

July 2023 Climate Review

Temperature Overview

After a cool start to the summer season in June, July 2023 featured warmer than normal temperatures across the local area. Across the continental US, the pattern was dominated by a very strong upper-level ridge that was mostly in place from the west coast down through the southern tier of the nation, with an upper-level trough over the northern/central Plains to the western Great Lakes. Across the eastern US, the pattern was more variable, but temperatures were generally warmer to much warmer than average (see Figure 1 for national temperature departures). Regionally, the state of Virginia had its 19th warmest July on record, North Carolina its 20th warmest, and Maryland its 8th warmest (period of record is 129 years 1895-2023). Locally, average temperatures were mainly 1 to 2 degrees warmer than the long-term means, enough to make 2023 the 10th warmest on record at Salisbury, MD. Richmond, Norfolk, and Elizabeth City did not quite rank among the top 10 warmest.

Looking at daily high temperature departures at Richmond and Norfolk (Figure 3), no real extreme heat developed despite the overall consistent warmth with only a small number of days recording high temperatures that were 5 or more degrees above normal. As for days with a high 5 or more degrees cooler than normal, Richmond had none while Norfolk had 4 such days. In general, overnight low temperatures were more above normal than daytime highs (no daily record highs were recorded for the month at long-term stations). The only true heat wave developed late in the month from the 27th through the 29th when highs were in the mid to upper 90s and lows were primarily in the mid 70s inland and as high as 80° at the coast, setting a few daily high minimum temperature records. With high humidity during this stretch, peak heat index values reached into the 102° to 106° range across the piedmont and I-95 corridor, with values as high as 110° over far SE VA and interior NE NC. Temperatures cooled back off to near to below average for the final 2 days of the month.

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Precipitation Overview

July 2023 rainfall was generally near normal across the NWS Wakefield's County Warning Area (CWA). As the area fell into a typical summer scattered thunderstorm pattern, there were some notable exceptions to this as heavy downpours occurred over localized areas, specifically across portions of Hampton Roads, Norfolk, and extreme eastern Virginia. Norfolk received 8.81" of rain, or nearly 3" above normal for the month, while locations that missed out on the scattered downpours noted below-normal rainfall totals for the month; Elizabeth City only had 3.65" (2.00" below normal for July). Likewise, the COOP site at Williamsburg ended the month at 2.52" below normal after receiving only 3.40" of rain. Early in the month, there was still spotty areas of D1 (moderate) drought over the VA northern Neck, and fairly widespread D0 (abnormally dry) conditions over the north and also in NE NC. By month's end, all drought had been removed across the north, while still remaining classified as D0 across portions of NE NC.

Severe weather was observed on a few days of the month, the most notable being on the 3rd, and also the 29th as a strong cold front ended the heat wave. These were primarily damaging wind events, with no confirmed tornadoes reported across the CWA for the entire month.

The following table on page 3 shows detailed temperature and precipitation statistics for June 2023 at many locations within the Wakefield CWA. Page 4 shows national temperature departures and rankings. On page 5, daily high temperature departures are shown at Richmond and Norfolk, followed by monthly precipitation maps and drought (page 6,7), with daily records set during the month at our 4 main climate sites on the last page.

Tabular Summary of Data for Selected Climate Sites (June):

July 2023 Temperature Summary Data <small>* also on other dates All Normals are 1991-2020</small>																			
Site	Avg Max		Avg Min		Avg Temp		Daily Highs					Daily Mins					Remarks		
	(°F)		(°F)		(°F)		Warmest (°F)			Coldest (°F)		Warmest (°F)			Coldest (°F)				
	Actual	Dep	Actual	Dep	Actual	Dep	Actual	Date	Dep	Actual	Date	Dep	Actual	Date	Dep	Actual		Date	Dep
Richmond	90.8	1.3	71.6	2.4	81.2	1.8	98	28th	-1	85	22nd	7	77	28th	1	65	23rd	4	21 days 90+
Norfolk	89.6	0.2	74.5	1.7	82.1	1.0	97	3rd	-1	82	30th	4	80	29th	1	69	31st	4	14 days 90+
Salisbury	89.2	1.7	70.7	2.4	79.9	2.0	94	*29th	-3	81	19th	5	80	28th	3	63	*31st	7	10th warmest July on record
Wallops Island	87.3	1.2	72.9	2.5	80.1	1.9	94	*29th	-2	81	30th	5	82	28th	4	66	*31st	5	8 days 90+
Elizabeth City	89.9	1.7	72.2	1.2	81.0	1.4	94	*29th	-2	84	10th	4	80	14th	2	61	31st	-1	19 days 90+
Ashland, VA	88.3	1.6	69.3	1.7	78.8	1.6	96	29th	1	83	10th	7	77	28th	2	62	23rd	4	9 days 90+
Corbin, VA	88.1	0.7	68.0	1.2	78.0	0.9	95	28th	-2	82	22nd	6	74	*28th	0	62	*23rd	6	11 days 90+
Louisa, VA	88.0	1.3	66.2	1.0	77.1	1.1	94	28th	-2	83	*31st	6	75	28th	3	58	11th	4	7 days 90+
Painter, VA	87.9	0.3	71.9	2.5	79.9	1.4	93	4th	-3	84	*31st	6	80	28th	1	62	31st	3	12 days 90+
Wakefield, VA	90.0	0.3	70.5	2.5	80.2	1.4	95	28th	-3	84	*22nd	7	78	28th	2	64	23rd	6	19 days 90+
Williamsburg, VA	89.1	0.6	71.8	1.6	80.5	1.2	95	28th	-2	83	*24th	5	79	28th	2	66	31st	6	14 days 90+
Edenton, NC	89.5	0.5	73.6	1.6	81.6	1.1	94	*3rd	-2	82	10th	2	79	29th	0	64	31st	2	17 days 90+

July 2023 Precipitation & Snowfall Summary Data <small>* also on other dates All Normals are 1991-2020</small>																			
Site	Total Pre		# Pre Days		# Pre Days		Greatest	Total Snow		# Snow Days		# Snow Days		Greatest		Remarks			
	(in.)		(≥0.01")		(≥0.10")		(in.)	(in.)		(≥0.1")		(≥1.0")		(in.)	(in.)				
	Actual	Dep	Actual	Dep	Actual	Dep	Act	Date	Act	Dep	Act	Dep	Act	Dep	Daily		Date	Storm	Date
Richmond	5.82	1.45	13	2	8	0	2.03	16th											
Norfolk	8.81	2.73	10	-1	8	1	1.80	19th											
Salisbury	5.32	0.59	13	3	11	4	2.26	16th											
Wallops Island	4.55	0.18	12	1	6	-1	1.65	16th											
Elizabeth City	3.65	-2.00	12	0	6	-2	1.97	3rd											
Ashland, VA	3.26	-1.03	8	-2	6	-1	1.82	16th											
Corbin, VA	5.33	1.37	11	2	6	0	2.57	17th											
Louisa, VA	6.00	1.82	11	0	7	0	2.81	16th											
Painter, VA	5.04	0.05	6	-4	5	-2	2.35	16th											
Wakefield, VA	5.75	0.28	11	0	7	-1	1.77	8th											
Williamsburg, VA	3.40	-2.52	10	-2	7	-2	0.86	24th											
Edenton, NC	5.77	-0.27	9	-1	7	-1	2.49	3rd											

* **“Dep”= Departure** from the 30-year normals (1991-2020). Temperature departures are shaded orange for 1 F or more warmer than average (dark red for 4 F or greater anomalies) and blue for 1 F or more cooler than average (dark blue for 4 F or more below normal). Similarly, precipitation departures are shaded green for 0.50” or more wetter than average (dark green for 2.00” or more) and tan for 0.50” or more drier than average (dark brown for 2.00” or more drier). Snowfall departures are shaded purple for 1” or more above average and tan for 1” or more below average.

National Temperature Departure: July 2023

Mean Temp (F) Anomaly
30-day mean ending Jul 31 2023

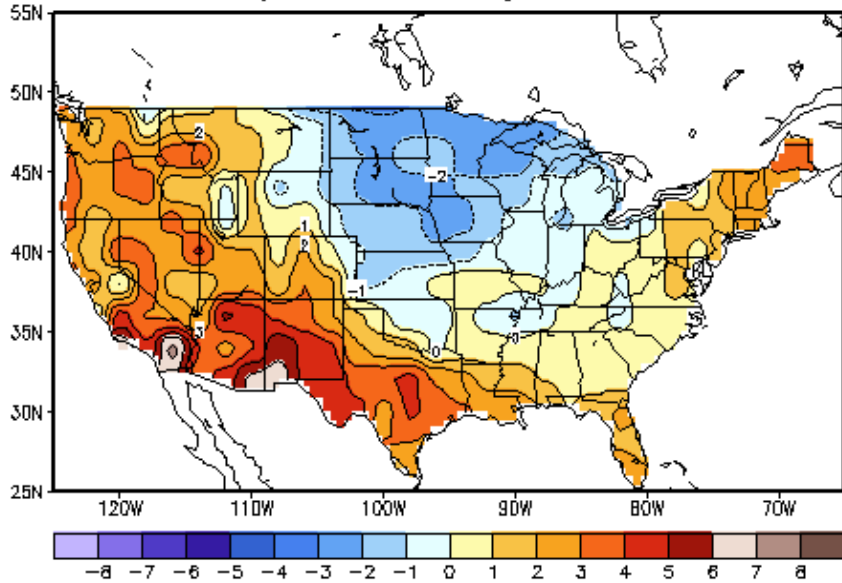


Figure 1: (source: CPC)

Statewide Average Temperature Ranks
July 2023
Period: 1895-2023

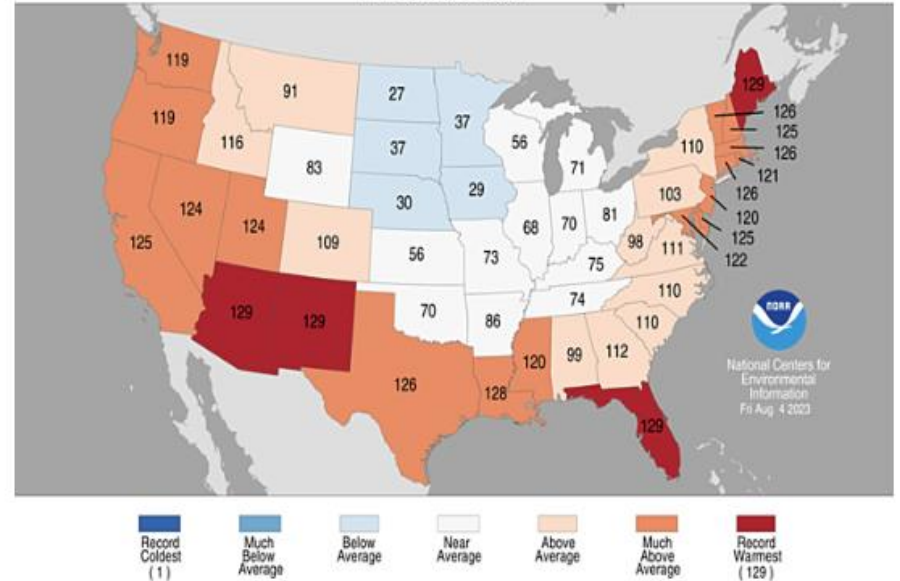


Figure 2: (source: NCEI)

Daily High Temperature Departures at Richmond & Norfolk, VA

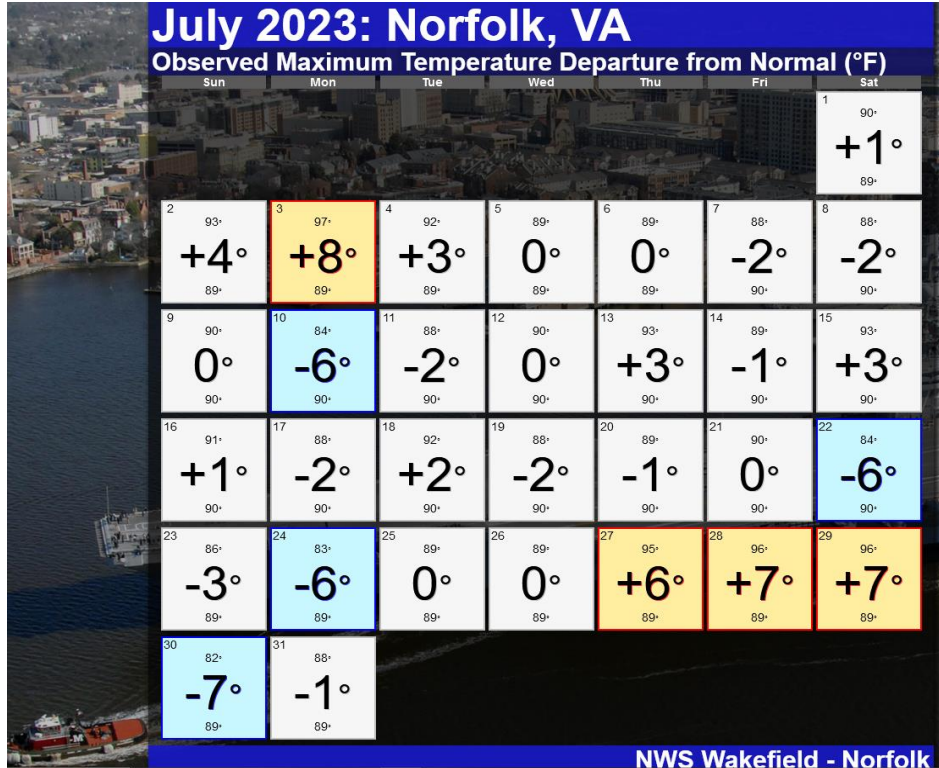
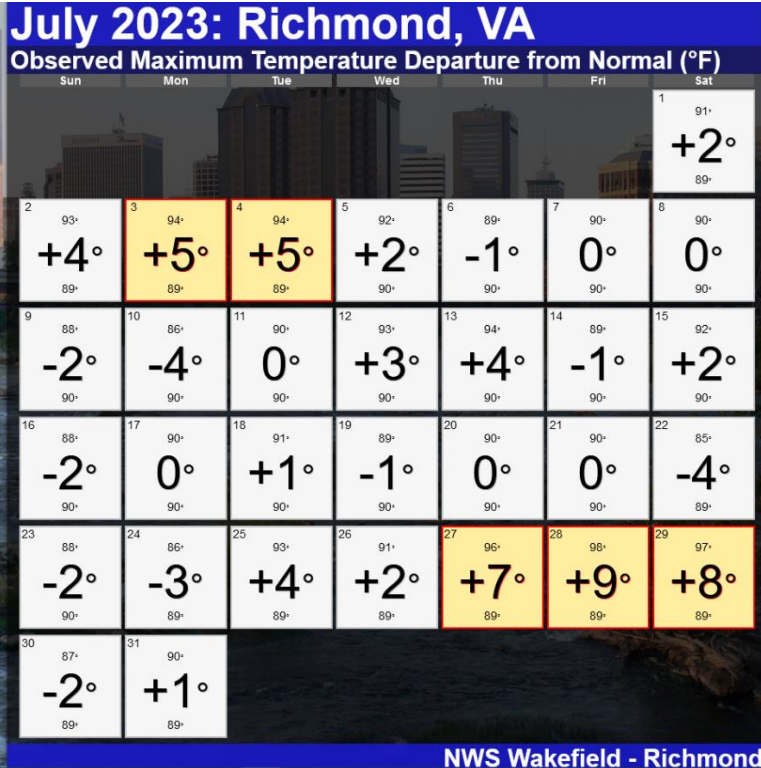
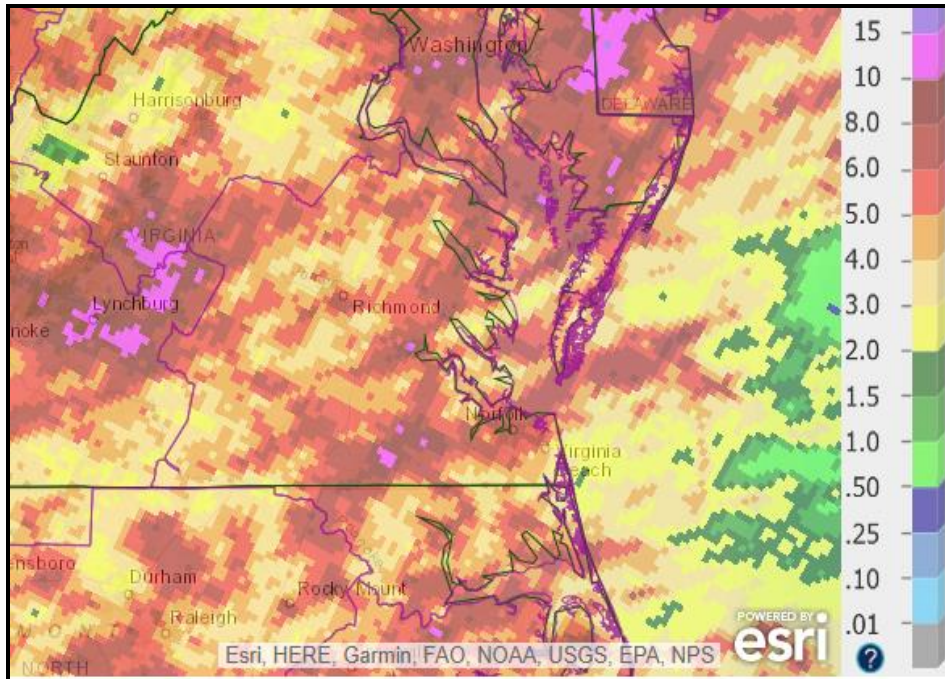
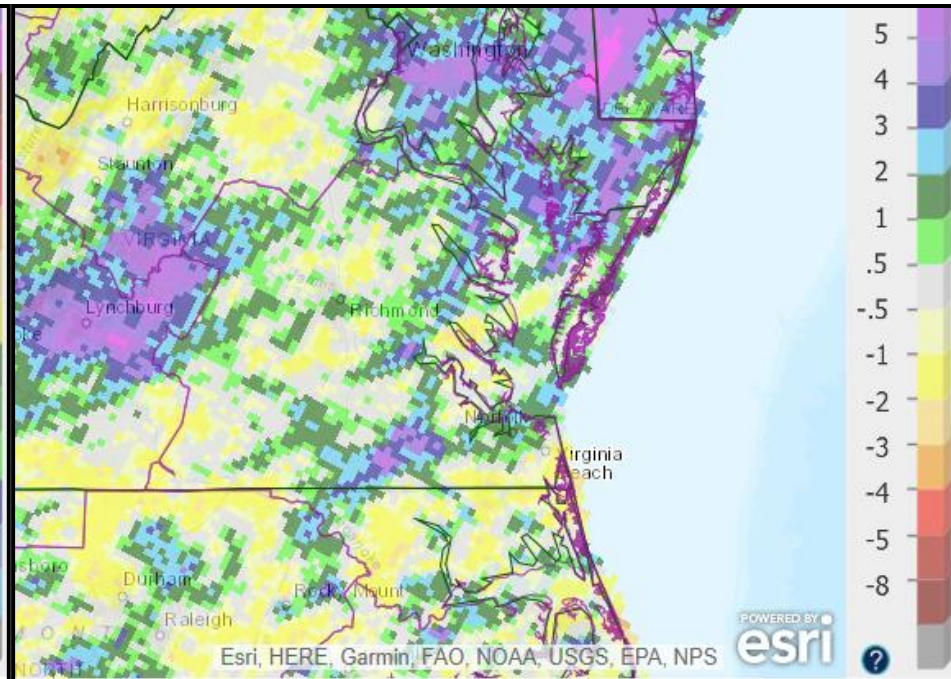


Figure 3

Regional Precipitation Maps: July 2023



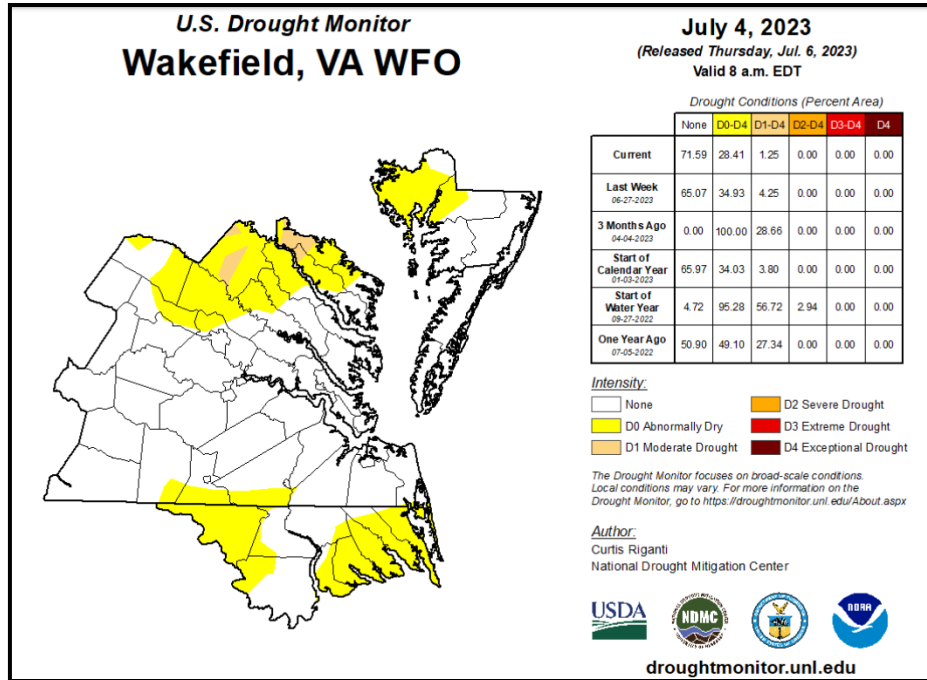
Total Precipitation (in.)



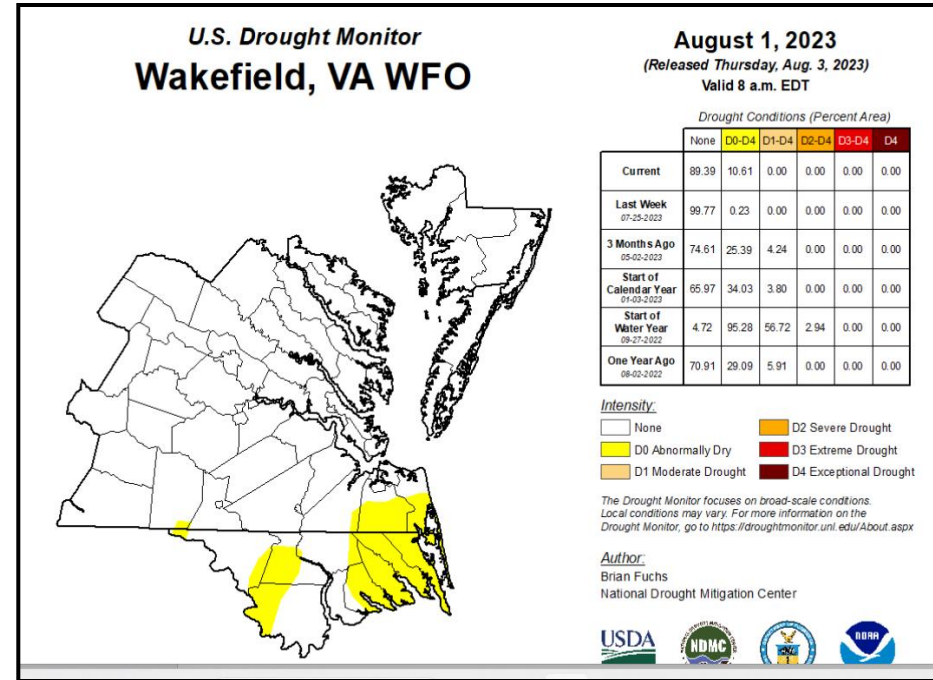
Departure from normal (in.)

Total Precipitation for the month is shown in the map on the left. ***Departures*** from the 30-year normals (1991-2020) are shown on the map on the right.

Drought Monitor Maps: July 2023



Early in month.



at Month's end

Daily Records for Long Term Climate Sites (July):

Norfolk, VA Records (Period of Record 150 yrs./1874-2023)

**tie*

Record Highs: none set.

Record Low Maximums: none set.

Record Lows: none set.

Record High Minimums: none set.

Daily Precipitation: none set.

Richmond, VA Daily Records (Period of Record 127 yrs./1897-2023)

**tie*

Record Highs: none set.

Record Low Maximums: none set.

Record Lows: none set.

Record High Minimums: 77 (28th).

Daily Precipitation: none set.

Salisbury, MD Daily Records (Period of Record 117 yrs./1907-2023)

**tie*

Record Highs: none set.

Record Low Maximums: none set.

Record Lows: none set.

Record High Minimums: 78 *(28th), 75 *(27th).

Daily Precipitation: none set.

Elizabeth City, NC Daily Records (Period of Record 90 yrs./1934-2023)

**tie*

Record Highs: none set.

Record Low Maximums: none set.

Record Lows: none set.

Record High Minimums: 79 *(29th), 80 (14th).

Daily Precipitation: none set.