

Tropical Cyclone Report
Tropical Storm Gert
(AL072011)
13 – 16 August 2011

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26 October 2011

Gert was a small tropical storm that formed over the central Atlantic Ocean, passed just to the east of Bermuda, and dissipated over the northwestern Atlantic.

a. Synoptic History

Gert originated from a frontal trough over the central Atlantic Ocean. The initial cold front moved southward over the central Atlantic on 7 and 8 August and lost much of its temperature gradient by 9 August. The resulting frontal trough remained nearly stationary to the northeast of the northern Leeward Islands during the next several days, and an upper-level shortwave trough induced the development of a well-defined low pressure system around 0600 UTC 13 August. Persistent deep convection developed near the low later that day, and a tropical depression is estimated to have formed around 1800 UTC while centered about 370 n mi southeast of Bermuda. The depression strengthened and became a tropical storm 12 h later. The “best track” of Gert’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 1¹.

Gert was located to the southwest of a central Atlantic subtropical high, and it moved slowly west-northwestward through early on 14 August. A deep-layer trough near the east coast of the United States was eroding the western end of the ridge, and this caused Gert to abruptly turn toward the northwest and north later that day. The storm strengthened little during that time due to northwesterly shear and entrainment of drier air from the west. The environment became a little more conducive for strengthening on 15 August, and Gert reached an estimated peak intensity of 55 kt around 1200 UTC as it was moving northward about 90 n mi to the east of Bermuda. Radar data from Bermuda (Fig. 4) indicate that Gert’s improved structure, consisting of a well-defined spiral band of deep convection around the center, only lasted for a few hours.

Gert began to weaken soon after reaching its peak intensity due to an increase in northeasterly shear and decreasing sea-surface temperatures. The cyclone turned northeastward and lost its deep convection early on 16 August. Gert became a post-tropical gale around 1200 UTC that day while centered about 435 n mi northeast of Bermuda, and it continued to produce gale-force winds for another 12 h. The remnant low accelerated northeastward at nearly 30 kt ahead of a cold front, and it dissipated after 1800 UTC 17 August about 400 n mi east of Cape Race, Newfoundland.

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 *bt* directory, while previous years’ data are located in the *archive* directory.

b. Meteorological Statistics

Observations in Gert (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 Dvorak estimates from the Cooperative Institute for Meteorological Satellite Studies/University of Wisconsin-Madison (UW-CIMSS). Observations also include flight-level, stepped frequency microwave radiometer (SFMR), and dropwindsonde observations from two flights of the 53rd Weather Reconnaissance Squadron of the U. S. Air Force Reserve Command. Data and imagery from NOAA polar-orbiting satellites (including UW-CIMSS Advanced Microwave Sounding Unit [AMSU] intensity estimates), the NASA Tropical Rainfall Measuring Mission (TRMM) and Aqua, the European Space Agency's Advanced Scatterometer (ASCAT), Defense Meteorological Satellite Program (DMSP) satellites, and the Bermuda Weather Service radar, among others, were also useful in constructing the best track of Gert.

Gert's estimated peak intensity of 55 kt at 1200 UTC 15 August is based on maximum SFMR-measured winds of 50 to 55 kt to the northeast of the center, as well as peak subjective satellite intensity estimates of 55 kt from TAFB. Radar data from Bermuda indicate that Gert had its tightest, most pronounced convective banding at this time. The maximum 850-mb flight-level wind measured by the Air Force Reserve aircraft was 61 kt at 1431 UTC. The estimated minimum central pressure of 1000 mb is based on a dropwindsonde measurement of 1002 mb with a surface wind of 26 kt at 1142 UTC 15 August.

No winds of tropical storm force were reported by land stations, ships, or buoys in association with Gert.

c. Casualty and Damage Statistics

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

d. Forecast and Warning Critique

The genesis of Gert was not forecast particularly well. The precursor disturbance was first mentioned in the Tropical Weather Outlook at 0600 UTC 12 August and given a "low" (< 30%) chance of genesis over the next 48 h, 1.5 days before it became a tropical depression. The disturbance was given a "medium" (30 – 50%) chance of development 18 h before genesis and a "high" (> 50%) chance at the time of genesis.

A verification of NHC official track forecasts for Gert through 48 h is given in Table 2a. Based on CLIPER (OCD5) errors, Gert's track was a little more difficult to forecast compared to an average Atlantic tropical cyclone over the past 5 yr. Still, official forecast track errors were smaller than the mean official errors for the previous 5-yr period through 36 h and were skillful relative to OCD5 through 48 h. A homogeneous comparison of the official track errors with selected guidance models is given in Table 2b. Although the sample size in the verification is

small, the European Centre for Medium-Range Weather Forecasts model (EMXI) was the only model that had consistently lower errors than the official forecast. The official forecast performed better than the multi-model consensus for the Atlantic basin, TVCA. The UKMET model (EGRI)—and consequently the GUNA consensus—did not meet the homogeneity requirement to be included in the verification.

A verification of NHC official intensity forecasts for Gert is given in Table 3a. Official forecast intensity errors were less than the mean official errors for the previous 5-yr period and were more skillful than SHIFOR (OCD5) at 24 through 48 h. A homogeneous comparison of the official intensity errors with selected guidance models is given in Table 3b. Only the 12-h consensus model (ICON and IVCN) forecasts and the 24-h dynamical hurricane model (GHMI and HWFI) forecasts had lower average errors than the official forecasts at those times, but the sample size is too small to draw any meaningful conclusions.

The Bermuda Weather Service issued a tropical storm watch for Bermuda at 0300 UTC 14 August and upgraded it to a tropical storm warning at 1500 UTC that day, roughly 24 h before Gert's closest approach to the island. The tropical storm warning was discontinued at 1500 UTC 15 August when Gert was located due east of and beginning to move away from the island.

Table 1. Best track for Tropical Storm Gert, 13 – 16 August 2011.

Date/Time (UTC)	Latitude (°N)	Longitude (°W)	Pressure (mb)	Wind Speed (kt)	Stage
13 / 0600	26.2	58.0	1013	30	low
13 / 1200	26.9	59.4	1012	30	"
13 / 1800	27.3	60.6	1011	30	tropical depression
14 / 0000	27.5	61.5	1011	30	"
14 / 0600	27.7	62.3	1011	35	tropical storm
14 / 1200	28.1	62.9	1010	40	"
14 / 1800	28.8	63.1	1009	40	"
15 / 0000	29.6	63.3	1006	45	"
15 / 0600	30.6	63.4	1003	50	"
15 / 1200	31.6	63.2	1000	55	"
15 / 1800	32.9	62.7	1003	50	"
16 / 0000	34.2	61.6	1005	45	"
16 / 0600	35.6	60.3	1007	45	"
16 / 1200	37.1	58.1	1008	40	low
16 / 1800	38.6	55.8	1008	40	"
17 / 0000	40.1	53.4	1010	35	"
17 / 0600	41.5	50.9	1012	30	"
17 / 1200	42.9	48.3	1014	30	"
17 / 1800	44.9	44.8	1015	30	"
18 / 0000					dissipated
15 / 1200	31.6	63.2	1000	55	maximum wind and minimum pressure

Table 2a. NHC official (OFCL) and climatology-persistence skill baseline (OCD5) track forecast errors (n mi) for Tropical Storm Gert, 13 – 16 August 2011. Mean errors for the 5-yr period 2006-10 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	27.8	47.8	61.0	95.8			
OCD5	53.9	105.1	213.0	284.9			
Forecasts	8	6	4	2			
OFCL (2006-10)	31.0	50.6	69.9	89.5	133.2	174.2	214.8
OCD5 (2006-10)	47.7	98.3	156.4	218.1	323.3	402.2	476.1

Table 2b. Homogeneous comparison of selected track forecast guidance models (in n mi) for Tropical Storm Gert, 13 – 16 August 2011. 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	26.9	50.1	65.5	107.4			
OCD5	58.1	117.9	246.2	310.3			
GFSI	46.7	113.4	209.8	345.2			
GHMI	25.3	70.0	184.8	173.6			
HWFI	39.3	78.5	138.6	115.6			
GFNI	44.5	73.9	66.0	107.4			
NGPI	50.6	66.9	67.3	130.1			
EMXI	22.0	26.4	33.3	34.2			
NAMI	45.0	85.2	141.0	274.4			
AEMI	36.8	60.2	85.5	63.8			
TVCA	31.8	54.7	98.5	141.0			
TVCC	30.4	48.5	83.5	130.4			
LBAR	38.5	62.2	132.0	124.9			
BAMD	56.0	119.2	233.4	337.2			
BAMM	51.4	106.8	207.2	295.2			
BAMS	45.3	94.2	188.8	288.5			
Forecasts	7	5	3	1			

Table 3a. NHC official (OFCL) and climatology-persistence skill baseline (OCD5) intensity forecast errors (kt) for Tropical Storm Gert, 13 – 16 August 2011. Mean errors for the 5-yr period 2006-10 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	8.1	9.2	5.0	2.5			
OCD5	8.1	10.8	6.5	3.0			
Forecasts	8	6	4	2			
OFCL (2006-10)	7.2	11.0	13.2	15.1	17.2	17.9	18.7
OCD5 (2006-10)	8.5	12.3	15.4	17.8	20.2	21.9	21.7

Table 3b. Homogeneous comparison of selected intensity forecast guidance models (in kt) for Tropical Storm Gert, 13 – 16 August 2011. 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	8.6	10.0	3.3	0.0			
OCD5	8.3	11.4	4.7	3.0			
GHMI	8.6	16.0	11.7	2.0			
HWFI	8.7	9.0	6.0	1.0			
GFNI	10.0	7.2	5.3	5.0			
DSHP	8.6	11.6	5.7	1.0			
LGEM	8.9	12.2	8.0	2.0			
ICON	8.0	12.0	5.3	0.0			
IVCN	8.4	11.0	4.0	1.0			
Forecasts	7	5	3	1			

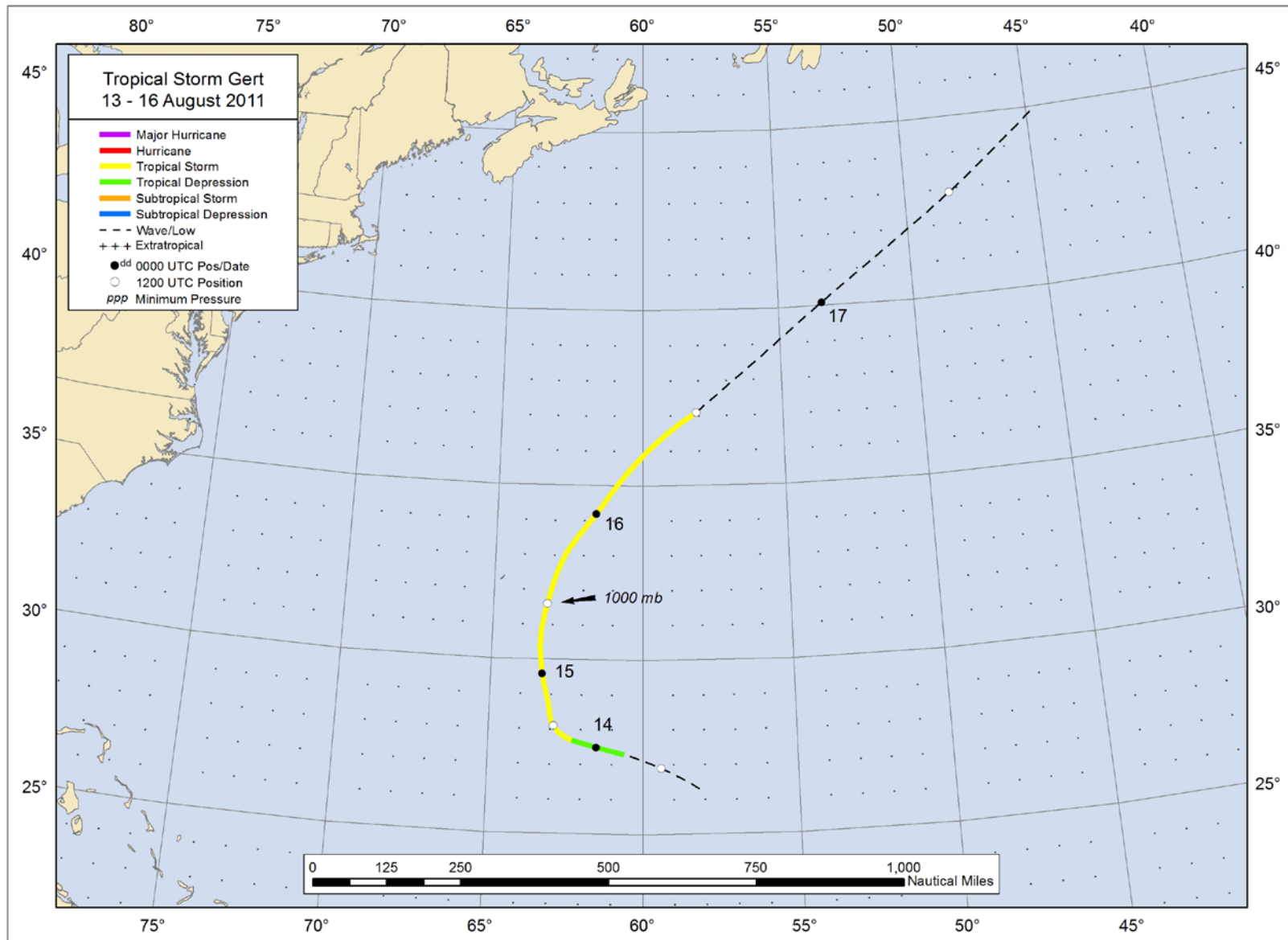


Figure 1. Best track positions for Tropical Storm Gert, 13 – 16 August 2011.

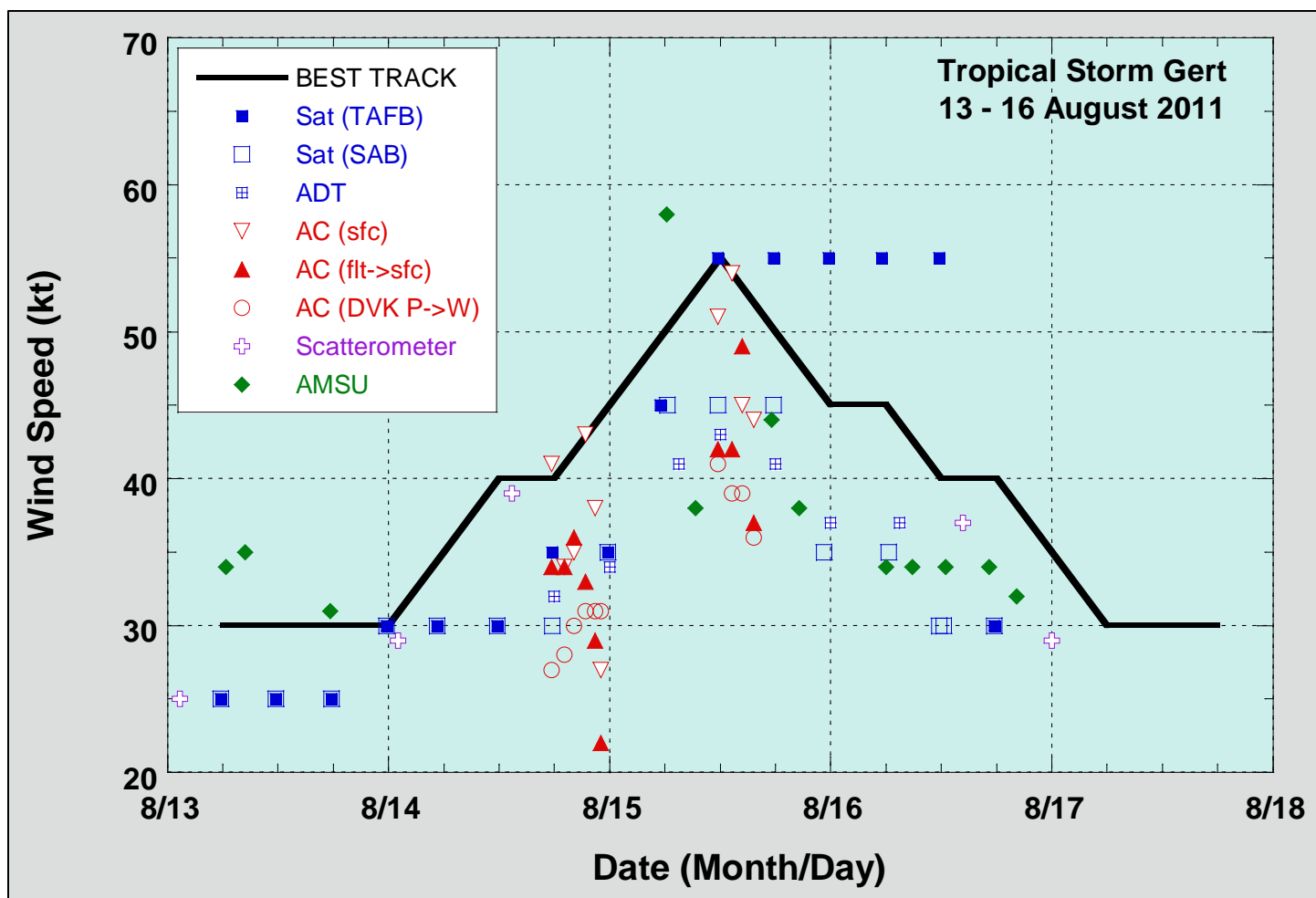


Figure 2. Selected wind observations and best track maximum sustained surface wind speed curve for Tropical Storm Gert, 13 – 16 August 2011. Aircraft observations have been adjusted for elevation using an 80% adjustment factor for observations from 850 mb. Advanced Dvorak Technique estimates represent linear averages over a three-hour period centered on the nominal observation time. AMSU intensity estimates are from the Cooperative Institute for Meteorological Satellite Studies technique. Estimates during the post-tropical stage are based on analyses from the NOAA Ocean Prediction Center. Dashed vertical lines correspond to 0000 UTC.

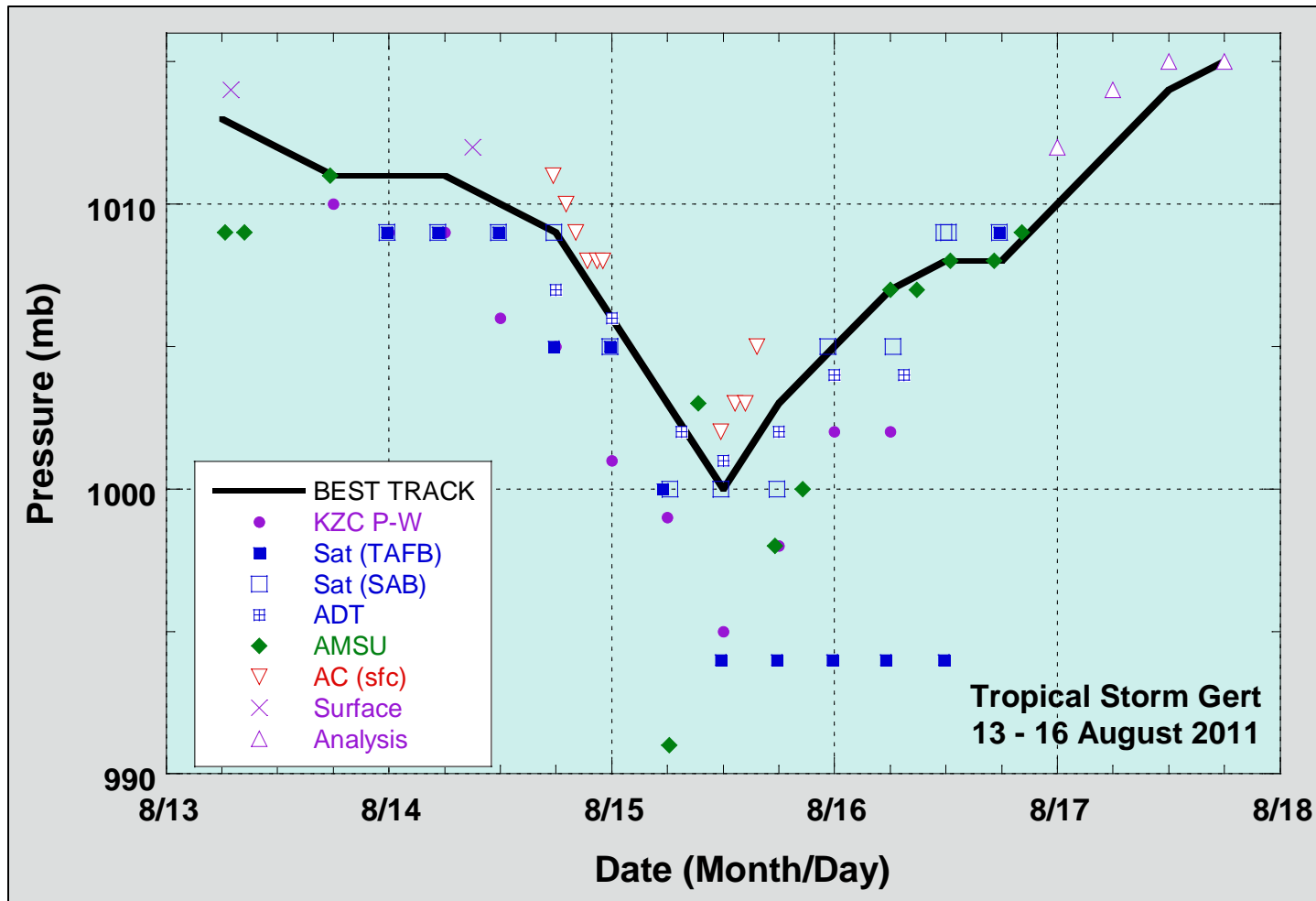


Figure 3. Selected pressure observations and best track minimum central pressure curve for Tropical Storm Gert, 13 – 16 August 2011. Advanced Dvorak Technique estimates represent linear averages over a three-hour period centered on the nominal observation time. AMSU intensity estimates are from the Cooperative 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 post-tropical stage are based on analyses from the NOAA Ocean Prediction Center. Dashed vertical lines correspond to 0000 UTC.

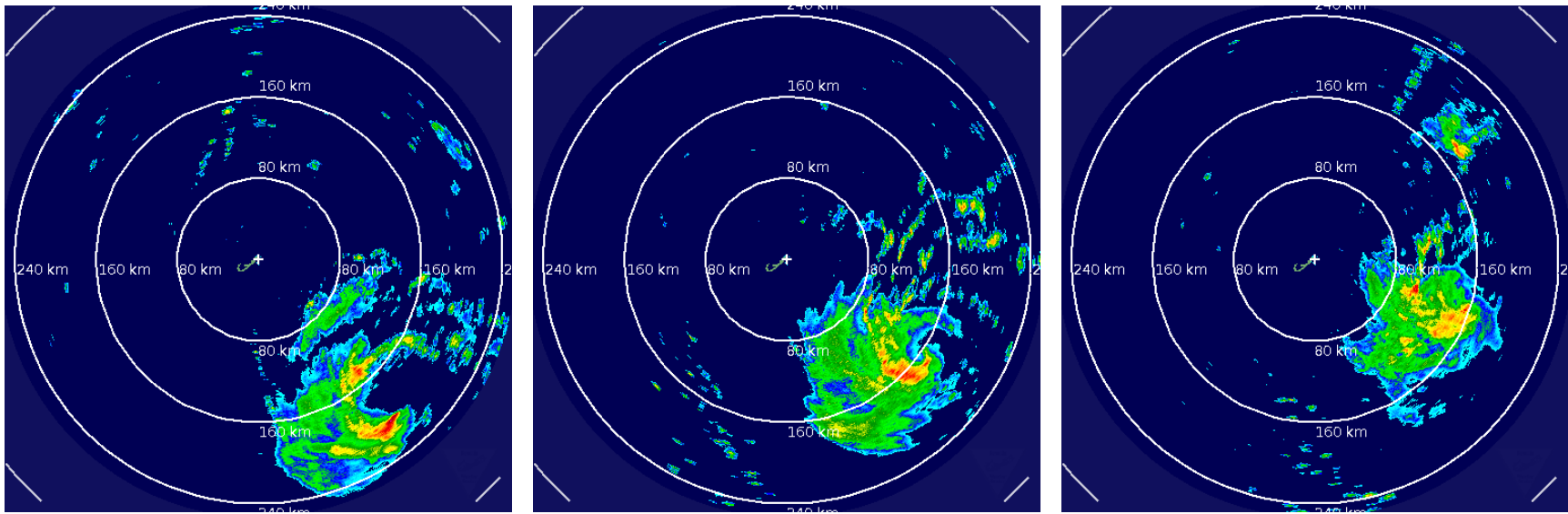


Figure 4. Radar images from Bermuda at 0912 UTC (left), 1212 UTC (middle), and 1512 UTC (right) 15 August 2011 showing the evolution of the structure of Tropical Storm Gert over a 6-h period centered on the time of its peak intensity. Images courtesy of the Bermuda Weather Service.