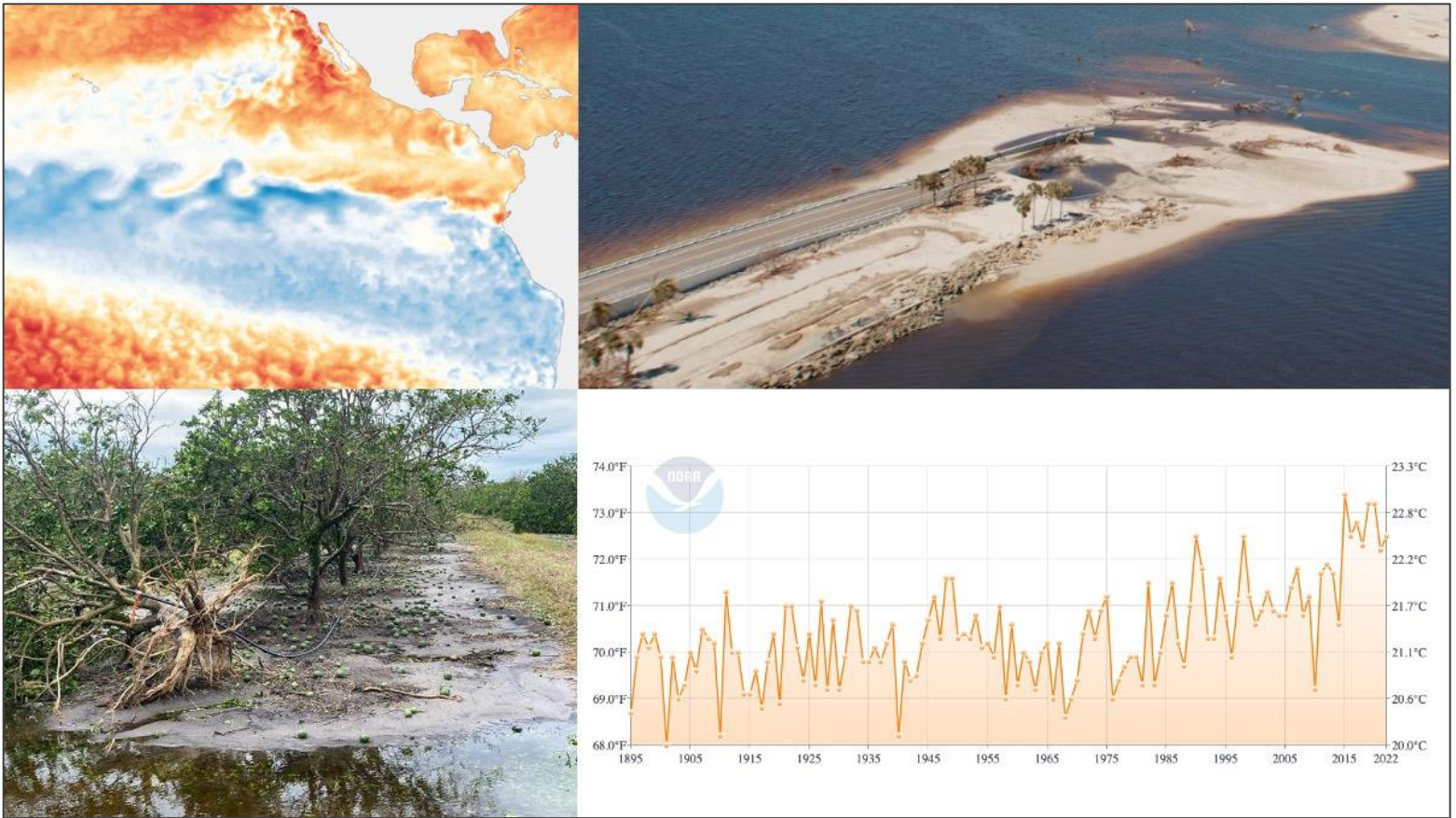




2022 FLORIDA WEATHER AND CLIMATE SUMMARY

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Florida Climate Center
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From top left to right: La Nina conditions continued; damage to the Sanibel bridge and causeway from Hurricane Ian (credit: Florida DEP); damage to citrus from Hurricane Ian (credit: UF/IFAS); Florida temperatures continued recent warming trends.



Temperatures

According to the National Centers for Environmental Information (NCEI), the 2022 average annual temperature for the contiguous U.S. ranked as the **18th-warmest year on record**, based on records dating back to 1895. The average contiguous U.S. temperature was 53.4°F, which was 1.4°F above the 20th century average. Western and eastern regions of the U.S. saw above-average temperatures in 2022, generally between 1.5 and 2.6°F above average, while much of the Midwest and Ohio Valley regions were near normal (Figure 1).

2022 was the **5th-warmest year on record in Florida** since 1895. Annual average temperatures across the state were above the historical average (1901-2000). The statewide annual average temperature was 72.5°F in 2022, which was 2.3°F above the 20th century average of 70.2°F (Figures 2 and 3). The warmest months of the year were March and November, which were +4.5°F and +5.3°F above average, respectively; the coolest month of the year was October, when the monthly average temperature was -1.6°F below average.

Table 1. 2022 statewide monthly average temperature departures from the long-term average (1901-2000).

Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
-0.2	3.6	4.5	2.6	2.6	2.5	2.1	1.7	0.8	-1.6	5.3	2.8

Florida continues to see above-average warmth. 2022 was the 12th year in a row with above-average temperatures, and 26 out of the past 27 years have been warmer than the historical average in Florida. 2015 remains our warmest year on record, which had an annual average temperature of 73.4 °F which was +3.3 °F above average.

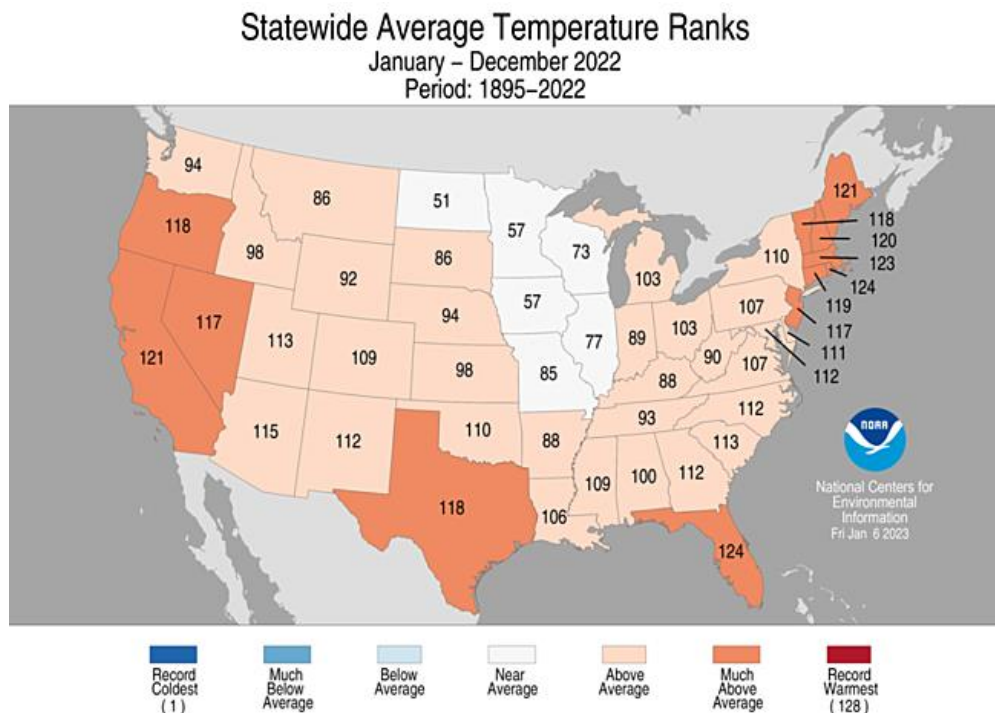


Figure 1. Map displaying the ranking of each state's annual average (mean) temperature in 2022, based on the historical instrumental record 1895-2022.

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 2022 was 104°F at **Crestview and Tallahassee** (COOP) on June 23 and 25, respectively. The lowest temperature recorded in 2022 was 15°F at **Mayo** (COOP) on December 25, followed by 16°F recorded near **Crestview** (at the Duke Field Afs ASOS station) on December 26.

Tampa and Fort Myers recorded their warmest year on record, based on annual average temperatures, while several additional locations across the Peninsula recorded one of their top 5 warmest years on record, such as **Daytona Beach** (3rd warmest), **Orlando** (3rd warmest), and **Miami** (5th warmest). Additional highlights for the year are provided in Figure 3 for select cities. Figure 4 shows annual average temperature rankings by county.

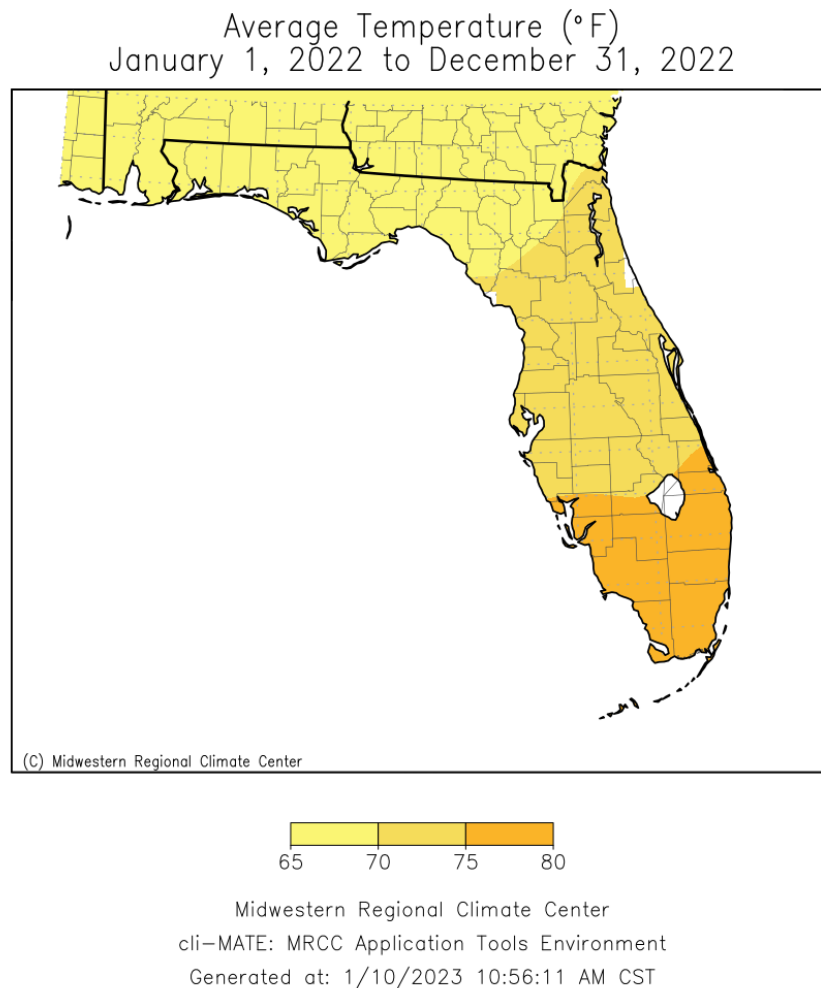


Figure 2. Map of the annual average temperatures, in °F, in Florida for 2022.

2022 Climate Stats for Select Florida Cities

Pensacola

- 6th warmest year on record
- 9 of top 10 warmest years on record have all occurred in the past decade
- May was the wettest month with 12.05" of rain (8.15" above normal); October was the driest month with 1.15" of rain (3.48" below normal)

Tampa

- 2022 was the warmest year on record
- 9 of the top 10 warmest years on record have all occurred in the past decade

Tallahassee

- 12th warmest year on record
- 2nd hottest temperature ever recorded of 104°F occurred on June 24 (also hottest temperature of the year)
- 10th-driest Fall on record, with severe drought development

Orlando

- 3rd warmest year on record
- 5th wettest year on record
- Orlando International Airport recorded a new all-time record for heaviest 1-day rainfall with 7.72" on September 28

Daytona Beach

- 3rd warmest year on record
- A new high maximum temperature record was broken with 101°F, recorded on June 23
- Wettest month was September with 19.12" of rain (+11.97" above normal); driest month was October with just 0.36" of rain (-4.49" below normal)

Miami

- 5th warmest year on record
- 2nd warmest Fall (SON) on record (tied with 2020)



Figure 3. 2022 climate summary stats for select Florida cities.

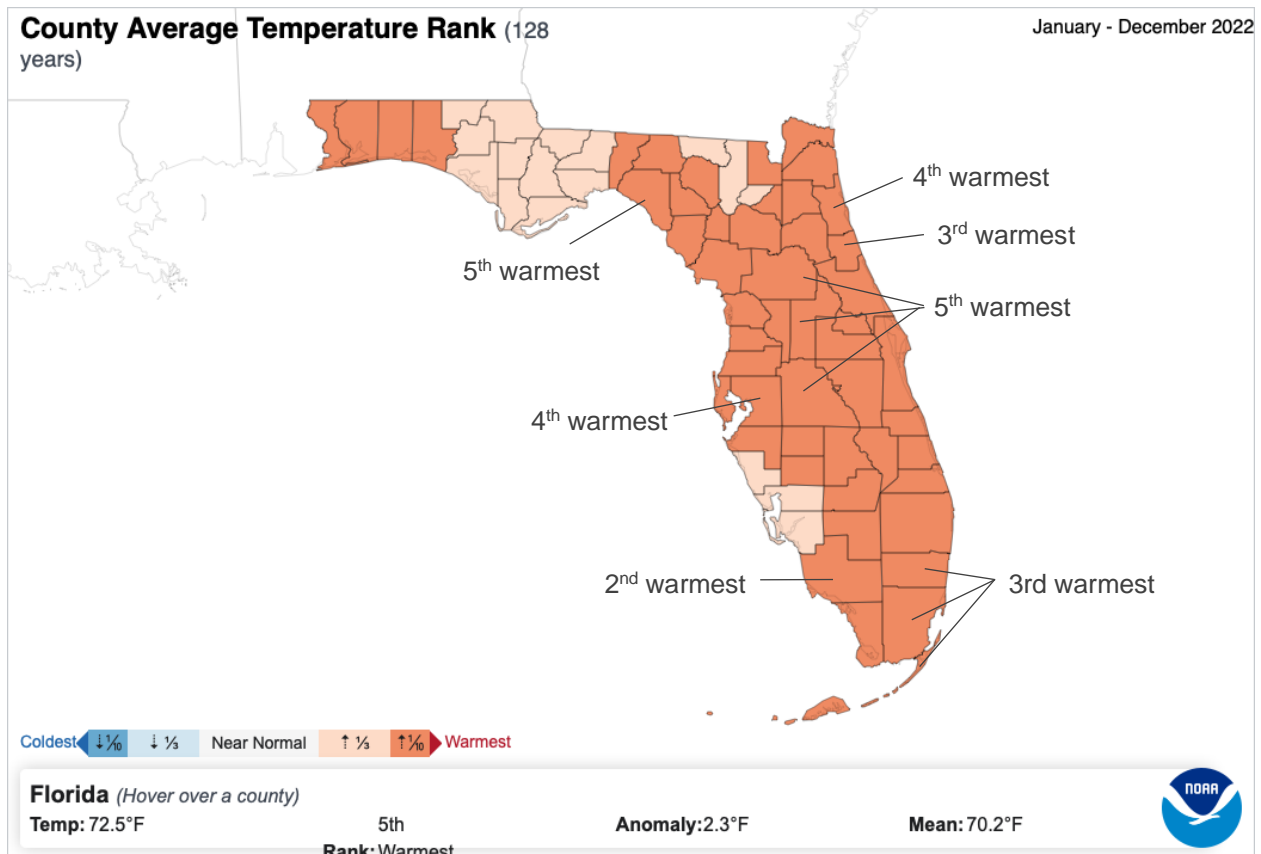


Figure 4. Map displaying the ranking of each county's annual average (mean) temperature in 2022, based on the historical instrumental record since 1895.

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). The 2022 annual average temperatures by climate division and their rankings are shown in Table 2. All climate divisions, except #1, ranked within the top 10 warmest years on record since 1895, and climate divisions 3-7, representing central to south Florida, had one of their top 5 warmest years.

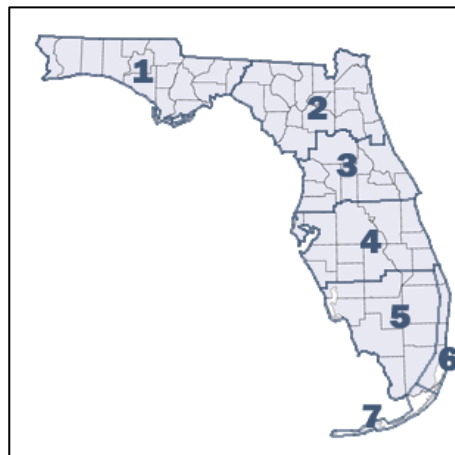


Figure 5. Map of Florida's seven climate divisions.

La Nina continued to affect our winter weather and climate in 2022, with an overall warmer and drier than normal winter. Divisional seasonal average temperatures and their rankings (in parentheses) compared to the long-term average (1895-2022) are shown in Table 3. Spring and summer were the warmest seasons, and Southeast Florida stayed well above average throughout the year.

Table 2. Annual 2022 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	68.4	16 th warmest
2	70.2	8 th warmest
3	73.1	5 th warmest
4	74.3	5 th warmest
5	76.3	5 th warmest
6	77.3	4 th warmest
7	79.1	4 th warmest

Table 3. Statewide and divisional 2022 seasonal mean temperatures (°F) and their rankings compared to the 1895-2021 instrumental record, in parentheses. Winter includes December 2021, consistent with the definition of that season.

DIVISION NO.	WINTER (DJF)	SPRING (MAM)	SUMMER (JJA)	FALL (SON)
Statewide	62.4 (12 th warmest)	72.7 (4 th warmest)	82.6 (6 th warmest)	73.7 (16 th warmest)
1	56.3 (19 th warmest)	68.9 (12 th warmest)	81.9 (13 th warmest)	68.9 (44 th warmest)
2	59.0 (11 th warmest)	70.4 (7 th warmest)	82.2 (5 th warmest)	71.3 (21 st warmest)
3	62.9 (11 th warmest)	73.5 (3 rd warmest)	83.2 (3 rd warmest)	74.8 (8 th warmest)
4	64.9 (19 th warmest)	74.6 (3 rd warmest)	82.9 (5 th warmest)	75.9 (12 th warmest)
5	68.7 (10 th warmest)	76.2 (3 rd warmest)	83.1 (9 th warmest)	78.1 (11 th warmest)
6	70.3 (7 th warmest)	77.2 (2 nd warmest)	83.5 (5 th warmest)	79.2 (6 th warmest)
7	72.7 (10 th warmest)	78.9 (3 rd warmest)	84.4 (6 th warmest)	81.0 (4 th warmest)

Precipitation

Nationwide, precipitation in 2022 was generally near average across the country, per the NCEI, except for the central and southern Great Plains, California, and Georgia where it was below average; West Virginia and Maine had above average precipitation (Figure 6). The annual average precipitation for the contiguous U.S. was 28.35 inches, which was -1.59 inches below the historical average (1901-2000) of 29.94 inches. This made 2022 the **27th-driest year on record for the U.S.**

Precipitation in Florida in 2022 was near the historical average, when considering the annual total averaged over the land area of the state. The 2022 statewide average precipitation was 54.12 inches (exclusively rainfall), which was +0.47 inches above the historical average of 53.65 inches (1901-2000). This ranked **57th-wettest** in the instrumental record dating back to 1895.

Total annual precipitation values ranged from just over 40 inches in **Cross City** and north-central Florida to over 70 inches in **Fort Myers** and **Miami** (Figure 6). Total annual precipitation in **Hollywood** was 90.84 inches for the year, 25.8 inches above normal, which became the wettest year on record. **Fort Myers** recorded a total of 72.70 inches of rainfall in 2022, which was 15 inches above normal for the year (6th all-time wettest on record), and **Orlando's** total annual precipitation was 61.92 inches or 10.5 inches above average (5th all-time wettest on record). Rainfall from Hurricanes Ian and Nicole brought excess annual rainfall across portions of the state. Meanwhile, total annual precipitation in **Pensacola** and **Tallahassee** ended up near average for the year, at +0.8 inches above and -0.4 inches below average, respectively.

The greatest total annual rainfall observed for the year was 96.90 inches, recorded at a CoCoRaHS station (Margate 0.4 W) in Broward County. The greatest total annual rainfall observed among FAWN stations was 78.00 inches, recorded at the Pierson station in Volusia County. The lowest annual precipitation total was 38.53 inches at the Mayo FAWN station in Lafayette County.

The greatest daily rainfall total within the NWS COOP and ASOS networks was 25.6 inches observed at **Titusville** on September 29. The greatest daily rainfall total within the FAWN system was 16.96 inches, which was observed at **Joshua** on September 28.

Statewide seasonal precipitation departures from the 20th century average are provided in Figure 8. Winter was the driest season in 2022, which meant moderate drought emerged in early spring in much of the Big Bend and western Peninsula regions. Pockets of severe drought developed in South Florida, but drought dissipated with a wetter-than-normal spring. The summer rainy season rainfall was near normal. Fall was wet with a surplus of 1.65 inches above average, particularly as the hurricane season ratcheted up and brought heavy rainfall across much of the Peninsula. Moderate to severe drought formed in the Panhandle in fall, as this part of the state continued to see below normal rainfall, which persisted into winter of 2022-2023.

Total annual precipitation values by climate division and their rankings (in parentheses) are provided in Table 4. The Panhandle (climate division 1) fell below normal for the year, while the rest of the state was somewhat wetter but still near normal; no region ranked in the top third wettest or driest for 2022. Seasonal precipitation totals and rankings for each climate division are provided in Table 5. Here, we can see the fluctuations in drier versus wetter than normal throughout the course of the year, with most regions much drier than normal in winter. Climate divisions 3 and 4 (central Florida) had their 5th and 4th wettest fall on record, respectively, with the impacts of Hurricanes Ian and Nicole.

Statewide Precipitation Ranks

January – December 2022

Period: 1895–2022

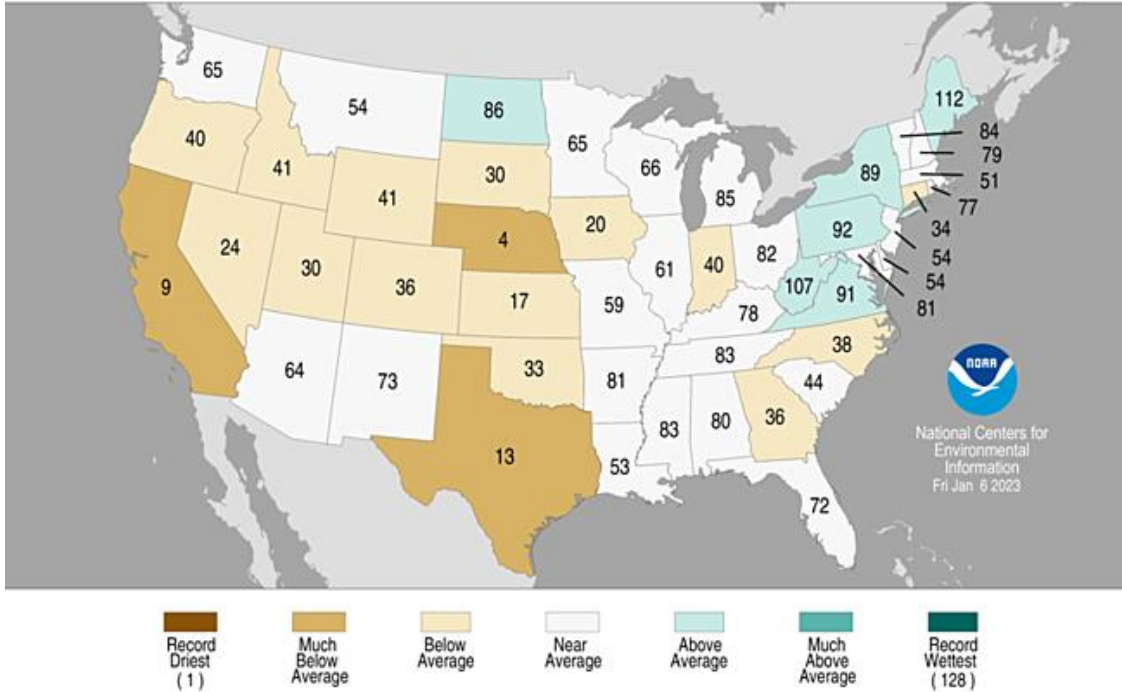
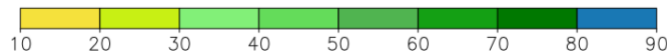
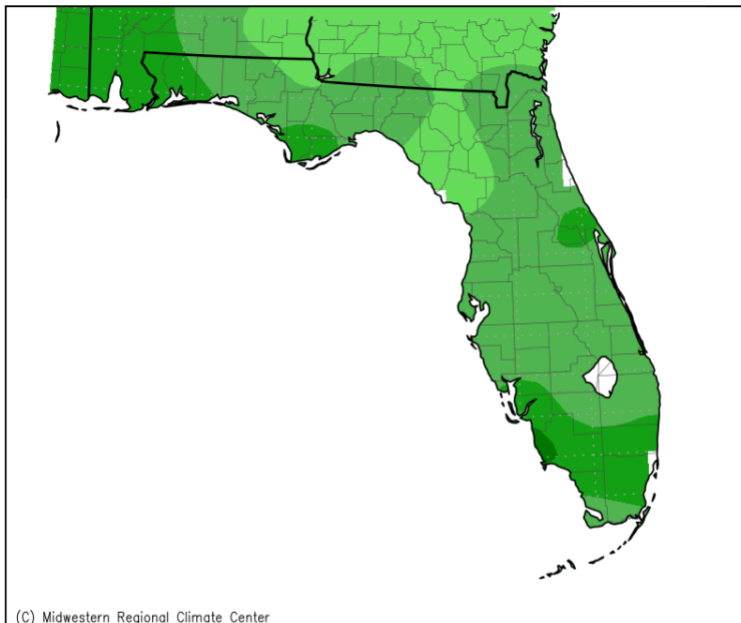


Figure 6. Map displaying the ranking of each state's annual average (mean) precipitation in 2022, based on the historical instrumental record 1895-2022.

Accumulated Precipitation (in)
January 1, 2022 to December 31, 2022



Midwestern Regional Climate Center
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Figure 7. Map displaying statewide accumulated precipitation (in inches) for 2022.

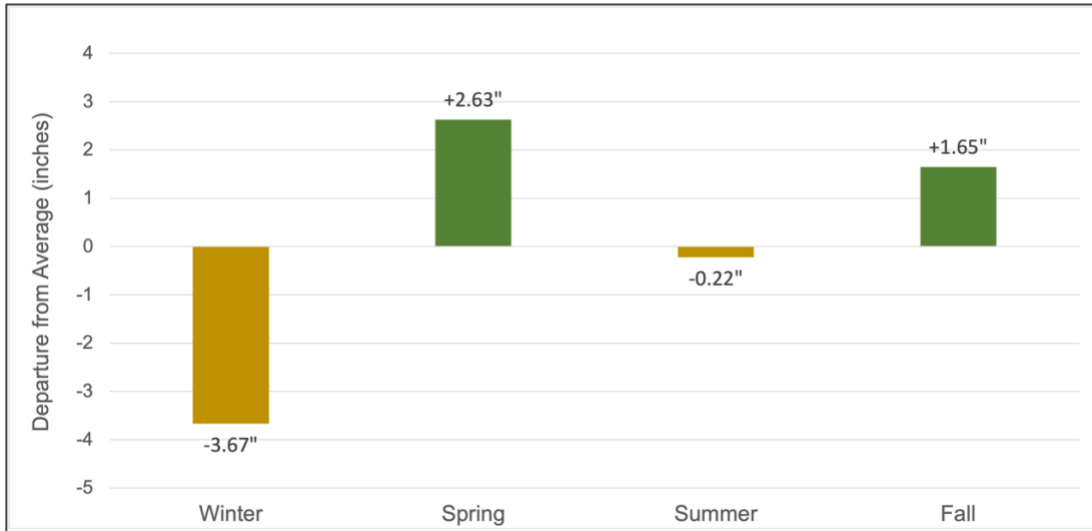


Figure 8. Statewide seasonal precipitation departures from average (1901-2000) for 2022.

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	54.12	57 th wettest
1	55.45	42 nd driest
2	50.43	52 nd driest
3	55.29	37 th wettest
4	54.55	45 th wettest
5	55.36	44 th wettest
6	57.67	59 th wettest
7	43.75	43 rd driest

Table 5. Statewide and divisional seasonal precipitation totals (in inches) and their ranking compared to the 1895-2022 instrumental record, in parentheses. Winter includes December 2021, consistent with the definition of that season.

DIVISION NO.	WINTER (DJF)	SPRING (MAM)	SUMMER (JJA)	FALL (SON)
Statewide	5.17 (15 th driest)	13.32 (29 th wettest)	21.23 (62 nd driest)	14.35 (35 th wettest)
1	8.00 (13 th driest)	17.02 (22 nd wettest)	22.27 (34 th wettest)	7.54 (25 th driest)
2	5.47 (15 th driest)	15.95 (10 th wettest)	21.09 (58 th wettest)	9.10 (32 nd driest)
3	4.01 (15 th driest)	14.09 (19 th wettest)	20.16 (42 nd driest)	17.62 (5 th wettest)
4	3.11 (13 th driest)	10.13 (48 th wettest)	19.81 (29 th driest)	20.72 (4 th wettest)
5	4.52 (56 th driest)	9.47 (57 th wettest)	22.99 (62 nd wettest)	17.93 (28 th wettest)
6	6.79 (59 th wettest)	9.64 (51 st driest)	19.51 (51 st driest)	20.78 (40 th wettest)
7	4.81 (60 th driest)	7.32 (50 th driest)	15.99 (54 th driest)	14.06 (51 st driest)

Figure 9 below shows the 2022 average precipitation rankings by county. Northwestern counties tended to lean drier than normal for the year, while annual precipitation for the majority of counties was closer to normal for the year. Several counties in the Peninsula were wetter than normal, including Lee (10th wettest), Charlotte (17th wettest), Osceola (17th wettest), Orange (19th wettest), and Seminole (15th wettest) counties.

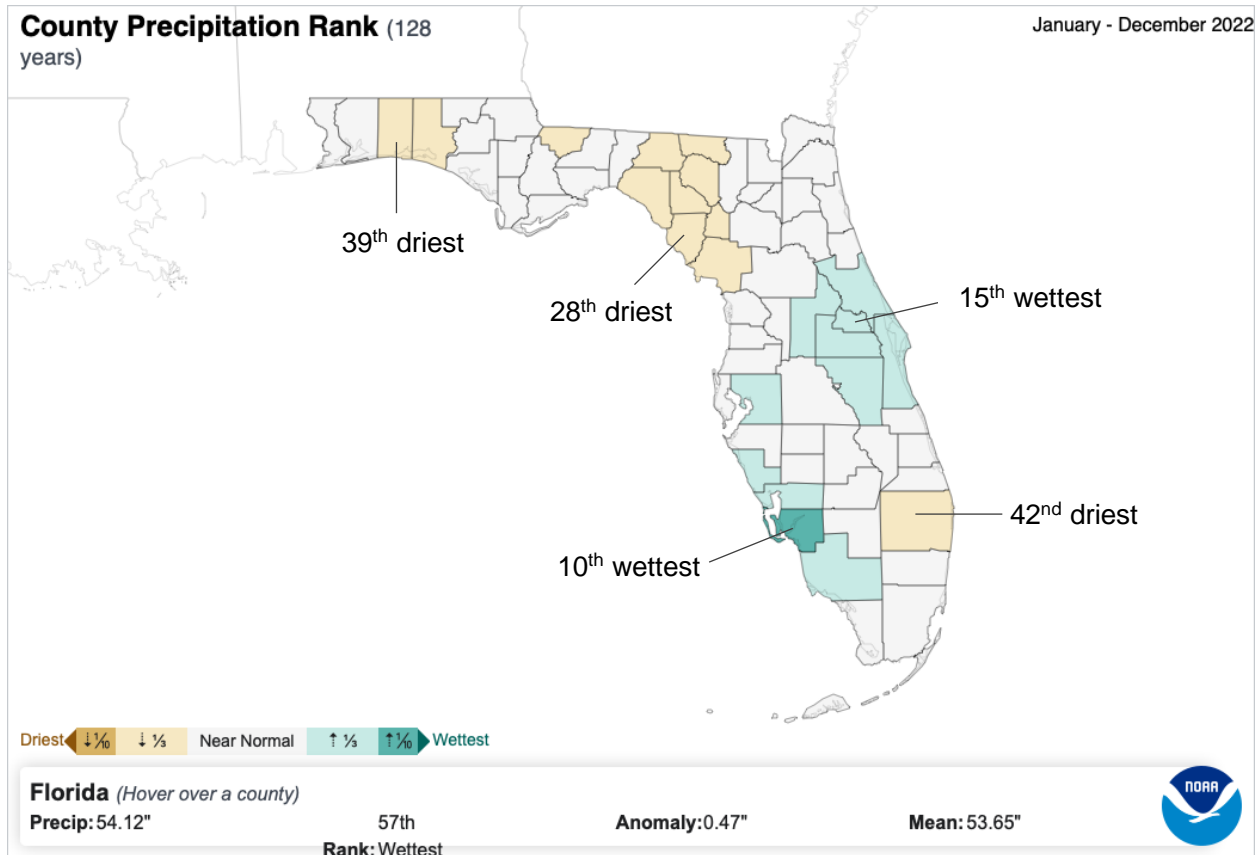


Figure 9. Map displaying the ranking of each county's annual average (mean) precipitation in 2022, based on the historical instrumental record 1895-2021.

Severe Weather

According to NOAA, the U.S. had 18 weather and climate disasters that cost at least \$1 billion or more in 2022. The **total disaster costs for 2022 exceeded \$165 billion**, which ranked as the 3rd highest on record. The storm of the season was Hurricane Ian, which caused a total of \$112.9 billion in estimated damages. Ian became the third most costly hurricane on record in the U.S., behind Hurricanes Katrina (\$190 billion) in 2005 and Harvey (\$151.3 billion) in 2017 (based on the 2022 consumer price index adjusted cost per NOAA). Hurricane Nicole made landfall along Florida's eastern shore on November 10, flooding the coast and causing severe coastal erosion in east-central Florida. Nicole was the first hurricane to hit Florida during November in nearly 40 years (since Hurricane Kate in 1985).

The 2022 Atlantic Hurricane Season was near normal in terms of season metrics, with 14 named storms, 8 of which became hurricanes and 2 major hurricanes. The Accumulated Cyclone Energy, or ACE, was about 77% of normal for the season. This hurricane season was the first in 25 years without any tropical cyclones to develop in the month of August. The season kicked into gear in September with the emergence of major Hurricane Fiona in the Atlantic, which became a category 4 hurricane that severely impacted Puerto Rico and the Dominican Republic and maintained hurricane strength into the North Atlantic Ocean, eventually impacting Nova Scotia as a large and powerful post-tropical cyclone.



Fig. 10 Hurricane Ian's track (credit: NWS Melbourne)

Hurricane Ian made its first landfall in western Cuba as a category 3 storm and then turned north and northeast as it strengthened into a major category 4 storm and made landfall in southwest Florida on September 28. The storm moved through central and eastern Florida before moving offshore into the Atlantic and making a second landfall as a category 1 hurricane near Georgetown, South Carolina. Ian became the most costly and deadly storm of the season, with an estimated 120 deaths in Florida. Storm surge and high winds led to catastrophic damage in Lee County especially, as well as other areas along the southwest Florida coast. The storm caused severe inland flooding due to heavy rainfall, and some river basins remained in flood stage weeks to months following the storm's passing.

Hurricane Nicole made landfall as a category 1 hurricane just south of Vero Beach, Florida on November 10. Nicole resulted in damaging storm surge, flooding from heavy rainfall, and severe erosion along the east-central Florida coast, with the worst effects in Volusia County and where Hurricane Ian passed less than two months prior (Fig. 12). Nicole quickly weakened to a tropical depression as it moved north through the state later that day. It is estimated to have led to \$500 million in damages and at least five fatalities in Florida.



Fig. 11 Hurricane Nicole's track (credit: NWS Melbourne)



Figure 12. Beach damage and coastal erosion due to Hurricane Nicole in Volusia County (source: NWS Melbourne, credit: Volusia County).

According to the NCEI Storm Events Database, there were 59 tornados reported in 2022 in Florida. This number of tornado reports is right at the historical annual average (59), based on data from 1985-2014 from NOAA. These tornadoes led to a total of seven injuries. The strongest tornadoes reported included four EF3s, one of which was reported in Leon County as part of a major severe weather and tornado outbreak on March 3 that produced 13 tornadoes in all. Another EF3 was reported in Washington County on March 31, which led to two fatalities. There were 897 NWS-issued severe thunderstorm and tornado warnings in 2022, which was above average based on data from 1986-2022 (Figure 13).

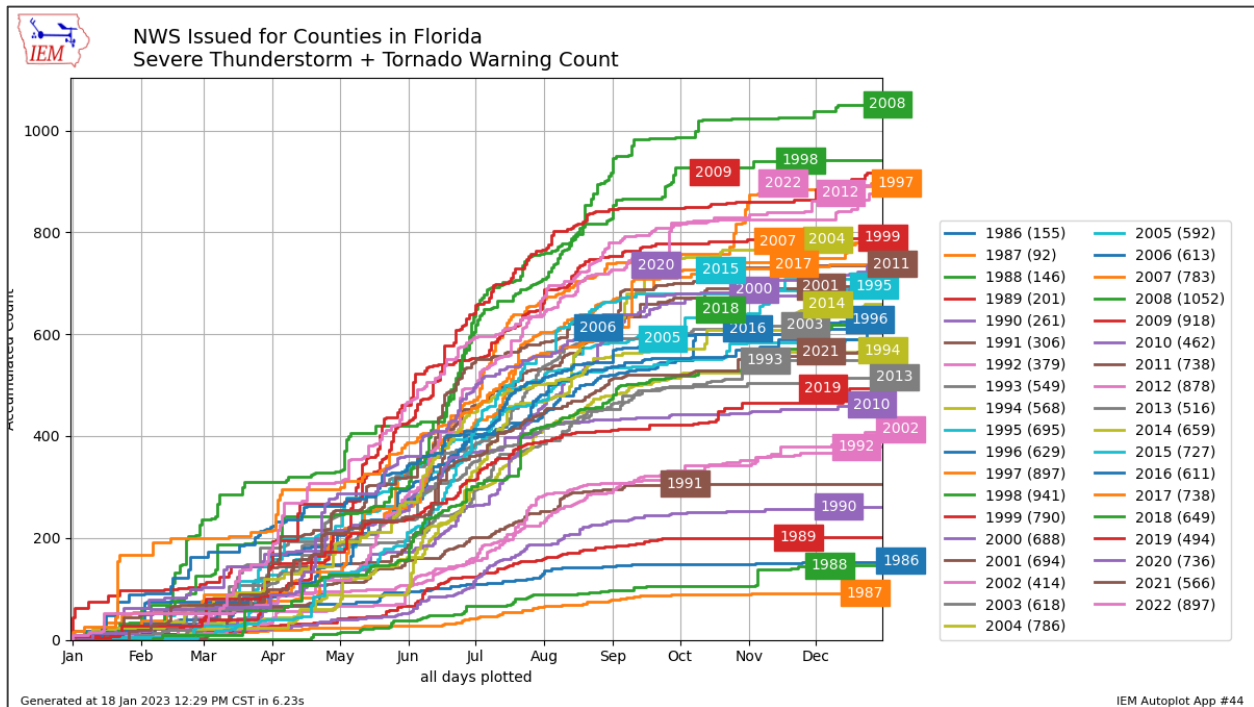


Figure 13. Accumulated annual total of National Weather Service issued severe thunderstorm and tornado warnings in Florida from 1986-2022.

Agricultural Impacts

Nearly 5 million acres of agricultural land were affected by Hurricane Ian, with the commodity groups most impacted being citrus, vegetables, and melons, according to a preliminary assessment conducted by UF/IFAS. According to the Florida Department of Agriculture and Consumer Services (FDACS), total crop losses from Hurricane Ian have been estimated between \$687 million to \$1.3 billion. Total losses to agricultural production and infrastructure were estimated at approximately \$1.2 - \$1.9 billion. Citrus was hit hard by the storm, with damages from fruit drop, damage to trees, and impacts from heavy flooding. Infrastructural damage and cleanup costs were also significant.

There were 8 frost/freeze events in early 2022, from January 30-31, that affected Collier, Glades, Palm Beach and Hendry Counties with temperatures in the mid to upper 20s. Sweet corn and green bean crops suffered the most damage. Another round of severe cold and deep freezes affected the state at the end of the year over the Christmas holiday, which lasted 3-4 nights in most places. Minimum temperatures reached into the upper teens in the Panhandle, low 20s across North Florida, and upper 20s as far south as Lakeland in central inland Florida. The cold spell brought damage to pastures across the state and resulted in cattle deaths.

Water Management Impacts

Heavy rainfall from Hurricane Ian caused rivers to swell beyond their banks, flooding surrounding areas in the days, weeks and even months following the storm. River basins experiencing major flooding included the Kissimmee, Peace and St. Johns Rivers. Lake Okeechobee, which had experienced below-average elevation in the months preceding Ian, absorbed runoff from Ian and rebounded by over 2 feet in just one month following the storm. Heavy rainfall from Hurricane Nicole once again caused rivers in east-central Florida to swell, which delayed drainage of the St. Johns River which had been in flood stage since Ian's passing. The short-wave infrared satellite imagery in Figure 14 shows the flooding at Lake Harney and the St. Johns River before and after Hurricane Ian.

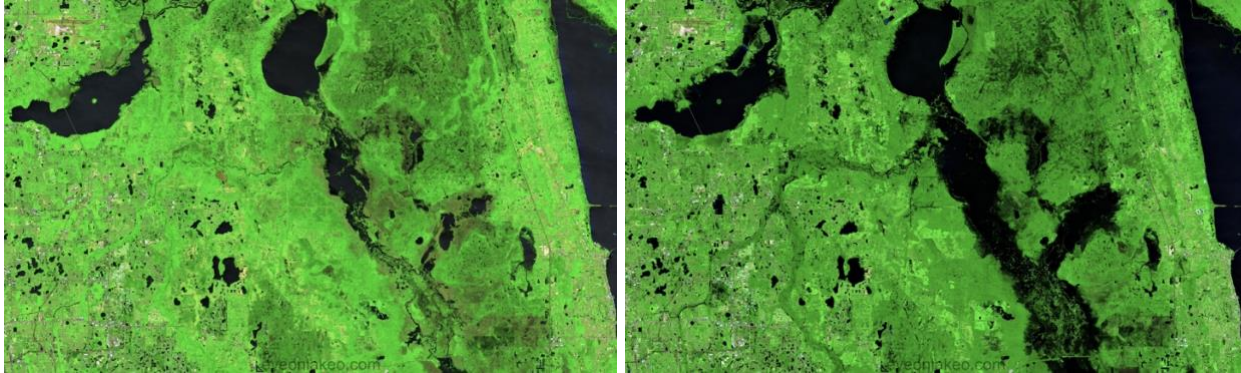


Figure 14. Lake Harney and the St. John River before (left) taken on April 4, 2022 and after (right) taken on September 30, 2022 the passing of Hurricane Ian (source: eyeonlakeo.com).