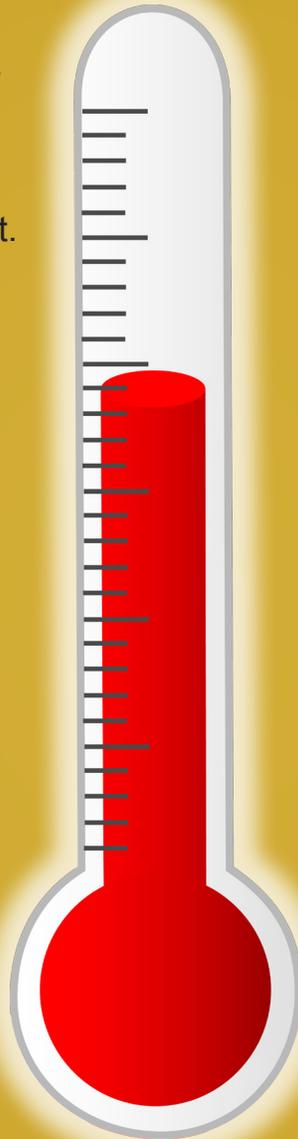


1998 EXTREME HEAT

From late spring through summer of 1998, a record-breaking heat episode seared Florida without relief. Multiple streaks of days over 100°F, and nearly 1,500 daily maximum temperature records (either tied or broken) occurred from April to August. Florida residents experienced heat without a break, while record power usages soared. This extensive heat contributed to at least eight deaths, massive wildfires burning nearly 500,000 Florida acres, and millions of dollars lost in agriculture and livestock.

“In some places, like Melbourne, you wouldn’t expect this to happen more than once every few hundred years.”

Neal Lott,
National Climatic Data Center



“RED-HOT JUNE SETS RECORD SCORCHING HEAT WAVE UNMATCHED IN 108 YEARS”

Sarasota Herald-Tribune,
June 30, 1998

“VOLUSIA PARCHED AS TEMPS SIZZLE OVER 100 AGAIN”

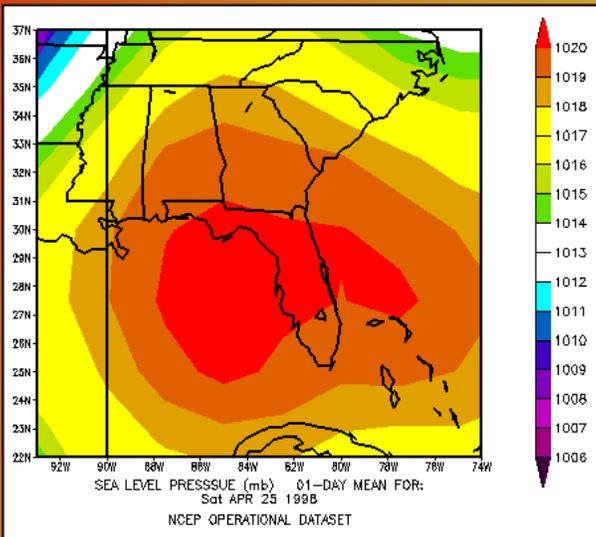
Daytona Beach News-Journal,
June 6, 1998



This touchstone event summary highlights an exceptional weather event, extreme heat in 1998, and related health outcomes in Florida. Utilizing the Florida Climate Extremes Index, technical reports, and newspapers, a touchstone event was identified for this priority hazard. It is important to note that these reports were not validated with vital statistics or notifiable disease surveillance data. Experiences and memories from historical events can highlight the importance of public health preparedness and adaptation planning.

1998 Extreme Heat

METEOROLOGICAL SET-UP

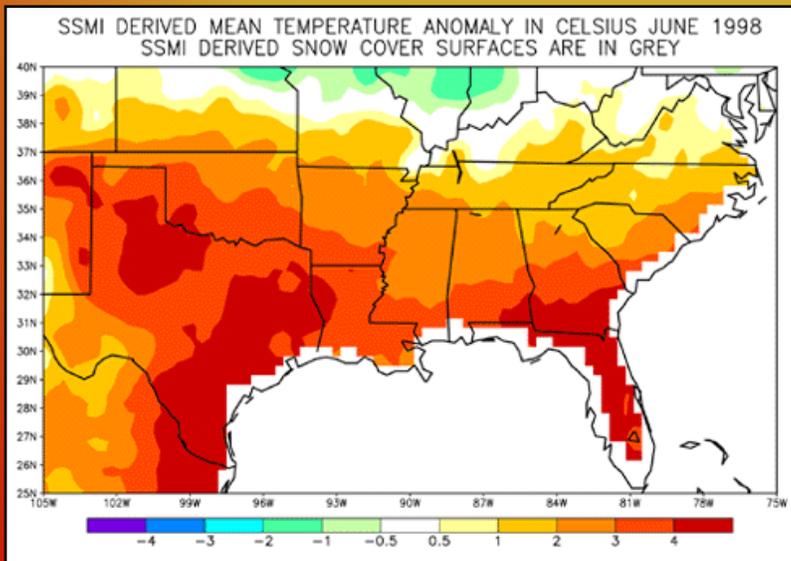
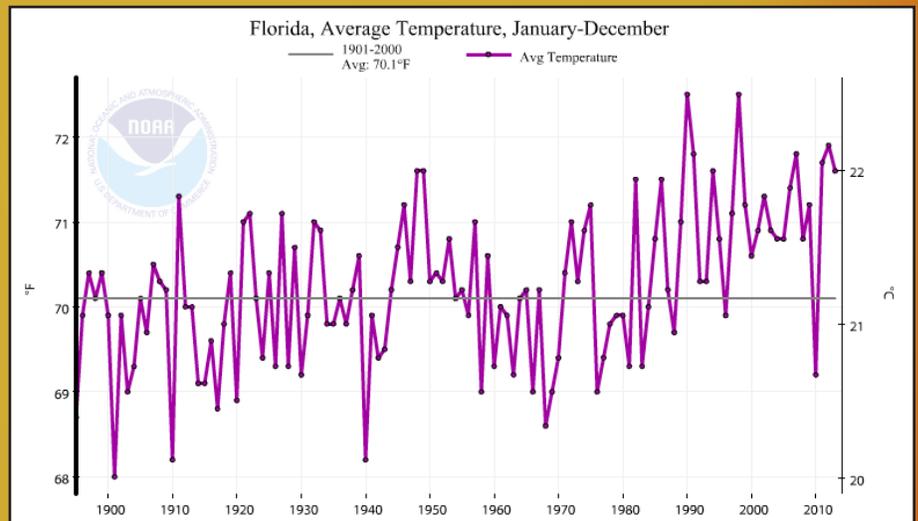


High pressure remained over Florida from late April to early July, locking out the cooling effect and precipitation brought by the sea breeze. Additionally, this deficit caused a drought from May to June (Figure 1).

Figure 1. Sea Level Pressure (mb), April 25, 1998
Earth Systems Research Laboratory, NOAA

For the entire state of Florida, 1998 (tied with 1990) was the highest annual averaged temperature in over 100 years (Figure 2).

Figure 2. Annual Florida statewide averaged temperature, with anomaly base period (1900-2000), National Climatic Data Center (NCDC).



June and July experienced the harshest conditions of the heat episode, with many locations throughout Florida suffering daily maximum temperatures above 95°F for the majority of both months.

Figure 3. Mean Temperature Anomalies (°C) June, 1998 (4°C ≈ 7°F difference)
NOAA



1998 Extreme Heat

RECORDS

From April to August 1998, nearly 1,500 daily maximum temperature records were either tied or broken throughout Florida. The sweltering heat exceeded many previous daily maximum temperature records by up to 9 degrees Fahrenheit. As seen in Figure 4, a majority of these records were established decades ago, including some broken records originating as far back as 106 years (at that time).

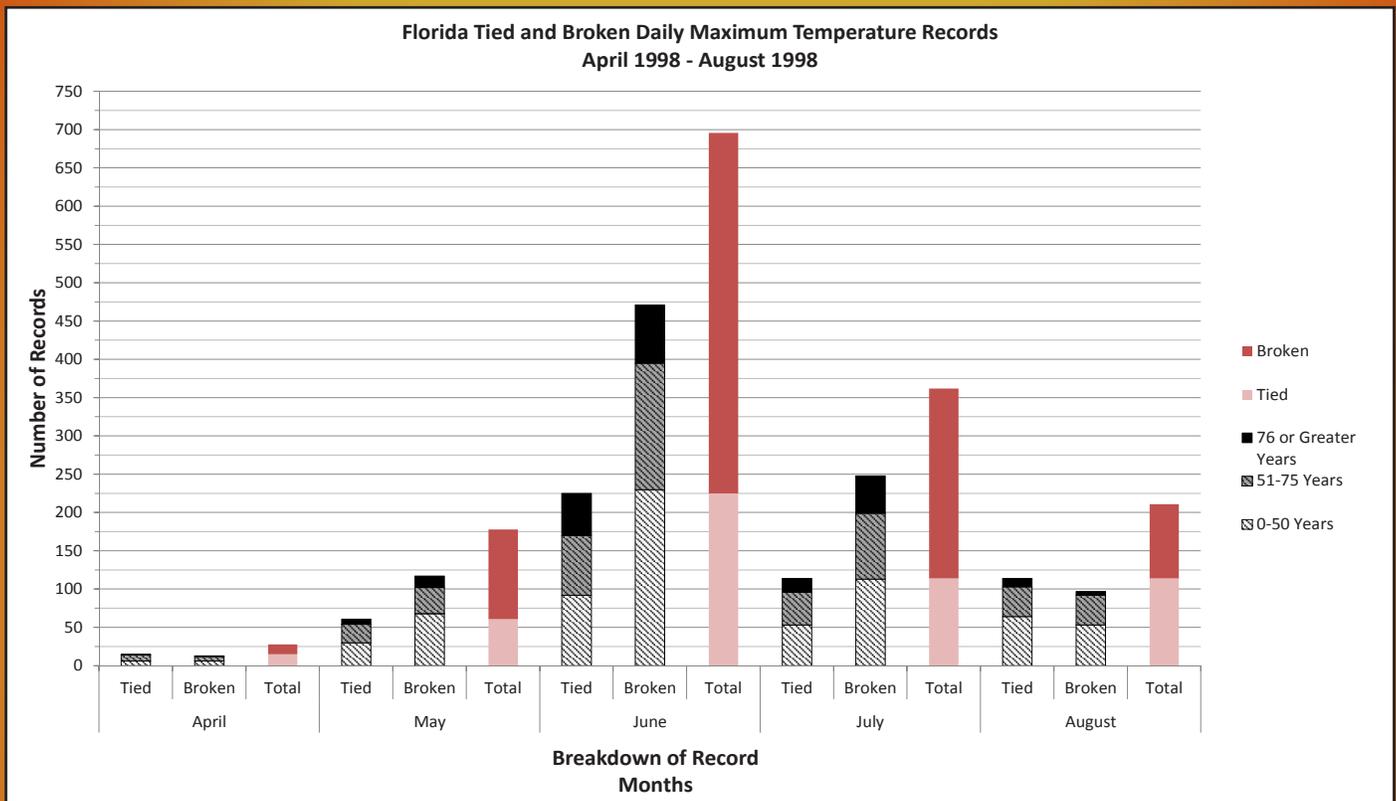


Figure 4. Florida Tied and Broken Daily Maximum Temperature Records, April 1998-August 1998. Quantity of records is represented on the y-axis, red and pink represent record type, while greyscale shadings represent number of years since original record was established. Source: National Climatic Data Center (NCDC) U.S. Daily Records.

Extreme Daily Maximum Temperatures

- Live Oak, FL: 106°F (6/18)
- Jacksonville, FL: 104°F (6/19)
- Sanford, FL: 103°F (7/1)
- Tallahassee, FL: 103°F (6/19)
- Gainesville, FL: 103°F (6/19)
- Daytona Beach, FL: 101°F (6/2)

Consecutive Days 100°F or Greater

- Daytona Beach, FL: 9 days
- Jacksonville, FL: 6 days
- Melbourne, FL: 4 days
- Orlando, FL: 3 days

Source: National Climatic Data Center (NCDC) U.S. Daily Records



1998 Extreme Heat

The heat sent the entire state inside, where residents ran their air conditioners non-stop. Utility companies experienced a high demand for power, and even broke usage records that year. The threat of a massive power outage could result in thousands of people without air conditioning, seriously endangering their lives.

Drought simultaneously struck Florida during this time period, and with the increased demand for water (recreational, watering lawns, etc.), shortages began (Figure 5). The lack of precipitation added to the high temperatures, not receiving the cool-down from clouds and rain. Residents were taking to lakes to cool-off, and potentially exposing themselves to concentrated pathogens in remaining water bodies.

In addition to many heat-related injuries, there were at least 8 heat-related deaths from April to August: 4 reported by the National Weather Service, and 4 reported by local newspapers.

IMPACTS AND HEALTH

ONE FOR THE RECORD BOOKS - JUNE WAS THE HOTTEST OF 20TH CENTURY IN SOUTH FLORIDA

"These temperatures are far above anything else we've ever seen," said Paul Hebert, meteorologist-in-charge of the National Weather Service's Miami office. "Usually, you have a warm spell and get a break. This year, there was no break."

Sun Sentinel, July 1, 1998

» Terry McElroy of the Department of Agriculture reported in the Tampa Tribune on July 8, 1998, that at least \$135 million in crops had been lost, as well as \$37 million in livestock to the heat wave.

» Schools and summer camps canceled outdoor activities to protect young populations.

» Businesses such as swimming pool contractors and stores, A/C repair services, and roadside assistance thrived, while outdoor activities like golfing and fishing took a large hit.

Heat withers the Sunshine State



Eight-year-old Kelsey Fisher splashes through one of the water obstacles Friday at St. Pete Beach Recreation Center during Monte Hoge Mud Day. Fifty children took part in the competition.

■ Record heat sparks fires, blows tires and claims lives. Water management officials watch the water supply as the rainy season approaches.

Compiled from staff, wire reports

Record heat continued to bake Florida on Friday, causing two deaths, touching off numerous fires and leading to a disaster declaration for the entire state.

For the first time, water managers began to raise concerns about the possibility of drought.

Forecasters are calling for weekend thunderstorms for Tampa Bay and several areas of Florida, but much of the state will see little reprieve, including North Florida, which has become a fiery tapers.

In developments Friday:
■ Lightning touched off another 90 fires across North Florida, burning nearly 9,000 new acres of woodland and adding fresh scorch marks to the state's northern tier.

■ The heat caused at least two deaths in south and central Florida, prompting a state agency Friday to urge older residents to take precautions — cool baths, loose-fitting clothing, lighter meals.

■ Regional water officials, while careful not to predict drought, said they are paying close attention to long-range forecasts that call for above normal temperatures in July, August and September.

■ Tow truck operators across the Tampa Bay and the North Suncoast are being besieged by calls to repair dead batteries and blown tires.

More fires

State emergency management officials say more than 100 wildfires are blazing in 29 of Florida's 67 counties.

An enormous new fire ignited late Thursday

DRYING UP: Heat and demand for water for lawns have virtually exhausted St. Petersburg's reclaimed water system. PAGE 4B

Figure 5. *The St. Petersburg Times*, June 20, 1998.



Extreme Heat Vulnerability in Florida

Florida has historically been vulnerable to heat, although this hazard takes a different form in the state than in other parts of the continental U.S. due to the impact of humidity and the persistent nature of summer heat. Projected increases in dry days and warmer temperatures could lead to more persistent heat in the future.

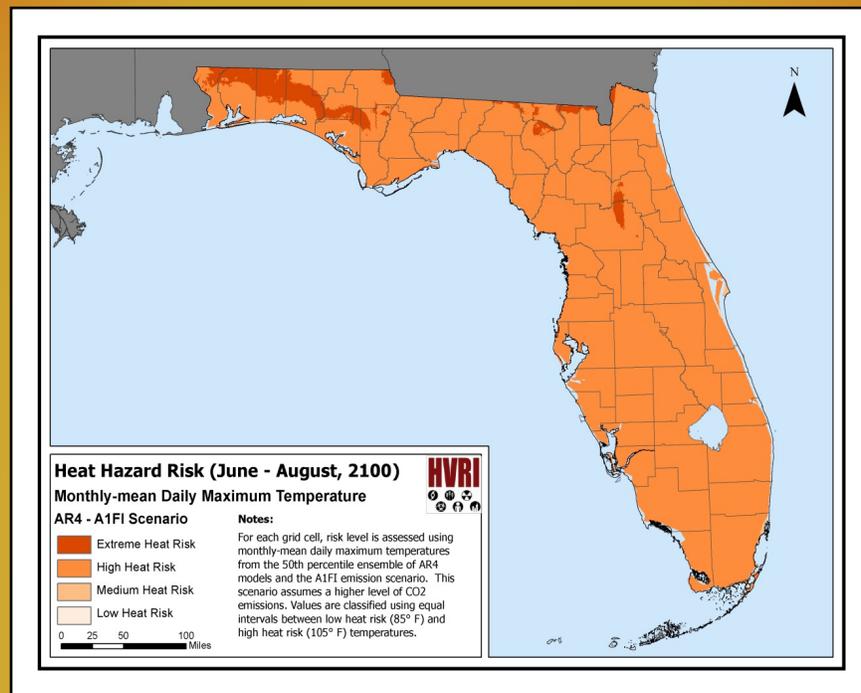


Figure 6. Heat hazard risk for A1FI scenario in Florida, June-August, 2100. Source: C. Emrich, University of South Carolina Hazards and Vulnerability Research Institute, 2014.

Heat vulnerability in Florida was assessed with statistically downscaled projections using three scenarios: low (B1), middle (A1B), and high (A1FI). Monthly-mean daily maximum temperatures and temperature changes (baseline of 1960-1991) from these downscaled projections were used to create spatial representations of future heat hazard areas by the year 2100 for summer (June-August) and annually. Four heat risk categories (extreme, high, medium, and low) were used.

Under the high scenario (Figure 6), nearly all the state is at high risk (over 18 million people) and approximately 335,000 people in 20 counties are at extreme risk of summer heat. Locations that are both physically and socially vulnerable are places where a combination of hazard and social adaptation practices can maximize positive outcomes. For outcomes for each case scenario, please see the Florida BRACE Vulnerability Assessment Report.

For more information, please contact the Florida Department of Health BRACE Program or visit www.floridahealth.gov.