North Carolina Drought Management Advisory Council
Annual Meeting
Department of Agriculture – Agricultural Sciences Center

Summary from September 11, 2024 Meeting

The meeting commenced at approximately 12:55 pm by Mr. Klaus Albertin, North Carolina Department of Environmental Quality (NCDEQ) - Division of Water Resources (DWR) – Water Supply Planning Engineer and North Carolina Drought Management Advisory Council (NC DMAC) chairman. He thanked everyone for attending the annual meeting of the NC DMAC and introduced Mr. David Smith, Deputy Commissioner, Department of Agriculture, to open the meeting. Mr. Smith thanked everyone for coming and for the efforts made all year through the weekly drought call. He noted that the drought in June coupled with extremely heavy rainfall events this summer has made for a devasting year for agriculture in North Carolina. It has been decades since we've observed anything near this devastation with estimated crop losses of 30 percent in 50 counties from Hurricane Debby, not to mention up to 50 percent estimated losses from the drought in June throughout the state.

Following Mr. Smith, Mr. Linwood Peele provided a few opening remarks. He thanked the members of the Council both for their attendance today, as well as, every week for the drought call. The North Carolina Drought Management Advisory Council is a volunteer group of a wide range of federal and state agencies and private energy companies and is viewed across the country as a model for drought councils.

Mr. Albertin reiterated his appreciation for all the effort the technical team puts in to produce a weekly recommendation sent to the National Drought Monitor. He began the presentations with the statutory requirements and guidance, noting that the purpose of the NC DMAC is multi-faceted. The primary purposes of the NC DMAC include improved coordination, management, and notification of drought conditions statewide. In addition, the NC DMAC should work to increase the confidence from the public in our drought preparedness. The information reported is to include a wide range of factors including not only the climatic and measurable conditions, but also impacts to people and property. To achieve this, the involvement from many partner groups and agencies are critical. Representatives from the various agencies included in the NC DMAC are required to meet annual to discuss not only the current conditions of the state, but to review the conditions experienced over the past year and share any achievements and/or lessons learned. Following this overview of the NC DMAC, Mr. Albertin provided an agenda for the day's proceedings.

The agenda followed the customary order of reports as presented during the weekly conference calls, with the North Carolina State Climate Office (SCO) leading off. Mr. Corey Davis, SCO Assistant State Climatologist, provided an overview of the statistical climate data over the past

year (July 2023 – July 2024). Mr. Davis used the term "whiplash" to describe the past year with wetter conditions in late summer and early fall quickly transition to severe dryness by the end of November 2023, leading D2 and D3 stages in the Mountains and Piedmont. Then, quickly dissipating due to heavy rains primarily from wet weather patterns through the early winter. Regular rainfall events continued through the winter, with another brief period of dryness in March and April. Rains throughout May put the state back in somewhat normal conditions. However, those gains quickly disappeared as the rain dried up and the heat intensified from a heat dome in June 2024. As a result, June 2024 will go down as the 2nd driest and 20th warmest on record. Interestingly, the onset drought in June was also noted as being the 2nd most rapid since the drought monitor began keeps records. In addition to June 2024 having had the warmest average temperatures, every month during the review period was warmer than average.

Following Mr. Davis' presentation, Mr. Albertin asked everyone in the room to introduce themselves. Then he introduced Mr. Barrett Smith, service hydrologist with the National Weather Service (NWS) in Raleigh. Mr. Albertin noted that the weather forecasts are much needed information that provides context for the reports that follow from the membership of the weekly Drought Council Technical Team. However, it also important to note that the Drought Council does not directly consider the NWS forecasts in drawing the weekly drought map recommendations, focusing instead on the current conditions. Mr. Smith opened his presentation by discussing the SPoRT Soil Moisture graphics that show the state appears to be drying following Hurricane Debby. We are expected to continue recovering from the June dry period. In addition, a low front off the coast of North Carolina may become yet another significant rain event with 2-4 inches projected across the Mountains and Piedmont. Therefore, following a bit of a lull in the tropics, it appears that the influence from tropical storm systems is increasing. The longer-term three-month outlook shows the hot and dry weather returning. The ENSO (El Nino Southern Oscillation) forecasts show a return of a La Nina weather pattern in the winter. Typically, this suggests drier and warmer conditions.

Mr. Curtis Weaver, Assistant Director for Data - North Carolina with the United States Geological Service (USGS) in Raleigh, provided a presentation on stream flow gage data over the previous year. Mr. Weaver opened his presentation by introducing Sarina Little, who is expected to take over Mr. Weaver's long-held day-to-day participation on the Drought Council within the next few months. Mr. Weaver then provided some necessary background on stream flows and their relationship to inputs and outputs in the water cycle. USGS is often known as the preeminent water data repository in the United States. In North Carolina alone the agency maintains 294 continuously recording streamflow gages and 64 groundwater well gages across the state, hosting this data, much of which in real time, on the USGS maintained website. In addition, there are 167 precipitation stations, co-located with existing streamflow gage stations. Mr. Weaver discussed the connection between streamflows and groundwater. Baseflow in streams represents the portion provided by surficial groundwater, with all streamflow above the baseflow volume supplied by surface runoff. Mr. Weaver also provided

a brief tutorial on how the gages operate through use of transducers in the water pressuring changes that directly correlate to known discharge curves created for each stream gage location. These discharge curves are then used to determine the flow.

Using the statewide graphic of stream flows denoting 7-day average flow and 28-day average flow, Mr. Weaver noted four distinct dry periods over the study period, with two of those being significant; November 2023 and June 2024. However, similar to Corey Davis' presentation the streamflow graphics denote regular swings between low-flow to high-flow conditions throughout the year. There were no new period of record minimums set for any stream gage in the state and there were only 10 gages that set minimum monthly records over the past year.

Following Mr. Weaver's presentation, Mr. Albertin introduced Mr. Mark Durway, Hydrogeologist in the DWR - Groundwater Resources Branch, to provide a synopsis of groundwater conditions statewide over the previous year. Mr. Durway opened his presentation by noting the Groundwater Management Branch maintains 240 groundwater stations containing 699 individual groundwater wells. 84 wells monitoring drought response. He then provided graphical data depicting the back-and-forth nature of water level conditions in 2023-2024 caused by heavy rainfalls followed by long dry periods, similar to what had been discussed in previous presentations.

Following Mr. Durway's presentation, Mr. Phil Fragapane, Engineer with Duke Energy Hydro Operations, provided a brief annual summary for each of their projects/reservoirs on the Catawba River, Yadkin River, and waters in the western portion of the state. He noted that the long dry periods in the Fall of 2023 resulted in implementation of LIP stage 1 for all projects in the Catawba Wateree River basin in November 1, 2023. Stage 1 was improved to Stage 0 on January 17, 2024 because of the significant rains observed in early winter 2023-2024. This trend continued, and on February 16, 2024, all LIP Stage Restrictions were lifted. He added that even though there were noted drier and wetter periods in the Yadkin - Pee Dee River basin there were no low inflow protocol (LIP) stages initiated at any time over the past year due in part to careful management.

Next, Mr. Tony Young, United States Army Corps of Engineers (USACE) – Wilmington District Water Management Chief, provided a synopsis of the reservoir conditions over the past year. He opened by going through a figure depicting of the water level departures from guide curve elevations for all four of the projects/reservoirs managed by the USACE in North Carolina over the past year. The four projects managed by the USACE in North Carolina are, Falls Lake, Jordan Lake, Kerr Scott Reservoir, and Kerr Lake. Similar to earlier reports, Mr. Young noted significant dips in reservoir storage statewide in November 2023 and June 2024, The November decline coincided with an operational drawdown at Jordan Lake resulting in water elevations falling to more than four feet below normal pool. During this time Jordan Lake had approximately 50 percent of the water quality storage remaining to meet downstream needs, while the water quality storage in Falls Lake dropped to approximately 38 percent remaining.

However, those conditions dramatically changed in the following couple months, with the water elevations in Kerr Scott Reservoir rising to more than 12 feet above the normal pool in January. Similar to previous reports, by late-June conditions had worsened and Kerr Scott Reservoir found itself two feet below normal pool, which ranks as the third lowest water elevation on record at the reservoir. This was followed by heavy rains in July and August, which resulted in the water levels in Jordan Lake to rise 13 feet above normal pool. As a result of these roller-coaster conditions, the USACE has been managing the four reservoir projects across the state on a week-by-week basis.

Following the report from Mr. Young, Mr. Harold Brady, NCDEQ - Division of Water Resources, provided the annual reports of the reservoir conditions from the Tennessee Valley Authority (TVA) and Cube Hydro. According to the information provided, TVA was largely able to remain at or above guide curve all year long due to steady rainfall in the south-western portions of the state. Similarly, Cube Hydro reported their projects were able to remain near guide curve throughout the year, with no triggering of the low-inflow protocol (LIP) stages.

Mr. Jaime Dunbar, North Carolina Forest Service - Fire Environmental Forester, then provided details of fire conditions across North Carolina over the past year. He began by providing some background on the State Forest Service within the Department of Agriculture which currently has over 600 full-time staff managing the forest resources across North Carolina. Mr. Dunbar pointed out that the "burn bans" (i.e., fuel & fire advisories) during the dry conditions in November 2023 were part of the largest contiguous coverage of advisories in the southeast since 2016. So far, 2024 has not been an unusually abnormal year, with 5,766 reported fires impacting over 28,000 acres across the state. Interestingly, the number of fires of above average, while the acreage impacted is below average. Robeson County has had the greatest number of fires in 2024, while Carteret County has reported the greatest acreage of impacts from fire. Debris burning and lightning accounted for the largest percentage of burned acreage with both blamed for 24 percent of the fires each. Currently, near normal fire danger conditions are present across the state, except for areas in the Mountains that are in the 98th percentile following the Keetch-Byrum Drought Index (KBDI). The Keetch-Byrum Drought Index (KBDI) provides a numerical guide using multiple environmental variables at specific sites to estimate fire danger, with low values associated with reduced fire danger and high values associated with increased fire danger. This index effectively estimates the capacity of the soil to hold water based on a 0-800 scale, with 0 being completely saturated and 800 having no moisture in the soil. Values greater than 600 are always a concern no matter where in the state they are observed. Factors used to determine the KBDI values include the location, temperature, and precipitation.

Lastly, Dr. Mike Yoder, Emergency Programs Coordinator with the North Carolina State University Cooperative Extension, provided a synopsis of the previous year's agricultural drought issues statewide. Dr. Yoder opened by reiterating Mr. David Smith's comments at the beginning of the meeting, that this has been an extremely tough year for agriculture across the state. As bad as the drought impacts have been to crops, the extremely heavy rainfall at times

is perhaps even more impactful. That said, the dry conditions in November 2023 were actually helpful for farmers, as it provided good conditions for harvesting without any negative yield impacts. Following the dry conditions in late-Fall, the winter and early-Spring rains provided excellent conditions for planting. As well, the heavy rainfall in May allowed for prime conditions for late season planting. However, extremely dry conditions throughout June were crippling for many crops, including corn. For corn, rain in June is critical for the development of "silking". Without the rainfall the corn crop will be severely stunted with significant impacts to yield. The degree of impacts from the dry June conditions varied considerably based largely on location and soil type. The soils with limited water holding capacities appear to have had the largest crop impacts. The crops that did survive the June drought conditions, particularly tobacco, were then battered by the heavy rains in July and August, leading to even greater yield losses. Even the late season crops were not spared from these impacts. All of these issues have led to one of the worst years for agriculture in North Carolina in decades.

Mr. Albertin ended the meeting by providing a recap of the changing drought map over the past year, noting the 3 drought periods: November 2023, April 2024, and June 2024. Mr. Albertin briefly mentioned the potential development of by-laws for the Council, but that it will largely serve to reiterate structure and expectations already provided in the general statute that established the Drought Management Advisory Council and Technical Committee. He thanked all of the partner organizations and attendees, reminding everyone in the meeting that the National Drought Monitor promotes the North Carolina Drought Management Advisory Council as a model for other states to follow. Mr. Albertin stated that he looks forward to seeing everyone at next year's annual meeting of the North Carolina Drought Management Advisory Council. With no further business to discuss, Mr. Albertin adjourned the meeting at approximately 4:00pm.