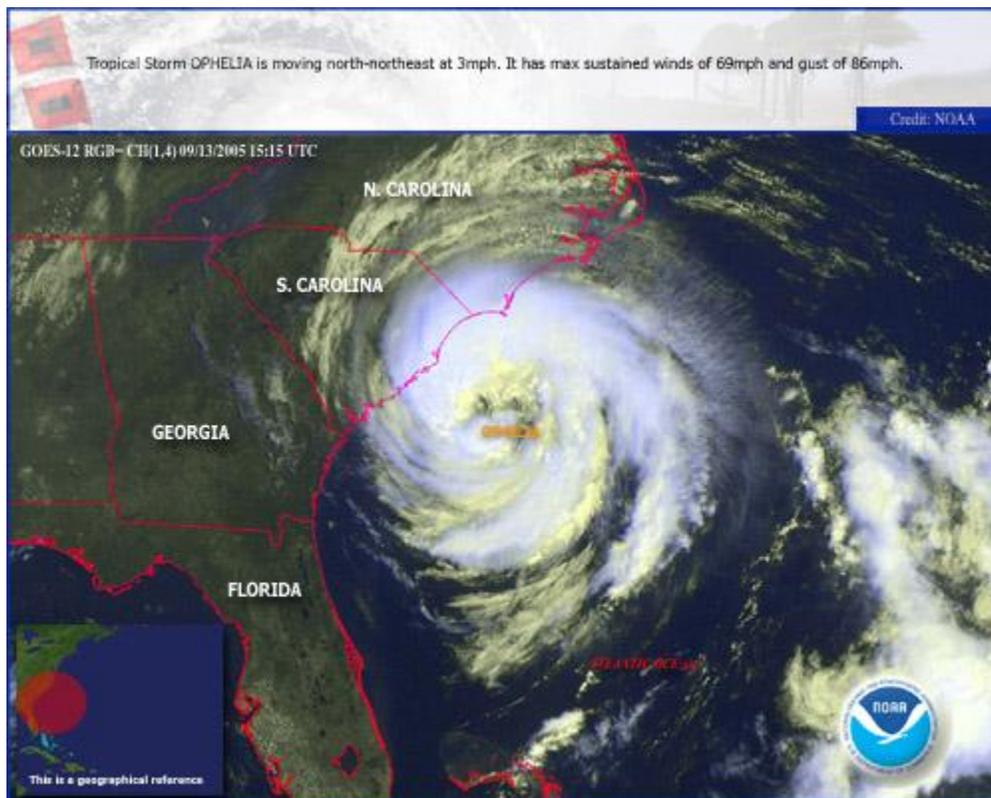


Rainy Season 2005 Summary

It's All or Nothing: Many Areas Left Dry after a Wet Start (A Review of Summer 2005 in West Central and Southwest Florida)



Enhanced NOAA Satellite photo of Hurricane Ophelia spinning off the South Carolina Coast. Note the lack of clouds across Florida during the late morning of September 13th. Not only were clouds few and far between, but rainfall was virtually nil during mid September.

Overview

In 2004, the rainy season began with a fairly typical June, followed by a rather dry start to July. The action picked up in mid-July with a heavy rain episode, which was followed in August and September by hurricanes Charley, Frances, and Jeanne, which closed out the season. Suncoast residents will not soon forget the rainy season of 2004.

The 2005 rainy season began with a bang. June rumbled in with locally strong thunderstorms, especially south of Tampa Bay; the month ended just as impressively, this time over metropolitan Tampa Bay. The questions arose regarding how much rain might fall this season, especially with a large number of tropical cyclones yet to come. By late June, two small tropical storms had already developed in the Gulf.

Then came The Ridge. High pressure, extending from the surface to deep in the atmosphere, took up semi-permanent residence across the Bahamas, Florida, and the eastern Gulf, sometimes extending northwest into the lower Mississippi Valley and southern Plains. The Ridge not only suppressed the typical afternoon and evening thunderstorm activity, it prevented upper level disturbances from dipping into the southeastern U.S. Most importantly, The Ridge shunted four major tropical cyclones well south of the Suncoast, and even enhanced deep dry air when another tropical cyclone spun off the Carolina coast in mid-September.

The Ridge not only ensured a drier than normal rainy season, but ratcheted up the heat as well. Following a cooler than normal April and May, and a wet and slightly cooler than normal June, July through September featured temperatures above normal to the point of setting all-time records in Tampa. Apparent temperatures touched 105 and remained above 85 overnight in urban centers near the coast on several occasions in late July and August. Such values are fairly common a few days each summer, but they were more noticeable in 2005 due to the comparatively cool and wet weather in June. Table 1 (below) shows the rivers that exceeded flood stage in June, July, and early August. Unlike in September 2004, when several gaging points reached all-time highs and moderate to major flooding was common, September 2005 was the complete opposite, with rivers running well below flood stage.

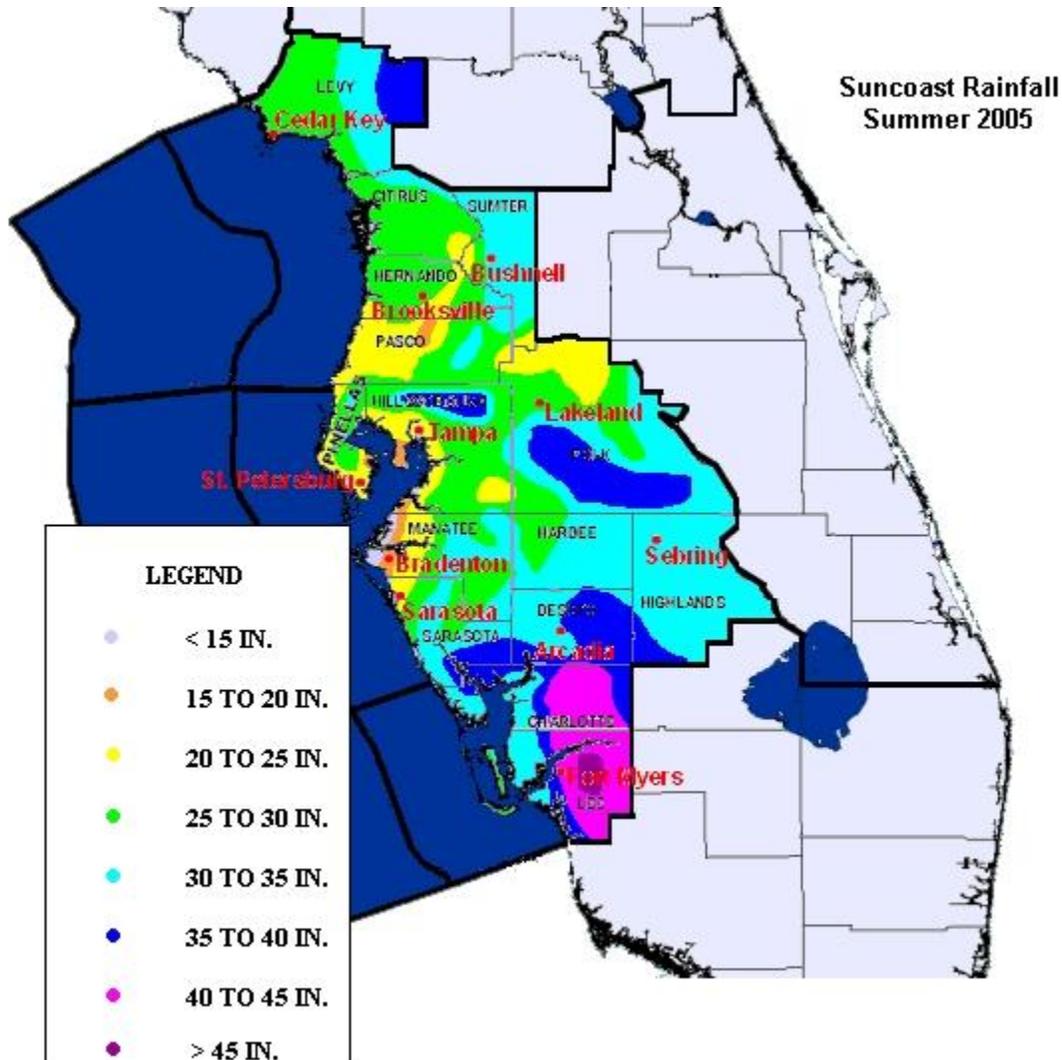


Figure 1. Total rainfall, June 1 through September 30, 2005.

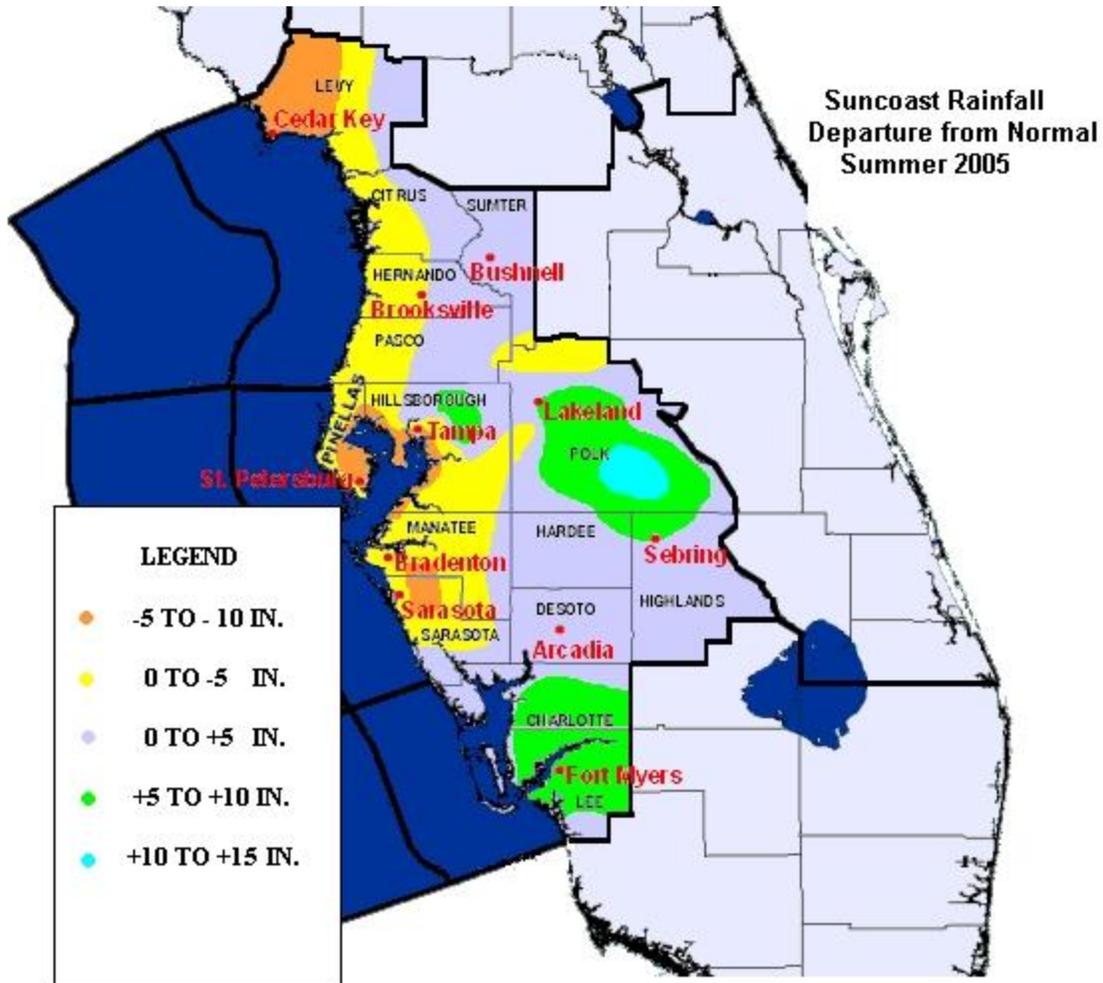


Figure 2. Total rainfall departure from 30 year climatic normals (1971-2000) for June through September, in 2005.

Table 1. Abbreviated Flood Stage Report, NWS Tampa Bay, June through September, 2005. Rivers remained largely below flood stage from mid July onward.

River and Station	Flood Stage	Peak Crest	
		Stage (Ft)	Date
Peace R. at Bartow	8	8.62	July 6th
Withlacoochee R. at Dunnellon	29	29.23	August 8th
Withlacoochee R. at Trilby	12	12.79	July 18th
Peace R. at Zolfo Springs	16	17	July 3rd
Manatee R. at Myakka Head	11	13.19	June 30th/July 1st
Peace R. at Arcadia	11	13.21	June 13th
Little Manatee R. at Wimauma	11	13.08	July 15th
Myakka R. at Myakka State Park	7	8.89	June 13th

Horse Cr. near Arcadia	12	13.96	June 6th
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Monthly Reviews

June

Soaking Rains Early and Late

June began with a bang, as locally heavy rains from strong to severe storms overnight on May 31st eased into southwest Florida from June 1st through the 3rd. The combination of a stationary front draped across southern Georgia, with upper level southwesterly flow, dumped torrential rains over portions of southwest Florida, including a whopping 7.06 inches on the first three days of the month at Fort Myers. Minor sheet flow flooding was reported in portions of Lee and Charlotte Counties.

For the next two weeks, conditions settled down as an upper ridge flattened across the state. The one exception was June 10th and 11th, when Tropical Storm Arlene raced through the east central Gulf and produced thick clouds and light rain keeping temperatures cool (10th) with heavier convection early on the 11th. Otherwise, rainfall was on the light side, as the Bermuda High that normally develops by mid June was suppressed by a continued active jet stream across the northern third of the U.S. One of these troughs nudged into the Southeast U.S. around the 20th, but westerly flow, rather than deep southwest flow, held rainfall totals down on the suncoast.

After the trough dissipated, the Bermuda High finally set up to close out the month. The high, combined with weak energy from easterly waves, produced another round of locally heavy rainfall along the Suncoast between the 27th and 30th. This time, the heavier rains were concentrated in the Tampa Bay area. For the four day period, Tampa received 6.26 inches, which was more than half of the monthly total of 12.26 inches.

Monthly rainfall is shown in Figure 3.

July

The Florida Mixed Bag: Wet for Some, Dry for Many

Unfortunately, the Bermuda High would be suppressed southward in early July, and rainfall, especially near the Suncoast, was limited for the first week of the month. Some relief was felt in the form of rain and cooler temperatures along the Suncoast between the 8th and 11th, as Hurricane Dennis motored from southeast to northwest from western Cuba to the extreme western Florida panhandle. However, that rain came with a small price in the form of a half dozen small tornadoes and tropical storm force winds, along with significant beach erosion.

During the next 10 days, the Bermuda High became reestablished, but with a slight twist. That twist was a southwest extension of the ridge axis across Florida, which weakened the surface wind flow and kept afternoon thunderstorm coverage mostly scattered. During this time, some of the most interesting local weather occurred, with a long-lived waterspout in Charlotte Harbor, and a small tornado in Largo. The final ten days were fairly non-descript - typical heat and humidity with isolated to scattered non-severe thunderstorms on most afternoons and evenings. Torrential afternoon rains over interior portions of the Nature Coast, and the Green Swamp, on the 29th and 30th helped produce the last minor river flood event (table 1, above) of the season, occurring along the Withacoochee River in early August.

Monthly rainfall is shown in Figure 4.

August

Even Rain Goes on "Vacation"

Summer sizzle was on display in August, as rainfall dwindled across not only the Suncoast but over interior west central

Florida as well. The culprit continued to be the ridge axis, which generally extended across the state into the western Gulf. The ridge not only weakened the sea breeze effects, but at times provided deep layer drying which helped dissipate much of the low level moisture being lifted. The result was oppressive heat, especially at night. The average low temperature at Tampa was 77.5; along the toasty waters of Tampa Bay, the average low was 81.3 degrees at Albert Whitted Airport in Saint Petersburg. The superheated waters - as high as 91 degrees well into the eastern Gulf - would set the stage for the worst U.S. natural disaster.

Katrina was initially born as a tropical wave east of the Lesser Antilles in mid August, but the initial depression would not survive shear as it tracked west. However, a remnant of the depression reached the Bahamas a week later, then festered in the shallow warm waters until a circulation developed southeast of Nassau on the 23rd. As the depression drifted northwestward, it encountered less shear and became a tropical storm the next day. The system began intensifying more definitively early on the 25th as it encountered the Gulf Stream, and by evening the strong Category 1 storm was battering Miami-Dade County.

Any hope for significant rains from Katrina was dashed by the strength of location of the ridge, as strong east-northeast flow toward its southern periphery shoved Katrina on a southwest track across the deep Everglades, the west track just north of the Keys on the 26th. Over the next few days, Katrina grew into the now-legendary monster storm, feeding on the low shear environment and 90+ degree waters of the Gulf. Katrina's increasing girth allowed for at least some rains and cooler temperatures to briefly affect the Suncoast on the 27th, but nowhere near what might have fallen had the storm tracked farther north.

Katrina's other effects were high surf and tides, as, similar to Ivan in 2004, the entire Gulf became a "bowl" of high water.

Monthly rainfall is shown in Figure 5.

September

Dry Season Starts Early?

Rainy season? What rainy season? By early September, it seemed like an eternity since the heavy rains of late June pushed many area rivers toward or just above flood stage. In fact, September 2005 was the polar opposite of September 2004, which will always be remembered for the persistent effects of Hurricanes Frances (early), Ivan (middle), and Jeanne (late). While rivers burst over their banks following Frances during the first and second weeks of September 2004, river levels were well below normal for the same period in 2005. The dry trend which began in July bottomed out in September. All areas were below normal, and aside from a few pockets of monthly rain totals above 6 inches, most areas were below 4 inches, and some, such as Tampa, had a monthly total **below** the lowest average for *any* month!

September average temperatures were just a shade lower than those in August, but still some 1 to 2 degrees above normal. Once again, the flat ridge that dominated August remained a major fixture in September. However, the large areal extent of below normal precipitation can be traced directly to lumbering Tropical Cyclone Ophelia, which spent more than a week ripping up beaches along the Southeast U.S. coast. At the same time, deep layered subsidence on Ophelia's west side transported very dry air across the Florida peninsula, and virtually no rain fell *anywhere* between the 10th and 20th.

Initially, the dry air was refreshing as humidity fell and nighttime low temperatures, especially in the suburbs and rural areas, dropped to normal. However, as the low level winds died, the mid level inversion did not, and particulates built up near the surface, creating thick haze and some of the poorest air quality of the year between the 15th and 17th.

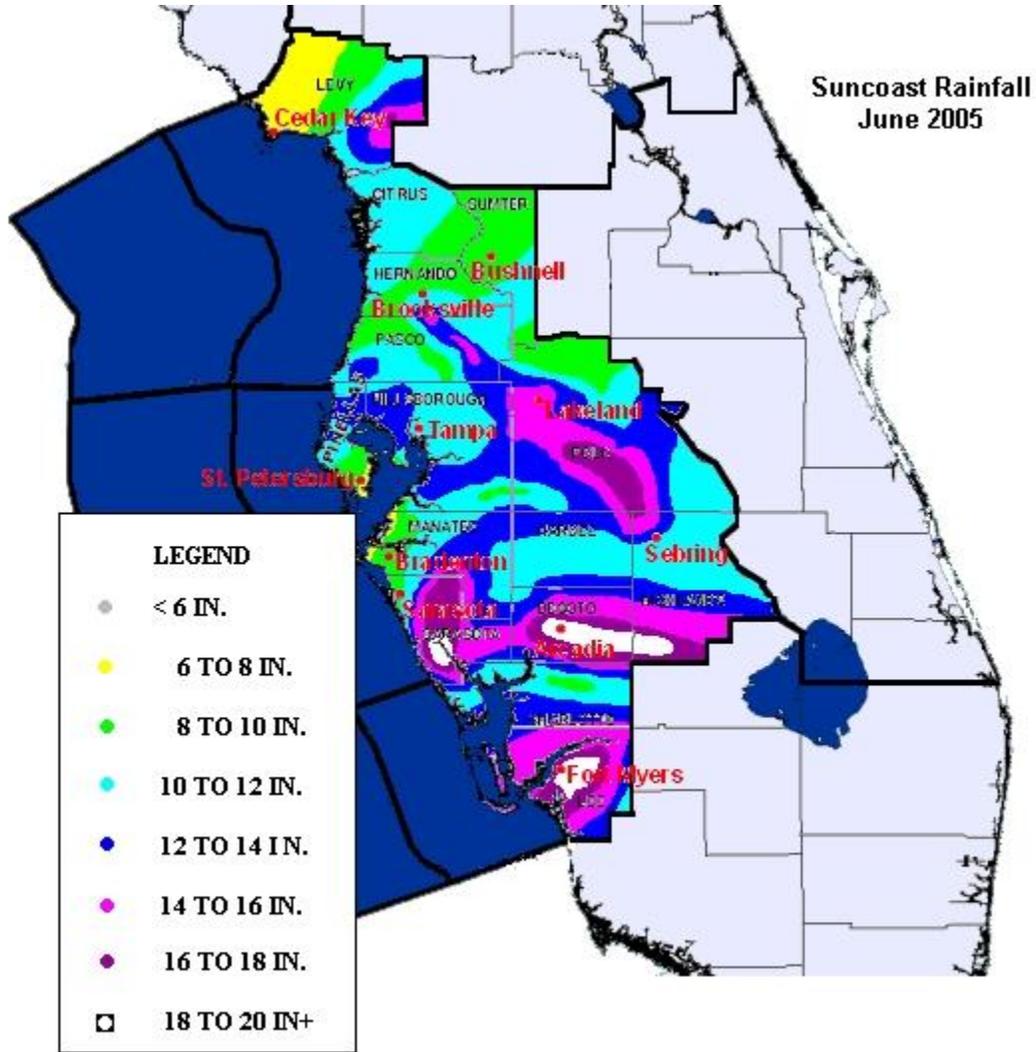
Almost immediately after Ophelia exited toward the Canadian Maritimes, the combination of a fresher surface high over the mid Atlantic region and a rapidly moving tropical wave cleaned out the pollution by the 19th. Unfortunately, this tropical wave rapidly intensified into a tropical storm which became, in effect, Katrina's boisterous "little sister" Rita.

Rita moved steadily across the southern Bahamas, Florida straits, and lower Keys while intensifying solidly to a Category 2 hurricane. Rita slowed as it entered the central Gulf, passing just south of where Katrina did 4 weeks earlier. By this time, the Gulf waters had recovered, and Rita explosively deepened to a Category 5 storm in less than 24 hours, dropping an astounding 70 millibars to 897 at one point. Rita's faster overall motion, smaller eye, and longer westerly track pulled most of the highest seas with it, with the Suncoast seeing moderate to locally high surf and rip currents, but nothing more. Once again, rain was limited to convergent bands over the peninsula well northeast of the center, and was

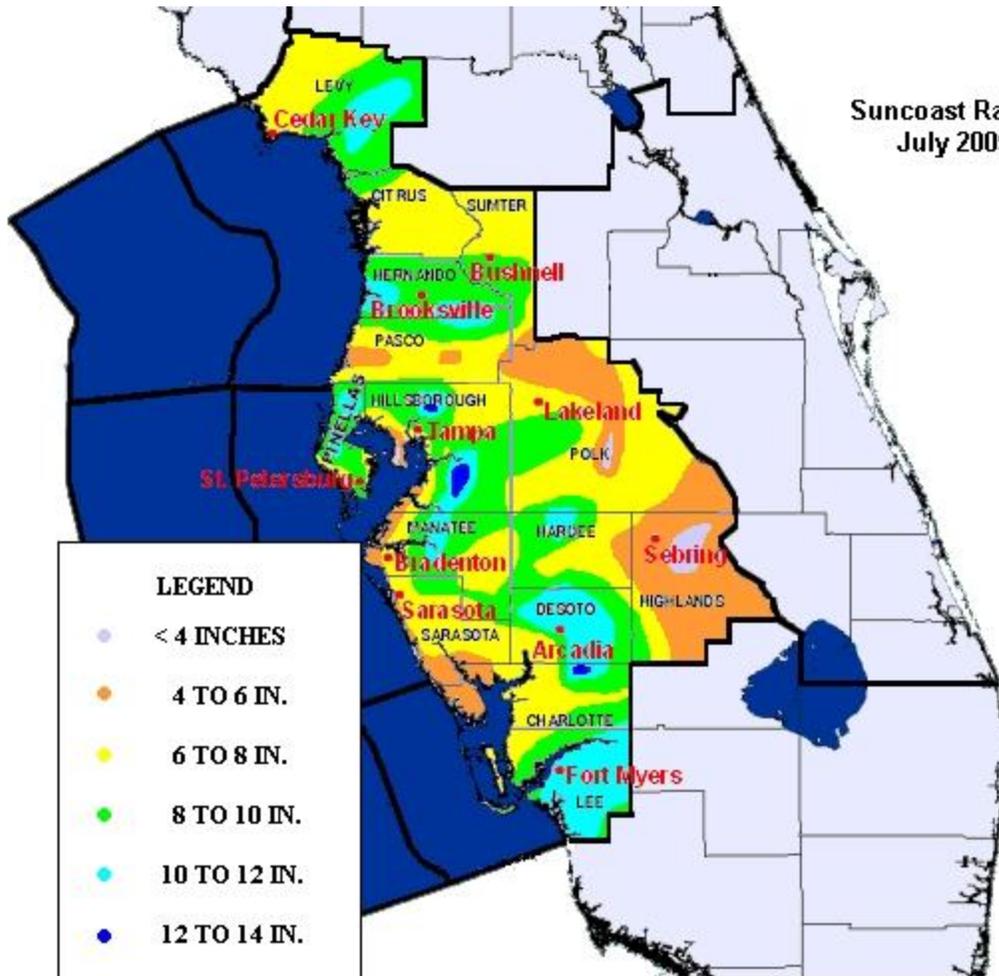
quite a bit less than a similar situation with Katrina.

The month ended with continued dry weather. October picked up where September left off with more very warm and humid conditions. Interestingly, a series of upper level disturbances actually tripled September's rainfall by October 10th in Tampa. The rains were certainly needed, but unfortunately were too little, and too late, to salvage a true "rainy" season.

Monthly rainfall is shown in Figure 6.



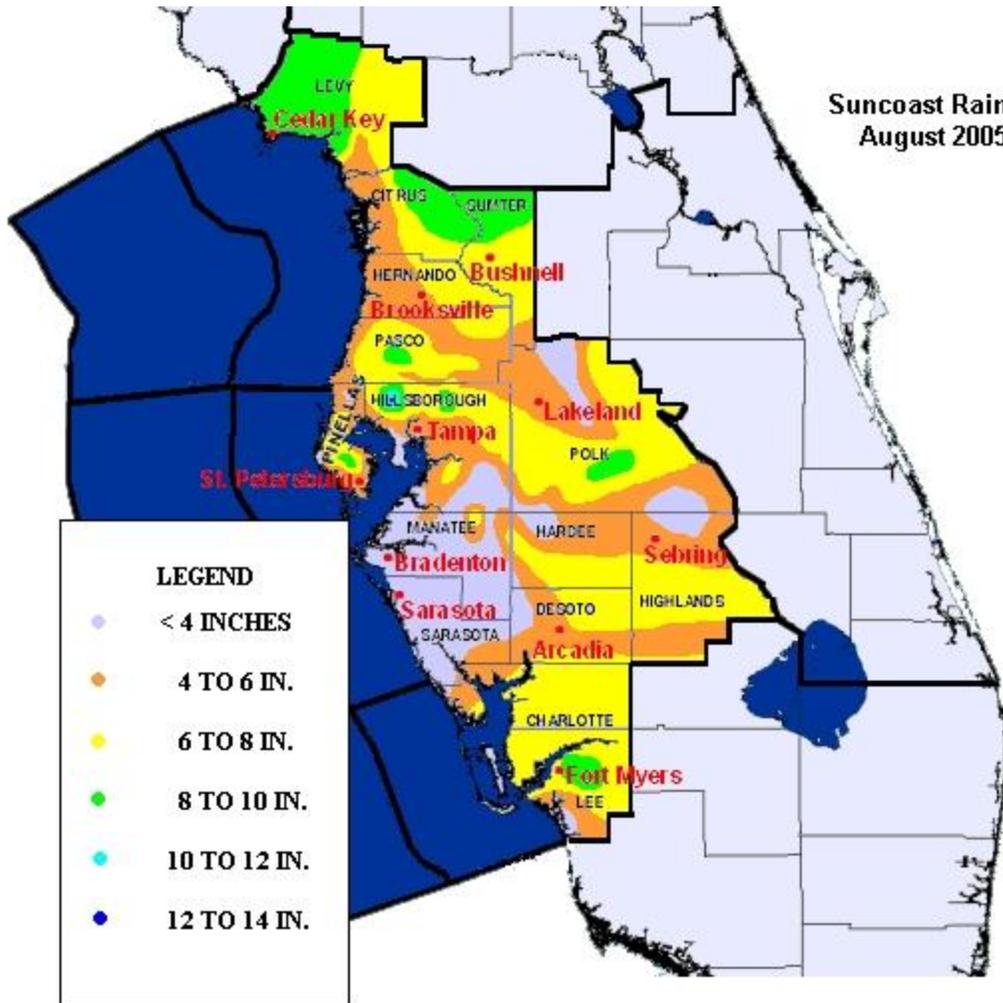
Suncoast Rainfall
July 2005

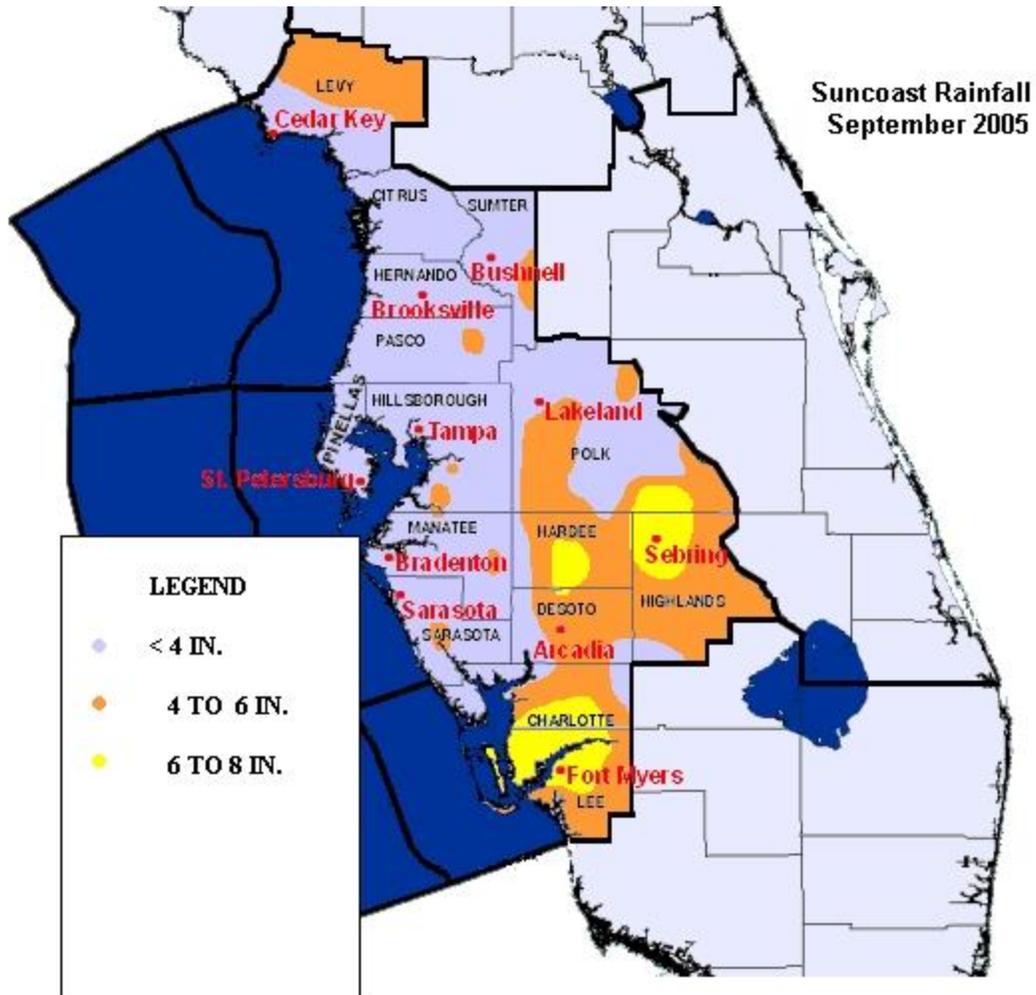


LEGEND

- < 4 INCHES
- 4 TO 6 IN.
- 6 TO 8 IN.
- 8 TO 10 IN.
- 10 TO 12 IN.
- 12 TO 14 IN.

Suncoast Rainfall
August 2005





Figures 3 through 6: West Central and Southwest Florida summer 2005 rainfall for June (far left), July (middle left), August (middle right), and September (far right). Click on each for a larger image. Data courtesy of Southwest Florida Water Management District and the National Weather Service. Thanks to Tom Blackburn (NWS ret.) for compiling the data. Click each to enlarge.