

A satellite weather map of the tropical Pacific region, showing cloud cover and temperature variations. The map includes latitude and longitude markings along the top and bottom edges. A large, intense storm system is visible in the lower right quadrant, characterized by a bright orange and red core surrounded by green and blue outer rings. Another smaller storm system is visible in the upper left quadrant, with a green and blue core. The background shows the outlines of the continents of North and South America.

Tropical Topics Week 2021

NWS Florida & NHC



Tropical Topics Week

Daily Webinars @ 2 pm



NHC & FDEM

National Messaging,
FDEM Director &
NHC Director Ken
Graham



Monday
May 17

Wind Threat Surge Threat

Threat
Recognition,
Impacts &
Messaging



Tuesday
May 18

Threat Recognition,
Impacts, Messaging &
Vulnerability



Wednesday
May 19

Rainfall Threat

Threat Recognition,
Impacts & Messaging



Thursday
May 20

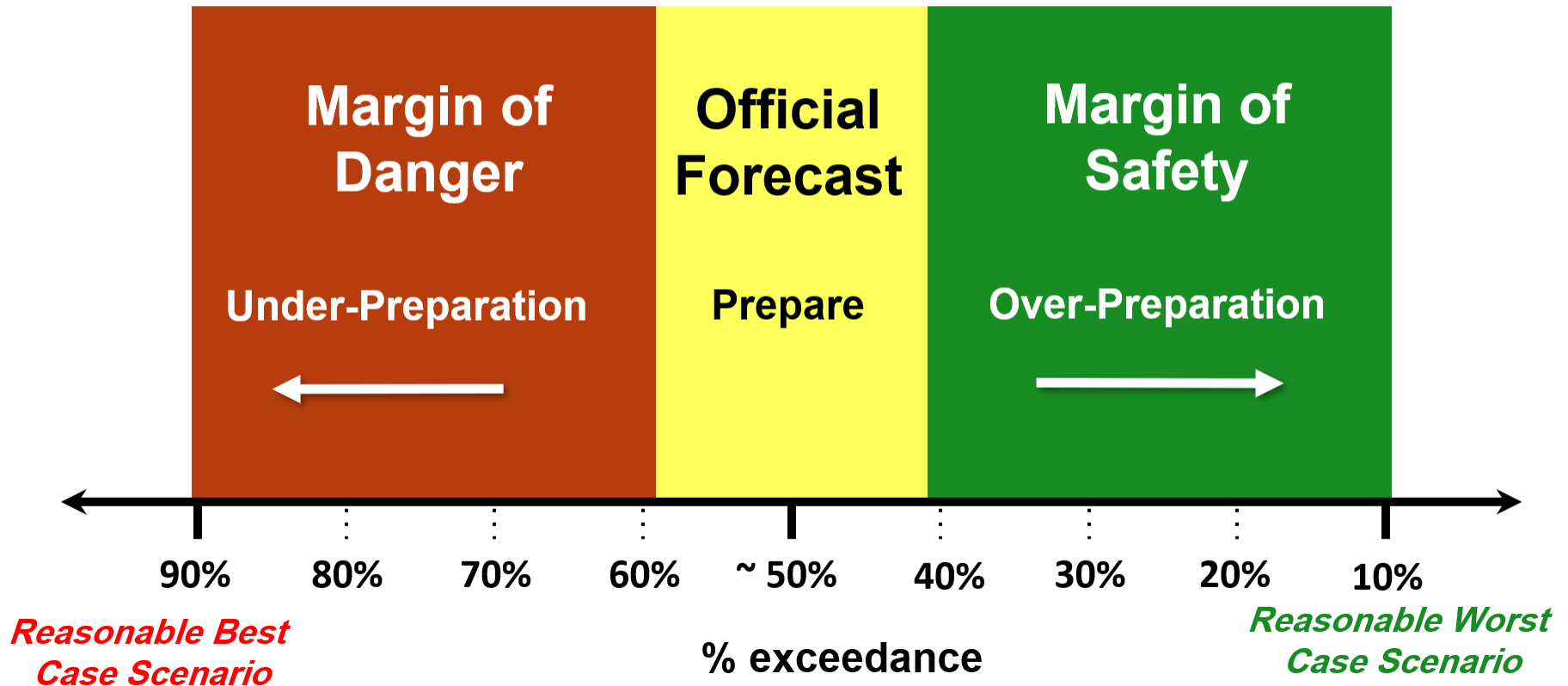
Tornado Threat

Threat
Recognition,
Impacts,
Messaging

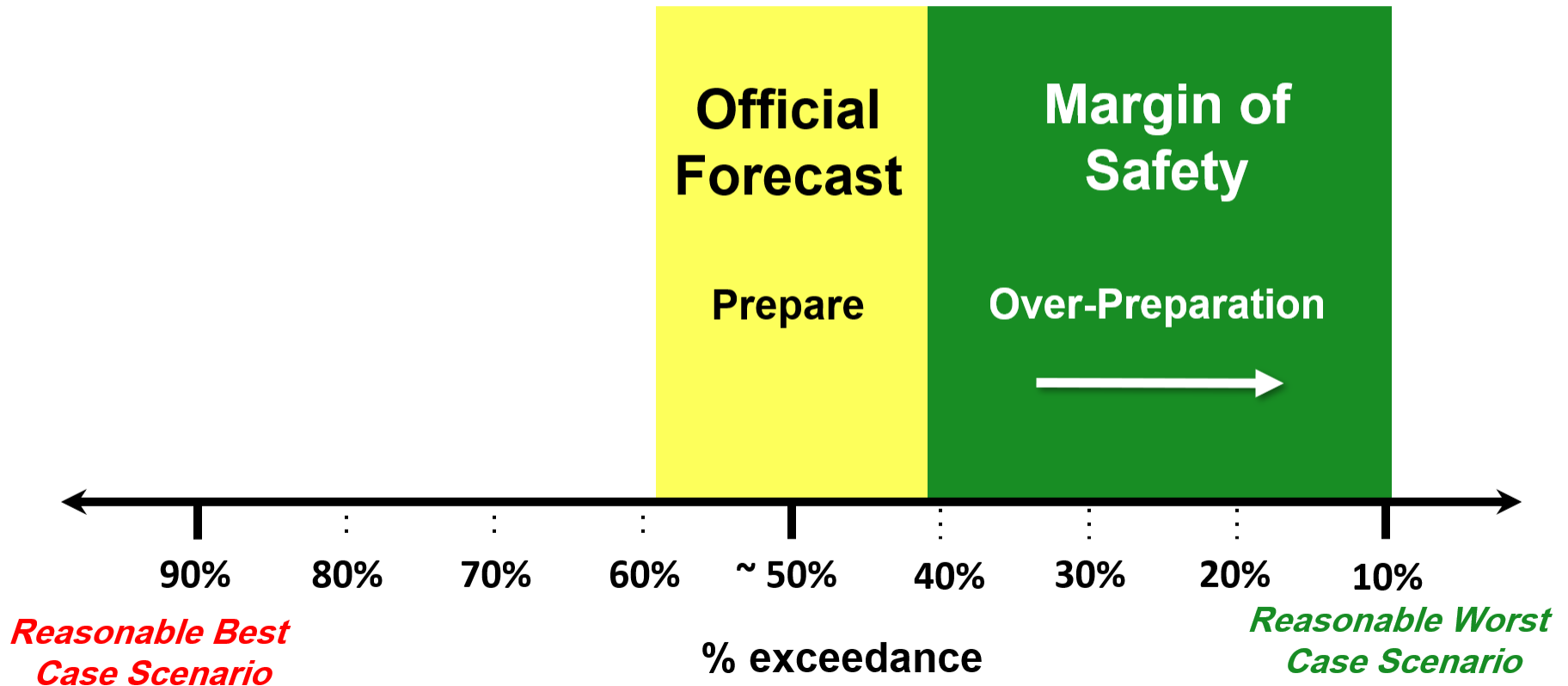


Friday
May 21

Risk Tolerance & Strategic Preparation



Risk Tolerance & Strategic Preparation



Risk Tolerance & Strategic Preparation

What about the official forecast? What does it look like and can we responsibly prepare based only on it?

**Official
Forecast**

Prepare

**Margin of
Safety**

Over-Preparation



90%

80%

70%

60%

~ 50%

40%

30%

20%

10%

*Reasonable Best
Case Scenario*

% exceedance

*Reasonable Worst
Case Scenario*

Michael Adv 8 - Peak Wind Swath

51 hours from landfall - Around 75 miles forecast error



Wind > 110 mph

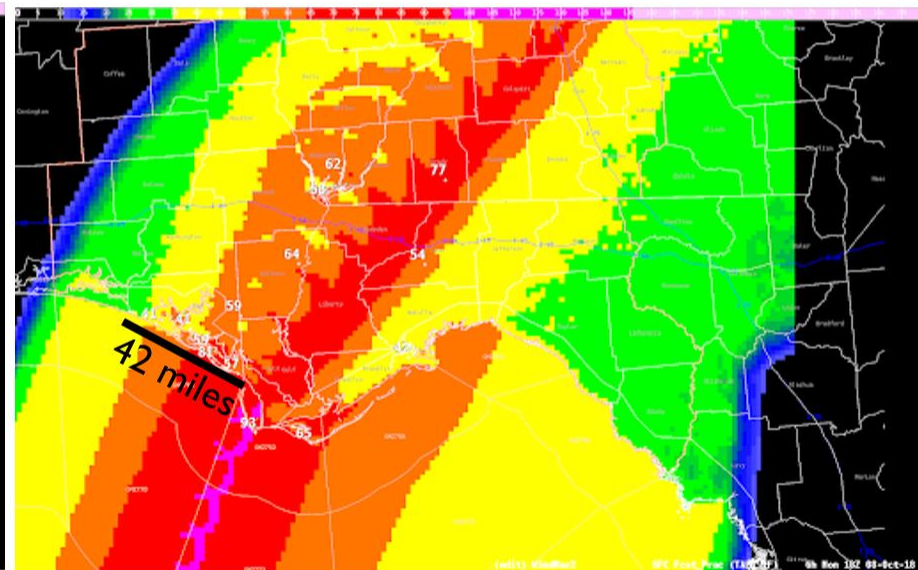
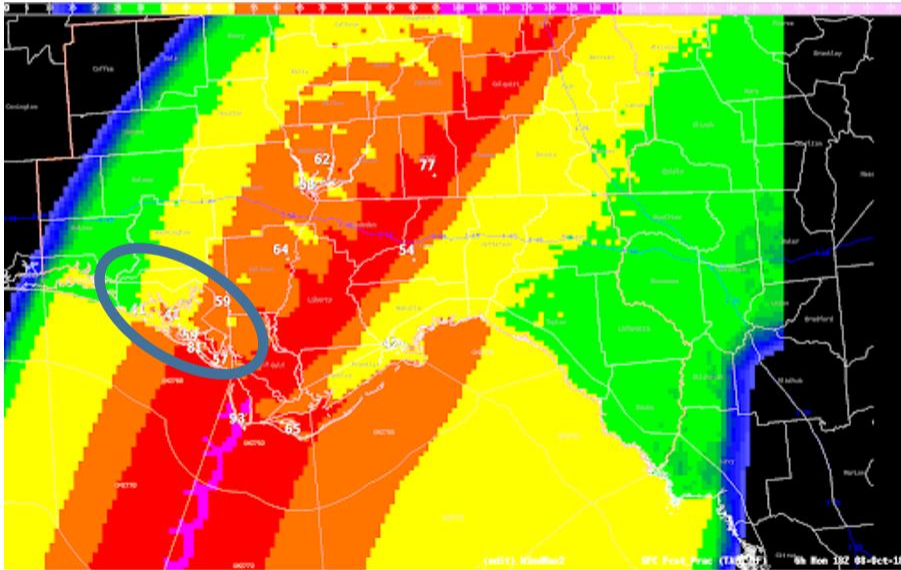
Wind 74-110 mph

Wind 58-73 mph

Wind 39-57 mph

Wind < 39 mph

- Coastal Bay County Encircled**



This diagram shows a depiction of the Peak Wind swath derived from NHC Michael Advisory #8. This is what is generally considered as the most likely scenario. Given that Bay County is ~42 miles wide vs. a typical track error of ~75 miles at 48-60 hours out, this means conditions could end up being dramatically different than what is depicted here. So, should this be the sole basis of wind preparedness decisions for interests in Bay County?

Risk Tolerance & Strategic Preparation

Hence we want to convey information with a margin of safety in mind. This is at the center of messaging threats and potential impacts

**Official
Forecast**

Prepare

**Margin of
Safety**

Over-Preparation



90%

80%

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60%

~ 50%

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30%

20%

10%

*Reasonable Best
Case Scenario*

% exceedance

*Reasonable Worst
Case Scenario*



The Wind Hazard: Messaging the Wind Threat & Corresponding Potential Impacts

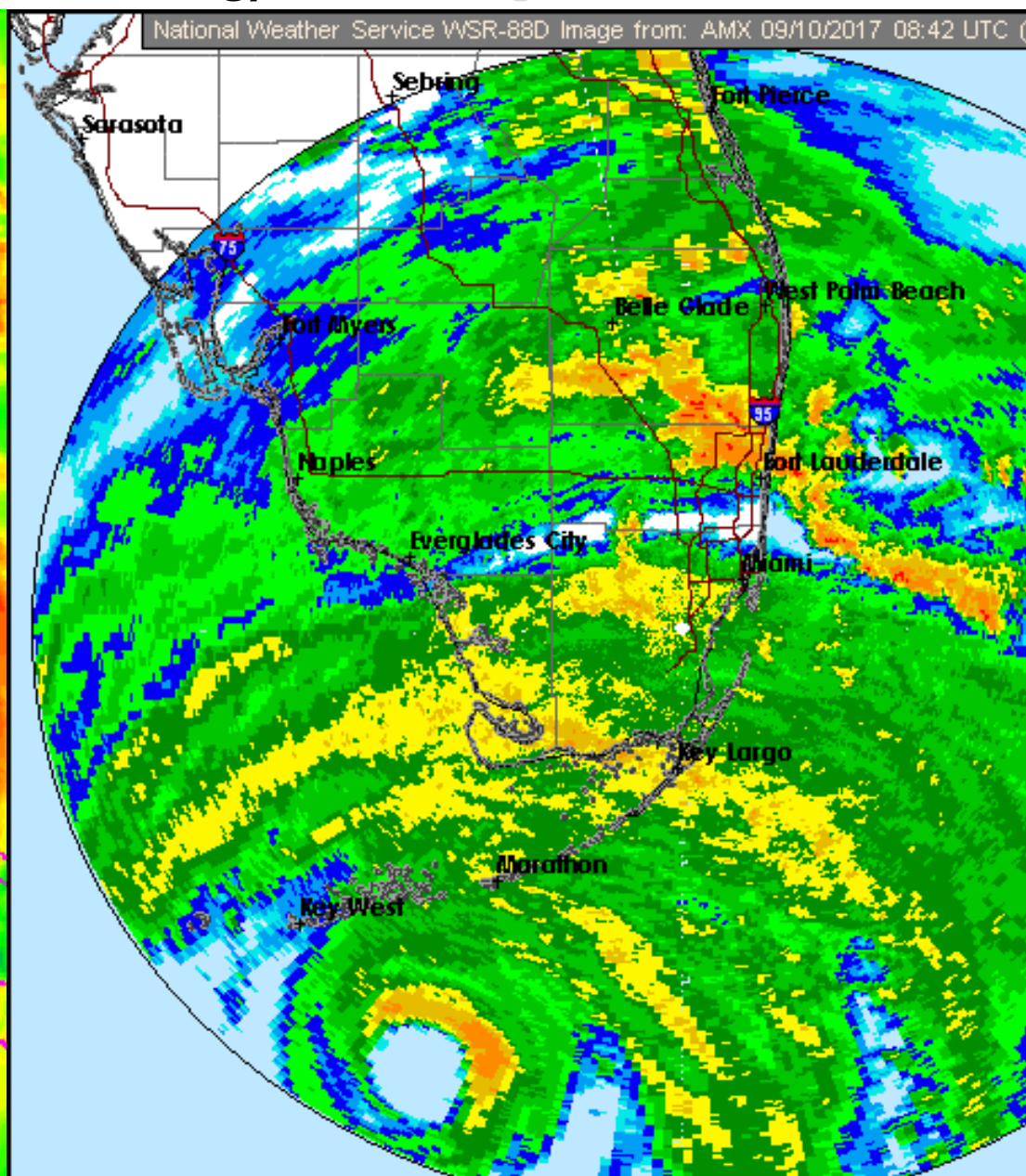
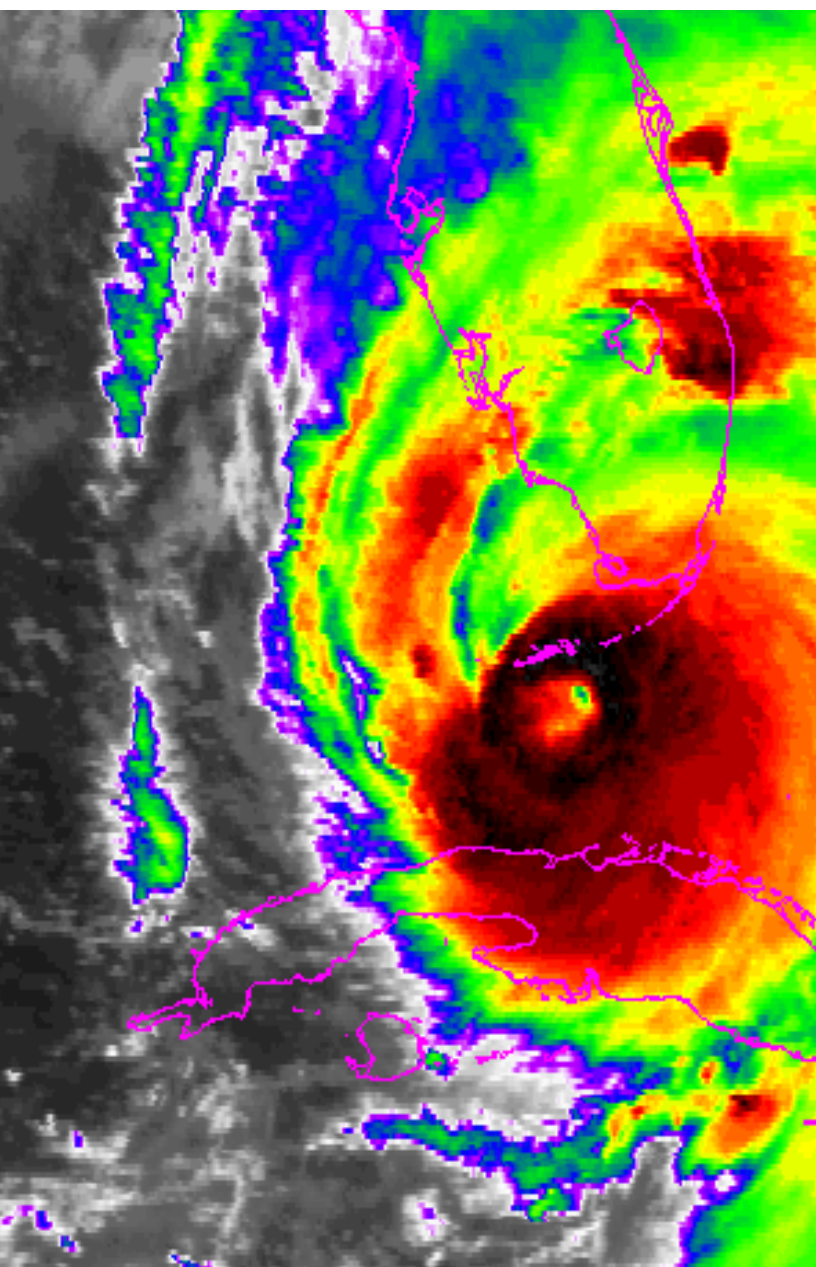
David Sharp
Meteorologist-in-Charge
NWS Melbourne, FL

Pablo Santos
Meteorologist-in-Charge
NWS Miami, FL

Scott Spratt
Warning Coordination Meteorologist
NWS Melbourne, FL



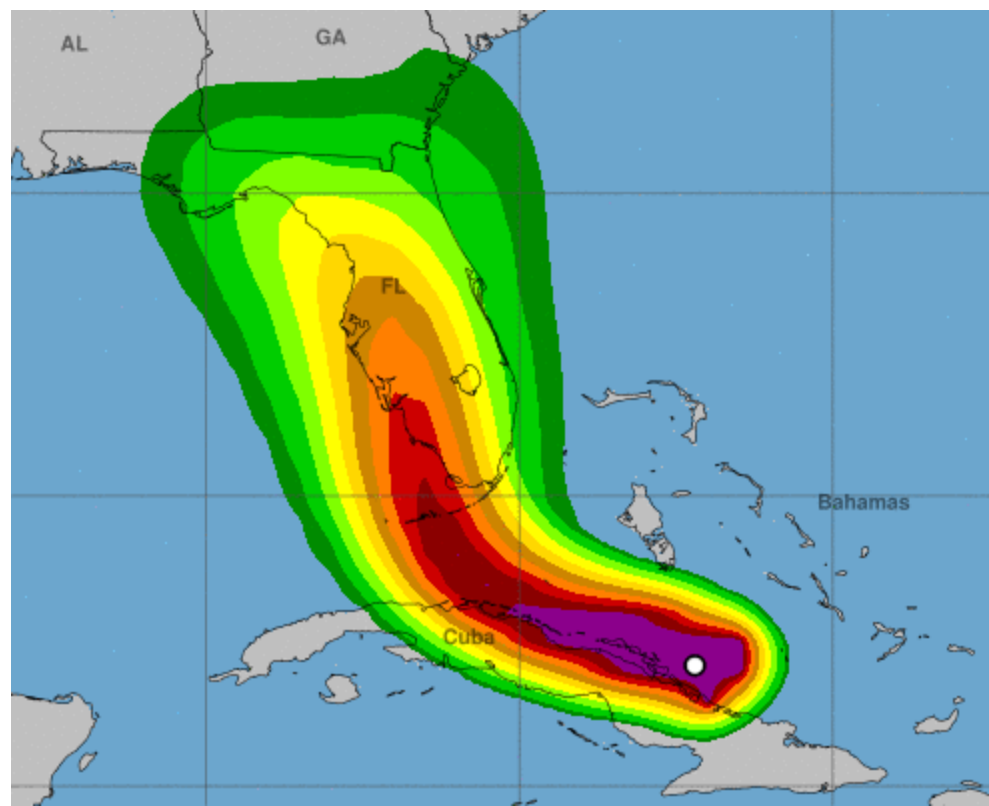
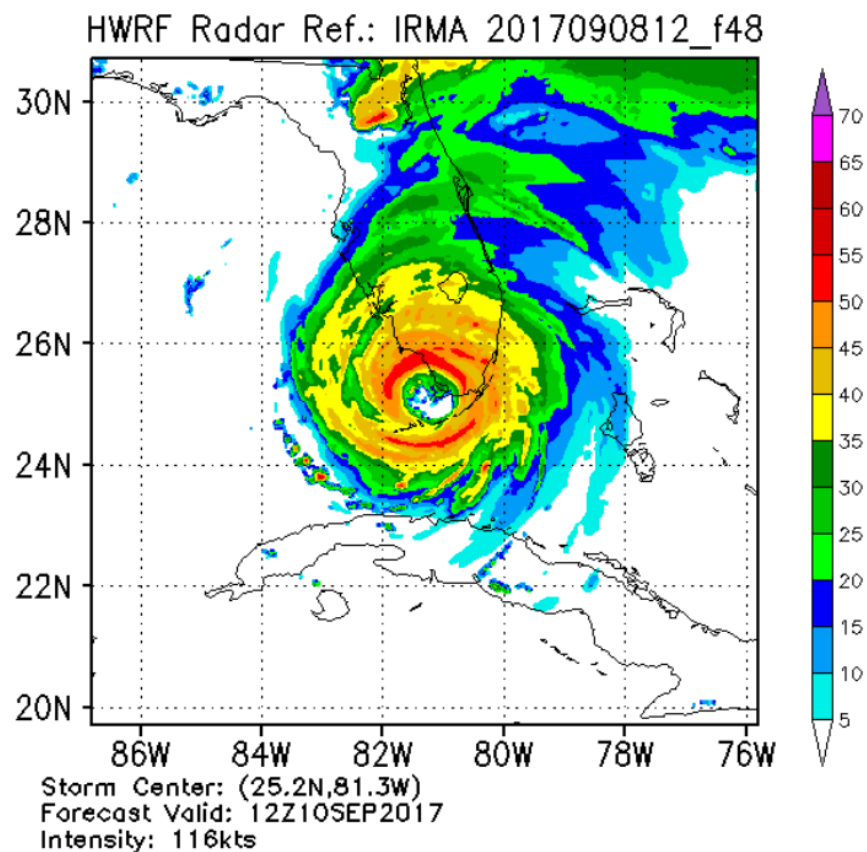
How do we use the best technology, modeling, and science ...



GOES-FLOATER RBTOP IR - SEP 10 17

Warnings: Tornado Severe Thunderstorm Flash Flood Special Marine Extr

How do we use the best technology, modeling, and science ...



to assess the current tropical threat to our communities ...



... and communicate the corresponding impacts to the people!





Communicating Complex Information

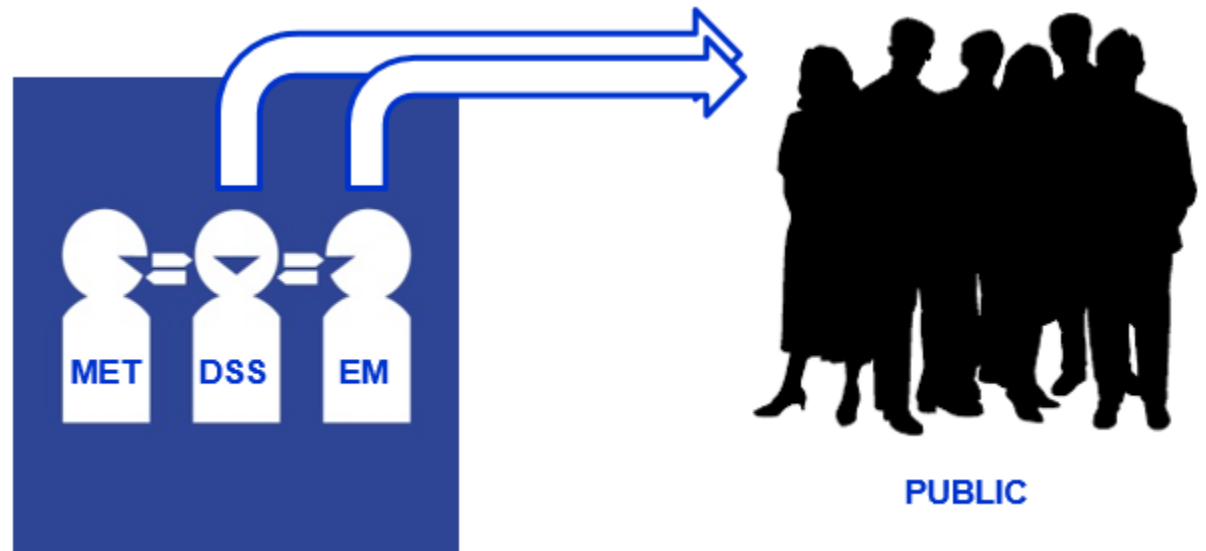
- The majority of NWS partners and customers are not hurricane experts!
- When providing weather information for planning purposes, we must speak their language.

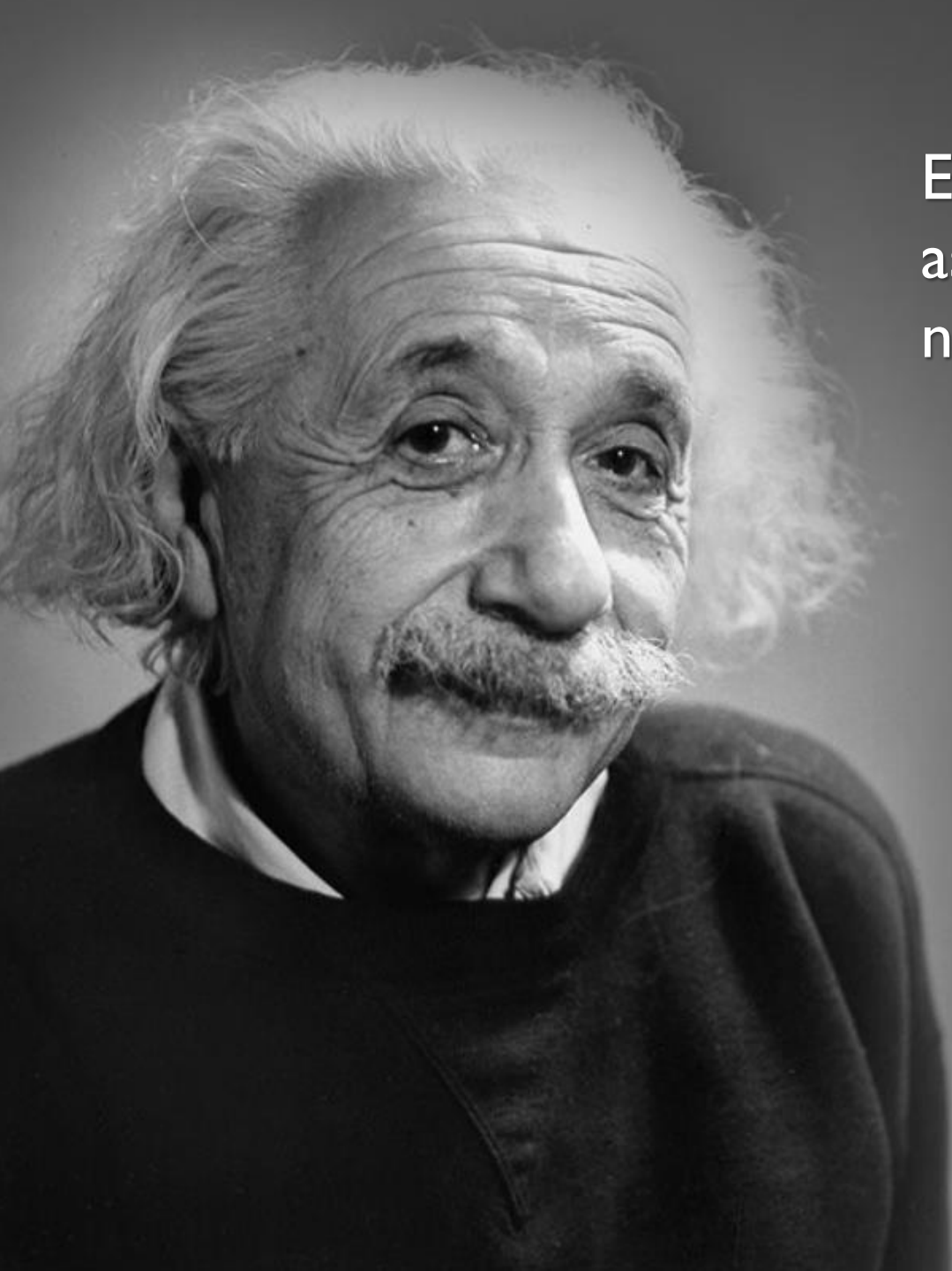




Communicating Complex Information

- Our complex tropical wind information must be:
 - **Distilled** ... *made concise and focused*
 - **Translated** ... *converted to easy to understand language*
 - **Interpreted** ... *meaning maintained and relatable*

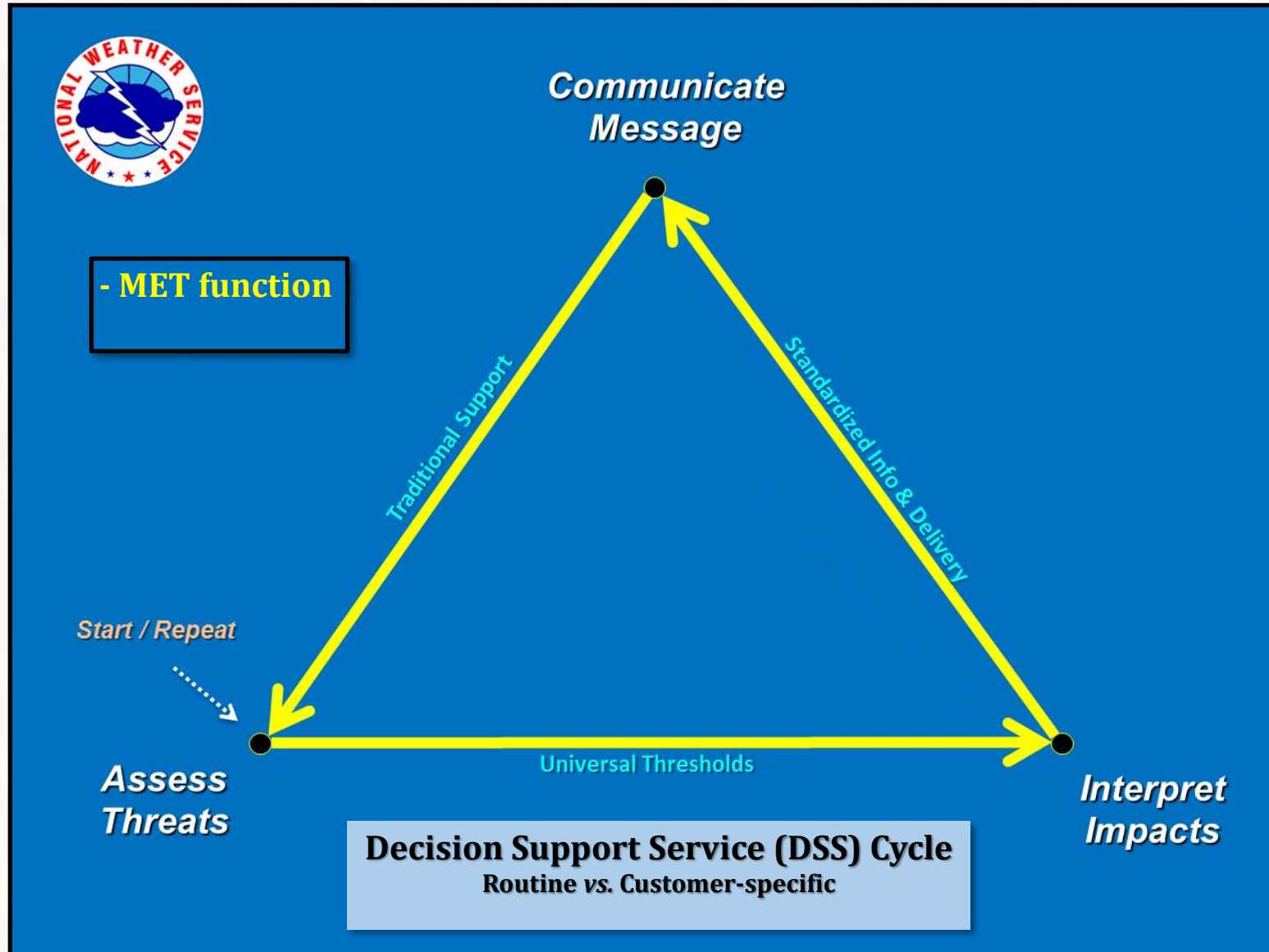




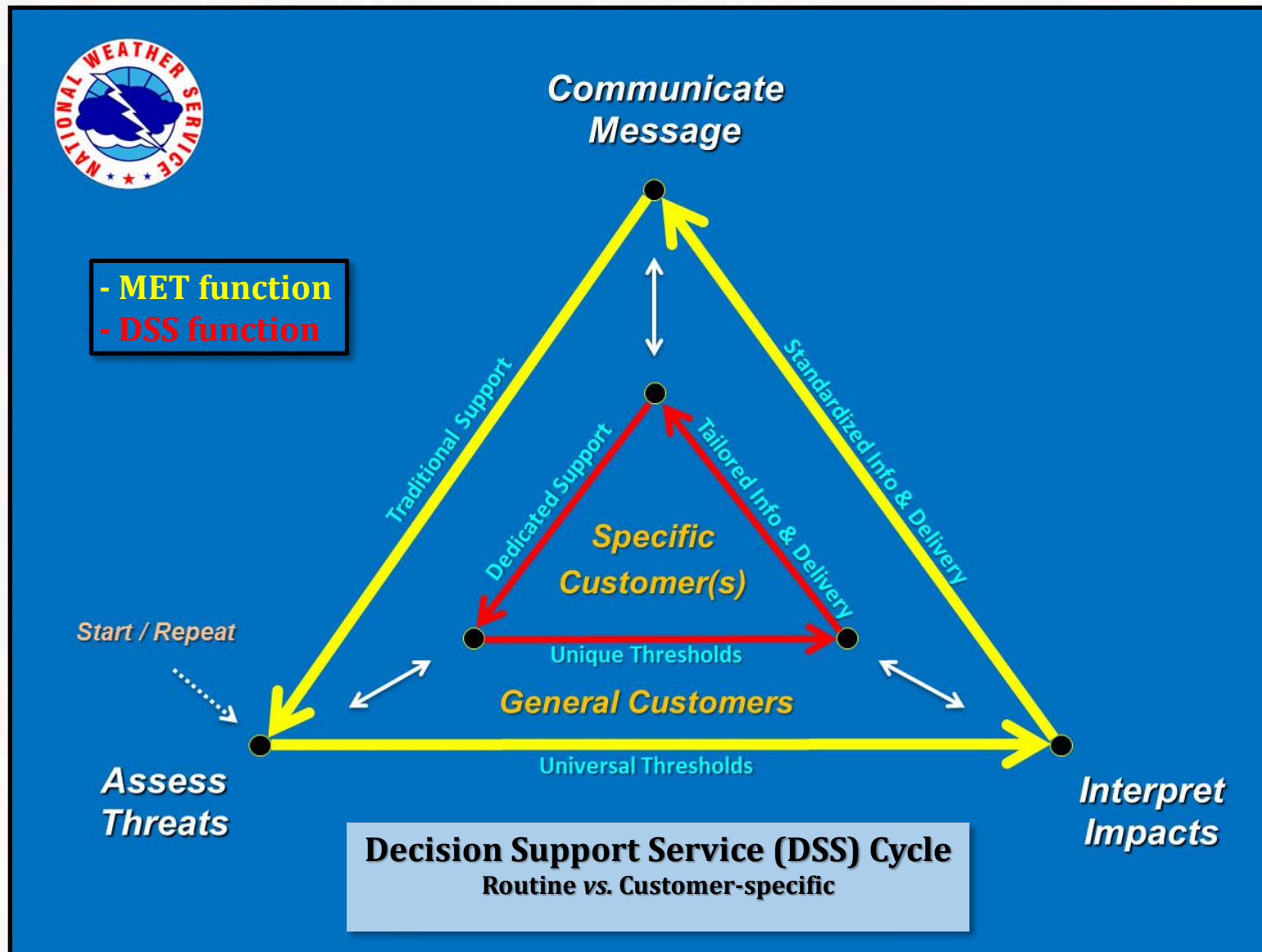
Everything should be made
as simple as possible, but
not simpler.

- Albert Einstein

Crafting the Right Message



Crafting the Right Message



The Tropical Wind Hazard

HURRICANE IRMA
SEP 2017



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

A photograph showing a large, ancient tree with thick, gnarled trunks and a dense network of exposed, reddish-brown roots. The roots are sprawling over a white picket fence and a concrete foundation. In the background, a two-story house with yellow siding and white trim is visible. The house appears to be in poor condition, with a damaged roof and some structural decay. The scene suggests a tropical environment where natural forces like wind and storms can cause significant damage to infrastructure.

CONSIDERATION #1:

To decision-makers,
the WIND hazard is often
the “*modulator*” of a local
tropical cyclone event.



Damaging Winds & Gusts



Tornadoes & Tornadic Waterspouts

CONSIDERATION #2:

To decision-makers, local assessments of the WIND hazard are often thought to contain the collective of wind concerns.

- Plan for Threats
- Prepare for Impacts
- Act on Thresholds

Supporting Both Community Actions & Family Actions

Tropical Wind Messaging

Decision Support Messaging



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

Public Safety Messaging



Targeted - "Who"

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

- Plan for Threats
- Prepare for Impacts
- Act on Thresholds

To get the right people to do the right things at the right times.



The Challenges of Messaging

- Conflicting or ambiguous information leads to confusion
- Confusion inhibits effective decision-making and leads to delayed actions
- Clear, consistent, and unified messaging is key
 - whether internally, or among inter-agencies and the partnership
 - for the benefit of the public



NOAA NWS National Hurricane Center

Now that we have entered the heart of the hurricane season, there is an increase in the Internet hype around disturbances that NHC is monitoring. Given the long lead times involved, the wide range of possible outcomes, and the historically poor and erratic performance of guidance models with weak disturbances, there is no reliable science to forecast potential impacts to specific locations that would be more than a week away.

Nearly every disturbance poses some potential to become a dangerous hurricane. Folks in hurricane-prone areas should always be keeping an eye on the tropics and be prepared to respond when a true threat develops, but also remember the limitations in the science. NHC's forecasts of tropical cyclone formation and track extend out only to 5 days - because the science hasn't advanced enough to reliably forecast beyond that time frame. (We're working on internal forecasts out to 7 days, but we're a ways away from feeling comfortable making them public because the errors can be quite large.)

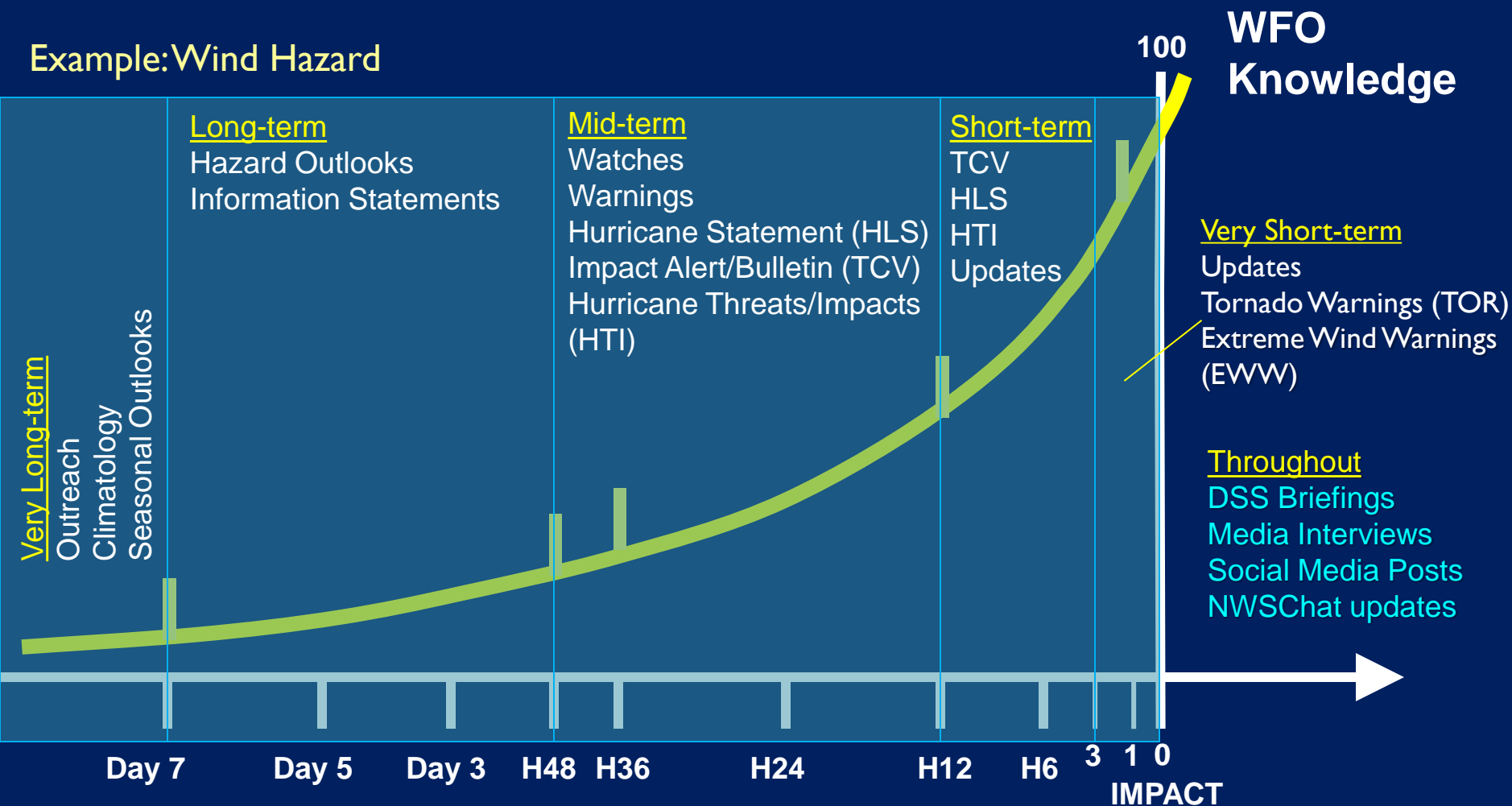
The bottom line really is: be alert, be prepared, but also be wary of long-range projections that go beyond what the science can offer. And make the NOAA National Hurricane Center www.hurricanes.gov your calm, clear, and trusted source for official forecast and warning information on tropical cyclones.

Like · Comment · Share · Yesterday

“The bottom line really is: be alert, be prepared, but also be wary of long-range projections that go beyond what the science can offer.”

Getting the Message Out About Potential Impacts

Example: Wind Hazard



User Needs – Plan/Prepare

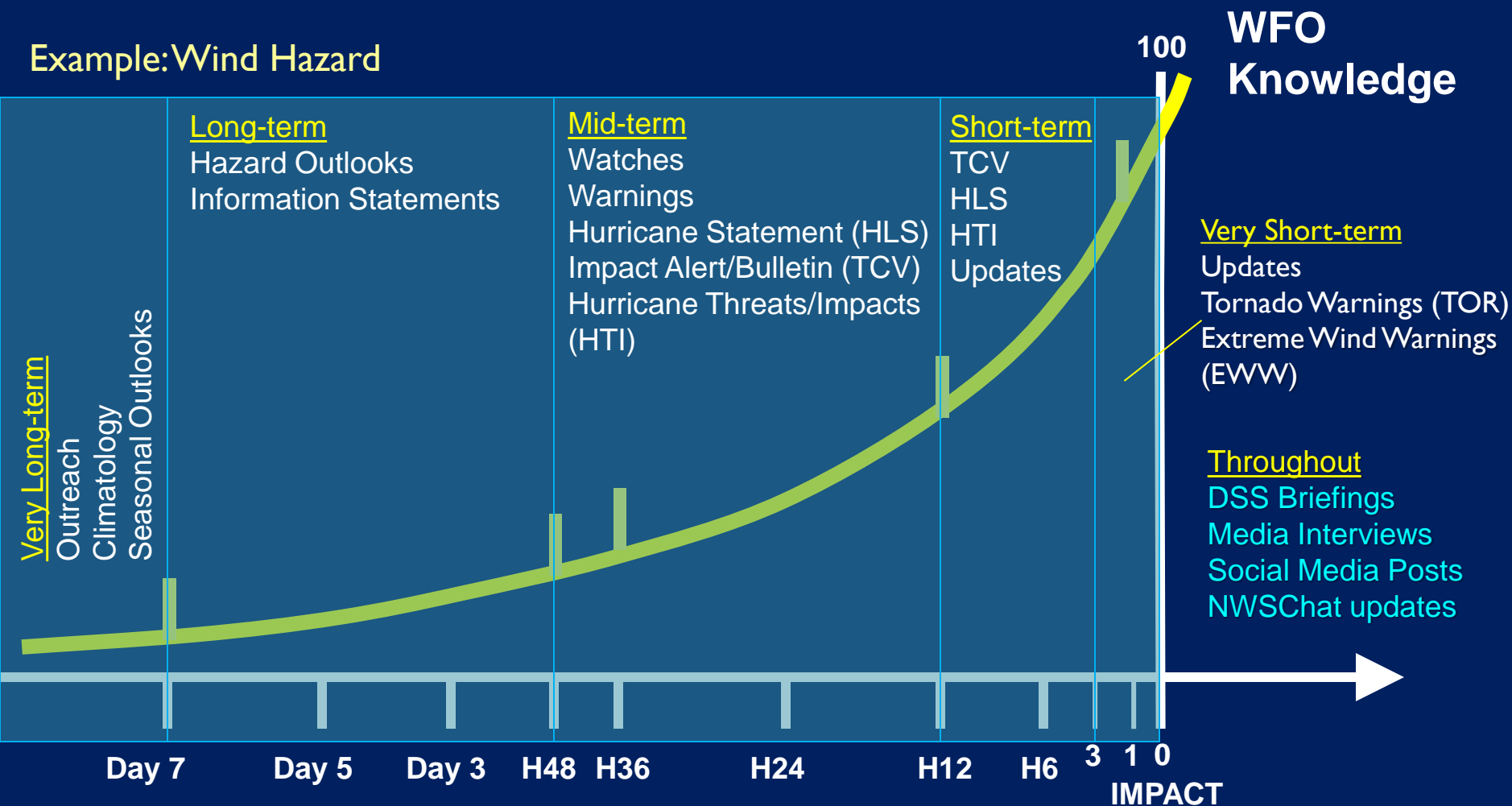
Implement According to Plan

Last
Chance

Recovery

Getting the Message Out About Potential Impacts

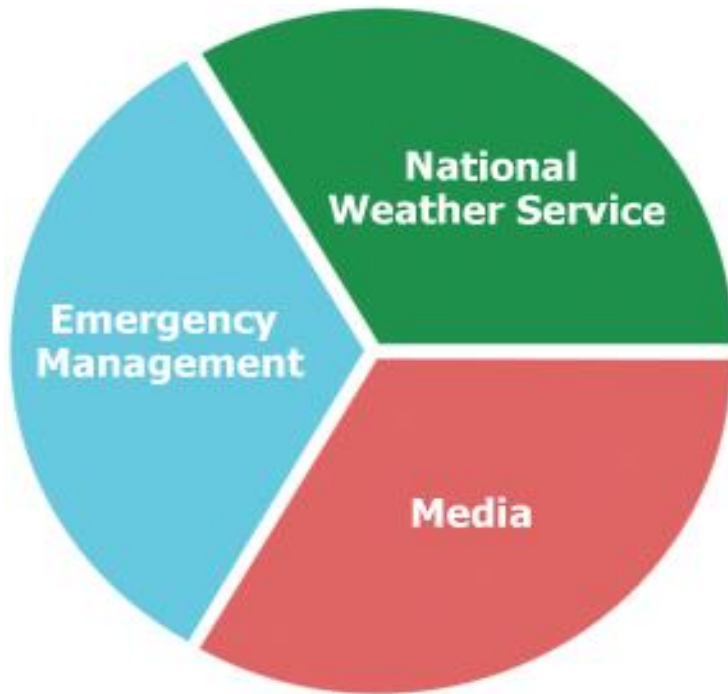
Example: Wind Hazard



Speaking with Increasing Specificity



Public Messaging Challenges



NOAA/NWS values our partner relationships, and being a ***trusted source*** of weather/water information during hurricane emergencies.

Question:

Before tropical winds arrive, which of the following options should you use as your “*planning forecast*” if you want to fully err on the side of caution for safety sake?

- A) The latest official forecast (NHC; NWS)
- B) The most likely alternative scenario
- C) The reasonable worst case scenario
- D) Update from weather app you just found

Question:

Before tropical winds arrive, which of the following options should you use as your “*planning forecast*” if you want to fully err on the side of caution for safety sake?

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- C) The reasonable worst case scenario**
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Latest Official Forecast

Most Likely Scenario

Most Likely Alternate Scenario

Reasonable Worst Case Scenario



Scenario Types for Decision Support

• Latest Forecast

- The “*official forecast*”
- Deterministic
 - implies comparable precision throughout the full forecast window
- Uncertainty NOT taken into account

Orange-Seminole-
Including the cities of Apopka, Maitland, Orlando, Winter Park,
Union Park, Altamonte Springs, Casselberry, Oviedo, Sanford,
and Winter Springs
546 AM EDT Sat Sep 9 2017

...FLOOD WATCH IN EFFECT THROUGH MONDAY EVENING...
...HURRICANE WARNING IN EFFECT...

.TODAY...Mostly cloudy with numerous showers and isolated
thunderstorms. Breezy. Highs in the upper 80s. Northeast winds
15 to 20 mph with gusts to around 30 mph. Chance of rain
70 percent.

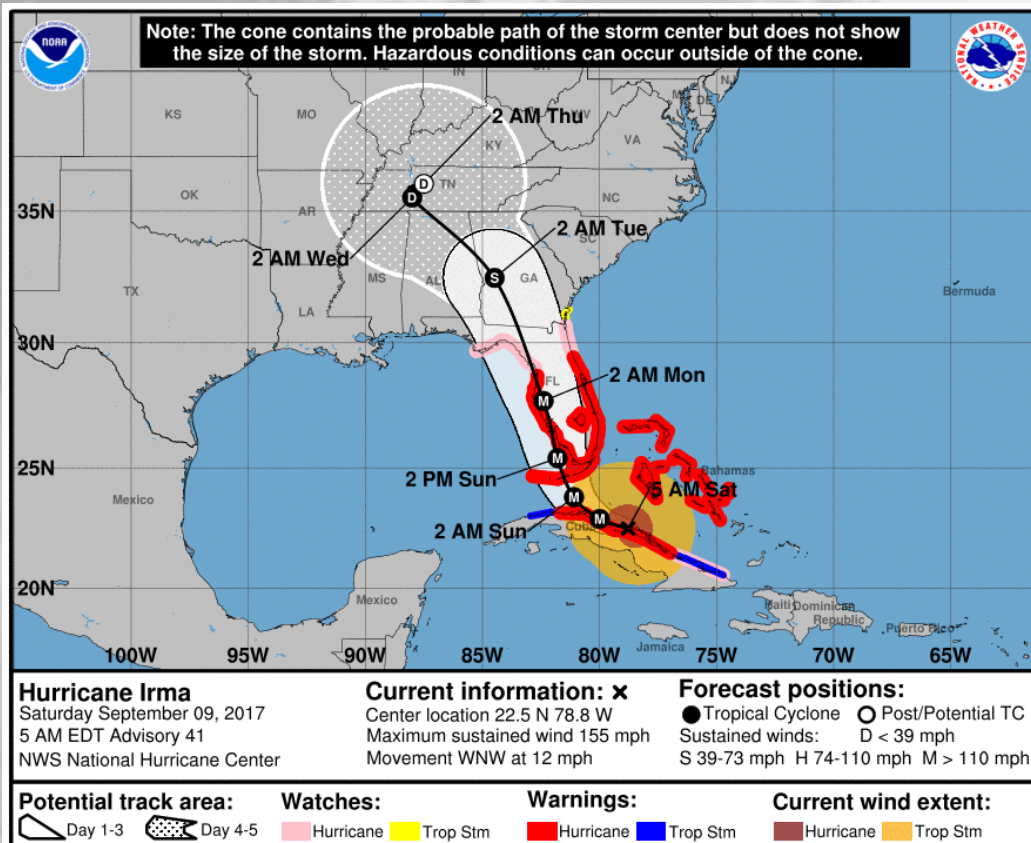
.TONIGHT...Widespread showers and isolated thunderstorms. Windy.
Lows in the upper 70s. Northeast winds 15 to 20 mph increasing to
20 to 25 mph after midnight. Chance of rain 90 percent.

.SUNDAY... Tropical storm conditions expected with hurricane
conditions possible. Widespread showers and isolated
thunderstorms. Locally heavy rainfall possible. Highs around 80.
East winds 25 to 30 mph with gusts to around 45 mph increasing to
35 to 45 mph with gusts to around 60 mph in the afternoon. Chance
of rain near 100 percent.

.SUNDAY NIGHT... Hurricane conditions expected. Widespread
showers and isolated thunderstorms. Locally heavy rainfall
possible. Lows in the mid 70s. East winds 45 to 60 mph becoming
southeast after midnight. Gusts up to 75 mph. Chance of rain near
100 percent.

• Most Likely Scenario

- Typically approximates the latest official forecast
- Mostly deterministic
- An average measure of uncertainty (often) taken into account
 - Partial Accommodation - track vs. intensity, size, and timing errors



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Including the cities of Apopka, Maitland, Orlando, Winter Park, Union Park, Altamonte Springs, Casselberry, Oviedo, Sanford, and Winter Springs
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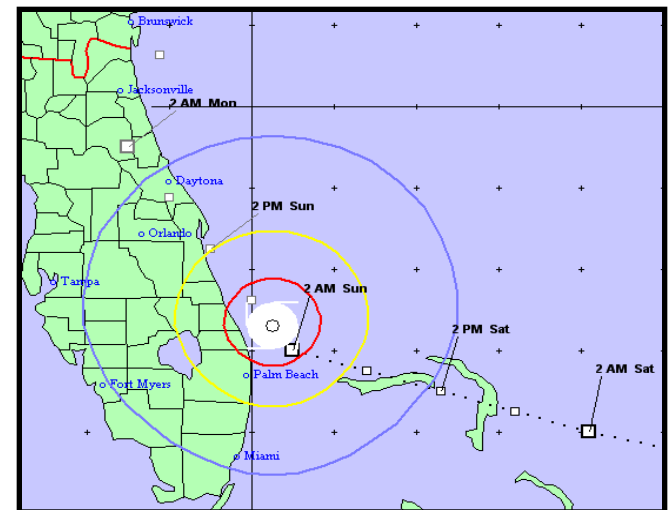
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.SUNDAY NIGHT... Hurricane conditions expected. Widespread showers and isolated thunderstorms. Locally heavy rainfall possible. Lows in the mid 70s. East winds 45 to 60 mph becoming southeast after midnight. Gusts up to 75 mph. Chance of rain near 100 percent.

Messaging Uncertainty

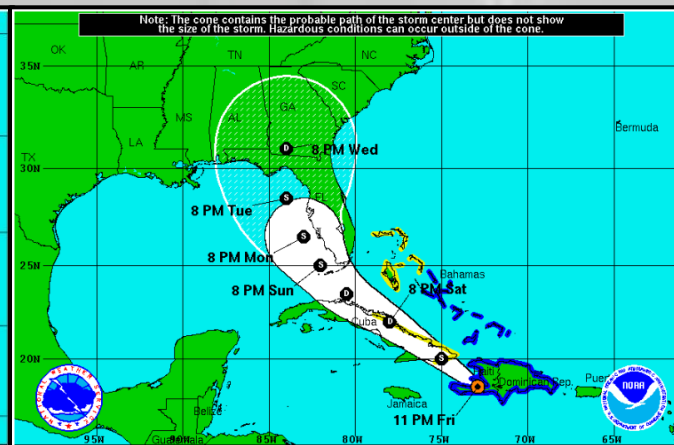
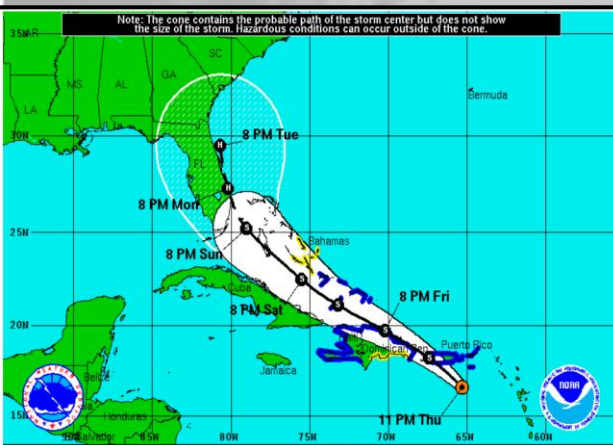
- **IMPORTANT:** The sole use of the latest deterministic forecast and/or the most likely scenario can be problematic for decision-making relative to high impact hurricane wind events, especially in challenging forecast situations.
- Hurricane conditions expected. Periods of showers and a chance of thunderstorms. Heavy rainfall possible. Highs in the mid 80s. North winds 90 to 110 mph with gusts up to 135 mph.

**Sometimes the
risk is too great!**



• Most Likely Alternate Scenario

- The alternative outcome which is next likely to occur if the most likely scenario does not (qualitatively) come to pass
- Situationally recognizes potential for error associated with the latest forecast and/or most likely scenario such that an alternate scenario should also be considered
- Secondary contingent (“what-if”) forecast; situationally used only when needed
- Increased difficulties for planning and messaging

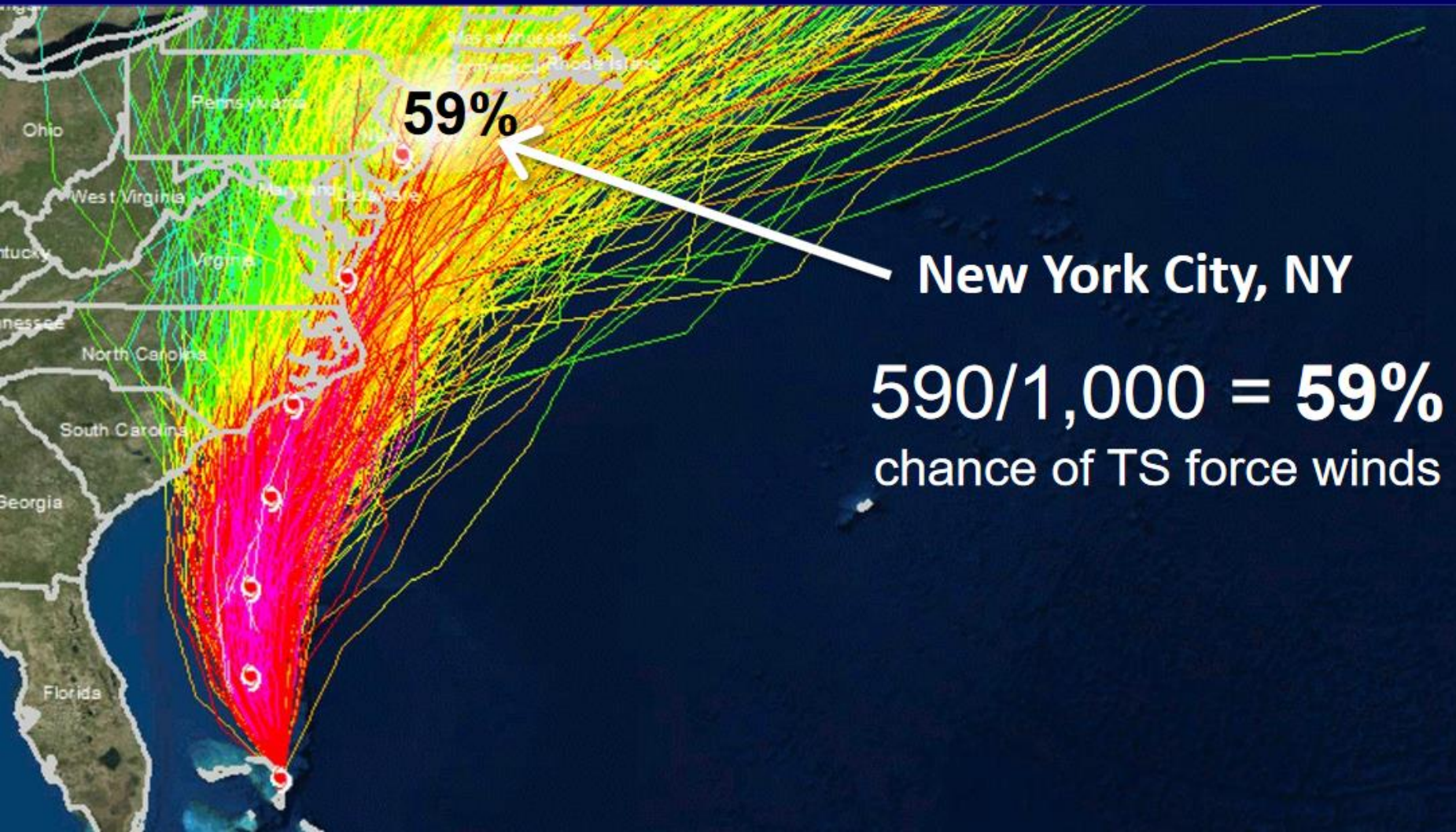


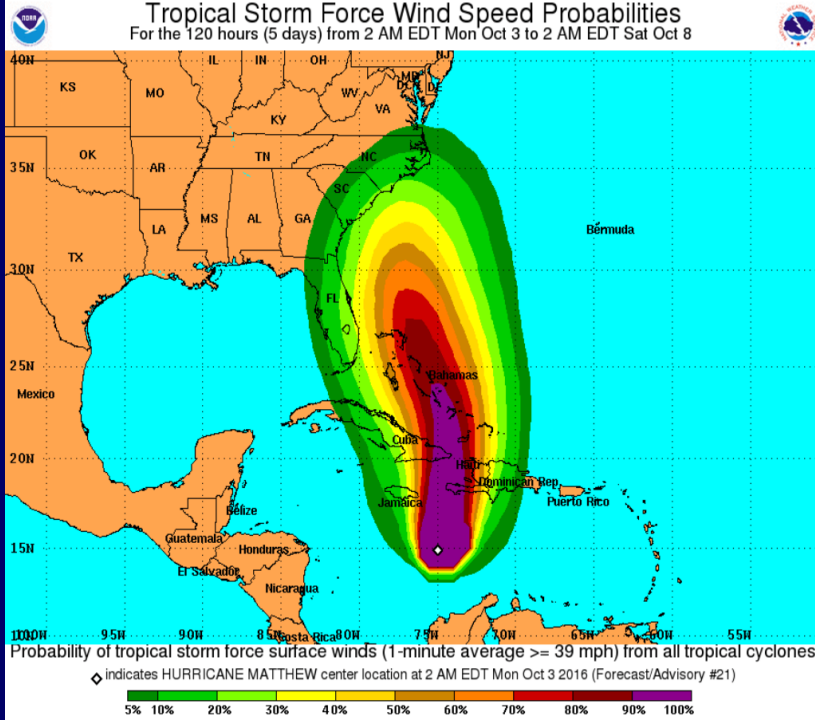
T.S. Erika: degraded to a broad area of low pressure



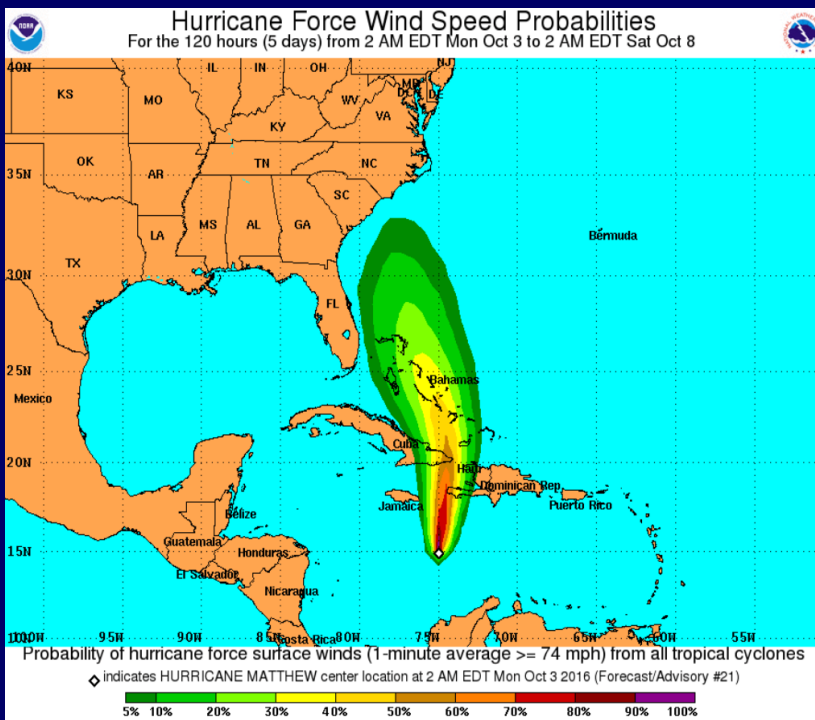
Wind Speed Probabilities

How are they generated?





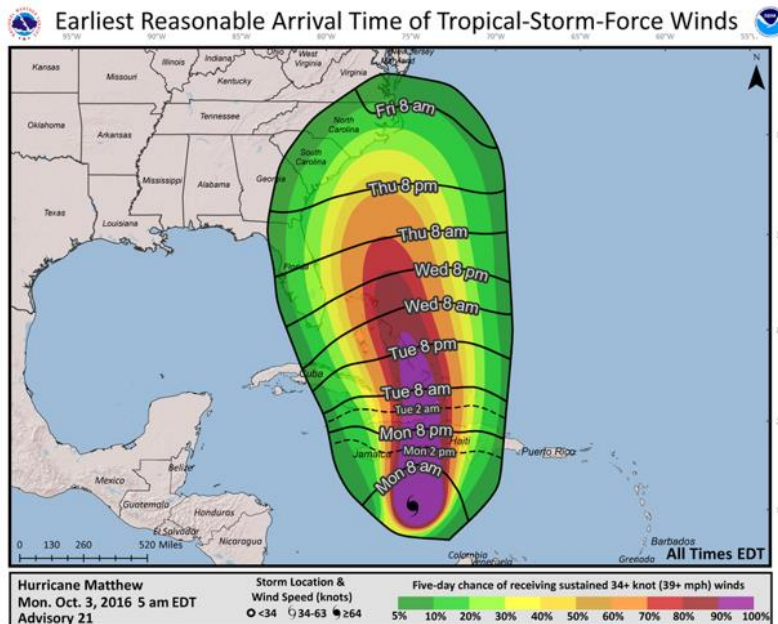
Tropical Storm Force Wind Speed Probabilities



Hurricane Force Wind Speed Probabilities

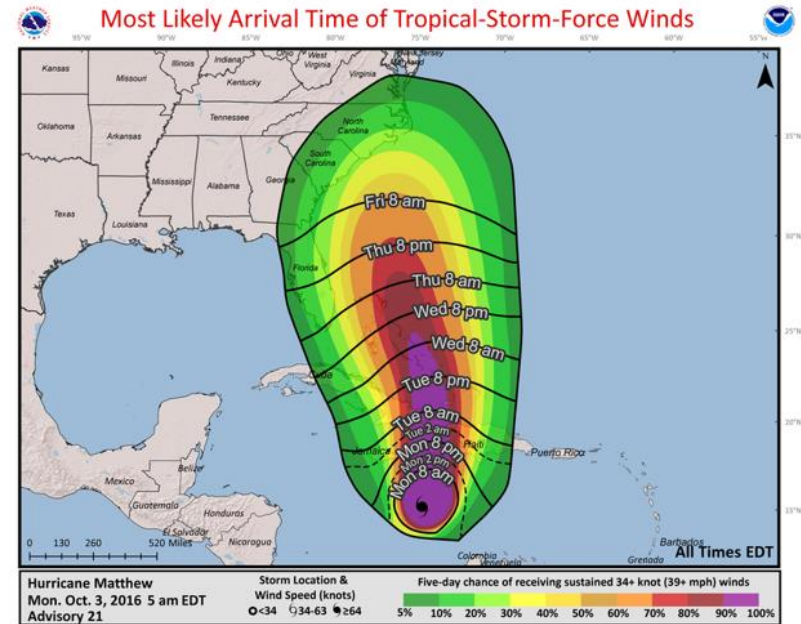
Time of Arrival of Tropical Storm Force Winds

Hurricane Matthew



1-in-10 chance (10%) of arriving earlier

*Emphasize this one,
especially early*



5-in-10 chance (50%) of arriving earlier

*Converge on this one
as event nears*

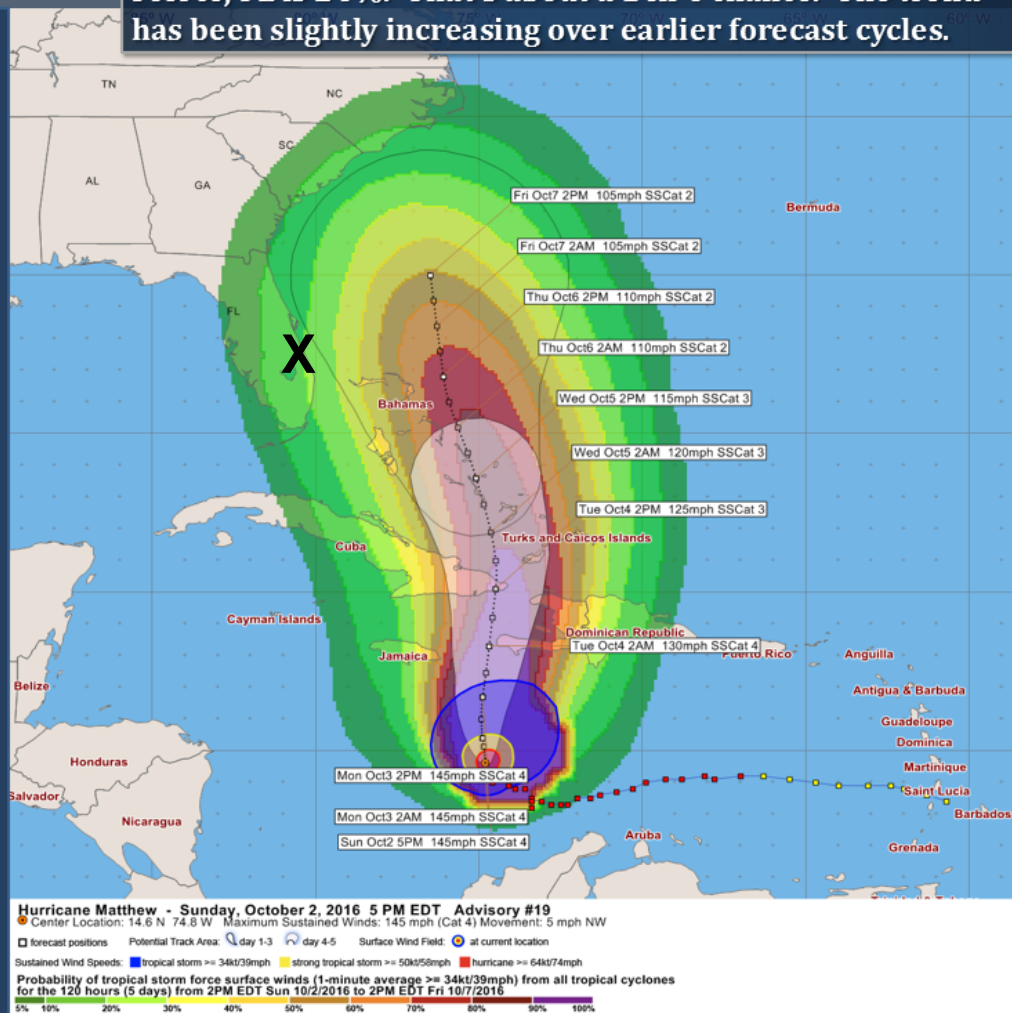




Situation Overview

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.



Melbourne
WEATHER FORECAST OFFICE



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



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October 2, 2016



Situation Overview

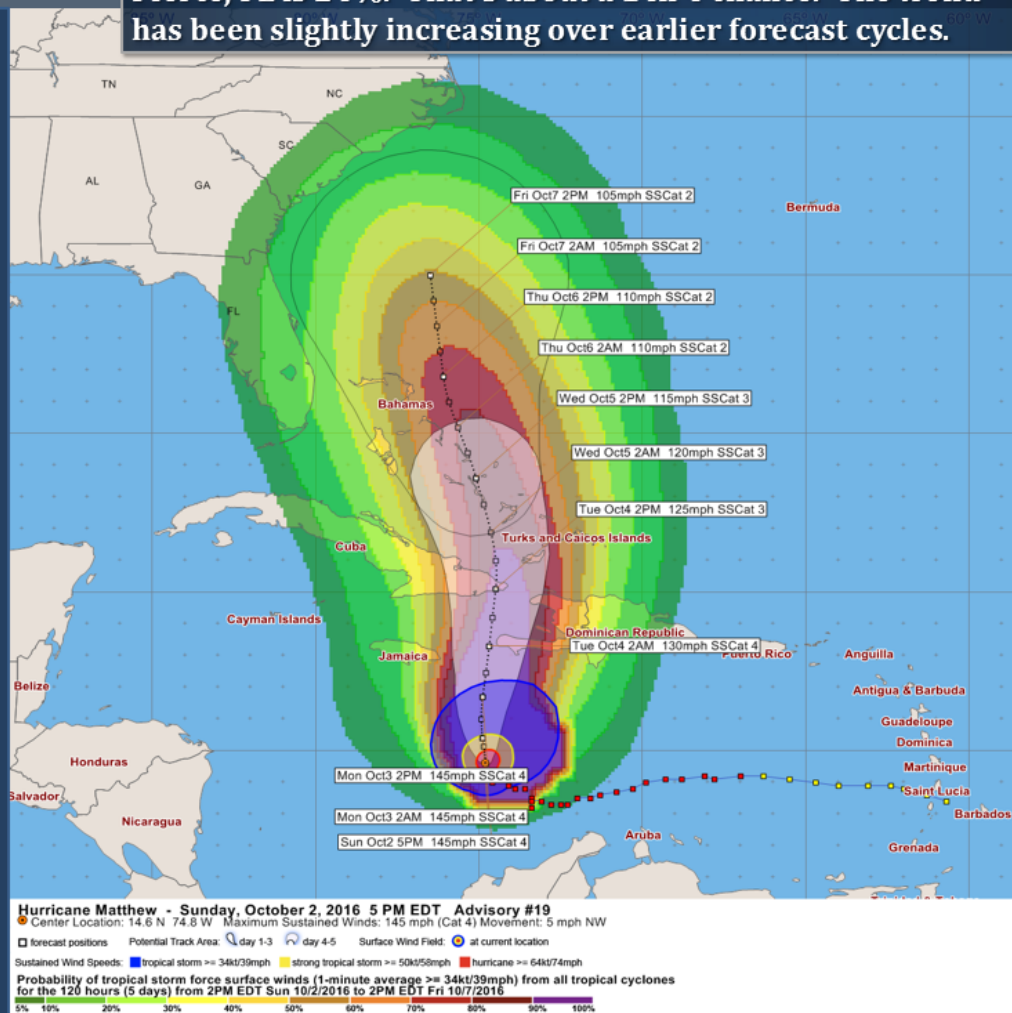
East Central Florida & Adjacent Coastal Waters

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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.

Key Point: It is possible for a major hurricane to be in vicinity of ECFL by mid-late week.



Melbourne
WEATHER FORECAST OFFICE



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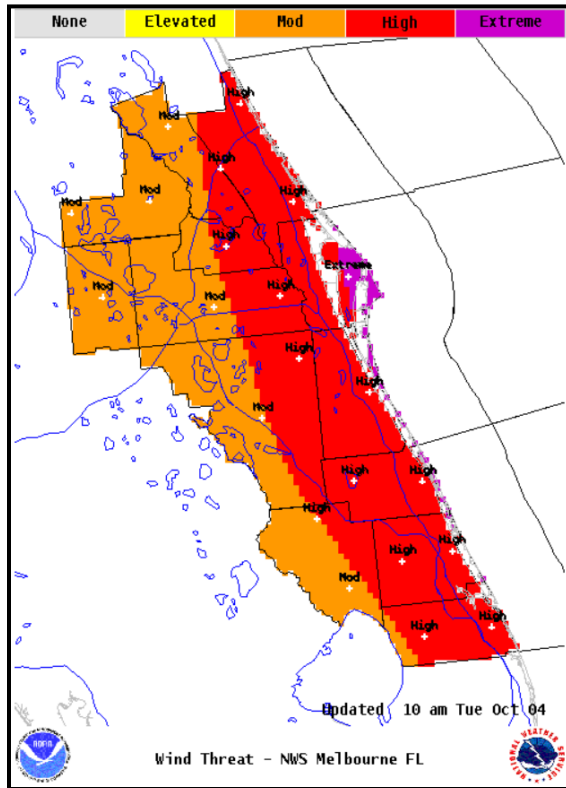
October 2, 2016



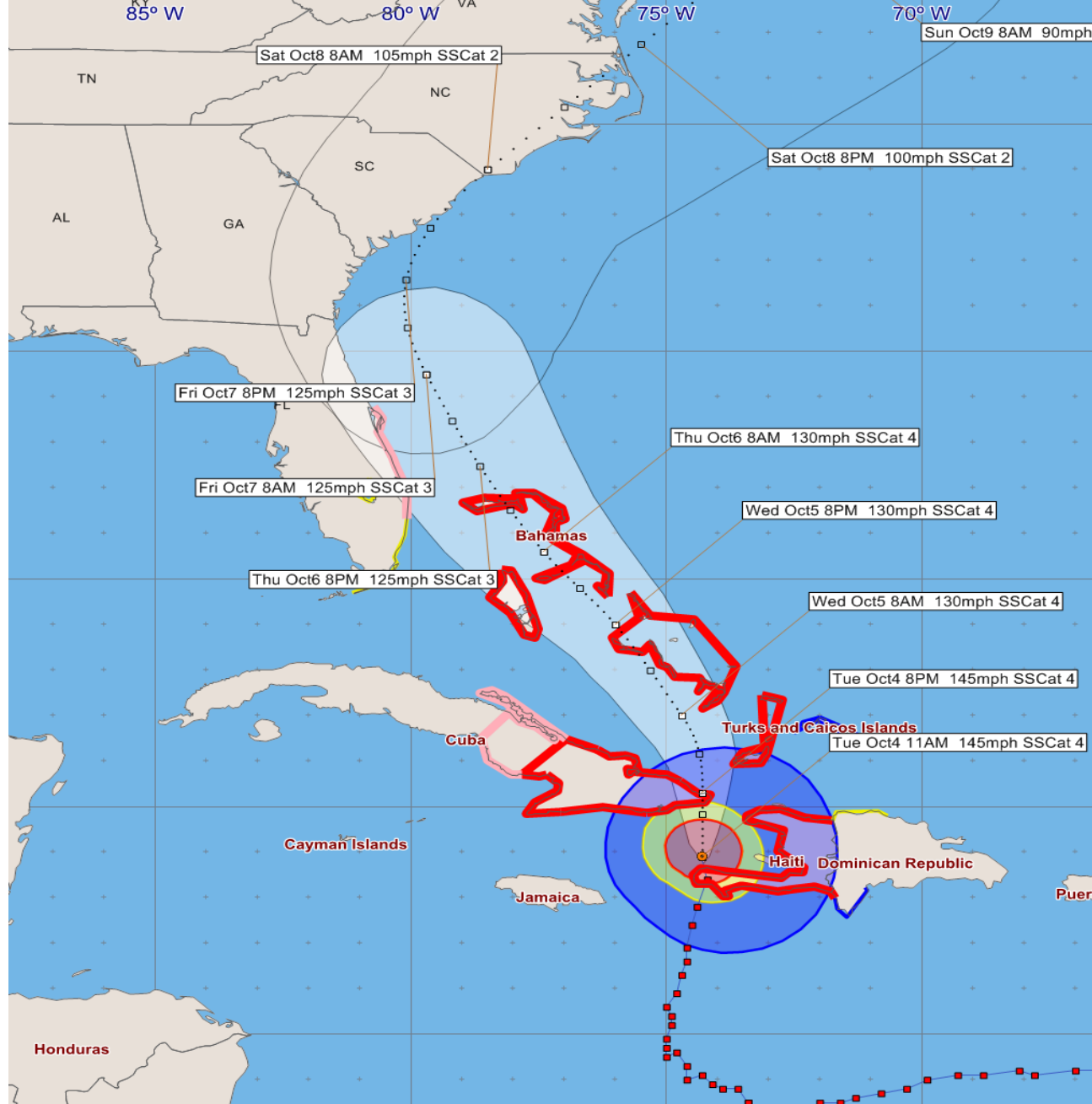
• Reasonable Worst Case Scenario

- Probability-based; defined as having only a 10% probability of being exceeded; location specific
- A “*Safety Margin Forecast*” extended to its widest reasonable extent; the solution of least regret safety-wise
 - Best incorporated into wind (and surge) evacuation planning to err on the side of caution

To be Safe, Prepare for This



Wind Threat
Potential for wind greater than 110 mph
Potential for wind 74 to 110 mph
Potential for wind 58 to 73 mph
Potential for wind 39 to 57 mph
Wind less than 39 mph



Hurricane Matthew - Tuesday, October 4, 2016 11 AM EDT Advisory #26

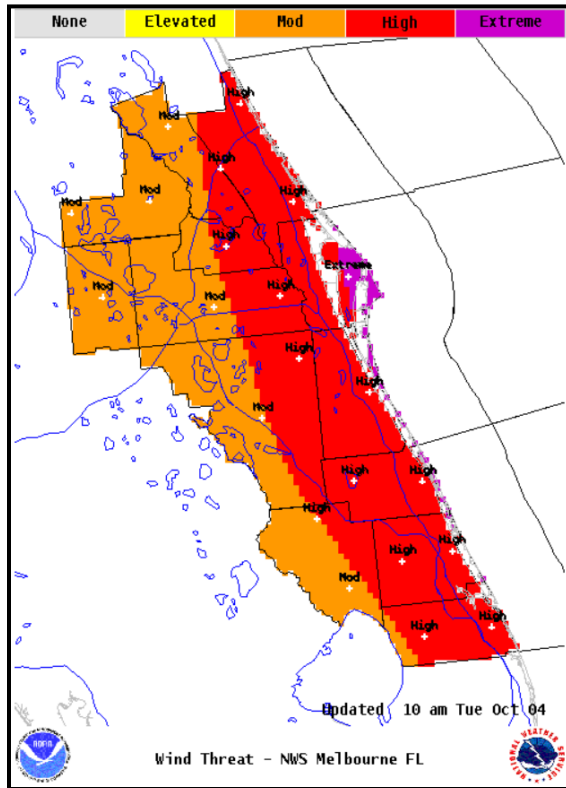
Center Location: 18.9 N 74.3 W Maximum Sustained Winds: 145 mph (Cat 4) Movement: 10 mph N

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 ≥ 34 kt/39mph strong tropical storm ≥ 50 kt/58mph hurricane ≥ 64 kt/74mph

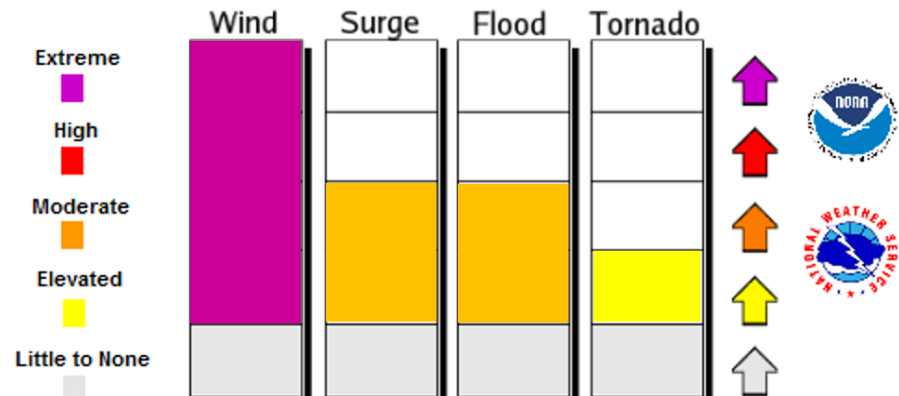
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Wind less than 39 mph

Hurricane Hazards Threat Meter

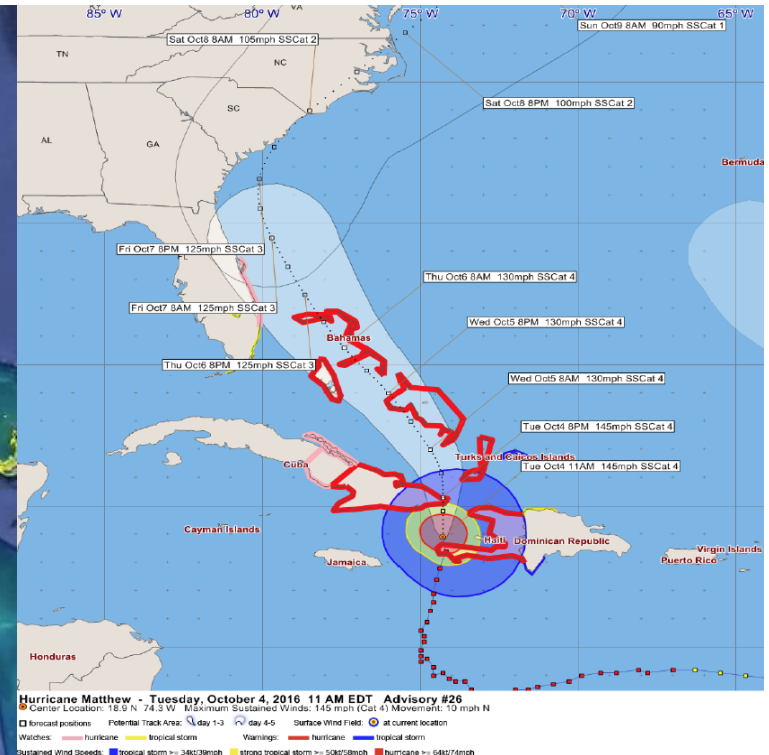
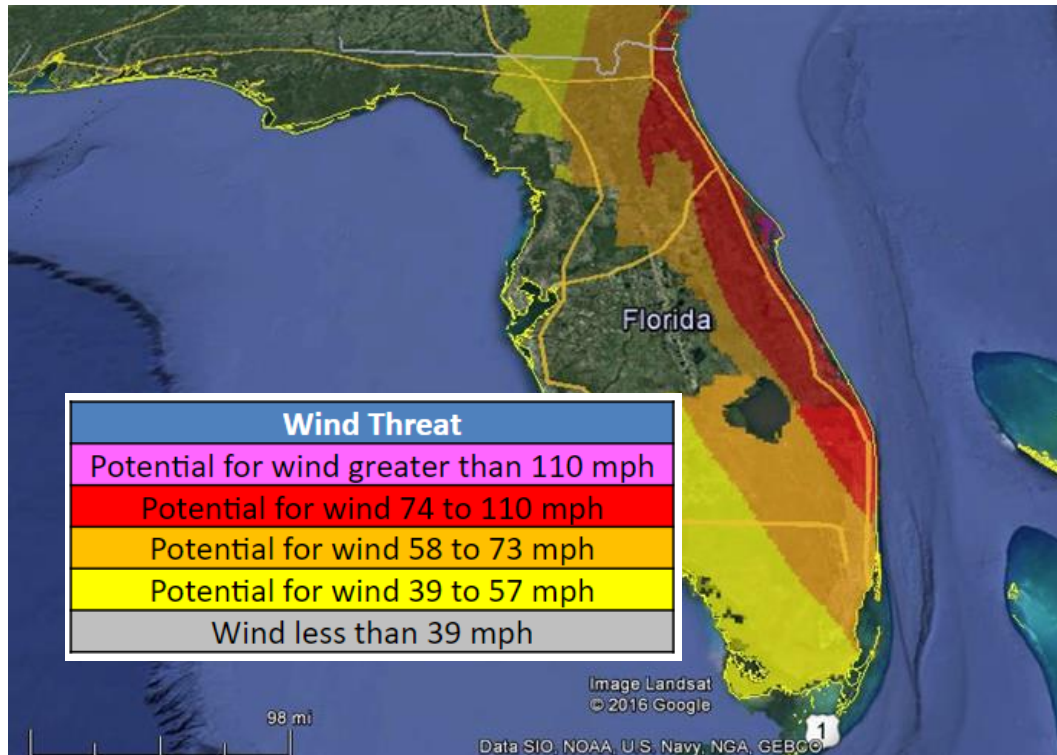
Specific to East Central Florida



Storm: Major Hurricane Matthew

Issued: 11 AM EDT TUE OCT 4 2016

Hurricane Threats and Impacts - Wind Mosaic



Impacts Bulletin (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

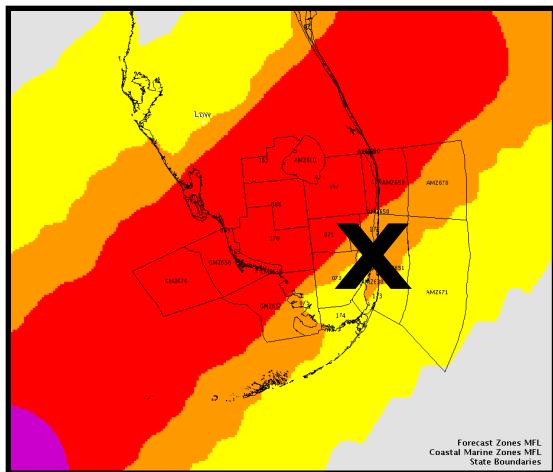
...HURRICANE WARNING IN EFFECT...

- * 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



Most likely outcome
(deterministic forecast)

WTUS82 KMFL 230915

TCVMFL

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WILMA LOCAL WATCH/WARNING STATEMENT/ADVISORY NUMBER 32
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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

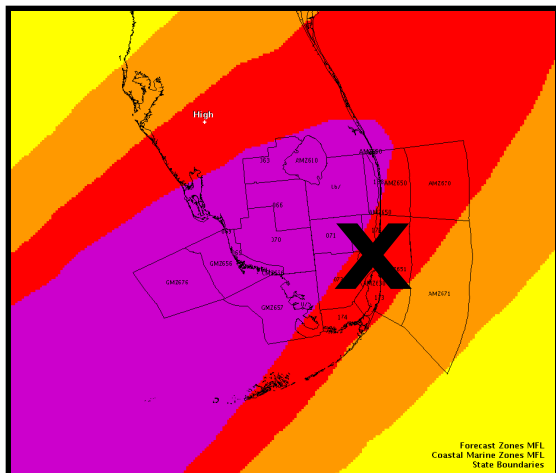
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 - FAILURE TO ADEQUATELY SHELTER MAY RESULT IN SERIOUS INJURY OR LOSS OF LIFE.
- POTENTIAL IMPACTS: EXTENSIVE
 - CONSIDERABLE DAMAGE TO ROOFING AND SIDING MATERIALS OF STURDY BUILDINGS, WITH SOME HAVING WINDOW, DOOR, AND GARAGE DOOR FAILURES LEADING 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



Incorporating uncertainty
(probabilistic forecast)

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

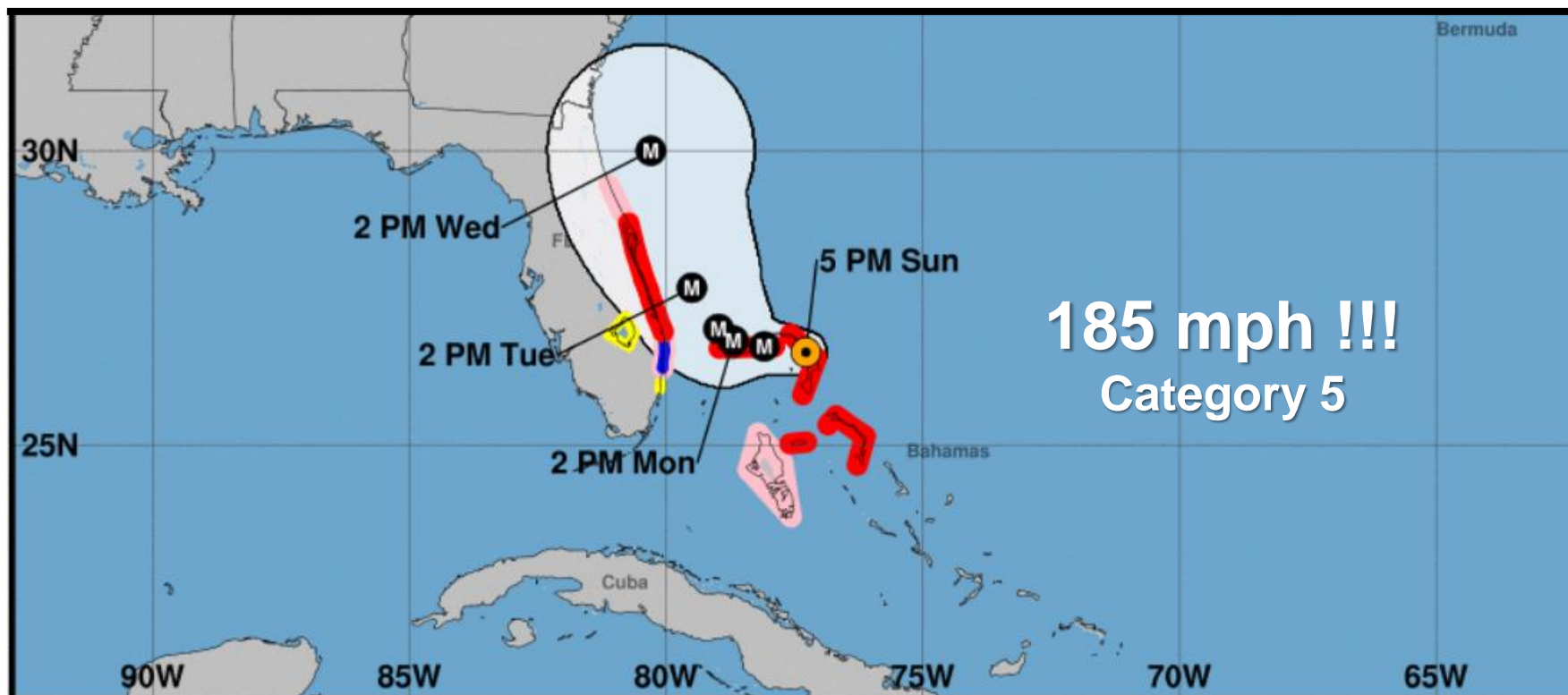
- THREAT TO LIFE AND PROPERTY: HIGH

- 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.
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Hey, my community is being threatened by a major hurricane!



Hurricane Dorian

Sunday September 01, 2019

5 PM EDT Advisory 34

NWS National Hurricane Center

Current information: ●

Center location 26.6 N 77.3 W

Maximum sustained wind 185 mph

Movement W at 5 mph

Forecast positions:

● Tropical Cyclone ○ Post/Potential TC

Sustained winds: D < 39 mph

S 39-73 mph H 74-110 mph M > 110 mph

Potential track area:



Day 1-3



Day 4-5

Watches:



Hurricane



Trop Storm

Warnings:



Hurricane



Trop Storm

Locally, a Hurricane Warning is in effect but hurricane wind speeds are not being forecast, except for gusts.



Martin-

522 PM EDT Sun Sep 1 2019

Martin County Stuart, FL

...HURRICANE WARNING IN EFFECT...
...STORM SURGE WARNING IN EFFECT...

A Hurricane Warning means hurricane-force winds are expected somewhere within this area within the next 36 hours

A Storm Surge Warning means there is a danger of life-threatening inundation, from rising water moving inland from the coastline, somewhere within this area within the next 36 hours

* LOCATIONS AFFECTED

- Stuart
- Hobe Sound

* WIND

- LATEST LOCAL FORECAST: Equivalent Tropical Storm force wind
 - Peak Wind Forecast: 40-50 mph with gusts to 75 mph
 - Window for Tropical Storm force winds: early Monday morning until early Wednesday morning
- POTENTIAL THREAT TO LIFE AND PROPERTY: Potential for wind 74 to 110 mph
 - The wind threat has remained nearly steady from the previous assessment.
 - PLAN: Plan for life-threatening wind of equivalent CAT 1 or 2 hurricane force due to possible forecast changes in track, size, or intensity.
 - PREPARE: Remaining efforts to protect life and property should be urgently completed. Prepare for considerable wind damage.
 - ACT: Move to safe shelter before the wind becomes hazardous.
- POTENTIAL IMPACTS: Extensive
 - Considerable roof damage to 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. 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 impassable.
 - Large areas with power and communications outages.

Florida's Space & Treasure Coasts

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So, to what extent should local wind preparations be made to remain safe?



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Florida's Space & Treasure Coasts

- **WIND**



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Threat Statements:

Actionable information that is proportional to the threat and according to phase of the event.

Each message is sculpted within 140 characters or less.





Threat Statements:

Actionable information that is proportional to the threat and according to phase of the event.

- **Media Sound Bites**
 - Interviews; Products/Services
- **Social Media Posts**
 - FaceBook; Twitter; Instagram
- **Facilitate Media Messaging**
 - NWSChat; TV Crawls
- **Facilitate EM Messaging**
 - Smart Devices/Signs
 - IDSS Briefings



In more relatable terms, what are the potential impacts that should be protected against?



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Florida's Space & Treasure Coasts

• **WIND**

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Florida's Space & Treasure Coasts

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Structural Damage

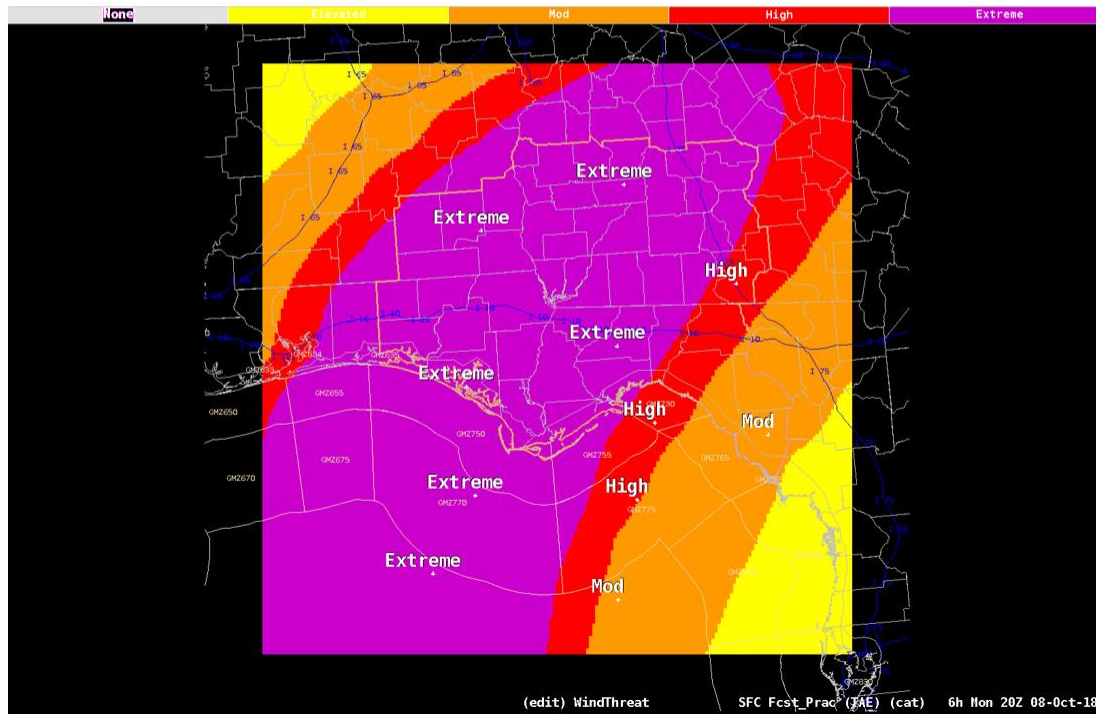
Trees & Foliage

Roads & Bridges

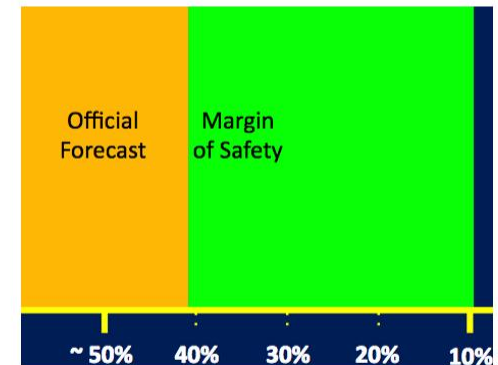
Essential Utilities



Probabilities & the Safety Margin

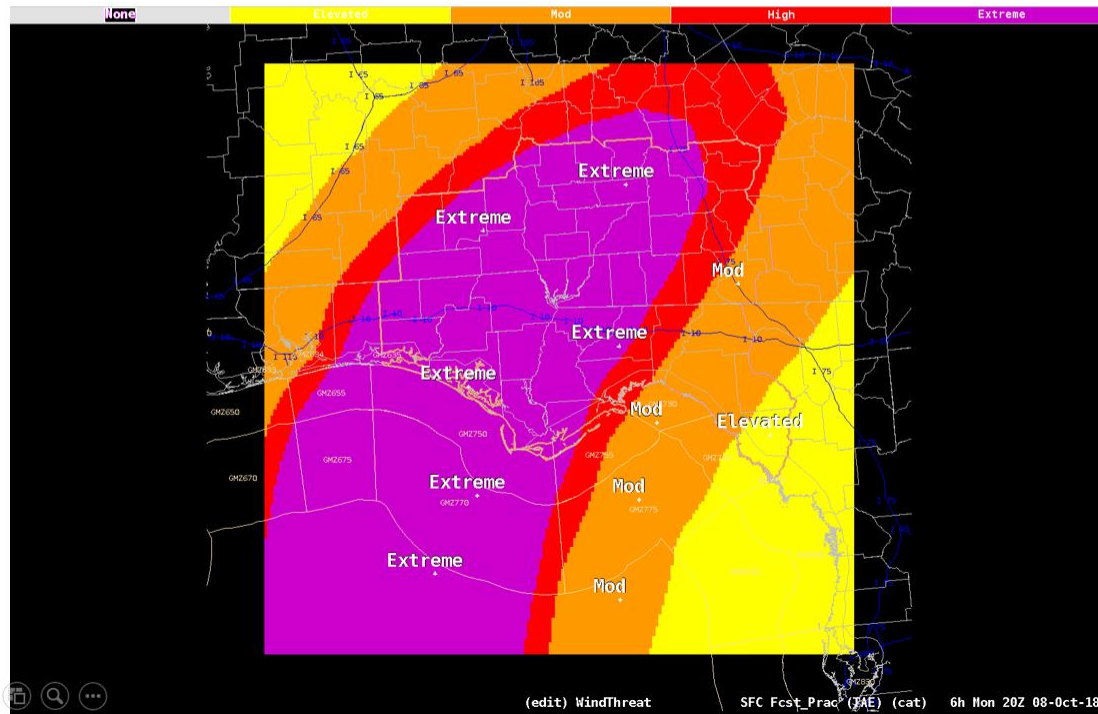


10% Exceedance

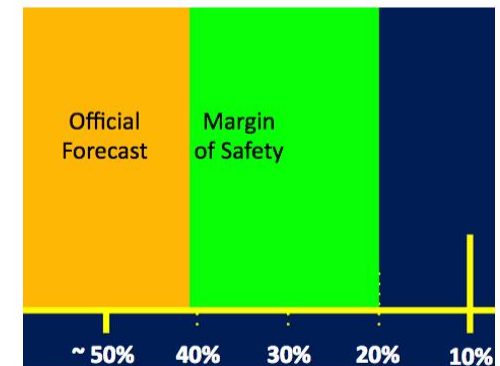




Probabilities & the Safety Margin

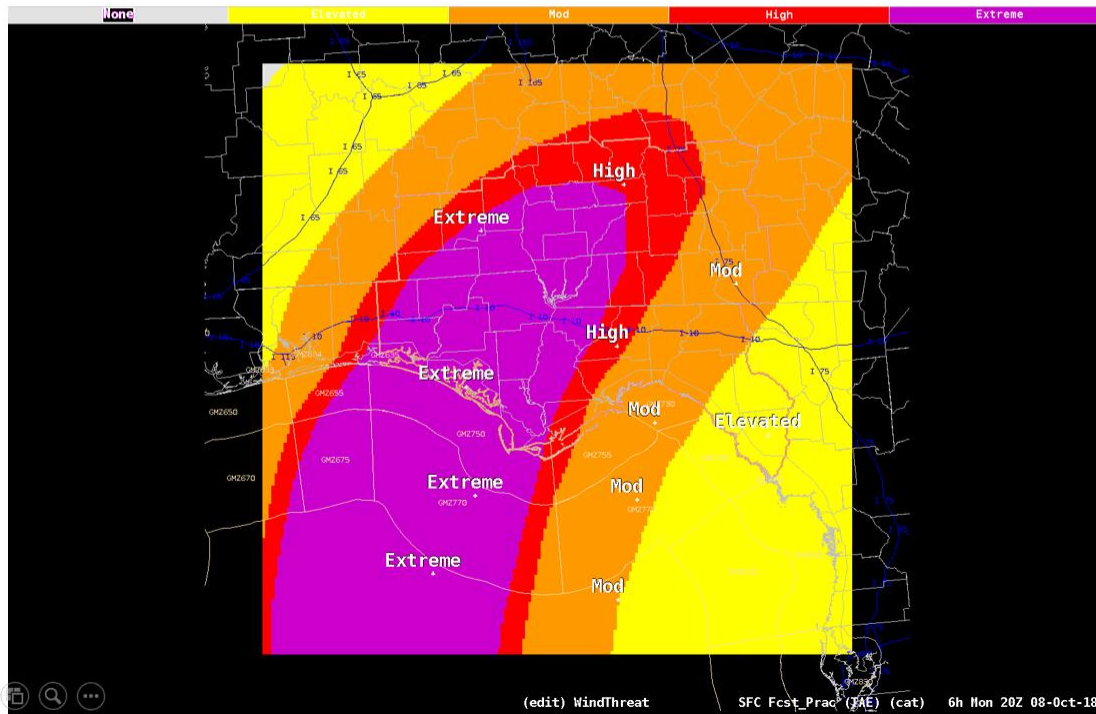


20% Exceedance

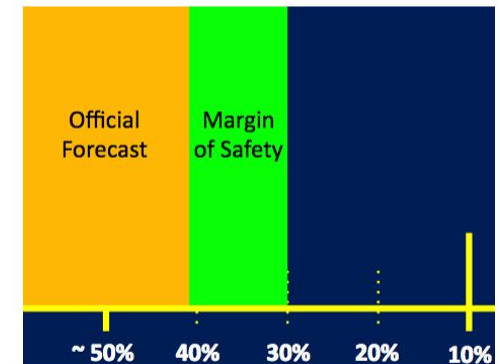


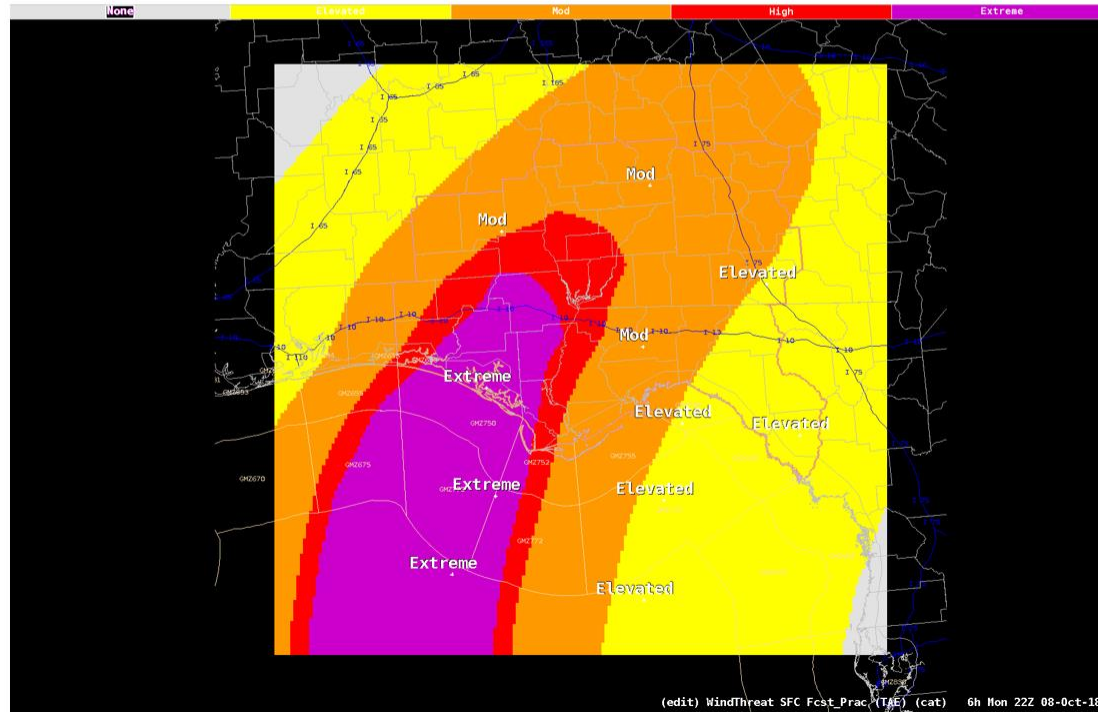


Probabilities & the Safety Margin



30% Exceedance





Question:

For each County/Zone, what tropical wind information is included within the TCV text product?

- A) The latest official forecast**
- B) The reasonable worst case scenario**
- C) The corresponding potential impacts**
- D) All of the above**

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For each County/Zone, what tropical wind information is included within the TCV text product?

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NWS Southern Region Tropical Webpage

[Weather.gov](#) > [Southern Region Headquarters](#) > NWS Southern Region Tropical Webpage

Southern Region Headquarters

Regional Headquarters

[Local Forecast Offices A-L](#) [Local Forecast Offices M-Z](#) [River Forecast Centers](#) [Center Weather Service Units](#) [Regional HQ](#)

[National Hurricane Center homepage](#)

[Provide Feedback on this Webpage](#)

[Outlook](#)

Threats and Impacts

[Satellite](#)

[Radar](#)

[Social Media](#)

[Preparedness](#)

[Links](#)

Hurricane Threats and Impacts Graphics FAQ

Graphics are for areas subject to active tropical cyclone wind and/or storm surge watches and warnings.

What are the Hurricane Threats and Impacts (HTI) Graphics?

HTI graphics are issued by local Weather Forecast Offices (WFOs) when tropical cyclone (i.e. hurricane or tropical storm) wind watches and warnings, and/or storm surge watches and warnings, are in effect for at least part of their land area of responsibility. Once available, they are updated by respective WFOs with each new forecast issued by the National Hurricane Center (NHC) or Central Pacific Hurricane Center (CPHC) and maintained until the threats of these hazards have locally passed. Any departure in the forecast from the actual track, size, or intensity of a hurricane can dramatically change its impacts. Through the implicit use of probability data, color-coded HTI graphics depict the potential conditions to protect against with accompanying descriptions of potential impacts needed for effective preparations. The HTI graphics account for the latest forecast at specific locations while also including a reasonable safety margin to account for any forecast errors.

What hazards are described by the HTI Graphics?

Tropical wind, storm surge, flooding rain, and tornadoes are the hazards addressed within the HTI graphics suite. Figure 1 (below) offers an example of each hazard-based HTI graphic with the NHC Cone Graphic superimposed (from Hurricane Irma, 2017). Since the Cone Graphic only reveals the most probable track of the center of the storm, it provides little to no information about projected impacts. The HTI graphics, however, show the geographic extent of associated hazards; their level of threat and potential impacts. Impacts often extend well-beyond the area depicted in the Cone Graphic alone. The HTI color-scale corresponds to increasing levels of threat and is graduated from warm to hot colors.

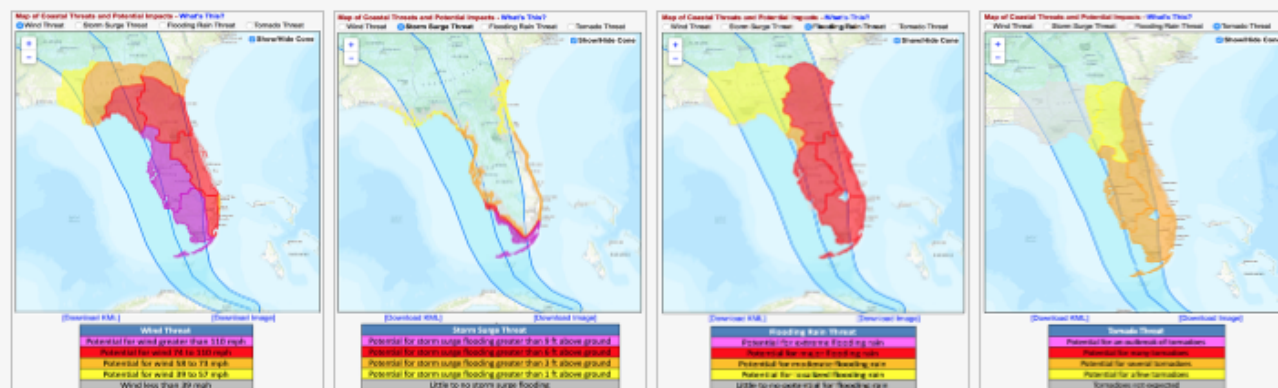


Figure 1. Example of HTI Graphics for the tropical wind, storm surge, flooding rain, and tornado hazards (left to right) from Hurricane Irma (2017).

Regional Mosaics: *Provision of HTI in the 48-72 hour time frame*

Criteria:

- Whenever the Day 3 Error Cone has overspread any part of a WFO's land-based CWA for at least two consecutive advisories, and the forecast trend continues to increasingly favor some measure of local impacts.


= O R =

- Whenever the Days 1-3 Composite Excessive Rainfall Outlook shows at least a marginal risk of excessive rain associated with a tropical cyclone.

IDSS Briefing Summary:

- for inclusion within text products
- for inclusion within media exchanges
- for inclusion within social media posts

Some Things You Should Know
Hurricane Irma

 **Melbourne**
WEATHER FORECAST OFFICE

- **Hurricane Irma is powerful and very dangerous !!!**
 - Forecast to move WNW toward the Florida Straits during remainder of this week
 - Forecast to then turn toward the N placing it in vicinity of ECFL this weekend
- **Hurricane Watches may be needed as early as tomorrow in ECFL.**
 - Becoming increasingly breezy/windy with dangerous surf conditions Thursday and Friday
 - Tropical storm conditions could arrive as early as Saturday
- **It is too early to determine specific impacts.**
 - Potential impacts from high wind, storm surge, flooding rain, and tornadoes are all concerns
 - Listen for changes in the forecast as the event unfolds

Public Safety Message: "Stay informed of the latest situation regarding very dangerous and powerful Hurricane Irma. Review your family emergency plan, and be ready to act if tropical watches or warnings are issued for your area."

9/6/2017 11:30 AM For East Central Florida & Adjacent Coastal Waters www.weather.gov/melbourne



Fact Sheet:

Extreme Hurricane Winds



Near Port Charlotte, FL after Hurricane Charley (2004)

Major hurricanes ... contain extreme winds greater than 110 mph of Category 3, 4, or 5 intensity. Located within the core of the storm, winds of such incredible speeds are highly destructive. When they threaten, aggressive actions must be taken to protect life and property. Hurricane Andrew (1992) is the archetype example. Andrew's extreme winds (165 mph; Category 5) battered South Florida, crippling the towns of Homestead and Florida City. Damage associated with a Category 3 hurricane can be devastating, but with a Category 4 or 5 hurricane damage can be catastrophic.

When extreme winds blow, people should take cover in the safest place within their shelter, taking the same protective actions as if threatened by a violent tornado.

Recent Florida hurricanes ... which contained extreme winds of historical impact include:

- Hurricane Charley (2004)
- Hurricane Ivan (2004)
- Hurricane Jeanne (2004)
- Hurricane Wilma (2005)
- Hurricane Matthew (2016)
- Hurricane Irma (2017)
- Hurricane Michael (2018)



When extreme winds arrive in your town ...

Lives are greatly imperiled

Skies become filled with flying debris

Damage is devastating to catastrophic

Emergency response becomes difficult

Numerous rescues likely

Community infrastructure collapses

Recovery is much longer

Extreme Wind Warnings are issued at the imminent onset of extreme hurricane winds as a last chance to save lives.



Near Orlando, FL after Hurricane Charley (2004)

National Weather Service
Melbourne, FL

www.weather.gov/mlb/

Fact Sheets

Pre-made hand-outs;
ready to give to reporters





Website:
NWS/WFO Melbourne, FL

Social Media: Partnering with Emergency Management



MYTH "BREVARD COUNTY DOESN'T GET HURRICANES; THAT'S WHY THEY PUT THE KENNEDY SPACE CENTER HERE..."



FACT 40 TROPICAL STORMS AND HURRICANES HAVE PASSED WITHIN 50 MILES OF CAPE CANAVERAL SINCE 1850. REMEMBER, HURRICANES ARE **NOT** SINGLE POINTS!

 **Melbourne**
WEATHER FORECAST OFFICE

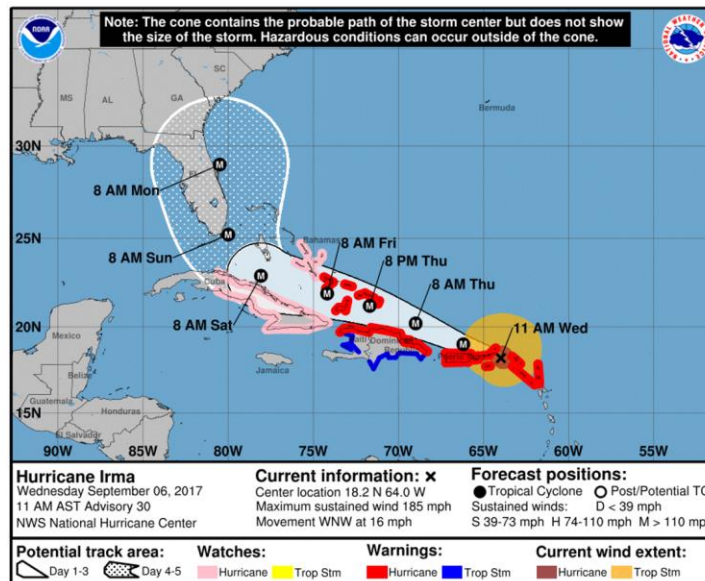
WWW.WEATHER.GOV/MELBOURNE
WWW.EMBREVARD.COM

 **brevard**
COUNTY
Emergency Management

Debunking Myths

Some Things You Should Know

Hurricane Irma



NOTE: Do not focus on the exact forecast track. Impacts can occur well outside the area enclosed by the forecast error cone.

The Latest Situation:

- Hurricane Irma is very dangerous and powerful, and moving this way.
- Locally, hurricane watches may be needed as early as tomorrow.
- It's too early to determine exact impacts.

Public Safety:

Stay informed of the latest situation. Review your family emergency plan, and be ready to act if tropical watches or warnings are issued for your area.

9/6/2017 11:30 AM

For East Central Florida & Adjacent Coastal Waters

www.weather.gov/melbourne



NWS Melbourne @NWSMelbourne · Sep 6

Hurricane Irma is moving this way. If you don't have an emergency plan, visit Ready.gov for more information.

Hurricane Irma: Have a Plan; Be Prepared.

Floridians:

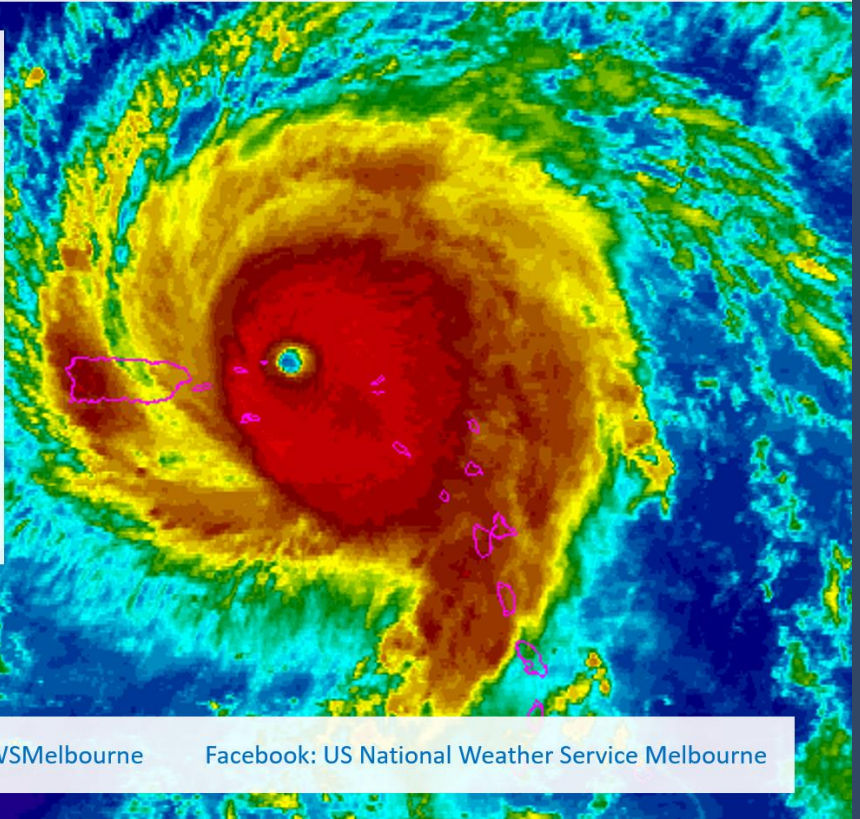
- ✓ Stay informed to the latest forecast
- ✓ Review your family emergency plan
- ✓ Check your emergency kit for completeness
- ✓ Stock up on needed hurricane supplies
- ✓ Be ready to act

For more information visit:
Ready.gov



Twitter: @NWSMelbourne

Facebook: US National Weather Service Melbourne



NWS Melbourne @NWSMelbourne · Sep 6

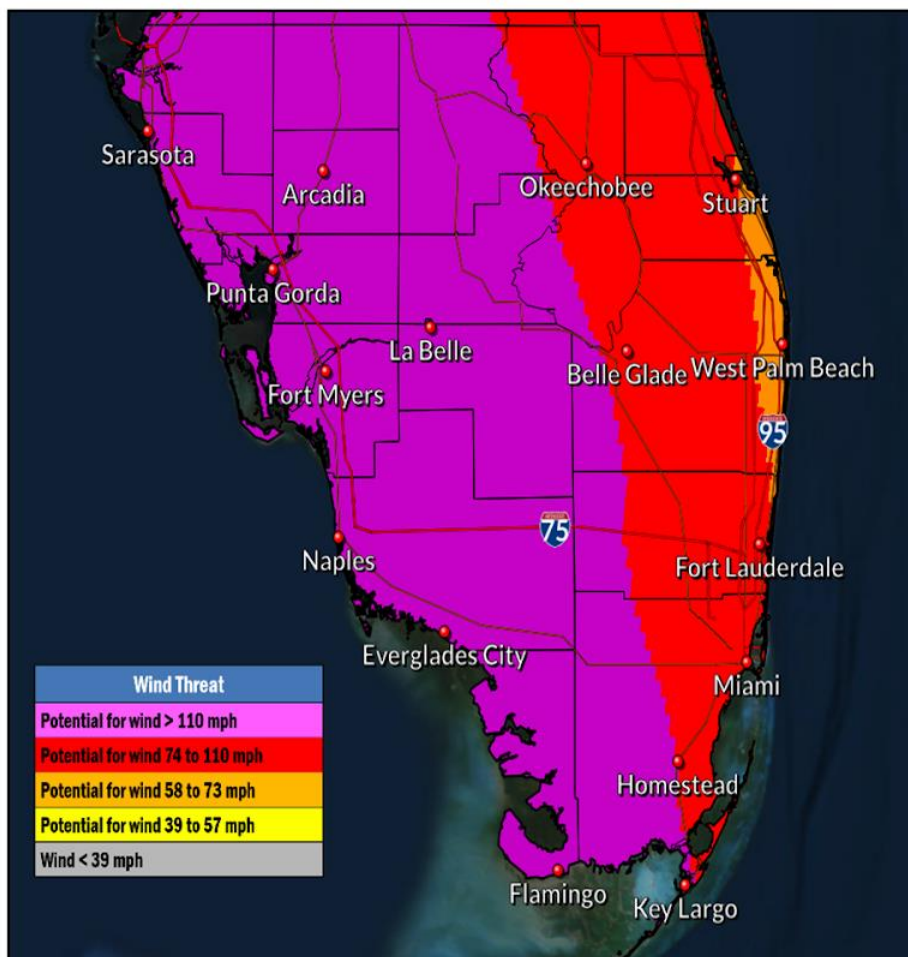
Looks like a serious hurricane event is developing for Florida in a few days. Have a plan; be prepared. Encourage your friends and neighbors to do likewise.

Wind Threat/Potential Impacts



Miami/South Florida
WEATHER FORECAST OFFICE

Hurricane Irma



Wind Threat
Potential for wind > 110 mph
Potential for wind 74 to 110 mph
Potential for wind 58 to 73 mph
Potential for wind 39 to 57 mph
Wind < 39 mph

WIND THREAT

Be safe and prepare for these potential conditions

Potential Wind Impacts

Reasonable Worst Case Scenario

Potential for Winds Greater Than 110 mph

- Structural damage to sturdy buildings, some with complete roof and wall failures
- Complete destruction of mobile homes
- Damage greatly accentuated by large airborne projectiles
- 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, and more within urban or heavily wooded places
- Widespread power and communications outages

Potential for Winds 74 to 110 mph

Potential for Winds 58 to 73 mph

Potential for Winds 39 to 57 mph

Potential for Winds Less Than 39 mph

Locations of Concern

- All of South Florida

Timing

- Greatest wind threat is Sunday through Monday

NWS Melbourne | Social Media Strategy

Pre-event infographics developed (simple, concise, graphics/photos)

❖ Time until impact

- ☐ Plan (>36 hours)
- ☐ Complete Preparations (24-36 hours)
- ☐ Shelter in Place (<24 hours)
- ☐ Recover (post-impact)

❖ Type of hazard

- ☐ Wind
- ☐ Surge
- ☐ Flooding
- ☐ Tornadoes

❖ Level of threat

- ☐ Low
- ☐ Moderate
- ☐ High
- ☐ Extreme



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- ☐ Surge
- ☐ Flooding
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❖ Level of threat

- ☐ Low
- ☐ Moderate
- ☐ High
- ✓ Extreme



Extreme wind threat | 36+ hrs til arrival

Extreme Wind Threat

Plan For

3+

Plan for catastrophic hurricane winds of Category 3 or higher



Check Your
Plan



Get
Supplies



Secure
Home



If told,
Evacuate



Extreme wind threat | 24-36 hrs til arrival

Hurricane Warning

Prepare For

3+

Prepare for catastrophic hurricane force winds of Category 3 or higher



Activate Your
Plan



Get
Supplies



Secure
Home



If told,
Evacuate



Extreme wind threat | 6-12 hrs til arrival

Hurricane Warning

Prepare For

3+

Finish preparations for a possible major hurricane. Move to safe shelter



**Final
Preparations**



**Remain
Indoors**



**Complete
Evacuation**



Extreme wind threat | 0-6 hrs til arrival

Hurricane Warning

Prepare For

3+

Now is the time to take shelter,
Stay in shelter until storm passes



Shelter In
Place



Extreme wind threat | extreme wind onset

Extreme Wind Warning

ACT NOW!



**Move to the safest place
inside your shelter!**



**Catastrophic winds in excess of
115 mph are imminent!**



VCP 121
0.25 km, 0.5 dBz
MX: 52dBZ

Extreme Wind Warning



Fri 10:30Z 07-Oct-16

The Tropical Wind Hazard



THANK YOU