Report to Governor Josh Stein and the North Carolina General Assembly Environmental Review Commission

North Carolina Drought Management Advisory Council

October 1, 2025

Division of Water Resources

NORTH CAROLINA DEPARTMENT OF ENVIRONMENTAL QUALITY

Pursuant to G.S. 143-355.1

North Carolina Department of Environmental Quality
Division of Water Resources

N.C. Drought Management Advisory Council Annual Report
July 1, 2024 - June 30, 2025

Introduction

The North Carolina Drought Management Advisory Council (DMAC), created as required by North Carolina General Statute 143-355.1, coordinates drought monitoring, assessment and response activities between state and federal agencies, public water systems and water users. The objective of the DMAC is to provide consistent and accurate information on drought conditions to these entities: the U.S. Drought Monitor, the N.C. Environmental Management Commission, the secretary of the N.C. Department of Environmental Quality, the N.C. Environmental Review Commission and the public in order to manage and mitigate the harmful effects of drought. In accordance with statutory requirements, the council must submit an annual report to the secretary of the N.C. Department of Environmental Quality, the governor and the N.C. Environmental Review Commission by Oct. 1 of each year.

Drought Overview 2024 - 2025

Climate Summary - State Climate Office (Corey Davis)

Overall Summary

The period from July 2024 through June 2025 was the 11th-warmest (2.1°F above average) and 33rd-wettest (4.14 inches above average) 12-month period out of the past 130 years, based on data from the National Centers for Environmental Information.

Despite the net wet conditions in this 12-month period, it featured a prolonged drought through parts of the fall, winter and spring, but was book-ended by several significant rain events, including record-breaking rainfall in the Mountains from Hurricane Helene.

Due to the timing of this drought, which emerged after the end of the growing season and persisting during our cool season, there were limited impacts to agriculture and water supplies, but major impacts on wildfire activity, which were amplified by storm damage from Hurricane Helene in western North Carolina.

July and August 2024

A fast-emerging flash drought in June 2024 left 88 percent of the state classified in some stage of drought by July 9. Parts of Columbus County were classified as experiencing Extreme Drought (D3) for the first time since August 2011. This flash drought extended into early July with more hot, dry weather, including an all-time record high temperature of 106°F at the Raleigh-Durham Airport on July 5.

Rain showers became more frequent by mid-July, especially across eastern North Carolina. Greenville had its wettest July on record, with 14.30 inches in total, while Washington had as much as 17.84 inches. Statewide, the month of July ranked as our eighth wettest on record since 1895.

That was followed by our 22nd wettest August on record that featured several days of heavy rain from Tropical Storm Debby across the Piedmont and Coastal Plain, with widespread rainfall totals of 4 inches or more. That led to flash flooding as far west as Charlotte, several dam failures around Fayetteville, and closed roads after up to 15 inches of rain fell in parts of Brunswick County.

The wet end to summer brought significant drought recovery, and by August 27, only a small pocket of far western North Carolina remained in Moderate Drought (D1). Those areas totaled less than an inch of rain all month in August, and it was the driest August on record in Franklin, with only 0.47 inches in total.

Fall (September, October, and November 2024)

September 2024 will long be remembered as one of the wettest and most impactful months ever in North Carolina, primarily because of two heavy rain events on either end of the state. From September 14 to 17, a remnant frontal boundary off our southern coastline, categorized as Potential Tropical Cyclone Eight, pushed significant moisture across the southern Coastal Plain, with totals of up to 20.81 inches at Carolina Beach. The excessive rainfall caused local flooding, washed-out roads and necessitated water rescues.

Less than two weeks later, the remnants of Hurricane Helene, which made landfall along Florida's Gulf coast at Category-4 intensity, moved over western North Carolina with heavy rain and high winds in tow. A weather station at Busick in southern Yancey County recorded 31.33 inches of rain over three days, which included contributions from Helene and a predecessor frontal event across the southern Appalachians that was fed with moisture from the fringes of the storm.

In the aftermath, sites along the Broad, French Broad, Pigeon, and Swannanoa rivers reached major flood stage, and valley towns such as Asheville, Marshall, and Chimney Rock suffered catastrophic damage. With damage costing almost $60 billion and 108 confirmed fatalities in North Carolina, Helene became the state's costliest and deadliest tropical system on record.

After our eighth wettest September, the state immediately entered a prolonged dry pattern during its 3rd-driest October and 35th-driest November on record statewide. In October, both Morganton and Fayetteville measured only 0.01 inches of rain all month, including 30 days in a row without measurable rainfall in Fayetteville – its longest such streak since December 1988.

By the end of the climatological fall, the entire state was classified as Abnormally Dry (D0) or in Moderate Drought, including in western areas that had received heavy rain from Helene earlier in the season. By late November, low streamflows were evident in the far western Mountains, the northern Piedmont, and scattered parts of the Coastal Plain.

Winter (December 2024, January 2025, February 2025)

Going into the winter, a weak La Niña pattern was emerging, which tends to favor overall warm and dry weather in North Carolina due to a weakening of the jet streams that tends to shift the storm track to our north. Indeed, the season finished as our 63rd-warmest and 22nd-driest on record, although it wasn't warm and precipitation-free from end to end.

December saw several rounds of precipitation in the west, beginning with a light snow event and continuing with several frontal passages in the middle and end of the month. However, eastern areas missed out on these events and endured another dry month. Contrasting those conditions, Mount Airy had its 5th-*wettest* December on record while it was the 11th-*driest* December in New Bern.

In early January, a much different weather pattern emerged, with cold air rushing in from the north. That prolonged cold blast made it our 17th-coolest January on record statewide. Moisture from passing weather systems produced multiple wintry events, including rare totals of more than 6 inches along the Outer Banks on January 21-22. But the liquid equivalent of that powdery snow was low, and with few rain events mixed in, it finished as our state's 7th-driest January on record.

February brought one more snow event, with 8 inches in Elizabeth City, but it was otherwise a warm and spring-like month. Areas to the north and west were generally wetter than normal, which more than halved the coverage of Moderate Drought – from 92 percent at the beginning of the month to 43 percent at the end. Southeastern areas were drier, with Wilmington

recording its 11th-driest February on record. Moderate to Severe Drought (D2) conditions lingered in that corner of the state by the end of the winter.

Spring (March, April, and May 2025)

As quickly as drought faded in February, it returned in March, as bone dry weather across the western half of the state during the spring fire season contributed to rapid development of wildfire activity. Statewide, it was the 22nd-driest March on record, but local sites were even drier, including the driest March for Danbury and the 2nd-driest in Lenoir and North Wilkesboro.

April showers were also shier than usual, with the month ranking as our 40th-driest April on record. Coastal areas again missed out on the rain this month, and Severe Drought expanded across the southern and central Coastal Plain into areas such as Plymouth, which had its 6th-driest April on record. Wildfires remained an issue at both ends of the state, including the 950-acre Black Swamp fire in Brunswick County and the 2,085-acre Bee Rock Creek fire in McDowell County both igniting in April.

May finally brought the widespread return of rainfall, and it finished as our 4th-wettest May on record statewide. Areas such as Asheville and Shelby had their wettest single days since Helene, and that rain combined with the progressing green-up helped wind down the active spring fire season. It also reduced the coverage of drought, leaving only 6 percent of the state – mostly along the coastline – in Moderate Drought entering the summer.

June 2025

June picked up where May left off, with more locally heavy rain showers particularly in the northeast – the first areas where drought emerged in the fall of 2024. Greenville had its fifth-wettest June on record, and that rain finally blotted out the last traces of drought in the state almost eight months after it first emerged. With 33 consecutive weeks of drought present in part of the state, it was the sixth-longest drought for North Carolina since the advent of the U.S. Drought Monitor in 2000.

<u>Streamflow and Groundwater – US Geological Survey (USGS) (Sarina Little, Curtis Weaver)</u>

Streamflow conditions during the annual report period (July 1, 2024, through June 30, 2025) were characterized by four brief periods during which below-normal conditions (less than the 25th percentile) were observed across much of the state. These below-normal periods were noted in the first half of July 2024, from the latter half of January 2025 through mid-February

2025, end of March 2025 through mid-April 2025, and the end of April 2025 through the beginning of May 2025.

Figure 1 shown below indicates the percentage of USGS stream gages in North Carolina with seven-day average stream flows (or seven-day flows) less than the 25th, 10th, and 1st percentiles (or record-low for the calendar date) during the annual period. The percentages of USGS streamgages across North Carolina having seven-day flow percentiles below the 25th and 10th percentiles reached maximum values of 90 percent (January 30, 2025) and 41 percent (April 2, 2025), respectively. The maximum percentages observed during the previous annual period (2023-2024) were 89 and 57 percent, respectively, for these two streamflow indicators.

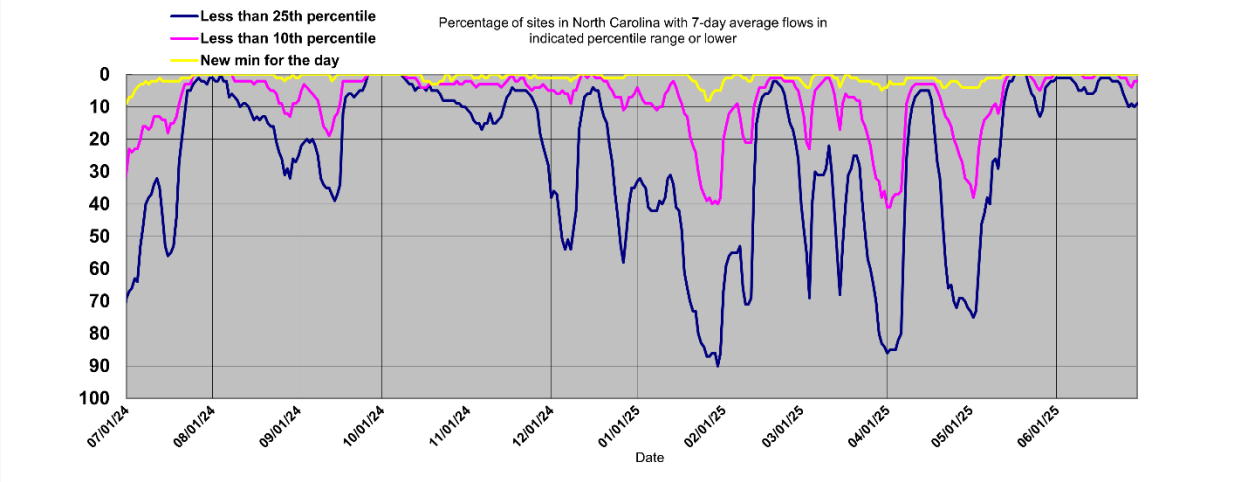

Figure 1. *7-day Flow Percentiles for USGS Streamgages in North Carolina*

The extent of below-normal streamflows across North Carolina during the start of the 2025 calendar year was further echoed with 92%of the stream gages across the state having 28-day average streamflows (or 28-day flows) less than the 25th percentile on February 9-11, 2025 (Figure 2, similarly structured as Figure 1 but for 28-day flows). Correspondingly, the maximum percentage of streamgages with 28-day flows less than the 10th percentile during that time reached 35 percent on February 11, 2025. The maximum percentage of streamgages with 28-day flows less than the 10th percentile, however, was 36 percent on April 6, 2025, which corresponded with the next period of below-normal conditions.

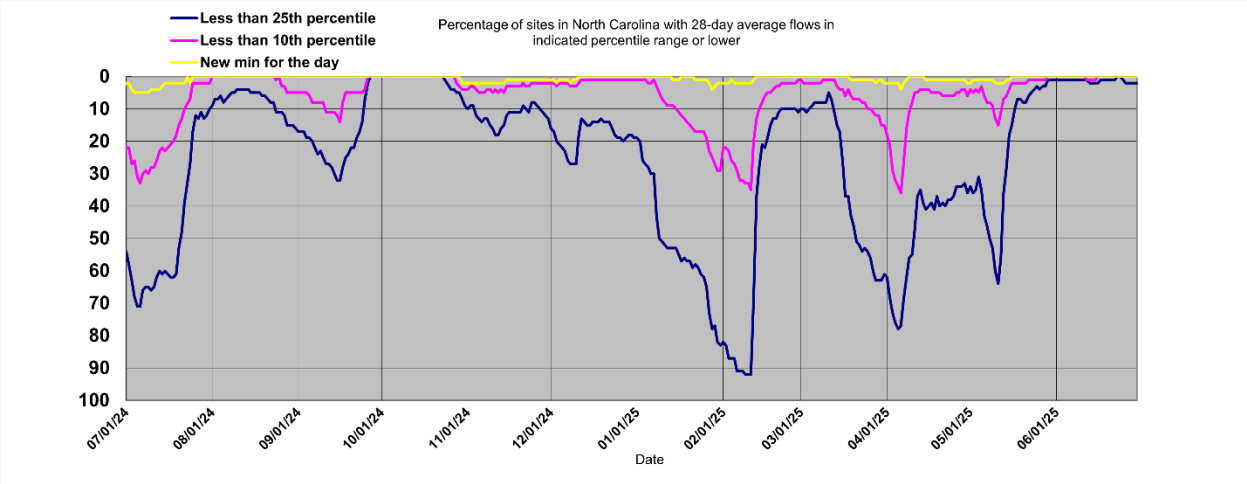

Figure 2. *28-day Flow Percentiles for USGS Streamgages in North Carolina*

Examination of approved (2024 water year) and provisional (2025 water year) daily discharge data indicates no period of record minimum daily mean discharges were set at any USGS streamgages in North Carolina during the annual period. However, varying numbers of zero-flow occurrences were observed at three streamgages during the period, meeting the previous record "zero flow" daily discharges set at these streamgages:

(1) USGS 0208111310 - Cashie River at SR 1257 near Windsor in Bertie County (11 days during July 1-11, 2024),
(2) USGS 02084557 – Van Swamp near Hoke in Washington County (2 days during July 5-6, 2024), and
(3) USGS 02101800 – Tick Creek near Mount Vernon Springs in Chatham County (5 days during July 1-5, 2024).

No period of record minimum seven-day flows were observed at any of the USGS streamgages in North Carolina, with exception of two of the three streamgages identified above (0208111310 and 02101800), where the previous record "zero flow" seven-day average streamflows were again observed within parts of the above-indicated periods.

No new minimum monthly average streamflows were observed during the annual period at the USGS streamgages North Carolina. However, new maximum monthly average streamflows were observed at 19 streamgages across central and eastern parts of the State. Of note, these new maximum records for monthly average streamflow were set for the month of August 2024 at all 19 streamgages following the passage of Hurricane Debby across central and eastern of the State.

Groundwater levels at the 13 observation wells within the USGS Climate Response Network (Figure 3) varied widely during the annual period from July 1, 2024, through June 30, 2025. The water levels in these 13 wells reflect the climate conditions (occurrence of precipitation), but changes in water levels are also affected by individual well characteristics (e.g., well depth, surrounding material through which the water moves). The number of observation wells within this network declined from 14 to 13, following the discontinuation of the Champion observation well in Haywood County (site number 352315082484401) in September 2024. The well was discontinued due to the loss of funding support for continued data collection. It should be noted that from mid-October 2024 through the end of April 2025, the Simpson well in Pitt County (site number 353219077153801) was discontinued until funding was procured to support continued data collection at the site, so there is no data available during that time period. Water levels at all wells were in normal to above-normal ranges at the close of the annual period (Figure 3).

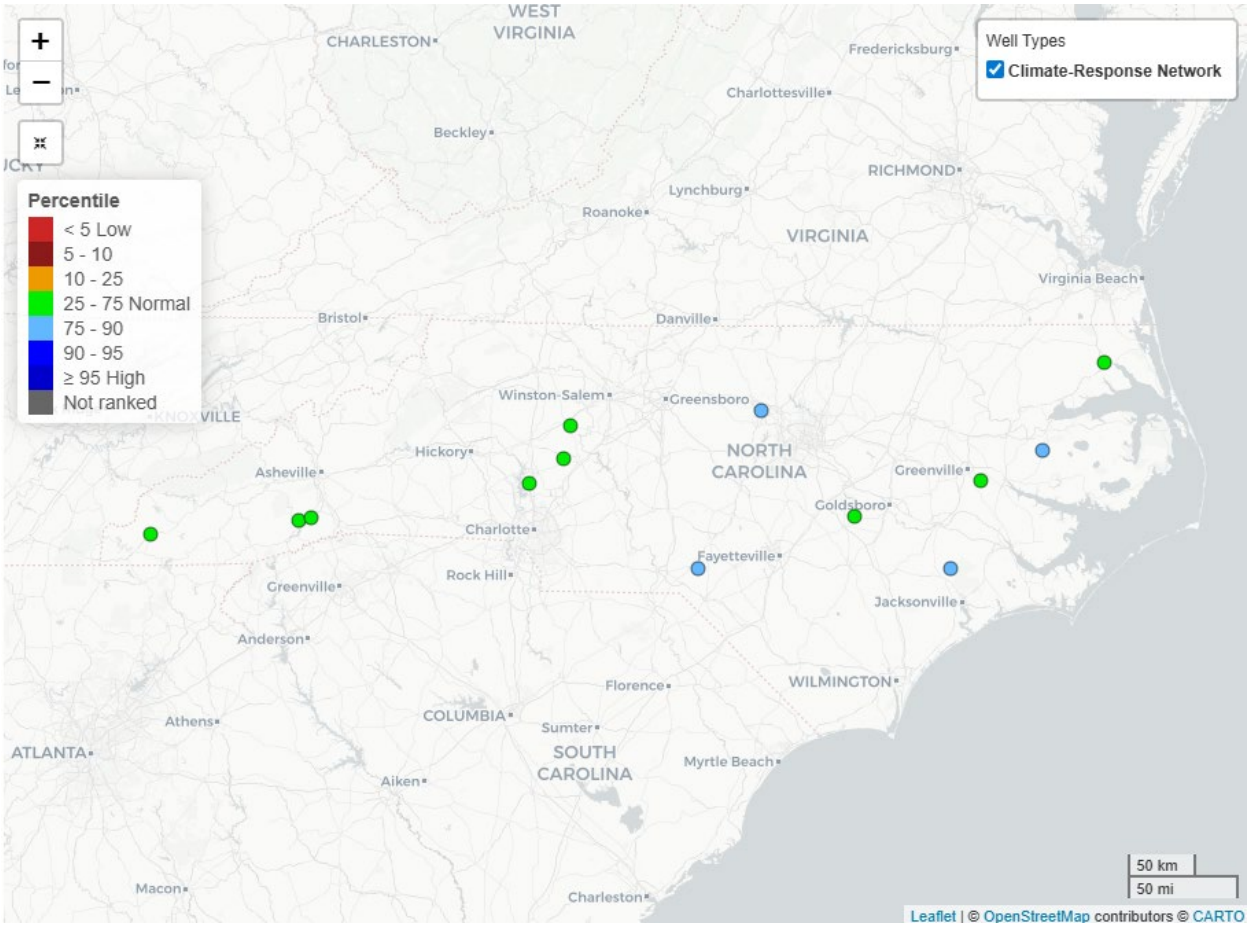

Figure 3. *13 Observation Wells across North Carolina within the USGS Climate Response Network as of June 30, 2025. All wells are in normal to above-normal percentile ranges for water level at the close of the annual period.*

At the beginning of the annual period in July 2024, observed water levels at the three Blue Ridge observation wells in this network began a general decline from mostly normal conditions. At the turn of the calendar year, water levels began to increase, though trends varied from site to site. The deeper Blantyre well in Transylvania County (site number 351808082374302), which typically shows slow-changing water levels, remained in normal or above-normal conditions for the annual period. The Pisgah Forest Alluvium well in Transylvania County (site number 351709082434101) remained in the normal to above-normal ranges for most of the annual period, though water levels dropped close to the below-normal range in mid-July 2024, mid-September 2024, and mid-February 2025, and for a very brief period from the end of March 2024 through beginning of April 2024. The most pronounced changes were seen in the Marble well in Cherokee County (site number 351121083545002). While primarily remaining in normal to above-normal ranges due to beneficial precipitation events, water levels at this well were in below-normal to well below-normal conditions from the end of June 2024 through end of July 2024, briefly at the end of September 2024, middle of November 2024, beginning and end of December 2024, and fairly consistently from the beginning of January 2025 through the end of April 2025. This mimics a period of dryness seen in the coastal wells (Figure 4).

It is worth noting that in all three wells, though of differing magnitudes, a response was seen at the end of September from the Hurricane Helene event. Overall, the end of the annual period ended within the normal range of water levels for all Blue Ridge observation sites. No period of record minimum water levels were noted among any of these three Blue Ridge wells during the annual period, however a new minimum monthly mean of daily mean water level values was recorded for the Marble well in Cherokee County for the month of March 2025. A new period of record maximum water level was recorded at the Pisgah Forest Alluvium well in Transylvania County on Sept. 27, 2024.

Water levels at three of the four Piedmont observation wells in this network, Langtree well in Iredell County (site number 353135080524201), the Barber well in Rowan County (site number 354057080362601), and Mocksville well in Davie County (site number 355359080331701) generally were in the normal ranges throughout the annual period, although occasional fluctuations into the above-normal ranges were observed. All three locations were in above-normal conditions for one to two months after Hurricane Helene at the end of September 2024. Analogous to water levels in the Blantyre well in the Blue Ridge region, water level changes in the Duke Forest well in Orange County (site number 355944079013401) have been observed to be from extremely slow to seemingly almost nonresponsive to precipitation events. Water levels at this site consistently increased and remained in above-normal to well above-normal conditions for the entirety of the annual period after leaving normal conditions in August 2024.

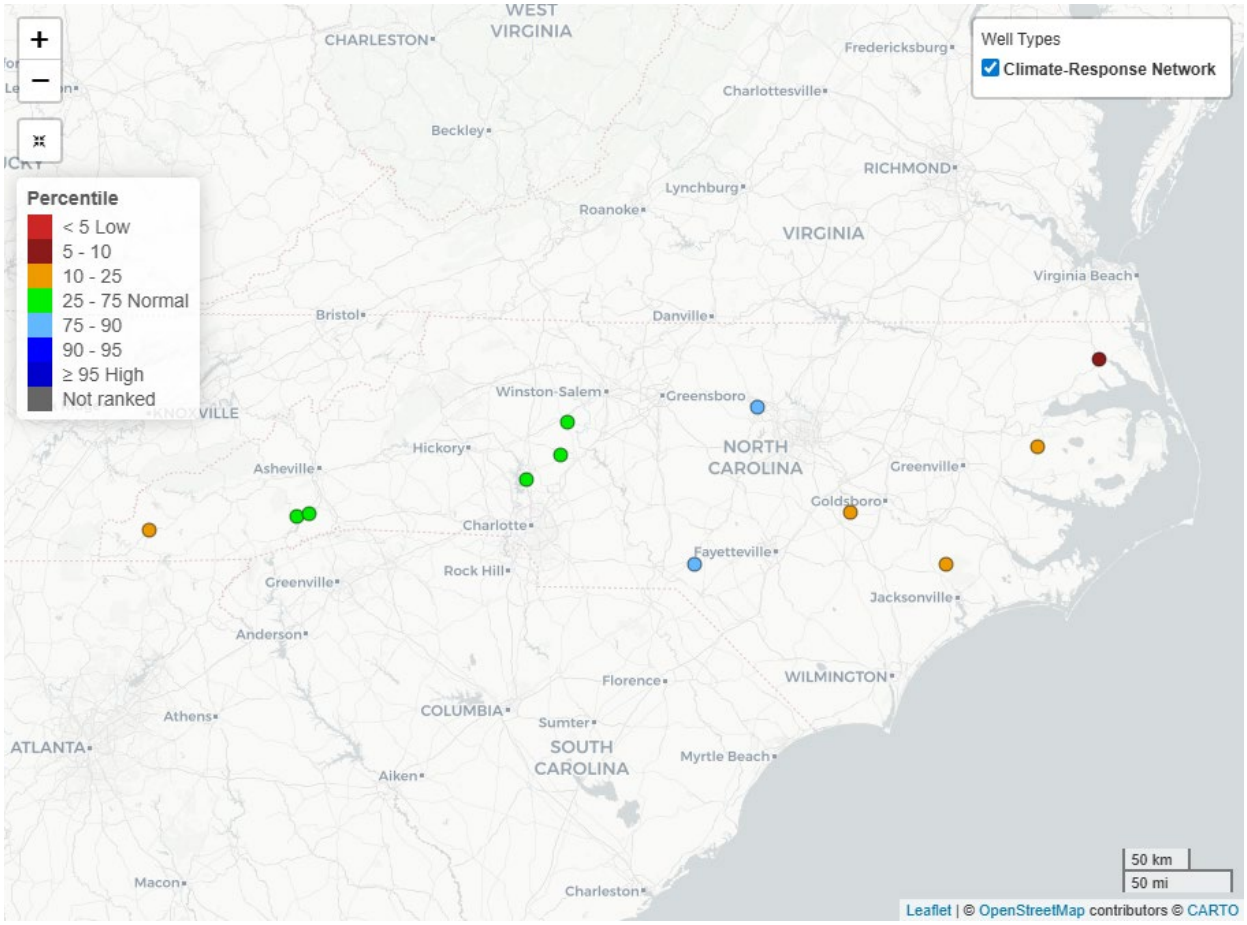

Figure 4. *13 Observation Wells across North Carolina within the USGS Climate Response Network as of December 03, 2024. Low water level conditions can be noted in the western most well and Coastal Plain wells, displaying the trend that occurred through the annual period.*

No period of record minimum water levels or new minimum monthly mean of daily mean water level values were noted among any of these four Piedmont wells during the annual period.

Water levels in the Marston observation well in Scotland County (Sandhills region, site number 345812079313401) were sustained within the normal to well above-normal ranges throughout the annual period, similar to patterns noted for the wells in the Piedmont region. Water levels were declining at the start of the annual period, then increased from mid-August 2024 through mid-October 2024. From October 2024 through the beginning of April 2025, water levels were characterized by a slow decline while remaining within the normal ranges. At the beginning of April 2025, water levels began to increase again, and the annual period ended with that trend. No period of record or monthly mean of daily mean water level values were noted for this well. Similar to water levels in the Blantyre well in the Blue Ridge region and the Duke Forest well in

the Piedmont region, water levels in the Marston well are characterized by slow responses to the occurrence of precipitation events.

Water levels varied widely during the annual period among the five observation wells in the Coastal Plain: Grantham well in Wayne County (site number 351849078163901), Simpson well in Pitt County (site number 353219077153801), Hoke well in Washington County (site number 354418076463601), Comfort Research Station (RS) well in Jones County (site number 345809077301408), and Elizabeth City in Pasquotank County (site number 361829076163201). Given the shallow depths of the Coastal Plain wells, water levels are typically quick to respond to the occurrence of precipitation. Hence a wide range of conditions can be in effect at a given point in time, as was noted for this annual period. All sites started the annual period in July 2024 with a pattern of increasing water level before taking on naturally differing fluctuations. With the exception of the Elizabeth City well in Pasquotank County, water levels in the remaining four Coastal Plain wells began the annual period in the below-normal water ranges. Conversely, below-normal water levels were present mostly throughout the annual period at the Elizabeth City well, reflective of the persistent dry conditions that remained in all months except for July, August, and September 2024.

Water levels in the Grantham well in Wayne County, Hoke well in Washington County, and Comfort Research Station (RS) well in Jones County were in the below-normal ranges for about half of the year. With the exception of the Simpson well (no data available during that time) water levels were in the below normal to well-below normal ranges beginning in either October, November, or December 2024 through May and June 2025, depending on the site (Figure 4). Despite the longer periods of low water level conditions, all Coastal Plain sites ended the annual period in normal to well-above normal water level conditions. In short, the above characterizations suggest water levels in the northern Coastal Plain were more commonly in the below-normal ranges during the annual period, though they exhibited a wide range of fluctuations across all water level ranges. No period of record water levels were noted for any of the five Coastal Plain wells. New minimum monthly mean of daily mean water levels were recorded for Grantham well in Wayne County for the month of February 2025, Comfort Research Station (RS) well in Jones County for the month of April 2025 and Elizabeth City in Pasquotank County for the month of May 2025.

Forestry – N.C. Forest Service (Jamie Dunbar)

From July 1, 2024, to June 30, 2025, the N.C. Forest Service responded to 5,634 wildfires across the state that, all together, burned approximately 34,266 acres on both public and private lands. The number of wildfires decreased by approximately 2 percent, while the number of acres increased by 22 percent over the previous fiscal year. The number of wildfires was 23 percent more than the 10-year average. The total number of acres burned was 16 percent above the 10-year average. Figure 5 presents the wildfire activity by month for the fiscal year 2025.

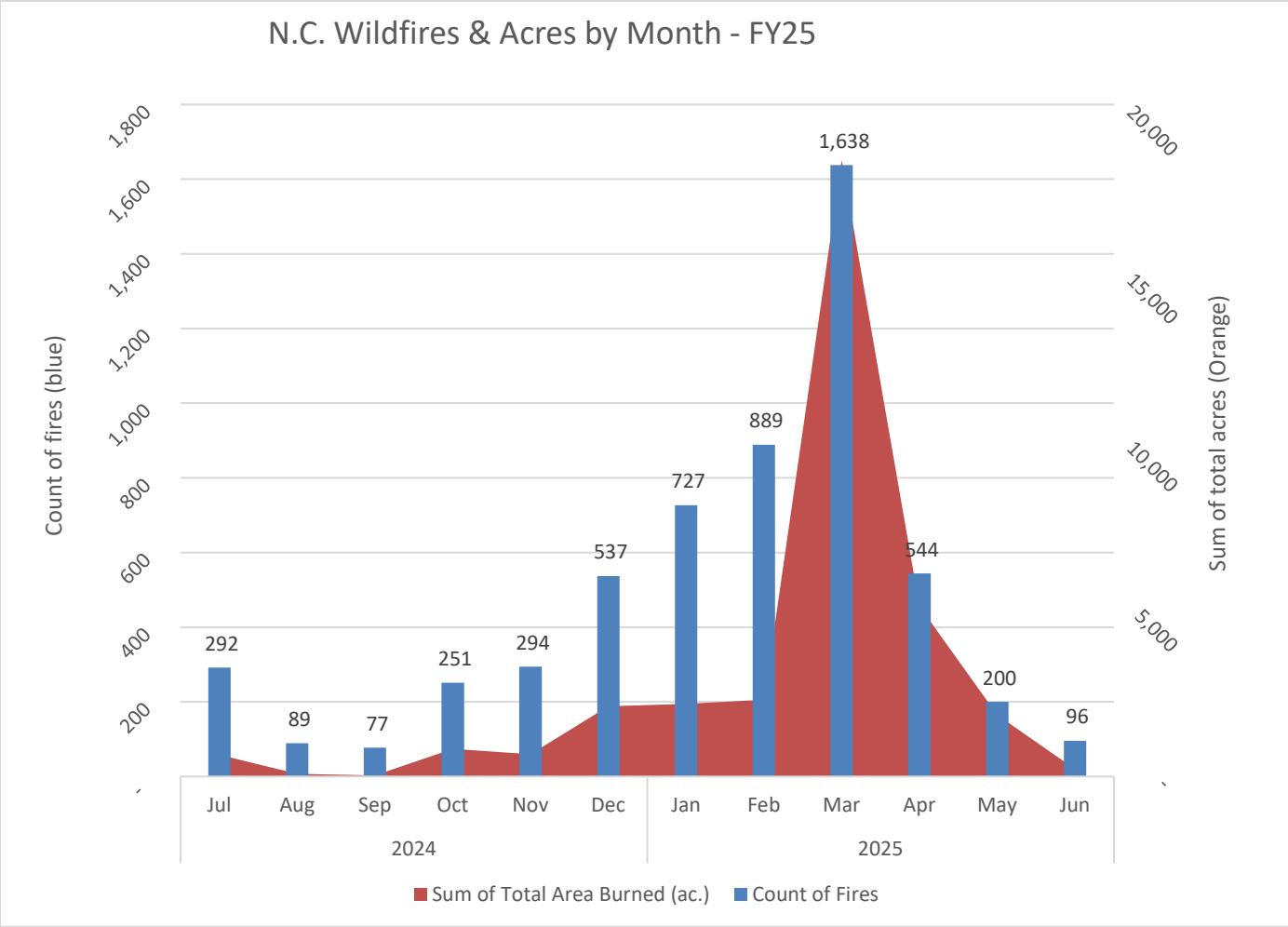

Figure 5. *Wildfire Activity by Month for Fiscal Year 2025*

Across North Carolina, bouts of abnormally hot and dry (and cold/dry) weather aligned with seasonal influences on forest fuels, leading to a significant increase in wildfire activity and difficulty of control from late fall 2024 through much of spring 2025. Surges of very dry air

combined with dormant, highly receptive fuels during winter and spring created ideal conditions for high-intensity wildfires, particularly in areas impacted by Hurricane Helene.

Helene's severe effects on the landscape substantially altered forest structure – reducing overstory shading and wind interception, increasing fuel loading, and rearranging fuels across thousands of acres. Damaged infrastructure and widespread "jackstraw timber" created additional challenges for access and fireline construction, further complicating wildfire suppression efforts. These conditions led to multiple concurrent Incident Management Team deployments, out-of-area resource requests, and significant control challenges, especially in the Mountain Region (NCFS Region 3). This is likely to be the new normal for the next several years, as more of the heavier fuels die/decay and become available to burn.

Major Wildfire Activity (FY25)

Numerous large wildfires occurred through winter/spring 2025 on both state and federally protected lands across North Carolina, with at least 37 wildfires exceeding 100 acres—many of them highly complex on a combination of state and federal jurisdictions.

Naming a few in Western North Carolina:

- **December 2024:** Buck Creek Fire (518 acres, McDowell County) and Coyote Fire (665 acres, Gaston County)
- **January 2025:** North Fork Fire (681 acres) and Crooked Creek Fire (235 acres), both in McDowell County
- **March 2025:** 3910 Fire (619 acres, Polk County); Deep Woods and Black Cove Fires (~7,473 acres, Polk/Henderson Counties)

Drought-related fuel dryness became a major contributor in the size, duration and intensity of incidents in the Coastal Region through late spring. Several larger coastal fires included:

- **February 2025:** Bud Stephens Road Fire (106 acres, Columbus County) and Rough Horn Road Fire (264 acres, Columbus County)
- **April 2025:** Hwy 210 Fire (661 acres, Pender County)
- **May 2025:** Sunset Road Fire (1,321 acres, Brunswick County)

Agriculture - North Carolina Cooperative Extension (Mike Yoder)

Summer – Fall 2024

July 2024 started out extremely dry across most of the state, from abnormally dry in the west to reports of severe and extreme dryness across the eastern 75 percent of the state. This was a carry-over from June so late planted crops were hurt the worst. Heavy coastal and then wide-spread rains alleviated much of this dryness by the third week in July.

By the end of August, the state's agricultural picture was in reasonably good shape with portions of the state seeing 150 to 400 percent of normal precipitation. There were, however, areas where stunted crops would not fully recover, due to the impact of the earlier drought conditions.

Early September saw moderate dryness creeping back into the western mountains with the greatest impacts on forages and pastures. This dryness too was somewhat alleviated with just spotty, abnormal dryness reported across the whole state through mid-October.

The great exception was the 40-inches of rain that fell on portions of western North Carolina as a result of Hurricane Helene. Helene was a 1,000-year flood event, and the flooding and landslides from the hurricane devastated agricultural lands and operations. By the end of October, spotty, moderate dryness was spread across the state, lasting into early November.

Winter – Spring 2025

The year started out with mild weather and enough moisture to maintain small grains and pastures across the state. March saw moderate dryness shift from the mountains to the Coastal Plain. This dryness, while temporary, slowed planting in a few eastern counties but did not impact crop production in any meaningful way. April started with abnormal dryness scattered throughout the state. Several of the counties bordering Virginia stayed dry through much of April and into May, but no agricultural impact was evident.

May through June was temperate with modest-but-adequate rainfall. There was an excellent crop response to the growing environment and adequate forage/pasture for livestock. The period ended with conditions near normal statewide.

2024 Overall

Generally-speaking, 2024 was a rather normal year for agriculture in North Carolina. While there were challenges, overall production was unchanged from the average year. The old saying that "all disasters are local" definitely applies to the spring drought in the eastern counties and the devastating floods and landslides of September in the west, the impacts of which will be felt in our state for many years.

Drought Condition Summary – North Carolina Department of Environmental Quality Division of Water Resources (Klaus Albertin)

The July 1, 2024, to June 30, 2025, period began with all of the state in moderate to severe drought or Abnormally Dry conditions. Heavy rains in September and October reset conditions to normal but a near complete lack of rainfall following Hurricane Helene resulted in Abnormally Dry conditions returning in November. It was notable that areas that had received 30+ inches of rainfall from Hurricane Helene were reporting dry conditions and low streamflows less than two months later. Conditions were consistently dry through the remainder of the time period, only returning to normal by late-June 2025 (see Figure 6).

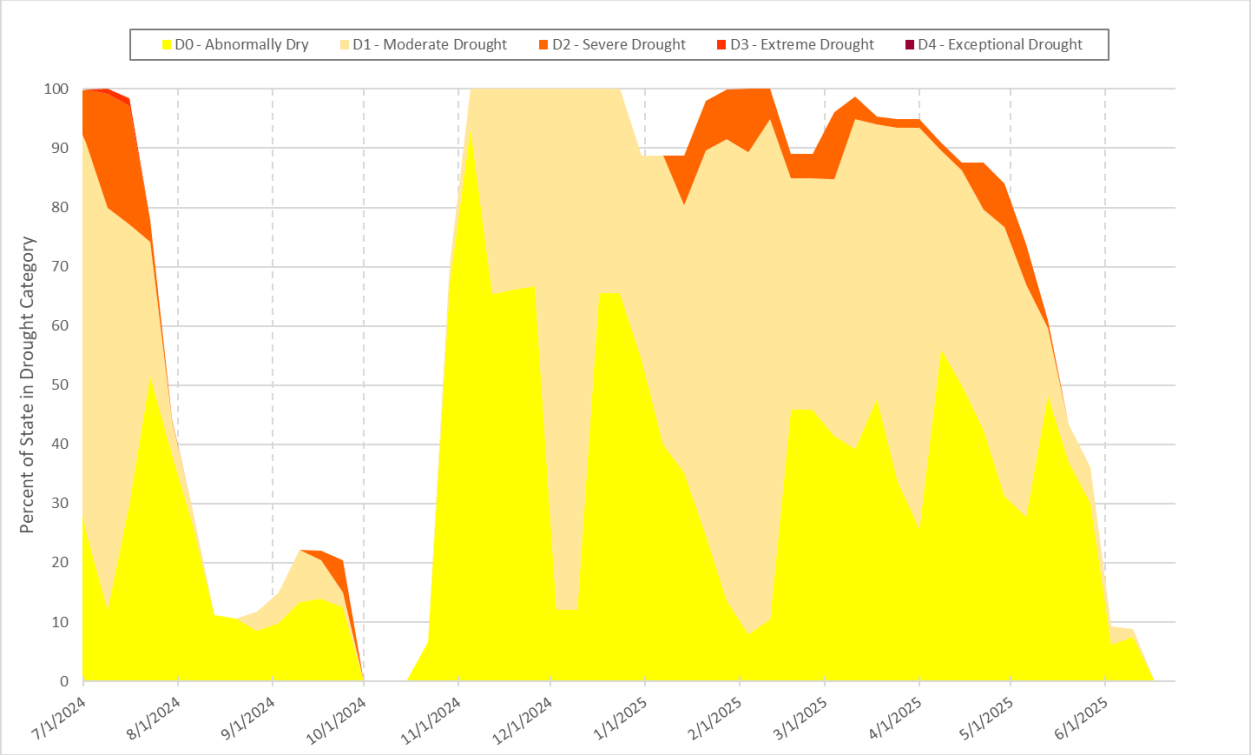

Figure 6. *Drought Levels from July 1, 2024, through June 30, 2025*

Summer 2024

Following a normal spring in 2024, dryness expanded rapidly in June. The entire state saw some level of dryness or drought on July 2, 2024 (Figure 7).

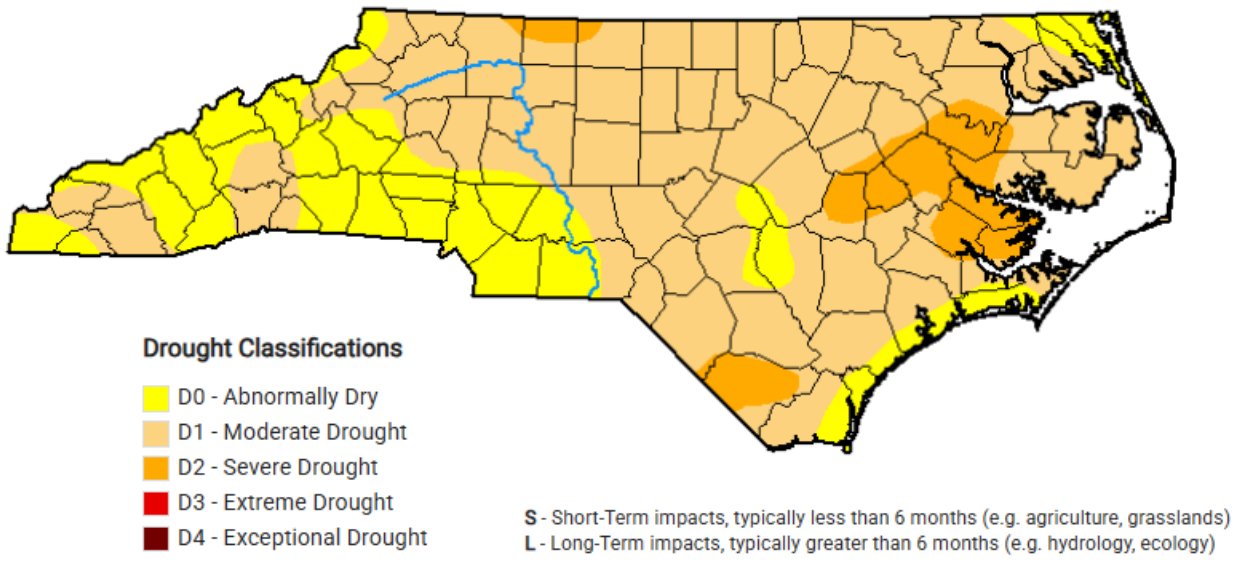

Figure 7. *North Carolina Drought Classification (July 2, 2024)*

Heavy rains in late July and early August improved conditions and only 11 percent of the state was abnormally dry by August 13, 2024 (Figure 8).

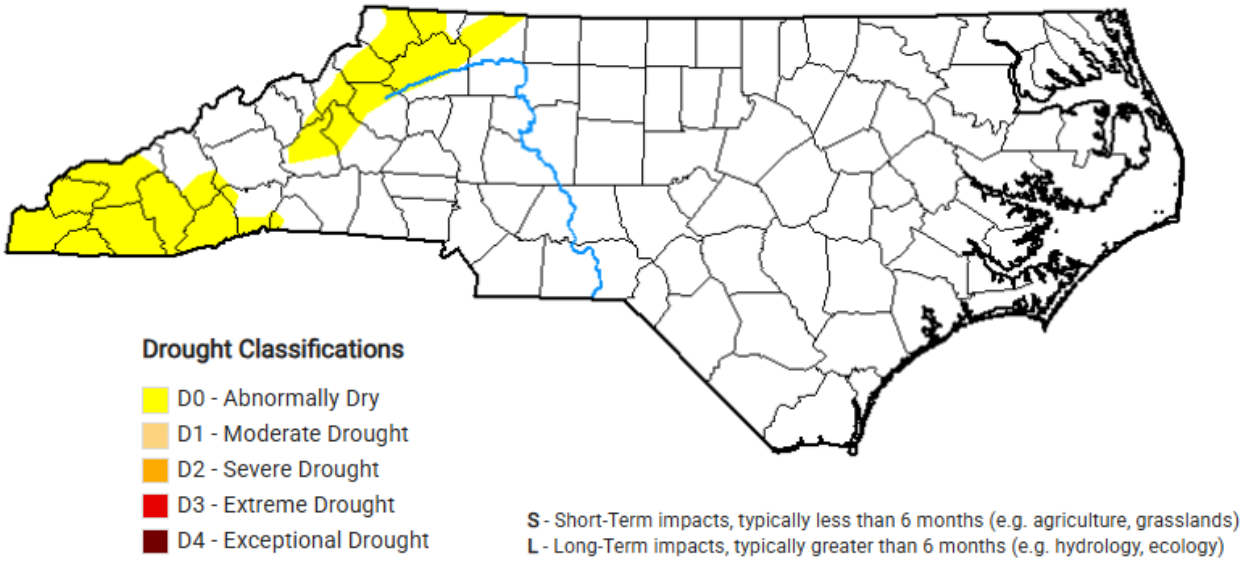

Figure 8. *North Carolina Drought Classification (mid-August 2024)*

A few weeks of below-normal rainfall saw severe drought and abnormal dry conditions creep back into western North Carolina in mid-September (Figure 9).

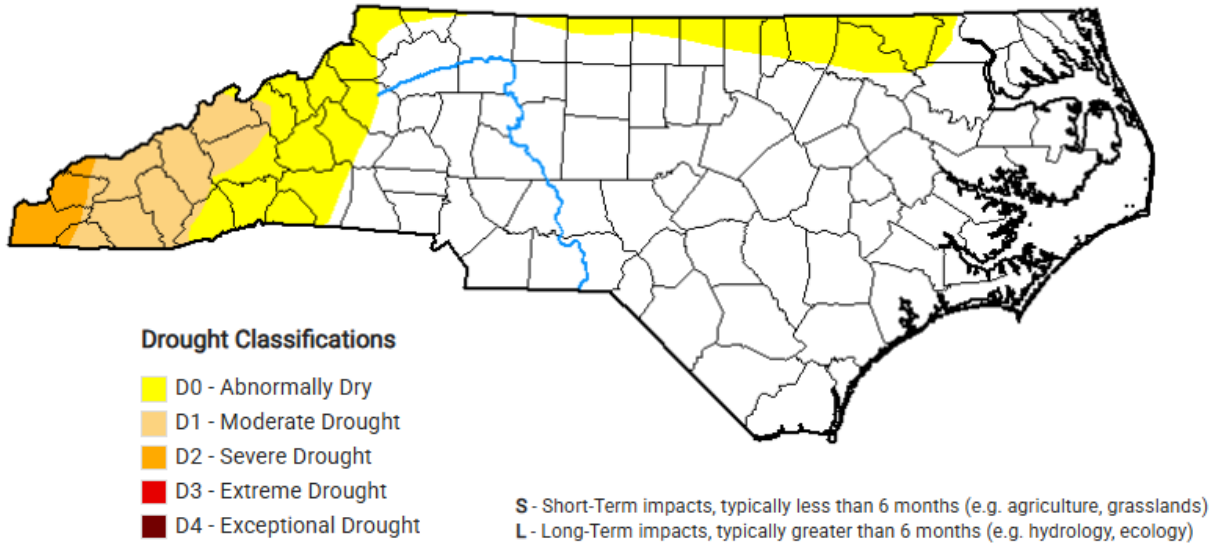

Figure 9. *North Carolina Drought Classification (mid-September 2024)*

Hurricane Helene and other rain in late September removed all traces of dryness. An extremely dry October saw severe drought and abnormal dry conditions return statewide by November 5, 2024 (Figure 10).

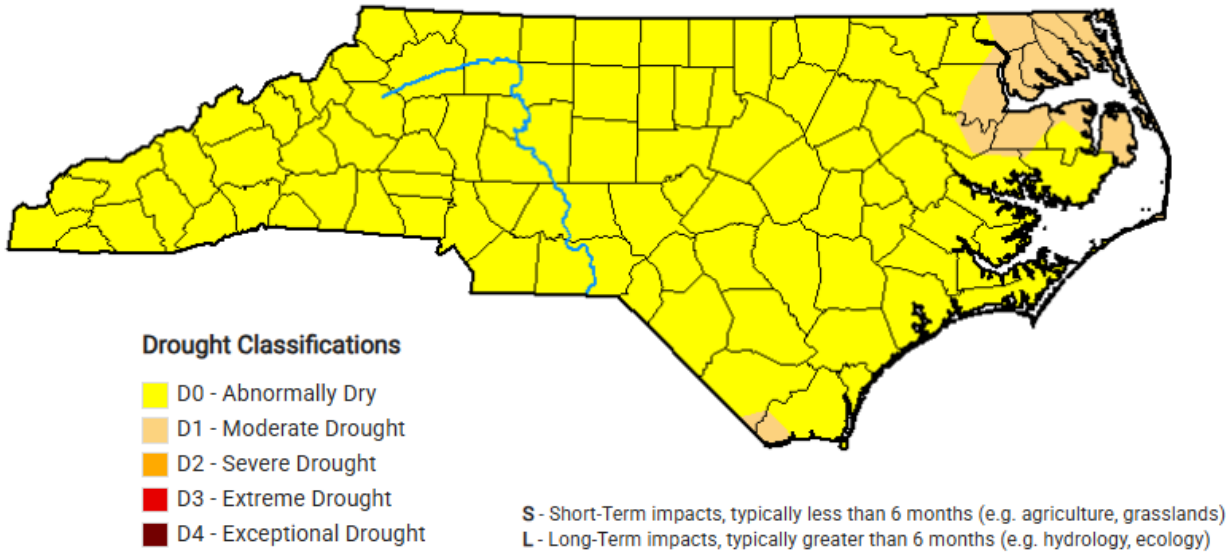

Figure 10. *North Carolina Drought Classification (November 21, 2024)*

Conditions gradually worsened throughout the winter with 90 to 100 percent of the state seeing some level of dryness or drought (Figure 11). The peak drought level was seen the week ending February 4th with over 81 percent of the state being in moderate drought and almost 11 percent being in severe drought. The remainder of the state was considered to be abnormally dry (Figure 12).

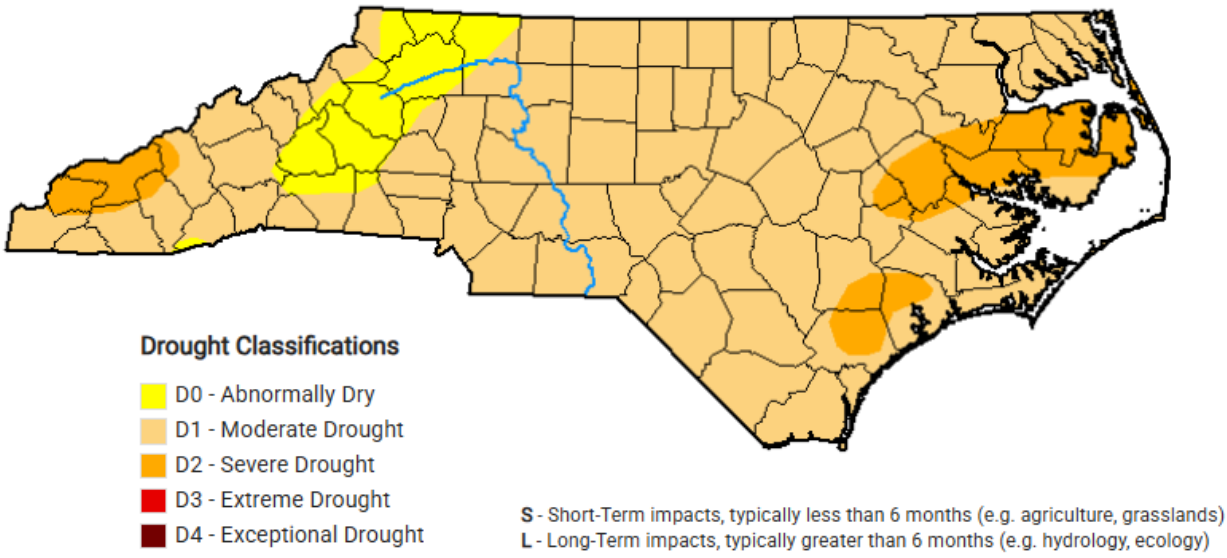

Figure 11. *North Carolina Drought Classification (February 4, 2025)*

Beneficial rains began in early spring and continued to reduce the dry areas in the state. By June 3, 2025, only three percent of the state remained in drought and six percent was abnormally dry. Rain in early June erased the last traces of dryness by June 17, 2025 (Figure 12).

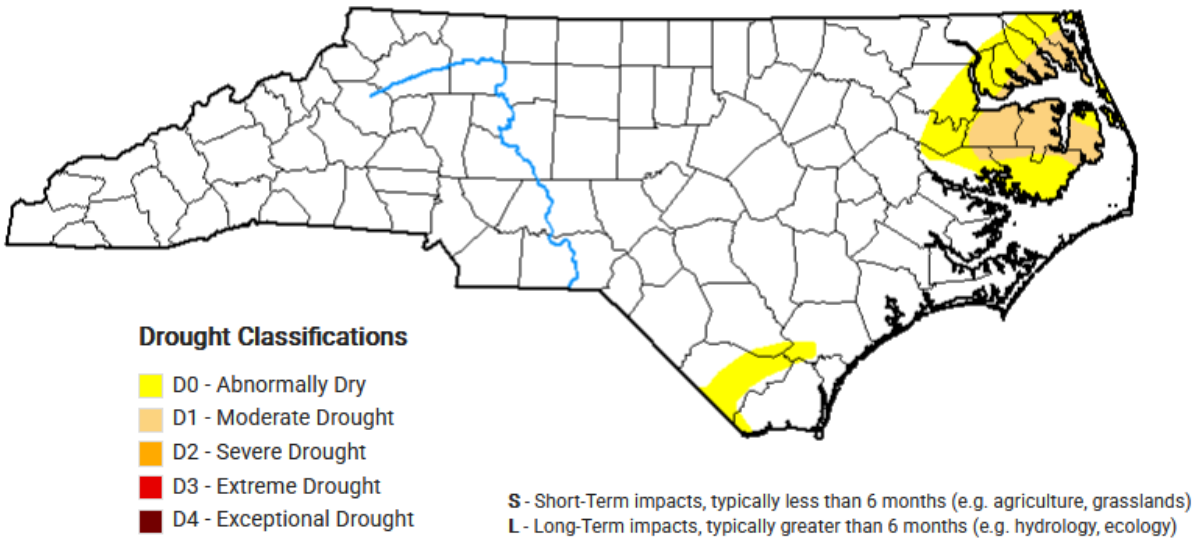

Figure 12. *North Carolina Drought Classification (June 3, 2025)*

Historical Perspective

Due to the natural variability of climate, drought may occur at any location in the state and at any time of the year. Typically, we see some part of the state with Abnormally Dry conditions and a much smaller area in Moderate Drought at some point in the year. Severe Drought or worse conditions do occur in many years, but the extent is often limited. The areas that are affected also shift throughout the year, as localized rainfall either hits or misses locations. In this context, the 2024 – 2025 period was fairly typical, although the state did see an extreme swing in conditions with Hurricane Helene and then the limited rainfall in October. Much of the state saw Abnormally Dry or Moderate Drought at some point during the year, but the severity and impacts were very limited. The most extreme drought of the period occurred during the winter, when water demands are typically the lowest and much of the state's ecosystem is semi-dormant.

Analysis using one of the standard drought assessment metrics, the Palmer Hydrologic Drought Index (PHDI), provides insight into long-term drought conditions for North Carolina (Figure 13). Similar to the standard deviation of a normal distribution in statistics, PHDI values within +/- 2 reflect typical conditions. Values outside of this range show either very wet (positive) or very dry (negative) conditions. Values above +4 and below -4 reflect very extreme conditions.

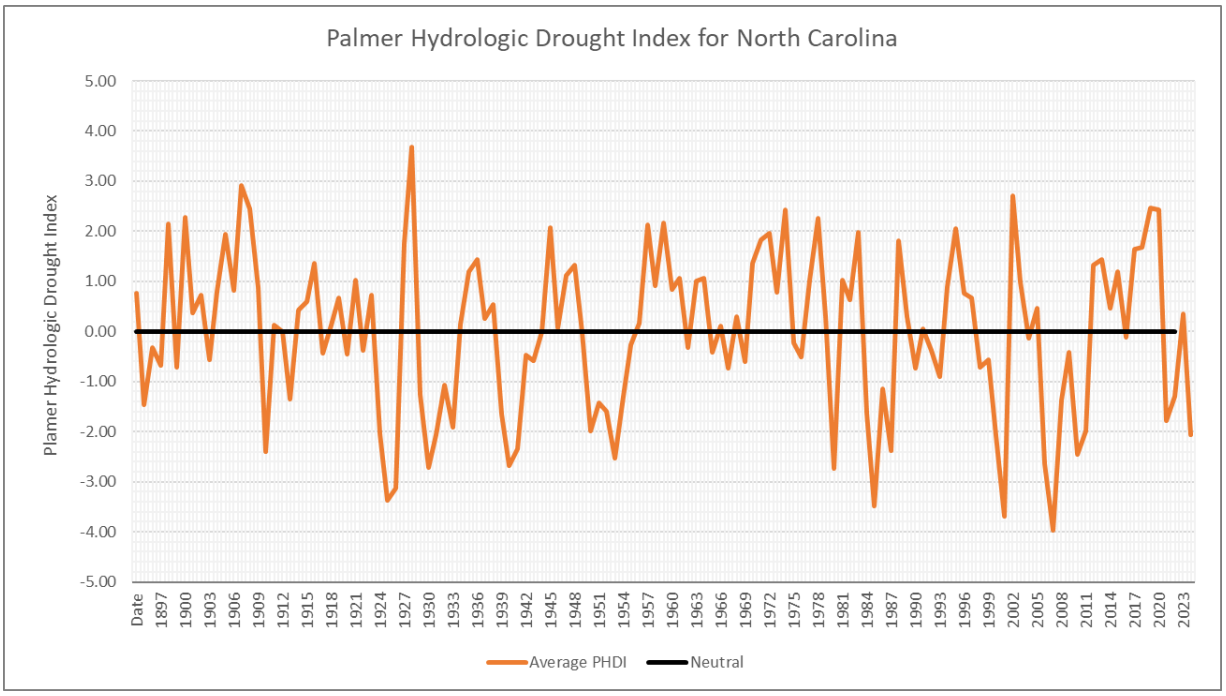

Figure 13. *Palmer Hydrologic Drought Index since 1895* Source: NOAA, 2025

North Carolina experienced extreme drought conditions from 1925 through 1927, with PHDI values reaching -4.1 at one point. A very wet period followed, and then an extreme drought occurred in 1932-1933. This extreme drought period saw the lowest individual monthly PHDI value of -4.74. Occasional, moderate droughts occured in the 1940s and 1950s, but it wasn't until the late 1980s that extreme drought returned. The PHDI reached a low of -4.6 in July 1986. Moderate to wet conditions returned in the 1990s, but two of the most extreme droughts in North Carolina's recorded meteorological history occurred between 2000 and 2010. One of the wettest years also occurred during this period. Since 2010, conditions have been less extreme but highly variable, swinging from moderately wet to moderately dry. No clear trend is seen, but it does appear that more extreme swings in conditions are likely. The North Carolina PHDI values for the report period averaged -0.56 (NOAA, 2025). Since the 2007 to 2008 drought, conditions had been trending wetter than normal. However, conditions over recent years swung back to slightly below normal.

The 2020 North Carolina Climate Science Report (Kunkel et. Al., 2020) found that based on historical observations and projected changes to temperature and rainfall, it is likely that future droughts in North Carolina will be more frequent and intense due to higher temperatures, leading to increased evaporation. The total annual precipitation is not expected to change significantly but variability is expected to increase with more frequent intense rain events and more severe dry periods.

DMAC Meetings

Drought conditions in North Carolina are updated weekly through a video call with a Technical Drought Advisory Team, which is a sub-group of the DMAC. The team consists of experts on climate, weather, hydrology, water supply, forestry and agriculture that report each week on streams flows, groundwater levels, reservoirs levels, wildfire activity, water supplies, and crop conditions. Based on this information, the team makes a recommendation to the U.S. Drought Monitor author on the state's drought conditions for that week. Those recommendations are used to draw the national drought map (https://droughtmonitor.unl.edu/CurrentMap.aspx) each Thursday. To see or download a copy of the current drought map for North Carolina, visit the state's official drought website at: www.ncdrought.org.

The DMAC is required by law to meet in person at least once each calendar year. The 2025 annual council meeting is scheduled for Sept. 18 at 10 a.m. Items to be discussed at the meeting include a recap of stream flow and groundwater levels, lake and reservoir levels, agriculture, forestry, and public water systems conditions over the July 2024 through June 2025 period.

References:

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