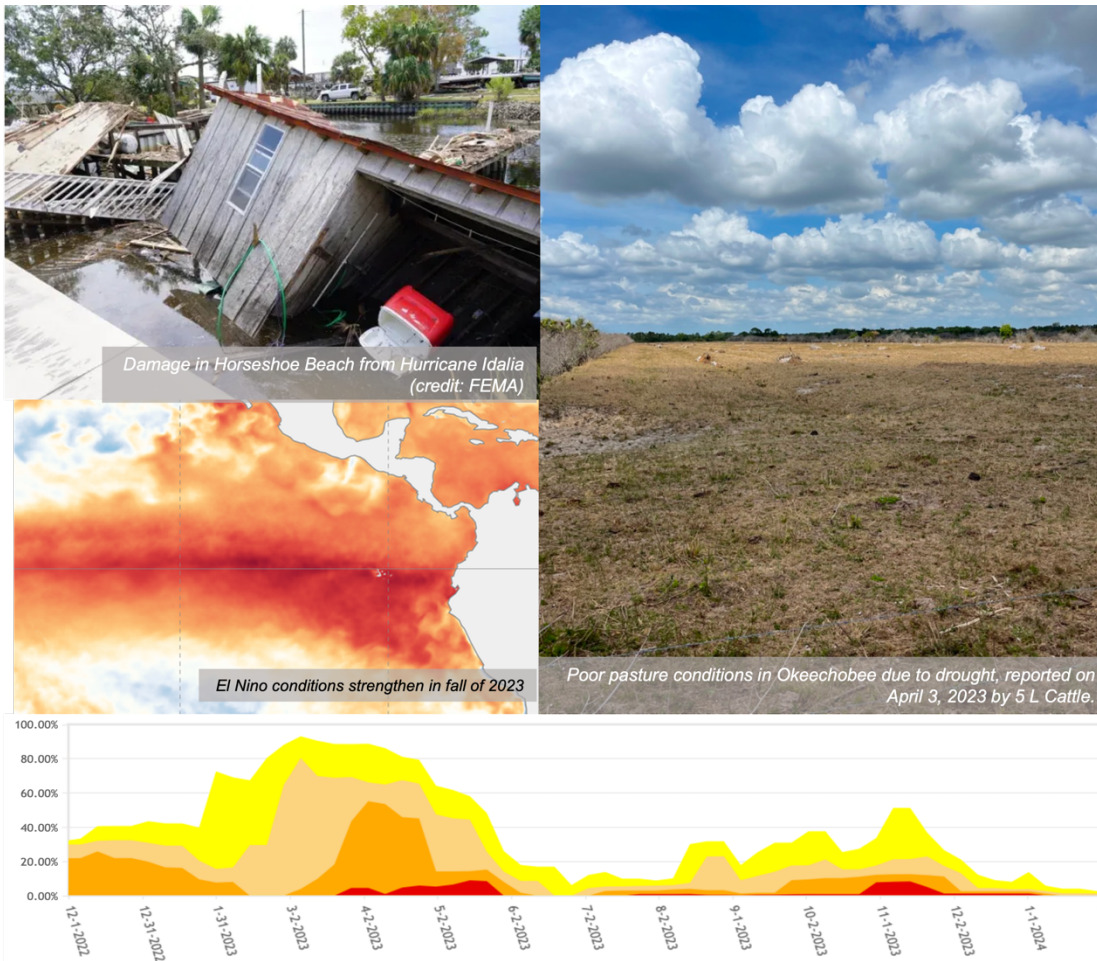




2023 FLORIDA WEATHER AND CLIMATE SUMMARY

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Florida Climate Center
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From top left to right: Damage in Horseshoe Beach from Hurricane Idalia (credit: FEMA); severely dry pasture in Okeechobee on April 3, 2023 reported by a local observer; eastern Pacific Ocean sea surface temperature anomalies showing strengthening El Nino (credit: NOAA); time series showing the percentage of the state in drought, from the US Drought Monitor (bottom).



2023 Ties for Hottest Year on Record in Florida

Florida continues to see above-average warmth. According to the National Centers for Environmental Information (NCEI), 2023 tied as the **warmest year on record in Florida** since 1895. The statewide annual average temperature was 73.4°F in 2023, which was 3.2°F above the 20th century average of 70.1°F and tied with 2015. Statewide monthly average temperature anomalies are provided in Table 1; 2023 had 12 consecutive months with above-average temperatures. **The statewide annual average maximum temperature ranked record warm in 2023**, at 83.6°F. The statewide annual average minimum temperature ranked 4th-warmest on record, at 63.1°F.

Florida experienced persistent summer heat. While summer (JJA) ranked 3rd-warmest based on statewide average temperatures, both July and August each set new all-time records for hottest months ever recorded for the state, at 84.2°F and 85.0°F, respectively.

According to NCEI, the 2023 average annual temperature ranked as the **5th-warmest year on record for the contiguous U.S.**, based on records dating back to 1895. The average annual contiguous U.S. temperature was 54.4°F, which was 2.4°F above the 20th century average. The Gulf South and parts of New England were record warm in 2023, while much of the West was closer to normal (Figure 1).

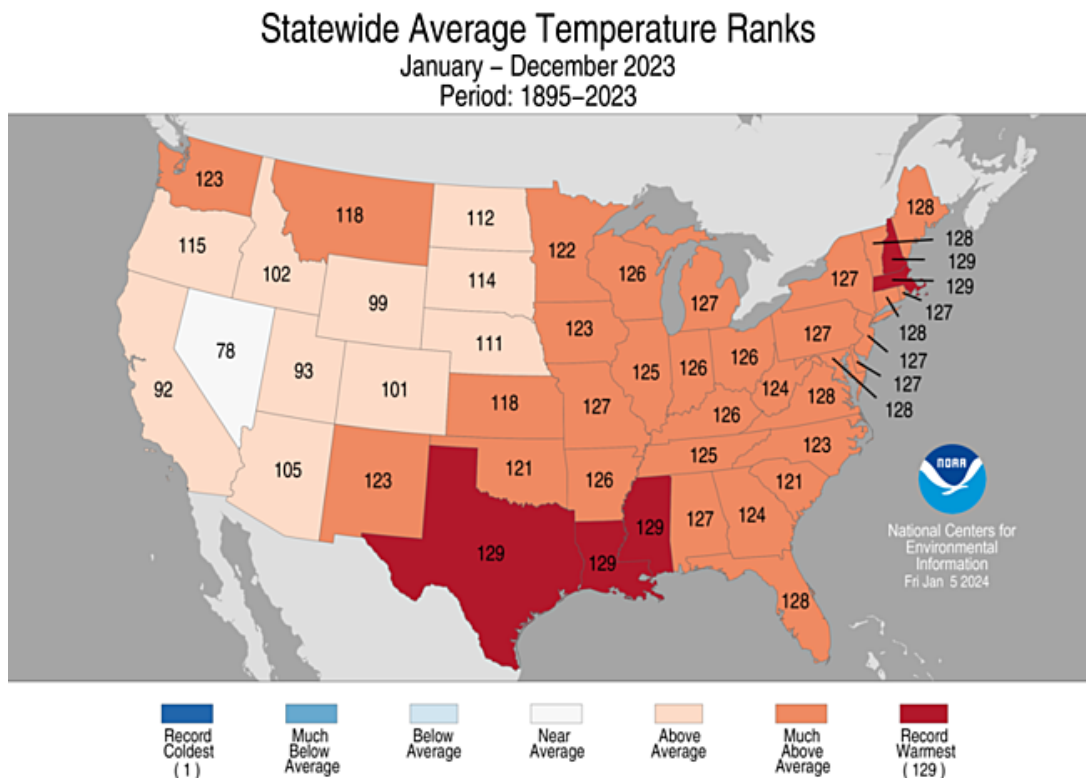


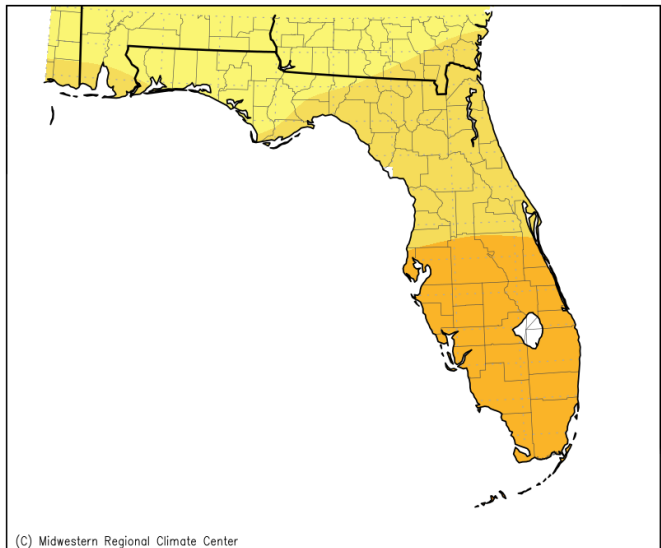
Figure 1. State-level rankings of annual average (mean) temperature in 2023, based on the historical instrumental record from 1901-2000, from NOAA/NCEI.

Table 1. 2023 statewide monthly average temperature departures from average (1901-2000) for Florida.

Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
+4.2	+8.2	+5.2	+4.0	+1.2	+1.1	+3.1	+3.9	+1.5	+1.2	+2.4	+2.6

Based on a review of stations in the NWS COOP and ASOS networks, as well as stations from the Florida Automated Weather Network (FAWN), the highest maximum temperature recorded in Florida in 2023 was 111.2°F at **Clewiston** (FAWN) on June 2. The lowest temperature recorded in 2023 was 15.0°F at **the Archbold Bio Station** (COOP) on January 15.

Many stations in Florida recorded a record hot year in 2023 based on annual average temperatures. These stations include **Pensacola, Daytona Beach, Tampa, Orlando, Venice, Punta Gorda, Fort Myers, Naples, Miami, and Key West**. Figure 3 shows annual average temperature rankings by county. Many counties had their hottest year on record as well (dark red), and nearly every county experienced one of their top 5 warmest years on record.



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Figure 2. The 2023 annual average temperatures, in °F, in Florida, courtesy of the Midwestern Regional Climate Center.

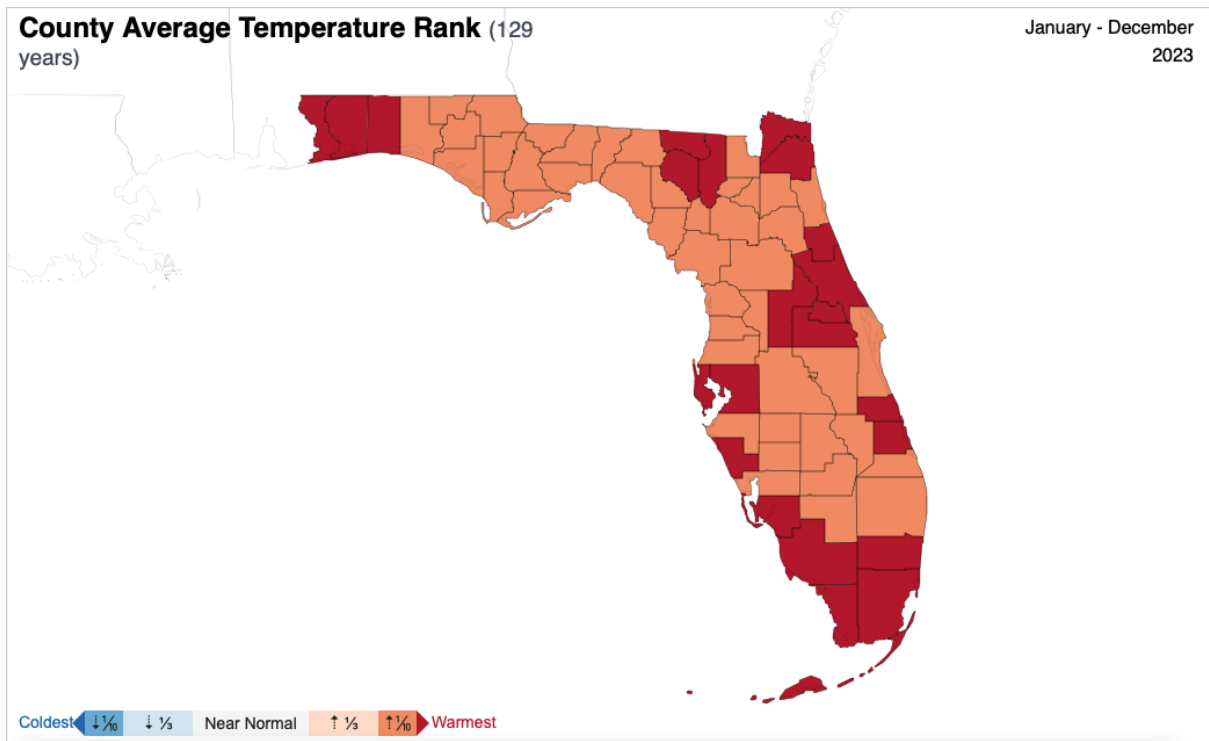


Figure 3. County level rankings of annual average (mean) temperatures in 2023, based on the instrumental record from 1901-2000, from NOAA/NCEI.

Florida is divided into 7 climate divisions representing regions of generally homogenous climate. These 7 divisions are as follows: Panhandle (1), North (2), North Central (3), South Central (4), Everglades and Southwest Coast (5), Lower East Coast (6), and Keys (7) (Figure 5).

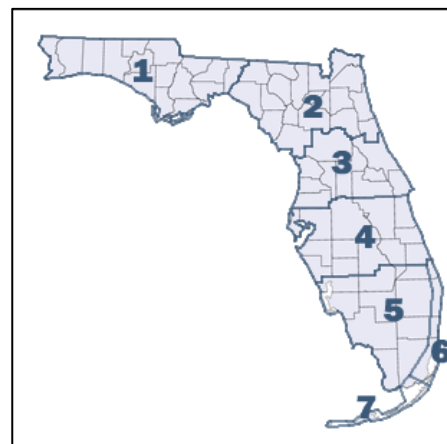


Figure 5. Map of Florida's seven climate divisions.

The 2023 annual average temperatures by climate division and their rankings are shown in Table 2. All climate divisions ranked 1st or 2nd warmest on record in 2023.

Divisional seasonal average temperatures and their rankings (in parentheses) compared to the long-term mean temperature (1901-2000) are shown in Table 3. Spring and summer were the warmest seasons, while fall was the coolest season, though still well above average especially for South Florida.

Table 2. Annual 2023 mean temperatures (°F) by climate division and rankings compared to historical values, based on data from the NOAA National Centers for Environmental Information.

DIVISION NO.	ANNUAL MEAN TEMPERATURE (°F)	RANKING (since 1895)
1	69.7	1 st warmest
2	71.2	1 st warmest
3	73.8	2 nd warmest
4	75.1	2 nd warmest
5	77.0	1 st warmest
6	77.8	1 st warmest
7	79.8	1 st warmest

Table 3. Statewide and divisional 2023 seasonal mean temperatures (°F) and their rankings compared to the 1901-2000 instrumental record, in parentheses. Winter includes December 2022, consistent with the definition of that season.

DIVISION NO.	WINTER (DJF)	SPRING (MAM)	SUMMER (JJA)	FALL (SON)
Statewide	63.7 (6 th warmest)	72.9 (4 th warmest)	83.2 (3 rd warmest)	73.6 (23 rd warmest)
1	58.4 (7 th warmest)	69.1 (11 th warmest)	82.6 (5 th warmest)	69.0 (42 nd warmest)
2	60.2 (7 th warmest)	70.8 (5 th warmest)	82.6 (4 th warmest)	70.9 (33 rd warmest)
3	63.7 (8 th warmest)	73.7 (3 rd warmest)	83.3 (2 nd warmest)	74.1 (18 th warmest)
4	66.0 (6 th warmest)	74.7 (2 nd warmest)	83.5 (2 nd warmest)	75.9 (13 th warmest)
5	69.8 (4 th warmest)	76.3 (4 th warmest)	83.9 (3 rd warmest)	78.3 (9 th warmest)
6	71.2 (3 rd warmest)	77.1 (3 rd warmest)	84.0 (3 rd warmest)	79.2 (6 th warmest)
7	73.4 (3 rd warmest)	78.7 (3 rd warmest)	86.0 (1 st warmest)	81.3 (3 rd warmest)

El Niño’s Impact on Weather in 2023

In early 2023, the ongoing 3-year La Niña began to weaken. El Niño quickly developed by summer and was in place by the start of the 2023 hurricane season. El Niño conditions in the equatorial Pacific Ocean continued to strengthen throughout the year, becoming a strong El Niño by the end of the year. However, its impacts were delayed across much of Florida, with a turn toward a more typical wetter and stormier pattern by winter. El Niño conditions tend to suppress or inhibit tropical cyclone formation in the Atlantic basin. However, the 2023 season was very active with an above-average number of named storms despite the developing El Niño. The presence and persistence of very warm sea surface temperatures in the North Atlantic and Gulf of Mexico provided ample fuel for hurricane development and intensification. These two competing factors – El Niño and record warm SSTs – each played a role, but the record warm ocean temperatures had a more dominating influence on overall hurricane activity.

2023 Brought Too Much or Not Enough Rainfall

Nationwide, annual average precipitation was near average in 2023 with an average annual total of 29.50 inches, which was 0.44 inches below the long-term mean of 1901-2000 (Figure 6). This made 2023 the **44th-driest year on record for the U.S.**

Annual precipitation in Florida was near the historical average, when considering the annual total averaged over the land area of the state. The 2023 statewide annual average precipitation was 54.17 inches (exclusively rainfall), which was +0.52 inches above the historical average of 53.65 inches (1901-2000). This ranked **58th-wettest** in the instrumental record dating back to 1895.

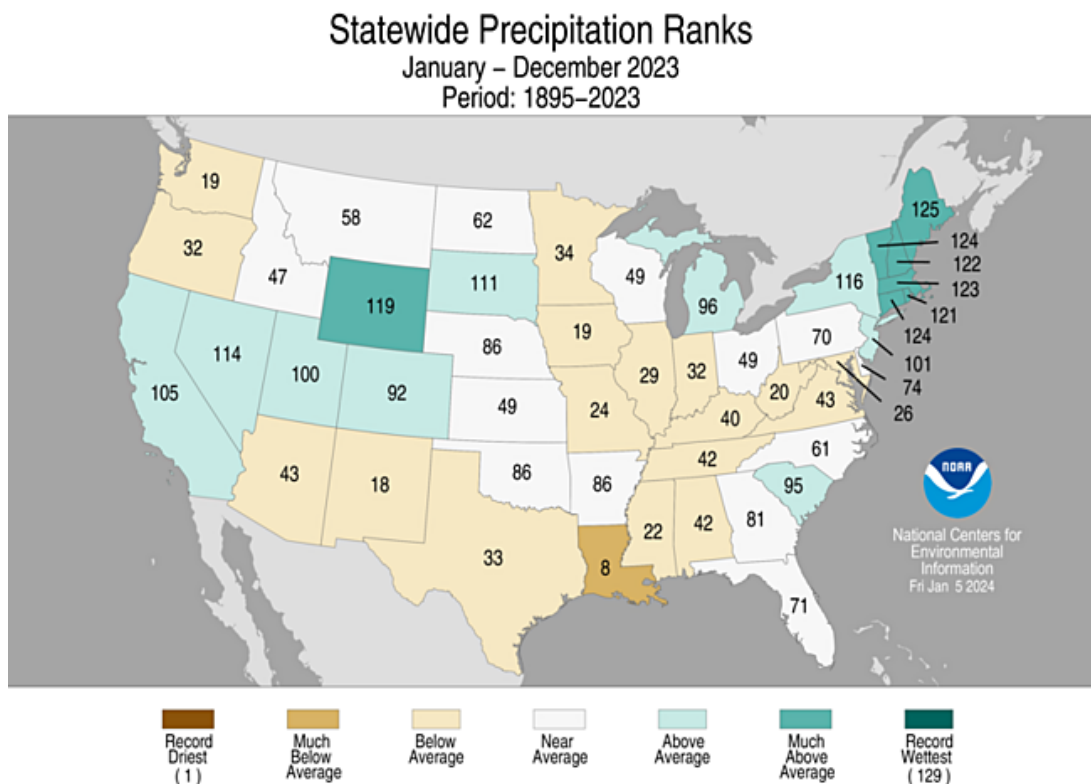


Figure 6. State rankings of annual average (mean) precipitation in 2023, based on the historical instrumental record from 1901-2000, from NOAA/NCEI.

Annual precipitation values ranged from over 30 inches in west central Florida and the northern Panhandle to over 80 inches in Southeast Florida (Figure 7). Total annual precipitation was record high in **Fort Lauderdale** with 113.61 inches for the year, which was +52.66 inches above normal. This was the highest annual rainfall total observed for any station in Florida. **Sarasota** had its driest year on record in 2023, with 27.13 inches of rain, which was -29.15 inches below normal.

Based on a review of all **CoCoRaHS** stations with at least 95% complete data for the year, the greatest total annual rainfall reported among CoCoRaHS observers was 112.33 inches (Plantation 3.4 E) in Broward County. The lowest total annual rainfall observed within the CoCoRaHS network was 25.05 inches (St. Petersburg 6.3 NNW) in Pinellas County.

Annual precipitation totals by climate division and their rankings (in parentheses) are provided in Table 4. Seasonal precipitation totals and rankings for each climate division are provided in Table 5.

The wettest region of the state in 2023 was Southeast Florida, while central Florida was the driest.

Winter was the driest season of the year. The winter seasonal departure from normal was -3.30 inches for the state as a whole, while spring, summer and fall were closer to normal. At the start of the year, drought impacted the Panhandle. By March 2023, extreme drought (D3) emerged in southwest Florida with the rest of the Peninsula experiencing severe drought (D2). Extreme drought moved north along the western coast during spring, affecting an area stretching from coastal Levy County through Sarasota County. Drought, or abnormally dry conditions, persisted in coastal west-central Florida through the rainy season and through the end of the year. Meanwhile, flash drought impacted the western Panhandle during fall.

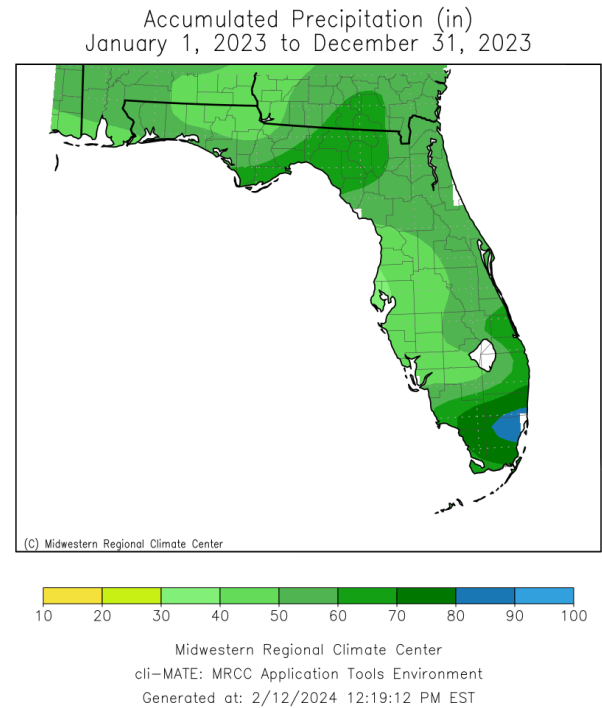


Figure 7. Total annual accumulated precipitation (in inches) in Florida in 2023, courtesy of the Midwestern Regional Climate Center.

Table 4. Annual total precipitation (inches) by climate division and rankings compared to historical values, based on data from the National Centers for Environmental Information.

DIVISION NO.	ANNUAL TOTAL RAINFALL (inches)	RANKING (since 1895)
Statewide	54.17	59 th wettest
1	52.28	35 th driest
2	58.35	28 th wettest
3	51.06	61 st driest
4	49.81	55 th driest
5	55.23	47 th wettest
6	72.33	6 th wettest
7	48.54	50 th wettest

Table 5. Statewide and divisional seasonal precipitation totals (in inches) and their ranking compared to the 1901-2000 instrumental record, in parentheses. Winter includes December 2022, consistent with the definition of that season.

DIVISION NO.	WINTER (DJF)	SPRING (MAM)	SUMMER (JJA)	FALL (SON)
Statewide	5.54 (21 st driest)	11.01 (57 th wettest)	21.78 (64 th wettest)	12.43 (64 th driest)
1	10.54 (31 st driest)	11.20 (50 th driest)	15.91 (21 st driest)	10.22 (55 th driest)
2	5.79 (19 th driest)	11.59 (51 st wettest)	23.96 (32 nd wettest)	11.19 (57 th wettest)
3	3.64 (8 th driest)	9.01 (60 th driest)	22.72 (58 th wettest)	12.70 (55 th wettest)
4	3.54 (23 rd driest)	8.78 (58 th driest)	23.93 (47 th wettest)	11.92 (57 th driest)
5	3.25 (27 th driest)	12.94 (25 th wettest)	22.06 (52 nd driest)	15.13 (51 st wettest)
6	5.64 (53 rd driest)	17.79 (13 th wettest)	25.96 (21 st wettest)	21.33 (38 th wettest)
7	4.56 (58 th driest)	9.12 (55 th wettest)	15.11 (37 th driest)	17.15 (45 th wettest)

Figure 9 below shows the 2023 average precipitation rankings by county. This map shows the east-west divide between the areas of the state that received ample and extreme rainfall and those that received too little rainfall during the year. Northwestern and west-central counties were drier than normal, with Pinellas County experiencing its driest year on record. East coastal counties and the Big Bend were above normal. Broward County had its 4th-wettest year on record, and Miami-Dade County had its 9th-wettest year on record.

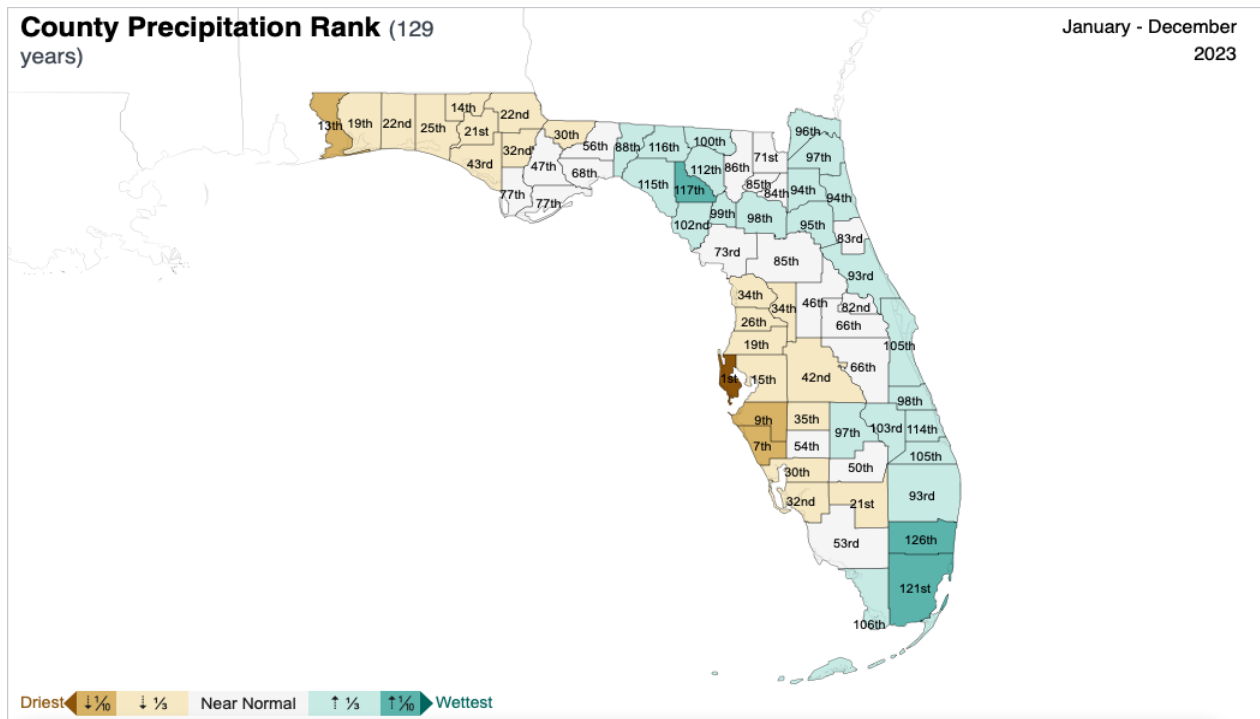


Figure 9. County-level rankings of annual average (mean) precipitation in 2023, based on the historical instrumental record 1901-2000, from NOAA/NCEI.

Extreme Events in 2023

According to NOAA, the U.S. had 28 weather and climate disasters that each incurred a cost of at least \$1 billion or more in 2023, ranking first for the highest number of billion-dollar disasters in any calendar year since 1980. The previous record was 22 events in 2020. Disaster costs for 2023 totaled \$92.9 billion.

Hurricane Idalia

Hurricane Idalia was the only storm to directly impact Florida in 2023. The storm made landfall near Keaton Beach in the Big Bend region on August 30th as a strong Category 3 storm with winds of 125 mph. Idalia resulted in an estimated \$3.6 billion in damages.

Idalia produced damaging storm surge between 7-12 feet above ground in Taylor and Dixie Counties. The surge and winds caused extensive damage to homes, businesses, trees, power lines, and other infrastructure. The storm's landfall coincided with low tide, which means storm surge could have been a few feet higher had it made landfall a few hours later. The storm produced 5-10 inches of rainfall across the Big Bend and northern Florida (Fig. 12). The storm's impacts were further tempered by the fact that its inner core was degrading as it underwent an eyewall replacement cycle immediately prior to landfall. More information can be found from the NWS Tallahassee summary at: <https://www.weather.gov/tae/HurricaneIdalia2023>.

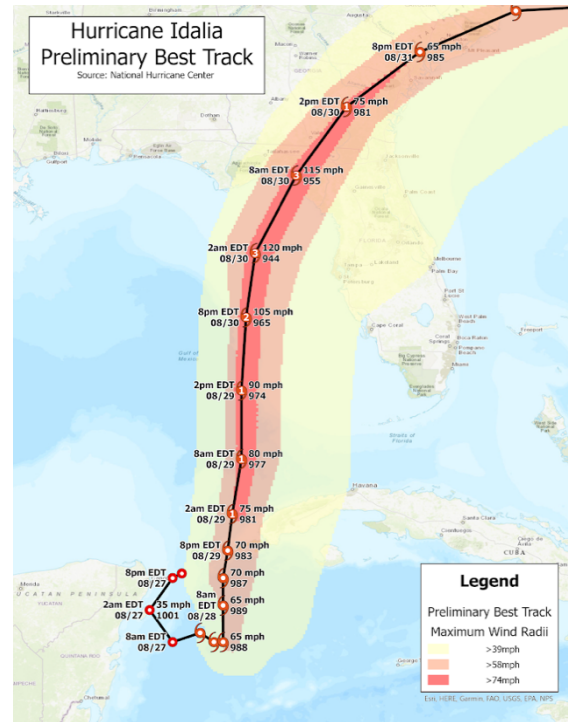


Fig. 11 Hurricane Idalia's track and intensity (credit: NWS Tallahassee)

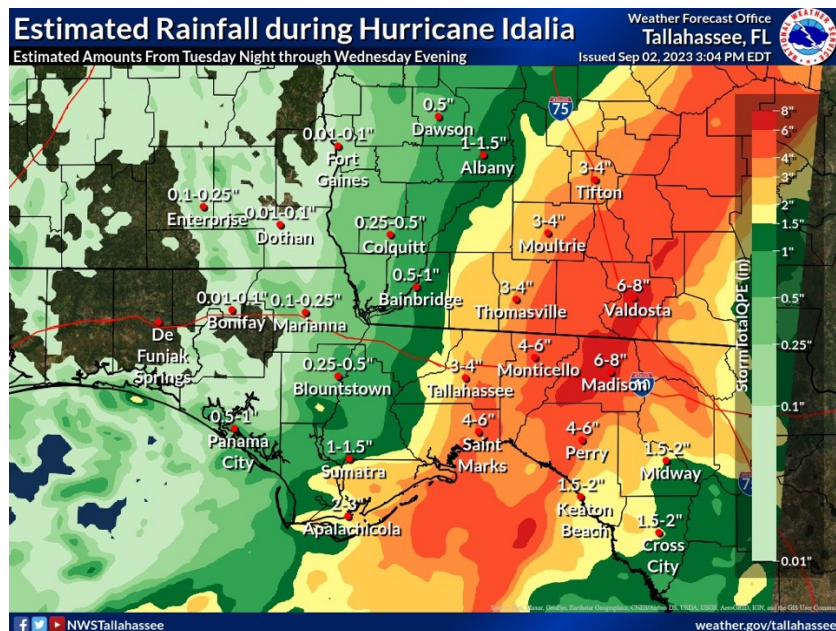


Figure 12. Radar estimated rainfall from Hurricane Idalia in Florida and Georgia (source: NWS Tallahassee).

Fort Lauderdale Extreme Rainfall Event

One of the more notable and memorable extreme weather events during the year was the record rainfall and flooding in Fort Lauderdale. On April 12-13, the Fort Lauderdale area experienced copious amounts of rainfall from a series of thunderstorms that brought multiple hours of heavy rainfall, with rates of 3-6 inches per hour and 12-hour totals exceeding 20 inches. The Fort Lauderdale airport received more than 25 inches of rain in less than 24 hours. This was estimated to be a 1,000-year event and smashed the one-day record rainfall of 14.59 inches set on April 25, 1979. Flash flooding left cars stranded on roadways, inundated homes, and shut down the FLL airport. The NWS in Miami developed a detailed account of the storm, [available here](#).

Severe Weather

According to the NCEI Storm Events Database, there were 49 tornadoes reported in 2023 in Florida. This is just below the historical annual average of tornadoes in the state (59), based on data from 1985-2014 from NOAA. Only one injury and no fatalities were reported. There were a total of 1,160 NWS-issued severe thunderstorm and tornado warnings combined in 2023, which was more than any other year on record from 1986-2023 (Figure 13).

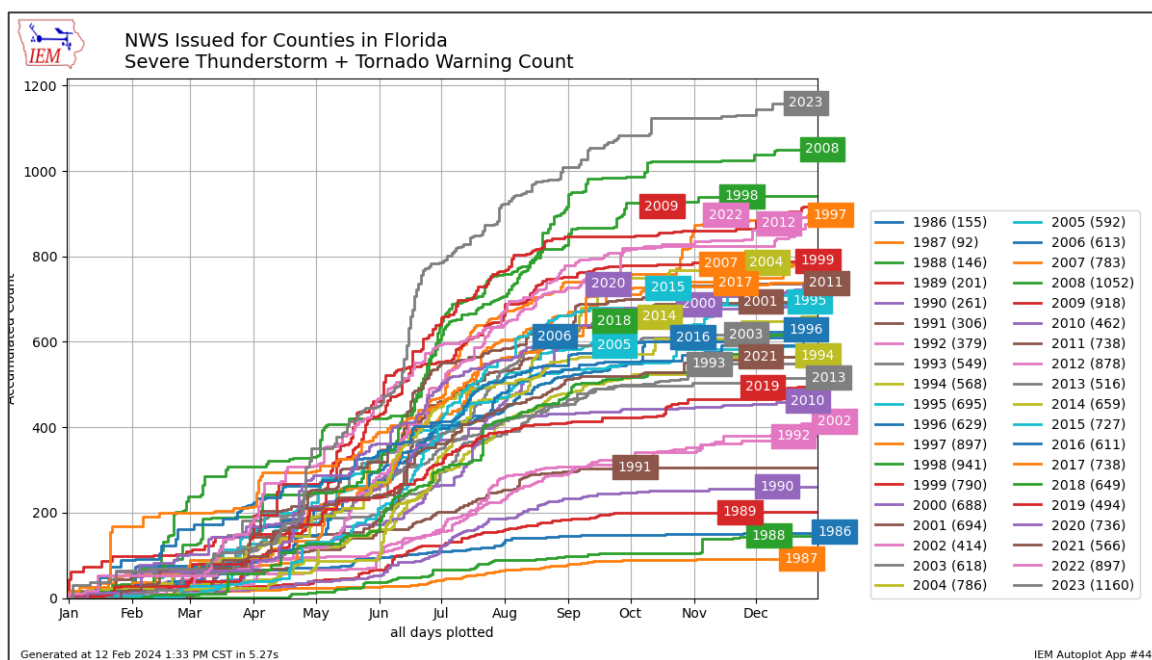


Figure 13. Accumulated annual total of National Weather Service (NWS) issued severe thunderstorm and tornado warnings in Florida from 1986-2023.