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Operations and Services

Tropical Cyclone Weather Services Program, NWSPD 10-6

TROPICAL CYCLONE COORDINATION AND EMERGENCY OPERATIONS

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SUMMARY OF REVISIONS: This directive supersedes NWS Instruction 10-602, *Tropical Cyclone Coordination and Emergency Operations*, dated August 11, 2017. Changes include:

Section 1: Added clarifying remarks to coordination with the RFCs and WRH.

Section 1.1: Added clarifying comments on Hurricane Hotline Call coordination and a figure to indicate areas and times of the calls.

Section 1.1: Added clarifying remarks to cover the NHC internal forecast points for Days 6 and 7 to WPC, OPC's maps.

Section 1.1.2: Added clarifying times to the account for NHC internal forecast points for Days 6 and 7.

Section 1.6: Added the Hurricane Multi-scaled Ocean-coupled Non-hydrostatic (HMON) to replace the removed Geophysical Fluid Dynamics Laboratory (GFDL).

Section 3.1 and 3.2: Added clarifying remarks.

Figure 1 added to represent HCH Coordination Call areas for the Atlantic basin.

Signed

8/2/2018

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Date

Director

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Tropical Cyclone Coordination and Emergency Operations

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1 Coordination

For the purposes of this directive, all references to tropical cyclones are inclusive of potential tropical cyclones, post-tropical cyclones, and subtropical cyclones.

Atlantic basin: The National Oceanic and Atmospheric Administration (NOAA) Hurricane Coordination Hotline (HCH) and the electronic worksheet are the primary means of coordination for tropical cyclones by the National Hurricane Center (NHC). NHC conducts meteorological and operational watch / warning decisions during tropical cyclone situations on the HCH with coastal (Atlantic, Gulf of Mexico) Weather Forecast Offices (WFOs) and other national centers (Storm Prediction Center [SPC], Weather Prediction Center [WPC], and the Ocean Prediction Center [OPC]). HCH calls are initiated and conducted by the NHC at 0200, 0800, 1400, 2000 Coordinated Universal Time (UTC) for the 0300, 0900, 1500, and 2100 UTC advisories, respectively, on tropical cyclones with analysis or forecast points located within an area south of 20°N and west of 60°W, or anywhere west of 70°W (excluding the Caribbean Sea west of 75°W), and anywhere west of 65°W north of 38°N (See Figure 1). HCH calls are also conducted before the first advisory of all tropical cyclones, before the issuance of special advisories, or upon request. In addition, NHC and WPC conduct a medium-range tropical cyclone coordination call at 1700 UTC. The Climate Prediction Center (CPC) is also invited to regularly participate in the medium-range cyclone coordination call. Any HCH participant can initiate calls at any time.

An electronic worksheet, providing draft forecast positions, intensity, and wind radii will normally be available to conference call participants for all tropical cyclones by one hour before the regularly scheduled advisory issuance time. A coordination call is required if the advisory information is not available on the electronic worksheet for any tropical cyclone by the deadline noted above and within the area described in Figure 1.

The Analyze, Forecast and Support Office, Marine, Tropical and Tsunami Services Branch (AFS26) is responsible for assessing all requests for offices/other agencies to be added to the HCH. Requests for access are evaluated against the following criteria:

- (1) An office or federal agency actively coordinating in the preparations of NHC advisory products, or
- (2) An office or federal agency requiring access to pre-decisional advisory information in order to issue their own hurricane-related official products in a timely manner.

The Office of Dissemination provides configuration management and control for the HCH network and associated equipment.

There is a requirement that any addition of NOAA or non-NOAA offices to the existing HCH network must be accompanied by a written agreement for the office to pay for the installation of the HCH service, the HCH equipment, and all ongoing operations and maintenance for the service.

Since forecast positions, intensity, wind radii, forecast reasoning, watches and warnings, etc., are discussed approximately one hour before official products are issued, no outside users or the public are permitted to listen to the call or access the electronic worksheet. National Weather Service (NWS) staff members will not provide tropical cyclone related information discussed or coordinated via the HCH or electronic worksheet to any user or the public prior to the official release of this information by NHC. This provides for the issuance of information to all users at the same time on an equal basis. An exception is that state and local emergency management officials can be briefed prior to the release of the advisory products regarding watches and warnings so that these officials will be prepared to answer inquiries when the package is officially issued.

Eastern North Pacific basin: Telephone and the electronic worksheet are the primary means of coordination. The electronic worksheet will normally be available one hour before the regularly scheduled issuance time for all tropical cyclones.

Coastal Tropical Cyclone Coordination: NHC will coordinate with Western Region (WR) WFOs, River Forecast Centers (RFCs), OPC, WPC, SPC, and the WR Regional Operations Center (ROC) when any tropical cyclone forecast point falls within Western Region land or marine boundaries or OPC offshore waters boundaries. NHC notifies the WR ROC (or WFO Tucson as a backup) of the initial need for a conference call, and the WR ROC notifies the remainder of the WR WFOs and RFCs that are to be included on the call. NHC notifies WPC, OPC, and SPC of the need for an initial call. NHC logs onto these calls as the leader. Conference calls are conducted by conventional telephone and will normally occur at 0200, 0800, 1400, and 2000 UTC, which is one hour prior to the scheduled release of the advisory package. The call times may be adjusted if there are active tropical cyclones in the Atlantic basin. NHC will provide expertise regarding the tropical cyclone's movement, intensity, and expected winds. RFCs and WPC will be prepared to discuss expected precipitation amounts and potential for flash flooding. SPC will be prepared to discuss potential for severe weather.

Inland-only Tropical Cyclone Coordination: It is possible for a tropical cyclone to affect certain inland WR land areas *without* affecting WR coastal land zones or marine areas (e.g., a system moving across Mexico from the Gulf of California). For these scenarios, the following procedures will apply. NHC contacts WPC and the WR ROC (or WFO Tucson as a backup) and coordinates on the need for an initial conference call when any 0-72 hour tropical cyclone forecast point falls within Western Region land boundaries. This call normally occurs at approximately 2000 UTC, but it can be adjusted by mutual agreement if needed. Conventional conference call methods will be used. WR ROC will notify affected WFOs and RFCs of the conference call information, and NHC will notify WPC and SPC. Should an upgrade of a days 1-3 excessive rainfall outlook to a moderate or high risk for an active tropical cyclone be necessary (most likely around 0630 UTC and 1830 UTC), WPC will contact NHC concerning the upcoming conference call via phone. Leader and timing of such calls will be coordinated between the WR ROC, WPC, and NHC. NHC logs onto these calls as the leader. Calls will normally be limited to one per day, with an option for a second call, if needed. Normally this will be decided during the previous call, but may also be requested by WR WFO(s) or the WR ROC. If a second call is conducted, it will normally occur at approximately 0200 UTC. Daily calls will

continue as long as an active tropical cyclone continues (analyzed or forecast) in any WR WFO's area(s) of responsibility. NHC will provide expertise regarding the tropical cyclone's movement, intensity, and expected winds. RFCs and WPC will be prepared to discuss expected precipitation amounts and potential for flash flooding. SPC will be prepared to discuss potential for severe weather. If the WR ROC or WFOs feel a need to coordinate with NHC prior to the period when a 0-72 hour forecast point lies in WR, they will call NHC.

1.1 Tropical Cyclone Forecasts and Advisories

1.1.1 Atlantic and U.S. Mainland West Coast

NHC will discuss forecast issues on the HCH call prior to the issuance of each advisory. OPC will provide NHC their estimates for the time of extratropical transition, intensity, and wind radii for the anticipated extratropical portion of the track for storms initially north of 25°N. WPC has the option of providing NHC with estimates of extratropical transition while a system is over the United States.

HCH calls will be initiated and conducted by the NHC at 0200, 0800, 1400, 2000 Coordinated Universal Time (UTC) for the 0300, 0900, 1500, and 2100 UTC advisories, respectively, on tropical cyclones with analysis or forecast points located within an area south of 20°N and west of 60°W, anywhere west of 70°W (excluding the Caribbean Sea west of 75°W), and anywhere west of 65°W north of 38°N. HCH calls are also conducted before the first advisory of all tropical cyclones, before the issuance of special advisories, or upon request. In addition, NHC and WPC conduct a medium-range tropical cyclone coordination call at 1700 UTC. The Climate Prediction Center (CPC) is also invited to regularly participate in the medium-range cyclone coordination call. Any HCH participant can initiate calls at any time.

Hurricane Hotline Coverage in the Atlantic Basin



Conference calls occur for all systems with analysis or forecast points west of the red line, excluding hatched area in the SW Caribbean.

Figure 1. Areas of Hurricane Hotline Call Coordination for the Atlantic basin.

WPC and NHC will conduct discussions each day at 1700 UTC (1300 Eastern Daylight Time and 1200 Eastern Standard Time) to coordinate tropical cyclone positions for days 6 and 7 and positions of disturbances that have a high potential of becoming a tropical cyclone during the 3 to 7 day time period.

The Tropical Analysis and Forecast Branch (TAFB) will provide OPC with positions of tropical cyclones in the north central, northwest and south Pacific for the area covered by the unified surface analysis.

WPC and OPC will place on their prognostic surface charts NHC’s and CPHC’s tropical cyclone forecast positions out to 120 hours for WPC and 96 hours for OPC. Unnamed systems forecast to attain tropical storm or hurricane / typhoon strength during the forecast period will have their prognostic positions labeled as a tropical cyclone. For all NWS offices that issue day 3 through 7 prognostic charts, those offices will use the appropriate tropical cyclone symbols on charts through the end of the tropical cyclone advisory forecast period on day 5 (120 hours).

NHC, WPC, and WFOs coordinate the issuance and discontinuance of watches and warnings, storm surge, and other storm parameters. NHC includes WPC's Senior Branch Forecaster in coordination calls whenever NHC plans to include quantitative precipitation forecast amounts (with the issuance of a warning, usually 36-hour or less) for the United States mainland in tropical cyclone advisories. NHC makes final coordination calls one hour before advisory time. NHC will involve all affected regional offices, WFOs, and marine offshore and high seas forecast offices (OPC, TAFB) in the coordination call with WPC. NHC will make every effort to coordinate with these offices prior to the conference call, resources permitting, if issuing or canceling watches or warnings.

1.1.2 Central Pacific Coordination

NHC and CPHC will coordinate whenever a tropical cyclone is forecast to cross basins within 24 hours. In addition, NHC will coordinate with CPHC prior to issuing a forecast / advisory when a system to the east of 140°W could influence / affect Hawaii within the 7 day (168 hour) forecast period. In the event of a disagreement, the Center issuing the next advisory will make the final decision.

1.2 Other Advisories

NHC and WPC will coordinate, no later than 90 minutes before NHC's final advisory is issued, on the downgrade of a potential tropical cyclone, a tropical cyclone, or a subtropical cyclone centered over land. WPC will also coordinate with NHC if there is a reasonable possibility advisories may again be needed. WPC will coordinate with appropriate RFCs, National and Regional Operation Centers(s) and WFOs regarding inland flooding threats.

1.3 Flooding

Tropical Cyclone Centers (NHC and CPHC) will discuss rainfall information on their regular coordination calls and include rainfall information in their advisories. WPC, RFCs and local NWS forecast offices will provide input to their tropical cyclone center regarding flood potential.

1.4 Tornadoes

The SPC will be the single coordinated voice of the NWS regarding tornado threats for the continental U.S. (CONUS) and issue tornado watches as required for areas affected by tropical and subtropical cyclones. SPC should coordinate with NHC and WFOs before issuing a tornado watch. To assist NHC, this coordination should be done on regularly scheduled NHC coordination calls. Hurricane Local Statements (HLS) and Hurricane Local Watch/Warning (TCV) products, where applicable, will convey the level of tornadic threat forecast by SPC based upon SPC products. Tropical Cyclone Centers will include appropriate information about tornadoes in their advisories.

1.5 Military Services

The NWS is the basic source of tropical cyclone forecasts for all Department of Defense (DoD) interests in the North Pacific east of 180° longitude and for the North Atlantic as provided by

interdepartmental agreements in the National Hurricane Operations Plan (NHOP). If the DoD wishes to discuss special problems concerning warnings and forecasts for the Atlantic or eastern Pacific areas, they should contact the NHC Director or the NHC hurricane specialist on duty. In the Central Pacific, the CPHC Director will provide similar services to the military. WFO Guam generally bases its tropical cyclone products on the tropical cyclone bulletins of the Joint Typhoon Warning Center (JTWC), the United States designated center for U.S. DoD interests in the western Pacific. WFO Guam coordinates directly with Air Force Weather staff at Andersen Air Force Base and with the Joint Region Emergency Managers through the Guam Homeland Security/Office of Civil Defense.

1.6 Requesting Hurricane Multi-scaled Ocean-coupled Non-hydrostatic (HMON)/ Hurricane Weather Research and Forecasting System (HWRF) Model Guidance

NHC makes the decision to run the HMON/HWRF hurricane model for any tropical / subtropical cyclone or tropical disturbance in the Atlantic or eastern Pacific Ocean. NHC provides its requests to the National Centers for Environmental Prediction (NCEP) Central Operations Senior Duty Meteorologist (SDM), and the SDM executes the job run. CPHC makes requests for running the HMON/HWRF hurricane models in coordination with NHC. NHC and CPHC have access to 8 slots for running the HWRF model for each forecast cycle. The first five requests for HWRF runs also automatically set up a run of the HMON model.

2 Transfer of Responsibility for Issuing Advisories

When a tropical or subtropical cyclone approaches the line of division between centers responsible for issuing advisories, the forecaster who is currently handling the storm will:

- a. Contact the center into whose area the storm is moving, to plan for transferring responsibility after the issuance of the next advisory. When a tropical cyclone is approaching 180° longitude, CPHC will coordinate with both Regional Specialized Meteorological Center (RSMC) Tokyo (the World Meteorological Organization [WMO] designated tropical cyclone center) and JTWC for transferring responsibilities, and
- b. Add a statement to the final advisory as follows:

“THE NEXT ADVISORY ON (storm name) WILL BE ISSUED BY THE (appropriate Tropical Cyclone Forecast Center) AT (time in [UTC]).”

In these situations, the Tropical Cyclone Forecast Center issuing a final advisory will also provide the Advanced Weather Interactive Processing System (AWIPS) and WMO communications headings for the advisory product to be issued by the gaining Forecast Center.

When NHC and WPC coordinate for a transfer of responsibility to WPC, the following statement will be included in the final Tropical Cyclone Public Advisory (TCP) from NHC: “This is the last public advisory issued by the National Hurricane Center on this system. Future information on this system can

be found in public advisories issued by the Weather Prediction Center under AWIPS header TCPATn and WMO header WTNT3n KWNH beginning at HHMM AM/PM LTZ.” (Where n is 1-5 and LTZ is the appropriate local time zone). NHC will coordinate with WPC to determine the time of issuance of the first WPC Public Advisory.

For CPHC when a tropical cyclone is moving east to west across the International Dateline, the following statement will be included in the final TCP from CPHC: “This is the last bulletin issued by the Central Pacific Hurricane Center. The next bulletin will be issued by the RSMC Tokyo. For us interests, see the public advisories issued by us NWS forecast office Guam and DoD warnings issued by the Joint Typhoon Warning Center.”

3 Emergency Operating Instructions

National Centers and WFOs with primary and backup warning and forecast responsibilities for areas within 300 miles of the Gulf and Atlantic coasts and east or south of the Appalachian ridges, in Hawaii, Puerto Rico, Guam, Commonwealth of the Northern Mariana Islands, Federated States of Micronesia, Republic of Palau, Republic of the Marshall Islands, on the California coast from Point Piedras Blancas southward, and American Samoa in the South Pacific, will prepare and keep an up-to-date local Tropical Cyclone Emergency Operations Plan. The Plan should specify actions to be taken. This includes:

- a. What to do before each tropical cyclone season;
- b. What to do when a tropical cyclone constitutes a possible threat to its county warning area (CWA);
- c. What to do when a tropical storm, hurricane or typhoon watch is issued for its CWA;
- d. What to do when a tropical storm, hurricane or typhoon warning is issued for its CWA; and
- e. What to do immediately after the tropical cyclone has passed.

3.1 Exercises

WFOs and/or WPC require test / sample products from NHC or CPHC to support local exercises with emergency management officials or backup exercises, WFOs and/or WPC should coordinate in advance through their respective Regional tropical cyclone program manager or tropical team leader. NHC will only provide such support before the official start of the tropical cyclone season. Any test products provided by NHC will be carefully noted with the word “EXERCISE” at the beginning and end of each test product.

3.2 Emergency Action When Warning Not Received or Considered Inadequate

National tropical cyclone forecast centers or their backups initiate and issue tropical cyclone warnings. When tropical cyclone forecast center (or their back-up) warnings are not received by WFOs, or are inadequate to cover current or imminent conditions, coastal WFOs and their backup WFOs, should issue Hurricane Local Statements (HLSs), WFO Tropical Cyclone Watch / Warning (TCV) products, or other appropriate WFO-level warnings as needed. Whenever possible, the WFO should contact the appropriate tropical cyclone forecast center (or its backup, if necessary) and advise the center tropical cyclone warnings were not received or do not adequately represent current conditions. However, if communications failure prevents contact with the appropriate tropical cyclone forecast center, or if in the discretion of the forecast office, a delay would jeopardize life or property, the WFO should immediately issue WFO-level products to communicate the hazards. WFOs should notify the appropriate tropical cyclone forecast center (or its backup, if necessary) of the actions that were taken as soon as possible. Under such circumstances, WFO Guam will issue TCPs and HLSs, when warranted, if coordination cannot be made in a timely manner with the JTWC.