

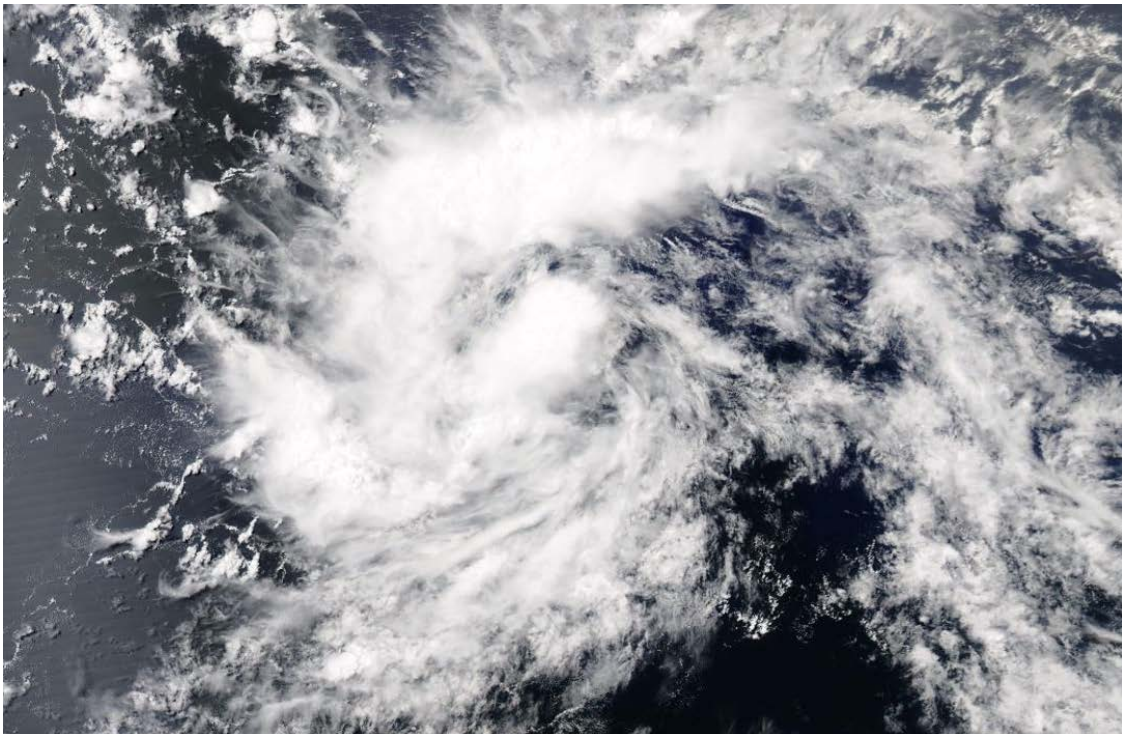


# NATIONAL HURRICANE CENTER TROPICAL CYCLONE REPORT

## TROPICAL STORM DON (AL052017)

17 – 18 July 2017

Eric S. Blake  
National Hurricane Center  
19 December 2017



NASA TERRA MODIS SATELLITE IMAGE OF DON AT 1707 UTC 17 JULY 2017.

Don was the third short-lived tropical cyclone to form in the deep Tropics early in the 2017 Atlantic hurricane season. It reached an intensity of 45 kt before decaying into a wave as it approached the Windward Islands.

# Tropical Storm Don

17 – 18 JULY 2017

## SYNOPTIC HISTORY

The precursor to Don was a tropical wave that moved off the west coast of Africa on 12 July with a small area of deep convection. This convection dissipated and any further activity was limited to the Intertropical Convergence Zone during the next few days while the wave moved westward. On 15 July, thunderstorms increased near the wave axis, likely due to a convectively coupled Kelvin wave passage. As a result, the wave amplified through the following day with an inverted-V structure noted on satellite images, as well as a mid-level circulation center also present. A burst of convection started late on 16 July, causing the generation of a surface low early the next day, and a tropical depression formed around 0600 UTC 17 July about 630 n mi east-southeast of Barbados. The depression became a tropical storm 6 h later. The “best track” chart of Don’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<sup>1</sup>.

Don gradually strengthened on 17 July as it moved quickly westward beneath a mid-level ridge. The small tropical cyclone reached a peak intensity of 45 kt at 0000 UTC 18 July according to Air Force Reserve reconnaissance aircraft data. However, some dry air aloft and westerly shear caused the storm to weaken overnight while it approached the southern Windward Islands. Don opened up into a tropical wave shortly after 1200 UTC 18 July about 150 n mi southeast of Barbados due to the unfavorable environment and its increasing forward speed. The remnant wave moved across the Windward Islands late on 18 July and produced a few showers and thunderstorms before losing its identity while moving rapidly westward across the Caribbean Sea.

## METEOROLOGICAL STATISTICS

Observations in Don (Figs. 2 and 3) include subjective satellite-based Dvorak technique intensity estimates from the Tropical Analysis and Forecast Branch (TAFB), the Satellite Analysis Branch (SAB), and the Advanced Dvorak Technique (ADT) from CIMSS at the University of Wisconsin. Observations also include flight-level, stepped frequency microwave radiometer (SFMR), and dropwindsonde observations from 3 flights of the 53<sup>rd</sup> Weather Reconnaissance Squadron of the U. S. Air Force Reserve Command. Data and imagery from NOAA polar-orbiting satellites including the Advanced Microwave Sounding Unit (AMSU), the NASA Global Precipitation Mission (GPM), the European Space Agency’s Advanced Scatterometer (ASCAT),

---

<sup>1</sup> 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*k directory, while previous years’ data are located in the *archive* directory.

and Defense Meteorological Satellite Program (DMSP) satellites, among others, were also useful in constructing the best track of Don.

The peak intensity of 45 kt is based on believable SFMR winds of 40-45 kt late on 17 July and a dropsonde at 2124 UTC 17 July which had a surface wind of 44 kt and surface-adjusted 150-m boundary layer winds of 43 kt. Generally, the Dvorak estimates were low biased for Don, perhaps due to the small size.

There were no ship or land reports of sustained tropical-storm-force winds associated with Don. Hewanorra International Airport on St. Lucia reported a wind gust to 35 kt at 2200 UTC 18 July after Don had dissipated.

## CASUALTY AND DAMAGE STATISTICS

There were no damage or deaths associated with Don.

## FORECAST AND WARNING CRITIQUE

The genesis forecasts for Don were poor (Table 2). The potential for tropical cyclone development was introduced into the Tropical Weather Outlook (TWO) only 30 h before genesis occurred and raised to a medium (40%-60%) chance of 5-day formation only 24 h before formation. However, the 2-day probability did not reach the medium category because it was thought that dry air and some shear would likely prevent tropical cyclone formation.

A verification of the official track and intensity forecasts is given in Tables 3 and 4. Only two verifying forecasts are available at 12 h, and none were available beyond that time, so no meaningful comparisons of the average NHC or model errors can be made.

Watches and warnings associated with Don are given in Table 5. Operationally, advisories on Don were continued for about 12 h after the cyclone had degenerated into a wave in the best track due to uncertainties on whether Don was still a tropical cyclone.

Table 1. Best track for Tropical Storm Don, 17 – 18 July 2017.

Date/Time (UTC)	Latitude (°N)	Longitude (°W)	Pressure (mb)	Wind Speed (kt)	Stage
17 / 0000	10.3	47.7	1011	25	low
17 / 0600	10.4	49.1	1010	30	tropical depression
17 / 1200	10.7	50.6	1009	35	tropical storm
17 / 1800	11.0	52.2	1007	40	"
18 / 0000	11.2	53.8	1005	45	"
18 / 0600	11.3	55.4	1008	40	"
18 / 1200	11.4	57.1	1011	35	"
18 / 1800					dissipated
18 / 0000	11.2	53.8	1005	45	minimum pressure and maximum winds

Table 2. Number of hours in advance of formation of Don associated with the first NHC Tropical Weather Outlook forecast in the indicated likelihood category. Note that the timings for the “Low” category do not include forecasts of a 0% chance of genesis.

	Hours Before Genesis	
	48-Hour Outlook	120-Hour Outlook
Low (<40%)	30	30
Medium (40%-60%)		24
High (>60%)		



Table 3. NHC official (OFCL) and climatology-persistence skill baseline (OCD5) track forecast errors (n mi) for Don. Mean errors for the previous 5-yr period 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	<b>13.4</b>						
OCD5	17.6						
Forecasts	2						
OFCL (2012-16)	24.9						
OCD5 (2012-16)	47.3						

Table 4. NHC official (OFCL) and climatology-persistence skill baseline (OCD5) intensity forecast errors (kt) for Don. Mean errors for the previous 5-yr period 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	<b>5.0</b>						
OCD5	8.5						
Forecasts	2						
OFCL (2012-16)	5.5						
OCD5 (2012-16)	7.1						



Table 5. Watch and warning summary for Tropical Storm Don, 17-18 July 2017.

<b>Date/Time (UTC)</b>	<b>Action</b>	<b>Location</b>
17 / 2100	Tropical Storm Warning issued	Grenada
17 / 2100	Tropical Storm Watch issued	St. Lucia, Barbados, St. Vincent and the Grenadines
18 / 0300	Tropical Storm Warning issued	St. Vincent and the Grenadines
18 / 0600	Tropical Storm Watch issued	Bonaire
18 / 1500	Tropical Storm Watch discontinued	St. Lucia
18 / 1800	Tropical Storm Watch discontinued	Barbados
19 / 0000	Tropical Storm Watch discontinued	Bonaire
19 / 0300	Tropical Storm Warning discontinued	Grenada, St. Vincent and the Grenadines

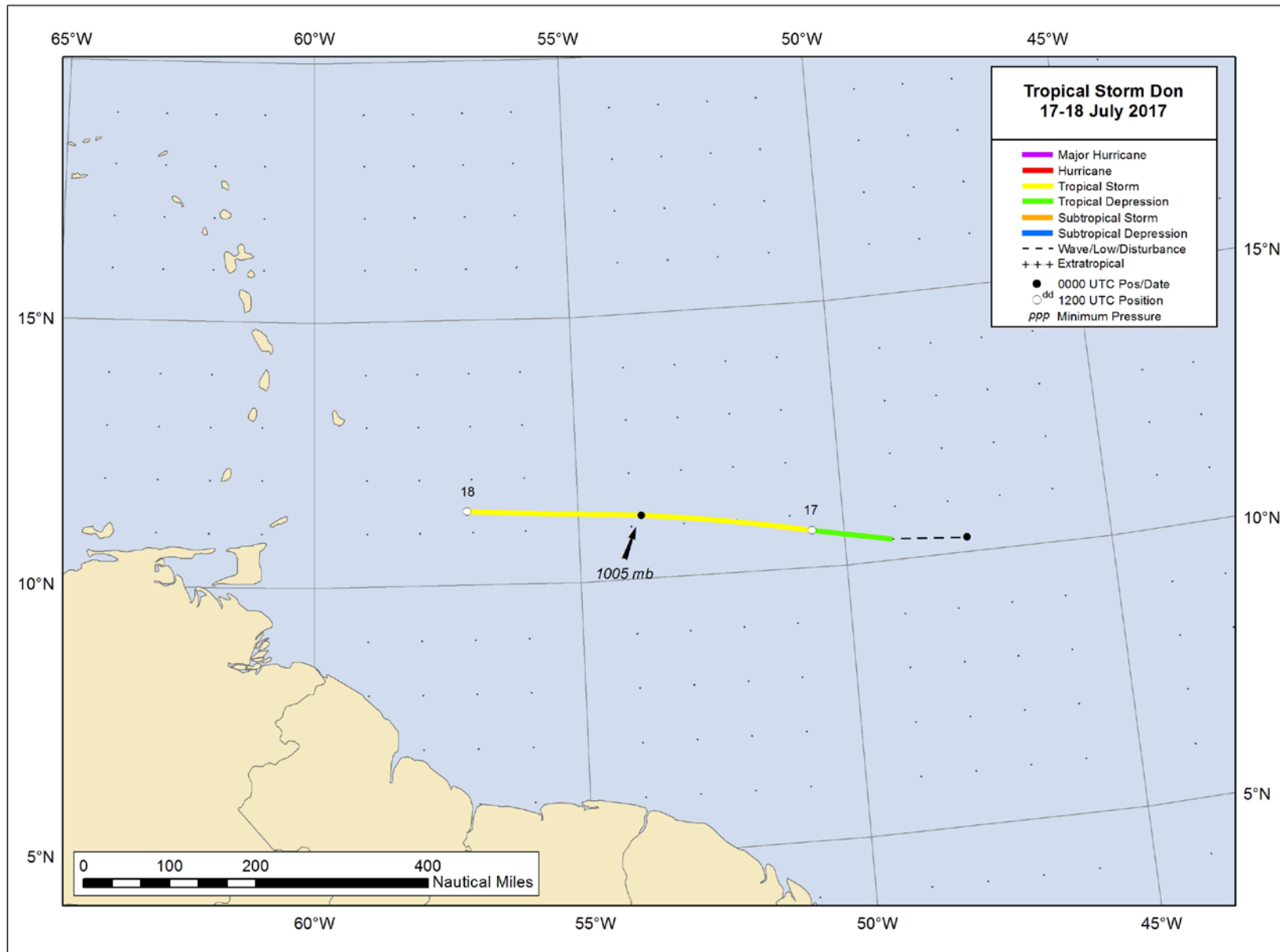


Figure 1. Best track positions for Tropical Storm Don, 17- 18 July 2017.

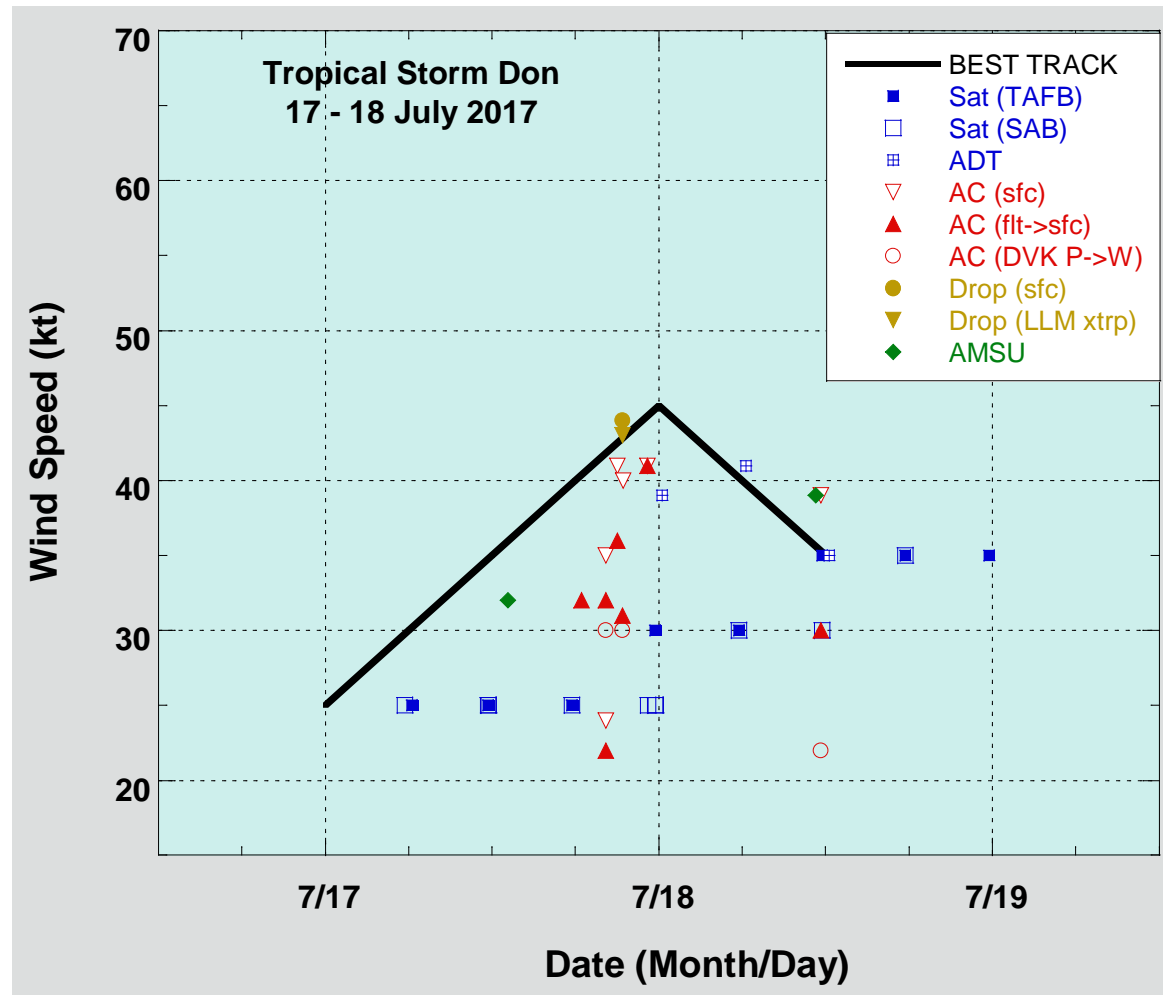


Figure 2. Selected wind observations and best track maximum sustained surface wind speed curve for Don. Dropwindsonde observations include actual 10 m winds (sfc), as well as surface estimates derived from the mean wind over the lowest 150 m of the wind sounding (LLM). Advanced Dvorak Technique estimates represent the Current Intensity at the nominal observation time. AMSU intensity estimates are from the Cooperative Institute for Meteorological Satellite Studies technique. Dashed vertical lines correspond to 0000 UTC.



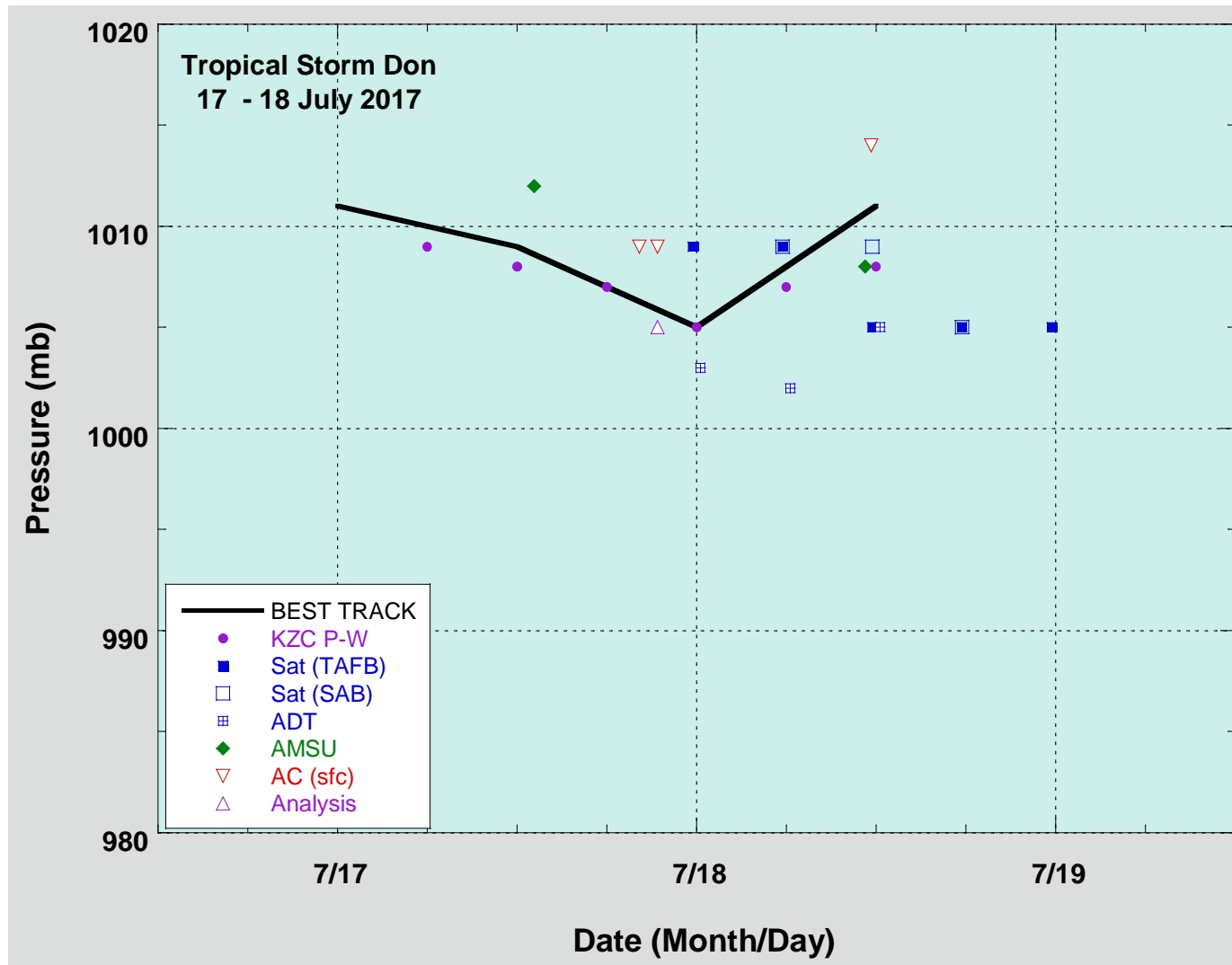


Figure 3. Selected pressure observations and best track minimum central pressure curve for Don. Advanced Dvorak Technique estimates represent the Current Intensity at the nominal observation time. AMSU intensity estimates are from the Cooperative Institute for Meteorological Satellite Studies technique. KZC P-W refers to pressure estimates derived using the Knaff-Zehr-Courtney pressure-wind relationship. Dashed vertical lines correspond to 0000 UTC.