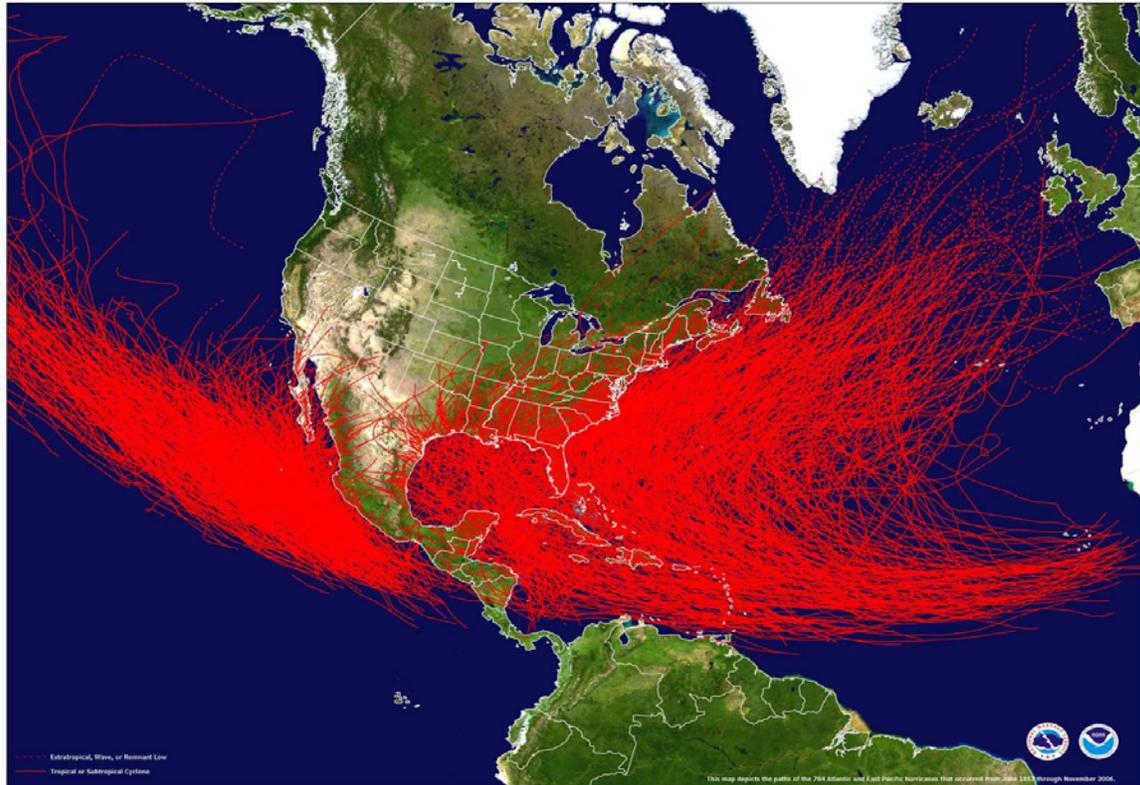


National Hurricane Center Product Description Document: A User's Guide to Hurricane Products

February 2010



Department of Commerce

National Oceanic and Atmospheric Administration

National Weather Service

National Centers for Environmental Prediction

National Hurricane Center

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NHC Text Product Descriptions

Tropical Cyclone¹ Public Advisory

Product Description: The Tropical Cyclone Public Advisory is the primary tropical cyclone information product intended for a general audience. It provides critical tropical cyclone watch, warning, and forecast information for the protection of life and property.

The Public Advisory has five sections:

- 1) A summary table of several cyclone parameters is placed at the top of the product in a fixed format that is suitable for parsing by computer software. This section contains the cyclone position in latitude and longitude coordinates, its distance from a well-known reference point, the maximum sustained winds, the cyclone's current direction and speed of motion, and the estimated or measured minimum central pressure.
- 2) A summary of all current coastal watches and warnings for the cyclone with recent changes to the watches and warnings highlighted at the top.
- 3) A discussion of the cyclone's current characteristics, including location, motion, intensity, and pressure and a general description of the predicted track and intensity of the cyclone over the next 24 to 48 hours. Any pertinent weather observations will also be included in this section.
- 4) A section that includes information on hazards to land such as storm surge/tide, wind, rainfall, tornadoes, and rip currents associated with the cyclone.
- 5) A section that states the time of the next advisory issuance.

Availability: Public Advisories are part of a suite of products issued for active cyclones every six hours at 0300, 0900, 1500, and 2100 UTC. Local issuance times are shown in the table below. When coastal watches or warnings are in effect, Intermediate Public Advisories are issued at either two or three hour intervals between the regular Public Advisories. Special Public Advisories may be issued at any time to advise of an unexpected significant change in the cyclone or when watches or warnings are to be issued.

¹ In this document the term "tropical cyclone" is understood to also include subtropical cyclones.

Basin	Advisory Issuance Times (UTC)	Local Issuance Times During Daylight Saving Time	Local Issuance Times During Standard Time
Atlantic	0300, 0900, 1500, 2100	5 am, 11 am, 5 pm, 11 pm EDT	4 am, 10 am, 4 pm, 10 pm EST
Eastern North Pacific	0300, 0900, 1500, 2100	2 am, 8 am, 2 pm, 8 pm PDT	1 am, 7 am, 1 pm, 7 pm PST

Product Headers: WMO and AWIPS headers are given in the table below. The final numeric digit in each header is assigned on a rotating basis by cyclone number, i.e., WTNT31 KNHC would be used for the first, sixth, and eleventh Atlantic cyclones, while WTNT32 KNHC would be used for the second, seventh, or twelfth cyclones, and so on.

Basin	WMO Header(s)	AWIPS Header(s)
Atlantic	WTNT31-5 KNHC	MIATCPAT1-5
Eastern North Pacific	WTPZ31-5 KNHC	MIATCPEP1-5

Example:

```
ZCZC MIATCPAT4 ALL
TTAA00 KNHC DDHMM
BULLETIN
HURRICANE IKE ADVISORY NUMBER 42
NWS TPC/NATIONAL HURRICANE CENTER MIAMI FL AL092008
1000 PM CDT THU SEP 11 2008
```

Product header/valid time

```
...IKE CONTINUES TO GROW IN SIZE BUT HAS NOT STRENGTHENED YET...
...HURRICANE WARNING ISSUED FOR NORTHWESTERN GULF COAST...
```

```
SUMMARY OF 1000 PM CDT...0300 UTC...INFORMATION
-----
LOCATION...25.5N 88.4W
ABOUT 580 MI...930 KM ESE OF CORPUS CHRISTI TEXAS
ABOUT 470 MI...760 KM ESE OF GALVESTON TEXAS
MAXIMUM SUSTAINED WINDS...100 MPH...160 KM/HR
PRESENT MOVEMENT...WNW OR 290 DEGREES AT 10 MPH...17 KM/HR
MINIMUM CENTRAL PRESSURE...945 MB...27.91 INCHES
```

Summary Table Formatted for Parsing

WATCHES AND WARNINGS

CHANGES WITH THIS ADVISORY...

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

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

SUMMARY OF WATCHES AND WARNINGS IN EFFECT...

A HURRICANE WARNING IS IN EFFECT FOR...

* MORGAN CITY LOUISIANA TO BAFFIN BAY TEXAS

A TROPICAL STORM WARNING IS IN EFFECT FOR...

* EAST OF MORGAN CITY TO THE MISSISSIPPI-ALABAMA BORDER...INCLUDING THE CITY OF NEW ORLEANS AND LAKE PONTCHARTRAIN

* SOUTH OF BAFFIN BAY TO PORT MANSFIELD

A HURRICANE WARNING MEANS THAT HURRICANE CONDITIONS ARE EXPECTED SOMEWHERE WITHIN THE WARNING AREA. A WARNING IS TYPICALLY ISSUED 36 HOURS BEFORE THE ANTICIPATED FIRST OCCURRENCE OF TROPICAL-STORM-FORCE WINDS...CONDITIONS THAT MAKE OUTSIDE PREPARATIONS DIFFICULT OR DANGEROUS. PREPARATIONS TO PROTECT LIFE AND PROPERTY SHOULD BE RUSHED TO COMPLETION.

A TROPICAL STORM WARNING MEANS THAT TROPICAL STORM CONDITIONS ARE EXPECTED SOMEWHERE WITHIN THE WARNING AREA WITHIN THE NEXT 36 HOURS.

FOR STORM INFORMATION SPECIFIC TO YOUR AREA...INCLUDING POSSIBLE INLAND WATCHES AND WARNINGS...PLEASE MONITOR PRODUCTS ISSUED BY YOUR LOCAL WEATHER OFFICE.

Watch/Warning Section with Changes Highlighted at the Top

DISCUSSION AND 48-HOUR OUTLOOK

Storm discussion and outlook for the next 48 hours

AT 1000 PM CDT...0300Z...THE CENTER OF HURRICANE IKE WAS LOCATED NEAR LATITUDE 25.5 NORTH...LONGITUDE 88.4 WEST. IKE IS MOVING TOWARD THE WEST-NORTHWEST NEAR 10 MPH...17 KM/HR. A GENERAL WEST-NORTHWESTWARD MOTION IS EXPECTED OVER THE NEXT DAY OR SO...AND THE CENTER OF IKE SHOULD BE VERY NEAR THE COAST BY LATE FRIDAY.

Location and Movement

MAXIMUM SUSTAINED WINDS ARE NEAR 100 MPH...160 KM/HR...WITH HIGHER GUSTS. IKE IS A CATEGORY TWO HURRICANE ON THE SAFFIR-SIMPSON SCALE. IKE IS FORECAST TO BECOME A MAJOR HURRICANE PRIOR TO REACHING THE COASTLINE.

Intensity

IKE REMAINS A VERY LARGE TROPICAL CYCLONE. HURRICANE FORCE WINDS EXTEND OUTWARD UP TO 115 MILES...185 KM...FROM THE CENTER...AND TROPICAL STORM FORCE WINDS EXTEND OUTWARD UP TO 275 MILES...445 KM.

Size

THE LATEST MINIMUM CENTRAL PRESSURE REPORTED BY A NOAA HURRICANE HUNTER AIRCRAFT WAS 945 MB...27.91 INCHES.

Pressure

HAZARDS AFFECTING LAND

*Hazards
Section*

STORM SURGE...STORM SURGE WILL RAISE WATER LEVELS AS MUCH AS 10 TO 15 FT ABOVE GROUND LEVEL ALONG THE COAST WITHIN THE HURRICANE WARNING AREA... WITH LARGE AND DANGEROUS BATTERING WAVES...NEAR AND TO THE EAST OF WHERE THE CENTER OF IKE MAKES LANDFALL. STORM SURGE WILL RAISE WATER LEVELS AS MUCH AS 5 TO 7 FEET ABOVE GROUND LEVEL ALONG THE COAST WITHIN THE TROPICAL STORM WARNING AREA ALONG THE NORTHERN GULF COAST. THE SURGE COULD PENETRATE AS FAR INLAND AS ABOUT 10 MILES FROM THE SHORE WITH DEPTH GRADUALLY DECREASING AS THE WATER MOVES INLAND.

*Storm
surge*

WIND...BECAUSE IKE IS A VERY LARGE TROPICAL CYCLONE...WEATHER WILL DETERIORATE ALONG THE COASTLINE LONG BEFORE THE CENTER REACHES THE COAST. HURRICANE CONDITIONS ARE EXPECTED TO REACH NORTHWESTERN GULF COAST WITHIN THE WARNING AREA FRIDAY AFTERNOON. WINDS ARE EXPECTED TO FIRST REACH TROPICAL STORM STRENGTH FRIDAY MORNING...MAKING OUTSIDE PREPARATIONS DIFFICULT OR DANGEROUS. PREPARATIONS TO PROTECT LIFE AND PROPERTY SHOULD BE RUSHED TO COMPLETION.

Wind

RAINFALL...IKE IS EXPECTED TO PRODUCE RAINFALL AMOUNTS OF 5 TO 10 INCHES ALONG THE CENTRAL AND UPPER TEXAS COAST AND OVER PORTIONS OF SOUTHWESTERN LOUISIANA...WITH ISOLATED MAXIMUM AMOUNTS OF 15 INCHES POSSIBLE. RAINFALL AMOUNTS OF 1 TO 2 INCHES ARE POSSIBLE OVER PORTIONS OF THE YUCATAN PENINSULA.

Rainfall

NEXT ADVISORY

NEXT INTERMEDIATE ADVISORY...100 AM CDT.
NEXT COMPLETE ADVISORY...400 AM CDT.

*Information on Next
Advisory Issuance*

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FORECASTER FRANKLIN

NNNN

Tropical Cyclone Forecast/Advisory

Product Description: The Tropical Cyclone Forecast/Advisory contains current and forecast storm information in a fixed format suitable for parsing by computer software. It contains a list of all current coastal watches and warnings, cyclone position, intensity, and direction and speed of motion. It also includes the current maximum radial extent of 12-ft seas, as well as the maximum radial extent of winds of 34, 50, and 64 kt in each of four quadrants around the storm. The Forecast/Advisory contains quantitative forecast information on the track and intensity of the cyclone valid 12, 24, 36, 48, 72, 96, and 120 h from the forecast’s nominal initial time, with size information forecast out to 72 h.

The Forecast/Advisory also contains the predicted status of the cyclone for each forecast time. This status may include any of the following: inland, dissipating, dissipated, or post tropical. “Post tropical” describes a cyclone that no longer possesses sufficient tropical characteristics to be considered a tropical cyclone; however these cyclones can continue to produce heavy rains and high winds. A remnant low is a post-tropical cyclone that no longer possesses the convective organization required of a tropical cyclone and has maximum sustained winds of less than 34 knots. An extratropical cyclone is a cyclone of any intensity for which the primary energy source results from the temperature contrast between warm and cold air masses.

Availability: Forecast/Advisories are part of a suite of products issued for active cyclones every six hours at 0300, 0900, 1500, and 2100 UTC. Local issuance times are shown in the table below. Special Forecast/Advisories may be issued at any time to advise of an unexpected significant change in the cyclone or when watches or warnings are to be issued.

Basin	Advisory Issuance Times (UTC)	Local Issuance Times During Daylight Saving Time	Local Issuance Times During Standard Time
Atlantic	0300, 0900, 1500, 2100	5 am, 11 am, 5 pm, 11 pm EDT	4 am, 10 am, 4 pm, 10 pm EST
Eastern North Pacific	0300, 0900, 1500, 2100	2 am, 8 am, 2 pm, 8 pm PDT	1 am, 7 am, 1 pm, 7 pm PST

Product Headers: WMO and AWIPS headers are given in the table below. The final numeric digit in each header is assigned on a rotating basis by cyclone number, i.e., WTNT21 KNHC would be used for the first, sixth, and eleventh Atlantic cyclones, while WTNT22 KNHC would be used for the second, seventh, or twelfth cyclones, and so on.

Basin	WMO Header(s)	AWIPS Header(s)
Atlantic	WTNT21-5 KNHC	MIATCMAT1-5
Eastern North Pacific	WTPZ21-5 KNHC	MIATCMEP1-5

Example:

```
ZCZC MIATCMAT4 ALL
TTAA00 KNHC DDHMM
TROPICAL STORM DEAN FORECAST/ADVISORY NUMBER 11
NWS TPC/NATIONAL HURRICANE CENTER MIAMI FL AL042007
0300 UTC THU AUG 16 2007
```

Product header/valid time

```
CHANGES TO WATCHES AND WARNINGS WITH THIS ADVISORY...

A HURRICANE WATCH HAS BEEN ISSUED FOR THE FOLLOWING LOCATIONS BY
THEIR RESPECTIVE GOVERNMENTS...ST. LUCIA...MARTINIQUE...GUADELOUPE
AND ITS DEPENDENCIES...SABA...AND ST. EUSTATIUS.

A TROPICAL STORM WATCH HAS BEEN ISSUED FOR ST. MAARTEN BY THE
GOVERNMENT OF THE NETHERLANDS ANTILLES.

SUMMARY OF WATCHES AND WARNINGS IN EFFECT...

A HURRICANE WATCH IS IN EFFECT FOR...
* ST. LUCIA...MARTINIQUE...GUADELOUPE AND ITS DEPENDENCIES...SABA
AND ST. EUSTATIUS

A TROPICAL STORM WATCH IS IN EFFECT FOR...
* ST. MAARTEN

A HURRICANE WATCH MEANS THAT HURRICANE CONDITIONS ARE POSSIBLE
WITHIN THE WATCH AREA. A WATCH IS TYPICALLY ISSUED 48 HOURS
BEFORE THE ANTICIPATED FIRST OCCURRENCE OF TROPICAL-STORM-FORCE
WINDS...CONDITIONS THAT MAKE OUTSIDE PREPARATIONS DIFFICULT
OR DANGEROUS.

A TROPICAL STORM WATCH MEANS THAT TROPICAL STORM CONDITIONS ARE
POSSIBLE WITHIN THE WATCH AREA WITHIN 48 HOURS.
```

Watch/Warning section

TROPICAL STORM CENTER LOCATED NEAR 13.1N 50.2W AT 16/0300Z
POSITION ACCURATE WITHIN 20 NM

PRESENT MOVEMENT TOWARD THE WEST OR 280 DEGREES AT 20 KT

ESTIMATED MINIMUM CENTRAL PRESSURE 991 MB
MAX SUSTAINED WINDS 60 KT WITH GUSTS TO 75 KT.
50 KT..... 20NE 0SE 0SW 20NW.
34 KT..... 60NE 45SE 30SW 45NW.
12 FT SEAS..210NE 60SE 60SW 150NW.
WINDS AND SEAS VARY GREATLY IN EACH QUADRANT. RADII IN NAUTICAL
MILES ARE THE LARGEST RADII EXPECTED ANYWHERE IN THAT QUADRANT.

REPEAT...CENTER LOCATED NEAR 13.1N 50.2W AT 16/0300Z
AT 16/0000Z CENTER WAS LOCATED NEAR 13.0N 49.2W

*Current
position,
intensity, and
structure*

FORECAST VALID 16/1200Z 13.6N 53.2W
MAX WIND 65 KT...GUSTS 80 KT.
64 KT... 20NE 0SE 0SW 20NW.
50 KT... 30NE 30SE 20SW 30NW.
34 KT... 75NE 60SE 45SW 60NW.

12 hour forecast

FORECAST VALID 17/0000Z 14.2N 57.2W
MAX WIND 70 KT...GUSTS 85 KT.
64 KT... 20NE 0SE 0SW 20NW.
50 KT... 40NE 30SE 20SW 30NW.
34 KT... 90NE 70SE 50SW 80NW.

24 hour forecast

FORECAST VALID 17/1200Z 14.8N 61.1W
MAX WIND 75 KT...GUSTS 90 KT.
64 KT... 25NE 20SE 20SW 25NW.
50 KT... 50NE 40SE 30SW 45NW.
34 KT...100NE 75SE 60SW 90NW.

36 hour forecast

FORECAST VALID 18/0000Z 15.3N 64.7W
MAX WIND 85 KT...GUSTS 105 KT.
50 KT... 50NE 40SE 30SW 45NW.
34 KT...100NE 75SE 60SW 90NW.

48 hour forecast

FORECAST VALID 19/0000Z 16.3N 71.5W
MAX WIND 95 KT...GUSTS 115 KT.
50 KT... 50NE 40SE 30SW 45NW.
34 KT...110NE 90SE 75SW 100NW.

72 hour forecast

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

OUTLOOK VALID 20/0000Z 17.8N 78.5W
MAX WIND 105 KT...GUSTS 130 KT.

96 hour forecast

OUTLOOK VALID 21/0000Z 19.5N 85.5W
MAX WIND 115 KT...GUSTS 140 KT.

120 hour forecast

REQUEST FOR 3 HOURLY SHIP REPORTS WITHIN 300 MILES OF 13.1N 50.2W

NEXT ADVISORY AT 16/0900Z

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FORECASTER BROWN

Tropical Cyclone Discussion

Product Description: The Tropical Cyclone Discussion describes the rationale for the forecaster’s analysis and forecast of a tropical cyclone. It will typically discuss the observations justifying the analyzed intensity of the cyclone, a description of the environmental factors expected to influence the cyclone’s future track and intensity, and a description of the numerical guidance models. It may also describe the forecaster’s degree of confidence in the official forecast, discuss possible alternate scenarios, and highlight unusual hazards. The product also includes a table of forecast positions and intensities out to 120 h. This table also indicates the forecast status of the cyclone, which may include any of the following: inland, dissipating, dissipated, or post tropical. “Post tropical” describes a cyclone that no longer possesses sufficient tropical characteristics to be considered a tropical cyclone; however these cyclones can continue to produce heavy rains and high winds. A remnant low is a post-tropical cyclone that no longer possesses the convective organization required of a tropical cyclone and has maximum sustained winds of less than 34 knots. An extratropical cyclone is a cyclone of any intensity for which the primary energy source results from the temperature contrast between warm and cold air masses.

Availability: Tropical Cyclone Discussions are part of a suite of products issued for active cyclones every six hours at 0300, 0900, 1500, and 2100 UTC. Local issuance times are shown in the table below. Special Discussions may be issued at any time to advise of an unexpected significant change in the cyclone or when watches or warnings are to be issued.

Basin	Advisory Issuance Times (UTC)	Local Issuance Times During Daylight Saving Time	Local Issuance Times During Standard Time
Atlantic	0300, 0900, 1500, 2100	5 am, 11 am, 5 pm, 11 pm EDT	4 am, 10 am, 4 pm, 10 pm EST
Eastern North Pacific	0300, 0900, 1500, 2100	2 am, 8 am, 2 pm, 8 pm PDT	1 am, 7 am, 1 pm, 7 pm PST

Product Headers: WMO and AWIPS headers are given in the table below. The final numeric digit in each header is assigned on a rotating basis by cyclone number, i.e., WTNT41 KNHC would be used for the first, sixth, and eleventh Atlantic cyclones, while WTNT42 KNHC would be used for the second, seventh, or twelfth cyclones, and so on.

Basin	WMO Header(s)	AWIPS Header(s)
Atlantic	WTNT41-5 KNHC	MIATCDAT1-5
Eastern North Pacific	WTPZ41-5 KNHC	MIATCDEP1-5

Example:

```
ZCZC MIATCDAT1 ALL
TTAA00 KNHC DDHMM
HURRICANE FELIX DISCUSSION NUMBER 15
NWS TPC/NATIONAL HURRICANE CENTER MIAMI FL AL062007
1100 PM EDT MON SEP 03 2007
```

Product header/valid time

```
THERE HAVE BEEN NO ADDITIONAL AIRCRAFT DATA SINCE 21Z...BUT THERE
HAVE BEEN SOME STRUCTURAL CHANGES OVER THE PAST SEVERAL HOURS
APPARENT IN MICROWAVE AND CONVENTIONAL IMAGERY. AN 18Z MICROWAVE
PASS SHOWED THAT AN OUTER EYEWALL HAD FORMED...AND OVER THE PAST
SEVERAL HOURS THE INNER EYEWALL HAS DECAYED IN INFRARED IMAGES AND
THE OUTER FEATURE IS NOW MORE PROMINENT. RAW OBJECTIVE DVORAK
NUMBERS ARE HIGHER THAN SIX HOURS AGO...UP TO T6.7...BUT I'M
GUESSING THAT THE INNER CORE PRESSURE GRADIENT HAS NOT YET
RECOVERED FROM THE EYEWALL REPLACEMENT...AND IT MAY TAKE A FEW MORE
HOURS FOR THESE STRUCTURAL CHANGES TO BE REFLECTED IN THE WIND
FIELD. THE ADVISORY INTENSITY IS BEING HELD AT 115 KT...WITH SOME
RE-STRENGTHENING EXPECTED PRIOR TO LANDFALL IN ANOTHER 6-9 HOURS.
ANOTHER RECONNAISSANCE AIRCRAFT WILL BE IN THE HURRICANE AROUND
05Z.
```

```
THE INITIAL MOTION ESTIMATE IS 270/17...AS FELIX CONTINUES TO BE
STEERED BY DEEP-LAYER HIGH PRESSURE TO THE NORTH OF THE CYCLONE.
THERE IS A LITTLE LESS RIDGING AHEAD OF FELIX AND SO SOME DECREASE
IN FORWARD SPEED IS LIKELY OVER THE NEXT 24 HOURS...BUT THE RIDGING
SHOULD BE SUFFICIENT TO KEEP FELIX BASICALLY ON TRACK. MOST OF THE
MODEL GUIDANCE KEEPS FELIX OUT OF THE BAY OF CAMPECHE...WITH ONLY
THE 12Z UKMET AND 18Z NOGAPS TAKING FELIX BACK OVER WATER. THE 18Z
UKMET...WHICH IS AVAILABLE ONLY OUT TO 48 HOURS...IS ALSO A LITTLE
SOUTH OF ITS EARLIER RUN. THE OFFICIAL FORECAST HAS BEEN SHIFTED A
LITTLE TO THE SOUTH OF THE PREVIOUS ADVISORY AND NOW KEEPS FELIX
ENTIRELY OVER LAND. AS A RESULT OF THE SOUTHWARD ADJUSTMENT IN THE
TRACK FORECAST...THE INTENSITY FORECAST IS ADJUSTED SHARPLY
DOWNWARD AFTER 12 HOURS...AND IF THE TRACK FORECAST VERIFIES THE
SMALL CIRCULATION OF FELIX IS LIKELY TO DISSIPATE MUCH EARLIER THAN
SHOWN BELOW.
```

Free form forecast discussion

FORECAST POSITIONS AND MAX WINDS

INITIAL	04/0300Z	14.4N	81.1W	115 KT
12HR VT	04/1200Z	14.6N	83.5W	125 KT...INLAND
24HR VT	05/0000Z	15.1N	85.9W	65 KT...INLAND
36HR VT	05/1200Z	15.7N	88.1W	40 KT...INLAND
48HR VT	06/0000Z	16.4N	90.2W	30 KT...INLAND
72HR VT	07/0000Z	18.0N	94.0W	25 KT...INLAND
96HR VT	08/0000Z	19.5N	97.5W	20 KT...INLAND
120HR VT	09/0000Z	...DISSIPATED		

*Forecast
position and
intensity table*

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FORECASTER FRANKLIN

Tropical Cyclone Surface Wind Speed Probabilities

Product Description: The Tropical Cyclone Surface Wind Speed Probability product is a tabular text product that provides probabilistic (i.e., the likelihood of an event, expressed as a percentage) information on the future intensity of a tropical cyclone, as well as the likelihood of sustained (1-min average) winds meeting or exceeding specific thresholds at particular locations. There is also a graphical version of this product, described in part immediately below and more fully later in this document.

Information on cyclone intensity is given in the form of probabilities that the storm's intensity will fall into each of the following categories: the five hurricane categories of the Saffir-Simpson Hurricane Scale, tropical storm, and tropical depression. The probability that the cyclone will dissipate is also given. These categorical forecasts are valid at 12, 24, 36, 48, 72, 96, and 120 h after the nominal initial time of the forecast.

Location-specific information is given in the form of probabilities of sustained winds occurring at or above the thresholds of 34 kt (tropical storm force), 50 kt, and 64 kt (hurricane force), over specific periods of time as discussed below. These probabilities are provided for coastal and inland cities as well as for offshore locations (e.g., buoys). These probabilities are based on the track, intensity, and wind structure (size) forecasts from the National Hurricane Center and their historical error characteristics.

Two kinds of location-specific probabilities are defined below:

Cumulative occurrence probabilities – These values tell you the probability the wind event will *occur* sometime during the specified *cumulative* forecast period (0-12, 0-24, 0-36 hours, etc.) at each specific point. These values are provided in both the text and graphical form of the Surface Wind Speed Probability product. In the text product, the cumulative probabilities appear in parentheses (example provided below). The graphical products depict only cumulative values.

Individual onset probabilities – These values tell you the probability the wind event will *start* sometime during the specified *individual* forecast period (0-12, 12-24, 24-36 hours, etc.) at each specific point. These values are provided only in the text NHC product. They are the values outside of the parentheses.

Availability: This product is part of a suite of products issued for active cyclones every six hours at 0300, 0900, 1500, and 2100 UTC. Local issuance times are shown in the table below. Special Wind Speed Probability products may be issued at any time to advise of an unexpected significant change in the cyclone or when watches or warnings are to be issued.

Basin	Advisory Issuance Times (UTC)	Local Issuance Times During Daylight Saving Time	Local Issuance Times During Standard Time
Atlantic	0300, 0900, 1500, 2100	5 am, 11 am, 5 pm, 11 pm EDT	4 am, 10 am, 4 pm, 10 pm EST
Eastern North Pacific	0300, 0900, 1500, 2100	2 am, 8 am, 2 pm, 8 pm PDT	1 am, 7 am, 1 pm, 7 pm PST

Product Headers: WMO and AWIPS headers are given in the table below. The final numeric digit in each header is assigned on a rotating basis by cyclone number, i.e., FONT11 KNHC would be used for the first, sixth, and eleventh Atlantic cyclones, while FONT12 KNHC would be used for the second, seventh, or twelfth cyclones, and so on.

Basin	WMO Header(s)	AWIPS Header(s)
Atlantic	FONT1-5 KNHC	MIAPWSAT1-5
Eastern North Pacific	FOPZ1-5 KNHC	MIAPWSEP1-5

Example:

ZCZC MIAPWSAT1 ALL
 TTAA00 KNHC DDHHMM
 TROPICAL STORM TEST WIND SPEED PROBABILITIES NUMBER 1
 NWS TPC/NATIONAL HURRICANE CENTER MIAMI FL AL812008
 2100 UTC WED APR 16 2008

AT 2100Z THE CENTER OF TROPICAL STORM TEST WAS LOCATED NEAR LATITUDE 25.3 NORTH...LONGITUDE 87.9 WEST WITH MAXIMUM SUSTAINED WINDS NEAR 50 KTS...60 MPH...95 KM/HR.

Z INDICATES COORDINATED UNIVERSAL TIME (GREENWICH)
 ATLANTIC STANDARD TIME (AST)...SUBTRACT 4 HOURS FROM Z TIME
 EASTERN DAYLIGHT TIME (EDT)...SUBTRACT 4 HOURS FROM Z TIME
 CENTRAL DAYLIGHT TIME (CDT)...SUBTRACT 5 HOURS FROM Z TIME

I. MAXIMUM WIND SPEED (INTENSITY) PROBABILITY TABLE

CHANCES THAT THE MAXIMUM SUSTAINED (1-MINUTE AVERAGE) WIND SPEED OF THE TROPICAL CYCLONE WILL BE WITHIN ANY OF THE FOLLOWING CATEGORIES AT EACH OFFICIAL FORECAST TIME DURING THE NEXT 5 DAYS. PROBABILITIES ARE GIVEN IN PERCENT. X INDICATES PROBABILITIES LESS THAN 1 PERCENT.

- - - MAXIMUM WIND SPEED (INTENSITY) PROBABILITIES - - -							
VALID TIME	06Z THU	18Z THU	06Z FRI	18Z FRI	18Z SAT	18Z SUN	18Z MON
FORECAST HOUR	12	24	36	48	72	96	120
DISSIPATED	X	X	1	3	25	54	58
TROP DEPRESSION	1	2	9	12	33	26	18
TROPICAL STORM	86	49	53	59	34	15	15
HURRICANE	13	50	37	27	8	5	10
HUR CAT 1	12	44	31	21	6	3	7
HUR CAT 2	1	5	3	4	1	1	2
HUR CAT 3	X	1	2	2	X	X	1
HUR CAT 4	X	X	X	X	X	X	X
HUR CAT 5	X	X	X	X	X	X	X
FCST MAX WIND	55KT	65KT	65KT	55KT	35KT	15KT	5KT

Categorical maximum wind speed (intensity) probabilities for various intensity stages and for the five categories on the Saffir-Simpson Hurricane Scale

In this example, the probability of the cyclone being a category 1 hurricane at 36 hours is 31%, while at 48 hours the probability is 21%.

II. WIND SPEED PROBABILITY TABLE FOR SPECIFIC LOCATIONS

CHANCES OF SUSTAINED (1-MINUTE AVERAGE) WIND SPEEDS OF AT LEAST
 ...34 KT (39 MPH... 63 KPH)...
 ...50 KT (58 MPH... 93 KPH)...
 ...64 KT (74 MPH...119 KPH)...

FOR LOCATIONS AND TIME PERIODS DURING THE NEXT 5 DAYS

PROBABILITIES FOR LOCATIONS ARE GIVEN AS IP(CP) WHERE

IP IS THE PROBABILITY OF THE EVENT BEGINNING DURING
 AN INDIVIDUAL TIME PERIOD (INDIVIDUAL PROBABILITY)
 (CP) IS THE PROBABILITY OF THE EVENT OCCURRING BETWEEN
 18Z WED AND THE FORECAST HOUR (CUMULATIVE PROBABILITY)

PROBABILITIES ARE GIVEN IN PERCENT

X INDICATES PROBABILITIES LESS THAN 1 PERCENT

PROBABILITIES FOR 34 KT AND 50 KT ARE SHOWN AT A GIVEN LOCATION WHEN
 THE 5-DAY CUMULATIVE PROBABILITY IS AT LEAST 3 PERCENT.

PROBABILITIES FOR 64 KT ARE SHOWN WHEN THE 5-DAY CUMULATIVE
 PROBABILITY IS AT LEAST 1 PERCENT.

- - - - WIND SPEED PROBABILITIES FOR SELECTED LOCATIONS - - - -

TIME PERIODS	FROM 18Z WED TO 06Z THU	FROM 06Z THU TO 18Z THU	FROM 18Z THU TO 06Z FRI	FROM 06Z FRI TO 18Z FRI	FROM 18Z FRI TO 18Z SAT	FROM 18Z SAT TO 18Z SUN	FROM 18Z SUN TO 18Z MON
FORECAST HOUR	(12)	(24)	(36)	(48)	(72)	(96)	(120)

COLUMBUS GA	34	X	1(1)	3(4)	8(12)	8(20)	1(21)	X(21)
COLUMBUS GA	50	X	X(X)	X(X)	1(1)	2(3)	X(3)	X(3)
MONTGOMERY AL	34	X	1(1)	8(9)	17(26)	7(33)	1(34)	X(34)
MONTGOMERY AL	50	X	X(X)	X(X)	3(3)	4(7)	X(7)	X(7)
MONTGOMERY AL	64	X	X(X)	X(X)	1(1)	X(1)	1(2)	X(2)
PENSACOLA FL	34	2	12(14)	19(33)	14(47)	2(49)	X(49)	X(49)
PENSACOLA FL	50	X	X(X)	4(4)	6(10)	2(12)	X(12)	X(12)
PENSACOLA FL	64	X	X(X)	1(1)	2(3)	X(3)	1(4)	X(4)
GFMX 290N 870W	34	7	28(35)	15(50)	4(54)	1(55)	X(55)	X(55)
GFMX 290N 870W	50	X	3(3)	7(10)	3(13)	X(13)	X(13)	1(14)
GFMX 290N 870W	64	X	X(X)	2(2)	X(2)	1(3)	X(3)	X(3)
MOBILE AL	34	1	13(14)	25(39)	20(59)	3(62)	X(62)	X(62)
MOBILE AL	50	X	X(X)	7(7)	14(21)	1(22)	X(22)	1(23)
MOBILE AL	64	X	X(X)	1(1)	4(5)	1(6)	X(6)	X(6)
GULFPORT MS	34	2	15(17)	32(49)	17(66)	3(69)	1(70)	X(70)
GULFPORT MS	50	X	1(1)	11(12)	15(27)	2(29)	X(29)	1(30)

Probability of winds of at least 34 kt beginning at Mobile, AL during the 12-hour period from 06z Friday to 18z Friday

Cumulative probability of winds of at least 34 kt at Mobile, AL for the 48-hour period ending at 18z Friday.

\$\$
 FORECASTER
 NNNN

$$0 + 1 + 11 + 15 = 27$$

Note the sum of the individual onset probabilities from 0-48 hours is equal to the cumulative occurrence probability at 48 hours

Tropical Cyclone Update

Product Description: The Tropical Cyclone Update is a brief statement issued in lieu of or preceding a special advisory to inform of significant changes in a tropical cyclone or to post, modify, or cancel watches or warnings. When a TCU is issued and any storm summary information has changed from the previous Public Advisory (e.g., upgrade from tropical storm to hurricane), a storm summary section identical in format to that found in the Public Advisory will also be included. If new data suggest that a change in status of the tropical cyclone has occurred, but the forecaster is not prepared to update all of the storm information, a TCU can be issued without the storm summary information and indicate that another TCU or special advisory changing the storm status will be issued. In that case, the first TCU will not officially change the storm status, but will simply provide users with the information that a change in status is forthcoming. If a TCU is issued to only modify watches and warnings and there are no changes to the storm summary information (e.g., position, intensity, movement, pressure, etc.) from the previous NHC public advisory, then the storm summary information will not be included in the TCU.

Availability: This is an event-driven product issued as needed.

Product Headers: WMO and AWIPS headers are given in the table below. The final numeric digit in each header is assigned on a rotating basis by cyclone number, i.e., WTNT61 KNHC would be used for the first, sixth, and eleventh Atlantic cyclones, while WTNT62 KNHC would be used for the second, seventh, or twelfth cyclones, and so on.

Basin	WMO Header(s)	AWIPS Header(s)
Atlantic	WTNT61-5 KNHC	MIATCUAT1-5
Eastern North Pacific	WTPZ61-5 KNHC	MIATCUEP1-5

Example 1: TCU to change the status of a tropical cyclone

```
ZCZC MIATCUAT4 ALL
TTAA00 KNHC DDHHMM
TROPICAL STORM CLAUDETTE TROPICAL CYCLONE UPDATE
NWS TPC/NATIONAL HURRICANE CENTER MIAMI FL AL042009
1215 PM EDT SUN AUG 16 2009
```

*Product
header/valid
time*

```
...DEPRESSION BECOMES TROPICAL STORM CLAUDETTE...
```

```
DATA FROM THE NOAA DOPPLER RADAR IN TALLAHASSEE FLORIDA INDICATE
THAT SURFACE WINDS ASSOCIATED WITH THE DEPRESSION HAVE INCREASED TO
40 MPH...65 KM/HR...MAKING THE DEPRESSION TROPICAL STORM CLAUDETTE.
```

*Free form
discussion*

SUMMARY OF 1215 PM EDT...1715 UTC...INFORMATION

LOCATION...28.7N 84.6W
ABOUT 75 MI...120 KM SSE OF APALACHICOLA FLORDIA
MAXIMUM SUSTAINED WINDS...40 MPH...65 KM/HR
PRESENT MOVEMENT...NW OR 320 DEGREES AT 14 MPH...23 KM/HR
MINIMUM CENTRAL PRESSURE...1011 MB...29.85 INCHES

*Summary Table
Formatted for
Parsing*

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FORECASTER ROBERTS/BRENNAN

NNNN

Example 2 - TCU to notify users that change in status is forthcoming

ZCZC MIATCUAT2 ALL
TTAA00 KNHC DDHHMM
TROPICAL DEPRESSION SEVEN TROPICAL CYCLONE UPDATE
NWS TPC/NATIONAL HURRICANE CENTER MIAMI FL AL072008
200 PM EDT MON AUG 25 2008

*Product
header/valid
time*

PRELIMINARY REPORTS FROM AN AIR FORCE HURRICANE HUNTER AIRCRAFT
INDICATE THAT TROPICAL DEPRESSION SEVEN HAS STRENGTHENED. A SPECIAL
ADVISORY WILL BE ISSUED WITHIN THE NEXT 30 MINUTES TO UPDATE THE
INTENSITY FORECAST AND WATCHES AND WARNINGS FOR HISPANIOLA.

*Free form
discussion*

\$\$
FORECASTER PASCH

NNNN

Example 3 - TCU to update watches or warnings (no change in storm summary information)

ZCZC MIATCUAT4 ALL
TTAA00 KNHC DDHHMM
HURRICANE IKE TROPICAL CYCLONE UPDATE
NWS TPC/NATIONAL HURRICANE CENTER MIAMI FL AL092008
600 PM AST FRI SEP 05 2008

*Product
header/valid
time*

AT 6 PM AST...2200 UTC...THE GOVERNMENT OF THE BAHAMAS HAS ISSUED A
HURRICANE WATCH FOR THE SOUTHEASTERN BAHAMAS...INCLUDING THE
ACKLINS...CROOKED ISLAND...THE INAGUAS...MAYAGUANA...AND THE RAGGED
ISLANDS...AS WELL AS FOR THE TURKS AND CAICOS ISLANDS.

*Free form
discussion*

NO OTHER CHANGES ARE REQUIRED FROM THE 500 PM AST ADVISORY.

\$\$
FORECASTER BLAKE/BEVEN

NNNN

Tropical Cyclone Position Estimate

Product Description: Tropical Cyclone Position Estimates are used to provide a continuous flow of information regarding the center location of a tropical cyclone when warnings are in effect.

Availability: Position Estimates are issued hourly in between 2-hourly Intermediate Public Advisories. Intermediate Public Advisories are issued at 2-hourly intervals whenever tropical storm or hurricane warnings are in effect and coastal radars are able to provide reliable hourly center positions.

Product Headers: WMO and AWIPS headers are given in the table below. The final numeric digit in each header is assigned on a rotating basis by cyclone number, i.e., WTNT51 KNHC would be used for the first, sixth, and eleventh Atlantic cyclones, while WTNT52 KNHC would be used for the second, seventh, or twelfth cyclones, and so on.

Basin	WMO Header(s)	AWIPS Header(s)
Atlantic	WTNT51-5 KNHC	MIATCEAT1-5
Eastern North Pacific	WTPZ51-5 KNHC	MIATCEEP1-5

Example:

```
WTNT51 KNHC 261340
TCEAT1
HURRICANE JEANNE POSITION ESTIMATE
NWS TPC/NATIONAL HURRICANE CENTER MIAMI FL AL102004
1000 AM EDT SUN SEP 26 2004
```

*Product
header/valid
time*

```
AT 10 AM EDT...1400Z...THE EYE OF HURRICANE JEANNE WAS ESTIMATED
NEAR LATITUDE 27.8 NORTH...LONGITUDE 81.9 WEST...OR ABOUT 40 MILES
EAST-SOUTHEAST OF TAMPA FLORIDA.
```

*Free form
discussion*

FORECASTER PASCH

Tropical Cyclone Watch Warning Product

Product Description: The Tropical Cyclone Watch Warning product summarizes all new, continued, and canceled tropical cyclone watches and warnings issued by the National Hurricane Center for the U.S. Atlantic, Gulf, and Pacific coasts, Puerto Rico, and the U.S. Virgin Islands, in a form suitable for decoding by computer software.

Availability: This product is issued concurrently with all Tropical Cyclone Public Advisories (whether routine, Intermediate, or Special) for which a U.S. watch or warning is continued, posted, changed, or cancelled.

Product Headers: WMO and AWIPS headers are given in the table below. The final numeric digit in each header is assigned on a rotating basis by cyclone number, i.e., WTNT81 KNHC would be used for the first, sixth, and eleventh Atlantic cyclones, while WTNT82 KNHC would be used for the second, seventh, or twelfth cyclones, and so on.

Basin	WMO Header(s)	AWIPS Header(s)
Atlantic	WTNT81-5 KNHC	MIATCVAT1-5
Eastern North Pacific	WTNT81-5 KNHC	MIATCVEP1-5

Example:

```
WTNT82 KNHC 020902
TCVAT2
```

```
BARRY WATCH/WARNING BREAKPOINTS/ADVISORY NUMBER 3
NWS TPC/NATIONAL HURRICANE CENTER MIAMI FL AL022007
500 AM EDT SAT JUN 2 2007
```

```
.TROPICAL STORM BARRY
```

```
FLZ028-034-039-042-048-049-050-051-055-060-061-062-065-021500-
/O.CON.KNHC.TR.W.1002.000000T0000Z-000000T0000Z/
500 AM EDT SAT JUN 2 2007
```

```
KEATON-BEACH-FL          29.82N 83.60W
BONITA-BEACH-FL         26.33N 81.85W
```

```
$$
```

```
FLZ018-027-021500-
/O.CON.KNHC.TR.A.1002.000000T0000Z-000000T0000Z/
500 AM EDT SAT JUN 2 2007
```

```
ST-MARKS-FL             30.10N 84.20W
KEATON-BEACH-FL        29.82N 83.60W
```

```
$$
```

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

Aviation Tropical Cyclone Advisory

Product Description: The Aviation Tropical Cyclone Advisory is issued to provide short-term tropical cyclone forecast guidance for international aviation safety and routing purposes. The Aviation Advisory lists the current cyclone position, motion, and intensity, and includes forecast positions and intensities valid 6, 12, 18, and 24 h after the advisory issuance time (0300, 0900, 1500, or 2100 UTC). This is in contrast to the forecast positions provided in the Tropical Cyclone Discussion and Forecast/Advisory, which are relative to the nominal initial times of 0000, 0600, 1200, and 1800 UTC. It is important to note that forecast values in the Aviation Tropical Cyclone Advisory are obtained by interpolation from the values contained in the Forecast/Advisory.

Availability: This product is part of a suite of products issued for active cyclones every six hours at 0300, 0900, 1500, and 2100 UTC. Local issuance times are shown in the table below. Special Aviation Tropical Cyclone Advisory products may be issued at any time to advise of an unexpected significant change in the cyclone or when watches or warnings are to be issued.

Basin	Advisory Issuance Times (UTC)	Local Issuance Times During Daylight Saving Time	Local Issuance Times During Standard Time
Atlantic	0300, 0900, 1500, 2100	5 am, 11 am, 5 pm, 11 pm EDT	4 am, 10 am, 4 pm, 10 pm EST
Eastern North Pacific	0300, 0900, 1500, 2100	2 am, 8 am, 2 pm, 8 pm PDT	1 am, 7 am, 1 pm, 7 pm PST

Product Headers: WMO and AWIPS headers are given in the table below. The final numeric digit in each header is assigned on a rotating basis by cyclone number, i.e., FKNT21 KNHC would be used for the first, sixth, and eleventh Atlantic cyclones, while FKNT22 KNHC would be used for the second, seventh, or twelfth cyclones, and so on.

Basin	WMO Header(s)	AWIPS Header(s)
Atlantic	FKNT21-5 KNHC	MIATCAAT1-5
Eastern North Pacific	FKPZ21-5 KNHC	MIATCAEP1-5

Example:

FKPZ23 KNHC 070835
TCAPZ3

HURRICANE FELICIA ICAO ADVISORY NUMBER 15
NWS TPC/NATIONAL HURRICANE CENTER MIAMI FL EP082009
0900 UTC FRI AUG 07 2009

TC ADVISORY

DTG: 20090807/0900Z

TCAC: KNHC

TC: FELICIA

NR: 015

PSN: N1730 W13424

MOV: WNW 09KT

C: 0960HPA

MAX WIND: 100KT

FCST PSN + 06 HR: 071500 N1758 W13516

FCST MAX WIND + 06 HR: 090KT

FCST PSN + 12 HR: 072100 N1824 W13612

FCST MAX WIND + 12 HR: 080KT

FCST PSN + 18 HR: 080300 N1848 W13712

FCST MAX WIND + 18 HR: 075KT

FCST PSN + 24 HR: 080900 N1906 W13818

FCST MAX WIND + 24 HR: 070KT

RMK

THE FORECAST POSITION INFORMATION IN
THIS PRODUCT IS INTERPOLATED FROM
OFFICIAL FORECAST DATA VALID AT 0000...
0600...1200...AND 1800Z.

NXT MSG: 20090807/1500Z

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Tropical Weather Outlook

Product Description: The Tropical Weather Outlook discusses significant areas of disturbed weather and their potential for development during the next 48 hours, including a categorical forecast of the probability of tropical cyclone formation. The potential for tropical cyclone formation for each disturbance within the next 48 hours is given to the nearest 10% and expressed in terms of one of the following categories: low probability of development (<30%), medium probability (30-50%), and high probability of development (>50%). The Outlook also includes the locations of any active cyclones and their WMO and AWIPS headers during the first 24 hours of their existence.

Availability: Tropical Weather Outlooks are issued every six hours from 1 June – 30 November for the Atlantic Basin and from 15 May–30 November for the eastern North Pacific Basin, at 0000, 0600, 1200, and 1800 UTC. Local issuance times are shown in the table below.

Basin	Outlook Issuance Times (UTC)	Local Issuance Times During Daylight Saving Time	Local Issuance Times During Standard Time
Atlantic	0000, 0600, 1200, 1800	2 am, 8 am, 2 pm, 8 pm EDT	1 am, 7 am, 1 pm, 7 pm EST
Eastern North Pacific	0000, 0600, 1200, 1800	5 am, 11 am, 5 pm, 11 pm PDT	4 am, 10 am, 4 pm, 10 pm PST

Product Headers: WMO and AWIPS headers are given in the table below.

Basin	WMO Header	AWIPS Header
Atlantic	ABNT20 KNHC	MIATWOAT
Eastern North Pacific	ABPZ20 KNHC	MIATWOEP

Example:

ABPZ20 KNHC 032333
TWOEP
TROPICAL WEATHER OUTLOOK
NWS TPC/NATIONAL HURRICANE CENTER MIAMI FL
500 PM PDT MON AUG 3 2009

*Product
header/valid
time*

FOR THE EASTERN NORTH PACIFIC...EAST OF 140 DEGREES WEST LONGITUDE..

THE NATIONAL HURRICANE CENTER IS ISSUING ADVISORIES ON NEWLY-FORMED TROPICAL DEPRESSION SEVEN-E...LOCATED ABOUT 705 MILES SOUTH-SOUTHWEST OF THE SOUTHERN TIP OF BAJA CALIFORNIA.

*Free form
discussion*

SHOWERS AND THUNDERSTORMS ASSOCIATED WITH AN AREA OF DISTURBED WEATHER LOCATED ABOUT 1150 MILES SOUTHWEST OF THE SOUTHERN TIP OF BAJA CALIFORNIA HAVE CONTINUED TO BECOME BETTER ORGANIZED...AND A TROPICAL DEPRESSION MAY BE FORMING. IF CURRENT TRENDS CONTINUE... ADVISORIES MAY BE INITIATED LATER THIS EVENING AS THE SYSTEM MOVES WESTWARD OR WEST-NORTHWESTWARD AT AROUND 15 MPH. THERE IS A HIGH CHANCE...80 PERCENT...OF THIS SYSTEM BECOMING A TROPICAL CYCLONE DURING THE NEXT 48 HOURS.

ELSEWHERE...TROPICAL CYCLONE FORMATION IS NOT EXPECTED DURING THE NEXT 48 HOURS.

PUBLIC ADVISORIES ON TROPICAL DEPRESSION SEVEN-E ARE ISSUED UNDER WMO HEADER WTPZ32 KNHC AND UNDER AWIPS HEADER MIATCPEP2. FORECAST/ADVISORIES ON TROPICAL DEPRESSION SEVEN-E ARE ISSUED UNDER WMO HEADER WTPZ22 KNHC AND UNDER AWIPS HEADER MIATCMEP2.

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FORECASTER SCHAUER CLARK/BRENNAN

Special Tropical Weather Outlook

Product Description: A Special Tropical Weather Outlook is issued when there have been important changes with areas of disturbed weather over tropical or subtropical waters that need to be conveyed before the next scheduled release of the Tropical Weather Outlook. The potential for tropical cyclone formation for each disturbance within the next 48 hours is given to the nearest 10% and expressed in terms of one of the following categories: low probability of development (<30%), medium probability (30-50%), and high probability of development (>50%). The Special Tropical Weather Outlook can be used to report the findings of reconnaissance aircraft missions, and can also be used for disturbances outside of the normal hurricane season when Tropical Weather Outlooks are not routinely issued. The disturbance being updated in the Special Tropical Weather Outlook will be highlighted at the top of the product, and other systems discussed in previous Tropical Weather Outlooks will also be included.

Availability: This is an event-driven product issued as needed.

Product Headers: WMO and AWIPS headers are given in the table below.

Basin	WMO Header	AWIPS Header
Atlantic	ABNT20 KNHC	MIATWOAT
Eastern North Pacific	ABPZ20 KNHC	MIATWOEP

Example

```
ABPZ20 KNHC 211453
TWOEP
SPECIAL TROPICAL WEATHER OUTLOOK
NWS TPC/NATIONAL HURRICANE CENTER MIAMI FL
755 AM PDT SUN JUN 21 2009
```

Product header/valid time

FOR THE EASTERN NORTH PACIFIC...EAST OF 140 DEGREES WEST LONGITUDE..

```
SPECIAL OUTLOOK ISSUED TO UPDATE DISCUSSION OF LOW PRESSURE AREA
SOUTH OF ACAPULCO MEXICO.
```

```
UPDATED...SATELLITE IMAGES INDICATE THAT SHOWERS AND THUNDERSTORMS
ASSOCIATED WITH THE AREA OF LOW PRESSURE CENTERED ABOUT 150 MILES
SOUTHWEST OF ACAPULCO MEXICO CONTINUE TO BECOME BETTER ORGANIZED...
BUT THE LOW-LEVEL CENTER OF CIRCULATION IS NOT YET WELL-DEFINED.
ONLY A SLIGHT INCREASE IN THE ORGANIZATION OF THIS SYSTEM WOULD
RESULT IN THE FORMATION OF A TROPICAL DEPRESSION...AND ADVISORIES
COULD BE INITIATED LATER TODAY. THERE IS A HIGH CHANCE...90
PERCENT...OF THIS SYSTEM BECOMING A TROPICAL CYCLONE DURING
THE NEXT 48 HOURS. HEAVY RAINS COULD AFFECT PORTIONS OF THE
```

Free form discussion

SOUTHERN AND SOUTHWESTERN COAST OF MEXICO DURING THE NEXT DAY OR TWO...AND INTERESTS IN THIS REGION SHOULD MONITOR THE PROGRESS OF THIS SYSTEM.

AN AREA OF LOW PRESSURE LOCATED ABOUT 1600 MILES SOUTHWEST OF THE SOUTHERN TIP OF BAJA CALIFORNIA IS PRODUCING A DISORGANIZED AREA OF SHOWERS AND THUNDERSTORMS. DEVELOPMENT OF THIS SYSTEM...IF ANY... WILL BE SLOW TO OCCUR AS IT MOVES EAST-NORTHEASTWARD AT 5 TO 10 MPH OVER THE NEXT COUPLE OF DAYS. THERE IS A LOW CHANCE...20 PERCENT ...OF THIS SYSTEM BECOMING A TROPICAL CYCLONE DURING THE NEXT 48 HOURS.

ELSEWHERE...TROPICAL CYCLONE FORMATION IS NOT EXPECTED DURING THE NEXT 48 HOURS.

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FORECASTER BERG/PASCH

Monthly Tropical Weather Summary

Product Description: The Monthly Tropical Weather Summary briefly describes the previous month's tropical cyclone activity and provides a summary table for all of the season's tropical cyclones to date.

Availability: The Monthly Tropical Weather Summary is issued at 8 am local time on the first day of the month following each month of the hurricane season. The Tropical Weather Summary issued on 1 December will give a brief account of the entire season.

Product Headers: WMO and AWIPS headers are given in the table below.

Basin	WMO Header	AWIPS Header
Atlantic	ABNT30 KNHC	MIATWSAT
Eastern North Pacific	ABPZ30 KNHC	MIATWSEP

Example:

```
ABPZ30 KNHC 011135
TWSEP
MONTHLY TROPICAL WEATHER SUMMARY
NWS TPC/NATIONAL HURRICANE CENTER MIAMI FL
800 AM PDT SAT AUG 01 2009
```

FOR THE EASTERN NORTH PACIFIC...EAST OF 140 DEGREES WEST LONGITUDE..

FOUR TROPICAL CYCLONES WERE OBSERVED DURING JULY...TROPICAL STORM BLANCA...HURRICANE CARLOS...TROPICAL STORM DOLORES AND TROPICAL STORM LANA. LANA FORMED IN THE EASTERN NORTH PACIFIC BASIN AS A TROPICAL DEPRESSION AND BECAME A TROPICAL STORM IN THE CENTRAL NORTH PACIFIC BASIN. THE LONG-TERM AVERAGE FOR JULY IS FOR ABOUT THREE OR FOUR TROPICAL STORMS TO FORM...TWO OF THEM TO BECOME HURRICANES...AND ONE TO STRENGTHEN INTO A MAJOR HURRICANE. IN TERMS OF THE ACCUMULATED CYCLONE ENERGY (ACE) INDEX...WHICH MEASURES THE COLLECTIVE DURATION AND STRENGTH OF TROPICAL STORMS AND HURRICANES...OVERALL TROPICAL CYCLONE ACTIVITY DURING JULY WAS ONLY 440F THE LONG-TERM (1971-2008) MEAN.

FOR THE 2009 SEASON SO FAR...THE EASTERN PACIFIC HAS HAD FOUR TROPICAL STORMS AND TWO HURRICANES. THESE NUMBERS ARE CONSIDERABLY BELOW THE LONG-TERM AVERAGES OF ABOUT SIX TROPICAL STORMS...THREE HURRICANES...AND ONE OR TWO MAJOR HURRICANES. IN TERMS OF ACE... OVERALL TROPICAL CYCLONE ACTIVITY IS ONLY 370F THE LONG-TERM MEAN...AND THE SIXTH LOWEST OBSERVED VALUE SINCE RELIABLE RECORDS BEGAN IN 1971.

REPORTS ON INDIVIDUAL CYCLONES...WHEN COMPLETED...ARE AT THE WEB SITE OF THE NATIONAL HURRICANE CENTER...USE LOWER CASE LETTERS...
[HTTP://WWW.NHC.NOAA.GOV/2009EPAC.SHTML](http://www.nhc.noaa.gov/2009EPAC.shtml)

SUMMARY TABLE

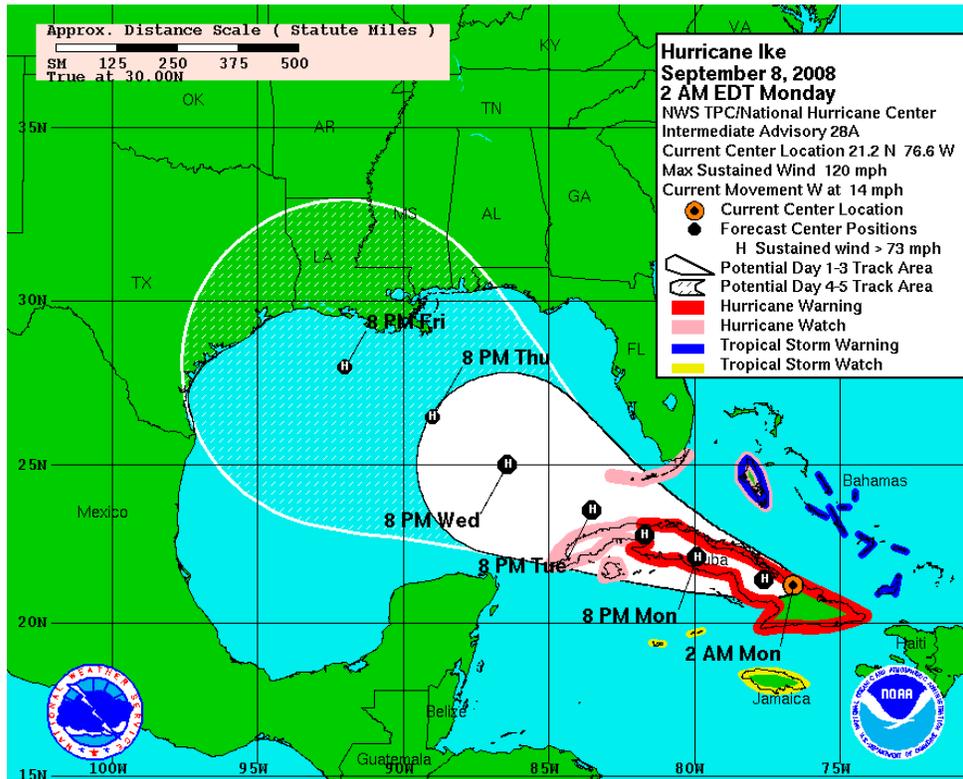
NAME	DATES	MAX WIND (MPH)	DEATHS
TD ONE-E	18-19 JUN	35	0
H ANDRES	21-24 JUN	80	1
TS BLANCA	6-8 JUL	50	0
H CARLOS	10-16 JUL	105	0
TS DOLORES	15-17 JUL	50	0
TS LANA	30- JUL	65	0

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FORECASTER AVILA/BLAKE

NHC Graphics Product Descriptions

Tropical Cyclone Track Forecast Cone and Watch/Warning Graphic



Product Description: This graphic depicts the most recent NHC track of the center of a tropical cyclone along with an approximate representation of associated coastal areas under a hurricane warning (red), hurricane watch (pink), tropical storm warning (blue) and tropical storm watch (yellow). The orange circle indicates the current position of the center of the tropical cyclone. The black dots show the NHC forecast position of the center at the times indicated. The letter inside the dot indicates the forecast strength of the cyclone category: (D)epression, (S)torm, (H)urricane, (M)ajor hurricane, or remnant (L)ow. Systems forecast to be extratropical are indicated by white dots (with black letters indicating intensity).

The cone represents the probable track of the center of a tropical cyclone, and is formed by enclosing the area swept out by a set of circles (not shown) along the forecast track (at 12, 24, 36 hours, etc). The size of each circle is set so that two-thirds of historical official forecast errors over a 5-year sample fall within the circle. The circle radii defining the cones in 2009 for the Atlantic and eastern North Pacific basins are given in the table below.

Radii of NHC forecast cone circles for 2010, based on error statistics from 2005-2009:

Forecast Period (hours)	2/3 Probability Circle, Atlantic Basin (nautical miles)	2/3 Probability Circle, Eastern North Pacific Basin (nautical miles)
12	36	36
24	62	59
36	85	82
48	108	102
72	161	138
96	220	174
120	285	220

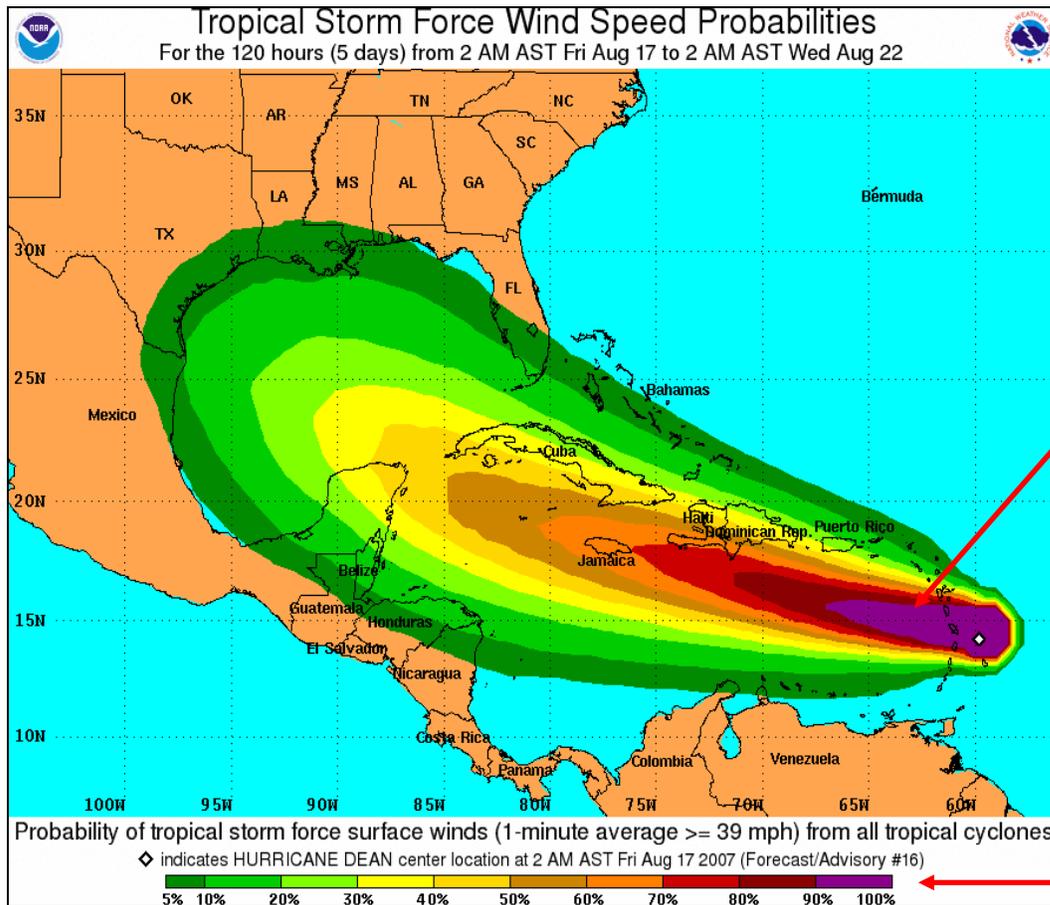
One can also examine historical tracks to determine how often the *entire* 5-day path of a cyclone remains completely within the area of the cone. This is a different perspective that ignores most timing errors. For example, a storm moving very slowly but in the expected direction would still be within the area of the cone, even though the track forecast error could be very large. Based on forecasts over the previous 5 years, the entire track of the tropical cyclone can be expected to remain within the cone roughly 60-70% of the time.

It is important to remember that tropical cyclones are not a point. Their effects can span many hundreds of miles from the center. The area experiencing hurricane force (one-minute average wind speeds of at least 74 mph) and tropical storm force (one-minute average wind speeds of 39-73 mph) winds can extend well beyond the white areas shown enclosing the most likely track area of the center. The distribution of hurricane and tropical storm force winds in this tropical cyclone can be seen in the Cumulative Wind Distribution graphic described below.

Availability: This graphic is part of a suite of products issued for active cyclones every six hours at 0300, 0900, 1500, and 2100 UTC. Local issuance times are shown in the table below. When coastal watches or warnings are in effect, the graphic will be updated at either two or three hour intervals concurrent with the issuance if Intermediate Public Advisories. The graphic will also be updated with the issuance of Special Advisories.

Basin	Graphic Issuance Times (UTC)	Local Issuance Times During Daylight Saving Time	Local Issuance Times During Standard Time
Atlantic	0300, 0900, 1500, 2100	5 am, 11 am, 5 pm, 11 pm EDT	4 am, 10 am, 4 pm, 10 pm EST
Eastern North Pacific	0300, 0900, 1500, 2100	2 am, 8 am, 2 pm, 8 pm PDT	1 am, 7 am, 1 pm, 7 pm PST

Tropical Cyclone Surface Wind Speed Probabilities



To determine the probability of sustained winds exceeding a threshold (in this example 39 mph or tropical storm force) for a particular location, match the colors depicted on the map with the corresponding probability ranges below.

Product Description: This graphic depicts the probability (likelihood, expressed as a percentage) that sustained (1-min average) winds meeting or exceeding specific thresholds will occur at particular locations over particular intervals of time. These probabilities are based on the track, intensity, and wind structure (size) forecasts from the National Hurricane Center and their historical error characteristics. Separate graphics are provided for the 34 kt (tropical storm force), 50 kt, and 64 kt (hurricane force) wind thresholds.

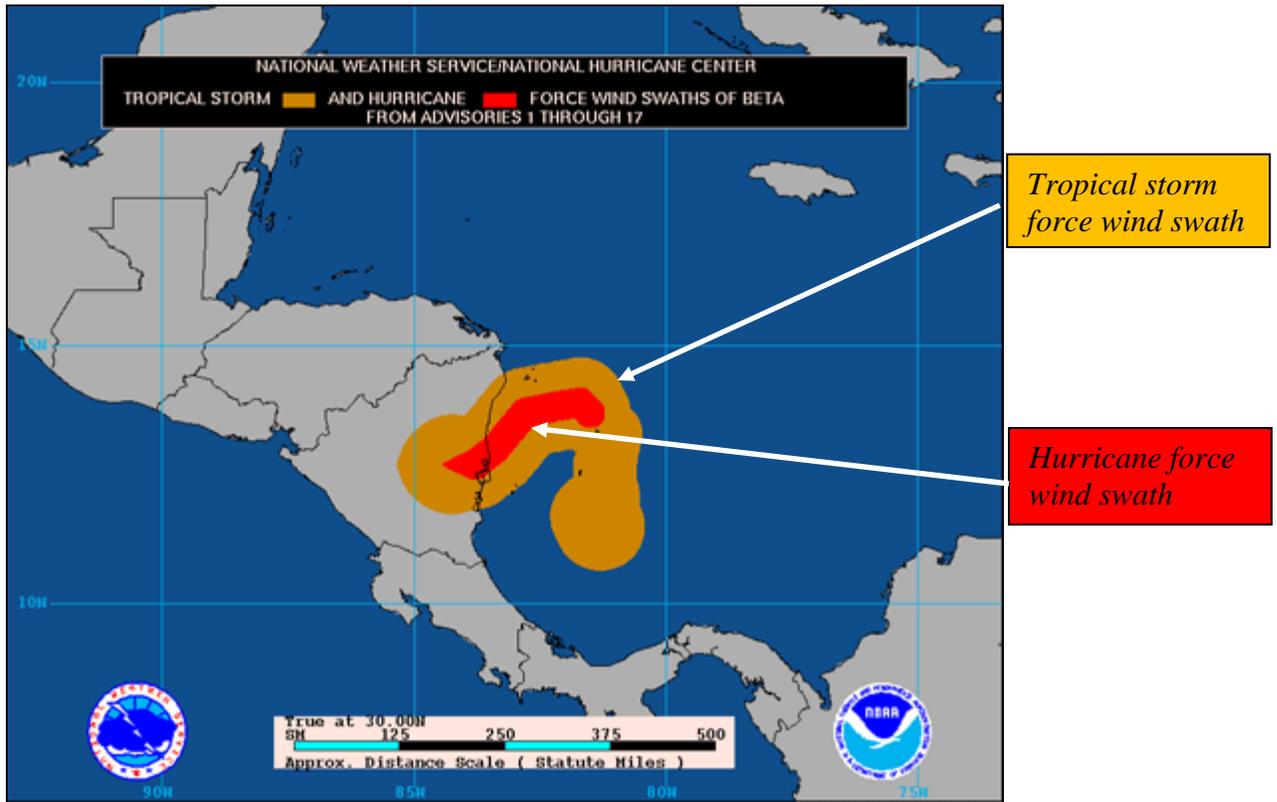
The graphic provides location-specific *cumulative occurrence probabilities* – these values tell you the probability the wind event will occur sometime during the specified cumulative forecast period (0-12, 0-24, 0-36 hours, etc., out to 0-120 h) at each specific point. The images can be looped to show how the threat evolves over the five-day period of the forecast.

It is important for users to realize that probabilities that may seem relatively small (e.g., 5-10%) may still be quite significant. Users are urged to consider the potentially large costs (in terms of lives, property, etc.) of not preparing for an extreme event.

Availability: This graphic is part of a suite of products issued for active cyclones every six hours at 0300, 0900, 1500, and 2100 UTC. Local issuance times are shown in the table below. The graphic will also be updated with the issuance of Special Public Advisories.

Basin	Graphic Issuance Times (UTC)	Local Issuance Times During Daylight Saving Time	Local Issuance Times During Standard Time
Atlantic	0300, 0900, 1500, 2100	5 am, 11 am, 5 pm, 11 pm EDT	4 am, 10 am, 4 pm, 10 pm EST
Eastern North Pacific	0300, 0900, 1500, 2100	2 am, 8 am, 2 pm, 8 pm PDT	1 am, 7 am, 1 pm, 7 pm PST

Cumulative Wind History



Product Description: This graphic shows how the size of the storm has changed, and the areas potentially affected so far by sustained winds of tropical storm force (in orange) and hurricane force (in red). The display is based on the wind radii contained in the set of Forecast/Advisories indicated at the top of the figure. Users are reminded that the Forecast/Advisory wind radii represent the maximum possible extent of a given wind speed within particular quadrants around the tropical cyclone. As a result, not all locations falling within the orange or red swaths will have experienced sustained tropical storm or hurricane force winds, respectively.

Availability: This graphic is part of a suite of products issued for active cyclones every six hours at 0300, 0900, 1500, and 2100 UTC. Local issuance times are shown in the table below. The graphic will also be updated with the issuance of Special Public Advisories.

Basin	Graphic Issuance Times (UTC)	Local Issuance Times During Daylight Saving Time	Local Issuance Times During Standard Time
Atlantic	0300, 0900, 1500, 2100	5 am, 11 am, 5 pm, 11 pm EDT	4 am, 10 am, 4 pm, 10 pm EST
Eastern North Pacific	0300, 0900, 1500, 2100	2 am, 8 am, 2 pm, 8 pm PDT	1 am, 7 am, 1 pm, 7 pm PST

Maximum 1-minute Wind Speed Probability Table



Maximum 1-minute Wind Speed Probability Table for Dean
 From NHC Advisory 16
 5:00 AM EDT Aug 17 2007



In this example, the probability of the cyclone being a category 3 hurricane at 12 hours is 58% while the probability of the cyclone being a category 3 hurricane at 24 hours is 43%

Wind Speed Interval (mph)	Forecast Time						
	12 hour for 2 PM Fri	24 hour for 2 AM Sat	36 hour for 2 PM Sat	48 hour for 2 AM Sun	72 hour for 2 AM Mon	96 hour for 2 AM Tue	120 hour for 2 AM Wed
Dissipated	<2%	<2%	<2%	<2%	<2%	3%	16%
Tropical Depression (<39)	<2%	<2%	<2%	<2%	<2%	3%	13%
Tropical Storm (39-73)	<2%	<2%	2%	<2%	4%	22%	23%
Hurricane (>=74)	100%	100%	99%	99%	95%	72%	40%
Category 1 (74-95)	<2%	2%	5%	5%	8%	28%	18%
Category 2 (96-110)	3%	7%	9%	10%	14%	21%	12%
Category 3 (111-130)	58%	43%	33%	36%	28%	16%	12%
Category 4 (131-155)	38%	44%	44%	38%	32%	6%	6%
Category 5 (>155)	<2%	4%	8%	11%	13%	<2%	<2%

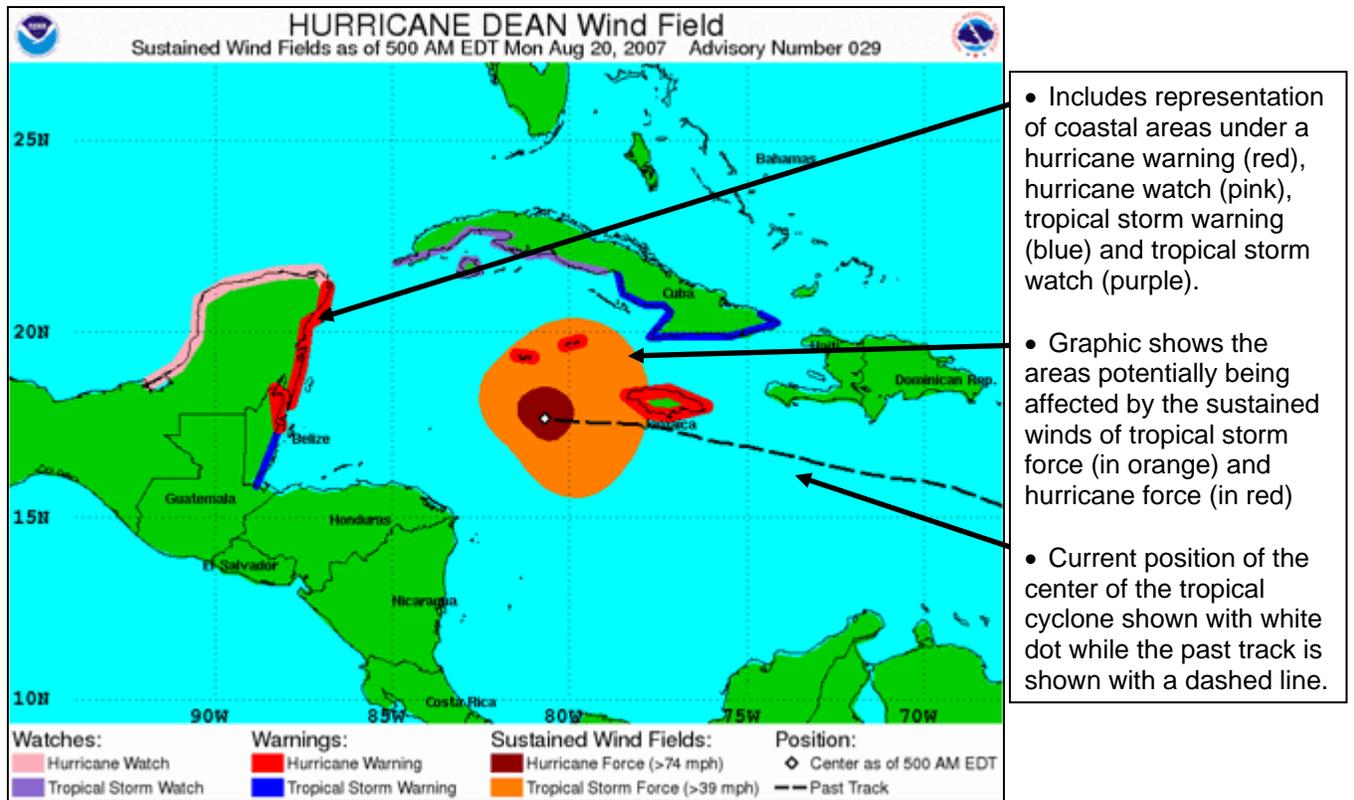
In this example, the probability of the cyclone being a category 4 hurricane at 36 hours is 44%, while the probability of the cyclone being a category five hurricane at 36 hours is 8%

Product Description: This product shows the probability that the maximum sustained (1-minute) surface wind speed of the tropical cyclone will be within various intensity ranges (tropical depression, tropical storm, the five hurricane categories of the Saffir-Simpson Hurricane Scale, or dissipated) during the next 120 hours. Like the Tropical Cyclone Wind Speed Probability Product, these probabilities are based on the NHC track and intensity forecasts and their historical error characteristics. However, these probabilities apply to the maximum sustained surface wind associated with the cyclone, and not to winds that could occur at specific locations.

Availability: This graphic is part of a suite of products issued for active cyclones every six hours at 0300, 0900, 1500, and 2100 UTC. Local issuance times are shown in the table below. The graphic will also be updated with the issuance of Special Public Advisories.

Basin	Graphic Issuance Times (UTC)	Local Issuance Times During Daylight Saving Time	Local Issuance Times During Standard Time
Atlantic	0300, 0900, 1500, 2100	5 am, 11 am, 5 pm, 11 pm EDT	4 am, 10 am, 4 pm, 10 pm EST
Eastern North Pacific	0300, 0900, 1500, 2100	2 am, 8 am, 2 pm, 8 pm PDT	1 am, 7 am, 1 pm, 7 pm PST

Tropical Cyclone Wind Field Graphic



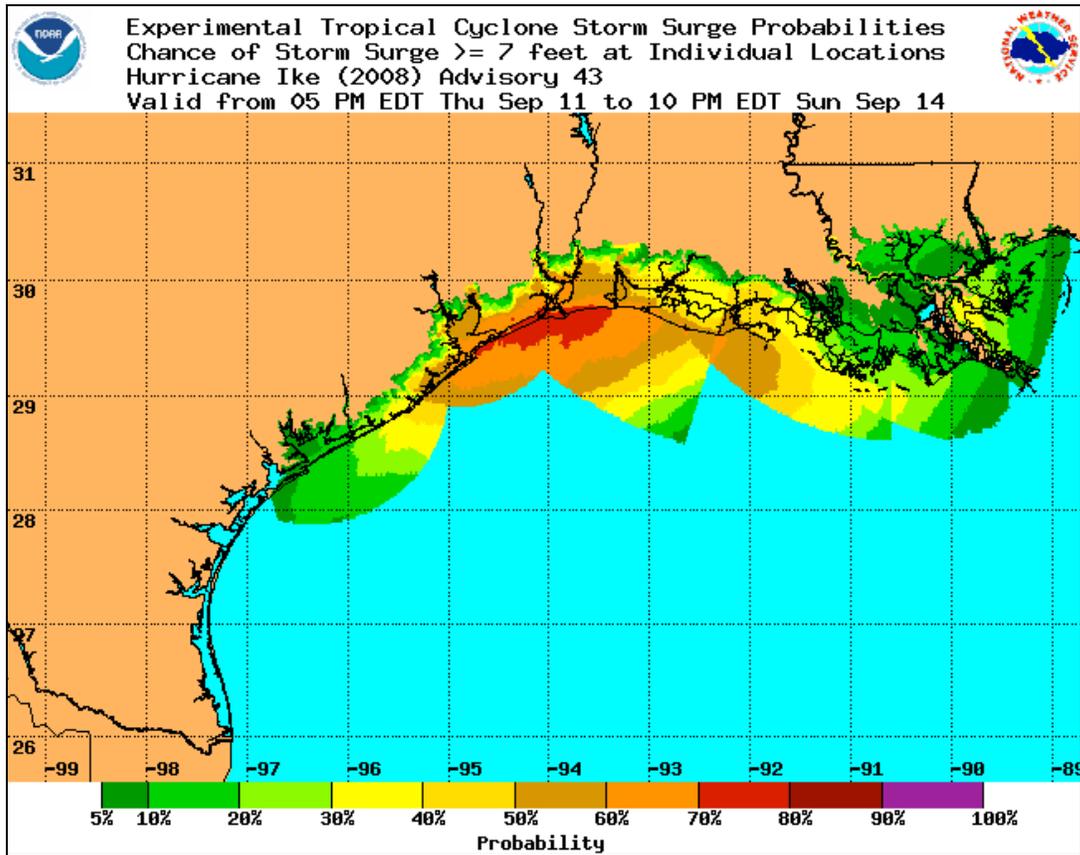
Product Description: This graphic shows the areas potentially being affected by the sustained (1 min average) winds of tropical storm force (in orange) and hurricane force (in red). The display is based on the wind radii contained in the latest Forecast/Advisory (indicated at the top of the figure). Users are reminded that the Forecast/Advisory wind radii represent the maximum possible extent of a given wind speed within particular quadrants around the tropical cyclone. As a result, not all locations falling within the orange or red shaded areas will be experiencing sustained tropical storm or hurricane force winds, respectively.

In addition to the wind field, this graphic shows an approximate representation of coastal areas under a hurricane warning (red), hurricane watch (pink), tropical storm warning (blue) and tropical storm watch (purple). The white dot indicates the current position of the center of the tropical cyclone, and the dashed line shows the previous track of the center of the tropical cyclone.

Availability: This graphic is part of a suite of products issued for active cyclones every six hours at 0300, 0900, 1500, and 2100 UTC. Local issuance times are shown in the table below. The graphic will also be updated with the issuance of Special Public Advisories.

Basin	Graphic Issuance Times (UTC)	Local Issuance Times During Daylight Saving Time	Local Issuance Times During Standard Time
Atlantic	0300, 0900, 1500, 2100	5 am, 11 am, 5 pm, 11 pm EDT	4 am, 10 am, 4 pm, 10 pm EST
Eastern North Pacific	0300, 0900, 1500, 2100	2 am, 8 am, 2 pm, 8 pm PDT	1 am, 7 am, 1 pm, 7 pm PST

Tropical Cyclone Storm Surge Probabilities

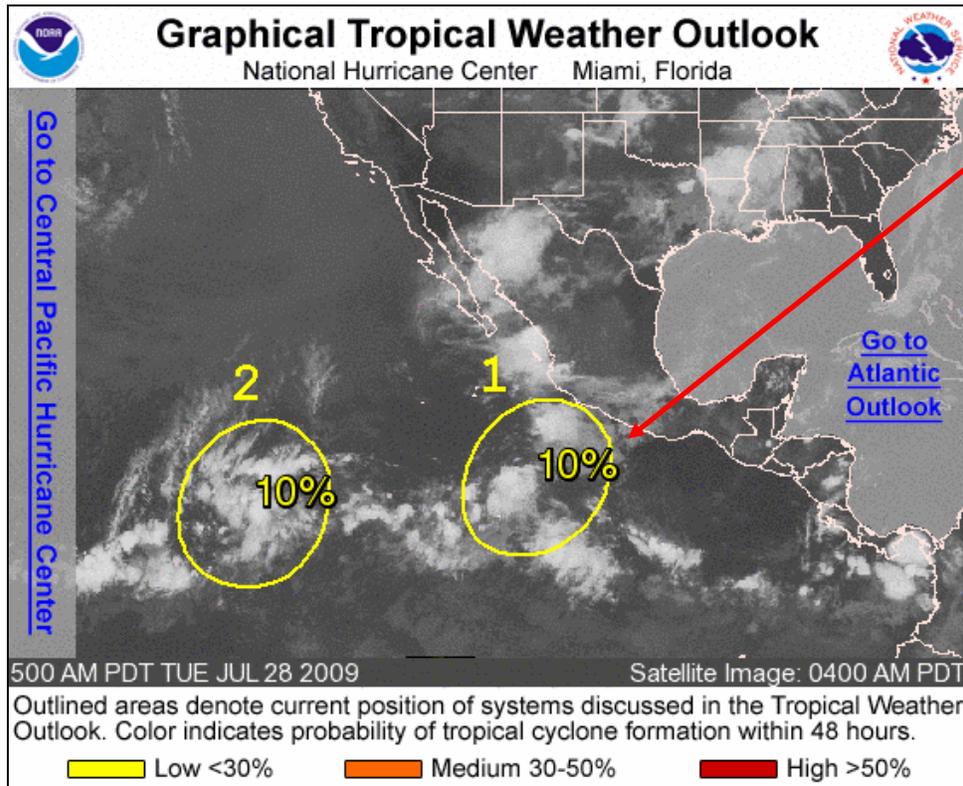


Product Description: The Tropical Cyclone Storm Surge Probabilities graphics depict the likelihood that a specified storm surge in one-foot increments from 2 to 25 feet above normal tide levels will occur at particular locations during the next 72 hours. The probabilities are based on storm surge values from the Sea, Lake, and Overland Surges from Hurricanes (SLOSH) model, the current official NHC tropical cyclone track and intensity forecast, and the error characteristics of those forecasts. The probabilities also include the effects of storm size variability.

It is important for users to realize that probabilities that may seem relatively small (e.g., 5-10%) may still be quite significant. Users are urged to consider the potentially large cost (in terms of lives, property, etc.) of not preparing for an extreme event.

Availability: This graphic is part of a suite of products issued for active cyclones every six hours at 0300, 0900, 1500, and 2100 UTC, whenever a hurricane watch or hurricane warning is in effect for any portion of the Gulf or Atlantic coasts of the continental United States. The graphic will also be updated with the issuance of Special Public Advisories. *Due to the nature of the computations involved in producing this product, however, there will generally be a delay of an hour or more in the posting of this graphic to the NHC web site.*

Graphical Tropical Weather Outlook



Area 1 in the graphic corresponds with area 1 discussed in the text below. Users can also mouse over the disturbance in the graphic and a pop-up window will appear providing the same text as below.

ABPZ20 KNHC 281135
TWOEP
TROPICAL WEATHER OUTLOOK
NWS TPC/NATIONAL HURRICANE CENTER MIAMI FL
500 AM PDT TUE JUL 28 2009

FOR THE EASTERN NORTH PACIFIC...EAST OF 140 DEGREES WEST LONGITUDE..

1. A LARGE AREA OF SHOWERS AND THUNDERSTORMS ASSOCIATED WITH A TROPICAL WAVE IS LOCATED SEVERAL HUNDRED MILES SOUTH AND SOUTH-SOUTHWEST OF MANZANILLO MEXICO. THERE ARE NO SIGNS OF ORGANIZATION AND DEVELOPMENT...IF ANY...SHOULD BE SLOW TO OCCUR AS THE SYSTEM MOVES WEST TO WEST-NORTHWESTWARD AROUND 10 TO 15 MPH. THERE IS A LOW CHANCE...10 PERCENT...OF THIS SYSTEM BECOMING A TROPICAL CYCLONE DURING THE NEXT 48 HOURS.

2. A BROAD AREA OF DISTURBED WEATHER LOCATED ABOUT 1400 MILES SOUTHWEST OF THE SOUTHERN TIP OF BAJA CALIFORNIA REMAINS POORLY ORGANIZED. DEVELOPMENT OF THIS SYSTEM...IF ANY...IS EXPECTED TO BE SLOW TO OCCUR AS IT MOVES WESTWARD AROUND 10 TO 15 MPH. THERE IS A LOW CHANCE...10 PERCENT...OF THIS SYSTEM BECOMING A TROPICAL CYCLONE DURING THE NEXT 48 HOURS.

ELSEWHERE...TROPICAL CYCLONE FORMATION IS NOT EXPECTED DURING THE NEXT 48 HOURS.

The Graphical Tropical Weather Outlook depicts significant areas of disturbed weather and their potential for development during the next 48 hours. The Outlook also shows the locations of any active tropical cyclones. Areas of disturbed weather on the graphic are circled and numbered, with text discussions for each disturbance given beneath the graphic. The potential for tropical cyclone formation for each disturbance within the next 48 hours will be indicated by the color of the enclosing circle: yellow indicates a low probability of development (<30%), orange indicates medium likelihood (30-50%), and red indicates a high likelihood of development (>50%). The graphic is interactive; users can mouse over cyclones or disturbances in the graphic and pop-up windows will appear with cyclone advisory information or the text Outlook discussion for that disturbance. Clicking on a tropical cyclone symbol will take the user to a new web location that contains all advisories and products for that cyclone.

It is important to note that the areas depicted in the Graphical Tropical Weather Outlook represent only the *current location* of the weather systems. Information on motion and potential impacts is available in the text descriptions but is not displayed graphically.

Availability: Graphical Tropical Weather Outlooks are issued every six hours from 1 June–30 November for the Atlantic Basin and from 15 May–30 November for the eastern North Pacific Basin, at 0000, 0600, 1200, and 1800 UTC. Local issuance times are shown in the table below. The Graphical Tropical Weather Outlook is also updated whenever a Special Tropical Weather Outlook is issued.

Basin	Outlook Issuance Times (UTC)	Local Issuance Times During Daylight Saving Time	Local Issuance Times During Standard Time
Atlantic	0000, 0600, 1200, 1800	2 am, 8 am, 2 pm, 8 pm EDT	1 am, 7 am, 1 pm, 7 pm EST
Eastern North Pacific	0000, 0600, 1200, 1800	5 am, 11 am, 5 pm, 11 pm PDT	4 am, 10 am, 4 pm, 10 pm PST

NHC Non-Operational Product Descriptions

Tropical Cyclone Reports

Product Description: The National Hurricane Center's Tropical Cyclone Reports (TCRs) contain comprehensive information on each storm, including a final best track and synoptic history, meteorological statistics, casualties and damage, and a forecast and warning critique.

Availability: TCRs are available in the archives section of the NHC/TPC website in Microsoft Word and pdf format. The time to prepare a TCR after the tropical cyclone has ended can vary from a couple of weeks to several months, depending on the longevity of the cyclone, available data, and the extent of the cyclone's impacts.