3/26/2018

HURRICANE READINESS
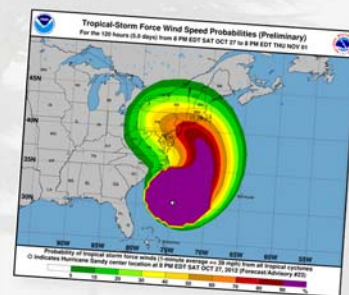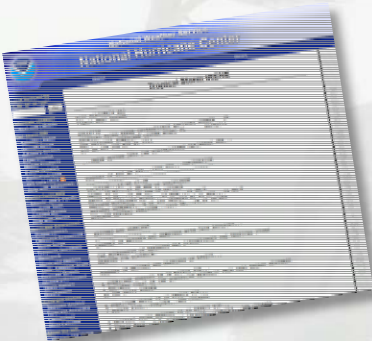*L-311*

FEMA

UNIT TWO
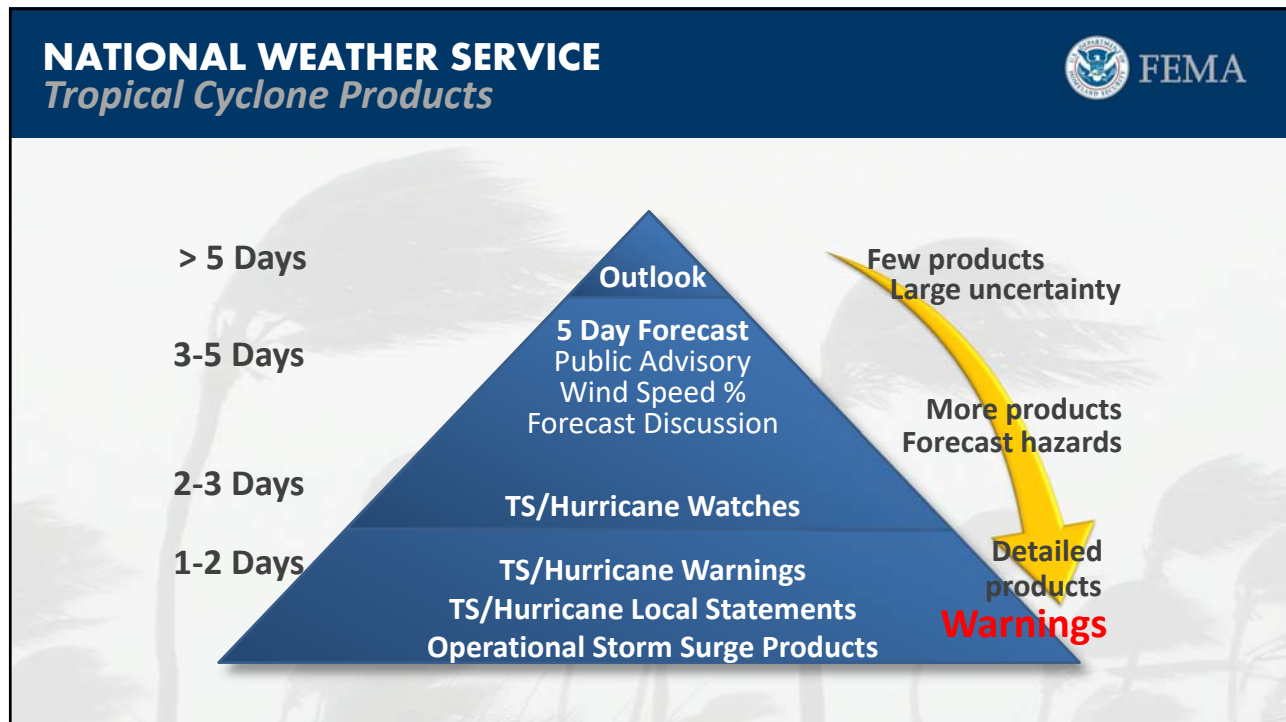## *There is a Storm. What's the info?*

NATIONAL WEATHER SERVICE
Tropical Cyclone Products

FEMA

TROPICAL CYCLONES
NHC provides the 'big picture' that complements and guides local NWS forecast office products

NATIONAL WEATHER SERVICE
Tropical Cyclone Products

FEMA

> 5 Days

3-5 Days

2-3 Days

1-2 Days

Outlook

5 Day Forecast
Public Advisory
Wind Speed %
Forecast Discussion

TS/Hurricane Watches

TS/Hurricane Warnings
TS/Hurricane Local Statements
Operational Storm Surge Products

Few products
Large uncertainty

More products
Forecast hazards

Detailed products
Warnings

NATIONAL HURRICANE CENTER
Frequently Asked Questions

FEMA

FAQs

- What's going on in the tropics?
- Any potential for development?
- Should we be concerned?

- **Tropical Outlook**

TROPICAL OUTLOOK
Scheduled Updates

FEMA

OUTLOOK SCHEDULE

– A *Special Tropical Outlook* can be issued at anytime for significant or unexpected changes

- **2 am – Tropical Outlook**
- **8 am – Tropical Outlook**
- **2 pm – Tropical Outlook**
- **8 pm – Tropical Outlook**

TIMES IN EDT

TROPICAL OUTLOOK
Assessment of Tropical Activity

FEMA

NATIONAL HURRICANE CENTER
NATIONAL OCEANIC AND ATMOSPHERIC ADMINISTRATION

TROPICAL WEATHER OUTLOOK
NWS NATIONAL HURRICANE CENTER MIAMI FL
800 PM EDT MON OCT 20 2014

For the North Atlantic...Caribbean Sea and the Gulf of Mexico:

Showers and thunderstorms associated with an area of low pressure located over the southwestern Bay of Campeche have changed little in organization since this afternoon. This system has the potential to become a tropical cyclone during the next couple of days while it moves slowly eastward across the southern Bay of Campeche. Later in the week, the low is forecast to interact and possibly merge with a frontal system over the southeastern Gulf of Mexico or northwestern Caribbean Sea. An Air Force Reserve reconnaissance aircraft is scheduled to investigate the disturbance tomorrow afternoon, if necessary. Interests in the Yucatan Peninsula should monitor the progress of this system.
* Formation chance through 48 hours...medium...50 percent.
• Formation chance through 5 days...medium...60 percent.

Forecaster Brown

Potential for development?

Headed where?

TROPICAL OUTLOOK
Assessment of Tropical Activity

FEMA

NATIONAL HURRICANE CENTER
NATIONAL OCEANIC AND ATMOSPHERIC ADMINISTRATION

```
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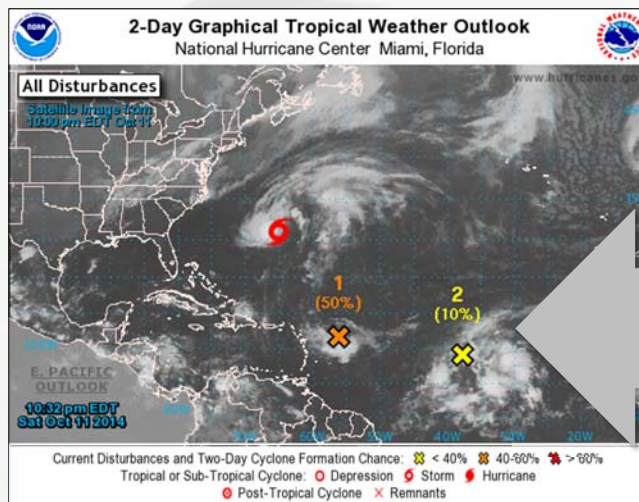
Sending a plane?

TROPICAL OUTLOOK
2-Day Formation Potential

FEMA

2-Day Graphical Tropical Weather Outlook
National Hurricane Center Miami, Florida

All Disturbances

Satellite Imagery from
10:00 pm EDT Oct 11

1
(50%)

2
(10%)

E. PACIFIC
OUTLOOK

10:32 pm EDT
Sat Oct 11 2014

Current Disturbances and Two-Day Cyclone Formation Chance: ❌ < 40% ❌ 40-60% 🌀 > 60%
Tropical or Sub-Tropical Cyclone: ◯ Depression 🌀 Storm 🌀 Hurricane
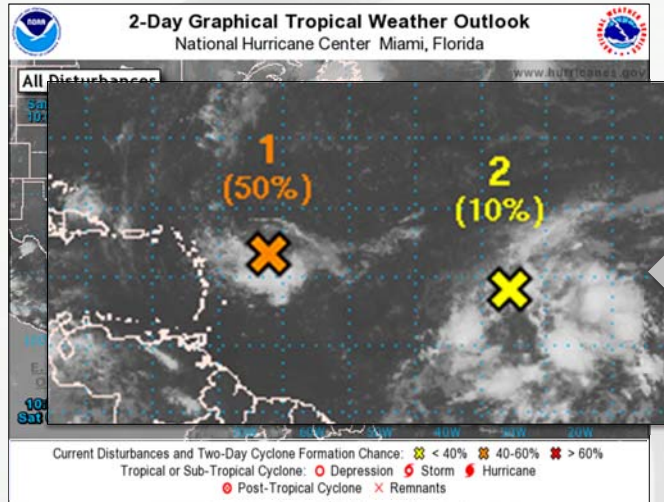◯ Post-Tropical Cyclone ✕ Remnants

- **Current location of disturbances**

- **Formation chance during the next 48 hrs**

- **CATEGORICAL**
  (Low, Medium, and High)
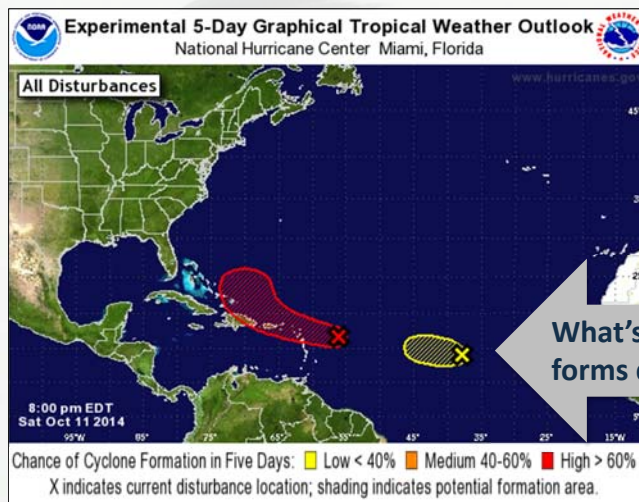- **PROBABILITIES**

TROPICAL OUTLOOK
2-Day Formation Potential

Should we be concerned?

TROPICAL OUTLOOK
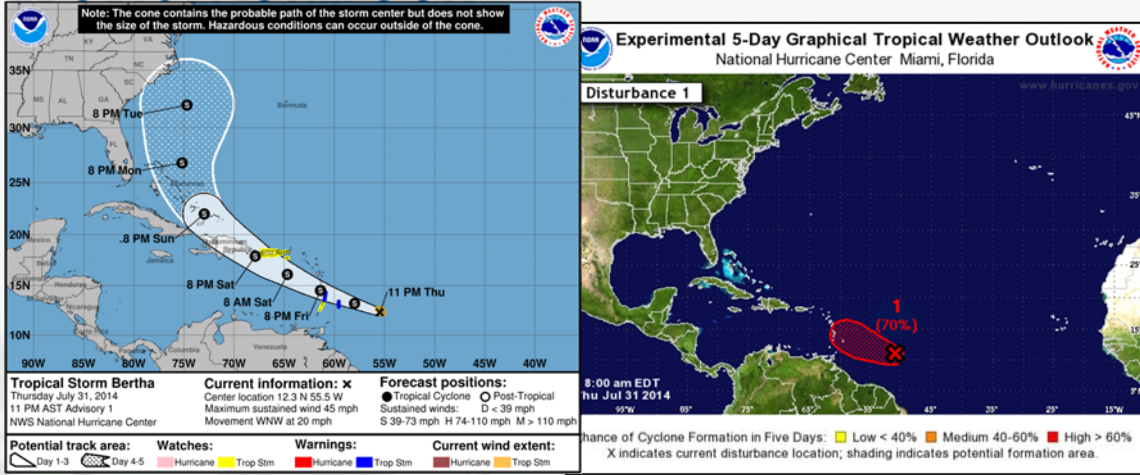### *5-Day Formation Potential*

- **Initial location of disturbance (x) indicated**

- **Formation potential during the next 5 days**
  - Shading represents formation area

What's the chance this area forms during the next 5 days?

TROPICAL OUTLOOK
5-Day Formation Potential

FEMA

SPECIAL TROPICAL OUTLOOK
Significant or Unexpected Changes

FEMA

NATIONAL HURRICANE CENTER
NATIONAL OCEANIC AND ATMOSPHERIC ADMINISTRATION

SPECIAL TROPICAL WEATHER OUTLOOK
NWS NATIONAL HURRICANE CENTER MIAMI FL
430 PM EDT MON JUN 30 2014

Special outlook issued to update discussion of the area of low pressure east of Florida.

Updated: An Air Force Reserve unit reconnaissance aircraft is investigating the area of low pressure centered about 110 miles east of Melbourne, Florida. While the low is well defined, the associated thunderstorm activity is just below the organizational threshold required to initiate tropical cyclone advisories. Environmental conditions continue to be favorable for development, and only a slight increase in the organization and persistence of the thunderstorm activity would result in the formation of a tropical depression.

Data from the reconnaissance aircraft indicate that peak sustained winds with the low are about 30-35 mph. The low is moving southwestward at around 5 mph, but is expected to turn westward tonight and northward by Wednesday when it will be near the east coast of Florida. If this system becomes a tropical cyclone, a tropical storm watch could be required for portions of the central or northern Atlantic coast of Florida. A turn toward the northeast near the southeastern U.S. coast is expected by Thursday.
* Formation chance through 48 hours...high...80 percent.
* Formation chance through 5 days...high...80 percent.

Why is it being issued?

SPECIAL TROPICAL OUTLOOK
Significant or Unexpected Changes

FEMA

NATIONAL HURRICANE CENTER
NATIONAL OCEANIC AND ATMOSPHERIC ADMINISTRATION

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What did the aircraft find?

SPECIAL TROPICAL OUTLOOK
Significant or Unexpected Changes

FEMA

NATIONAL HURRICANE CENTER
NATIONAL OCEANIC AND ATMOSPHERIC ADMINISTRATION

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Watches possible?

NATIONAL HURRICANE CENTER
www.hurricanes.gov

NATIONAL HURRICANE CENTER
Potential, Post-, Tropical Cyclones

NHC ADVISORIES

- **Tropical Cyclones**
  - Tropical Depressions
  - Tropical Storms
  - Hurricanes

- **Post-Tropical Cyclones**
  - Remains a threat to land (e.g., Sandy & Hermine)

- **Potential Tropical Cyclones**
  - Systems not yet a tropical cyclone
  - Threat of TS-force winds to land within 48 hours. (New for 2017)

Potential Tropical Cyclone Three
(Cindy 2017)

NATIONAL HURRICANE CENTER
Frequently Asked Questions

FEMA
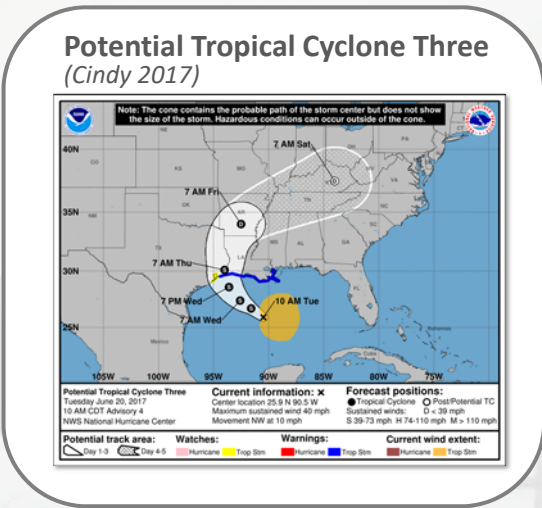
FAQs

- **When is new information available?**
- **When is a good time for a conference call?**

- **NHC Advisory Timeline**

NHC ADVISORY TIMELINE
Scheduled Updates

FEMA

NO WATCHES/WARNINGS

NHC ADVISORY	NHC ADVISORY	NHC ADVISORY	NHC ADVISORY	NHC ADVISORY
• Public Advisory • Forecast Discussion • Wind Speed Probabilities • Forecast Cone	• Public Advisory • Forecast Discussion • Wind Speed Probabilities • Forecast Cone	• Public Advisory • Forecast Discussion • Wind Speed Probabilities • Forecast Cone	• Public Advisory • Forecast Discussion • Wind Speed Probabilities • Forecast Cone	• Public Advisory • Forecast Discussion • Wind Speed Probabilities • Forecast Cone

5AM   11AM   5PM   11PM   5AM

NHC ADVISORY TIMELINE
Scheduled Updates

FEMA

WATCHES/WARNINGS *in effect*

NHC ADVISORY
- Public Advisory
- Forecast Discussion
- Wind Speed Probabilities
- Forecast Cone
- Storm Surge Products (possible)

NHC ADVISORY
- Public Advisory
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- Public Advisory

5AM 8AM 11AM 2PM 5PM 8PM 11PM 2AM 5AM

NHC ADVISORY TIMELINE
Scheduled Updates

FEMA

WATCHES/WARNINGS *in effect and eye tracked by radar*

NHC ADVISORY
- Public Advisory
- Forecast Discussion
- Wind Speed Probabilities
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NHC ADVISORY
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- Public Advisory

Tropical Cyclone Update (×8)

5AM 11AM 5PM 11PM 5AM

NATIONAL HURRICANE CENTER
Frequently Asked Questions

FEMA

FAQs

- **How strong is the storm?**
- **What are the hazards?**
- **Are there any warnings?**

- **Public Advisory**

PUBLIC ADVISORY
Location. Strength. Hazards. Warnings

FEMA

NATIONAL HURRICANE CENTER
NATIONAL OCEANIC AND ATMOSPHERIC ADMINISTRATION

```
HURRICANE ISAAC ADVISORY NUMBER  34
NWS NATIONAL HURRICANE CENTER MIAMI FL        AL092012
1000 AM CDT WED AUG 29 2012

... ISAAC DRENCHING SOUTHEASTERN LOUISIANA...DANGEROUS STORM SURGE
AND FLOOD THREAT FROM HEAVY RAINS LIKELY TO CONTINUE THROUGH
TONIGHT...

SUMMARY OF 1000 AM CDT...1500 UTC...INFORMATION
---------------------------------------------
LOCATION...29.6N 90.7W
ABOUT 0 MI...0 KM N OF HOUMA LOUISIANA
ABOUT 45 MI...75 KM SW OF NEW ORLEANS LOUISIANA
MAXIMUM SUSTAINED WINDS...75 MPH...120 KM/H
PRESENT MOVEMENT...NW OR 310 DEGREES AT 6 MPH...9 KM/H
MINIMUM CENTRAL PRESSURE...972 MB...28.70 INCHES

WATCHES AND WARNINGS
--------------------
A HURRICANE WARNING IS IN EFFECT FOR...
* EAST OF MORGAN CITY LOUISIANA TO THE MISSISSIPPI-ALABAMA BORDER...
INCLUDING METROPOLITAN NEW ORLEANS...LAKE PONTCHARTRAIN...AND LAKE
MAUREPAS

A HURRICANE WATCH IS IN EFFECT FOR...
* INTRACOASTAL CITY TO MORGAN CITY LOUISIANA
```

- **Plain-language text**
- **Originally intended as "rip and read"**

PUBLIC ADVISORY
Location. Strength. Hazards. Warnings

FEMA

NATIONAL HURRICANE CENTER
NATIONAL OCEANIC AND ATMOSPHERIC ADMINISTRATION

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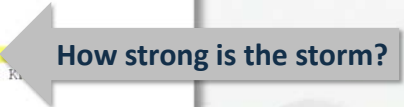
Where is the storm located?

PUBLIC ADVISORY
Location. Strength. Hazards. Warnings

FEMA

NATIONAL HURRICANE CENTER
NATIONAL OCEANIC AND ATMOSPHERIC ADMINISTRATION

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WATCHES AND WARNINGS
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A HURRICANE WATCH IS IN EFFECT FOR...
* INTRACOASTAL CITY TO MORGAN CITY LOUISIANA
```

How strong is the storm?

3/26/2018

PUBLIC ADVISORY
Location. Strength. Hazards. Warnings

FEMA

NATIONAL HURRICANE CENTER
NATIONAL OCEANIC AND ATMOSPHERIC ADMINISTRATION

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* INTRACOASTAL CITY TO MORGAN CITY LOUISIANA
```

Watches or Warnings?

PUBLIC ADVISORY
Location. Strength. Hazards. Warnings

FEMA

NATIONAL HURRICANE CENTER
NATIONAL OCEANIC AND ATMOSPHERIC ADMINISTRATION

```
DISCUSSION AND OUTLOOK
------------------------------
At 1000 AM CDT, 1500 UTC, the center of Hurricane Isaac was
located by NOAA Doppler weather radar near latitude 29.6 North,
longitude 90.7 West, or very near Houma, Louisiana. Isaac is moving
toward the northwest near 6 mph (9 km/h). This general motion is
expected to continue through tonight, followed by a turn toward
the north-northwest by Thursday night or early Friday. On the
forecast track, the center of Isaac will move farther inland over
Louisiana today and tomorrow, and over southern Arkansas by early
Friday.

Maximum sustained winds have decreased to near 75 mph (120 km/h)
with higher gusts. Isaac is a category one hurricane on the
Saffir-Simpson Hurricane Wind Scale. Gradual weakening is forecast
during the next 48 hours as the hurricane continues moving farther
inland and Isaac is expected to weaken to a tropical storm later
today.

Hurricane-force winds extend outward up to 45 miles (75 km) from
the center, and tropical-storm-force winds extend outward up to 175
miles (280 km).

A gust to 74 mph was recently reported at the Mid Lake station in
Lake Pontchartrain and a wind gust to 63 mph was reported at
New Orleans International Airport.
```

Where is the storm headed?

13

PUBLIC ADVISORY
Location. Strength. Hazards. Warnings

FEMA

NATIONAL HURRICANE CENTER
NATIONAL OCEANIC AND ATMOSPHERIC ADMINISTRATION

DISCUSSION AND OUTLOOK

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A gust to 74 mph was recently reported at the Mid Lake station in Lake Pontchartrain and a wind gust to 63 mph was reported at New Orleans International Airport.

Covers a 3-day period

Forecast to weaken? Strengthen?

PUBLIC ADVISORY
Location. Strength. Hazards. Warnings

FEMA

NATIONAL HURRICANE CENTER
NATIONAL OCEANIC AND ATMOSPHERIC ADMINISTRATION

HAZARDS AFFECTING LAND

STORM SURGE: The combination of a dangerous storm surge and the tide will cause normally dry areas near the coast to be flooded by rising waters. The water could reach the following depths above ground if the peak surge occurs at the time of high tide...

* MISSISSIPPI AND SOUTHEASTERN LOUISIANA...6 TO 12 FT
* ALABAMA...3 TO 6 FT
* SOUTH-CENTRAL LOUISIANA...3 TO 6 FT
* FLORIDA PANHANDLE AND APALACHEE BAY...2 TO 4 FT

The deepest water will occur along the immediate coast in areas of onshore flow. Surge-related flooding depends on the relative timing of the surge and the tidal cycle, and can vary greatly over short distances. For information specific to your area, please see products issued by your local National Weather Service forecast office. Near the coast, the surge will be accompanied by large and dangerous waves.

Storm surge values of near 8 feet have recently been reported at Shell Beach Louisiana and Waveland Mississippi.

WIND...Tropical storm conditions will continue across the warning area today, and hurricane conditions will continue to affect Portions of southeastern louisiana and mississippi in the hurricane Warning area into this afternoon.

How much storm surge is forecast?

PUBLIC ADVISORY
Location. Strength. Hazards. Warnings

FEMA

NATIONAL HURRICANE CENTER
NATIONAL OCEANIC AND ATMOSPHERIC ADMINISTRATION

HAZARDS AFFECTING LAND

WIND...Tropical storm conditions will continue across the warning
area today, and hurricane conditions will continue to affect
portions of southeastern Louisiana and Mississippi in the hurricane
warning area into this afternoon.

Winds affecting the upper floors of high-rise buildings will be
significantly stronger than those near ground level. At about the
30th story, winds would likely be one Saffir-Simpson category
stronger than at the surface.

RAINFALL...Isaac is expected to produce total rainfall amounts of
7 to 14 inches, with possible isolated maximum amounts of 20
inches over much of Louisiana, southern Mississippi, and
southwest Alabama through Friday morning. These rains could result
in significant lowland flooding. Rains are expected to increase
northward into Arkansas on Thursday, with amounts of 3 to 6 inches
expected over southern Arkansas by Friday morning.

TORNADOES...Isolated tornadoes are possible along the central Gulf
Coast region and parts of the lower Mississippi river valley
through Thursday.

SURF...Dangerous surf and rip current conditions will continue to
Affect the west coast of florida and the northern gulf coast for the
Next day or so.

How much rain is forecast?

NATIONAL HURRICANE CENTER
Frequently Asked Questions

FEMA

FAQs
- **How confident are the forecasters?**
- **Key messages?**

- **Forecast Discussion**

FORECAST DISCUSSION
Confidence. Scenarios. Key Messages.

FEMA

NATIONAL HURRICANE CENTER
NATIONAL OCEANIC AND ATMOSPHERIC ADMINISTRATION

HURRICANE JOAQUIN DISCUSSION NUMBER 15
NWS NATIONAL HURRICANE CENTER MIAMI FL   AL112015
1100 AM EDT THU OCT 01 2015

An Air Force Reserve Hurricane Hunter aircraft reported 700-mb flight-level winds of 119 kt in the northwestern eyewall, with a 117 kt surface wind estimate from the Stepped Frequency Microwave Radiometer in the southwestern eyewall. The latest central pressure was 942 mb. Based on these data, the advisory intensity is increased to 110 kt. Satellite imagery indicates that an eye is trying to form in the central dense overcast, and that the cirrus outflow is good in all directions. Joaquin is expected to intensify a little more in the next 12 to 24 hours as it remains over very warm waters and in an environment of decreasing vertical shear. After that time, there could be some fluctuations in intensity due to eyewall replacement cycles. There is some uncertainty in the intensity forecast in the 48-96 hour period. The statistical models suggest that Joaquin should weaken due to increasing shear. However, several of the global models forecast the hurricane to move into an area of strong upper-level divergence and show a falling central pressure. The new forecast will continue to show weakening during this time, but it would not be a surprise if it is stronger than currently forecast. The initial motion is 220/5. Water vapor imagery shows a mid- to upper-level ridge north of the hurricane, with a developing deep-layer trough over the eastern and southeastern United States. The

- **Forecast reasoning**
- **Relevant Observations**
- **Model Guidance**
- **Forecast Uncertainties**

FORECAST DISCUSSION
Confidence. Scenarios. Key Messages.

FEMA

NATIONAL HURRICANE CENTER
NATIONAL OCEANIC AND ATMOSPHERIC ADMINISTRATION

KEY MESSAGES:

1. Preparations to protect life and property in the central Bahamas should be complete. The slow motion of Joaquin over the next day or so will bring a prolonged period of hurricane force winds, storm surge, and very heavy rainfall to those islands.

2. Confidence in the details of the forecast after 72 hours is still low, since there have been some large changes in the model guidance overnight and a large spread in the model solutions remains, with potential impacts from the Carolinas through New England. It is also possible that Joaquin will remain far from the U.S. east coast. A hurricane watch for the U.S. coast would likely not occur until at least Friday morning.

3. Efforts to provide the forecast models with as much data as possible continue, with twice daily NOAA G-IV jet missions in the storm environment, and extra NWS balloon launches.

4. It's too early to talk about specific wind, rain, or surge impacts from Joaquin in the United States. Regardless of Joaquin's track, strong onshore winds will create minor to moderate coastal flooding along the coasts of the mid-Atlantic and northeastern states through the weekend.

5. Many portions of the eastern U.S. are currently experiencing heavy rains and gusty winds associated with a frontal system.

Key Messages

- **Forecast Confidence**
- **Highlight Threats**

FORECAST DISCUSSION
Confidence. Scenarios. Key Messages.

FEMA

NATIONAL HURRICANE CENTER
NATIONAL OCEANIC AND ATMOSPHERIC ADMINISTRATION

4. It's too early to talk about specific wind, rain, or surge
impacts from Joaquin in the United States. Regardless of
Joaquin's track, strong onshore winds will create minor to
moderate coastal flooding along the coasts of the mid-Atlantic
and northeastern states through the weekend.

5. Many portions of the eastern U.S. are currently experiencing
heavy rains and gusty winds associated with a frontal system.
These heavy rains are likely to continue for the next few days,
even if the center of Joaquin stays offshore. The resulting
inland flood potential could complicate preparations for Joaquin
should it head toward the coast, and even more substantial inland
flooding is possible if Joaquin later passes near or over these
same areas.

```
FORECAST POSITIONS AND MAX WINDS

INIT  01/1500Z  23.0N  73.9W  110 KT  125 MPH
 12H  02/0000Z  22.9N  74.2W  115 KT  130 MPH
 24H  02/1200Z  23.7N  74.6W  120 KT  140 MPH
 36H  03/0000Z  25.2N  74.4W  120 KT  140 MPH
 48H  03/1200Z  27.5N  73.7W  110 KT  125 MPH
 72H  04/1200Z  32.0N  73.0W   95 KT  110 MPH
 96H  05/1200Z  36.0N  73.5W   75 KT   85 MPH
120H  06/1200Z  40.0N  72.5W   55 KT   65 MPH
```

Table of track and intensity forecasts

Forecaster Beven

NATIONAL HURRICANE CENTER
Frequently Asked Questions

FEMA

FAQs
- **How large is the storm?**
- **Where is the storm headed?**

- **Forecast Advisory**

FORECAST ADVISORY
Position. Size. Radii. Intensity.

FEMA

NATIONAL HURRICANE CENTER
NATIONAL OCEANIC AND ATMOSPHERIC ADMINISTRATION

```
HURRICANE ISAAC FORECAST/ADVISORY NUMBER  34
NWS NATIONAL HURRICANE CENTER MIAMI FL        AL092012
1500 UTC WED AUG 29 2012

THE TROPICAL STORM WARNING HAS BEEN DISCONTINUED EAST OF THE
ALABAMA-FLORIDA BORDER.

SUMMARY OF WATCHES AND WARNINGS IN EFFECT...

A HURRICANE WARNING IS IN EFFECT FOR...
* EAST OF MORGAN CITY LOUISIANA TO THE MISSISSIPPI-ALABAMA BORDER...
INCLUDING METROPOLITAN NEW ORLEANS...LAKE PONTCHARTRAIN...AND LAKE
MAUREPAS

HURRICANE CENTER LOCATED NEAR 29.6N  90.7W AT 29/1500Z
POSITION ACCURATE WITHIN  15 NM

PRESENT MOVEMENT TOWARD THE NORTHWEST OR 310 DEGREES AT   5 KT

ESTIMATED MINIMUM CENTRAL PRESSURE  972 MB
MAX SUSTAINED WINDS  65 KT WITH GUSTS TO  80 KT.
64 KT....... 30NE  40SE   0SW   0NW.
50 KT....... 80NE  70SE  40SW  40NW.
34 KT.......150NE 150SE 140SW 100NW.
12 FT SEAS..180NE 240SE  90SW   0NW.
WINDS AND SEAS VARY GREATLY IN EACH QUADRANT.  RADII IN NAUTICAL
MILES ARE THE LARGEST RADII EXPECTED ANYWHERE IN THAT QUADRANT.
```
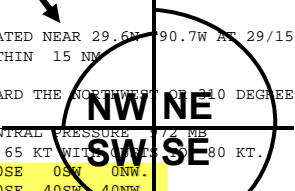
Only source for all the forecast data

Watches and Warnings

Data is used in HURREVAC and other commercial tracking software

---

FORECAST ADVISORY
Position. Size. Radii. Intensity.

FEMA

NATIONAL HURRICANE CENTER
NATIONAL OCEANIC AND ATMOSPHERIC ADMINISTRATION

```
HURRICANE ISAAC FORECAST/ADVISORY NUMBER  34
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12 FT SEAS..180NE 240SE  90SW   0NW.
WINDS AND SEAS VARY GREATLY IN EACH QUADRANT.  RADII IN NAUTICAL
MILES ARE THE LARGEST RADII EXPECTED ANYWHERE IN THAT QUADRANT.
```

Forecast wind radii

FORECAST ADVISORY
Position. Size. Radii. Intensity.

FEMA

WIND RADII
- **NHC forecasts the wind radii in four quadrants**

Radii are the largest distance from the center in a quadrant

Leads to an inherent over-estimate of radii, especially near land

---

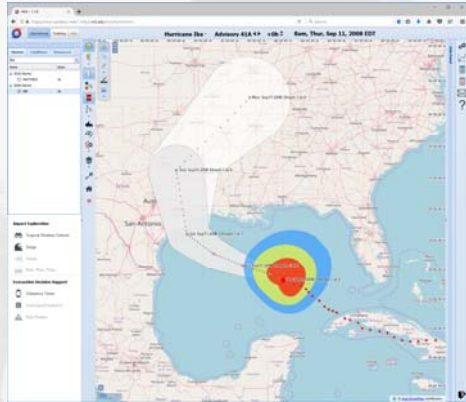## FORECAST ADVISORY
Position. Size. Radii. Intensity.

FEMA

WIND RADII
- **NHC forecasts the wind radii in four quadrants**

FORECAST TIME

	34 kt	50 kt	64 kt
12 hr			
24 hr			
36 hr			
48 hr			

FORECAST ADVISORY
Position. Size. Radii. Intensity.

FEMA

WIND RADII

• **NHC forecasts the wind radii in four quadrants**

FORECAST TIME

	34 kt	50 kt	64 kt
12 hr			
24 hr			
36 hr			
48 hr			
72 hr			N/A

FORECAST ADVISORY
Position. Size. Radii. Intensity.

FEMA
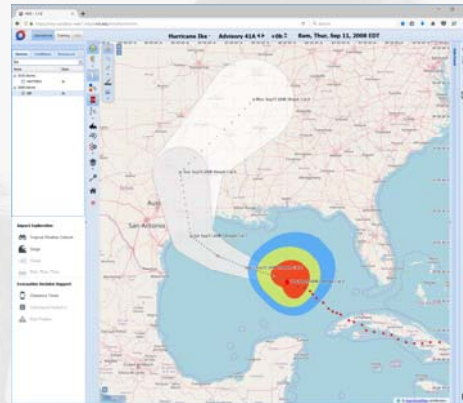
WIND RADII

• **NHC forecasts the wind radii in four quadrants**

FORECAST TIME

	34 kt	50 kt	64 kt
12 hr			
24 hr			
36 hr			
48 hr			
72 hr			N/A
96 hr	N/A	N/A	N/A
120 hr	N/A	N/A	N/A
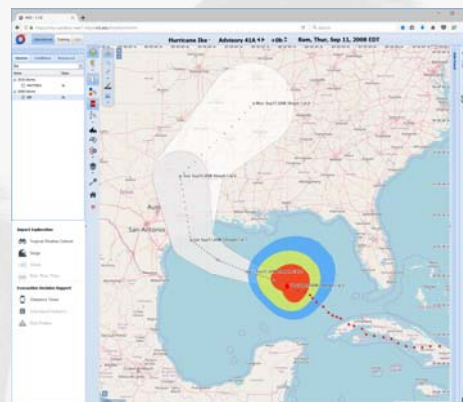
FORECAST ERROR CONE
Probable Track. Watches. Warnings.

FEMA
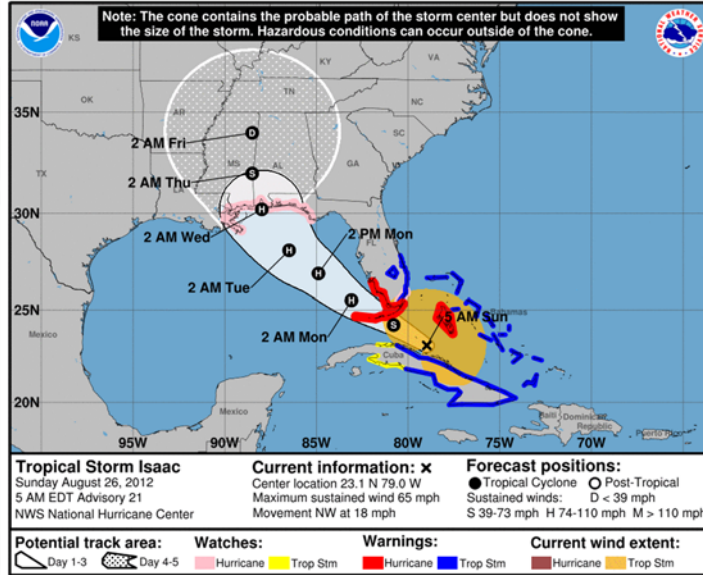
FORECAST ERROR CONE
The cure for the skinny black line?

FEMA

ERROR CONE

- **Probable track of the center of the tropical cyclone**

- **Formed by connecting circles centered on each forecast point**

- **Each circle uses NHC historical (5-year) track errors**
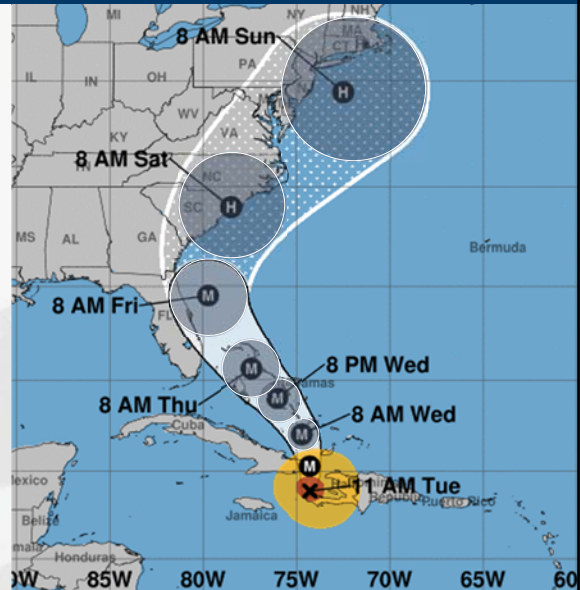 Actual storm position will be within the circle 67% of the time
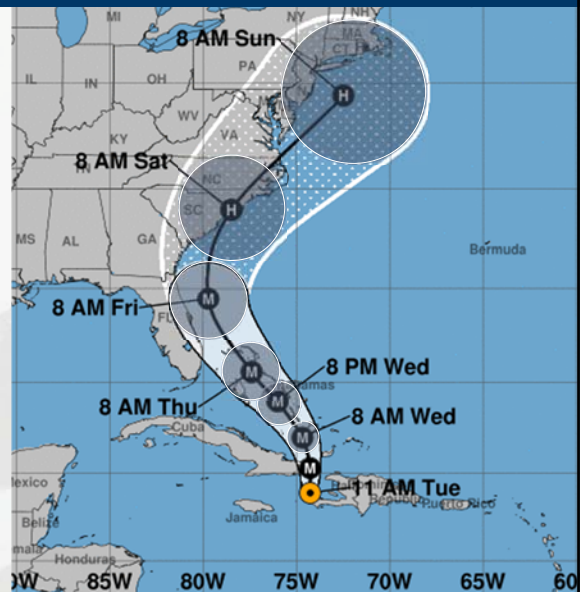
FORECAST ERROR CONE
No worries, not in the cone?

FEMA

ERROR CONE

- **Only displays information about track uncertainty**
  Nothing about specific impacts

- **Impacts can occur well outside the area enclosed by the cone**
  Center is expected to be outside the cone about 1/3 of the time

---

NATIONAL HURRICANE CENTER
Frequently Asked Questions

FEMA

FAQs

- **Chance for some effects?**
- **Are staging areas at risk?**
- **When is the earliest TS winds could begin?**

- **Wind Speed Probabilities**

WIND SPEED PROBABILITIES
Text Product

FEMA

NATIONAL HURRICANE CENTER
NATIONAL OCEANIC AND ATMOSPHERIC ADMINISTRATION

```
TROPICAL STORM ISAAC WIND SPEED PROBABILITIES NUMBER  21
NWS NATIONAL HURRICANE CENTER MIAMI FL          AL092012
0900 UTC SUN AUG 26 2012

  - - - - WIND SPEED PROBABILITIES FOR SELECTED  LOCATIONS - - - -

                 FROM      FROM      FROM      FROM      FROM      FROM      FROM
  TIME        12Z WED  00Z THU   12Z THU   00Z FRI   12Z FRI   12Z SAT   12Z SUN
PERIODS         TO        TO        TO        TO        TO        TO        TO
              00Z THU   12Z THU   00Z FRI   12Z FRI   12Z SAT   12Z SUN   12Z MON

FORECAST HOUR   (12)      (24)      (36)      (48)      (72)      (96)     (120)
- - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - -
LOCATION      KT

PANAMA CITY FL 34   X     3( 3)    22(25)    30(55)    16(71)     2(73)     1(74)
PANAMA CITY FL 50   X     X( X)     1( 1)    13(14)    15(29)     2(31)     1(32)
PANAMA CITY FL 64   X     X( X)     X( X)     3( 3)     6( 9)     2(11)     1(12)

PENSACOLA FL   34   X     X( X)    10(10)    32(42)    31(73)     5(78)     X(78)
PENSACOLA FL   50   X     X( X)     X( X)     6( 6)    28(34)     5(39)     1(40)
PENSACOLA FL   64   X     X( X)     X( X)     1( 1)    14(15)     3(18)     X(18)

MOBILE AL      34   X     X( X)     5( 5)    24(29)    35(64)     8(72)     1(73)
MOBILE AL      50   X     X( X)     X( X)     3( 3)    22(25)     8(33)     1(34)
MOBILE AL      64   X     X( X)     X( X)     1( 1)     8( 9)     4(13)     1(14)

GULFPORT MS    34   X     X( X)     3( 3)    21(24)    34(58)    10(68)     1(69)
```

Location-specific Probabilities
- Tropical-Storm-Force
- 58 mph
- Hurricane-Force

WIND SPEED PROBABILITIES
Text Product

FEMA

NATIONAL HURRICANE CENTER
NATIONAL OCEANIC AND ATMOSPHERIC ADMINISTRATION

```
TROPICAL STORM ISAAC WIND SPEED PROBABILITIES NUMBER  21
NWS NATIONAL HURRICANE CENTER MIAMI FL        AL092012
0900 UTC SUN AUG 26 2012

   - - - - WIND SPEED PROBABILITIES FOR SELECTED  LOCATIONS - - - -

                FROM      FROM      FROM      FROM      FROM      FROM      FROM
   TIME      12Z WED   00Z THU   12Z THU   00Z FRI   12Z FRI   12Z SAT   12Z SUN
 PERIODS        TO        TO        TO        TO        TO        TO        TO
             00Z THU   12Z THU   00Z FRI   12Z FRI   12Z SAT   12Z SUN   12Z MON

FORECAST HOUR    (12)      (24)      (36)      (48)      (72)      (96)     (120)
- - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - -
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PANAMA CITY FL 34  X    3( 3)   22(25)   30(55)   16(71)    2(73)    1(74)
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PENSACOLA FL   34  X    X( X)   10(10)   32(42)   31(73)    5(78)    X(78)
PENSACOLA FL   50  X    X( X)    X( X)    6( 6)   28(34)    5(39)    1(40)
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MOBILE AL      50  X    X( X)    X( X)    3( 3)   22(25)    8(33)    1(34)
MOBILE AL      64  X    X( X)    X( X)    1( 1)    8( 9)    4(13)    1(14)

GULFPORT MS    34  X    X( X)    3( 3)   21(24)   34(58)   10(68)    1(69)
```

Location-specific Probabilities
- Tropical-Storm-Force
- 58 mph
- Hurricane-Force

WIND SPEED PROBABILITIES
Text Product

FEMA

NATIONAL HURRICANE CENTER
NATIONAL OCEANIC AND ATMOSPHERIC ADMINISTRATION

```
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NWS NATIONAL HURRICANE CENTER MIAMI FL        AL092012
0900 UTC SUN AUG 26 2012

   - - - - WIND SPEED PROBABILITIES FOR SELECTED  LOCATIONS - - - -

                FROM      FROM      FROM      FROM      FROM      FROM      FROM
   TIME      12Z WED   00Z THU   12Z THU   00Z FRI   12Z FRI   12Z SAT   12Z SUN
 PERIODS        TO        TO        TO        TO        TO        TO        TO
             00Z THU   12Z THU   00Z FRI   12Z FRI   12Z SAT   12Z SUN   12Z MON

FORECAST HOUR    (12)      (24)      (36)      (48)      (72)      (96)     (120)
- - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - -
LOCATION      KT

PANAMA CITY FL 34  X    3( 3)   22(25)   30(55)   16(71)    2(73)    1(74)
PANAMA CITY FL 50  X    X( X)    1( 1)   13(14)   15(29)    2(31)    1(32)
PANAMA CITY FL 64  X    X( X)    X( X)    3( 3)    6( 9)    2(11)    1(12)

PENSACOLA FL   34  X    X( X)   10(10)   32(42)   31(73)    5(78)    X(78)
PENSACOLA FL   50  X    X( X)    X( X)    6( 6)   28(34)    5(39)    1(40)
PENSACOLA FL   64  X    X( X)    X( X)    1( 1)   14(15)    3(18)    X(18)

MOBILE AL      34  X    X( X)    5( 5)   24(29)   35(64)    8(72)    1(73)
MOBILE AL      50  X    X( X)    X( X)    3( 3)   22(25)    8(33)    1(34)
MOBILE AL      64  X    X( X)    X( X)    1( 1)    8( 9)    4(13)    1(14)

GULFPORT MS    34  X    X( X)    3( 3)   21(24)   34(58)   10(68)    1(69)
```
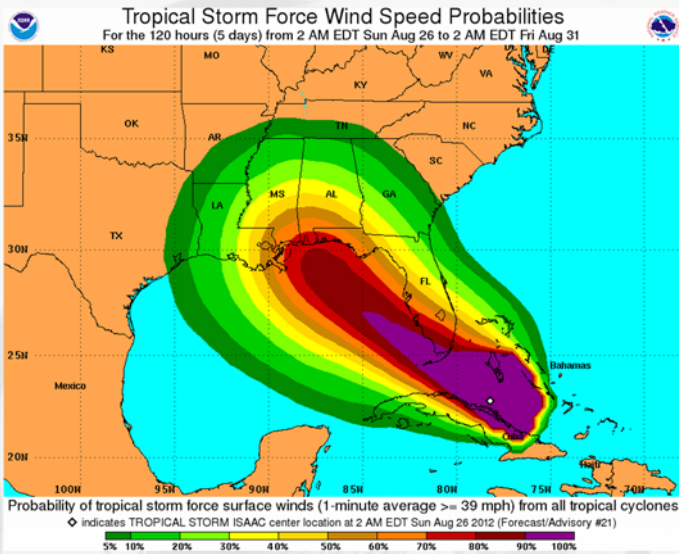
Onset Probabilities
- Timing information

WIND SPEED PROBABILITIES
Text Product

FEMA

```
NATIONAL HURRICANE CENTER
NATIONAL OCEANIC AND ATMOSPHERIC ADMINISTRATION

TROPICAL STORM ISAAC WIND SPEED PROBABILITIES NUMBER  21
NWS NATIONAL HURRICANE CENTER MIAMI FL        AL092012
0900 UTC SUN AUG 26 2012

 - - - - WIND SPEED PROBABILITIES FOR SELECTED  LOCATIONS - - - -

                FROM    FROM    FROM    FROM    FROM    FROM    FROM
   TIME       12Z WED 00Z THU 12Z THU 00Z FRI 12Z FRI 12Z SAT 12Z SUN
 PERIODS        TO      TO      TO      TO      TO      TO      TO
             00Z THU 12Z THU 00Z FRI 12Z FRI 12Z SAT 12Z SUN 12Z MON

 FORECAST HOUR  (12)    (24)    (36)    (48)    (72)    (96)    (120)
 - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - -
 LOCATION     KT

 PANAMA CITY FL 34  X    3( 3)  22(25) 30(55) 16(71)  2(73)  1(74)
 PANAMA CITY FL 50  X    X( X)   1( 1) 13(14) 15(29)  2(31)  1(32)
 PANAMA CITY FL 64  X    X( X)   X( X)  3( 3)  6( 9)  2(11)  1(12)

 PENSACOLA FL   34  X    X( X)  10(10) 32(42) 31(73)  5(78)  X(78)
 PENSACOLA FL   50  X    X( X)   X( X)  6( 6) 28(34)  5(39)  1(40)
 PENSACOLA FL   64  X    X( X)   X( X)  1( 1) 14(15)  3(18)  X(18)

 MOBILE AL      34  X    X( X)   5( 5) 24(29) 35(64)  8(72)  1(73)
 MOBILE AL      50  X    X( X)   X( X)  3( 3) 22(25)  8(33)  1(34)
 MOBILE AL      64  X    X( X)   X( X)  1( 1)  8( 9)  4(13)  1(14)

 GULFPORT MS    34  X    X( X)   3( 3) 21(24) 34(58) 10(68)  1(69)
```

Cumulative Probabilities
- Total chance through the time period

WIND SPEED PROBABILITIES
5-Day Cumulative Graphic

FEMA

Tropical Storm Force Wind Speed Probabilities
For the 120 hours (5 days) from 2 AM EDT Sun Aug 26 to 2 AM EDT Fri Aug 31

Probability of tropical storm force surface winds (1-minute average >= 39 mph) from all tropical cyclones
◇ indicates TROPICAL STORM ISAAC center location at 2 AM EDT Sun Aug 26 2012 (Forecast/Advisory #21)

5% 10% 20% 30% 40% 50% 60% 70% 80% 90% 100%

Location-specific Probabilities
- Tropical-Storm-Force
- 58 mph
- Hurricane-Force

WIND SPEED PROBABILITIES
5-Day Cumulative Graphic

FEMA

Location-specific Probabilities
- Tropical-Storm-Force
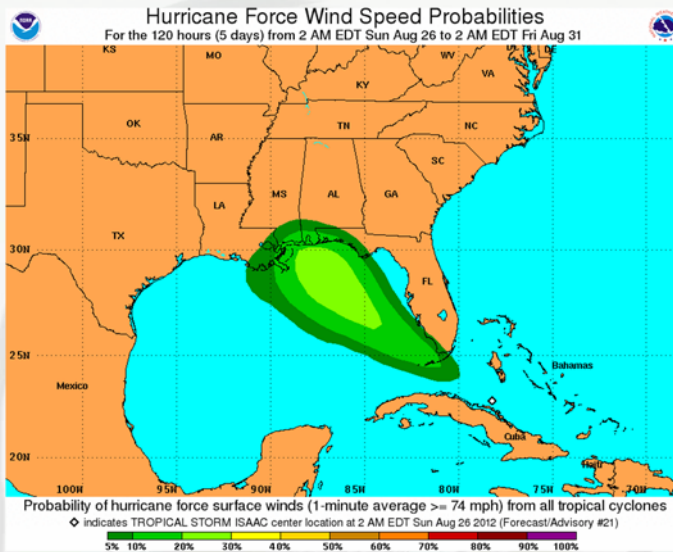- 58 mph
- Hurricane-Force

WIND SPEED PROBABILITIES
5-Day Cumulative Graphic

FEMA
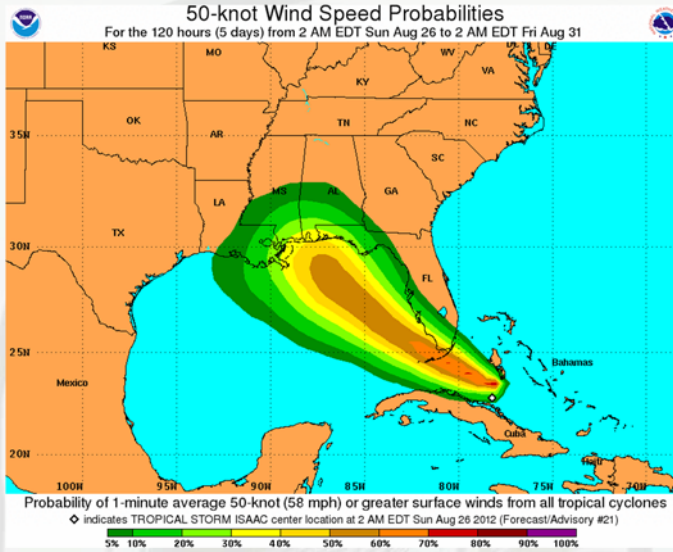
Location-specific Probabilities
- Tropical-Storm-Force
- 58 mph
- Hurricane-Force

WIND SPEED PROBABILITIES
Tropical Storm Isaac (2012)

FEMA

NATIONAL HURRICANE CENTER
NATIONAL OCEANIC AND ATMOSPHERIC ADMINISTRATION

TIME PERIODS		FROM 12Z WED TO 00Z THU	FROM 00Z THU TO 12Z THU	FROM 12Z THU TO 00Z FRI	FROM 00Z FRI TO 12Z FRI	FROM 12Z FRI TO 12Z SAT	FROM 12Z SAT TO 12Z SUN	FROM 12Z SUN TO 12Z MON
FORECAST HOUR		(12)	(24)	(36)	(48)	(72)	(96)	(120)
LOCATION	KT							
PANAMA CITY FL	34	X	3(3)	22(25)	30(55)	16(71)	2(73)	1(74)
PANAMA CITY FL	50	X	X(X)	1(1)	13(14)	15(29)	2(31)	1(32)
PANAMA CITY FL	64	X	X(X)	X(X)	3(3)	6(9)	2(11)	1(12)
PENSACOLA FL	34	X	X(X)	10(10)	32(42)	31(73)	5(78)	X(78)
PENSACOLA FL	50	X	X(X)	X(X)	6(6)	28(34)	5(39)	1(40)
PENSACOLA FL	64	X	X(X)	X(X)	1(1)	14(15)	3(18)	X(18)
MOBILE AL	34	X	X(X)	5(5)	24(29)	35(64)	8(72)	1(73)
MOBILE AL	50	X	X(X)	X(X)	3(3)	22(25)	8(33)	1(34)
MOBILE AL	64	X	X(X)	X(X)	1(1)	8(9)	4(13)	1(14)
GULFPORT MS	34	X	X(X)	3(3)	21(24)	34(58)	10(68)	1(69)
GULFPORT MS	50	X	X(X)	X(X)	2(2)	19(21)	7(28)	2(30)
GULFPORT MS	64	X	X(X)	X(X)	X(X)	8(8)	3(11)	1(12)
BURAS LA	34	X	X(X)	4(4)	19(23)	31(54)	7(61)	1(62)
BURAS LA	50	X	X(X)	X(X)	2(2)	18(20)	6(26)	1(27)
BURAS LA	64	X	X(X)	X(X)	X(X)	7(7)	4(11)	X(11)

12 14 18 12
11

Location-specific Probabilities
- Tropical-Storm-Force
- 58 mph
- Hurricane-Force

l cyclones
#21)

TIME OF ARRIVAL GRAPHIC
Earliest Reasonable Onset of TS Winds

FEMA

EARLIEST REASONABLE

- **10% chance of onset**
  - Most conservative / Risk-averse
  - Prototype graphic for 2017

- **Arrival time of TS winds**
  - Black contours

- **5-day cumulative TS probabilities**
  - Color fill

Earliest Reasonable Arrival Time of Tropical-Storm-Force Winds

Mon 8 am
Sun 8 pm
Sun 8 am
Sat 8 pm
Sat 8 am
Fri 8 pm
Fri 8 am
Thu 8 pm
Thu 8 am

All Times AST

Hurricane Irma
Thu. Sep. 7, 2017 5 am AST
Advisory 33

Storm Location: ○ < 34 kt (39 mph) ○ 34-63 kt (39-73 mph) ● ≥64 kt (74 mph)
Wind Speed
5-day chance of receiving sustained 34+ kt (39+ mph) winds
5 10 20 30 40 50 60 70 80 90 100 %
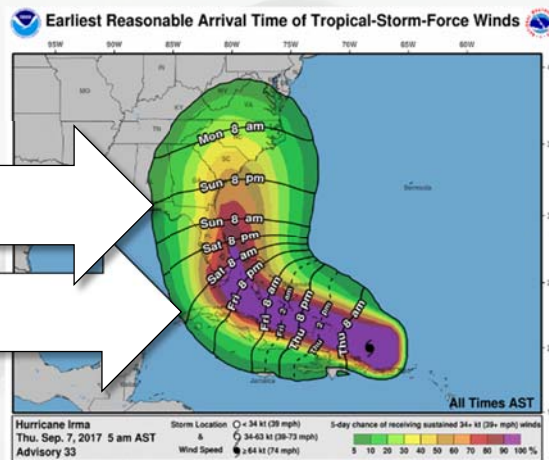
TIME OF ARRIVAL GRAPHIC
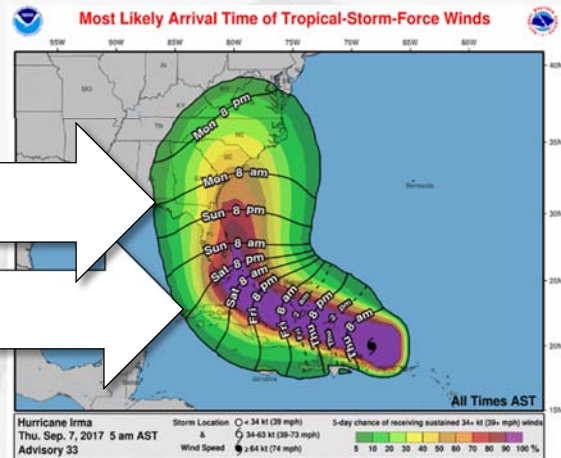*Most Likely Onset of TS Winds*

FEMA

MOST LIKELY

- **50% chance of onset**
  - Equally likely to occur before as after
  - Prototype graphic for 2017

- **Arrival time of TS winds**
  - Black contours

- **5-day cumulative TS probabilities**
  - Color fill

NATIONAL HURRICANE CENTER
Frequently Asked Questions

FEMA

FAQs

- **Where is the greatest concern?**
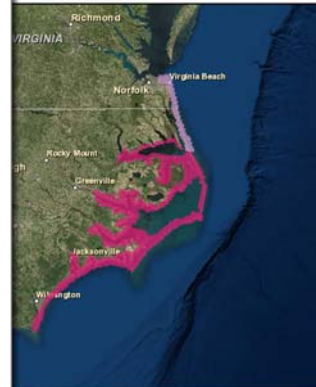- **When will hurricane hazards begin?**

- **Watches and Warnings**

WATCHES & WARNINGS
Where. When. What. Action.

FEMA

NATIONAL HURRICANE CENTER
NATIONAL OCEANIC AND ATMOSPHERIC ADMINISTRATION

STORM SURGE WATCH
There is the **possibility** of life-threatening inundation generally **within 48 hours.**

STORM SURGE WARNING
There is a **danger** of life-threatening inundation generally **within 36 hours.**

WATCHES & WARNINGS
Where. When. What. Action.

FEMA

NATIONAL HURRICANE CENTER
NATIONAL OCEANIC AND ATMOSPHERIC ADMINISTRATION

HURRICANE WATCH
Hurricane conditions are **possible** within the watch area, generally **within 48 hours**

HURRICANE WARNING
Hurricane conditions are **expected** within the warning area, generally **within 36 hours**

Note: The lead time for Hurricane Watches and Warnings is tied to the anticipated **arrival time of tropical-storm-force winds**
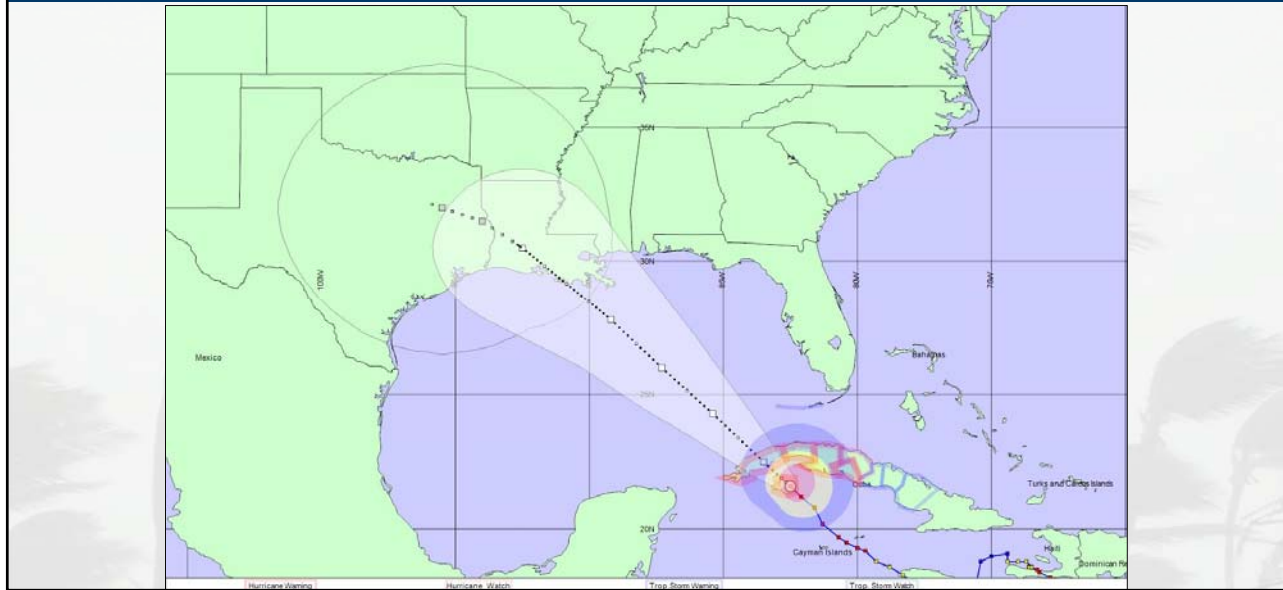
WATCHES & WARNINGS
Where. When. What. Action.

WATCHES & WARNINGS
Where. When. What. Action.
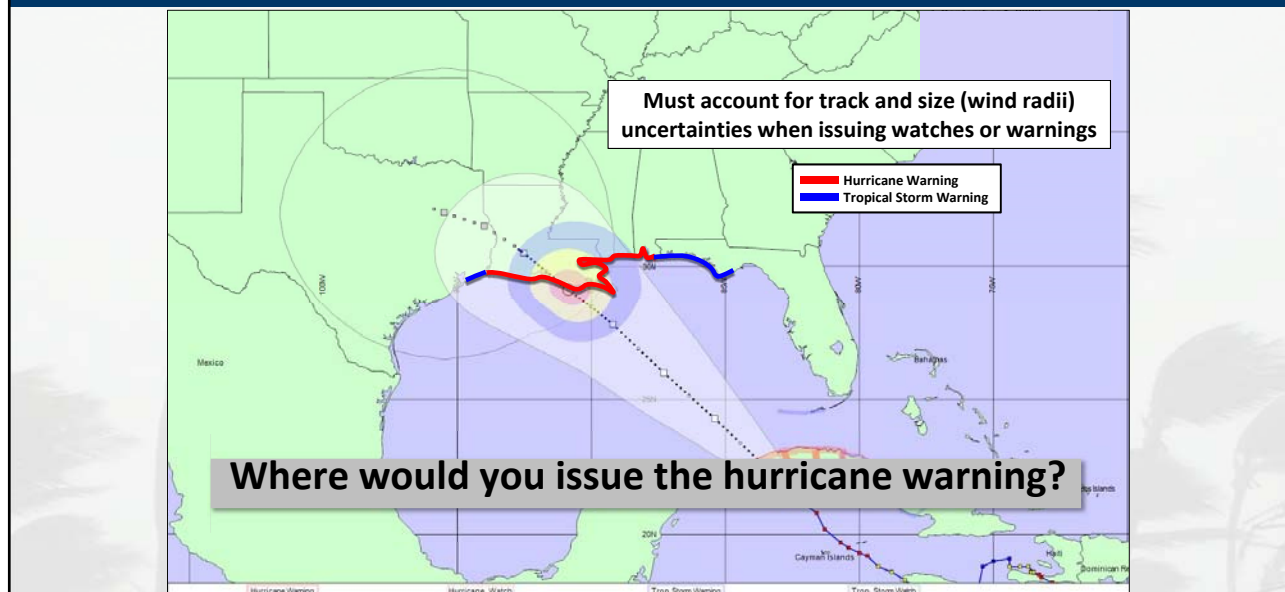
Warnings issued 36 hours prior to anticipated arrival of Tropical-Storm-Force winds

3/26/2018

WATCHES & WARNINGS
Where. When. What. Action.

Area of Hurricane-Force Winds **(red)**

Where would you issue the hurricane warning?

WATCHES & WARNINGS
Where. When. What. Action.

Must account for track and size (wind radii)
uncertainties when issuing watches or warnings

Hurricane Warning
Tropical Storm Warning

Where would you issue the hurricane warning?

31

3/26/2018

32
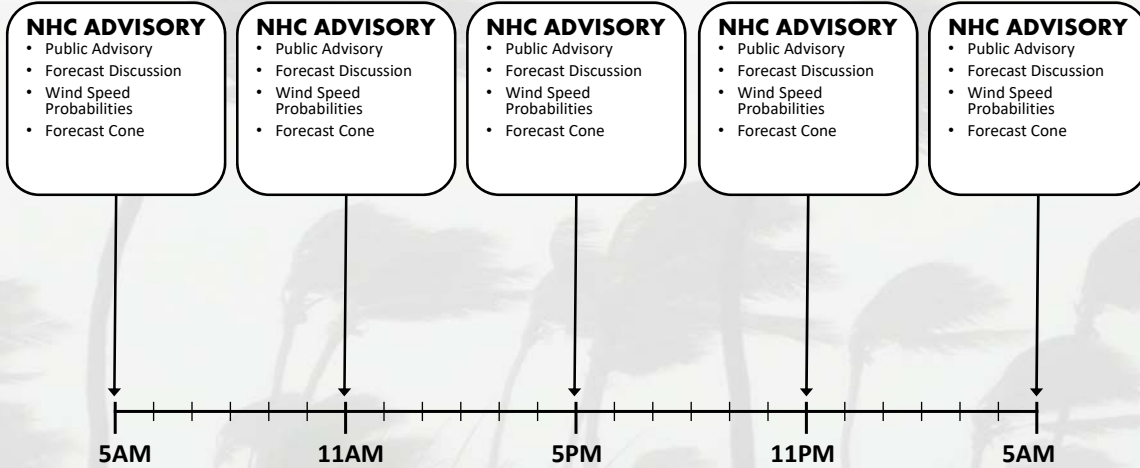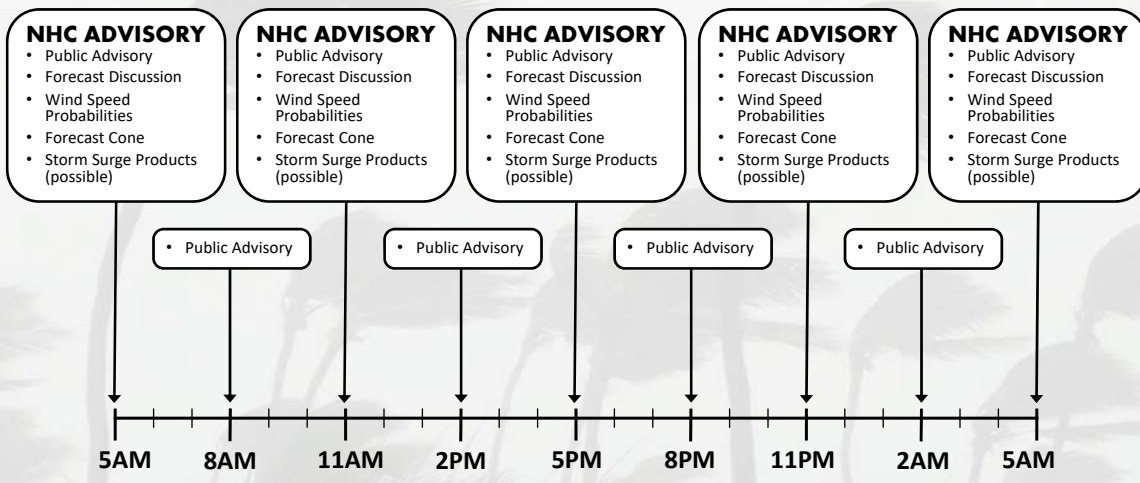
INTERMEDIATE PUBLIC ADVISORY
Issued when Watches or Warnings in effect

FEMA

NATIONAL HURRICANE CENTER
NATIONAL OCEANIC AND ATMOSPHERIC ADMINISTRATION

```
HURRICANE ISAAC INTERMEDIATE ADVISORY NUMBER  34A
NWS NATIONAL HURRICANE CENTER MIAMI FL        AL092012
100 PM CDT WED AUG 29 2012

...ISAAC SOAKING SOUTHEASTERN LOUISIANA AND SOUTHERN MISSISSIPPI
WITH HEAVY RAIN...DANGEROUS COASTAL STORM SURGE AND INLAND FLOOD
THREAT EXPECTED THROUGH TONIGHT...

SUMMARY OF 100 PM CDT...1800 UTC...INFORMATION
---------------------------------------------
LOCATION...29.7N 90.8W
ABOUT 10 MI...15 KM NW OF HOUMA LOUISIANA
ABOUT 45 MI...75 KM WSW OF NEW ORLEANS LOUISIANA
MAXIMUM SUSTAINED WINDS...75 MPH...120 KM/H
PRESENT MOVEMENT...NW OR 310 DEGREES AT 6 MPH...9 KM/H
MINIMUM CENTRAL PRESSURE...973 MB...28.73 INCHES

WATCHES AND WARNINGS
--------------------
A HURRICANE WARNING IS IN EFFECT FOR...
* EAST OF MORGAN CITY LOUISIANA TO THE MISSISSIPPI-ALABAMA
BORDER...
INCLUDING METROPOLITAN NEW ORLEANS...LAKE PONTCHARTRAIN...AND LAKE
MAUREPAS

A HURRICANE WATCH IS IN EFFECT FOR...
```

Similar content but issued 3 hours after complete advisory package

✓ **Watch or Warning in effect**

NHC ADVISORY TIMELINE
Scheduled Updates

FEMA

WATCHES/WARNINGS *in effect and eye tracked by radar*

5AM   11AM   5PM   11PM   5AM
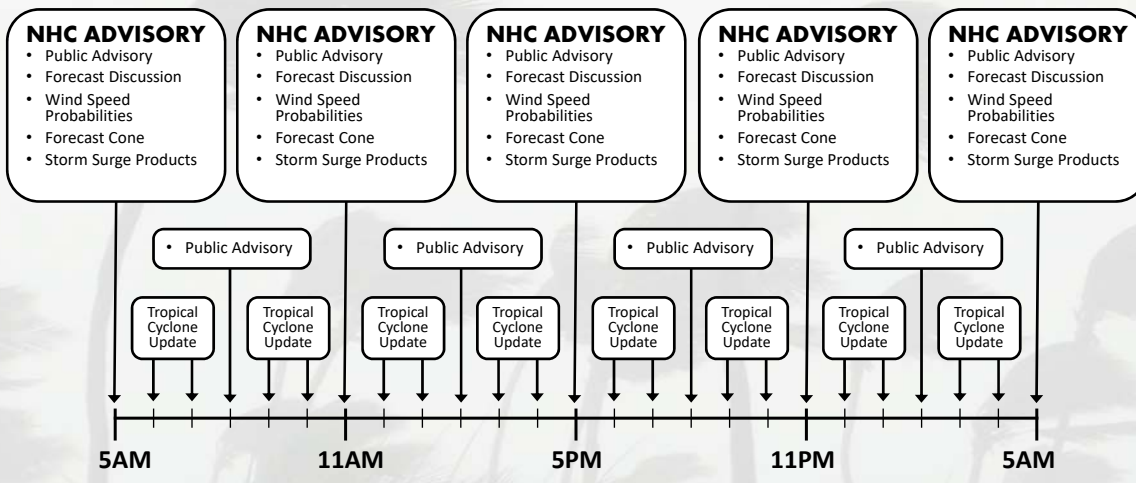
TROPICAL CYCLONE UPDATE
Unexpected Changes. Location. Landfall.

FEMA

NATIONAL HURRICANE CENTER
NATIONAL OCEANIC AND ATMOSPHERIC ADMINISTRATION

```
HURRICANE ISAAC TROPICAL CYCLONE UPDATE
NWS NATIONAL HURRICANE CENTER MIAMI FL        AL092012
1100 AM CDT WED AUG 29 2012

...ISAAC CONTINUES TO MOVE SLOWLY OVER SOUTHEASTERN LOUISIANA...
HEAVY SQUALLS LASHING NEW ORELANS AND THE MISSISSIPPI COAST...

At 1100 am CDT...1600 UTC...The center of hurricane Isaac was
Estimated near latitude 29.6 north...Longitude 90.7 west...Or very
Near Houma Louisiana...And about 45 miles southwest of New Orleans
Louisiana. Isaac is moving toward the northwest near 6 mph...9
Km/h and this general motion is expected to continue through
tonight.

A gust to 67 mph was recently reported at Shell Beach, Louisiana.
Tropical storm conditions continue along the Mississippi and
Alabama coasts.

SUMMARY OF 1100 AM CDT...1600 UTC...INFORMATION
--------------------------------------------
LOCATION...29.6N 90.7W
ABOUT 1 MI...2 KM W OF HOUMA LOUISIANA
ABOUT 45 MI...75 KM SW OF NEW ORLEANS LOUISIANA
MAXIMUM SUSTAINED WINDS...75 MPH...120 KM/H
PRESENT MOVEMENT...NW OR 310 DEGREES AT 6 MPH...9 KM/H
MINIMUM CENTRAL PRESSURE...972 MB...28.70 INCHES

$$
FORECASTER STEWART/BEVEN/ZELINSKY
```

- **Unexpected changes occur in the cyclone**
- **Cyclone landfall**
- **Issuing international watches and warnings**
- **1-hourly position estimates when a cyclone with an eye is nearing land**
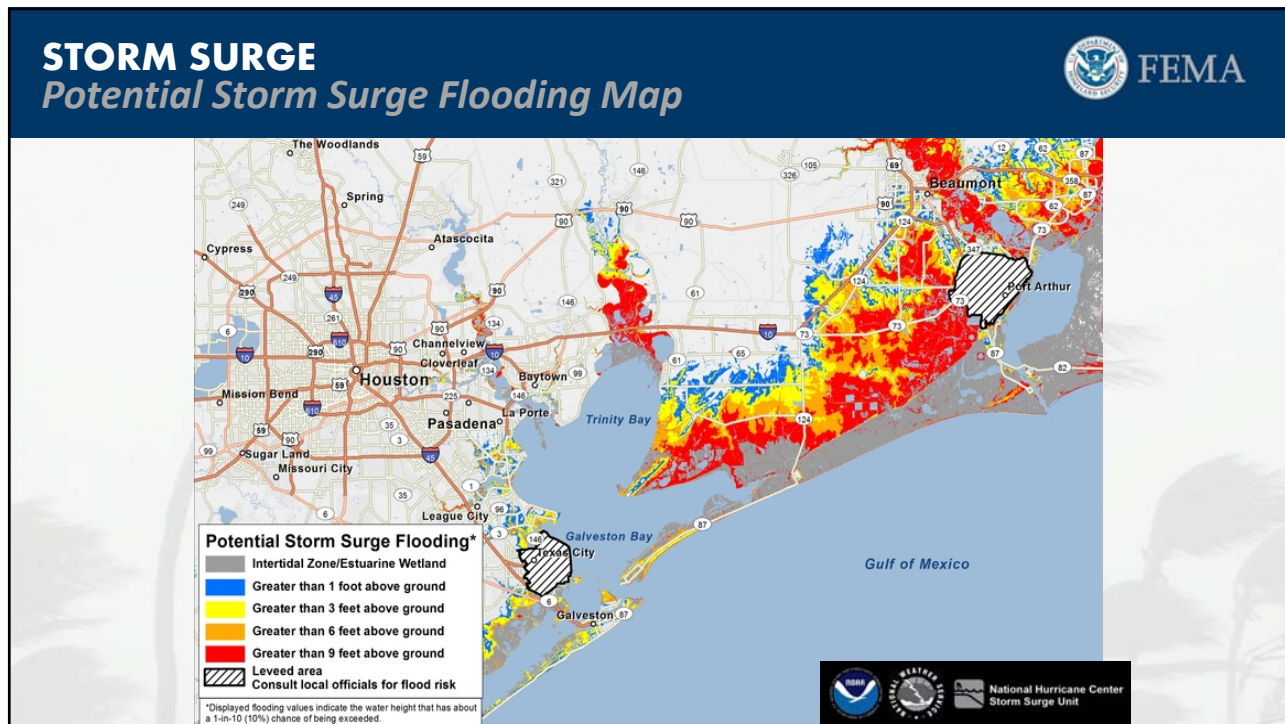

NATIONAL HURRICANE CENTER
Frequently Asked Questions

FEMA

FAQs
- **What areas will flood?**
- **How high could the water get?**

- **Storm Surge Products**

STORM SURGE
Potential Storm Surge Flooding Map

FEMA

STORM SURGE
Potential Storm Surge Flooding Map

FEMA

INUNDATION MAP

- **Height above ground that the water <u>could</u> reach**
  - Reasonable worst-case scenario for any individual location
  - Values have a 10% chance of being exceeded

- **Issuance with hurricane watch**
  - In some cases for a tropical storm watch

- **Available 60+ minutes after the advisory release**

NATIONAL HURRICANE CENTER
Frequently Asked Questions

FEMA

FAQs

- **What areas will flood?**
- **How much rain is forecast?**

- **Rainfall Products**

WEATHER PREDICTION CENTER
Rainfall Forecast

NHC Tropical Cyclone
Advisory Products

FEMA

Hurricane MATTHEW
72-hour Day 1-3 Rainfall Forecast (inches)
Created 5:16 AM EDT Fri Oct 7 2016
Valid 8:00 AM EDT Fri Oct 7 2016
through 8:00 AM EDT Mon Oct 10 2016
NOAA/NWS/NCEP/WPC

Local point maximum rainfall may be higher than shown.
See the NHC public advisories for the latest tropical cyclone information.
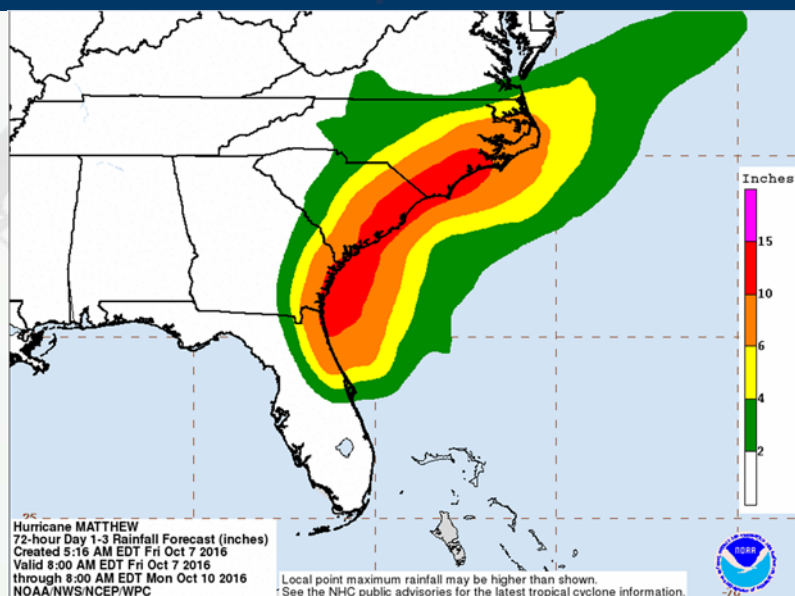
WEATHER PREDICTION CENTER
Excessive Rainfall Outlook

FEMA

NATIONAL HURRICANE CENTER
Frequently Asked Questions

FEMA
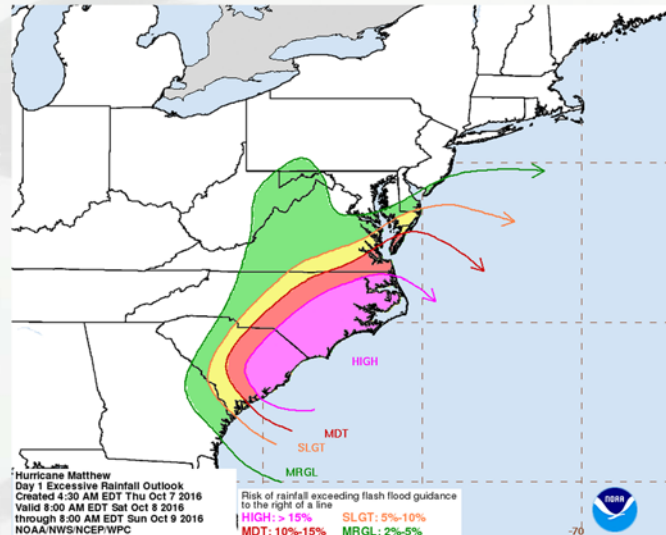
FAQs
- Local impacts?
- Localized forecast information?
- Inland Watches and Warnings?

  - **NWS Forecast Offices**

Slide 1

NWS FORECAST OFFICES
Hurricane Local Statements

FEMA

NATIONAL HURRICANE CENTER
NATIONAL OCEANIC AND ATMOSPHERIC ADMINISTRATION

HURRICANE WILMA LOCAL STATEMENT ADVISORY NUMBER 32
NATIONAL WEATHER SERVICE MIAMI FL   AL242005
530 AM EDT SUN OCT 23 2005

THIS PRODUCT COVERS MAINLAND SOUTH FLORIDA

**EXTENSIVE TO DEVASTATING DAMAGE AND LIFE-THREATENING CONDITIONS
EXPECTED AS HURRICANE WILMA MOVES NORTHEAST ACROSS SOUTH FLORIDA**

NEW INFORMATION
----
* CHANGES TO WATCHES AND WARNINGS:
- A HURRICANE WATCH HAS BEEN UPGRADED TO A HURRICANE WARNING FOR
MIAMI-DADE…BROWARD…PALM BEACH…COLLIER…GLADES AND MONROE COUNTIES

* CURRENT WATCHES AND WARNINGS:
- A HURRICANE WARNING IS IN EFFECT FOR MIAMI -DADE…BROWARD…PALM
BEACH…COLLIER…HENDRY…GLADES AND MAINLAND MONROE COUNTIES

* STORM INFORMATION:
- ABOUT 405 MI SW OF NAPLES FL
- 22.1N 86.6W
- STORM INTENSITY 100 MPH WITH HIGHER GUSTS
- MOVING NORTHEAST AT 3 MPH

SITUATION OVERVIEW

EXTREMELY DANGEROUS HURRICANE WILMA IS EXPECTED TO IMPACT SOUTH
FLORIDA BEGINNING THIS EVENING. THE MAIN CONCERN IS FOR LIFE-
THREATENING INUNDATION IN SURGE-PRONE AREAS OF COLLIER/MAINLAND

Issued by local NWS office
• Hurricane (Tropical Storm) Watch/Warning in effect

Situation overview
• Watch/warning information
• Potential impact information
• Preparedness actions

Slide 2

NWS FORECAST OFFICES
Hurricane Local Statements

FEMA

NATIONAL HURRICANE CENTER
NATIONAL OCEANIC AND ATMOSPHERIC ADMINISTRATION

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THREATENING INUNDATION IN SURGE-PRONE AREAS OF COLLIER/MAINLAND

What is the affected area?

NWS FORECAST OFFICES
Hurricane Local Statements

Are there any changes since the last update?

NWS FORECAST OFFICES
Hurricane Threats & Impacts (HTI)

HAZARDS
- **Wind**
- **Storm Surge Flooding**
- **Inland Flooding**
- **Tornadoes**
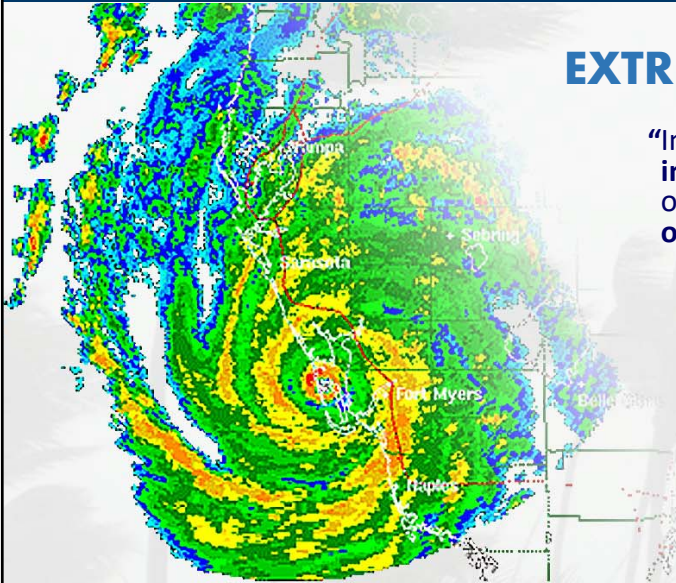- **Marine Hazards**

THREAT & IMPACTS
- **Elevated** (yellow)
- **Moderate** (orange)
- **High**   (red)
- **Extreme**   (magenta)
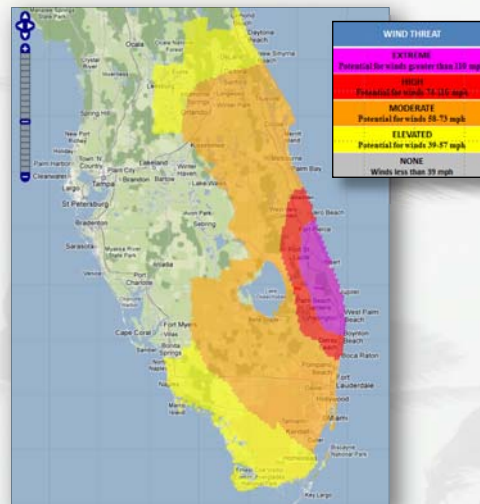
NWS FORECAST OFFICES
Extreme Wind Warning

FEMA

EXTREME WIND WARNING

"Inform the public of the need to take **immediate shelter** in an interior portion of a well-built structure **due to the onset of extreme tropical cyclone winds.**"

Issuance criteria:
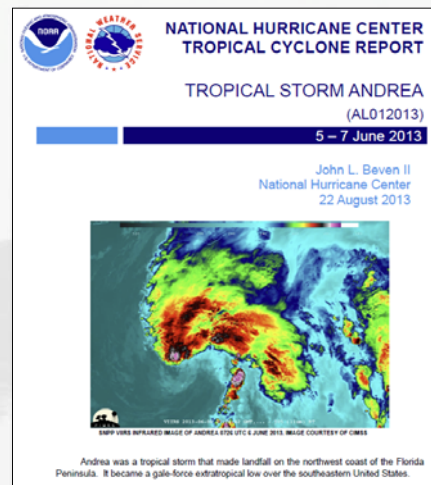- Category 3 or greater
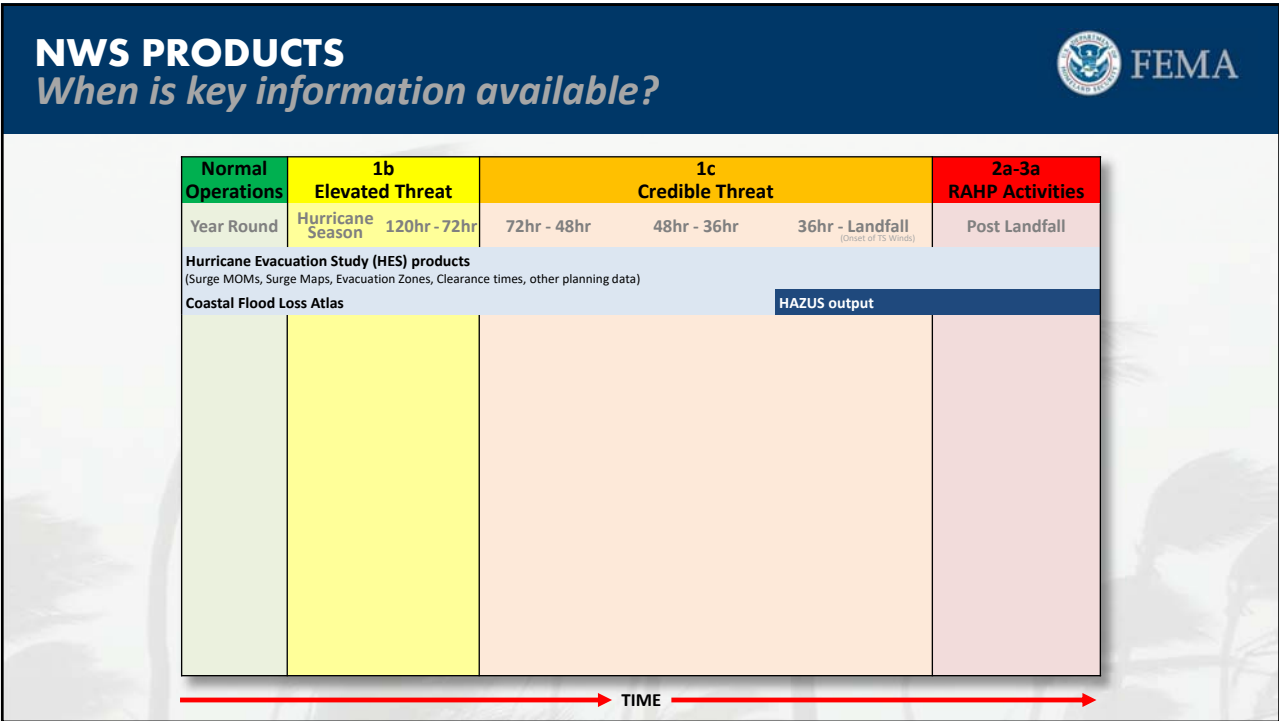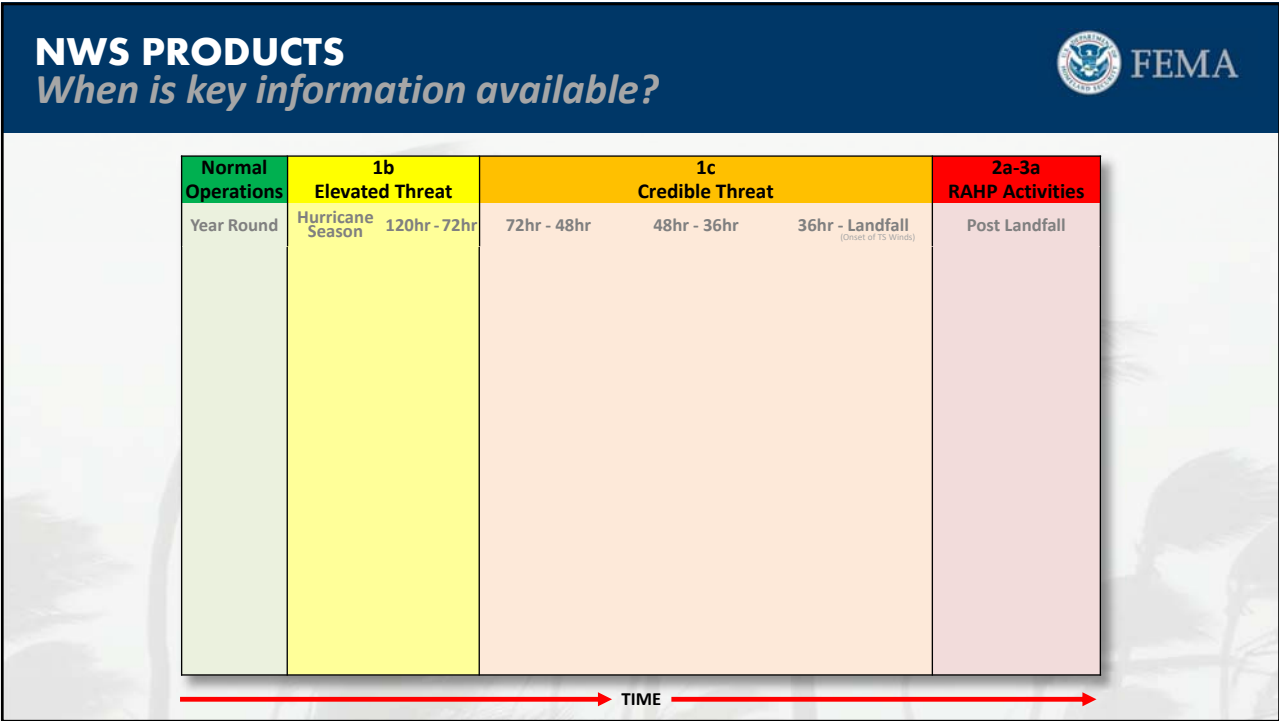- Valid time 2 hours or less

NATIONAL HURRICANE CENTER
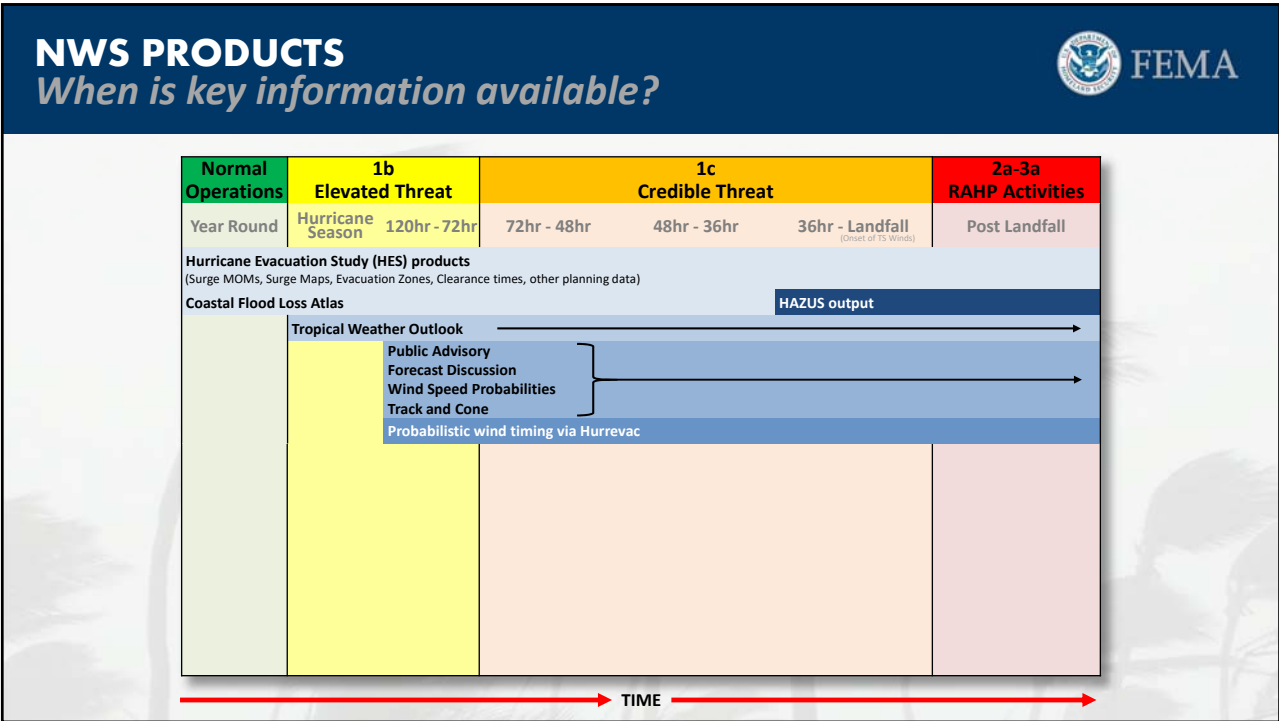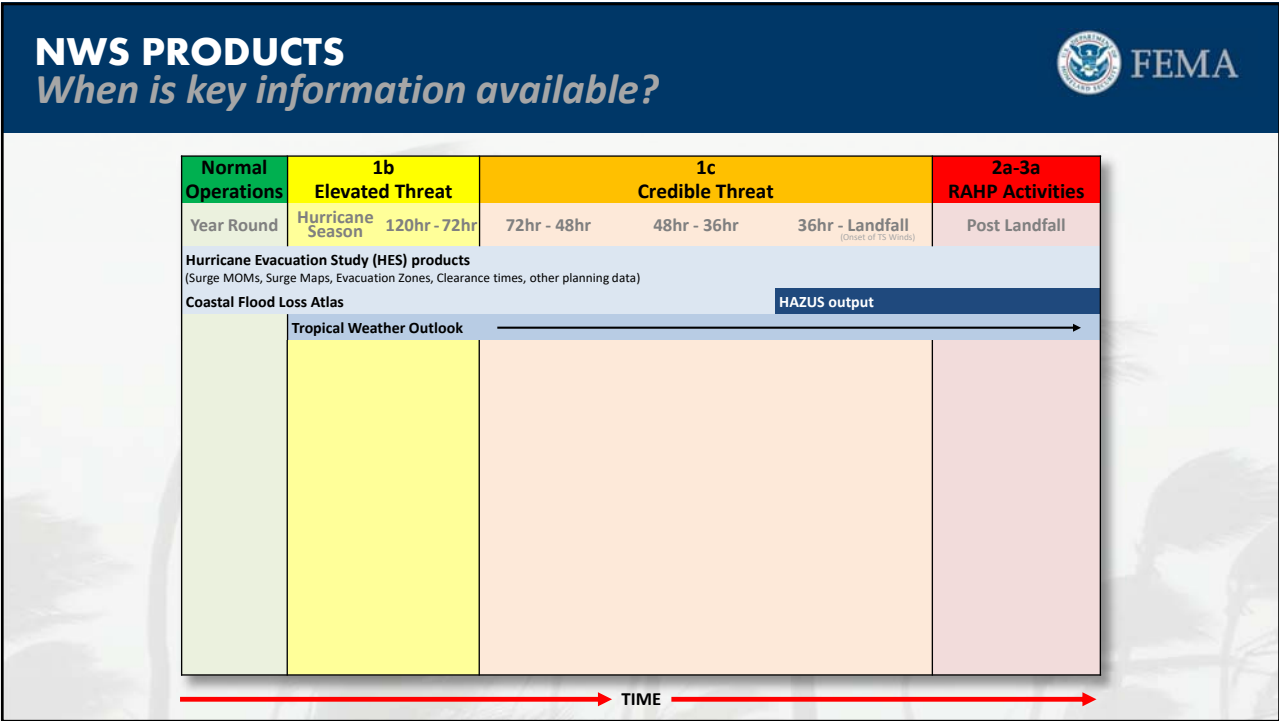*Tropical Cyclone Reports*

FEMA

SUMMARY REPORT

- Tropical Cyclone Reports provide a complete summary report for every Atlantic and East Pacific storm

- Available on NHC Website weeks to months after each storm

- Final track, intensity and size info

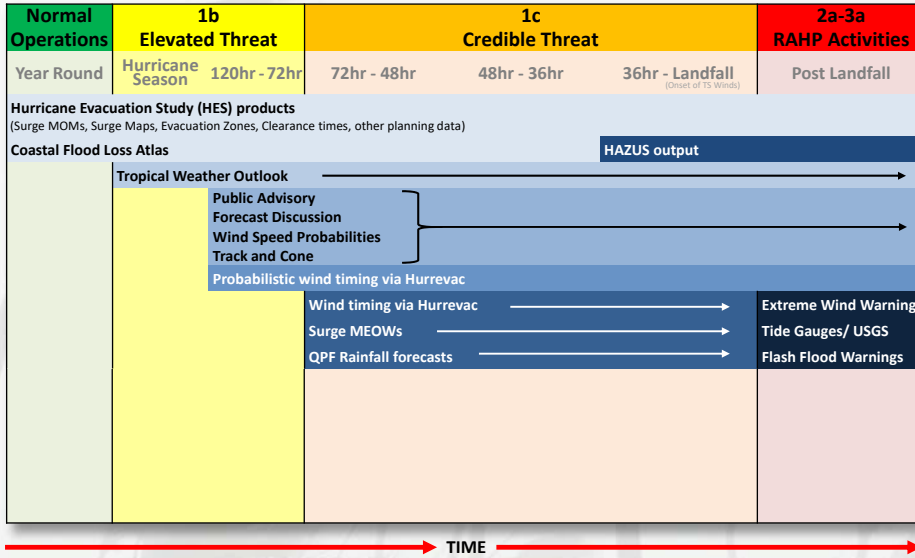- Damage and casualty figures

- Forecast critique

NWS PRODUCTS
When is key information available?

FEMA

Normal Operations	1b Elevated Threat	1c Credible Threat				2a-3a RAHP Activities
Year Round	Hurricane Season 120hr - 72hr	72hr - 48hr	48hr - 36hr	36hr - Landfall (Onset of TS Winds)		Post Landfall

TIME

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FEMA

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Hurricane Evacuation Study (HES) products
(Surge MOMs, Surge Maps, Evacuation Zones, Clearance times, other planning data)

Coastal Flood Loss Atlas   HAZUS output

TIME

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Coastal Flood Loss Atlas

HAZUS output

Tropical Weather Outlook

TIME

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Coastal Flood Loss Atlas

HAZUS output

Tropical Weather Outlook

Public Advisory
Forecast Discussion
Wind Speed Probabilities
Track and Cone

Probabilistic wind timing via Hurrevac

TIME

NWS PRODUCTS
When is key information available?

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Normal Operations	1b Elevated Threat	1c Credible Threat			2a-3a RAHP Activities
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Coastal Flood Loss Atlas — HAZUS output

Tropical Weather Outlook

Public Advisory
Forecast Discussion
Wind Speed Probabilities
Track and Cone

Probabilistic wind timing via Hurrevac

Wind timing via Hurrevac — Extreme Wind Warnings
Surge MEOWs — Tide Gauges/ USGS
QPF Rainfall forecasts — Flash Flood Warnings

TIME

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When is key information available?

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Coastal Flood Loss Atlas — HAZUS output

Tropical Weather Outlook

Public Advisory
Forecast Discussion
Wind Speed Probabilities
Track and Cone

Probabilistic wind timing via Hurrevac

Wind timing via Hurrevac — Extreme Wind Warnings
Surge MEOWs — Tide Gauges/ USGS
QPF Rainfall forecasts — Flash Flood Warnings

River Forecasts   Flood Outlooks   River Flood Warnings
TS/Hurricane Watches TS/Hurricane Warnings
Hurricane Local Statements
Storm Surge Probabilities & Inundation Map
Storm Surge Watch   Storm Surge Warning
Tornado Watches & Warnings

TIME

NATIONAL WEATHER SERVICE
Tropical Cyclone Products

FEMA

> 5 Days

3-5 Days

2-3 Days

1-2 Days

Outlook

5 Day Forecast
Public Advisory
Wind Speed %
Forecast Discussion

TS/Hurricane Watches

TS/Hurricane Warnings
TS/Hurricane Local Statements
Operational Storm Surge Products

Few products
Large uncertainty

More products
Forecast hazards

Detailed products
Warnings

HURRICANE READINESS
L-311

FEMA

Questions/Comments?

HURRICANE READINESS
What do you know?

FEMA

QUESTION 1

Which product shows the probable track or path of the center of the tropical cyclone?

A. Cumulative Wind History

B. Wind Speed Probability Graphic

C. Cone Graphic

D. Graphical Tropical Weather Outlook

HURRICANE READINESS
What do you know?

FEMA

QUESTION 2

Which product gives the chance of tropical cyclone formation?

A. Tropical Weather Outlook

B. Tropical Cyclone Discussion

C. Public Advisory

D. Wind Speed Probability Graphic

HURRICANE READINESS
What do you know?

FEMA

QUESTION 3

Which product provides wind timing information beyond 72 hours?

A. **Forecast Advisory**

B. **Cone Graphic**

C. **Public Advisory**

D. **Wind Speed Probabilities**

HURRICANE READINESS
What do you know?

FEMA

QUESTION 4

Which product shows the current size of the tropical cyclone wind field?

A. **NWS Hurricane Threats and Impacts Graphic (HTI)**

B. **Wind Speed Probability Graphic**

C. **Tropical Cyclone Cumulative Wind History**

D. **Cone Graphic**

3/26/2018

HURRICANE READINESS
What do you know?

FEMA

QUESTION 5

Which product provides the reasoning behind the forecast?

A. Public Advisory

B. Forecast Discussion

C. Hurricane Local Statement

D. Forecast Advisory

HURRICANE READINESS
What do you know?

FEMA

QUESTION 6

Which product shows areas of possible tropical cyclone formation?

A. Cone Graphic

B. Tropical Weather Outlook

C. Graphical Tropical Weather Outlook

D. Wind Speed Probability Graphic

HURRICANE READINESS
What do you know?

FEMA

QUESTION 7

Which product contains forecast position, intensity, and wind radii information?

A. Public Advisory

B. Tropical Cyclone Discussion

C. Tropical Weather Outlook

D. Forecast Advisory

HURRICANE READINESS
What do you know?

FEMA

QUESTION 8

When are Special Advisories issued?

A. When a significant, unexpected change in the storm occurs

B. When a tropical cyclone is within Radar range

C. Upon request

D. Before an Emergency Management briefing

HURRICANE READINESS
What do you know?

FEMA

QUESTION 9

Which products provide continuous flow of information when a tropical cyclone is near land?

A. **Public Advisory & Tropical Outlook**

B. **Public Advisory, Intermediate Advisory, & TC Update**

C. **Public Advisory & Cone Graphic**

D. **Public Advisory & Forecast Discussion**

HURRICANE READINESS
What do you know?

FEMA

QUESTION 10

How often is a new NHC track and intensity forecast routinely issued?

A. **Every 3 hours**

B. **Every 6 hours**

C. **Every 8 hours**

D. **Only when there is a change in the models**

HURRICANE READINESS
What do you know?

FEMA

QUESTION 11
When are intermediate public advisories issued?

A. All of the time

B. When the 5-day forecast reaches land

C. When ships are crossing the path of the storm

D. When coastal watches and warnings are in effect

HURRICANE READINESS
What do you know?

FEMA

QUESTION 12
Which warning is issued when a major (cat 3 or stronger) hurricane is about to make landfall?

A. Extreme Wind Warning

B. Hurricane Warning

C. Tornado Warning

D. Severe Thunderstorm Warning

HURRICANE READINESS
What do you know?

FEMA

QUESTION 13
How many days does the forecast information in the
Public Advisory cover?

WHAT DO YOU KNOW? WHAT DO YOU KNOW? WHAT DO YOU KNOW? WHAT DO YOU KNOW? WHAT DO YOU KNOW?

A. 1 day   B. 2 days

C. 3 days   D. 5 days

WHAT DO YOU KNOW? WHAT DO YOU KNOW? WHAT DO YOU KNOW? WHAT DO YOU KNOW? WHAT DO YOU KNOW?

HURRICANE READINESS
What do you know?

FEMA

QUESTION 14
The lead time for a Hurricane Watch of Warning is tied to
the arrival of _____.

WHAT DO YOU KNOW? WHAT DO YOU KNOW? WHAT DO YOU KNOW? WHAT DO YOU KNOW? WHAT DO YOU KNOW?

A. Hurricane force   B. Life threatening
   winds   inundation

C. The eye   D. Tropical storm force
                               winds

WHAT DO YOU KNOW? WHAT DO YOU KNOW? WHAT DO YOU KNOW? WHAT DO YOU KNOW? WHAT DO YOU KNOW?

HURRICANE READINESS
What do you know?

FEMA

QUESTION 15
Which product is often issued when a tropical cyclone makes landfall?

A. Special Advisory

B. Intermediate Public Advisory

C. Tropical Cyclone Update

D. Special Tropical Weather Outlook

HURRICANE READINESS
What do you know?

FEMA

QUESTION 16
The cone graphic provides information about the following hazards? (Choose all correct answers)

Trick Question

A. Heavy rainfall

B. Storm surge flooding

E. The cone does not provide information about hazards.

C. Tropical storm force winds

D. Tornadoes

HURRICANE READINESS
What do you know?

FEMA

QUESTION 18
NHC track forecasts are most accurate for this (strength) of Tropical Cyclones?

A. Hurricanes

B. Tropical Storms

C. Tropical Depressions

D. All of the above

HURRICANE READINESS
What do you know?

FEMA

QUESTION 19
The NHC assigns Saffir-Simpson Hurricane Scale categories based on what?

A. Size of the hurricane

B. Maximum sustained winds

C. Forecast Storm Surge

D. Minimum pressure

3/26/2018

HURRICANE READINESS
What do you know?

FEMA

QUESTION 20
Which one of the following is used to construct the size of the NHC forecast error cone?

A. Possible impact areas

B. Geographic size of the windfield

C. Model spread

D. Past 5 years of track forecast error

HURRICANE READINESS
What do you know?

FEMA

QUESTION 21
The NHC's 24 and 48 hour intensity forecasts are on average off by _____ Saffir-Simpson categories?

A. 1

B. 2

C. 3

D. 4