Tropical Cyclone Report
Tropical Storm Tony
(AL192012)
22-25 October 2012

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Tony was a short-lived and relatively weak tropical storm that remained over the central Atlantic through its lifetime.

a. Synoptic History

Tony's genesis was associated with a tropical wave that moved off the west coast of Africa on 11 October. The wave moved westward and spawned Hurricane Sandy over the Caribbean Sea on 22 October; in addition, global model analyses of lower- to mid-tropospheric humidity suggest that the wave also initiated a disturbance over the eastern tropical Atlantic around 13 October. This disturbance drifted westward, much more slowly than the wave, over the eastern and central tropical Atlantic during the following week or so, while an upper-level trough just to the west of the system moved nearly in tandem with it. The combination of the disturbance and the upper-level trough resulted in a large area of disorganized cloudiness and thunderstorms under the influence of strong southwesterly shear. By 21 October, when the system was near 50°W longitude, the upper-level trough became a large cutoff low, and the shear over the disturbance relaxed somewhat. A closed surface low pressure system developed about 700 n mi east of the northern Leeward Islands that day, but the associated deep convection lacked sufficient organization for the system to be classified as a tropical cyclone. By 1800 UTC 22 October, the low had acquired enough convective organization to be designated a tropical depression, centered about 620 n mi east-northeast of the northern Leeward Islands. The "best track" chart of the tropical cyclone's path is given in Fig. 1, with the wind and pressure histories shown in Figs. 2 and 3, respectively. The best track positions and intensities are listed in Table 1[1].

The flow on the eastern side of the cutoff low steered the depression northward with some increase in forward speed over the next day. Although the shear was not very strong, the system failed to strengthen until around 0000 UTC 24 October when the associated deep convection increased and became better organized, resulting in the cyclone becoming a tropical storm. Tony turned toward the northeast around this time, within the flow between a mid-level trough to the northwest and a ridge to the east. The storm strengthened a little more on 24 October, and Tony reached its peak intensity of 45 kt by 1200 UTC that day, located about midway between the northern Leeward Islands and the Azores. Although there were some

[1] A digital record of the complete best track, including wind radii, can be found on line at ftp://ftp.nhc.noaa.gov/atcf. Data for the current year's storms are located in the *btk* directory, while previous years' data are located in the *archive* directory.

fluctuations in inner-core convection, Tony is estimated to have maintained its 45-kt intensity for about 24 h while turning toward the east-northeast and accelerating. After 0000 UTC 25 October, the combination of increasing vertical wind shear and cooler waters caused a weakening trend to commence. Tony's intensity decreased to 35 kt by 1200 UTC 25 October while continuing to move quickly toward the east-northeast. A little later that day, the circulation began to entrain cooler and drier air and strong southwesterly shear displaced the deep convection well away from the center. By 1800 UTC 25 October, Tony had the appearance of a frontal cyclone on satellite images, and it is estimated that it became extratropical around that time. The cyclone turned toward the east and dissipated several hundred n mi to the south of the Azores by 1800 UTC 26 October.

b. Meteorological Statistics

Observations in Tony (Figs. 2 and 3) include subjective satellite-based Dvorak technique intensity estimates from the Tropical Analysis and Forecast Branch (TAFB) and the Satellite Analysis Branch (SAB), and objective Advanced Dvorak Technique (ADT) estimates from the Cooperative Institute for Meteorological Satellite Studies/University of Wisconsin-Madison. Data and imagery from NOAA polar-orbiting satellites including the Advanced Microwave Sounding Unit (AMSU), the NASA Tropical Rainfall Measuring Mission (TRMM), the European Space Agency's Advanced Scatterometer (ASCAT), and Defense Meteorological Satellite Program (DMSP) satellites, among others, were also useful in constructing the best track of Tony.

The estimated 45-kt maximum intensity of Tony was based on subjective Dvorak T-numbers of 3.0 derived by both TAFB and SAB.

There were no reliable ship reports of tropical-storm-force winds associated with Tony.

c. Casualty and Damage Statistics

There were no reports of damage or casualties associated with Tony.

d. Forecast and Warning Critique

Tony's genesis was fairly well anticipated - until development was imminent. The area of disturbed weather that led to the formation of the tropical cyclone was first introduced into the Tropical Weather Outlook 78 h prior to genesis with a "low" (<30%) probability of development within 48 h. The formation probability was raised to the "medium" (30-50%) category 42 h prior to genesis; however, the genesis probability was never increased to "high" (>50%) before the tropical cyclone formed.

A verification of the NHC official track forecasts for Tony is given in Table 2a. For 24 through 72 h, the official forecast track errors were higher than the mean official errors for the previous 5-yr period. A homogeneous comparison of the official track errors with selected

guidance models is given in Table 2b. The EMXI and BAMM were among the best performing track guidance, with the latter having remarkably low errors at 24 through 48 h. Due to the short lifetime of Tony, the sample size for forecast verification is very small.

A verification of NHC official intensity forecasts for Tony is given in Table 3a. Official forecast intensity errors were lower than the mean official errors for the previous 5-yr period, and the climatology and persistence intensity forecast errors were lower than the previous 5-yr means at all verifiable forecast intervals. The low official intensity forecast errors are not surprising, since Tony never strengthened nor weakened rapidly, and did not reach a very high intensity. A homogeneous comparison of the official intensity errors with selected guidance models is given in Table 3b. For this sample, none of the guidance had lower mean errors than the official forecast.

There were no coastal watches or warnings issued for Tony.

Table 1. Best track for Tropical Storm Tony, 22-25 October 2012.

Date/Time (UTC)	Latitude (°N)	Longitude (°W)	Pressure (mb)	Wind Speed (kt)	Stage
21 / 1800	20.1	50.8	1011	25	low
22 / 0000	20.4	51.2	1011	25	"
22 / 0600	20.8	51.5	1010	25	"
22 / 1200	21.3	51.7	1009	30	"
22 / 1800	21.9	51.8	1006	30	tropical depression
23 / 0000	22.5	51.8	1006	30	"
23 / 0600	23.6	51.6	1006	30	"
23 / 1200	24.7	51.3	1006	30	"
23 / 1800	25.7	50.6	1005	30	"
24 / 0000	26.5	49.6	1004	35	tropical storm
24 / 0600	27.2	48.5	1003	40	"
24 / 1200	27.9	46.8	1000	45	"
24 / 1800	28.7	44.7	1000	45	"
25 / 0000	29.5	42.4	1000	45	"
25 / 0600	30.1	40.0	1000	45	"
25 / 1200	30.6	37.6	1000	35	"
25 / 1800	31.0	35.1	1001	35	extratropical
26 / 0000	31.3	32.6	1001	35	"
26 / 0600	31.2	30.5	1004	30	"
26 / 1200	30.9	28.6	1006	25	"
26 / 1800					dissipated
24 / 1200	27.9	46.8	1000	45	maximum wind and minimum pressure

Table 2a. NHC official (OFCL) and climatology-persistence skill baseline (OCD5) track forecast errors (n mi) for Tropical Storm Tony, 22-25 October 2012. Mean errors for the 5-yr period 2007-11 are shown for comparison. Official errors that are smaller than the 5-yr means are shown in boldface type.

	Forecast Period (h)						
	12	24	36	48	72	96	120
OFCL	**28.3**	67.7	142.4	217.7	285.5		
OCD5	77.8	182.7	341.4	487.2	855.7		
Forecasts	11	9	7	5	1		
OFCL (2007-11)	30.4	48.4	65.9	83.1	124.4		
OCD5 (2007-11)	46.9	95.2	151.7	211.6	316.8		

Table 2b. Homogeneous comparison of selected track forecast guidance models (in n mi) for Tropical Storm Tony, 22-25 October 2012. Errors smaller than the NHC official forecast are shown in boldface type. The number of official forecasts shown here will generally be smaller than that shown in Table 2a due to the homogeneity requirement.

Model ID	Forecast Period (h)						
	12	24	36	48	72	96	120
OFCL	27.9	76.6	169.6	259.9			
OCD5	80.7	201.8	374.0	508.0			
GFSI	29.2	**74.0**	171.4	309.3			
GHMI	54.3	132.3	258.8	400.6			
HWFI	39.2	95.6	**168.1**	**216.8**			
UKMI	52.4	139.7	228.2	261.2			
EGRI	52.4	139.7	232.5	270.7			
EMXI	**25.8**	**73.1**	**149.3**	**221.6**			
CMCI	33.8	80.5	**162.1**	**246.8**			
AEMI	34.9	110.3	232.4	334.2			
TVCA	36.0	100.1	194.4	280.5			
LBAR	54.2	95.8	**153.6**	**232.6**			
BAMD	66.9	116.7	205.8	368.4			
BAMM	36.7	**45.8**	**64.0**	**82.4**			
BAMS	66.3	170.9	290.6	382.5			
Forecasts	7	6	5	3			

Table 3a. NHC official (OFCL) and climatology-persistence skill baseline (OCD5) intensity forecast errors (kt) for Tropical Storm Tony, 22-25 October 2012. Mean errors for the 5-yr period 2007-11 are shown for comparison. Official errors that are smaller than the 5-yr means are shown in boldface type.

	Forecast Period (h)						
	12	24	36	48	72	96	120
OFCL	**3.6**	**5.6**	**4.3**	**3.0**	**10.0**		
OCD5	4.6	8.0	8.9	4.2	14.0		
Forecasts	11	9	7	5	1		
OFCL (2007-11)	7.1	10.8	13.0	15.0	16.9		
OCD5 (2007-11)	8.4	12.4	15.4	17.7	20.5		

Table 3b. Homogeneous comparison of selected intensity forecast guidance models (in kt) for Tropical Storm Tony, 22-25 October 2012. Errors smaller than the NHC official forecast are shown in boldface type. The number of official forecasts shown here will generally be smaller than that shown in Table 3a due to the homogeneity requirement.

Model ID	Forecast Period (h)						
	12	24	36	48	72	96	120
OFCL	3.6	5.6	4.3	3.0	10.0		
OCD5	4.6	8.0	8.9	4.2	14.0		
GHMI	6.1	10.4	13.6	9.6	14.0		
HWFI	7.5	11.7	7.6	13.6	22.0		
DSHP	5.8	8.3	7.0	8.0	27.0		
LGEM	4.5	7.8	8.1	3.8	18.0		
ICON	6.1	9.1	5.6	4.8	20.0		
IVCN	6.1	9.1	5.6	4.8	20.0		
Forecasts	11	9	7	5	1		

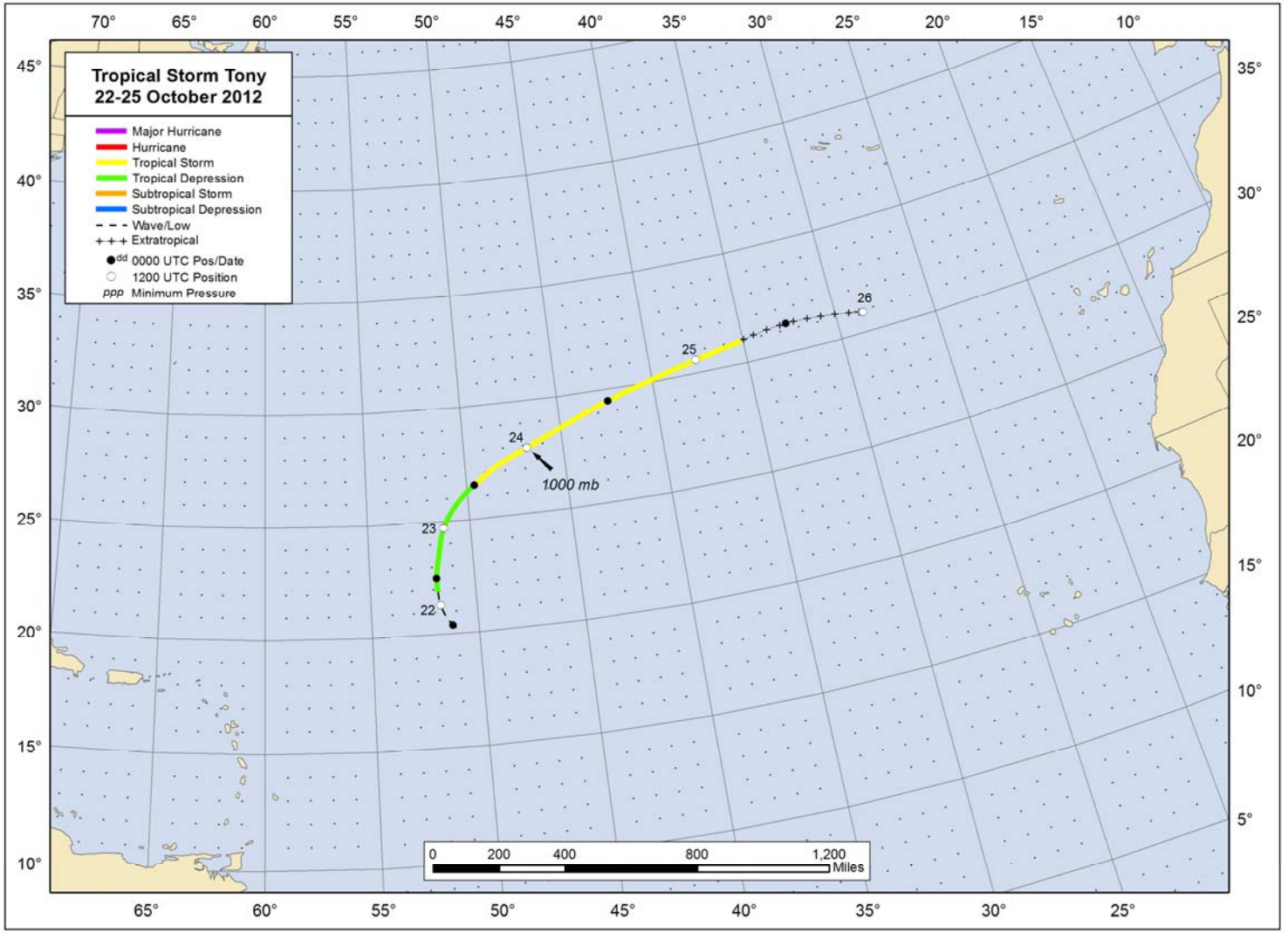

Figure 1. Best track positions for Tropical Storm Tony, 22-25 October 2012. Track during the extratropical stage is based partially on analyses from the NOAA Ocean Prediction Center.

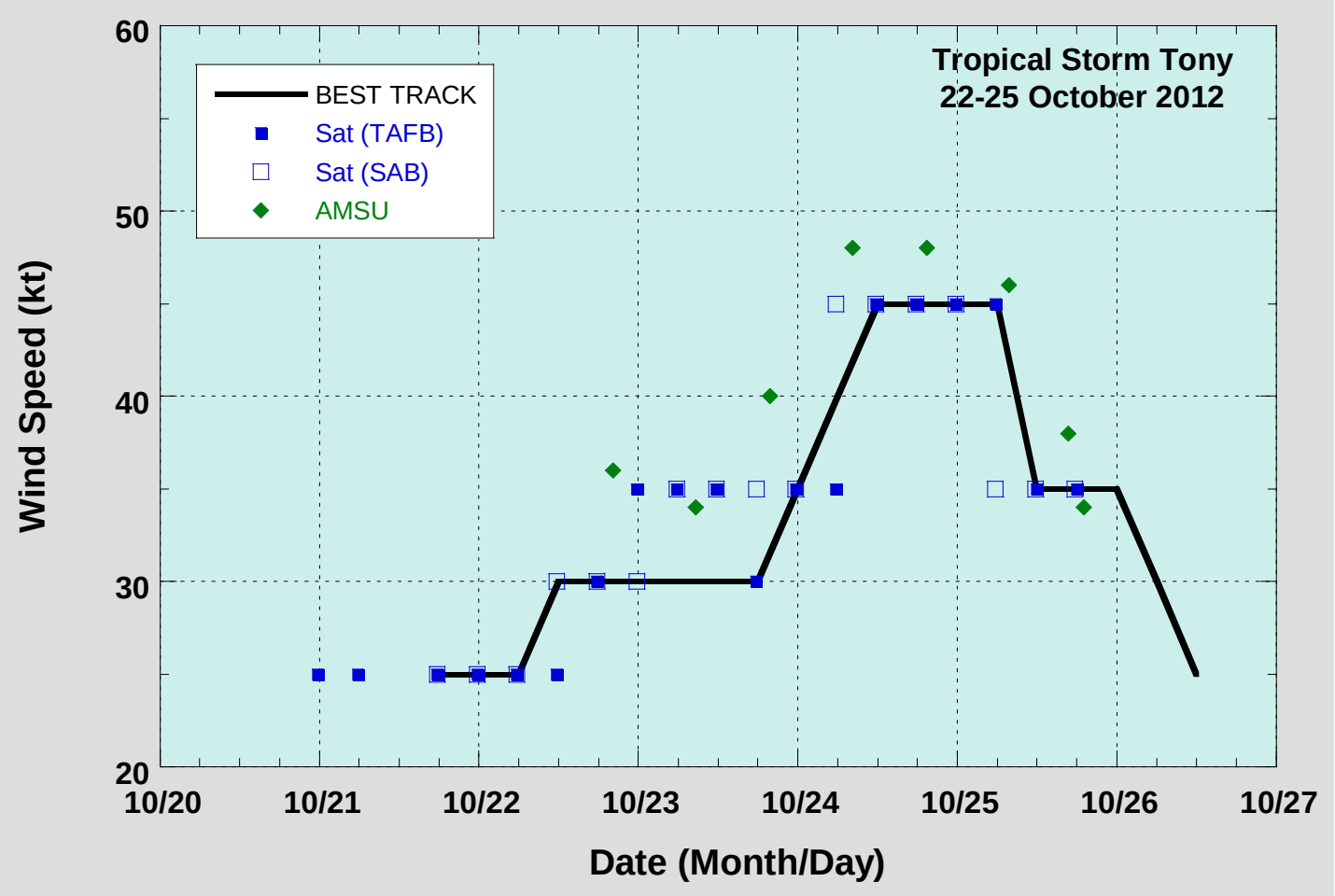

Figure 2. Selected wind observations and best track maximum sustained surface wind speed curve for Tropical Storm Tony, 22-25 October 2012. AMSU intensity estimates are from the Cooperative Institute for Meteorological Satellite Studies technique. Estimates during the extratropical stage are based partially on analyses from the NOAA Ocean Prediction Center. Dashed vertical lines correspond to 0000 UTC.

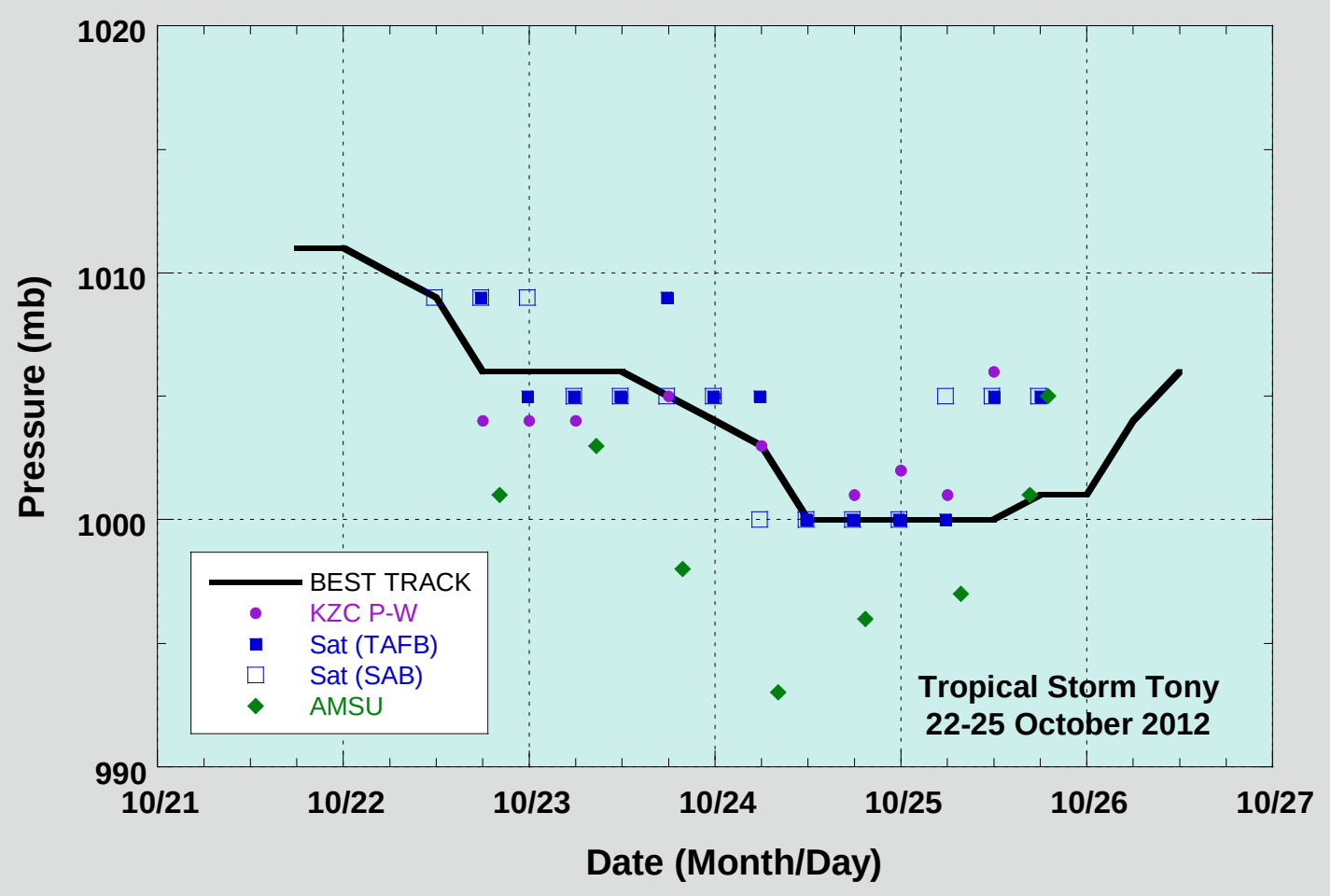

Figure 3. Selected pressure observations and best track minimum central pressure curve for Tropical Storm Tony, 22-25 October 2012. AMSU intensity estimates are from the Cooperative Institute for Meteorological Satellite Studies technique. The KZC P-W values are obtained by applying the Knaff-Zehr-Courtney pressure-wind relationship to the best track wind data. Estimates during the extratropical stage are based partially on analyses from the NOAA Ocean Prediction Center. Dashed vertical lines correspond to 0000 UTC.