North Carolina Drought Management Advisory Council
Annual Meeting
North Carolina Department of Agriculture and Consumer Services
Steve Troxler Agricultural Sciences Center
4400 Reedy Creek Rd., Raleigh

Summary from September 27, 2022 Meeting

The meeting commenced at approximately 1:00 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 (NCDMAC) chairman. He thanked everyone for attending the first in-person annual meeting of the NCDMAC since 2019 and noted that the NCDMAC is national recognized as a model for drought groups nationwide. Mr. Albertin then introduced Ms. Karen Higgins, DWR – Water Planning Section Chief for a brief welcome statement for all attendees.

Ms. Higgins began by thanking all of the attendees for their participation in the annual meeting. She gave a special thanks to the NCDMAC technical team members for their continued efforts throughout the year, keeping the weekly drought meetings going and for their efforts putting together the annual report. She wished Cabe Speary, former North Carolina Division of Forest Resources (NCDFR) NCDMAC representative, a good retirement and welcomed Greg Hicks who will serve as NCDFR's representative until a permanent replacement is selected. She then introduced Mr. David Smith, Chief Deputy Commissioner of the North Carolina Department of Agriculture and Consumer Services (NCDACS).

Mr. Smith welcomed everyone to the newly constructed NCDACS Steve Troxler Agricultural Sciences Center. He thanked the Drought Management Advisory Council Technical Team for the work all year and encouraged everyone to go to the State Fair which was to start in the following couple weeks.

Following Mr. Smith, Mr. Albertin reiterated his appreciation for all the effort the technical team puts in weekly to produce a weekly recommendation sent to the U.S. Drought Author. He began the presentations with the statutory requirements and guidance, noting that even though the annual meeting is required by statute it also serves an important purpose to the members and partners by providing an opportunity to connect or reconnect in person. The meeting looks back at the previous year and helps to prepare for the year ahead. The purpose of the NCDMAC is multi-faceted. The primary purposes of the NCDMAC include improved coordination, management, and notification of drought conditions statewide. In addition, the NCDMAC should work to increase the confidence of the public in our drought preparedness. Current or impending drought conditions and issues should be reported to the national drought monitor, the Environmental Management Commission (EMC), the NCDEQ Secretary, and the

Environmental Review Commission (ERC). 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 is critical. Representatives from the various agencies included in the NCDMAC are required to meet annually 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 NCDMAC, 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 Asst. State Climatologist, provided an overview of the statistical climate data over the past year (September 2021 – August 2022). Mr. Davis described the past year as generally drier than normal with periods of heavy precipitation, often coming when most needed. Statewide, temperatures were generally above normal all year, with December being the 2nd warmest on record. Last year was also below normal for precipitation statewide, with June being the 3rd driest on record. There were three tropical systems to impact North Carolina in the summer of 2021, with Hurricane Fred hitting the Mountains region especially hard resulting in several causalities. However, by early December 2021 severe drought covered half the state leading to a "La Nina" winter (warm/dry) as 2022 began. However, a more regular rainfall pattern in early Spring led to a clearing of the drought map with only moderate drought remaining in a few spots across the state. As Spring moved into Summer, this rainfall pattern became less reliable and areas of the Coastal Plain region of the state slipped back into severe drought. This pattern persisted through much of the summer with the severe drought not dissipating until late-August, largely from more regular afternoon thunderstorms. Due to these persistently dry conditions, the 2021-2022 period is noted as the fifth longest drought in North Carolina since the Drought Monitor began keeping these records in 2000.

Mr. Albertin provided a short introduction for Mr. Barrett Smith, service hydrologist with the National Weather Service (NWS) in Raleigh, noting that the weather forecasts are much needed information that provide context for the reports that follow from the membership of the weekly Drought Management Advisory Council Technical Team. However, it also important to note that the DMAC 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 with discussing the current soil moisture conditions, noting the particularly dry conditions persisting in the eastern portion of the state. He then provided detailed information related to the current Category 3 storm, Hurricane Ian, moving over Cuba at the time. The models were generally in. agreement that the hurricane would strengthen to Category 4 before hitting the United States; however, the models were not generally in agreement over the location of land fall. Nonetheless, it was predicted that North Carolina would receive between 3 to 5 inches of rainfall directly from the storm. Following Hurricane Ian, the hot and dry weather pattern is expected to continue across the state. The longer-term three-month outlook shows the

warmer than normal weather continuing, with below normal rainfall. 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; however, Mr. Smith noted that the La Nina pattern in 2020 led to wetter than normal conditions.

Following Mr. Smith's presentation, Mr. Albertin introduced Mr. Mark Durway, NCDWR Hydrogeologist with the Groundwater Management Branch. Mr. Durway opened his presentation by noting the Groundwater Management Branch maintains 235 groundwater monitoring stations and over 700 wells, with 65 of these wells designated as drought wells. These drought wells are relatively shallow and directly influenced by precipitation. These wells in combination with United States Geological Survey (USGS) stream flow gages are used to estimate baseflow conditions in streams across North Carolina. Mr. Durway then briefly detailed the how the "Well and Baseflow Drought Graphic" available on the Branch's webpage, and shown weekly during the drought call, is produced. Effectively, it overlays data from the drought indictor well network with baseflow data derived from USGS streamflow gage data. The derived baseflow data provides a supplemental, surrogate measurement of the volume of water provided by surficial groundwater. Mr. Durway provided detailed information on upcoming well drilling projects including a new well in Scotland County. These continual expansions of the drought indicator well network will further improve the statewide trend analyses already in place.

Mr. Curtis Weaver, Hydrologist with the USGS in Raleigh, provided a presentation on stream flow gage data over the previous year. Mr. Weaver noted that the USGS maintains 290 continuously recording streamflow gages and 65 groundwater well gages (adding one since last year's meeting) across the state, hosting this data, much of which in real time, on the USGS maintained website. Mr. Weaver described the new national water dashboard that will be rolled out in North Carolina soon. The new web application will contain all of the USGS data sources, including stream flow gages. Continuing the discussion from Mr. Durway, Mr. Weaver briefly discussed the importance of baseflow in streams and the connection with groundwater. Baseflow in streams represents the portion provided by surficial groundwater, with all streamflow above the baseflow volume supplied by surface runoff.

Between July 2020 and September 2021, Mr. Weaver noted only one new Period of Record (POR) minimum daily record and one new Period of Record (POR) maximum daily record, for the streamflow gages statewide. Using the annual "upside down" streamflow graphic, Mr. Weaver pointed out the consistent low flow conditions observed during November and December of 2021. Streamflow conditions in 2022 appeared to be directly correlated to precipitation patterns, with dramatic ups and downs with every rainfall event. This suggested that there was little surficial groundwater storage that would allow for the baseflow to buffer the fluctuations to a degree.

Following Mr. Weaver's presentation, Ms. Lynne Dunn, 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. Duke observed lower than normal conditions nearly throughout the entire year, with the Yadkin Pee-Dee basin in Low Inflow Protocol (LIP) Stage 0 for much of the year.

Next, Mr. Linwood Peele, DWR Water Supply Planning Branch Supervisor, provided a synopsis of the reservoir conditions over the past year for the United States Army Corps of Engineers (USACE) – Wilmington District Water Management District. He opened by stating that due to the reduced inflows over the past several months, both Falls and Jordan Lakes are currently in drought contingency, which allows for reduced minimum releases, as needed, from the projects. Currently, Falls Lake is operating under a 225 cfs target downstream of the dam at the US Highway 42 USGS gage. Jordan Lake currently has approximately 77 percent of the water quality pool remaining and has reduced the releases from the dam as a response. Nonetheless, at the time of the presentation, the USACE was preparing flood operations in preparation for the expected rainfalls from Hurricane Ian later in the week.

Mr. Peele also provided an update on the reservoir conditions for the Tennessee Valley Authority (TVA) projects in western North Carolina. He reported that unlike most of North Carolina, the TVA has observed somewhat higher than normal precipitation over the past year, which has allowed for the reservoirs to remain at or above their guide curves for most the year. Lastly, Mr. Peele provided an update on the reservoir conditions for Cube Hydro, which manages several projects in the Yadkin Pee-Dee basin. Cube Hydro reported current inflows of approximately 88.4 percent of normal. Currently, the water surface elevation at High Rock Lake is 2.2 feet below normal, with plans to draw it down another foot in anticipation of the remnants of Hurricane Ian.

Following Mr. Peele's presentations, Mr. Greg Hicks, North Carolina Forest Service – Assistant State Forester—Forest Protection, provided details of wildfire conditions across North Carolina over the past year. However, before speaking to the wildfire numbers from the past year, he took a few minutes to acknowledge the recently retired Mr. Cabe Speary, who served on the NCDMAC for many years as the NCFS representative. Mr. Hicks noted that this past year had above average numbers of wildfires as well as above average acreages burned in North Carolina. The wildfires of particular note this past year included the Grindstone Fire at Pilot Mountain, which burned approximately 1050 acres during the November/December 2021 time period; the Fairview Road fire in Hyde County; and the Juniper Road fire #2 in Pender County. Throughout the year, the numbers and severity of wildfires tended to closely match the drought patterns as observed in the weekly drought map created by the NCDMAC. Interestingly, debris burning is the #1 cause of wildfires in North Carolina, with lightning (non-human induced) only accounting for 1-2 percent of the total number of wildfires.

Lastly, Dr. Mike Yoder, Associate Director with the North Carolina State University Cooperative Extension, provided a synopsis of the previous year's agricultural drought issues statewide. Dr. Yoder opened by noting that across the state agricultural irrigation is tending to be moving more towards greenhouses, which has the benefit of increasing yields on high value crops while using less water. Similarly, even outdoor agricultural irrigation is transitioning away from high-gun center-pivot towards lower irrigation heads on pivots. This results in better directed irrigation directly on the crop, avoiding losses through evaporation and wind-carry. The past year has been a great year, in general, for agriculture in North Carolina with higher-than-normal yields in nearly all crops across the state. There were virtually no "flash" droughts over the past year, which can often be the most devastating particularly during specific times when the crops need water the most. But over the past year rainfall tended to come when it was most needed for production and stayed away during times of harvest. There was a dry spell during a critical growing stage for corn which resulted in crop losses and lower yields in parts of the state. Dr. Yoder concluded his presentation by fielding several interesting questions related to potential impacts from heavy rains in the late-September/early October timeframe. These questions were in context to impending Hurricane Ian expected to impact North Carolina within the next week. Dr. Yoder noted that most of the high yield crops have been harvested by this time of the year and, except for the potential flooding, the crops remaining the fields should be fine even under heavy rains.

Mr. Albertin ended the meeting by reiterating the purpose of the NCDMAC codified in general statute. He thanked all the partner organizations and attendees, reminding everyone in the meeting that the U.S. Drought Monitor views and 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 3:00 pm.