

# North Carolina Department of Environmental Quality

Pat McCrory  
Governor

Donald R. van der Vaart  
Secretary

October 19, 2015

## MEMORANDUM

TO: NC GOVERNOR  
Pat McCrory

NCDEQ SECRETARY  
Donald R. van der Vaart

ENVIRONMENTAL REVIEW COMMISSION  
The Honorable Brent Jackson, Co-Chair  
The Honorable Mike Hager, Co-Chair

FROM: Matthew Dockham, Director of Legislative Affairs

SUBJECT: 2015 Drought Management Advisory Council Report on Water Resources Act

DATE: October 19, 2015

Pursuant to G.S.143-355.1(g), the Drought Management Advisory Council shall submit a report to report on the implementation of this section to the Secretary, the Governor, and the Environmental Review Commission. Please consider the attached as the formal submission of this report.

If you have any questions or need additional information, please contact me by phone at (919) 707-8618 or via e-mail at [matthew.dockham@ncdenr.gov](mailto:matthew.dockham@ncdenr.gov).

cc: Tom Reeder, Assistant Secretary for the Environment, NCDEQ  
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Jeffrey Hudson, Commission Council, NCGA

Department of Environmental Quality  
North Carolina Division of Water Resources

North Carolina Drought Management Advisory Council Annual Report  
July 1, 2014 through June 30, 2015

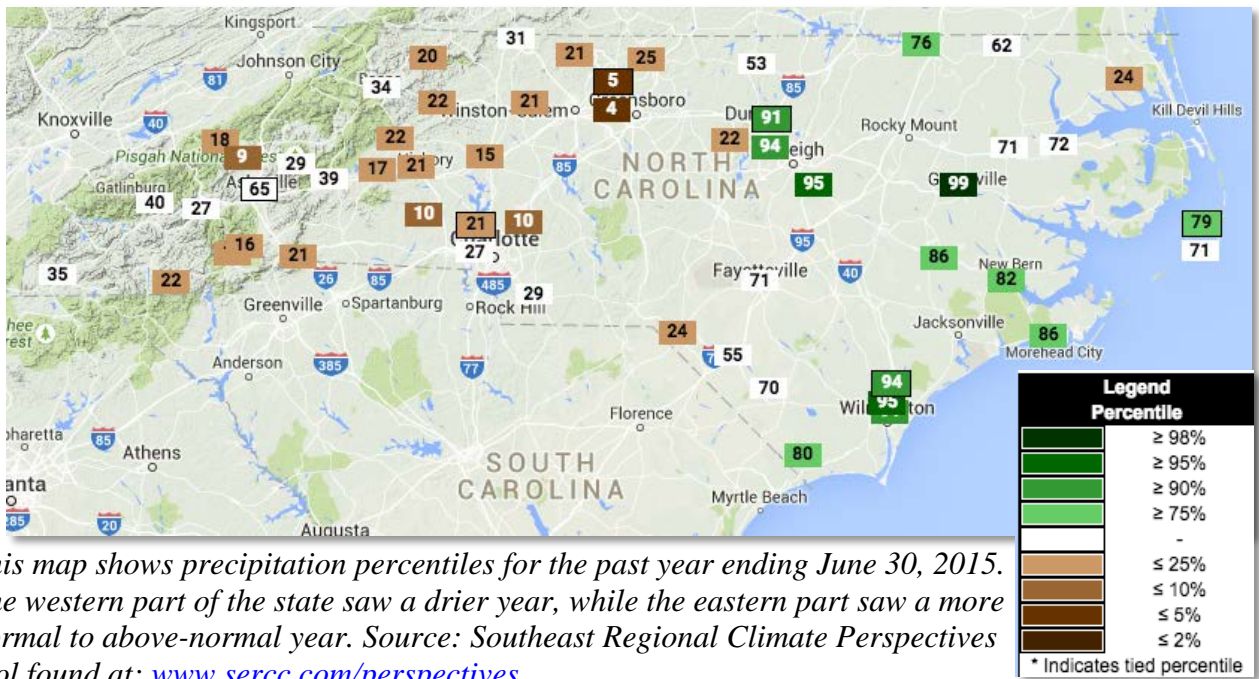
Introduction

This is the ninth annual report of the North Carolina Drought Management Advisory Council required by North Carolina General Statute 143-355.1. In accordance with statutory requirements, the council submits the report to the Secretary of the N.C. Department of Environmental Quality, the Governor of North Carolina and the N.C. Environmental Review Commission by Oct. 1 of every year.

Drought Overview 2014/2015

Climate Summary

The period from July 1, 2014 to June 30, 2015 saw normal to below normal temperatures across much of the state combined with a pattern of dryness over western North Carolina and slightly wetter conditions over eastern North Carolina, as seen in the figure below of precipitation percentiles.



*This map shows precipitation percentiles for the past year ending June 30, 2015. The western part of the state saw a drier year, while the eastern part saw a more normal to above-normal year. Source: Southeast Regional Climate Perspectives tool found at: [www.sercc.com/perspectives](http://www.sercc.com/perspectives)*

Summer 2014 was cooler across the state, with both July and August seeing much below normal temperatures. Precipitation was mixed: the western Piedmont saw below normal precipitation, while the Mountains and much of the Coast received above-normal amounts. Wetter conditions on the coast were in part due to Hurricane Arthur, which made landfall on July 3, 2014 near Beaufort, NC, bringing heaving rains and strong winds with it.

Fall 2014 was cool, finishing with a very cold November (fourth coldest November on record). While September and October started to see precipitation deficits in the western Piedmont, November's cold and wetter conditions stemmed concerns about developing dryness.

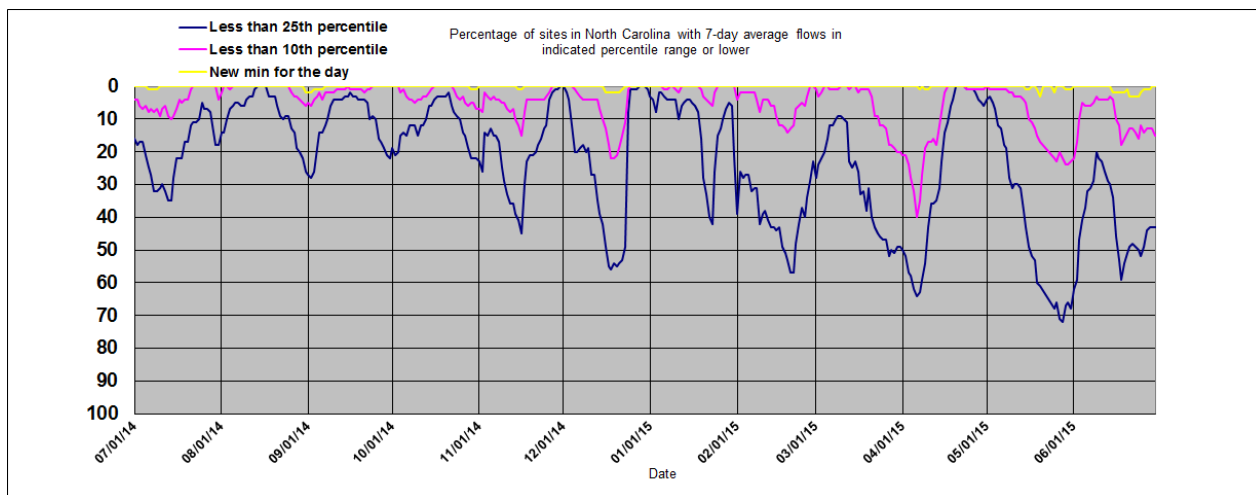
A pattern of below-normal precipitation over the western half of the state and above-normal precipitation over the eastern half of the state emerged in the December 2014 through February 2015 winter. Temperatures during the winter finished below normal, in large part to a cold February. In fact, February ranked as the 10<sup>th</sup> coldest on record, and was the coldest February the state had seen in 35 years, with multiple wintry events and temperatures for the month anywhere from 6F to nearly 10F below normal.

Above-normal precipitation in April assuaged any concerns about dryness. However, the May that followed brought above-normal temperatures combined with below-normal precipitation to most of the state outside of the coast. The western Piedmont was hit particularly hard, with deficits of 2-3 inches for the month. The Charlotte Douglas Airport only saw one day with precipitation that month, May 26, when 0.32 inches fell, making it the second driest May on record at this location. The June that followed was also warm and dry, and ranked as the fifth warmest on record.

### Streamflow and Groundwater

During the summer and early fall seasons of the annual period (July 1, 2014, through June 30, 2015), streamflow conditions at U.S. Geological Survey (USGS) continuous-record stream gages were, generally, in the normal and above-normal ranges across most of North Carolina, with exception of the northern central Piedmont and Sandhills, where conditions at some stream gages were frequently in the below-normal ranges. Beginning in November, below-normal streamflow conditions became more widespread in parts of the Piedmont and Coastal Plain until improvements were observed in early January. In February, however, below-normal streamflow conditions were observed at stream gages in the Blue Ridge and western Piedmont, with a growing number of stream gages depicting conditions in the "less than 10th percentile" range. Streamflow conditions briefly improved in latter April across the state, but below-normal conditions quickly returned across much of western North Carolina in mid-May with further expansion into the central Piedmont from late spring towards the end of the annual period. Coastal Plain streams were in the normal and above-normal ranges from the winter into the late spring season following the sustained above-normal precipitation that occurred across the eastern third of the state during this time.

The graph shown below indicates the percentage of USGS stream gages in North Carolina with 7-day flows less than the 25th, 10th, and first percentiles (or record-low for the calendar date) during the annual period.



The expansion of below-normal streamflow conditions began to occur in November with declines reaching levels by late winter and spring 2015 that resulted in up to 72 and 40 percent of USGS stream gages within the state with percentiles for 7-day average flows below the 25th and 10th percentiles, respectively. These percentages are higher than the maximum values (47 and 18 percent, respectively) observed during the previous annual period.

Examination of provisional daily discharges indicates no new record minimum daily mean discharges for the period of record were set at the USGS stream gages across North Carolina during July 1, 2014 through July 31, 2015. However, a provisional new record minimum monthly average streamflow was set at one stream gage on Reedy Fork near Gibsonville in Guilford County in June 2015.

Groundwater conditions at 15 USGS observation wells within the N.C. Climate Response Network varied on a weekly basis during July 1, 2014, through June 30, 2015. But comparisons for the overall period indicate water levels were, generally, in the normal and above-normal ranges during the summer and early fall seasons. From the latter fall to the spring seasons, water level fluctuations in the Blue Ridge and Piedmont observation wells were primarily observed in the lower-normal and below-normal ranges, while wide variations from below to above-normal conditions continued to be observed in the Coastal Plain wells.

Inspection of provisional water level records indicate no new record minimum monthly water levels were observed at any of the 15 wells during the annual period from July 1, 2014 through

July 31, 2015. However, new record maximum monthly water levels were observed at the Comfort Research Station well in Jones County (February, March, and May 2015), the Grantham well in Wayne County (January through April 2015), the Simpson well in Pitt County (September 2014, December through February, April through June 2015), the Hoke well in Washington County (April, June 2015), and the Elizabeth City well in Pasquotank County (February through May 2015). These new record maximum monthly water levels were in response to the sustained above-normal precipitation that occurred across the eastern third of the state during this time.

### Agriculture

In July 2014, Hurricane Arthur passed over the coastal area of the state. Arthur was a Category 2 hurricane that produced up to five inches of rain and had wind speeds between 30-50 miles per hour. Areas of the Piedmont continued to report abnormally dry conditions. A cold front pushed through North Carolina the week ending July 27, bringing widespread rain totaling between 0.4 and 7.4 inches and temperatures ranging between 1 and 4 degrees below normal.

These conditions continued throughout August until late in the month when temperatures rose to the upper nineties in most areas. Corn, cotton and soybean progress looked to be on target with projected five year averages. Peach harvest was on target and apple harvest was a bit ahead of the five year projected average. By September, weather conditions were seemingly normal and farmers were busy harvesting corn, sweet potatoes and tobacco.

There was a major rain event the week ending September 14. Some areas of the state reported more than eight inches of rain, while others reported less than 0.5 inches. As of September 28, statewide topsoil moisture levels were at 1 percent very short, 9 percent short, 74 percent adequate and 16 percent surplus. October brought the first frost of the season in the mountains. Dry conditions aided the harvest and by November 2, farmers were on target harvesting all commodities and planting small grains. By Thanksgiving, the state received another snow event in the mountains bringing 3-6 inches.

Most crops had been harvested with the exception of soybeans and sorghum. Wheat was 88 percent planted. Wet and warm temperatures dominated in December. By the end of the month the sorghum and soybeans harvest was almost complete. Topsoil moisture levels were rated 0 percent very short, 2 percent short, 57 percent adequate and 41 percent surplus. January brought widespread rainfall with much of the state experiencing below normal temperatures. February was much the same as January with the last week of February being especially cold temperatures with snow and ice. Soil moisture was rate 21 percent adequate and 79 percent surplus.

By mid-April corn was 25 percent planted with soil moisture still rated adequate or surplus, along with small grains reporting fair to good conditions. The beginning of May recorded temperatures from 4 to 11 degrees below normal. However, by the end of May temperatures were several degrees above normal with cotton 83 percent planted, peanuts 81 percent planted, soybeans 55 percent planted, sweet potatoes 25 percent planted and tobacco 96 percent planted. Mid-June continued with above normal temperatures and soil moisture dropped with 10 percent very short, 32 percent short, 53 percent adequate and 5 percent surplus. Small grains were 65 percent to 75 percent harvested. By the beginning of July, much of the state had received rainfall with soil moisture improving and corn, cotton and soybeans progressing along with the 5-year averages.

### Forest Resources

Weather impacts had limited impacts on forestry operations across the state during the past year. Site preparation only impacted some organic soil areas last summer due to high precipitation levels. Tree planting was delayed, especially in the coastal plain, due to higher than normal precipitation events during the winter months. Prescribed burning was also affected, particularly in the mountain region, which showed a 22 percent reduction in acreage burned compared to the previous year.

From July 1, 2014 to June 30, 2015, the N.C. Forest Service responded to 3,841 wildfires across the state that burned approximately 10,433 acres. The number of fires was approximately 15 percent less than the 10 year average for the state; however the total number of acres burned was less than half of the 10 year average. These reductions were primarily due to wet weather and early green up during the spring fire season. There were 73,290 acres on state and private lands which were treated with prescribed fire during the past fiscal year.

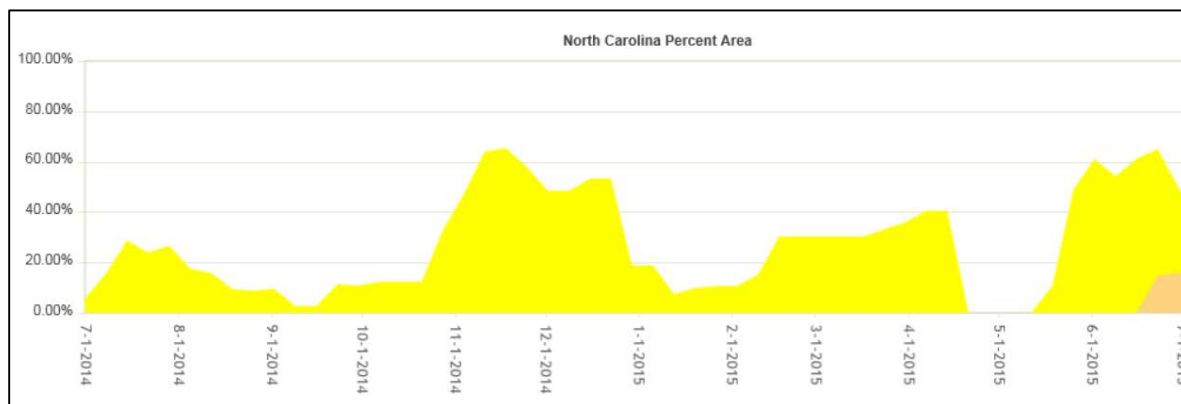
Weather conditions during the past year were for the most part favorable for healthy forest growth. Except for areas of Ips engraver beetle-killed drought stressed trees in the Sandhills area and scattered Ips/drought stress mortality elsewhere, evidence of past drought effects on forest trees has diminished. Oak decline (cause by a complex of stress agents, with drought being a contributing factor) continues to occur throughout North Carolina. Older, shallow-rooted red oaks are mainly affected. In addition, some tulip poplar trees lost their leaves in mid-summer. Poplar trees will drop leaves prematurely when stress, although is a contributing factor.

### Drought Conditions

During the past year in North Carolina, the worst drought conditions occurred in the month of June 2015, and the best conditions occurred during the month of May 2015 with no drought

designations. During the week ending June 30, 2015, the number of water systems that were affected by the drought conditions were as follows:

- 183 water systems were under abnormally dry conditions (D0)
- 109 water systems were under moderate drought conditions (D1)



### Council Meetings

Drought conditions in North Carolina are updated weekly through an audio-video telecom with a Technical Drought Advisory Team, which is a sub-group of the N.C. Drought Management Advisory Council. The team consists of experts on climate, weather, geology, water supply, forestry and agriculture that report each week on streams flows, groundwater levels, reservoirs levels, wildfire activity and crops. 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 each Thursday. To see or download a copy of the current drought map, go to the state's official drought website at:

[www.ncdrought.org](http://www.ncdrought.org).

The Drought Management Advisory Council (DMAC) is required by law to meet in person at least once each calendar year. The annual council meeting was held on April 30, 2015 at 10:00 am with 28 representatives and associates of the DMAC in attendance. Items discussed at the meeting included current conditions on stream flow and ground water levels, lake and reservoir levels, agriculture, forestry and public water systems.