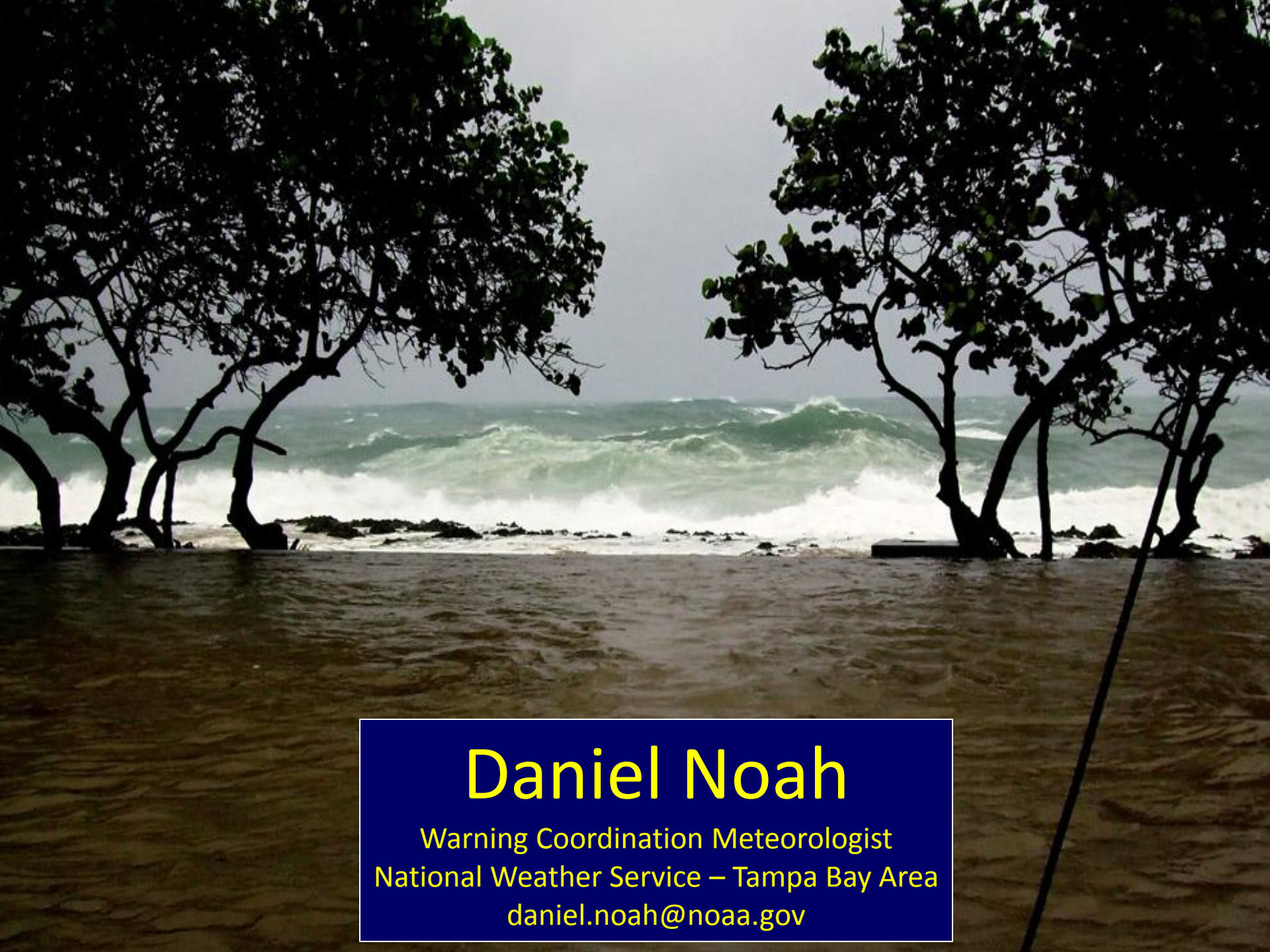


# Tampa Bay Hurricane Threat



[weather.gov/tampabay](https://weather.gov/tampabay)



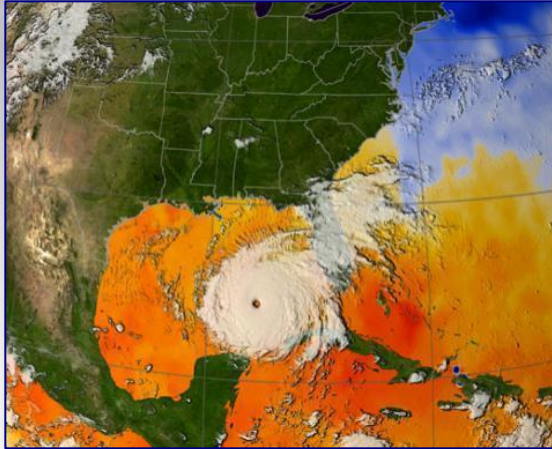


# Daniel Noah

Warning Coordination Meteorologist  
National Weather Service – Tampa Bay Area  
[daniel.noah@noaa.gov](mailto:daniel.noah@noaa.gov)



# Partners in the Hazardous Weather Warning Process



Emergency Management  
Broadcast and Print Media  
National Weather Service

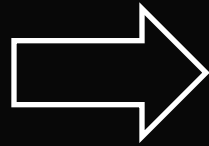


[weather.gov/tampabay](https://weather.gov/tampabay)

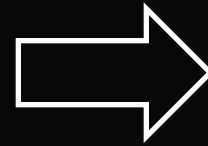


# The Role of your local NWS Forecast Office

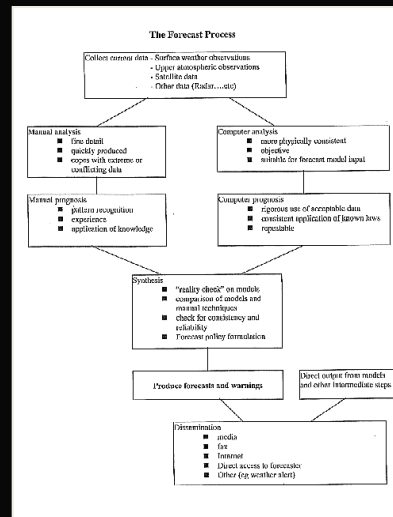
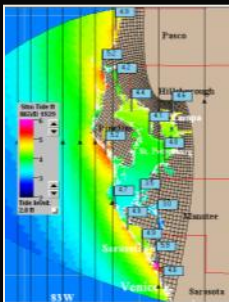
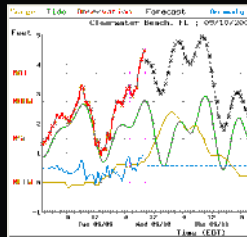
Analyze all the various products and forecasts



Develop localized picture of timing and impact



Communicate uncertainty and impacts so our customers can make informed decisions

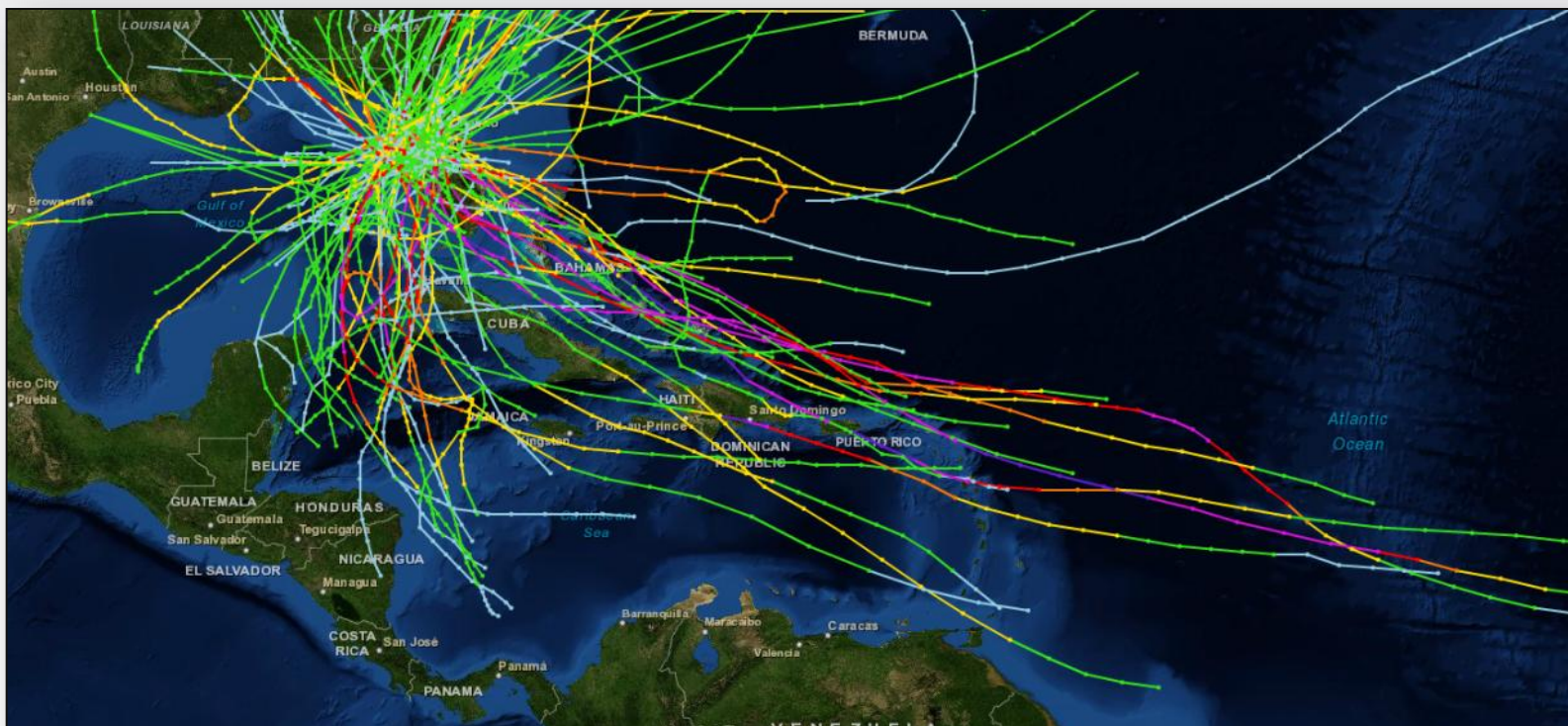




# Tampa Bay Area Hurricanes

Within 100 miles Center of Tampa Bay, 1851-2015

- Tropical Storms: 63
- CAT 1: 16
- CAT 2: 4
- CAT 3: 3
- Total = 86



[weather.gov/tampabay](https://weather.gov/tampabay)



# Interactive Live Poll

Open an Internet browser on you smartphone or tablet





# Interactive Live Poll

Open an Internet browser on you smartphone or tablet



[Pollev.com/flnws](https://Pollev.com/flnws)



# Your poll will show here

1

Install the app from  
[pollev.com/app](https://pollev.com/app)

2

Make sure you are in  
Slide Show mode

Still not working? Get help at [pollev.com/app/help](https://pollev.com/app/help)

*or*

[Open poll in your web browser](#)



# NWS Tampa Bay Social Media

You do not need an account to view our social media posts



<http://weather.gov/tampabay>



[@NWSTampaBay](https://twitter.com/NWSTampaBay)



[fb.com/NWSTampaBay](https://fb.com/NWSTampaBay)



[youtube.com/NWSTampa](https://youtube.com/NWSTampa)



# Our First Facebook Post to go Viral



2,548 Shares

424 New Likes to our page

119 Comments

= 366,599 Reach

(showed up on someone's timeline)

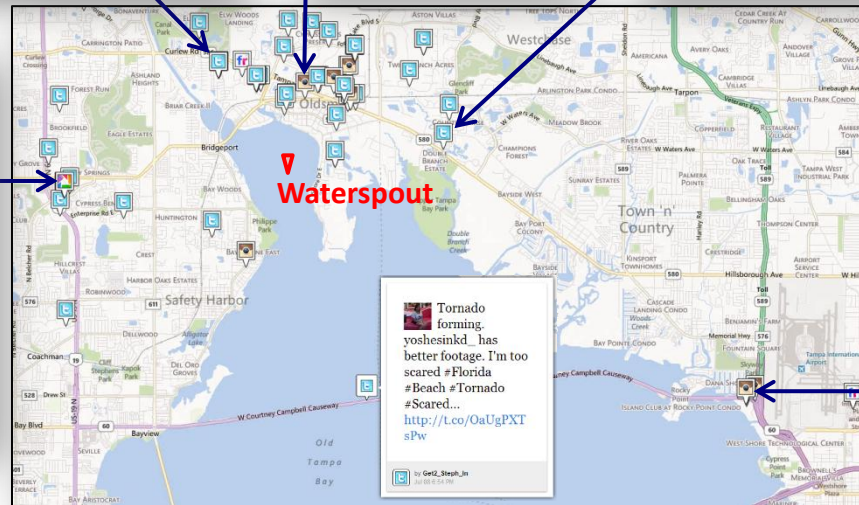


[weather.gov/tampabay](http://weather.gov/tampabay)



# Waterspout via Social Media

Waterspout in Tampa Bay Evening of July 8, 2013



GeoFeedia



weather.gov/tampabay





# Hyping of Tropical Events on Social Media



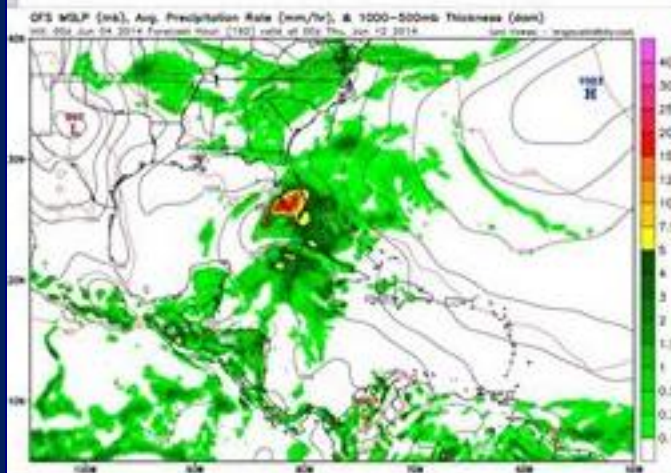
Florida Tropical Updates

4 hours ago

00z GFS.

I'm off now folks. Getting very sleepy, plus having a trigonometry test in the morning. I will have more updates tomorrow afternoon on this potential system ( #Arthur).

... Continue Reading



Louisiana Hurricane Center

May 27

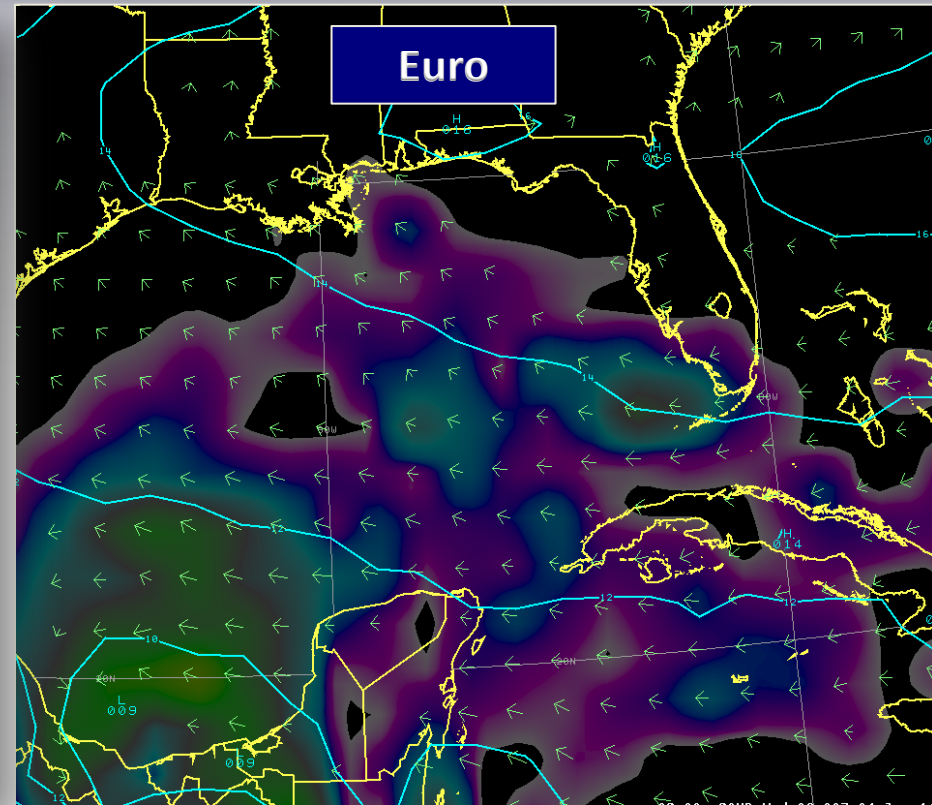
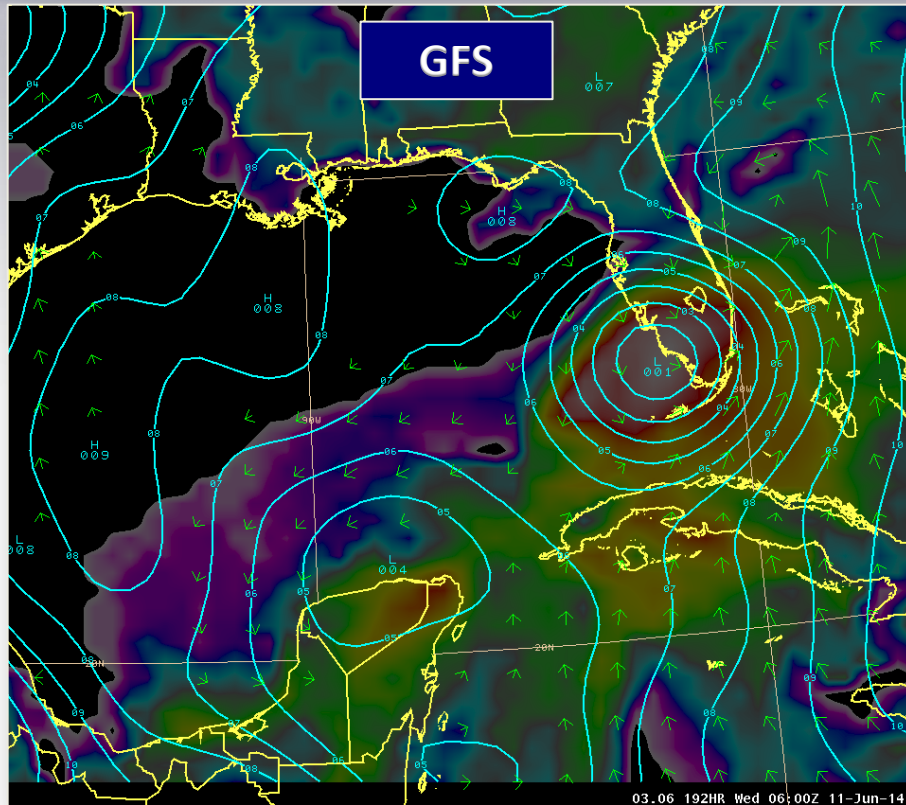
\*\*\*Model Watch\*\*\* GFS continuing today to show a possible depression/weak Tropical Storm coming out of the NW Caribbean... the model/image below is showing what could be a storm in the extreme southern Gulf June 4th. The FIM and CMC are als... See More



Like · Comment · Share

391 Shares

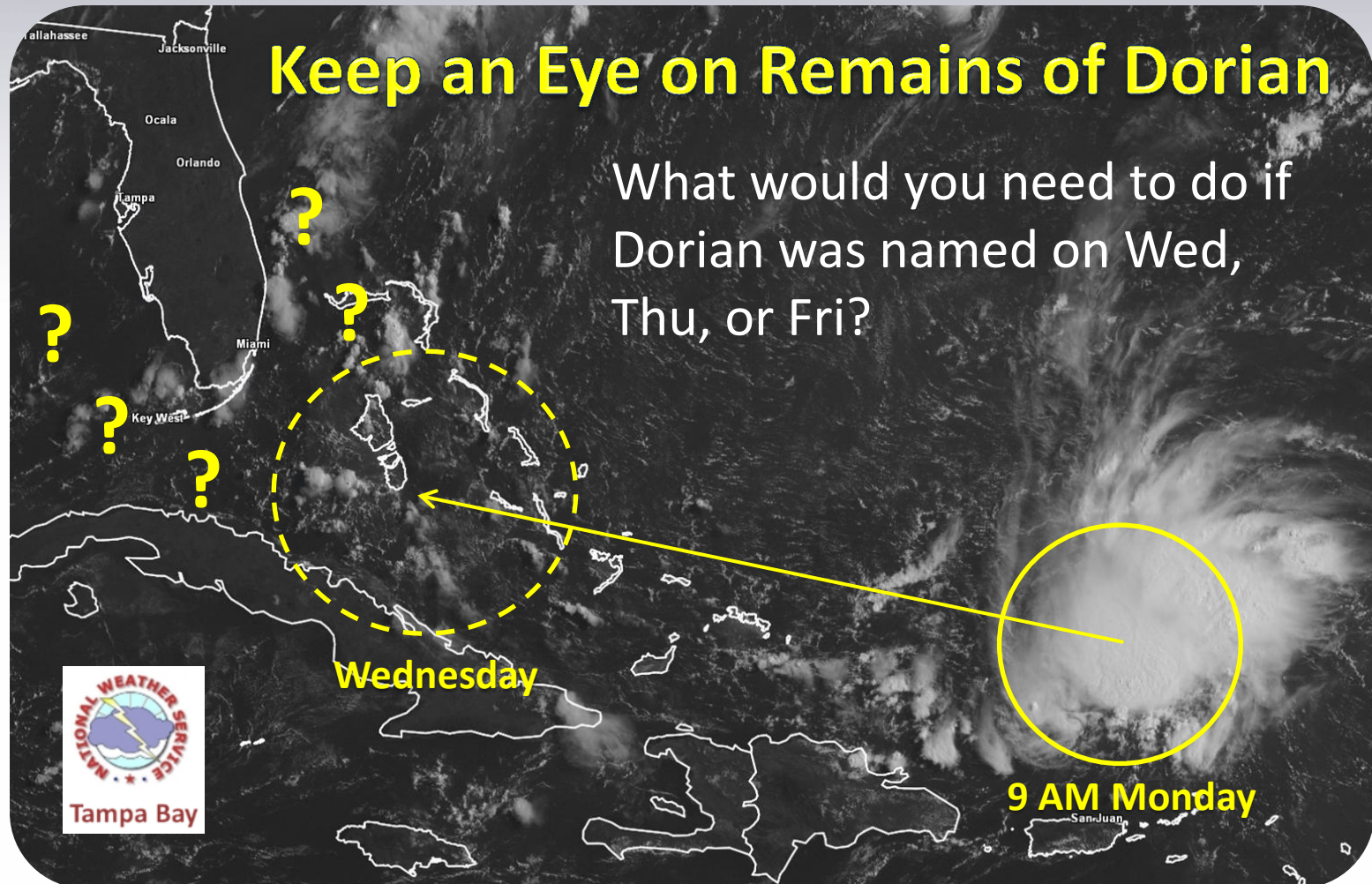
# May 3, 2014 GFS vs European Model Forecast for May 11, 2014



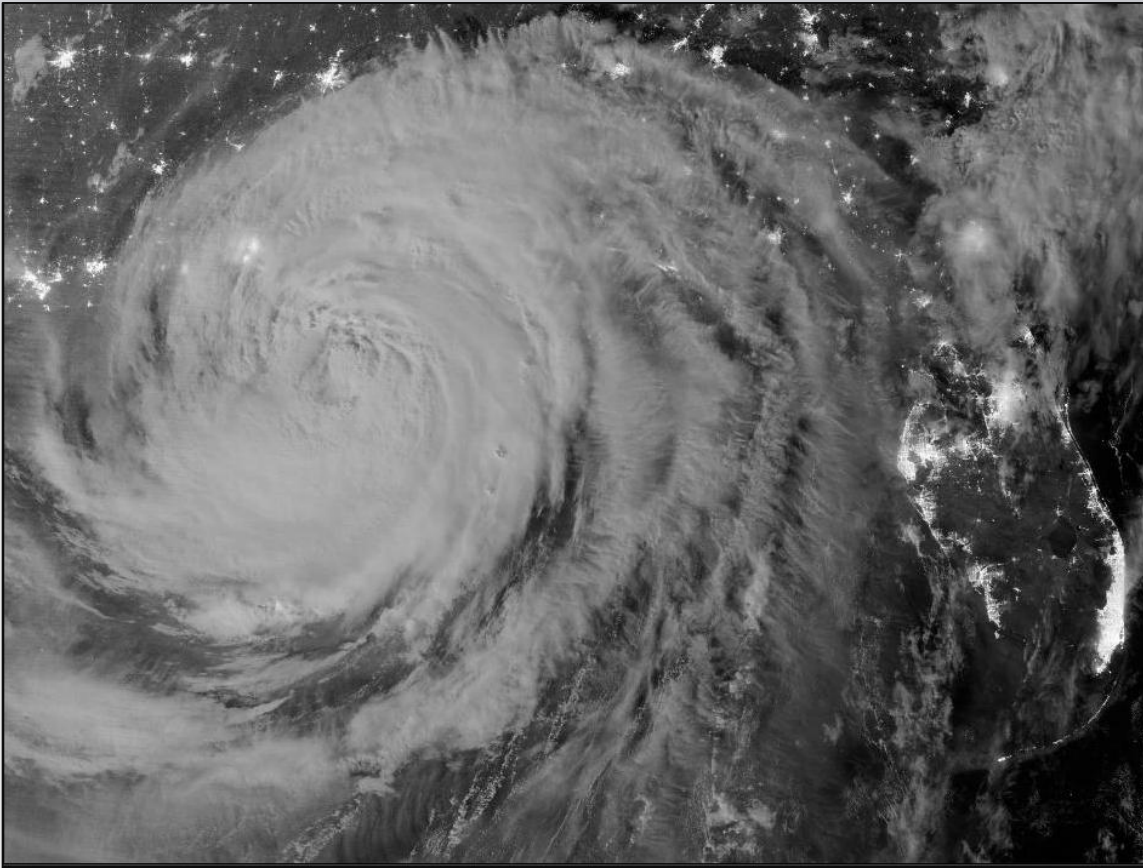
- Models do much better once a storm has actually developed, but have trouble developing storms from scratch
- Models develop many more storms that do not form than do form



# Only Use Trusted Sources



# 2012 Hurricane Isaac



August 21 to Sept 1

80 MPH CAT 1

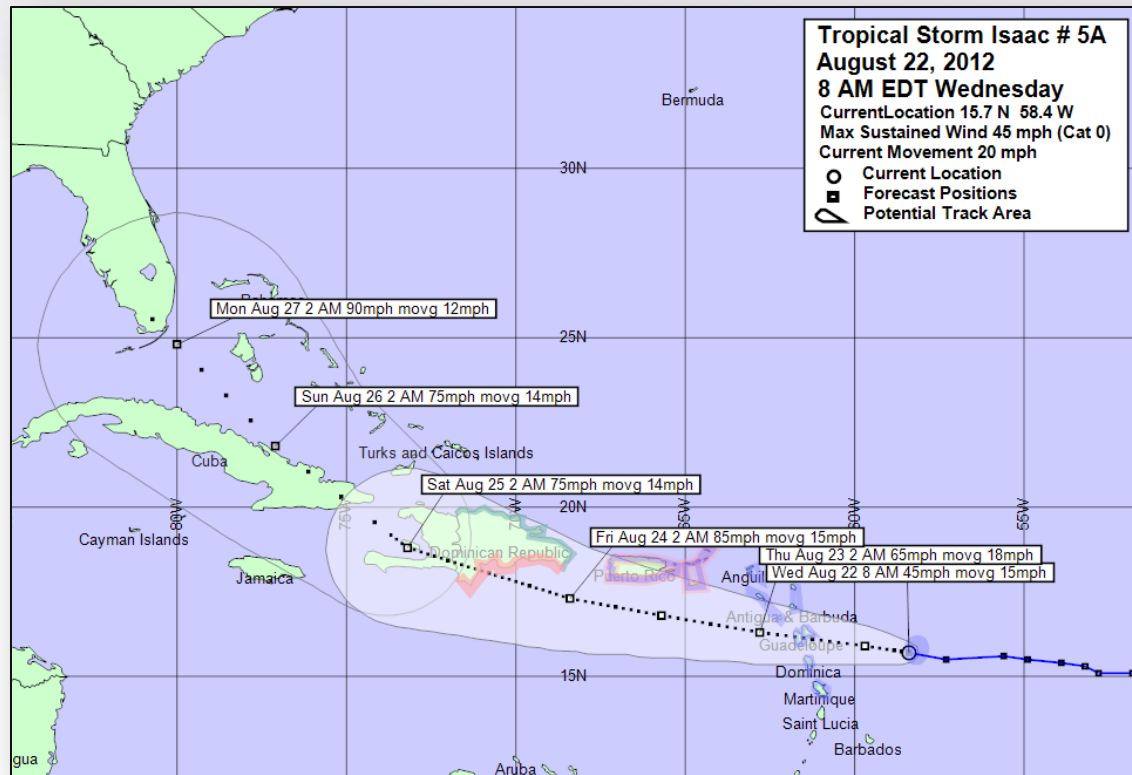
44 Fatalities

\$2 billion in damage

# Aug 22 Official Forecast

RNC Aug 26-30

Hurricane Watch likely somewhere in Florida Friday night or Saturday morning, RNC starts Monday



[weather.gov/tampabay](http://weather.gov/tampabay)







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*or*

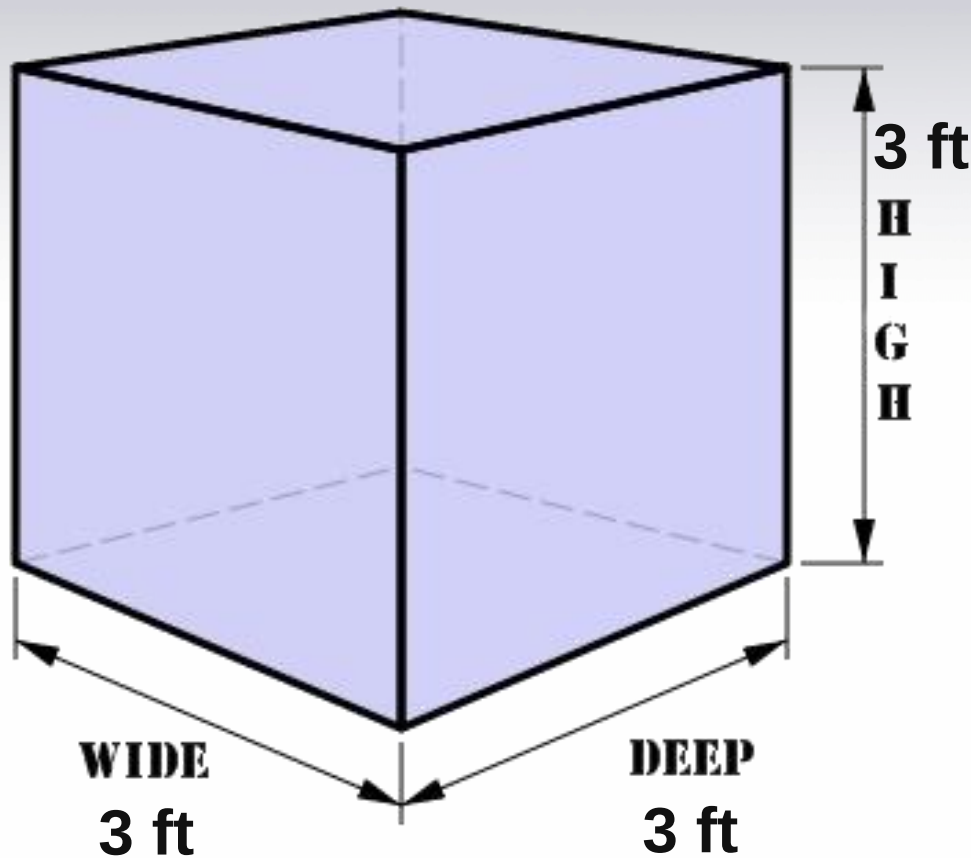
[Open poll in your web browser](#)



Storm Surge has the greatest potential  
for loss of life and property

# Water is Heavy

## Moving Water can be Deadly



1 cubic yard of  
water weighs  
1,700 pounds!



# Wind versus Surge

# Wind in 2012 Tropical Storm Beryl

Late May 2012 - 6,000 without power



[weather.gov/tampabay](http://weather.gov/tampabay)





# Wind

Arcadia, FL after 2004  
Hurricane Charley





# Surge

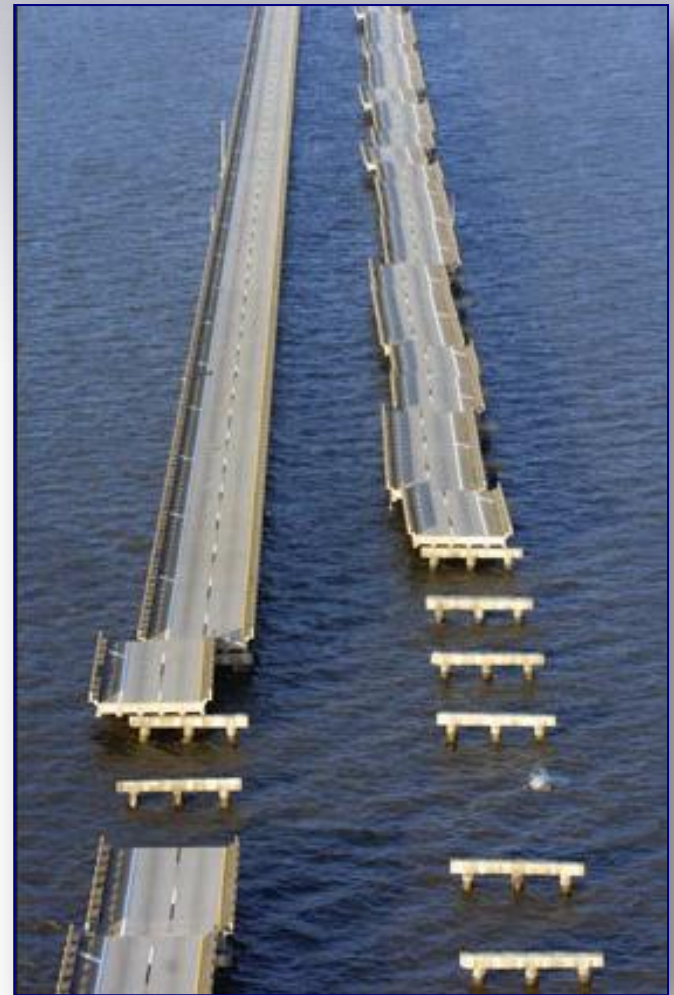




# Storm Surge can be Devastating

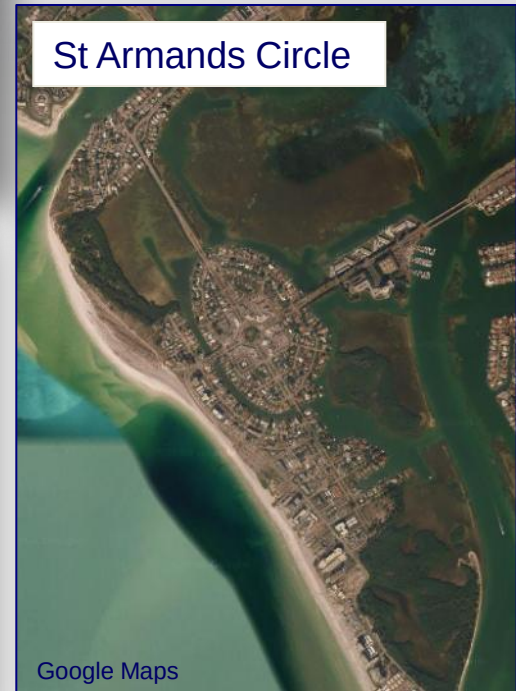


2008 Hurricane Ike, near Galveston, TX



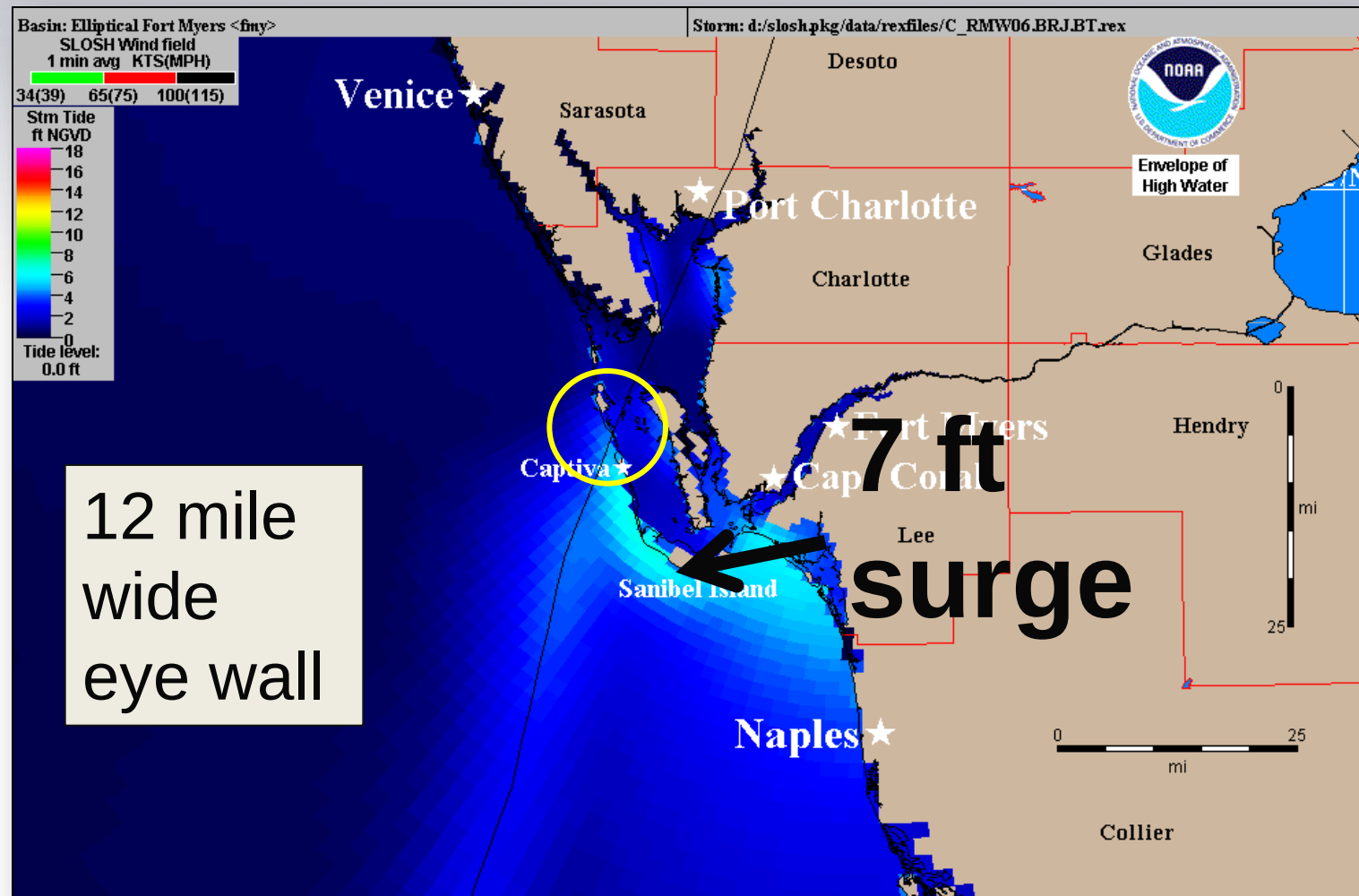
2004 Hurricane Ivan, I-10, Pensacola, FL

# Our Barrier Islands Are No Different



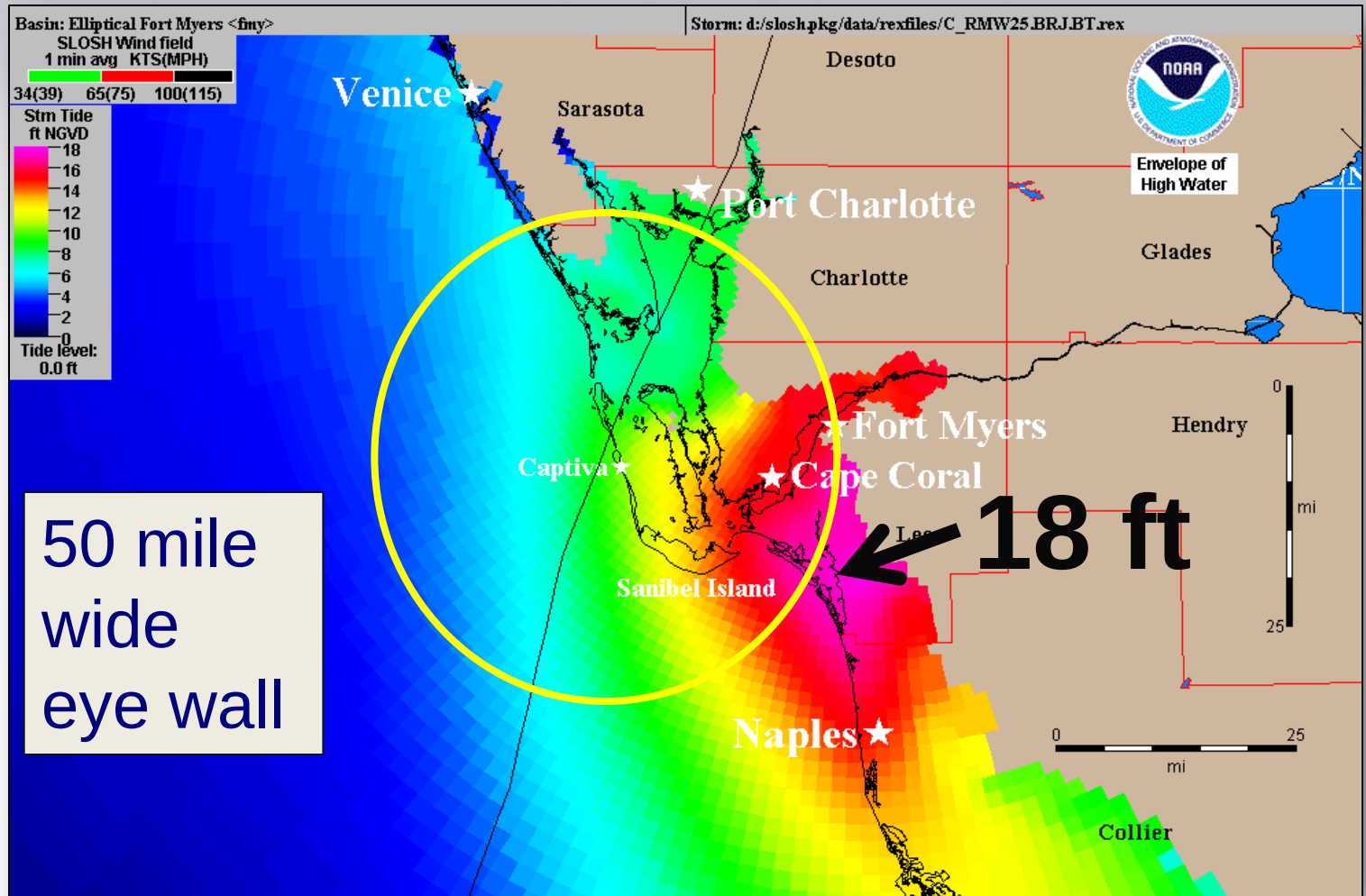


# 2004 Hurricane Charley's Eye Wall was Tiny

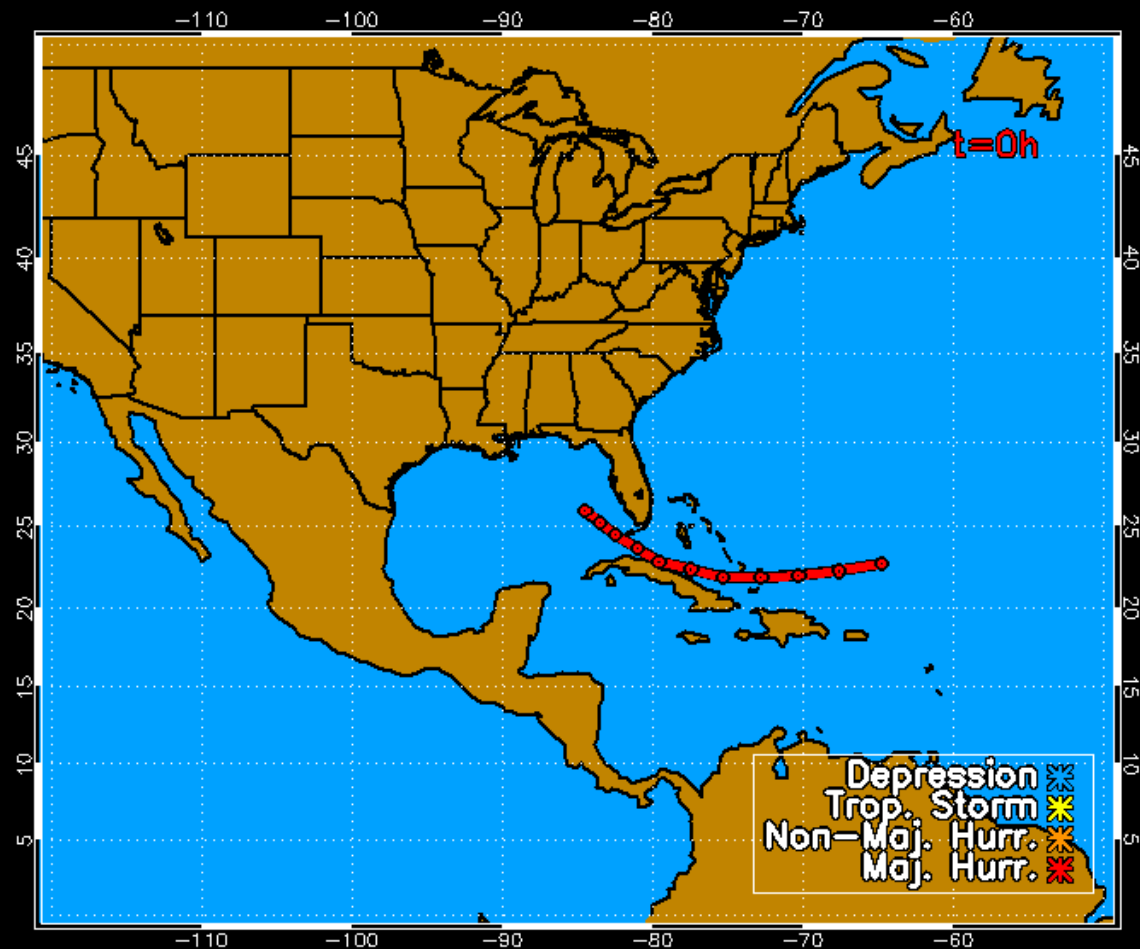




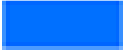
# What if Charley was a Normal Size Storm?

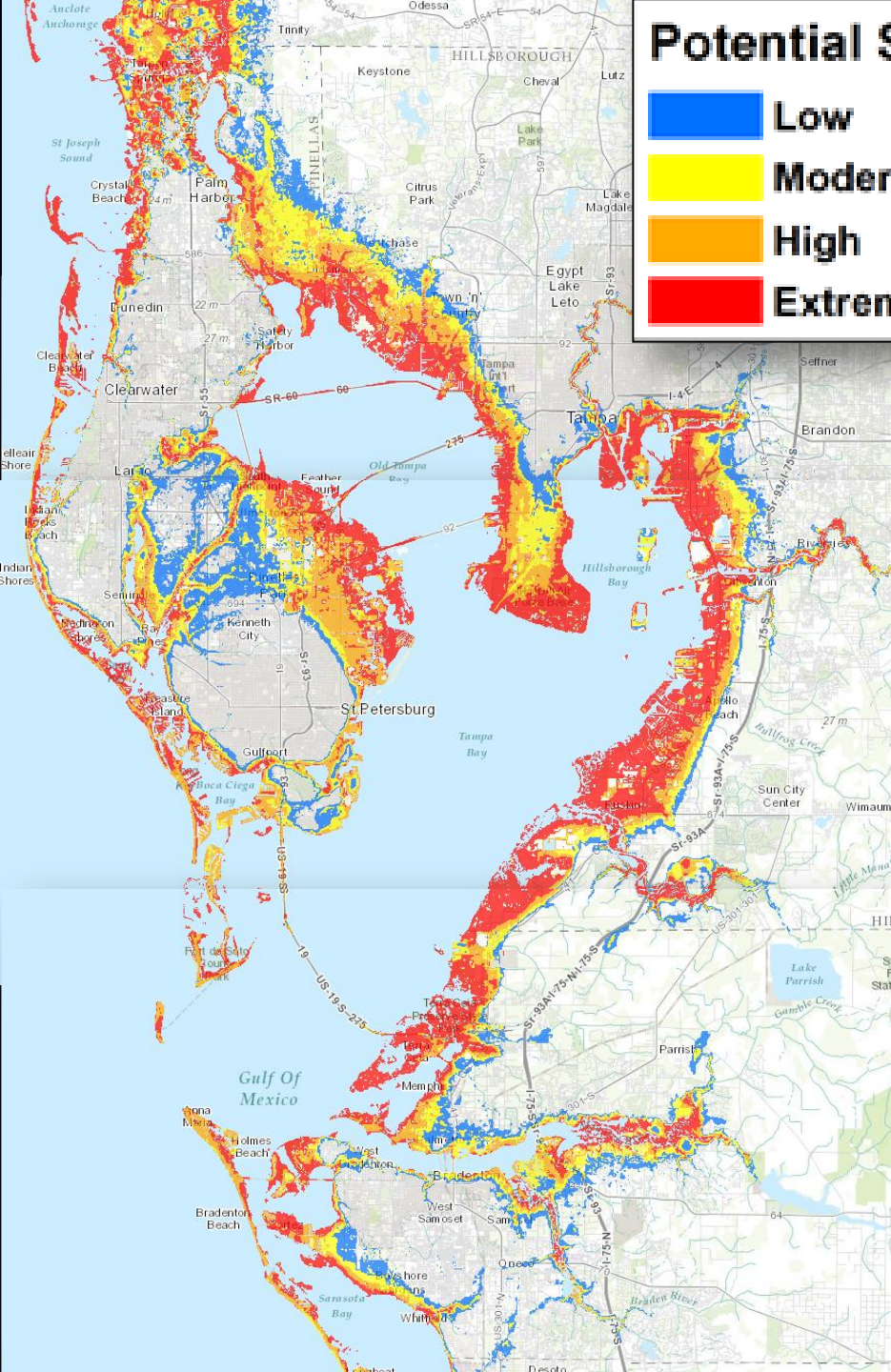


# Surge and Wind Probabilities



# Potential Storm Surge Hazard

|                                                                                   |                 |                                                      |
|-----------------------------------------------------------------------------------|-----------------|------------------------------------------------------|
|   | <b>Low</b>      | (3 feet or less above ground at that location)       |
|  | <b>Moderate</b> | (3 to 6 feet above ground at that location)          |
|  | <b>High</b>     | (6 to 9 feet above ground at that location)          |
|  | <b>Extreme</b>  | (9 to 12 feet or more above ground at that location) |



Available on NHC website  
at <http://hurricanes.gov>

- Created when warning issued, about 48 hours before impact
- 45 to 60 minutes after Advisory issued
- Updated every 6 hours





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[pollev.com/app](https://pollev.com/app)

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*or*

[Open poll in your web browser](#)



Inland Flooding from heavy rain is the second leading cause of fatalities in a tropical cyclone

# Looping Storms Have Happened Before

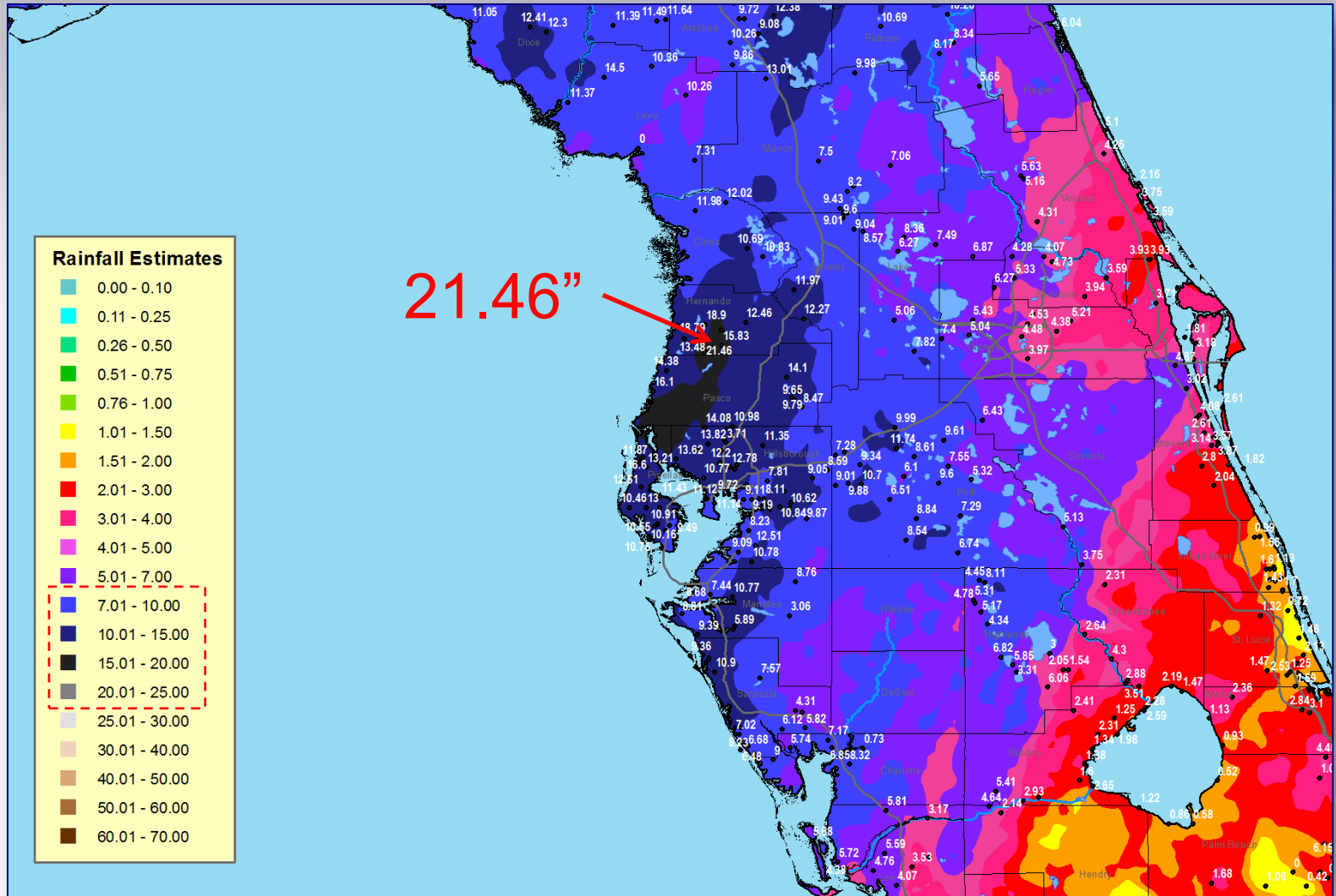


- Peak winds 125 MPH (CAT 3)
- 38.7 inches of rain in 24 hrs in Yankeetown
  - The most ever in Florida in a 24 hour period!



# Fresh Water Flooding

## 2012 T.S. Debby 7 Days of Rain



# Clay County Road Washed Out

## 2012 T.S. Debby

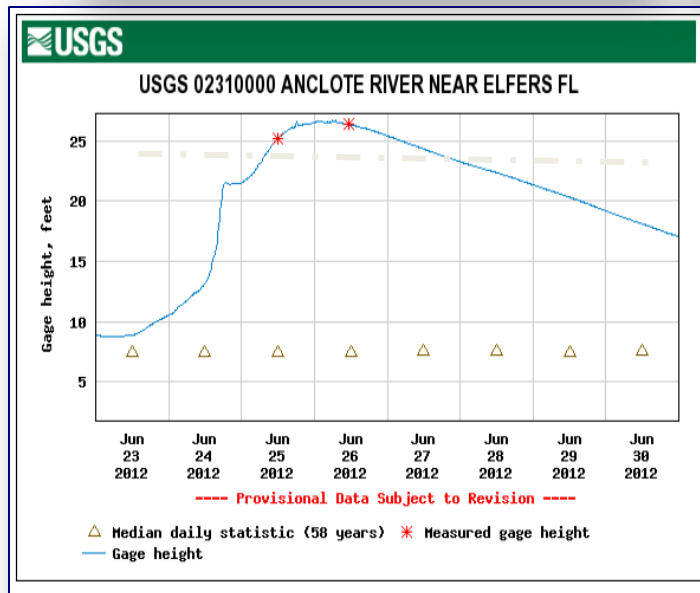


Clay County engineers and contractors inspect CR 218 west of Middleburg, Fla. Wednesday, June 27, 2012, after the road washed out overnight. Heavy rains from Tropical Storm Debby were the cause of the floods. Photo: The Florida Times-Union, Will Dickey / AP



# Major Flood Ancloste River

Elfers, FL - Second Highest Crest in 67 Years



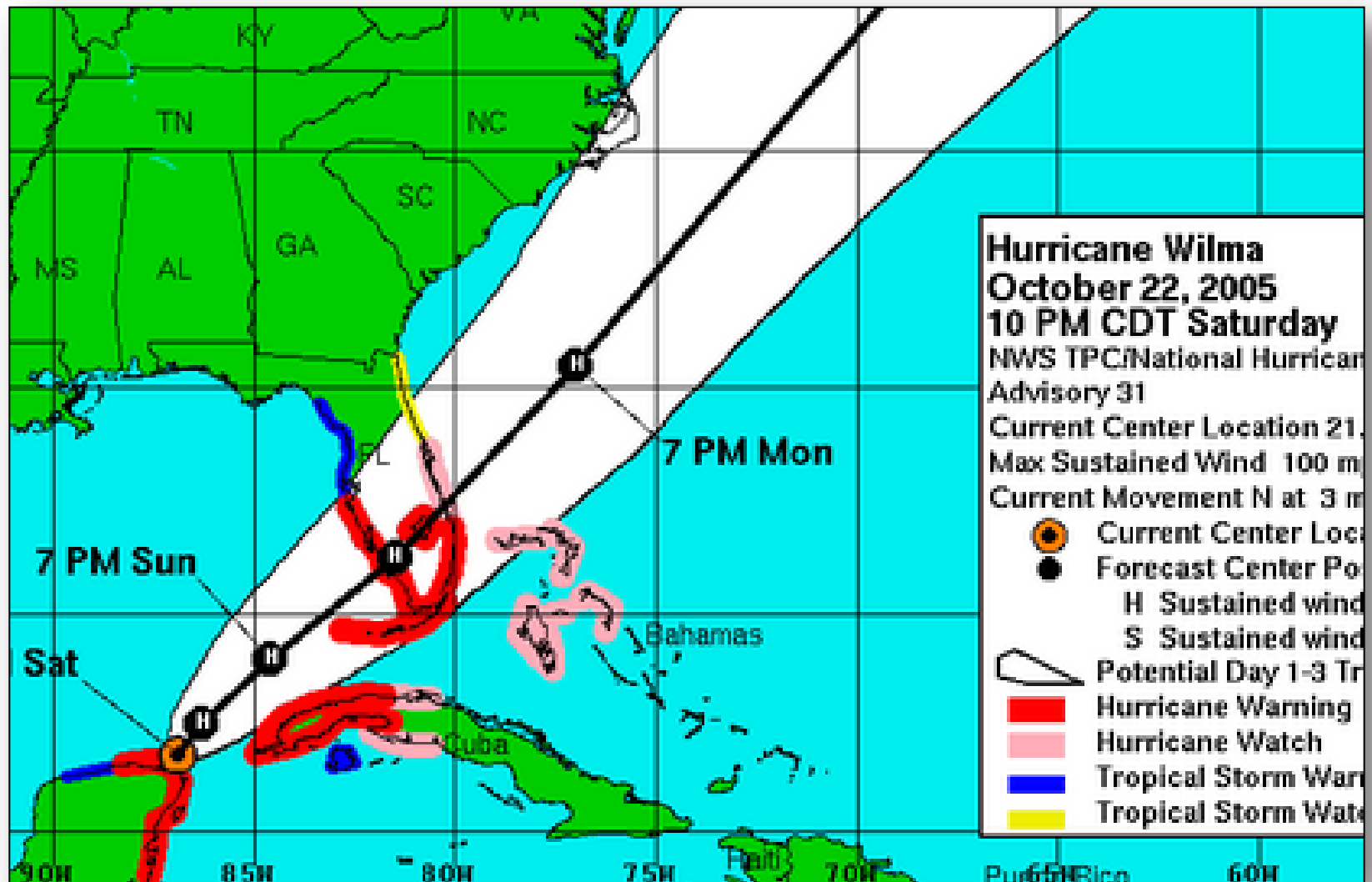


# Pinellas County

## Don't Drive in Flooded Roads



# What does the shaded area in white represent?





# Your poll will show here

**1**

Install the app from  
[pollev.com/app](https://pollev.com/app)

**2**

Make sure you are in  
Slide Show mode

Still not working? Get help at [pollev.com/app/help](https://pollev.com/app/help)

*or*

[Open poll in your web browser](#)





What does the shaded area in white represent?







# Newspaper Headline

## Perception is Reality

**St. Petersburg Times**  
WEEKEND EDITION, Aug. 14, 2004  
 SATURDAY, August 14, 2004

# A HARD TURN

**145 MPH WINDS:** With an unexpected jog east, Hurricane Charley devastates Southwest Florida.  
**GOING HOME:** After tense day, Tampa and St. Petersburg get less than inch of rain, 30 mph winds.  
**BACK TO SEA:** Storm pummels Orlando and Daytona Beach area before heading into the Atlantic.

3:45 p.m.  
 Time Charley made landfall in Central Island

145  
 Sustained surface wind in mph at landfall

5  
 Diameter of eye in miles at landfall

25.94  
 Storm surge potential in feet at landfall  
 Hurricane force wind 20-25 miles

7  
 Storm surge in feet at landfall

30  
 Highest winds in mph at landfall

0.25  
 Rainfall in inches at landfall

\$15-billion  
 Preliminary property damage estimate for the state

160  
 Highest sustained wind in mph

1.9-million  
 People without power at landfall

272  
 Storm surge potential in feet at landfall

21,980  
 People in shelter at landfall

50  
 Storm surge potential in feet at landfall



Steve Brooks looks out the window from what's left of his mobile home at a park in Punta Gorda. "It was pretty scary," said Brooks, who suffered a heart attack during the storm.

### Intensity surprises Southwest coast

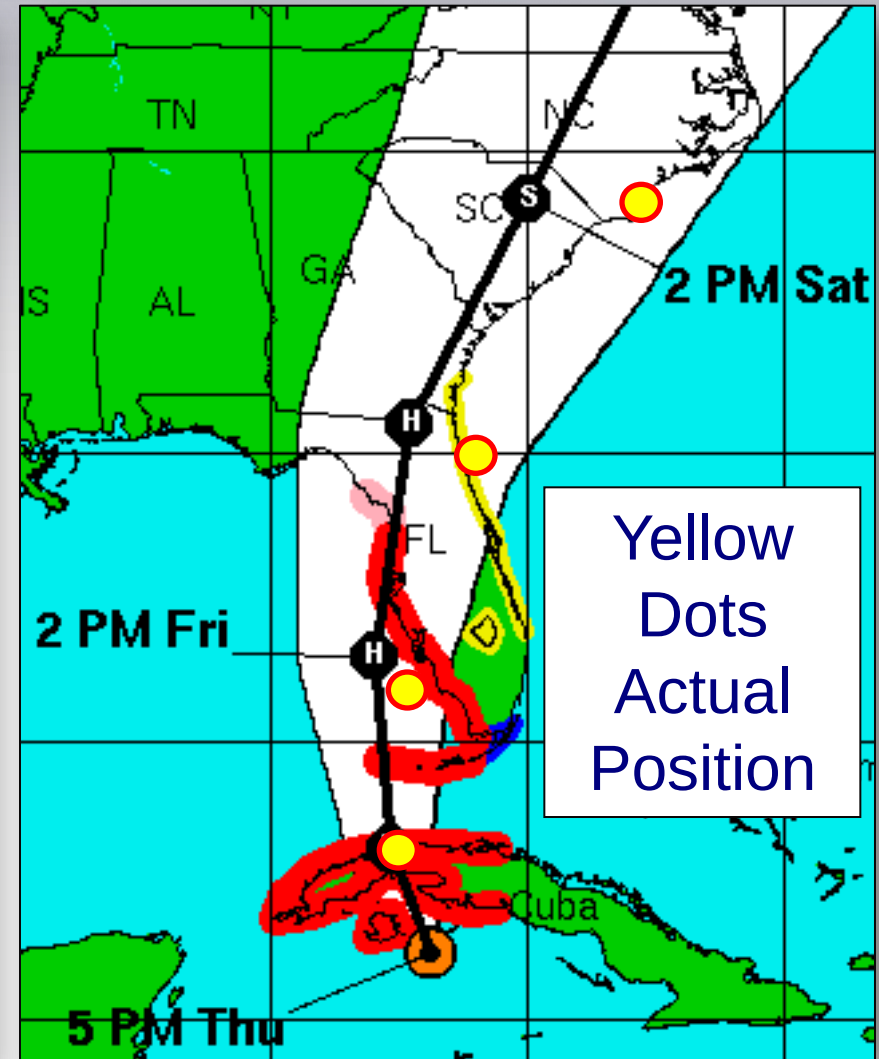
By JAMES HAMILTON  
 ST. PETERSBURG, Fla. (UPI) — Hurricane Charley, which struck the Southwest Florida coast Saturday, surprised many with its intensity and the damage it caused.

### Why Charley turned

Why did the storm turn east? The answer may lie in the storm's path. Charley was a tropical storm when it struck the coast. It was a tropical storm when it struck the coast. It was a tropical storm when it struck the coast.

### Tampa Bay relieved as storm brushes by

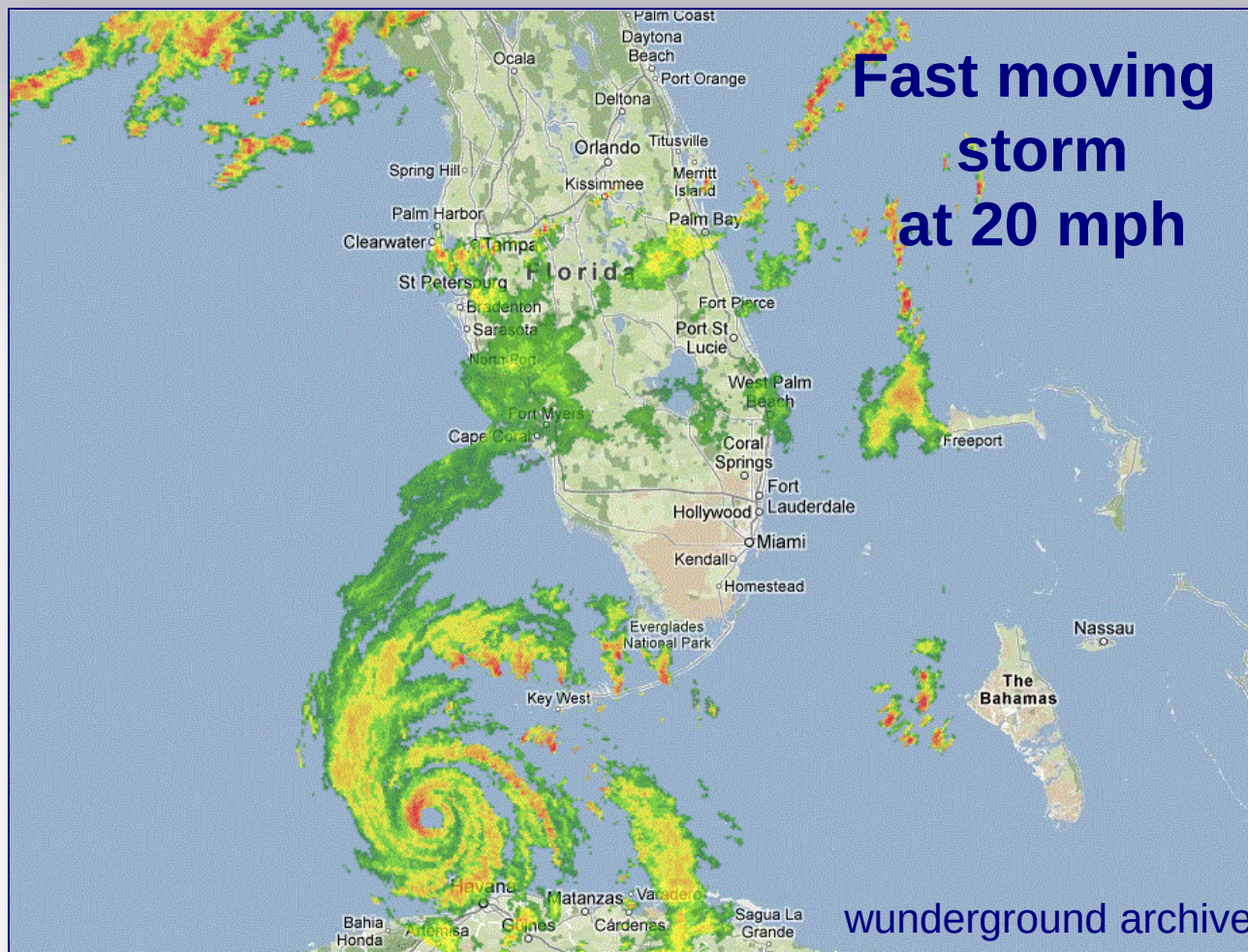
By JAMES HAMILTON  
 TAMPA, Fla. (UPI) — Tampa Bay was spared the worst of Hurricane Charley's wrath as the storm brushed by the city Saturday.





# 2004 Hurricane Charley

## Landfall on Friday, August 13



[weather.gov/tampabay](http://weather.gov/tampabay)



# 2004 Charley Size vs 1988 Gilbert

## Max Diameter of T.S. Force Winds



# Evacuations



[weather.gov/tampabay](https://weather.gov/tampabay)







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Make sure you are in  
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*or*

[Open poll in your web browser](#)



# Top 5 Most Difficult Hurricane Evacuations

according to Donald Lewis, VP of ATKINS at the 2012 National Hurricane Conference

5. Southeast Florida
4. New York City / New Jersey Coast
3. Delmarva Peninsula (DE, MD, VA)
2. Tampa Bay Area, FL
1. Southwest Florida



# Hurricane Dangers - Evacuation



Motorists trapped on I-26 as Hurricane Floyd approached Charleston, SC in 1999



Houston as Hurricane Rita approached in 2004

*Evacuate 10s of miles, not 100s of miles*





# Evacuation Called for Only 2 Reasons

## 1. For People in the Storm Surge Zone



Hurricane Charley - 2004  
Motorists fleeing  
Pinellas County on the  
Howard Franklin Bridge



# Evacuation Called for Only 2 Reasons

## 2. For People in Manufactured Homes



# 2016 Hurricane Season Forecast

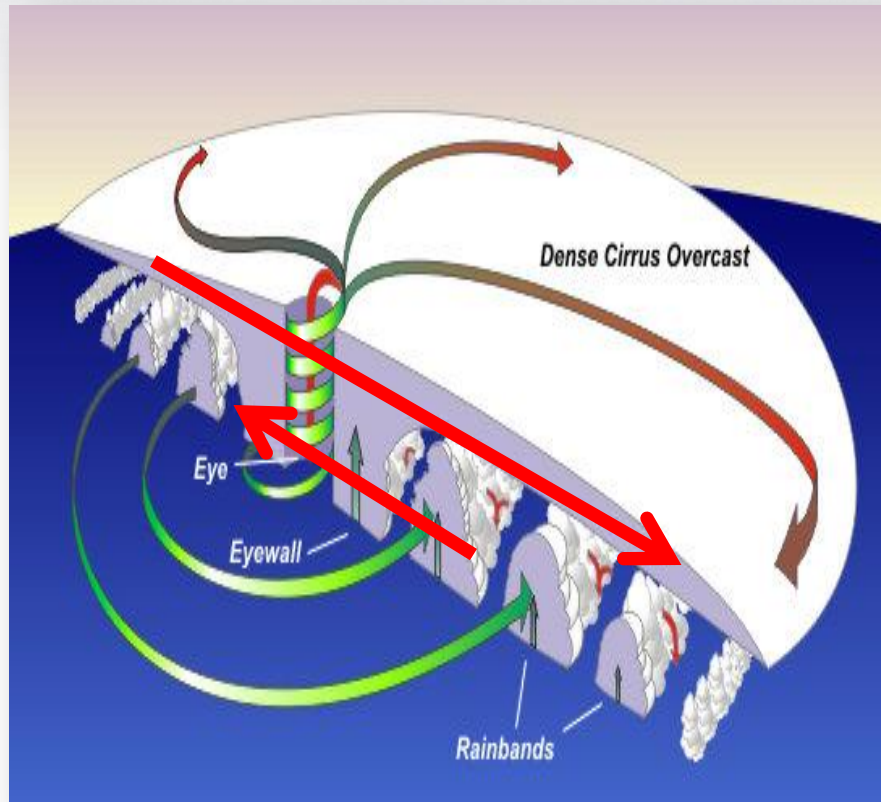
Favors Hurricane Development – La Nina

Hinders Hurricane Development – Cold Atlantic Waters

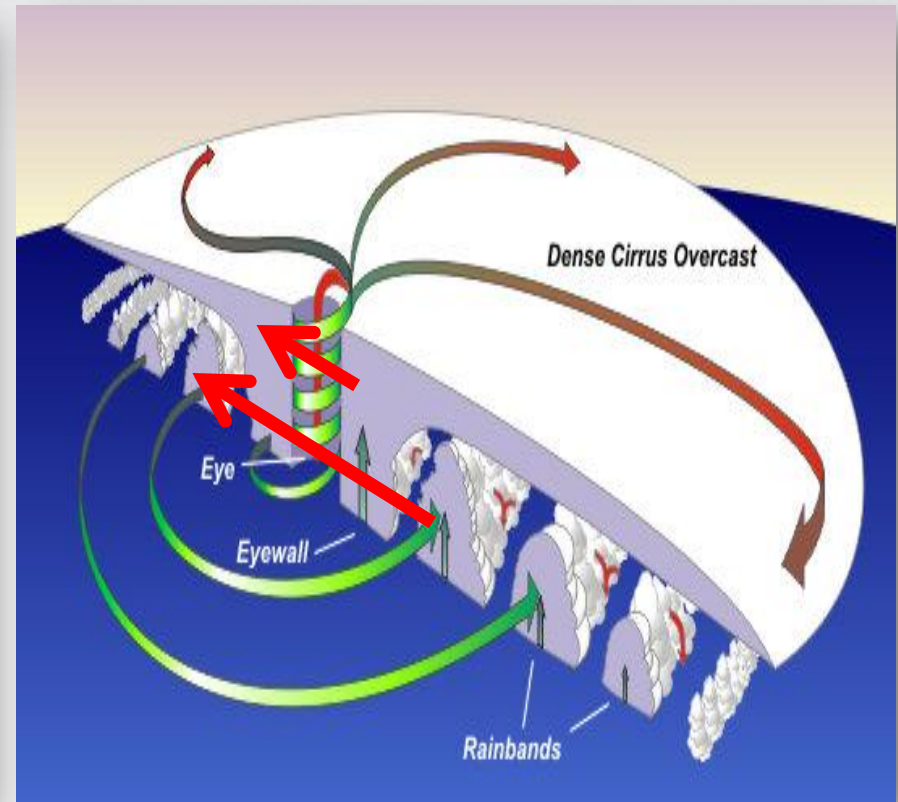


# Large Scale Flow: El Nino VS La Nina

El Nino

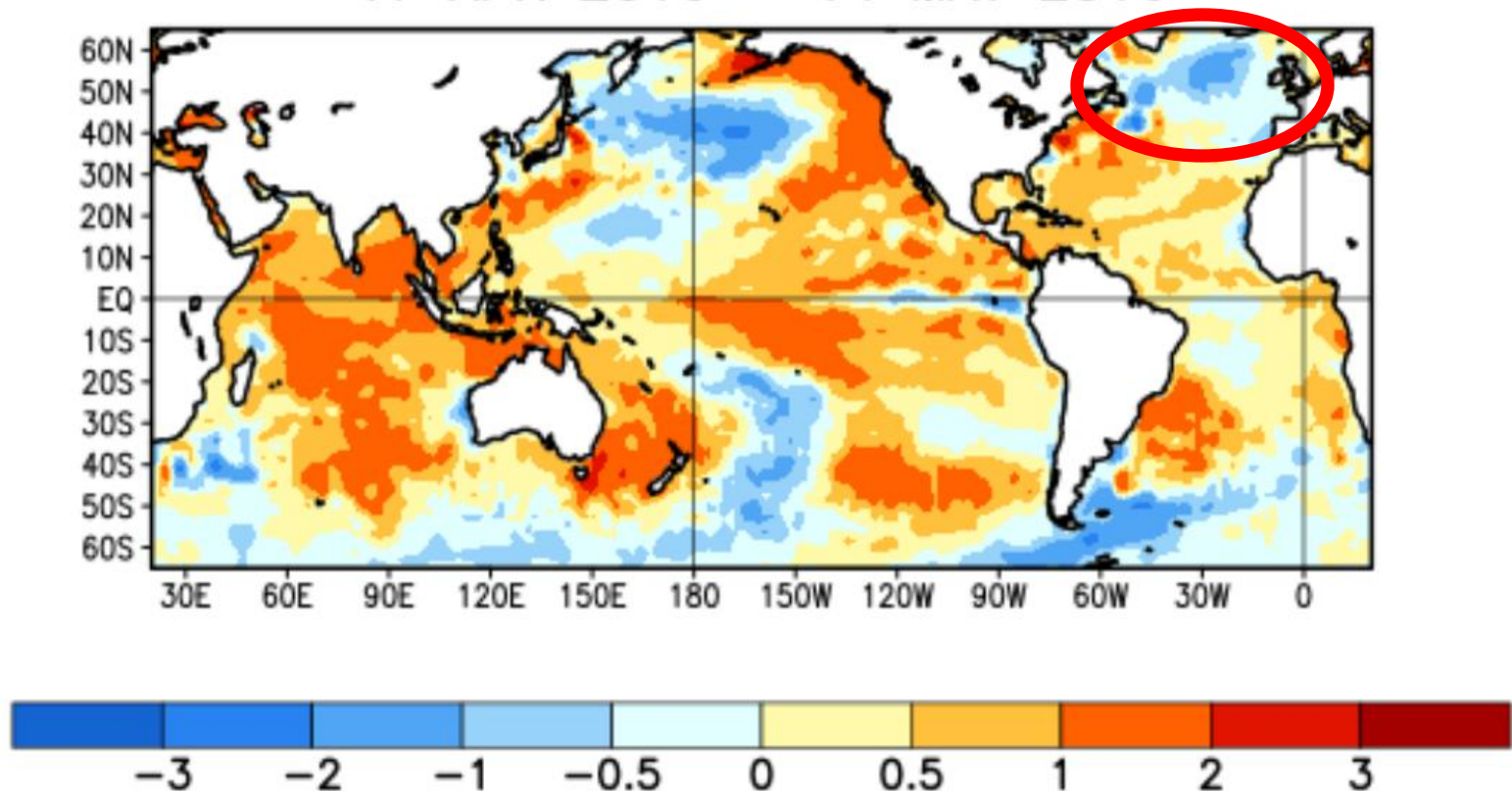


La Nina



# Colder Than Normal Atlantic Waters

Average SST Anomalies  
17 APR 2016 – 14 MAY 2016



# 2016 Hurricane Season Forecast

| Dr Phil Klotzbach<br>Colorado State University | Forecast | 30 Year<br>Average |
|------------------------------------------------|----------|--------------------|
| Tropical Storms                                | 13       | 12                 |
| Hurricanes                                     | 6        | 6                  |
| Major Hurricanes                               | 2        | 3                  |



# What is an Average Year in Florida?

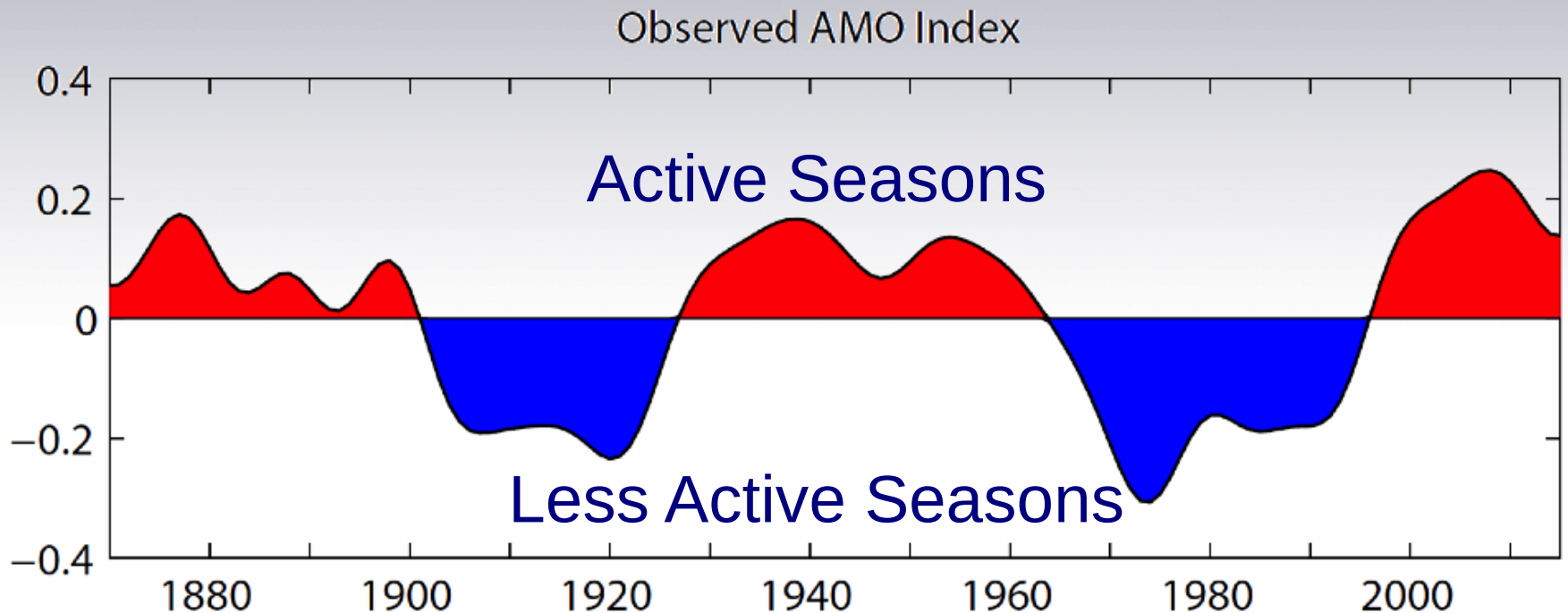
## **Florida Tropical Cyclone Climatology**

- Prob of Hurricane: 51%
- Prob of Major Hrcn: 21%

## **Climatology Hernando-Collier Counties**

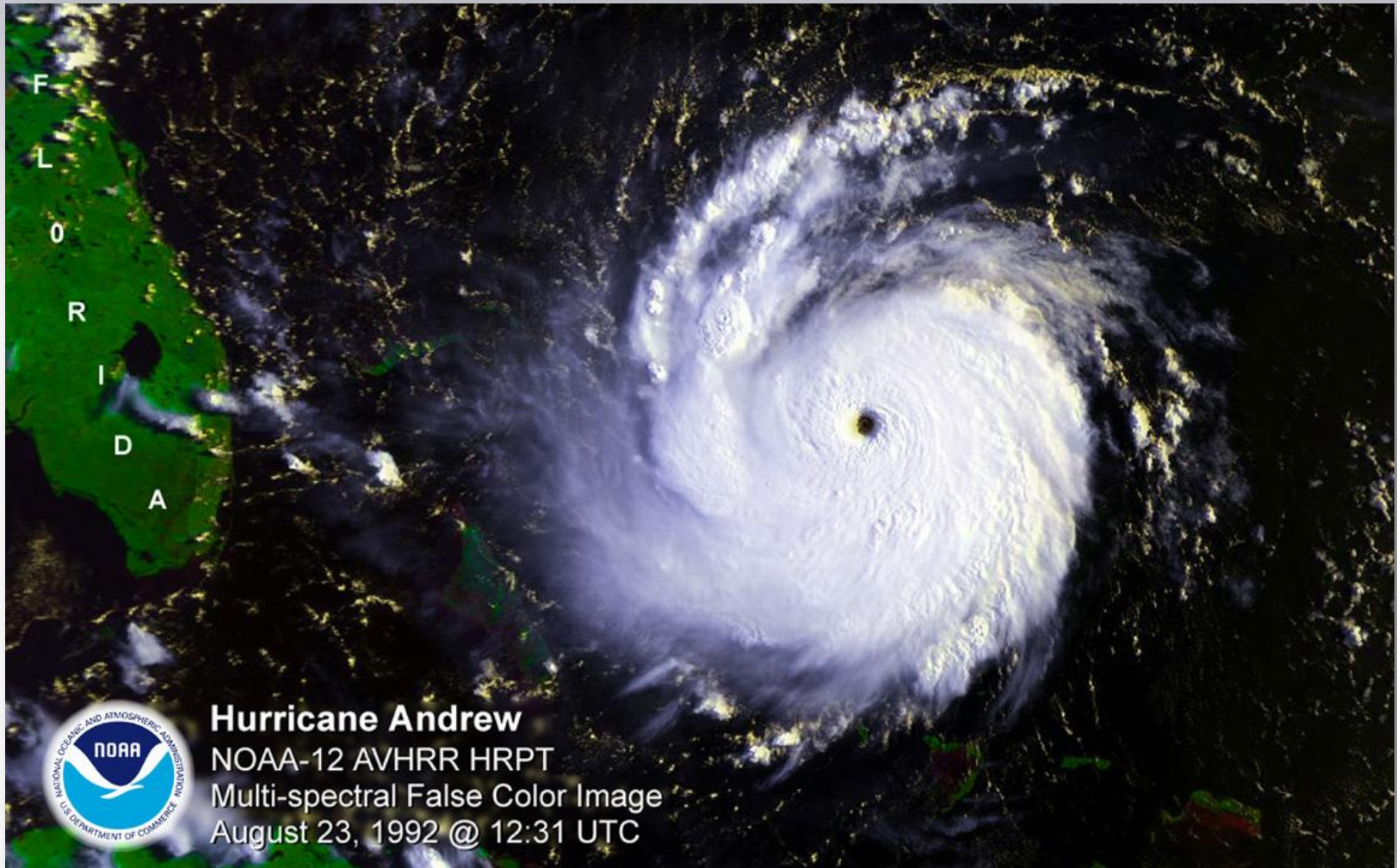
- Prob of T.S. for Region: 20.6%
- Prob of Hrcn for Region: 7.7%
- Prob of M.H. for Region: 4.3%

# Atlantic Multidecadal Oscillation



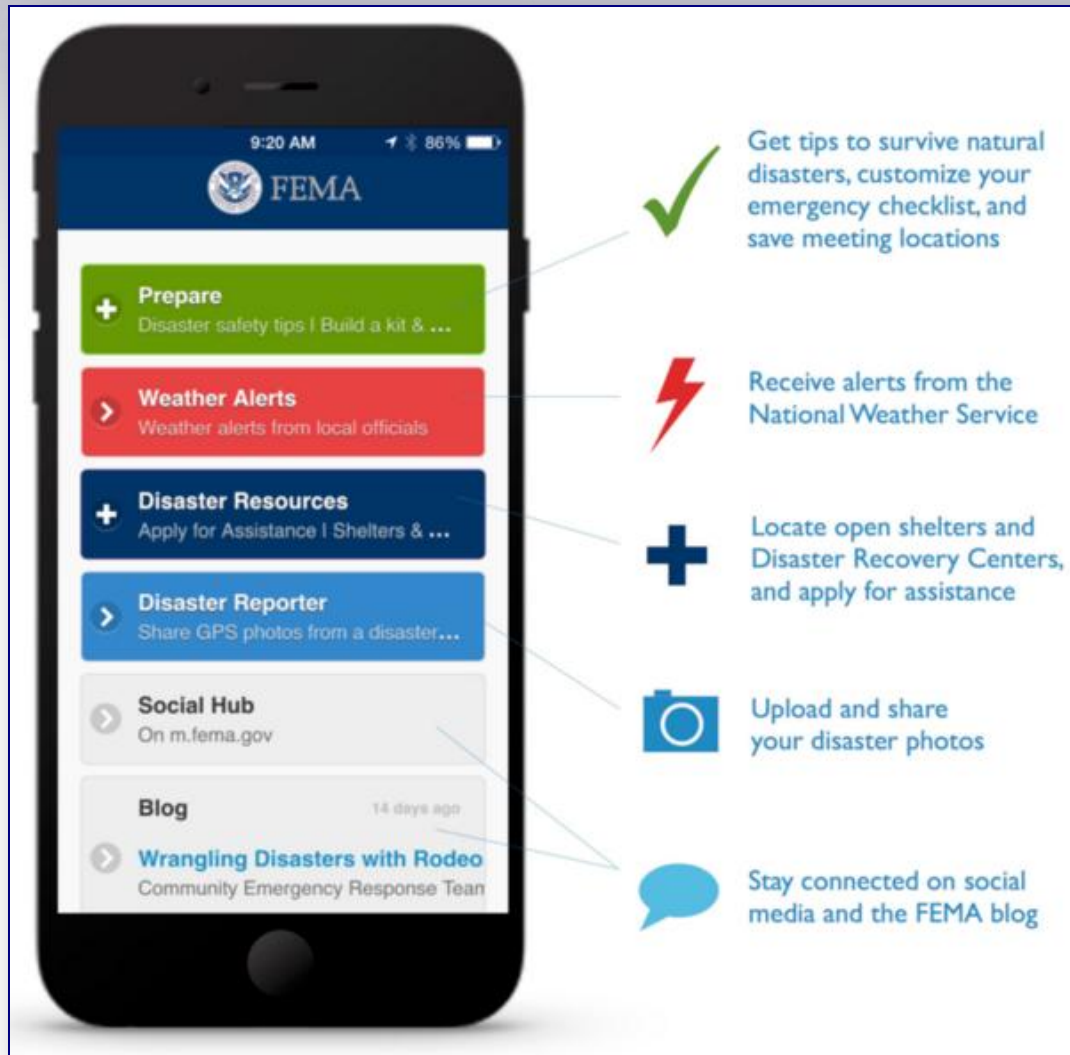
Are we headed to a 20-30 year period of cooler than normal Atlantic waters? Possibly

# Andrew Occurred in a Below Normal Season with Cooler than Normal Atlantic Water



# Free FEMA App

<http://fema.gov/app>



The image shows a smartphone displaying the FEMA mobile application. The app's interface includes a status bar at the top showing the time as 9:20 AM and battery level at 86%. Below the status bar is a blue header with the FEMA logo and the word "FEMA". The main content area features several colored buttons and sections:

- Prepare** (green button): "Disaster safety tips | Build a kit & ..."
- Weather Alerts** (red button): "Weather alerts from local officials"
- Disaster Resources** (dark blue button): "Apply for Assistance | Shelters & ..."
- Disaster Reporter** (blue button): "Share GPS photos from a disaster..."
- Social Hub** (light gray button): "On m.fema.gov"
- Blog** (light gray button): "14 days ago"
- Wrangling Disasters with Rodeo** (blue link): "Community Emergency Response Team"

Callouts with icons point to specific features:

-  Get tips to survive natural disasters, customize your emergency checklist, and save meeting locations
-  Receive alerts from the National Weather Service
-  Locate open shelters and Disaster Recovery Centers, and apply for assistance
-  Upload and share your disaster photos
-  Stay connected on social media and the FEMA blog



# The NWS is Looking for Ambassadors at Your Place of Work



# Who Can Become a WRN Ambassador?

<http://weather.gov/tampa/?n=wrn>



The Sanctuary at Longboat Key Club  
Community Assoc., Inc

- ALFs and SNFs
- Housing Associations
- Churches
- Businesses large and small
- Non-profit and non-governmental organizations
- TV, Radio, and Print media
- Academia
- Any organization across all levels of government

# A Few of our Local Ambassadors

- WUSF Public Radio
- TECO Energy
- Port Tampa Bay
- Tampa Premium Outlets
- Home Shopping Network
- Fox 13 WTVT



# Simple 2 Page Plan for Employees

## <http://ready.gov>



## Family Communication Plan

*Let them know you're OK!*

Pick the same person for each family member to contact. It might be easier to reach someone who's out of town.

Emergencies can happen at any time. Does your family know how to get in touch with each other if you are not all together?

Before an emergency happens, have a family discussion to determine who would be your out-of-state point of contact, and where you would meet away from your home — both in the neighborhood and within your town.

### Important Information

Fill in this information and keep a copy in a safe place, such as your purse or briefcase, your car, your office, and your disaster kit. Be sure to look it over every year and keep it up to date.

#### Out-of-Town Contact

Name: \_\_\_\_\_  
Home: \_\_\_\_\_  
Cell: \_\_\_\_\_  
Email: \_\_\_\_\_  
Facebook: \_\_\_\_\_  
Twitter: \_\_\_\_\_

#### Neighborhood Meeting Place:

\_\_\_\_\_

#### Regional Meeting Place:

\_\_\_\_\_

#### Work Information

Workplace: \_\_\_\_\_  
Address: \_\_\_\_\_  
Phone: \_\_\_\_\_  
Facebook: \_\_\_\_\_  
Twitter: \_\_\_\_\_  
Evacuation Location: \_\_\_\_\_

#### School Information

School: \_\_\_\_\_  
Address: \_\_\_\_\_  
Phone: \_\_\_\_\_  
Facebook: \_\_\_\_\_  
Twitter: \_\_\_\_\_  
Evacuation Location: \_\_\_\_\_

#### School Information

School: \_\_\_\_\_  
Address: \_\_\_\_\_  
Phone: \_\_\_\_\_  
Facebook: \_\_\_\_\_  
Twitter: \_\_\_\_\_  
Evacuation Location: \_\_\_\_\_

<http://www.ready.gov/kids>



## Important Information (continued)

#### Family Information

Name: \_\_\_\_\_ Date of Birth: \_\_\_\_\_  
Social Security Number: \_\_\_\_\_  
Important Medical Information: \_\_\_\_\_

#### Medical Contacts

Doctor: \_\_\_\_\_  
Phone: \_\_\_\_\_  
Doctor: \_\_\_\_\_  
Phone: \_\_\_\_\_  
Pediatrician: \_\_\_\_\_  
Phone: \_\_\_\_\_  
Dentist: \_\_\_\_\_  
Phone: \_\_\_\_\_  
Dentist: \_\_\_\_\_  
Phone: \_\_\_\_\_  
Specialist: \_\_\_\_\_  
Phone: \_\_\_\_\_  
Specialist: \_\_\_\_\_  
Phone: \_\_\_\_\_  
Pharmacist: \_\_\_\_\_  
Phone: \_\_\_\_\_  
Veterinarian/Kennel: \_\_\_\_\_  
Phone: \_\_\_\_\_

#### Insurance Information

Medical Insurance: \_\_\_\_\_  
Phone: \_\_\_\_\_  
Policy Number: \_\_\_\_\_  
Homeowners/Rental Insurance: \_\_\_\_\_  
Phone: \_\_\_\_\_  
Policy Number: \_\_\_\_\_

<http://www.ready.gov/kids>

*Text, don't talk!*  
Unless you are in danger, send a text. Texts may have an easier time getting through than phone calls, and you don't want to tie up phone lines needed by emergency workers.





# Prepare for One Storm Each Season and Ignore the Hurricane Season Forecasts

<http://flash.org>

What does it  
mean to be  
**#HurricaneStrong?**

WATCH VIDEO

Get started and make a plan today!



**PERSONAL  
SAFETY**

Know Your  
Evacuation Zone



**FINANCIAL  
SECURITY**

Have an  
Insurance Check Up



**FAMILY  
PREPAREDNESS**

Build a Disaster  
Supply Kit



**DAMAGE  
PREVENTION**

Strengthen  
Your Home



**COMMUNITY  
SERVICE**

Help Your  
Neighbor

