NWS 2017 Tropical Product and Service Changes

- Weather Forecast Office (WFO) Tropical Product Suite Overview
- Miscellaneous changes to NHC/CPHC Products and Services
- Watches and Warnings for Potential Tropical Cyclones
- Experimental Arrival of Tropical-Storm-Force Winds Products from NHC
- Changes to the NHC/CPHC Forecast Graphics
- Storm Surge Products and Services including new Watches and Warnings for the Gulf and East Coast of the Contiguous United States
- FCC Approval of the Extreme Wind Warning and Storm Surge Watch and Warning Event Codes
- New Format for the National Tropical Cyclone Watch/Warning VTEC Product for the Atlantic Basin (TCVAT#)
- Resources and Sample Data
<table>
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<tr>
<th>Acronym</th>
<th>Description</th>
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<tbody>
<tr>
<td>CAP</td>
<td>Common Alerting Protocol</td>
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<td>CPHC</td>
<td>Central Pacific Hurricane Center</td>
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<td>EAS</td>
<td>Emergency Alert System</td>
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<td>FEMA</td>
<td>Federal Emergency Management Agency</td>
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<td>HLS</td>
<td>Hurricane/Tropical Cyclone Local Statement Product</td>
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<td>NOAA</td>
<td>National Oceanic and Atmospheric Administration</td>
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<td>NHC</td>
<td>National Hurricane Center</td>
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<td>NOS</td>
<td>National Ocean Service</td>
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<td>NOAA Weather Radio All Hazards</td>
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<td>Tropical Cyclone Watch/Warning VTEC Product</td>
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<td>UGC</td>
<td>Universal Geographic Code</td>
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<td>VTEC</td>
<td>Valid Time Event Code</td>
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<td>WFO</td>
<td>Weather Forecast Office</td>
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WFO Tropical Cyclone Local Watch/Warning Product (TCV) at Atlantic basin WFOs and WFO Honolulu

- Produced at **Atlantic** basin offices
- WFO Honolulu (HFO) will add a TCVHFO product in 2017
- 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 (when applicable)
  - Flooding Rain
  - Tornadoes
**URGENT - IMMEDIATE BROADCAST REQUESTED**

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

NCZ104-112145-
/O.NEW.KMHX.HU.W.1009.170111T1426Z-000000T0000Z/
/O.UPG.KMHX.HU.A.1009.000000T0000Z-000000T0000Z/
Outer Banks Hyde-
926 AM EST Wed Jan 11 2017

...HURRICANE WARNING IN EFFECT...

A Hurricane Warning means Hurricane wind conditions are expected somewhere within this area and within the next 36 hours

* LOCATIONS AFFECTED
  - Ocracoke

* WIND
  - LATEST LOCAL FORECAST: Equivalent Cat 1 Hurricane force wind
    - Peak Wind Forecast: 75-95 mph with gusts to 115 mph
    - Window for Tropical Storm force winds: Thursday morning until Friday afternoon
    - Window for Hurricane force winds: Thursday evening until Friday afternoon

  - CURRENT THREAT TO LIFE AND PROPERTY: Extreme
    - Emergency plans should include a reasonable threat for major hurricane force wind greater than 110 mph of equivalent Category 3 intensity or higher.

  - POTENTIAL IMPACTS: Devastating to Catastrophic
    - Structural damage to sturdy buildings, some with complete roof and wall failures. Complete destruction of mobile homes. Damage greatly accentuated by large airborne projectiles. Locations may be uninhabitable for weeks or months.

* STORM SURGE
  - LATEST LOCAL FORECAST: Life-threatening storm surge possible
    - Peak Storm Surge Inundation: The potential for 2-4 feet above ground somewhere within surge prone areas
    - Window of concern: Begins early Thursday afternoon

  - CURRENT THREAT TO LIFE AND PROPERTY: Moderate
    - To be safe, earnestly prepare for the potential of significant storm surge flooding impacts. Evacuation efforts should now be brought to completion. Evacuations must be complete before driving conditions become unsafe.

  - POTENTIAL IMPACTS: Significant
    - Areas of inundation with storm surge flooding accentuated by waves. Damage to several buildings, mainly near the coast.

* FLOODING RAIN
  - LATEST LOCAL FORECAST:
    - Peak Rainfall Amounts: 4-8 inches, with locally higher amounts

  - CURRENT THREAT TO LIFE AND PROPERTY: Moderate
    - Emergency plans should include a reasonable threat for moderate flooding where peak rainfall totals notably exceed amounts conducive for flash flooding and rapid inundation. Rescues and emergency evacuations are possible.

  - POTENTIAL IMPACTS: Significant
    - Rivers and tributaries may quickly become swollen with swifter currents and overspill their banks in a few places.

* TORNADO
  - LATEST LOCAL FORECAST:
    - Situation is favorable for tornadoes

  - CURRENT THREAT TO LIFE AND PROPERTY: Moderate
    - To be safe, earnestly prepare for the potential of significant tornado impacts.

  - POTENTIAL IMPACTS: Significant
    - Several places may experience tornado damage with a few spots of considerable damage, power loss, and communications failures.

* FOR MORE INFORMATION:
  - http://ready.gov/hurricanes
  - http://www.weather.gov/mhx/Tropical

$$
WTUS82 KMHX 111342
TCVMHX

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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 affected coastal CWAs) available at: weather.gov/hti

- Also available in GRIB2 format (delayed) from the National Digital Forecast Database

Intended to serve as a companion graphic to the TCVWFO product
Atlantic/WFO Honolulu Hurricane Local Statement (HLS)

- Discussion focused on preparedness and conveying a succinct message on threats and impacts across the WFO county warning area
- Does not contain VTEC
- The product is not segmented by zone
- **NEW FOR 2017:** WFOs can now select specific Universal Geographic Code (UGC) to determine which zones to alert with an HLS. Previously, an entire WFO county warning area would alert if an HLS was issued
- **NEW FOR 2017:** WFO Honolulu will issue the HLS in this format
WTUS82 KMHX 111443
HLSMHX
NCZ029-044>047>048>051>054-057-060>061-062-065

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
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* 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
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* 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
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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

• The Pacific basin HLS product is segmented by zone

• There is no companion TCV product or HTI graphics from these WFOs

• WFOs who only issue HLS products include:
  - WFO San Diego
  - WFO Oxnard
  - WFO Guam
  - WSO American Samoa
...WIND INFORMATION...
SOUTHWEST WINDS OF 25 TO 35 MPH THIS MORNING WILL STEADILY SUBSIDE TO BETWEEN 10 AND 20 MPH TONIGHT.

...STORM SURGE AND SURF INFORMATION...
COMBINED SEAS OF 10 TO 12 FEET AND HAZARDOUS SURF OF 11 TO 14 FEET ALONG SOUTH AND WEST FACING SHORES THIS MORNING WILL GRADUALLY SUBSIDE TODAY. MINOR COASTAL INUNDATION IS POSSIBLE BEFORE NOON.

...OTHER STORM EFFECTS...
RAINFALL OF 1 TO 2 INCHES IS POSSIBLE THROUGH TONIGHT.

&&

...TROPICAL STORM WATCH REMAINS IN EFFECT...

...PRECAUTIONARY/PREPAREDNESS ACTIONS...
STAY INFORMED AND LISTEN FOR CHANGES TO THE FORECAST. REVIEW YOUR DISASTER PREPAREDNESS PLAN. PREPARATIONS FOR THE POSSIBILITY OF DAMAGING WINDS FROM TYPHOON IN-FA SHOULD BE MADE TODAY.

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...WINDS AND SEAS...
TROPICAL STORM FORCE WINDS ARE POSSIBLE FOR SOUTHERN COASTAL WATERS AND THERE IS STILL A THREAT FOR TROPICAL STORM FORCE WINDS OVER THE ISLAND OF GUAM IF IN-FA DEVIATES TO THE NORTH AS IT APPROACHES.

SEAS OF 8 TO 10 FEET THIS MORNING WILL BUILD TO BETWEEN 12 AND 16 FEET BY SATURDAY AS TROPICAL STORM IN-FA PASSES TO THE SOUTH.

...OTHER STORM EFFECTS...
RAINFALL OF 2 TO 4 INCHES IS POSSIBLE THROUGH SATURDAY EVENING.

&&

...ULUL...
...PRECAUTIONARY/PREPAREDNESS ACTIONS...
THE TYPHOON WARNING HAS BEEN CANCELLED FOR ULUL. LISTEN TO INSTRUCTIONS AND UPDATES FROM YOUR LOCAL LEADERS.
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GUZ001-PMZ151-200615-/O.CON.PGUM.TR.A.0005.000000T0000Z-000000T0000Z/
GUAM-GUAM COASTAL WATERS-
801 AM CHST FRI NOV 20 2015

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THE NEXT LOCAL STATEMENT WILL BE ISSUED BY THE NATIONAL WEATHER SERVICE AROUND 3 PM CHST...OR SOONER IF CONDITIONS WARRANT.
NEW FOR 2017
Proposed Retirement of NHC Guidance Messages

<table>
<thead>
<tr>
<th>Retired Product Name</th>
<th>WMO Header</th>
<th>AWIPS ID</th>
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<tbody>
<tr>
<td>Geophysical Fluid Dynamics Lab (GFDL) Hurricane Model Message</td>
<td>WHXX04 KWBC</td>
<td>CHGQLM</td>
</tr>
<tr>
<td>Tropical Cyclone Guidance Message (Atlantic basin)</td>
<td>WHXX01 KWBC</td>
<td>CHGHUR</td>
</tr>
<tr>
<td>Tropical Cyclone Guidance Message (Eastern and Central Pacific basins)</td>
<td>WHXX01 KMIA</td>
<td>CHGE77</td>
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</tbody>
</table>

- The GFDL Hurricane Model as well as the Beta Advection (BAM) and the Limited Barotropic (LBAR) tropical cyclone track models that make up the bulk of the guidance in these messages will be discontinued before the start of the 2017 hurricane season.
- See [Public Information Statement (PNSWSH) 17-09](https://www.nhc.noaa.gov/archive/pdf/17-09.pdf). Comment period ends today.
- Users can access a comprehensive real-time database of tropical cyclone guidance models, which includes the SHIPS model and other models that provide tropical cyclone track and intensity guidance at: [ftp://ftp.nhc.noaa.gov/atcf/aid_public/](ftp://ftp.nhc.noaa.gov/atcf/aid_public/)
Special messages that are posted to the NHC website and Twitter simultaneously to indicate when advisories will be initiated.

NEW FOR 2017: NHC now has a Public Information Statement (PNSNHC) product to provide information to users on delays, updates, etc.
Changes to the CPHC Tropical Weather Outlook

- CPHC will expand the valid time of their Tropical Weather Outlook (TWO) product to 5 days
- Formation chances will be provided in 10 percent increments for the next
  - 48 hours
  - 5 days
- CPHC will also add a 5-day companion graphic
- These changes will allow CPHC TWO products to match the forecast period of the TWO products issued by NHC

Tropical Weather Outlook
NWS Central Pacific Hurricane Center Honolulu HI
740 PM HST Fri Sep 2 2017

For the central North Pacific...between 140W and 180:

1. A weak area of low pressure associated with former tropical cyclone Madeline is located around 200 miles east of Johnston Island. Scattered thunderstorms associated with this remnant low continue to develop, but show little signs of organization. Environmental conditions are expected to inhibit redevelopment.
   * Formation chance through 48 hours...low...near 0 percent
   * Formation chance through 5 days...low...near 0 percent

Elsewhere, no tropical cyclones are expected through Sunday evening.

$$
Gibbs

ACPN50 PHFO 030540
TWOCP

Tropical Weather Outlook
NWS Central Pacific Hurricane Center Honolulu HI
740 PM HST Fri Sep 2 2017
The NWS now has the option to issue watches and warnings for disturbances that are not yet a tropical cyclone but pose a threat of bringing tropical cyclone conditions to land within 48h.

Tropical Cyclone Watch and Warning criteria will not change:
- Watch – conditions possible within 48 h
- Warning – conditions expected within 36 h

Systems would be identified as *Potential Tropical Cyclones*:
- Same numbering system as depressions – “One”, “Two”, etc.
- The standard suite of WFO and NHC/CPHC tropical cyclone products will be issued for Potential Tropical Cyclones.
• **Issued only for systems threatening land within the watch/warning time frame**

• Advisory packages will be discontinued when watches and warnings are no longer necessary on land. This could result in occasional gaps in product issuance when the threat to land is not imminent

• See [Service Change Notice 17-28](#) for more information
Potential Tropical Cyclones
NHC/CPHC Products

• The standard suite of NHC/CPHC advisory products at standard advisory times used for Potential TCs
  • Public Advisory (including Intermediates)
  • Forecast Advisory
  • Discussion
  • Wind Speed Probabilities
  • Cone graphic
  • Storm surge products, as needed

• Genesis probabilities will appear in both the Tropical Weather Outlook and the Public Advisory

• The Graphical TWO will no longer display a formation area for these systems, to avoid confusion with the (now available) 5-day track forecast and cone graphic

• Changes to the Graphical TWO for 2017 are noted in PNSWSH 17-30
Potential Tropical Cyclones
Automated TC Forecast Database (ATCF)

- No new storm type will be added to the ATCF for Potential Tropical Cyclones.
- Potential Tropical Cyclones could be associated with several existing non-tropical system types, most commonly:
  - "LO" (for low pressure system)
  - "DB" (for disturbance)
  - "EX" (for an extratropical system transitioning to tropical)
  - "WV" (for tropical wave)
- INVEST systems will continue to be given ID numbers in the 90s. They will be renumbered to the next sequential tropical cyclone number for the basin for that season when advisory packages from NHC or CPHC are issued
  
  **EXAMPLE: AL93 “INVEST” becomes AL02 “Two”**
- Potential Tropical Cyclones will use ATCF numbers from 01-49 just like tropical cyclones
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.
• Primary graphic depicts the time window that individuals can safely assume will be free from tropical-storm-force winds (“earliest reasonable” arrival time - no more than a 10% chance of onset).

• A secondary graphic will show the “most likely” arrival time – the time before or after which the onset of TS-force winds is equally likely.

• Available on hurricanes.gov with the tropical cyclone graphics in 2017
Proposed Changes to NHC/CPHC Tropical Cyclone Graphics

- NHC/CPHC plan to update the look of the tropical cyclone advisory graphics
- Graphics suite would have consistent background maps and colors and a “cleaner” look and feel
- Storm size information (initial wind field) could now be toggled onto the cone graphic. This would reinforce the fact for users that hazardous conditions occur outside the cone
- The static URLs of the latest-available graphics from NHC for a given tropical cyclone would change. A complete list of proposed URL changes: [http://www.nhc.noaa.gov/new-tc-graphics/](http://www.nhc.noaa.gov/new-tc-graphics/)
- CPHC products are provided on dynamic URLs that change for each tropical cyclone. The graphics for active tropical cyclones can be found on the CPHC webpage: [http://www.prh.noaa.gov/cphc/](http://www.prh.noaa.gov/cphc/)
The following kml files and shapefiles are proposed to be available in 2017 at: www.nhc.noaa.gov/gis/

- The estimated extent of 34-kt, 50-kt, and 64-kt winds at advisory time, as well as the forecast extent of 34-kt, 50-kt, and 64-kt winds
- The estimated cumulative wind swath of hurricane-force and tropical-storm-force winds
- The 5-day probability of 34-kt, 50-kt and 64-kt winds would be available on a 5 km grid (previously, these files used 10 km grid spacing. The resolution of the model used to generate the input data has not changed)

Comments collected on proposed TC Graphics changes through April 9 (PNSWSH 17-10)
Inundation Graphic
(Potential Storm Surge Flooding Map)

- For the U.S. Gulf and East Coast only
- Became operational in 2016
- Provides a quantitative risk assessment for decision makers
- Shows height above ground that the water could reach
  - Depicts the “reasonable worst-case scenario” at any individual location
  - Shows inundation levels that have a 10% chance of being exceeded
- First map generally issued with the initial hurricane or storm surge watch/warning or at other times as appropriate (i.e., with a tropical storm watch/warning)
Available on hurricanes.gov about 60 to 90 minutes following the advisory release

NHC provides downloadable datasets in GeoTIFF format at: http://www.nhc.noaa.gov/gis/

Map Services provided on the NOAA nowCOAST webpage (delayed)
• Storm Surge Watches and Warnings will become operational for the U.S. Gulf and East Coast in 2017

• The first gridded watches/warnings from the NWS

• SSWW will be communicated using:
  - Graphic on NHC website, including downloadable kml file
  - NDFD grid (delayed availability)
  - 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

SUMMARY OF WATCHES AND WARNINGS IN EFFECT:

A Hurricane Warning is in effect for...
* Anclote River to Indian Pass Florida

A Storm Surge Warning is in effect for...
* Aripeka to Indian Pass Florida
Storm Surge Watch and Storm Surge Warning - Definitions

Issued only for Atlantic basin tropical cyclones affecting the U.S. Gulf and East Coast

**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, in association with a potential or ongoing tropical, subtropical, or post-tropical cyclone

**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, in association with a potential or ongoing tropical, subtropical, or post-tropical cyclone

*May be issued earlier if other hazards may hinder evacuations.*
The SSWW is the first NWS watch/warning that is native to a 2.5 km grid

The SSWW is grid-based because the area being warned is generally confined to areas bordering coasts and estuaries

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 will over-warn the SSWW

See Service Change Notice 17-16 for more information
风暴潮警报/警告（SSWW）图形

SSWW图形

- 显示了协作的格网监视和警告区域，用于风暴潮危害
- 图形将与网站上的实时风暴信息一起出现
- SSWW图形KML文件可在NHC网站上找到：nhc.noaa.gov/gis
- GRIB2（延迟）：
  - 国家数字预报数据库
- 原型图形是在Hurricanes Hermine和Matthew期间实时生成的
• Two new hazard codes (SS.W, SS.A) added to NDFD Hazard element grids (see https://graphical.weather.gov/docs/grib_design.html#hazard_keys for a list of NDFD hazard codes)
• New version of NDFD GRIB2 decoder includes new Hazard codes is now available (http://www.weather.gov/mdl/degrib_download)
• Sample NDFD GRIB2 file with new Hazard codes can be downloaded at http://www.nhc.noaa.gov/2017examples

• NDFD web graphics (https://digital.weather.gov/) updated to include SS.W and SS.A
• NDFD Web Services (XML/SOAP/REST) Hazards updated to include SS.W and SS.A
• NDFD begins production of Hurricane Threats and Impacts (HTI) grids for Hawaii on June 1, 2017
• NDFD only updates for the days 1-3 time period (W/W period) every 30 minutes
Map Services for the Storm Surge Watch/Warning Graphic and Inundation Graphic

NOAA/NOS nowCOAST

• The Inundation Graphic became available via nowCOAST’s map services & map viewer in Sept. 2016 just prior to Hurricane Matthew

• Storm Surge Watch/Warning Graphic at native 2.5 km resolution will be available on nowCOAST for the 2017 Hurricane Season

• Similar to the Inundation Graphic, the SSWW Graphic will be available via both GeoServices REST Map Services & OCG Web Map Services, allowing users to view via desktop and server-based GIS and overlay with evacuation routes, critical infrastructure, etc.

• Products available 10-20 minutes after posting on the NHC website
How does the Inundation Graphic differ from the SSWW Graphic?

- The Inundation Graphic provides **objective quantitative** guidance on where inundation *could* occur.

- The Storm Surge Watch/Warning is based on objective guidance but is **subjectively adjusted** by the forecaster. It is **not** quantitative. It simply identifies those areas at risk for life-threatening inundation.

- The Inundation Graphic was created with decision makers in mind, whereas the Storm Surge Watch/Warning is intended for the general public.
The inundation values in the NWS products will be different

**NHC Tropical Cyclone Public Advisory (TC-scale product)**
Provides the highest expected surge values within the area noted between coastal points

**NHC Inundation Graphic (Point-specific product)**
Provides the “reasonable worse-case scenario” given historical forecast errors in hurricane track, size, and intensity at a given point

**WFO TCV Product (WFO County-Warning-Area-scale product)**
As the event draws nearer, values in the WFO TCV trend toward expected values (for rescue/recovery decisions) rather than the “reasonable worst case scenario” (for evacuations decisions)
• The Storm Surge Watch/Warning is issued on a grid and is not tied to entire counties or NWS zones

• Users are highly encouraged to use the Keyhole Markup Language (kml) files available on the NHC website rather than the Valid Time Event Code (VTEC)

• The geographical area associated with a Storm Surge Watch or Warning using the zones alerted by VTEC from the TCV products will be larger than the actual area of the watch or warning as depicted by the grid

• The following VTEC phenomenon and significance codes will be used: **SS.A** - Storm Surge Watch   **SS.W** - Storm Surge Warning

• VTEC will continue to be used to activate some dissemination systems, including the Emergency Alert System (EAS) and NOAA Weather Radio All-Hazards (NWR)
The 2017 WFO-issued TCV will include storm surge watch/warning VTEC (SS.A and SS.W), when applicable, in addition to the tropical cyclone wind watch/warning VTEC

- Only WFOs on the Gulf and East Coast of the contiguous U.S. will issue storm surge watches and warnings
- If you use the VTEC to display the area under a SSWW, you will alert areas that are not under a warning
- To correctly show the warning area, partners are encouraged to use the kml files provided on the NHC website. These files are available when the SSWW graphic is issued
WTUS82 KMHX 251259
TCVMHX

URGENT - IMMEDIATE BROADCAST REQUESTED
IRENE LOCAL WATCH/WARNING STATEMENT/ADVISORY NUMBER 20
NATIONAL WEATHER SERVICE NEWPORT/MOREHEAD CITY NC AL092011
859 AM EDT Thu Aug 25 2011

NCZ103-252100-
/O.NEW.KMHX.SS.A.1009.110825T1259Z-000000T0000Z/
/O.NEW.KMHX.HU.A.1009.110825T1259Z-000000T0000Z/
OUTER BANKS DARE-
859 AM EDT Thu Aug 25 2011

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

A HURRICANE WATCH MEANS HURRICANE WIND CONDITIONS ARE POSSIBLE SOMEWHERE WITHIN THIS AREA AND WITHIN THE NEXT 48 HOURS

A STORM SURGE WATCH MEANS LIFE THREATENING INUNDATION LEVELS ARE POSSIBLE SOMEWHERE WITHIN THIS AREA AND WITHIN THE NEXT 48 HOURS
2017 TCVWFO Truncated Example
With a Storm Surge Watch

WTUS82 KMHX 251259
TCVMHX

URGENT - IMMEDIATE BROADCAST REQUESTED
IRENE LOCAL WATCH/WARNING STATEMENT/ADVISORY NUMBER 20
NATIONAL WEATHER SERVICE NEWPORT/MOREHEAD CITY NC AL092011
859 AM EDT Thu Aug 25 2011

NCZ103-252100-
/O.NEW.KMHX.SS.A.1009.110825T1259Z-000000T0000Z/
/O.NEW.KMHX.HU.A.1009.110825T1259Z-000000T0000Z/
OUTER BANKS DARE-
859 AM EDT Thu Aug 25 2011

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

A HURRICANE WATCH MEANS HURRICANE WIND CONDITIONS ARE POSSIBLE SOMEWHERE WITHIN THIS AREA AND WITHIN THE NEXT 48 HOURS

A STORM SURGE WATCH MEANS LIFE THREATENING INUNDATION LEVELS ARE POSSIBLE SOMEWHERE WITHIN THIS AREA AND WITHIN THE NEXT 48 HOURS
**Alerting the Storm Surge Watch/Warning**

- **Pink** = Storm Surge Warning Area
- **Green** = All areas that are vulnerable to tropical cyclone storm surge inundation (Category 5 MOM)
- **Red** = NWS zones that are vulnerable to tropical cyclone storm surge inundation somewhere in the zone
Some SS.W alerts are triggered for the entire NWS zone (red) included in the WFO TCV. Other alerts are triggered only for the areas of each NWS zone included in the WFO TCV that are vulnerable to tropical cyclone storm surge inundation (green)

- **Red** = NWR and EAS alerts
- **Green** = NWS Front Page (WWA) Map and Point and Click area
Red = All areas that can be alerted for a Storm Surge Watch/Warning via VTEC, EAS and NWR (entire zone is alerted)

Green = All areas that can be alerted for a Storm Surge Watch/Warning via the NWS front page (WWA) map and “Point and Click” pages (zones and portions of zones that lie within the largest possible area for tropical cyclone storm surge flooding)
EAS Code Approval by the FCC for SSA, SSW, and EWW

• **Beginning with the 2017 hurricane season**, WFOs may request EAS activation using the SSW event code /SSW/. WFOs will broadcast Storm Surge Warnings, preceded by the SAME and 1050 Hz tones.

• There are no immediate plans for the NWS to tone the Storm Surge Watch (SSA event code)

• **The Extreme Wind Warning (EWW)** is an existing operational warning issued for advance notice of sustained surface winds of 115 mph or great associated with major hurricanes.

• **Beginning with the 2017 hurricane season**, NWS will request EAS activations using the EWW event code /EWW/. The warning will be broadcast on NWR, preceded by the SAME and 1050 Hz tones.
Changes for NOAA Weather Radio
All-Hazards

- Broadcasters in geographic areas potentially impacted by tropical cyclones should contact their EAS equipment manufacturer if they need instructions for updating equipment
- If EAS equipment is not updated and the WFO requests EAS activation using the new Event Codes, the EAS encoder/decoder equipment will usually decode the information received as an “UNKNOWN” Event Code and the EAS will not automatically activate

Existing SAME receivers, including Public AlertTM receivers, will process the new event codes

- For those receivers providing a limited, caption-like message display, the receiver will likely show wording such as “UNKNOWN WATCH” or “UNKNOWN WARNING”; however, NWR SAME and Public AlertTM receivers should activate
- NWR tone alert receivers should activate with the 1050 Hz tone for the warnings
- NWS Headquarters is working with the receiver manufacturers to ensure the new codes are added to newly manufactured receivers
THE NATIONAL WEATHER SERVICE IN MELBOURNE HAS ISSUED A

* EXTREME WIND WARNING FOR...
  NORTHEASTERN BREVARD COUNTY IN FLORIDA...

* UNTIL 715 AM EDT

* AT 521 AM EDT...SURFACE OBSERVATIONS AND DOPPLER RADAR INDICATED EXTREME WINDS... ASSOCIATED WITH THE EYEWALL OF HURRICANE MATTHEW WERE ABOUT TO MOVE ONSHORE CAPE CANAVERAL INCLUDING PORT CANAVERAL AND MOVING NORTH-NORTHWEST AT 15 MPH. THIS IS AN EXTREMELY DANGEROUS AND LIFE-THREATENING SITUATION!

PRECAUTIONARY/PREPAREDNESS ACTIONS...

FREQUENT DESTRUCTIVE WIND GUSTS TO AROUND 115 MPH WILL SPREAD ACROSS THE CAPE CANAVERAL AREA...PRODUCING SWATHS OF TORNADO-LIKE DAMAGE. A WIND GUST OF 100 MPH WAS RECENTLY RECORDED AT THE TIP OF CAPE CANAVERAL.

&&

LAT...LON 2839 8056 2837 8063 2879 8072 2878 8068
  2864 8057 2860 8055 2846 8049
TIME...MOT...LOC 0921Z 255DEG 12KT 2849 8049 2819 8045

$$

CRISTALDI
BULLETIN - EAS ACTIVATION REQUESTED
EXTREME WIND WARNING
NATIONAL WEATHER SERVICE MELBOURNE FL
526 AM EDT FRI OCT 7 2016

THE NATIONAL WEATHER SERVICE IN MELBOURNE HAS ISSUED A

* EXTREME WIND WARNING FOR...
  NORTHEASTERN BREVARD COUNTY IN FLORIDA...

* UNTIL 715 AM EDT

* AT 521 AM EDT...SURFACE OBSERVATIONS AND DOPPLER RADAR INDICATED
  EXTREME WINDS... ASSOCIATED WITH THE EYEWALL OF HURRICANE MATTHEW
  WERE ABOUT TO MOVE ONSHORE CAPE CANAVERAL INCLUDING PORT CANAVERAL
  AND MOVING NORTH-NORTHWEST AT 15 MPH. THIS IS AN EXTREMELY
  DANGEROUS AND LIFE-THREATENING SITUATION!

PRECAUTIONARY/PREPAREDNESS ACTIONS...

FREQUENT Destructive WIND GUSTs TO AROUND 115 MPH WILL SPREAD ACROSS
THE CAPE CANAVERAL AREA...PRODUCING SWATHS OF TORNADO-LIKE DAMAGE.
A WIND GUST OF 100 MPH WAS RECENTLY RECORDED AT THE TIP OF CAPE
CANAVERAL.

&&

LAT...LON 2839 8056 2837 8063 2879 8072 2878 8068
  2864 8057 2860 8055 2846 8049
TIME...MOT...LOC 0921Z 255DEG 12KT 2849 8049 2819 8045

$$

CRISTALDI
• SSWWs on the NWS’ weather.gov Front Page (WWA) Map will be populated using CAP 1.2 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 will be **Dark Purple**

• SS Watch will be **Light Purple**

• When you click on a warning link, only the TCV will be seen (not the CAP data)

• The CAP 1.2 data can be found on alerts.weather.gov or through the WWA Map legend

NOTE: There is no SSWW in this example
Changes to the “National” TCV from NHC for the Atlantic basin

• New 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 will no longer contain breakpoints. It will list all NWS zones under a tropical cyclone watch or warning. See SCN 17-23

• 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 relative to its previous availability, and may be issued up to 45 minutes after a special advisory

• There will be no change in the issuance time of the WFO TCVs

• The National TCV does not contain plain language meteorological threats and potential impacts information like the local WFO TCV

Irene Watch/Warning Breakpoints/Advisory Number 22
NWS National Hurricane Center Miami FL AL092017
1115 AM EDT Wed Jul 12 2017
Hurricane Irene
MDZ021>023-025-VAZ078-084-086-095-098-099-523>525-110830-/O.UPG.KNHC.SS.A.1009.000000T0000Z-000000T0000Z/
/O.NEW.KNHC.SS.W.1009.170111T1330Z-000000T0000Z/
/O.CON.KNHC.HU.A.1009.000000T0000Z-000000T0000Z/
1115 AM E Wed Jul 12 2017
$$
NATIONAL OCEANIC AND ATMOSPHERIC ADMINISTRATION

2017 TCVAT# Example

WTNT81 KNHC 030123
TCVAT1

Nate Watch/Warning Breakpoints/Advisory Number 6
NWS NATIONAL HURRICANE CENTER MIAMI FL    AL812015
823 PM EST WED DEC 2 2015

Hurricane Nate.

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.

FLZ024-025-GAZ116>119-138>141-153-154-165-166-SCZ043-045-047>056-030930-
/O.NEW.KNHC.HU.A.1001.151203T0123Z-000000T0000Z/
/O.NEW.KNHC.SS.A.1001.151203T0123Z-000000T0000Z/
823 PM EST WED DEC 2 2015

$$

FLZ032-033-037-038-NCZ045>047-080-081-093>095-098-103>110-030930-
/O.NEW.KNHC.HU.A.1001.151203T0123Z-000000T0000Z/
/O.NEW.KNHC.TR.A.1001.151203Y0123Z-000000T0000Z/
823 PM EST WED DEC 2 2015

$$

ATTN...WFO...CHS...ILM...JAX...MHX
WTNT81 KNHC 030123
TCVAT1

Nate Watch/Warning Breakpoints/Advisory Number 6
NWS NATIONAL HURRICANE CENTER MIAMI FL AL812015
823 PM EST WED DEC 2 2015

Hurricane Nate.

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.

/O.NEW.KNHC.SS.A.1001.151203T0123Z-000000T0000Z/
823 PM EST WED DEC 2 2015

$$

FLZ032-033-037-038-NCZ045>047-080-081-093>095-098-103>110-030930-/O.NEW.KNHC.HU.A.1001.151203T0123Z-000000T0000Z/
/O.NEW.KNHC.SS.A.1001.151203T0123Z-000000T0000Z/
823 PM EST WED DEC 2 2015

$$

FLZ020>023-030-031-035-036-040-030930-/O.NEW.KNHC.TR.A.1001.151203Y0123Z-000000T0000Z/
823 PM EST WED DEC 2 2015

$$

ATTN...WFO...CHS...ILM...JAX...MHX
"National" TCV for the Pacific

No changes to the "National" TCVs for the Pacific in 2017

- TCVEP# - Eastern North Pacific TCV from NHC will continue to supply VTEC for the coastal tropical cyclone wind warning area between coastal breakpoints only

- TCVCP# - Central North Pacific TCV from CPHC will continue to supply VTEC for islands under a tropical cyclone wind warning only
2017 TCVEP# and TCVCP# Examples

**TCVEP# Example**

WTPZ85 KNHC 202100
TCVEP5

TEST WATCH/WARNING BREAKPOINTS/ADVISORY NUMBER 1
NWS NATIONAL HURRICANE CENTER MIAMI FL   EP802016
200 PM PDT WED JUL 20 2016

.TROPICAL STORM TEST

CAZ043-210300- 
/O.NEW.KNHC.TR.W.2080.160720T2100Z-000000T0000Z/  
200 PM PDT WED JUL 20 2016

SAN-ONOFRE-STATE-BEACH-CA  33.39N 117.59W
MOUTH-OF-TIJUANA-RIVER-CA  32.53N 117.12W

$$

CAZ041-087-552-210300- 
/O.NEW.KNHC.TR.A.2080.160720T2100Z-000000T0000Z/  
200 PM PDT WED JUL 20 2016

POINT-MUGU-CA  34.11N 119.12W
SAN-ONOFRE-STATE-BEACH-CA  33.39N 117.59W

$$

ATTN...WFO...LOX...SGX...

**TCVCP# Example**

WTPA81 PHFO 292041
TCVCP1

FLOSSIE WATCH/WARNING BREAKPOINTS/ADVISORY NUMBER 20
NWS CENTRAL PACIFIC HURRICANE CENTER HONOLULU HI
EP062013
1100 AM HST MON JUL 29 2013

.TROPICAL STORM FLOSSIE

HIZ001-004-005-011-012-022-023-028-300300- 
/O.CON.PHFO.TR.W.2006.130729T2100Z-000000T0000Z/  
1100 AM HST MON JUL 29 2013

HAWAII  19.65N 155.50W
KAUAI-NIIHAU  22.06N 159.51W
MAUI-MOLOKAI-LANAI-KAHOOLAWE  20.80N 156.35W
OAHU  21.46N 158.00W

$$

POINT-MUGU-CA                                      34.11N 119.12W
SAN-ONOFRE-STATE-BEACH-CA           33.39N 117.59W

$$

ATTN...WFO...HFO...
Educational Resources

Storm surge and tropical cyclone related COMET modules online

https://www.meted.ucar.edu

- Introduction to Tropical Cyclone Storm Surge
- Storm Surge and Datums (also in Spanish)
- Forecasting Tropical Cyclone Storm Surge (also in Spanish)
- Determining the Onset and Risk of Tropical Cyclone Winds
- Tropical Cyclone Forecast Uncertainty
- Real-Time Storm Surge Products

Webinars sponsored by NOAA’s Southeast & Caribbean Regional Team

http://www.regions.noaa.gov/secar/

- Planned for May/early June
- Geared toward emergency managers and broadcast meteorologists
Sample data is available on the NHC Website

http://www.nhc.noaa.gov/2017examples

http://www.nhc.noaa.gov/gis/

Sample data available for download include:

- WFO TCV text file
- 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
- Examples of new TC Graphics
- SSWW Graphic KML
- Inundation Graphic GeoTIFF
- Hurricane Threats and Impacts KMLs
- 34-, 50-, and 64-kt Wind Swath GRIB2 data
Questions

NWS Tropical Services Program Leader:

Jessica Schauer
jessica.schauer@noaa.gov
305-229-4476
Backup