

GFE Operations during a Tropical Cyclone – 2020 Season

(Initiate if the CWA is within the NHC Track Forecast Cone, Incremental Wind Speed Probability Thresholds have been met, and/or Tropical Cyclone Watches or Warnings have been issued. Steps 1, 6, 8, 9, 10, 11, 14, 17, 18, and 20 should be run regardless of a tropical cyclone watch or warning in effect for the CWA. The rest of the steps should **ONLY** be run when a tropical cyclone watch or warning is in effect for the CWA. Steps 15-21 highlighted in blue should only be completed **AFTER** NHC issues a public advisory.)

1.) Load the HTI Weather Element Group in GFE.

2.) By **02Z, 08Z, 14Z, and 20Z**, run the **TCtornadoThreat** GFE Procedure (ensure that SPCGuide data is available in AWIPS before running). A TornadoThreat grid will be produced. Collaborate with neighboring WFOs, if you decide to edit this grid.

3.) By **02Z, 08Z, 14Z, and 20Z**, begin creating the “*Situation Overview*” (**SATWRKHLs**) section in an AWIPS text workstation. This is the synopsis of the storm as it relates to our CWA. It should be clear and concise (i.e., no more than a few paragraphs). Address impacts and threats from each footprint of the storm. Consider mentioning decision thresholds (i.e., timing of tropical storm force winds), specific evacuation orders, and the timing of airport, road, and bridge closures. Use uncertainty phrases, when necessary, to convey the confidence level of impacts/threats occurring.

4.) Join the **tropical_collaboration1** or **tropical_collaboration2** (only used if multiple storms exist) chat room on NWSChat. By **0230Z, 0830Z, 1430Z, and 2030Z** (but after the intermediate NHC advisory, if issued), run the **TCStormSurgeThreat** GFE Procedure. Use the appropriate storm surge source after coordinating with NHC’s Storm Surge Unit (SSU). If the source used is either **PHISH** (default option) or **P-ETSS** (typically only used for weak tropical cyclones when no P-Surge data is available), then use SSU’s recommended exceedance percentage (most of the time this will be 10%). The **Grid Smoothing** option only applies if the source used is either PHISH or P-ETSS. Use the **Manually Replace** (used to replace all inundation grids) or **Manually Add** (used to fine-tune certain areas) options and slider bars to incorporate SSU’s expected inundation values at various communication points. The SSU will communicate these expected inundation values within NWSChat and also possibly the hotline call. The **Manually Replace** and **Manually Add** options should also be used if PHISH/P-ETSS data is unrepresentative/unavailable or the **ISC** option is not available. Remember, to use an appropriate edit area when using the Manual options. The edit area chosen will be clipped to the *StormSurgeWW_EditArea* edit area. The *Inundation Height* slider bar is used for the Manual options and has a range from 0 to 20 feet AGL. The *Start Hour* and *End Hour* slider bars are used for the Manual options and are relative to the advisory model cycle. For example, selecting *Start Hour 0* and *End Hour 6* would edit the current (first) 6-hour InundationTiming grid while selecting *Start Hour 6* and *End Hour 12* would edit the next (second) 6-hour grid. StormSurgeThreat, InundationMax, and InundationTiming grids will be created with this GFE Procedure. Four datum (MSL, MLLW, MHHW, NAVD) grids will only be produced if the **PHISH, P-ETSS**, or the **ISC** option (only if grids are unedited from the SSU) is used. If tidal influences exceed 1 foot in the InundationTiming grids, then you can zero these out and re-run the GFE Procedure using the option **UpdateInunMax**. This will re-calculate the InundationMax and StormSurgeThreat grids and adjust the storm surge window to be more representative. The **ISC** option (unedited or edited PHISH or P-ETSS grids from the SSU) is **NOT** recommended since SSU is not expected to provide this data this season. **DO NOT POST-EDIT StormSurgeThreat and InundationMax grids!**

5.) Ensure that the initial ProposedSSnc grid has arrived from the SSU via an AWIPS banner. If so, then run the **CopyNHCPProposed** GFE Procedure which will copy the ProposedSSnc grid into the ProposedSS grid and also create a difference grid, CollabDiffSS, which will be useful for tracking changes between the ProposedSSnc and Hazards grids. Edit the ProposedSS grid to add or remove areas, if necessary. Pay attention to major changes, zone boundaries, and CWA borders. Collaborate with neighboring WFOs. Another round of collaboration may be necessary if additional changes are recommended by the SSU. Once the SSU has finalized all WFO edits and the entire collaboration process has been completed, then an AWIPS banner will display stating that you should now run the **MergeProposedSS** GFE Procedure. This GFE Procedure will copy the final ProposedSSnc grid into the Hazards grid. The storm surge watch/warning hazard will now be included in the Hazards grid. Finalize this entire storm surge collaboration process no later than **0230Z, 0830Z, 1430Z, and 2030Z**.

6.) By **0220Z, 0820Z, 1420Z, and 2020Z**, initialize the QPF grids with the latest WPC guidance. Collaborate with WPC and neighboring WFOs if you decide to edit this grid to account for “local mesoscale factors”.

7.) By **0230Z, 0830Z, 1430Z, and 2030Z**, run the **TCfloodingRainThreat** GFE Procedure (ensure that WPC’s Excessive Rainfall Outlook Probabilities for Days 1-3 are in AWIPS before running). A FloodingRainThreat grid will be produced. Collaborate if edits are performed.

8.) ~30 minutes prior to the time of the NHC conference call, begin preparing your Wind grids. Delete your existing Wind grids and then populate using a collaborated background wind field that is closest to the official NHC forecast. The NBM is the recommended background wind field source. Account for “local factors”, if necessary. Coordinate with neighboring WFOs and the NHC DSS Coordinator.

9.) Between the NHC conference call and ~45 minutes prior to the NHC advisory issuance, the pre-TCM (MIAPREAT#, where # = 1, 2, 3, 4, or 5) and pre-RCL will arrive in AWIPS. If so, then run the **TCMWindTool** GFE Procedure using the PREAT# option. If the pre-RCL is unavailable or incomplete, ensure representative wind radii values exist for days 3-5 using the slider bars. Use the default selections most of the time. If you decide to change the land reduction factor (30% is recommended for inland WFOs) and/or use the asymmetrical option (up to 3

Period	PWS64	PWS34
0-12 hour	25%	45%
13-24 hour	20%	35%
25-36 hour	15%	30%
37-48 hour	12.5%	25%
49-60 hour	10%	22.5%
61-72 hour	8%	20%
73-84 hour	7%	17.5%
85-96 hour	6%	15%
97-108 hour	5%	12.5%
109-120 hour	4%	10%

Incremental Wind Speed Probability Thresholds

- quadrants), then please coordinate these selections with your neighboring WFOs. If edits to the output Wind grids are made, then please collaborate these edits with neighboring WFOs. Do not use GFE interpolation on any of these edited Wind grids due to erratic results!
- 10.)** Produce the WindGust grids using the **TC_WindGust** Smart Tool over the same time range in which the tropical cyclone vortex appears in your Wind grids. Use the default gust multiplier of **1.5** which will be applied to winds below tropical storm force. If you wish to use a different gust multiplier, then coordinate with neighboring WFOs and NHC.
- 11.)** ~30 minutes prior to the NHC advisory issuance, preliminary cumulative and incremental wind speed probabilities (WSP) should arrive in AWIPS. Check to make sure that the latest pre-WSP data are in AWIPS before running the **PWS_Procedure** GFE Procedure using the *“Preliminary”* option. Check **TPCWindProb_Prelim** under the SfcGrid menu on the D2D Volume Browser or the **MIAWRKWSP** text product to determine if the pre-WSP data is available. If pre-WSP data is not available, then you must wait until 7-15 minutes after the NHC advisory issuance for the official WSP data (**TPCWindProb** under the SfcGrid menu on the D2D Volume Browser) to be available in AWIPS. You would use the *“Official”* option in that case. Cumulative (prob34, prob64), Incremental (pwsD34, pwsD64, pwsN34, pwsN64), and Interval (pws34int, pws64int) Wind Speed Probability grids will be produced by the GFE Procedure. **DO NOT POST-EDIT!**
- 12.)** Between the NHC conference call and ~45 minutes prior to the NHC advisory issuance, the pre-TCV (MIAPTCAT#) product will arrive in AWIPS. You will be notified via an AWIPS banner. After following the instructions on the banner, run the **PlotTCPEvents** GFE Procedure. The Hazards grid will be modified with tropical cyclone watches/warnings issued by NHC for “coastal” and “island” zones only. This GFE Procedure will output NHC-issued tropical cyclone wind hazards for “coastal” and “island” zones that are in effect for only 48 hours. You should extend or shrink the length of these wind hazards to match the duration of tropical storm/hurricane force winds that are expected across the CWA. It is suggested to use the *Incremental Wind Speed Probability Thresholds* table and the Wind grids as a guide for the length (i.e., duration) of the wind hazards and to determine the appropriate wind hazards for both inland and marine zones. Another option to determine the wind hazards is to use Cumulative WSP data. Inland locations that have $\geq 40\%$ Cumulative WSP of tropical storm force winds occurring through the 48 to 54-hour timeframe (Use the 36 to 48-hour timeframe for warning issuances) are recommended to issue a tropical storm watch. For an inland hurricane watch issuance, $\geq 35\text{--}40\%$ Cumulative WSP of hurricane force winds are recommended. NHC’s time of arrival of tropical storm force wind graphics can also be used during this process. Collaborate with neighboring WFOs.
- 13.)** If pre-WSP grids are available, then run the **TCWindThreat** GFE Procedure using the *“Preliminary”* option. If pre-WSP grids are not available, then you must wait until 7-15 minutes after the NHC advisory issuance for the official WSP grids to be available in AWIPS. You would then use the *“Official”* option in that case. Adjust the **Confidence Level in the Deterministic Wind Forecast Used for the Wind Threat Composition** option as the storm approaches. Most of the time you should use the default *“Typical Confidence”* option (i.e., reasonable worst-case scenario). A WindThreat grid will then be produced. Collaborate with neighboring WFOs, if you decide to edit this grid.
- 14.)** Save and publish grids from both the **HTI** and **All** weather element groups.
- 15.)** Run the **Hazard_TCV** Text Formatter with the appropriate advisory selected. The default selections for the Surge and WSP sections should be fine since this data will typically exist before the NHC advisory has been issued. Transmit the **SATTCVBRO** no later than **0305Z, 0905Z, 1505Z, and 2105Z. DO NOT POST-EDIT!**
- 16.)** Run the **HLS** Text Formatter. Select which zones will be included in the UGC line of the HLS. This affects what zones appear on the WWA map but the HLS will still cover the entire CWA. Use appropriate selections and entries for Steps 1-7 within the HLS GUI. If using a unique headline, you do NOT need to add ** to either side of the headline phrase. You also do NOT need to include all 4 hazards, especially for a weak system that will have limited impacts to the CWA. Ensure that the formatter has copied the *“Situation Overview”* text contained within **SATWRKHLS**. Update the situation overview section, if necessary. Edit the framing code for the area descriptors, possible/additional sections, and the Precautionary/Preparedness Actions section. Remove the leading phrase (e.g., WATCH/WARNING PHASE) from the evacuations phrase you decide to use within the Evacuations sub-section. Delete unnecessary content within both the Evacuations and Other Preparedness Information sub-sections. If necessary, you can replace the content of these 2 sub-sections with your own text. You have the option of placing specific evacuation information within the Evacuations sub-section or the Situation Overview section. Transmit the **SATHLSBRO** no later than **0315Z, 0915Z, 1515Z, and 2115Z.**
- 17.)** Run both the **ZFP** and **CWF** Formatters with the **Include Tropical?** option set to *“Yes”*. Edit, as necessary, and transmit both products.
- 18.)** Run the **Hazard_MWW** Formatter. To segment a marine zone for meteorological reasoning, make its end time different by 1 hour from other marine zones’ end time. This will force segmentation of the **SATMWWBRO** text product. Edit and transmit.
- 19.)** If necessary, issue a **CFW** product if there are coastal areas that do not have a storm surge watch/warning in effect **AND** 1-3 feet of inundation is expected. Ensure consistency with the TCV and TCP products. Use a range of inundation values, no lower than a 0.5-foot resolution. Issue a CF.Y for ~1-2 ft AGL and a CF.A/CF.W for ~2-3 ft AGL inundation. Issue a SU.Y/SU.W/RP.S as conditions warrant.
- 20.)** Issue the **SRF** product as needed.
- 21.)** Check the NDFD web page (<https://digital.weather.gov/>) to ensure that all of the HTI and Wind Speed Probability forecasts have been transmitted. Also, check the tropical web page (<https://www.weather.gov/srh/tropical?office=bro>) to ensure that the HLS and TCV text products and HTI KML files have been transmitted. If there are any issues, then please contact the ITO, SOO, GFE Program Leader, and/or the AWIPS Program Leader.