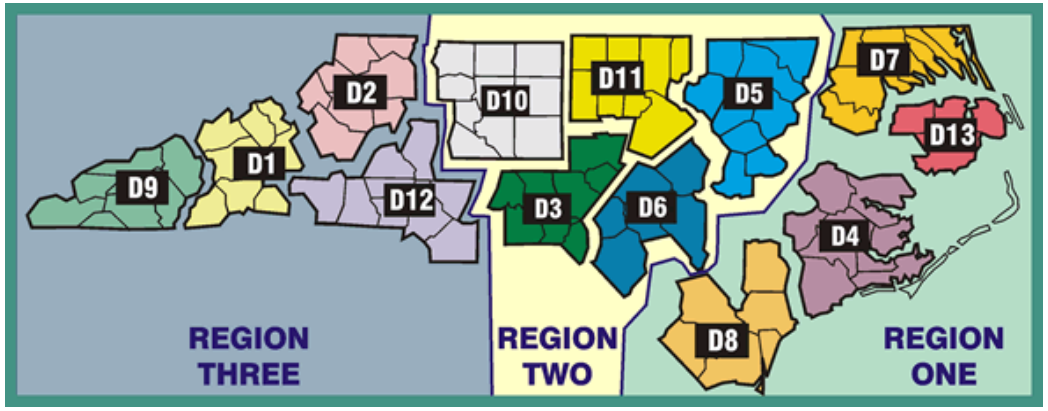
Statewide Seasonal Fire Danger Assessment

– January 2024 Update –



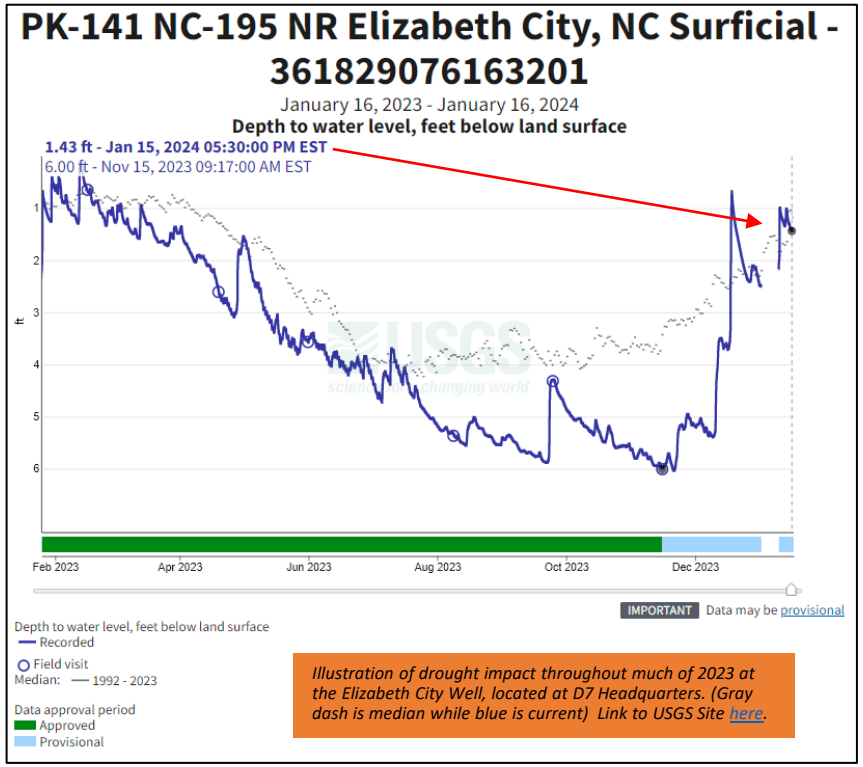
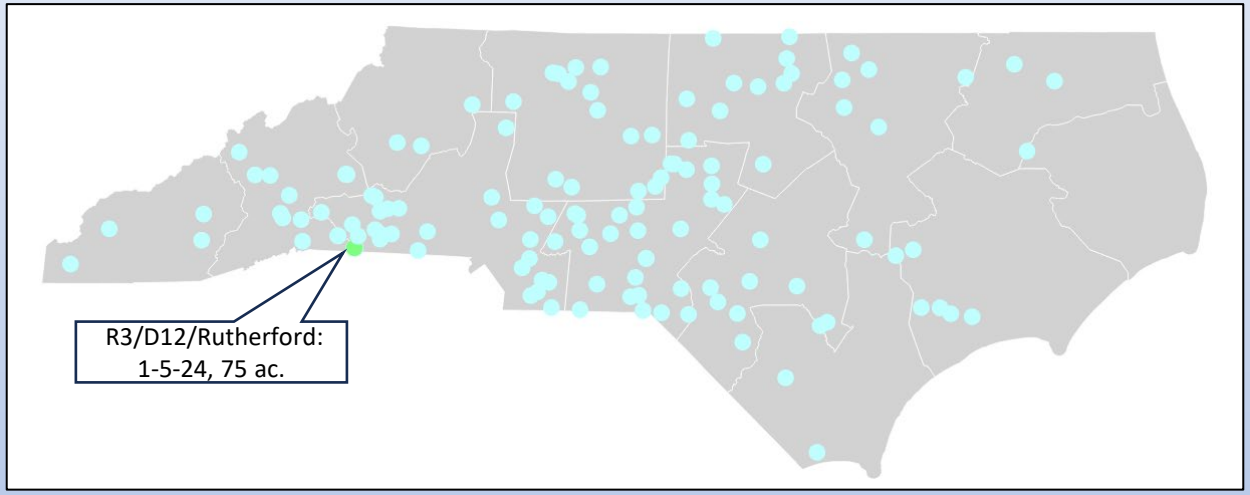


Illustration of drought impact throughout much of 2023 at the Elizabeth City Well, located at D7 Headquarters. (Gray dash is median while blue is current) Link to USGS Site here.

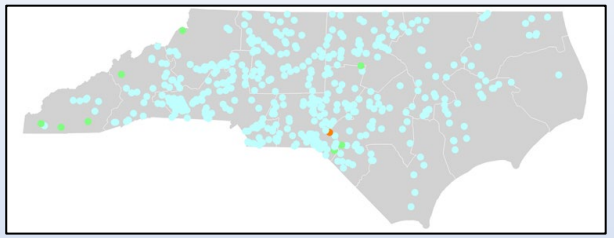
Created by: Jamie Dunbar
Fire Environment Staff Forester
NC Forest Service

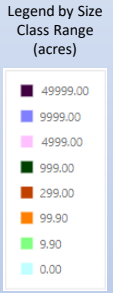
Month to Date Incident Activity

fiResponse Incident Location Map (for general context, preliminary data)
Date Range: 1/1 – 1/15, 2024
Report: Business Intelligence Module, Response Trends Map



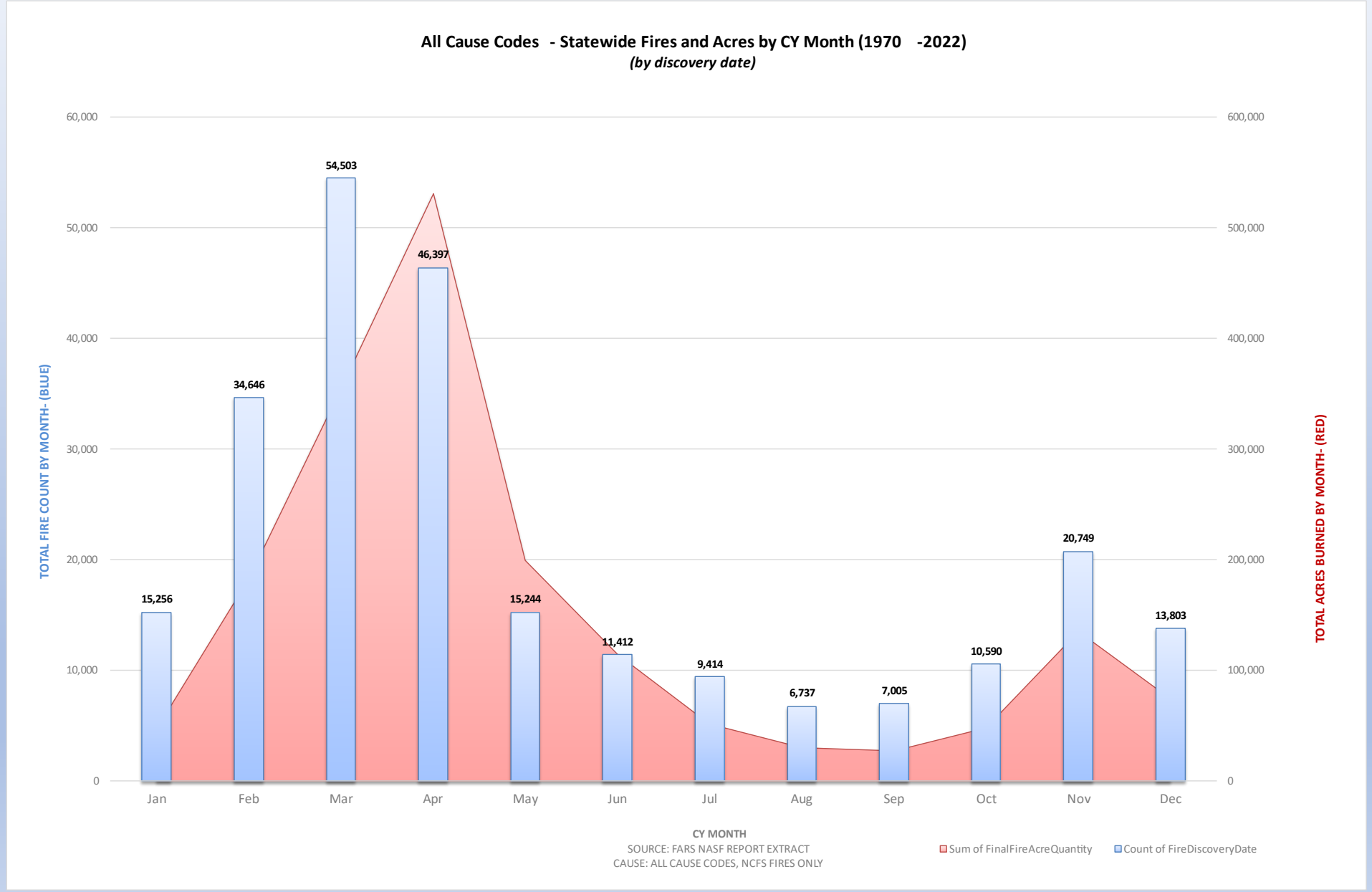
12/1 – 12/31





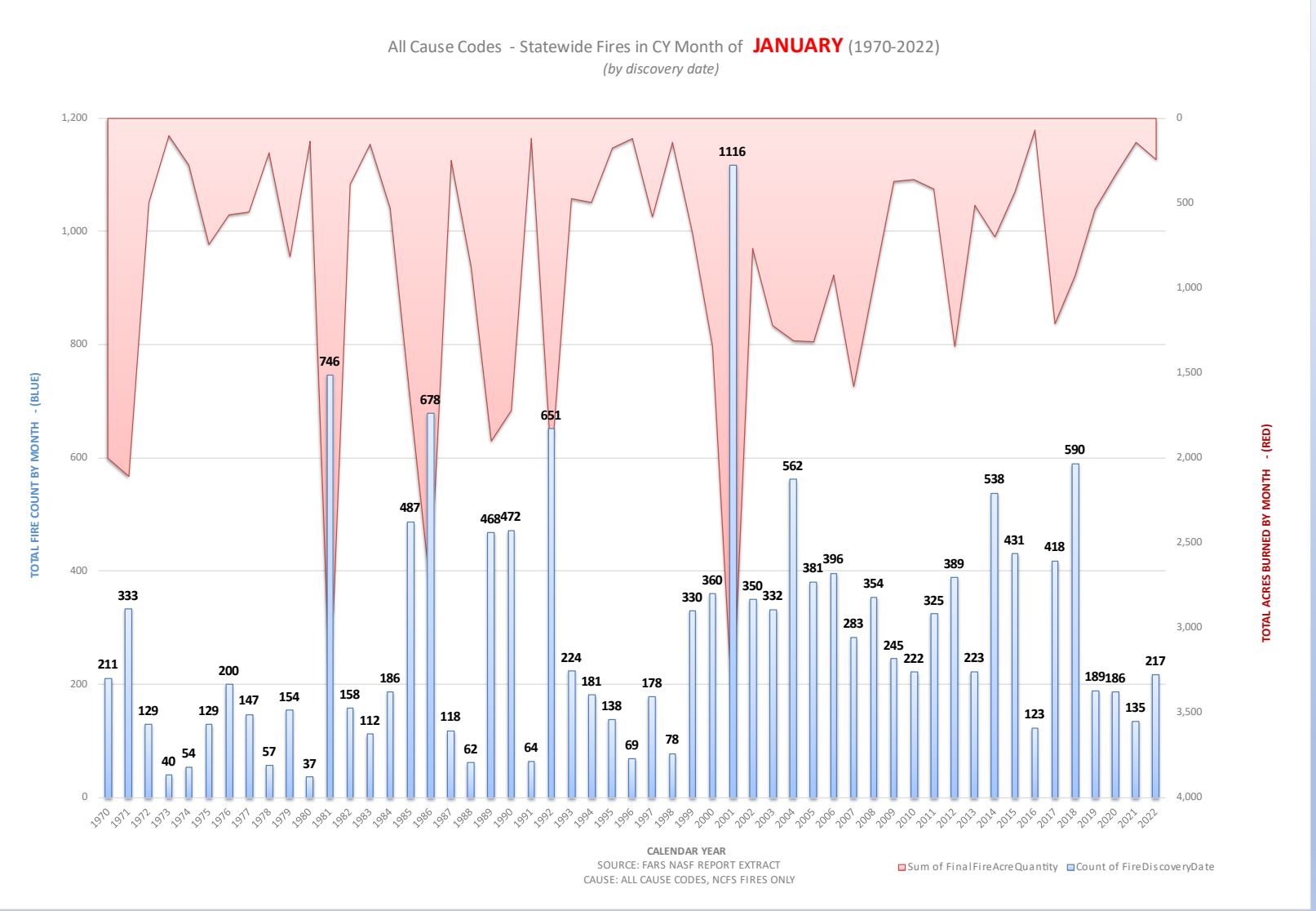
NCFS – By Region				
Monthly Fire Activity (Does Not Include Federal Ownerships)				
Data Source:	Signal 14 Regional Activity Summary Report (Signal 14 is a daily snapshot in time)			
Date Range:	1/1 – 1/15, 2024			
Area	Wildfire Count	Wildfire Acres	RX Count (State & Private)	RX Acres (State & Private)
R1	17	11.3	10	332
R2	65	53.8	17	520
R3	32	14.9	0	0

Distribution of All Fires & Acres by Month from 1970 - 2022



Cause: All Cause Codes, Statewide, NCFS Reported Fires Only

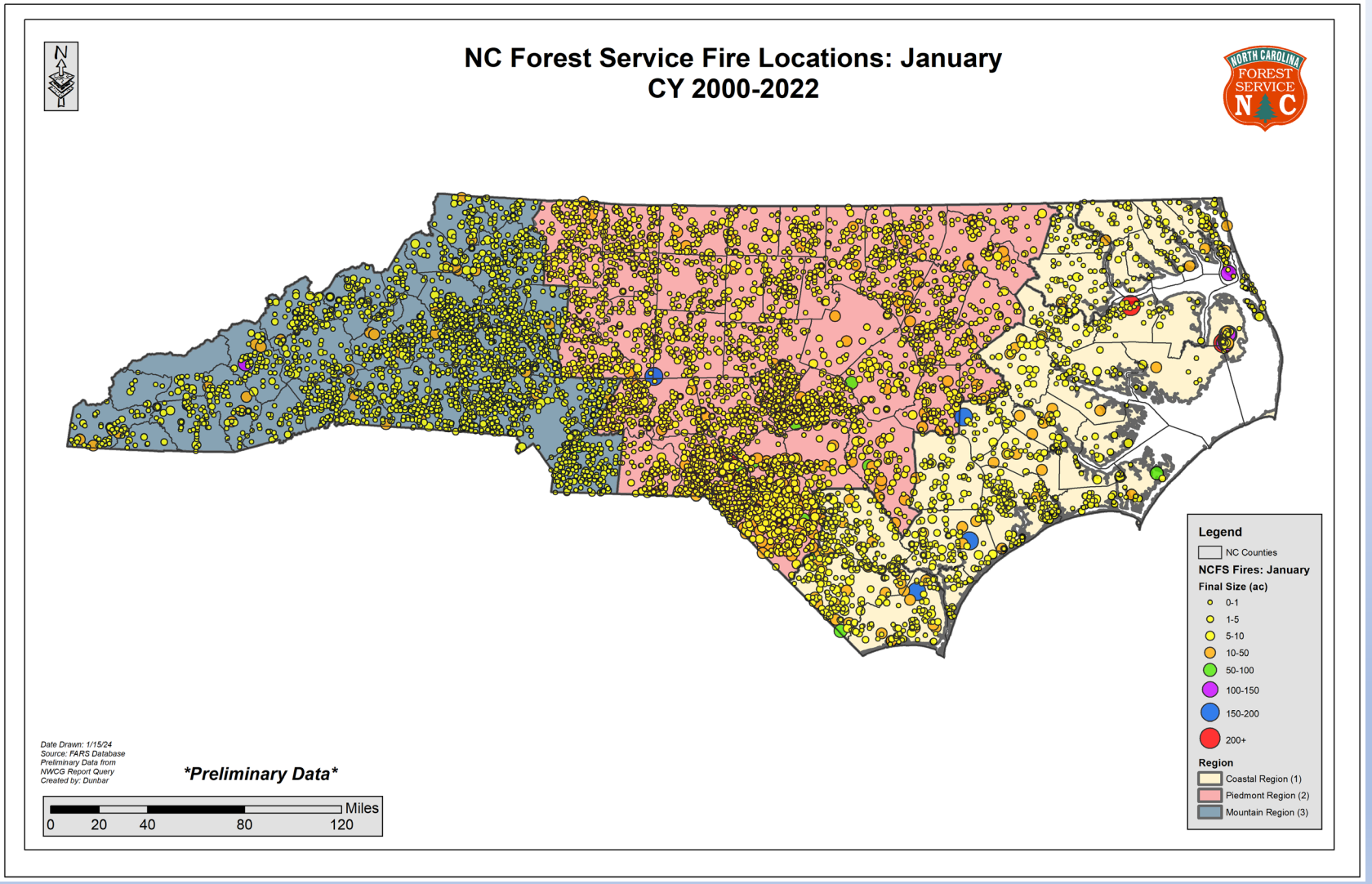
Distribution of All Fires for month of January from 1970 - 2022



Cause: All Cause Codes, Statewide, NCFS Reported Fires Only

10-Yr. Rolling Average for January: ~ 305 Fires for 511 Acres

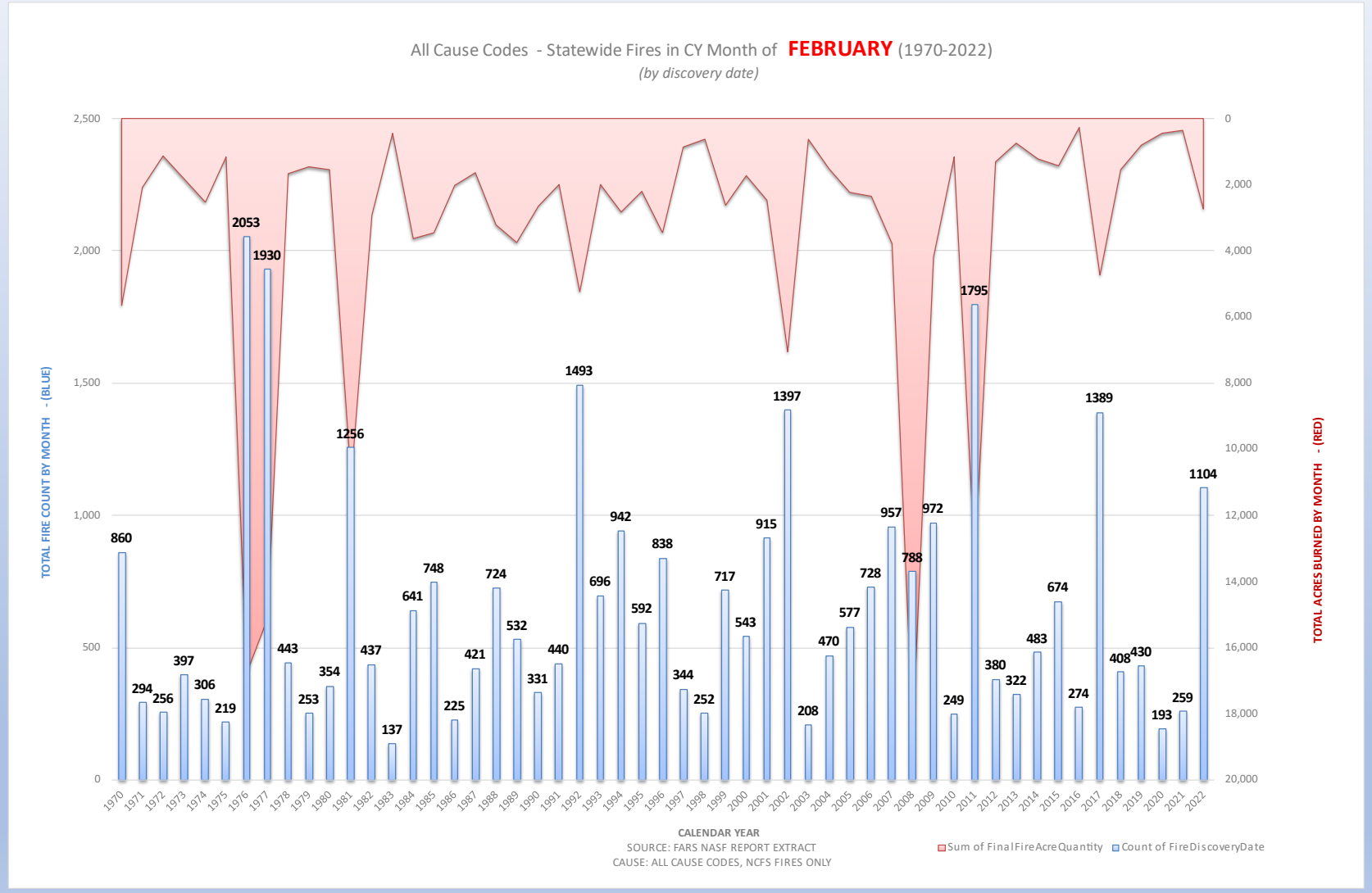
Fire Locations of All Fires for month of January from 2000 - 2022



Cause: All Cause Codes, Statewide, NCFS Reported Fires Only

10-Yr. Rolling Average for January: ~ 305 Fires for 511 Acres

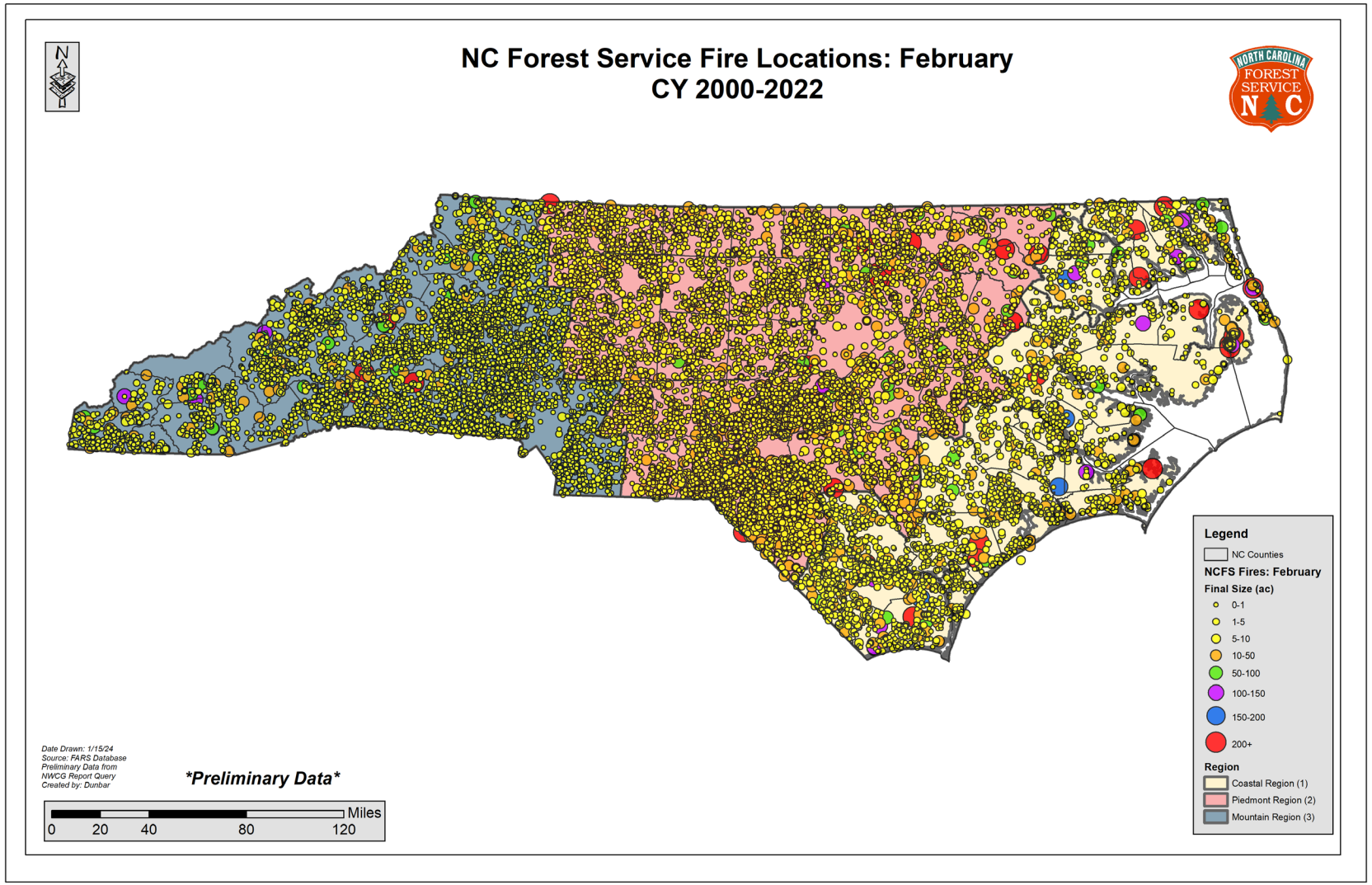
Distribution of All Fires for month of February from 1970 - 2022



Cause: All Cause Codes, Statewide, NCFS Reported Fires Only

10-Yr. Rolling Average for February: ~ 553 Fires for 1,427 Acres

Fire Locations of All Fires for month of February from 2000 - 2022

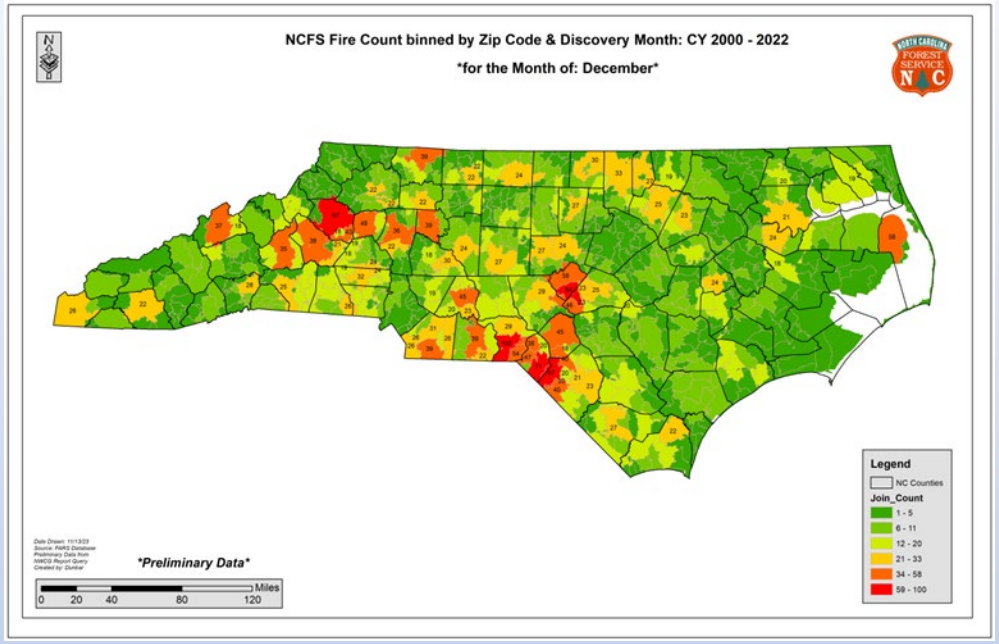


Cause: All Cause Codes, Statewide, NCFS Reported Fires Only

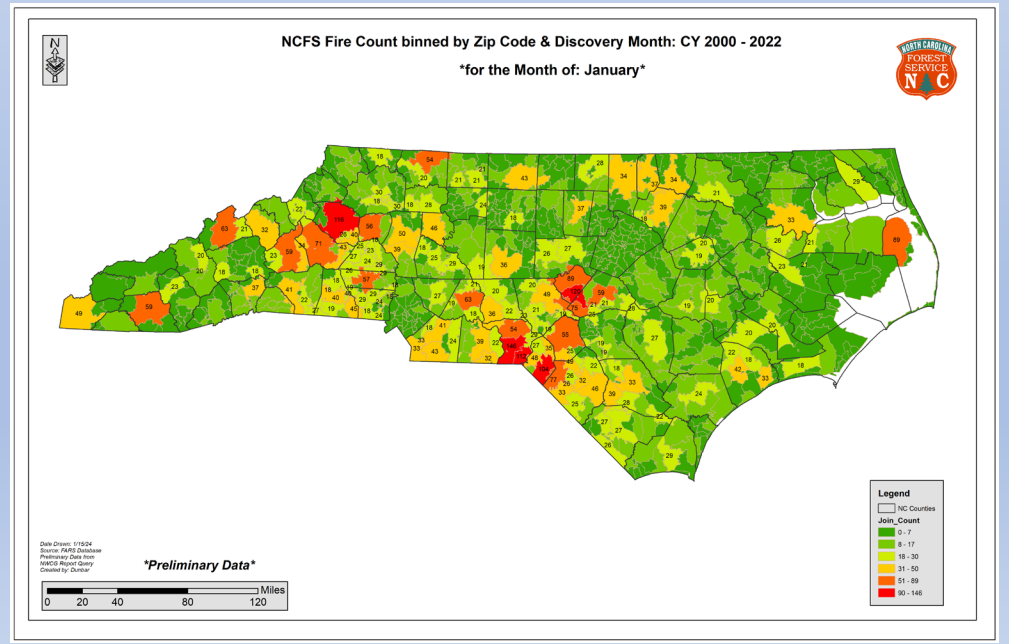
10-Yr. Rolling Average for February~ 553 Fires for 1,427 Acres

NCFS Fire Count Binned by Zip Code & Discovery Month CY 2000-2022

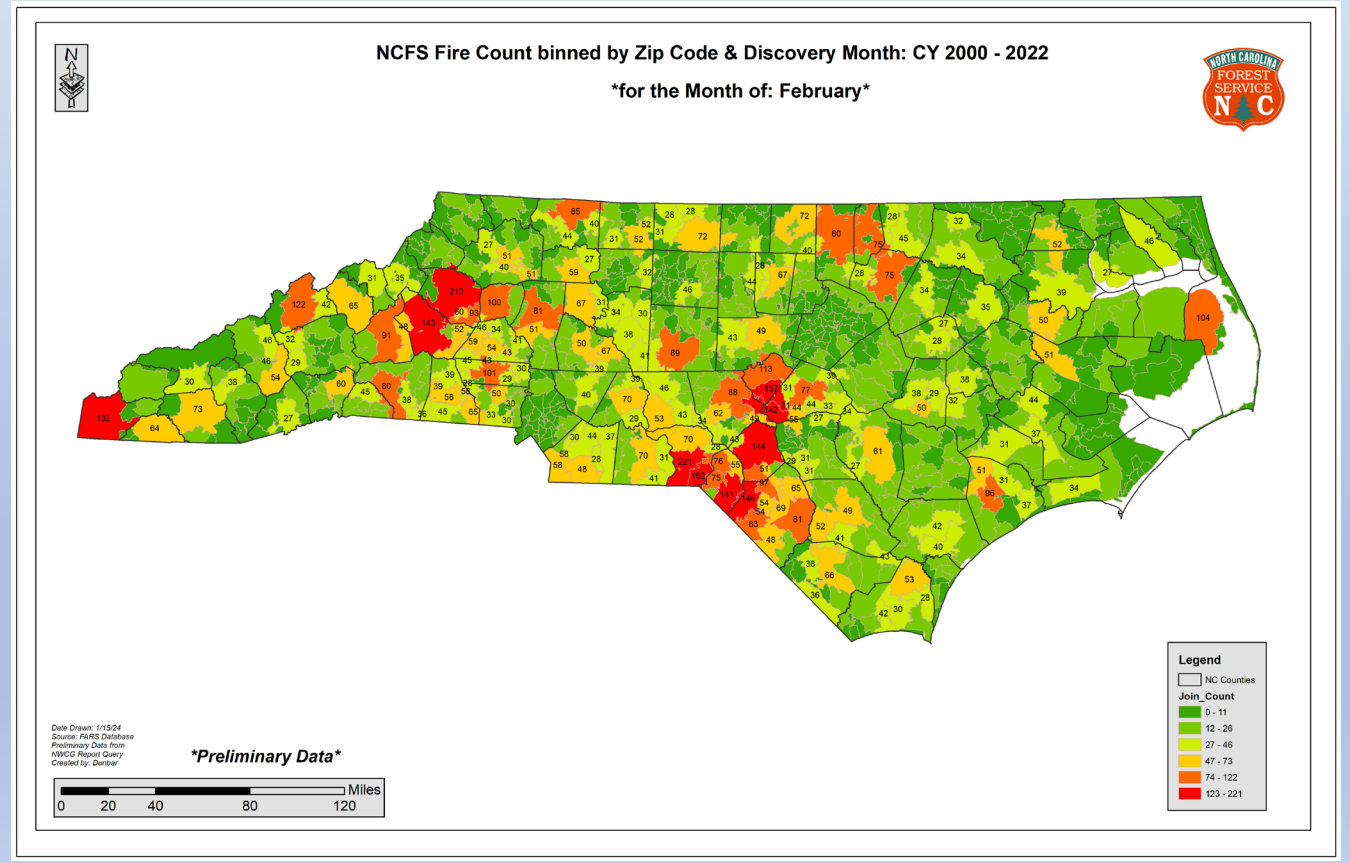
December



January



February



Fire Environment Slides

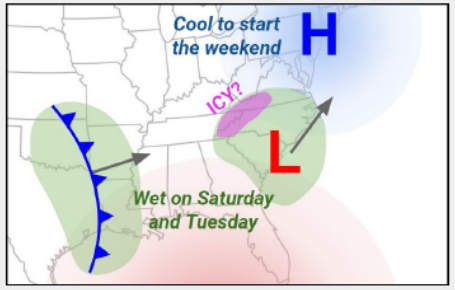
Summary at End

State Climate Office: Short-Range Monthly Outlook for NC

Released 1/4/24 & Location: https://climate.ncsu.edu/fire/outlooks/

Short-Range Outlook for North Carolina

Week 1: January 4 to 10, 2024



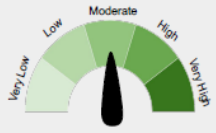
A Cooler Start

High pressure to our north will keep temperatures slightly below normal today through Saturday, with overnight lows dropping below freezing on Friday and Saturday mornings. We should warm up by early next week, possibly into the low 60s on Tuesday.

Wet Weather on the Way

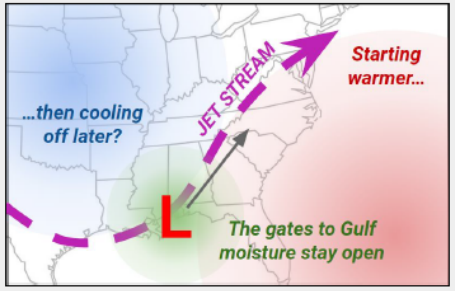
Low pressure will move to our south and east on Saturday, bringing rainfall totaling half an inch to an inch in most areas, with a wintry mix possible in the northwest. After that, an even stronger (and likely wetter) frontal system will move through on Tuesday.

Forecast Confidence



The exact timing and rain amounts for both systems is still coming into focus, but it's shaping up to be a wet week to start 2024.

Week 2: January 11 to 17, 2024



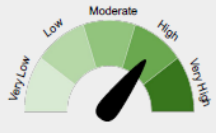
A Temperature Transition?

This week's jet stream pattern should see troughing to our west and ridging offshore, with North Carolina straddling the line between them. We're likely to start off on the warm side, but later in the week as that trough shifts eastward, cooler weather may arrive.

A Favorable Pattern for Precipitation

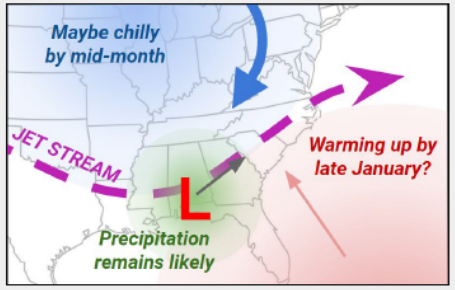
With the jet stream running from our southwest – over the Gulf of Mexico – to our northeast, the conveyor belt of moisture should continue this week, with at least one weather system likely to move through, perhaps around Monday, January 15.

Forecast Confidence



Forecast models are in good agreement about the overall weather pattern, which should continue to favor wet weather for NC.

Weeks 3-4: January 18 to 31, 2024



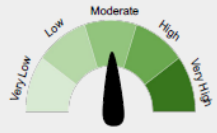
Cooling Off, then Warming Up

The jet stream trough should shift over the eastern US by mid-month, with cooler air – possibly the coldest of the season – moving in. Current forecasts show the trough retreating north by the last week of January, with above-normal temperatures returning.

More Rain, or Even Snow?

The overall pattern continues to show an El Niño-like setup with moisture-rich weather systems moving in from the south or just off our coast through the end of January. If paired with cooler air, those systems could offer something frozen in the heart of winter.

Forecast Confidence



Confidence is relatively high for this period, but we can't yet nail down the timing or precip. types for any events this far out.

This infographic is based on forecast and outlook guidance from the National Weather Service. For more information, visit **www.weather.gov**.

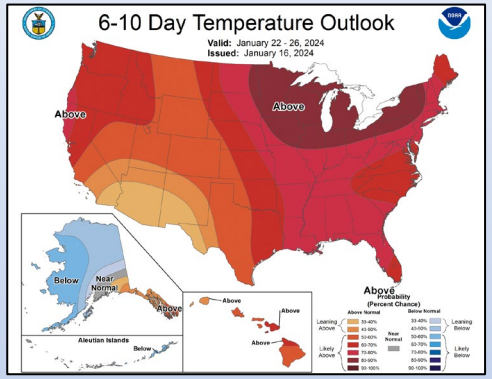
Author: Corey Davis (NCSCO)
cndavis@ncsu.edu

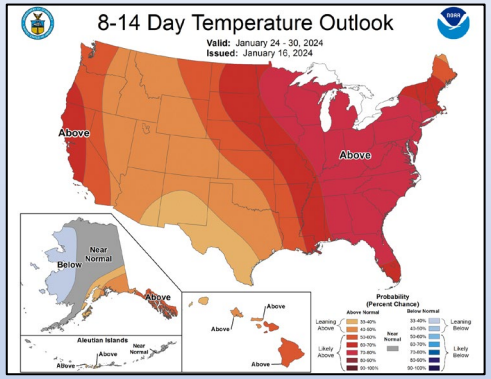
NORTH CAROLINA CLIMATE OFFICE

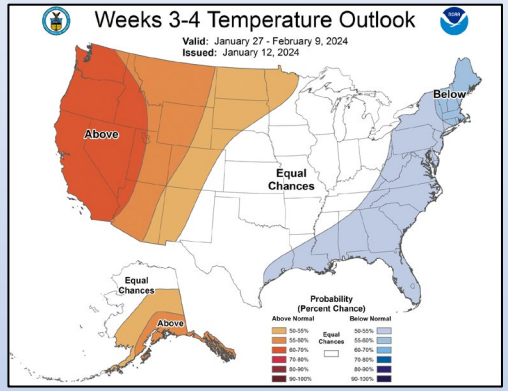
Supported by:

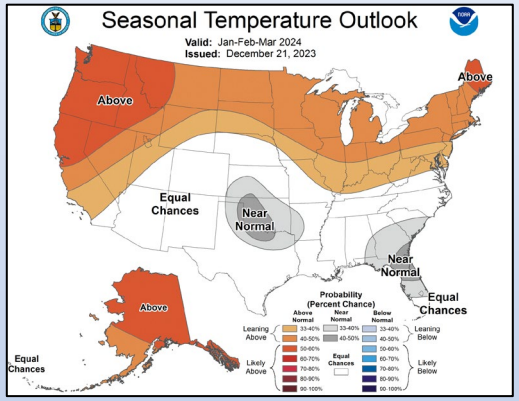
CPC Temp & Precip Outlook

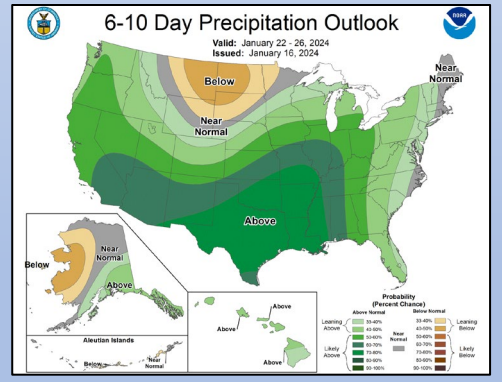
6-10 Day, 8-14 Day, Weeks 3-4, Seasonal

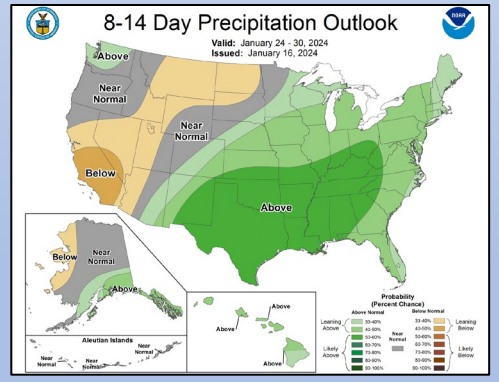


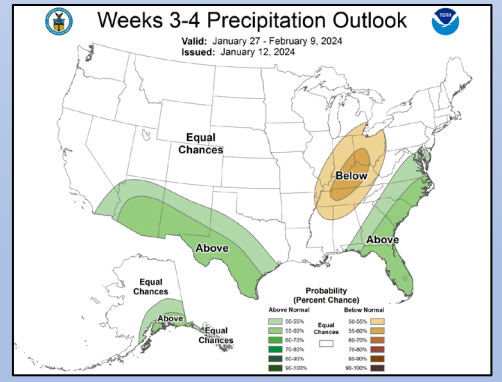


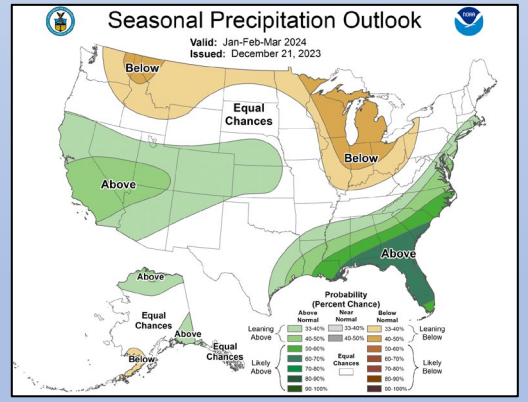








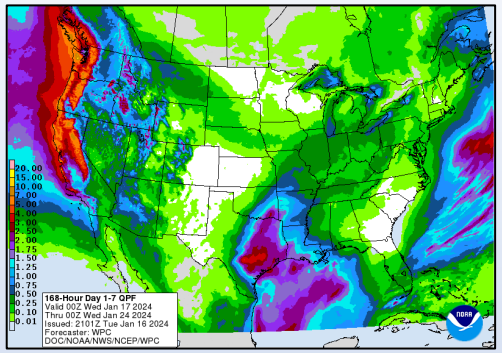




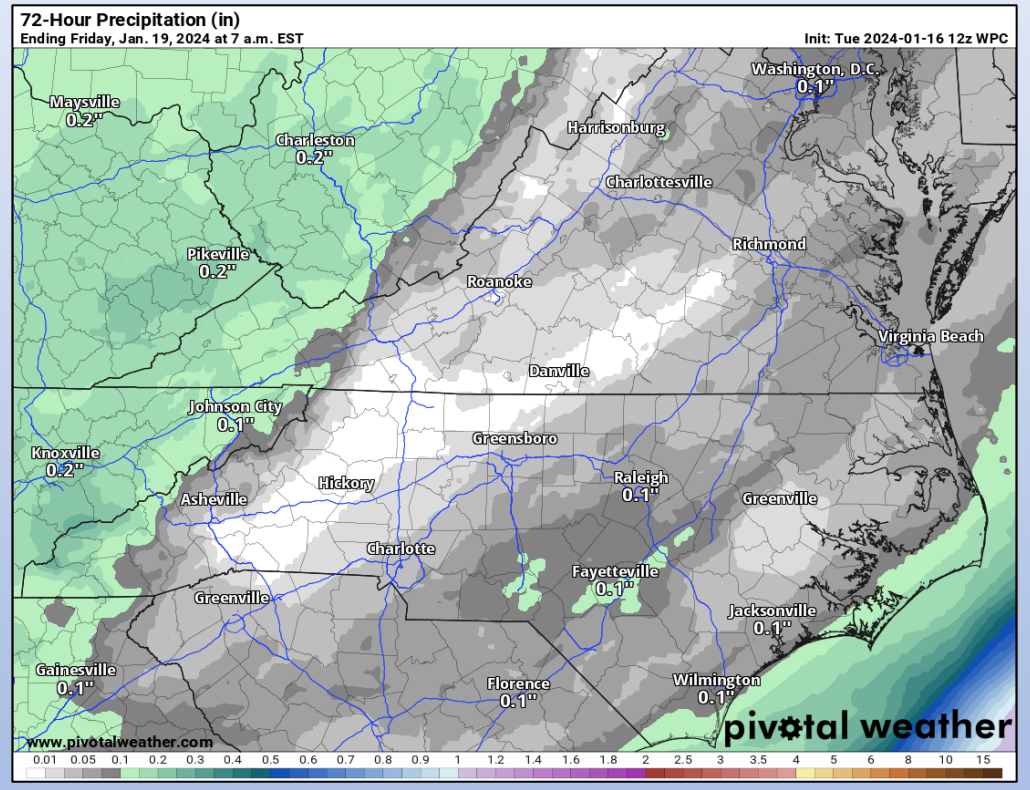
Source: https://www.cpc.ncep.noaa.gov/

Quantitative Precipitation Forecast, Day 1-7

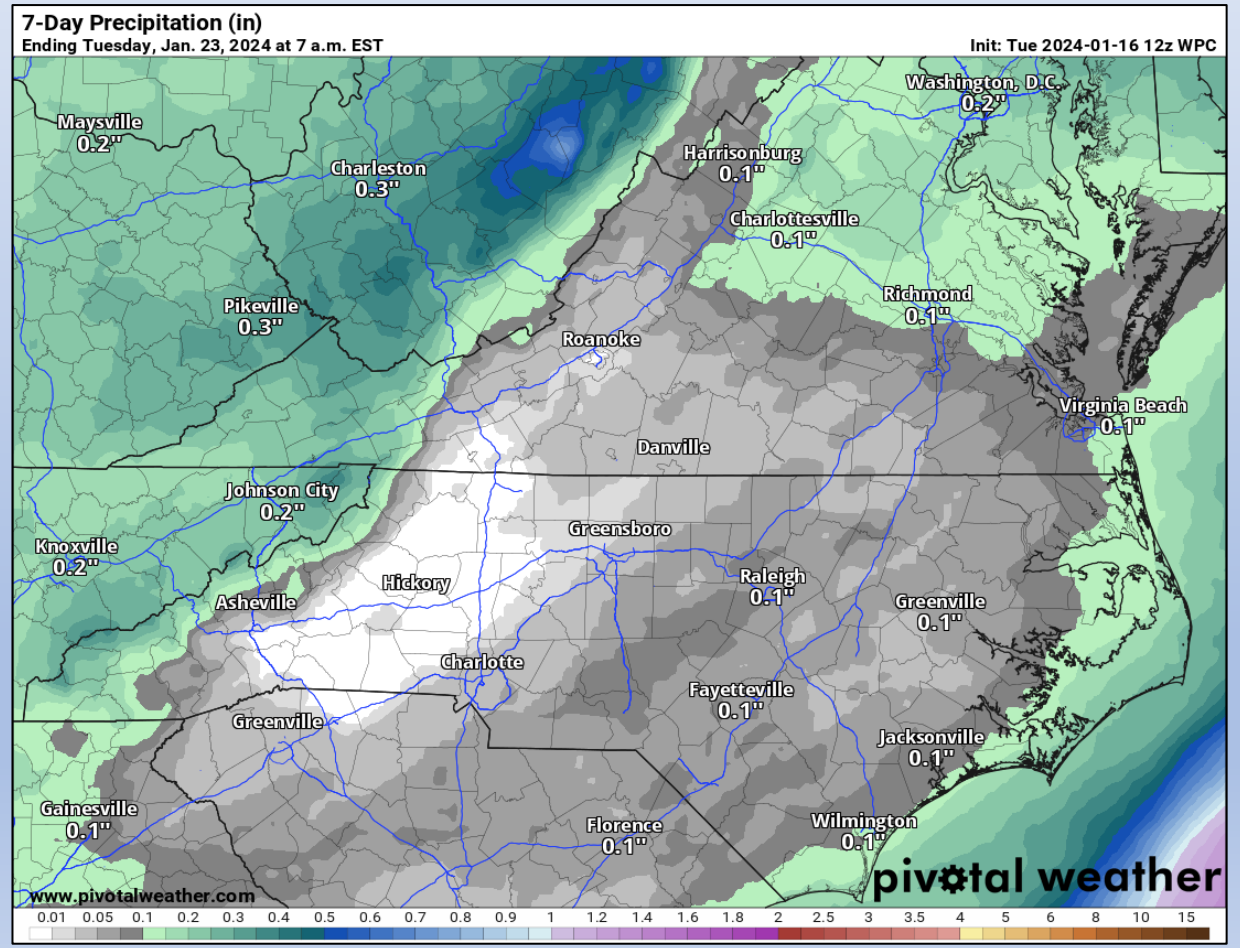
Location: https://www.wpc.ncep.noaa.gov/#



3-Day QPF Total



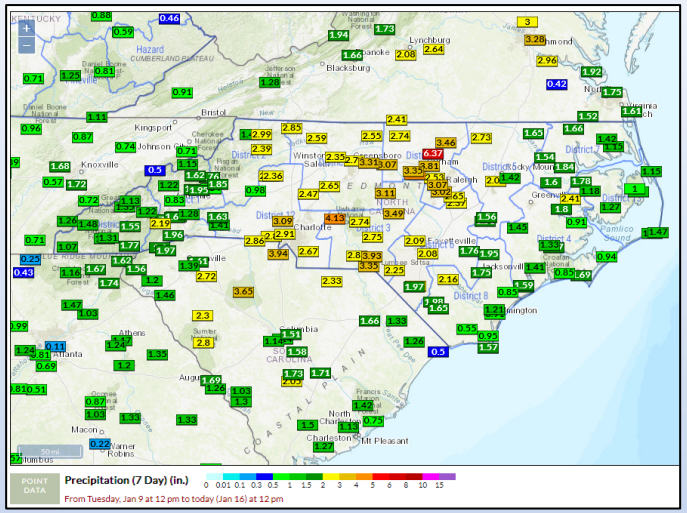
7-Day QPF Total

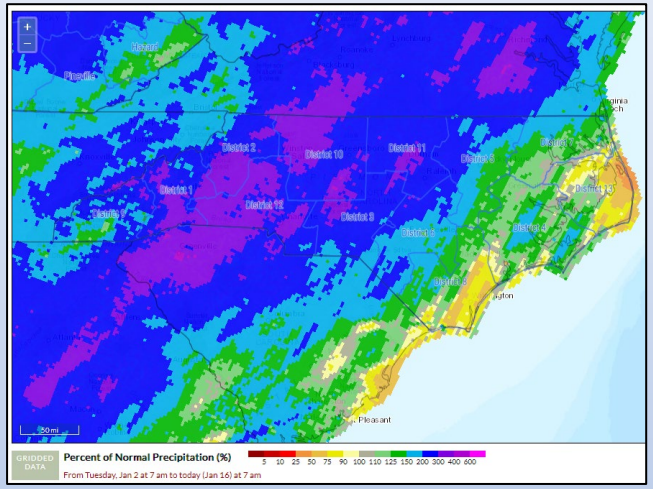


**Significant forecast uncertainty exists later in forecast period concerning possible precip amounts (related to track changes in potential storm systems, etc.)

7 Day Precipitation Totals

FWIP (Point accumulation ending at 1200 on 1/16)

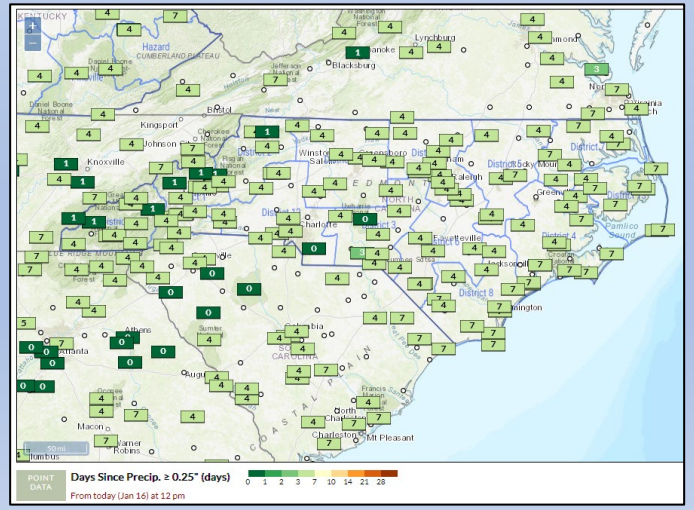




Note areas of improvement and those still behind normal at the 14-day time scale, includes this past weekend's rain (above).

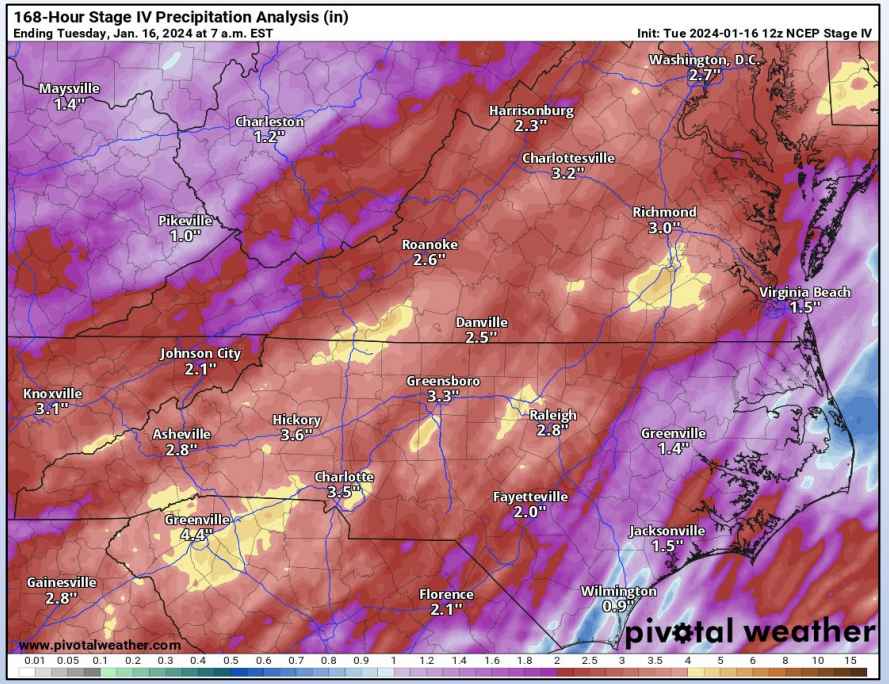
Days Since Wetting Rain Event

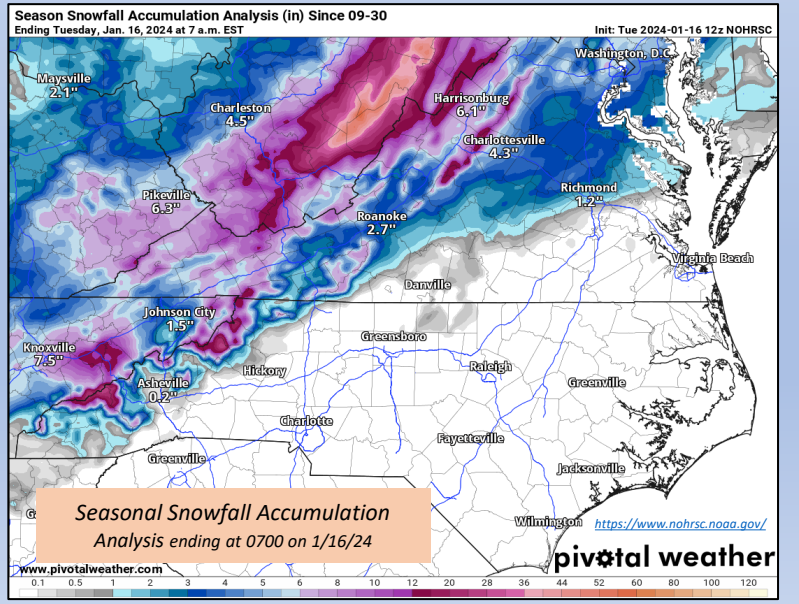
FWIP (Point calculation ending at 1200 on 1/16)



Modeled 7-Day Observed Precip Totals

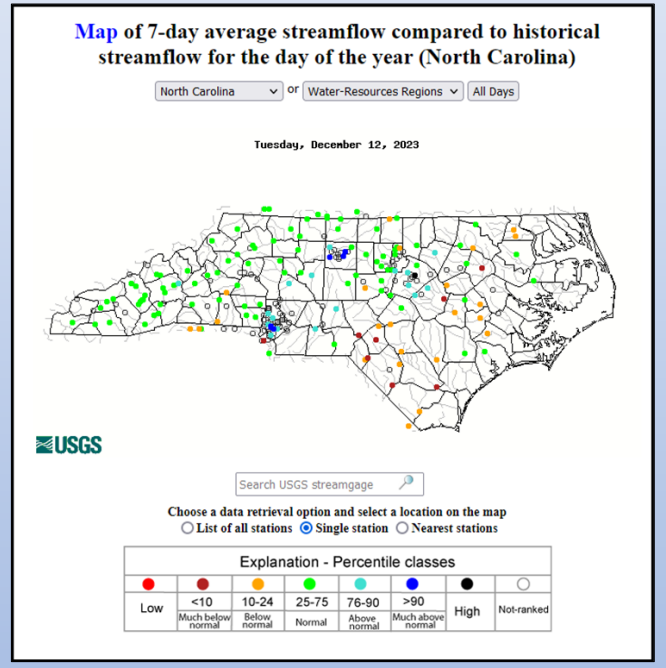
ending at 0700 on 1/16



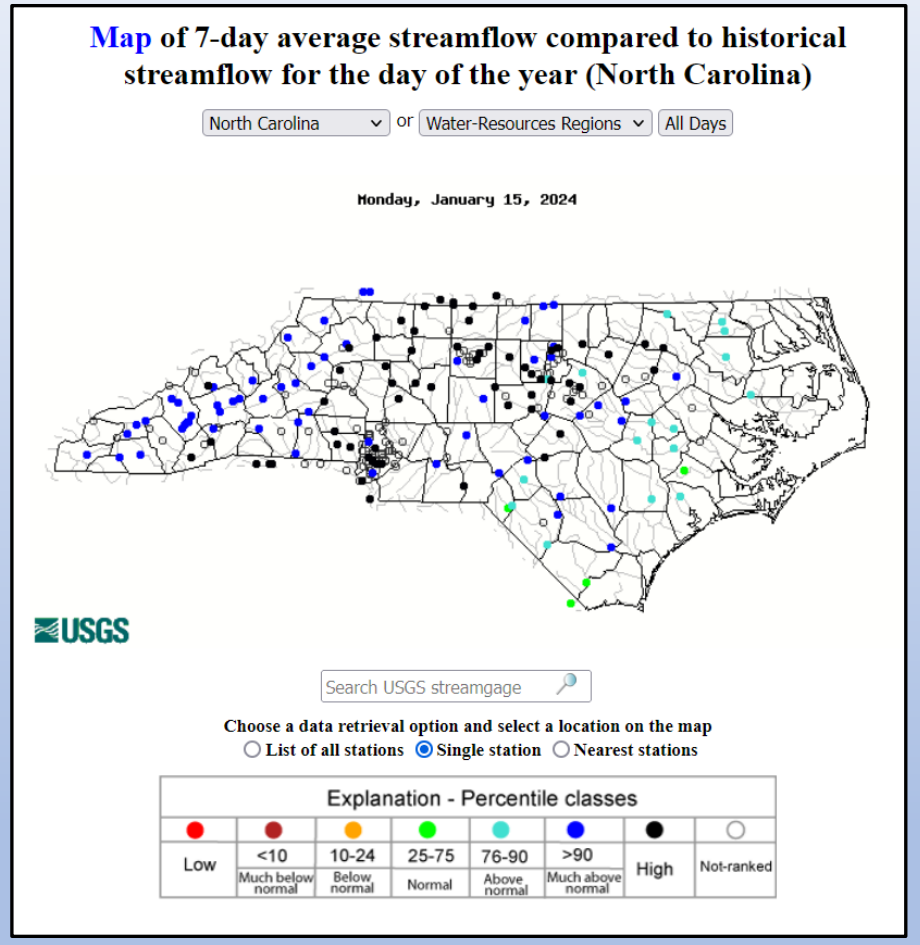


Streamflow:

- Last Month



- Current Month

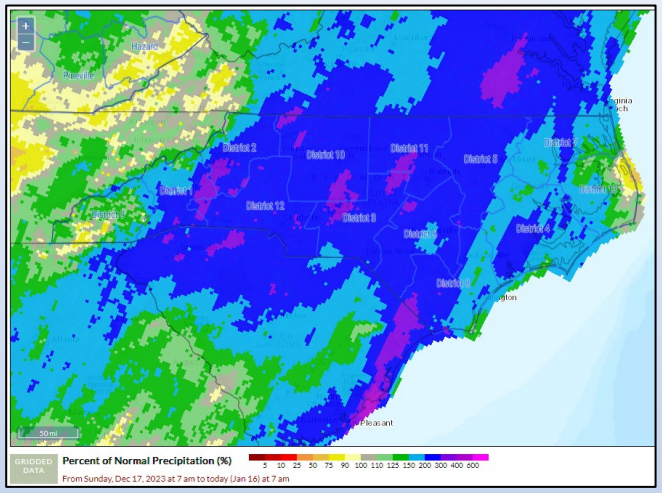


Increase in average streamflow with significant rainfall in many watersheds, especially to the west.

Source: https://waterwatch.usgs.gov/index.php?m=pa07d&r=nc&w=map

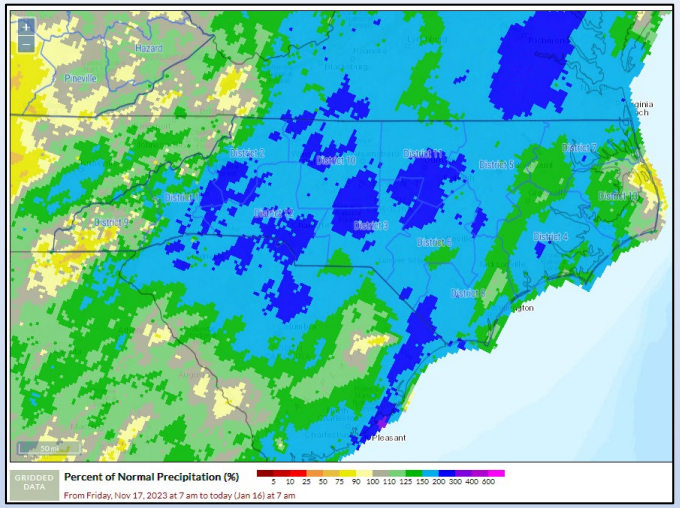
Percent of Normal Precip & SPI, *FWIP* *(Ending 0700 1/16)*

30-Day % of Normal



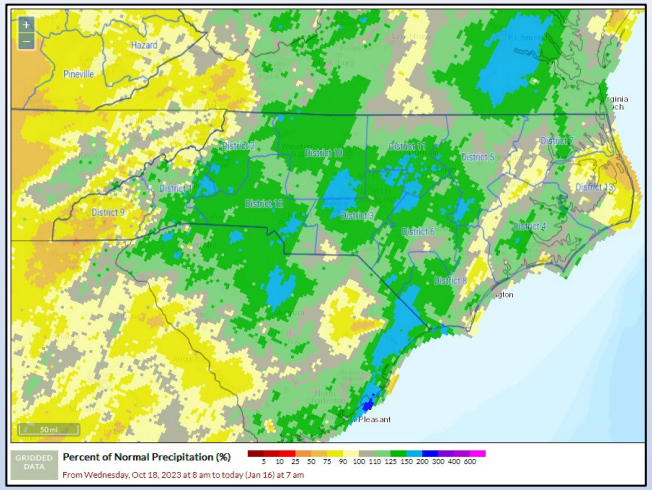
Significant improvements at the 1-Month scale.

60-Day % of Normal



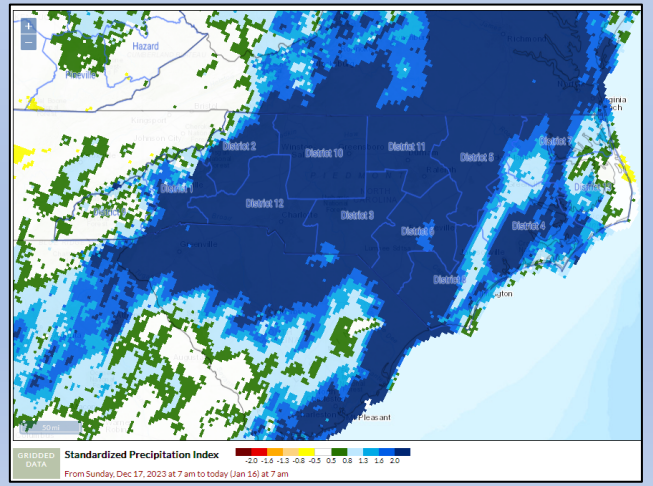
Improvements, especially central, at 2-Month scale.

90-Day % of Normal

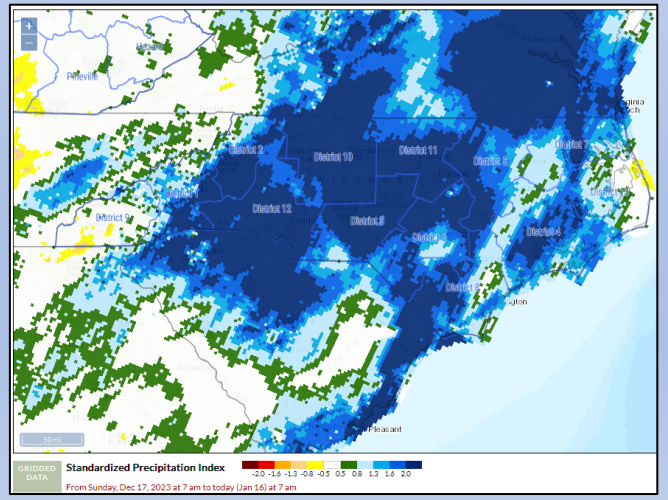


Driest areas ~ 55-60% of normal at 3-Month scale.

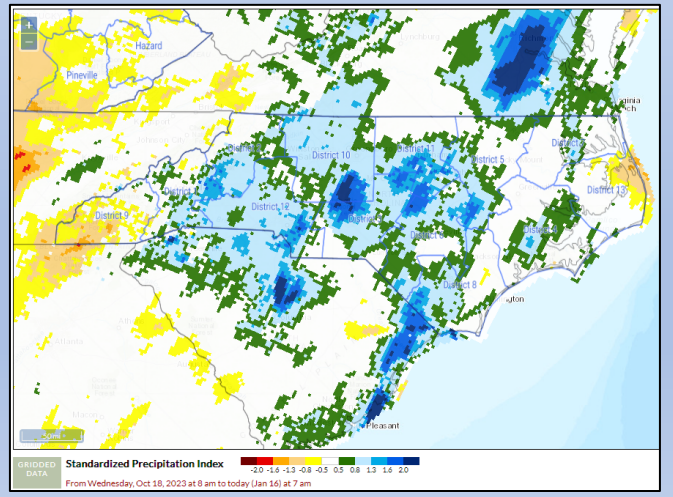
30-Day SPI



60-Day SPI



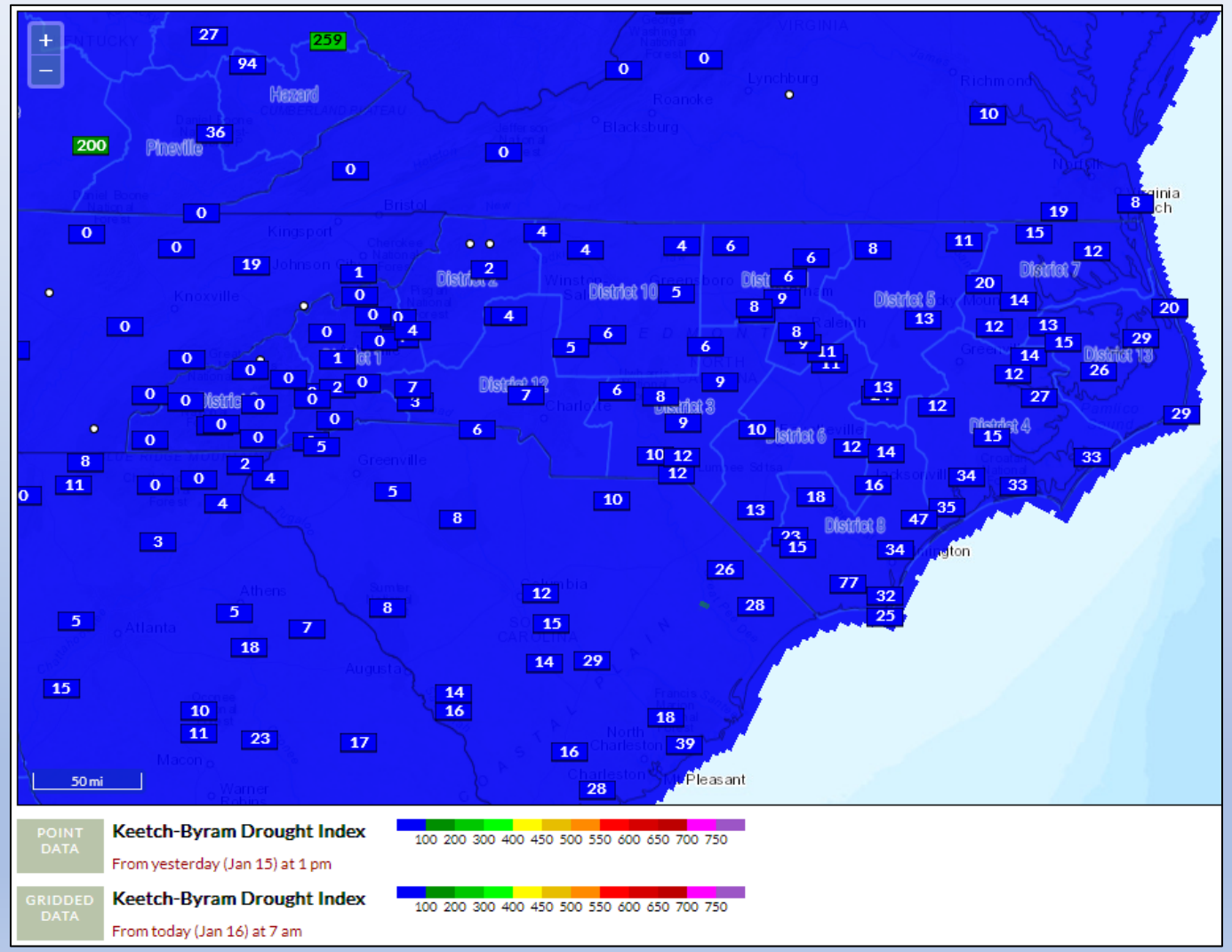
90-Day SPI

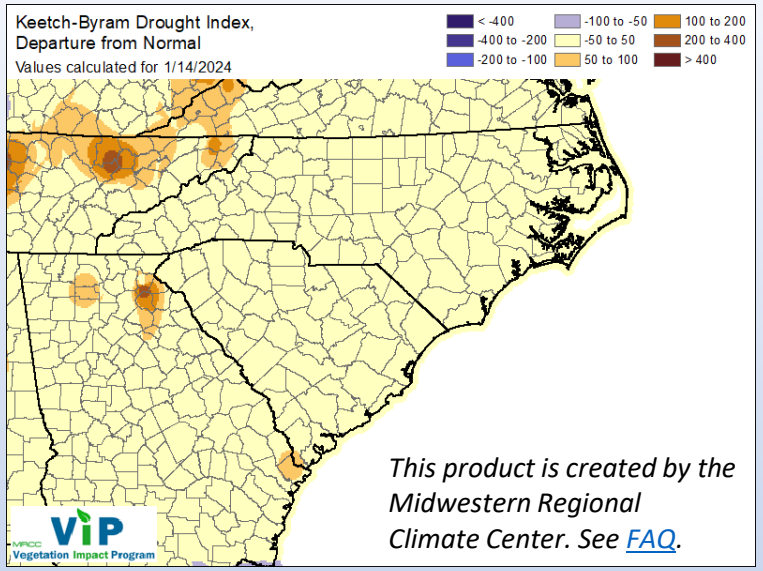


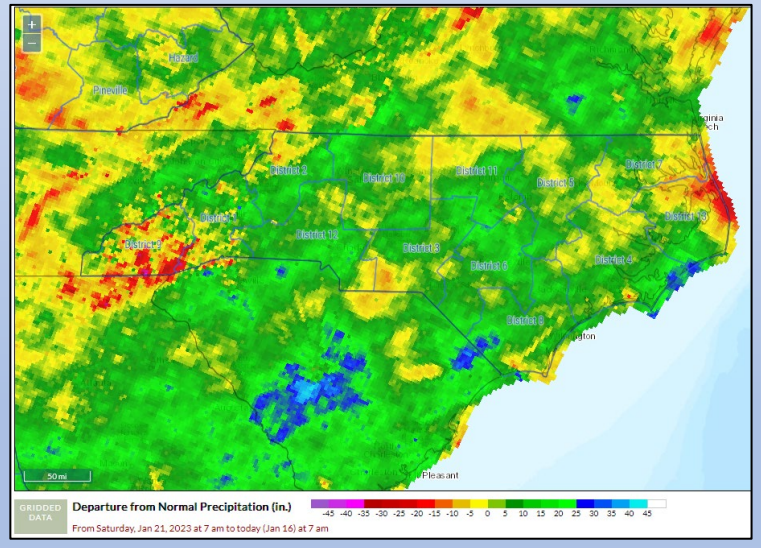
Description of Standardized Precipitation Index

KBDI - Gridded & Station Points

FWIP (Point calculation from WIMS @ 1300 on 1/15/24, SCO created Grid ending 0700 1/16/24)







General improvement for much of state. However, 12-Mo departures of 6 -12 inches still exist in some locations - around 15% + of annual precip. Compounded by different timescales of onset.

North Carolina Drought Update

Created By: North Carolina Drought Management Advisory Council — www.ncdrought.org | NC Climate Office — climate.ncsu.edu | NC State — @NCSCO

For the assessment period ending **Jan. 9, 2024**

*From the US Drought Monitor, with input from the **NC DMAC***

The Main Takeaway

Two rain events in quick succession this week brought more improvements, especially to areas in the far west that have been the slowest to see the drought diminish.

This Week's Summary

Last weekend's system brought half an inch to an inch of rain in most areas, while western areas saw an additional 2 to 3 inches early on Tuesday before the data cutoff for this week's drought assessment. Most of the state is decidedly wet in the short term, and even seasonal rainfall deficits are quickly eroding this winter.

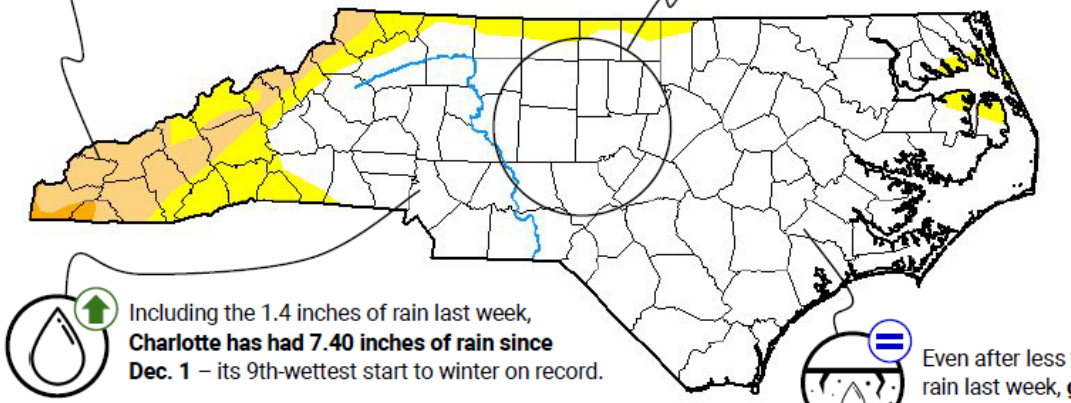
Next Week's Outlook

A quick-hitting rain event will begin on Friday evening, with up to an inch possible especially in the Mountains. Coastal areas may pick up light rain on Monday night and Tuesday as another system develops offshore.

For your local drought status, visit **www.ncdrought.org**

After Tuesday's rain, **Fontana Lake was expected to rise 4 to 5 feet**, toward the upper end of its normal operating range.

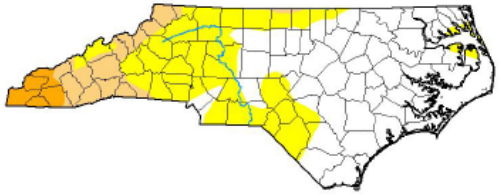
Streamflows from the Triad to the Triangle are **running above normal over the past 28 days.**



Including the 1.4 inches of rain last week, **Charlotte has had 7.40 inches of rain since Dec. 1** – its 9th-wettest start to winter on record.

Even after less than half an inch of rain last week, **groundwater levels in Jones County are holding steady.**

Last Week's Drought Status



Statewide Coverage by Category

Category	Current Coverage	Change Since Last Week
D0: Abnormally Dry	10.04%	-22.75%
D1: Moderate Drought	7.26%	-2.46%
D2: Severe Drought	0.50%	-3.04%
D3: Extreme Drought	0.00%	0.00%
D4: Exceptional Drought	0.00%	0.00%

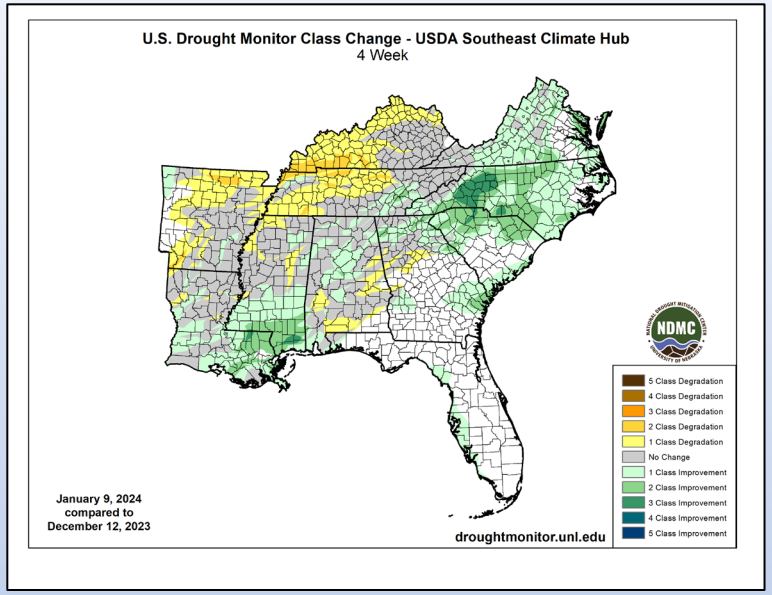
Next Update on 1/18/24

Drought Monitor (USDM)

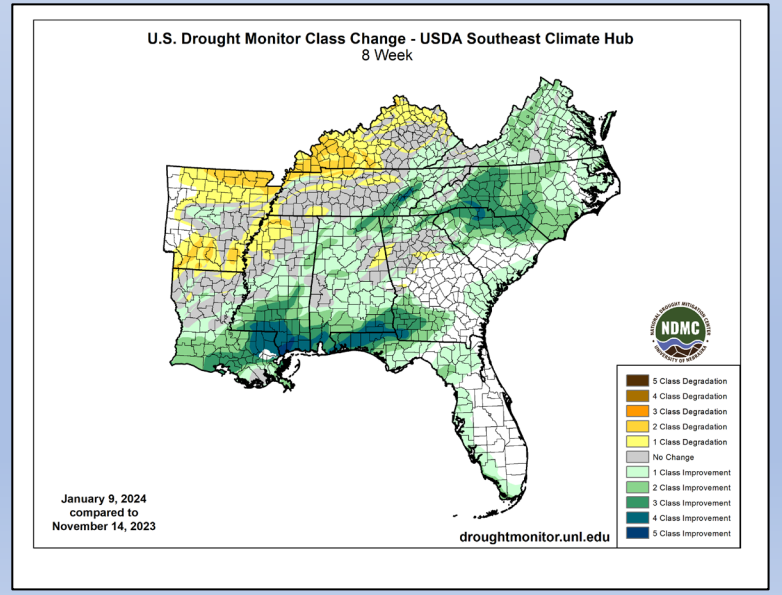
- "D0" Abnormally Dry Designation now for ~10% of State
- "D1" Moderate Drought Designation now ~7% of State
- "D2" Severe Drought Designation now ~0.5% of State

The USDM map is released every Thursday morning, with data valid through Tuesday at 7am Eastern.

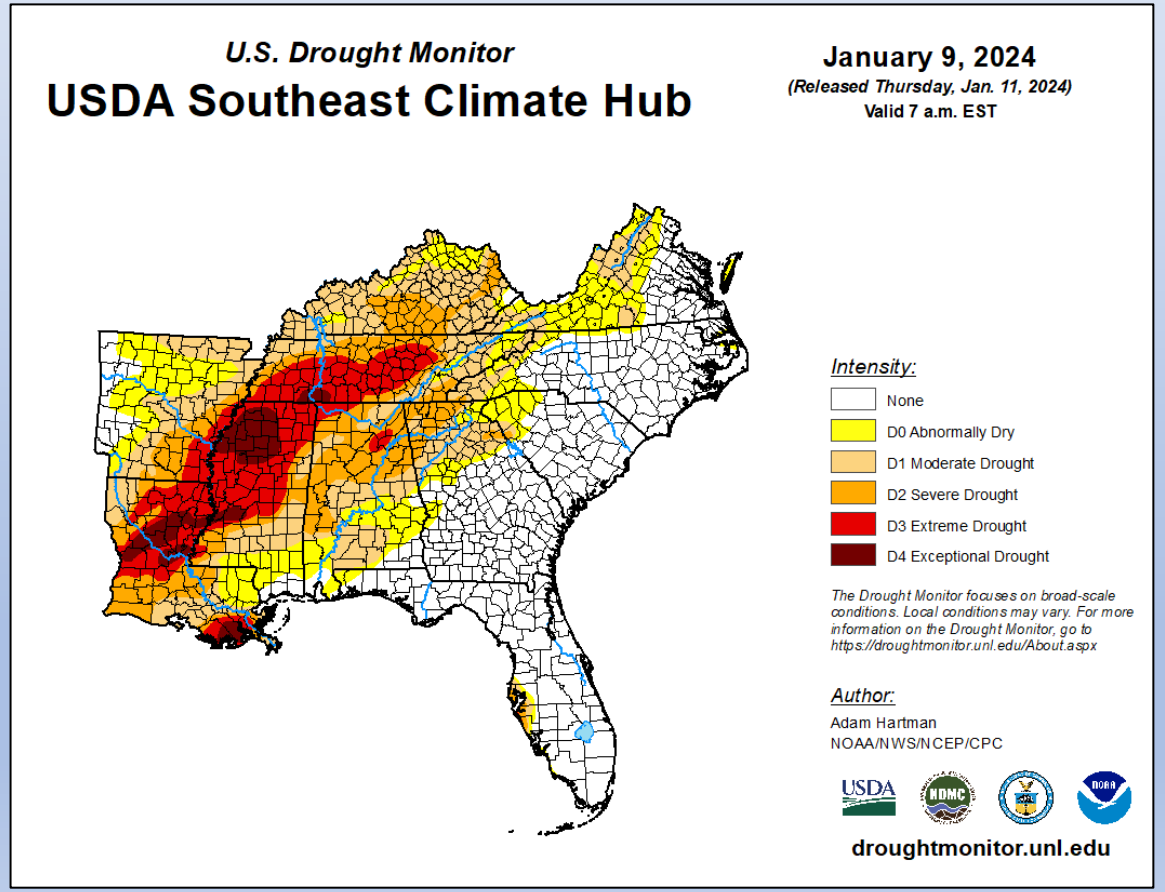
1-Month Change Map:



2-Month Change Map:



Current Week:

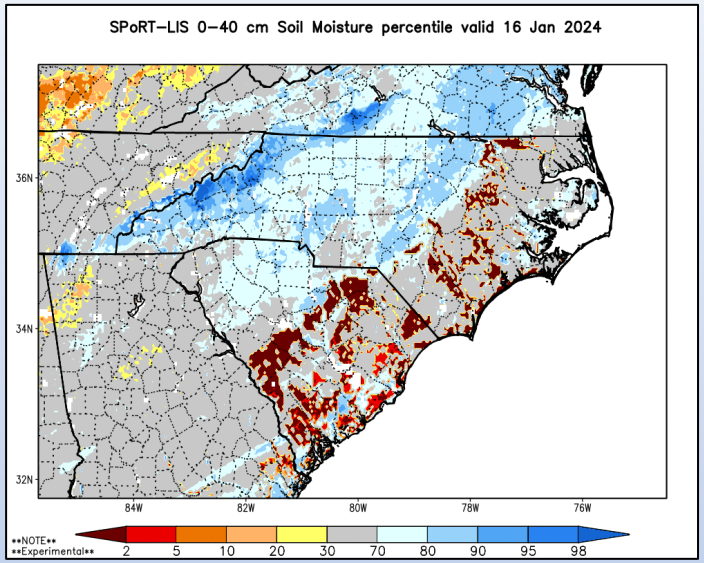


Sources: https://droughtmonitor.unl.edu/Maps/CompareTwoWeeks.aspx

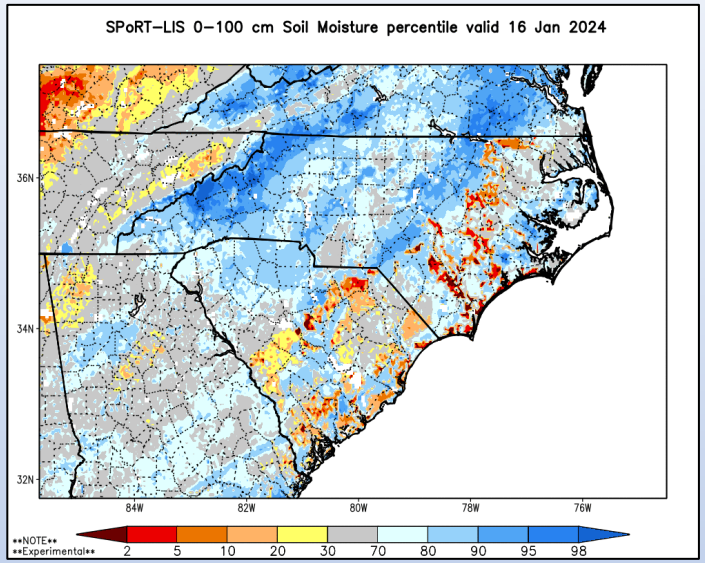
NASA SPoRT-LIS Soil Moisture

1/16/24

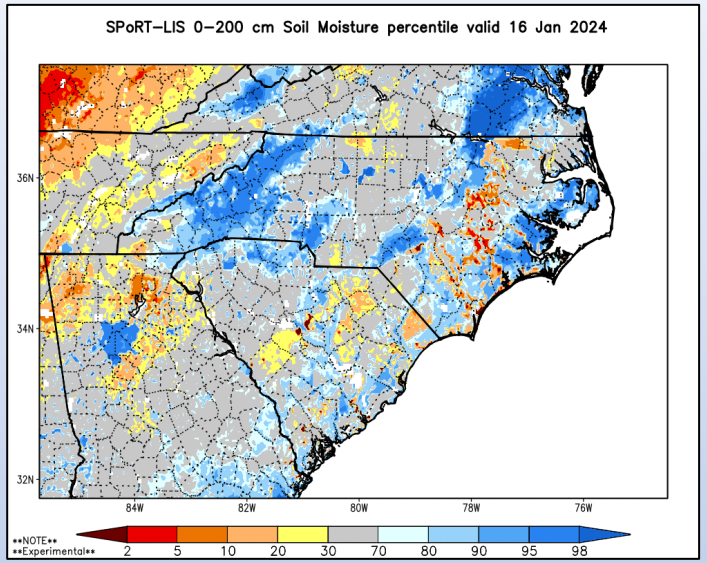
0-40cm Percentile



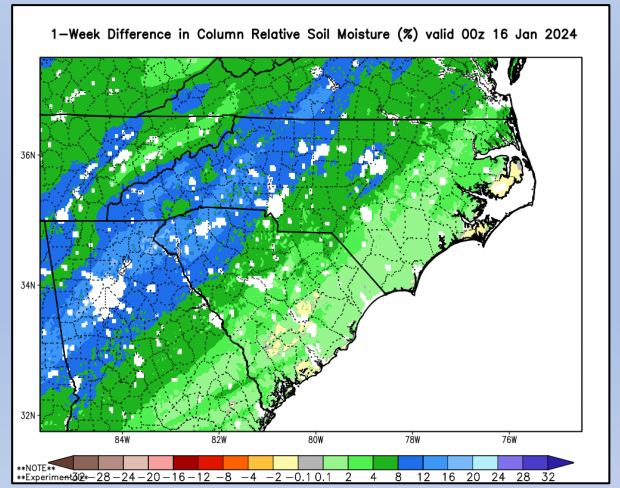
0-100cm Percentile

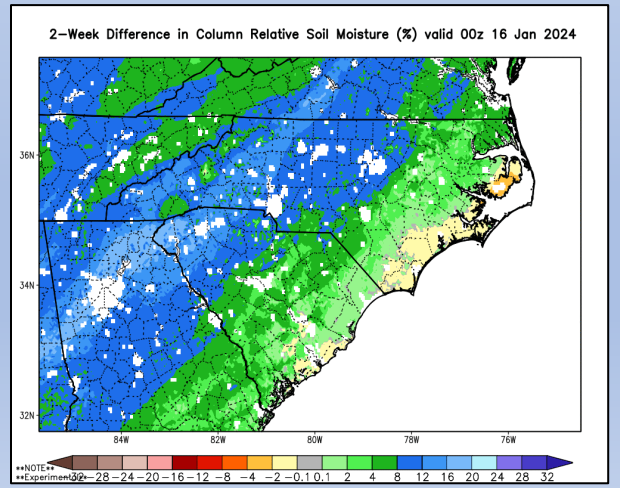


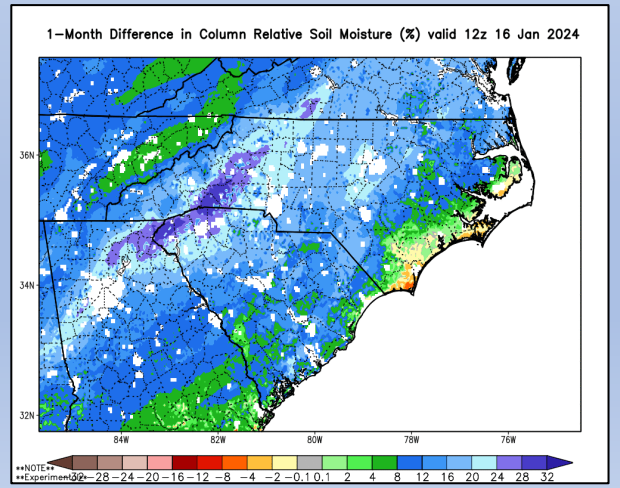
0-200cm Percentile

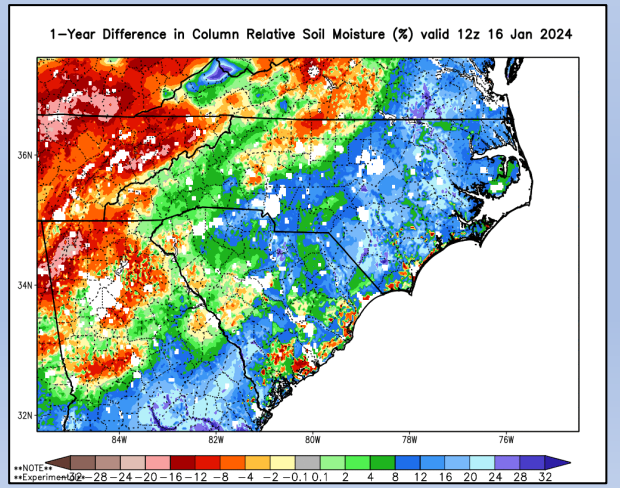


Most significant modeled improvement at shallower to medium soil depths with generalized improvement overall for much of state.





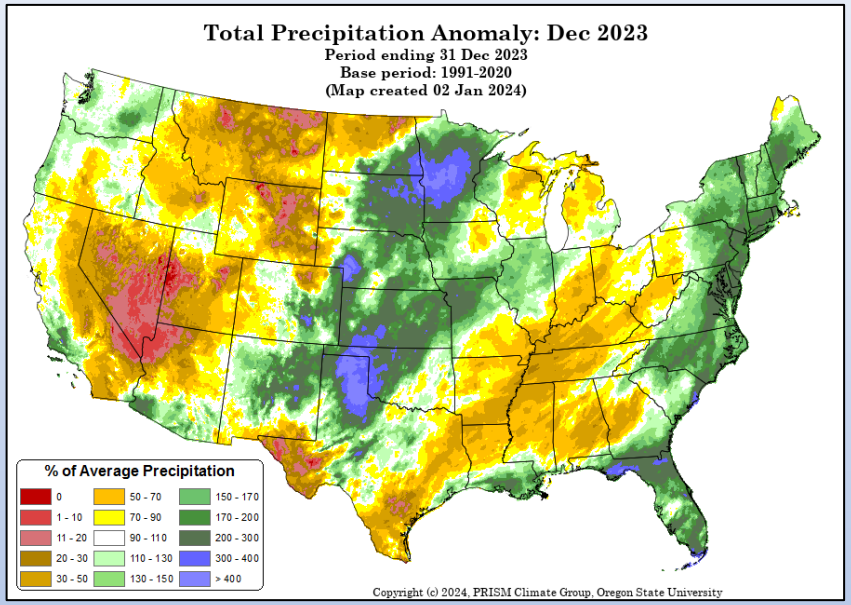


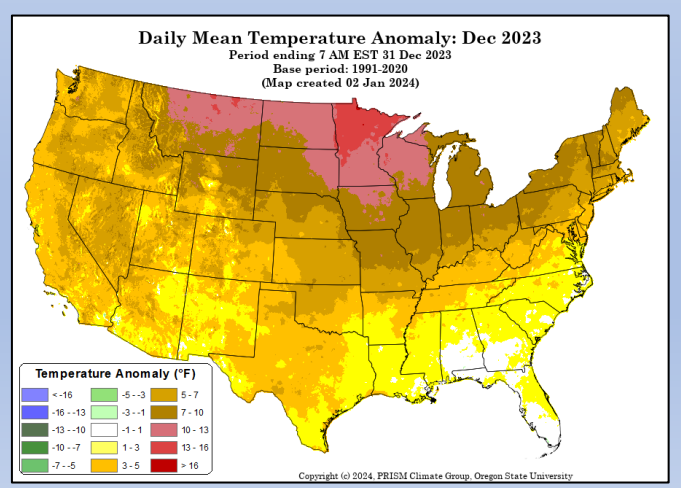


Precip and Temp Anomalies – US Context

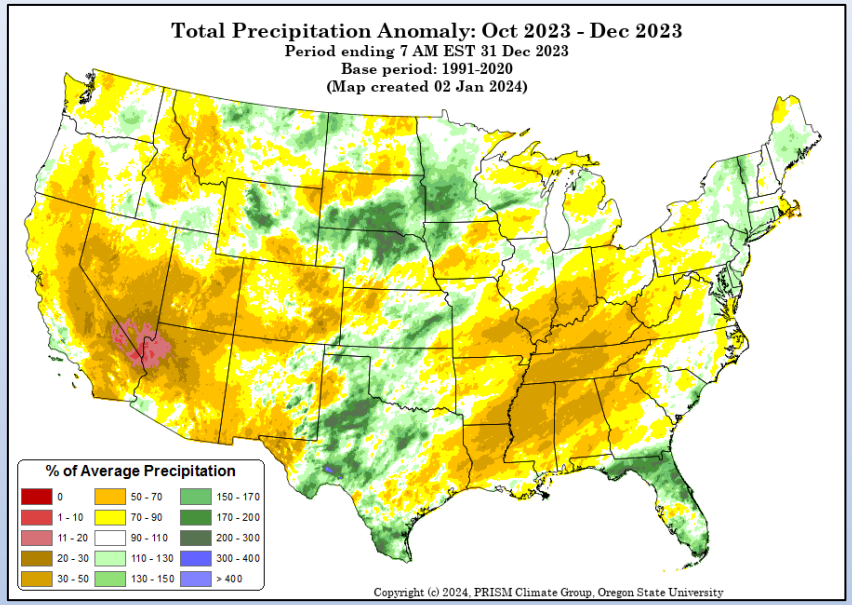
Source: https://prism.oregonstate.edu/mtd/

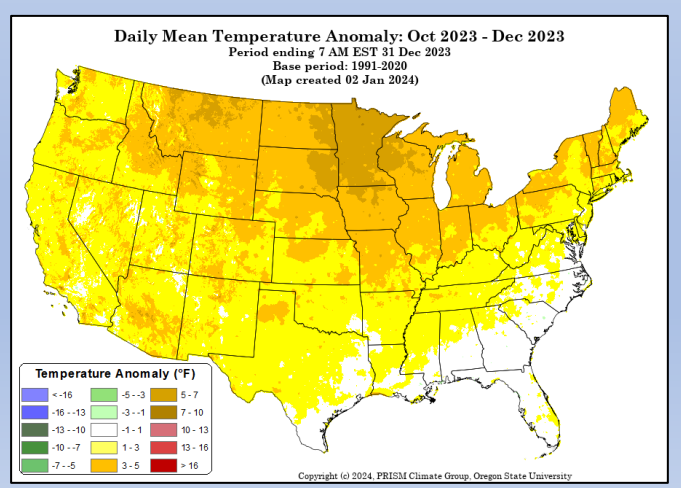
1-Month Comparison (Dec 23')



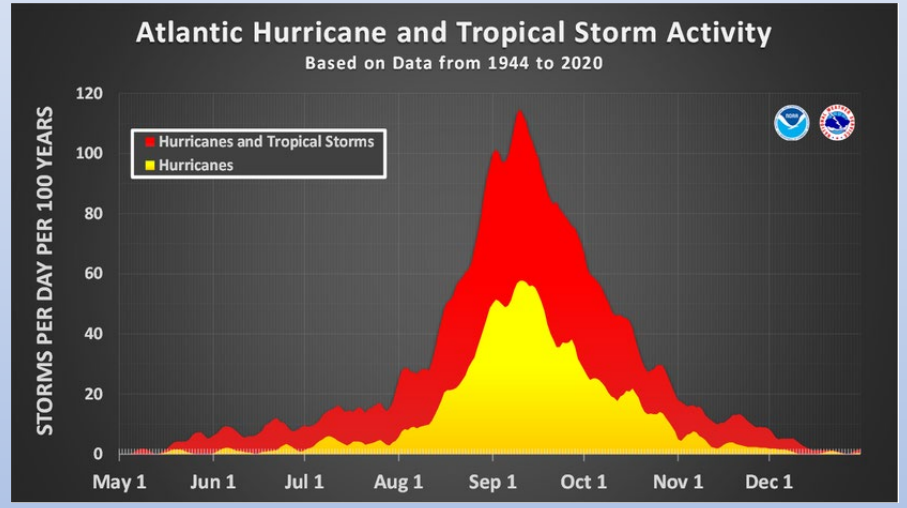


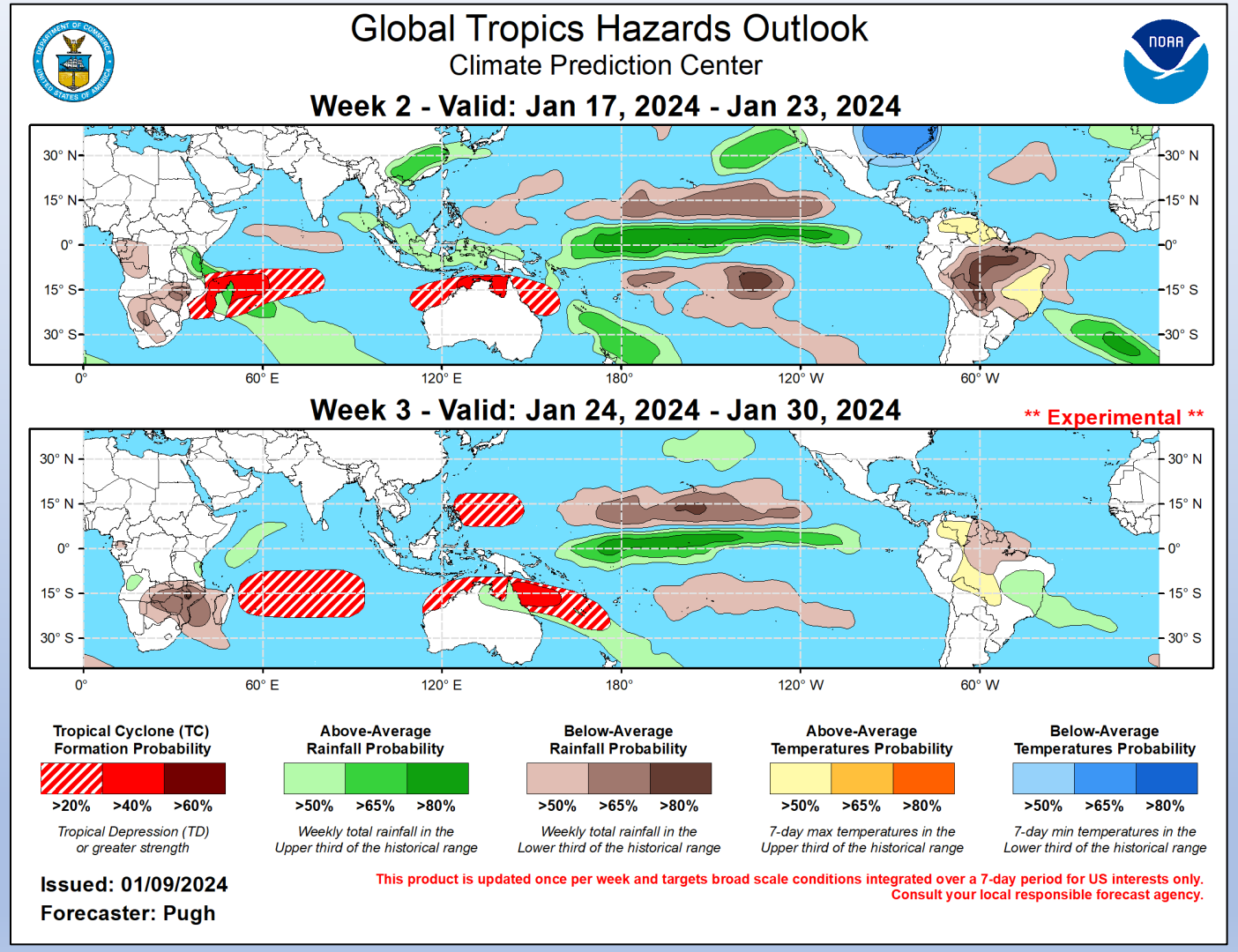
3-Month Comparison (Oct-Dec 23')





Tropical Hazards Outlook





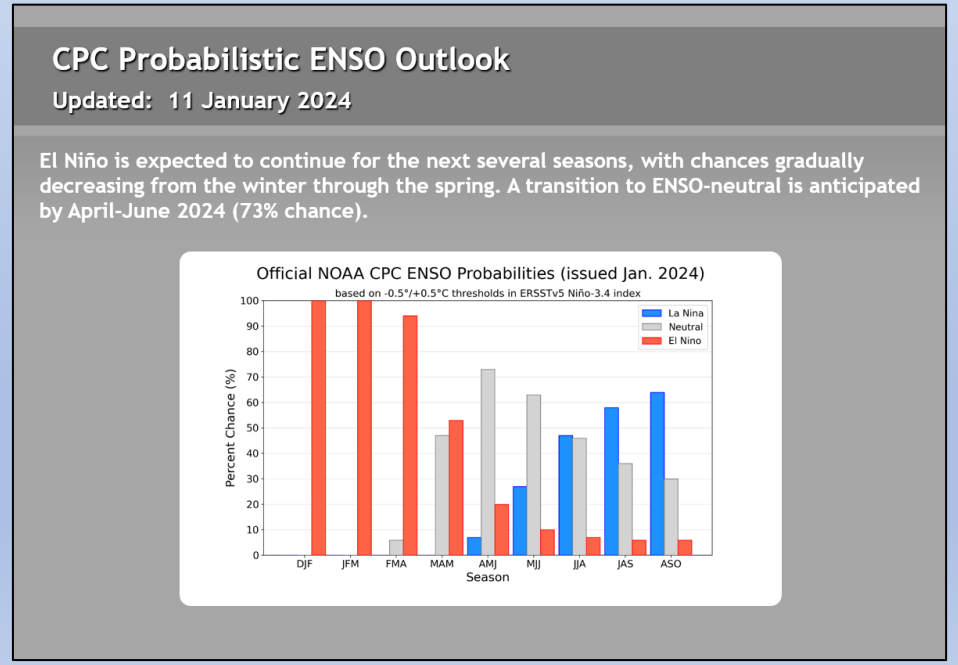
https://www.cpc.ncep.noaa.gov/products/precip/CWlink/ghaz/index.php

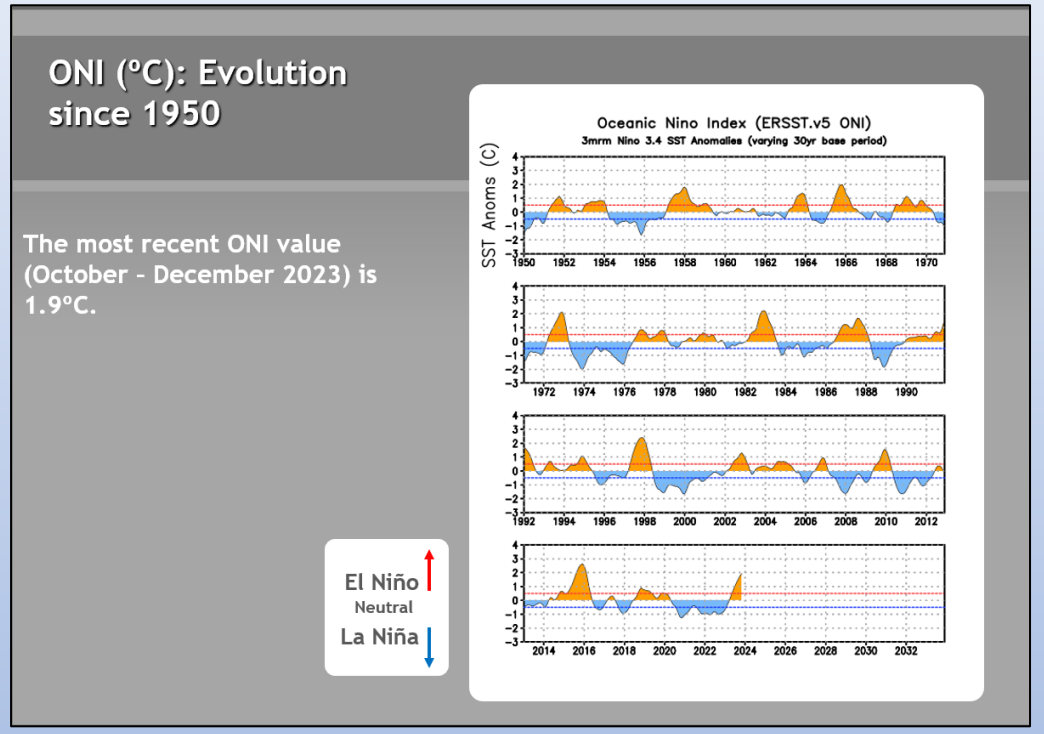
ENSO Notes from the CPC (1/11/24 Update)

ENSO Alert System Status: **El Niño Advisory**

El Niño is expected to continue for the next several seasons, with chances gradually decreasing from the winter through the spring.
A transition to ENSO-neutral is anticipated by April-June 2024 (73% chance).

ENSO, or El Nino Southern Oscillation, is a fluctuation in the sea surface temperature (SST) in the equatorial Pacific Ocean. Research has shown that even slight changes in the SST, particularly in area 3.4, can influence weather in North America. Generally, when SSTs are lower than normal, known as La Nina, NC has drier than normal conditions and can have more fire occurrence. However, La Nina also can lead to more tropical activity. El Nino, on the other hand, usually means wetter weather for NC, but less opportunity for tropical landfalls due to increased wind shear. In order to declare a La Nina, the departure from average SST must be at least -0.5° C (line shown in green) for 3 consecutive months. For El Nino, the departure must be at least 0.5° C above average for 3 consecutive months.





From the most recent CPC Diagnostic Discussion (ENSO Diagnostics Discussion):

Some state-of-the-art dynamical climate models suggest a transition to ENSO-neutral as soon as March-May 2024. The forecast team, however, delays this timing and strongly favors a transition to ENSO-neutral in April-June 2024. There are also increasing odds of La Niña in the seasons following a shift to ENSO-neutral. It is typical for El Niño to peak in December/early January, but despite weakening, its impacts on the United States could last through April.

Slide Source: *https://www.cpc.ncep.noaa.gov/products/analysis_monitoring/lanina/enso_evolution-status-fcsts-web.ppt*

El Niño Discussion

NC State Climate Office Insights/Discussion:

- In terms of current conditions, for the latest three-month period from October through December, the Oceanic Niño Index -- a measure of sea surface temperature anomalies over a specific region in the Pacific -- was +1.9°C, which is the 6th-highest on record at that time of the year. The last El Niño this strong was in 2015-16. That just confirms that this is a strong event, and since early December, we have been feeling those effects with more moisture-rich weather systems tracking in from the south and southwest.

- We expect more of the same over the next month or so, both because the current pattern has been so favorable for these sorts of events, and also because of the climatological odds in moderate to strong El Niño winters like this one. As our winter outlook noted, in the 12 such past El Niños, it was wetter than normal in 10 of those 12 Februarys.

- Current model forecasts of El Niño are showing a similar strength through the winter before weakening during the spring and summer. That's extremely common with El Niño events, since they rarely last more than one winter (more on that below), and they commonly fade following the winter season. Only 5 of the past moderate/strong El Niño winters were followed by a wetter-than-normal March, so we could see those impacts disappear pretty quickly once we enter the spring.

- Even strong El Niños aren't immune to this effect. In 2016, following our 6th-wettest winter on record and the 15th-wettest February on record, we switched immediately into our 8th-driest March. There's certainly no guarantee that our spring will be dry; in 1998 following that strong El Niño, we actually had a fairly wet spring. But the main point is that the El Niño tends to be a lot less prominent by that time of year, so without that broad-scale forcing on the jet stream, our weather comes down to the whims of more local patterns, and is often a bit more variable.

- The Climate Prediction Center's three-month outlook for the spring does still show a lingering wet pattern across the Southeast, but if you read their discussion, they mention that "El Niño impacts are less pronounced in the forecasts beginning in AMJ 2024," so they're also expecting that the current reliably wet pattern probably won't last too far into the spring.

- Beyond that, there is very little correlation between ENSO and our summer weather, and it's a bit too early now to say where ENSO may go later this year, other than just noting that back-to-back El Niños are fairly rare, and are pretty much unheard of following a strong El Niño like this one. NOAA's ENSO Blog had a nice explanation of this a few years ago, that can be summed up by saying that because stronger El Niño events move more heat from the tropical ocean and atmosphere toward the poles, that pretty much wipes away any trace of El Niño by the spring and leaves less support behind for another one to form after it.

El Niño Discussion continued

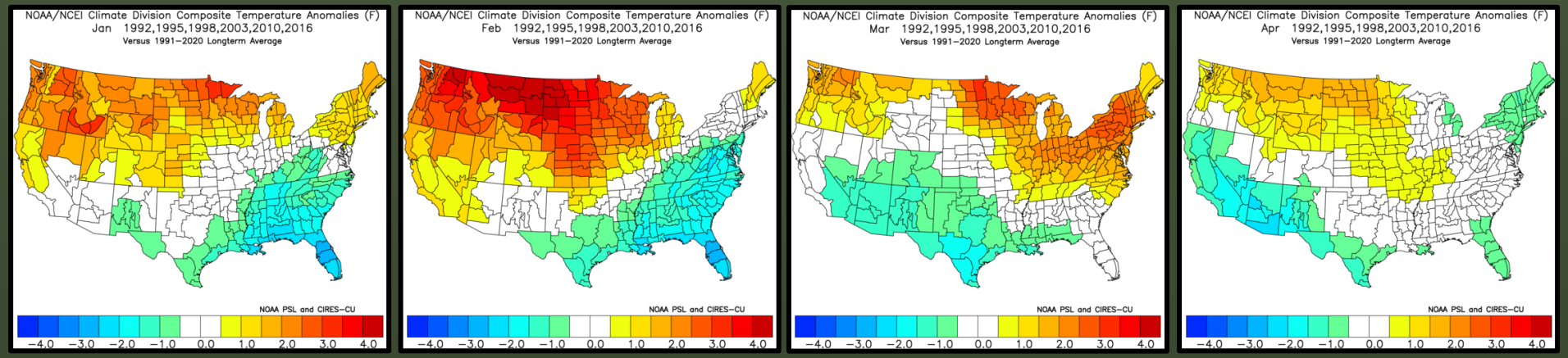
The following six slides were shared from the SACC Monthly Fire Environment Outlook Briefing, presented by Andrew Snyder on 1/5/24.

These temperature and precipitation graphics correspond to the earlier discussion from NC State Climate Office, especially the increase in variability/level of uncertainty as you move further away in time from the typical winter El Niño influences/impacts we are currently experiencing.

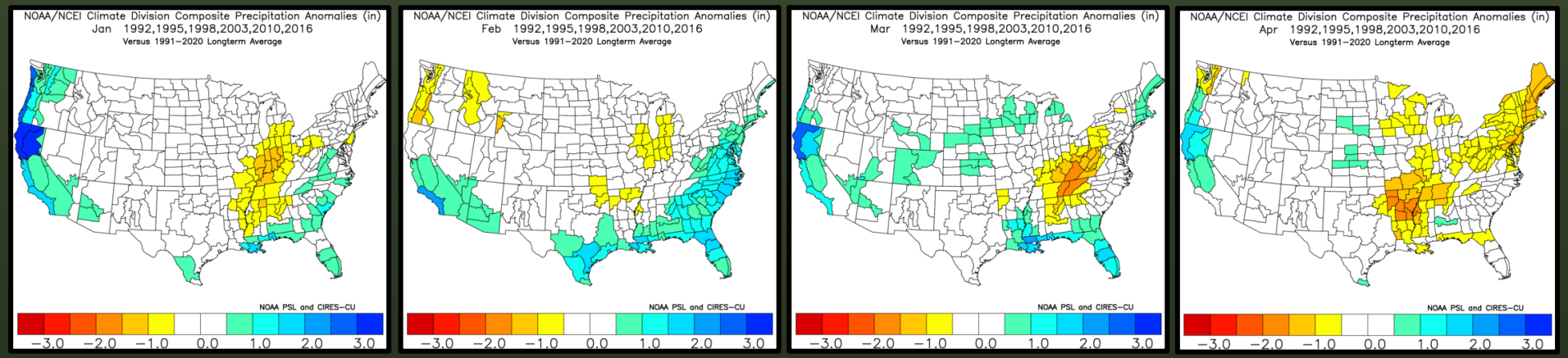
The final slide copied from the briefing (#6) gives further context into conditions possible moving into Spring 2024.

El Niño Analogs

Typical Moderate to Strong El Niño Jan. - April Temperature Anomalies



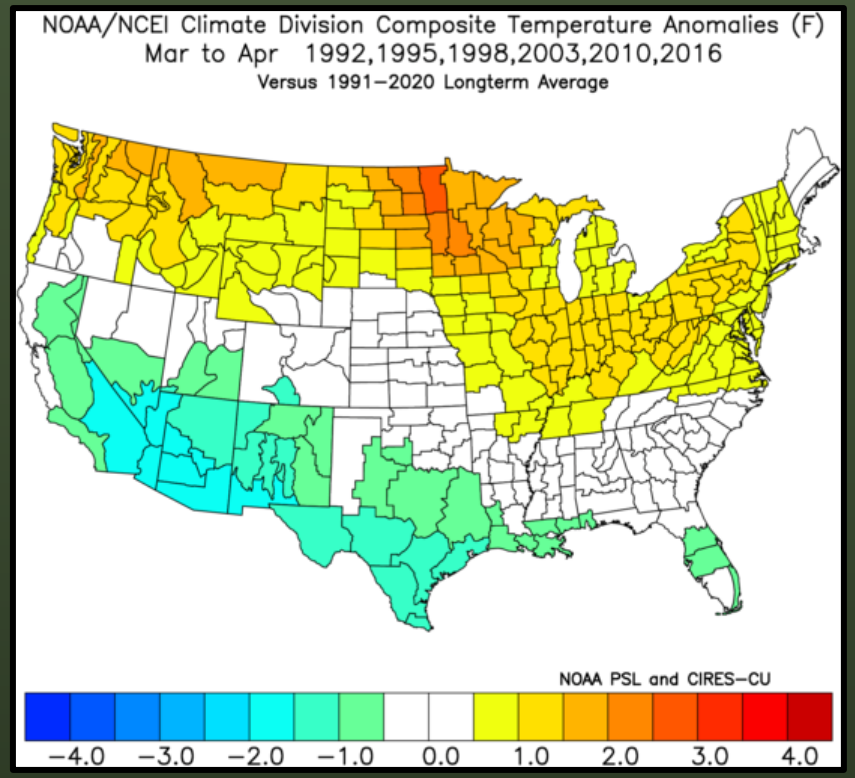
Typical Moderate to Strong El Niño Jan. - April Precipitation Anomalies



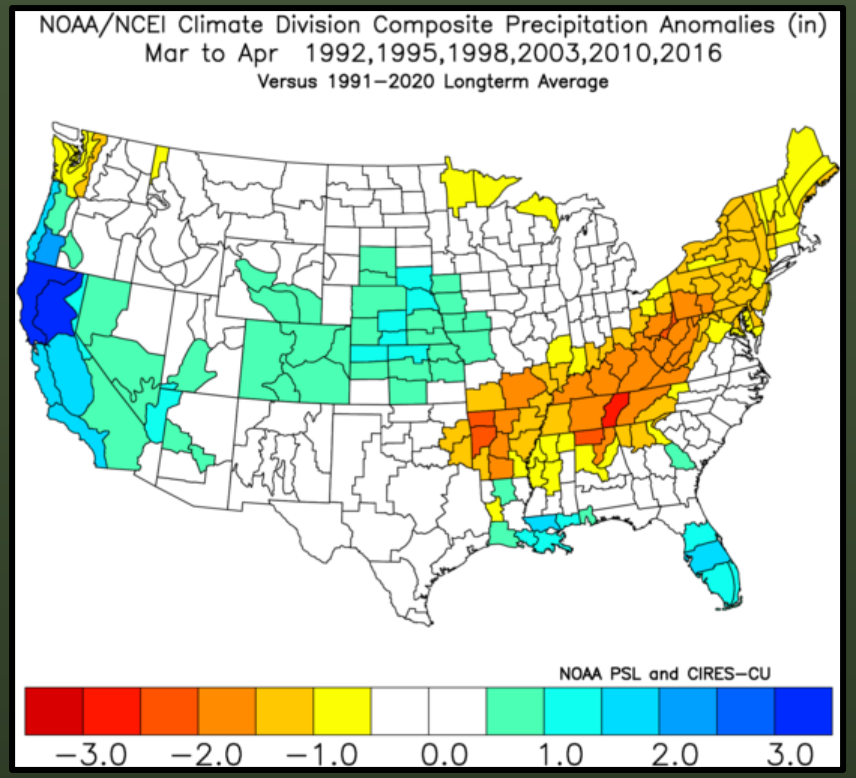
NOAA/NCEI U.S. Climate Division Data Plots: NOAA Physical Sciences Laboratory

Strong El Niño Spring Analogs

March + April Temperature Anomalies

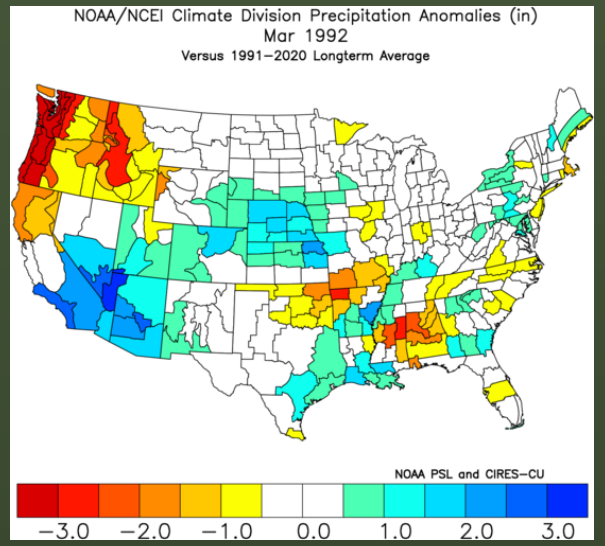


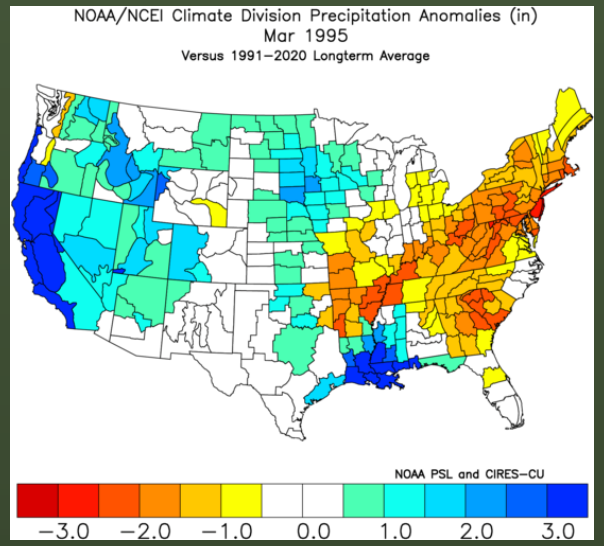
March + April Precipitation Anomalies

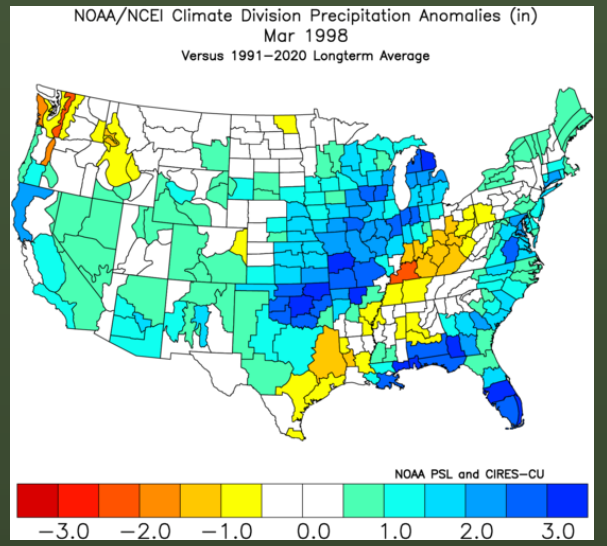


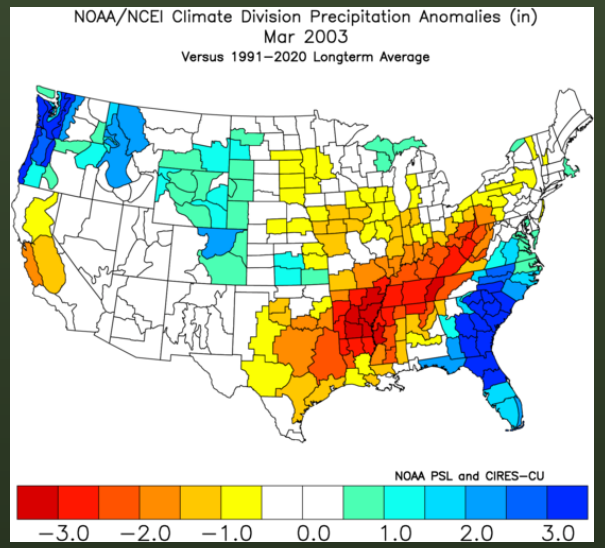
NOAA/NCEI U.S. Climate Division Data Plots: NOAA Physical Sciences Laboratory

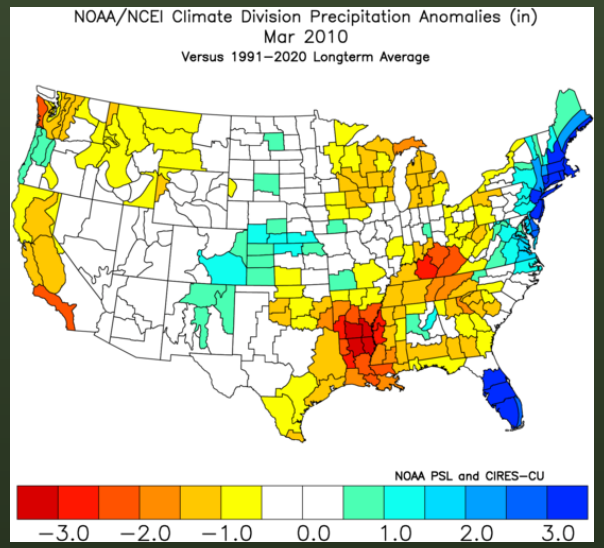
Strong El Niño March Precip. Analogs

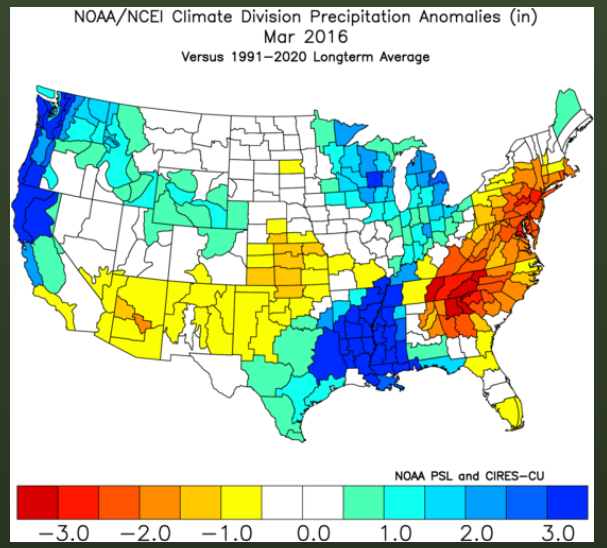






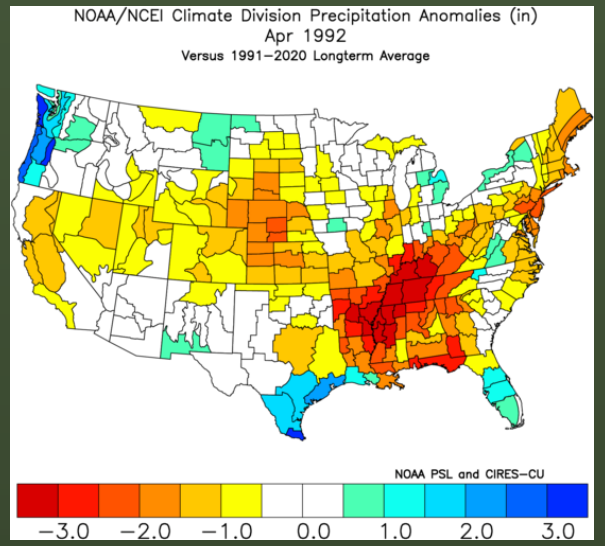


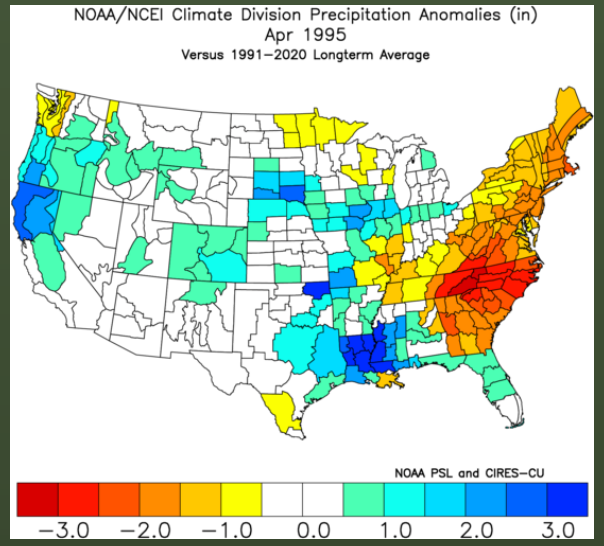


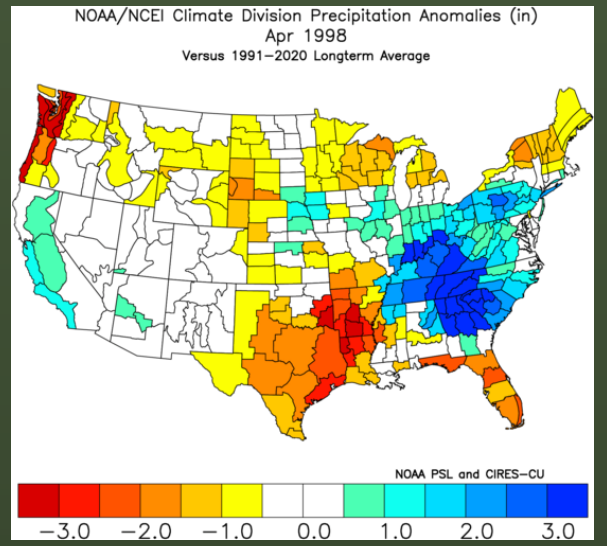


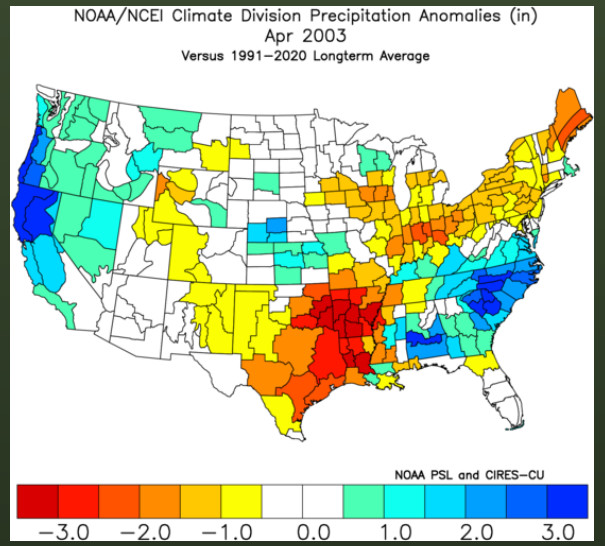
NOAA/NCEI U.S. Climate Division Data Plots: NOAA Physical Sciences Laboratory

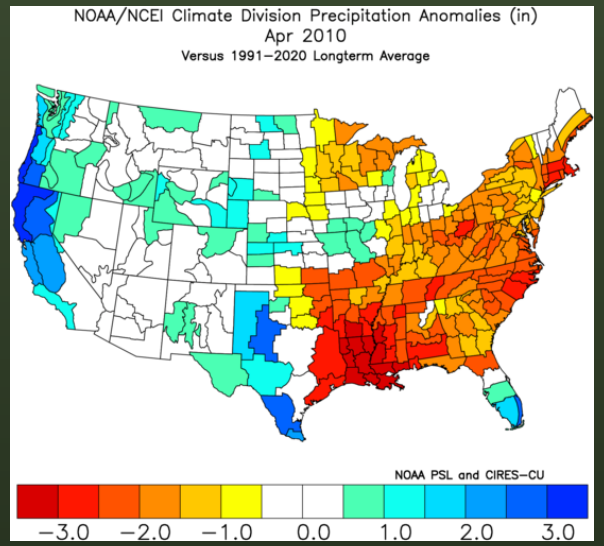
Strong El Niño April Precip. Analogs

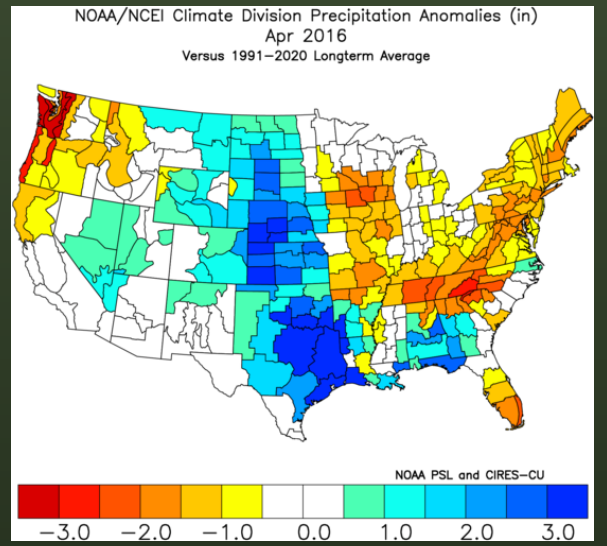






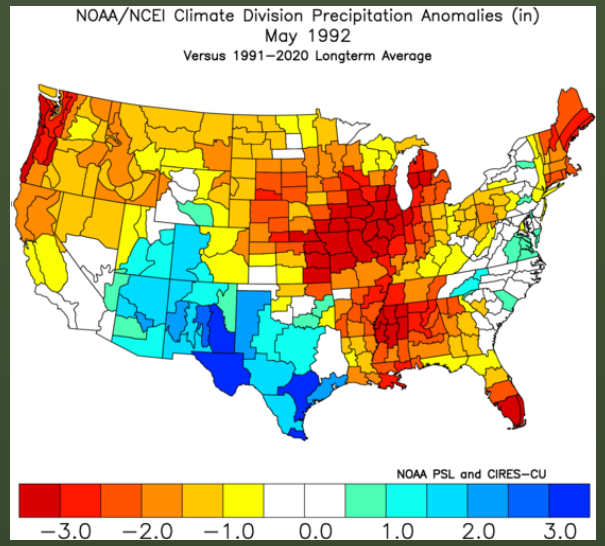


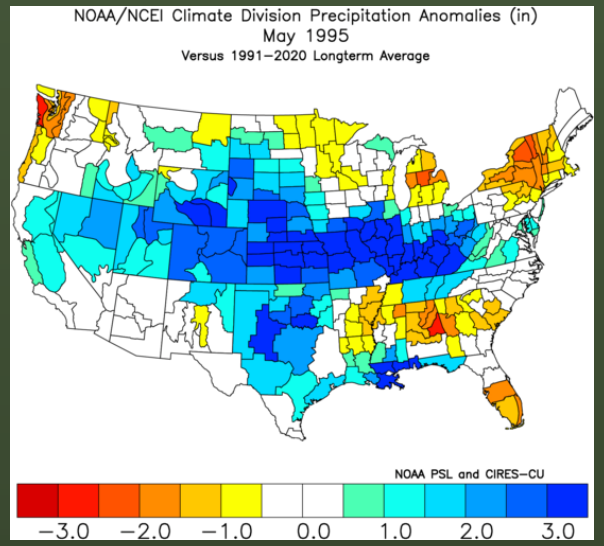


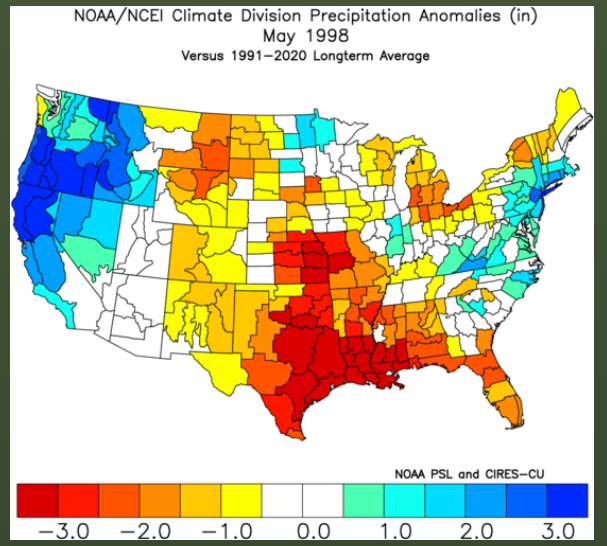


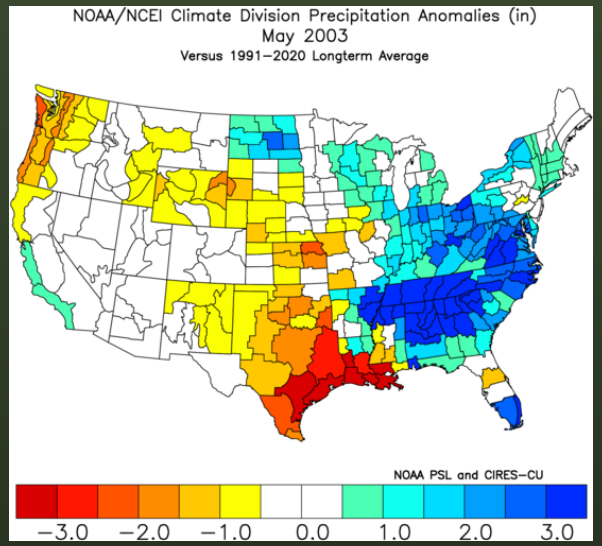
NOAA/NCEI U.S. Climate Division Data Plots: NOAA Physical Sciences Laboratory

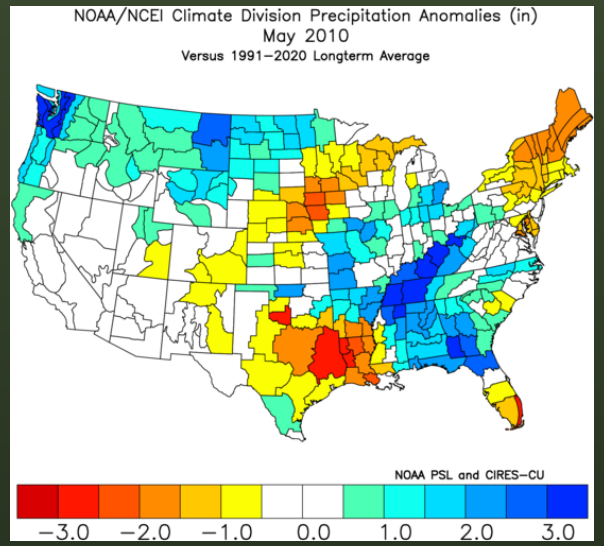
Strong El Niño May Precip. Analogs

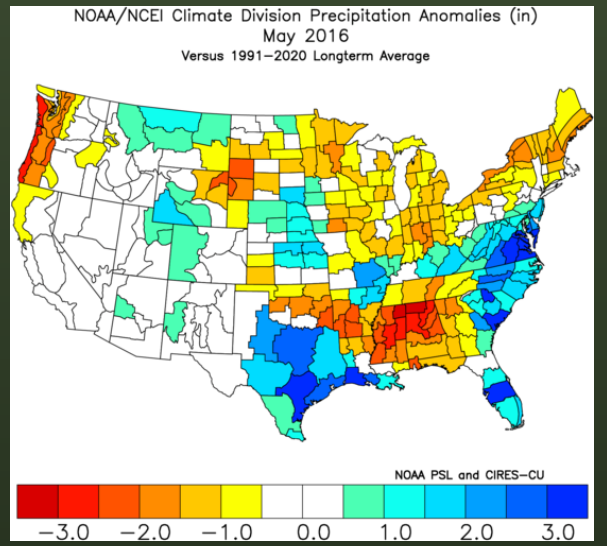








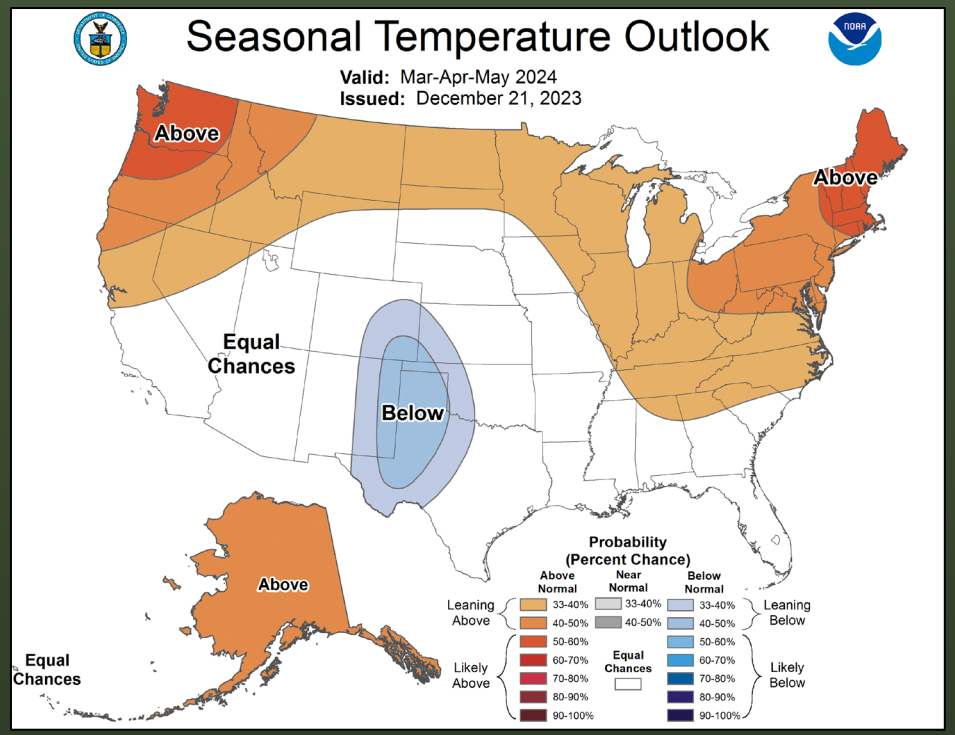




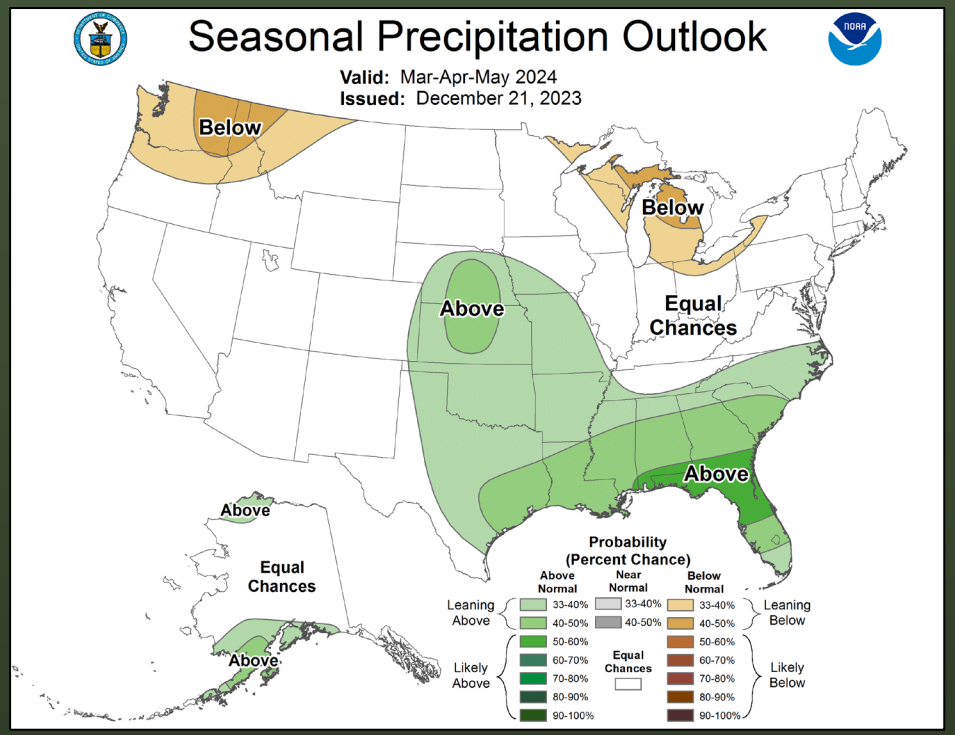
NOAA/NCEI U.S. Climate Division Data Plots: NOAA Physical Sciences Laboratory

NOAA's March to May Outlook

Temperature



Precipitation



- Suppressed storm track through winter, resulting in very wet conditions near the coasts
- Winter and early spring tornado outbreaks mostly favored across the FL peninsula
- Below normal evaporative demand in the wet areas due to persistent clouds and periods of cool weather
- Winter storm risk higher than normal

Fire Danger Related Materials

including Self-Briefing & Situational Awareness Links

Daily WIMS Observations and NFDRS Estimates

Averaged by FDRA SIG Group
This is available on the FWIP at: https://products.climate.ncsu.edu/fwip/nfdrs.php?data=ob&state=NC

- The averaged values are derived from the SIG Station Outputs for a particular FDRA
  (SIG station names shown in bold on the live link above)
- You can toggle the percentiles on/off, displaying below the actual calculated values
  these percentiles are based on analysis of "All Days" for entire calendar year range through 2021 for these stations

Daily WIMS Forecast Observations and NFDRS Estimates are also available

Averaged by FDRA SIG Group
This is available on the FWIP at: https://products.climate.ncsu.edu/fwip/nfdrs.php?data=fc

Daily Observations for 1/16/24

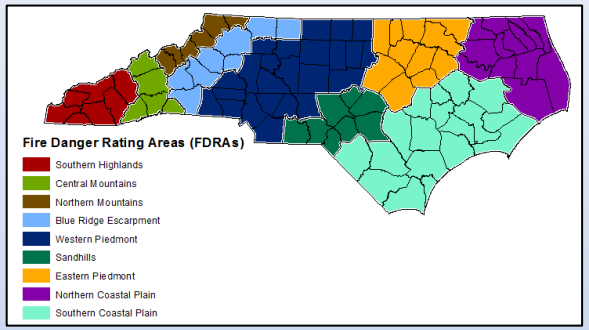
Averages by FDRA

FDRA	STATION_COUNT	NFDR_DATE	BI	ERC	IC	SC	KBDI	1HR	10HR	100HR	1000HR	HRB	WOODY	TEMP	RH	WIND	PRECIP	DUR
Southern Highlands	3	2024-01-16	20.63 26.8%	3.43 15.5%	0.20 17.2%	21.43 68.7%	0.00	22.40 80.0%	25.06 85.4%	20.56 69.9%	23.13 87.0%	30.00	50.00	22.7°F	79.0%	NW 8.3 mph	0.20 in.	7.0
Central Mountains	3	2024-01-16	28.50 52.5%	7.97 22.1%	0.27 15.5%	17.93 64.9%	0.67	19.84 77.1%	23.26 79.2%	19.70 62.9%	22.32 83.1%	30.00	50.00	25.3°F	72.0%	N 4.3 mph	0.21 in.	4.3
Northern Highlands	2	2024-01-16	29.85 54.5%	5.75 24.0%	0.25 21.8%	27.50 69.9%	0.00	19.94 72.9%	25.79 88.8%	20.33 63.1%	22.73 91.2%	50.00	80.00	25.0°F	71.0%	NE 8.5 mph	0.62 in.	12.0
Blue Ridge Escarpment	3	2024-01-16	59.30 67.6%	14.37 33.0%	1.30 23.1%	54.97 86.5%	3.67	18.62 75.6%	24.26 80.6%	18.59 45.9%	19.99 50.8%	30.00	56.67	32.0°F	56.3%	NNW 14.3 mph	0.11 in.	6.0
Western Piedmont	3	2024-01-16	1.17 7.4%	0.43 7.6%	0.00 12.3%	0.37 6.9%	6.00	28.69 93.3%	23.03 83.8%	20.75 80.8%	22.88 94.8%	30.00	50.00	40.3°F	95.7%	WSW 4.3 mph	0.17 in.	4.0
Sandhills	3	2024-01-16	0.00 6.9%	3.10 7.1%	0.00 11.7%	0.00 7.5%	11.33	30.95 94.9%	22.05 81.1%	20.15 68.3%	22.23 86.8%	36.67	63.33	43.3°F	97.3%	NW 6.0 mph	0.14 in.	2.3
Eastern Piedmont	4	2024-01-16	0.00 5.1%	0.00 5.7%	0.00 10.9%	0.00 4.9%	7.75	34.92 100.0%	23.51 86.8%	20.32 68.6%	22.35 89.0%	30.00	60.00	39.5°F	99.5%	NNW 4.8 mph	0.13 in.	2.8
Southern Coastal	7	2024-01-16	4.30 5.3%	1.51 6.6%	0.01 9.3%	1.74 5.5%	24.86	27.23 93.8%	25.21 88.3%	21.31 71.9%	24.48 95.3%	50.00	90.00	54.3°F	90.4%	SW 2.1 mph	0.01 in.	0.6
Northern Coastal	4	2024-01-16	0.00 6.3%	0.00 6.8%	0.00 12.2%	0.00 5.9%	19.50	33.24 97.4%	25.64 90.1%	20.82 75.2%	24.68 98.9%	50.00	90.00	50.3°F	99.3%	W 2.5 mph	0.01 in.	0.8

Weekly Outlook - FDRA General Fire Danger Forecast Matrix:

- Available on the FWIP within the "Resources for NCFS" page.
- The operation link is: https://products.climate.ncsu.edu/fwip/outlook.php
- The matrix updates daily - please review the tool notes below for more details.
- For the 9 FDRAs in North Carolina

Two of Nine FDRAs Shown: 1/16/24 PM Run



Weekly Outlook

Southern Highlands FDRA - General Fire Danger Forecast

For planning purposes only; forecast is subject to change

Four or more RED blocks in a day signals the potential for a **Critical Fire Day**

DAY	WED 17-Jan	THU 18-Jan	FRI 19-Jan	SAT 20-Jan	SUN 21-Jan	MON 22-Jan	TUE 23-Jan
Avg. Max. Temp. (°F)	33	43	34	22	37	44	
Avg. Min. Humidity (%)	21	19	61	38	25	28	
Avg. 20' Wind Speed (mph)	6	5	11	11	6	5	
Avg. Wind Direction*	WNW	SSW	W	NNW	SSW	SE	
Avg. Probability of Precip. (%)	2	76	11	0	2	6	
Days Since a Wetting Rain**	1.3	2.3					
Forecast ERC (Fuel Model X)	36.7	59.2	38.4	40.7	49.5	57.4	46.8
Forecast BI (Fuel Model X)	110.8	144.4	148.3	146.5	123.7	139.6	118.4
Forecast IC (Fuel Model X)	4.2	15.3	5.8	4.6	6.5	10.5	5.5
Forecast 100-Hr. FMC	20.4	20.4	20.2	20.0	19.6	19.2	18.5
Forecast 1000-Hr. FMC	23.1	23.1	23.1	23.1	23.1	23.0	23.0
KBDI	0.0						

Weekly Outlook

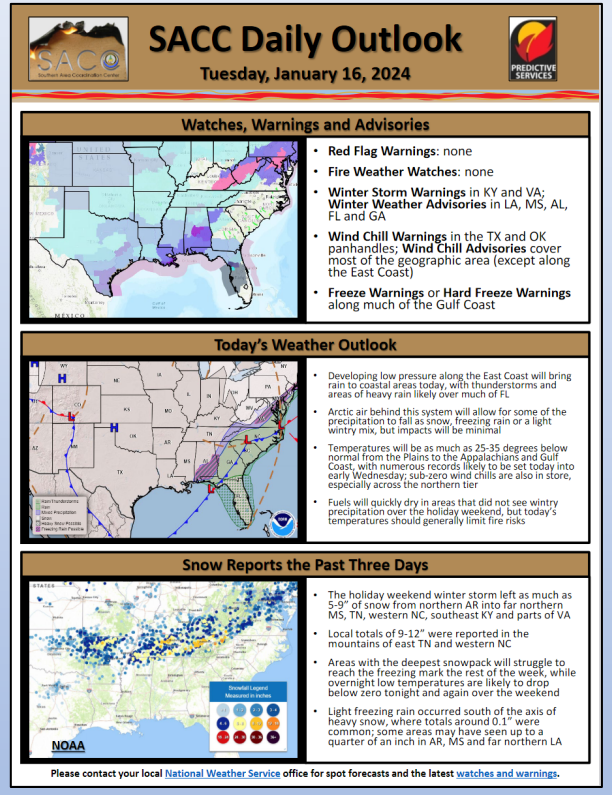
Southern Coastal FDRA - General Fire Danger Forecast

For planning purposes only; forecast is subject to change

Four or more RED blocks in a day signals the potential for a **Critical Fire Day**

DAY	WED 17-Jan	THU 18-Jan	FRI 19-Jan	SAT 20-Jan	SUN 21-Jan	MON 22-Jan	TUE 23-Jan
Avg. Max. Temp. (°F)	40	54	52	36	40	50	
Avg. Min. Humidity (%)	28	41	60	32	32	38	
Avg. 20' Wind Speed (mph)	6	4	6	11	8	3	
Avg. Wind Direction*	WNW	SSW	W	NW	W	ENE	
Avg. Probability of Precip. (%)	0	27	20	0	0	0	
Days Since a Wetting Rain**	5.4	6.4					
Forecast ERC (Fuel Model X)	27.9	36.4	19.6	29.4	38.0	36.7	25.2
Forecast BI (Fuel Model X)	68.5	80.9	58.4	90.5	86.8	65.3	52.4
Forecast IC (Fuel Model X)	3.5	5.6	2.6	4.6	5.4	3.9	2.5
Forecast 100-Hr. FMC	21.1	20.7	19.8	19.3	18.9	18.3	17.6
Forecast 1000-Hr. FMC	24.5	24.4	24.4	24.4	24.4	24.3	24.2
KBDI	26.3						

Southern Area Daily Outlook Page:



SACC Daily Outlook
Tuesday, January 16, 2024

Watches, Warnings and Advisories

- **Red Flag Warnings**: none
- **Fire Weather Watches**: none
- **Winter Storm Warnings** in KY and VA; **Winter Weather Advisories** in LA, MS, AL, FL and GA
- **Wind Chill Warnings** in the TX and OK panhandles; **Wind Chill Advisories** cover most of the geographic area (except along the East Coast)
- **Freeze Warnings** or **Hard Freeze Warnings** along much of the Gulf Coast

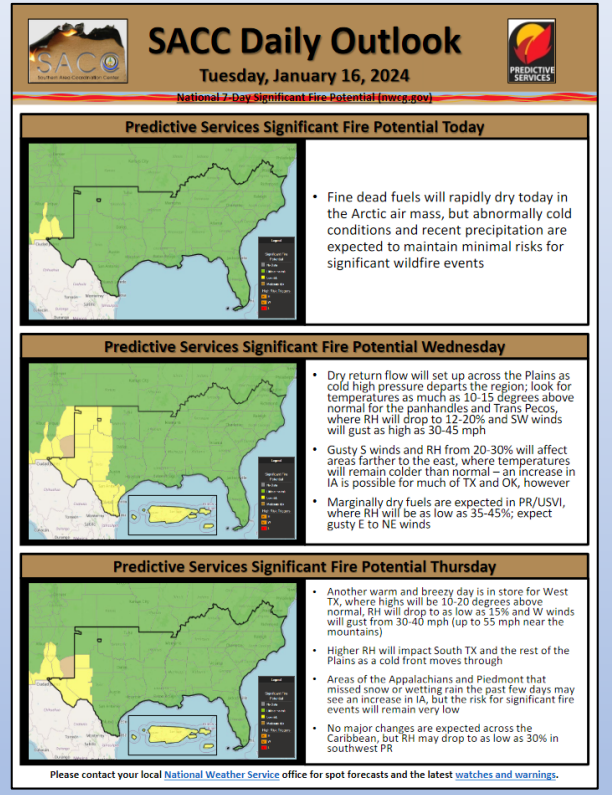
Today's Weather Outlook

- Developing low pressure along the East Coast will bring rain to coastal areas today, with thunderstorms and areas of heavy rain likely over much of FL
- Arctic air behind this system will allow for some of the precipitation to fall as snow, freezing rain or a light wintry mix, but impacts will be minimal
- Temperatures will be as much as 25-35 degrees below normal from the Plains to the Appalachians and Gulf Coast, with numerous records likely to be set today into early Wednesday; sub-zero wind chills are also in store, especially across the northern tier
- Fuels will quickly dry in areas that did not see wintry precipitation over the holiday weekend, but today's temperatures should generally limit fire risks

Snow Reports the Past Three Days

- The holiday weekend winter storm left as much as 5-9" of snow from northern AR into far northern MS, TN, western NC, southeast KY and parts of VA
- Local totals of 9-12" were reported in the mountains of east TN and western NC
- Areas with the deepest snowpack will struggle to reach the freezing mark the rest of the week, while overnight low temperatures are likely to drop below zero tonight and again over the weekend
- Light freezing rain occurred south of the axis of heavy snow, where totals around 0.1" were common; some areas may have seen up to a quarter of an inch in AR, MS and far northern LA

Please contact your local National Weather Service office for spot forecasts and the latest watches and warnings.



SACC Daily Outlook
Tuesday, January 16, 2024
National 7-Day Significant Fire Potential (nwcg.gov)

Predictive Services Significant Fire Potential Today

- Fine dead fuels will rapidly dry today in the Arctic air mass, but abnormally cold conditions and recent precipitation are expected to maintain minimal risks for significant wildfire events

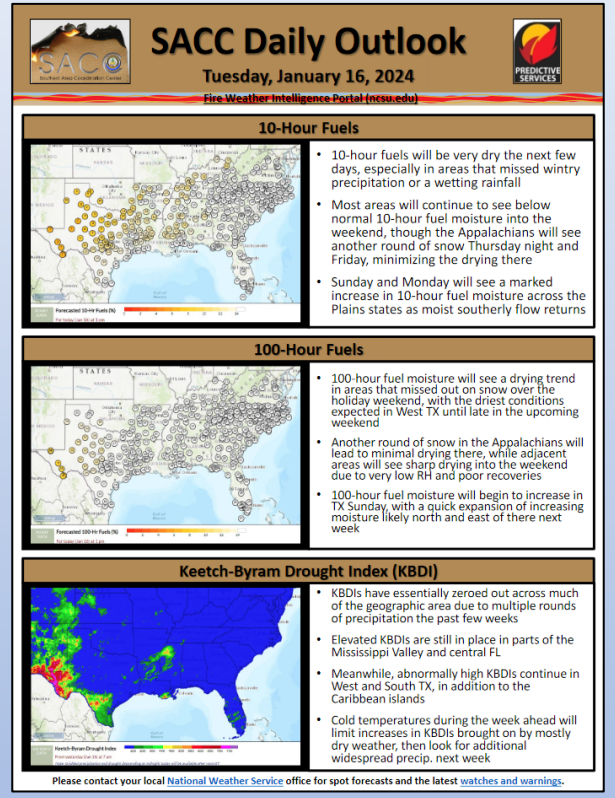
Predictive Services Significant Fire Potential Wednesday

- Dry return flow will set up across the Plains as cold high pressure departs the region; look for temperatures as much as 10-15 degrees above normal for the panhandles and Trans Pecos, where RH will drop to 12-20% and SW winds will gust as high as 30-45 mph
- Gusty S winds and RH from 20-30% will affect areas farther to the east, where temperatures will remain colder than normal – an increase in IA is possible for much of TX and OK, however
- Marginally dry fuels are expected in PR/USVI, where RH will be as low as 35-45%; expect gusty E to NE winds

Predictive Services Significant Fire Potential Thursday

- Another warm and breezy day is in store for West TX, where highs will be 10-20 degrees above normal, RH will drop to as low as 15% and W winds will gust from 30-40 mph (up to 55 mph near the mountains)
- Higher RH will impact South TX and the rest of the Plains as a cold front moves through
- Areas of the Appalachians and Piedmont that missed snow or wetting rain the past few days may see an increase in IA, but the risk for significant fire events will remain very low
- No major changes are expected across the Caribbean, but RH may drop to as low as 30% in southwest PR

Please contact your local National Weather Service office for spot forecasts and the latest watches and warnings.



SACC Daily Outlook
Tuesday, January 16, 2024
Fire Weather Intelligence Portal (ncsu.edu)

10-Hour Fuels

- 10-hour fuels will be very dry the next few days, especially in areas that missed wintry precipitation or a wetting rainfall
- Most areas will continue to see below normal 10-hour fuel moisture into the weekend, though the Appalachians will see another round of snow Thursday night and Friday, minimizing the drying there
- Sunday and Monday will see a marked increase in 10-hour fuel moisture across the Plains states as moist southerly flow returns

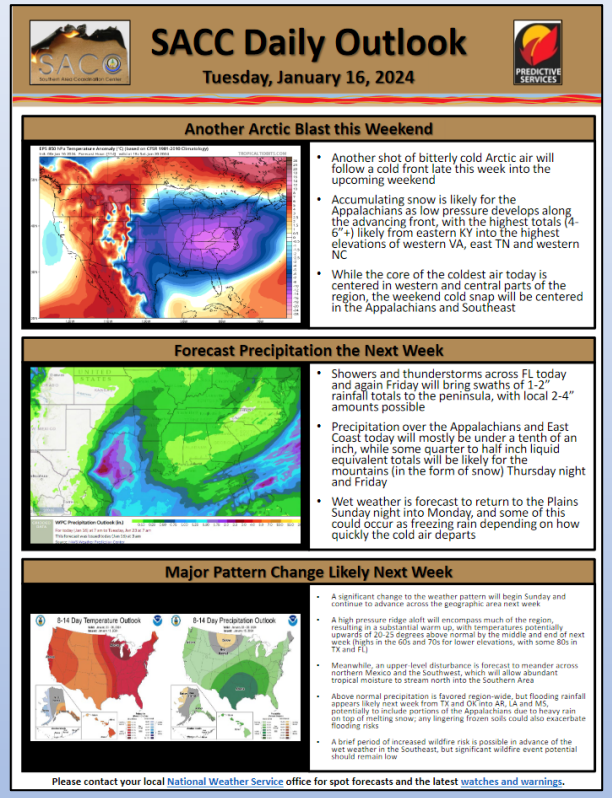
100-Hour Fuels

- 100-hour fuel moisture will see a drying trend in areas that missed out on snow over the holiday weekend, with the driest conditions expected in West TX until late in the upcoming weekend
- Another round of snow in the Appalachians will lead to minimal drying there, while adjacent areas will see sharp drying into the weekend due to very low RH and poor recoveries
- 100-hour fuel moisture will begin to increase in TX Sunday, with a quick expansion of increasing moisture likely north and east of there next week

Keetch-Byram Drought Index (KBDI)

- KBDIs have essentially zeroed out across much of the geographic area due to multiple rounds of precipitation the past few weeks
- Elevated KBDIs are still in place in parts of the Mississippi Valley and central FL
- Meanwhile, abnormally high KBDIs continue in West and South TX, in addition to the Caribbean islands
- Cold temperatures during the week ahead will limit increases in KBDIs brought on by mostly dry weather, then look for additional widespread precip. next week

Please contact your local National Weather Service office for spot forecasts and the latest watches and warnings.



SACC Daily Outlook
Tuesday, January 16, 2024

Another Arctic Blast this Weekend

- Another shot of bitterly cold Arctic air will follow a cold front late this week into the upcoming weekend
- Accumulating snow is likely for the Appalachians as low pressure develops along the advancing front, with the highest totals (4-6"+) likely from eastern KY into the highest elevations of western VA, east TN and western NC
- While the core of the coldest air today is centered in western and central parts of the region, the weekend cold snap will be centered in the Appalachians and Southeast

Forecast Precipitation the Next Week

- Showers and thunderstorms across FL today and again Friday will bring swaths of 1-2" rainfall totals to the peninsula, with local 2-4" amounts possible
- Precipitation over the Appalachians and East Coast today will mostly be under a tenth of an inch, while some quarter to half inch liquid equivalent totals will be likely for the mountains (in the form of snow) Thursday night and Friday
- Wet weather is forecast to return to the Plains Sunday night into Monday, and some of this could occur as freezing rain depending on how quickly the cold air departs

Major Pattern Change Likely Next Week

- A significant change to the weather pattern will begin Sunday and continue to advance across the geographic area next week
- A high pressure ridge aloft will encompass much of the region, resulting in a substantial warm up, with temperatures potentially upwards of 20-25 degrees above normal by the middle and end of next week (highs in the 60s and 70s for lower elevations, with some 80s in TX and FL)
- Meanwhile, an upper-level disturbance is forecast to meander across northern Mexico and the Southwest, which will allow abundant tropical moisture to stream north into the Southern Area
- Above normal precipitation is favored region-wide, but flooding rainfall appears likely next week from TX and OK into AR, LA and MS, potentially to include portions of the Appalachians due to heavy rain on top of melting snow; any lingering frozen soils could also exacerbate flooding risks
- A brief period of increased wildfire risk is possible in advance of the wet weather in the Southeast, but significant wildfire event potential should remain low

Please contact your local National Weather Service office for spot forecasts and the latest watches and warnings.

Product is generally updated weekdays unless increased activity in the Geographic Area (1/16 Outlook shown)

https://gacc.nifc.gov/sacc/resources/predictive/sacc-daily-outlook.pdf

NC DAQ Air Quality Forecast - *Three Day Outlook*

The North Carolina Division of Air Quality issues forecasts for fine particulate matter year-round and ozone from March through October. Forecasts and discussions are updated each afternoon for the next three days, and are sometimes updated in the morning to reflect the latest ambient conditions.

View: ◉ The latest forecast discussion ○ The afternoon forecast discussion from Jan 15, 2024 Display

This forecast was issued on **Tuesday, January 16, 2024** at **2:35 pm**. This forecast is currently valid.

Today's Air Quality Conditions

Sporadic Code Yellow hourly fine particulate concentrations are being observed throughout the interior today, while most daily average values hold in the Code Green range statewide.

For a display of the most recent Air Quality Index (AQI) conditions throughout the day, visit the Ambient Information Reporter (AIR) tool.

General Forecast Discussion

Very cold and very dry conditions will be present on Wednesday with zonal upper-level flow developing and surface high pressure building in from the southwest. Particle pollution will be in the low Code Green range statewide within this clean Arctic air mass.

Outlook

On Thursday, the surface high will move offshore resulting in southwesterly WAA. Increasing cloud cover and a stable cold air wedge in place will inhibit mixing, especially in the interior. On Friday, the cold wedge will erode as a shortwave disturbance approaches and the associated surface low lifts northeast across the state, producing light precipitation. Particle pollution should hold in the mid-upper Code Green range on both days.

Author: *Kreuser - NC Division of Air Quality*

Extended Air Quality Outlook

The forecast Air Quality Index value for each pollutant represents the highest value expected within each county, so some areas and monitors may see lower values. We use the best information and techniques available to ensure the quality and accuracy of the forecasts we provide to the public. Note that ranges do *not* include the nine-county Triad region, which is covered by the Forsyth County Office of Environmental Assistance and Protection.

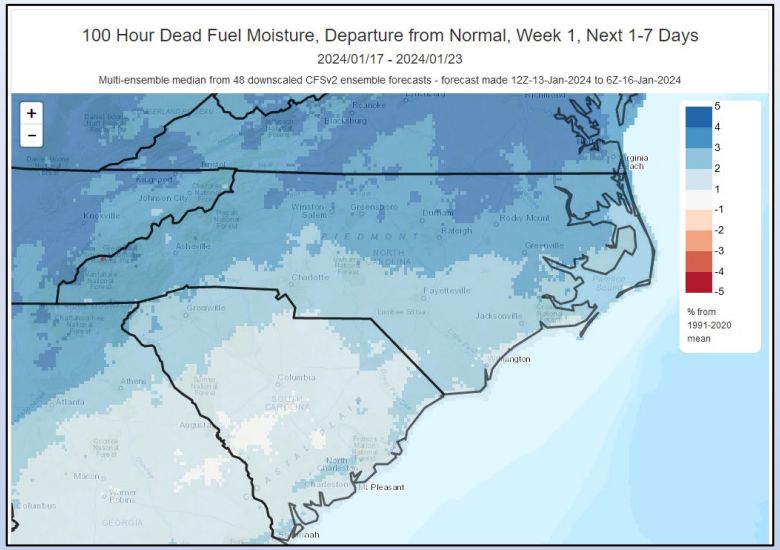
Forecast Day	AQI Range	Category Range	Download KML
Tuesday (Jan 16)	35 to 40	Green	download
Wednesday (Jan 17)	20	Green	download
Thursday (Jan 18)	30 to 42	Green	download
Friday (Jan 19)	35	Green	download

From: ***https://airquality.climate.ncsu.edu/discussion/?view=latest***
DAQ Air Quality Portal: ***https://airquality.climate.ncsu.edu/***

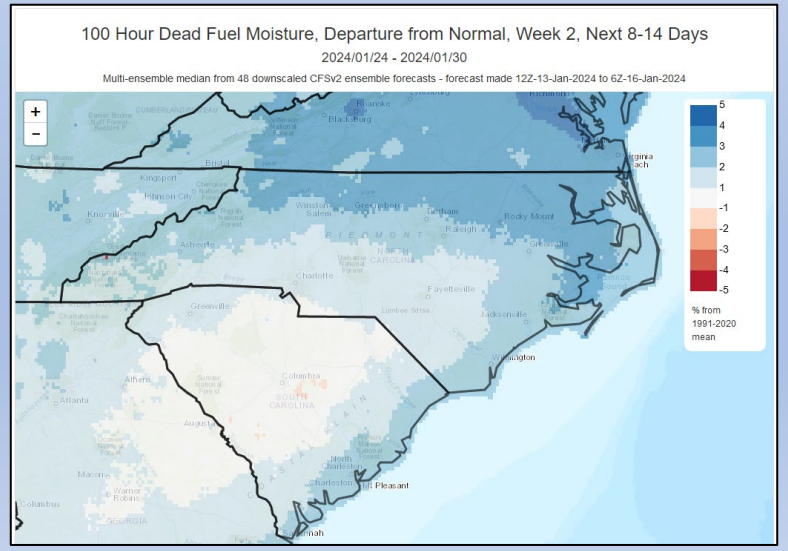
Modeled Departure from Normal by Week: 100-hr Fuels

Output relies on experimental forecast outputs and is subject to change

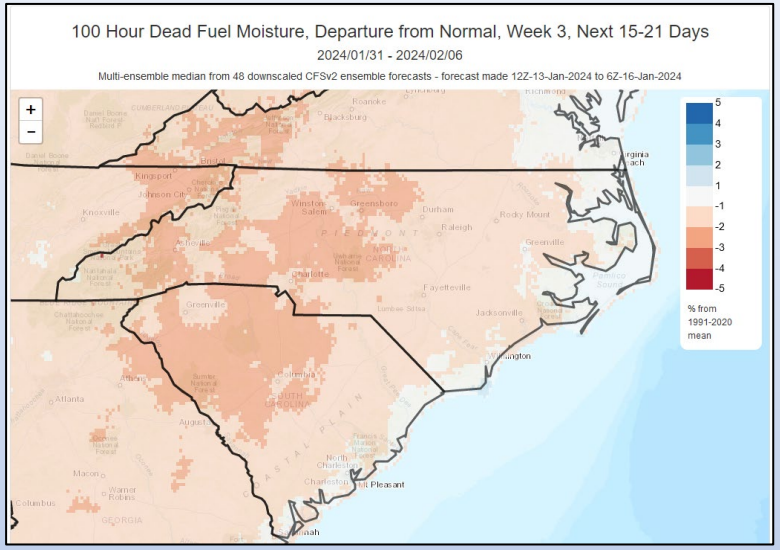
Week-1



Week-2



Week-3



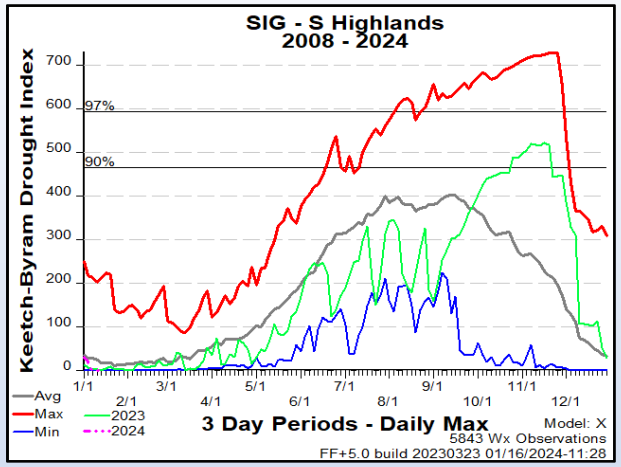
This output can provide insight into general drying trends.

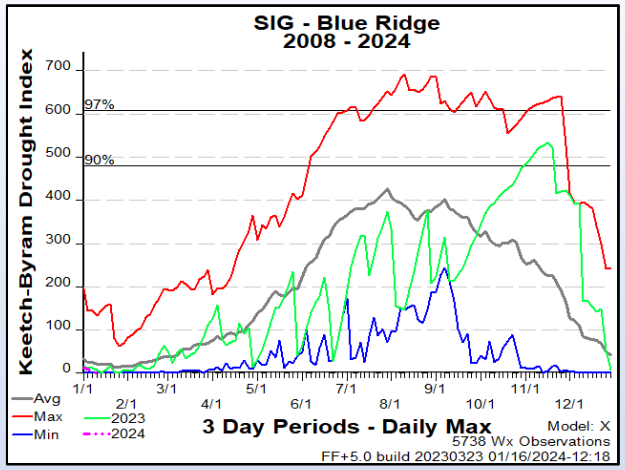
Note above to near normal in Week-1 & 2. Week-3 shows potential for more significant departure from normal in the western part of the state.

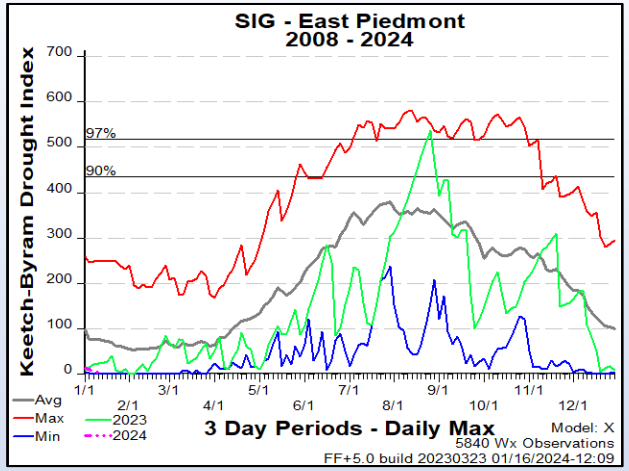
Relates to interactions of warmer/colder temps, moist/dry air masses, precip amt/duration and overnight RH recovery trends.

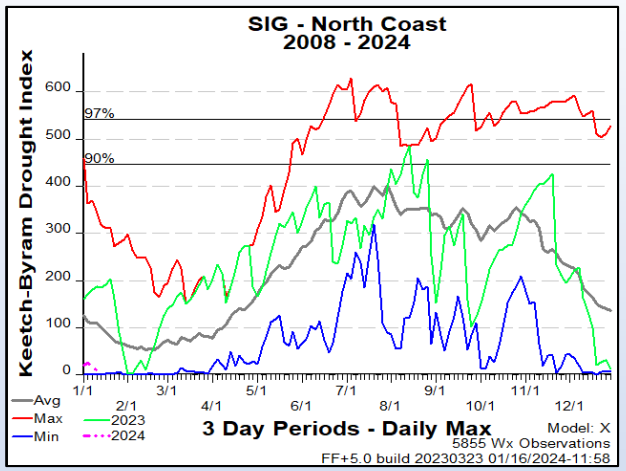
Important to note that there is significant forecast uncertainty as you go further out in time, especially in an El Niño Transition Year.

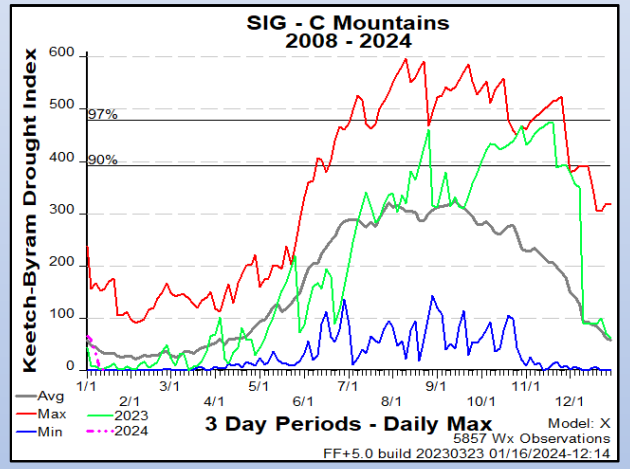
From: https://climatetoolbox.org/tool/Climate-Mapper , 100-hr Map Link

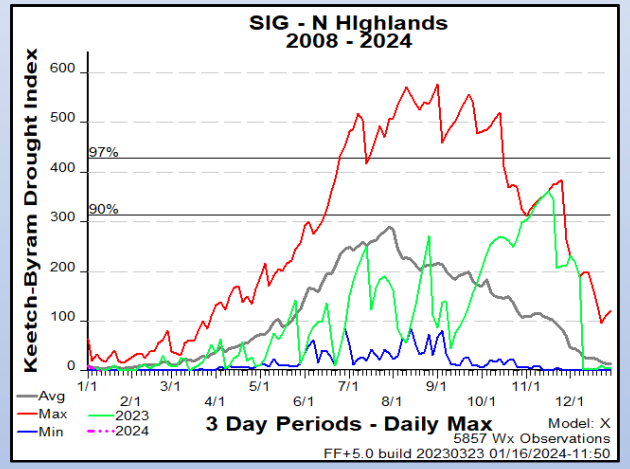


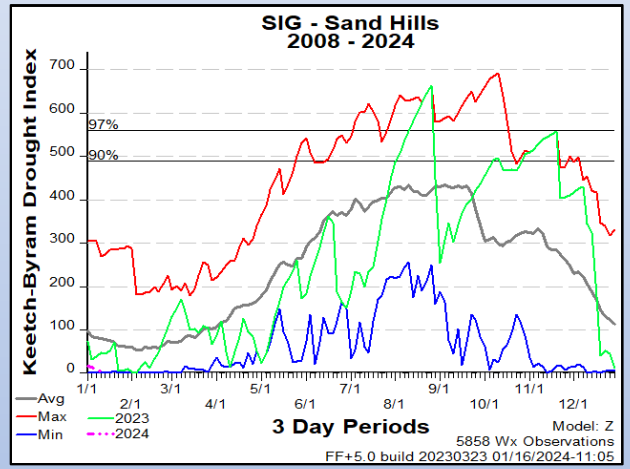


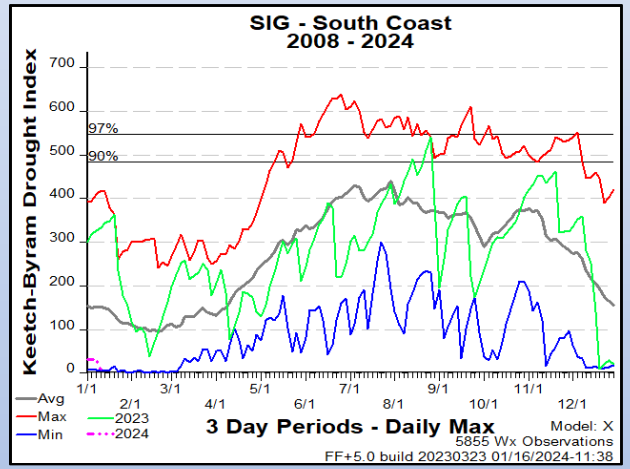


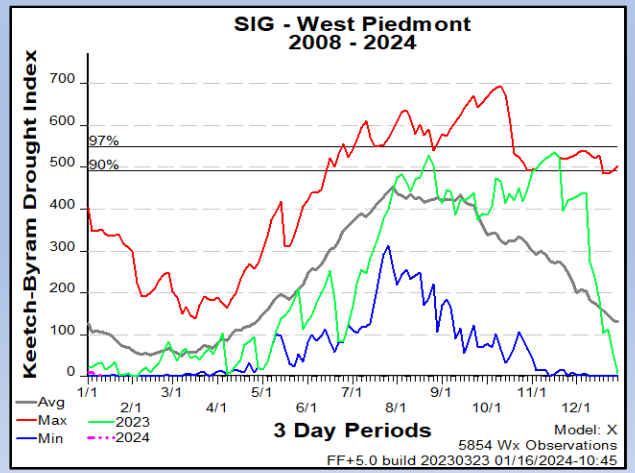








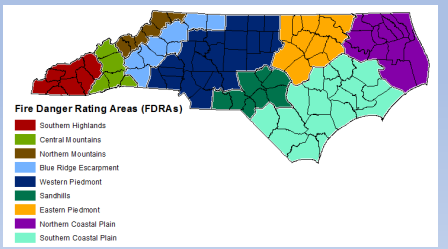


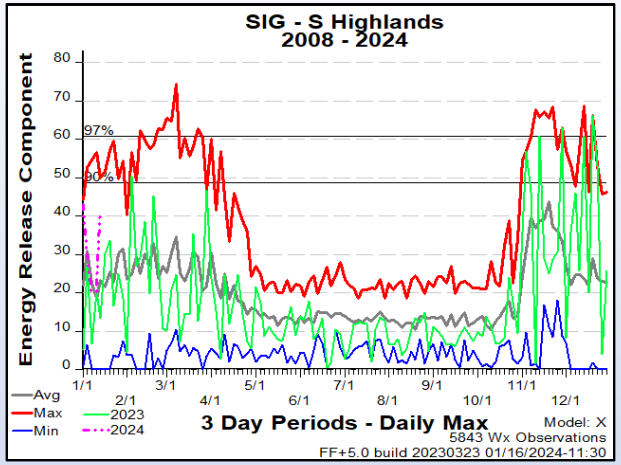


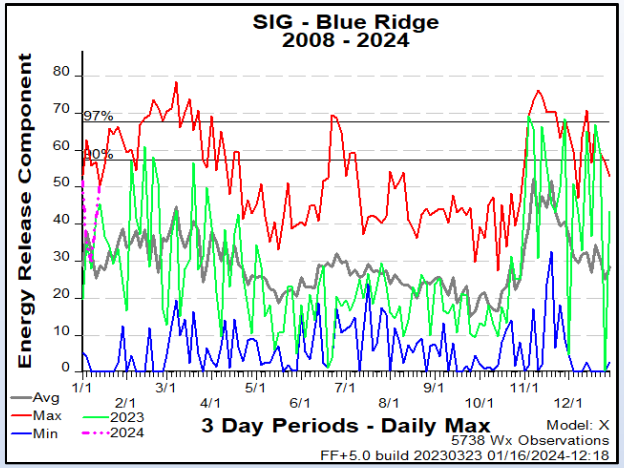
FDRA Outputs from FF+ Run: KBDI

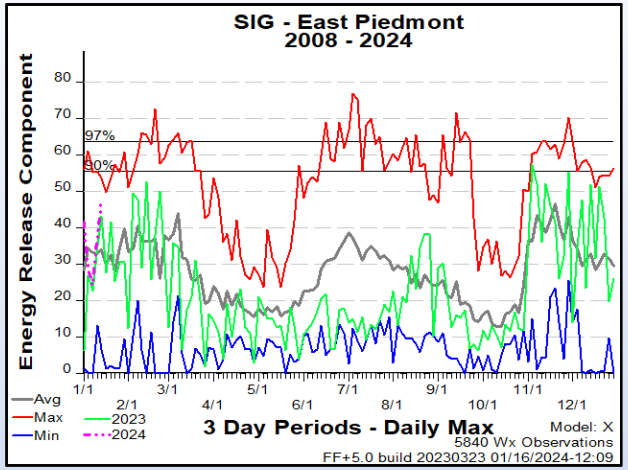
(2008-2024 Data, ending 1/15/24)

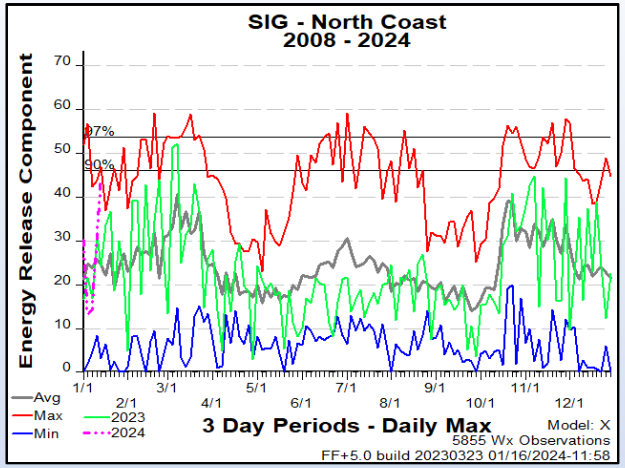
2024 YTD KBDI values are near 0 at time of graphic creation (making them hard to discern above).

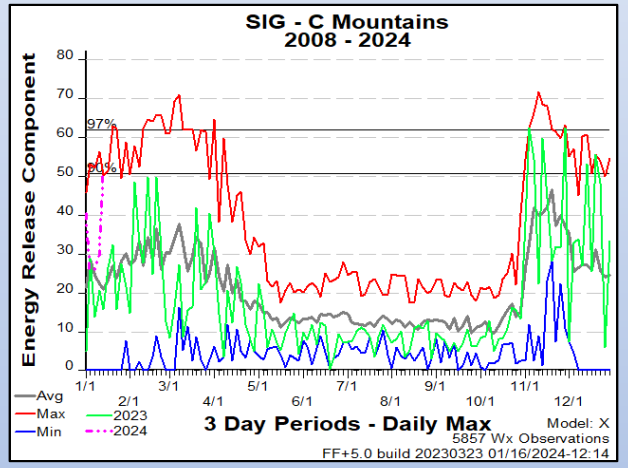


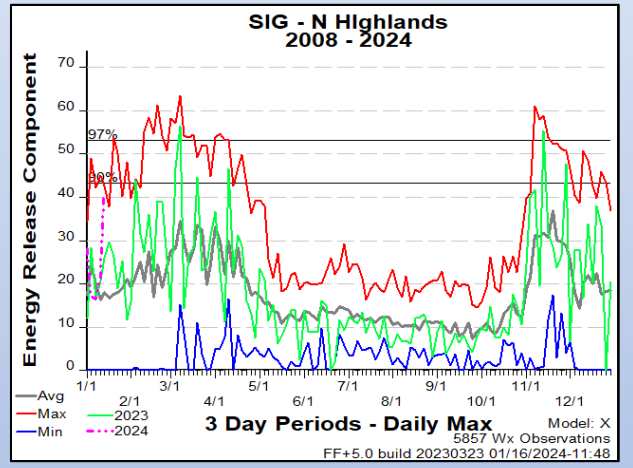


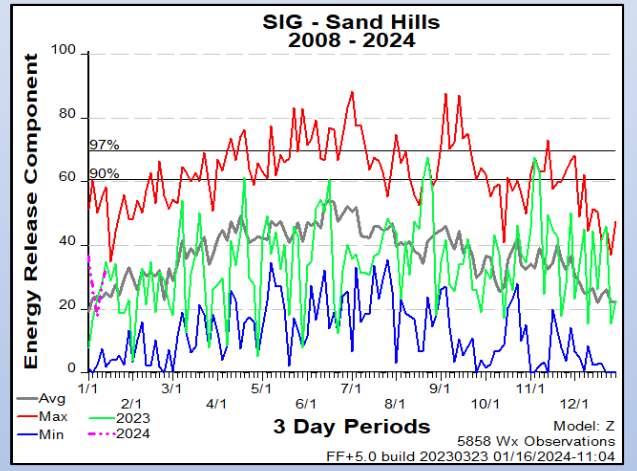


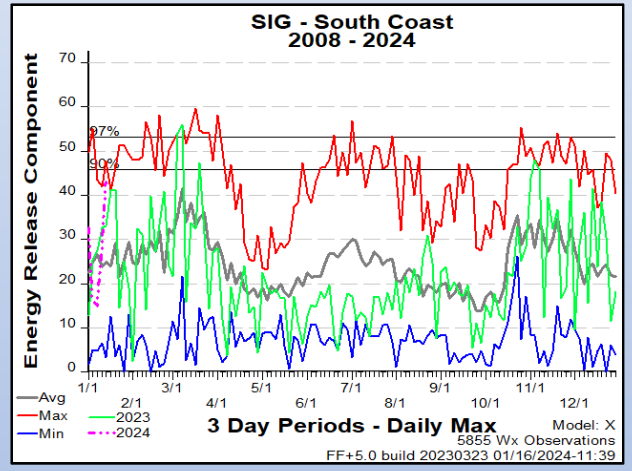


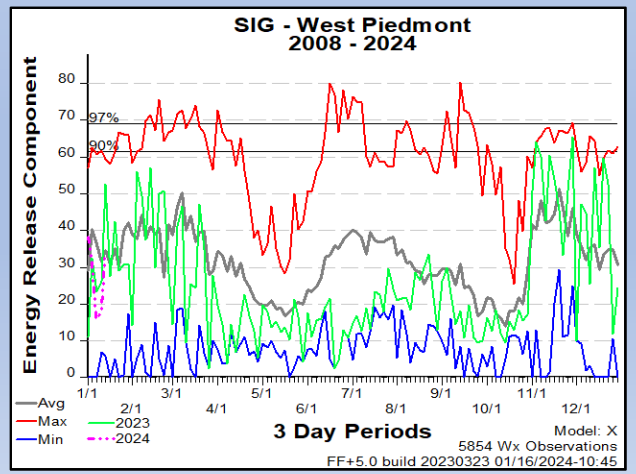






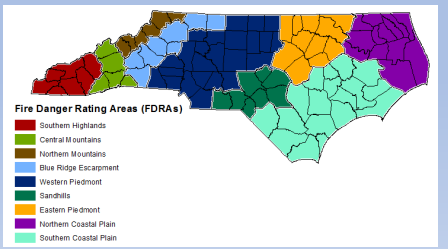


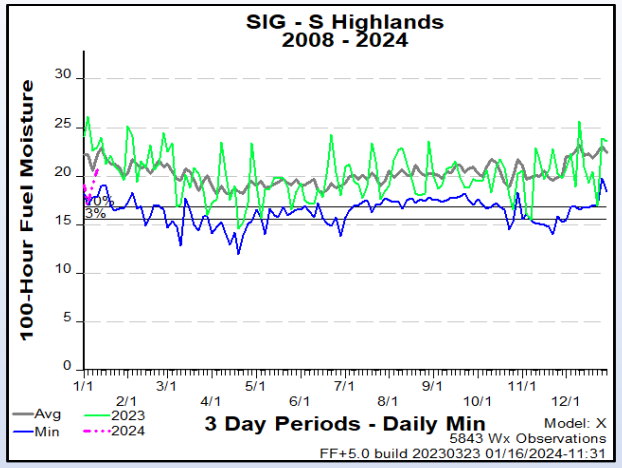


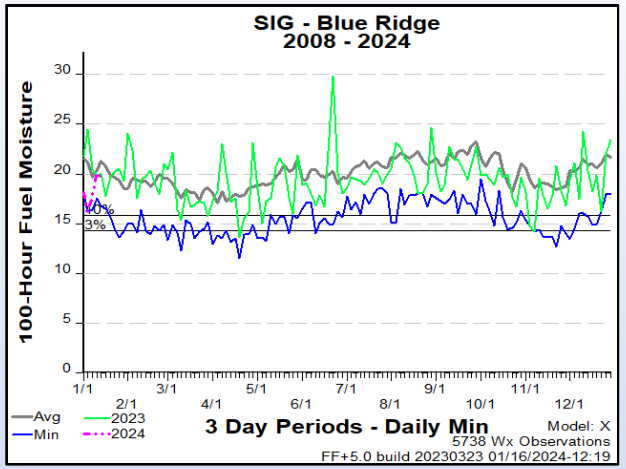


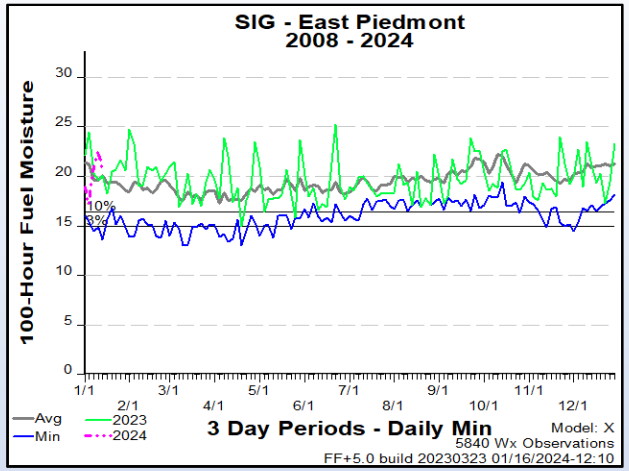
FDRA Outputs from FF+ Run: ERC

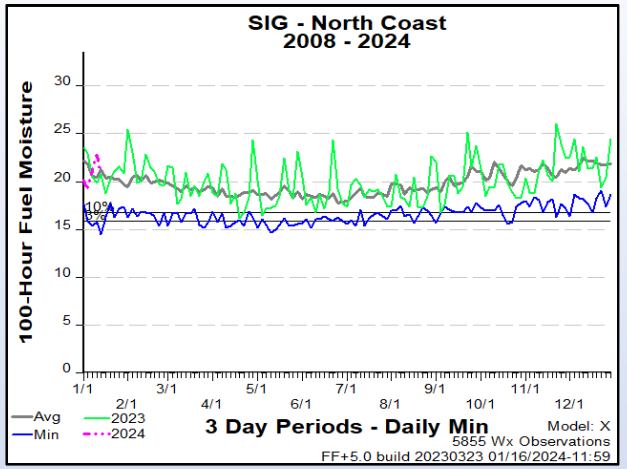
(2008-2024 Data, ending 1/15/24)

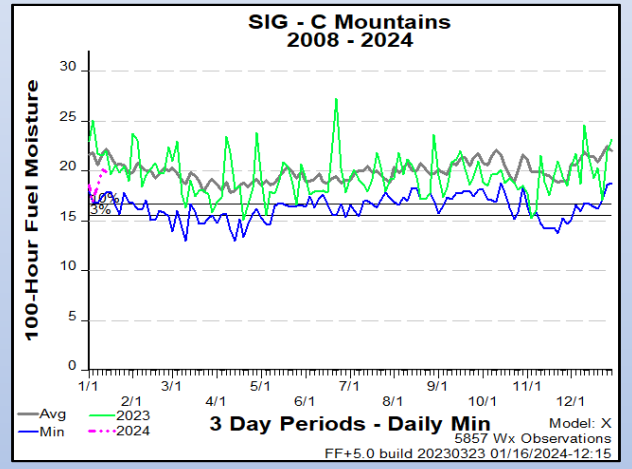


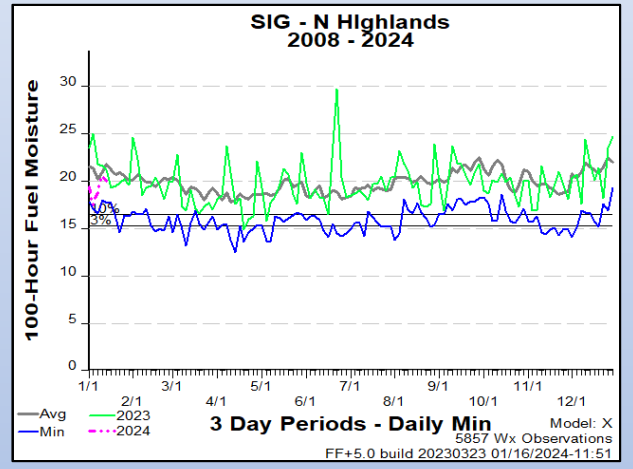


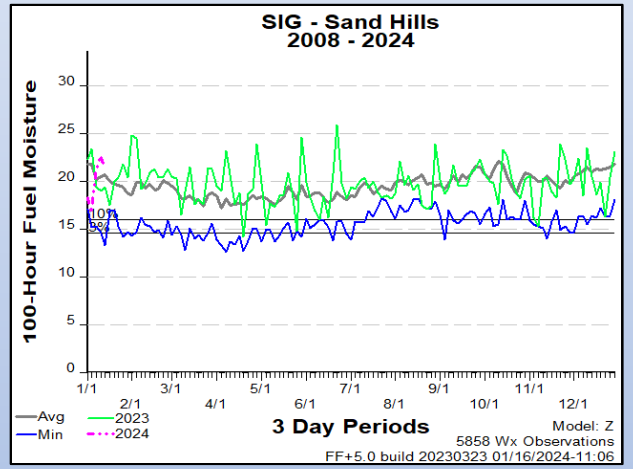


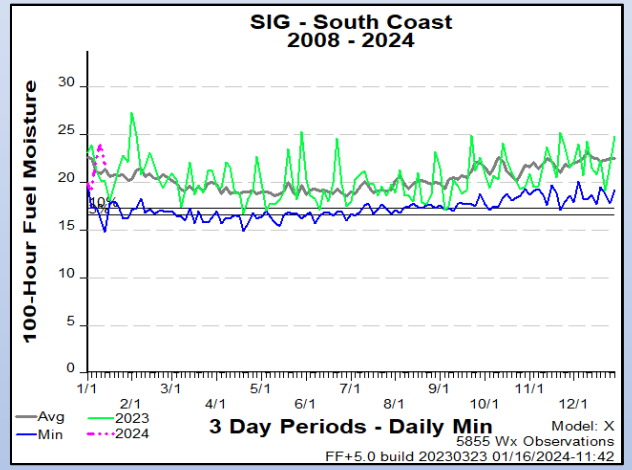


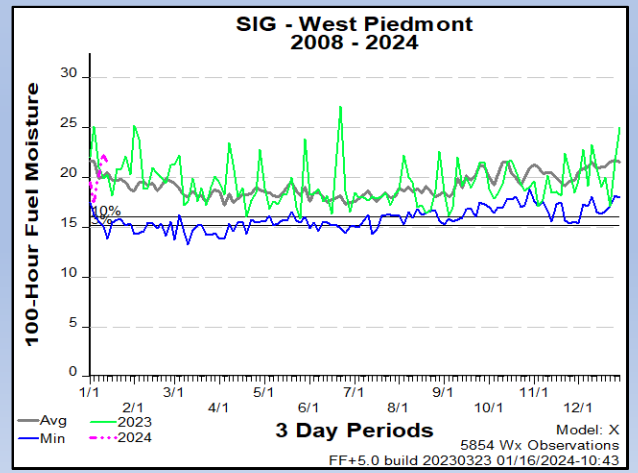






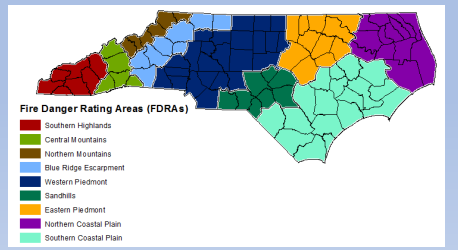


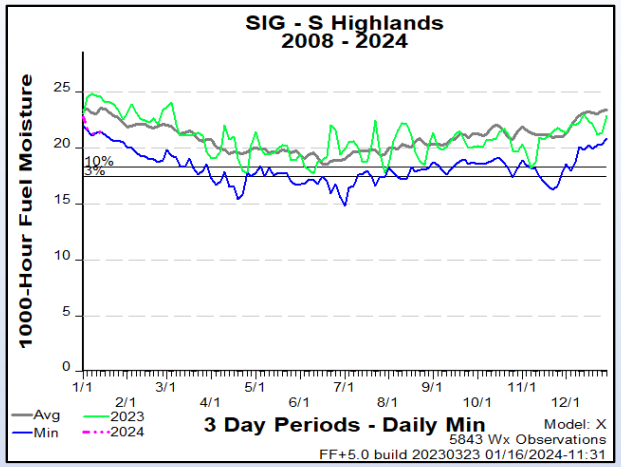


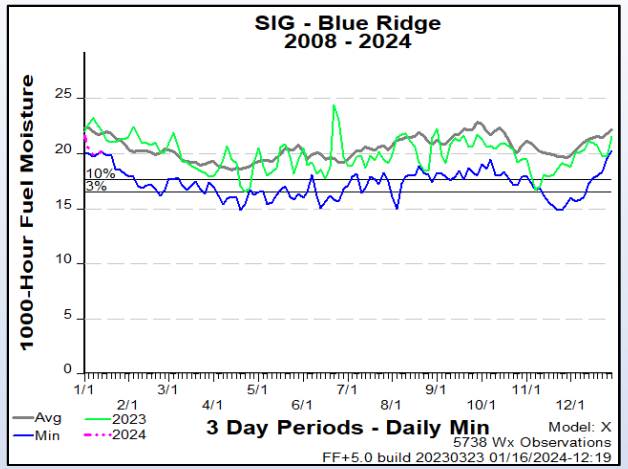


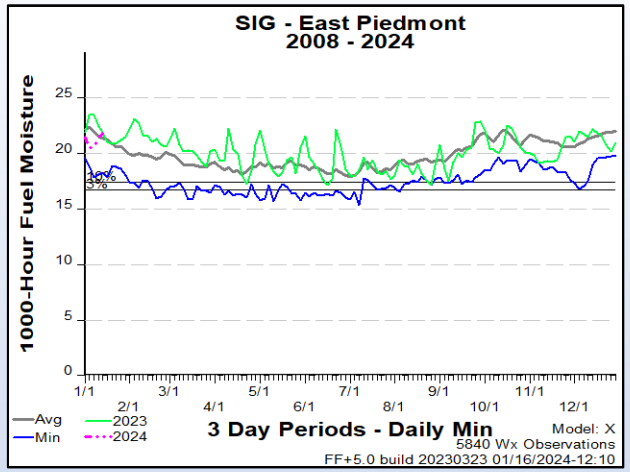
FDRA Outputs from FF+ Run: 100-Hr

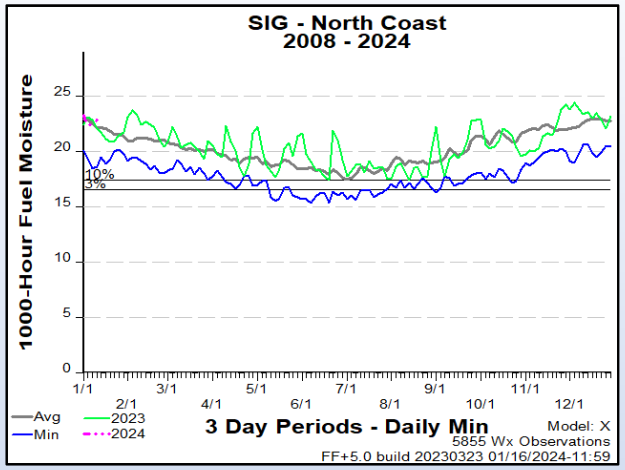
(2008-2024 Data, ending 1/15/24)

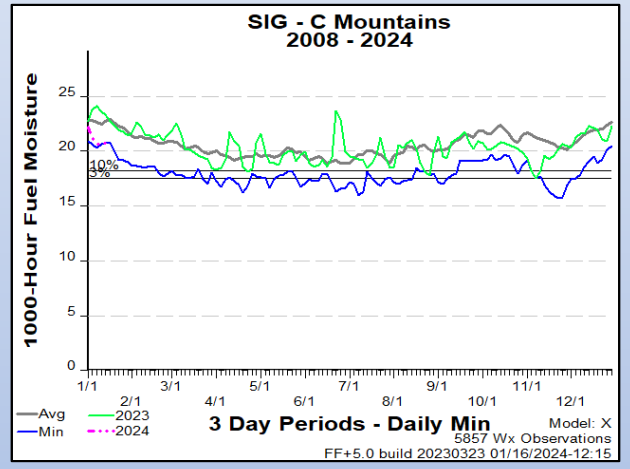


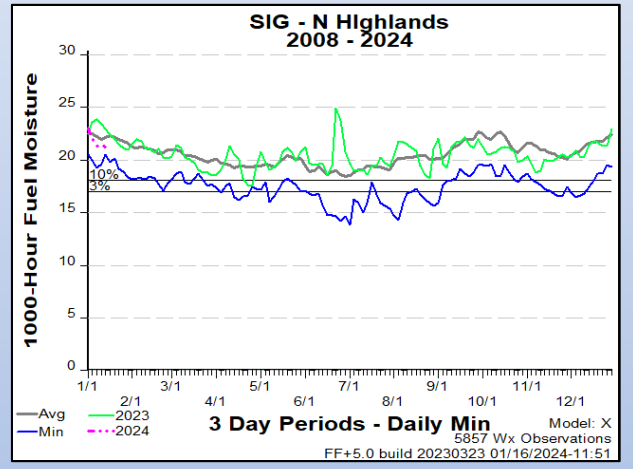


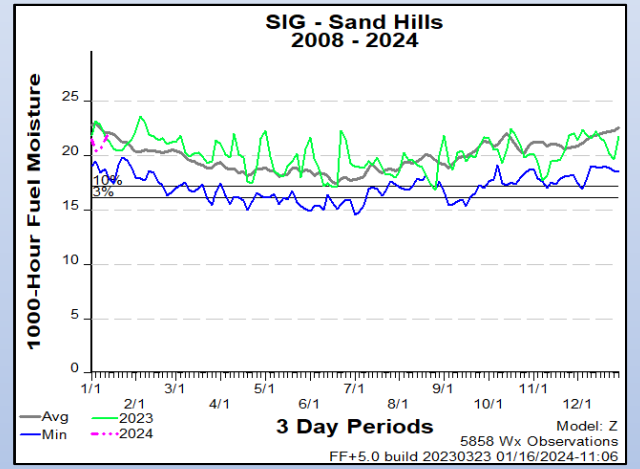


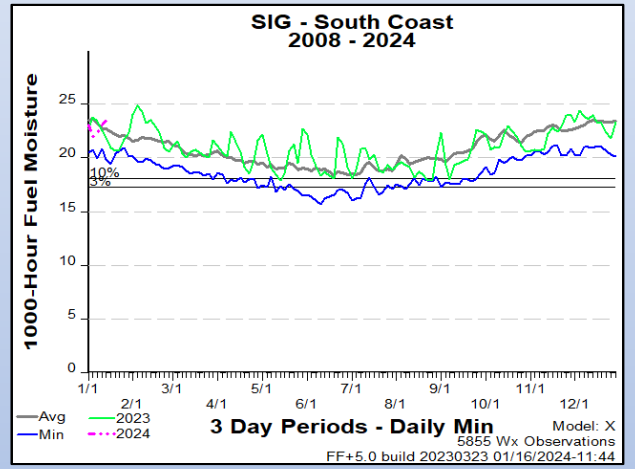


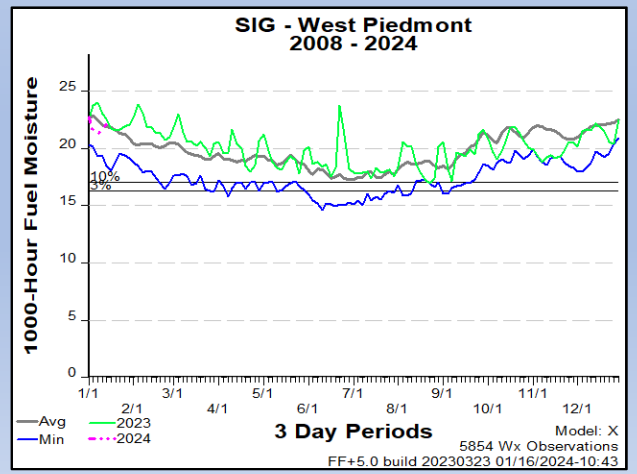






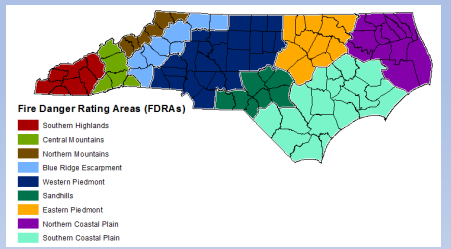






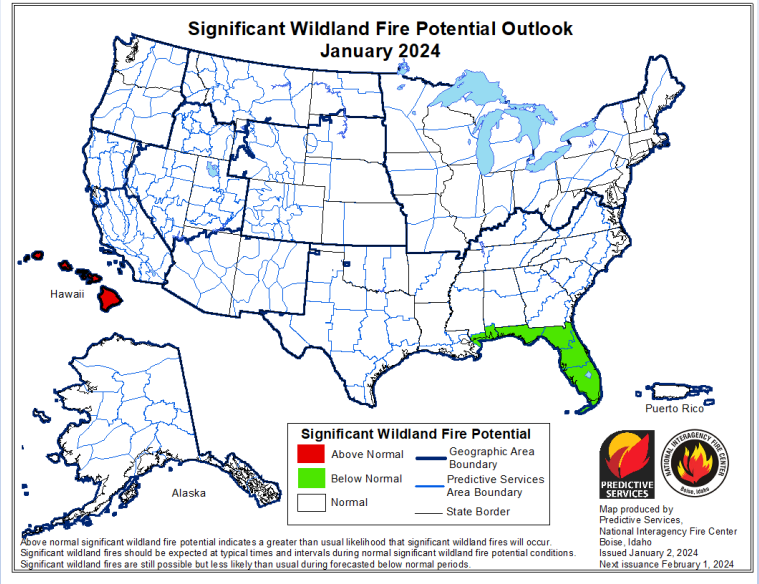
FDRA Outputs from FF+ Run: 1000-Hr

(2008-2024 Data, ending 1/15/24)

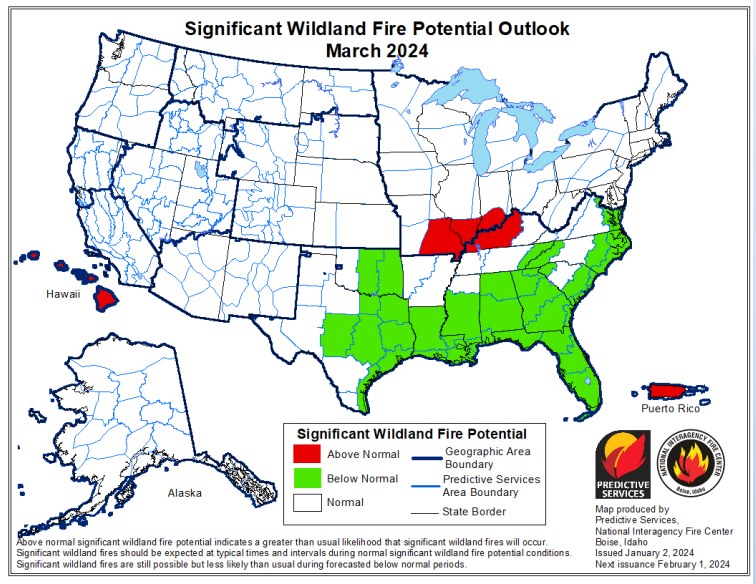


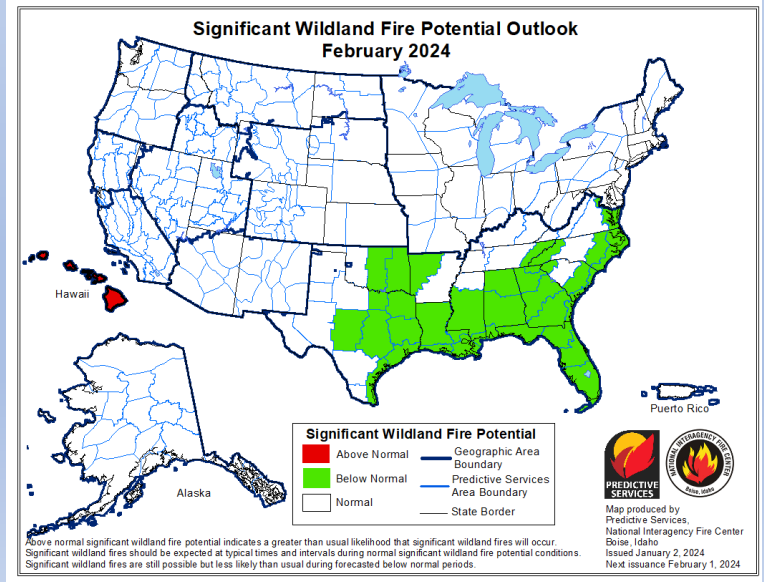
Significant Wildland Fire Potential Outlook:

Updated 1/2/24 – Next Update on 2/1/24

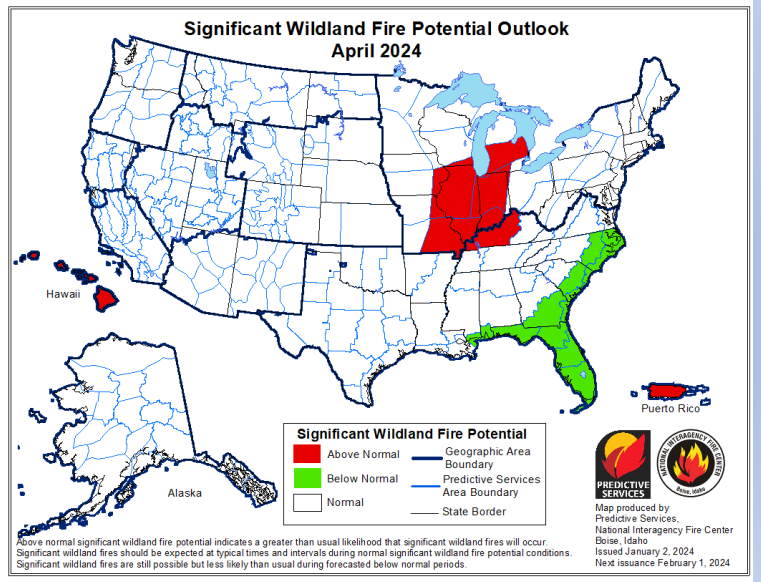


***Forecast uncertainty could lead to an expansion of "Normal" or "Above Normal" Fire Potential if abnormally dry conditions redevelop or worsen going into Spring.**

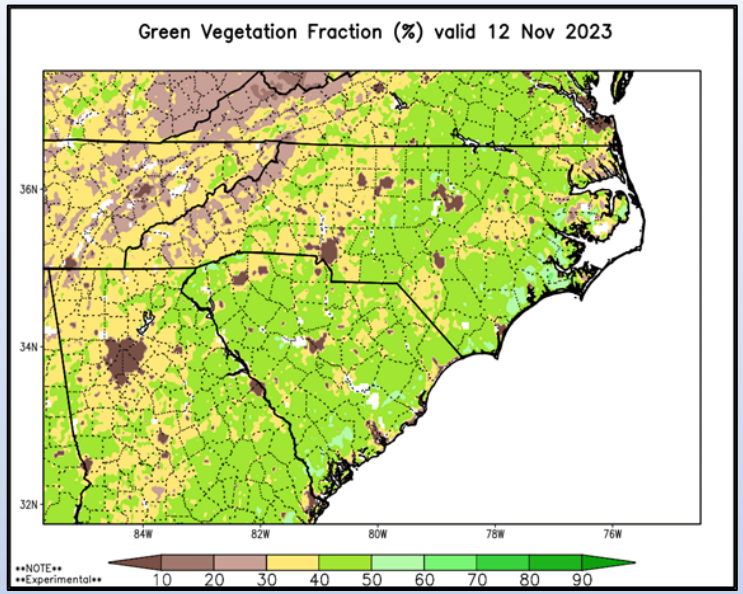


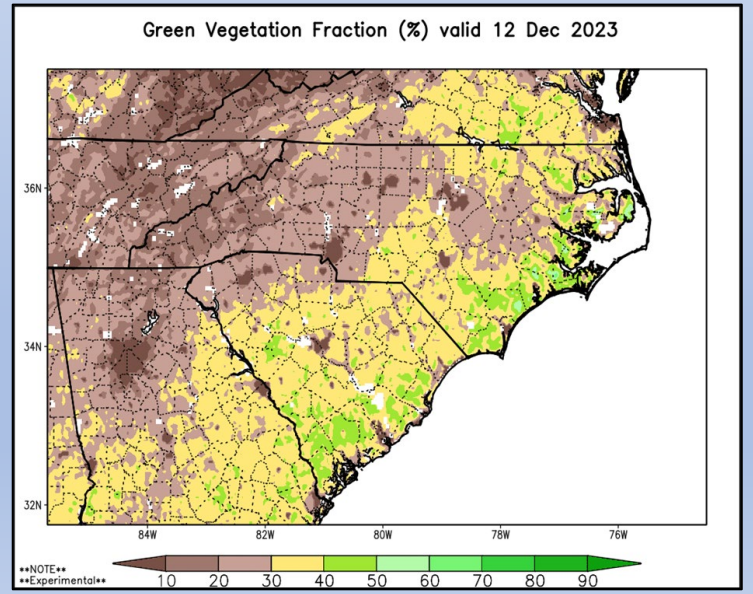


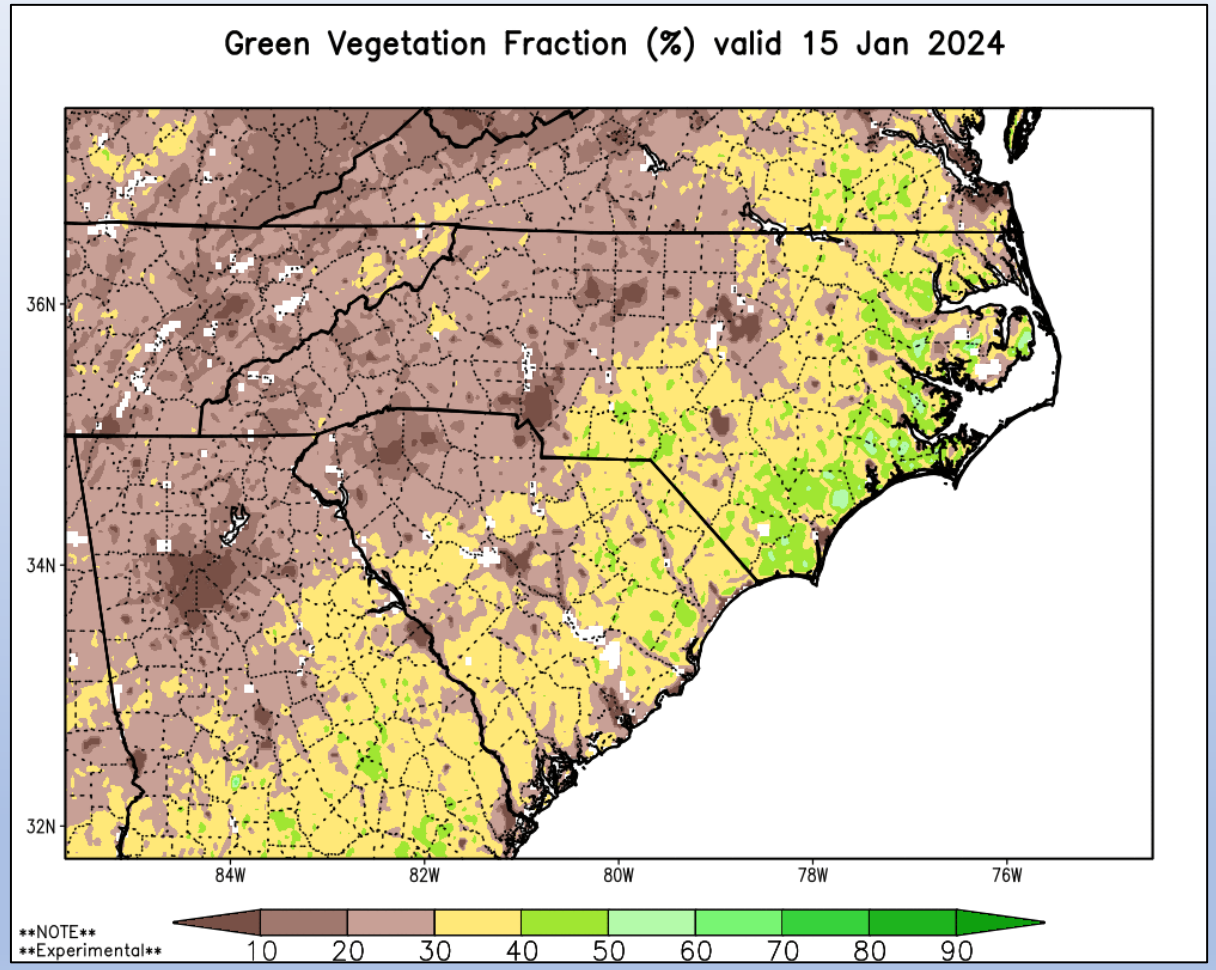
A significant fire is one that requires resources from outside the district (other than aviation). IA potential is based more on shorter term weather factors. Just a few days of dry weather can increase IA activity considerably as we have seen this year.



Green Veg Fraction – 3 Month Modeled Changes







General Fire Activity Discussion:

- For December - IA activity continued to decrease as wetting rain events began to occur more frequently. "Signal-14" totals for December included approximately 377 fires for 889 acres (note that the Signal-14 is only a snapshot in time for each daily reporting period).

- January fire activity has continued to be tempered by repeated widespread rain events for most areas of the state, but with IA picking back up as fine fuels dry out. Freezing/colder fuel temps along with snow for some higher elevation areas have also contributed to reduction in activity.

- MTD "209" Criteria Fires:
  - None Noted

- Predictive Services Significant WF Potential Outlook, See Slide #41:
  - Normal Activity is favored statewide through the rest of January, with a mixture of Below-Normal to Normal activity for February through April (assuming normal El Nino pattern of wetness continues).
    - There is still significant forecast uncertainty more than 7-10 days out in storm system track and potential rainfall amounts.
    - Drought impacts to the state were/still are significant, with some locations still having 12-mo deficits of 6"-12" or more.
    - Reminder that Significant WF Potential is not a predictor of "IA Fire" activity for a particular location but suggests larger geographic areas likely requiring larger incident mobilization/out of area support.
    - There is significant uncertainty as we move into Spring and Summer – with ENSO conditions generally being less of a direct influence (see previous discussion).

- See slides 3-8 for general trends in fire occurrence and acres in a monthly context.

  - We will see daylength continue to increase moving towards summer, along with longer fuel exposure/heating.
  - Fire activity generally builds later in January/February in-part due to the extra daylight, fuel heating, fine fuel drying and alignment with conducive weather events.
  - General trends are subject to local factors (time and space) including drought, fire problem, abnormal weather events, etc.

Image of Mt. Mitchell area in Yancey County from weather camera on 1/16/24; link here

Broader Fuels/Indices Discussion:

- Drought conditions have greatly improved for most of the state, through December and early January.
  - Drought severity and extent has continued to decrease over the past month (see Slide #17).
  - KBDI values are generally well below 100 – but a continued note of caution:
    Dry surface horizons and duff can quickly reach a saturated state – leading to significant runoff/low absorption, especially in areas with slope. This condition can easily leave the lower duff, litter and soil horizons significantly unchanged. Models can have a hard time representing this, when it occurs. Repeated soaking rains will continue be necessary.
  - 100-hr & 1000-hr fuels have trended more towards or above seasonal normals, with recent rains and better overnight recoveries (see FDRA Fuel Slides).
  - Duff/Organic consumption and smoldering will remain a concern for any fires occurring in remaining drought impacted areas not sufficiently recharged (example being potential impact of rapid runoff, low infiltration from sites managed through maintained pattern drainage).

- Refer to the FDRA Indices and FM slides for FDRA Specific Seasonal Trends.

- A rapid change from a short-duration weather event aligning with dry dormant fuels can lead to <u>significant enhancement</u> of area-wide fire danger and local fire behavior this time of year. Underlying wet conditions can cause trafficability concerns for equipment while surface fires can be intense/fast moving (note larger fire acreage points on Slides #5 & #7).