

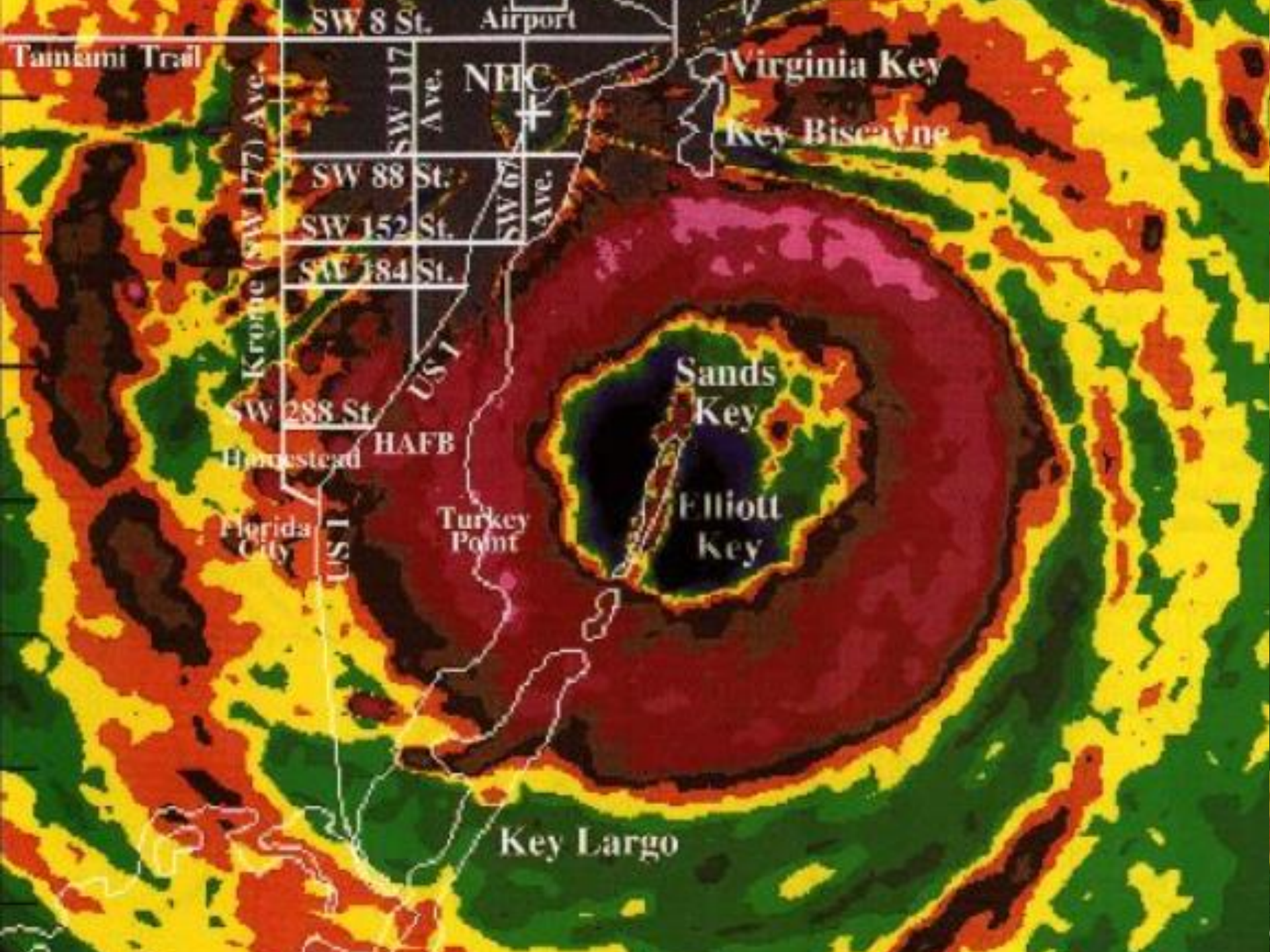


Communicating Hurricane Threats & Impacts

David Sharp
Science & Operations Officer
NOAA/National Weather Service
Melbourne, FL



**“When the
Physical Science
intersects the
Social Science”**





SW 8 St. Airport
Fairchild Trail 117 NHC

Virginia Key



Ultimately, it's about people!



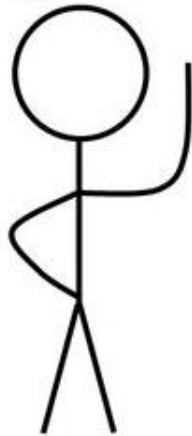
QUESTION: If you could go back in time to about 12-18 hours before Hurricane Andrew's landfall and take with you the knowledge of the wind impacts about to be realized, what **main message** would you have for the people of Homestead, FL?

- “The probability of hurricane and tropical storm force winds are both increasing for Homestead.”
- “A hurricane warning remains in effect for South Florida, which includes the town of Homestead.”
- “Act now to protect your life! This is an extremely dangerous and potentially catastrophic wind situation for Homestead.”



Public Messaging

THINKING AND FEELING



Thinkers

**focus first on the
use of things**



Feelers

**focus first on the
meaning of things**

*“Act now to protect your life!
This is an extremely dangerous
and potentially catastrophic
wind situation for Homestead.”*





It's All About Impacts

"The Impact Footprint"



- **Hurricane Hazards:**
 - High Wind
 - Storm Surge & Tide
 - Flooding Rain
 - Pounding Surf/Dangerous Seas
 - Tornadoes & Waterspouts





“When tropical cyclone hazards dangerously intersect with communities and ecosystems...”



Hurricane Irene (2011)



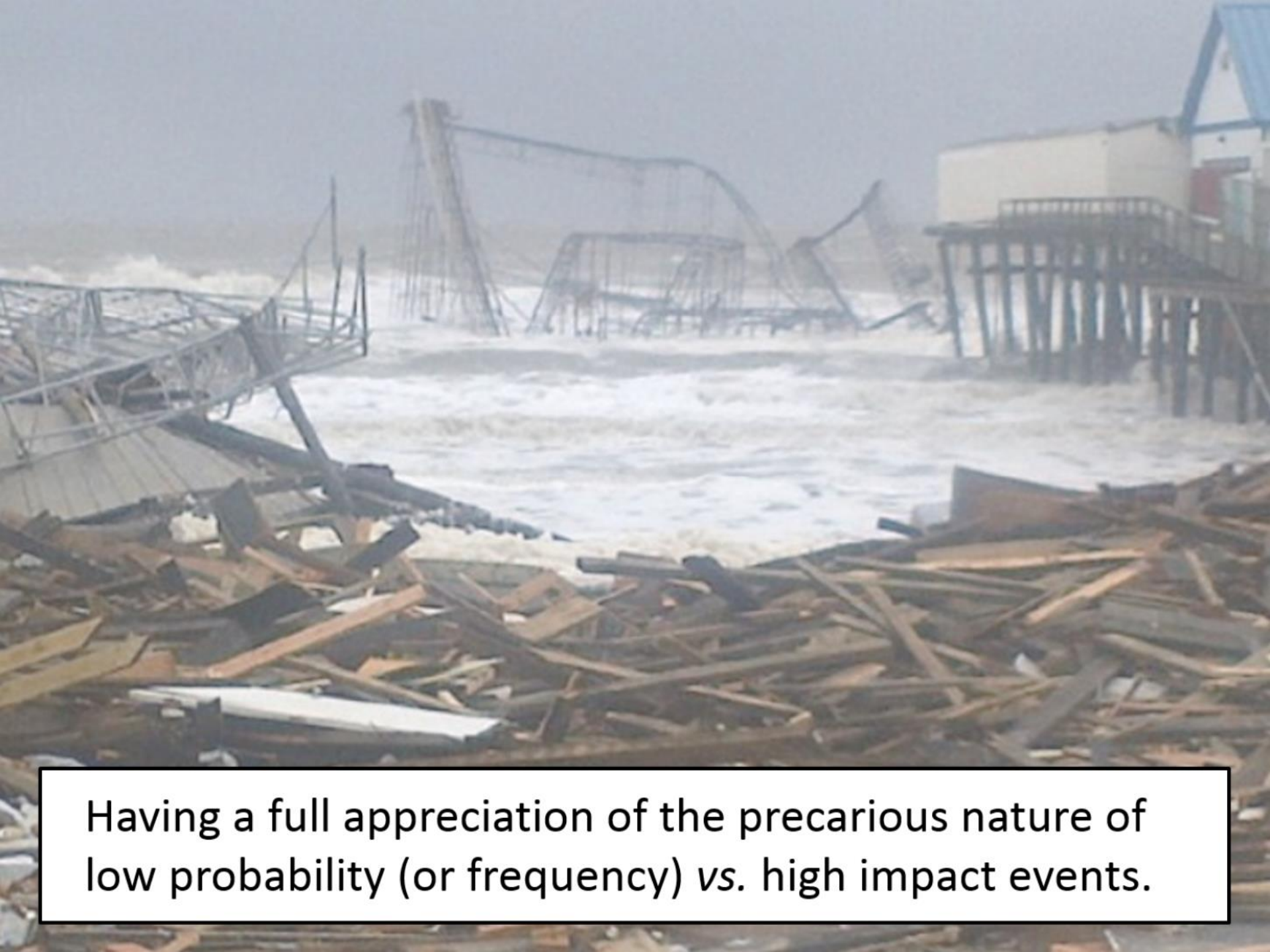
“Hurricane” Sandy (2012)



Hurricane Isaac (2012)



“...there are plenty of key decisions to be made and a considerable need for decision support.”



Having a full appreciation of the precarious nature of low probability (or frequency) vs. high impact events.

Societal Vulnerability to Hurricanes

Exposure:

Population at Risk

Property at Risk

Community Preparedness

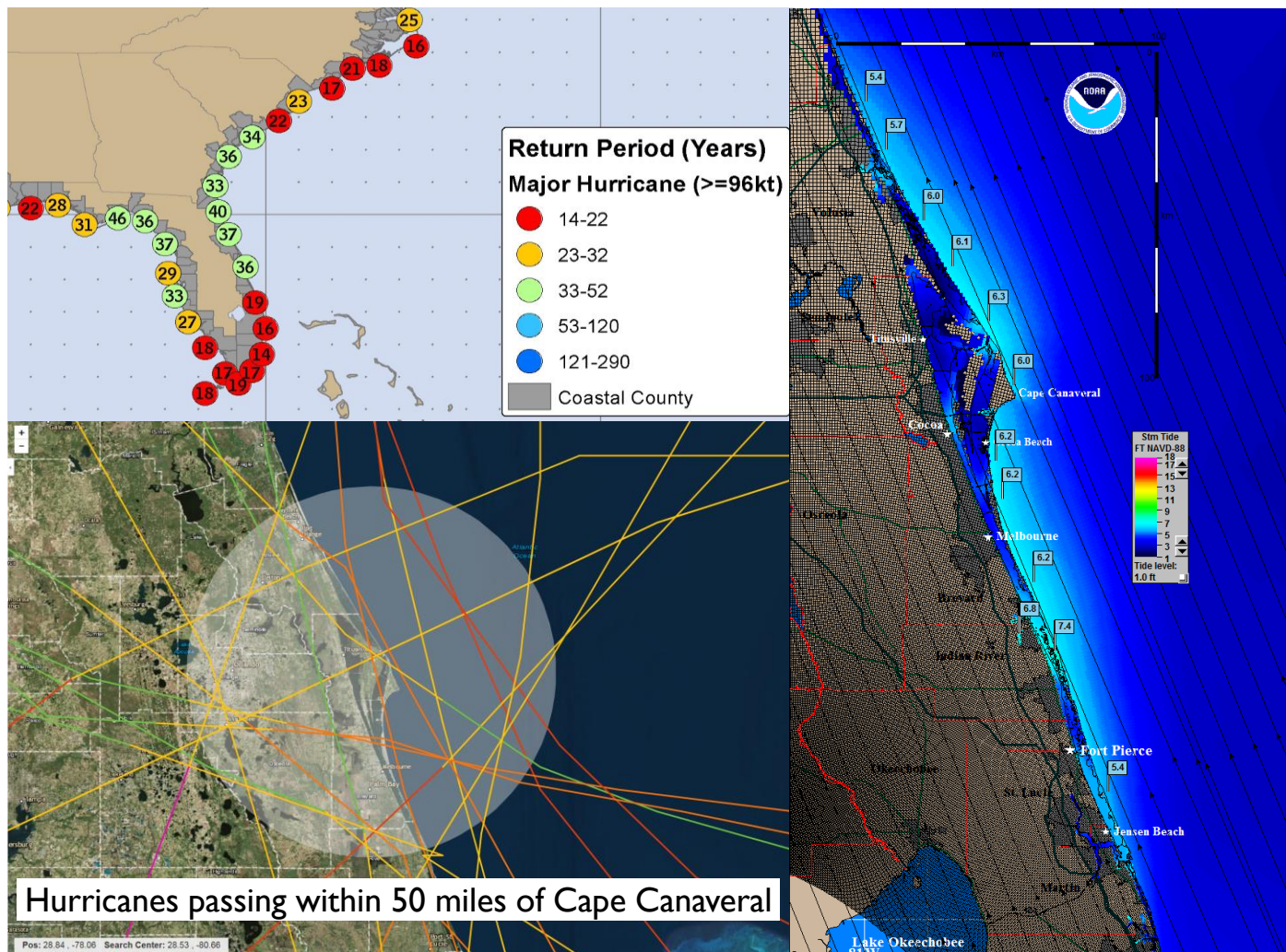
Incidence:

Frequency

Intensity



Pielke & Pielke 1997



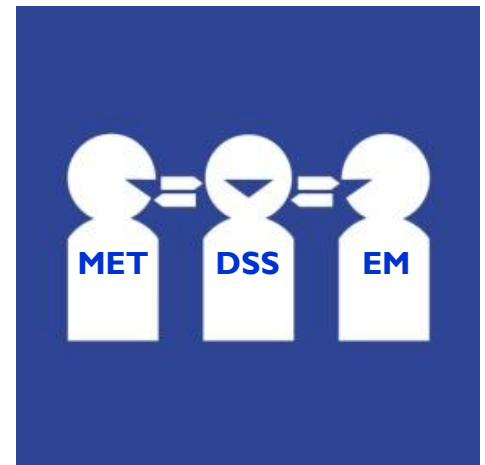
Know the Local Risk & Vulnerability for the Situation

- Local Demographics
- Local Infrastructure
- Local Sensitivities
- Changes since Last Season
- Changes since Last Event
- Changes Planned or in Progress



Making Things Simple

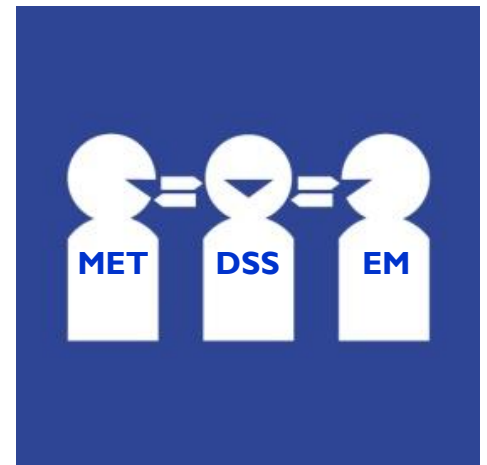
- **FACT:** The majority of our customers are not meteorologists, hydrologists, or oceanographers.
 - Some are weather-wise; most are other-wise
- We must learn to speak the language of the customer.





Making Things Simple

- Our science-based wind information must be:
 - **Distilled** ... *made succinct*
 - **Translated** ... *put in customer-speak*
 - **Interpreted** ... *maintain meaning*





The Nature of Information



- **A Danger of the Information Age** - we can now yield an overwhelming volume of weather/water data and information.
 - But, are we simply adding to the *information fire hose*?





The Nature of Information



- Providing increasingly more information of ambiguous utility is not helpful.
- ***This neither helps community decision-makers nor serves the public!***
 - “Drowning in Information”
 - “Information Overload & Paralysis”
 - “Over-Anxiety & Hurricane Fatigue ”





The Nature of Information



- **Information Management Age** - we must move beyond the information age and onward to the *information management* & *decision support* age.
 - Sharing only necessary information
 - Remaining a trusted source





Why Should I Listen To You?

For community decision-making ...



- I need to listen to someone who is credible.
 - **Credibility = Expertise + Trust**
- I want to listen to someone who understands.
 - **Understanding = Empathy + Trust**

“Things really start clicking when these are found in a common source.”

Public Safety Messaging

An aerial, high-angle photograph of a long, multi-lane bridge spanning a body of water. The bridge has multiple support pillars and stretches from the bottom left towards the top right of the frame. The water is a light blue-grey color, and the sky is a pale, hazy blue.

1. **Coordinate Public Safety Messages**
 - in conjunction with emergency management partners
2. **Communicate Public Safety Messages**
 - in conjunction with media partners

An integrated approach

Communication of Weather-related Hurricane Emergency Information

3 Routes



From *Social and Behavior Influences on Weather-Driven Decisions* (Galluppi et al. 2013)

Finding ways...

*“To help get the right people...
to do the right things...
at the right time.”*





Cause vs. Effect

- The **CAUSE** of a thing
 - Meteorologists like to speak about analyzed and forecast conditions (e.g., the magnitude and likelihood of occurrence).



Cause: The Raindrop



Cause vs. Effect

- The **EFFECT** of a thing
 - Customers like to speak about the resulting impacts, and what should be done to lessen the ill-effects.



Effect: The Ripple on the Pond



Tropical Cyclone Winds



To help with Messaging
the Hurricane Forecast

Saffir-Simpson Hurricane Wind Scale

Category 1 Hurricane	<i>Some Damage</i>
Category 2 Hurricane	<i>Extensive Damage</i>
Category 3 Hurricane	<i>Devastating Damage</i>
Category 4 Hurricane	<i>Catastrophic Damage</i>
Category 5 Hurricane	<i>Catastrophic Damage</i>

Cause

vs.

Effect



Tropical Cyclone Winds



To help with **Community Preparedness Messaging**

Hurricane Threats & Impacts Wind Scale

Threat of **Tropical Storm Winds**
of 39-57 mph

Limited Impacts Possible

Threat of **Strong Tropical Storm Winds**
of 58-73 mph

Significant Impacts Possible

Threat of **Hurricane Winds**
of 74-110 mph

Extensive Impacts Possible

Threat of **Major Hurricane Winds**
of >110 mph

*Devastating to Catastrophic
Impacts Possible*

Threat

vs.

Potential Impacts



What is the one thing everyone wants but we cannot provide?

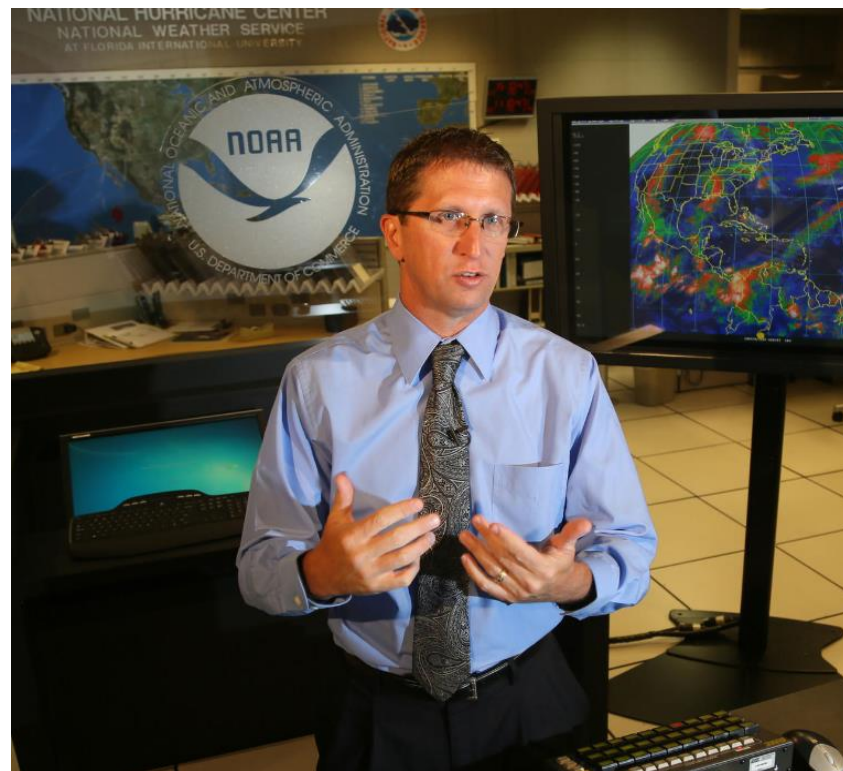
... a perfect forecast !!!



DSS



What should be our intent?



“Our mutual intent is to change the outcome of the event!”

“Wind Talkers”

Decision Support Messaging



...WHAT...WHERE...WHEN...HOW MUCH...HOW LONG...HOW SURE...

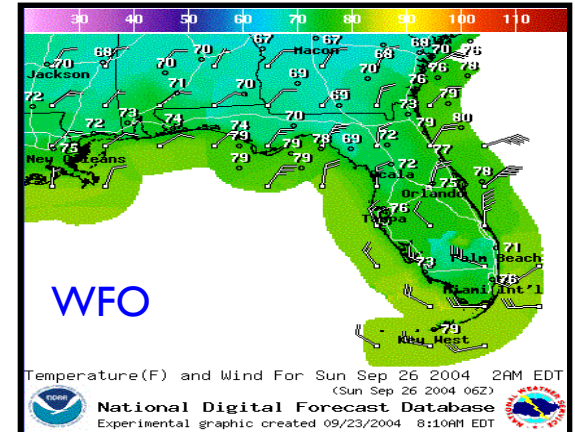
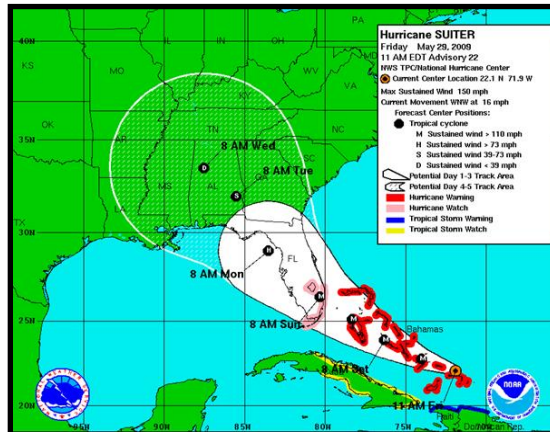
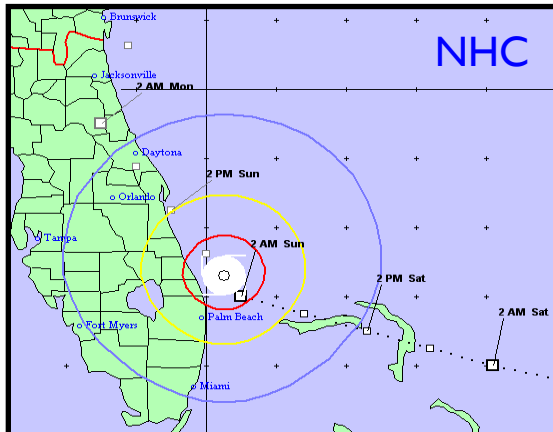
Public Safety Messaging



...WHAT AM I SUPPOSED TO DO ABOUT IT...

We ...

- Are comfortable with conveying our latest forecast
- But still struggle with conveying forecast uncertainty
 - Rules of Thumb (subjective; empirical)
 - Error Cone (track errors only)

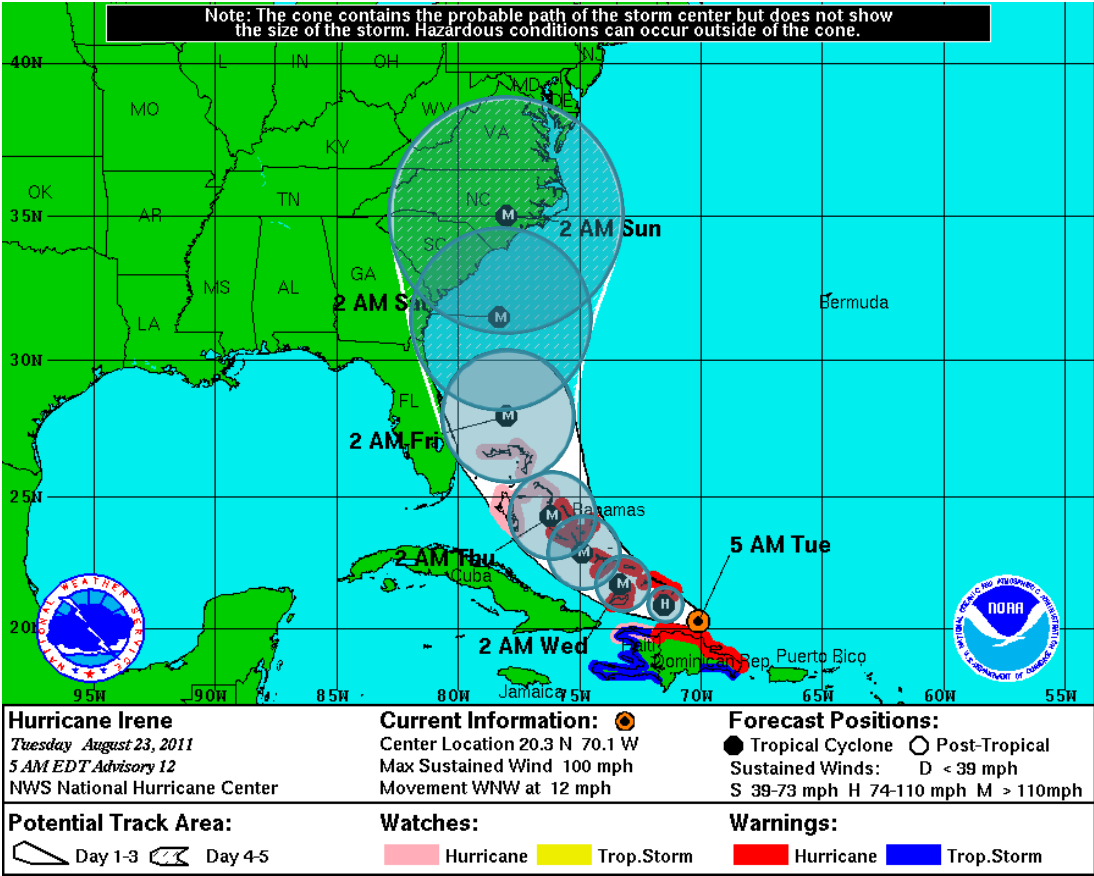


NHC Forecast Error Cone

Cautionary Tales

- “Don’t focus only on the skinny black line.”

ORIGINAL



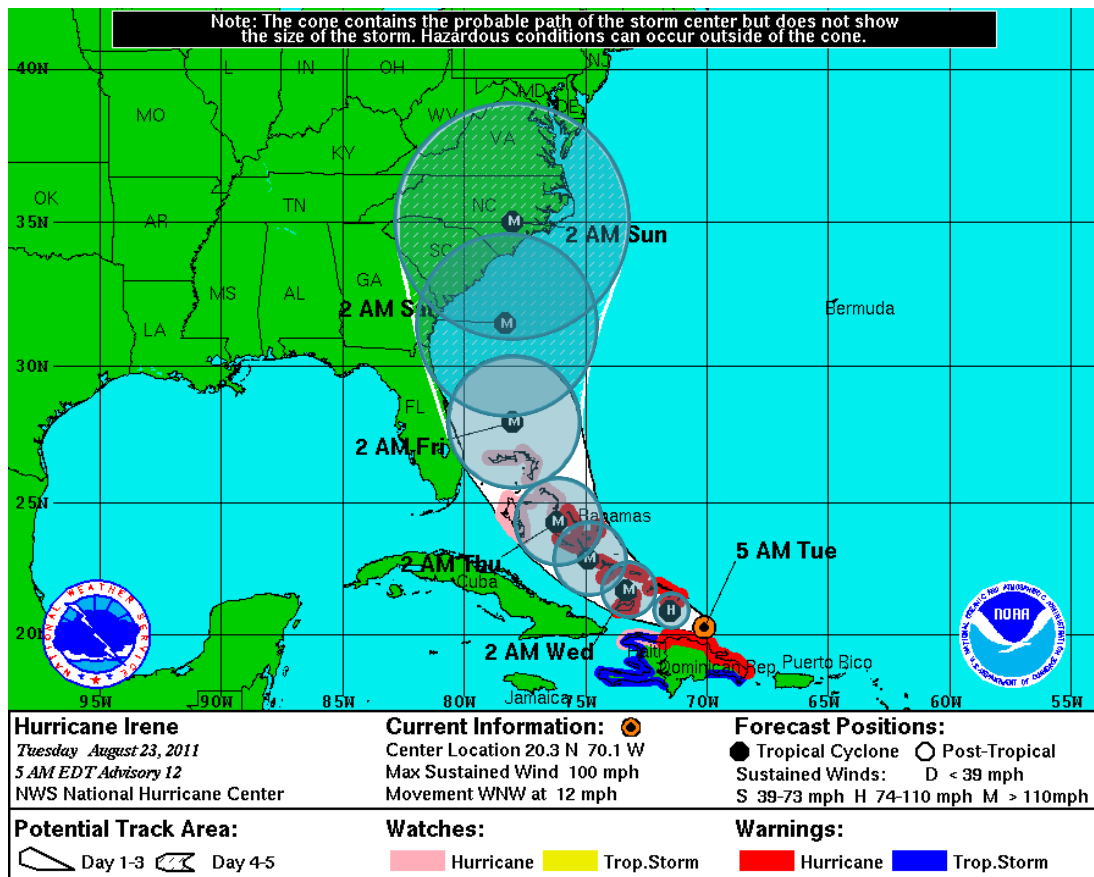
NHC Forecast Error Cone

Cautionary Tales

- “Don’t focus only on the skinny black line.”

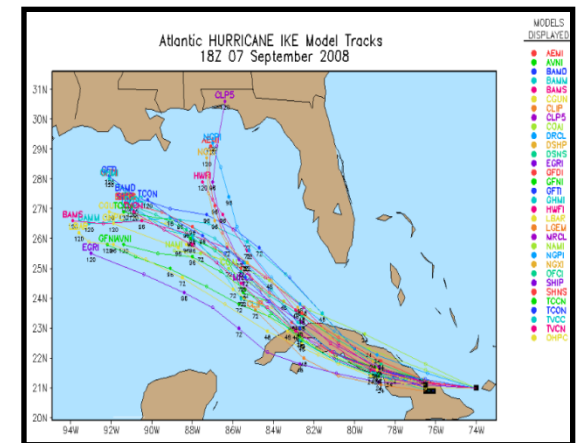
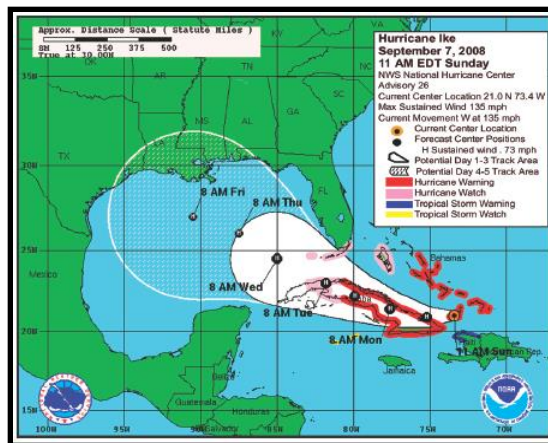
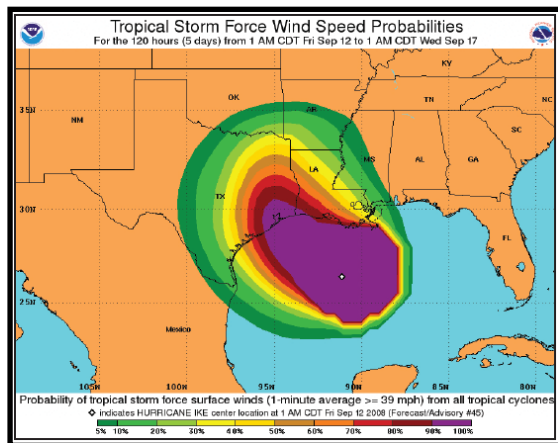


- “Don’t focus only on the error cone.”

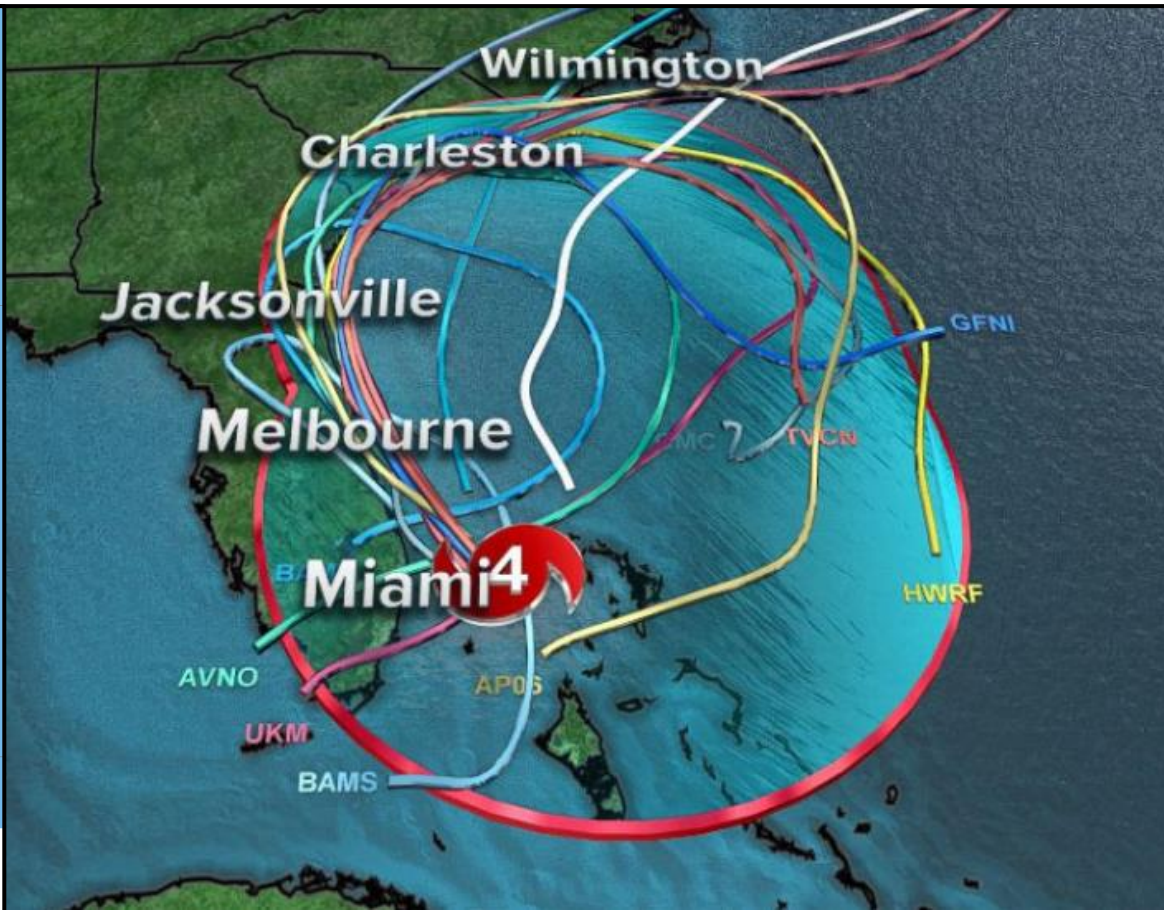
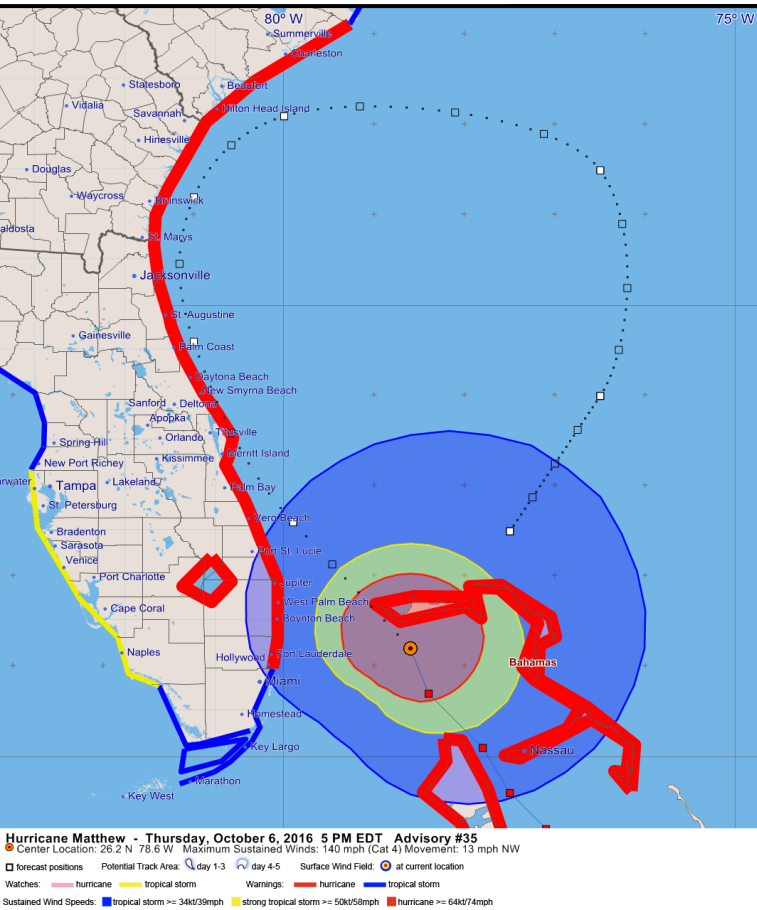


We ...

- Are comfortable with conveying our latest forecast
- But still struggle with conveying forecast uncertainty
 - Rules of Thumb (subjective; empirical)
 - Error Cone (track errors only); Spaghetti Plots (for confidence)
 - Wind Speed Probabilities (for critical thresholds)



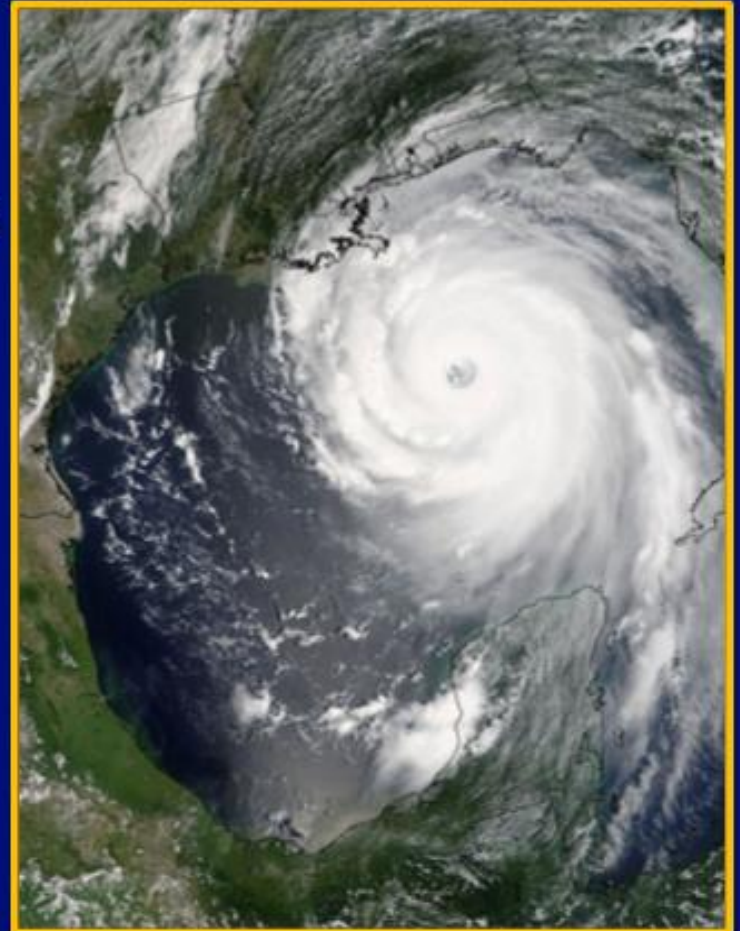
Spaghetti Plots (as seen on TV)



Helping? ... or ... Hurting?

Mental Noise Model

- ❑ **Stress affects information processing**
- ❑ **Impact of stress on attention**
(Covello)
 - High stress conditions: people lose 80 – 90% of what they hear
 - Scientific facts account for less than 5%
- ❑ **Effect of emotion on information seeking**
(Turner, et al, 2006)
 - Greater emotion = less information retention



Scenario Types for Decision Support



Simplify

Latest Forecast

Most Likely Scenario

Most Likely Alternate Scenario

Reasonable Worst Case Scenario

Reasonable Best Case Scenario



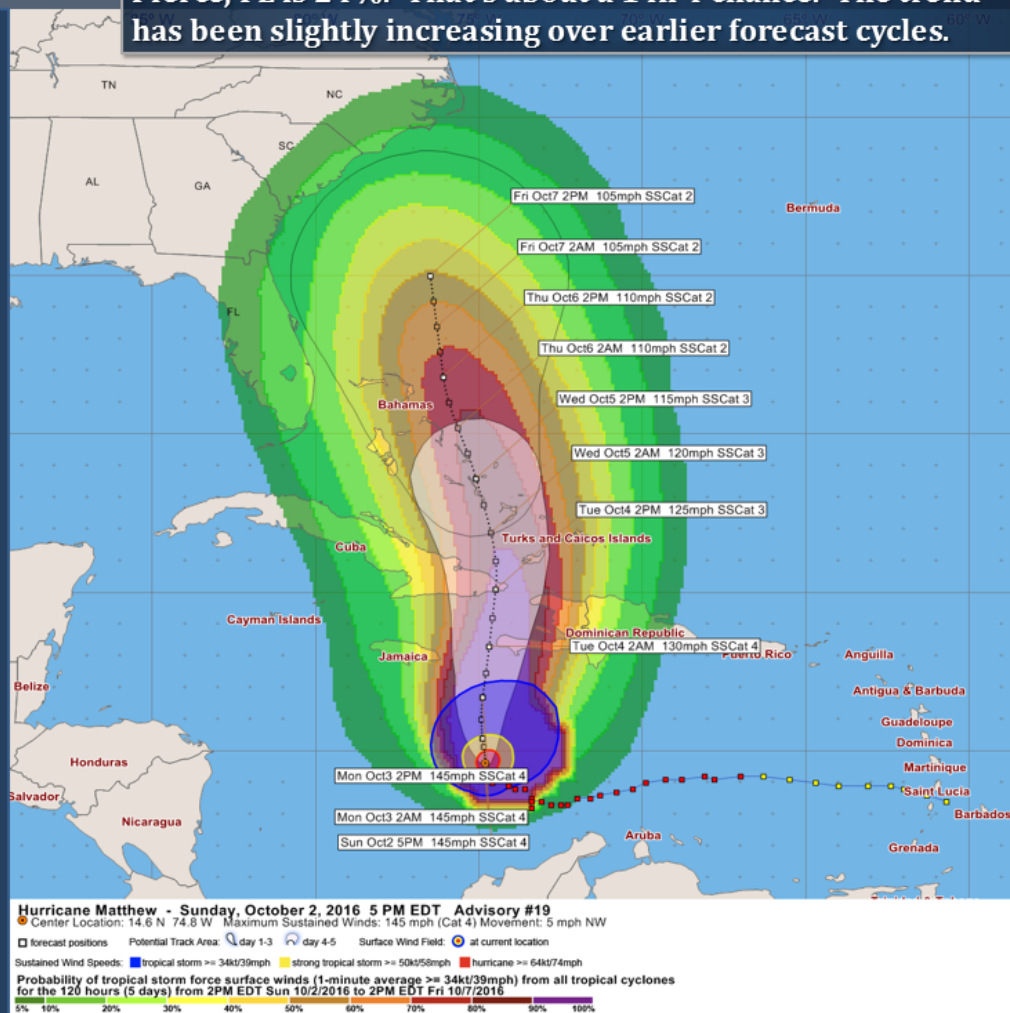
Situation Overview

East Central Florida & Adjacent Coastal Waters

The **probability for tropical storm force winds** at Fort Pierce, FL is 24%. That's about a 1 in 4 chance. The trend has been slightly increasing over earlier forecast cycles.

According to the latest forecast...

- A most likely scenario still keeps Matthew to the east of the Florida Peninsula.
 - Offering significant marine and coastal/beach concerns to ECFL
- An alternate scenario could bring Matthew closer to ECFL.
 - Increasing the concern for potential wind impacts for land locations
- It is still too early to describe exact impacts. For now, the overall threat to ECFL remains about the same.
- It is possible for a major hurricane to be in vicinity of ECFL mid-late week.
- Stay informed !!!



Melbourne
WEATHER FORECAST OFFICE



<http://www.weather.gov/melbourne>
[facebook.com/NWSMelbourne](https://www.facebook.com/NWSMelbourne)



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

October 2, 2016



Situation Overview

East Central Florida & Adjacent Coastal Waters

The probability for tropical storm force winds at Fort Pierce, FL is 24%. That's about a 1 in 4 chance. The trend is for a decrease in forecast cycles.

According to

- An
- to
- An
- Ma
- It i
- im
- EC
- It i
- vic
- Stay

Public Safety Message:

It is possible for a major hurricane to be in our vicinity by mid-late week. Stay informed of the latest forecast. Review your hurricane emergency plan and check your seasonal supplies.



Melbourne
WEATHER FORECAST OFFICE



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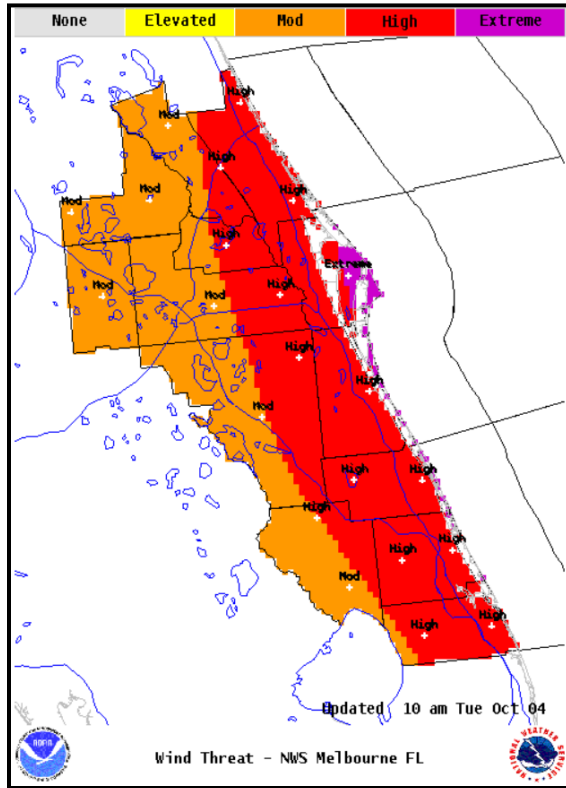


@NWSMelbourne

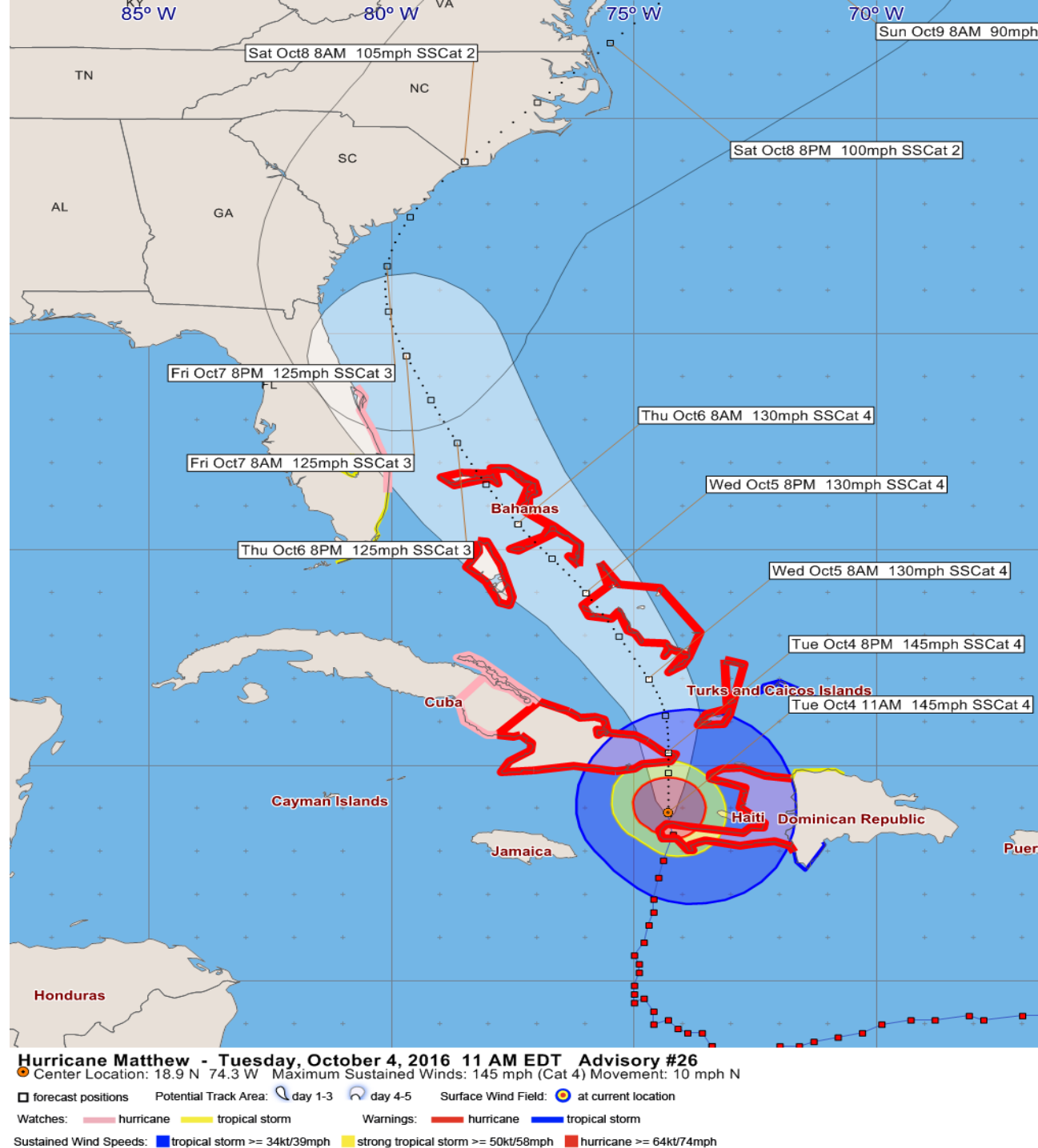
<http://www.weather.gov/melbourne>

October 2, 2016

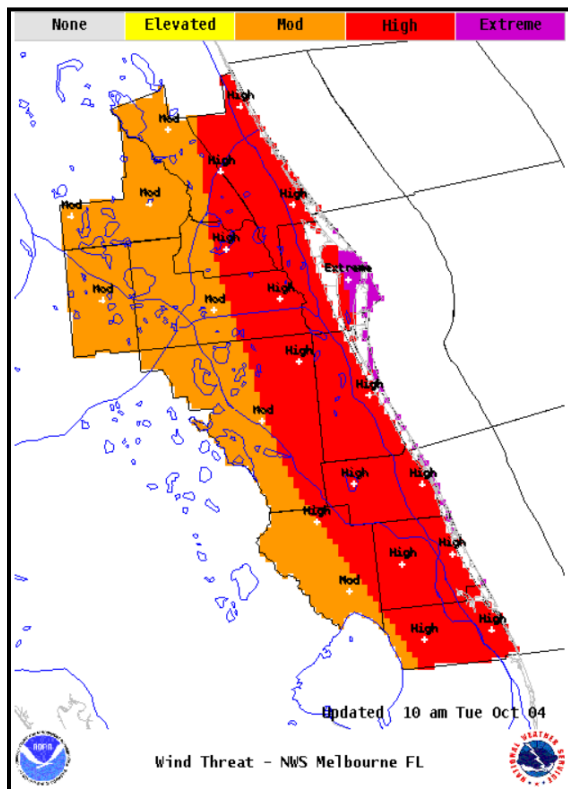
To be Safe, Prepare for This



EXTREME THREAT for wind greater than 110 mph
HIGH THREAT for wind 74-110 mph
MODERATE THREAT for wind 58-73 mph
ELEVATED THREAT for wind 39-57 mph
LITTLE TO NO THREAT wind less than 39 mph



To be Safe, Prepare for This



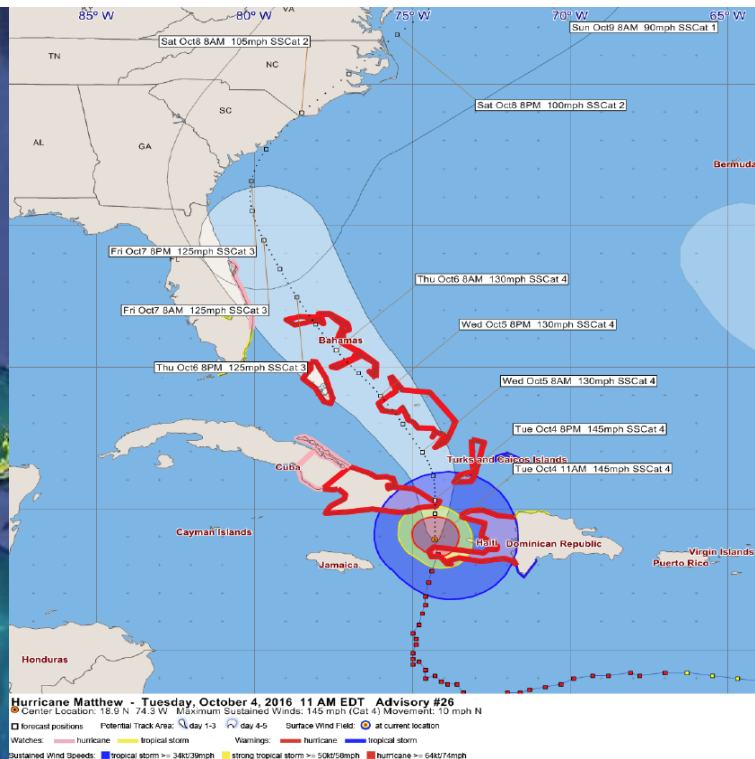
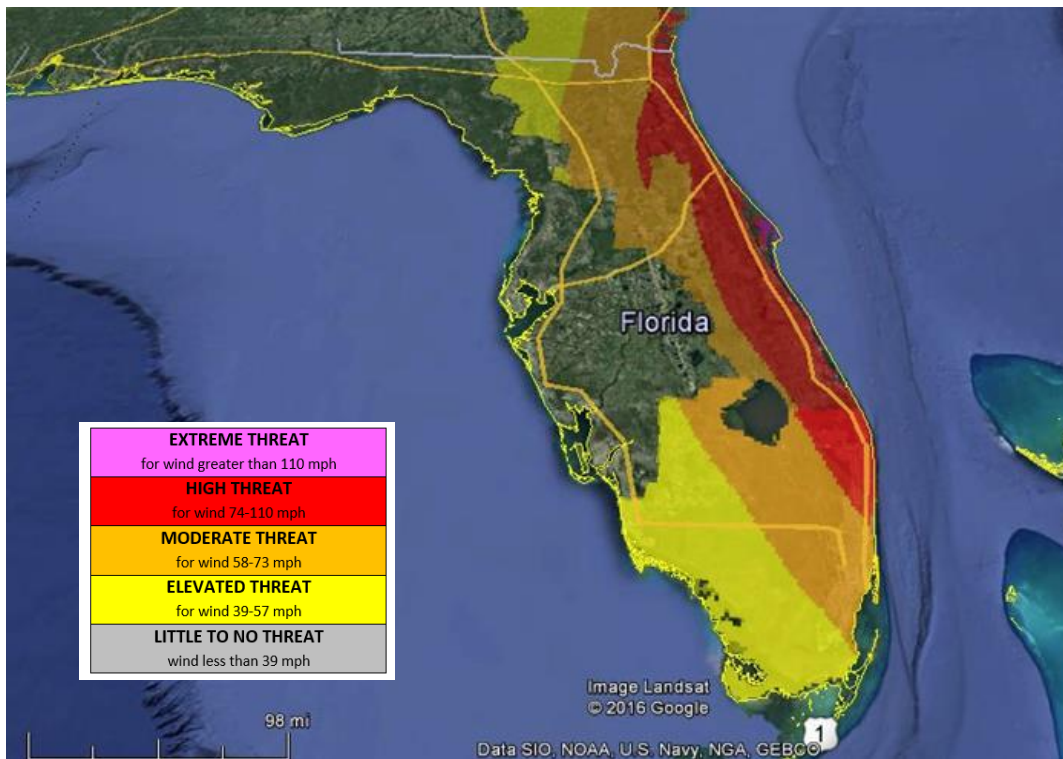
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Public Safety Message: (Wind)

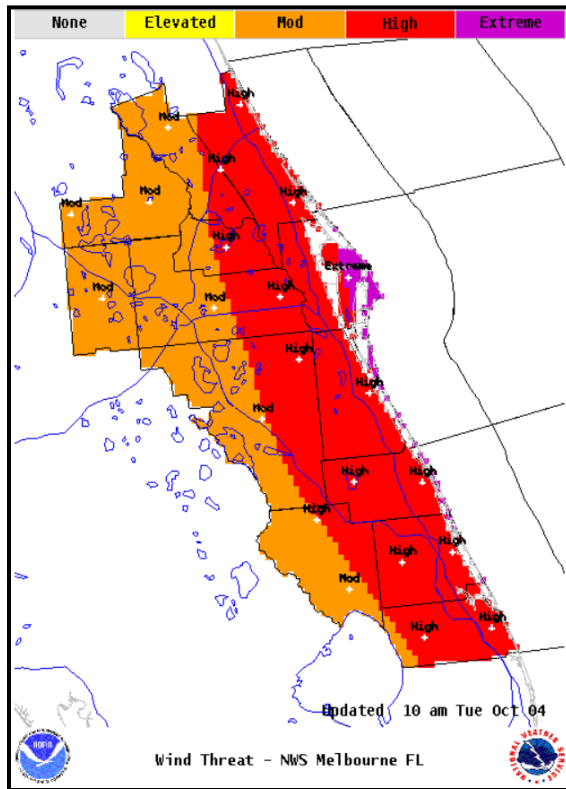
The threat to our area from Hurricane Matthew has increased. A hurricane watch is now in effect. People located in coastal counties should prepare for the threat of hurricane force winds while those on barrier islands should make ready for possible extreme winds. Listen for evacuation orders, and heed them if issued.

Hurricane Matthew - Tuesday, October 4, 2016 11 AM EDT Advisory #26
 Center Location: 18.9 N 74.3 W Maximum Sustained Winds: 145 mph (Cat 4) Movement: 10 mph N
 ☐ forecast positions ☐ Potential Track Area: ☐ day 1-3 ☐ day 4-5 ☐ Surface Wind Field: ☐ at current location
 Watches: ☐ hurricane ☐ tropical storm Warnings: ☐ hurricane ☐ tropical storm
 Sustained Wind Speeds: ☐ tropical storm >= 34kt/39mph ☐ strong tropical storm >= 50kt/58mph ☐ hurricane >= 64kt/74mph

Wind Threat Mosaic (HTI)



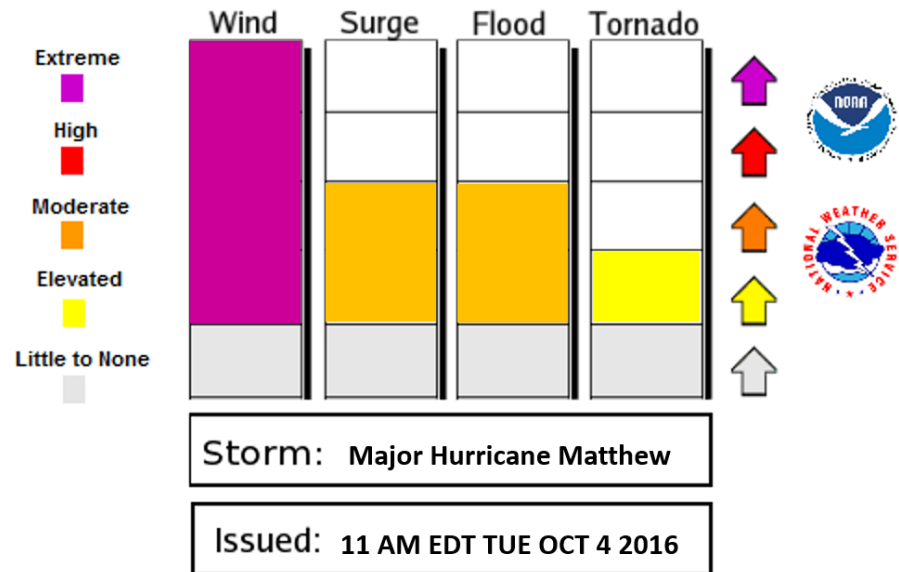
To be Safe, Prepare for This



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LITTLE TO NO THREAT wind less than 39 mph

Hurricane Hazards Threat Meter

Specific to East Central Florida



Extreme Wind Threat

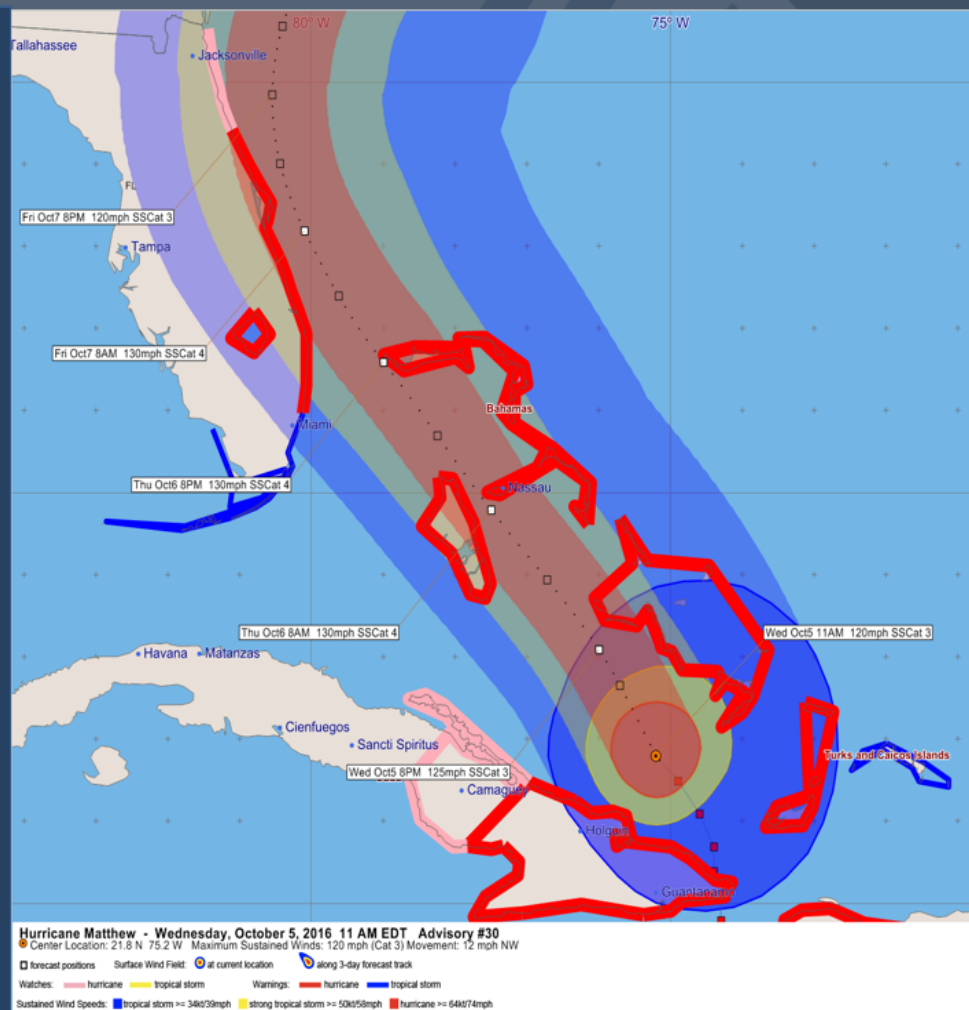
- Rare and Historic Event
- Extremely Dangerous
- Overwhelming Threat to Life
- Potential for Catastrophic Impacts



Situation Overview

East Central Florida & Adjacent Coastal Waters

- This is a very serious situation! Major Hurricane Matthew is headed for ECFL!
- Hurricane Warnings are now in effect for all ECFL counties, except for Lake County where a Tropical Storm Warning is now in effect.
- Hurricane Warnings will soon be in effect for all adjacent waters over the marine area.
- Concerns are critical for extensive impacts from hurricane force winds. Potential impacts may even be locally devastating from major hurricane force gusts in coastal counties (especially along and east of Interstate 95), and with the tropical wind threat also spreading well inland.



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<http://www.weather.gov/melbourne>

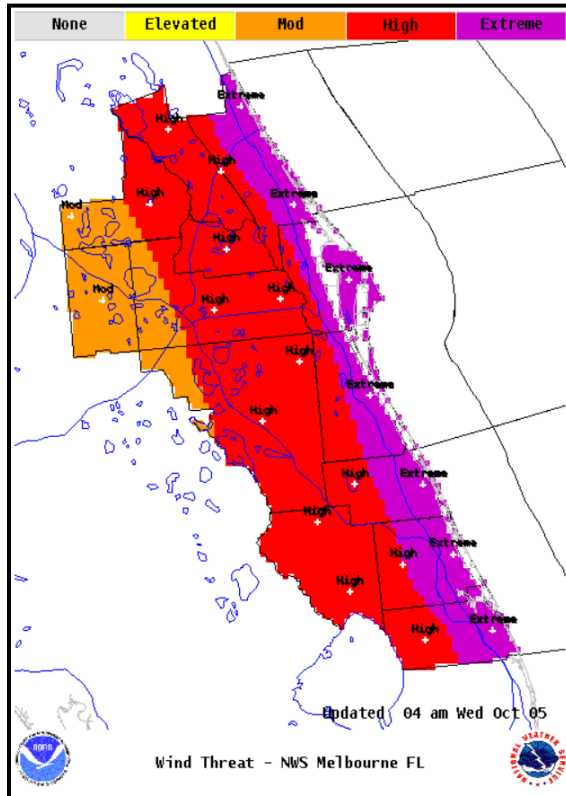
[facebook.com/NWSMelbourne](https://www.facebook.com/NWSMelbourne)



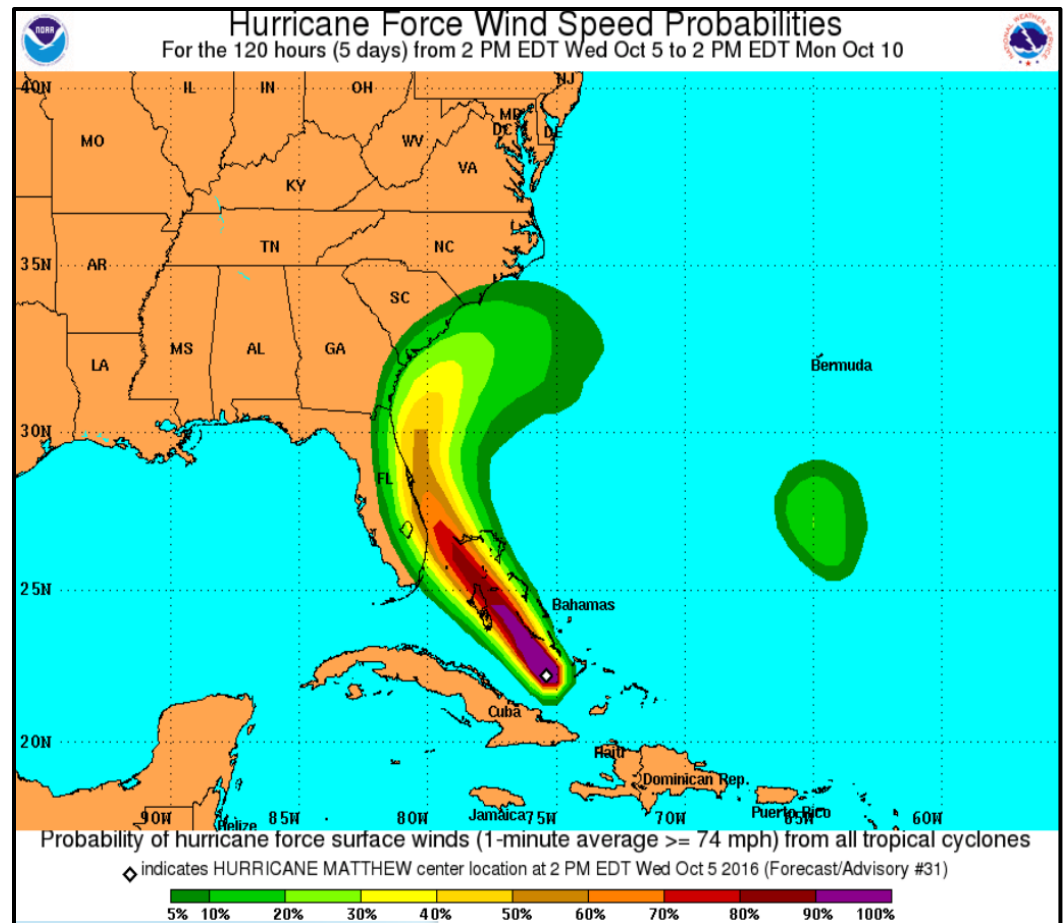
[@NWSMelbourne](https://twitter.com/NWSMelbourne)

October 5, 2016

To be Safe, Prepare for This



EXTREME THREAT for wind greater than 110 mph
HIGH THREAT for wind 74-110 mph
MODERATE THREAT for wind 58-73 mph
ELEVATED THREAT for wind 39-57 mph
LITTLE TO NO THREAT wind less than 39 mph



Extreme Wind Threat

- Most locations along the ECFL coast have a similar chance to receive hurricane force winds
- The best chance for major hurricane force winds is east of I-95, especially for the barrier islands and Cape Canaveral

Wind Hazard

Major Hurricane Force (≥ 96 kt)

Hurricane Force (64 - 95 kt)

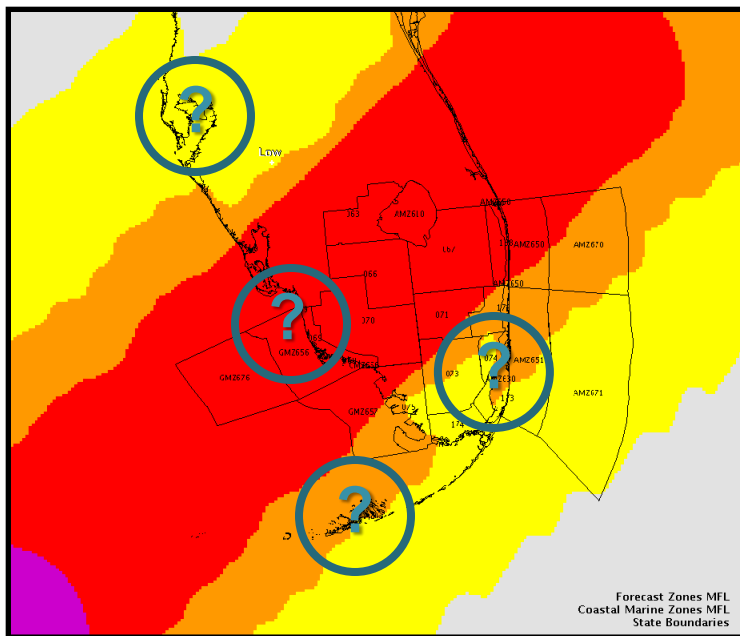
Strong Tropical Storm Force (50 - 63 kt)

Tropical Storm Force (34 - 49 kt)

Less Than Tropical Storm Force (< 34 kt)

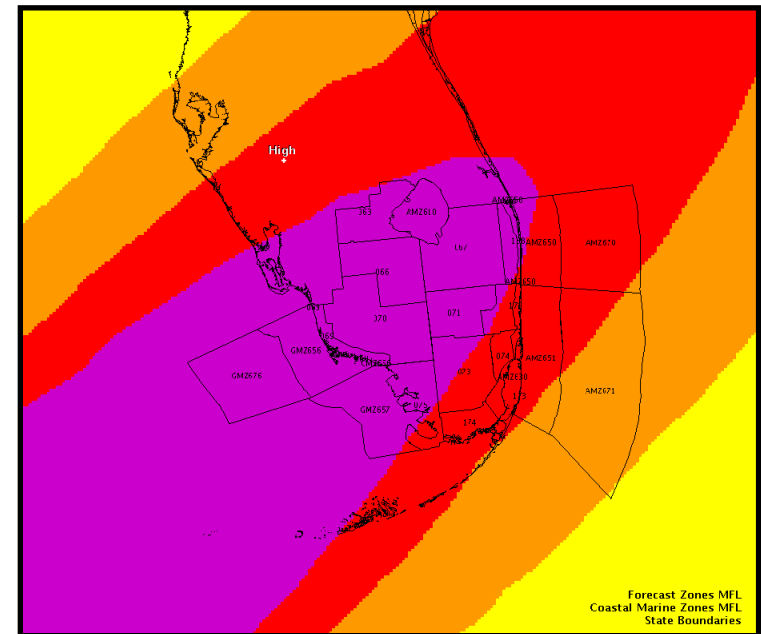
How does HTI Wind help support preparedness actions?

Forecast: “**Peak Wind Swath**”



Most Likely Scenario

Forecast: “**Peak Wind Threat Swath**”

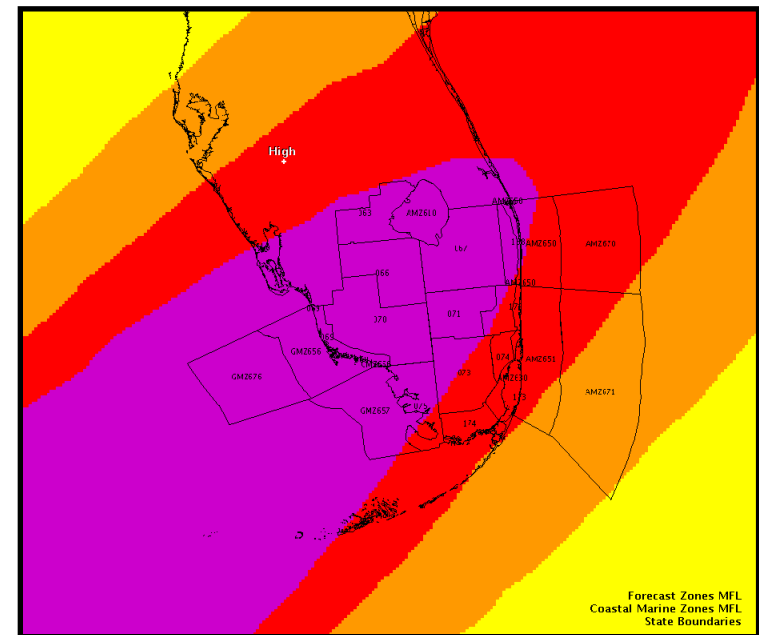


Reasonable Worst Case Scenario

EXTREME THREAT for wind greater than 110 mph
HIGH THREAT for wind 74-110 mph
MODERATE THREAT for wind 58-73 mph
ELEVATED THREAT for wind 39-57 mph
LITTLE TO NO THREAT wind less than 39 mph

HTI Wind conveys the forecast with an appropriate safety margin.

POTENTIAL IMPACTS	
	DEVASTATING TO CATASTROPHIC
	EXTENSIVE
	SIGNIFICANT
	LIMITED
	LITTLE TO NONE



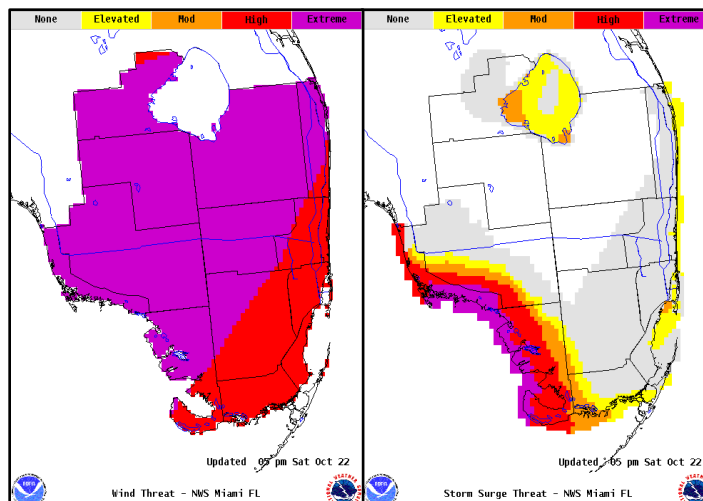
Reasonable Worst Case Scenario



Threat Assessments x 4

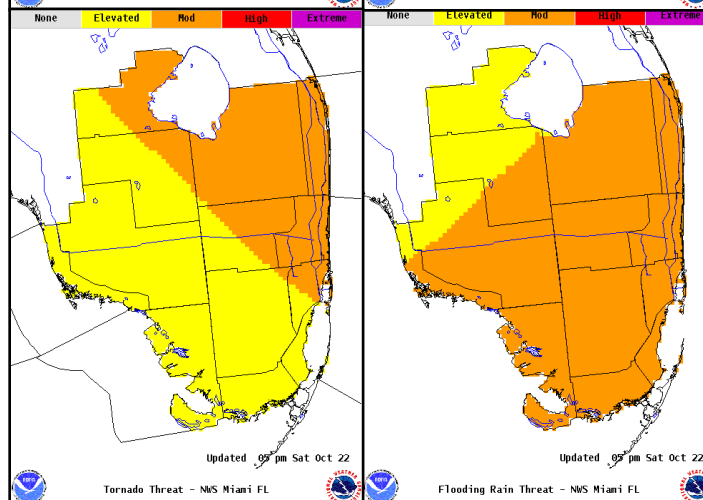
Wind

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HIGH THREAT for wind 74-110 mph
MODERATE THREAT for wind 58-73 mph
ELEVATED THREAT for wind 39-57 mph
LITTLE TO NO THREAT wind less than 39 mph



Storm Surge

EXTREME THREAT for surge flooding greater than 9 feet above ground
HIGH THREAT for surge flooding 6-9 feet above ground
MODERATE THREAT for surge flooding 3-6 feet above ground
ELEVATED THREAT for surge flooding 1-3 feet above ground
LITTLE TO NO THREAT little to no surge flooding



EXTREME THREAT for an outbreak of tornadoes
HIGH THREAT for numerous tornadoes
MODERATE THREAT for scattered tornadoes
ELEVATED THREAT for isolated tornadoes
LITTLE TO NO THREAT tornadoes not anticipated

EXTREME THREAT for extreme rainfall flooding
HIGH THREAT for major rainfall flooding
MODERATE THREAT for moderate rainfall flooding
ELEVATED THREAT for minor rainfall flooding
LITTLE TO NO THREAT little to no rainfall flooding

Tornadoes

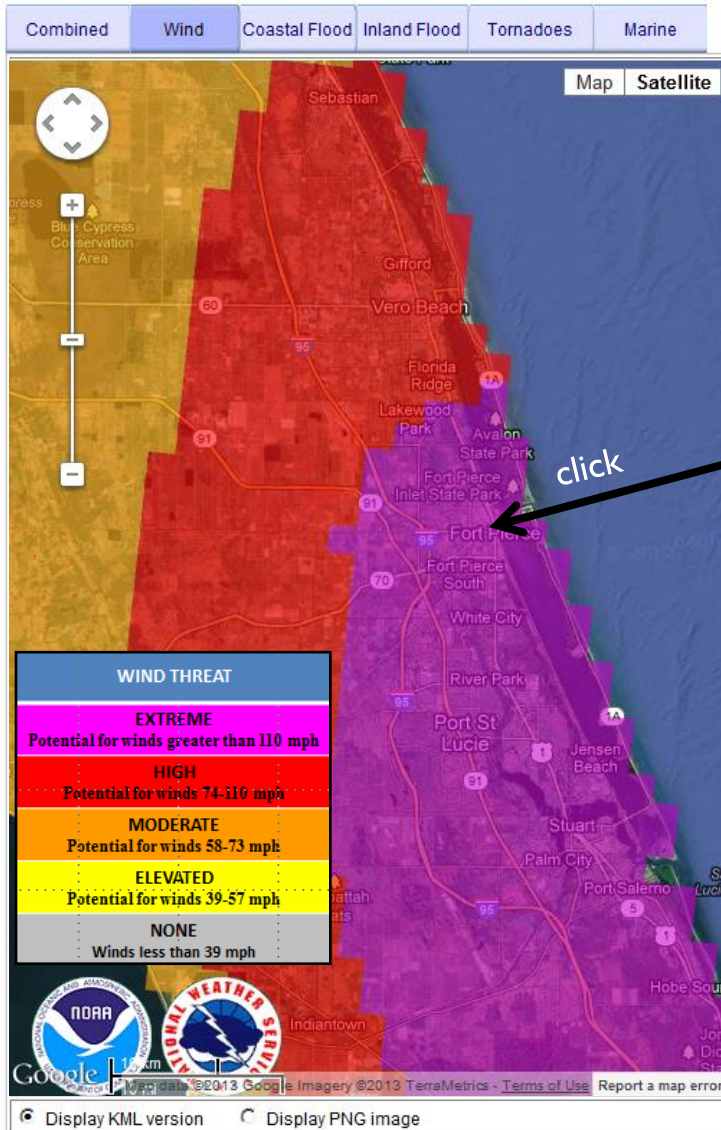
Flooding Rain



East Central Florida - Hurricane Threats & Impacts

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Hurricane Omega

**ZOOM**

Prepare for These Potential Impacts:

Wind Threat	Potential Wind Impacts (generalized)
EXTREME THREAT for wind greater than 110 mph Imperiled Lives Buildings Trees/Signs Roads/Bridges Power/Comms	DEVASTATING TO CATASTROPHIC IMPACTS <ul style="list-style-type: none">To be safe, aggressively prepare for the potential of devastating to catastrophic wind impacts from major hurricane force wind of equivalent Category 3 intensity or greater.Life threatening wind possible. Failure to adequately shelter from extreme wind may result in serious injury, loss of life, or immense human suffering.Structural damage to sturdy buildings with some experiencing complete roof and wall failures. Complete destruction of mobile homes. Damage greatly accentuated by large airborne projectiles. Hardest hit locations may be uninhabitable for weeks or months.Numerous large trees snapped or uprooted along with fences and roadway signs blown over.Many roads impassable from large debris. Many bridges, causeways, and access routes connecting barrier islands impassible.Widespread power and communication outages with many areas suffering extended outages.

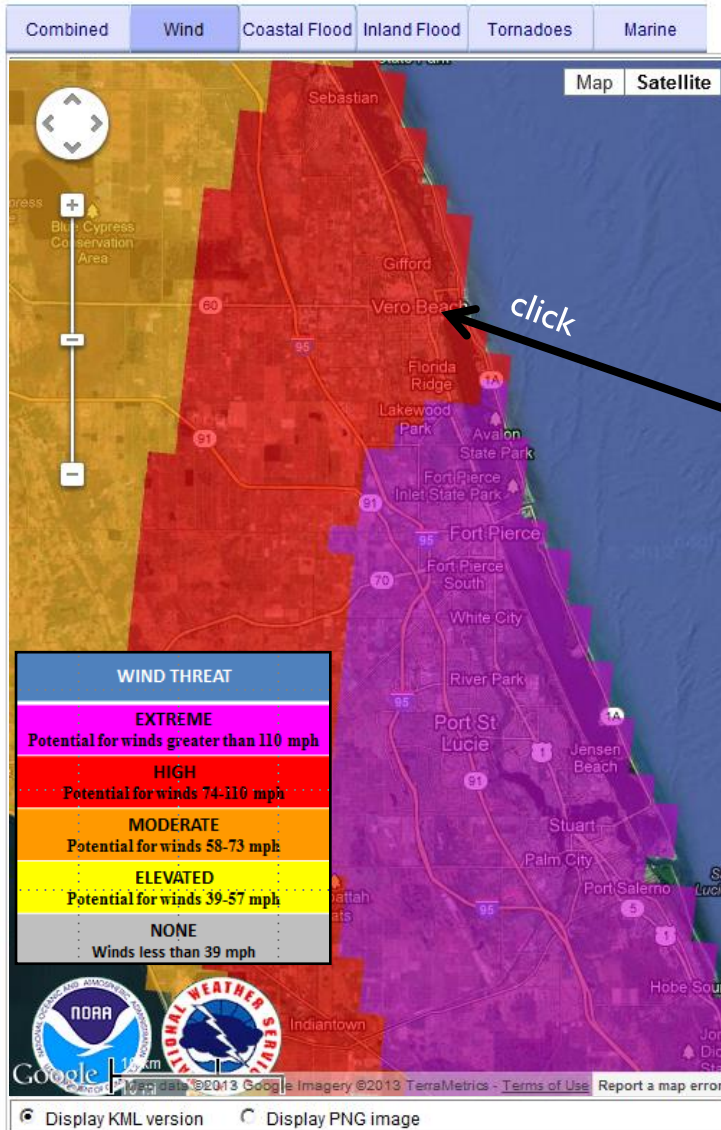
Also good for local hurricane briefings ... with added detail.



East Central Florida - Hurricane Threats & Impacts

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Hurricane Omega



Prepare for These Potential Impacts:

Wind Threat	Potential Wind Impacts (generalized)
HIGH THREAT for wind 74-110 mph	EXTENSIVE IMPACTS <ul style="list-style-type: none">To be safe, aggressively prepare for the potential of extensive wind impacts from hurricane force wind of equivalent Category 1 or 2 intensity.Life threatening wind possible. Failure to adequately shelter may result in serious injury or loss of life.Considerable damage to roofing and siding materials of sturdy buildings, with some having window, door, and garage door failures leading to structural damage. Mobile homes severely damaged, with some destroyed. Damage accentuated by airborne projectiles. Hardest hit locations may be uninhabitable for weeks.Many large trees snapped or uprooted along with fences and roadway signs blown over.Some roads impassable from large debris, and more within urban or heavily wooded places. Several bridges, causeways, and access routes connecting barrier islands impassable.Power and communications outages across large areas, with several places suffering extended outages.

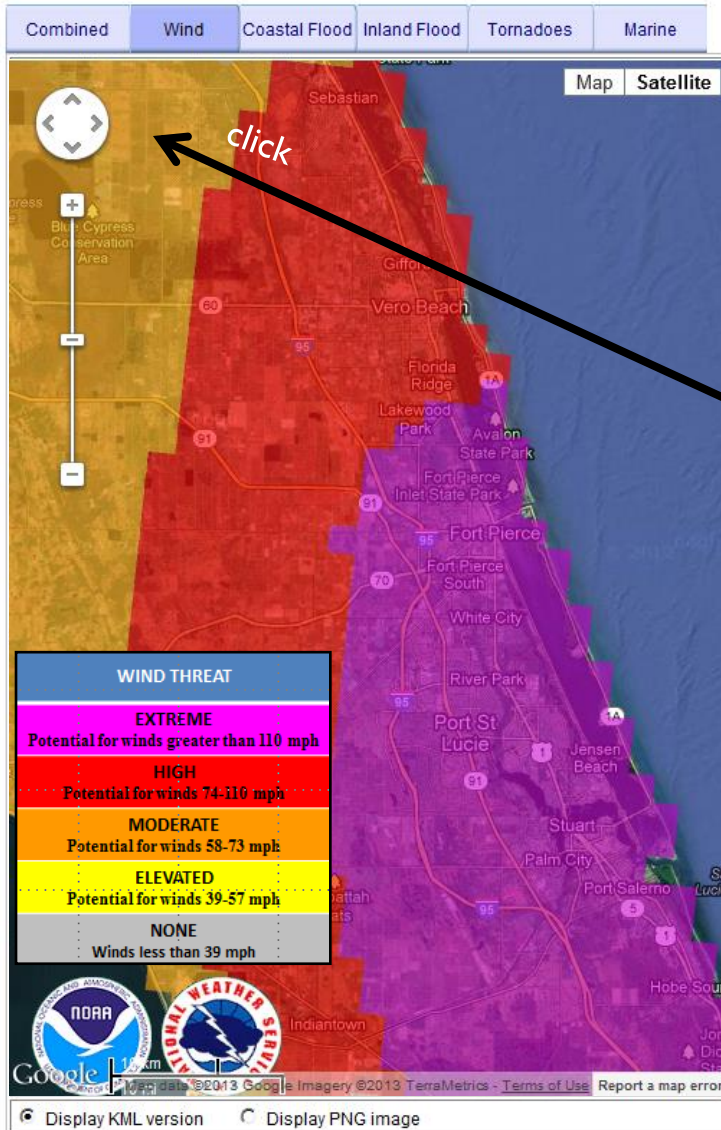
Also good for local hurricane briefings ... with added detail.



East Central Florida - Hurricane Threats & Impacts

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Hurricane Omega



Prepare for These Potential Impacts:

Wind Threat	Potential Wind Impacts (generalized)
MODERATE THREAT for wind 58-73 mph	SIGNIFICANT IMPACTS <ul style="list-style-type: none">To be safe, earnestly prepare for the potential of significant wind impacts from strong tropical storm force wind.Dangerous wind possible. Failure to adequately shelter may result in serious injury, and in some cases loss of life.Some damage to roofing and siding materials, along with damage to porches, awnings, carports, and sheds. A few buildings experiencing window, door, and garage door failures. Mobile homes damaged, especially if unanchored. Unsecured lightweight objects become dangerous projectiles.Several large trees snapped or uprooted, but with greater numbers in places where trees are shallow rooted. Several fences and roadway signs blown over.A few roads impassable from large debris, and more within heavily wooded places. A few bridges, causeways, and access routes connecting barrier islands impassable.Scattered power and communications outages, but more prevalent in areas with above ground lines.

Also good for local hurricane briefings ... with added detail.

TCV Text Product

WTUS82 KMFL 230915

TCVMFL

URGENT - IMMEDIATE BROADCAST REQUESTED
WILMA LOCAL WATCH/WARNING STATEMENT/ADVISORY NUMBER 32
NATIONAL WEATHER SERVICE MIAMI FL AL242005
515 AM EDT SUN OCT 23 2005

FLZ173-231545-
/O.NEW.KMFL.HU.W.1024.051023T0915Z-000000T0000Z/
/O.UPG.KMFL.HU.A.1024.000000T0000Z-000000T0000Z/
COASTAL MIAMI DADE COUNTY-
515 AM EDT SUN OCT 23 2005

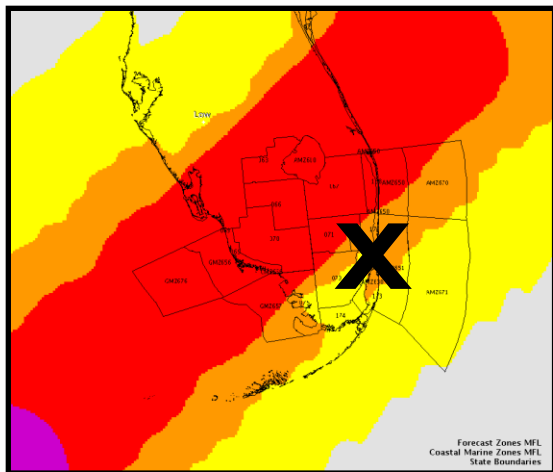
...HURRICANE WARNING IN EFFECT...

* LOCATIONS AFFECTED
- MIAMI BEACH
- DOWNTOWN MIAMI

* WIND

- LATEST LOCAL FORECAST: EQUIVALENT TO STRONG TROPICAL STORM FORCE WIND
 - PEAK WIND FORECAST: 55-70 MPH WITH GUSTS TO 90 MPH
 - WINDOW FOR TROPICAL STORM FORCE WINDS: EARLY MONDAY MORNING THROUGH MONDAY AFTERNOON
- THREAT TO LIFE AND PROPERTY: HIGH
 - THE WIND THREAT HAS REMAINED NEARLY STEADY FROM THE PREVIOUS ASSESSMENT.
 - EMERGENCY PLANNING SHOULD INCLUDE A REASONABLE THREAT FOR HURRICANE FORCE WIND OF 74 TO 110 MPH OF EQUIVALENT CATEGORY 1 OR 2 INTENSITY.
 - TO BE SAFE, AGGRESSIVELY PREPARE FOR THE POTENTIAL OF EXTENSIVE WIND IMPACTS. LIFE THREATENING WIND POSSIBLE. EFFORTS TO SECURE PROPERTIES SHOULD BE COMPLETED AS SOON AS PRACTICAL.
 - FAILURE TO ADEQUATELY SHELTER MAY RESULT IN SERIOUS INJURY OR LOSS OF LIFE.
- POTENTIAL IMPACTS: EXTENSIVE
 - CONSIDERABLE DAMAGE TO ROOFING AND SIDING MATERIALS OF STURDY BUILDINGS, WITH SOME HAVING WINDOW, DOOR, AND GARAGE DOOR FAILURES LEADING TO STRUCTURAL DAMAGE. MOBILE HOMES SEVERELY DAMAGED, WITH SOME DESTROYED. HARDEST HIT LOCATIONS MAY BE UNINHABITABLE FOR WEEKS.
 - MANY LARGE TREES SNAPPED OR UPROOTED ALONG WITH FENCES AND ROADWAY SIGNS BLOWN OVER. SOME ROADS IMPASSABLE FROM LARGE DEBRIS, AND MORE WITHIN HEAVILY WOODED PLACES.
 - SEVERAL BRIDGES, CAUSEWAYS, AND ACCESS ROUTES CONNECTING BARRIER ISLANDS IMPASSIBLE.
 - POWER OUTAGES ACROSS LARGE AREAS, WITH SEVERAL PLACES SUFFERING EXTENDED OUTAGES.

TCV Text Product



WTUS82 KMFL 230915

TCVMFL

URGENT - IMMEDIATE BROADCAST REQUESTED
WILMA LOCAL WATCH/WARNING STATEMENT/ADVISORY NUMBER 32
NATIONAL WEATHER SERVICE MIAMI FL AL242005
515 AM EDT SUN OCT 23 2005

FLZ173-231545-
/O.NEW.KMFL.HU.W.1024.051023T0915Z-000000T0000Z/
/O.UPG.KMFL.HU.A.1024.000000T0000Z-000000T0000Z/
COASTAL MIAMI DADE COUNTY-
515 AM EDT SUN OCT 23 2005

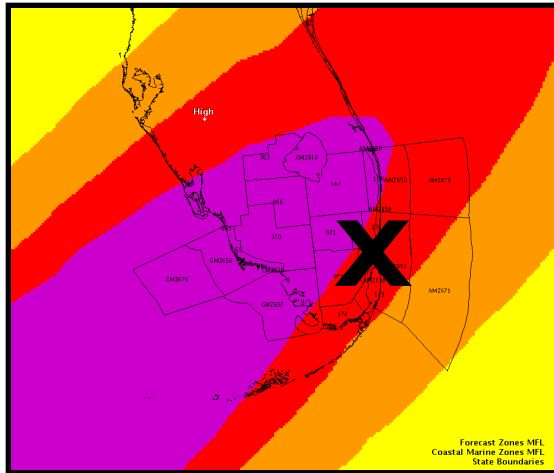
...HURRICANE WARNING IN EFFECT...

- * LOCATIONS AFFECTED
- MIAMI BEACH
 - DOWNTOWN MIAMI

* WIND

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Wind Situation for “My County”



“The threat to life and property is high for My County. Hurricane Alpha is forecast to approach the Southwest Florida coast early this weekend as a major hurricane.

A hurricane warning is now in effect for My County. The local forecast is for peak winds of strong tropical storm force of 50-70 mph with hurricane force gusts. Winds may increase as early as Saturday afternoon with peak winds arriving as early as Saturday night.

There is also a chance that My County could realize hurricane force winds of 74-110 mph with the potential for extensive impacts. To be safe, protect against these possible conditions.”

Messaging “Blurbs”

“Dangerous and life-threatening winds possible this weekend.”

“Prepare for the potential of extensive impacts from Hurricane Alpha.”

“Failure to act may result in injury or loss of life. Now is the time to take protective action.”

“Enact your Emergency Plan for the threat of hurricane winds.”

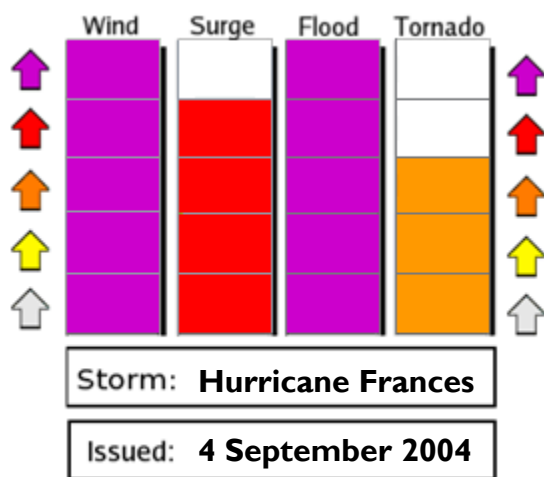




All Hazards Assessments

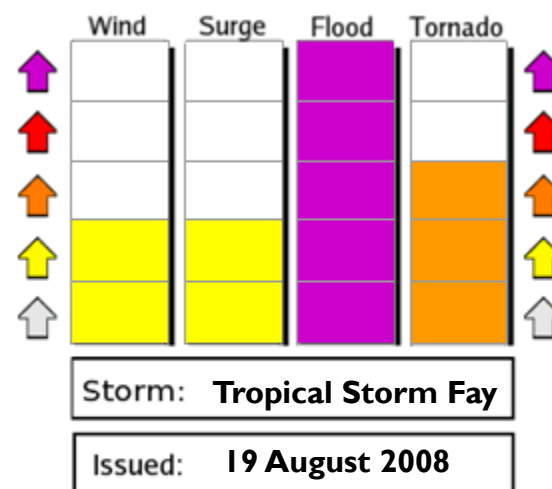
Hurricane Frances - All Hazards

Saint Lucie County, FL



Tropical Storm Fay - All Hazards

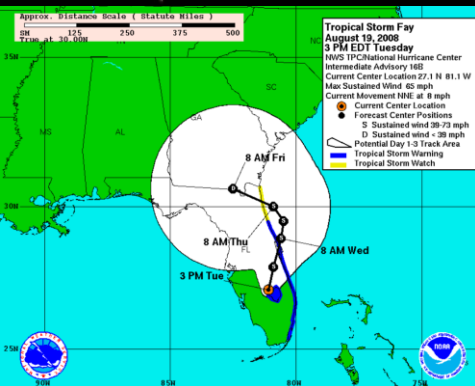
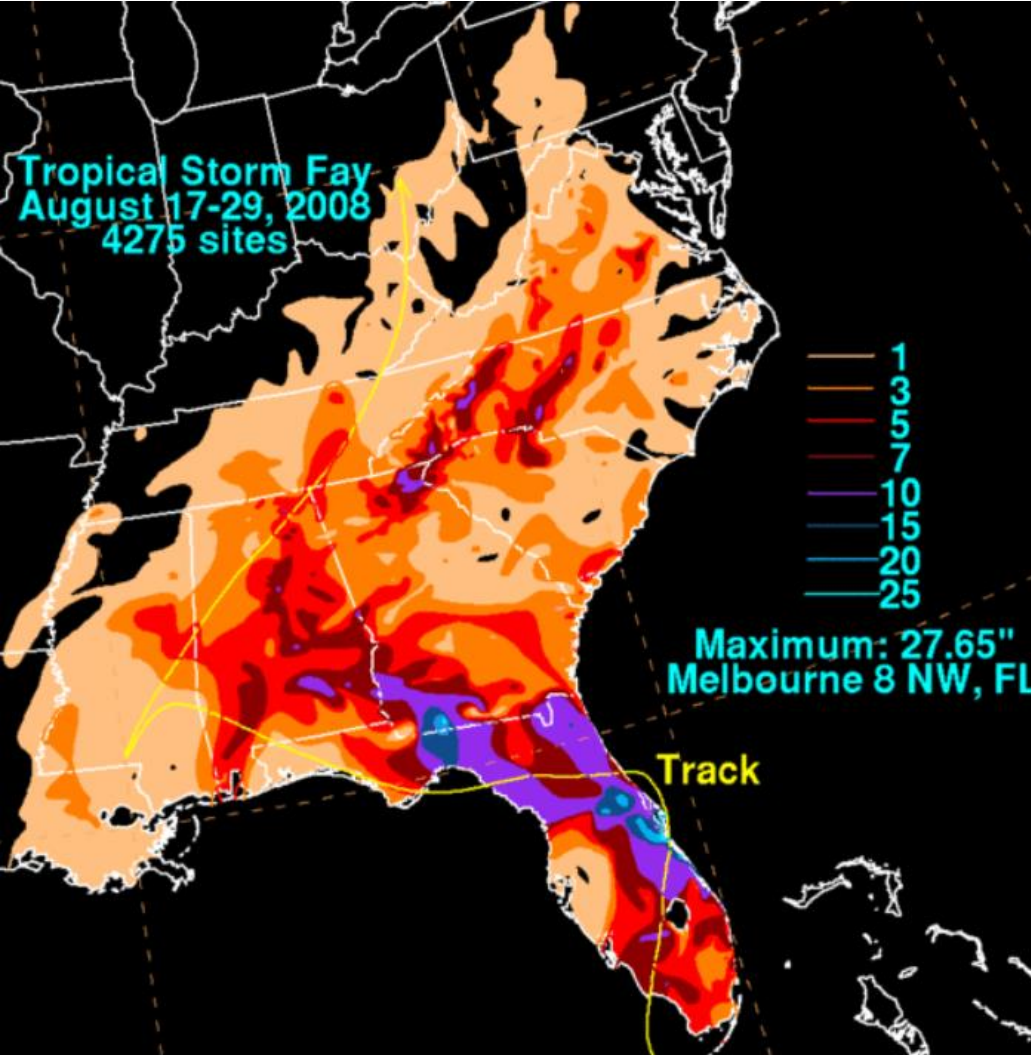
Lat/Lon 28.12N 80.62W



*“Emoticons”
to help overcome
language barriers?*



Community Distress Index



Steps To Effective Warning Response



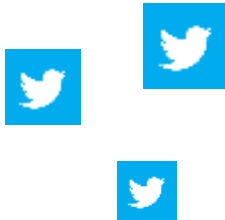
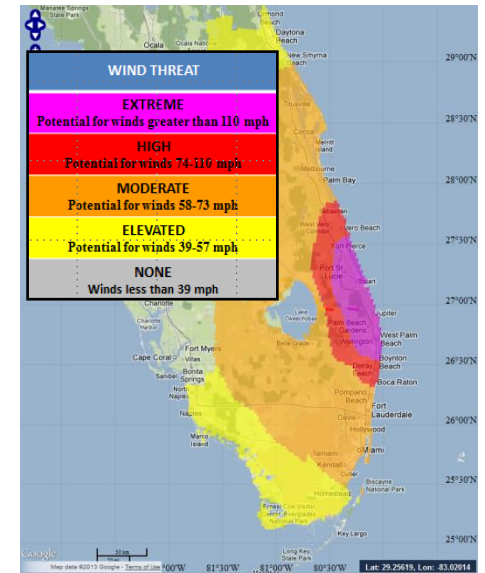
RESOURCES?

Appropriate Protective Action

Considerations for Public Safety Messaging to evoke Desired Societal Response

What's the Main Message?

- From the “Communications Desk”
 - Messaging Points for Media Interviews
 - NWSSChat
 - Graphiccasts; Graphical Posts
 - Flash Cards
 - Social Media
 - Facebook, Twitter, YouTube, etc.



*“Historic hurricane event unfolding!
Dangerous Hurricane Omega is
coming our way!”*



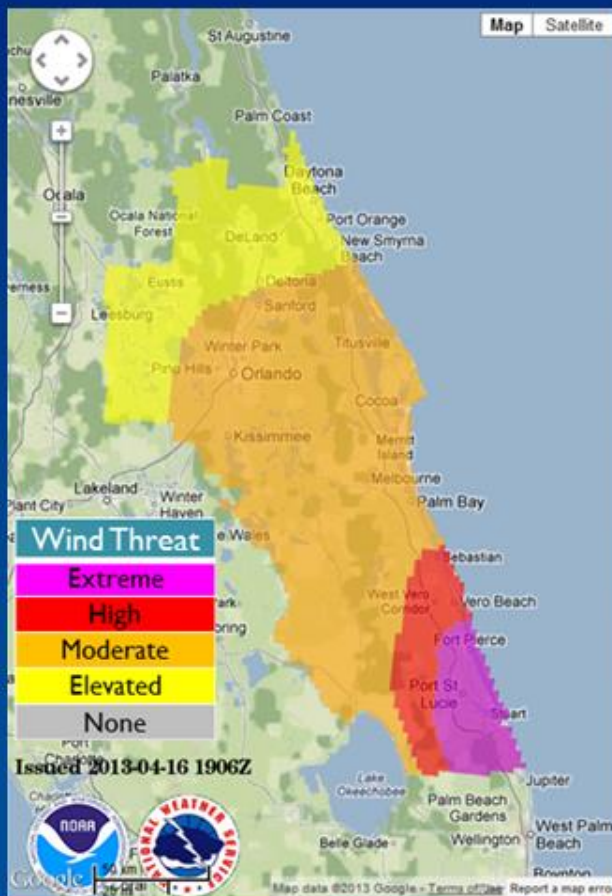
BLUF - Bottom Line Up Front
KISS - Keep It Simple (Stupid)



National Weather Service
Melbourne, FL
September 13, 2009 at 6:00 am

Hurricane Omega

Life-Threatening & Historic Winds Possible for Treasure Coast



- Hurricane Warnings are in effect for all of East Central Florida; dangerous winds may arrive as early as Saturday afternoon
- The wind threat is extreme for Martin and Saint Lucie Counties; a high wind threat for Indian River County
- All counties subject to at least a reasonable chance for tropical storm force wind

To be safe, protect against the greatest threat of damaging wind as depicted for your area.

EXTREME THREAT for wind greater than 110 mph
HIGH THREAT for wind 74-110 mph
MODERATE THREAT for wind 58-73 mph
ELEVATED THREAT for wind 39-57 mph
LITTLE TO NO THREAT wind less than 39 mph





Hurricane Winds

When wind speeds reach tropical storm strength, they become dangerous. That's why evacuation plans and shelter decisions are based on these speeds. If winds reach hurricane strength, the threat to life and property significantly increases. The wind threat is extreme with hurricanes of Category 3 force or greater.



High Wind Safety Tips:



- Know your vulnerability relative to hurricane winds.
- Those living in mobile homes, high rise buildings, along the immediate coast, and at higher elevations are most susceptible.
- If you are vulnerable to high winds, relocate to safer shelter.
- Securing doors and deploying shutters can help reduce the risk of property damage.
- Securing yard objects can help reduce the chance for dangerous projectiles.



National Weather Service
Melbourne, FL

Coastal Evacuations for East Central FL

Information as of Wednesday, October 5 at 9:00 PM

Brevard County

Mandatory evacuations for barrier islands, low-lying areas & mobile/manufactured homes.

Volusia County

Mandatory evacuations for beachside, low-lying areas, and RV and mobile home parks.

Indian River County

Mandatory evacuations for barrier islands, low-lying areas, RV and mobile home parks.
Voluntary US-1 to the river

St. Lucie County

Mandatory evacuation of barrier islands, low-lying areas & manufactured homes.

Martin County

Mandatory evacuations for islands, low-lying areas, & mobile/manufactured homes.



Melbourne
WEATHER FORECAST OFFICE



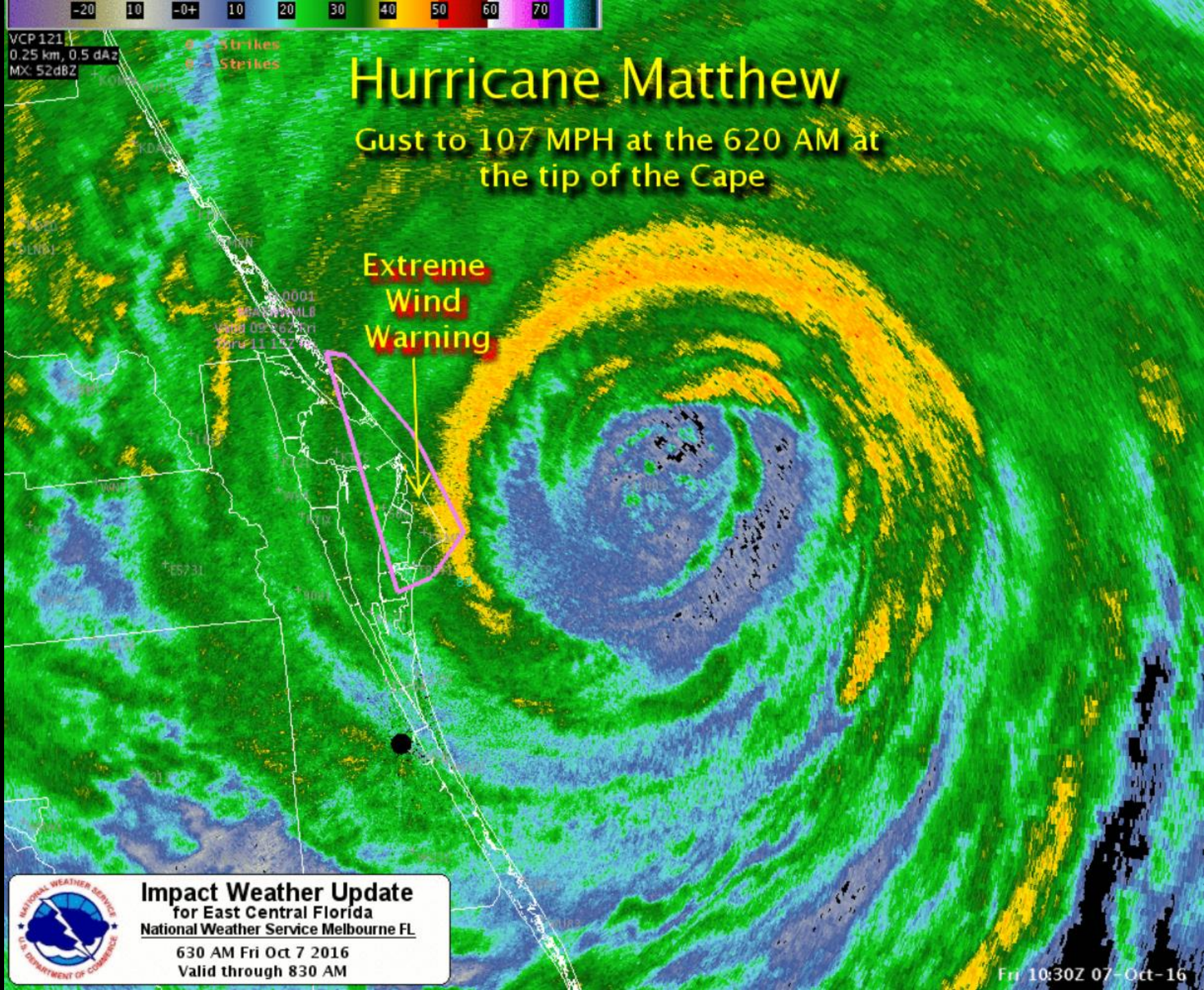
facebook.com/NWSMelbourne



@NWSMelbourne

<http://www.weather.gov/melbourne>

October 5, 2016



Hurricane Matthew

Gust to 107 MPH at the 620 AM at the tip of the Cape

**Extreme
Wind
Warning**



**Impact Weather Update
for East Central Florida**
National Weather Service Melbourne FL

630 AM Fri Oct 7 2016
Valid through 830 AM

Fri 10:30Z 07-Oct-16

Using Social Media to Communicate Public Safety Message

Kimberly Prosser, Director
Brevard County Emergency Management

- EM & WFO sharing and commenting on each others' Facebook posts and re-tweeting on Twitter increases the ...
 - **Timeliness** of information received
 - **Visibility** (of posts and agencies themselves)
 - **Credibility** (one agency bolsters credibility of the other)
 - **Accuracy** (EMs no longer need to rewrite WFO alerts/emails)
 - **Interaction** (public is likely to interact with both entities)
 - **Reach** (each agency's audience is largely unique)
 - **Opportunity** to reach those without weather radios, etc.

Real-time Social Media Info Sharing

facebook Search for people, places and things

Brevard County Emergency... Timeline Now

Brevard County Emergency Management
April 14

Severe thunderstorm warning for S Brevard until 11:15 PM. Storm capable of 60+ MPH winds is near Palm Bay, moving NE at 20 MPH.

Like · Comment · Share 10 21 11

CPI Green Energy, Designing Premier Events & Weddings, Christina Carr and 7 others like this.

Cathy Holland Smith Thanks so much for keeping us so up to date. It's awesome!
April 14 at 10:41pm via mobile · Like · 1

Amanda Rashid Crap! Both my front and backyard are flooded almost up to our house, and our outside office building is underwater. No more rain!! ☹️
April 14 at 10:42pm via mobile · Like · 1

US National Weather Service Melbourne Florida Hi Amanda. We are your local National Weather Service office down in Melbourne. Would you be willing to tell us where in Brevard County you live? We would really appreciate it.
April 14 at 10:45pm · Like · 3

Sandy Clark Pfrimmer pouring in Melbourne still.
April 14 at 10:52pm via mobile · Like

Lisa Schuster-Stella Thank you for keeping us up to date
April 14 at 10:52pm via mobile · Like

Vedrana Choper Great lightning show on the beach & not much wind at all 😊
April 14 at 10:54pm · Edited · Like

Carol White Wilkins pouring in Rockledge again too
April 14 at 10:54pm · Like

Cathy Holland Smith Also in Viera
April 14 at 11:14pm via mobile · Like

Amanda Rashid I'm in Merritt Island. Sorry for the delayed answer.
April 14 at 11:14pm via mobile · Unlike · 1

Jennifer Sawyer Misty Tedesco house jus got hit by a tornado in palm bay area
April 14 at 11:18pm via mobile · Like · 1

NWS
comments
on EM FB
page during
tornado
event

EM requests
public to tweet
damage reports
direct to NWS &
EM

Brevard EOC @BrevardEOC 14 Apr
Severe thunderstorm capable of tornado is 6 mi S of Lone Cabbage Fish Camp, moving E at 15 MPH.
Expand

Brevard EOC @BrevardEOC 14 Apr
Severe thunderstorm warning for Brevard County until 10:15 PM.
Expand

Karin Miller @triagain 14 Apr
[@MicahGrimes](#) [@aarpjeff](#) [@brevardeoc](#) he saw a #tornado off to the right. But he's ok. Thanks y'all!
Expand

Brevard EOC @BrevardEOC 14 Apr
[@triagain](#) where did he see the tornado?
Hide conversation Reply Retweet Favorite More

1 RETWEET

7:54 PM - 14 Apr 13 · Details

Karin Miller @triagain 14 Apr
[@BrevardEOC](#) he said he saw it when lightning flashed off to his right. He was on i95s between 520 and 519. I can ask exactly where if u want
Expand

Brevard EOC @BrevardEOC 14 Apr
[@triagain](#) only if he saw it touch down. Thanks!
Expand

Karin Miller @triagain 14 Apr
[@BrevardEOC](#) ill let ya know but not sure he saw it long enuf - too busy trying to avoid and dodge hail!
Expand

Brevard EOC @BrevardEOC 14 Apr
If tornado or damage is spotted, please tweet to [@BrevardEOC](#) and [@NWSMelbourne](#). Do not put yourself in danger to verify!

Real-time Social Media Info Sharing

Social Media: For “fostering” the unified message

- To highlight the main message in event context
- To spotlight sub-messages as the event unfolds
- To address changes to the main message
- To squash rumors; maintain message integrity
- Emphasis on proper societal response in the customer language (i.e. the safety message)

comments
on EM FB
page during
tornado
event

EM requests
public to tweet
damage reports
direct to NWS &
EM

facebook Search for people, places and things

Brevard County Emergency

Brevard County Emergency
April 14 · 10

Severe thunderstorm warning
Storm capable of 60+ MPH with
20 MPH.

Like · Comment · Share

CPI Green Energy, Designing P
and 7 others like this.

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date. It's awesome!
April 14 at 10:41pm via mobile · Like · 1

Amanda Rashid Crop! E
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Jennifer Sawyer Maty Tedesco house jus got hit by a tornado in
palm bay area
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Brevard EOC @BrevardEOC

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Cabbage Fish Camp, moving E at 15 MPH.

14 Apr

Brevard County until 10:15

14 Apr

14 Apr

14 Apr

★ Favorite · More

7:54 PM - 14 Apr 13 · Details



Karin Miller @triagain

14 Apr

@BrevardEOC he said he saw it when lightning flashed off to
his right. He was on I95s between 520 and 519. I can ask exactly
where if u want

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14 Apr

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too busy trying to avoid and dodge hail!

Expand



Brevard EOC @BrevardEOC

14 Apr

If tornado or damage is spotted, please tweet to @BrevardEOC
and @NWSMelbourne. Do not put yourself in danger to verify!

NWSChat

Use of NWSChat to keep the media “on message” during the event.

The screenshot shows the NWSChat Live web application running in Internet Explorer. The browser's address bar displays <https://nwschat.weather.gov/live/>. The application interface is divided into several sections:

- Map Panel:** Displays a Google Map of Florida. The map is titled "Map Valid: 3:20 PM". It includes navigation controls (compass, zoom in/out, and a globe icon) and an "Opacity" slider. The map shows major cities like Sarasota, Port St. Lucie, West Palm Beach, Cape Coral, Bonita Springs, Naples, Fort Lauderdale, Miami, and Homestead. The Everglades National Park is also visible.
- Buddies:** A list of chat participants on the left side. It includes groups like "SR SOO Group", "WDTB Group", "Southern Region HQ", "Southern Region - Regional Op", and "NWSChat Admin Team". Individual users listed include "Daryl Herzmann", "nwsbot", "nwsfwd-soo", "nwslix-soo", "nwsffc-soo", "nwsmeg-soo-Tom S.", "wdtb-elliott", "nws-wdtb-don", and "nwswdtb-chris-spanagle".
- Layers Control:** A panel on the right side showing various map layers. It includes "Base Layer" (Blank, Google Street), "Satellite" (GOES Water, GOES West V, GOES East Vi, GOES Visible, GOES IR), and "Precip/RADAR" (NMQ Q2 3 Da, NMQ Q2 2 Da, NMQ Q2 1 Da).
- Chatroom Bookmarks:** A section at the bottom left with a "+" button.
- Chatrooms:** A section at the bottom right with a "+" button.
- Chatroom List:** A horizontal bar at the bottom showing active chatrooms: "Help", "All Chats", "sr-roc", "mlbchat", "mlbemchat", "tbwchat", and "tbwemchat".

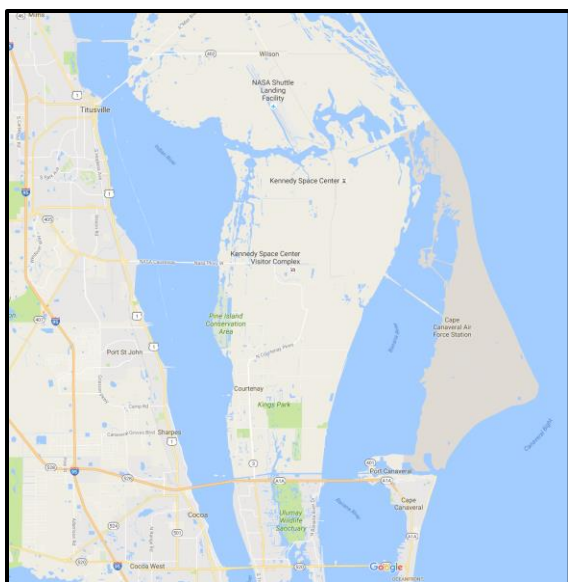
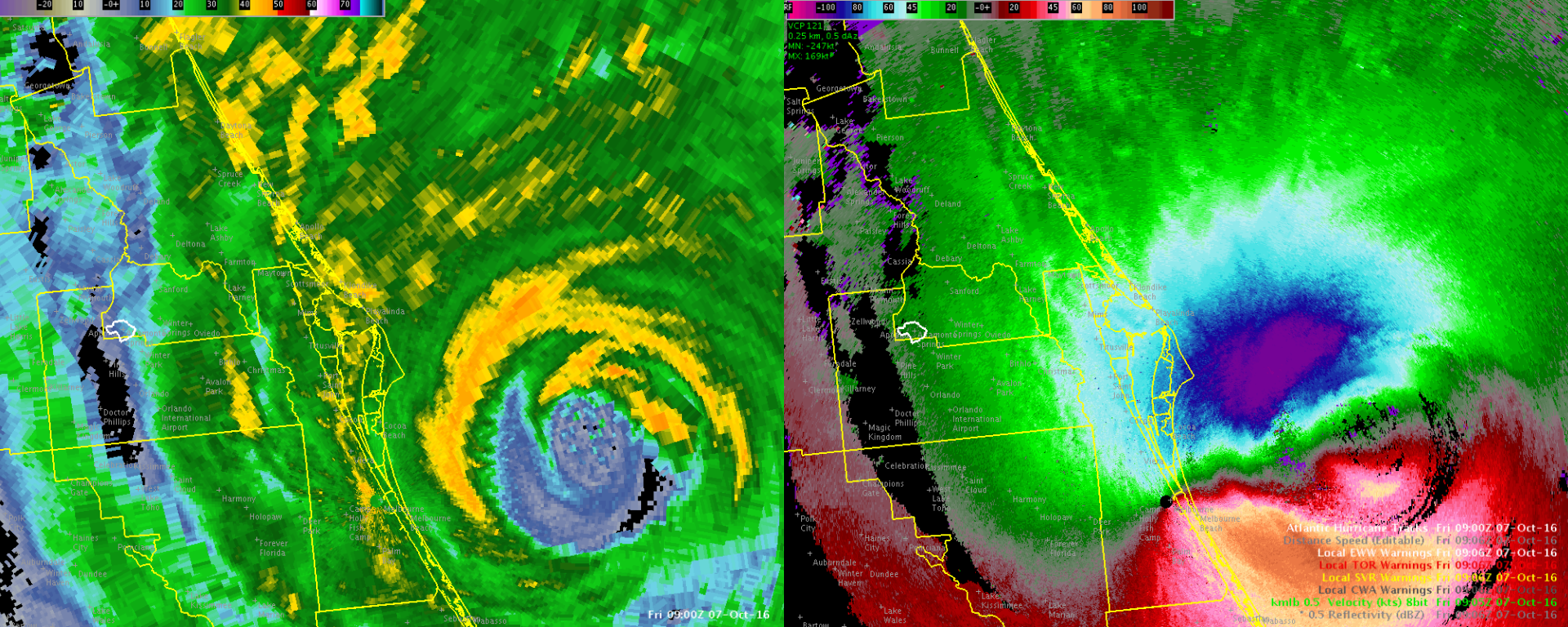
nws-david.sharp: If an EWW is issued, it means that it is time to shelter within shelter. The message - move now to the safest place within your shelter and protect your head and body from extreme winds.



Major Hurricanes & Societal Impacts:

- Lives greatly imperiled
- Devastating to catastrophic damage
- Increased projectile loading
- Numerous rescues
- Difficult initial response
- Community infrastructure collapsed
- Long-term recovery





Extreme Winds & Major Hurricane Matthew

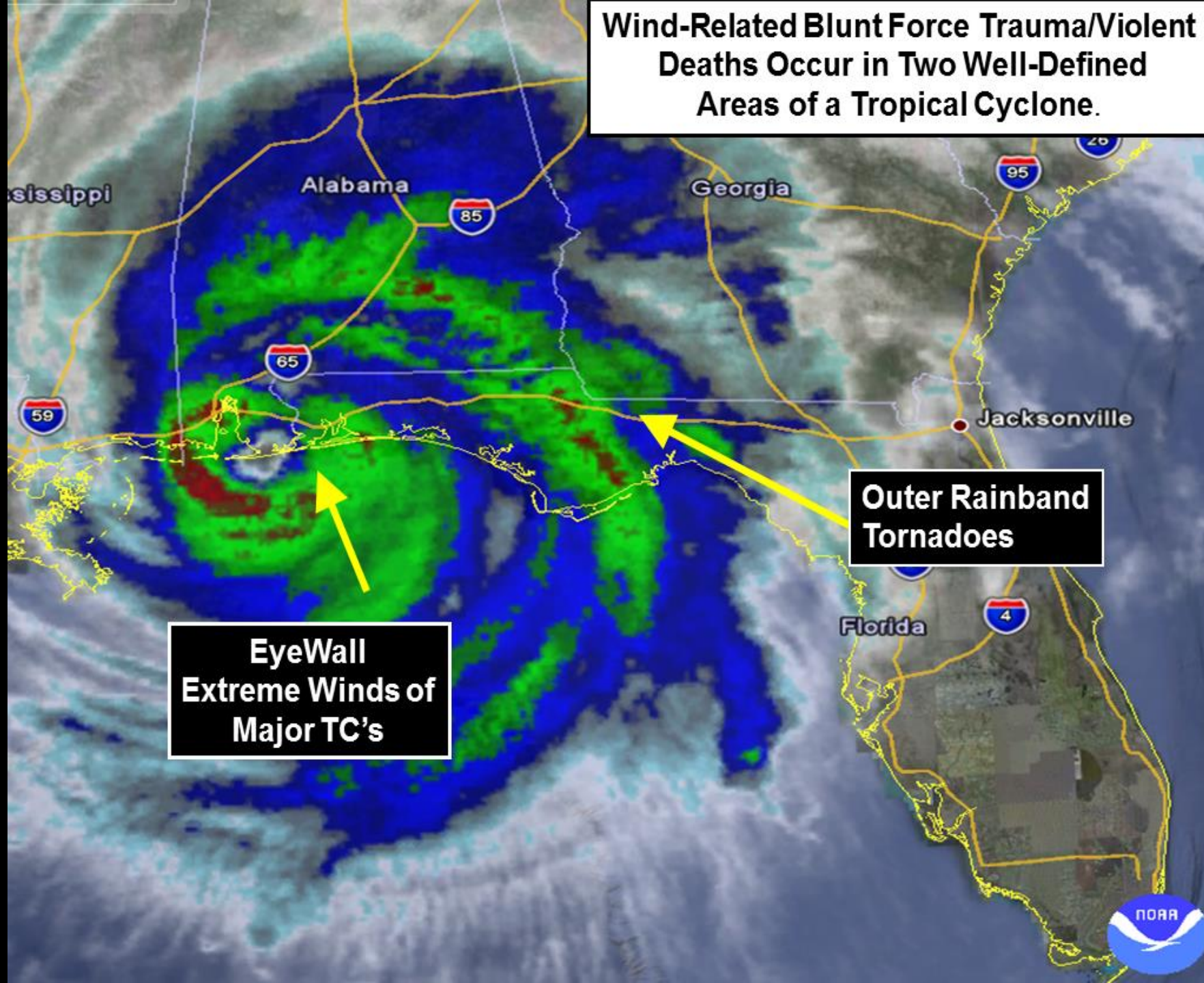


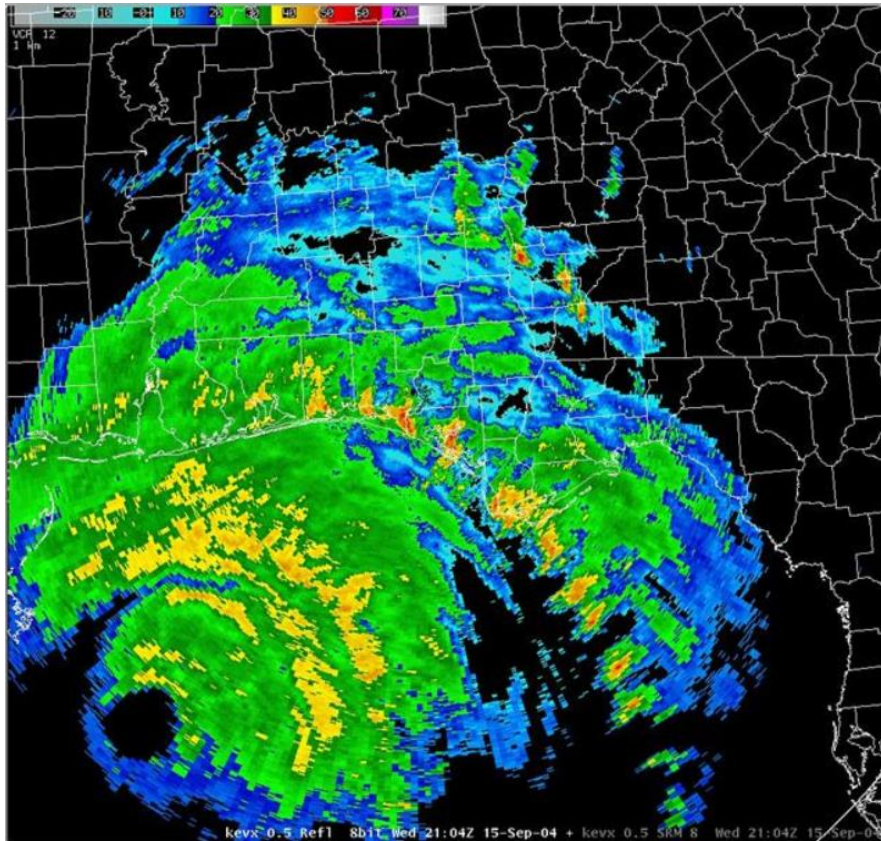
Extreme Wind Warning

- **Issuance Criteria:** An EWW is issued when both of the following criteria are met:
 - The tropical cyclone is a CAT 3 or greater.
 - Sustained winds of 100 kt (115 mph) or greater are expected to occur in a WFO's county warning area within 1 hour; product valid time is not to exceed 2 hours.

Message: Shelter within shelter

Wind-Related Blunt Force Trauma/Violent Deaths Occur in Two Well-Defined Areas of a Tropical Cyclone.





Typically, counties/cities do not have a tornado contingency within their hurricane emergency plans.

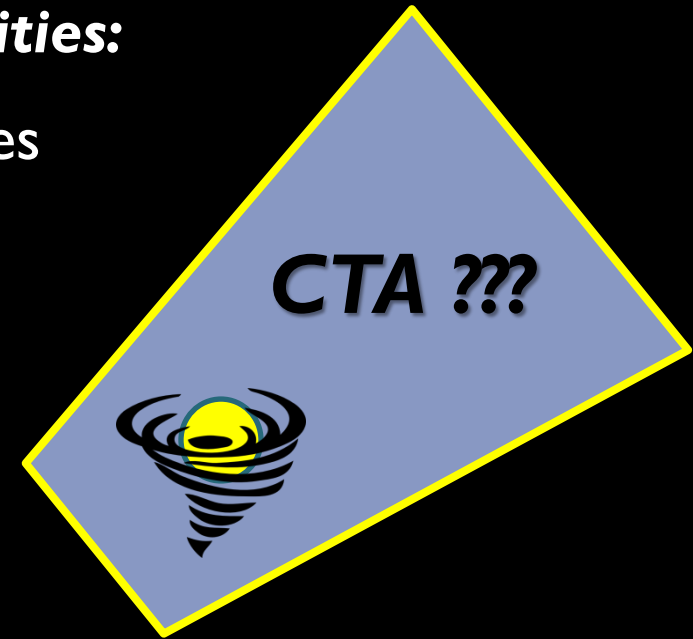
- Tornadoes can occur ahead of the main wind event.
- Tornadoes can occur after the main wind event.
- Tornadoes can occur in places away from the main wind event.
- Tornadoes can occur post landfall over inland locations.

Tornado Outbreak !!!

Within Tornado Warning Polygons

Interrupting Hurricane Emergency Activities:

- Precautionary and preparedness activities
- Significant evacuations and re-sheltering
 - Roadside sheltering
- Rescue or recovery activities
 - Shelter within shelter actions
 - Within disaster areas
- Public awareness otherwise lowered



How should I take cover?



Sage Advice

Breathe!

Stay Calm

Stay Focused

Be the Voice
of Reason

Stay Connected

Follow Through





Thank You