NOAA

National Weather Service

2025 Tropical Outreach Webinar

Seasonal Changes, Reminders, and Proposed Changes

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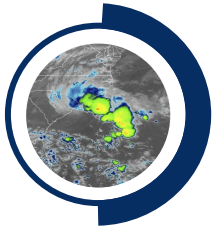
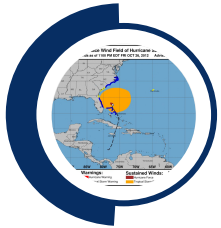
Andy Nash: Meteorologist in Charge (MIC)

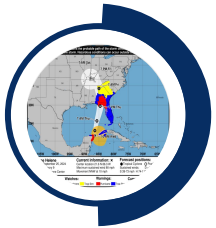
Overview of Changes for the 2025 Hurricane Season



Ability to Issue Potential Tropical Cyclone Advisory Products up to 72 Hours Before the Impacts

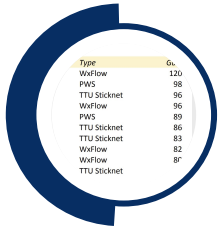
Extension of NHC/CPHC Hurricane Force Wind Radii Forecasts to 72 hours



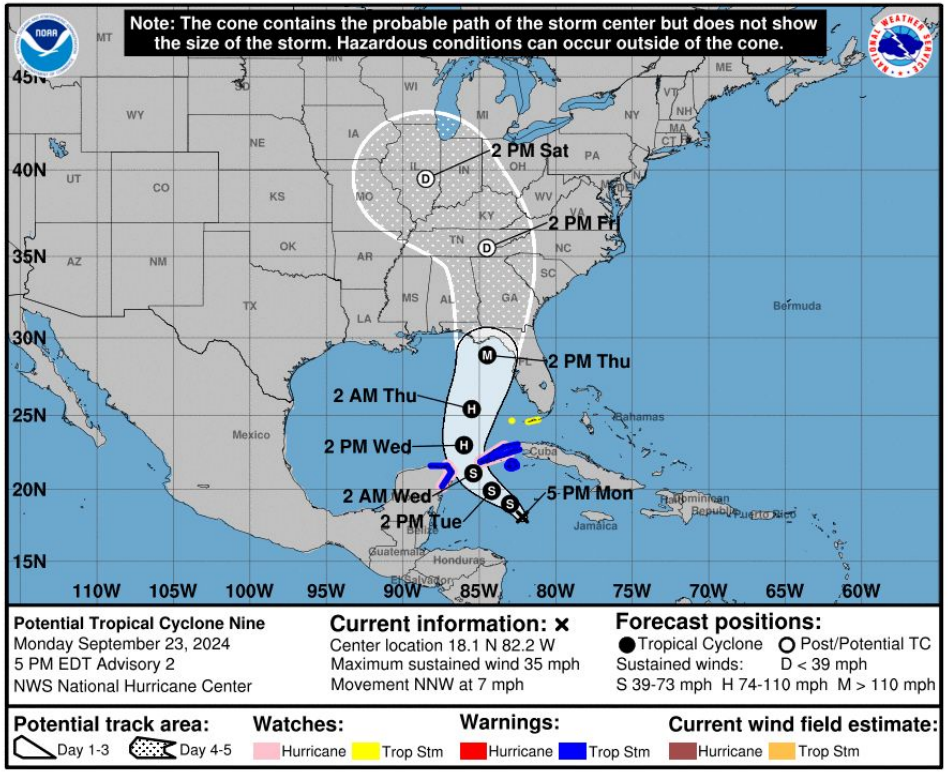


Cone graphics with coastal and inland U.S. tropical wind watches/warning continues experimentally in 2025

Separate list for the top 10 wind gusts in the PSH Observational Data Summary



Advisory Products for Potential Tropical Cyclones (PTCs)

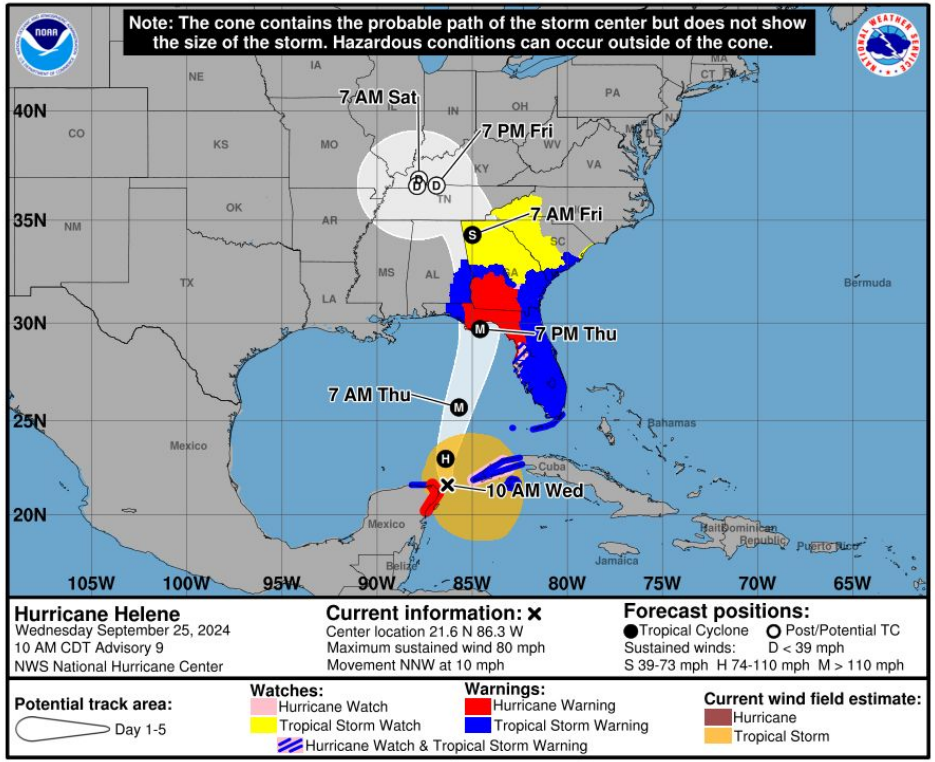


****New for 2025****

Advisory products can be issued up to **72 hours in advance** of storm surge or tropical storm force winds reaching land. Previously this was 48 hours in advance.

A potential tropical cyclone is a disturbance that isn't yet a tropical cyclone (tropical depression, tropical storm, or hurricane), but there is high confidence that it will bring tropical cyclone impacts (wind and/or storm surge) to land.

Cone Graphic with Inland Tropical Wind Watches/Warnings



Experimental cone graphic depicting inland U.S. tropical storm and hurricane watches and warnings will continue to be available experimentally for the 2025 hurricane season

Based on feedback, the color/pattern for an area with both a Tropical Storm Warning and a Hurricane Watch has been added to the legend

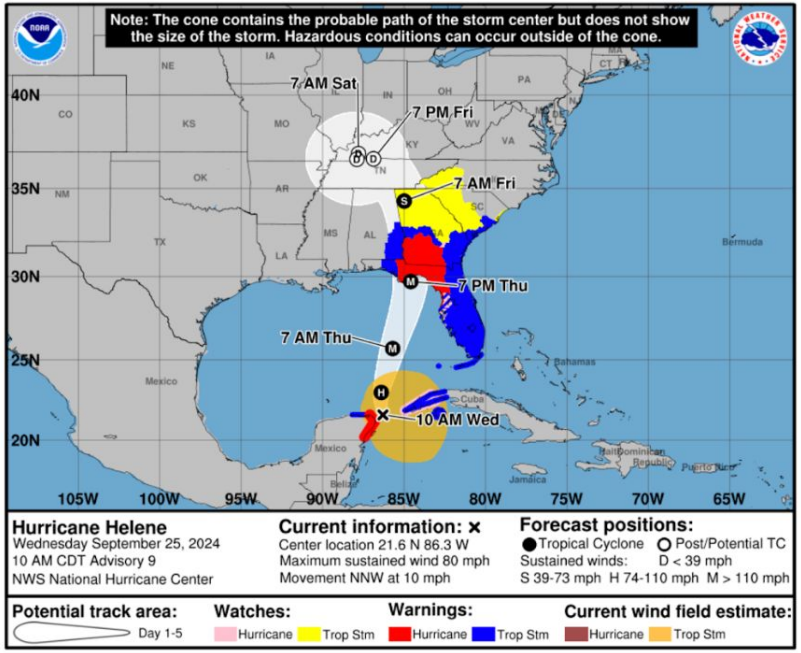
This graphic helps to convey wind hazard risk over land

Graphic may not be available as soon as the current cone graphic due to the time need to compile complete inland watch and warning information

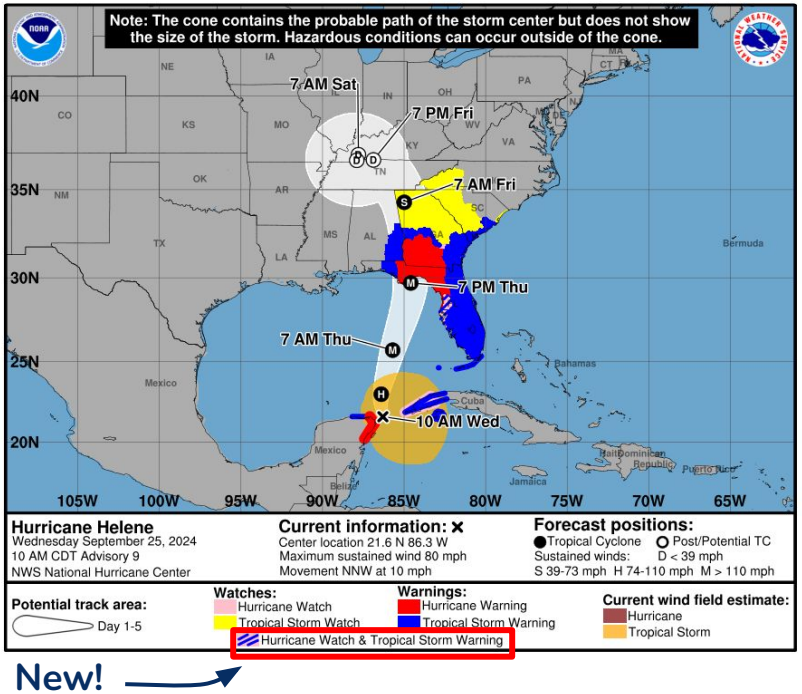
Available at hurricanes.gov along with the current operational version of the cone graphic

Cone Graphic with Inland Tropical Wind Watches/Warnings

2024 Version

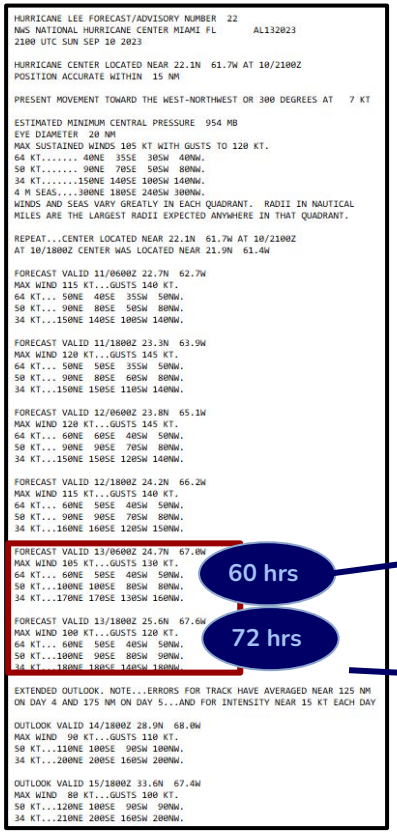


2025 Version



New!

Extension of NHC Hurricane Force Wind Radii to 72 Hours



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HURRICANE LEE FORECAST/ADVISORY NUMBER  22
NWS NATIONAL HURRICANE CENTER MIAMI FL       AL132023
2100 UTC SUN SEP 10 2023

HURRICANE CENTER LOCATED NEAR 22.1N  61.7W AT 10/2100Z
POSITION ACCURATE WITHIN  15 NM

PRESENT MOVEMENT TOWARD THE WEST-NORTHWEST OR 300 DEGREES AT   7 KT

ESTIMATED MINIMUM CENTRAL PRESSURE  954 MB
EYE DIAMETER  20 NM
MAX SUSTAINED WINDS 105 KT WITH GUSTS TO 120 KT.
64 KT..... 40NE  35SE  30SW  40NW.
50 KT..... 90NE  70SE  50SW  80NW.
34 KT.....150NE 140SE 100SW 140NW.
4 M SEAS....300NE 180SE 240SW 300NW.
WINDS AND SEAS VARY GREATLY IN EACH QUADRANT.  RADII IN NAUTICAL
MILES ARE THE LARGEST RADII EXPECTED ANYWHERE IN THAT QUADRANT.

REPEAT...CENTER LOCATED NEAR 22.1N  61.7W AT 10/2100Z
AT 10/1800Z CENTER WAS LOCATED NEAR 21.9N  61.4W

FORECAST VALID 11/0600Z 22.7N  62.7W
MAX WIND 115 KT...GUSTS 140 KT.
64 KT... 50NE  40SE  35SW  50NW.
50 KT... 90NE  80SE  50SW  80NW.
34 KT...150NE 140SE 100SW 140NW.

FORECAST VALID 11/1800Z 23.3N  63.9W
MAX WIND 120 KT...GUSTS 145 KT.
64 KT... 50NE  50SE  35SW  50NW.
50 KT... 90NE  80SE  60SW  80NW.
34 KT...150NE 150SE 110SW 140NW.

FORECAST VALID 12/0600Z 23.8N  65.1W
MAX WIND 120 KT...GUSTS 145 KT.
64 KT... 60NE  60SE  40SW  50NW.
50 KT... 90NE  90SE  70SW  80NW.
34 KT...150NE 150SE 120SW 140NW.

FORECAST VALID 12/1800Z 24.2N  66.2W
MAX WIND 115 KT...GUSTS 140 KT.
64 KT... 60NE  50SE  40SW  50NW.
50 KT... 90NE  90SE  70SW  80NW.
34 KT...160NE 160SE 120SW 150NW.

FORECAST VALID 13/0600Z 24.7N  67.0W
MAX WIND 105 KT...GUSTS 130 KT.
64 KT... 60NE  50SE  40SW  50NW.
50 KT...100NE 100SE  80SW  80NW.
34 KT...170NE 170SE 130SW 160NW.

FORECAST VALID 13/1800Z 25.6N  67.6W
MAX WIND 100 KT...GUSTS 120 KT.
64 KT... 60NE  50SE  40SW  50NW.
50 KT...100NE  90SE  80SW  90NW.
34 KT...180NE 180SE 140SW 180NW.

EXTENDED OUTLOOK. NOTE...ERRORS FOR TRACK HAVE AVERAGED NEAR 125 NM
ON DAY 4 AND 175 NM ON DAY 5...AND FOR INTENSITY NEAR 15 KT EACH DAY

OUTLOOK VALID 14/1800Z 28.9N  68.0W
MAX WIND  90 KT...GUSTS 110 KT.
50 KT...110NE 100SE  90SW 100NW.
34 KT...200NE 200SE 160SW 200NW.

OUTLOOK VALID 15/1800Z 33.6N  67.4W
MAX WIND  80 KT...GUSTS 100 KT.
50 KT...120NE 100SE  90SW  90NW.
34 KT...210NE 200SE 160SW 200NW.
```

60 hrs

72 hrs

NHC and CPHC will now issue hurricane force (64-kt) wind radii forecasts out to 72 hours

Previously this data was only available through 48 hours

Data will be available in the:

- **Tropical Cyclone Forecast Advisory (TCM) text product (left) at hurricanes.gov**
- **GIS based wind radii forecast data at hurricanes.gov/gis**

FORECAST VALID 13/0600Z 24.7N 67.0W
MAX WIND 105 KT...GUSTS 130 KT.
64 KT... 60NE 50SE 40SW 50NW.
50 KT...100NE 100SE 80SW 80NW.
34 KT...170NE 170SE 130SW 160NW.

FORECAST VALID 13/1800Z 25.6N 67.6W
MAX WIND 100 KT...GUSTS 120 KT.
64 KT... 60NE 50SE 40SW 50NW.
50 KT...100NE 90SE 80SW 90NW.
34 KT...180NE 180SE 140SW 180NW.

Post Tropical Cyclone Report (PSH) Wind Gusts

Previously the PSH Data Summary included a single list of combined highest sustained winds and wind gusts

Highest 10 Land Winds (kts)*

Station	*State*	*Type*	*Sustained*	*Gust*
Dulac	LA	WxFlow	87	120
Laplace	LA	PWS	86	
1 NW Killona	LA	TTU Sticknet	70	96
Bourg	LA	PWS	70	
1 N Live Oak	LA	TTU Sticknet	64	86
Mandeville	LA	WxFlow	63	96
Waggaman	LA	WxFlow	63	80
4.7 S Vacherie	LA	TTU Sticknet	61	77
2 E Raceland	LA	TTU Sticknet	60	83
7.8 SE Violet	LA	TTU Sticknet	60	79

* Anemometer heights < 20 m

Highest 10 Land Winds (kts)*

Station	*State*	*Type*	*Sustained*
Dulac	LA	WxFlow	87
Laplace	LA	PWS	86
1 NW Killona	LA	TTU Sticknet	70
Bourg	LA	PWS	70
1 N Live Oak	LA	TTU Sticknet	64
Mandeville	LA	WxFlow	63
Waggaman	LA	WxFlow	63
4.7 S Vacherie	LA	TTU Sticknet	61
2 E Raceland	LA	TTU Sticknet	60
7.8 SE Violet	LA	TTU Sticknet	60

* Anemometer heights < 20 m

Highest 10 Land Gusts (kts)*

Station	*State*	*Type*	*Gust*
Dulac	LA	WxFlow	120
New Orleans	LA	PWS	98
1 NW Killona	LA	TTU Sticknet	96
Mandeville	LA	WxFlow	96
2 NE Port Fourchon	LA	PWS	89
1 N Live Oak	LA	TTU Sticknet	86
2 E Raceland	LA	TTU Sticknet	83
Lakefront Airport	LA	WxFlow	82
Waggaman	LA	WxFlow	80
7.8 SE Violet	LA	TTU Sticknet	79

* Anemometer heights < 20 m

Top 10 wind and wind gusts are now separated into two different tables in the PSH Data Summary

Reminders

Reminders About “Invests” (Tropical Disturbances)

Opening an invest allows NHC to:

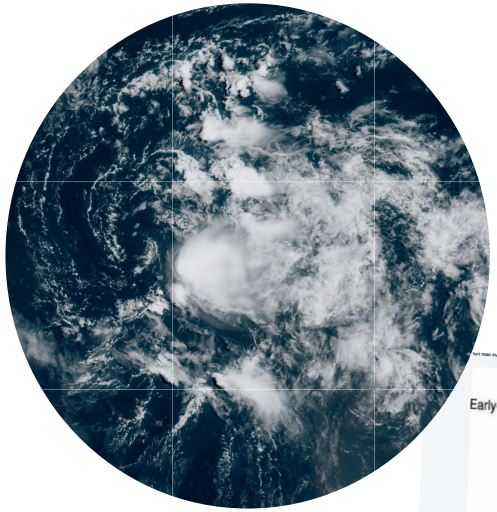
- Monitor disturbances more carefully
- Collect microwave satellite data
- Record “fixes” (circulation center location)
- Run model guidance

Caveats for invests:

- No standard for opening one – up to forecaster discretion
- Invest information only has to be updated every 12 h
- Guidance typically run when a cloud system center is apparent

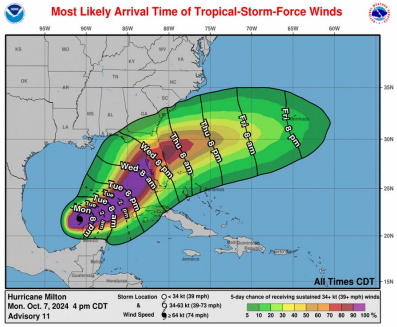
More meteorological uncertainty associated with invests!

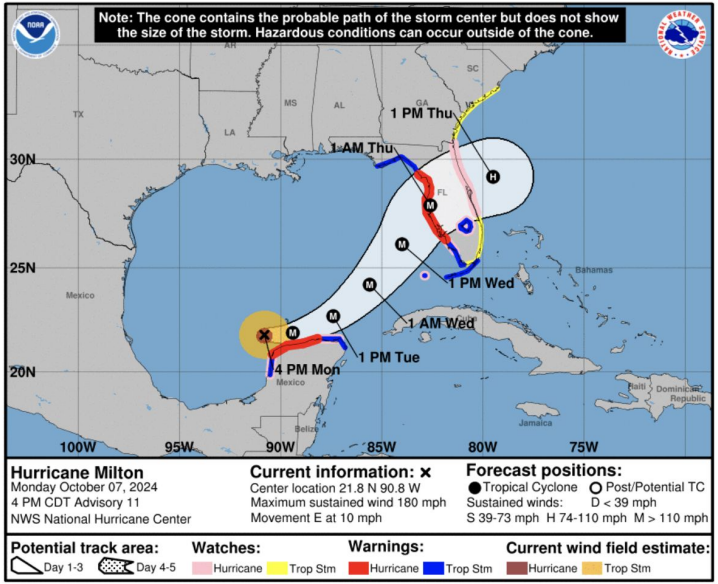
- Extreme caution should be used when looking at model guidance for invests

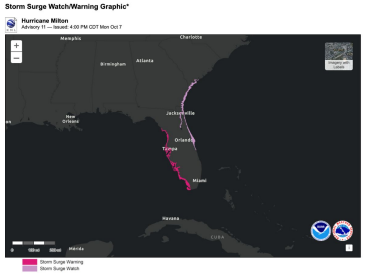


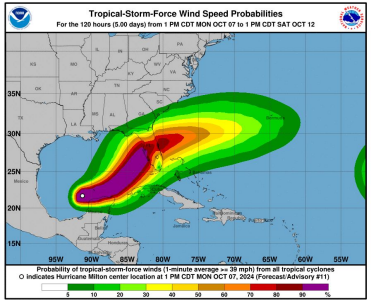
Advisory Package

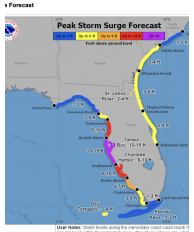
What is included in an advisory package?

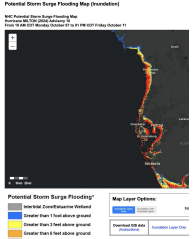












*Storm surge graphics are not always available for lower-end events

Track Forecast/Cone Graphic

What is the “cone of uncertainty” and how is it determined?

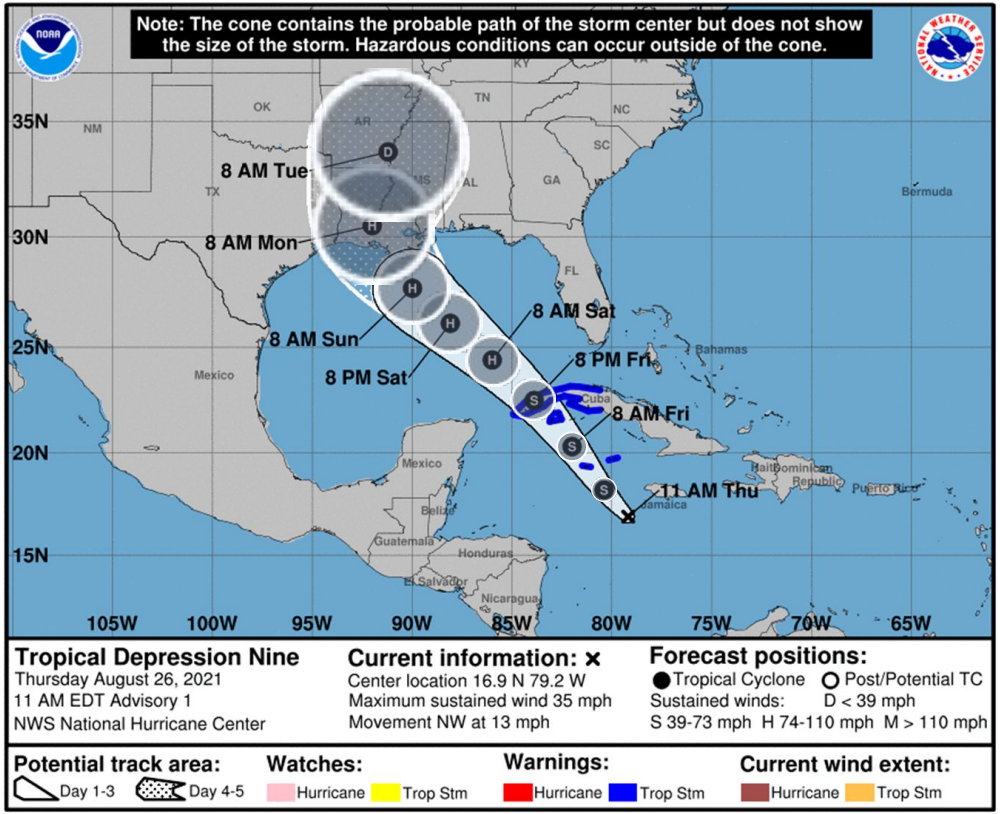
Conveys the most likely track of the center of the storm

Does NOT convey impacts

Based on the 2/3rds track error from the past five years (67th percentile of the past 5 years of track errors)

The cone size does not change through the season

Information about the NHC cone and reminders



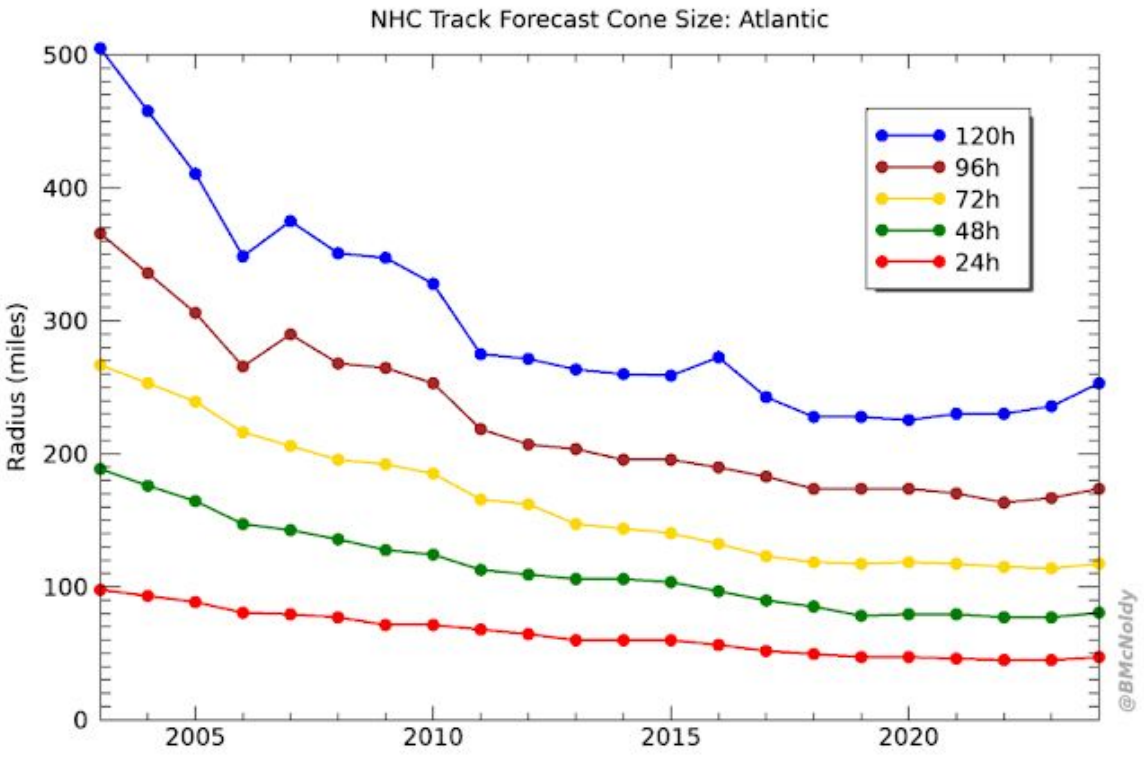
Track Forecast/Cone Graphic

Cone Size Since Its Inception

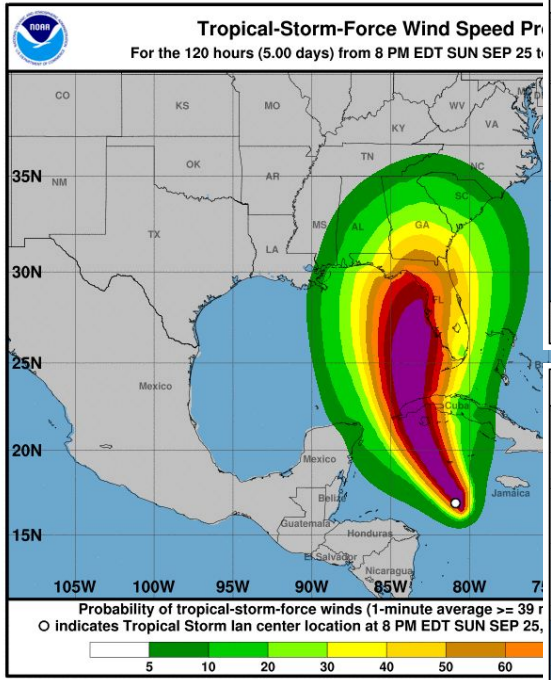
Cone size decreased dramatically from its inception until the early 2010s.

Much smaller reduction during the past decade.

Recently, only small fluctuations in size have been seen year-to-year.

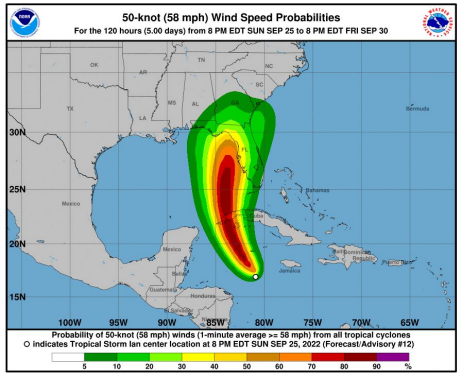


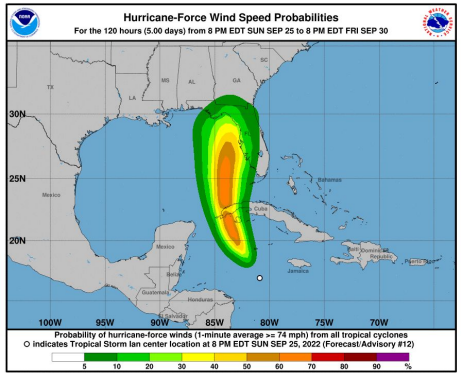
Wind Speed Probability Graphics



Tropical Storm Force

Strong Tropical Storm Force





Hurricane Force

Depicts cumulative probability of tropical storm force (39 mph), strong tropical storm force (58 mph), or hurricane force winds (74 mph) for a specific location over the next 5 days

Takes into account more than just the center of the storm, it includes typical track, intensity, and size errors

Wind Speed Probabilities

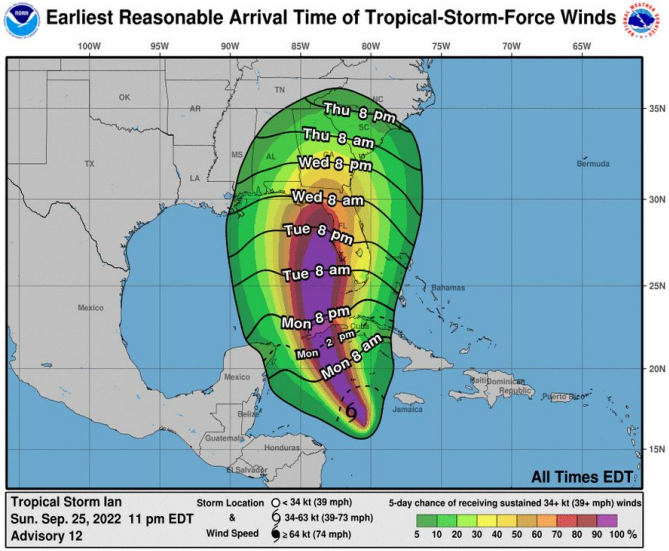
Based on 1,000 realistic alternative scenarios created using:

- Official NHC track and intensity forecast
- Historical NHC track and intensity forecast errors
- Climatology and persistence wind radii model

Uses model spread to account for track uncertainty

Tropical Storm Force Wind Speed Time of Arrival Graphics

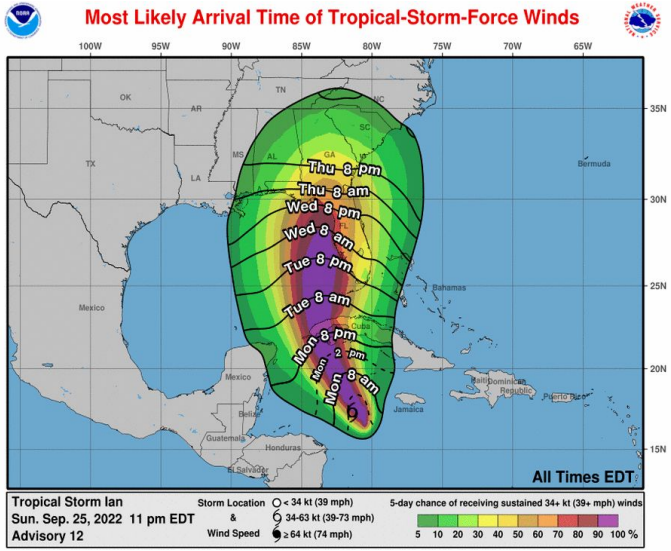
Earliest Reasonable



Only 1 in 10 chance of tropical storm force winds arriving earlier than noted time

Best for users with low risk tolerance

Most Likely

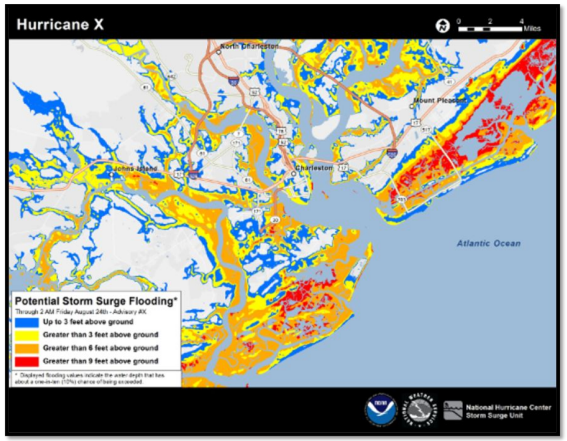


Equal chances of tropical storm force winds arriving before or after the time listed

Preparations should be completed by this time

Storm Surge Products

Potential Storm Surge Flooding Map

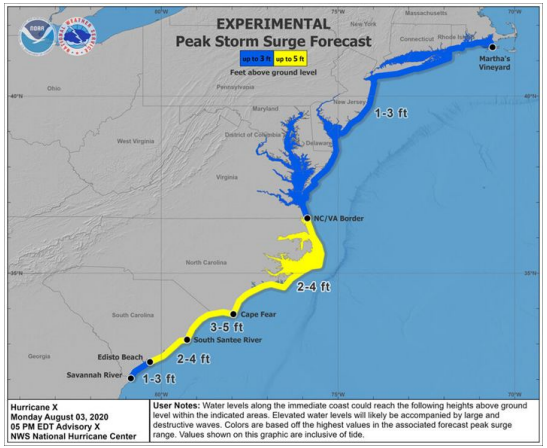


Reasonable worst case scenario

Only a 1 in 10 chance storm surge will be greater than shown

Doesn't represent a flooding footprint

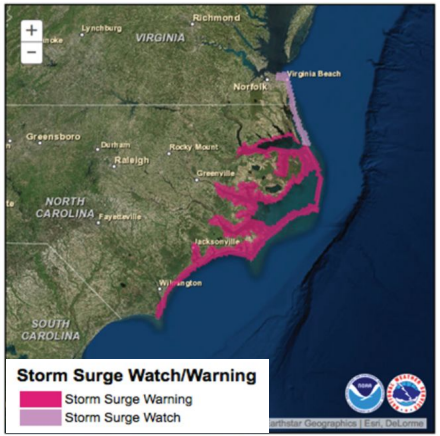
Peak Storm Surge Forecast



Peak values water could reach above normally dry ground

Only valid along the immediate coast - does not depict inland extent

Storm Surge Watch/Warning

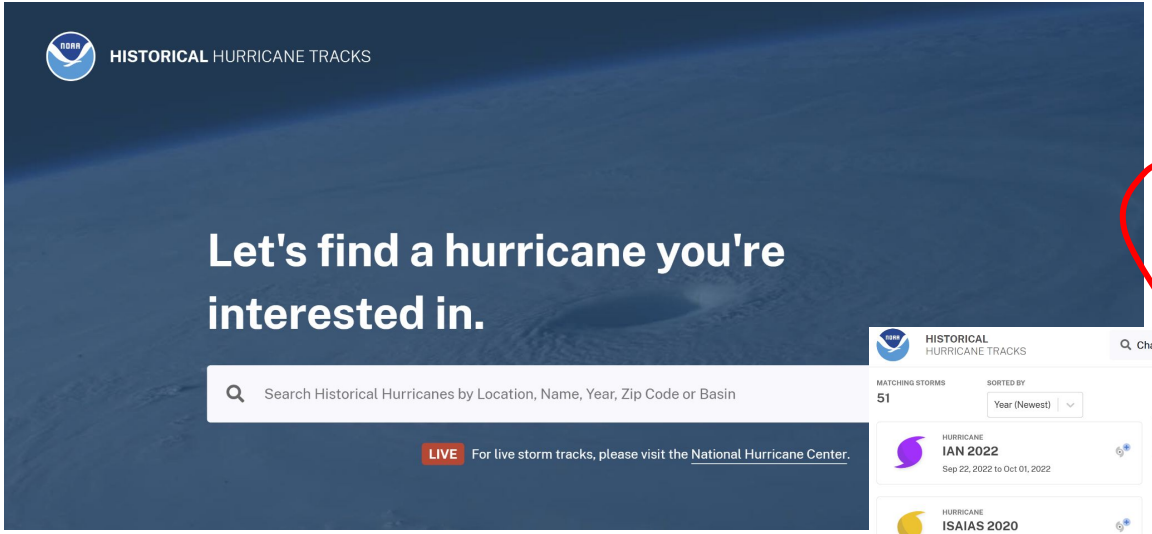


Storm Surge Watch - Possibility of life-threatening inundation generally within 48 hours

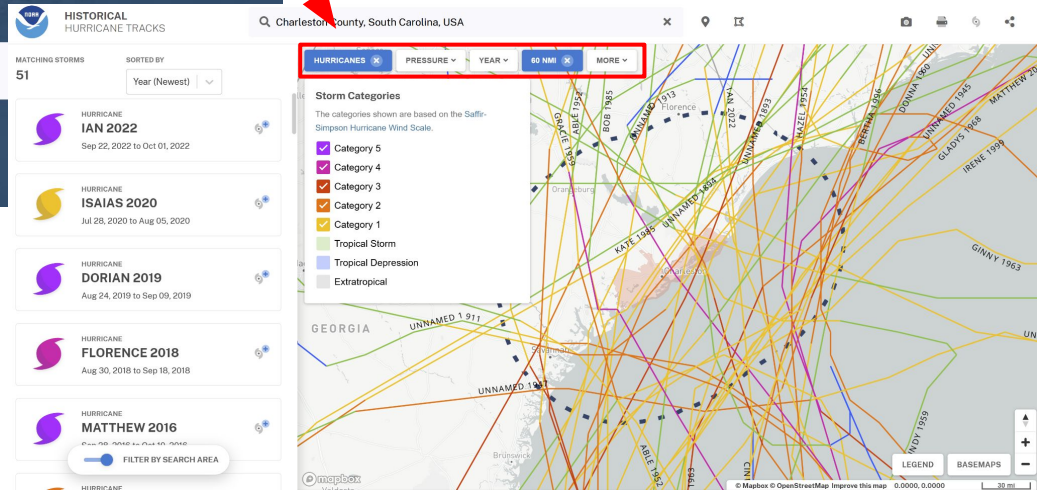
Storm Surge Warning - Danger of life-threatening inundation generally within 36 hours

Curious About Past Hurricane Tracks?

https://coast.noaa.gov/hurricanes

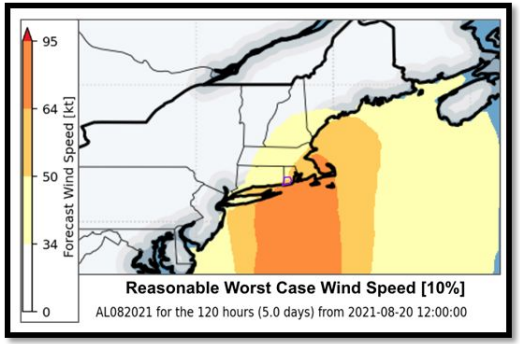


Can filter by category, pressure and year

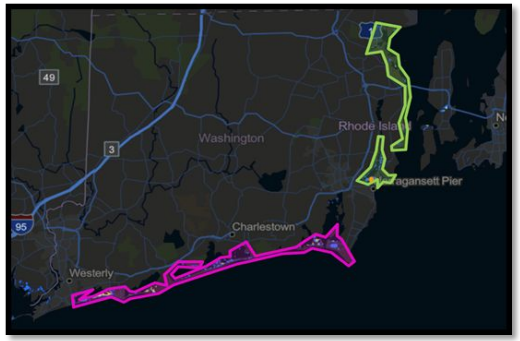


Future Changes to Tropical Products

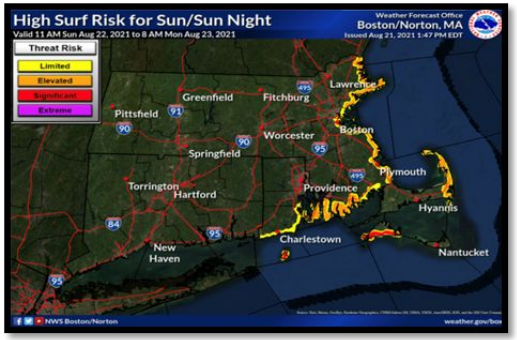
Future Changes to the NWS Tropical Program (FY28+)



- The the Local Tropical Cyclone Watch/Warning (TCV) text product will only contain tropical wind hazards.
- New Wind Speed Probabilities (WSP2.0) will be implemented that will apply an inland wind reduction.



- The Storm Surge Watch/Warning will move to the “Coastal/Lakeshore Hazard Message” (CFW) to the "Coastal/Lakeshore Flood Message" product."
- The Storm Surge Watch/Warning will be polygon based in the CFW.



- Hurricane Threat and Impact Graphics will transition to the Graphical Hazardous Weather Outlook
- The Hurricane Local Statement will transition the situation overview to key messages while the potential impacts section will include additional hazards beyond the core hurricane hazards.

Future Local Tropical Cyclone Watch/Warning (TCV)

1. The the Local Tropical Cyclone Watch/Warning (TCV) text product will be streamlined to ***focus only on tropical wind (tropical storm, hurricane/typhoon) hazards*** and the storm surge hazards will move into the CFW

2. The Local TCV product format will change to align with the **"What, Where, When" format** in most other NWS products

3. The Local TCV will utilize **probabilistic information** from the new, not yet operational TC Wind Speed Probabilities (WSP 2.0) that will apply to an inland wind reduction

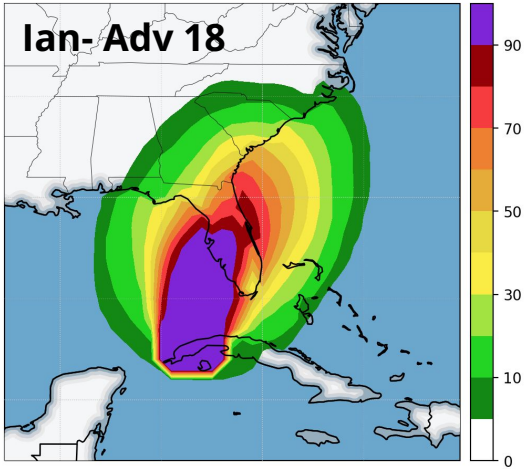
The new local TCV text product will be implemented no earlier than 2028

Next Generation Wind Speed Probability Model

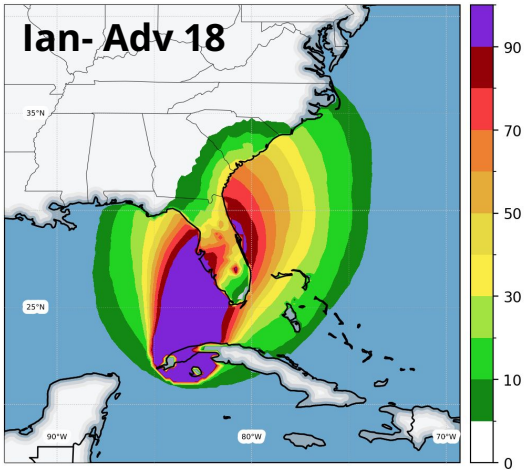
WSP 2.0 will be implemented no earlier than 2028

A new Wind Speed Probability Model (WSP 2.0) is being developed

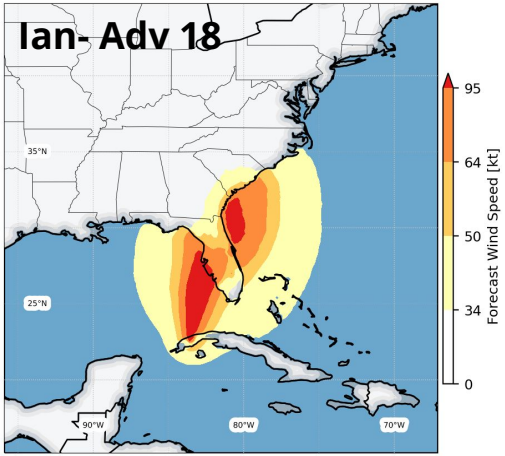
Prob > 34 kts - Legacy



Prob > 34 kts - WSP 2.0



10% Exceedance Map



Can reduce wind probabilities over land by up to 40%

- More accurate, especially over land as it uses high-resolution surface wind reduction scheme over land
- Consistent with other NWS TC wind products
- More options for potential output products including: wind exceedance, wind gust probabilities, and the possibility for thresholds other than 34-, 50- and 64kt

Future Changes to the Storm Surge/Coastal Lakeshore Flood Hazards

1. The Storm Surge Watch/Warning and related information currently provided in the Tropical Cyclone Watch/Warning Statement (TCV) will move into the CFW text product. The CFW product will also continue to include Coastal/Lakeshore Flood hazards, but other shoreline hazards will move to a new product.

2. The CFW will change from the "Coastal/Lakeshore Hazard Message" to the "Coastal/Lakeshore Flood Message" product."

3. Storm surge watch/warning will become polygon based.

Storm surge will move into the CFW product no earlier than 2028

Future CFW Storm Surge Example

Storm surge will move into the CFW product no earlier than 2028

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URGENT - IMMEDIATE BROADCAST REQUESTED
Coastal Flood Message
National Weather Service Boston/Norton MA
1115 AM EDT Sun Aug 22 2021

RIZ006-222315-
/O.CON.KBOX.SS.W.1008.000000T0000Z-210822T1815Z/
Washington RI-
1115 AM EDT Sun Aug 22 2021

...STORM SURGE WARNING IN EFFECT...

* WHAT...The danger of life-threatening violent moving
  water of up to 4 feet above ground.

* WHERE...Portions of Washington County in Rhode Island.
  Some locations in the storm surge warning area
  include
    - Narragansett
    - Westerly
    - Kingstown

* WHEN...Through early Monday morning

* IMPACTS... {Truncated}

* ADDITIONAL DETAILS...{Optional text}

PRECAUTIONARY/PREPAREDNESS ACTIONS...
 {Truncated}

&&
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"WHAT" statement will include a reasonable maximum upper bound water level

Up to 3 locations within the zone are listed. These locations are also all within the polygon(s) with the same hazard type (in this case, Storm Surge) in that zone

Updated statements from a collaborative project with the NWS Social Science Program will be used in the potential impact & precautionary/preparedness action statements

Future Changes Hurricane Local Statement

1. The Hurricane Local Statement (HLS) will transition from including a situation overview section to a key messages section.

2. The HLS will allow for the inclusion of information beyond the typical four main tropical hazards (wind, storm surge, flooding rain, tornadoes). For example, if heat was a concern after a storm that was expected to cause power outages, heat messaging could be included in the HLS in advance of the storm.

3. The HLS currently relies on Hurricane Threats and Impacts (HTI) graphics but in the future will use information from the Graphical Hazardous Weather Outlook (GHWO). When this occurs, the HTI graphics will be discontinued as the information will be incorporated in the GHWO.

These changes are planned for no earlier than 2028

Questions and Feedback

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