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EASTERN NORTH CAROLINA
MONTHLY CLIMATE REPORT

JULY
2023

WEATHER FORECAST OFFICE
NEWPORT/MOREHEAD CITY, NC

National Weather Service
NEWPORT/MOREHEAD CITY, NC

MONTHLY SUMMARY

July finally broke the streak of below average temperatures as troughing across the Eastern Seaboard retrograded to the Upper Midwest. Thunderstorms were once again plentiful in July, but Eastern North Carolina's streak of below average rainfall continued as rain was very boom or bust across the area. Matter of fact, the 94 warnings that were issued between marine and severe/tornado warnings in July were the most since 2012. Though all counties did end up averaging lower than average precipitation amounts, given the convective nature of the rain, localized areas of heavy rain did fall across ENC. The big winner being Rose Hill in Duplin County and Jacksonville in Onslow County where over 10 inches of rain fell resulting in multiple flash flood warnings being issued in Duplin and Onslow Counties even leaving some vehicles stranded in flood waters across portions of Wallace.

Drought conditions did not change with no areas under drought conditions at the end of July. The seasonal drought outlook continues to reinforce the idea that we remain drought free across Eastern North Carolina over the next few months. Seasonal CPC outlooks continue to favor above average temperatures (33-40%) and above average precipitation (40-50%) into the fall months.

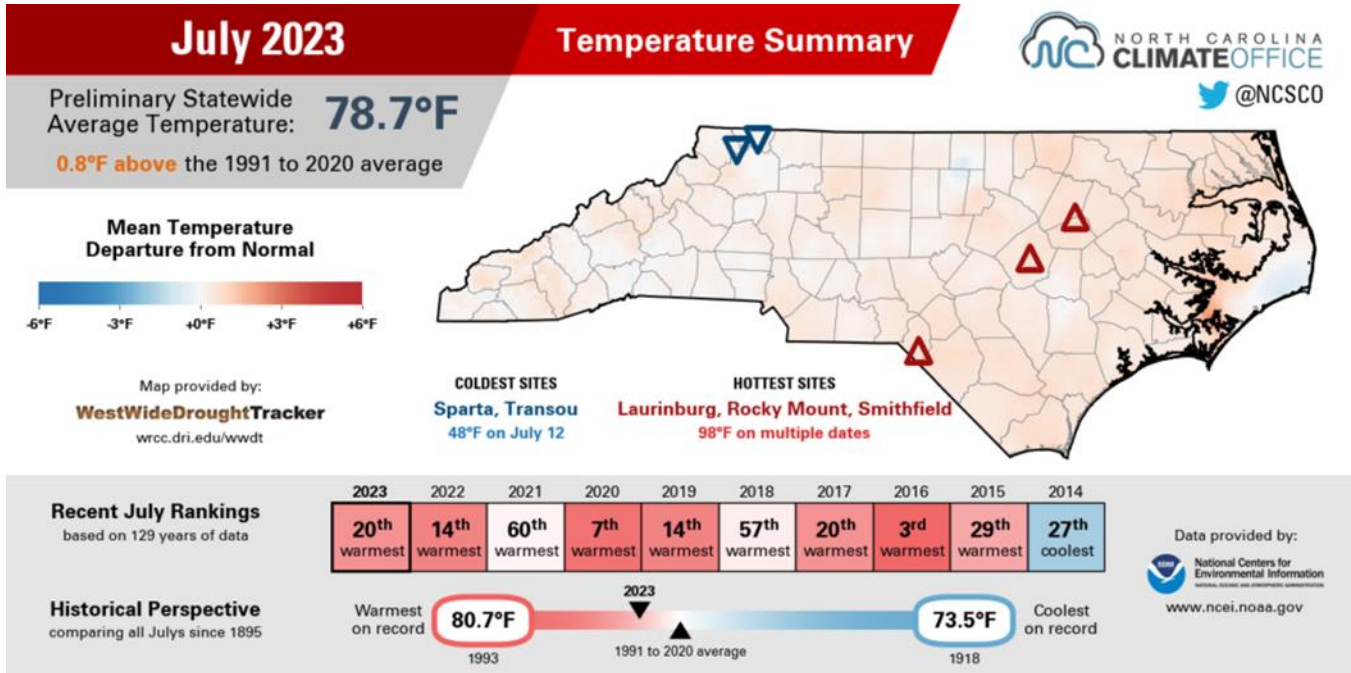
One additional tropical cyclone was named in July in the Atlantic basin, but it ended up being the year's first hurricane. Hurricane Don started out as a sub-tropical storm in the Central Atlantic during the middle of July but then quickly gained tropical characteristics on July 16th. Luckily, Don remained over the open waters of the Atlantic harmlessly tracking across the Central North Atlantic before finally transitioning into a post-tropical cyclone on July 24th over the colder waters of the northern North Atlantic.

A quick note about Cape Hatteras data: the temperature sensor at the Billy Mitchell Airport (KHSE) began reporting erroneously low readings starting in early July – several degrees below surrounding stations. The data was therefore removed from the record. All Hatteras data in this report has been flagged to account for this gap. Office technicians were able to repair the instrument a few weeks later.

The August 2023 report will be published around October 1st, 2023.

TEMPERATURES

The average July statewide temperature was 78.7°F, or 0.8°F above the 1991 to 2020 average. July 2023 is the 20th warmest July since record keeping began in 1895.



July 2023 Temperature Summary | Source: NC State Climate Office

The average temperatures in eastern North Carolina were generally a few degrees above the state average with the lone exceptions being Duplin, Jones, and Martin Counties, which were either equal just below the state average. Dare County had the greatest average temperature anomaly for all of North Carolina with an average temperature 2.6°F *above* the 1901-2000 mean temperature. This was its 8th warmest July on record. Additional observations can be found in Appendix A.

MHX Select Site Temperature Statistics: July 2023

Site	Avg. High (°F)	Avg. Low (°F)	Avg. Temp (°F)	Normal (°F)	Departure (°F)
Beaufort (KMRH)	87.7	76.2	81.7	80.6	1.1
Hatteras (KHSE)	86.1	74.4	80.3	81.3	-1.1

MHX Select Site Temperature Statistics: July 2023

Site	Avg. High (°F)	Avg. Low (°F)	Avg. Temp (°F)	Normal (°F)	Departure (°F)
New Bern (KEWN)	91.2	73.4	82.3	80.4	1.9

Normals are based on a period from 1990-2020.

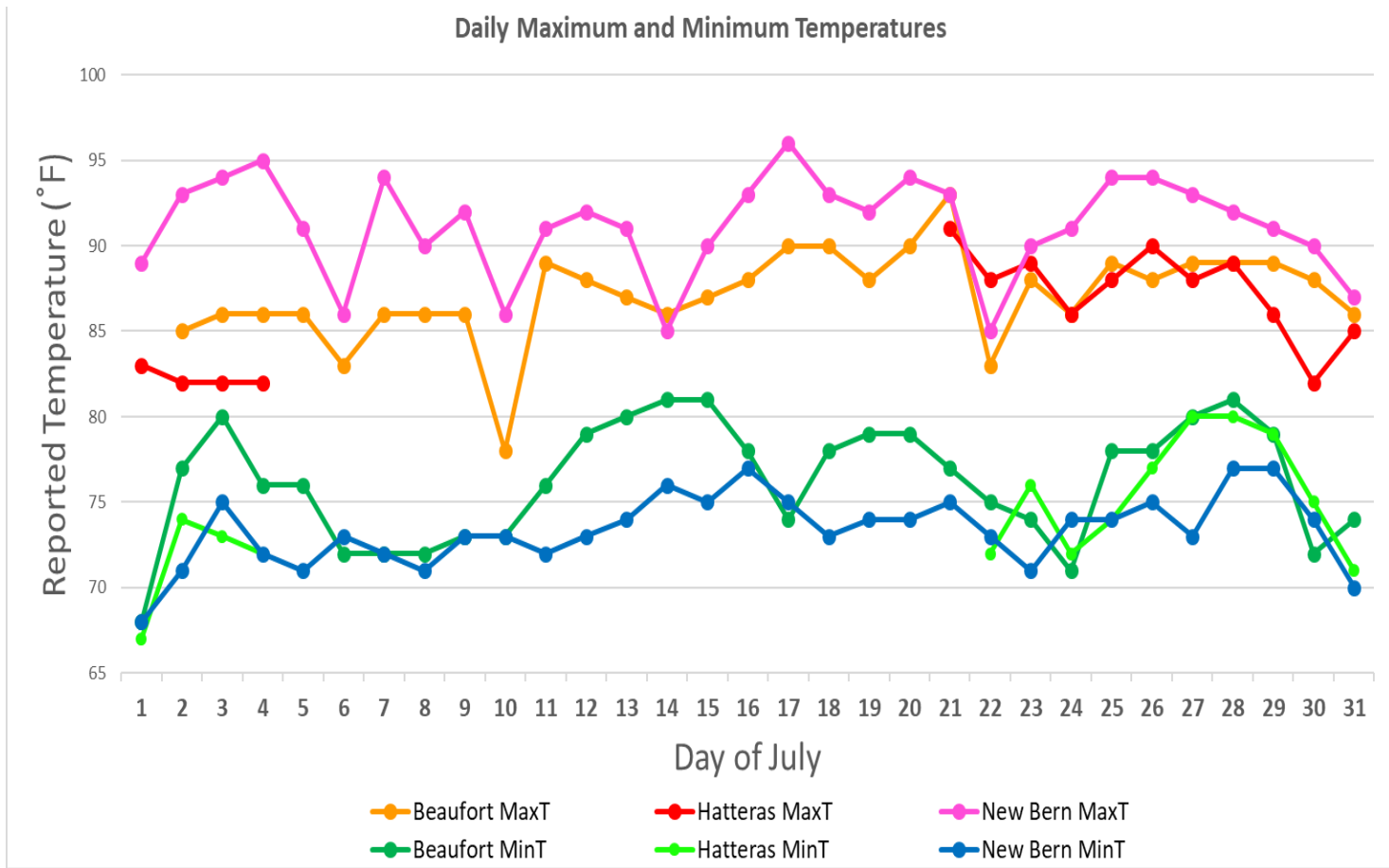
County-averaged statistics are presented in the following table. Note that mean temperature and anomaly calculations are based on a period of 1901-2000, rather than 1990-2020. Data courtesy of the National Centers for Environmental Information (NCEI).

County	Avg. Temperature (°F)	Mean (°F)	Departure (°F)	Rank
Beaufort	81.1	79.0	2.1	18 W
Carteret	81.5	79.3	2.2	18 W
Craven	81.1	78.8	2.3	18 W
Dare	81.5	78.9	2.6	8 W
Duplin	81.1	78.7	2.4	12 W
Greene	81.0	79.0	2.0	21 W
Hyde	81.6	79.5	2.1	14 W
Jones	80.9	78.5	2.4	13 W
Lenoir	80.8	78.8	2.0	21 W
Martin	80.8	78.4	2.4	16 W
Onslow	81.3	78.8	2.5	9 W
Pamlico	81.3	79.5	1.8	20 W
Pitt	80.9	79.0	1.9	19 W
Tyrrell	81.2	78.8	2.4	12 W
Washington	80.6	78.4	2.2	18 W
Area Average	81.1	78.9	2.2	

County	Avg. Temperature (°F)	Mean (°F)	Departure (°F)	Rank
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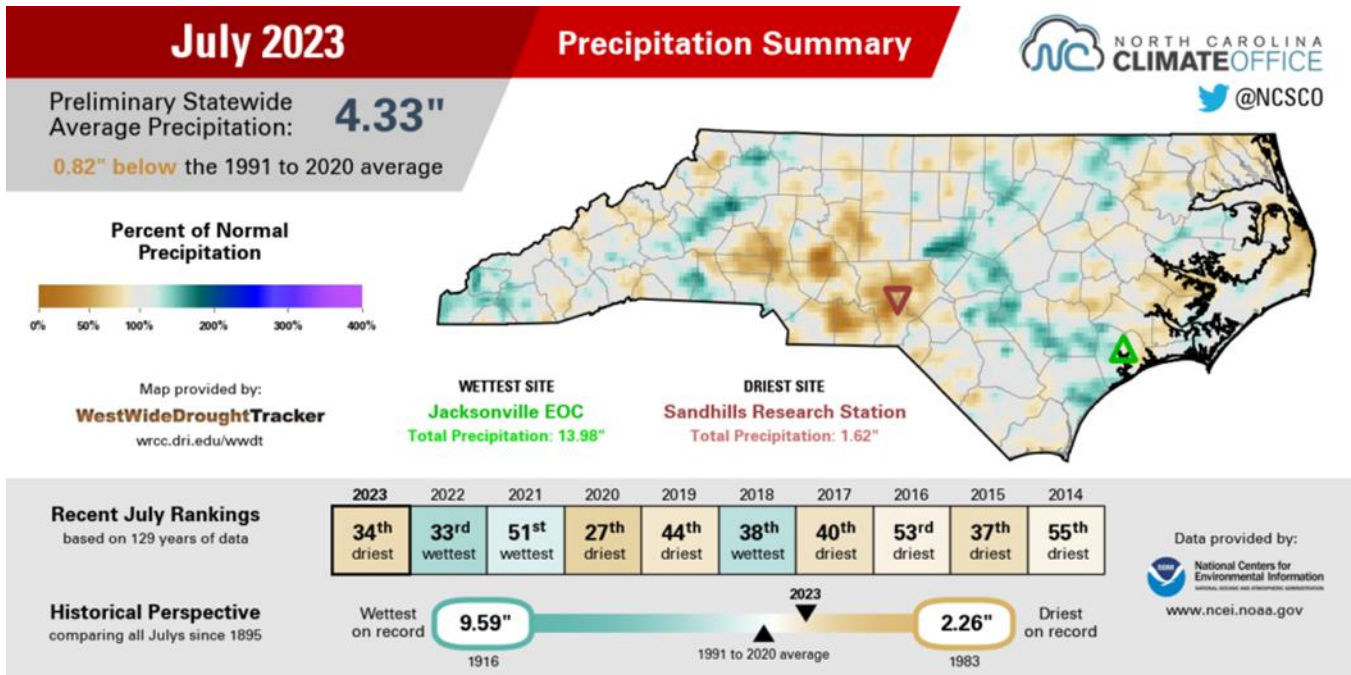
Means are based on a period from 1901-2000. For rankings, "C" designates coldest and "W" designates warmest.

New Bern tied a record high temperature on July 4th when it reached 95°F, tying the previous record of 95°F set in 2012.



PRECIPITATION

Analysis conducted by the North Carolina State Climate Office indicated average statewide precipitation was 4.33” for July, or about 0.82” inches below average. This ended up being the 34th driest July for the state since records began in 1895.



Most of eastern North Carolina was generally below the statewide average with the exception of the southeast corner of the state where over 13” of rain fell at the Jacksonville EOC. The driest spot in all of North Carolina was at the Sandhills Research Station where they received only 1.62” of rain in July.

MHX Select Site Precipitation Statistics: July 2023

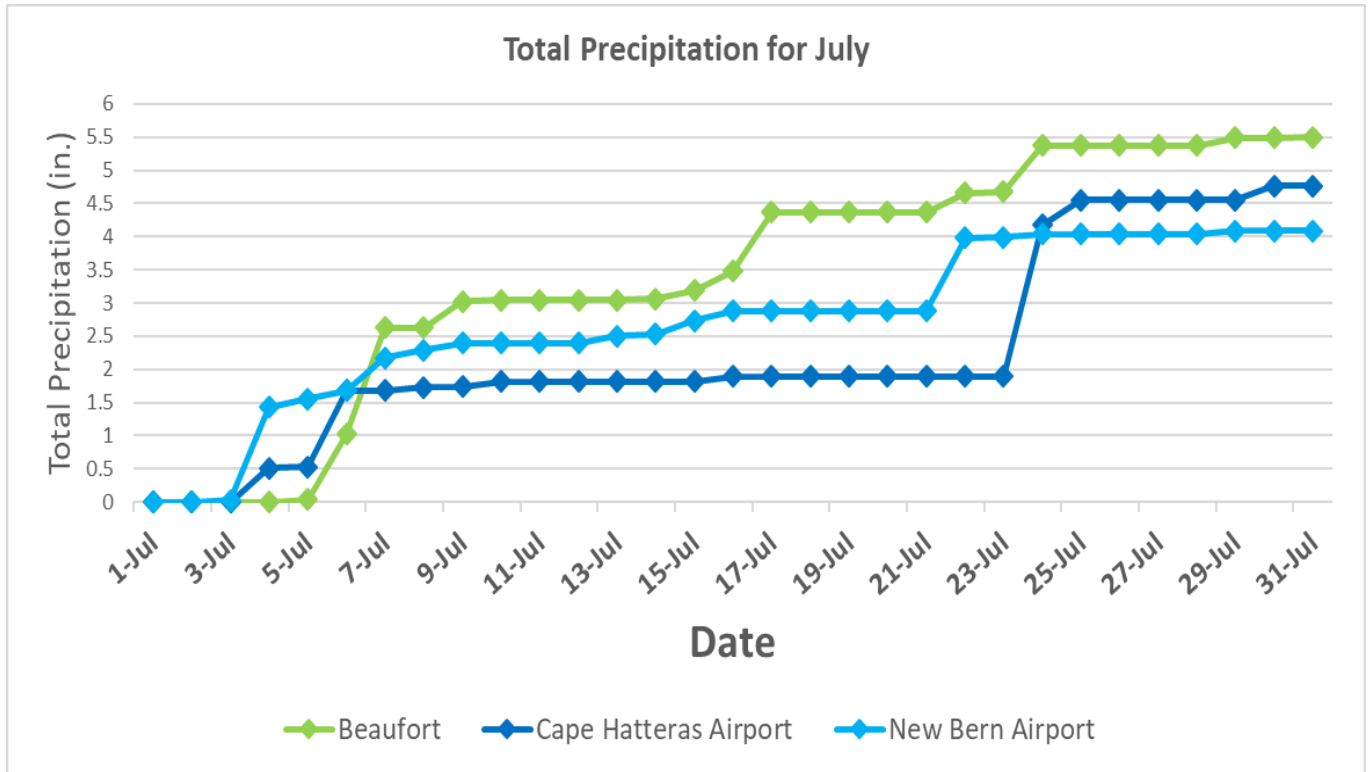
Site	Total Precipitation (in.)	Normal (in.)	Departure (in.)
Beaufort (KMRH)	5.50	5.81	-0.31
Hatteras (KHSE)	5.71	4.41	-0.62
New Bern (KEWN)	4.08	4.60	-2.17

County-averaged statistics are presented in the following table. Like temperatures, mean and anomaly precipitation calculations are based on a period 1901-2000. Data courtesy of the National Centers for Environmental Information (NCEI).

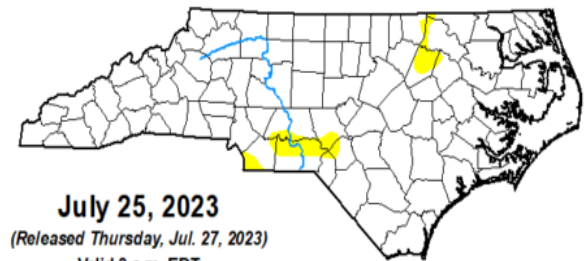
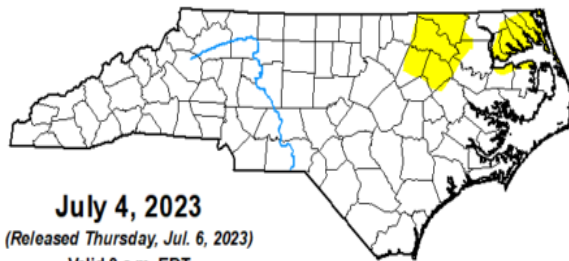
County	Avg. Accum. (in.)	Mean (in.)	Departure (in.)	Rank
Beaufort	4.80	6.71	-1.91	33 D
Carteret	4.23	7.09	-2.86	25 D
Craven	4.10	7.14	-3.04	14 D
Dare	4.01	6.04	-2.03	32 D
Duplin	4.72	7.03	-2.31	27 D
Greene	4.06	6.21	-2.15	23 D
Hyde	5.06	6.42	-1.36	52 D
Jones	4.12	7.17	-3.05	15 D
Lenoir	4.00	6.64	-2.64	18 D
Martin	4.79	6.15	-1.36	39 D
Onslow	4.52	7.42	-2.90	17 D
Pamlico	3.87	7.09	-3.22	19 D
Pitt	4.39	6.23	-1.84	31 D
Tyrrell	4.77	6.30	-1.53	37 D
Washington	5.64	6.41	-0.77	57 D
Area Average	4.47	6.67	-2.20	

Means are based on a period from 1901-2000. For rankings, “W” designates wettest and “D” designates driest.

Washington County had the highest average accumulation (5.64”), which was still 0.77” below the 1901-2000 June average. The greatest accumulation at a single station was in Onslow County (Sneads Ferry 1.2 SSW) where 10.24” of rain was recorded, which barely beat out the second highest total in Duplin County (Rose Hill 0.1 NNW) where 10.22” of rain fell. Even with these totals, given the convective nature of the amounts both Duplin and Onslow County averaged 2-3” below the average amount for the month of July.



We began the month of July with some abnormally dry spots primarily along the far northern counties, but by the end of the month, Eastern North Carolina was once again drought free. The seasonal drought outlook isn't calling for drought development and the Climate Prediction Center has given all of North Carolina a 40-50% above average precipitation forecast for the next three months.



**U.S. Drought Monitor
 North Carolina**

Intensity:

D0 Abnormally Dry	D3 Extreme Drought
D1 Moderate Drought	D4 Exceptional Drought
D2 Severe Drought	



<http://droughtmonitor.unl.edu/>

ADDITIONAL CLIMATE RESOURCES

For a look at climate on the national scale, as well as statistics from a CONUS-wide to county and city level, please visit the **National Centers for Environmental Information** at <https://www.ncei.noaa.gov/>. Additional maps and data, as well as teaching materials and a climate resiliency toolkit, can be found at **NOAA's** <https://www.climate.gov>.

For additional drought information, including a wealth of maps of data focused on topics such as agriculture, fire, and water supply, please visit **NOAA's National Integrated Drought Information System (NIDIS)** at <https://www.drought.gov>.

For climate statistics and real time observations across the state of North Carolina, please visit the **North Carolina State Climate Office** at <https://climate.ncsu.edu/>.

For climate forecasts and outlooks, visit the **Climate Prediction Center** at <https://www.cpc.ncep.noaa.gov/>.

For community-based precipitation observations from across the United States, visit **CoCoRaHS** at <https://www.cocorahs.org/>.

For climate statistics relevant to various regions of North Carolina, please visit the following climate pages:

Eastern (WFO Morehead City): <https://www.weather.gov/wrh/climate?wfo=mhx>

Southeastern (WFO Wilmington): <https://www.weather.gov/wrh/climate?wfo=ilm>

Northeastern (WFO Wakefield, VA): <https://www.weather.gov/wrh/climate?wfo=akq>

Central (WFO Raleigh): <https://www.weather.gov/wrh/climate?wfo=rah>

Northwestern (WFO Blacksburg, VA): <https://www.weather.gov/wrh/climate?wfo=rnk>

Southwestern (WFO Greer, SC): <https://www.weather.gov/wrh/climate?wfo=gsp>

Cherokee and Clay Co. (WFO Knoxville, TN): <https://www.weather.gov/wrh/climate?wfo=mrx>

APPENDIX A: ADDITIONAL TEMPERATURE DATA

Cooperative Observation Site Temperature Statistics: July 2023

Site	Avg. High (°F)	Avg. Low (°F)	Avg. Temp (°F)	Normal (°F)	Departure (°F)
Greenville	90.8	72.3	81.6	80.8	0.8
Kinston	91.0	72.0	81.5	81.0	0.5
Williamston	90.2	72.7	81.5	79.9	1.6
Plymouth	89.0	71.6	80.3	79.8	0.5
Bayboro	89.7	72.1	80.9	79.4	1.5
Manteo	88.6	75.7	82.2	79.6	2.6

Normals are based on a period from 1990-2020.

Maximum and Minimum Monthly Temperatures: July 2023

Site	Max High (°F)	Date Observed	Min Low (°F)	Date Observed
Beaufort (KMRH)	93	July 21	68	July 1
Hatteras (KHSE)	91	July 21	67	July 1
New Bern (KEWN)	96	July 17	68	July 1
Greenville	96	July 3	65	July 31
Kinston	96	July 27	64	July 31
Williamston	94	July 27	64	July 31
Plymouth	93	July 3	62	July 31
Bayboro	94	July 5	66	July 1
Manteo	95	July 29, 30	68	July 2

APPENDIX B: ADDITIONAL PRECIPITATION DATA

Cooperative Observation Site Precipitation Statistics: July 2023

Site	Total Precipitation (in.)	Normal (in.)	Departure (in.)
Bayboro	4.04	6.79	-2.75
Greenville	4.76	5.87	-1.11
Kinston	4.02	5.79	-1.77
Plymouth	6.54	5.70	0.84
Williamston	5.13	5.75	-0.62

Sites in red have missing data in their record.

CoCoRaHS Monthly Accumulated Precipitation: July 2023

Site	County	Amount (in.)
Pantego 0.4 WSW	Beaufort	6.24
Washington 1.0 SSW	Beaufort	5.46
Bath 1.6 SSE	Beaufort	5.05
Beaufort 12.1 N	Carteret	9.55
Morehead City 2.9 WNW	Carteret	8.04
Newport 1.0 N	Carteret	7.85
Newport 2.5 W	Carteret	7.68
Newport 0.2 SW	Carteret	7.55
Beaufort 5.3 N	Carteret	7.11
Newport 1.7 SSE	Carteret	7.09
Pine Knoll Shores 1.4 E	Carteret	6.89

CoCoRaHS Monthly Accumulated Precipitation: July 2023

Site	County	Amount (in.)
Pine Knoll Shores 0.3 NE	Carteret	6.65
Cape Carteret 1.5 NE	Carteret	6.54
Cape Carteret 0.8 NE	Carteret	6.48
Ocean 0.5 S	Carteret	6.20
Cedar Island 0.3 SSE	Carteret	5.97
Beaufort 0.5 W	Carteret	5.94
Cape Carteret 1.0 NNW	Carteret	5.72
Beaufort 3.8 N	Carteret	5.38
Swansboro 2.7 NE	Carteret	5.28
Beaufort 1.5 NNW	Carteret	4.53
Cedar Point 0.9 WSW	Carteret	4.48
Morehead City 6.0 WNW	Carteret	4.25
Swansboro 3.7 NNE	Carteret	4.07
New Bern 5.3 SW	Craven	8.14
Trent Woods 1.3 SSE	Craven	6.46
Havelock 1.9 SSE	Craven	6.43
Trent Woods 0.9 WNW	Craven	6.39
New Bern 4.2 S	Craven	5.73
Trent Woods 1.0 NNE	Craven	5.44
New Bern 3.8 S	Craven	5.29
New Bern 5.2 SE	Craven	5.16

CoCoRaHS Monthly Accumulated Precipitation: July 2023

Site	County	Amount (in.)
New Bern 2.9 SSE	Craven	4.36
Bridgeton 0.3 SSE	Craven	4.26
New Bern 8.8 W	Craven	3.62
New Bern 1.3 NNE	Craven	2.82
Manteo 2.8 NW	Dare	4.61
Manteo 2.5 WNW	Dare	4.59
Rodanthe 1.0 SSE	Dare	4.57
Southern Shores 0.5 NNE	Dare	3.70
Rose Hill 0.1 NNW	Duplin	10.22
Kenansville 1.1 SW	Duplin	6.84
Mount Olive 2.4 SW	Duplin	3.85
Albertson 1.2 WNW	Duplin	3.43
Mount Olive 6.0 SE	Duplin	3.12
Ayden 6.5 WNW	Greene	3.47
Engelhard 0.8 NW	Hyde	8.59
Ocracoke 0.2 ESE	Hyde	4.69
SQ Tower	Hyde	4.22
Kinston 1.2 NW	Lenoir	5.05
Kinston 4.4 WNW	Lenoir	4.96
Kinston 5.1 WNW	Lenoir	4.44
Kinston 4.7 ESE	Lenoir	4.00

CoCoRaHS Monthly Accumulated Precipitation: July 2023

Site	County	Amount (in.)
Jamesville 6.1 SW	Martin	4.39
Williamston 8.9 SSE	Martin	4.29
Sneads Ferry 1.2 SSW	Onslow	10.24
Holly Ridge 9.0 ENE	Onslow	9.41
Jacksonville 4.5 NW	Onslow	6.75
Jacksonville 1.0 NW	Onslow	6.72
Hubert 4.9 SE	Onslow	4.90
Swansboro 3.3 NW	Onslow	3.70
Swansboro 2.8 WSW	Onslow	3.48
Oriental 1.9 WSW	Pamlico	9.24
Oriental 5.2 NE	Pamlico	7.86
Oriental 4.3 NNW	Pamlico	7.31
Lowland 0.2 SE	Pamlico	2.21
Winterville 2.8 WNW	Pitt	6.83
Winterville 3.5 W	Pitt	5.74
Fountain 0.1 NE	Pitt	4.11
Greenville 7.1 SSE	Pitt	3.82
Columbia 0.8 NNE	Tyrell	7.11

CoCoRaHS inclusion in this table is based on a complete 31-day liquid precipitation record. Thank you to all observers!