 2022 North America wildfire season continues a recent trend of wildfire seasons starting early and lasting longer, largely due to increasing temperatures and lengthening drought conditions from climate change.

- Officials have warned this could portend a volatile fire season in the coming months as various regions enter their peak wildfire seasons.
- Worsening drought conditions are contributing to an environment more at-risk for significant heatwaves and dry lightning strike igniting destructive fires, as well as depleting water sources used for much of the western United States.
- As has become customary in recent years, the 2022 wildfire season will be accompanied by both planned and unplanned power outages that may occur with little to no warning and last for multiple days, significantly disrupting business operations in affected areas.
 - Officials in several states, including California, Texas, and parts of the Midwest, have warned of potential power shortages due to insufficient capacity for what could be record demand.
 - California is also expected to deal with planned Public Safety Power Shutoff (PSPS) events by utilities to mitigate potential fire risks. While service providers have taken measures to limit the scope and duration of these outages, potentially hundreds of thousands of utility customers could be affected.
- In addition to potential power outages, wildfire-induced supply-chain disruptions are all but certain in the coming months. Disruptions to rail networks and/or closures to local roads and highways due to fires and fire-fighting activity, along with mandatory evacuation orders, will negatively affect shipping and delivery services, and overland travel in general.
- Businesses and residents, especially those in at-risk areas in western and central states, are advised to formulate and review emergency plans for responding to wildfire events and associated impacts, such as power outages, or evacuations, which could interrupt business operations and require contingency planning.

2021 WILDFIRE SEASON

In the past four years, 2021 marked the second-worst wildfire season in the U.S. in terms of acreage burned, with over 7.13 million acres consumed by 58,733 wildfires nationwide. The 2021 wildfire season is estimated to have resulted in between US \$70 billion and US \$90 billion in total damage and economic loss throughout the country, with California alone suffering between US \$45 billion and US \$55 billion. The most destructive fires were reported in California, Colorado, and Oregon. In California, the Dixie Fire became the second-largest wildfire and the largest single (non-complex) wildfire in recorded California history, ultimately burning 963,309 acres across five counties in northern California and destroying approximately 1,300 structures. The Dixie Fire reportedly cost US \$637.4 million to fight, making it the costliest fire suppression effort in U.S. history. Fueled on by multiple high wind events, the Dixie Fire also made history by being the first fire to cross over the Sierra Nevada range; the Caldor Fire, which burned over 200,000 acres, became the second shortly thereafter. Overall, approximately 2.6 million acres burned during California's wildfire season, and fires destroyed or damaged over 3,600 structures and injured seven people.

In Oregon, the Bootleg Fire was the largest fire in the state and was sparked by lightning amidst conditions that served as a de facto tinderbox, with Oregon reporting its hottest summer in 2021 and remaining under a drought emergency.

The conditions allowed the fire to spread rapidly, burning about 1,000 acres per hour during its growth period, consuming over 413,000 acres in total and destroying 408 structures and 342 vehicles, and injuring 20 people. Over 1,600 fires burned 653,000 acres in Oregon, destroying 450 structures, killing one, and injuring 73.

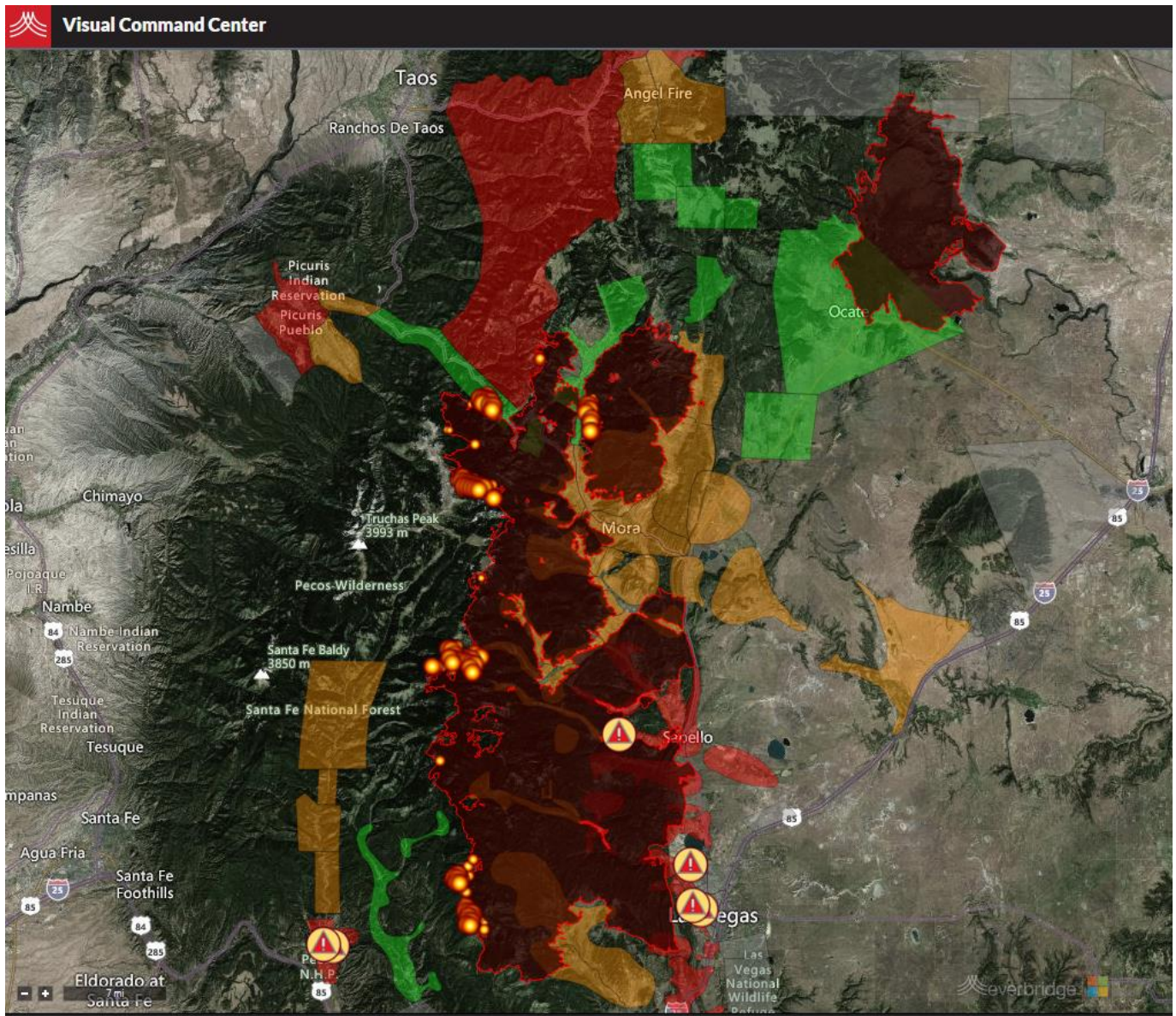
Drought conditions and accompanying fire threats lasted well beyond the summer and fall seasons in 2021, making way for winter wildfires that have become more common of late. In California, PSPS events were enacted in Southern California over the Thanksgiving holiday into late November due to fire weather warnings. Extreme drought conditions in Colorado also led to major out-of-season fire activity. On December 30, two wildfires, the Middle Fork Fire and the Marshall Fire, ignited near Boulder and spread rapidly due to high winds that reached more than 105 miles per hour. The fast-spreading blazes led to the evacuation of over 30,000 residents. While the Middle Fork Fire was quickly extinguished, the Marshall Fire burned for several more days, ultimately burning 2,026 acres, destroying 1,084 structures, killing two people, and injuring six others. Residential structure losses from the fire are estimated to have exceeded US \$513 million.

2022 WILDFIRE SEASON

With historic drought conditions continuing from last year combined with above-average temperatures in many regions, the 2022 wildfire season has had a particularly active start across the central and western United States. According to the National Interagency Fire Center (NIFC), an estimated 24,302 fires have already burned approximately 1.3 million acres across the U.S. since January. States currently reporting wildfires include Arizona, California, Colorado, Connecticut, Florida, Kansas, New Mexico, North Carolina, and South Carolina. Over the last 90 days the RIMC has reported at least 149 across the country. The NIFC has set the National Preparedness Level to Level 2, on a scale from one to five, as of March 28. Level 2 indicates that there are multiple large fires burning throughout the country, requiring resources to be mobilized from different areas.

New Mexico has already experienced one of its worst fire seasons in state history. Two fires, the Calf Canyon Fire and the Hermits Peak Fire, began in late April northeast of Santa Fe and, fueled by continuous wind events, dry conditions caused by drought, and above-average temperatures, merged into a single blaze that has now burned over 300,000 acres, the largest fire on record in the state. Though the fire has not caused significant casualties, it has destroyed or damaged nearly 300 structures and has forced the evacuation of nearly 40,000 residents across Mora, San Miguel, Colfax, and Taos counties. California has also reported some early-season fires including the ongoing Coastal Fire in Orange County, which began on May 11 and quickly spread to around 200 acres, destroying at least 20 homes.

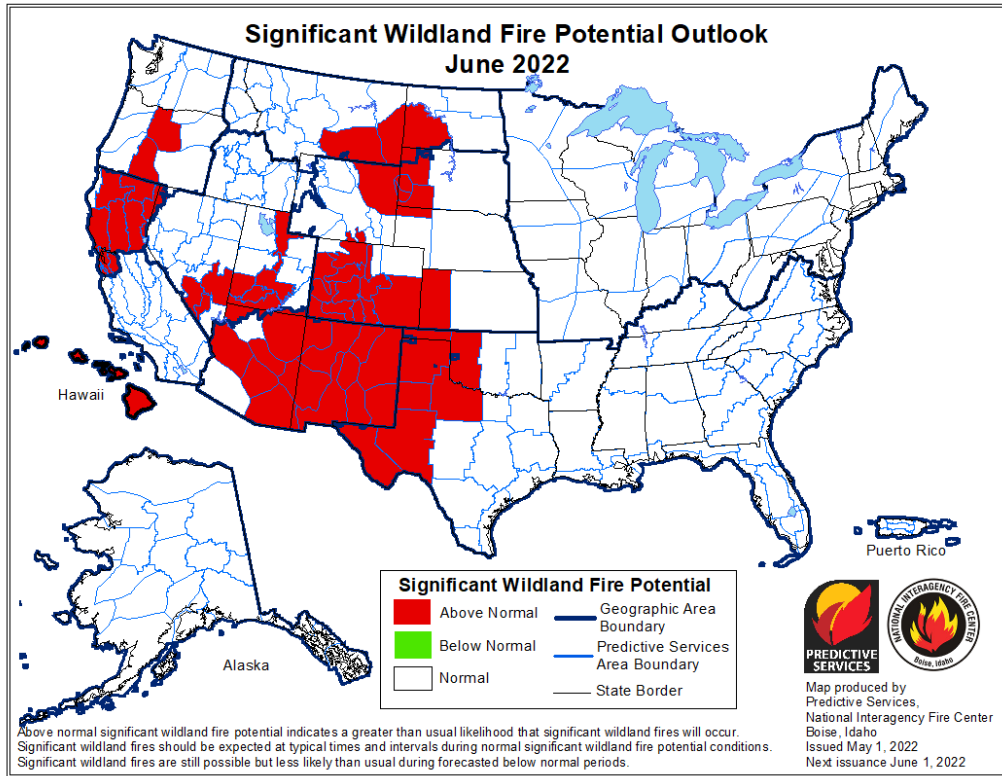
Hermits Peak and Calf Canyon Fire Perimeter and Evacuations



New Mexico's Ready, Set, GO! All-Hazard Evacuation System uses GREEN to indicate areas under mandatory evacuation orders. YELLOW to denote areas where voluntary evacuations are advised, and RED to identify areas where the public is advised to prepare for possible evacuation.

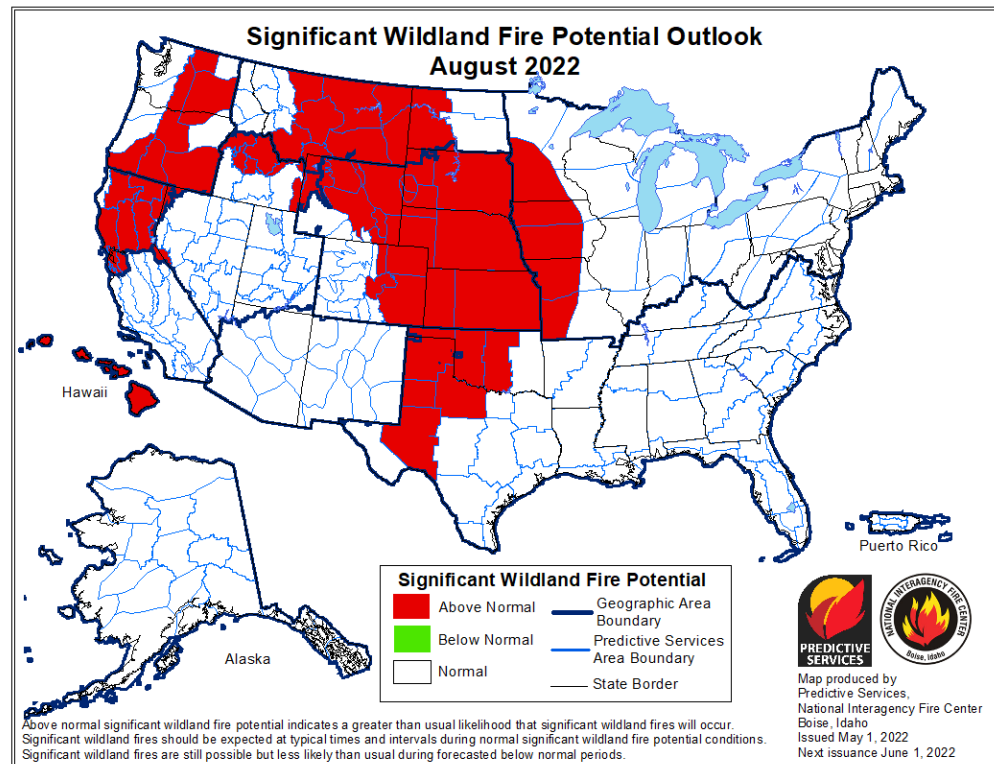
Source: Everbridge's Visual Command Center (VCC)

US Wildfire Outlook June 2022



Source: NIFC

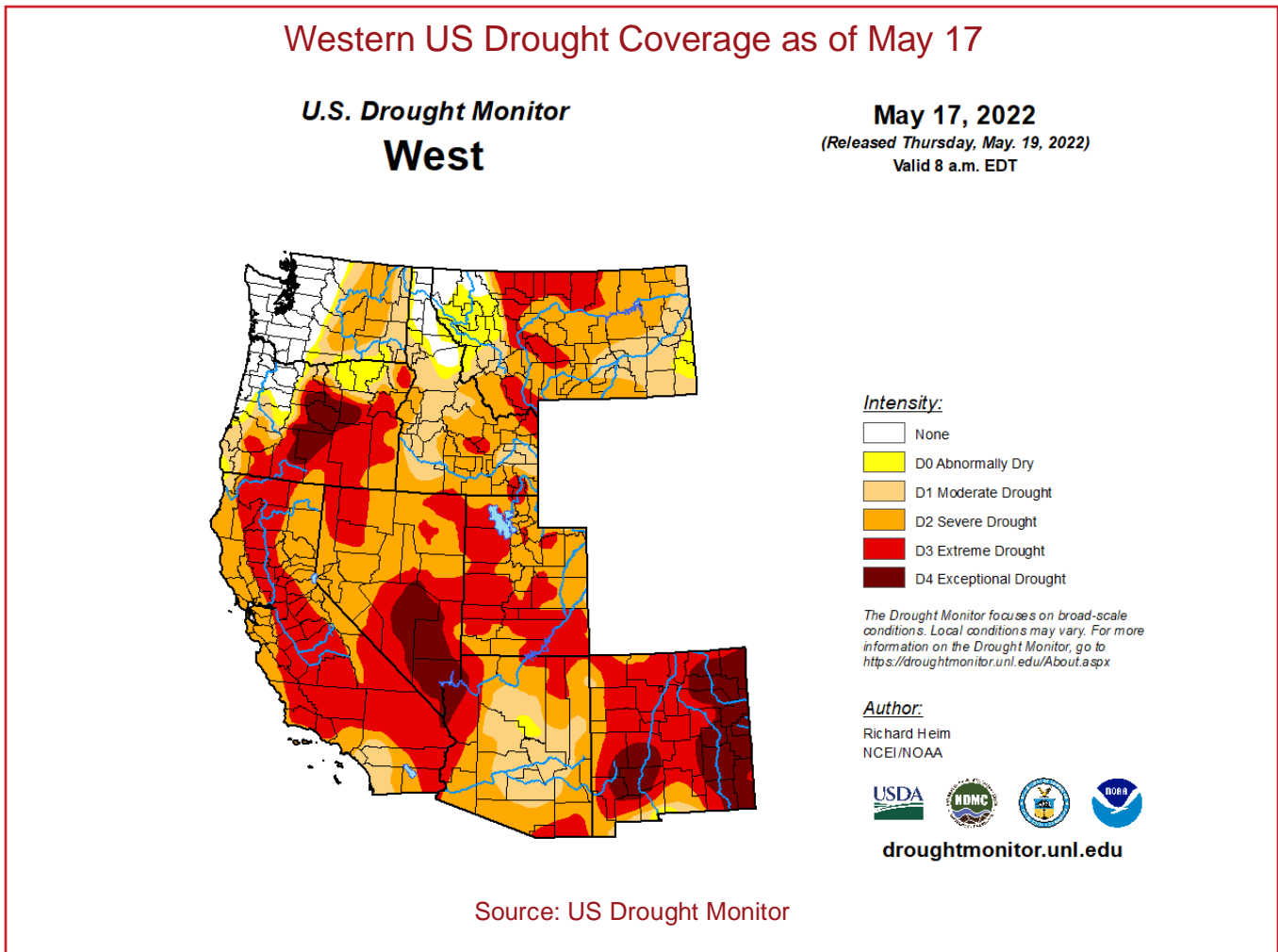
US Wildfire Outlook August 2022



Source: NIFC

DROUGHT CONDITIONS

Historic drought conditions were a main factor in the 2021 wildfire season and look to be a key catalyst for the 2022 season as well. Many parts of the western U.S. remain in a prolonged and historic drought and record-dry conditions in what are normally some of the wettest months of the year have led to exacerbating drought across much of the region. As of May 17, 93.6 percent of the West (considered to be Montana, Idaho, Washington State, Oregon, California, Nevada, Utah, Arizona, and New Mexico) is experiencing drought conditions, according to the U.S Drought Monitor. The cooperative uses five levels of drought ranging in severity from Abnormally Dry, Moderate Drought, Severe Drought, Extreme Drought, and Exceptional Drought. An estimated 40.2 percent of the West is designated as Extreme or Exceptional Drought. The worst drought conditions are being reported in eastern New Mexico, central Nevada, and Central Oregon.



The persisting drought conditions have led to dramatically lower water levels across the western United States. In California, the snowpack has been significantly depleted from normal levels following the driest January-April period on record. Meanwhile the Colorado River Basin, which provides water for much of the region, has had its levels significantly depleted due to drought conditions. According to the National Water and Climate Center, Lake Powell and Lake Mead (two of the main reservoirs that rely on the basin) were at 24 percent capacity and 30 percent capacity, respectively. The drastic decrease in water levels forced officials in early May to announce that water releases from Lake Powell to Lake Mead would be withheld for the first time ever. Lake Powell alone provides drinking water to 40 million people in the Southwest, in addition to providing hydroelectric power. The decision to withhold water was made in order to be able to ensure electricity generation.

The NIFC has released its outlook for wildfire risk for the upcoming months and forecast an increased risk of wildfire activity throughout much of the western and central United States. In June, there is an above-average risk for most of the Southwest, parts of southern Montana and northern Wyoming, and northern California. In July, the risk is expected to shift from the Southwest due to the annual monsoon season and move northward over the Great Plains region, while the above-average risk will remain in northern California and extend into central Oregon. In August, the above-average risks will remain relatively similar, mostly affecting the Great Plains region and part of the Midwest, as well as northern California, southern and central Oregon, and eastern Washington.

INFRASTRUCTURE IMPACTS

The drought conditions, above-average temperatures, and reduced power capacity at a time of increased demand may lead to more widespread blackouts or power outages this year relative to years past. In California, utility officials have warned that power shortages and rolling blackouts will be possible this summer in the event of significant heatwaves due to an increased strain on the state's electric grid that has been exacerbated by drought conditions and decreased output from hydroelectric power. On top of potential shortages, the state is expected to remain at risk of PSPS events later this year to help mitigate potential wildfire risks. PSPS events have become commonplace; however, utility operators were able to better target specific areas in 2021 that limited the scope and duration of the outages compared to previous years. Still, several hundred thousand utility customers were impacted by a PSPS during the Thanksgiving holiday last year due to a major late-season wind event.

Unlike previous years where power concerns were largely limited to California, other states have reported similar concerns about the potential for shortages or blackouts due to high demand and insufficient capacity. Already this year, the Electric Reliability Council of Texas (ERCOT) has reported record demand and power plant failures that have caused spikes in energy prices and warnings of potential loss of power. Similar situations may occur later this year as temperatures continue to rise in Texas. Elsewhere, the Midcontinent Independent System Operator (MISO), which oversees the power grid for the Midwest, has also warned it may have capacity shortages this summer that could cause outages or other emergency measures such as rolling blackouts.

ASSESSMENT

The 2021 wildfire season continued a multi-year trend of larger and more destructive fires, while the fire season lasted longer than usual. An earlier start and longer active fire season have been forecast for 2022 and is likely to become the norm going forward amid rising temperatures and persistent drought conditions linked to climate change. These factors have contributed to the major early-season fire activity witnessed across the country this year, with, the dry conditions creating a conducive environment for blazes to spark. Conditions have been exacerbated by above-average temperatures and wind events, both of which have occurred at an above-average frequency in parts of the central and western United States. As was the case last year, officials have expressed concern over the fire activity, as it could portend a particularly volatile fire season in the months ahead. The NIFC wildfire forecasts for the upcoming months suggest an above-average wildfire risk for much of the western and central United States.

While the persisting drought conditions help to create environments conducive to potentially destructive wildfires, this alone does not guarantee such wildfire activity. There are numerous factors that create wildfires, including temperature, vegetation to fuel fires, and a spark to start the fire. Last year's drought worked in a cyclical fashion with a wave of heatwaves across parts of the West. The heatwaves dried out water sources and vegetation, which worsened the drought conditions. The excessively dry, desiccated conditions in turn helped to extend heatwaves. While many wildfires are human caused, some of the most destructive fires in the past few years have been started by lightning strikes. Dry thunderstorms, in which the storm develops at a higher elevation causing the rain to evaporate before hitting the ground, are a frequent occurrence in the West. While these storms do not produce rain that makes it to the ground, they nonetheless produce lightning strikes that reach the ground are capable of igniting wildfires, especially with dry conditions created by drought. Of the 38 fires that burned at least 1,000 acres in California last year, at least 16 were sparked by dry lightning. Persisting, and potentially worsening drought conditions will increase the risk of dry lightning strikes sparking wildfires across the western United States, especially in California.

The unprecedented low water levels in reservoirs across the western U.S. highlight the other impacts caused by the prolonged drought conditions. U.S. officials have warned that there will likely be significantly lower crop yields both in California and in the Midwest. While these lower yields, are not likely to cause shortages of goods, they could raise the price of some goods such as wheat-based products and represent millions of dollars of potentially lost income for farmers. The lower water levels in various reservoirs across the West have already led to a multitude of water restrictions by states. These have largely involved restricting outdoor water use and lowering amounts of water distributed for agricultural purposes. Further lowering of water levels, particularly those in Lake Mead and Lake Powell, could also lead to lower hydroelectric power output. This will increase the risk of power shortages or rolling blackouts in the event of heatwaves that strain power grids in western states.

The potential for extended or intermittent power outages, both in the West and elsewhere in the United States, represents one of several potential supply chain risks posed by wildfires, heatwaves, and drought. Last year's fires in the U.S. and Canada also caused significant rail disruptions due to evacuations and damage to rail infrastructure from fires.

This led to delays in shipment of goods and in Canada, also caused delays at the Port of Vancouver due to a temporary shutdown of rail lines that led to the port. Similar disruptions will be possible this year in the event that fires burn near railroad tracks or intermodal hubs. Other ground transportation disruptions, including long-haul trucking and last-mile deliveries, will also be possible in the event that local roads or highways are closed due to wildfires. In some cases, these road closures have lasted extended periods of time, including multiple weeks or months.

Due to the numerous potential impacts from wildfires, individuals and businesses in areas of the U.S. that may be threatened by fires should create and review emergency plans and evacuation routes. Businesses are also advised to include contingencies in preparation for potential power outages and ground transportation and shipping disruptions, which could occur with little notice and last extended periods of time. The U.S. Department of Homeland Security has created guidelines to help individuals and businesses prepare for potential wildfire impacts, which can be viewed at the following link: <https://www.ready.gov/wildfires>. In addition, the creation of emergency supply kits for those individuals who live in areas at risk of wildfires is highly encouraged and could include the following items:

- A three-day supply of non-perishable food and three gallons of water per person
- A map of the surrounding area with at least two evacuation routes designated
- Prescriptions or special medications
- A change of clothing
- Extra eyeglasses or contact lenses
- Extra car keys, credit cards, cash, or traveler's checks
- A first-aid kit
- A flashlight
- Battery-powered radio with extra batteries
- Sanitation supplies
- Copies of important documents
- Pets and their supplies of food and water
- Face coverings to protect from smoke inhalation

The public is reminded to use caution near active fires and heed all evacuation orders and instructions from local authorities. When evacuation orders are lifted, returning evacuees should avoid hot ash, charred trees, and smoldering debris. The RIMC has a dedicated special event entitled Wildfires 2022 where all wildfire-related events in North America can be tracked and relevant information such as maps of evacuations or power outages will be included.