

Tropical Cyclone Report
Tropical Storm Barry (AL022007)
1-2 June 2007

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Barry was a short-lived tropical storm that brought beneficial rains to Florida.

a. Synoptic History

The precursor of Barry was associated with a westward moving tropical wave that spawned a broad area of low pressure near the eastern coast of the Yucatan Peninsula on 30 May. By 31 May, surface observations indicated that a circulation had developed with the area of minimum pressure centered southeast of Cozumel, Mexico. At that time, the system was not classified as a tropical depression because the shower activity was disorganized and well-removed from the area of low pressure. As the low moved north-northeastward over the northwestern Caribbean Sea and the southeastern Gulf of Mexico, the deep convection became somewhat concentrated near the center and it is estimated that a tropical depression formed just to the northwest of the western tip of Cuba at 1200 UTC 1 June. Thereafter, the shower activity increased further and the surface circulation become a little better organized.

The depression became a tropical storm at 1800 UTC 1 June and it reached its peak intensity of 50 knots, with a minimum pressure of 997 mb, at 0000 UTC 2 June about 130 n mi west-southwest of the Dry Tortugas. Thereafter, a mid- to upper-level trough over the Central Gulf of Mexico produced strong upper-level southwesterly winds over the cyclone resulting in weakening. It is estimated that the center of the broad circulation reached the Tampa Bay area at 1400 UTC 2 June. By then, the system had weakened to a tropical depression and had begun to acquire extratropical characteristics.

The depression moved between north-northeast and northeast across northern Florida and became fully extratropical by 0000 UTC 3 June over eastern Georgia. The extratropical cyclone intensified and moved toward the northeast along the east coast of the United States. It became absorbed by a larger extratropical cyclone at 1800 UTC 5 June near the St. Lawrence River. Strong winds occurred off the coast of northeastern Florida, when Barry was just north of Cuba. These winds were associated with a strong high pressure system and a cold front and not directly with the cyclone's circulation.

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.

b. Meteorological Statistics

Observations in Tropical Storm Barry (Figs. 2 and 3) include satellite-based Dvorak technique intensity estimates from the Tropical Analysis and Forecast Branch (TAFB) and the Satellite Analysis Branch (SAB), as well as observations from two flights of the 53rd Weather Reconnaissance Squadron of the U. S. Air Force Reserve Command. Microwave satellite imagery from NOAA polar-orbiting satellites, the NASA Tropical Rainfall Measuring Mission (TRMM), and the NASA QuikSCAT were also useful in tracking Barry.

Barry was embedded within strong southwesterly shear ahead of a mid-latitude trough and the cloud pattern had features of both a tropical and a subtropical cyclone. However, data from the Air Force Reconnaissance plane during the afternoon of 1 June indicated that the area of strongest winds was very close to the center, of the order of 5 to 10 n mi. This structure is typical of tropical cyclones, and because organized convection developed near the center during that period, Barry has been classified as a tropical cyclone. There was a flight level (1500 ft) peak wind of 67 knots in the northwest portion of the circulation reported at 2058 UTC 1 June. These winds were not representative of the intensity of the cyclone since they were short-lived and appeared to be associated with a convective downburst.

Data from a second reconnaissance mission on the morning of 2 June supported the weakening inferred by satellite. Flight-level winds at 1500 feet of 40 to 45 knots were observed in the southeastern quadrant over water just before landfall. However, that portion of the circulation was devoid of deep convection and the winds did not reach the surface as indicated by numerous observations nearby.

The cyclone produced heavy rains over Cuba and brought beneficial rains to Florida. There were reports of three tornadoes associated with Barry. One occurred in Playa Giron Cuba. The other two occurred in northern Sugarloaf Key in the Florida Keys, and in Cutler Bay, Florida. Selected surface observations from land stations and data buoys are given in Table 2. Fig 4 shows the total rainfall associated with the entire life of Barry.

c. Casualty and Damage Statistics

The tornado that occurred on northern Sugarloaf Key produced moderate damage to roofing materials and the one in Cutler Bay produced roof damage to a home and uprooted large trees. In general, the rains produced by Barry were beneficial primarily to Florida. These rain totals are included in Table 2.

d. Forecast and Warning Critique

While tropical cyclogenesis was not well anticipated, a special disturbance statement was issued about 20 hours prior to the formation of Barry indicating the potential for tropical or subtropical development. Advisories were initiated when data from a reconnaissance plane confirmed that the cyclone was not frontal. By then, the cyclone had already reached tropical

storm intensity and tropical storm watches and warnings were immediately issued. Table 3 summarizes the watches and warnings associated with Barry.

Average official track errors for Barry were 77 and 50 n mi for the 12 and 24 h forecasts, respectively. There were three 12-hour forecasts and only one 24-h forecast. The official 5-yr period (2002-2006) average errors are 35 and 61 n mi for these two forecast periods, respectively.

Average official intensity errors were 7 and 15 kt for the 12 and 24 h forecasts, respectively. For comparison, the average official intensity errors over the 5-yr period 2002-2006 are 6 and 10 kt, respectively.

Table 1. Best track for Tropical Storm Barry, 1-2 June 2007.

Date/Time (UTC)	Latitude (°N)	Longitude (°W)	Pressure (mb)	Wind Speed (kt)	Stage
31 / 0000	18.1	87.0	1008	25	low
31 / 0600	18.7	86.9	1007	25	"
31 / 1200	19.1	86.8	1006	25	"
31 / 1800	19.6	86.6	1005	25	"
01 / 0000	20.1	86.0	1005	25	"
01 / 0600	21.2	85.8	1005	25	"
01 / 1200	22.3	85.8	1004	30	tropical depression
01 / 1800	23.6	85.7	1000	40	tropical storm
02 / 0000	24.3	85.2	997	50	"
02 / 0600	25.1	84.6	998	45	"
02 / 1200	27.0	83.2	1000	40	"
02 / 1800	29.7	82.1	1001	30	tropical depression
03 / 0000	31.4	81.4	997	35	extratropical
03 / 0600	32.1	81.0	994	40	"
03 / 1200	32.8	80.0	994	40	"
03 / 1800	33.7	78.4	994	40	"
04 / 0000	35.3	76.0	992	40	"
04 / 0600	37.2	74.6	990	40	"
04 / 1200	39.0	73.2	990	40	"
04 / 1800	40.7	72.1	991	35	"
05 / 0000	42.4	70.8	992	35	"
05 / 0600	44.6	69.5	992	30	"
05 / 1200	47.5	68.5	992	30	"
06/ 1800					absorbed
02 / 1400	27.5	82.7	1000	30	landfall near Tampa Bay
02 / 0000	24.3	85.2	997	50	minimum pressure

Table 2. Selected surface observations for Tropical Storm Barry, 1-2 June, 2007.

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)			
Cuba								
Francia, Isla de la Juventud								4.54
Arroyo de Mantua, Pinar del Rio (PR)								11.02
Cabo San Antonio, (PR)								8.85
Isabel Rubio,(PR)								7.90
San Juan y Martinez,(PR)								5.69
Playa Giron, Matanzas								5.64
Tope de Collantes, Sancti Spiritus (SS)								8.87
Caracusey, SS								12.00
Condado, SS								11.53
Trinidad, SS								5.63
Florida								
Key West Int. Arpt. (KWYW)			2/0522	34	41			
Pulaski Shoal (PLSF1) (58 ft)			2/0252		42			
Sombrero Key Light (SMKF1) (159 ft)			2/0550	37	42			
Long Key Light (LONF1) (23 ft)			2/0622		34			
Islamorada (53 ft)			2/0932		34			
Cudjoe Key (30 ft)			2/0538		40			
Fort Lauderdale Int. Arpt								3.96
West Palm Beach Int. Arpt								6.99
West Palm Beach								6.84
Dowling Park								6.40
Melbourne WFO								6.03
Largo (McKay Creek)								6.01
Suwannee 6 NE								5.25

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)			
Chiefland 5 NE								5.15
Clearwater (Alligator Creek)								4.95
Clearwater Beach	2/1236	1000.6	2/1236		40			
Manatee Springs								4.88
Sarasota			2/1400		34			
Winter Haven			2/2025		36			
Bartow			2/2050		34			
Venice			2/1200		36			
Dunedin								4.63
NASA Shuttle Facility								4.57
Patrick AFB Cocoa Beach								4.56
Tarpon Springs								4.56
Wilcox								4.34
MacDill AFB			2/1301		39			4.24
Vero Beach Muni Airport								4.15
Safety Harbor								4.09
Jacksonville/ Mun. Airport								4.07
Horseshoe Fire								4.00
Town and Country								3.95
Ft. Lauderdale/Hollywood								3.94
St. Petersburg/Clearwater								3.79
Pinellas Park								3.74
Bronson Fawn								3.67
Cross City Airport								3.62
Albert Whitted								3.54
Inverness								3.50
Palm River								3.34
Tampa Int. Airport								3.17
Jacksonville Int. Airport								3.17
Thonotosassa								3.00

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)			
Georgia								
Mount Vernon								8.00
Nahunta								6.20
Levy								6.14
Downtown Savannah								5.91
Midway								5.70
Metter								5.68
Savannah Mun. Arpt.								5.21
Port Wentworth								4.17
Alma/Bacon Co. Arpt.								4.05
Hinesville								4.00
Valdosta								3.97
Appling								3.70
Tybee Island								3.68
Brunswick/Malcolm/McKinnon Arpt.								3.64
Clyattville								3.63
Augusta Bush Field								3.63
Fort Stewart								3.50
Hunter Army Airfield								3.20
Adel Raws								3.18
Quitman								3.06

^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).

() anemometer height

Table 3. Watch and warning summary for Tropical Storm Barry, 1-2 June.

Date/Time (UTC)	Action	Location
1/ 2100	Tropical Storm Warning issued	Bonita Beach to Keaton Beach, FL
1/ 2100	Tropical Storm Watch issued	North of Keaton beach to St. Marks, FL
2 /1500	Tropical Storm Warning discontinued	All
2 /1500	Tropical Storm Watch discontinued	All

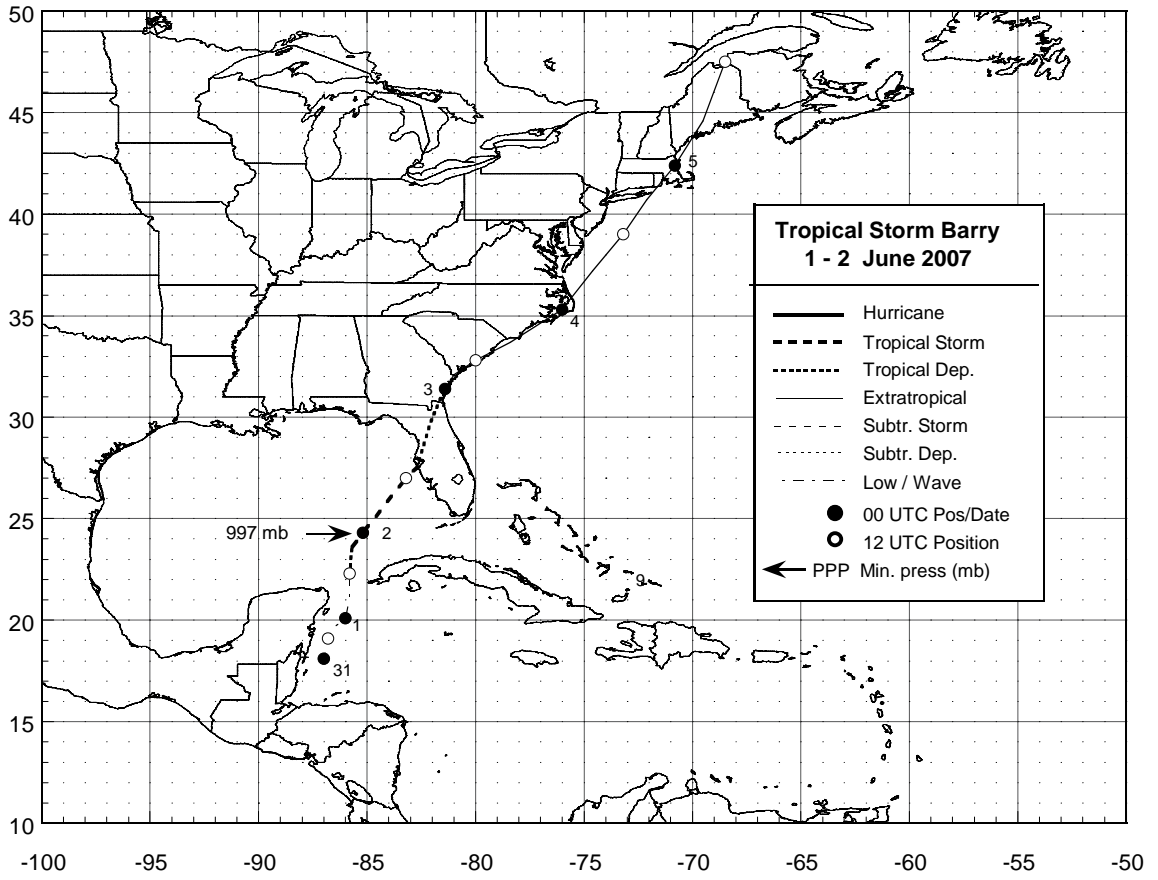


Figure 1. Best track positions for Tropical Storm Barry, 1-2 June, 2007.

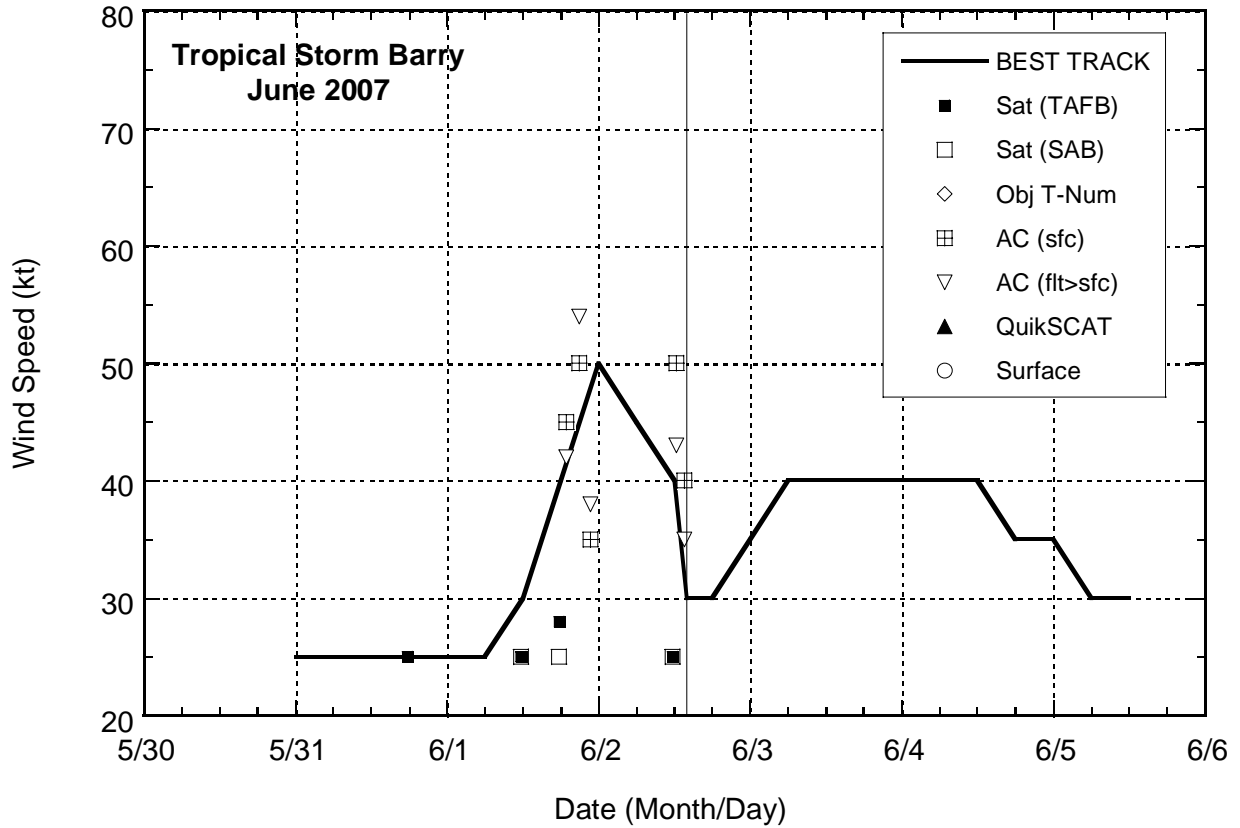


Figure 2. Selected wind observations and best track maximum sustained surface wind speed curve for Tropical Storm Barry, 1 - 2 June 2007. Aircraft observations have been adjusted for elevation using 90%, 80%, and 80% reduction factors for observations from 700 mb, 850 mb, and 1500 ft, respectively. Vertical solid line represents the landfall time.

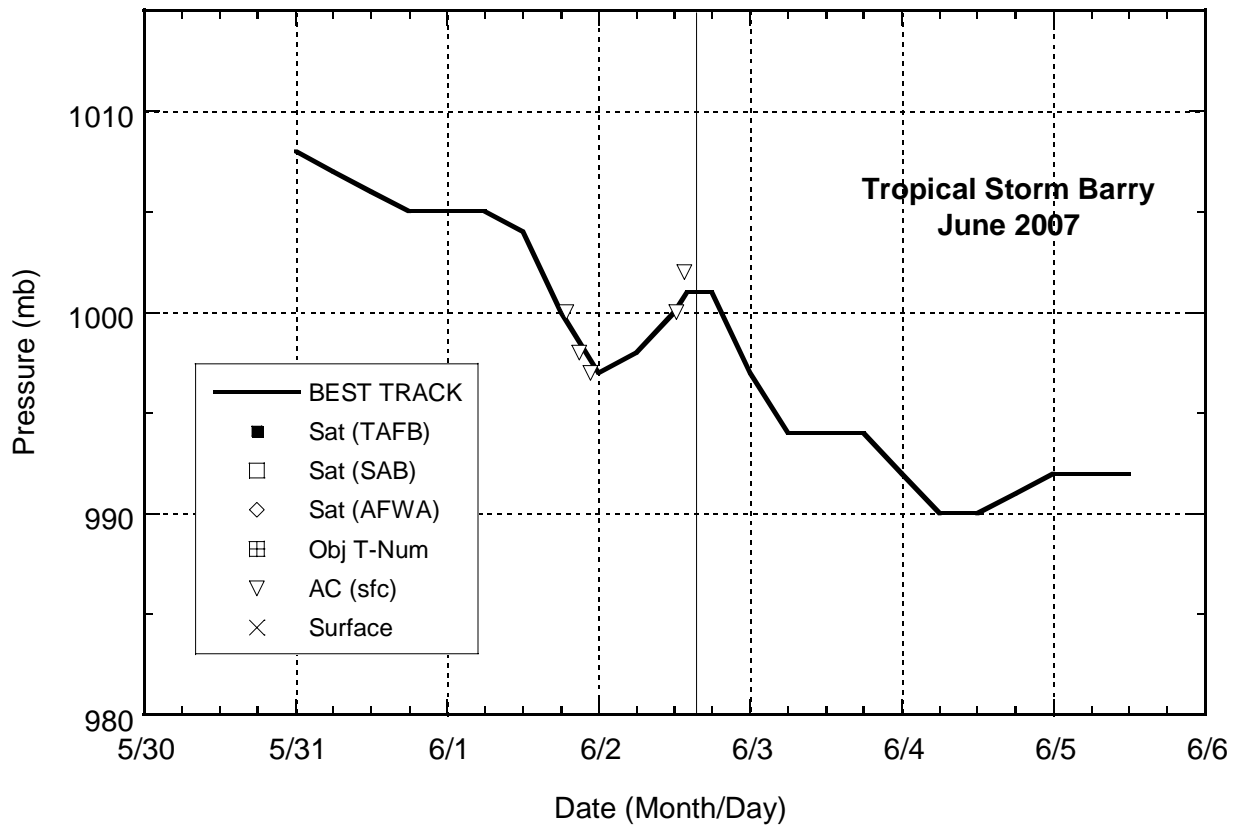


Figure 3. Selected pressure observations and best track minimum central pressure curve for Tropical Storm Barry, 1-2 June 2007. Vertical solid line represents the landfall time.

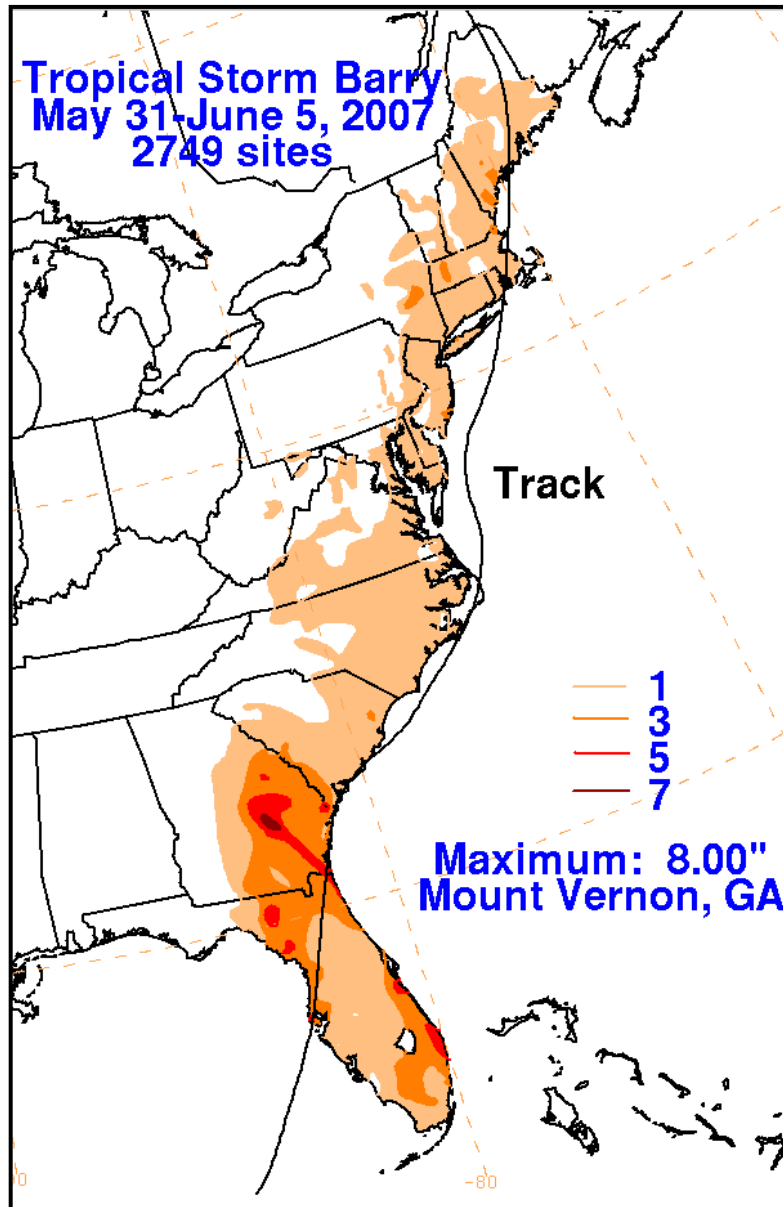


Figure 4. Total rainfall associated with Barry including the extratropical stage. Figure provided by the Hydrometeorological Prediction Center.