

A Digital Archive of Significant Florida Weather Events to Improve the Public's Response to Future Warnings

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I. Introduction

The past is our guide, our manual, it helps illuminate actions for the future. Through a NOAA Preserve America Initiative grant obtained in collaboration between the NWS (Tampa Bay region) and the University of South Florida (USF) two students were hired by NMFS Regional office to work at the Tampa Bay Area NWS to document historic weather events (Fig 1) and preserve weather relics. In an effort to save items of historical content, President Bush through his Preserve America executive order (E.O. 13287) called on NOAA and other federal agencies to inventory, preserve, and showcase federally-managed historic, cultural, or "heritage" resources and foster tourism in partnership with local communities.



Killer Tornadoes Leave a Path of Destruction across Central Florida over 100 Miles in 1966

Fact Sheet

- Date: April 4, 1966
- Time: 8:20 am
- Estimated Tornado Intensity: F4
- Estimated Maximum Wind: 207-260 mph
- Tornado Width (Yards): 300
- Path Length (Miles): 100
- Deaths: 11
- Injuries: 3350
- Damage Amount: 50 M+
- Number of Homes Damages: 279 homes-, 1 school, 1 restaurant, and many trailers
- County: Pinellas, Hillsborough, & Polk

Toll in Millions; Tampa, Polk Disaster Areas

By JOHN FRASCA
Tribune Staff Writer

Black, deadly tornadoes spawned by a treacherous line of squalls east of the Gulf of Mexico devastated huge sections of Central Florida yesterday, killing at least nine persons, injuring hundreds of others and causing "millions upon millions of dollars" in property damage.

Tampa Tribune

Tampa Badly Mauled In Furious Winds



AT LEAST 250 INJURED IN FLORIDA

Fig. 1. NOAA Preserve America web page of the 1966 tornado.

Under the umbrella of NOAA, the National Weather Service (NWS) has accumulated a wealth of historical resources including old maps, charts, photographs, books, scientific instruments, and

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other artifacts. These resources are of immense value not only to NOAA but also the American people their true owners. Two frail leather-bound U.S. Weather Bureau means books dating back to 1890 needed rebinding. The office also has a wealth of other record books, older original weather maps depicting major events, news articles, and photos of major past events.



Fig. 2. Scanned weather photos.

Many old weather artifacts from the past have been photographed and existing photographs of past weather events were scanned too (Fig. 2). When in electronic form, the pages of the books make accessible viewing on the Internet. Past forgotten events now in electronic form serve as a reference for the public, media, and others, and a reminder to complacent residents that this area is not immune to hazardous weather. The past weather events that have produced devastating impacts to our forecast area are divided into four primary categories: hurricanes, floods, tornadoes, and freezes and these are posted to our heritage web page: <http://www.srh.noaa.gov/tbw/?n=history>.

Additionally, the methodology for replicating this preservation process is described in articles and presentations for outreach and conferences. Knowledge of the past will help illuminate actions for the future.

II. Record Books

Leather bound U.S. Weather Bureau means books dating back to the weather service's inception, in 1890, were in poor condition (Fig 3). They have been scanned, rebound, and look like new (Fig. 4).



Fig. 3: Degraded record books.



Fig. 4: Record book recovered.

III. Artifacts

Some of these records include, older original weather maps depicting major events, news articles, and photos of major past events. The photos are fading as well as the news articles beginning to decompose. Weather maps on Difax paper (Fig. 5) are slowly darkening and degrading. The records are now in electronic format and are preserved. Old weather instruments have been photographed and documented too (Figs. 6-7).



Fig. 5: Old Difax weather map.



Fig. 6: Electronic communication handset with telephone rotary dialer.

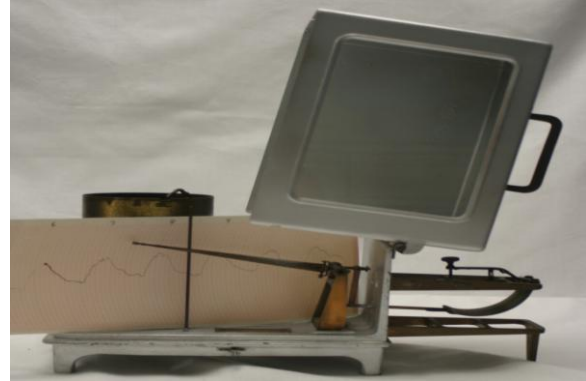


Fig. 7: Thermograph which records temperature onto a continuously moving chart of graph paper.

IV. Past Weather Events

The past weather events are divided into four primary categories that have produced devastating impacts to our residents: hurricanes, floods, tornadoes, and freezes. Many hours were spent at the USF library doing research. Some research was done through the internet using the library's databases and information from historical societies. Much of the research for past events was through old newspapers on microfilm. Case templates (Fig. 8) were developed for each event in all four categories. Every write-up was proofread and transferred into Portable Document Format (PDF). A NWS heritage page was developed and linked to the Preserve America website and other similar history websites from NWS offices. The NWS heritage web page is also linked from the USF weather website.

NOAA AND THE PRESERVE AMERICA Initiative

1921 Hurricane Inundates West Florida

Fact Sheet

- October 25, 1921
- Maximum Intensity: Category 4
- Intensity at Landfall: Category 2
- 3 deaths
- \$2 Million in damage
- Minimum Pressure: 27.80 in (941 mb)
- Pressure at landfall: 28.12 in (952 mb)
- Max rainfall: 11.73 in at St. Leo, FL
- Max storm surge: ~10.5 feet
- Maximum winds at landfall: 75 mph

Summary of event:
The morning of the event a small column on the front page of the Tampa Times was dedicated to warning the public of the impending disaster. The final statement given by Meteorologist W. J. Bennett at 11:30 on October 24, 1921 was that, "we are apparently in the apparent path of the storm, but in the past in practically identical circumstances, similar storms have always veered either to the north or the south of us, and probably this one will do likewise." The last advisory at the time of printing said, "Tropical storm central

Fig. 8. NOAA Preserve America web page of the 1921 hurricane.

These web pages allow simple straightforward access as references for many people including: the public, media, tourists, and emergency planners. This information will also show the residents in the Tampa Bay area that this area is not immune to harmful weather events. Many residents in the Tampa Bay region assume they have experienced the worst of catastrophes, when in reality they have not. Bringing information about the impacts of past events will help the Tampa Bay residents to better prepare themselves in advance of an oncoming storm and help them become more prepared in their household when a storm hits.

A. Hurricane Cases

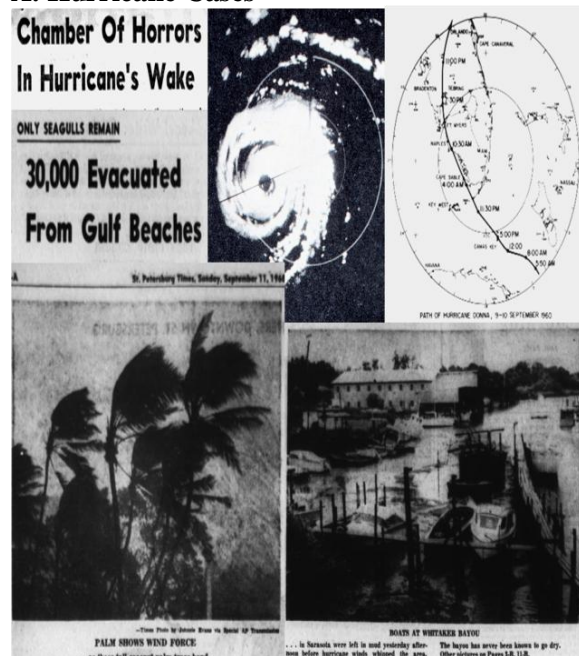


Fig. 9. Hurricane Donna newspaper clippings.

The hurricane events include the 1848, 1910, 1921, and 1935 major hurricanes and more recent storms including Hurricane Easy (1950), Hurricane Donna in 1960 (Fig. 9), and Hurricane Charley (2004). Hurricanes dump copious rain, produce strong winds, heavy waves, high tides, storm surge, and tornadoes. Storm surge is very dangerous and is a key factor to deaths during a hurricane. With the shallow continental shelf extending far into the Gulf of Mexico, predicted storm surge from a major hurricane up to 30 feet has the greatest impact on the west coast of Florida. The last time a major hurricane hit the Tampa Bay region was 1921 producing a 10-15 foot storm surge. Hurricanes produce very high winds as we saw with Hurricane Charley in 2004 with sustained winds at 140 mph. Those winds tore apart homes, overturned boats, uprooted trees, tore down

billboards, and tossed debris around with ease. Hurricane Easy in 1951 lingered north of the Tampa Bay area for several days dumping over 38 inches of rain in a 24 hour period causing severe flooding. For residents unaware of a hurricane's fury and not properly prepared, it can be life threatening. When people are fully informed about hurricanes, they are more likely to take proper actions. The thought of leaving home during an evacuation creates hesitation from those that don't know the impacts from a major hurricane.

B. Tornado Cases

Central Florida is one of the most tornado prone parts of the county and cool season thunderstorms and summertime tropical systems produce killer tornadoes on occasion. Significant killer tornadoes from 1882, 1918 (Fig. 10), 1966, 1972 and 1978, are documented with more recent cases from 1983, 1992, 1993, 1998, and 2007. While most of the tornados that develop over central Florida are weak, strong tornados associated with supercell thunderstorms are extremely dangerous, often last longer, and kill more people.



Fig. 10. School damaged in Apopka from tornado (1918).

C. Flood and Heavy Rain Cases

Another event, floods are most commonly associated with tropical storms and hurricanes but cool season rain events have occurred creating tremendous impacts. Two of the major rainfall events documented are cool season events from 1978 and more recently 2006 (Fig. 11) and a third prominent case of Florida's record 24 hour rainfall is from the warm season with Hurricane Easy in 1950. On February 3rd 2006 a line of intense thunderstorms stalled ahead of an approaching upper level disturbance and tropical moisture

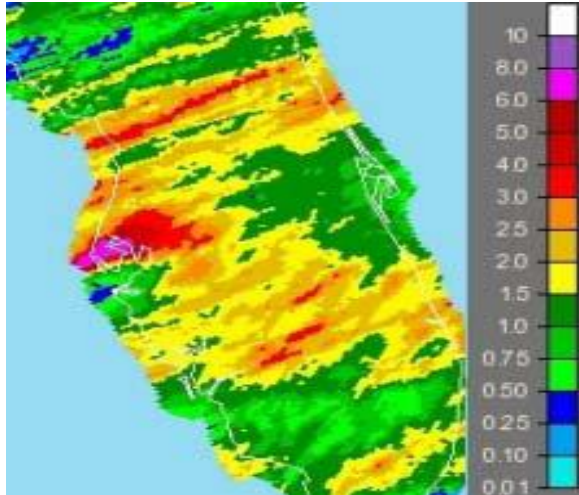


Fig. 11. Heavy rainfall (inches) over west central Florida in Feb 3, 2006.

flooding several areas of Tampa Bay (Fig.11). When the rain finally came to a stop, five hours later, 8 to 11 inches of rain had fallen in a swath extending from Pinellas Park northeast through Lealman and Feather Sound, then across Old Tampa Bay to west Tampa, including Tampa International Airport. The daily record was shattered at Tampa; in fact, the total of 8.29 inches ranked unofficially as the 4th wettest calendar day since 1890.

D. Freeze Cases

Agriculture, particularly winter crops, contributes over a billion dollars per year to Florida's economy and freezes have produced major interruptions in growing cycles costing millions of dollars. Freezes examined include those from 1835, 1886, 1894, 1899, 1901, 1905, 1918, 1934, 1957, 1962, and the three devastating freezes of the 1980's. Many acres are lost every year when freezes occur. Some of Florida's winter crops consist of snap beans cabbage, sweet corn, bell peppers, citrus fruit (Fig. 12), strawberries, and tomatoes.



Fig. 12. A Florida citrus tree covered in ice.

V. Summary

Putting these past events on display will help our residents to understand the magnitude of damage and the disturbing impacts our worst weather brings. With the ease of a click on the NWS heritage web page, hurricanes, floods, tornadoes, and freezes that include newspaper clippings (Fig 13) will contribute as a historic reference to the

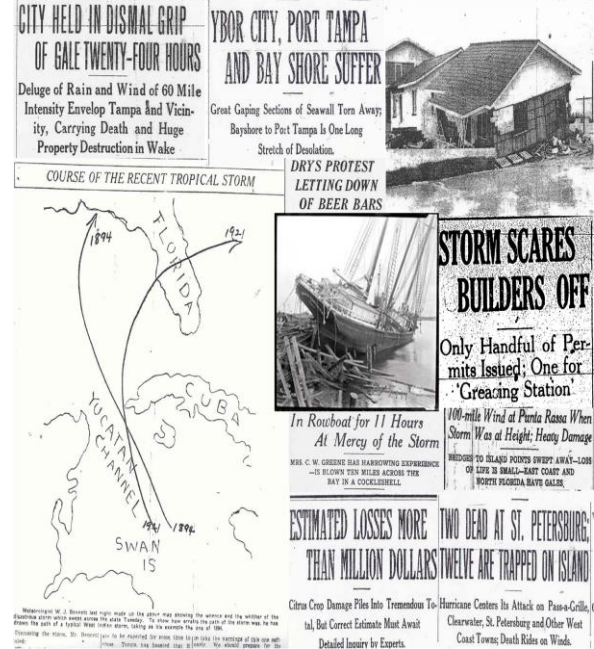


Fig. 13. News clippings from the 1921 Hurricane.

public, media, emergency planners, and many more. Being informed on the impacts of these events could better prepare Tampa Bay residents for the worst-case scenario. The goal is for every household to have a plan for every event. This could help save lives.

Considerable work and dedication was put into this effort. The students involved on the grant had already received training in meteorology prior to working on this grant through their classes and other research projects at USF and their participation with the West Central Florida Chapter of the American Meteorological Society. However this experience has provided them with an experiential learning environment and an engaged community scholarship opportunity. They have benefited in their classes from using the latest radar software. They now have a greater appreciation for the equipment and primitive technology environment of their predecessors.

VI Acknowledgements

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