Unnamed Tropical Storm
(AL022006)
17-18 July 2006

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As part of its routine post-season review, the Tropical Prediction Center/National Hurricane Center (TPC/NHC) occasionally identifies a previously undesignated tropical or subtropical cyclone based on new data or meteorological interpretation. The TPC/NHC re-analysis of 2006 has re-classified a short-lived system as a tropical storm. The storm remained offshore of the northeastern United States and Nova Scotia and dissipated as a tropical cyclone before moving across Newfoundland.

a. Synoptic History

The tropical cyclone originated along the tail end of a cold front that moved offshore of the northeastern United States late on 13 July and stalled over the western Atlantic Ocean. An extratropical low formed on 16 July along the decaying front when an upper trough approached from the west. The trough weakened, and the low moved slowly northeastward over warm waters with temperatures of 27°-28°C. Buoy and satellite data suggest the front associated with the low dissipated late on 16 July. However, the low lacked organized convection until early the next day when a large burst of convection formed near the center early on 17 July. It is estimated that a tropical depression formed at 0600 UTC 17 July about 210 n mi southeast of Nantucket Island, Massachusetts. 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.

Satellite intensity estimates indicate the low attained tropical storm strength six hours later while accelerating toward the northeast. A large curved band of convection formed in the northern portion of the storm, with other banding features becoming more prominent throughout the day. The system reached a peak intensity of about 45 kt twelve hours after genesis. Shortly thereafter, the cyclone crossed the north wall of the Gulf Stream and encountered much lower sea-surface temperatures. Convection significantly diminished overnight and by 1200 UTC 18 July, the system became a non-convective remnant low. The system moved across Newfoundland later on 18 July, then turned toward the east-northeast and dissipated on 19 July over the open waters of the north Atlantic Ocean.

b. Meteorological Statistics

Observations in this system (Figs. 2 and 3) include satellite-based Hebert-Poteat subtropical technique intensity estimates from the Tropical Analysis and Forecast Branch (TAFB) and the Satellite Analysis Branch (SAB). Microwave satellite imagery from NOAA polar-orbiting satellites, the NASA Tropical Rainfall Measuring Mission (TRMM), the NASA QuikSCAT and Aqua, and Defense Meteorological Satellite Program (DMSP) satellites were also useful in the analysis of the storm.

There are several pieces of evidence suggesting that this system had enough tropical characteristics to be considered a tropical storm instead of a non-tropical low as it was assessed operationally. Data from the Advanced Microwave Sounding Unit (AMSU), which was not available in real-time, show that the system had a significant warm core in the troposphere (Figure 4). Diagnostics data from the GFS model also analyzed the low as warm-core in nature. Figure 5 shows a phase diagram from Florida State University at the time of genesis, showing the low with the symmetric, warm core characteristics of a tropical cyclone. While real-time satellite classifications were performed on the system, they were subtropical in nature. Tropical classifications were not given at the time because the low was analyzed to be attached to fronts. A further examination of the temperature field near the storm reveals no significant frontal boundaries near the low (Figure 6) with uniform southerly winds everywhere outside of the circulation of the low. Figure 7 shows the system with a large burst of convection and the overall satellite appearance of a sheared tropical cyclone.

A QuikSCAT pass at 2234 UTC 17 July also strongly suggests the system was a tropical cyclone. The pass revealed winds of 40 to 45 kt with an approximate radius of maximum winds of 30 n mi. There was also no evidence of frontal structures in the wind field surrounding the low. Canadian buoy 44011 supports this assertion as the system passed 75 n mi west of the station. Temperature data from the buoy show that there was no cold air advection on the western side of the storm.

The cyclone passed very close to Canadian buoy 44137, providing more evidence that supports a tropical classification of this system. Data from the buoy show no significant temperature change in the vicinity of the cyclone, and also exhibit a steep drop in pressures plus a sharp increase in wind (Figure 8), typical of a tropical cyclone. The buoy reported 10 minute sustained 31 kt winds at 5 m elevation gusting to 38 kt at 2300 UTC 17 July with a minimum pressure of 1001.2 mb recorded one hour later. Figure 9 shows an infrared image as the system passed the buoy.

c. Casualty and Damage Statistics

There were no reports of casualties or damage due to this storm.

d. Forecast and Warning Critique

This system was mentioned in the Tropical Weather Outlook products for about 15 hours prior to tropical cyclogenesis. However, the Outlooks prognosticated only a low chance of further development due to the system nearing much cooler water.

No official forecasts were issued for the system, thus no verification is available. Operationally, it was treated as a non-tropical gale in High Seas forecasts issued by the Ocean Prediction Center.

e. Acknowledgements

Derrick Herndon at University of Wisconsin CIMSS, Chris Fogarty at the Canadian Hurricane Centre in Dartmouth, and Bob Hart of Florida State University supplied data and figures for the report.

Table 1. Best track for Unnamed Tropical Storm, 17-18 July 2006.

Date/Time (UTC)	Latitude (°N)	Longitude (°W)	Pressure (mb)	Wind Speed (kt)	Stage
16 / 1200	37.2	68.7	1009	30	extratropical
16 / 1800	37.7	68.2	1009	30	"
17 / 0000	38.3	67.6	1009	30	"
17 / 0600	39.1	66.4	1008	30	tropical depression
17 / 1200	40.0	65.1	1003	40	tropical storm
17 / 1800	41.1	63.7	998	45	"
18 / 0000	42.4	62.1	999	40	"
18 / 0600	43.7	60.1	1004	35	"
18 / 1200	45.5	58.0	1007	30	remnant low
18 / 1800	47.1	55.8	1009	25	"
19 / 0000	48.6	52.9	1012	25	"
19 / 0600	49.2	49.4	1012	25	"
19 / 1200	49.8	46.1	1014	25	"
19 / 1800					dissipated
17 / 1800	41.1	63.7	998	45	minimum pressure

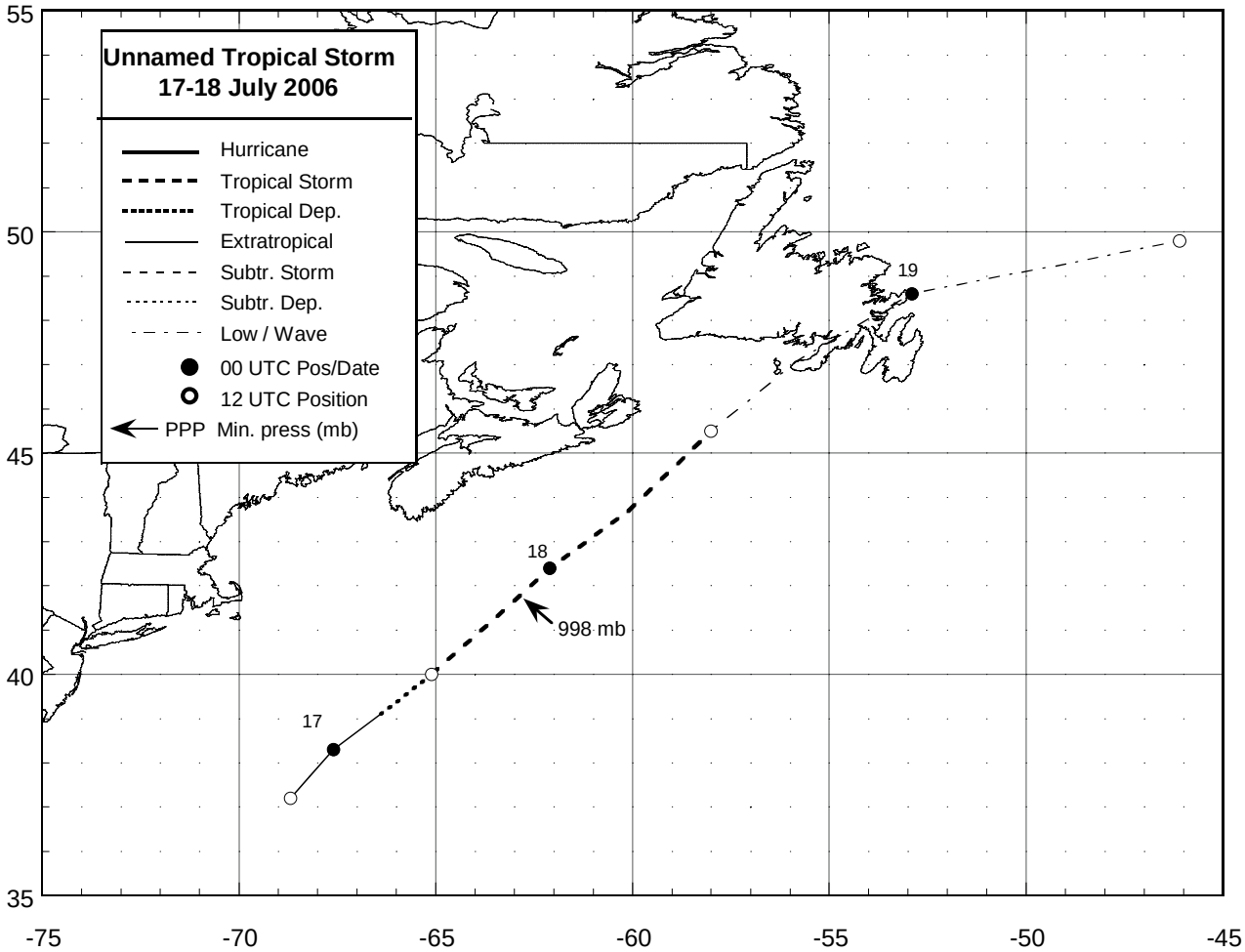

Figure 1. Best track positions for Unnamed Tropical Storm, 17-18 July 2006. Track during the extratropical and low stage is based on analyses from the NOAA Ocean Prediction Center.

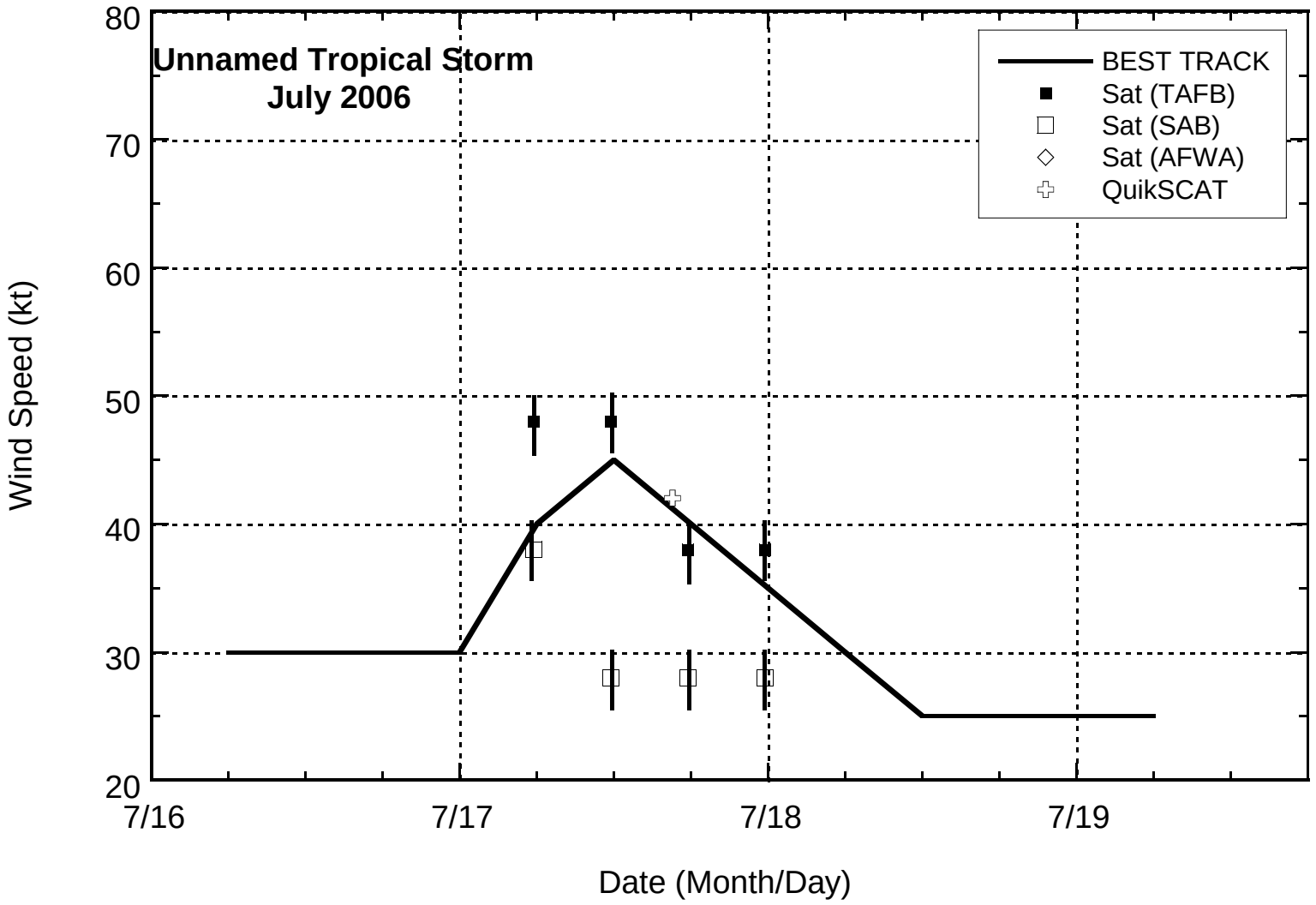

Figure 2. Selected wind observations and best track maximum sustained surface wind speed curve for Unnamed Tropical Storm, 17-18 July 2006. Estimates during the extratropical and low stage are based on analyses from the NOAA Ocean Prediction Center. Satellite classifications represent the mid-point of the Hebert-Poteat classification range, with the range indicated by the thin vertical bars.

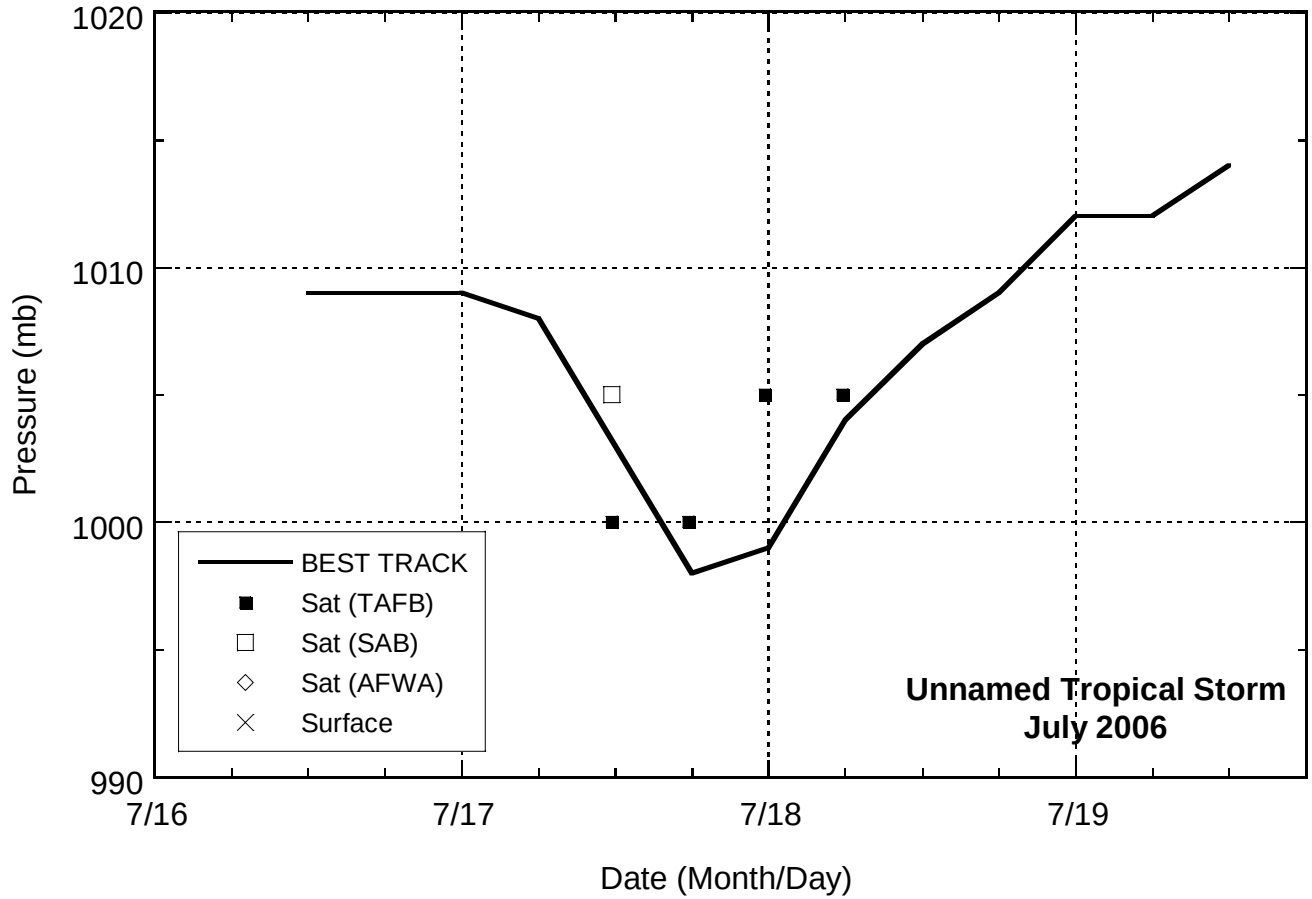

Figure 3. Selected pressure observations and best track minimum central pressure curve for Unnamed Tropical Storm, 17-18 July 2006. Estimates during the extratropical and low stage are based on analyses from the NOAA Ocean Prediction Center.

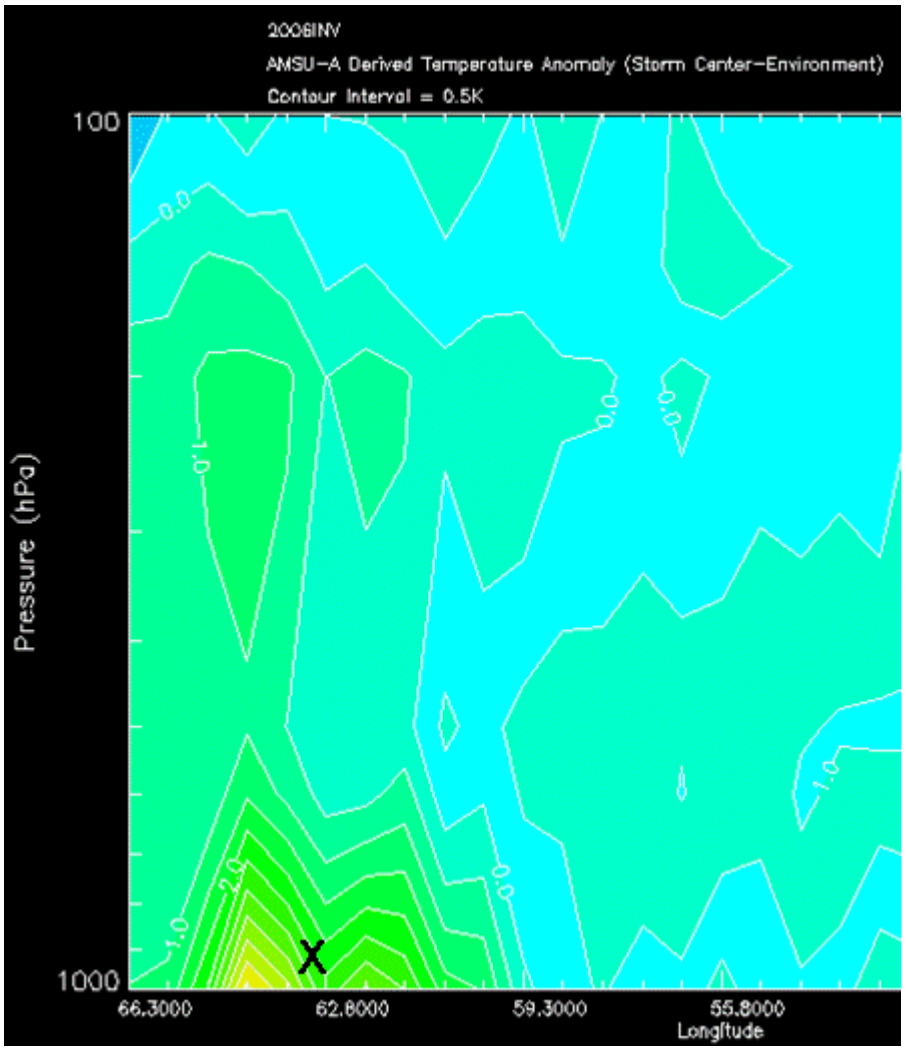

Figure 4. AMSU-A vertical cross-section of temperatures anomalies near the storm at 2047 UTC 17 July. The X denotes the center of the system. Figure courtesy CIMSS.

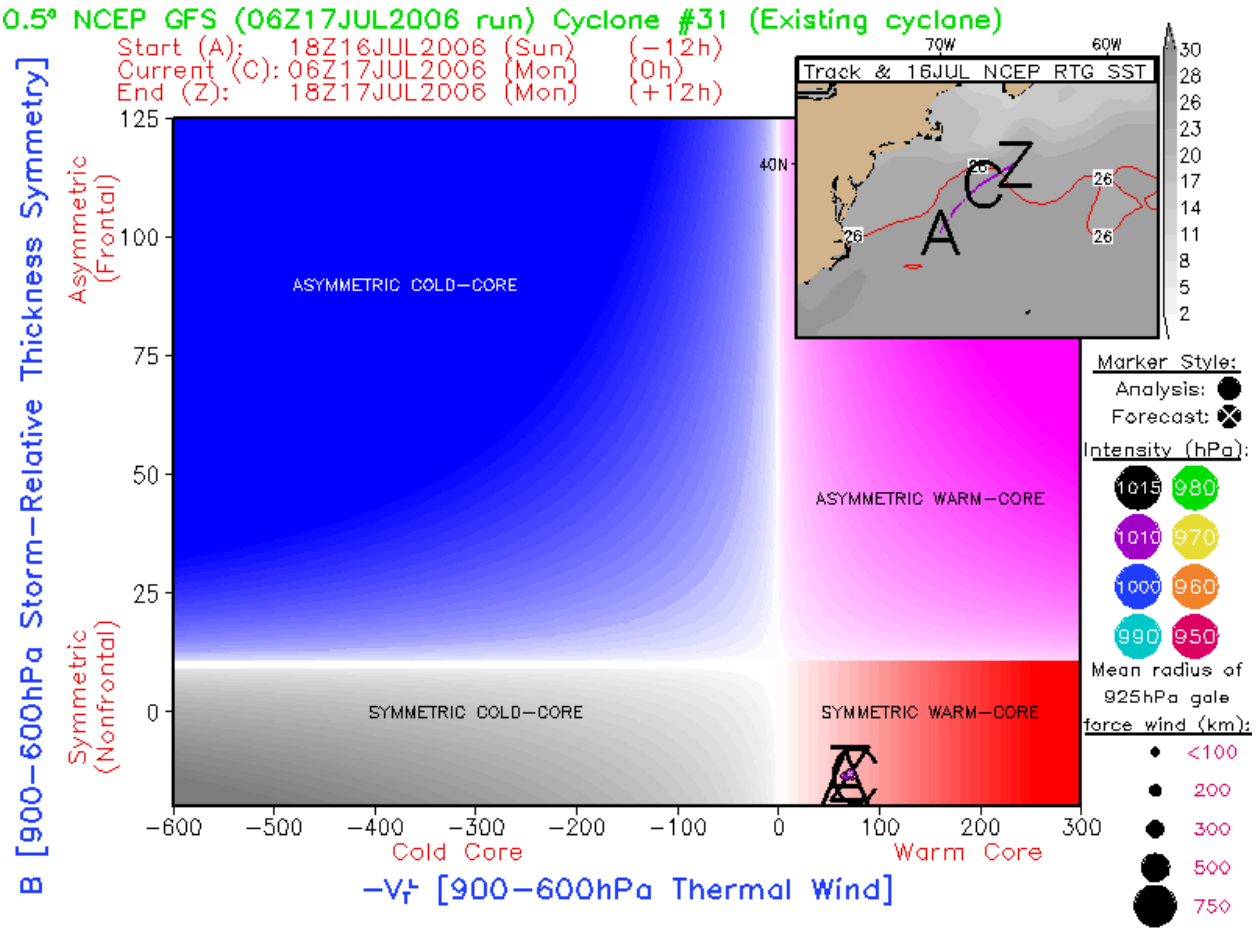

Figure 5. Phase diagram from the Global Forecast System (GFS) model showing the symmetric warm core nature of the system. Figure courtesy Florida State University.

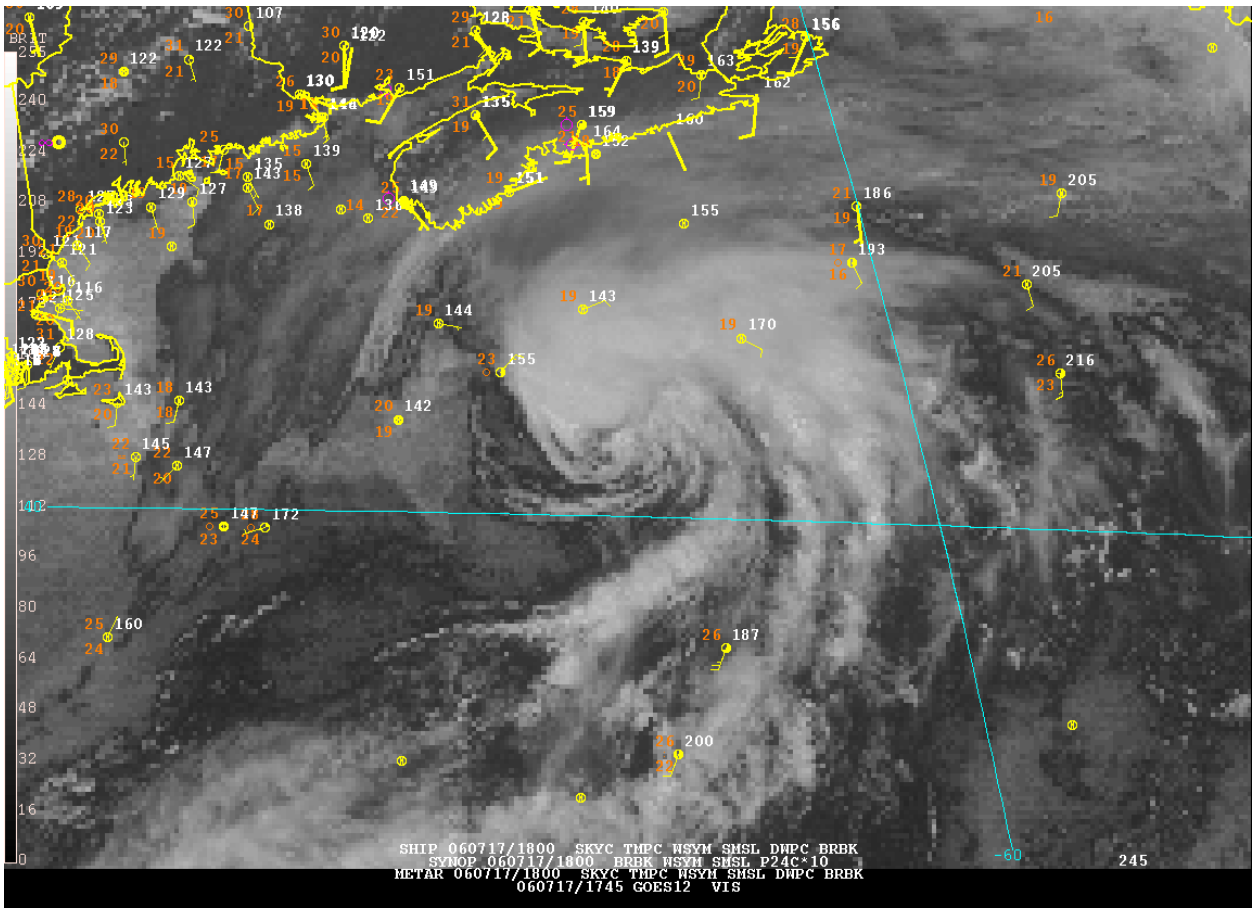

Figure 6. Visible satellite picture at 1800 UTC 17 July with temperatures, pressures and winds overlaid. Note the near uniform temperatures around the center and almost uniform southerly winds outside of the circulation.

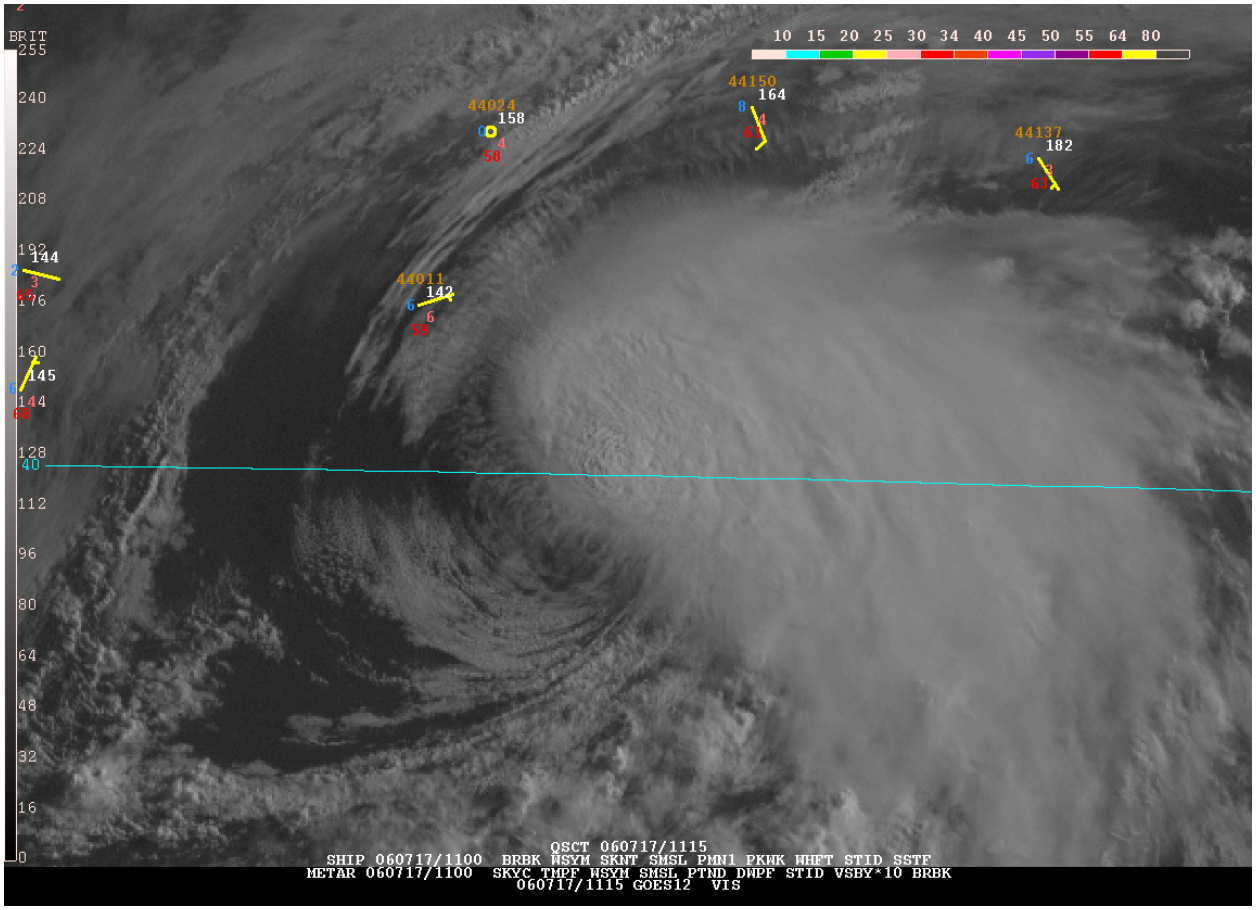

Figure 7. 1100 UTC visible satellite picture on 17 July.

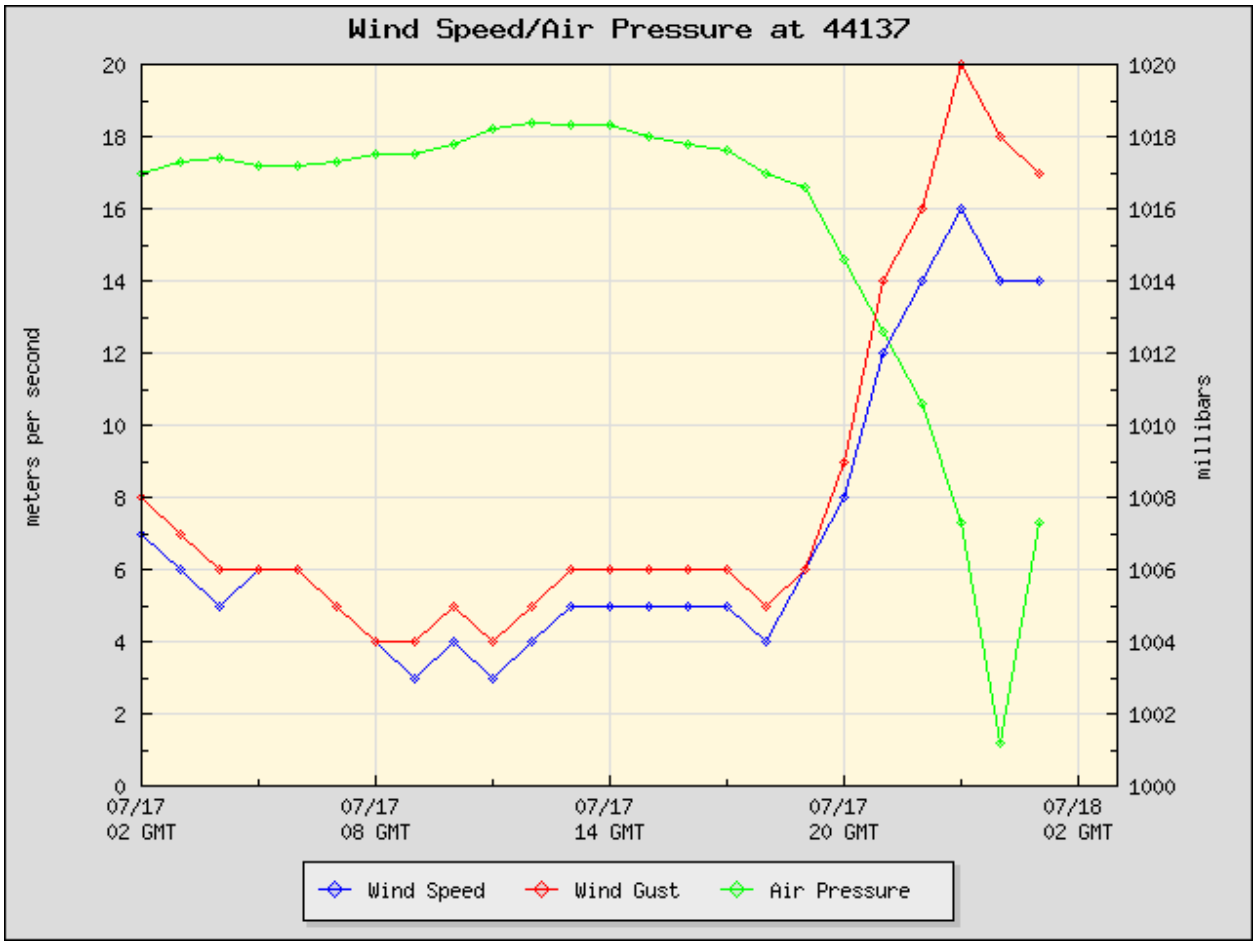

Figure 8. Time-series of meteorological data from Buoy 44137 (courtesy NDBC).

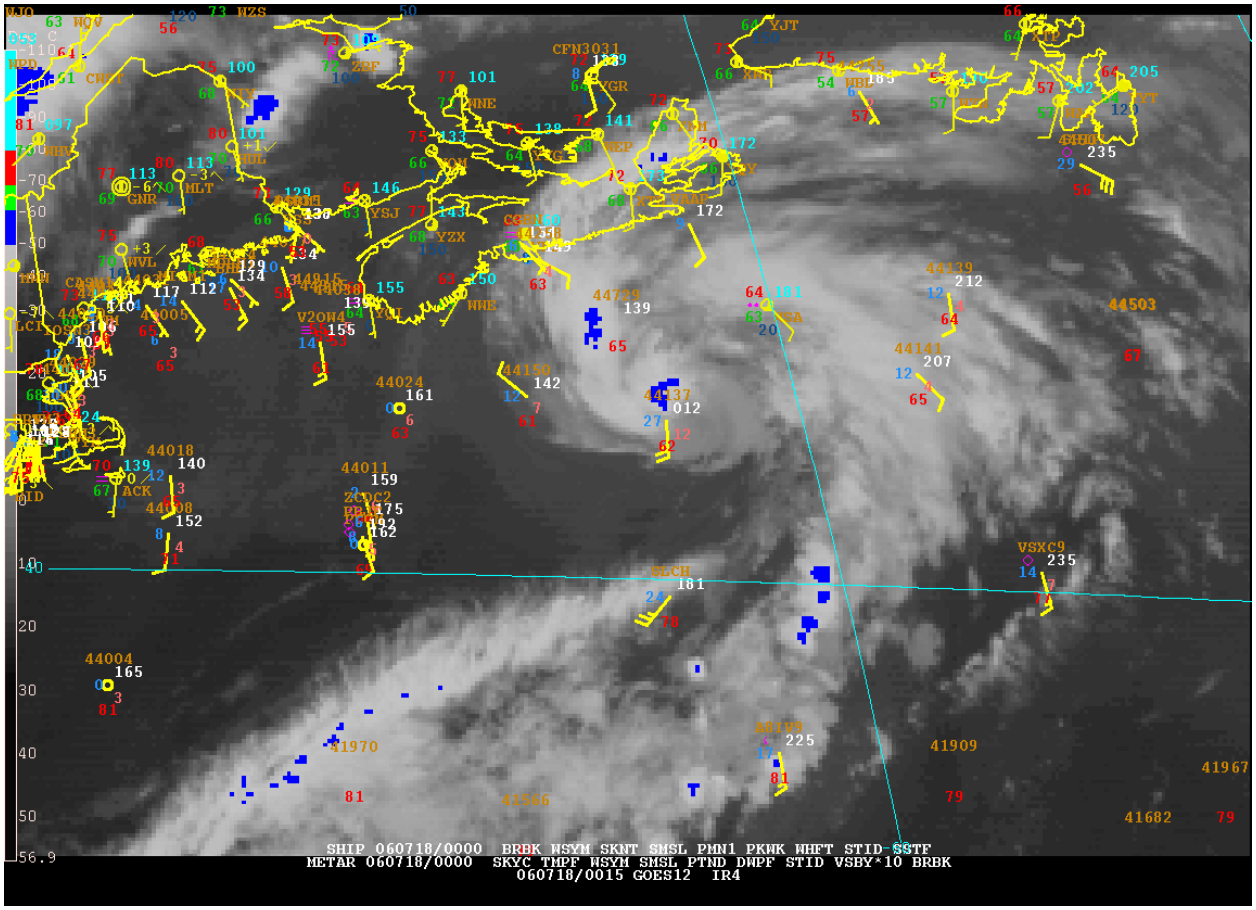

Figure 9. 0015 UTC 18 July infrared picture. Note the pressure of 1001.2 mb at buoy 44137 (center). The buoy reported 1017 mb six hours beforehand.