

Tropical Cyclone Report
Tropical Storm Bertha
4 - 9 August 2002

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Bertha was a minimal tropical storm that made landfall in southeastern Louisiana.

a. Synoptic History

Bertha had a non-tropical origin, forming from the same non-tropical surface trough of low pressure that spawned Tropical Storm Cristobal in the western North Atlantic Ocean. This trough extended from the north central Gulf of Mexico across Florida into the Atlantic on 1 August and moved little for the next two days. A broad low pressure area was first noted on 3 August. Satellite, surface, and radar observations indicated the low became better organized just east of the mouth of the Mississippi River on 4 August, and the system developed into Tropical Depression Two around 1800 UTC that day. The “best track” of the tropical cyclone’s path is shown 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.

The depression strengthened further as it moved west-northwestward. An Air Force Reserve Hurricane Hunter aircraft indicated the system became Tropical Storm Bertha near 2300 UTC 4 August. The broad center made landfall near Boothville, LA about two hours later. After landfall, Bertha assumed a wobbly northwestward motion that took the center to the north of Lake Ponchartrain later on the 5th. The cyclone weakened back to a depression at 1200 UTC that day.

Bertha maintained its circulation over land while moving slowly westward and then southward on 6 August. It began a southwestward motion on the 7th, which brought the center back to the Gulf of Mexico around 0900 UTC that day. This motion continued until late on 8 August. While satellite and radar data showed periods of increased organization, surface and aircraft observations showed only slight strengthening at most over the northwestern Gulf. The cyclone turned west-northwestward late on the 8th, and this motion brought the center to the Texas coast east of Kingsville around 0800 UTC 9 August. Bertha weakened quickly after landfall and dissipated over southern Texas later that day.

b. Meteorological Statistics

Observations in Bertha (Figs. 2 and 3) include satellite-based Dvorak technique intensity estimates from the Tropical Analysis and Forecast Branch (TAFB), the Satellite Analysis Branch (SAB) and the U. S. Air Force Weather Agency (AFWA), as well as flight-level observations from flights of the 53rd Weather Reconnaissance Squadron of the U. S. Air Force Reserve Command.

Tropical Depression Two was upgraded to Tropical Storm Bertha on the basis of an aircraft report of 47 kt flight-level winds north of the center at 850 mb. The highest surface winds measured during the storm were at NOAA buoy 42007, which reported 33 kt 10-minute average winds at 2240 UTC 4 August and 0310 UTC 5 August. The buoy reported a peak gust of 43 kt at 0441 UTC on the 5th. A nearby station run by Louisiana State University reported a 34 kt wind gust at 0000 UTC on the 5th. The highest wind at a coastal site was a gust of 36 kt at an National Ocean Service station in Waveland, MS.

Storm tides reached as high as 3-4 ft -- 1-2 ft above normal tide levels -- along portions of the Mississippi and southeastern Louisiana coasts. Rainfall totals associated with Bertha were mainly in the 3-6 inch range. There were locally heavier amounts, including reports of 10.25 inches at Pascagoula, MS and Norwood, LA. No tornadoes were reported in association with Bertha.

Selected surface observations from land stations and data buoys are given in Table 2, while storm-total rainfalls are summarized in Table 3.

c. Casualty and Damage Statistics

Press reports indicate one death associated with Bertha - a drowning in high surf at Perdido Key State Park, FL on 4 August.

Rains associated with Bertha produced areas of stream and street flooding, which affected some structures producing minor damage. No monetary damage figures are available.

d. Forecast and Warning Critique

Bertha was a tropical storm for only 12 h, so no meaningful forecast verification statistics are available.

A tropical storm warning was issued at 2330 UTC 4 August for the northern Gulf coast from Pascagoula, MS to the mouth of the Mississippi River including Lake Borgne and Lake Ponchartrain. This warning was issued 1.5 h before landfall as Bertha reached tropical storm strength. The warning was discontinued at 1200 UTC 5 August as Bertha weakened to a depression over land.

Acknowledgments

The National Weather Service WFO in Slidell, LA provided the detailed rainfall data in this report.

Table 1. Best track for Tropical Storm Bertha, 4 - 9 August 2002

Date/Time (UTC)	Latitude (°N)	Longitude (°W)	Pressure (mb)	Wind Speed (kt)	Stage
04 / 1800	29.0	88.5	1012	25	tropical depression
05 / 0000	29.3	89.2	1008	35	tropical storm
05 / 0600	29.6	89.7	1008	35	"
05 / 1200	30.5	90.1	1010	25	tropical depression
05 / 1800	30.9	90.6	1011	20	"
06 / 0000	30.9	91.0	1012	15	"
06 / 0600	30.8	91.4	1013	15	"
06 / 1200	30.6	91.5	1013	15	"
06 / 1800	30.3	91.6	1012	15	"
07 / 0000	30.0	91.7	1010	20	"
07 / 0600	29.7	92.2	1011	20	"
07 / 1200	29.4	92.7	1011	25	"
07 / 1800	29.0	93.2	1010	25	"
08 / 0000	28.6	93.8	1010	25	"
08 / 0600	28.2	94.4	1010	25	"
08 / 1200	27.7	95.3	1011	20	"
08 / 1800	26.9	96.1	1011	20	"
09 / 0000	27.0	96.6	1011	20	"
09 / 0600	27.2	97.1	1011	20	"
09 / 1200	27.5	97.7	1012	20	"
09 / 1800					dissipated
05 / 0100	29.4	89.2	1007	35	minimum pressure
05 / 0200	29.4	89.3	1008	35	landfall near Boothville, LA
09 / 0800	27.3	97.4	1011	20	landfall near Griffins Pt., TX

Table 2. Selected surface observations for Tropical Storm Bertha, 4 - 9 August 2002

Location	Minimum Sea Level Pressure		Maximum Surface Wind Speed			Storm surge (ft) ^c	Storm tide (ft) ^d	Total rain (in)
	Date/time (UTC)	Press. (mb)	Date/time (UTC) ^a	Sustained(kt) ^b	Gust (kt)			
Louisiana								
Bayou Bienvenue							3.67	
Bayou Dupre							3.79	
Industrial Canal							3.17	
Rigoletes							2.56	
Mississippi								
Biloxi (KBIX)								1.97 ^f
Biloxi							1.75	
Gulfport (KGPT)								2.12 ^f
Gulfport							4.00	
Waveland (NOS)			05/0800	27	36		4.12	
Offshore Stations								
NOAA Buoy 42007			04/2240	33 ^e	43			
LSU CSI-13	05/0400	1009.2	05/0000	29	34			

^a Date/time is for sustained wind when both sustained and gust are listed.

^b Except as noted, sustained wind averaging periods for C-MAN and land-based ASOS reports are 2 min; buoy averaging periods are 8 min.

^c Storm surge is water height above normal astronomical tide level.

^d Storm tide is water height above National Geodetic Vertical Datum (1929 mean sea level).

^e 10 min average

^f 24 h total

Table 3. Storm rainfalls for southeastern Louisiana and southern Mississippi from Tropical Storm Bertha, 4-9 August 2002.

Location	5 Aug.	6 Aug.	7 Aug.	3-Day Total
Louisiana				
Amite	0.01	1.29	0.12	1.42
Angie	Msg	4.04	0.12	4.16
Baton Rouge (Arpt)	0.01	0.23	0.00	0.24
Bogalusa	0.70	2.60	0.50	3.80
Bush	0.20	3.17	1.09	4.46
Camp Covington	0.09	1.89	0.24	2.22
Clinton	0.31	0.56	6.77	7.64
Covington	Msg	3.10	Msg	3.10
Darlington	0.00	0.11	2.28	2.39
Franklinton#2	0.21	5.36	0.57	6.14
Franklinton 5ssw	0.10	7.49	0.91	8.50
Grangeville	0.01	0.02	4.85	4.88
Houma	0.00	0.94	0.00	0.94
Jackson	Msg	1.11	2.38	3.49
Kentwood	0.00	1.80	0.12	1.92
Liverpool	0.00	3.06	0.25	3.31
N.O. Intl. Arpt.	0.06	0.07	1.03	1.16
N.O. Audubon Park	0.03	0.17	0.00	0.20
Norwood	Msg	1.30	8.95	10.25
Oaknolia	Msg	0.56	3.10	3.66
Olive Branch	Msg	0.35	1.74	2.09
Pearl River	2.21	0.02	0.46	2.69
Saint Francisville	Msg	Msg	0.79	0.79
Slidell (city)	3.47	0.13	0.13	3.73
Slidell, WFO	1.79	0.21	0.52	2.52
Slidell W-14	3.58	0.01	0.19	3.78
Sun	Msg	4.10	1.67	5.77
Vacherie	2.25	0.00	0.30	2.55
Zachary	0.00	0.00	1.10	1.10
Mississippi				
Bay St. Louis	Msg	1.88	0.28	2.16
Centerville	Msg	1.15	1.33	2.48

Location	5 Aug.	6 Aug.	7 Aug.	3-Day Total
Graham Ferry	3.28	0.41	0.00	3.69
Gulfport (Navy)	Msg	2.44	0.01	2.45
Gulfport (Brentwood)	1.94	Msg	Msg	1.94
Gulfport (7W)	1.20	Msg	Msg	1.20
McComb	Msg	4.48	Msg	4.48
McComb (6SW)	Msg	4.44	Msg	4.44
Merril	1.07	0.23	0.00	1.30
N.W. Harrison County	1.12	0.11	0.03	1.26
N. E. Harrison County	0.68	0.32	0.00	1.00
Ocean Springs	Msg	3.50	Msg	3.50
Pascagoula	6.90	2.65	0.70	10.25
Picayune	1.70	0.27	0.87	2.84
Picayune (4NE)	1.38	Msg	Msg	1.38
Poplarville	0.54	1.41	0.22	2.17
Smithddale	Msg	3.92	Ms	3.92
Tylertown (2WNW)	Msg	5.36	0.08	5.44
Vancleve	Msg	Msg	0.57	0.57
Waveland	2.65	0.15	0.17	2.97
Wiggins	0.65	0.61	0.04	1.30

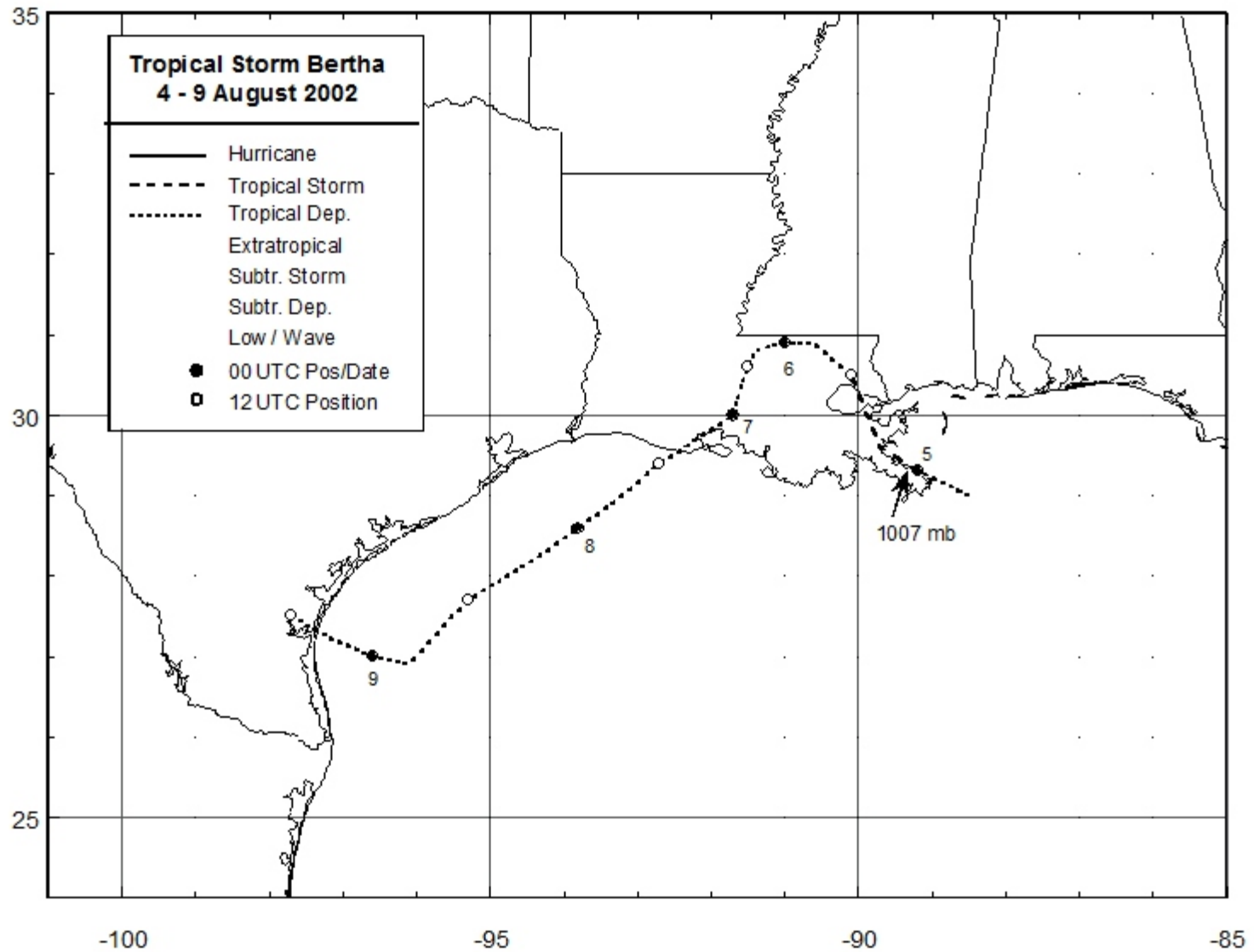


Figure 1. Best track positions and minimum pressure for Tropical Storm Bertha, 4 - 9 August 2002.

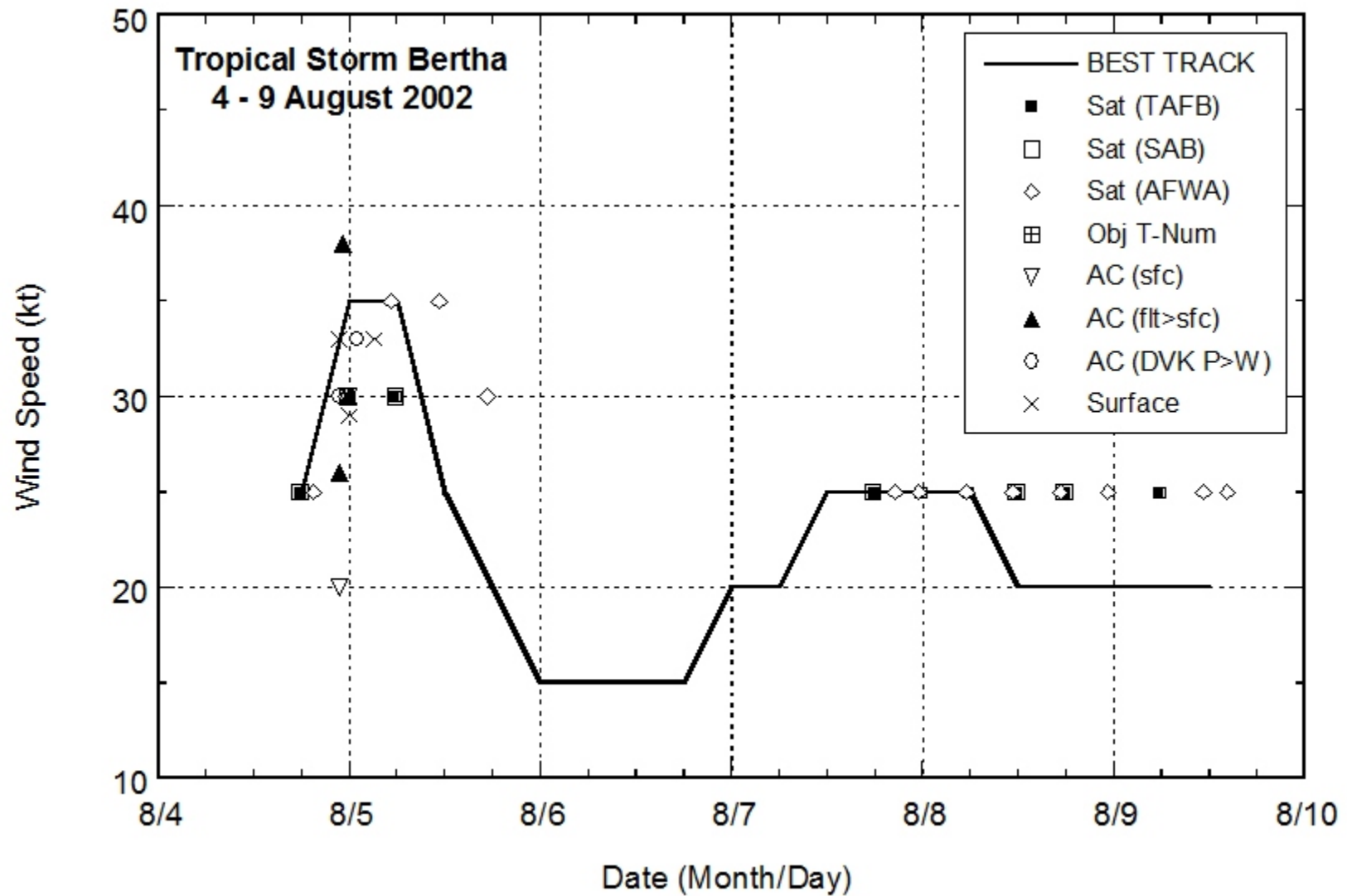


Figure 2. Selected wind observations and best track maximum sustained surface wind speed curve for Tropical Storm Bertha, 4- 9 August 2002. Aircraft observations have been adjusted for elevation using an 80% reduction factor for observations from 850 mb.

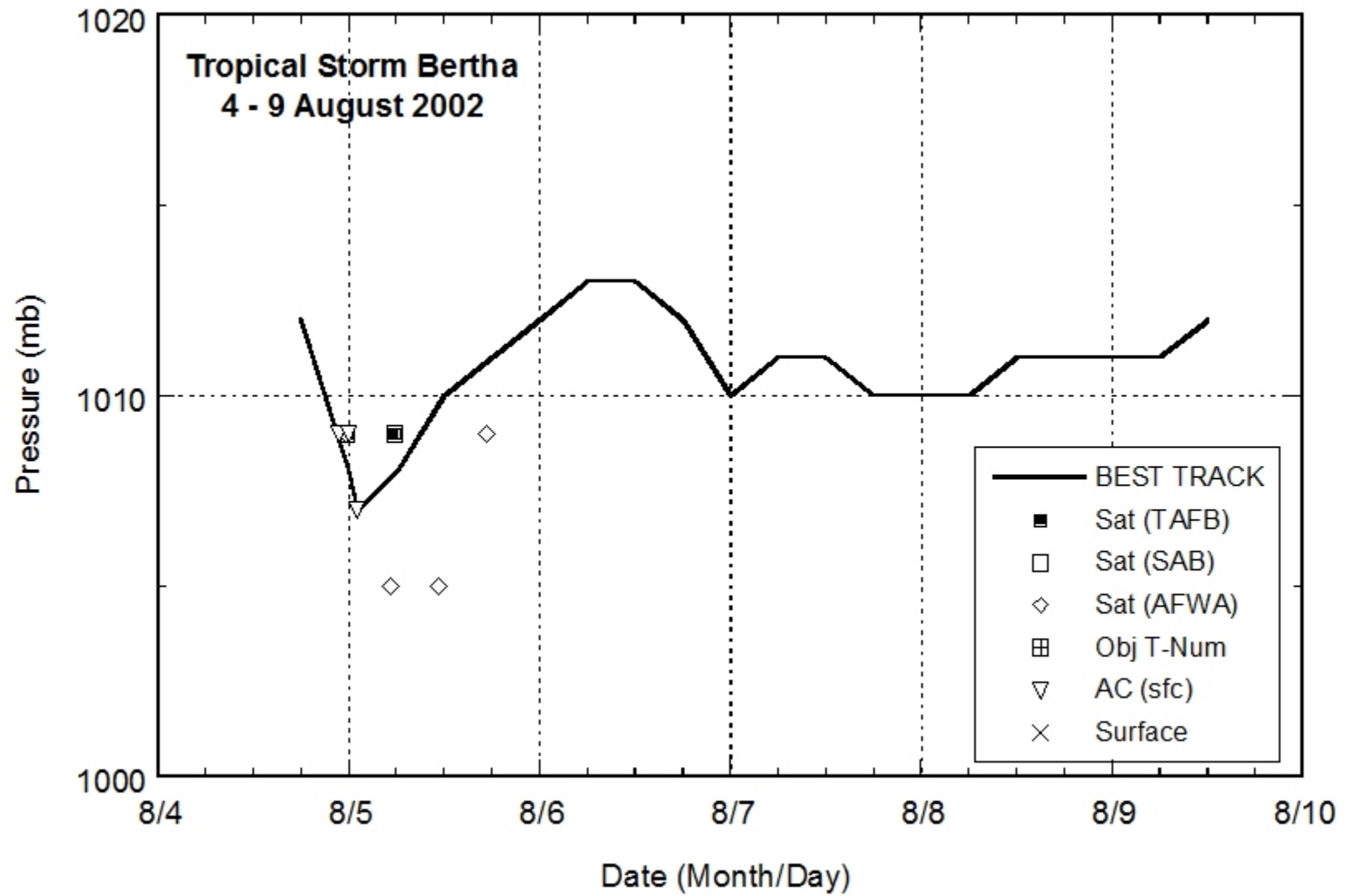


Figure 3. Selected pressure observations and best track minimum central pressure curve for Tropical Storm Bertha, 4 - 9 August 2002.