CHAPTER 3

GENERAL OPERATIONS AND PROCEDURES OF THE NATIONAL WEATHER SERVICE HURRICANE CENTERS

3.1. General. This chapter describes the products, procedures, and communications headers used by the Tropical Prediction Center/National Hurricane Center (TPC/NHC) and the Central Pacific Hurricane Center (CPHC). See Appendix A for a description of local National Weather Service (NWS) office products which support the tropical cyclone forecast and warning program.

3.2. Products.

3.2.1. Tropical Weather Outlook (TWO). Tropical weather outlooks are prepared and issued by the TPC/NHC and CPHC during their respective hurricane seasons. The TPC/NHC writes TWOs for both the Atlantic and Eastern Pacific Basins. They are transmitted at 0530, 1130, 1730, and 2230 Eastern Local Time in the Atlantic and at 0400, 1000, 1600, and 2200 Pacific Local Time. In the Central Pacific, TWOs are transmitted by the CPHC at 0200, 0800, 1400, and 2000 UTC. The outlook briefly describes significant areas of disturbed weather and their potential for tropical cyclone development out to 48 hours. A tropical weather summary of Atlantic, Eastern Pacific, and Central Pacific tropical cyclone activity will be prepared and issued at the end of each month during the hurricane season.

3.2.2. Tropical Cyclone Discussion. The TPC/NHC and the CPHC will, as appropriate, issue tropical cyclone discussions on Atlantic, Eastern Pacific, and Central Pacific tropical cyclones at 0300, 0900, 1500, and 2100 UTC. Discussions will contain preliminary prognostic positions and maximum wind-speed forecasts up to 72 hours; will describe objective techniques, synoptic features, and climatology used; and will provide reasons for track changes.

3.2.3. Tropical Cyclone Public Advisories. Tropical cyclone public advisories are issued by the TPC/NHC for all tropical cyclones in the Atlantic. In the Eastern Pacific, tropical cyclone public advisories are issued by TPC/NHC for tropical cyclones that are expected to affect land within 48 hours. In the Central Pacific, tropical cyclone public advisories are issued by CPHC for all tropical cyclones within the area of responsibility. Tropical cyclone public advisories are issued at the same time scheduled tropical cyclone forecast/advisories are issued; i.e., 0300, 0900, 1500, and 2100 UTC. Watch and warning break points are listed in Appendix B. In the Western Pacific, public advisories are issued by the NWS Forecast Office (WFO), Tiyan, Guam, for all tropical cyclones within the Territory of Guam and Micronesia, using tropical cyclone forecasts/advisories prepared by the Joint Typhoon Warning Center (JTWC) as guidance.

[NOTE: To further publicize local products, when a tropical cyclone threatens a land area, the following statement shall be included in the advisory..."For storm information specific to your area...please monitor products issued by your local weather office." Tropical cyclone public advisories use statute miles for distance and miles per hour for speed. Nautical miles and knots may be added at the discretion of the centers. Atlantic advisories should include the metric units in

kilometers and kilometers per hour following the equivalent English units except when the United States is the only country threatened.]

3.2.4. Tropical Cyclone Forecast/Advisories. Tropical cyclone forecast/advisories are issued by the TPC/NHC and the CPHC. See Section 4.3 for content and format of the advisories. In both the Atlantic and Pacific, the advisories are scheduled for 0300, 0900, 1500, and 2100 UTC. Pacific advisories should be transmitted 15 minutes before the effective time. In the Western Pacific, tropical cyclone forecasts/advisories are issued by the JTWC; Appendix C provides a listing of the abbreviated communications headings and titles for JTWC products. Information on the broadcast of tropical cyclone information to coastal and high-seas shipping can be found in Chapter 9, Marine Weather Broadcasts.

3.2.5. Probability of Hurricane/Tropical Storm Conditions.

3.2.5.1. When Issued. The probability of hurricane/tropical storm conditions shall be issued in tabular form at regularly scheduled tropical cyclone public advisory and tropical cyclone forecast/advisory times. These probabilities will generally be carried for all named storms in the Atlantic Basin[1] within 72 hours of forecasted landfall. In addition, TPC/NHC may issue probabilities for tropical depressions forecast to become named storms and be a threat to land within 72 hours. When a tropical cyclone is forecast to track parallel to a coastline, maximum values over water points should be included, and the tropical cyclone public advisory should state that the highest probabilities are over water. The 72-hour cumulative probabilities of less than 5 percent are not included in the transmitted probability tables.

3.2.5.2. When Computed. The probabilities, which are based on the official forecast track, should be issued when the 72-hour forecast position approaches the coast and should be carried in advisories until the storm makes landfall. Two conditions in which probability information should not be issued are: (1) the hurricane/tropical storm has made landfall and is not expected to reemerge over water and/or (2) the computed probability values are not significant. At the discretion of the hurricane forecaster, probabilities need not be listed for sites where the tropical storm or hurricane would likely be over land or less than tropical storm strength at the time it would affect the site. TPC/NHC may include a brief explanation of probabilities in the advisory.

These probabilities should be computed shortly after synoptic times for the 0-24, 24-36, 36-48, and 48-72 hours. A total probability for the next 72 hours should be shown in the last column and should represent a total of all forecast periods. The probability of the storm striking a coastal location within 48 hours may be determined by adding the 0-24, 24-36, and 36-48 hour probabilities. If the probability for a location is less than 1 percent, an "X" will be indicated in the table. If probabilities are not to be issued, a statement will be included in both the tropical cyclone public advisory and the tropical cyclone forecast/advisory. Refer to *Probability of Hurricane/Tropical Storm Conditions: A User's Manual* for further information.

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[1] Atlantic Basin includes the Atlantic, Caribbean, and Gulf of Mexico

3.2.5.3. Locations. When appropriate, specific probabilities will be computed for the following locations:

Brownsville, TX
Corpus Christi, TX
Port O'Connor, TX
Galveston, TX
Port Arthur, TX
New Iberia, LA
New Orleans, LA
Buras, LA
Gulfport, MS
Mobile, AL
Pensacola, FL
Panama City, FL
Apalachicola, FL
St. Marks, FL
Cedar Key, FL
Tampa, FL
Venice, FL
Fort Myers, FL
Marco Island, FL
Key West, FL
Marathon, FL
Miami, FL
West Palm Beach, FL
29N 85W
29N 87W
28N 89W
28N 91W
Fort Pierce, FL
Cocoa Beach, FL
Daytona Beach, FL
Jacksonville, FL
Savannah, GA
Charleston, SC
Myrtle Beach, SC
Wilmington, NC
Morehead City, NC
Cape Hatteras, NC
Norfolk, VA
Ocean City, MD
Atlantic City, NJ
New York City, NY
Montauk Point, NY
Providence, RI
Nantucket Island, MA
Hyannis, MA
Boston, MA
Portland, ME
Bar Harbor, ME
Eastport, ME
28N 93W
28N 95W
27N 96W
25N 96W

Note: Probabilities are not issued for the west coast of the continental United States, Hawaii, and the Territory of Guam and Micronesia.

3.2.6. Tropical Cyclone Updates. Tropical cyclone updates are brief statements in lieu of or preceding special forecasts to inform of significant changes in a tropical cyclone, or to post or cancel watches and warnings.

3.2.7. Tropical Cyclone Position Estimates. The hurricane centers and WFO Guam may issue a position estimate between 2-hourly intermediate public advisories whenever sufficient, reliable radar center fix information is available. Position estimates disseminated to the public, DOD, and other Federal agencies will provide geographical positions in two ways: by latitude and longitude and by distance and direction from a well-known point.

3.2.8. Special Tropical Disturbance Statement. Special tropical disturbance statements may be issued to furnish information on strong formative, non-depression systems.

3.2.9. HPC Public Advisories (TCP). The National Centers for Environmental Prediction's Hydrological Prediction Center (HPC) *will issue public advisories after TPC/NHC discontinues its on subtropical and tropical cyclones that have moved inland in the United States or Mexico, but still pose a threat of heavy rain and flash floods in the conterminous United States or Mexico. The last NHC advisory will normally be issued when winds in an inland tropical cyclone drop below tropical storm strength, and the tropical depression is not forecast to regain tropical storm intensity or re-emerge over water*. The TCP is an alphanumeric product, and advisories are issued at 0300, 0900, 1500, and 2100 UTC. TCPs will continue to be numbered in sequence with tropical cyclone advisories by TPC/NHC and will reference the former storm's name in the text. Content will refer to the decaying system's position, intensity, general forecast trends, highlight impacts which occurred and are expected to occur (usually in relation to heavy rain/flooding and tornadoes), and indicate when the next summary will be issued. Advisories will terminate when the threat of flash flooding has ended or when the remnants of these storms can no longer be distinguished from other synoptic features capable of producing flash floods.

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WTNT3i KWNH DDHHMM
TCPATc

PUBLIC ADVISORY NUMBER XX FOR (TROPICAL CYCLONE TYPE) (NAME)
NWS HYDROMETEOROLOGICAL PREDICTION CENTER CAMP SPRINGS MD
time am/pm time_zone day mon DD YYYY

TEXT


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Figure 3-1. **HPC Public Advisory Product Format**

3.2.10. Tropical Disturbance Rainfall Estimates. As required, the TPC/NHC/CPHC will issue satellite-based rainfall estimates for tropical disturbances and tropical cyclones within 36 hours of forecasted landfall.

3.2.11. Tropical Weather Summary (Monthly). NHC and CPHC will prepare and issue these products each month during the hurricane season. The product will summarize the previous month's tropical cyclone activity. The last product issued at the end of the hurricane season will summarize November's activity plus the activity for the whole season.

3.2.12. Tropical Cyclone Summary - Fixes. CPHC will issue these products when a tropical cyclone is classifiable using the Dvorak technique. Fixes will be issued for the north central Pacific from 140°W to 180° and for the south central Pacific from 120°W to 160°E. After the initial tropical

cyclone fix, succeeding fixes will be done at approximately 0000, 0600, 1200, and 1800 UTC as long as the system is classifiable using the Dvorak technique.

3.2.13. Tropical Cyclone Danger Area Graphic. The Tropical Cyclone Danger Area is a graphical marine product depicting a tropical cyclone's track (out to 72 hours) and shades in a danger area determined by adding 100, 200, and 300 nautical miles plus the 34-knot wind radii to the 24-, 48-, and 72- hour forecast position respectively in the Atlantic and east Pacific. For the central Pacific, the shaded danger area will vary in width dependent upon the hurricane specialist's confidence in the track and the length of the 34-knot wind radii. In addition, areas of possible tropical cyclone genesis (out to 36 hours) are included and depicted as either a circular, rectangle, oval, or polygon shaped area. The product is prepared by the TPC and covers the entire Atlantic north of the equator and the Pacific north of the equator from the Mexican and Central America coast west to 140°W. CPHC prepares a separate chart for 140°W to the International Dateline north of the equator. The product is disseminated four times per day during the hurricane season within 1 hour after the advisory package issuance. This would be at 0400, 1000, 1600 and 2200 UTC.

3.2.14 Aviation Tropical Cyclone Advisory (TCA). The TCA is intended to provide short-term tropical cyclone forecast guidance for international aviation safety and routing purposes. The product is prepared by TPC/NHC and CPHC for all ongoing tropical cyclone activity in their respective areas of responsibility. This requirement is stated in the World Meteorological Organization Region IV hurricane plan. TCAs list the current TC position, motion and intensity, and 12- and 24-hour forecast positions and intensities. It is an alphanumeric text product produced by hurricane forecasters and consists of information extracted from the official forecasts. This forecast is produced from subjective evaluation of current meteorological and oceanographic data as well as output from numerical weather prediction models, and is coordinated with affected WFOs, the National Centers, and the Department of Defense. It is prepared four times daily and issued at 0300, 0900, 1500, and 2100 UTC.

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FKaa2i CCCC DDHHMM
TCAxxx

(TROPICAL CYCLONE TYPE) ICAO ADVISORY NUMBER ##
ISSUING OFFICE CITY STATE
time am/pm time_zone day mon DD YYYY

TEXT


$$
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Figure 3-2. Aviation Tropical Cyclone Advisory Format

3.3. Designation of Tropical and Subtropical Cyclones.

3.3.1. Numbering of Tropical and Subtropical Depressions. The hurricane centers are responsible for numbering tropical and subtropical depressions in their areas of responsibility. Tropical depressions shall be numbered consecutively beginning each season with the spelled out number "ONE." For ease in differentiation, tropical depression numbers shall include the suffix "E" for Eastern Pacific, "C" for Central Pacific, or "W" for Western Pacific, after the number. In both the Atlantic and Pacific, once the depression has reached tropical storm intensity, it shall be named and the depression number dropped. The depression number will not be used again until the following year. Give tropical cyclones a name in the first advisory after intensifying to 34 knots (39 mph) or greater.

The following rules apply for tropical cyclones passing from one basin to another: Retain the name if a tropical cyclone passes from one basin into another basin as a tropical cyclone; i.e., advisories are continuous. An unnamed tropical depression will also retain its number (e.g. Tropical Depression Six-E remains Tropical Depression Six-E) if it crosses into another area of responsibility. For unnamed tropical depressions moving from west to east across 180°, CPHC will use the same number as previously assigned by the Regional Specialized Meteorological Center (RSMC) Tokyo. Additionally, CPHC will provide the associated JTWC number, if different, in parentheses.

Within a basin, if the remnant of a tropical cyclone redevelops into a tropical cyclone, it is assigned its original number or name. If the remnants of a former tropical cyclone regenerate in a new basin, the regenerated tropical cyclone will be given a new designation.

3.3.1.1. Atlantic Basin. Depression numbers, ONE, TWO, THREE, will be assigned by the TPC/NHC after advising the Naval Atlantic Meteorology and Oceanography Center (NAVLANTMETOCCEN) Norfolk.

3.3.1.2. Pacific East of 140°W. Depression numbers, with the suffix E, e.g., ONE-E, TWO-E, THREE-E, will be assigned by the TPC/NHC after advising JTWC, Pearl Harbor, HI. The assigned identifier shall be retained even if the depression passes into another warning area.

3.3.1.3. Pacific West of 140°W and East of 180°. Depression numbers, with suffix C; e.g., ONE-C, TWO-C, THREE-C, will be assigned by the CPHC after advising JTWC.

3.3.1.4. Pacific West of 180° and North of 0°. Depression numbers, with suffix W; e.g., ONE-W, TWO-W, THREE-W, are assigned by JTWC.

3.3.1.5. Subtropical Depressions. A single list of numbers and names will be used for all tropical and subtropical cyclones. Therefore, numbering of subtropical depressions will follow the same procedure as tropical depressions. For example, if the first subtropical depression follows the first tropical depression, the subtropical depression will be given the designation SUBTROPICAL DEPRESSION TWO. If a subtropical depression becomes a subtropical storm, it receives the next available name in the tropical cyclone naming sequence.

3.3.2. Numbering and Naming of Tropical and Subtropical Cyclones.

3.3.2.1 Numbering and Naming Tropical Cyclones. Tropical cyclone centers will number tropical depressions in their areas of responsibility. Number tropical depressions consecutively beginning each season with the spelled out number "ONE." In the north Pacific, for ease in differentiation, tropical depression numbers, assigned by NHC or CPHC, will include the suffix "E" for eastern (east of 140° west longitude) or "C," for central (180° to 140° west longitude) respectively, after the number. In both the Atlantic and Pacific, once the depression reaches tropical storm intensity, name it and drop the depression number. The depression number will not be used again until the following year. Give tropical cyclones a name in the first advisory after intensifying to 34 knots (39 mph) or greater.

The following rules apply for tropical cyclones passing from one basin to another: Retain the name if a tropical cyclone passes from one basin into another basin as a tropical cyclone, i.e. advisories are continuous. An unnamed tropical depression will also retain its number (e.g. Tropical Depression Six-E remains Tropical Depression Six-E) if it crosses into another area of responsibility. For unnamed tropical depressions moving from west to east across 180°, CPHC will use the same number as previously assigned by the Regional Specialized Meteorological Center (RSMC) Tokyo. Additionally, CPHC will provide the associated Joint Typhoon Warning Center (JTWC) number, if different, in parentheses.

Within a basin, if the remnant of a tropical cyclone redevelops into a tropical cyclone, it is assigned its original number or name. If the remnants of a former tropical cyclone regenerate in a new basin, the regenerated tropical cyclone will be given a new designation.

3.3.2.2 Numbering and Naming Subtropical Storms. A single list of numbers and names will be used for all tropical and subtropical cyclones. Therefore, numbering of subtropical depressions will follow the same procedure as tropical depressions. For example, if the first subtropical depression follows the first tropical depression, the subtropical depression will be given the designation SUBTROPICAL DEPRESSION TWO. If a subtropical depression becomes a subtropical storm, it receives the next available name in the tropical cyclone naming sequence.

3.3.2.3. Numbering Advisories and Tropical/Subtropical Cyclone Discussions. Number tropical and subtropical cyclone advisories and discussions in the Atlantic and the Pacific similarly. Number scheduled and special advisories and TCDs consecutively beginning with the number 1 (not spelled out) for each new tropical or subtropical cyclone, and continue through the duration of the cyclone. In situations where only TCMs and TCDs are being written (tropical cyclones in the eastern Pacific not threatening land) and at a later time a public advisory is required, the public advisory number will match the corresponding TCM. In both the Atlantic and the Pacific, intermediate advisories and TCDs will retain the advisory number of the scheduled or special advisory they update and append an alphabetic designator (e.g., "HURRICANE ALLISON INTERMEDIATE ADVISORY NUMBER 20A").

3.4. Transfer of Warning Responsibility.

3.4.1. TPC/NHC to CPHC. When a tropical or subtropical cyclone approaches 140°W, the coordinated transfer of warning responsibility from TPC/NHC to CPHC will be made and the appropriate advisory issued.

3.4.2. CPHC to JTWC/(RSMC, Tokyo). When a tropical or subtropical cyclone crosses 180°from east to west, the coordinated transfer of warning responsibility from CPHC to JTWC will be made and the appropriate advisory issued. At the same time, the CPHC will coordinate with the RSMC, Tokyo so that they are aware that CPHC will be suspending the issuance of advisories.

3.4.3. JTWC/(RSMC, Tokyo) to CPHC. When a tropical or subtropical cyclone crosses 180° from west to east, the coordinated transfer of warning responsibility from JTWC to CPHC will be made. JTWC will append the statement, "Next advisory by CPHC-HNL" to their last advisory. At the same time, the CPHC will coordinate with RSMC, Tokyo so that they are aware that CPHC will be assuming the issuance of advisories.

3.5. Alternate Warning Responsibilities.

3.5.1. Transfer to Alternate. In the event of impending or actual operational failure of a hurricane forecast center, tropical warning responsibilities will be transferred to an alternate facility in accordance with existing directives and retained there until resumption of responsibility can be made. Alternate facilities are as follows:

PRIMARY	ALTERNATE
TPC/NHC	National Centers for Environmental Prediction Hydrometeorological Prediction Center (HPC) Camp Springs, MD
CPHC	TPC/NHC
CARCAH	53rd Weather Reconnaissance Squadron (53 WRS)
JTWC	Fleet Numerical Meteorology and Oceanography Center (FLENUMETOCCEN), Monterey, CA
NWSO Tiyan, Guam	CPHC

3.5.2. Notification. The NAVLANTMETOCCEN, Norfolk, and JTWC, Pearl Harbor, will be advised by TPC/NHC, CARCAH, and CPHC, as appropriate, of impending or actual transfer of responsibility by the most rapid means available. JTWC will advise CPHC and TPC/NHC of impending or actual transfer of JTWC responsibilities. In the event of an operational failure of CARCAH, direct communication is authorized between the 53 WRS and the forecast facility. Contact 53 WRS at DSN 597-2409/COM 601-377-2409 or through the Keesler AFB Command Post at DSN 597-4330/COM 601-377-4330 (ask for the 53 WRS).

Table 3-1. Atlantic Tropical Cyclone Names

2004		**2005**		**2006**	
ALEX		ARLENE		ALBERTO	al-BAIR-toe
BONNIE		BRET		BERYL	BER-ril
CHARLEY		CINDY		CHRIS	
DANIELLE	dan-YELL	DENNIS		DEBBY	
EARL		EMILY		ERNESTO	er-NES-toe
FRANCES		FRANKLIN		FLORENCE	
GASTON		GERT		GORDON	
HERMINE	her-MEEN	HARVEY		HELENE	he-LEEN
IVAN	eye-van	IRENE		ISAAC	EYE-zak
JEANNE	JEEN	JOSE	ho-ZAY	JOYCE	
KARL		KATRINA	ka-TREE-na	KIRK	
LISA	LEE-sa	LEE		LESLIE	
MATTHEW		MARIA	ma-REE-ah	MICHAEL	MIKE-el
NICOLE	ni-COLE	NATE		NADINE	nay-DEEN
OTTO		OPHELIA	o-FEEL-ya	OSCAR	
PAULA		PHILIPPE	fe-leep	PATTY	
RICHARD	RICH-erd	RITA		RAFAEL	ra-fa-EL
SHARY	SHA-ree	STAN		SANDY	
TOMAS	to-MAS	TAMMY		TONY	
VIRGINIE	vir-JIN-ee	VINCE		VALERIE	
WALTER		WILMA		WILLIAM	

2007		**2008**		**2009**	
ANDREA		ARTHUR		ANA	
BARRY		BERTHA	BUR-tha	BILL	
CHANTAL	shan-TAHL	CRISTOBAL		CLAUDETTE	claw-DET
DEAN		DOLLY		DANNY	
ERIN	AIR-in	EDOUARD	eh-DWARD	ERIKA	ERR-ree-ka
FELIX	FEEL-ix	FAY		*FRED*	
GABRIELLE	ga-bree-EL	GUSTAV		GRACE	
HUMBERTO	oom-BAIR-to	HANNA		HENRI	ahn-REE
INGRID		IKE		*IDA*	
JERRY		JOSEPHINE	JO-ze-feen	*JOAQUIN*	
KAREN		KYLE		KATE	
LORENZO		*LAURA*		LARRY	
MELISSA		MARCO		MINDY	
NOEL		NANA		NICHOLAS	NIK-o-las
OLGA		OMAR		ODETTE	o-DET
PABLO	PA-blow	PALOMA	pa-LOW-ma	PETER	
REBEKAH		RENE	re-NAY	ROSE	
SEBASTIEN	say-BAS-tyan	SALLY		SAM	
TANYA	TAHN-ya	TEDDY		TERESA	te-REE-sa
VAN		VICKY		VICTOR	VIC-ter
WENDY		WILFRED		WANDA	

If over 21 tropical cyclones occur in a year, the Greek alphabet will be used following the W-named cyclone. *Laura replaces Lili for 2008. Fred replaces Fabian, Ida replaces Isabel, and Joaquin replaces Juan for 2009.*

Table 3-2. Eastern Pacific Tropical Cyclone Names

2004		2005		2006	
AGATHA		ADRIAN		ALETTA	a LET ah
BLAS		BEATRIZ	BEE a triz	BUD	
CELIA		CALVIN		CARLOTTA	
DARBY		DORA		DANIEL	
ESTELLE		EUGENE		EMILIA	ee MILL ya
FRANK		FERNANDA	fer NAN dah	FABIO	FAH bee o
GEORGETTE		GREG		GILMA	GIL mah
HOWARD		HILARY		HECTOR	
ISIS		IRWIN		ILEANA	ill ay AH nah
JAVIER		JOVA	Ho vah	JOHN	
KAY		KENNETH		KRISTY	
LESTER		LIDIA		LANE	
MADELINE		MAX		MIRIAM	
NEWTON		NORMA		NORMAN	
ORLENE		OTIS		OLIVIA	
PAINE		PILAR		PAUL	
ROSLYN		RAMON	rah MONE	ROSA	
SEYMOUR		SELMA		SERGIO	SIR gee oh
TINA		TODD		TARA	
VIRGIL		VERONICA		VICENTE	vee CEN tay
WINIFRED		WILEY		WILLA	
XAVIER		XINA	ZEE nah	XAVIER	ZAY vier
YOLANDA	yo LAHN da	YORK		YOLANDA	yo LAHN da
ZEKE		ZELDA	ZEL dah	ZEKE	

2007		2008		2009	
ALVIN		ALMA	AL mah	ANDRES	ahn DRASE
BARBARA		BORIS		BLANCA	BLAHN kah
COSME	COS may	CRISTINA		CARLOS	
DALILA		DOUGLAS		DOLORES	
ERICK		ELIDA	ELL ee dah	ENRIQUE	anh REE kay
FLOSSIE		FAUSTO	FOW sto	FELICIA	fa LEE sha
GIL		GENEVIEVE		GUILLERMO	gee YER mo
HENRIETTE	hen ree ETT	HERNAN	her NAHN	HILDA	
IVO		ISELLE	ee SELL	IGNACIO	eeg NAH cio
JULIETTE		JULIO	HOO lee o	JIMENA	he MAY na
KIKO	KEE ko	KARINA		KEVIN	
LORENA	low RAY na	LOWELL		LINDA	
MANUEL	mahn WELL	MARIE		MARTY	
NARDA		NORBERT		NORA	
OCTAVE	AHK tave	ODILE	oh DEAL	OLAF	OH lahf
PRISCILLA		POLO		PATRICIA	
RAYMOND		RACHEL		RICK	
SONIA	SONE yah	SIMON		SANDRA	
TICO	TEE koh	TRUDY		TERRY	
VELMA		VANCE		VIVIAN	
WALLIS		WINNIE		WALDO	
XINA	ZEE nah	XAVIER	ZAY vier	XINA	ZEE nah
YORK		YOLANDA	yo LAHN da	YORK	
ZELDA	ZEL dah	ZEKE		ZELDA	ZEL dah

Table 3-3. Central Pacific Tropical Cyclone Names

COLUMN 1		COLUMN 2	
Name	Pronunciation	Name	Pronunciation
AKONI	ah-KOH-nee	AKA	AH-kah
EMA	EH-mah	EKEKA	eh-KEH-kak
HANA	HAH-nah	HALI	HAH-lee
IO	EE-oo	IOLANA	ee-OH-lah-nah
KELI	KEH-lee	KEONI	keh-ON-nee
LALA	LAH-lah	LI	LEE
MOKE	MOH-keh	MELE	MEH-leh
NELE	NEH-leh	NONA	NOH-nah
OKA	OH-kah	OLIWA	oh-LEE-vah
PEKE	PEH-keh	PAKA	PAH-kah
ULEKI	oo-LEH-kee	UPANA	oo-PAH-nah
WILA	VEE-lah	WENE	WEH-neh

COLUMN 3		COLUMN 4	
Name	Pronunciation	Name	Pronunciation
ALIKA	ah-LEE-kah	ANA	AH-nah
ELE	EH-leh	ELA	EH-lah
HUKO	HOO-koh	HALOLA	hah-LOH-lah
IOKE	ee-OH-keh	IUNE	ee-OO-neh
KIKA	KEE-kah	KIMO	KEE-moh
LANA	LAH-nah	LOKE	LOH-keh
MAKA	MAH-kah	MALIA	mah-LEE-ah
NEKI	NEH-kee	NIALA	nee-AH-lah
OLEKA	oh-LEH-kah	OKO	OH-koh
PENI	PEH-nee	PALI	PAH-lee
ULIA	oo-LEE-ah	ULIKA	oo-LEE-kah
WALI	WAH-lee	WALAKA	wah-LAH-kah

NOTE: Use Column 1 list of names until exhausted before going to Column 2, etc. All letters in the Hawaiian language are pronounced, including double or triple vowels.

Table 3-4. International Tropical Cyclone Names for the Western Pacific and South China Sea

	I	II	III	IV	V
Contributor	**NAME**	**NAME**	**NAME**	**NAME**	**NAME**
Cambodia	Damrey	Kong-rey	Nakri	Krovanh	Sarika
China	Longwang	Yutu	Fengshen	Dujuan	Haima
DPR Korea	Kirogi	Toraji	Kalmaegi	Maemi	Meari
HK, China	Kai-tak	Man-yi	Fung-wong	Choi-wan	Ma-on
Japan	Tembin	Usagi	Kammuri	Koppu	Tokage
Lao PDR	Bolaven	Pabuk	Phanefone	Ketsana	Nock-ten
Macau	Chanchu	Wutip	Vongfong	Parma	Muifa
Malaysia	Jelawat	Sepat	*Nuri*	Melor	Merbok
Micronesia	Ewiniar	Fitow	Sinlaku	Nepartak	Nanmadol
Philippines	Bilis	Danas	Hagupit	Lupit	Talas
RO Korea	Kaemi	Nari	Changmi	Sudal	Noru
Thailand	Prapiroon	Wipha	Mekkhala	Nida	Kulap
U.S.A.	Maria	Francisco	Higos	Omais	Roke
Viet Nam	Saomai	Lekima	Bavi	Conson	Sonca
Cambodia	Bopha	Krosa	Maysak	Chanthu	Nesat
China	Wukong	Haiyan	Haishen	Dianmu	Haitang
DPR Korea	Sonamu	Podul	Pongsona	Mindulle	Nalgae
HK, China	Shanshan	Lingling	Yanyan	Tingting	Banyan
Japan	Yagi	Kajiki	Kujira	Kompasu	Washi
Lao PDR	Xangsane	Faxai	Chan-hom	Namtheun	Matsa
Macau	Bebinca	*Peipah*	Linfa	Malou	Sanvu
Malaysia	Rumbia	Tapah	Nangka	Meranti	Mawar
Micronesia	Soulik	Mitag	Sondelor	Rananim	Guchol
Philippines	Cimaron	Hagibis	*Molave*	Malakas	Talim
RO Korea	Chebi	Noguri	Koni	Megi	Nabi
Thailand	Durian	Rammasun	Morakot	Chaba	Khanun
U.S.A.	Utor	*Matmo*	Etau	Aere	Vicente
Viet Nam	Trami	Halong	Vamco	Songda	Saola

NOTE: The official international name list was effective January 1, 2000. Names will be assigned in rotation starting with Damrey for the first tropical cyclone of the year 2000 which is of tropical storm strength or greater. When the last name in column 5 (Saola) is used, the sequence will begin again with the first name in column 1 (Damrey).

3.6. Abbreviated Communications Headings. Abbreviated communications headings are assigned to advisories on tropical and subtropical cyclones and other advisories based on depression numbers or storm name and standard communications procedures. An abbreviated heading consists of three groups with ONE space between each of the groups. The first group contains a data type indicator (e.g., WT for hurricane), a geographical indicator (e.g. NT for Atlantic Basin), and a number. The second group contains a location identifier of the message originator (e.g., KNHC for TPC/NHC). The third group is a date-time group in UTC. An example of a complete header is: WTNT61 KNHC 180400.

3.6.1. Atlantic Headings (see paragraph 3.6.3 also).

ABNT20 KNHC	Tropical Weather Outlook
ABNT30 KNHC	Tropical Weather Summary (monthly)
WTNT61 KNHC	Tropical Cyclone Update
WTNT51 KNHC	Tropical Cyclone Position Estimate
WONT41 KNHC	Special Tropical Disturbance Statement
FXUS01 KWBC	1-2 Day Discussion
FXUS02 KWBC	3-7 Day Discussion
FXUS04 KWBC	Precipitation Discussion

3.6.2. Pacific Headings (see paragraph 3.6.3 also).

ABPZ20 KNHC	Tropical Weather Outlook (Eastern Pacific)
ABPZ30 KNHC	Tropical Weather Summary (monthly)
ACPN50 PHFO	Tropical Weather Outlook (Central Pacific)
ACPN60 PHFO	Tropical Weather Summary (monthly)
TXPN40 PHFO	Northern Hemisphere Tropical Cyclone Summary (Fixes)
TXPS40 PHFO	Southern Hemisphere Tropical Cyclone Summary (Fixes)
WTPZ51 KNHC	Tropical Cyclone Position Estimate (Eastern Pacific)
WTPA50 PHFO	Tropical Cyclone Position Estimate (Central Pacific)
WTPZ61 KNHC	Tropical Cyclone Update (Eastern Pacific)
WTPA60 PHFO	Tropical Cyclone Update (Central Pacific)
WOPZ41 KNHC	Special Tropical Disturbance Statement (Eastern Pacific)
ACPA80 PHFO	Special Tropical Disturbance Statement (Central Pacific)

3.6.3. Numbering. Depressions are numbered internally and storms are named internally, but the number in the abbreviated headings does not relate to either the internal number of the depression or the name of the storm. The first cyclone would have 21 and 31 in the abbreviated headings, the second cyclone would have 22 and 32, the sixth cyclone would have 21 and 31, etc. The abbreviated heading would not change when a depression was upgraded to storm status.

WTNT21-25 KNHC	Tropical Cyclone Forecast/Advisory (Atlantic)
WTNT31-35 KWNH	HPC Public Advisory (Atlantic)

WTNT41-45 KNHC	Tropical Cyclone Discussion (Atlantic)
WTNT71-75 KNHC	Tropical Cyclone Strike Probabilities (Atlantic)
WTPZ 21-25 KNHC	Tropical Cyclone Forecast/Advisory (Eastern Pacific)
WTPZ 31-35 KNHC	Tropical Cyclone Public Advisory (Eastern Pacific)
WTPZ41-45 KNHC	Tropical Cyclone Discussion (Eastern Pacific)
WTPA21-25 PHFO	Tropical Cyclone Forecast/Advisory (Central Pacific)
WTPA31-35 PHFO	Tropical Cyclone Public Advisory (Central Pacific)
WTPA41-45 PHFO	Tropical Cyclone Discussion (Central Pacific)
WTPQ31-35 PGUM	Tropical Cyclone Public Advisory (Western Pacific)

3.7. Hurricane Liaison Team (HLT).

3.7.1. National Weather Service (NWS) Responsibilities. The NWS supports the HLT through use of Tropical Prediction Center (TPC) meteorologists, Weather Forecast Office (WFO) personnel (typically warning coordination meteorologists and service hydrologists), and River Forecast Center (RFC) hydrologists. Eastern and Southern Region Headquarters will maintain a list of their available HLT candidates.

After HLT deactivation, the Hydrometeorological Prediction Center (HPC) will assume the briefing duties provided the remnants of the tropical cyclone remain a threat to inland areas. TPC and HPC will coordinate prior to the transfer. During the inland event HPC will coordinate with the appropriate WFOs and RFCs and when needed, hydrologists from the RFCs will provide hydrological briefings.

3.7.2. Activation. The HLT may be activated when a tropical cyclone in the Atlantic, Gulf of Mexico, Caribbean or eastern Pacific threatens the United States or its territories, and the Director or Deputy Director of TPC deems HLT assistance is required. TPC makes the request for activation by contacting the Federal Emergency Management Agency (FEMA) Operations Center (FOC). Upon FEMA's approval, the FOC will activate the HLT. The TPC Director or Deputy Director will contact the appropriate NWS Regional Director requesting meteorologic and/or hydrologic support. NWS personnel should arrive at TPC within 24 hours. The HLT will remain active until the hurricane threat has passed, at which time HLT operations will be terminated by FEMA. However, if the storm moves inland and if significant rainfall is expected, the HLT may remain activated.

If the HLT is deactivated, the Hydrometeorological Prediction Center (HPC) will assume the briefing duties provided the remnants of the tropical cyclone remain a threat to inland areas. TPC and HPC will coordinate prior to the transfer. During the inland event, HPC will coordinate with the appropriate WFOs and RFCs and, when needed, hydrologists from the RFCs will provide hydrological briefings.

3.7.3. Training. Completing NWS/FEMA's distance learning training module, Community Hurricane Preparedness, is required by HLT members. The module can be taken via the Internet at: http://meted.ucar.edu/hurrican/chp/index.htm. Other training opportunities are strongly

encouraged. They are: FEMA's "Introduction to Hurricane Preparedness" conducted at TPC for emergency mangers and NWS personnel, and FEMA's annual HLT training session held at TPC.

3.7.4. Meteorologic Duties. The HLT meteorologist will:

- Establish and maintain contact with the impacted WFOs, RFCs, and the HPC.
- Facilitate participation of the impacted NWS offices in conference calls, briefings, and in preparation and distribution of graphics.
- Provide meteorological interpretations on National Hurricane Center advisories (NHC), WFO hurricane local statements, HURREVAC products, and storm surge forecasts for federal, state and local agencies on request.
- Provide storm briefings via video/audio teleconferences for federal, state and local organizations.
- Respond to meteorology-related incoming calls from federal, state, and local emergency managers, and as appropriate, refer meteorologic inquires to the local WFO.

3.7.5. Hydrologic Duties. The HLT hydrologist will:

- Establish and maintain contact with the impacted local WFOs, RFCs, and the HPC.
- Facilitate participation of the impacted NWS offices in conference calls, briefings, and in preparation and distribution of graphics.
- Provide hydrologic interpretation on NHC advisories, WFO hurricane local statements, and WFO and RFC hydrologic products for federal, state and local agencies on request.
- Provide technical support for RFC lead during hydrologic portion of video teleconference. In absence of the RFC, lead the hydrologic portion of the video teleconference.
- Respond to hydrology-related incoming calls from federal, state, and local emergency managers and as appropriate, refer hydrologic inquires to the local WFO.