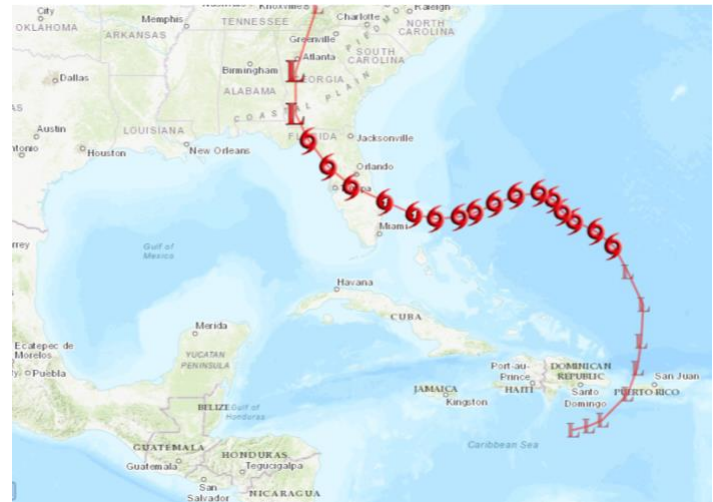


Hurricane Nicole: A Late Season Storm

Assembled by Emily Powell, Florida Climate Center, 19 December 2022



Nicole approaching Florida on 8 November 2022 at 1 PM EST
(Image from NASA/VIRRS)



Hurricane Nicole's track (Image from the North Carolina State Climate Office)

Hurricane Nicole made landfall as a category 1 hurricane on 10 November 2022, near Vero Beach, Florida with maximum sustained winds of 75 mph. It moved through central Florida, briefly emerged in the Gulf of Mexico, and made a second landfall later that day northwest of Cedar Key in the Big Bend region. The storm brought high winds, high surf, storm surge flooding, heavy rainfall, and significant beach erosion in areas previously impacted by Ian, including in Velano Beach, New Smyrna Beach, and Daytona Beach, which led to the collapse of beach structures. Nicole was a late-season storm. It became the 2nd-latest landfalling hurricane in the U.S. on record and only the third November hurricane on record to make landfall in Florida. It was the first November landfall in Florida in 37 years – since Hurricane Kate in 1985.

This summary report provides a high-level overview of observations observed, including wind and rainfall. However, the National Weather Service Melbourne Office has compiled an excellent post-storm report and Story Map. Therefore, we have not replicated this information and instead link to these and other additional resources at the end of this report.

Overview

Nicole began as a subtropical storm and transitioned to a tropical storm on November 8 as it continued to strengthen on its approach toward the Bahamas. Nicole became a large tropical cyclone with tropical-storm-force winds extending outward as much as 380 miles from its center. Peak storm surge heights of up to 4-5 feet were forecasted for areas along the eastern coast of Florida. Nicole reached category 1 hurricane status on November 9 around 6 PM EST before making landfall on Florida's East Coast on the 10th.

Nicole had maximum sustained wind speeds of 75 mph as it approached Florida's east coast, and the storm's large wind field brought a strong northeasterly wind flow up and down the northeastern coast of Florida. Strong onshore winds helped drive storm surge and severe erosion along coastal areas.

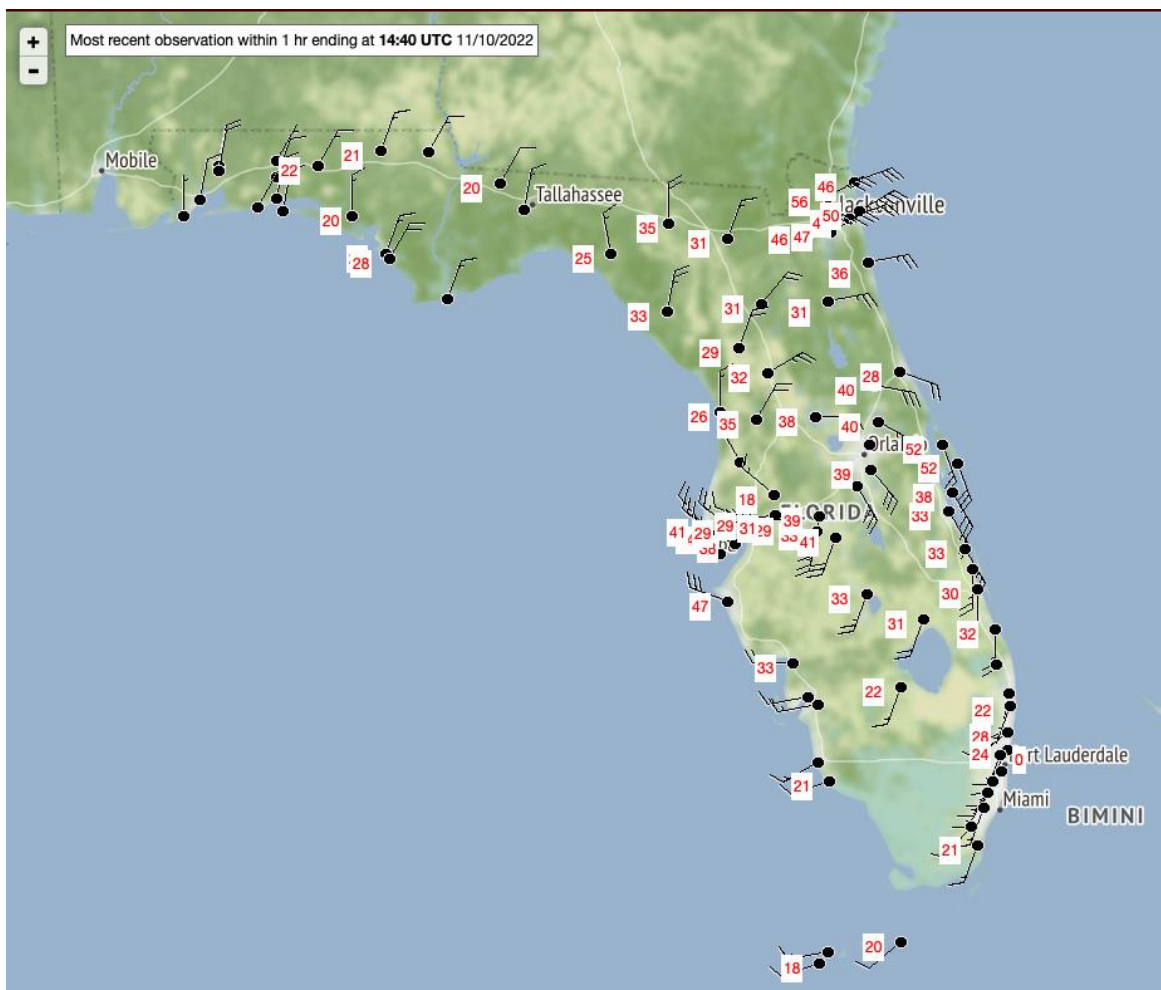


Figure: Wind gusts recorded on 10 November 2022 (from the University of Utah MesoWest).

Rainfall totals were over 5 inches in some parts of central Florida, from Sumter east through northern Brevard County, but rainfall was generally on the order of 2-3 inches across the rest of central Florida. Where recovery from Hurricane Ian was still underway such as along the St. Johns River, the

rain and coastal storm surge created more flooding and severe beach erosion that undermined coastal homes and other structures. However, the intermittent rain bands were a welcome relief from dry fall weather for others. Figures 4-6 below show accumulated rainfall totals from Nicole. Figure 4 shows accumulated storm totals across the state from November 9-11, while Figures 5 and 6 provide the daily rainfall totals from the storm on the 10th and 11th, respectively.

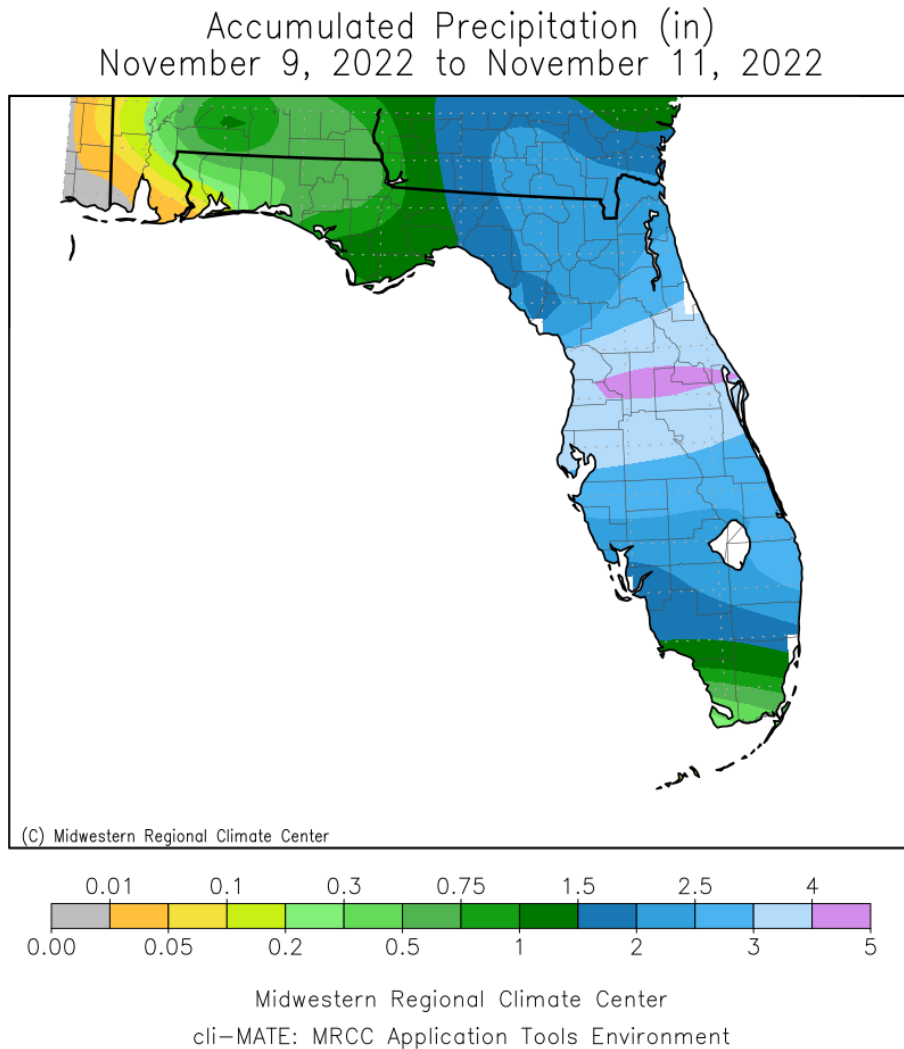


Figure 4. Accumulated rainfall during Hurricane Nicole from November 9-11, approximating the storm totals for Nicole.

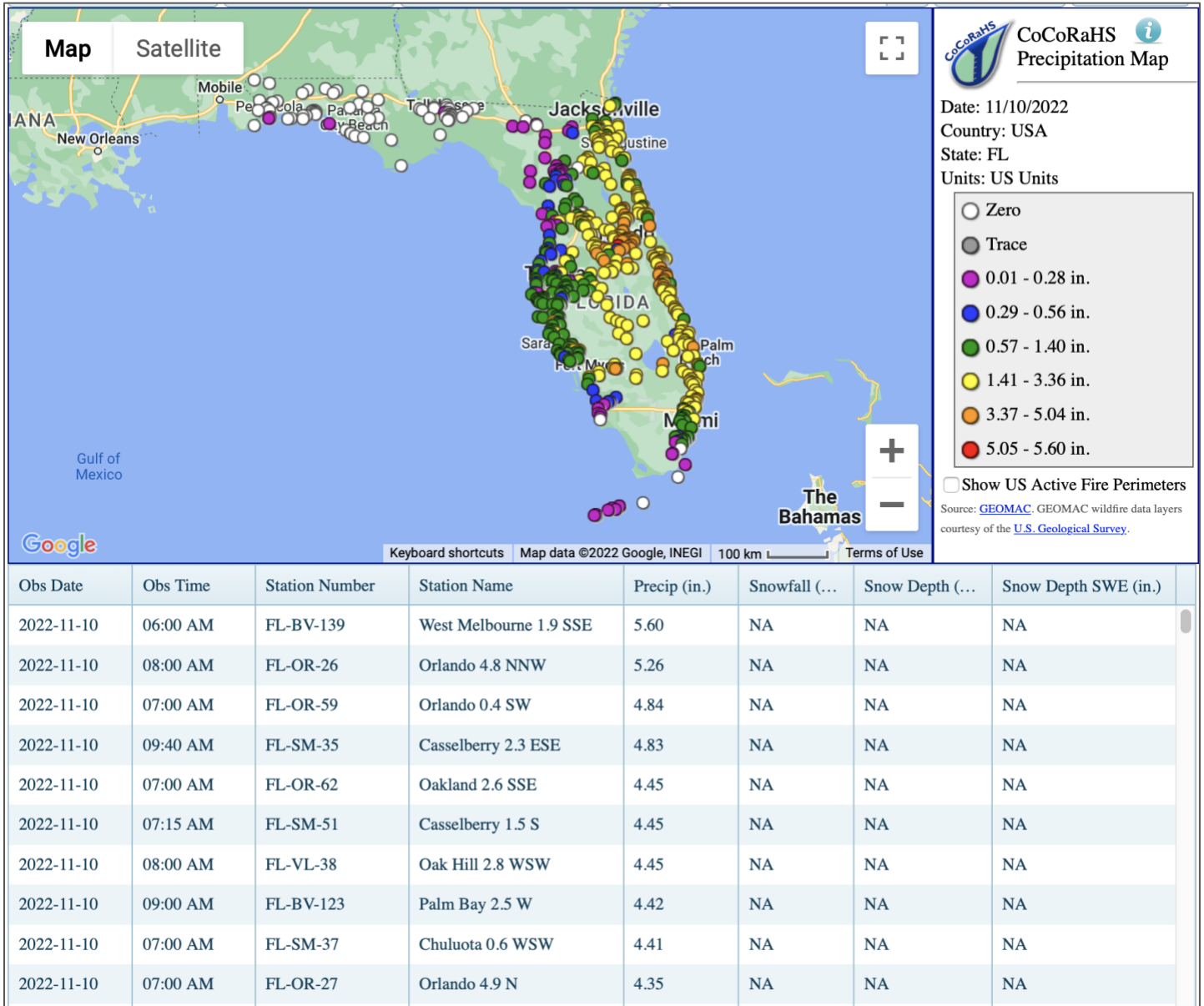


Figure 5. Daily rainfall totals reported by CoCoRaHS observers on 10 November; the table displays some of the highest daily rainfall totals reported.

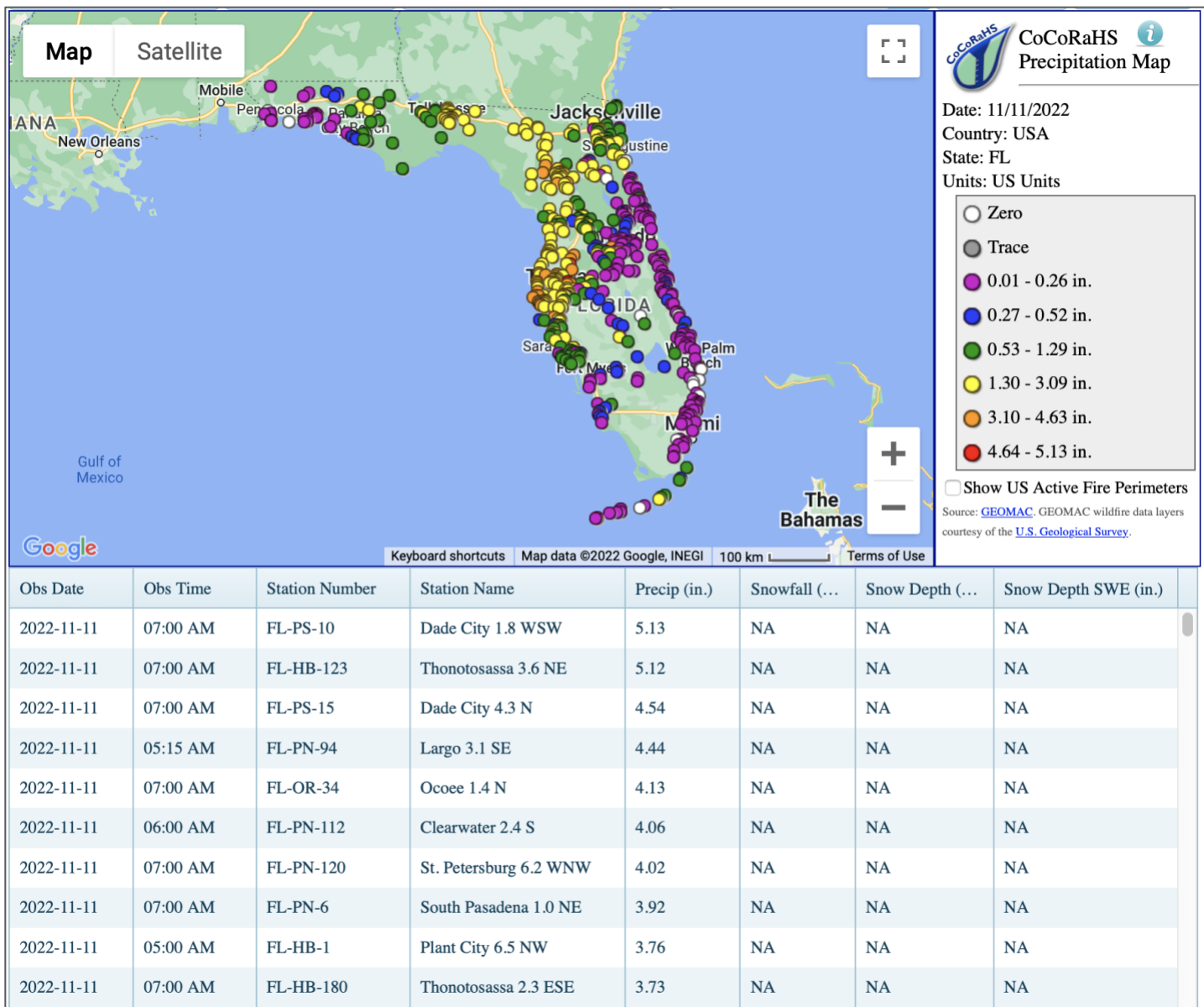


Figure 6. Daily rainfall totals reported by CoCoRaHS observers on 11 November; the table displays some of the highest daily rainfall totals reported.

Table 1. Select CoCoRaHS daily reports submitted during Hurricane Nicole, including daily rainfall totals in inches (typically observed at 7:00 am for the preceding 24 hours) and comments.

Date	Station name	City	Daily rainfall (in.)	Comments
11/10/2022	VL-3	DeLand	3.59	Tropical Storm/Hurricane Nicole moved ashore last night near Vero Beach. This is a large storm and my area is in the north part of the storm. My highest gust so far has been 43 mph. The air pressure is currently 29.43". Heavy rain as you can see from the total above. So far, the power has remained on in my area.
11/10/2022	HL-12	Sylvan Shores	3.22	Rains from overnight due to Hurricane/Tropical Storm Nicole. A bit windy with intermittent rain throughout the night. This morning, standing water in many places, but no where near the wind damage as seen with Ian a few weeks ago.
11/10/2022	IR-54	Vero Beach	2.89	Max winds here from Nicole 40 mph. Mostly misty blown drizzle after 4 AM. Power outages including this station. No standing water with very little in drainage canals. soggy soil
11/10/2022	SL-15	Fort Pierce	1.05	Direct hit of Hurricane Nicole Cat 1. Little rain, tide in canal off Indian River Lagoon near Fort Pierce Inlet was near top of seawall but not into house. About 2' tide above the already king tide.
11/10/2022	SL-54	Jensen Beach	1.92	In essence, beach 'flattened', so that the ocean is able to easily run up to the vegetation line on the 'rounded' dunes due to 'overtopping' (i.e., water came over the top of the dunes & subsequently ran into the trees & grass). Dunes not washed away but somewhat lowered in my vicinity. Any traces of a beach nourishment program from the past Apr-May completely gone including sea grass planted on the oceanside of the dunes.
11/11/2022	MA-22	Palmetto	3.44	Tropical Storm Nicole- Windswept rain steady in the morning/early afternoon then intermittent from early afternoon through midnight.
11/11/2022	VL-60	Port Orange	0.10	Nicole cleared out, not a big issue for us but devastating to the beach, about a mile away, 25 condo and hotel buildings declared unsafe and 25 homes also declared unsafe, all pending further inspection.
11/11/2022	PN-87	Gulfport	3.46	Mostly cloudy with calm winds. Puddles remain in the road. Highest wind gust recorded at 68.2 mph on roof top anemometer.
11/11/2022	PN-81	St. Petersburg	2.52	Bands of showers moved through all day from tropical storm Nicole which pasted just to the east of us. We had gust of winds up to 50MPH.
11/11/2022	NS-12	Fernandina Beach	2.00	Cloudy this morning; had passing showers yesterday several times. Winds have shifted to the SSE at approximately 3-8 knots. Temps in the low 70's. Still have flooding in the rivers at high tide.

Additional Resources:

- National Weather Service Melbourne Office StoryMap for Nicole:
<https://storymaps.arcgis.com/stories/95d77e39b6fb4959b691ce89961392c8>
- National Weather Service Melbourne Office Post Tropical Cyclone Report on Hurricane Nicole:
<https://nwschat.weather.gov/p.php?pid=202211121715-KMLB-ACUS72-PSHMLB>
- Weather Prediction Center storm summary reports archive for Nicole:
https://www.wpc.ncep.noaa.gov/storm_summaries/storm19/storm19_archive.shtml
- National Hurricane Center forecast graphics archive:
https://www.nhc.noaa.gov/archive/2022/NICOLE_graphics.php
- Florida Department of Environmental Protection's Hurricane Ian and Hurricane Nicole Preliminary Post-Storm Beach Conditions and Coastal Impact Report:
<https://floridadep.gov/rcp/coastal-engineering-geology/documents/hurricane-ian-hurricane-nicole-preliminary-post-storm>