



Southern Area Seasonal Wildfire Assessment - May 2026

Southern Area Decision Support Group



HWY 82 FIRE, SOUTHEAST GEORGIA, APRIL 25, 2026

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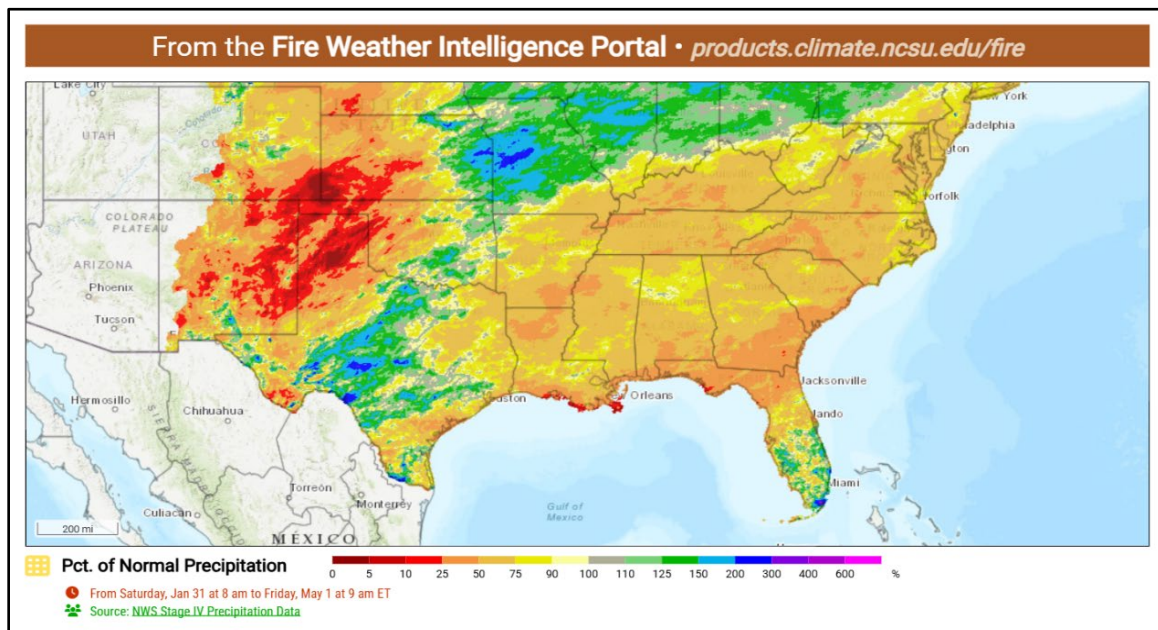
Regional Overview

This assessment updates and expands upon the previous version released on March 2, 2026. It summarizes spring fire season conditions observed through March and April and provides an outlook for the late spring fire season in May and June across the Southern Area.

Weather conditions during the preceding fall and winter are strong indicators of spring wildfire severity in the Southern Region. The fall of 2025 was historically dry across large portions of the Southeast, and this pattern persisted through winter. March and April were generally warmer and drier than normal throughout much of the region. As a result, fire occurrence increased, with active fire behavior, high rates of spread, and greater resistance to control.

This wildfire risk assessment evaluates the influences and impacts of the anomalous conditions currently affecting the area and their implications for fire management. The analysis focuses on severe drought conditions leading to atypical conditions within the fire environment that are affecting fire occurrence and behavior. Significant precipitation is needed to alleviate the abnormally dry conditions across the area.

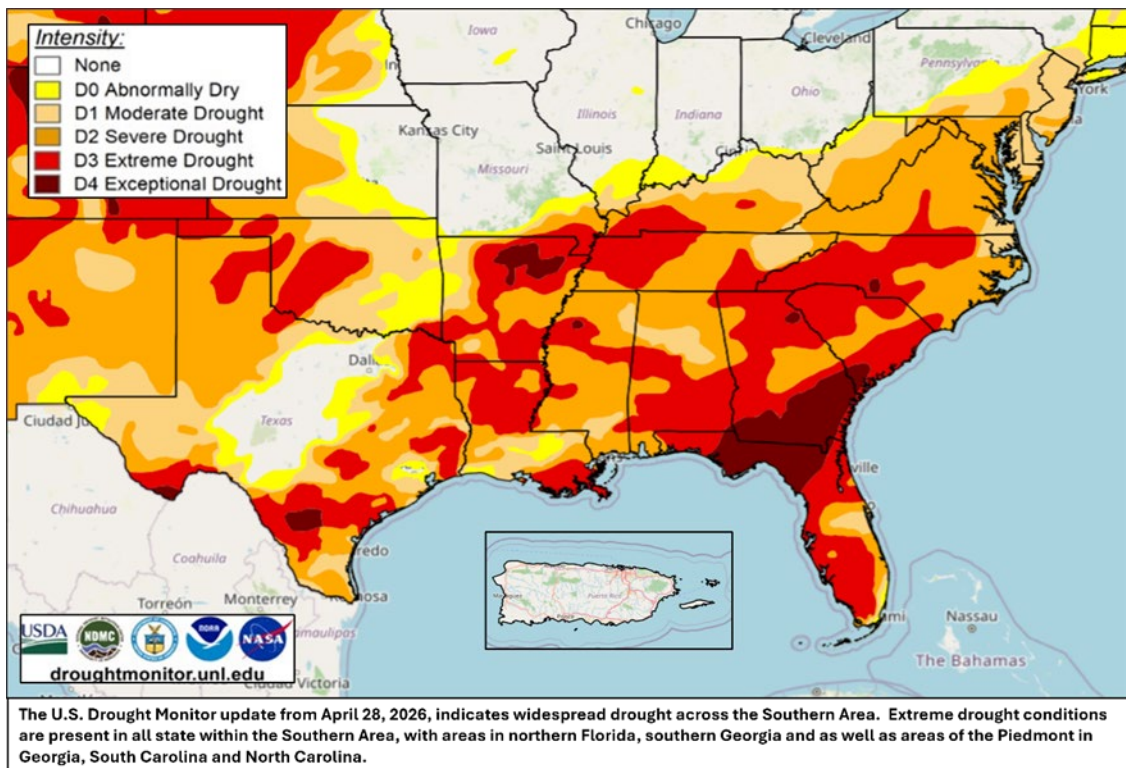
The Southern Area experienced one of the driest fall and winter seasons on record. Although winter precipitation can sometimes offset fall deficits, this winter did not provide enough rainfall to eliminate the intensifying drought conditions. Over the past 90 days, precipitation has averaged about 50% of normal across much of the region. Some isolated areas have reached as high as 80% of normal, while others have received as little as 25%. See map below.



Map depicting percent of normal precipitation for the last 90 days (from North Carolina State Climate Office Fire Weather Intelligence Portal: <https://products.climate.ncsu.edu/fire/>)

Areas of Texas/Oklahoma, southeast Georgia and the state of Florida, continue to have fuel anomalies (grass loading in Texas and Oklahoma, frost kill/drought/low water levels in SE GA and Florida) that significantly enhance fire behavior. The issue becomes more apparent when viewed from the fact that spring season is the time of year that more problematic fire weather is typically experienced in these areas, although May typically has a higher probability of increased precipitation.

For southeast Georgia and Florida, much of the area is in D3 (extreme) and D4 (exceptional) drought classification. Many areas will need at least 20-25 inches of precipitation to mitigate current drought conditions. It is unlikely that this will occur over the next 60 days.



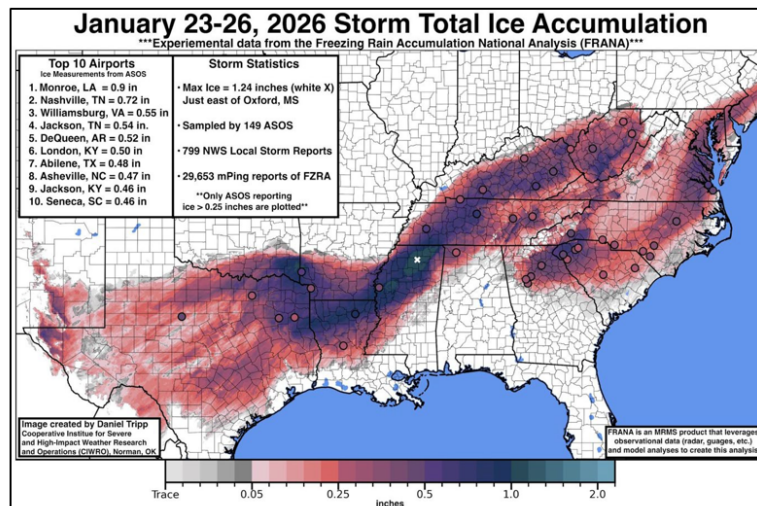
For these areas to avoid persistent, above-normal fire danger in May and June, weather patterns that deviate from typical climatology would need to develop. While elevated fire danger does not always translate directly to increased fire occurrence, the continued dry conditions make above-normal fire activity likely. Current fuel conditions, including extremely dry soil and organic matter, are causing fires to burn deep in ground fuels which hamper suppression efforts. Recent observations from wildfires in Florida and Georgia show fire burning 3-5 feet deep in ground fuels. This requires longer resources commitments to reach containment.

Other areas of concern include the Atlantic Coastal Plain and Piedmont areas of the Carolinas and Georgia. These areas have been in prolonged drought since late summer 2025. Although recent

precipitation events have provided short term relief, very low water levels coupled with the dry ground fuels increase for above normal fire potential in these areas.

Leaf-out in the Appalachians should reduce areas at risk for significant fires over the next few months, but most of the region has not received enough drought relief to signal the end of spring fire season. Drought stress that developed during a critical part of the growing season may also reemerge during extended periods of hot, dry weather this summer. Unusual dryness for this time of year may sustain some risk for problematic fires in the Appalachians, especially in areas most heavily impacted by Hurricane Helene. Although recent precipitation has moderated fire danger, the Southern Appalachians still face a rainfall deficit of roughly 50% of normal.

Another area that should be mentioned for potential concern is the area that suffered the greatest impact from Winter Storm Fern. Areas of Texas, Louisiana and in particular central Mississippi into central Tennessee experienced significant tree damage from freezing rain.

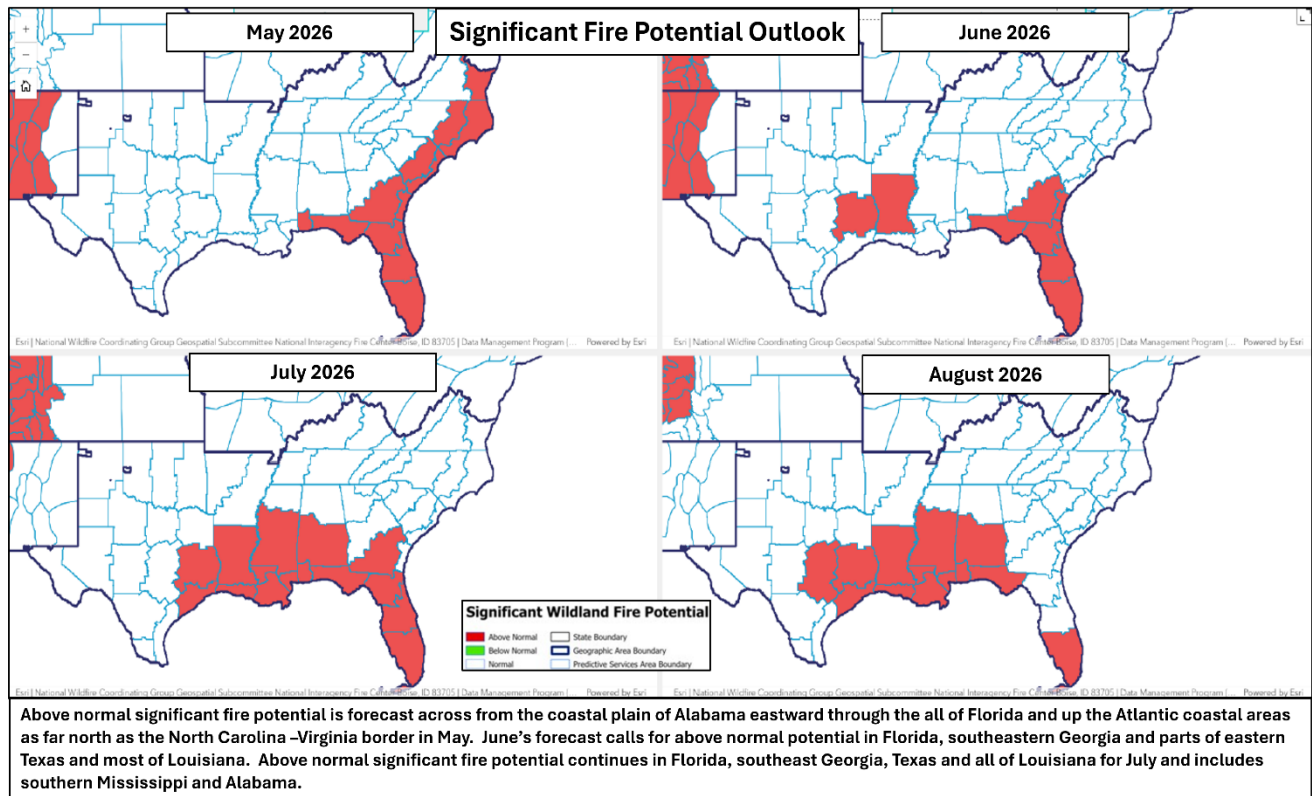


Experimental map product predicting total ice accumulation (inches) from Winter Storm Fern in January 2026. Image was created by Daniel Tripp at the Cooperative Institute for Severe and high-Impact Weather Research and Operations (CIWRO), Norman, OK from the Freezing Rain Accumulation National Analysis (FRANA).



There is a noticeable amount of new fuel on the ground within portions of the ice-storm path. In some areas, damage was limited to hardwoods, which is generally less concerning because winter leaf-off reduces fine fuels. However, many damaged areas were in pine or pine-hardwood mixes. Pine trees and limbs downed during the January ice storm will have ample time to dry and will likely contribute to fire behavior this spring. While this issue is more localized than regional, fire intensity will likely be higher in these ice damaged areas, and access and navigation may be more difficult.

The [National Significant Wildland Fire Potential Outlook](#) issued May 1, 2026 show the areas of concern for the southern area for the next several months. Within the outlook is an extended discussion on the specific current and expected conditions that increase fire potential.



Key Findings

- The fall of 2025 was one of the top 10 driest falls in 130 years across much of the Southern Area leading to severe drought conditions in much of the region.
- No tropical storm activity in Florida during the fall of 2025 coupled with continued dry weather has contributed to extremely dry conditions across most of that state. Cold temperatures in central and south Florida have created vast areas of atypical frost killed vegetation extending as far south as the Everglades.
- Areas of widespread blow down from Hurricane Helene continue to dry and become more available to contribute to fire intensity and spread. The blowdown also hampers access during suppression operations.
- The transition from WIMS to FEMS continues to produce fire danger outputs that require further calibration at the local level and could result in some misrepresentation of fire danger as we collectively learn the new system.
- The potential exists for multiple areas to experience high fire danger or increased fire activity at the same time.

Management Implications and Recommendations

Fuel Conditions and Anomalies

- Organic soils are abnormally dry due to the severe drought and low water levels, thus increasing burn duration and reburn potential.
- Surface fuels within fire areas have been observed to “reload” due to needle cast from scorched canopies.
- Expect increased fuel receptivity, fire behavior, and spotting in areas of drought stressed fuels, even in areas that appear to have experienced green up.
- Heavy fine fuel loading can be problematic for spotting and general fire control. Frost killed vegetation typically adds to the available fine fuel loading.

Fire Behavior and Spread Potential

- Expect Extreme Fire Behavior: In areas where fire danger indices exceed the 90th percentile, anticipate rapid fire spread, higher intensity, and increased spotting. Fire intensity may prevent direct attack – consider indirect attack and point protection.
- Fires have significant reburn potential given longer residual burn time and needle cast from scorched canopies. This has caused fires to escape containment weeks and months after fire spread was thought to be complete.
- Smoke production will be excessive when ground fire occurs or in fuels disturbed by hurricanes, tornados, ice storms, insects, etc. Consider an Air Resource Advisor or other smoke mitigations.
- Typical fire weather thresholds may not apply where drought, record high fire danger and heat align – critical conditions may occur with RH 5-10% above and winds 5-10 mph below local thresholds.
- Prepare for Dry Cold Fronts: Expect rapid drops in humidity and strong gusty winds behind springtime cold fronts. It is not uncommon for these fronts to be dry or nearly dry and they can sharply elevate fire behavior.
- Monitor Frost-Cured Vegetation: Vertically oriented frost cured fuel can be a fire control problem. Flame lengths tend to be at least as high as the vegetation. Expect volatility and increased intensity.
- Fires in drought-affected regions may smolder for extended periods, requiring more resources for mop-up and patrol. Be prepared for possible reburns on contained fires.
- All wildland fires may need additional staffing and contingency resources for safe execution.

Fire Danger Indicators and Assessment Tools

- Consider the indices that are chosen to portray fire danger. ERC and KBDI are a typical default metric in the Southern Area. For areas that contain predominantly fine fuels, Burning Index or Spread Component may be a better gauge of fire spread potential on any single day – especially if winds are elevated. The Canadian Fire Weather Index may also be a useful tool in Florida.

- Use Predictive Services: Helpful products are refreshed daily on the SACC website. RMA Dashboard has multiple tools such as Suppression Difficulty Index, POD lines, Snag hazard and Firefighter Evacuation times.

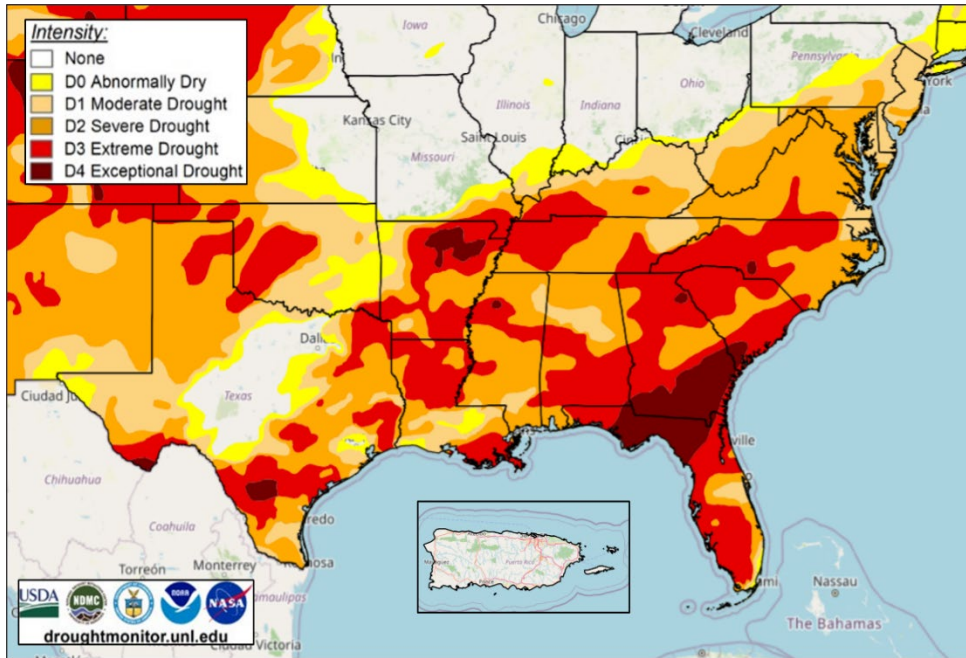
Safety, Staffing, and Preparedness

- Address Fatigue: Extended fire suppression efforts may lead to firefighter fatigue. Monitor fatigue closely and consider out-of-region resources to relieve local personnel.
- Other regions of the country are currently experiencing critically low snowpack. It is possible these areas may experience an early start to their fire season which could impact resource availability for the Southern Region.
- Thoroughly brief firefighters on fuel or weather conditions that are departed from normal. Provide a reference point and give examples, descriptions or photos of current fire behavior.
- Prioritize Safety: Always STOP, THINK, TALK, and ACT to minimize risks to firefighters.

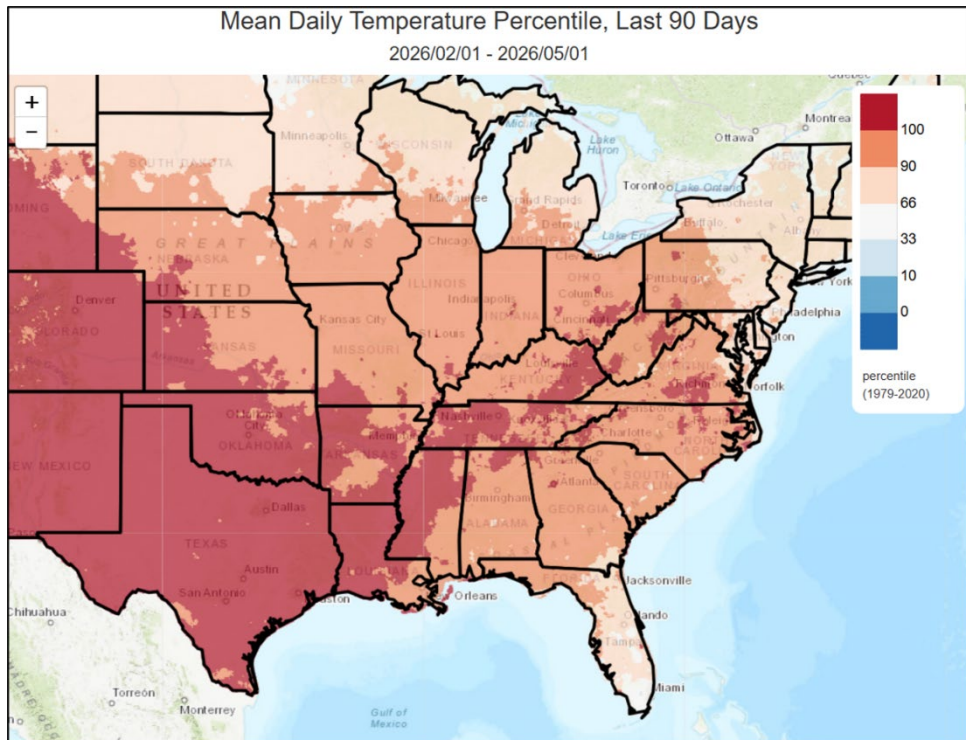
Climate and Weather Assessment

Summary

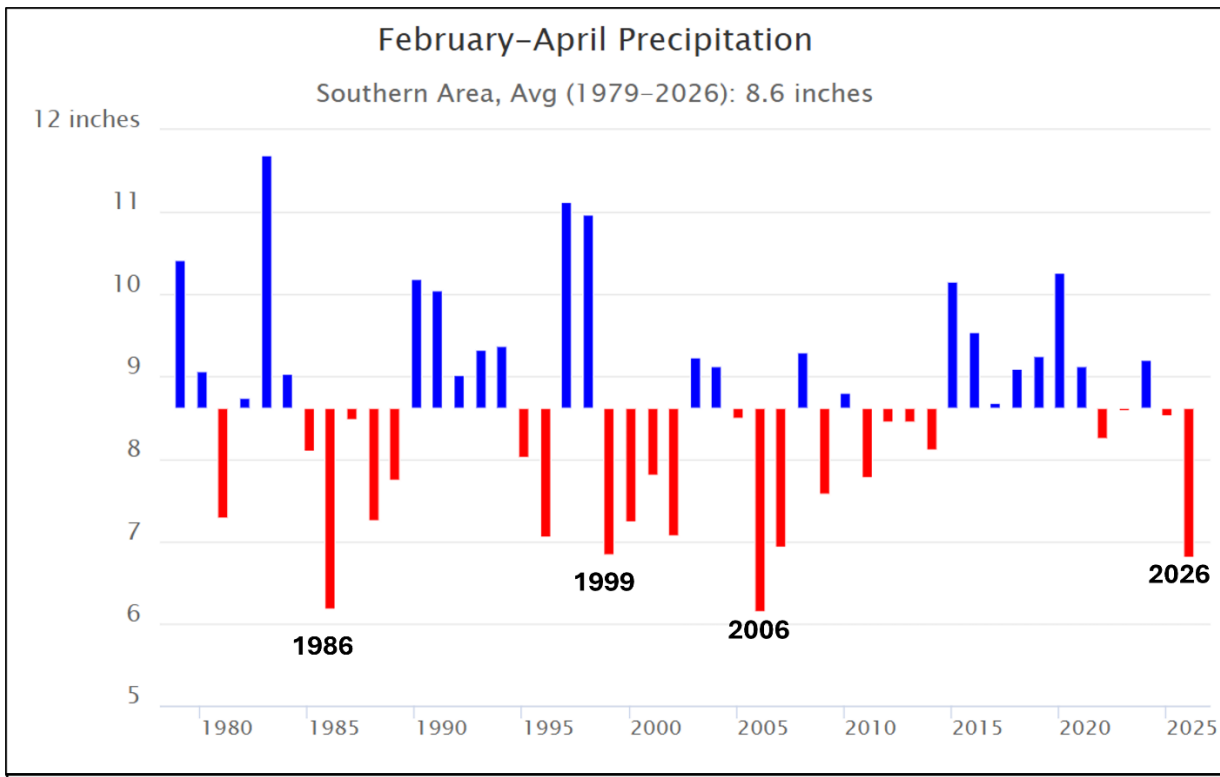
- February–April was the third driest such period in the Southern Area since at least 1979.
- March and April were unusually warm and dry compared to climatology.
- In March, the typical La Niña storm track brought brief drought relief and reduced above-normal fire potential across parts of the eastern Plains and Mid-Mississippi Valley.
- Recent precipitation has moderated conditions in the southern Appalachians and Piedmont, but underlying drought, complex terrain, and fuel loading from Hurricane Helene remain concerns.
- The coastal Southeast continues to experience significant drought impacts, with unusually low water levels and soil moisture contributing to increased suppression difficulty until substantial rainfall occurs.
- Extreme to exceptional drought impacts have expanded across the Southern Area through mid-spring and are likely to persist. Occasional wetter periods in May and June may offer temporary improvement, but ending significant fire potential will require a sustained wet pattern.
- Drought may persist into summer across parts of the Plains, Gulf Coastal Plain, and Southeast. As El Niño strengthens, increased flash-drought potential or intensifying existing drought may elevate wildfire activity in pine-dominant regions.



The U.S. Drought Monitor update from April 28, 2026, indicates widespread drought across the Southern Area. Extreme drought conditions are present in all state within the Southern Area, with areas in northern Florida, southern Georgia and as well as areas of the Piedmont in Georgia, South Carolina and North Carolina.

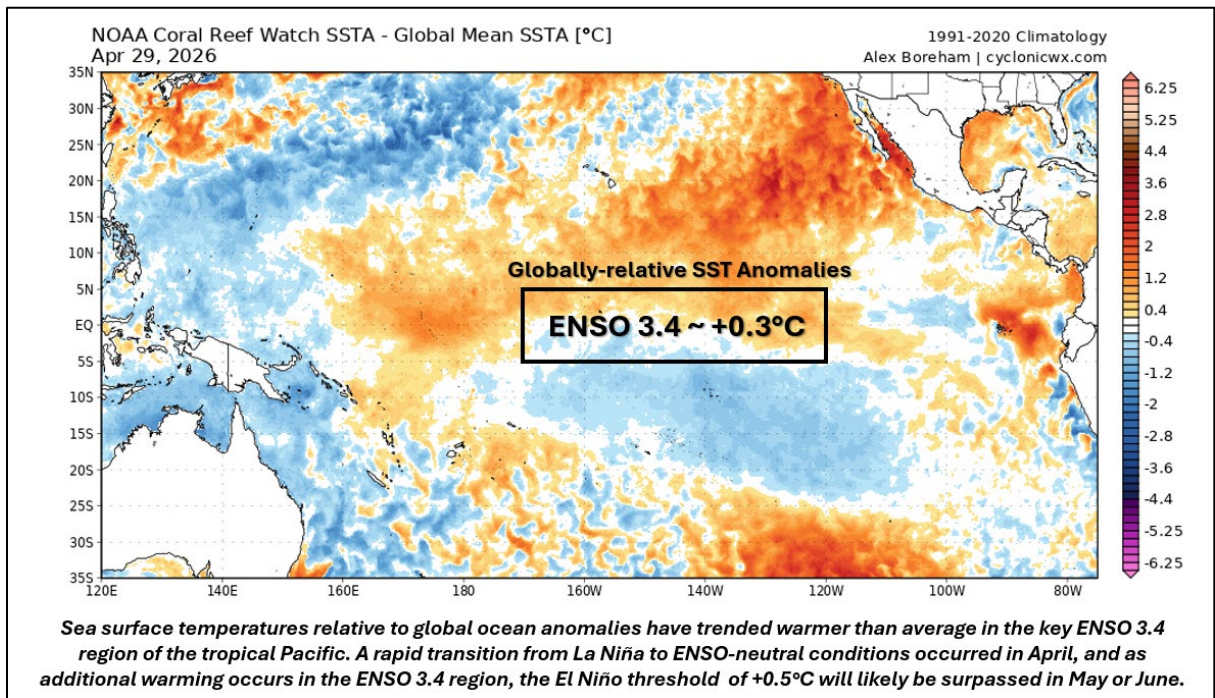


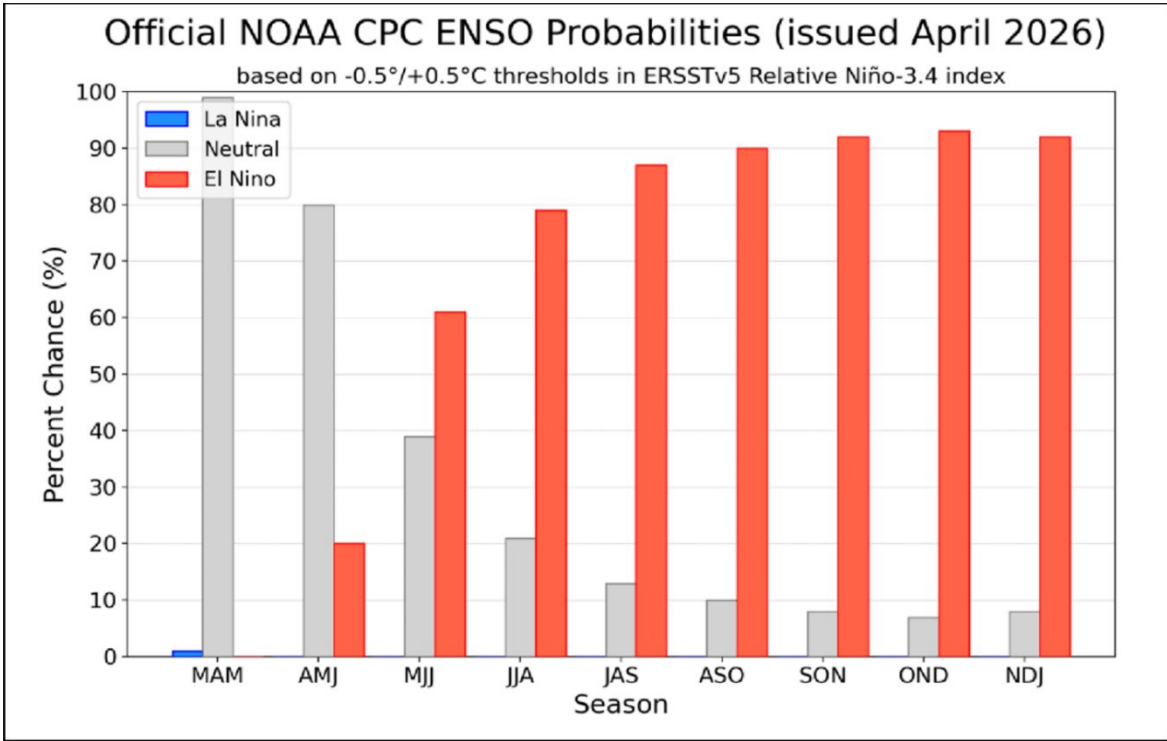
The Climate Toolbox climate tracker tool depicts 90-day temperature percentiles ending May 1. Near record warmth encompassed the western half of the Southern Geographic area while the eastern half of the area saw much warmer than average temperatures.



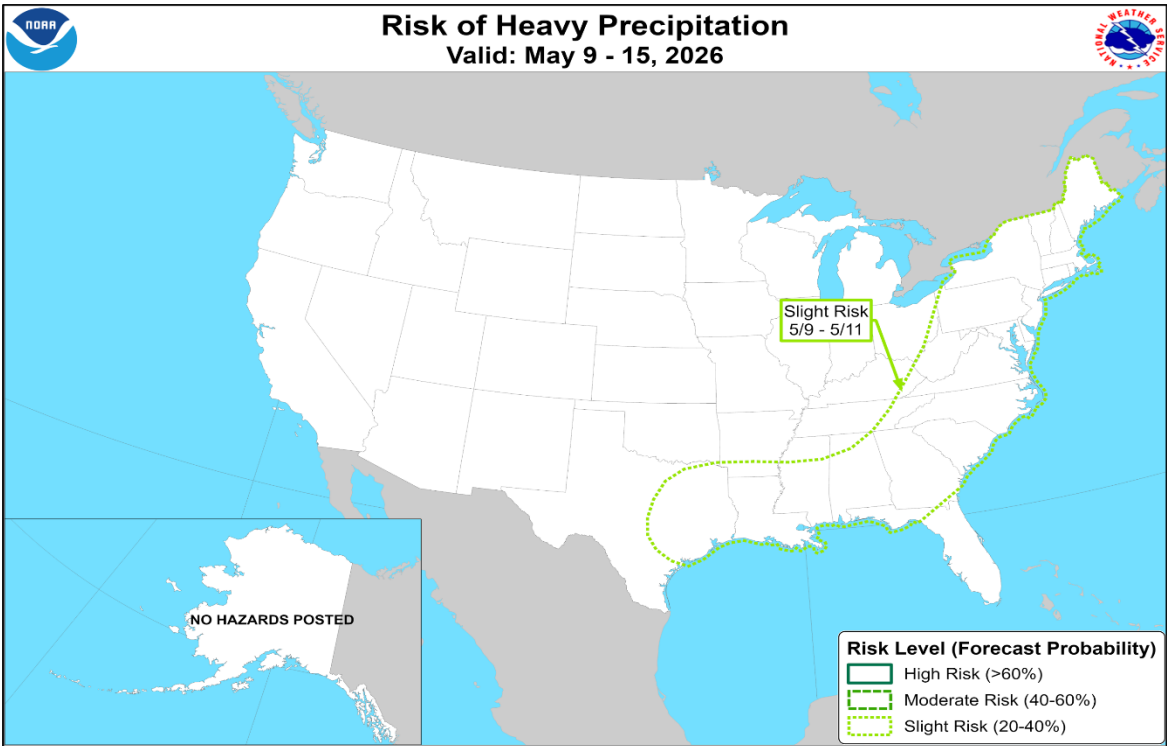
The Climate Toolbox historical climate tracker tool indicates the February to April 2026 period was tied with 1999 as the third driest since at least 1979 across a polygon encompassing the contiguous Southern Area. The closest comparisons include 1986, 1999 and 2006.

Weather/Climate Outlooks



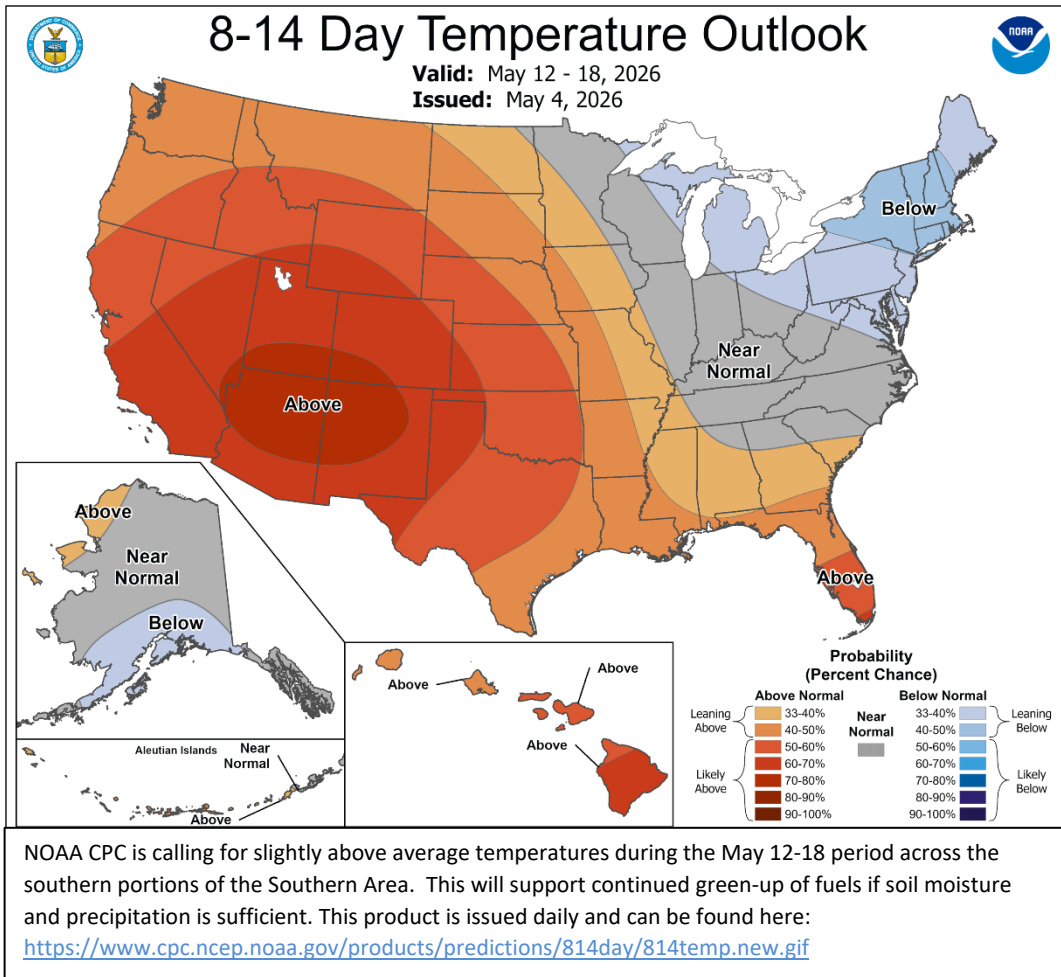


NOAA's Climate Prediction Center El Niño Southern Oscillation (ENSO) outlook calls ENSO-neutral conditions through late springs and transitioning to El Niño by June-July-August 2026.



Climate Prediction Center Follow us:
 Released: May 1, 2026 3:00 PM EDT www.cpc.ncep.noaa.gov

NOAA's Climate Prediction Center indicates a slight risk of heavy precipitation from eastern Texas eastward through the coastal Southeast and up the Atlantic. Most of Florida fall outside of this risk.



Additional short and long-term outlooks from Predictive Services can be referenced at the following links:

[SACC Daily Briefing](#)

[National 7-Day Significant Fire Potential](#)

[NIFC Predictive Services Wildland Fire Potential Outlook](#)

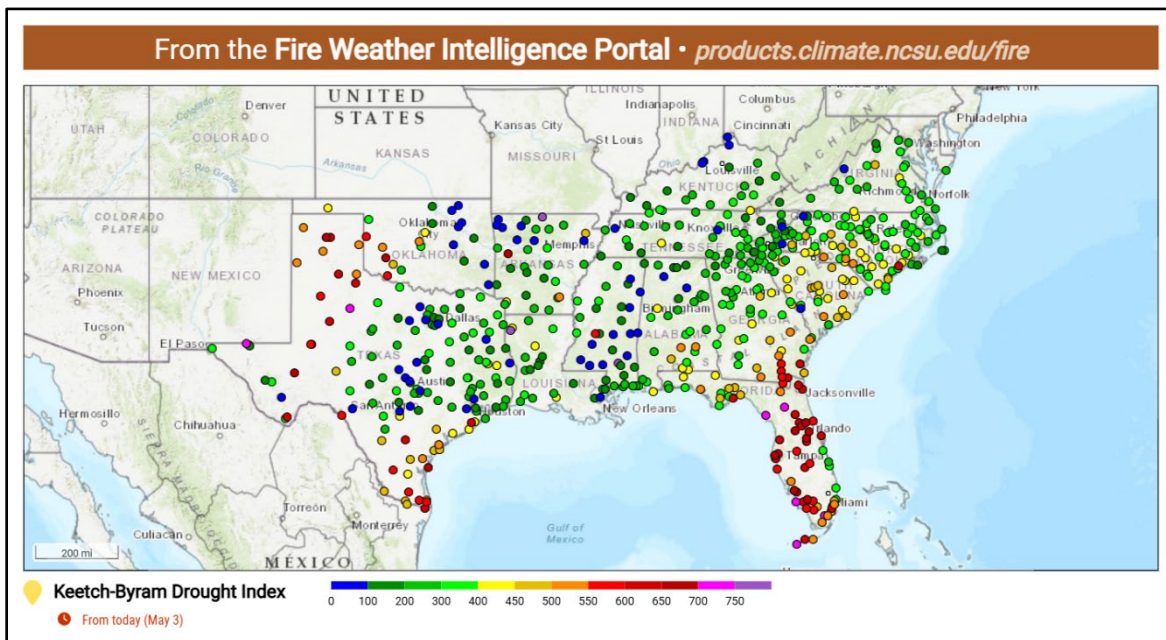
[Climate Prediction Center](#)

Fuels and Fire Danger Conditions

Preceding Fall and Winter Fuels Conditions

Despite elevated fire danger through the winter—driven by record-dry autumn conditions and expanding drought—overall fire activity stayed near normal. Notable exceptions were a mid-February wind-driven outbreak of large fires in the Southern Great Plains and a series of large fires that began on February 23 and continue in South Florida. As drought expanded after September 2025, NFDRS indicators such as KBDI and ERC rose as expected, while 100-hour and 1000-hour dead fuel moistures fell and remained below normal.

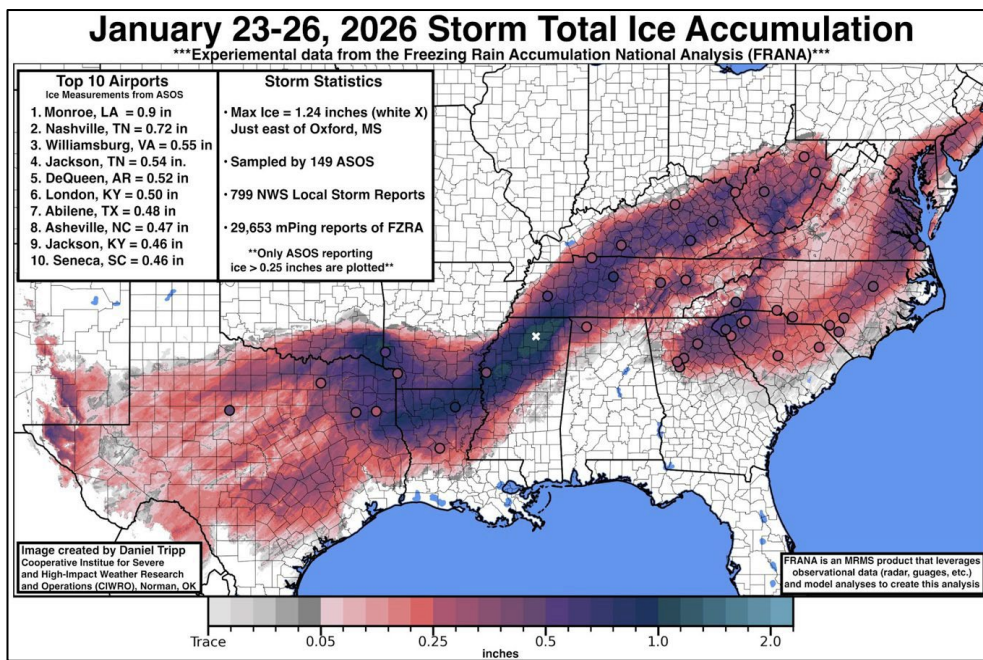
In the most severe drought areas of Florida and southern Georgia, swamps, wetlands, floodplains, and other natural barriers have dried enough that they no longer slow fire spread. These conditions increase the likelihood of prolonged duff and muck fires and long-duration smoke impacts. While the Florida Panhandle has seen some relief, most areas from the Ocala National Forest to the Everglades have KBDI values above 600, with several exceeding 700. Southeast Georgia, including the Okefenokee National Wildlife Refuge, is also much drier than normal, with KBDI roughly 200 points above average for this time of year.



Across Oklahoma and Texas—including the Plains, Hill Country, Cross Timbers, and Trans-Pecos—grass loading for the 2025–2026 dormant season is above normal to exceptional. Large, contiguous areas now contain taller and denser fuels than usual, with few natural breaks, creating potential for long runs of highly volatile fire. While peak spring fire season typically spans mid-February through April, or until green-up. If drought and warm temperatures persist, increased fire activity, resistance to control, and large fire growth—especially during pre- or post-frontal wind events—will likely continue even into the summer months.

Cooler temperatures associated with arctic air masses penetrating into the deep south in January and February moderated fire danger indices, particularly in the Southern Apps where snow and/or cold temps continue to subdue fire danger and KBDIs remain low. However, winter storms associated with these cold snaps in other parts of the GACC have caused variable and uncertain impacts on fuels which remain to be seen. The epic ice storm that impacted a broad swath of the western Coastal Plain and into Tennessee and Virginia in late January resulted in a swath of broken tree canopies and limbs which will add to coarse woody debris fuel loading and open the canopy in these areas to an increase in solar radiation and wind influence this spring. The damage included both hardwood and pine timber types, and in those areas that are pine dominated, an increase in wildfire intensity should be expected, as pine needles will have ample time to dry and become available at some point during the spring season. Access and the ability to navigate fireline construction could also be impacted from the damaged timber.

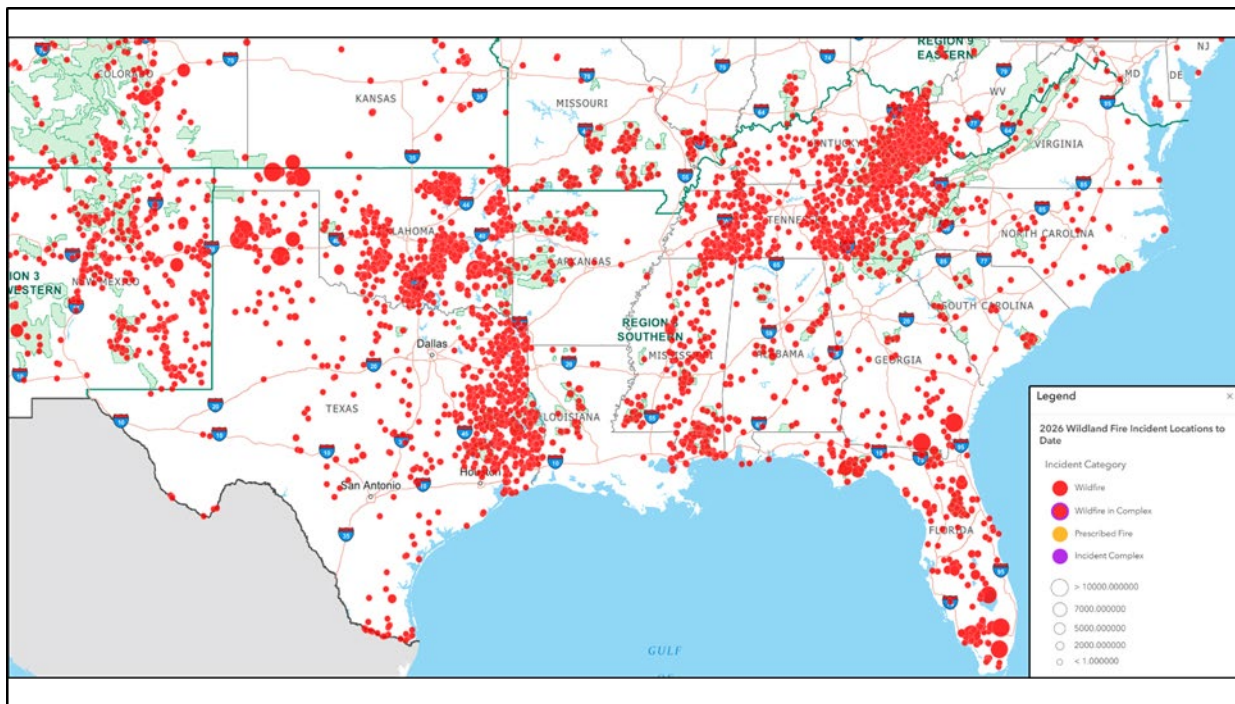
Providing some limited benefit to fire danger and potential, a coastal winter storm Fern in late January that impacted the Carolinas and Virginia, and to a lesser extent the mountains of east Tennessee and northeast Georgia, dumped nearly 2 feet of snow across coastal North Carolina. Greater than 8 inches fell across large portions of the Piedmont regions, and due to unusually cold temperatures, snow cover remained on the ground for several days. Fire managers across the impacted area reported heavy snow compacted litter fuels somewhat, and the expectation is that volatility will be reduced – at least for a time - by the compaction.



Conversely, ice, snow, and sleet from a winter storm in the Plains of Oklahoma and Texas reportedly compacted abundant grass loading, caused by wetter than normal conditions last growing season (close to 150% of normal loading according to the Rangeland Analysis Platform), which may now require longer drying periods to support a wind-driven fire due to the compaction. As these arctic air masses penetrated deep into South Florida, fuels became frost-cured much further south than in most years. There have been recent reports of dead cabbage palms and the invasive Brazilian pepper tree as far south as the Everglades.

2026 Wildfire Activity as of early May

The map below represents wildfire occurrence across the Southern Area since January 1, 2026 based on fire occurrence data from the Wildland Fire Interagency Geospatial Services (WFIGS) hosted in NIFC ArcGIS Online (AGOL). This service contains all wildland fire incidents from the Integrated Reporting of Wildland Fire Information (IRWIN) only, so it does not account for state and other fires not reported in IRWIN. These data account for both fire occurrence and fire size, so larger circles in the map represent larger wildfires with largest circles greater than 10,000 acres in size.

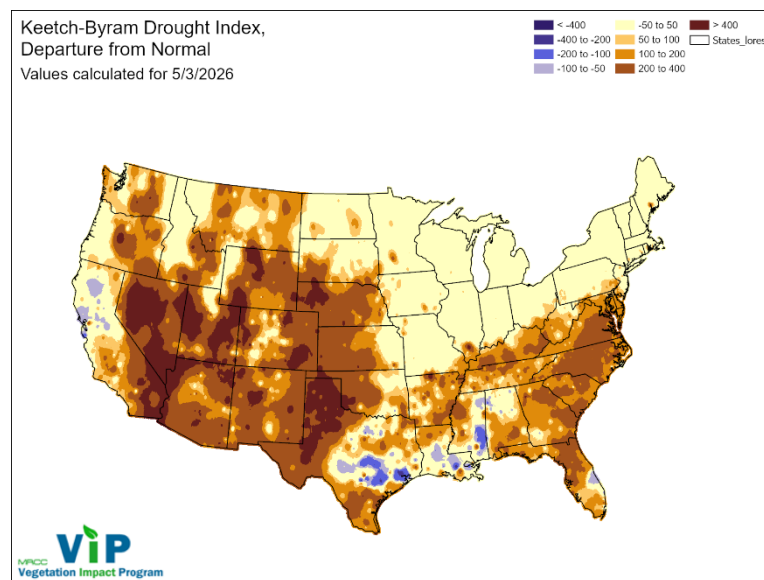


According to the National Significant Wildland Fire Potential Outlook from NIFC Predictive Services for May - August 2026 (issued May 1, 2026), "Fire activity was steady across the U.S. in April, with a moderate uptick in activity the latter half of the month. The Southern Area observed the most notable increase in activity in the last two weeks of April, with more modest increases in the Southwest and Eastern Areas."

Fire activity increased in late April in Georgia with the Pineland Road (32,575 acres) and Hwy 82 fires. The Hwy 82 Fire was discovered on Apr 20 in southeast Georgia and ultimately grew to 22,471 acres and destroyed over 100 primary residences. The fire burned actively overnight on numerous days due to the ongoing drought conditions and poor RH recovery. In Florida, The Hwy 41 Fire discovered on Apr 27 in Everglades NP burned 9,149 acres and made a 10-mile run in a 36-hour period. All three fires showed abnormally high rates of spread and resistance to control.

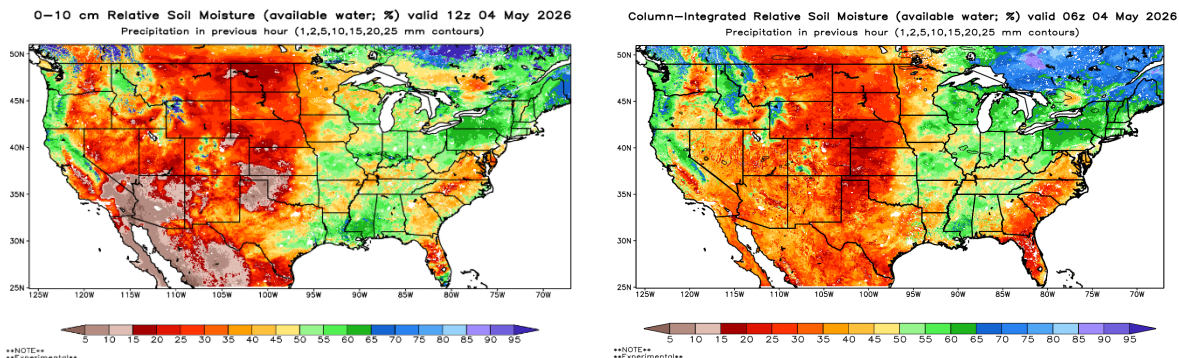
Current Conditions

Approximately 85% of the Southern Area is currently in D0 drought or above, but NFDRS indices have been variable across the region and not consistently aligned with the U.S. Drought Monitor. In most areas outside of Texas, Oklahoma, and Florida, KBDI is deceptively low despite higher ERC values and an increase in recent fire activity in some areas. ERCs are currently highest in the western portion of the GACC due to on-going drought and recent warm temps, while the eastern portion of the GACC generally displays lower ERCs due to lower temps and recent precipitation. 100-hr fuel moistures, although extremely low in Texas, Oklahoma, and northwest Arkansas, do not appear to be as critically low throughout the rest of the Southern Area despite persistent regional drought since last September. ERCs and KBDI will begin to rapidly increase, and 100-hr fuel moisture will rapidly decrease, due to evapotranspiration as green-up occurs over the next few weeks if warm and dry conditions persist or develop. Rapid green-up will compound stress on live fuels and exacerbate drought impacts, particularly in swamps, wetlands, and other low-lying areas which may no longer serve as reliable natural holding features. Fire managers should be prepared for long-term duff and muck fires and prolonged smoke impacts should wildfire become established in these typically wet areas.



KBDI departure from normal as of May 3, 2026 (Source: Midwestern Regional Climate Center.) <https://mrcc.purdue.edu/VIP/indexKBDI2>

To gain a sense of underlying drought beyond what we can glean from NFDRS indices like KBDI and ERC, it is instructive to examine soil moisture satellite products from NASA and the National Drought Mitigation Center’s (NDMC) soil moisture models. The NASA SPoRT-LIS Relative Soil Moisture (RSM) product offers information about the soil saturation state as a ratio of the volumetric soil moisture between the wilting and saturation points for a given soil type and is expressed as a percentage. SPoRT-LIS provides relative soil moisture % at 0-10 cm, 10-40 cm, 40-100 cm, and 100-200 cm or at any of these depths all the way through the soil moisture column (i.e., 0-100 cm, 0-200 cm, etc.). The 0-10 c, RSM product is useful for assessing shallow surface moisture conditions, while 0-200 cm RSM (also known as “Column-Integrated RSM”) strikes a balance between assessing long-term drought from moisture levels lower in the soil column while incorporating the shallower surface layers in assessing drought.

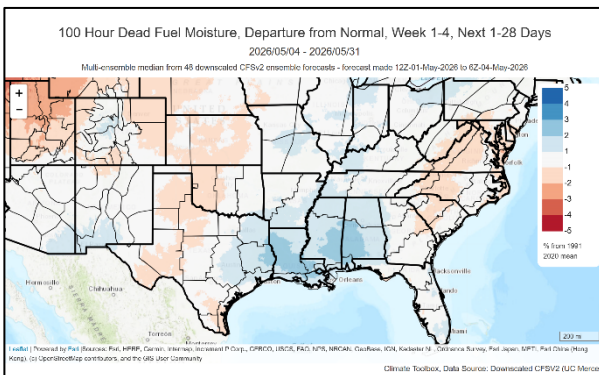
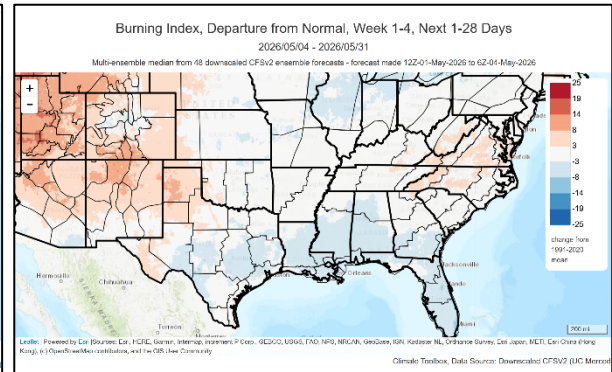
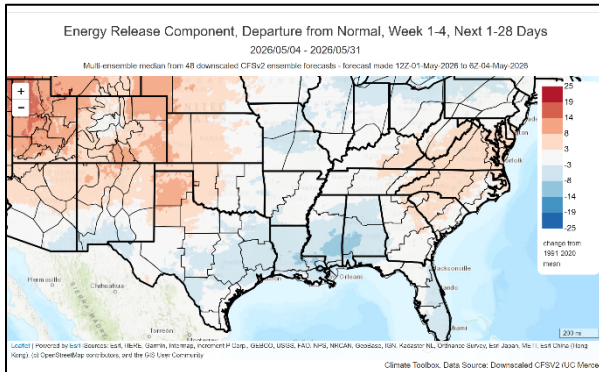


0-10 Root Soil Moisture (%) and 0-200 “Column-Integrated” Root Soil Moisture (%) as of May 4, 2026 from NASA SPoRT-LIS. https://weather.ndc.nasa.gov/sport/viewer/?dataset=lis_conus&product=rsoim0-100

Both the 0-10 cm and 0-200 cm Column-Integrated RSM products for May 4th display similar regional patterns of drought conditions to KBDI with areas in Texas and Oklahoma with 0-10 cm RSM as low as 10-15% and values of 20-25% in Florida. It is alarming to note that moderate recent precipitation is minimally impacting the 0-10cm soil moisture while the deep soil moisture down to 200cm remains historically low.

Late Spring Fuels Condition Outlook

As previously discussed, fuel conditions continue to be elevated across the Southern Area and can be referenced in the [National Significant Wildland Fire Potential Outlook](#). There are a few products that provide experimental NFDRS or soil moisture forecasts for this spring. Climate Mapper (<https://climatetoolbox.org/tool/climate-mapper>) provides weekly forecasts out to 28 days for ERC, Burning Index (BI), and 100-hr fuel moisture departure from normal based on 48 downscaled CFSv2 ensemble forecasts. Based on these forecasts displayed in the ERC maps below, a pattern emerges of further deterioration in fuel conditions in the western portion of the GACC with the greatest impacts in the Texas and Oklahoma Panhandles over the next month. ERC and 100-hr fuel moisture forecasts also highlight areas of above average ERC, with lower than normal 100-hr fuel moistures, across western North Carolina and central Virginia.



Experimental energy release component, burning index, and 100-hr dead fuel moisture departure from normal over the next 4 weeks (28 days) from Climate Mapper based on multi-ensemble median from 48 downscaled CFSv2 ensemble forecasts for 05/04/2026 – 05/31/2026. (<https://climatetoolbox.org/tool/climate-mapper>).

Special Considerations for Hurricane Helene-Impacted Areas

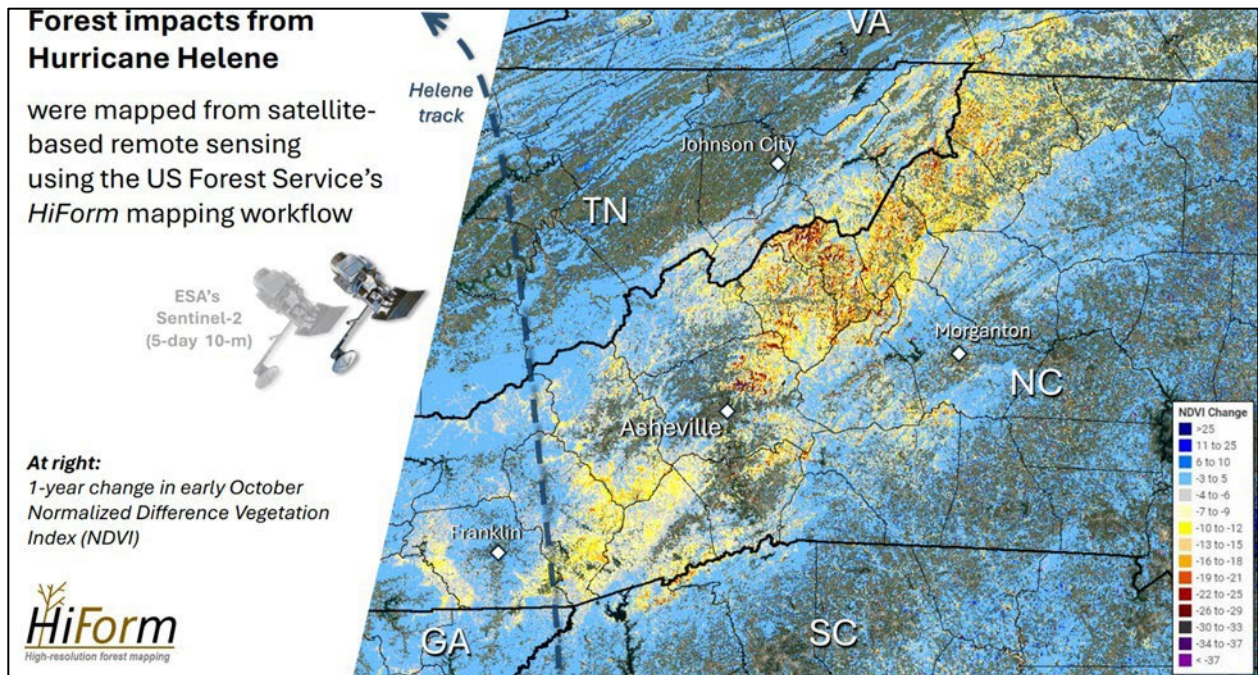
It has been over 18 months since Hurricane Helene made landfall and blazed a path of destruction from Florida up through Georgia and South Carolina and into the Southern Apps. Over the past 18 months, 1-hour, 10-hour, and some 100-hour fuels from vegetation impacted by this disturbance have likely become fully cured, while 1000-hour fuels are beginning to cure, and in some cases, the outer bark and cambium are becoming available to burn. Thus far, Helene fuels have posed a greater *potential* problem than *realized* problem. Random fires have occurred in Helene damaged areas that did increase intensity and complicated firefighting logistics, but widespread catastrophic results have not yet occurred. It is important to stress the continued fire danger from Helene fuels, and an alignment of the right weather conditions and fire occurrence in these fuels could pose challenging to potentially catastrophic fire intensity. While rates of spread would typically be less in heavy downed timber than in open litter fuels, the intensity and resistance to control would be much greater. Smoke production would be significantly increased, and access limitations that would likely necessitate much larger fire footprints should be planned for.

Structurally, the open canopy conditions over large areas of tree blowdown have exposed fuels to increased sunlight and reduced wind drag and have begun releasing the mountain laurel and rhododendron understory. Although the remaining overstory and midstory in many of the

impacted stands have begun to recover canopy biomass, many of these impacted areas will not have a full canopy to shade surface fuels and moderate the drying influences of sun and wind as leaf-on occurs this coming growing season. As fuels continue to decompose and become more available, there will be an increased risk of higher flame lengths, increased fire line intensities, and short to medium range spot fires from damaged fuels. Under moist conditions, the larger tree boles laying on the ground break up fine fuel continuity and may continue to impede fire spread until these heavier fuels become more available. There have also been multiple reports of standing eastern hemlocks with broken crowns causing spot fires over creeks and riparian areas which used to hold fire, so crews should patrol creek boundaries for snags and slopers when using these features as natural firebreaks. The extreme winds from Helene caused the bark to become looser and flakier in many hemlocks facilitating fire spread into tree crowns and leading to increased spotting potential.

Firefighters should be aware of these changes to fuels, how fuels may respond under drier conditions, and the safety watchouts associated with degraded ingress/egress, snag hazards, fire behavior, and overall response. In many cases, wildfire suppression operations will need to be adjusted to consider more indirect attack strategies, use of larger heavy equipment, safety checklists and briefings, improved personnel accountability, and extended attack due to slowed suppression efforts. Prescribed fire this coming spring in the Helene-impacted area will require burn plan revisions, careful planning, higher burn staffing, and increased consideration of contingency plans. For more in-depth treatment of Helene's impacts to fuels and fire behavior, as well as recommendations for adjusting fire management operations to mitigate safety concerns, refer to [Fuels and Fire Management Considerations for Hurricane Helene Damaged Areas](#) and [Post-Hurricane Fuels and Suppression Considerations Bulletin](#) produced by USFS Region 8 Fire and Aviation Management and hosted on the Southern Fire Exchange website: [Resources for Understanding Hurricane Impacts on Prescribed Fire and Wildfire](#)

The following map produced by Steve Norman at Southern Research Center Eastern Forest Threat Assessment Center (EFETAC) displays the Hurricane Helene impact area across the Southern Appalachians estimated from HiForm Normalized Difference Vegetation Index (NDVI) pre- and post-Helene change detection. EFETAC continues to provide updated and improved Hurricane Helene spatial change detection products as additional remote sensing imagery is acquired. Current and future updated HiForm spatial data products, including links to data in AGOL, can be found on the HiForm website: <https://hiform.org/projects/2024-hurricane-helene-southern-appalachians>

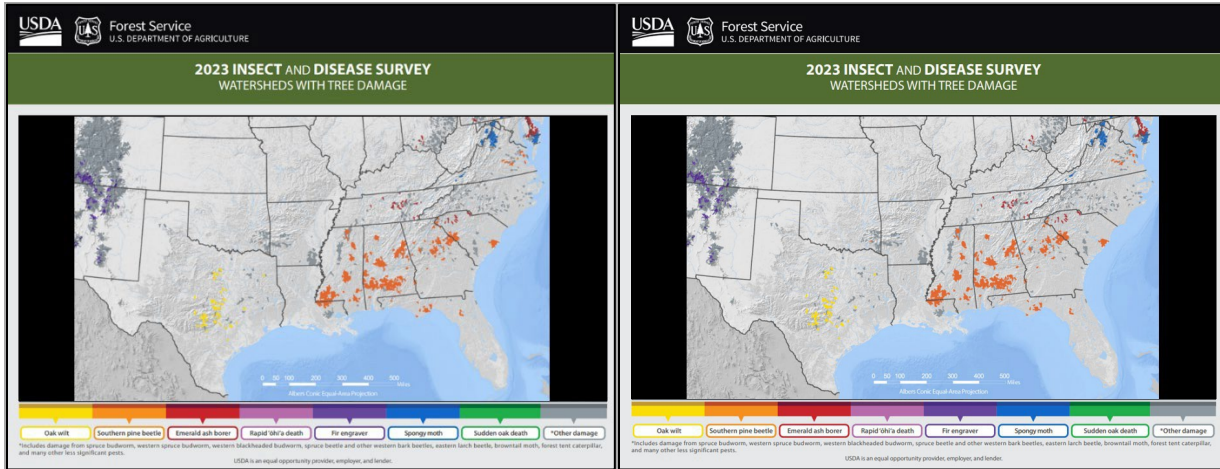


LANDFIRE released their disturbance and fuel model product updates for 2024 at the end of September 2025. These updates include spatial representation of the estimated Hurricane Helene disturbance footprint in Southern Appalachia from EFETAC's HiForm change detection product and fuel model crosswalks to represent slash and blowdown fuel models in impacted areas.

These LANDFIRE products, updated for 2024, can be found on the [LANDFIRE website](#) and a description of LANDFIRE's process for producing preliminary Hurricane Helene disturbance products can be found at [LANDFIRE Hurricane Helene Preliminary Disturbance Mapping](#).

Insect-Impacted Fuels

Another on-going concern that remains is the legacy of pine beetle infestations across parts of the Gulf States. These infestations of Ips and Southern Pine Beetle have left behind large amounts of standing dead timber, which serve as potent fuel sources for fires. Line production rates and overall suppression difficulty should be expected to increase considerably in areas with large amounts of available and standing dead fuel, and spotting from copious dead snags is a major concern.

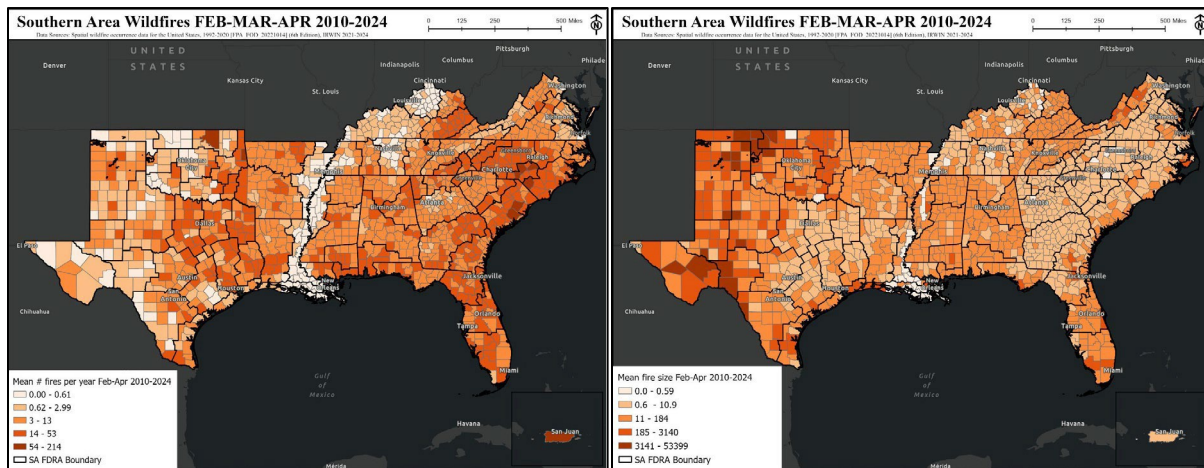


U.S. Forest Service Forest Health Protection insect and disease survey maps for 2023 and 2024 showing widespread southern pine beetle impacts across the Gulf Coast states, emerald ash borer in the Southern Apps, and spongy moth damage in Virginia (<https://www.fs.usda.gov/science-technology/data-tools-products/fhp-mapping-reporting/detection-surveys>).

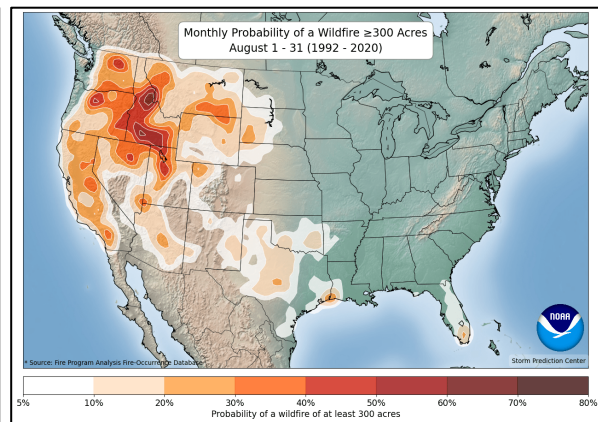
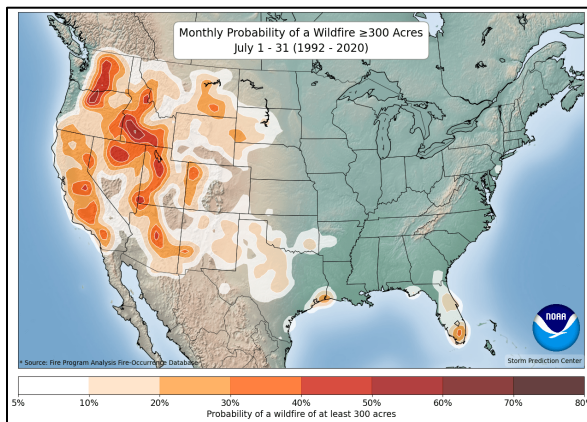
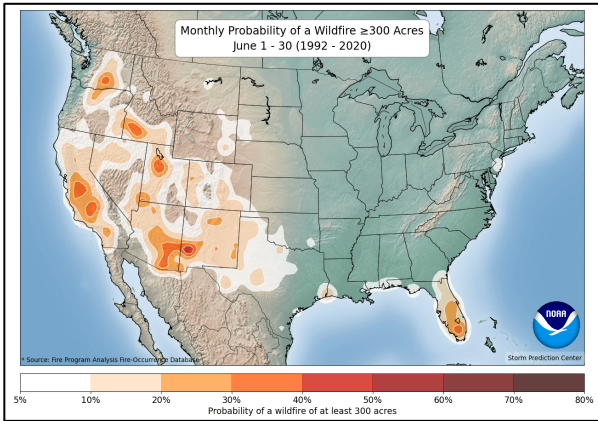
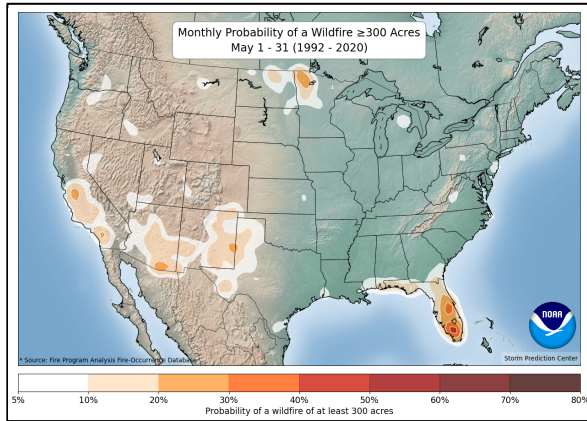
Appendix A. Historic Spring Fire Occurrence

Historic Seasonal Wildfire Activity

Using a combined FOD 6th edition and IRWIN dataset, all wildfires during FEB-APR 2010-2024 (“Spring season”) were aggregated by county and analyzed according to mean number of fires per Spring season by county and mean fire size during Spring season by county and (see figures below, analysis courtesy of Fire Planner/Analyst Mike Keys with NFs in Florida).



Similar to the map above, the following maps from the NOAA Storm Prediction Center display the probability of a wildfire ≥ 300 acres by month for May - August (1992-2020 period of record). Historically, late spring wildfire activity in the Southern Area continues increased potential in the with an area of probability in southeast Georgia and Florida through coastal Louisiana/Alabama. Fire occurrence begins to recede moving into June through August and is most likely to occur in coastal areas of southeastern Texas/western Louisiana, parts of the Florida panhandle and most of the Florida peninsula as convection thunderstorm patterns bring rain.



Monthly wildfire occurrence hotspot maps for fires greater than or equal to 300 acres in size within 25 miles. Fire severity can not be inferred from this analysis (based on 1992-2020 FPA-FOD data) provided by the NOAA Storm Prediction Center (<https://www.spc.noaa.gov/new/FWclimo/climo.php?parm=300ac>).

Appendix B. Critical Fire Weather and Environmental Conditions

The four critical weather elements that produce extreme fire behavior are **low relative humidity, strong surface wind, unstable air, and drought**. The critical fire weather patterns that support these conditions can be separated into two primary categories: those that produce strong surface winds, and those that produce atmospheric instability. In both cases, an unusually dry air mass for the region and season must also occur. In brush and timber fuels, drought becomes an important precursor by increasing fuel availability. It's necessary for firefighters to recognize the conditions that contribute to large fire growth because critical fire weather patterns may not be identified by name in the weather forecast.

Drought

Wildfires are complex events and influenced by multiple factors, including weather, fuel availability, and topography. However, one of the most critical drivers of wildfire behavior is drought. Drought affects the moisture content of dead fuel, live vegetation, and soil making the landscape more susceptible to ignition and more challenging to control once a fire begins. This relationship between drought and wildfire danger is particularly important for fire managers, as it can inform fire preparedness, response strategies, and resource allocation.

Because drought can significantly alter the fire environment, monitoring drought conditions is an essential part of fire management. Drought indices provide a quantitative way to assess drought severity, helping fire managers anticipate potential fire risks and allocate resources accordingly. However, not all drought indices are created equal, and understanding their specific applications is critical for accurate fire prediction.

Key Drought Indicators

There are two classes of drought indices, Timescale Aggregated and Point-in-Time, represent different approaches to understanding drought conditions based on temporal flexibility. Time-scale aggregated indices, such as the Evaporative Demand Drought Index (EDDI) and Standardized Precipitation Index (SPI), allow for analysis over different periods (e.g., weeks to months), offering insights into how short- and long-term conditions develop and evolve. These indices are particularly useful for monitoring trends over time, such as identifying "flash droughts" or prolonged dry spells that may impact wildfire risk, agriculture, or water resources differently based on the duration of drought stress. In contrast, point-in-time indices, like the

U.S. Drought Monitor (USDM), provide a snapshot of drought conditions at a specific moment, combining multiple data sources for a comprehensive current assessment. The time scale of an index is crucial, as short-term indicators can signal emerging risks like wildfire danger, while longer-term averages may highlight broader, more persistent drought patterns that influence

long-term planning. Understanding the appropriate timeframe for each index helps tailor drought assessments to specific risks and decision-making needs.

Timescale Aggregated

1. Precipitation Anomalies – Percent of Normal

- a. Lack of rainfall and days since rain are proven indicators of fire danger.
- b. Season and other factors are needed to interpret the impact of rainfall deficits or percent of normal.
- c. Rainfall deficit amounts can provide perspective and provide how much precipitation is required to return to normal.

2. Standardized Precipitation Index (SPI)

- a. Evaluates precipitation deficits over various time scales.

3. Where SPI considers precipitation only, SPEI or Standardized Precipitation

Evapotranspiration Index is precipitation minus potential evaporation. Evaporative Demand Drought Index (EDDI)

- a. Measures atmospheric moisture demand or thirst of the atmosphere rather than rainfall.
- b. Useful for detecting flash droughts for early drought warning (2–4-week time frame).

4. Vapor Pressure Deficit (VPD)

- a. Unlike SPEI or EDDI, which rely on precipitation and evapotranspiration balances, VPD is a direct measure of atmospheric dryness representing the difference between saturated and actual water vapor pressure in the air.
- b. VPD is calculated using temperature and humidity.
- c. VPD is a component of the Growing Season Index (GSI).
- d. Captures rapid (days to weeks) fluctuations in the drying power of the atmosphere.
- e. High VPD accelerates fuel moisture loss, increasing fire risk.

Point-in-Time indicators

5. Keetch-Byram Drought Index (KBDI)

- a. Estimates soil moisture depletion and fire risk.
- b. Responsive to precipitation and temperature changes.
- c. Best for near-term fire monitoring (1-2 weeks).

6. Energy Release Component (ERC)

- a. Tracks potential fire intensity based on long-term drying.
- b. Slow to change but highly indicative of fire season severity.

- c. The ERC percentiles are used as a fire danger threshold. ERC values are relative to a particular location, and the same value can mean something different in each FDRA

7. 100- and 1000-Hour Fuel Moisture

- a. Measures how available fuels are to burn.
- b. Critical fuel moisture values can vary across the region. They're often identified on pocket cards issued for each fire danger rating area (FDRA).

8. U.S. Drought Monitor (USDM)

- a. Provides a broad drought classification.
- b. Useful for long-term strategic planning.

9. Soil Moisture

- a. Satellite-based soil moisture monitoring.
- b. Helps assess near-surface moisture availability

The **Keetch-Byram Drought Index (KBDI)** and the **U.S. Drought Monitor (USDM)** serve different purposes and operate on different timescales, which can lead to divergence, particularly in the winter months in the South. **KBDI is a short-term fire risk indicator**, measuring **surface soil moisture depletion** and its impact on wildfire potential. It responds quickly to **rainfall and temperature changes**, meaning that a single heavy rain event or a period of cool, wet weather can significantly reduce KBDI values in a matter of **days to weeks**. However, this drop does not necessarily mean that deeper moisture reserves have recovered.

In contrast, the U.S. Drought Monitor captures long-term hydrological and ecological drought conditions, incorporating precipitation trends over months to years, streamflow, **groundwater levels, and soil moisture at deeper depths**. Even if KBDI decreases due to short-term rain, **long-term drought conditions can persist**, keeping an area classified under **moderate to severe drought (D1–D4)**. This is especially true if the preceding months were drier than normal, and deeper moisture sources—such as **subsurface soil layers and groundwater**—have not fully recharged.

The key difference in **temporal recovery** is that **KBDI can return to low levels in weeks** with consistent rain, whereas **the U.S. Drought Monitor may take months or even years** to fully reflect recovery, especially after extended dry periods. This seasonal discrepancy is common in the Southeast, where winter rainfall can temporarily lower KBDI but may not fully erase long-term drought deficits. As temperatures rise in spring and evapotranspiration increases, **KBDI can rapidly climb again**, often aligning more closely with the Drought Monitor's long-term drought classifications. This highlights the importance of using both indices together—KBDI for **short-term fire risk** and USDM for **long-term drought monitoring**—to gain a full picture of drought and wildfire potential.

Critical Wind Events

Dry Cold Fronts and Post-Frontal Winds

One of the most dangerous fire weather scenarios in the Southeast occurs after the passage of a dry cold front. These fronts, which are most common in March and April, can bring strong, gusty winds (15–25 mph, gusts of 30–40 mph) and very low humidity (as low as 8–15%). These conditions rapidly dry fuels, particularly hardwood leaf litter, increasing wildfire potential.

1. How It Develops:

- a. A cold front moves through the region, displacing warm, humid air.
- b. Instead of bringing rain, the front is followed by a surge of dry, polar air with strong northwesterly or westerly winds.
- c. Relative humidity drops significantly, sometimes staying below 20% for multiple days.

2. Fire Behavior Impact:

- a. Rapid drying of 10-hour fuels (small branches and leaf litter) to critically low moisture levels (3–5%).
- b. Increased spotting potential and extreme fire spread due to strong post-frontal winds.
- c. A period of elevated fire danger for 24–36 hours, with lingering dryness for 4–5 days.

Upper Ridge Breakdown and Pre-Frontal Warming

Another key fire weather pattern in the Southeast involves the breakdown of an upper-level ridge, which progresses through three stages:

1. **Pre-frontal warming:** Sunny, warm, and breezy conditions lead to very low relative humidity and fuel drying.
2. **Strong winds ahead of the front:** Winds increase significantly, enhancing fire spread potential.
3. **Cold front passage:** This can be dry or produce little precipitation, failing to alleviate fire danger.

Fire activity in the Southeast often peaks during or after the third stage, when post-frontal instability, gusty winds, and low humidity combine to create critical fire conditions.

Thunderstorm Outflows and Downbursts

Springtime thunderstorms, even those that do not directly produce rainfall at the surface, can pose sudden wildfire hazards through outflow winds and downbursts. These phenomena can:

- Rapidly change wind direction and speed, making fire behavior unpredictable.
- Cause fire flank runs or sudden shifts that endanger crews and structures.
- Create erratic fire spread over a short time, making initial attack efforts more difficult.

Any precipitation aloft (virga) or nearby thunderstorm activity should be closely monitored, as it may indicate the potential for strong outflow winds near an active fire.

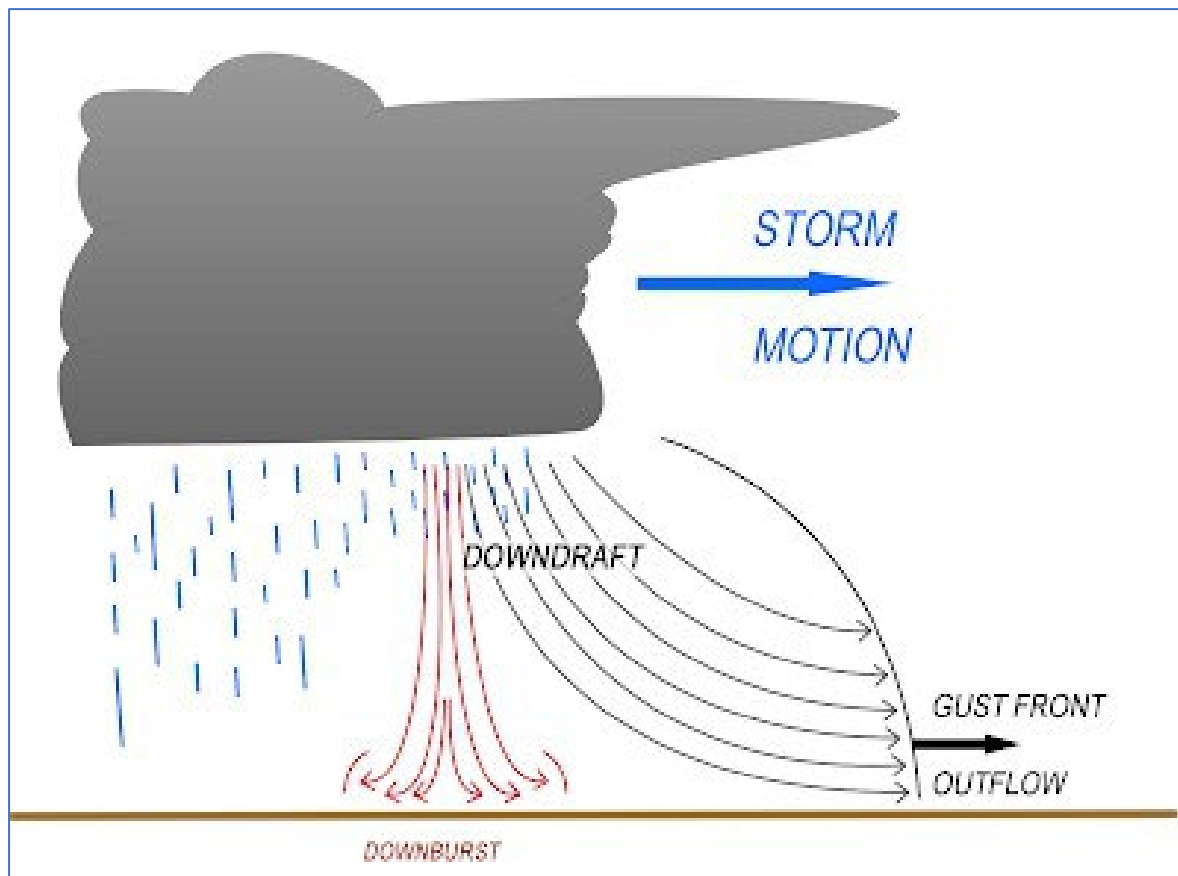


Illustration of wind events associated with thunderstorms

Sea Breeze Fronts and Coastal Fire Behavior

Along coastal areas and near large lakes, sea breezes can create unique fire weather challenges by:

- Bringing gusty, shifting winds as cool marine air pushes inland.
- Lowering humidity levels before the front arrives, increasing fire intensity.
- Occurring during the warmest and driest part of the day, when fuels are most receptive to ignition.

In areas like Florida, where sea breezes can converge from both coasts, complex wind interactions can lead to erratic fire spread and sudden changes in fire intensity.

Hot, Dry, and Unstable Events

Periods of above-normal temperatures, strong surface heating, and atmospheric instability can also contribute to rapid wildfire growth, even without strong winds.

- Key Characteristics:
 - Strong mid-level dry air intrusions, leading to critically low humidity (single digits possible).
 - Formation of heat bubbles, which destabilize the atmosphere and allow surface fires to transition into crown fires.
 - High temperatures combined with deep vertical mixing, leading to unexpectedly high fire intensity and rapid rates of spread.

These conditions are particularly dangerous because fires can exhibit extreme behavior even in the absence of high surface winds.

Tropical Cyclones and Their Adjacent Dry and Breezy Conditions

- **Dual Impact of Tropical Cyclones:** While tropical cyclones are relatively rare in the spring, these storms occasionally occur in late May and June and although they can quickly alleviate drought conditions through heavy rainfall, they can also generate critical fire weather on their periphery. Strong winds, not directly linked to the cyclone's core, often occur between the cyclone and high-pressure systems. As high-pressure systems strengthen in fall, they generate dry air masses, which, combined with subsiding air from cyclones, can create corridors of dry, gusty winds.
- **Subsidence and Fire Risk:** Subsidence, or downward-moving air on the edges of a cyclone, can warm as it descends, further drying the atmosphere. This warming can create localized areas of extreme fire danger, with enhanced winds contributing to faster fire spread. Tropical Storm Harold and Hurricane Idalia demonstrated this effect, leading to enhanced fire weather conditions. Historically, many tropical storms have resulted in similar impacts.

Additional Fire Danger and Fire Weather References

Texas A&M Forest Service

Predictive Services: Offers daily fire danger forecasts, fuel dryness maps, and other predictive services.

[TICC](#)

Texas Fire Potential Update: Provides regular updates on fire potential across the state.

[texas fire potential update.pdf](#)

Oklahoma Forestry Services

Fire Weather and Fuels Conditions: Delivers current fire weather forecasts and fuel condition reports.

[Fire Weather and Fuel Conditions – ODAFF](#)

Oklahoma Mesonet Portal: A collaborative project that offers real-time weather data, including fire weather parameters.

[Home | Mesonet](#)

North Carolina Forest Service

Fire Weather: Provides fire weather forecasts and related information.

[N.C. Forest Service - Fire Weather Reports | NC Agriculture](#)

Fire Weather Intelligence Portal: An interactive platform offering detailed fire weather data.

[Fire Weather Intelligence Portal](#)

Florida Department of Agriculture and Consumer Services

Wildland Fire: Shares information on current wildfires and fire management.

[Florida Forest Service Reporting System](#)

Fire Weather Outlook: Offers forecasts and outlooks pertinent to fire weather conditions. [Forecasts / Fire Weather / Wildland Fire / Forest & Wildfire / Home - Florida Department of Agriculture & Consumer Services](#)

South Carolina Forestry Commission

Fire and Burning Information: Provides guidelines and information on safe burning practices. [Fire & Burning - South Carolina Forestry Commission](#)

Current Wildfires: Updates on active wildfires within the state.

[South Carolina Current Wildfires](#)

Mississippi Forestry Commission

Fire Weather: Offers fire weather forecasts and related resources.

[Fire Weather - Mississippi Forestry Commission](#)

Louisiana Department of Agriculture and Forestry

Daily Fire Weather: Provides daily updates on fire weather conditions.

[Fire conditions and burn bans | Louisiana Department of Agriculture and Forestry](#) [Louisiana Current Wildfires](#)

Kentucky Energy and Environment Cabinet

Wildland Fire Management: Shares information on fire management practices and current conditions.

[Wildland Fire Management - Kentucky Energy and Environment Cabinet](#)

Georgia Forestry Commission

Fire Weather: Provides area-specific fire weather forecasts and related tools.

gatrees.org

Fire Weather Forecast: Offers detailed forecasts and maps for fire weather conditions.

[Fire Weather](#)

Virginia Department of Forestry

Wildfire Information: Shares updates on current fire conditions and safety guidelines.

[Wildfire in Virginia : Virginia Department of Forestry](#) [Virginia Current Wildfires](#)

Arkansas Department of Agriculture – Forestry Division

Fire Weather: Provides fire weather forecasts and information on current fire danger levels.

[Arkansas Current Wildfires](#)

[Burn Bans, Wildfire Danger & Prescribed Burns : Arkansas Forestry Division](#)

Alabama Forestry Commission

Fire Weather: Offers daily fire weather forecasts and related resources.

[AFC - Burn Weather](#)

[Alabama Forestry Commission](#)

Puerto Rico

National Weather Service

[NWS San Juan Fire WX](#)