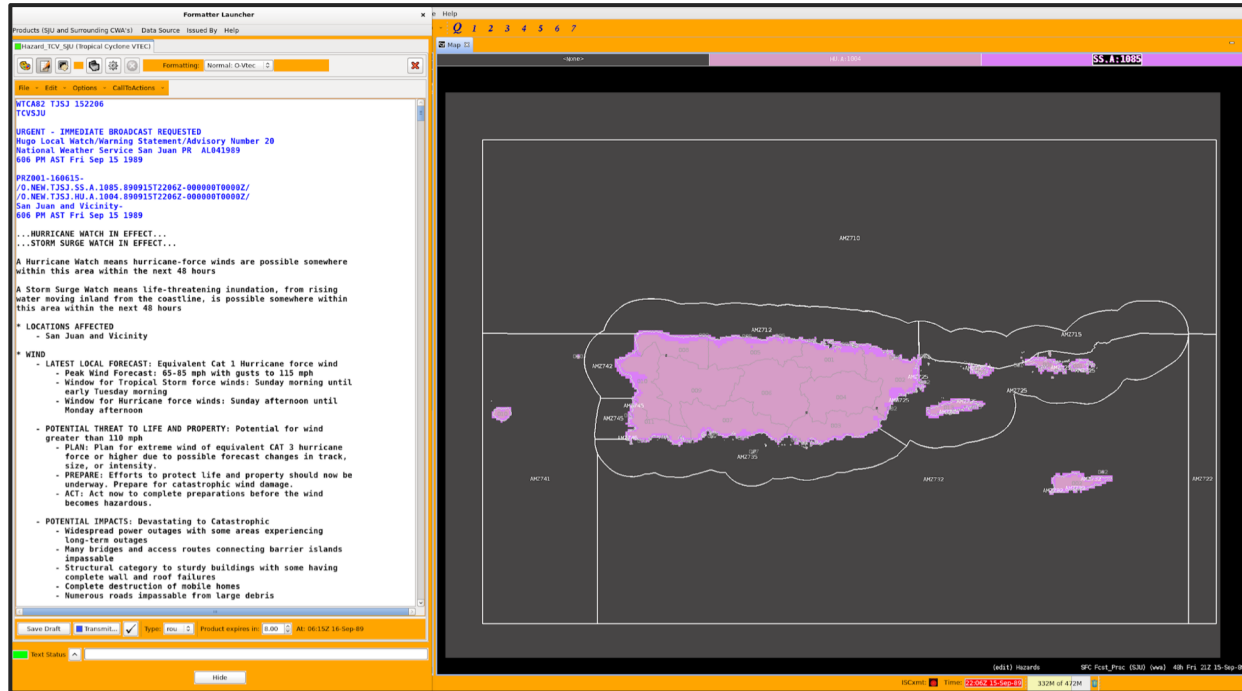


Updates to NWS Tropical Product Content and Display



Jessica Schauer

NWS Tropical Services Program Leader

Michael Brennan

NHC Hurricane Specialist Unit Branch Chief

Shannon White

NWS Tropical Training Leader



Meeting Purpose

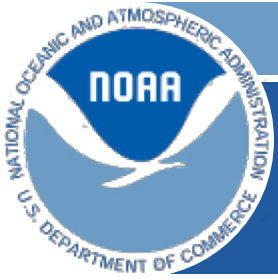
Why are we here?

Ensure everyone can access and display the products they need during a tropical cyclone event



Why are there so many words on these slides?

This presentation is intended to be a resource for you to use in preparation for a tropical cyclone event. It will be posted at: [weather.gov/wrn/calendar](https://www.weather.gov/wrn/calendar)



Acronyms

CAP – Common Alerting Protocol

CPHC – Central Pacific Hurricane
Center

EAS – Emergency Alert System

FEMA - Federal Emergency
Management Agency

HLS – Hurricane/Tropical Cyclone
Local Statement Product

JSON – JavaScript Object Notation
format file

NOAA – National Oceanic and
Atmospheric Administration

NHC – National Hurricane Center

NOS – National Ocean Service

NWR – NOAA Weather Radio All
Hazards

NWS – National Weather Service

SSWW – Storm Surge Watch/Warning

TC – Tropical Cyclone

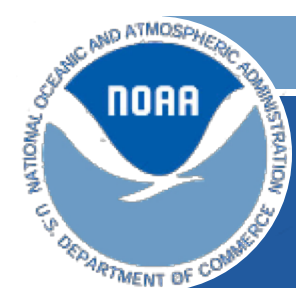
TCV – Tropical Cyclone
Watch/Warning VTEC Product

TS – Tropical Storm

UGC – Universal Geographic Code

VTEC – Valid Time Event Code

WFO – Weather Forecast Office



2018 Tropical Product Changes

- Operational Time of Arrival of Tropical Storm-Force Winds Graphics
- Vortex Message format changes
- Addition of hurricane-force-wind radii forecast at 48 hours
- Expansion of the forecast discussion to 72 hours in the Tropical Cyclone Public Advisory (TCP)
- Changes to TCP from the Weather Prediction Center (WPC)
- Clearer messaging in the Local Tropical Cyclone W/W (TCV) Product
- WFO Tropical Webpage
- Ability to issue CFW and SRF products during tropical events

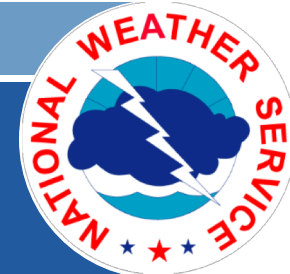




NEW 2019 Tropical Product Changes

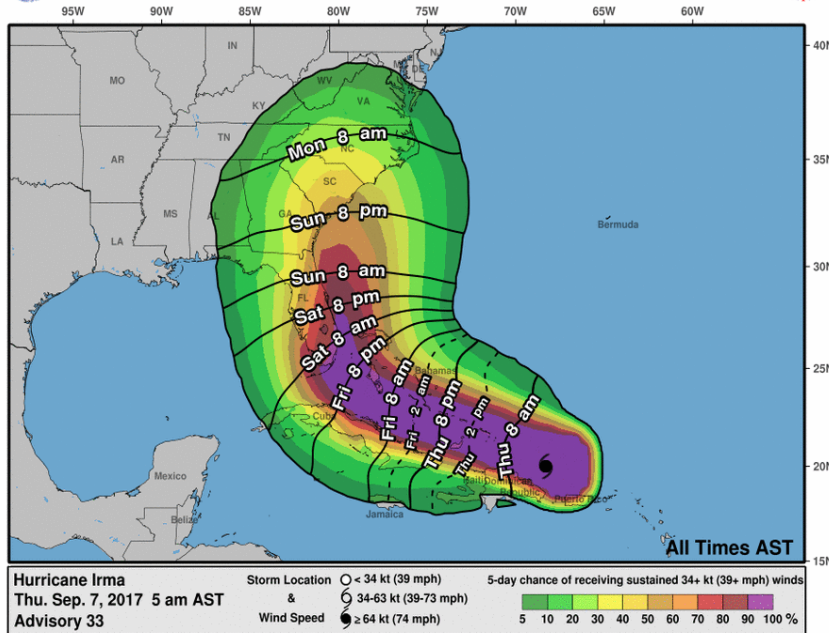
- Hawaii, Guam and other Pacific island NWS office websites move from prh.noaa.gov URLs to weather.gov
- Tropical Cyclone Information for Hawaii and the rest of the Central Pacific will be included on hurricanes.gov
- JSON files from NHC
- Experimental Time of Arrival Base Data available from NHC
- Storm Surge Watches and Warnings can be issued for Puerto Rico and the U.S. Virgin Islands
- Changes to the Local Post Tropical Cyclone Reports
- 360 Character Wireless Emergency Alerts (WEA) for Tropical Warnings



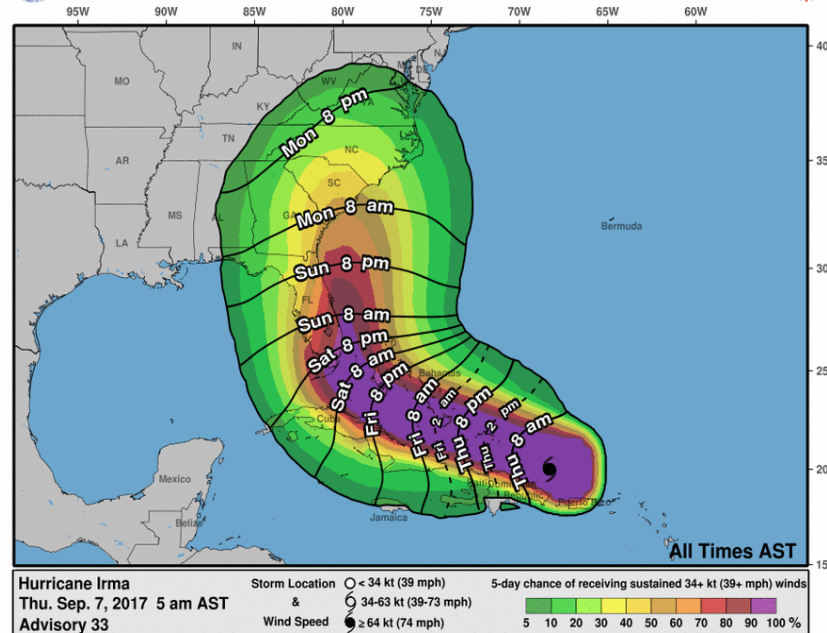


Arrival of Tropical Storm-Force Winds Graphics

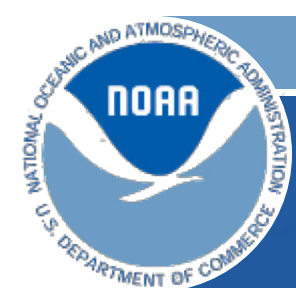
Earliest Reasonable Arrival Time of Tropical-Storm-Force Winds



Most Likely Arrival Time of Tropical-Storm-Force Winds

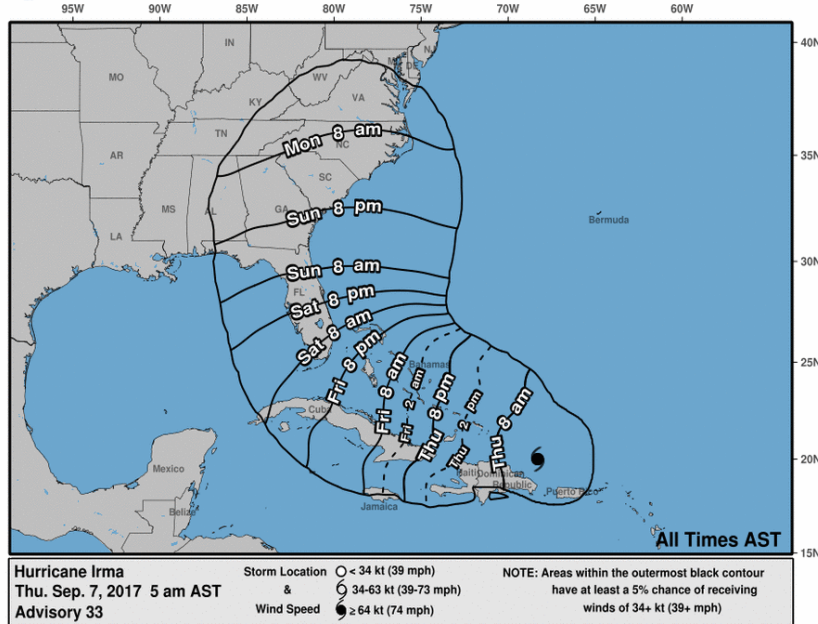


- One graphic depicts the **“earliest reasonable”** time window that individuals can safely assume will be free from tropical-storm-force winds
 - no more than a 1 in 10 chance of onset before this time
- A second graphic shows the **“most likely”** arrival time – the time before or after which the onset of TS-force winds is equally likely
- **New for 2019:** There will be 3-day versions of all time of arrival graphics to allow focus on shorter-term arrival times for fast moving storms

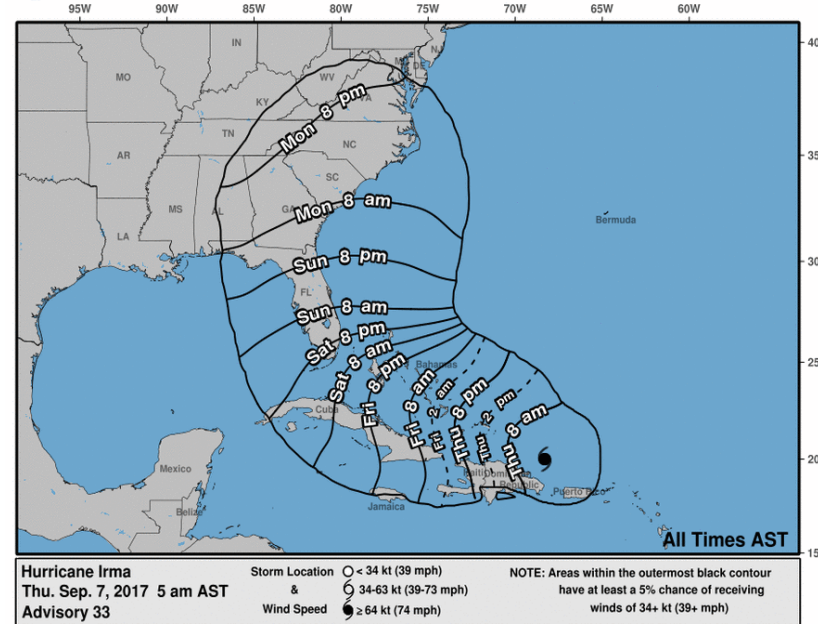


Arrival of Tropical Storm-Force Winds Graphics

Earliest Reasonable Arrival Time of Tropical-Storm-Force Winds



Most Likely Arrival Time of Tropical-Storm-Force Winds



- Arrival of Tropical-Storm (TS)-force winds is a critical planning threshold. Preparations become dangerous once winds reach TS force
- These graphics account for forecast uncertainty (track/intensity/size) from the same realizations used to create the wind speed probability products
- Users have the option to display graphics with or without the underlying wind speed probabilities

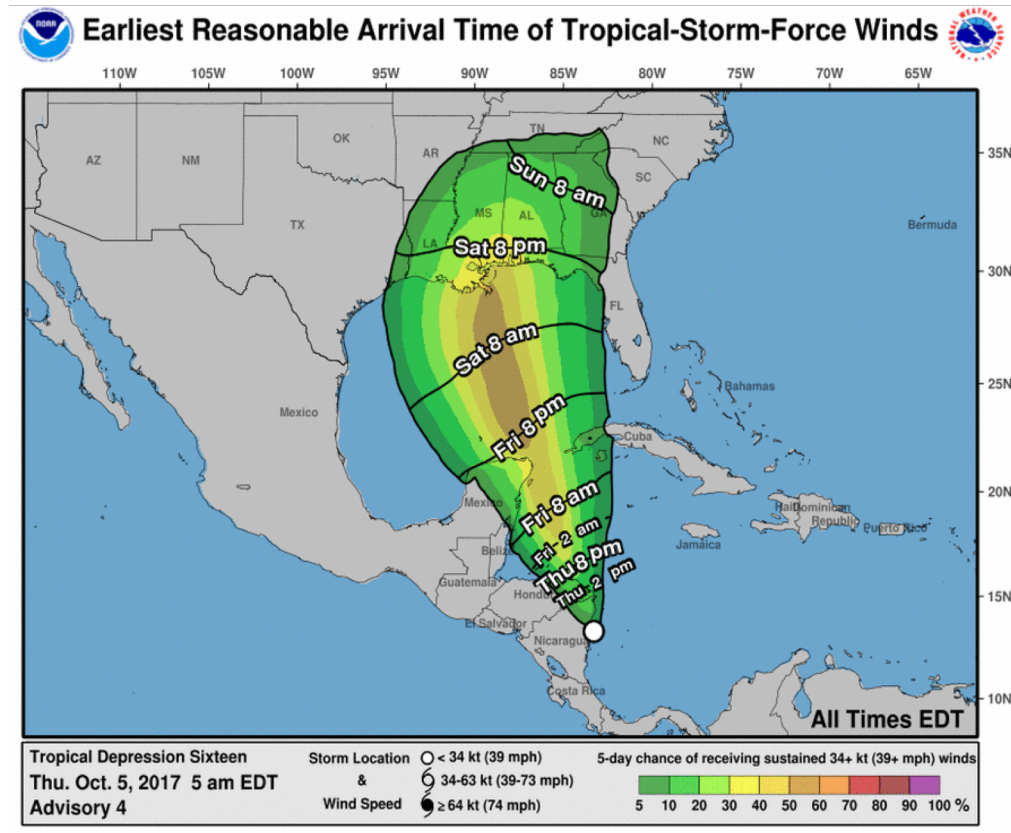


Arrival of Tropical Storm-Force Winds Graphics

Arrival Timing Graphics

- “**Earliest Reasonable**” graphic - best for users with low tolerance for risk
- “**Most Likely**” graphic - best for explaining when all preparations should be completed prior to onset of dangerous conditions
- Available on hurricanes.gov for active tropical cyclones for the Atlantic, Eastern Pacific, and Central Pacific
- Sample products in .PNG and GIS formats available under “graphical products” at:

hurricanes.gov/productexamples/





Experimental Time of Arrival Base Data

- Time of Arrival of TS-Force Wind Base Data is produced for Atlantic, East Pacific, and Central Pacific TCs
- When the NWS is issuing advisories, the base data will be available for download at the following ftp address:

<https://ftp.nhc.ncep.noaa.gov/toa/>
- The file naming structure will change for these files to sequentially order the archived data files by using a 3 digit advisory number. The new naming structure is depicted below:

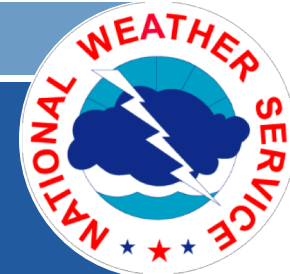
BBSSYYYY_TOA_TOD_34kt_adv###.grib2

Where B = basin ID (AL = Atlantic, EP = East Pacific,
CP = Central Pacific)

S = Storm ID (sequential number assigned to
storms within the basin)

Y = Year

= 3 digit advisory number for this Storm ID



TC Vortex Message Changes

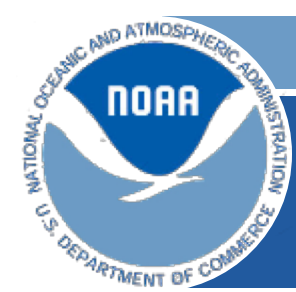
Hurricane Hunter Reconnaissance

```
URNT12 KNHC 241133
VORTEX DATA MESSAGE    AL162016
A. 24/11:12:50Z
B. 10.97 deg N 082.77 deg W
C. 700 mb 2927 m
D. 977 mb
E. 210 deg 11 kt
F. CLOSED
G. C20
H. 90 kt
I. 144 deg 5 nm 11:07:00Z
J. 253 deg 78 kt
K. 158 deg 8 nm 11:07:30Z
L. 95 kt
M. 314 deg 5 nm 11:17:00Z
N. 033 deg 108 kt
O. 349 deg 14 nm 11:17:30Z
P. 10 C / 3042 m
Q. 18 C / 3045 m
R. NA / NA
S. 12345 / 7
T. 0.02 / 1 nm
U. AF301 0616A OTTO OB 13
MAX FL WIND 108 KT 349 / 14 NM 11:17:00Z
```

Primary changes to the Vortex Message format made in 2018:

- A new outbound wind maxima section is provided to simplify data decoding and to ensure that no data are missed.
- The latitude and longitude will be listed in decimal degrees instead of degrees and minutes.
- The new message format includes a new tropical cyclone center data block section (Items C through G).
- The new message appends the observation times to the bearing and range location Items.
- The inbound maximum surface and flight-level wind block (Items E through G in the current format) is shifted downward to Items H through K.

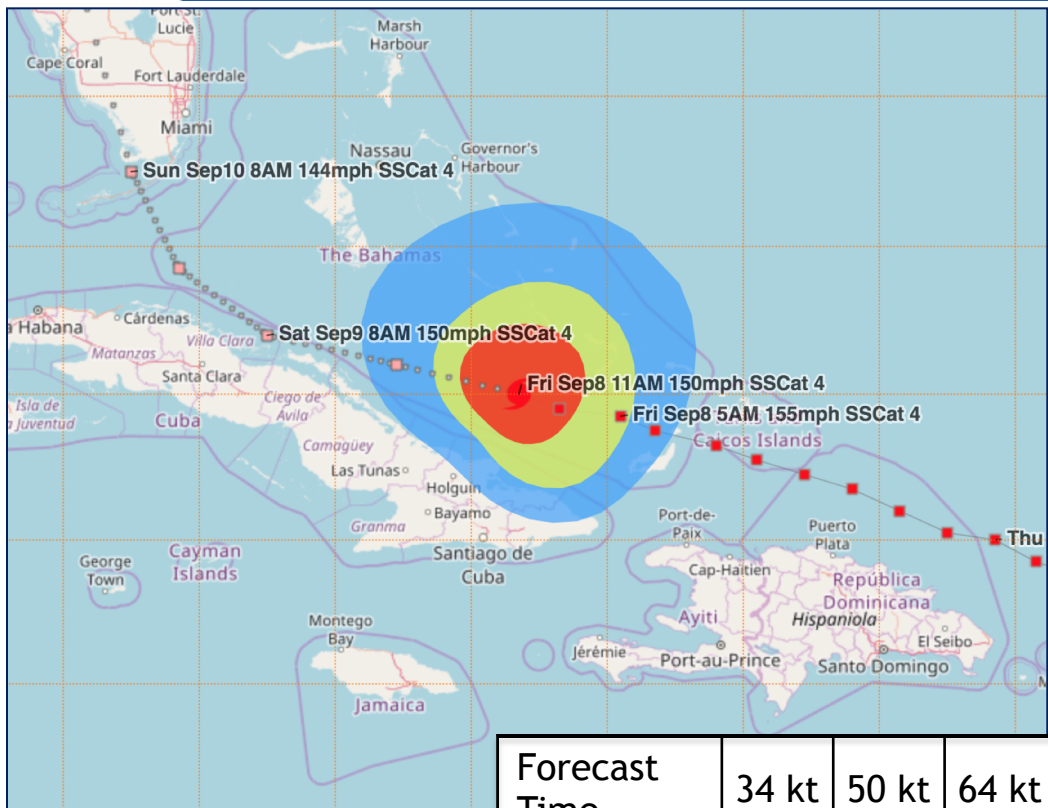
See [NWS Service Change Notice 18-15](#) for more details



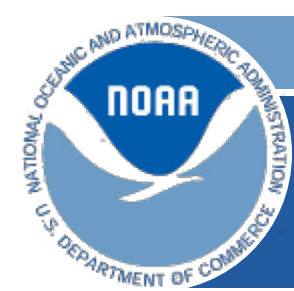
Extension of Hurricane-Force Wind Radii Forecasts

- In 2018, NHC/CPHC began providing 48-h hurricane-force (64-kt) wind radii forecasts (in quadrants)
- This change should assist forecasters in placing hurricane watches and warnings
- Previously provided hurricane-force wind radii forecasts out to 36 hours

See [NWS Service Change Notice 18-20](#) for more details



Forecast Time	34 kt	50 kt	64 kt
12 hr	Blue	Yellow	Red
24 hr	Blue	Yellow	Red
36 hr	Blue	Yellow	Red
48 hr	Blue	Yellow	Red
72 hr	Blue	Yellow	N/A
96 hr	N/A	N/A	N/A
120 hr	N/A	N/A	N/A



Extension of Hurricane-Force Wind Radii Forecasts

WTNT24 KNHC 111505
TCMAT4

HURRICANE IKE FORECAST/ADVISORY NUMBER 42
NWS NATIONAL HURRICANE CENTER MIAMI FL AL092008
1500 UTC THU SEP 11 2008

CHANGES IN WATCHES AND WARNINGS WITH THIS ADVISORY...

A HURRICANE WARNING HAS BEEN ISSUED FROM MORGAN CITY LOUISIANA TO
BAFFIN BAY TEXAS.

A TROPICAL STORM WARNING HAS BEEN ISSUED FROM SOUTH OF BAFFIN BAY TO
PORT MANSFIELD TEXAS.

SUMMARY OF WATCHES AND WARNINGS IN EFFECT...

A HURRICANE WARNING IS IN EFFECT FOR...
* MORGAN CITY LOUISIANA TO BAFFIN BAY TEXAS

A TROPICAL STORM WARNING IS IN EFFECT FOR...
* EAST OF MORGAN CITY TO THE MISSISSIPPI-ALABAMA BORDER...INCLUDING THE
CITY OF NEW ORLEANS AND LAKE PONTCHARTRAIN
* SOUTH OF BAFFIN BAY TO PORT MANSFIELD

A STORM SURGE WARNING IS IN EFFECT FOR...
* MORGAN CITY TO PORT MANSFIELD

HURRICANE CENTER LOCATED NEAR 25.5N 88.4W AT 11/1500Z
POSITION ACCURATE WITHIN 10 NM

PRESENT MOVEMENT TOWARD THE WEST-NORTHWEST OR 290 DEGREES AT 9 KT

ESTIMATED MINIMUM CENTRAL PRESSURE 945 MB
MAX SUSTAINED WINDS 85 KT WITH GUSTS TO 105 KT.
64 KT.....100NE 100SE 30SW 60NW.
50 KT.....150NE 150SE 90SW 140NW.
34 KT.....230NE 240SE 150SW 180NW.
12 FT SEAS..330NE 240SE 240SW 400NW.
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 25.5N 88.4W AT 11/1500Z
AT 11/1200Z CENTER WAS LOCATED NEAR 25.3N 88.0W

FORECAST VALID 12/0000Z 25.9N 90.0W
MAX WIND 90 KT...GUSTS 110 KT.
64 KT...100NE 100SE 30SW 60NW.
50 KT...150NE 150SE 90SW 140NW.
34 KT...230NE 240SE 150SW 180NW.

FORECAST VALID 12/1200Z 26.6N 92.0W
MAX WIND 95 KT...GUSTS 115 KT.
64 KT...100NE 100SE 50SW 60NW.
50 KT...150NE 150SE 90SW 140NW.
34 KT...230NE 240SE 150SW 180NW.

FORECAST VALID 13/0000Z 27.8N 94.2W
MAX WIND 105 KT...GUSTS 130 KT.
64 KT...100NE 100SE 50SW 60NW.
50 KT...150NE 150SE 90SW 120NW.
34 KT...230NE 240SE 150SW 160NW.

FORECAST VALID 13/1200Z 29.5N 95.9W...INLAND
MAX WIND 100 KT...GUSTS 120 KT.
64 KT... 75NE 75SE 30SW 45NW.
50 KT...120NE 125SE 75SW 90NW.
34 KT...180NE 240SE 120SW 120NW.

FORECAST VALID 14/1200Z 34.5N 94.0W...INLAND
MAX WIND 35 KT...GUSTS 45 KT.
34 KT... 75NE 75SE 50SW 50NW.

EXTENDED OUTLOOK. NOTE...ERRORS FOR TRACK HAVE AVERAGED NEAR
225 NM ON DAY 4 AND 300 NM ON DAY 5...AND FOR INTENSITY NEAR 20 KT
EACH DAY.

OUTLOOK VALID 15/1200Z 38.0N 85.0W...POST-TROP/EXTRATROP
MAX WIND 25 KT...GUSTS 35 KT.

OUTLOOK VALID 16/1200Z...ABSORBED

REQUEST FOR 3 HOURLY SHIP REPORTS WITHIN 300 MILES OF 25.5N 88.4W

NEXT ADVISORY AT 11/2100Z

\$\$
FORECASTER FRANKLIN



TC Public Advisory (TCP)

Changes to Discussion and Outlook Section

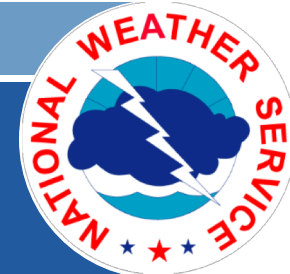
Hurricane Maria Advisory #2 5 PM Saturday September 16

DISCUSSION AND 48-HOUR OUTLOOK

At 500 PM AST (2100 UTC), the center of Tropical Storm Maria was located near latitude 12.3 North, longitude 52.6 West. Maria is moving toward the west near 20 mph (31 km/h). A slower west-northwest motion is expected during the next couple of days. On the forecast track, Maria is expected to approach the Leeward Islands on Monday.

Maximum sustained winds have increased to near 50 mph (85 km/h) with higher gusts. Additional strengthening is expected during the next 48 hours, and Maria is forecast to be a hurricane when it approaches the Leeward Islands early next week.

Previous format provided forecast information out to 48 h



TC Public Advisory (TCP)

Changes to Discussion and Outlook Section

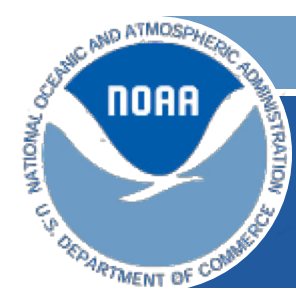
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At 500 PM AST (2100 UTC), the center of Tropical Storm Maria was located near latitude 12.3 North, longitude 52.6 West. Maria is moving toward the west near 20 mph (31 km/h). A slower west-northwest motion is expected during the next couple of days. On the forecast track, Maria is expected to approach the Leeward Islands on Monday.

Maximum sustained winds have increased to near 50 mph (85 km/h) with higher gusts. Additional strengthening is expected during the next 48 hours, and Maria is forecast to be a hurricane when it approaches the Leeward Islands early next week.

New format will provide forecast information to 72 h and beyond



TC Public Advisory (TCP)

Changes to Discussion and Outlook Section

Hurricane Maria Advisory #2
5 PM Saturday September 16

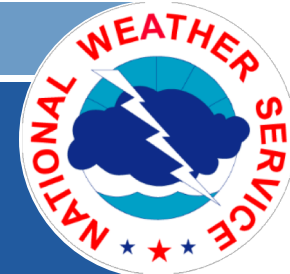
New format provides forecast information to 72 h and beyond

DISCUSSION AND OUTLOOK

At 500 PM AST (2100 UTC), the center of Tropical Storm Maria was located near latitude 12.3 North, longitude 52.6 West. Maria is moving toward the west near 20 mph (31 km/h). A slower west-northwest motion is expected during the next **several** days. On the forecast track, Maria is expected to pass over portions of the Leeward Islands late Monday, **and be near the Northern Leeward Islands on Tuesday. Maria is forecast to pass near or over the Virgin Islands and Puerto Rico on Wednesday, and could be near the Dominican Republic later this week.**

Maximum sustained winds have increased to near 50 mph (85 km/h) with higher gusts. Additional strengthening is expected during the next **several** days, and Maria is forecast to be a hurricane when it approaches the Leeward Islands. **Maria could be a major hurricane when it is near the Northern Leeward Islands, the Virgin Islands, and Puerto Rico next week.**

See [NWS Service Change Notice 18-18](#) for more details



Public Advisory (TCP)

Changes from the Weather Prediction Center

Tropical Depression Harvey Advisory Number 44
NWS Weather Prediction Center College Park MD AL092017
400 AM CDT Thu Aug 31 2017

...FLOODING RAINS CONTINUE ACROSS FAR EASTERN TEXAS AND WESTERN LOUISIANA WITH HEAVY RAINFALL EXPECTED TO SPREAD NORTHEASTWARD THROUGH THE LOWER MISSISSIPPI VALLEY AND INTO THE TENNESSEE VALLEY OVER THE NEXT DAY OR TWO...

SUMMARY OF 400 AM CDT...0900 UTC...INFORMATION

LOCATION...32.3N 92.0W
ABOUT 5 MI...10 KM S OF MONROE LOUISIANA
ABOUT 65 MI...105 KM NNE OF ALEXANDRIA LOUISIANA
MAXIMUM SUSTAINED WINDS...30 MPH...45 KM/H
PRESENT MOVEMENT...NNE OR 25 DEGREES AT 10 MPH...17 KM/H
MINIMUM CENTRAL PRESSURE...998 MB...29.47 INCHES

WATCHES AND WARNINGS

Flood and flash flood warnings and watches are in effect from eastern Texas through parts of the lower Mississippi Valley and into western portions of the Tennessee Valley and the lower Ohio Valley.

For storm information specific to your area, including possible inland watches and warnings, please monitor products issued by your local National Weather Service forecast office.

DISCUSSION AND OUTLOOK

At 400 AM CDT (0900 UTC), the center of Tropical Depression Harvey was located near latitude 32.3 North, longitude 92.0 West. The depression is moving toward the north-northeast near 10 mph (17 km/h) and is expected to continue this motion over the next 48 hours. This forecast track would take Harvey into northwestern Mississippi by Thursday afternoon, the western Tennessee Valley region on Friday, and into the lower Ohio Valley early Saturday before anticipated dissipation by Saturday afternoon.

- WPC issues Public Advisories (TCPs) for systems that have moved inland but continue to pose a threat for heavy rains and flooding
- Advisories are issued at the standard advisory times:
5 AM/PM and 11 AM/PM EDT
- WPC advisories will now be issued in the same format as NHC Public Advisories
- Unlike NHC/CPHC advisories, Public Advisories from WPC also include forecast positions



Storm Summaries from the Weather Prediction Center

- WPC issues storm summaries (SCCNS1-5) as needed to provide observed rainfall and wind gusts during significant landfalling U.S. tropical cyclones
- Previously, this information was contained in WPC Public Advisories
- This change allows WPC to issue storm summaries with observed rain/wind information even when NHC is still issuing Public Advisories (TCPs) on the cyclone

STORM SUMMARY NUMBER 1 FOR HURRICANE HARVEY RAINFALL AND WIND
NWS WEATHER PREDICTION CENTER COLLEGE PARK MD
500 AM EDT SAT AUG 26 2017

...HURRICANE HARVEY OBSERVED RAIN TOTALS AND WIND REPORTS...

FOR A DETAILED GRAPHICAL DEPICTION OF THE LATEST
WATCHES...WARNINGS AND ADVISORIES...PLEASE SEE WWW.WEATHER.GOV

AT 400 AM EDT...THESE ARE THE MOST RECENT RAINFALL AND WIND
REPORTS FROM HURRICANE HARVEY. PLEASE REFER TO THE NATIONAL
HURRICANE CENTER FOR THE LATEST PUBLIC ADVISORIES ON HURRICANE
HARVEY.

...SELECTED STORM TOTAL RAINFALL IN INCHES FROM 800 PM EDT THU AUG
24 THROUGH 400 AM EDT SAT AUG 26...

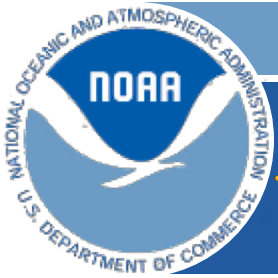
...TEXAS...

ARANSAS	10.54
AUSTWELL 6 SSE	9.61
VICTORIA 2 SW	9.37
EDNA	8.24
BRAZORIA NWR	7.86
SAN ANTONIO RIVER NEAR MCFAD	7.37
BRAZORIA COUNTY AIRPORT	7.12
PALACIOS MUNICIPAL AIRPORT	6.38
HOUSTON SOUTHWEST AIRPORT	5.39
GARCITAS CREEK NEAR INEZ	5.27
TIVOLI 3 NNE	4.86
GALVESTON	3.02
CORPUS CHRISTI 5W	2.89

...SELECTED PEAK WIND GUSTS IN MILES PER HOUR EARLIER IN THE
EVENT...

...TEXAS...

PORT ARANSAS 2 ENE	132
COPANO VILLAGE 1 ENE	125
LAMAR 2 SSW	110
ROCKPORT 1 S	108
TAFT 5 NNE	90
FLOUR BLUFF 4 ESE	72
ARANSAS PASS 7 SE	71
CORPUS CHRISTI NAS 5 SE	65



NEW

Experimental TC JSON Files

- NHC will provide an experimental JSON-formatted file containing a summary of active storm/advisory/storm surge information in a machine-readable JSON format at the following URL (could change):

<https://www.nhc.noaa.gov/CurrentStorms.json>

- The purpose of this file is to allow easier ingest and display of the latest analysis and forecast data, but avoid reprocessing of data that has already been ingested. There are ~ 70 pieces of information per storm, including:
 - 5-day track/cone
 - best track/wind swath
 - forecast wind field
- Users can write code to parse the JSON file to determine what products to retrieve from the NHC website.
- There will be a single JSON file containing metadata for all active storms within NHC/CPHC's area of responsibility. Sample file available here:

https://www.nhc.noaa.gov/productexamples/NHC_JSON_Sample.json



Retirement of NWS Pacific Region Web Server

The NWS will eliminate the web service found at the following address effective May 30, 2019:

www.prh.noaa.gov

The new URLs for the NWS Pacific Region websites are:

NWS OFFICE

- WFO Honolulu, Hawaii (HFO)
- WFO Tiyan, Guam (GUM)
- Weather Service Office (WSO) Majuro
- WSO Pohnpei
- WSO Chuuk
- WSO Yap
- WSO Koror
- Central Pacific Hurricane Center (CPHC)

NEW SITE URL

- www.weather.gov/hfo
- www.weather.gov/gum
- www.weather.gov/gum/majuro
- www.weather.gov/gum/pohnpei
- www.weather.gov/gum/chuuk
- www.weather.gov/gum/yap
- www.weather.gov/gum/koror
- hurricanes.gov

See [NWS Service Change Notice 19-17](#) for more details



Unified hurricanes.gov

The expansion of hurricanes.gov to consolidate NHC and CPHC content into a single website will make it easier for users to find tropical cyclone information from either issuing office

NATIONAL HURRICANE CENTER
NATIONAL OCEANIC AND ATMOSPHERIC ADMINISTRATION

ANALYSES & FORECASTS ▾ DATA & TOOLS ▾ EDUCATIONAL RESOURCES ▾ ARCHIVES ▾ ABOUT ▾ SEARCH ▾

Top News of the Day... [view past news](#) Last update Wed, 20 Mar 2019 17:11:29 UTC

- NOAA team sees Florence and Michael storm surge devastation first-hand. Did storm surge watches & warnings make a difference?
- Destructive 2018 Atlantic hurricane season draws to an end
- National Hurricane Center updates National Storm Surge Hazard Maps- Hawaii, U.S. Virgin Islands and Hispaniola added

Central Pacific	Eastern North Pacific	Atlantic
-----------------	-----------------------	----------

Central Pacific Tropical Cyclones and Disturbances

Eastern Pacific →

8:39 pm HST
Fri Nov 30 2018

www.weather.gov/cphc

Current Disturbances and Two-Day Cyclone Formation Chance: ☒ < 40% ☒ 40-60% ☒ > 60%

Tropical or Sub-Tropical Cyclone: ○ Depression ○ Storm ○ Hurricane

○ Post-Tropical Cyclone or Remnants

[Active Storms](#) | [2-Day Graphical Tropical Weather Outlook](#) | [5-Day Graphical Tropical Weather Outlook](#)

Atlantic - Caribbean Sea - Gulf of Mexico
Tropical Weather Outlook
Issuance will resume on June 1st or as necessary.

[Tropical Weather Discussion](#)
655 AM EDT Wed Mar 20 2019

There are no tropical cyclones in the Atlantic at this time.
The Atlantic hurricane season runs from June 1st through November 30th.

*Spanish translations, when available, are courtesy of the NWS San Juan Weather Forecast Office.

Eastern North Pacific (East of 140°W)
Tropical Weather Outlook
Issuance will resume on May 15th or as necessary.

[Tropical Weather Discussion](#)
1605 UTC Wed Mar 20 2019

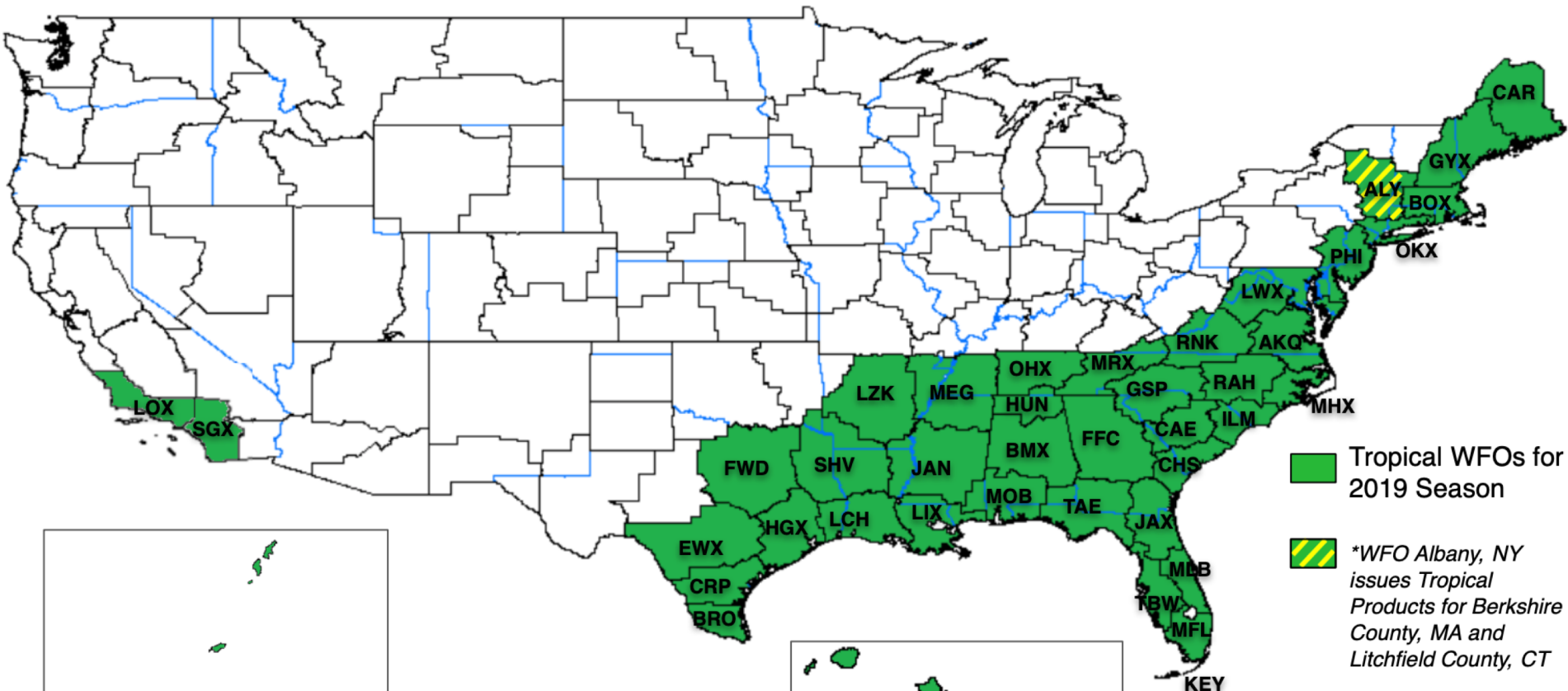
There are no tropical cyclones in the Eastern North Pacific at this time.
The Eastern North Pacific hurricane season runs from May 15th through November 30th.


Central North Pacific (140°W to 180°)
Tropical Weather Outlook
Issuance will resume on June 1st or as necessary.


There are no tropical cyclones in the Central North Pacific at this time.
The Central North Pacific hurricane season runs from June 1st through November 30th.



Weather Forecast Offices' (WFO) Ability to Issue Tropical Products



 Tropical WFOs for 2019 Season

 *WFO Albany, NY issues Tropical Products for Berkshire County, MA and Litchfield County, CT


WFO Tiyan, Guam
Including Micronesia
(Republic of the Marshall Islands, Federated States of Micronesia, Republic of Palau)


WSO Pago Pago, American Samoa
Including Swains Island

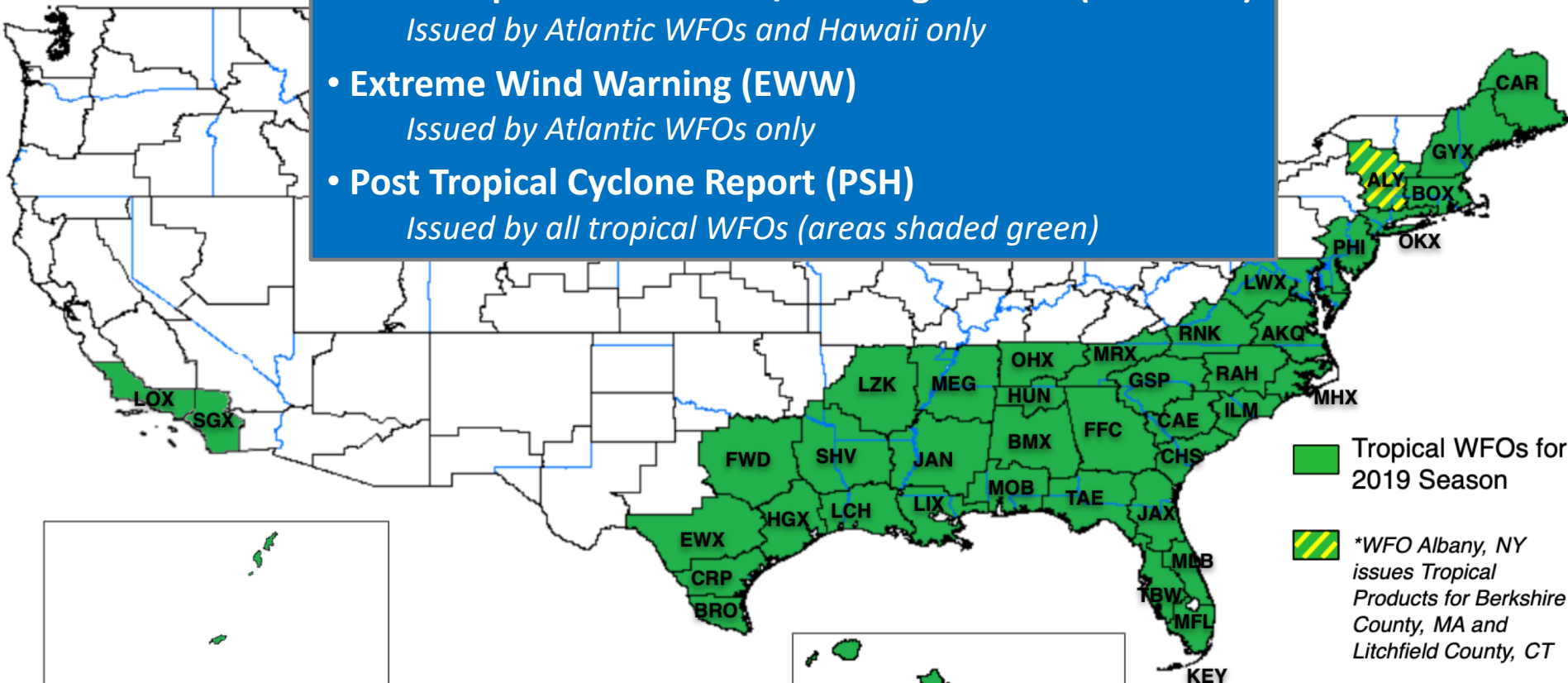

WFO Honolulu, Hawaii



WFO San Juan, Puerto Rico




NWS Tropical Product Suite Issuance

- **Hurricane/Typhoon Local Statement (HLS)**
Issued by all tropical WFOs (areas shaded green)
- **WFO Tropical Local Watch/Warning Product (WFO TCV)**
Issued by Atlantic WFOs and Hawaii only
- **Extreme Wind Warning (EWW)**
Issued by Atlantic WFOs only
- **Post Tropical Cyclone Report (PSH)**
Issued by all tropical WFOs (areas shaded green)



 Tropical WFOs for 2019 Season

 *WFO Albany, NY issues Tropical Products for Berkshire County, MA and Litchfield County, CT



WFO Tiyan, Guam
Including Micronesia
(Republic of the Marshall Islands, Federated States of Micronesia, Republic of Palau)



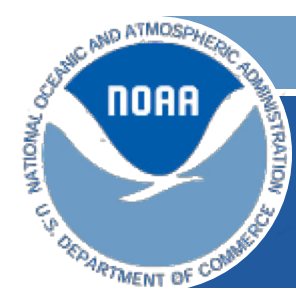
WSO Pago Pago, American Samoa
Including Swains Island



WFO Honolulu, Hawaii



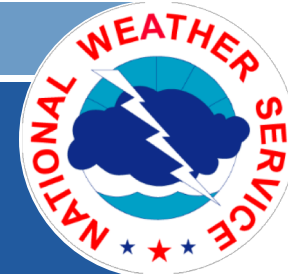
WFO San Juan, Puerto Rico



WFO Tropical Product Suite Overview: TCV Product (Atlantic/WFO Honolulu)

WFO Tropical Cyclone Local Watch/Warning Product (TCV) at Atlantic basin WFOs and WFO Honolulu

- Produced at **Atlantic** basin offices and **WFO Honolulu**
- Product contains the tropical cyclone watch/warning [Valid Time Event Code \(VTEC\)](#)
- Largely automated and includes all local land-based tropical watches and warnings and detailed information in a one zone-one segment basis
- For each geographic segment, the content also includes headlines, forecast, threat, and impact information for the 4 major tropical cyclone hazards:
 - Wind
 - Storm Surge (where applicable)
 - Flooding Rain
 - Tornadoes



TCVWFO Example

(a single zone segment shown)

WTUS82 KMHX 171959
TCVMHX

URGENT - IMMEDIATE BROADCAST REQUESTED

Irene Local Watch/Warning Statement/Advisory Number 25
National Weather Service Newport/Morehead City NC AL092011
259 PM EST Fri Nov 17 2017

NCZ103-180400-

/O.CON.KMHX.SS.W.1009.000000T0000Z-000000T0000Z/

/O.CON.KMHX.HU.W.1009.000000T0000Z-000000T0000Z/

Outer Banks Dare-

259 PM EST Fri Nov 17 2017

...HURRICANE WARNING REMAINS IN EFFECT...

...STORM SURGE WARNING REMAINS IN EFFECT...

*** LOCATIONS AFFECTED**

- Kill Devil Hills
- Manteo
- Buxton

*** WIND**

- LATEST LOCAL FORECAST: Equivalent Cat 2 Hurricane force wind

- Peak Wind Forecast: 80-100 mph with gusts to 120 mph
- Window for Tropical Storm force winds: until early Sunday morning
- Window for Hurricane force winds: Saturday morning until early Sunday morning

- POTENTIAL THREAT TO LIFE AND PROPERTY: Potential for wind greater than 110 mph

- The wind threat has remained nearly steady from the previous assessment.
- PLAN: Plan for extreme wind of equivalent CAT 3 hurricane force or higher due to possible forecast changes in track, size, or intensity.
- PREPARE: Last minute efforts should solely focus on protecting life. The area remains subject to catastrophic wind damage.
- ACT: Now is the time to shelter from life-threatening wind. Be ready to move to the safest place inside your shelter if necessary.

- POTENTIAL IMPACTS: Unfolding
- Potential impacts from the main wind event are unfolding.

*** STORM SURGE**

- LATEST LOCAL FORECAST: Life-threatening storm surge possible
- Peak Storm Surge Inundation: The potential for 4-7 feet above ground somewhere within surge prone areas
- Window of concern: through early Sunday evening

- POTENTIAL THREAT TO LIFE AND PROPERTY: Potential for storm surge flooding greater than 6 feet above ground

- The storm surge threat has increased from the previous assessment.
- PLAN: Shelter against life-threatening storm surge flooding of greater than 6 feet above ground.
- PREPARE: All ordered evacuations should be complete. Evacuees should be in shelters well away from storm surge flooding.
- ACT: Remain sheltered in a safe location. Do not venture outside. Move to upper floors to escape rising water if necessary.

- POTENTIAL IMPACTS: Unfolding
- Potential impacts from the main surge event are unfolding.

*** FLOODING RAIN**

TRUNCATED

*** TORNADO**

TRUNCATED

*** FOR MORE INFORMATION:**

- <http://ready.gov/hurricanes>

\$\$



TCVWFO Example

(a single zone segment shown)

WTUS82 KMHX 171959
TCVMHX

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Irene Local Watch/Warning Statement/Advisory Number 25
National Weather Service Newport/Morehead City NC AL092011
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NCZ103-180400-
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Outer Banks Dare-
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*** FLOODING RAIN**
TRUNCATED

*** TORNADO**
TRUNCATED

*** FOR MORE INFORMATION:**
- <http://ready.gov/hurricanes>

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TCVWFO Example

(a single zone segment shown)

WTUS82 KMHX 171959

TCVMHX

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Irene Local Watch/Warning Statement/**Advisory Number 25**

National Weather Service Newport/Morehead City NC **AL092011**

259 PM EST Fri Nov 17 2017

NCZ103-180400-

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* FLOODING RAIN

TRUNCATED

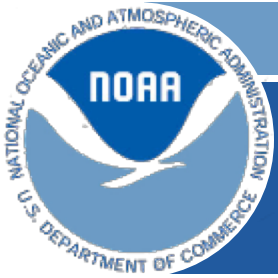
* TORNADO

TRUNCATED

* FOR MORE INFORMATION:

- <http://ready.gov/hurricanes>

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Changes to the Local TCV

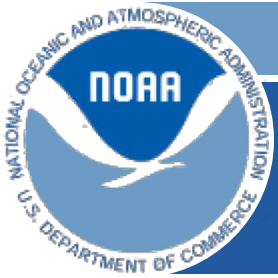
Tropical Cyclone Watch/Warning Product

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PLAN, PREPARE, and ACT statements at a Tweetable length



Changes to the Local TCV

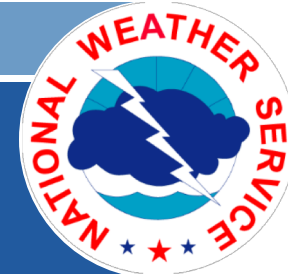
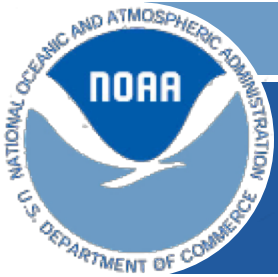
Tropical Cyclone Watch/Warning Product

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 - The wind threat has remained nearly steady from the previous assessment.
 - **PLAN**: Plan for extreme wind of equivalent CAT 3 hurricane force or higher due to possible forecast changes in track, size, or intensity.
 - **PREPARE**: Last minute efforts should solely focus on protecting life. The area remains subject to catastrophic wind damage.
 - **ACT**: Now is the time to shelter from life-threatening wind. Be ready to move to the safest place inside your shelter if necessary.

PLAN, PREPARE, and ACT statements provided for wind, surge, flooding rain, and tornado hazards



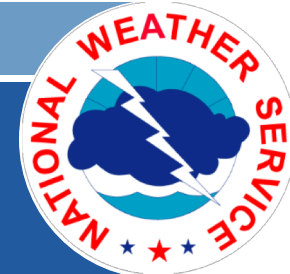
Changes to the Local TCV

Tropical Cyclone Watch/Warning Product

* WIND

- LATEST LOCAL FORECAST: Equivalent Cat 2 Hurricane force wind
 - Peak Wind Forecast: 80-100 mph with gusts to 120 mph
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 - The wind threat has remained nearly steady from the previous assessment.
 - PLAN: Plan for extreme wind of equivalent CAT 3 hurricane force or higher due to possible forecast changes in track, size, or intensity.
 - PREPARE: Last minute efforts should solely focus on protecting life. The area remains subject to catastrophic wind damage.
 - ACT: Now is the time to shelter from life-threatening wind. Be ready to move to the safest place inside your shelter if necessary.

Language used for hazard-based threat labels both in the TCV and on the graphics is now more quantitative rather than qualitative (i.e., moderate, high, etc.)

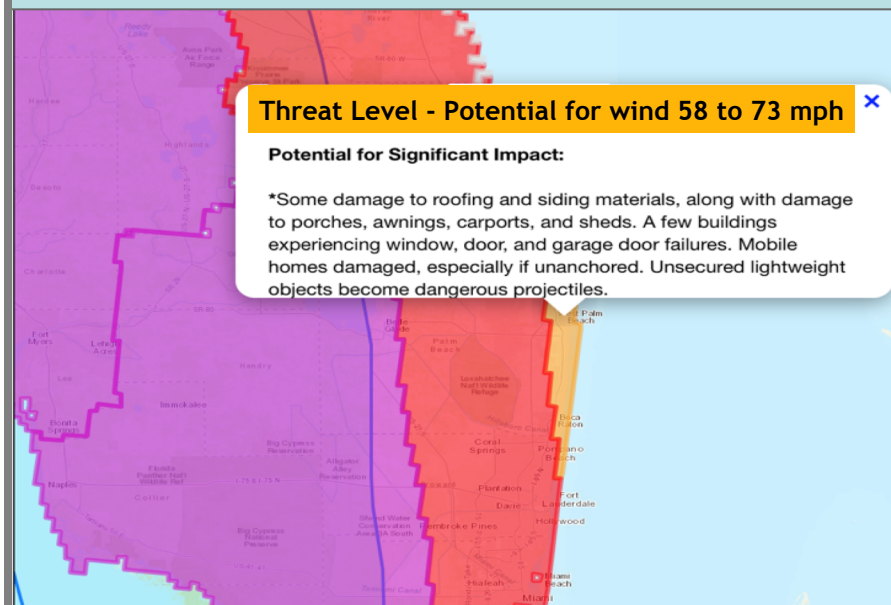


WFO Tropical Product Suite Overview: HTI Graphics from WFOs that Issue TCVs

Hurricane Threats and Impacts: HTI Graphics

- Communicates threats & potential impacts for each tropical hazard
 - ✓ Wind
 - ✓ Storm Surge
 - ✓ Flooding Rain
 - ✓ Tornadoes
- Helps communicate degree of preparation needed with a safety margin factored in
- kml files (mosaic of **ALL** affected CWAs) available at: weather.gov/hti
- Also available in GRIB2 format (delayed) from the [National Digital Forecast Database](#)

Each kml file includes a graphic with threat levels and potential impacts for each hazard



[Download KML]

[Download Image]

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

Intended to serve as a companion graphic to the TCVWFO product



New WFO Tropical Webpage

weather.gov/srh/tropical

- Communicates threats & potential impacts for each tropical hazard in the local area including: Wind, Storm Surge, Flooding Rain, and Tornadoes
- Helps communicate degree of preparation needed with safety margin factored in
- Can access a specific WFO version of the page by adding **?office=xxx** to the above web address

NATIONAL WEATHER SERVICE
NATIONAL OCEANIC AND ATMOSPHERIC ADMINISTRATION

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

NWS Corpus Christi homepage

Outlook Active Storms **Threats and Impacts** Local Products Satellite Radar Preparedness Miscellaneous

Map of Coastal Threats and Potential Impacts - What's This? Latest Forecast - What's This?

Wind Threat
 Storm Surge Threat
 Flooding Rain Threat
 Tornado Threat

Show/Hide Cone

Threat Level - Potential for wind greater than 110 mph

Potential for Devastating to Catastrophic Impact:
*Structural damage to sturdy buildings, some with complete roof and wall failures. Complete destruction of mobile homes. Damage greatly accentuated by large airborne projectiles.

For: Aransas County

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

* LOCATIONS AFFECTED
- Rockport
- Holiday Beach

* WIND
- LATEST LOCAL FORECAST: Equivalent Cat 2 Hurricane force wind
- Peak Wind Forecast: 85-105 mph with gusts to 125 mph
- Window for Tropical Storm force winds: until Wednesday morning
- Window for Hurricane force winds: until early this morning

- EMERGENCY PLANS SHOULD INCLUDE A REASONABLE THREAT AS DEPICTED ON THE LEFT.

* FOR MORE INFORMATION:
<http://www.weather.gov/srh/tropical?office=crp>

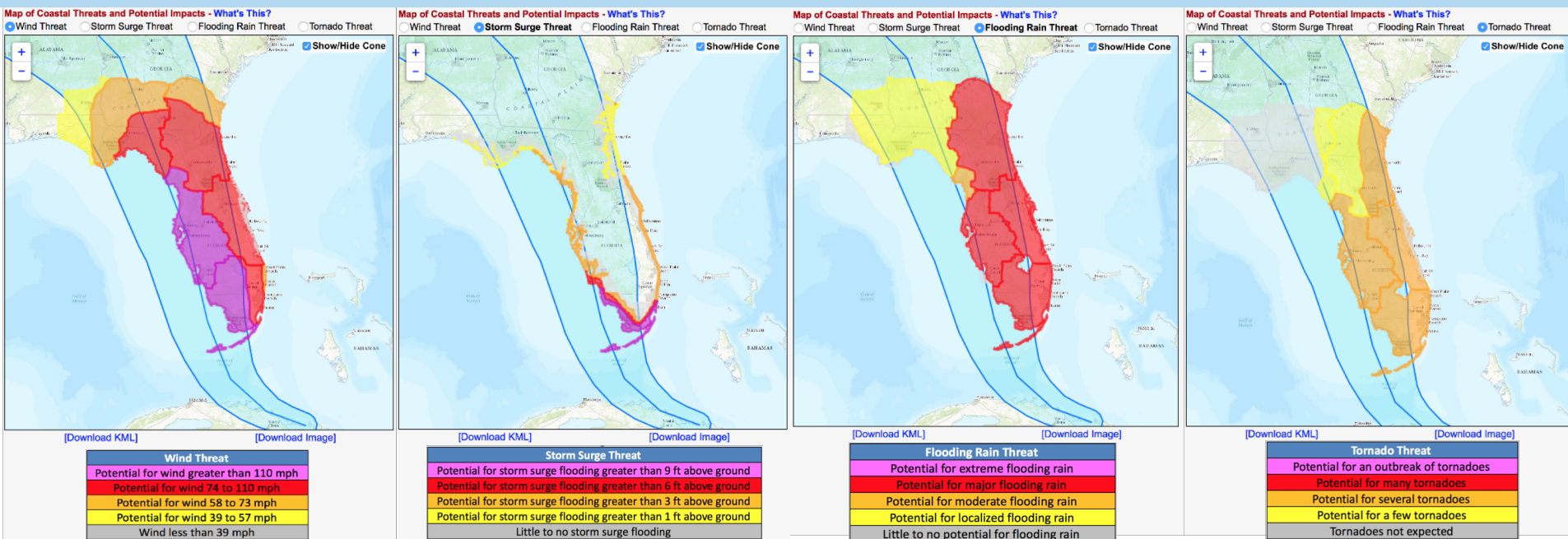
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USA.gov US Dept of Commerce National Oceanic and Atmospheric Administration National Weather Service Southern Region Headquarters 819 Taylor Street, Room 10A06 Fort Worth, TX 76102

Disclaimer Information Quality Help Glossary Privacy Policy Freedom of Information Act (FOIA) About Us Career Opportunities

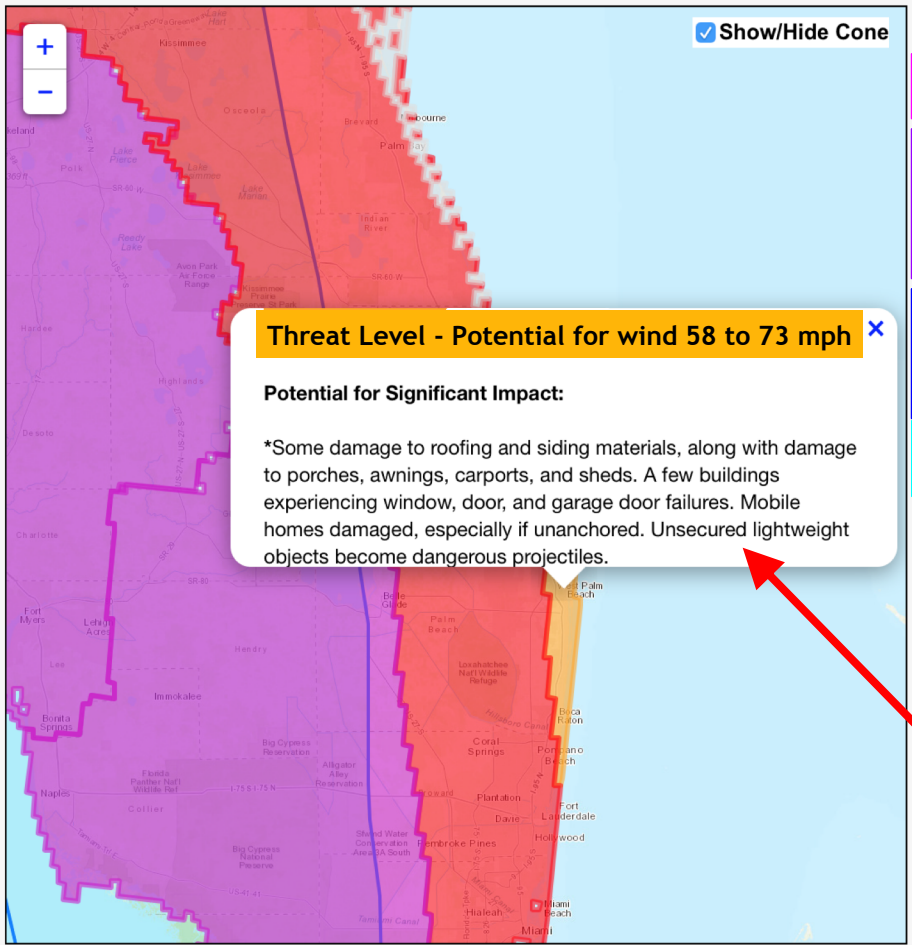
Comments? Questions? Please Contact Us.



Hurricane Threats and Impacts (HTI) Products

- Clicking on the map provides latest information from the TCV text product for your point relative to the four main tropical cyclone hazards: **Wind, Storm Surge, Flooding Rains, and Tornadoes**
- You will be able to find information on the **expected meteorological forecast** including *what* and *when* type information, **threat level** (which incorporates a safety margin), and corresponding **potential impact information** relative to each of those hazards.
- When there is an active storm, an HTI FAQ is linked at the top of the Threats and Impacts page (https://www.weather.gov/media/srh/tropical/HTI_Explanation.pdf)

- Wind Threat
- Storm Surge Threat
- Flooding Rain Threat
- Tornado Threat



Show/Hide Cone

Threat Level - Potential for wind 58 to 73 mph

Potential for Significant Impact:

*Some damage to roofing and siding materials, along with damage to porches, awnings, carports, and sheds. A few buildings experiencing window, door, and garage door failures. Mobile homes damaged, especially if unanchored. Unsecured lightweight objects become dangerous projectiles.

[Download KML]

[Download Image]

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

For: Coastal Palm Beach County

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

- * LOCATIONS AFFECTED
- West Palm Beach
 - Boca Raton
 - Juno Beach
 - Jupiter

- * WIND
- LATEST LOCAL FORECAST: Equivalent Tropical Storm force wind
 - Peak Wind Forecast: 45-55 mph with gusts to 75 mph
 - Window for Tropical Storm force winds: early Sunday morning until Monday afternoon

- EMERGENCY PLANS SHOULD INCLUDE A REASONABLE THREAT AS DEPICTED ON THE LEFT.

- * FOR MORE INFORMATION:
- <http://www.weather.gov/mfl>
 - www.co-palm-beach.fl.us
 - For storm information call 2-1-1

WHAT should I be concerned about?

WHERE is this possible?

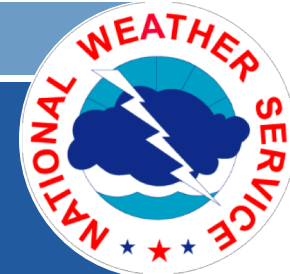
HOW MUCH is likely to occur?

WHEN should I expect it?

WHAT should I plan and prepare for?

Impact Statements customized for the local area (i.e., topography, land use, infrastructure, etc.)

Hazard-Based Threat Scale incorporates a "safety margin" relative to the uncertainty in the forecast at that phase of the event



New WFO Tropical Webpage

weather.gov/srh/tropical

- **NHC Outlook, Threats and Impacts, Satellite, Radar, Social Media, Preparedness Info, and Links tabs** are always available on the site
- When no active storms, the Threats and Impacts tab contains detailed information on HTI and the TCV (same information as the FAQ)
- **Social Media** and **Local Products** tabs allow users to select a WFO to see products from a particular WFO, including the Hurricane Local Statement (HLS)

NATIONAL WEATHER SERVICE
NATIONAL OCEANIC AND ATMOSPHERIC ADMINISTRATION

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

NWS San Juan homepage [Provide Feedback on this Webpage](#)

Outlook Threats and Impacts Satellite Radar **Social Media** Preparedness Links

US National Weather Service San Juan Puerto Rico
Like Page 148K likes

US National Weather Service San Juan Puerto Rico
32 minutes ago

2019 Caribbean Hurricane Awareness Tour
Highlights:
Top Hurricane Hunter aircraft NOAA P-3 and USAF WC-130J

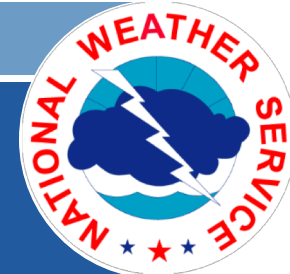
Tweets by @NWSSanJuan

NWS San Juan Retweeted
Nati Hurricane Ctr @NWSNHC
The 2019 Caribbean Hurricane Awareness Tour (CHAT) is set for April 8 to 13 covering six locations in Mexico and the Caribbean. [noaa.gov/media-release/...](https://noaa.gov/media-release/) Spanish version: noaa.gov/sites/default/... #HurricanePrep @NWS @53rdWRS @NWSSanJuan

2019 Caribbean Hurricane Awareness Tour
Highlights:
Top Hurricane Hunter aircraft NOAA P-3 and USAF WC-130J
Meet the pilots & flight crew
Speak with Hurricane Forecasters

April 8, Yucatan, Mexico
April 9, Coastal, Mexico
April 10, San Jose, Costa Rica
April 11, Antia
April 12, Duracao
April 13, Aguadilla, Puerto Rico

Choose a Facebook page Choose a Twitter feed



HLSWFO Example: Atlantic WFOs and WFO Honolulu

WTUS82 KMHX 111443
HLSMHX
NCZ029-044>047-079>081-090>095-098-103-104-112245-

Hurricane Irene Local Statement Advisory Number 22
National Weather Service Newport/Morehead City NC AL092017
943 AM EST Wed Jan 11 2017

This product covers Eastern North Carolina

****DANGEROUS HURRICANE IRENE FORECAST TO APPROACH EASTERN NORTH CAROLINA COAST ON THURSDAY****

NEW INFORMATION

* CHANGES TO WATCHES AND WARNINGS:

- A Hurricane Watch has been upgraded to a Hurricane Warning for Pitt, Duplin, Lenoir, Jones, and Martin
- A Tropical Storm Watch has been upgraded to a Tropical Storm Warning for Greene

* CURRENT WATCHES AND WARNINGS:

- A Hurricane Warning is in effect for Pitt, Duplin, Lenoir, Jones, and Martin
- A Tropical Storm Warning is in effect for Greene

* STORM INFORMATION:

- About 580 miles south of Buxton NC or About 530 miles south of Morehead City NC
- 27.0N 77.3W
- Storm Intensity 115 mph
- Movement North-northwest or 335 degrees at 14 mph

SITUATION OVERVIEW

When making decisions...do not focus on the exact forecast track. There is a potential for devastating impacts from wind across eastern North Carolina as well as significant to extensive impacts from storm surge along portions of the coast Thursday into Friday. Residents of eastern North Carolina need to heed the advice of their local emergency officials and complete their preparedness actions today.

POTENTIAL IMPACTS

* WIND:

Protect against life-threatening wind having possible devastating impacts across portions of eastern North Carolina. Potential impacts in this area include:

- Numerous large trees snapped or uprooted along with fences and roadway signs blown over.

* SURGE:

Similar format to Wind section

* FLOODING RAIN:

Similar format to Wind section

* TORNADOES:

Similar format to Wind section

PRECAUTIONARY/PREPAREDNESS ACTIONS

* EVACUATIONS:

For those under evacuation orders, leave as soon as practical with a destination in mind. Gas up your vehicle well ahead of time. Be sure that you take all essential materials from your emergency supplies kit. Let others know where you are going and when you intend to arrive.

* OTHER PREPAREDNESS INFORMATION:

Now is the time to bring to completion all preparations to protect life and property in accordance with your emergency plan.

* ADDITIONAL SOURCES OF INFORMATION:

- For information on appropriate preparations see ready.gov
- For information on creating an emergency plan see getagameplan.org

NEXT UPDATE

The next local statement will be issued by the National Weather Service in Newport/Morehead City NC around NOON, or sooner if conditions warrant.

\$\$



HLSWFO Example: Atlantic WFOs and WFO Honolulu

WTUS82 KMHX 111443
HLSMHX
NCZ029-044>047-079>081-090>095-098-103-104-112245-

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At least one of these hazard sections will be included in every HLS

- Jones, and Martin
- A Tropical Storm Warning is in effect for Greene

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WTUS82 KMHX 111443

HLSMHX

NCZ029-044>047-079>081-090>095-098-103-104-112245-

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943 AM EST Wed Jan 11 2017

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Similar format to Wind section

* FLOODING RAIN:
Similar format to Wind section

* TORNADOES:
Similar format to Wind section

The "Situation Overview" is the most commonly parsed portion of the HLS for rip-and-read or scrolling

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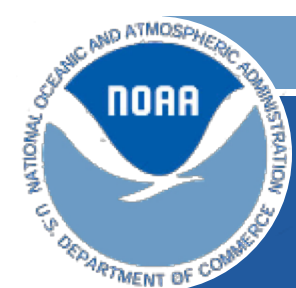
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- For information on appropriate preparations see ready.gov
- For information on creating an emergency plan see getagameplan.org

NEXT UPDATE

The next local statement will be issued by the National Weather Service in Newport/Morehead City NC around NOON, or sooner if conditions warrant.

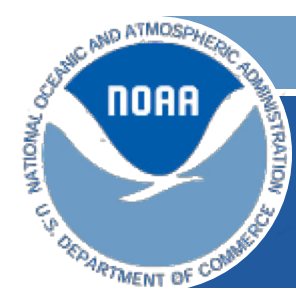
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WFO Tropical Product Suite Overview: HLS at Pacific WFOs (except WFO Honolulu)

Pacific Tropical Cyclone Local Statement (HLS) (except WFO Honolulu)

- Contains VTEC (except WSO American Samoa)
- The Pacific basin HLS product is segmented by zone groupings
- There is no companion TCV product or HTI graphics from these WFOs
- WFOs who only issue HLS products (and not TCV products) include:
 - WFO San Diego
 - WFO Oxnard
 - WFO Guam
 - WSO American Samoa (no VTEC)



HLSWFO Example: Pacific WFOs (except WFO Honolulu)

WTPQ81 PGUM 192201
HLSPQ1

URGENT - IMMEDIATE BROADCAST REQUESTED
TROPICAL CYCLONE LOCAL STATEMENT
NATIONAL WEATHER SERVICE TIYAN GU
801 AM CHST FRI NOV 20 2015

...TYPHOON IN-FA MOVING OUT OF CHUUK STATE...

.NEW INFORMATION...
THE TYPHOON WARNING HAS BEEN CANCELED FOR ULUL IN CHUUK STATE.

.AREAS AFFECTED...
THIS LOCAL STATEMENT PROVIDES INFORMATION AND RECOMMENDED ACTIONS
FOR PEOPLE IN GUAM AND THE SURROUNDING WATERS OUT TO 40 NM...AND
ON ULUL IN CHUUK STATE.

.WATCHES/WARNINGS...
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TYPHOON CONDITIONS ARE NO LONGER EXPECTED.

A TROPICAL STORM WATCH REMAINS IN EFFECT FOR GUAM. TROPICAL STORM
CONDITIONS...INCLUDING DAMAGING WINDS OF 39 MPH OR MORE...ARE
POSSIBLE WITHIN 36 HOURS.

.STORM INFORMATION...
AT 700 AM CHST...2100 UTC...THE CENTER OF TYPHOON IN-FA WAS
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NORTHWEST OF CHUUK. IN-FA WAS MOVING NORTHWEST AT 13 MPH WITH MAXIMUM
SUSTAINED WINDS OF 85 MPH.

.SITUATION OVERVIEW...
TYPHOON IN-FA IS MOVING OUT OF CHUUK STATE INTO THE OPEN WATERS
SOUTHEAST OF THE MARIANAS. THE CURRENT FORECAST TRACK BRINGS IN-FA
ABOUT 140 MILES SOUTH-SOUTHWEST OF GUAM EARLY SATURDAY MORNING.

&&

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.PRECAUTIONARY/PREPAREDNESS ACTIONS...
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GUZ001-200615-
/O.CON.PGUM.TR.A.0005.000000T0000Z-000000T0000Z/
GUAM-
801 AM CHST FRI NOV 20 2015

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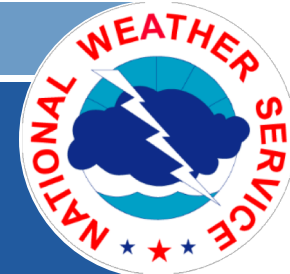
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WTPQ81 PGUM 192201
HLSPQ1

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Segmented portion

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GUZ001-200615-
/O.CON.PGUM.TR.A.0005.000000T0000Z-000000T0000Z/
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WTPQ81 PGUM 192201

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801 AM CHST FRI NOV 20 2015

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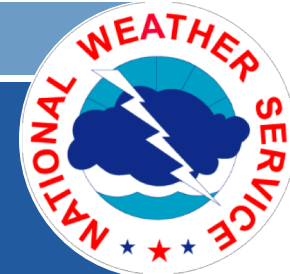
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.NEXT UPDATE...

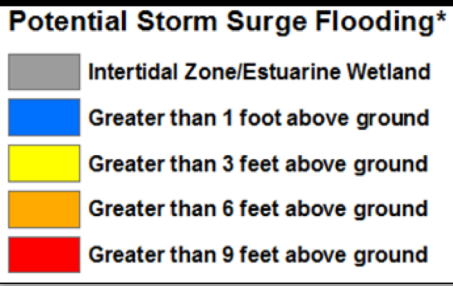
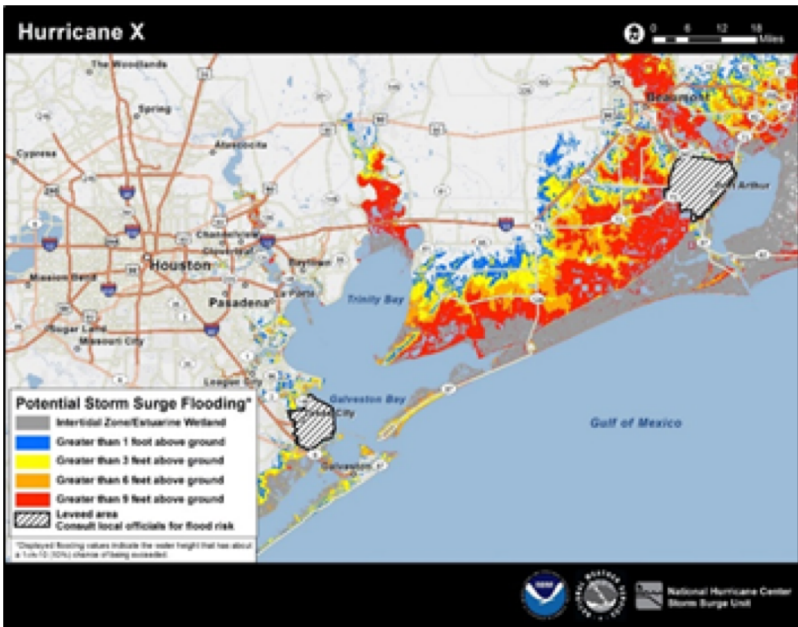
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VTEC found in US territory segments with active or recently canceled watches/warnings

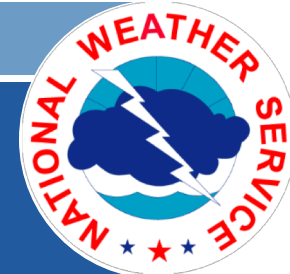




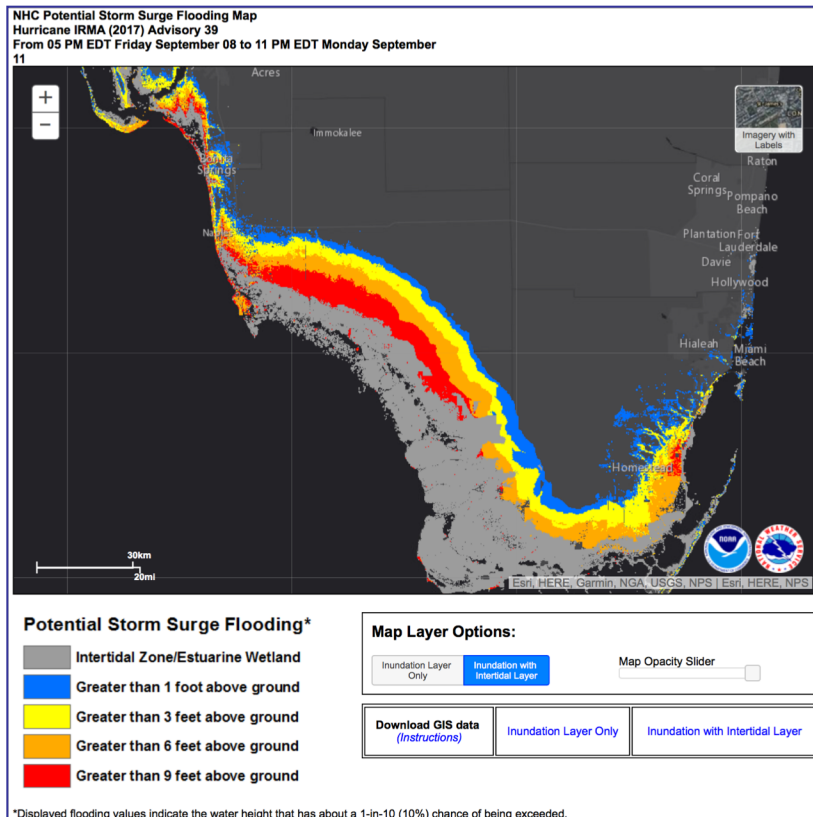
Potential Storm Surge Flooding Map Inundation Graphic



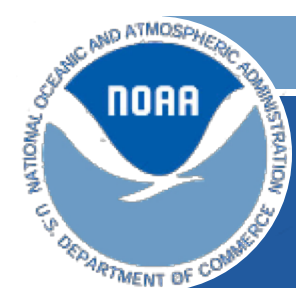
- **Provides a risk assessment**
 - Shows the height above ground that the water could reach at any given location based on the current forecast.
 - Accounts for potential errors in forecast track, intensity, forward speed and size of the hurricane
- **NOT A FORECAST OF EXPECTED CONDITIONS!**
Displays a realistic worst-case scenario
 - Displays storm surge flooding values that have a 1-in-10 chance of being exceeded at a given location
 - 9-in-10 times the surge will be less than what is on the map at any given location
- **First map issued with the initial hurricane watch or, in some cases, with a tropical storm watch**
- **Available about 60 to 90 minutes following the advisory release**



PSSFM/Inundation Graphic Availability



- Available on hurricanes.gov about 60 to 90 minutes following the advisory release
- NHC provides downloadable datasets in GeoTIFF format at: hurricanes.gov/gis/
- Map Services provided on the NOAA [nowCOAST](https://nowcoast.noaa.gov) webpage (delayed)
- **Only available for the Gulf and East Coast only (not in Pacific or Puerto Rico/USVI)**



Storm Surge Values in NWS Products

The inundation values in the NWS products can be different

NHC Inundation Graphic (*Point-specific*)

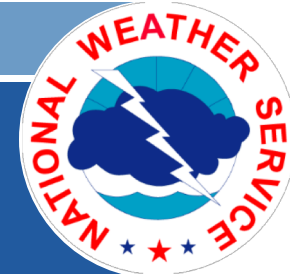
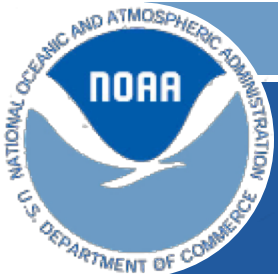
Provides the “reasonable worse-case scenario” at individual locations based on the NHC forecast and typical track, size, and intensity forecast errors

WFO TCV Product (*NWS Zone-scale*)

As the event draws nearer, values in the WFO TCV text trend toward peak expected values (to assist rescue/recovery decisions) rather than the “reasonable worst case scenario” (to assist evacuations decisions)

NHC Tropical Cyclone Public Advisory (*TC-scale*)

Provides the highest forecast storm surge inundation values somewhere within the area noted between coastal points in the NHC TCP text product



Storm Surge Watch/Warning

Issued for Atlantic basin tropical cyclones

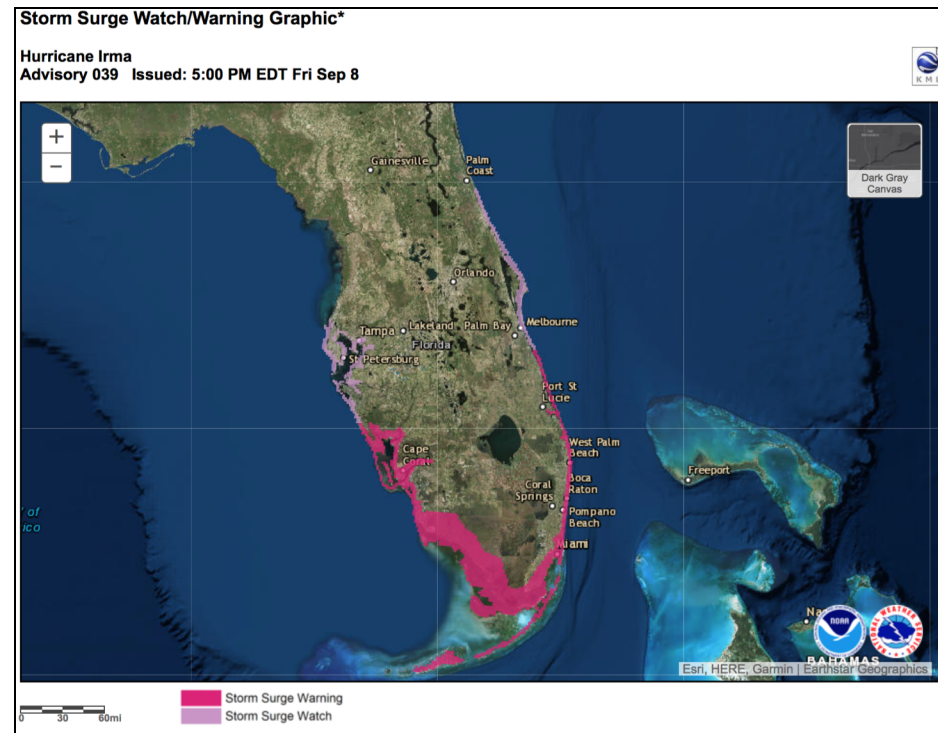
Storm Surge Watch (SS.A)

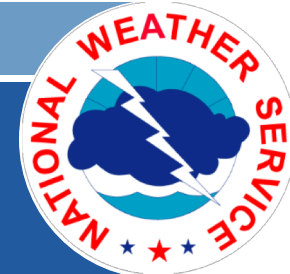
The **possibility** of life-threatening inundation from rising water moving inland from the shoreline somewhere within the specified area, generally within 48 hours

Storm Surge Warning (SS.W)

The **danger** of life-threatening inundation from rising water moving inland from the shoreline somewhere within the specified area, generally within 36 hours

May be issued earlier if other hazards may hinder evacuations.





Storm Surge W/W for Puerto Rico and the U.S. Virgin Islands

WTCA82 TJSJ 152141
TCVSJU

URGENT - IMMEDIATE BROADCAST REQUESTED
Hugo Local Watch/Warning Statement/Advisory Number 20
National Weather Service San Juan PR AL041989
541 PM AST Fri Sep 15 1989

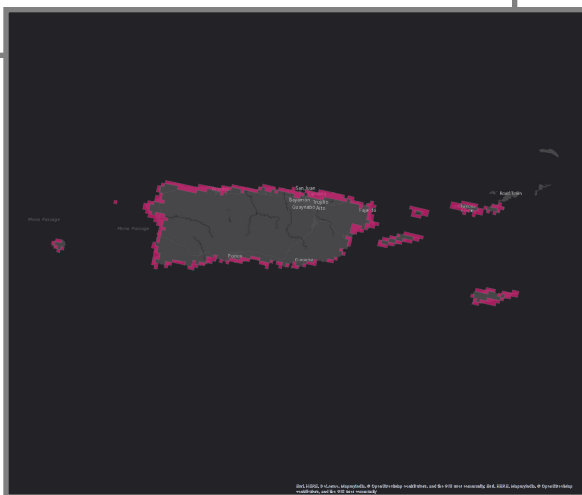
PRZ001-160545-
/O.NEW.TJSJ.SS.W.1085.890915T2141Z-000000T0000Z/
/O.NEW.TJSJ.HU.A.1004.890915T2141Z-000000T0000Z/
San Juan and Vicinity-
541 PM AST Fri Sep 15 1989

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

A Hurricane Watch means hurricane-force winds are possible somewhere within this area within the next 48 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
- San Juan and Vicinity

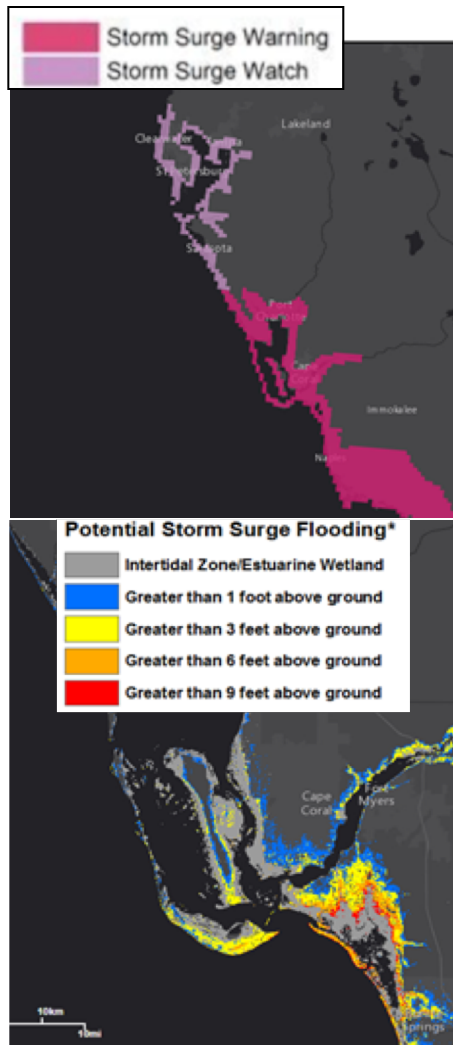


- Storm Surge Watches/Warnings will be issued using the same products as used in other areas in the Atlantic
 - TCV and HLS from WFO San Juan
 - TCP and National TCV from NHC
- Storm Surge Watch/Warning Graphic (including kml format) for this area is available during TC events on [hurricanes.gov](https://www.hurricanes.gov)
- No inundation graphic available for this area

See [NWS Service Change Notice 19-18](#) for more details



How does the Inundation Graphic differ from the SSWW Graphic?

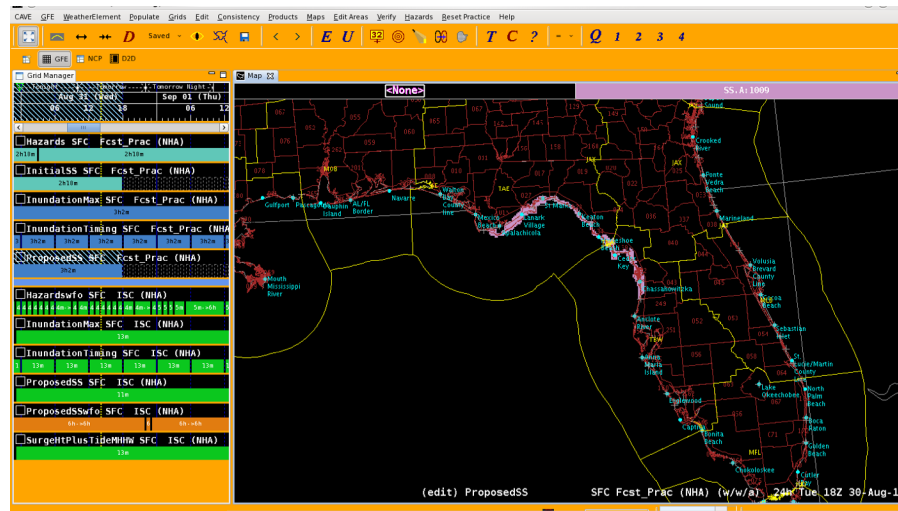


- **The Storm Surge Watch/Warning Graphic shows forecaster-identified areas that are at risk for life-threatening flooding from storm surge**
 - This graphic is targeted for the general public
 - This graphic is human generated (subjective) and changes as needed
- **The Potential Storm Surge Flooding Map provides guidance on where flooding could occur and how high above ground level the flooding could reach in a realistic worst-case**
 - This map is targeted for decision makers
 - This map is computer generated (objective)
 - This map is based on the NHC current forecast and the quantitative values on the map may change as that forecast changes



Storm Surge Watch/Warning

The NWS' First Grid-Based Warning

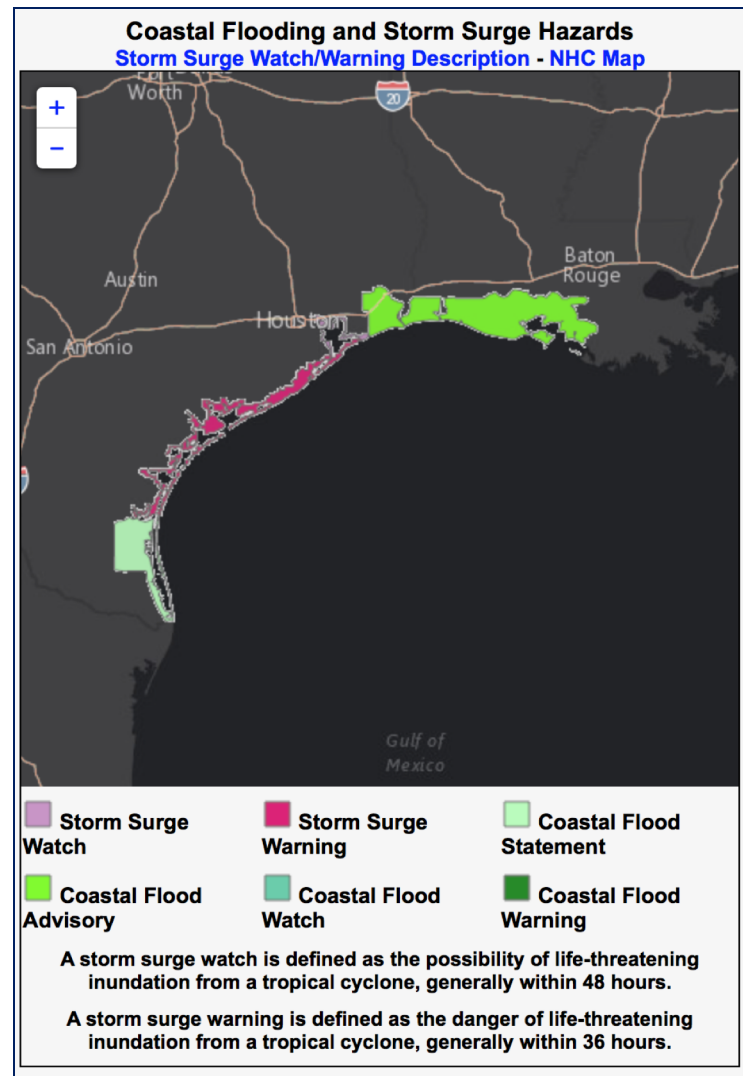


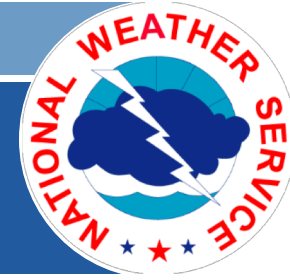
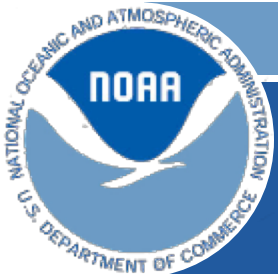
- **The SSWW is the first NWS watch/warning that is native to a grid**
 - The SSWW is grid-based to allow for the warning to be confined to areas bordering coasts, estuaries, and tidal rivers
- The SSWW is generated through inter-site collaboration of grids between the National Hurricane Center (NHC) and Weather Forecast Offices (WFOs)
- ***Dissemination methods that alert the entire zone or county (i.e., those that rely on VTEC) will over-warn the SSWW***



Coastal Hazards Message (CFW) Issuance During Tropical Events

- Coastal Hazards Messages (CFWs) can be issued throughout a tropical event
- Coastal Flood Warnings/Watches/Advisories may be issued in conjunction with Tropical Cyclone Watch/Warnings in situations of flooding caused by a tropical cyclone that does not meet storm surge W/W criteria
- High Surf Advisories/Warnings, Beach Hazard, and Rip Current statements can be issued concurrently with Storm Surge Watch/Warning products, but not Coastal Flood hazards.
- Storm Surge Watches/Warnings are issued on a grid while CFW products are issued for an entire NWS zone (VTEC-based alert)
- Some of the NWS systems that alert a SSWW for an entire zone instead of the specified gridded area include:
 - Emergency Alert System (EAS)
 - NOAA Weather Radio (NWR)
 - **SSWW REMOVED IN 2019** - National Hazards kmz file on weather.gov/gis

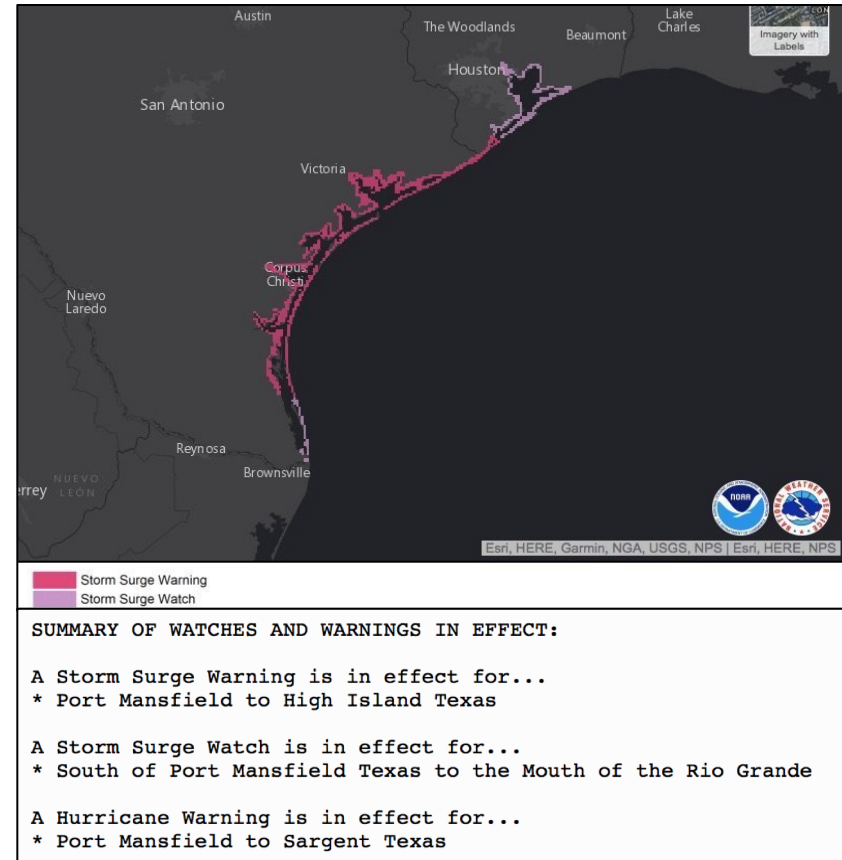


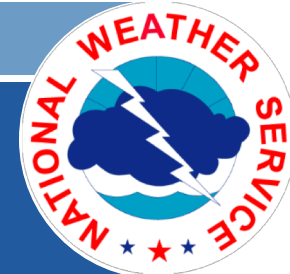


Storm Surge Watch/Warning Dissemination

Storm Surge Watch/Warning Dissemination:

- **Graphic, including downloadable kml file, available at: hurricanes.gov**
THIS IS THE MOST PRECISE AND READILY AVAILABLE REPRESENTATION OF THE WARNING AREA
- Map Services from nowCOAST (delayed)
- NDFD grib2 hazard grid (delayed)
- Approximate representation provided as a 100 lat/long point polygon in the CAP files for FEMA IPAWS and the NWS front page map.
 - CAP files available at: alerts.weather.gov
- Approximate representation in terms of zones in National and WFO TCV products
- Approximate representation using coastal breakpoints in the
 - NHC Public Advisory
 - NWS WFO Hurricane Local Statement





Map Services for the Storm Surge Watch/Warning Graphic and Inundation Graphic

NOAA/NOS nowCOAST

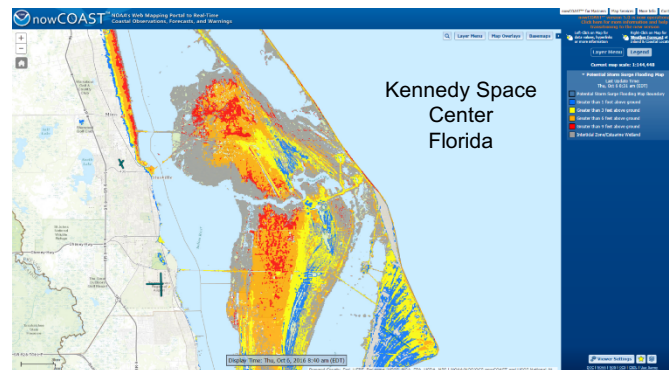
nowcoast.noaa.gov

Inundation Graphic and SSWW Graphic are available via:

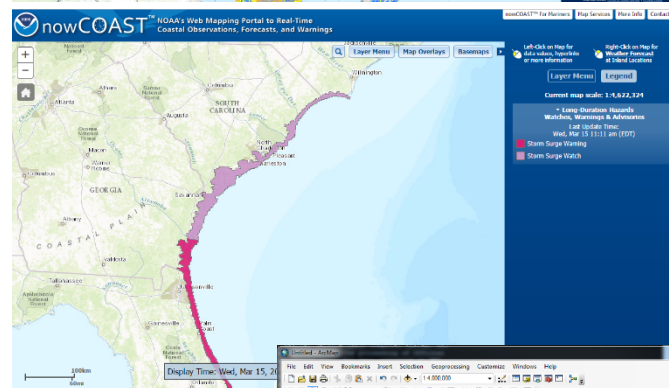
- GeoServices REST Map Services
- OCG Web Map Services

This allows users to view via desktop, server, and web-based GIS and overlay with evacuation routes, critical infrastructure, etc.

- Storm Surge W/W Graphic available on nowCOAST 5 minutes after posting on the hurricanes.gov
- Inundation Graphic available 10-20 minutes after posting on hurricanes.gov

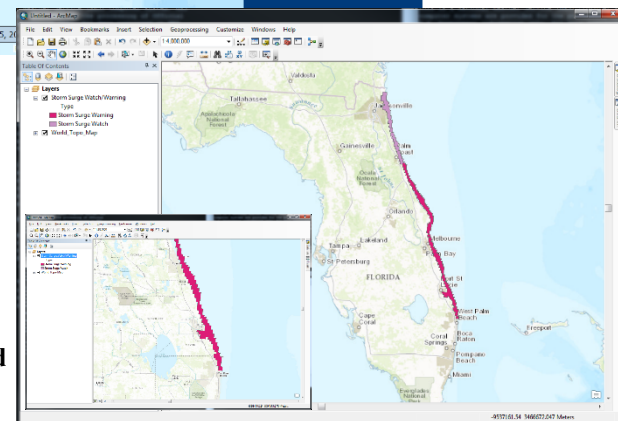


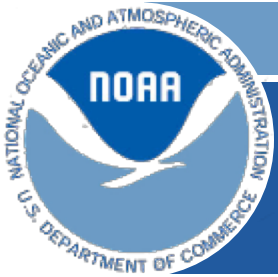
Inundation Map displayed on nowCOAST's map viewer during Hurricane Matthew (2016)



SS W/W Graphic displayed on nowCOAST's map viewer

SS W/W Graphic obtained from nowCOAST's map services and displayed on ArcGIS Desktop





“National” TCV from NHC for the Atlantic basin

- National TCV from NHC for the Atlantic compiles all tropical cyclone wind and surge watches and warnings into a single product
- The National TCV for the Atlantic lists all NWS zones under a tropical cyclone watch or warning.

Isaac Watch/Warning Advisory Number 19
NWS National Hurricane Center Miami FL AL042012
510 PM EDT Sat Aug 25 2012

.Tropical Storm Isaac

FLZ050-134-139-142-148-149-151-155-260515-
/O.UPG.KNHC.SS.A.1004.000000T0000Z-000000T0000Z/
/O.EXA.KNHC.SS.W.1004.000000T0000Z-000000T0000Z/
510 PM EDT Sat Aug 25 2012

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Truncated

- ***Because of the time required to compile all of the tropical cyclone W/W information from the WFOs, the National TCV for the Atlantic will be delayed approximately 15 min after the advisory time, and may be issued up to 45 minutes after a special advisory***
- The National TCV does not contain plain language meteorological threats and potential impacts information like the local WFO TCV



TCVAT# Example

WTNT84 KNHC 252110
TCVAT4

Isaac Watch/Warning Advisory Number 19
NWS National Hurricane Center Miami FL AL042012
510 PM EDT Sat Aug 25 2012

.Tropical Storm Isaac

Caution...this product only approximately conveys the extent of tropical cyclone wind and surge watches and warnings. Please see the latest public advisory from the National Hurricane Center for the precise lateral extent of wind watches and warnings along the coast...as well as the approximate lateral extent of surge watches and warnings. The precise extent of surge watches and warnings can be found in the NWS National Digital Forecast Database Hazard grids.

FLZ050-134-139-142-148-149-151-155-260515-
/O.UPG.KNHC.SS.A.1004.000000T0000Z-000000T0000Z/
/O.EXA.KNHC.SS.W.1004.000000T0000Z-000000T0000Z/
510 PM EDT Sat Aug 25 2012

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FLZ069-070-075-160-162-165-265-260515-
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510 PM EDT Sat Aug 25 2012

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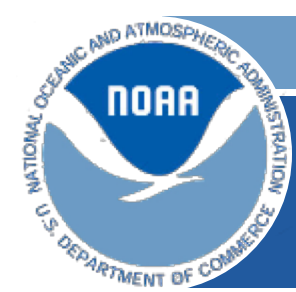
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510 PM EDT Sat Aug 25 2012 /410 PM CDT Sat Aug 25 2012/

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FLZ128-260515-
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510 PM EDT Sat Aug 25 2012

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ATTN...WFO...MFL...TAE...TBW...



TCVAT# Example

WTNT84 KNHC 252110

TCVAT4

Isaac Watch/Warning **Advisory Number 19**
NWS National Hurricane Center Miami FL **AL042012**
510 PM EDT Sat Aug 25 2012

.Tropical Storm Isaac

Caution...this product only approximately conveys the extent of tropical cyclone wind and surge watches and warnings. Please see the latest public advisory from the National Hurricane Center for the precise lateral extent of wind watches and warnings along the coast...as well as the approximate lateral extent of surge watches and warnings. The precise extent of surge watches and warnings can be found in the NWS National Digital Forecast Database Hazard grids.

**FLZ050-134-139-142-148-149-151-155-260515-
/O.UPG.KNHC.SS.A.1004.000000T0000Z-000000T0000Z/
/O.EXA.KNHC.SS.W.1004.000000T0000Z-000000T0000Z/
510 PM EDT Sat Aug 25 2012**

\$\$

**FLZ069-070-075-160-162-165-265-260515-
/O.CON.KNHC.SS.W.1004.000000T0000Z-000000T0000Z/
510 PM EDT Sat Aug 25 2012**

\$\$

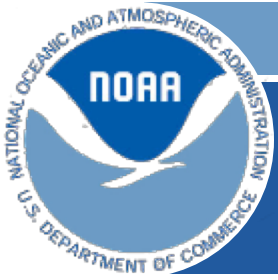
**FLZ014-015-027-028-108-112-114-115-118-127-260515-
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510 PM EDT Sat Aug 25 2012 /410 PM CDT Sat Aug 25 2012/**

\$\$

**FLZ128-260515-
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510 PM EDT Sat Aug 25 2012**

\$\$

ATTN...WFO...MFL...TAE...TBW...

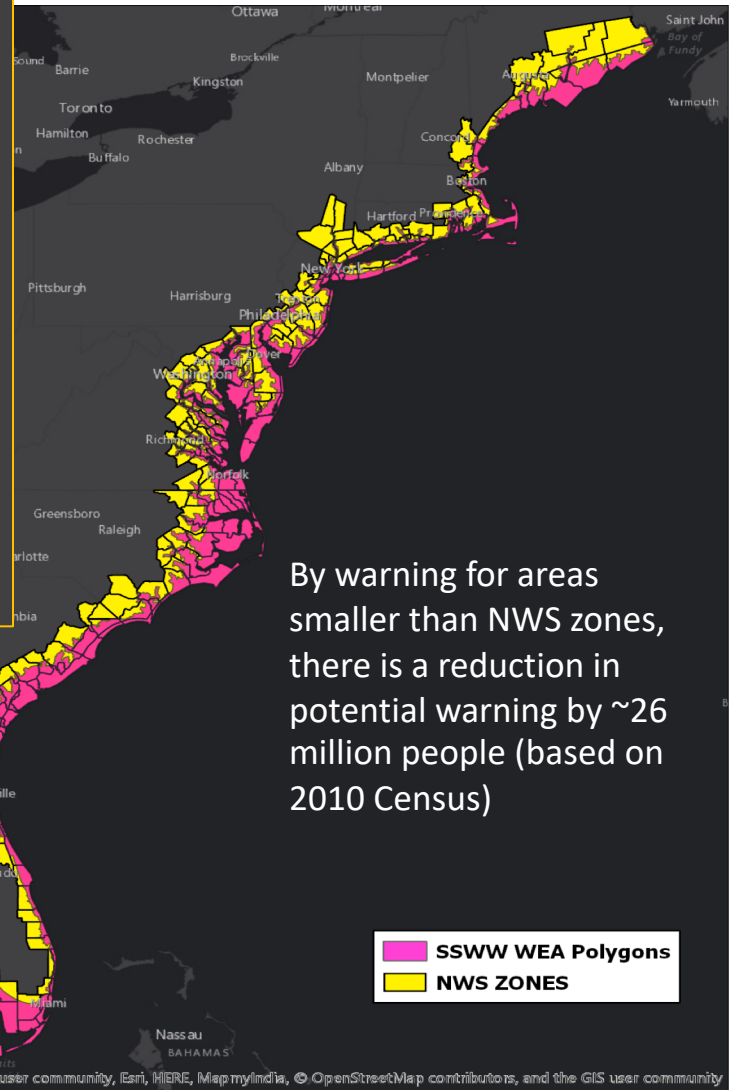


Storm Surge Watch/Warning Alerting

Pink = The farthest possible inland extent of a Storm Surge Watch/Warning. Also, the area that could be alerted via WEA, the NWS front page map, and “Point and Click” pages if a watch or warning is needed for the area.

Yellow = The largest collection of entire NWS zones that could be alerted to a Storm Surge Watch/Warning via EAS and NWR using VTEC.

The official grid-based warning area will be smaller in nearly all cases than the pink area on this map



By warning for areas smaller than NWS zones, there is a reduction in potential warning by ~26 million people (based on 2010 Census)

SSWW WEA Polygons
NWS ZONES



National Storm Surge Hazard Maps

<https://www.nhc.noaa.gov/nationalsurge/>

National Storm Surge Hazard Maps

NOAA/NWS/NHC Storm Surge Unit






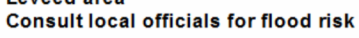
This is not a real-time product. For active tropical cyclones, please see hurricanes.gov and consult local products issued by the National Weather Service

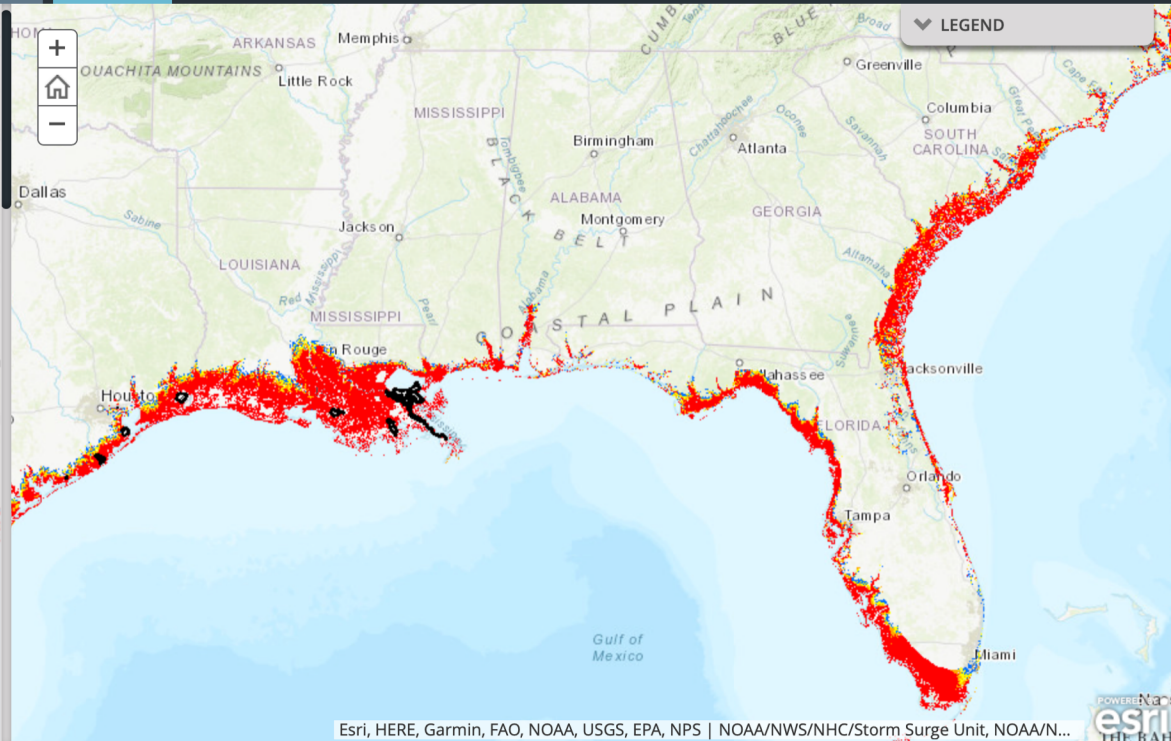


Texas to Maine Puerto Rico and U.S. Virgin Islands Hawaii Hispaniola

Category 1 Category 2 Category 3 Category 4 **Category 5**

This national depiction of storm surge flooding vulnerability helps people living in hurricane-prone coastal areas along the U.S. East and Gulf Coasts and Puerto Rico to evaluate their risk to the storm surge hazard. These maps make it clear that storm surge is not just a beachfront problem, with the risk of storm surge extending many miles inland from the immediate coastline in some areas. If you discover via these maps that you live in an area vulnerable to storm surge, find out today if you live in a hurricane storm surge evacuation zone as prescribed by your local emergency management agency. If you do live in such an evacuation zone, decide today where you will go and how you will get there, if and when you're instructed by your emergency manager to evacuate. If you don't live in one of those evacuation zones, then perhaps you can identify someone you care about who does live in an evacuation zone, and you could plan in advance to be their inland evacuation destination - if you live in a structure that is safe from the wind and outside of flood-prone areas.

-  Less than 3 feet above ground
-  Greater than 3 feet above ground
-  Greater than 6 feet above ground
-  Greater than 9 feet above ground
-  Leveed area
-  Consult local officials for flood risk

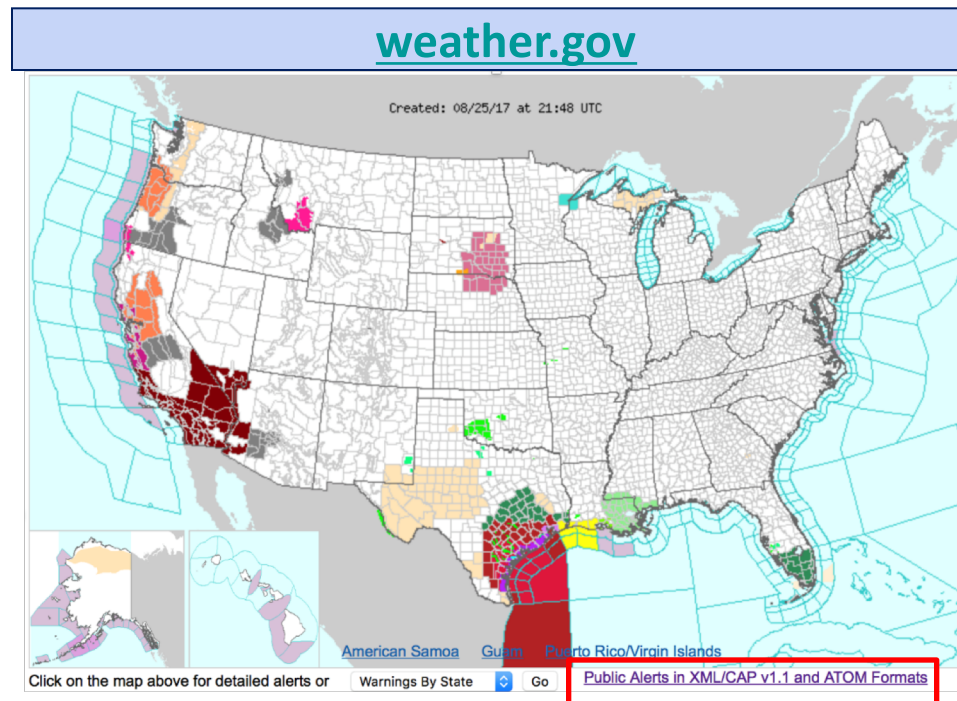




NWS Front Page Map

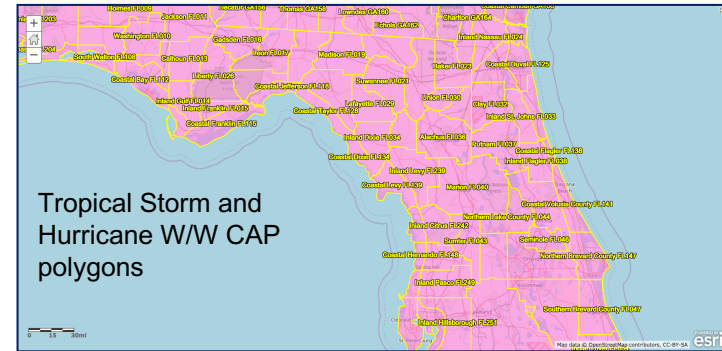
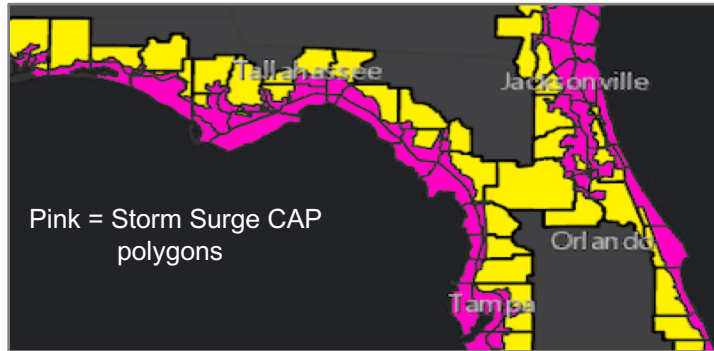
WWA (Watch/Warning/Advisory) Map

- Storm Surge W/Ws on the NWS' [weather.gov](https://www.weather.gov) Front Page (WWA) Map are populated using CAP data
- The WWA Map will display the geographic coverage of the entire area in each zone that is vulnerable to storm surge when the zone is included in the WFO TCV
 - It will be larger than the intended gridded warning area
 - The point forecast will be based on this area and will direct some users outside the gridded warning to the TCV for warning information
- SS Warning is in **Dark Purple**
- SS Watch is in **Light Purple**
- The CAP data can be found on alerts.weather.gov or through the WWA Map legend





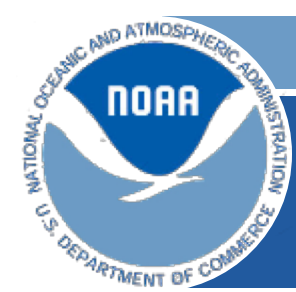
Tropical CAP Messages



TCV (Tropical Cyclone W/W) CAP messages will include:

- A 100 point or less polygon (left, pink) that represents the portion of a zone alerted with a SSWW via VTEC that is susceptible to surge from strongest TC
 - This area is generally larger than the gridded SSWW area created by the forecaster and available in the kml
- A 100 point or less polygon rendering of the NWS zone where a tropical storm or hurricane watch/warning is issued via VTEC
 - Previously, these areas were alerted in CAP messages using FIPS codes for entire counties rather than for NWS zones

Sample tropical CAP messages: hurricanes.gov/productexamples/
CAP data for active alerts: alerts.weather.gov



Tropical CAP Message Example

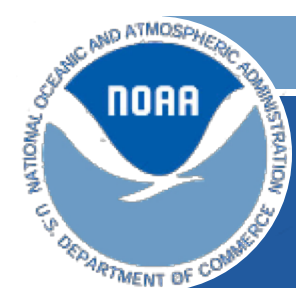
TRUNCATED

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<event>Tropical Storm Warning</event>
<responseType>Avoid</responseType>
<urgency>Immediate</urgency>
<severity>Severe</severity>
<certainty>Observed</certainty>
<eventCode>
<valueName>SAME</valueName>
<value>TRW</value>
</eventCode>
<effective>2018-03-13T08:31:00-04:00</effective>
<onset>2018-03-13T08:31:00-04:00</onset>
<expires>2018-03-28T13:00:00-04:00</expires>
<senderName>NWS Newport/Morehead City NC</senderName>
<headline>Tropical Storm Warning issued March 13 at 8:31AM EDT by NWS Newport/Morehead City NC</headline>
```

TRUNCATED

```
<areaDesc>Carteret</areaDesc>
<polygon>35.045,-76.004 34.979,-76.125 34.704,-76.441 34.576,-76.535 34.660,-76.600 34.688,-76.795 34.658,-
77.034 34.640,-77.099 34.644,-77.105 34.673,-77.094 34.681,-77.112 34.718,-77.102 34.722,-77.100 34.726,-
77.110 34.732,-77.116 34.741,-77.120 34.751,-77.119 34.768,-77.133 34.761,-77.140 34.768,-77.143 34.768,-77.149
34.771,-77.151 34.777,-77.154 34.782,-77.159 34.780,-77.162 34.785,-77.166 34.794,-77.161 34.798,-77.131
34.794,-77.120 34.803,-77.107 34.799,-77.095 34.803,-77.090 34.811,-76.956 34.826,-76.956 34.836,-76.882
34.845,-76.883 34.846,-76.758 34.871,-76.692 34.934,-76.651 34.958,-76.676 34.975,-76.680 34.996,-76.629
35.012,-76.511 35.085,-76.470 35.085,-76.408 34.986,-76.191 35.118,-76.069 35.108,-76.042 35.045,-
76.004</polygon>
<geocode>
```

TRUNCATED



Tropical CAP Message Example

TRUNCATED

<category>Met</category>
<event>Tropical Storm Warning</event>
<responseType>Avoid</responseType>
<urgency>Immediate</urgency>
<severity>Severe</severity>
<certainty>Observed</certainty>
<eventCode>
<valueName>SAME</valueName>
<value>TRW</value>
</eventCode>
<effective>2018-03-13T08:31:00-04:00</effective>
<onset>2018-03-13T08:31:00-04:00</onset>
<expires>2018-03-28T13:00:00-04:00</expires>
<senderName>NWS Newport/Morehead City NC</senderName>
<headline>Tropical Storm Warning issued March 13 at 8:31AM EDT by NWS Newport/Morehead City NC</headline>

TRUNCATED

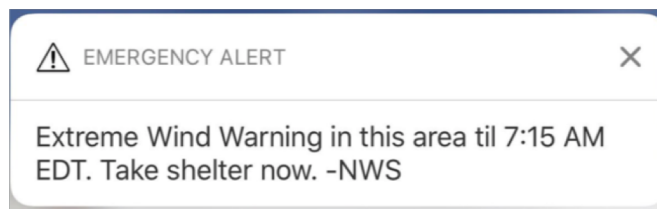
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<geocode>

TRUNCATED

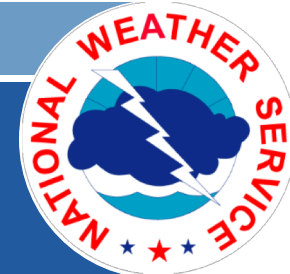


Wireless Emergency Alerts (WEA)



- Wireless Emergency Alert (WEA) is an alerting network in the United States designed to disseminate emergency alerts to mobile devices such as cell phones.
- WEA messages are triggered by the NWS for the following tropical warnings:
 - Hurricane Warning:
NWS: HURRICANE {TYPHOON} WARNING this area. Check media and local authorities
 - Storm Surge Warning*:
NWS: Life-threatening STORM SURGE danger. FOLLOW THE INSTRUCTIONS OF LOCAL OFFICIALS.
 - Extreme Wind Warning*:
NWS: EXTREME WIND WARNING this area til 11:35PM EDT. Take shelter now.

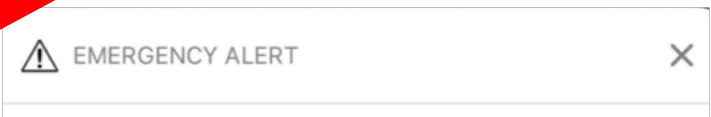
* While NWS is sending these warnings to FEMA IPAWS for alerting via WEA, not all wireless carriers had enabled WEAs for them through 2018



360 Character WEA Messages

- FCC Changes will allow for WEA messages up to 360 characters for devices on 4G networks or better beginning in May 2019
- NWS is planning to implement longer messages in English on or about May 30
 - Spanish messages are expected to follow shortly thereafter
 - Finalized messages will be posted at: [weather.gov/wrn/wea360](https://www.weather.gov/wrn/wea360)
- **FINAL CONTENT OF MESSAGES IS STILL UNDER REVIEW BY NWS LEADERSHIP**

Sample

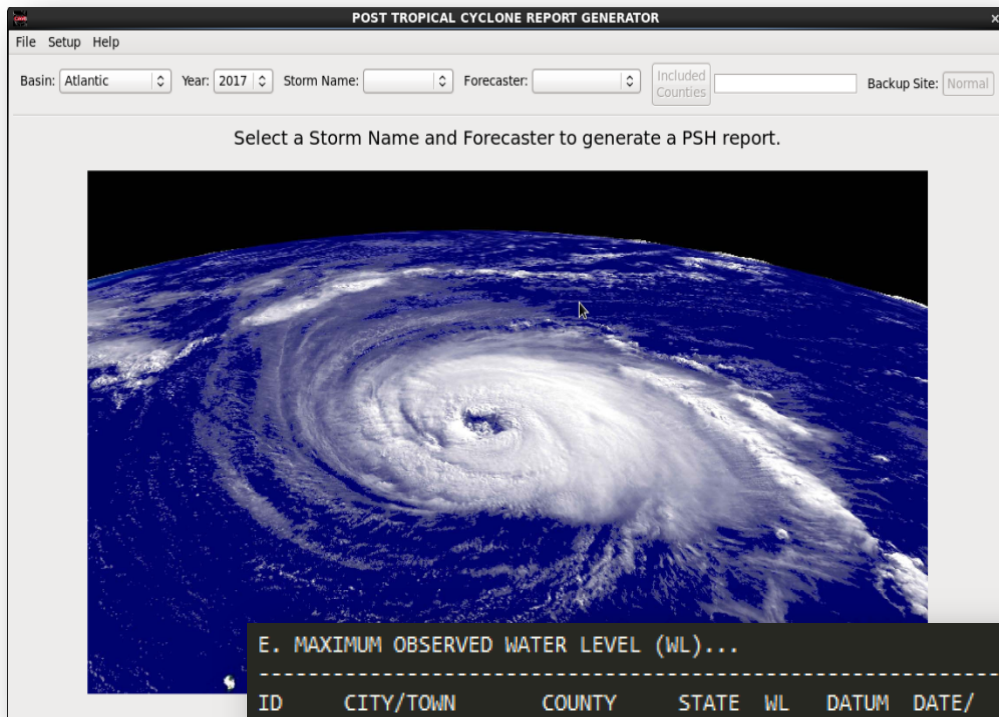


National Weather Service: A HURRICANE {TYPHOON} WARNING is in effect for this area for dangerous and damaging winds. This warning is issued up to 36 hours before hazardous conditions begin. Urgently complete efforts to protect life and property. Have food, water, cash, fuel, and medications for 3+ days. FOLLOW INSTRUCTIONS FROM LOCAL OFFICIALS.



Post Tropical Cyclone Report (PSH) Improvements

- Peak water levels will be reported rather than surge and tide separately
- Inclusion of station information, lat/lon, & reference datum
- NWS will be able to gather important observations more efficiently, & limit the potential for manual entry errors
- Reduces data platform inconsistencies & saves time with validation



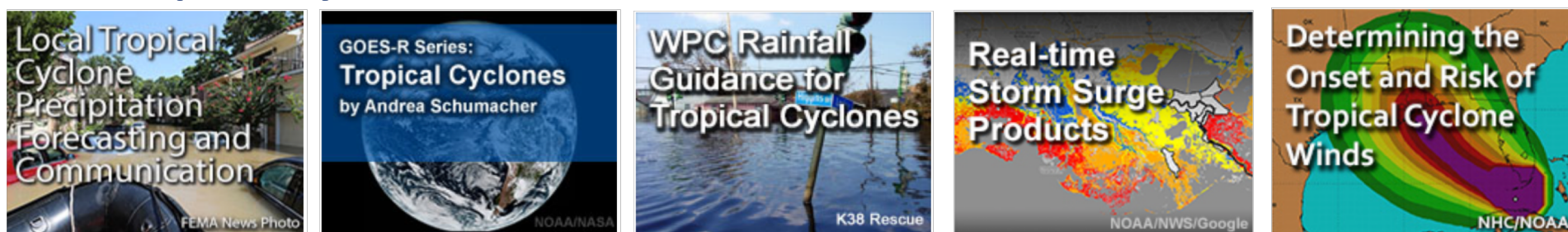
E. MAXIMUM OBSERVED WATER LEVEL (WL)...

ID	CITY/TOWN OR LOCATION	COUNTY	STATE	WL (FT)	DATUM	DATE/TIME	SOURCE
GISL1 29.2633	GRAND ISLE -89.9567	JEFFERSON	LA	1.21	MHHW	30/1248	NOS
PTFL1 29.1150	BELLE PASS/FOUR -90.2000	LAFOURCHE	LA	2.44	MHHW	29/1342	NOS I
BCFL1 30.0683	BONNET CARREY -90.3900	ST. JOHN	LA	2.42	MHHW	29/2012	NOS

REMARKS

Educational Resources

Tropical Cyclone COMET modules: www.meted.ucar.edu

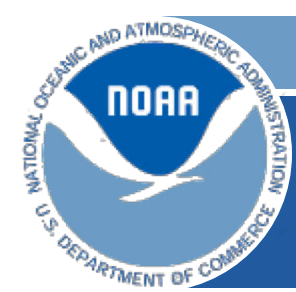


NOAA Hurricane Season Awareness Webinars

sponsored by NOAA's Southeast & Caribbean Regional Team

www.regions.noaa.gov/secar

- Planned for May/early June
- Geared toward emergency managers and broadcast meteorologists



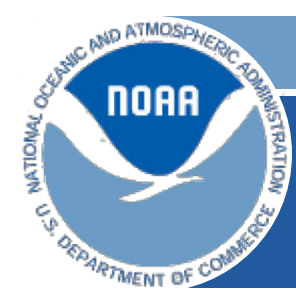
Sample Data

Sample data is available on hurricanes.gov

- hurricanes.gov/productexamples
- hurricanes.gov/gis/

Sample data available for download include:

- ✓ WFO TCV text file
- ✓ Atlantic National TCV text file
- ✓ WFO HLS text file
- ✓ Storm Surge Watch/Warning CAP
- ✓ GRIB2 Hazard Grid including a Storm Surge Watch and Warning
- ✓ Potential TC Advisory Package
- ✓ Experimental JSON file from NHC
- ✓ SSWW Graphic KML
- ✓ Inundation Graphic GeoTIFF
- ✓ Hurricane Threats and Impacts KMLs
- ✓ 34-, 50-, and 64-kt Wind Swath GRIB2 data



We Want to Hear From You



Submit feedback to the NWS Tropical Program:
Tropical.Program@noaa.gov



Where do I find this presentation?

www.weather.gov

www.weather.gov/wrn/calendar

NATIONAL WEATHER SERVICE
NATIONAL OCEANIC AND ATMOSPHERIC ADMINISTRATION

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Nor'easter Continues to Impact the Northeast; Below Normal Temperatures Throughout the East
Heavy snow will spread north with 1 to 2 feet is possible across portions of Maine. Gusty winds near the coast combined with wet snow, may cause downed trees and power outages. Hazardous travel can be expected across the region. This cold trough extends into the Deep South with freezing temperatures expected. A new west coast weather system will bring heavy snow to the Cascades. [Read More](#)

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National Program

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Be a Force of Nature when it comes to extreme weather by learning about potential hazards. Help advance the Weather-Ready Nation by being prepared for the worst. NOAA's National Weather Service (NWS) and its partners encourage individuals, families, businesses and communities to know their risk, take action, and be an example when it comes to dangerous weather.

UPCOMING EVENTS

[National Seasonal Safety Campaign](#)
(year-round)
The National Seasonal Safety Campaign is designed to prepare the public for seasonal weather hazards. Seasonal campaigns (winter, spring, summer, fall) will focus on the major weather hazards that are experienced around the country during each season.

[NWS Tropical User Webinar](#)
March 9, 2018
3 - 4:30 PM ET

PREVIOUS EVENTS

[NWS Partners Meeting](#)
January 11, 2018
Hilton Austin
Austin, TX

- [NWS Director and Deputy Director Remarks](#)
- [Update on Central Processing](#)
- [Update on Dissemination](#)
- [Update on NWS Observations](#)
- [Technical Update on NWS Dissemination](#)
- [Partners Meeting Summary](#)

[NWS Partners Workshop on IDSS and Dissemination](#)
December 6-7, 2017
Silver Spring Civic Building
Silver Spring, MD

- [NWS Workshop Summary](#)



Questions?

NWS Tropical Services Program Leader:

Jessica Schauer

Tropical.Program@noaa.gov

305-229-4476