

Tropical Cyclone Report  
Tropical Storm Melissa  
(AL142007)  
28-30 September 2007

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Melissa was a short-lived tropical storm over the eastern Atlantic that formed near the Cape Verde Islands but did not affect land.

a. Synoptic History

Melissa originated from a tropical wave that left the west coast of Africa on 26 September. An area of low pressure formed the next day in association with the wave near the Cape Verde Islands. Convection with the low abruptly increased early on 28 September, and the system became a tropical depression by 0600 UTC that day about 100 n mi west-southwest of the southernmost Cape Verde Islands. The “best track” chart of the path of the tropical cyclone and its remnant low 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.

Lacking a subtropical ridge to its north due to a deep-layer low pressure system over the northeastern Atlantic, the depression was initially trapped within very weak steering currents. While inching westward, it strengthened slightly and became a tropical storm at about 0600 UTC 29 September. Melissa remained at its peak intensity of 35 kt for the remainder of that day. The storm then weakened to a depression by 0600 UTC 30 September within an environment of increasing westerly wind shear. Now a more shallow system, the cyclone began moving a little faster toward the west-northwest, to the south of a rebuilding low-level ridge over the central and eastern Atlantic. Thunderstorm activity sputtered later on 30 September, and the depression degenerated to a remnant low by 1800 UTC that day about 475 n mi west of the Cape Verde Islands. Remaining south of the low-level ridge, the low continued generally west-northwestward for the next several days, producing intermittent convection until it dissipated within a frontal zone late on 5 October about 600 n mi northeast of the northern Leeward Islands.

b. Meteorological Statistics

Observations in Melissa (Figs. 2 and 3) are limited to satellite data, primarily the geostationary satellite-based Dvorak technique intensity estimates from the Tropical Analysis and Forecast Branch (TAFB) and the Satellite Analysis Branch (SAB). Microwave satellite data and imagery from NOAA polar-orbiting satellites, Defense Meteorological Satellite Program (DMSP) satellites, and National Aeronautics and Space Administration (NASA) satellites including QuikSCAT were also useful in tracking Melissa. The estimated strongest intensity of

35 kt on 29 September is based upon Dvorak estimates. QuikSCAT data were useful for estimating the intensity during the tropical depression and remnant low stages. No ship reports of winds of tropical storm force were received in association with Melissa.

c. Casualty and Damage Statistics

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

d. Forecast and Warning Critique

The abrupt genesis of Melissa was not anticipated very well in NHC Tropical Weather Outlooks (TWO). Although the incipient tropical wave was first mentioned in the TWO about 39 hours prior to genesis, significant development was not expected, and the TWOs never explicitly mentioned the possibility that a tropical depression could form.

Melissa was a short-lived tropical cyclone, so only a few track and intensity forecasts out to 48 hours could be verified. A verification of official and guidance model track forecasts is given in Table 2. Average official track errors for Melissa were 34, 41, 22, and 72 n mi for the 12, 24, 36, and 48 h forecasts, respectively. The corresponding average official intensity errors (Table 3) were 4, 5, 5, and 10 kt. The number of forecasts (for both track and intensity) ranged from seven at 12 h to only one at 48 h. This sample is not a representative one from which to draw any meaningful conclusions, but both the track and intensity errors are generally a little smaller than the corresponding average long-term official forecast errors.

No watches or warnings for any land areas were required for Melissa.

Table 1. Best track for Tropical Storm Melissa, 28-30 September 2007.

Date/Time (UTC)	Latitude (°N)	Longitude (°W)	Pressure (mb)	Wind Speed (kt)	Stage
28 / 0600	14.0	25.8	1010	25	tropical depression
28 / 1200	14.0	26.2	1009	30	"
28 / 1800	14.0	26.6	1008	30	"
29 / 0000	14.2	27.0	1007	30	"
29 / 0600	14.5	27.4	1006	35	tropical storm
29 / 1200	15.0	28.1	1005	35	"
29 / 1800	15.3	29.0	1005	35	"
30 / 0000	15.6	29.9	1005	35	"
30 / 0600	15.8	30.9	1006	30	tropical depression
30 / 1200	15.9	32.0	1007	25	"
30 / 1800	16.1	33.3	1007	25	remnant low
01 / 0000	16.2	34.8	1007	25	"
01 / 0600	16.3	36.0	1007	25	"
01 / 1200	16.5	37.2	1008	25	"
01 / 1800	16.9	38.6	1008	25	"
02 / 0000	17.2	40.1	1009	25	"
02 / 0600	17.5	41.5	1010	20	"
02 / 1200	18.2	42.6	1010	20	"
02 / 1800	18.9	43.5	1010	25	"
03 / 0000	19.5	44.5	1010	25	"
03 / 0600	20.1	45.5	1010	25	"
03 / 1200	20.7	46.5	1010	25	"
03 / 1800	21.3	47.5	1010	30	"
04 / 0000	21.7	48.7	1010	25	"
04 / 0600	22.0	49.7	1010	25	"
04 / 1200	22.4	50.7	1010	25	"
04 / 1800	23.1	51.3	1010	25	"
05 / 0000	23.7	51.9	1010	25	"
05 / 0600	24.3	52.5	1010	25	"
05 / 1200	24.5	53.0	1011	20	"
05 / 1800	24.6	53.5	1011	20	"
06 / 0000					dissipated
29 / 1200	15.0	28.1	1005	35	minimum pressure and maximum wind

Table 2. Preliminary track forecast evaluation (heterogeneous sample) for Tropical Storm Melissa, 28-30 September 2007. Forecast errors (n mi) are followed by the number of forecasts in parentheses. Errors smaller than the NHC official forecast are shown in bold-face type. Verification includes the depression stage, but does not include the remnant low stage.

Forecast Technique	Forecast Period (h)						
	12	24	36	48	72	96	120
CLP5	39 ( 8)	58 ( 6)	31 ( 4)	<b>15 ( 2)</b>			
GFNI	<b>24 ( 3)</b>	<b>24 ( 1)</b>					
GFDI	47 ( 6)	82 ( 4)	131 ( 2)				
HWFI	46 ( 6)	93 ( 4)	168 ( 2)				
GFSI	78 ( 5)	226 ( 2)	332 ( 2)				
AEMI	74 ( 4)	131 ( 1)					
NGPI	<b>25 ( 4)</b>	<b>28 ( 2)</b>					
UKMI	39 ( 4)	44 ( 4)	42 ( 2)				
BAMD	48 ( 8)	73 ( 6)	101 ( 4)	189 ( 2)			
BAMM	36 ( 8)	47 ( 6)	44 ( 4)	104 ( 2)			
BAMS	62 ( 8)	111 ( 6)	172 ( 4)	225 ( 2)			
CONU	40 ( 6)	57 ( 4)	100 ( 2)				
GUNA	<b>27 ( 2)</b>						
FSSE	<b>22 ( 3)</b>	<b>25 ( 1)</b>					
OFCL	34 ( 7)	41 ( 5)	22 ( 3)	72 ( 1)			
NHC Official (2002-2006 mean)	35 (1852)	61 (1686)	86 (1519)	112 (1362)	162 (1100)	221 (885)	290 (723)

Table 3. Preliminary intensity forecast evaluation (heterogeneous sample) for Tropical Storm Melissa, 28-30 September 2007. Forecast errors (kt) are followed by the number of forecasts in parentheses. Errors smaller than the NHC official forecast are shown in bold-face type. Verification includes the depression stage, but does not include the remnant low stage.

Forecast Technique	Forecast Period (h)						
	12	24	36	48	72	96	120
SHF5	5.3 ( 8)	6.7 ( 6)	9.8 ( 4)	19.5 ( 2)			
GHMI	5.2 ( 6)	<b>2.8 ( 4)</b>	7.0 ( 2)				
HWFI	6.8 ( 6)	6.0 ( 4)	5.0 ( 2)				
SHIP	5.0 ( 7)	5.4 ( 5)	6.3 ( 3)	<b>2.0 ( 1)</b>			
DSHP	5.0 ( 7)	5.4 ( 5)	6.3 ( 3)	<b>2.0 ( 1)</b>			
FSSE	7.7 ( 3)	15.0 ( 1)					
ICON	4.8 ( 6)	<b>3.5 ( 4)</b>	<b>3.5 ( 2)</b>				
OFCL	4.3 ( 7)	5.0 ( 5)	5.0 ( 3)	10.0 ( 1)			
NHC Official (2002-2006 mean)	6.4 (1852)	9.8 (1686)	12.0 (1519)	14.1 (1362)	18.3 (1100)	19.8 (885)	21.8 (723)

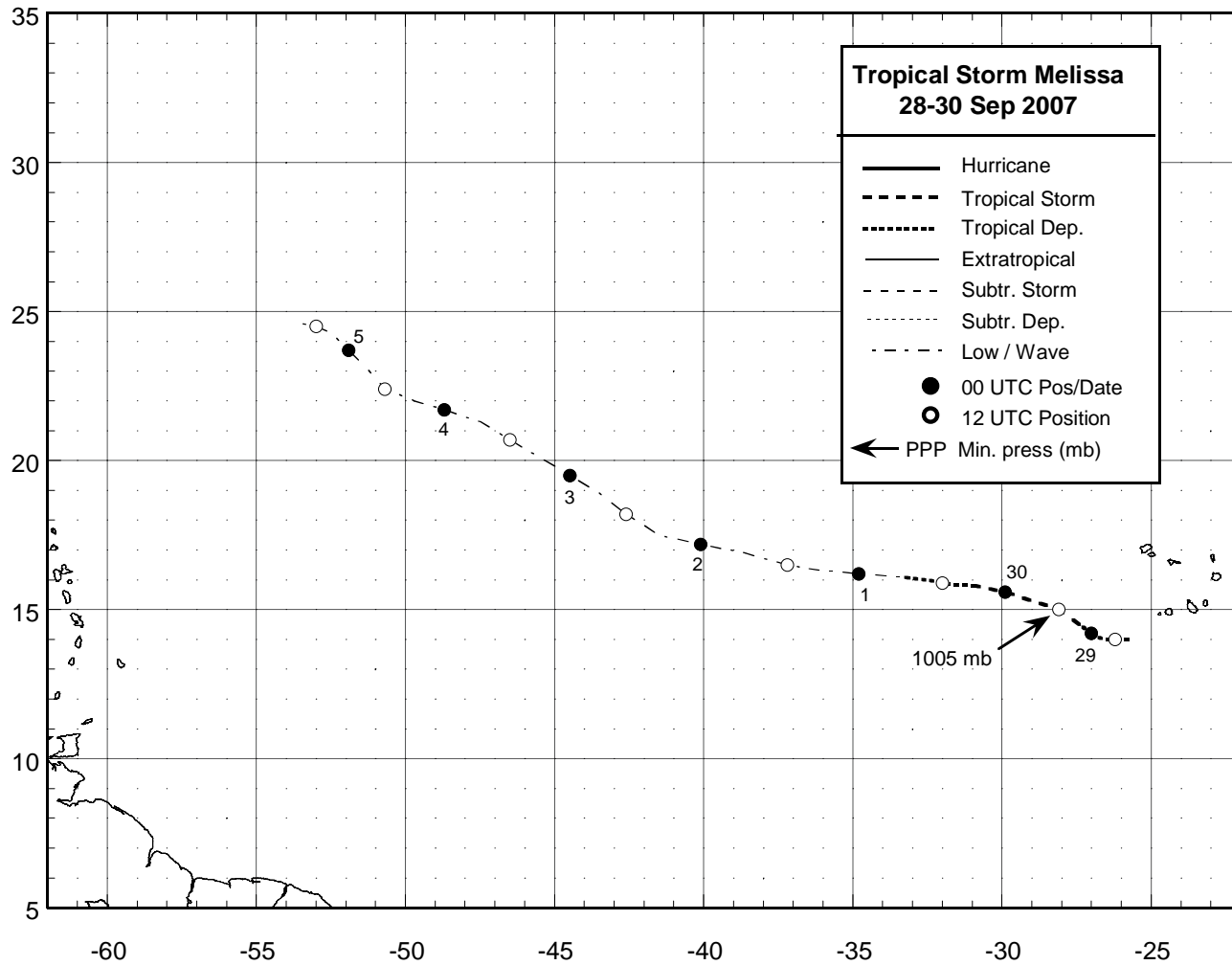


Figure 1. Best track positions for Tropical Storm Melissa, 28-30 September 2007. Best track includes the remnant low stage during 30 September-5 October.

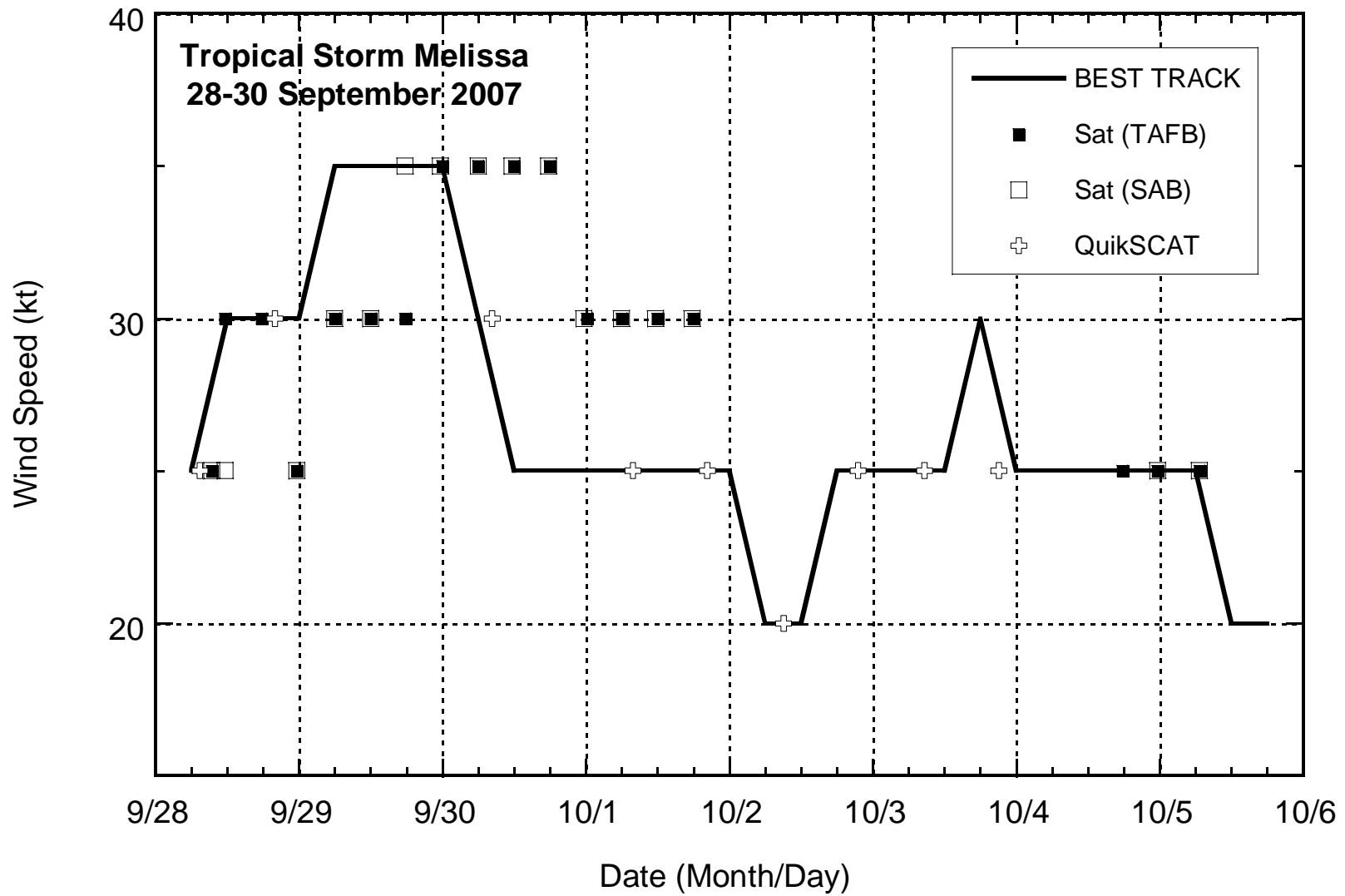


Figure 2. Selected wind observations and best track maximum sustained surface wind speed curve for Tropical Storm Melissa, 28-30 September 2007. Best track includes the remnant low stage during 30 September-5 October.

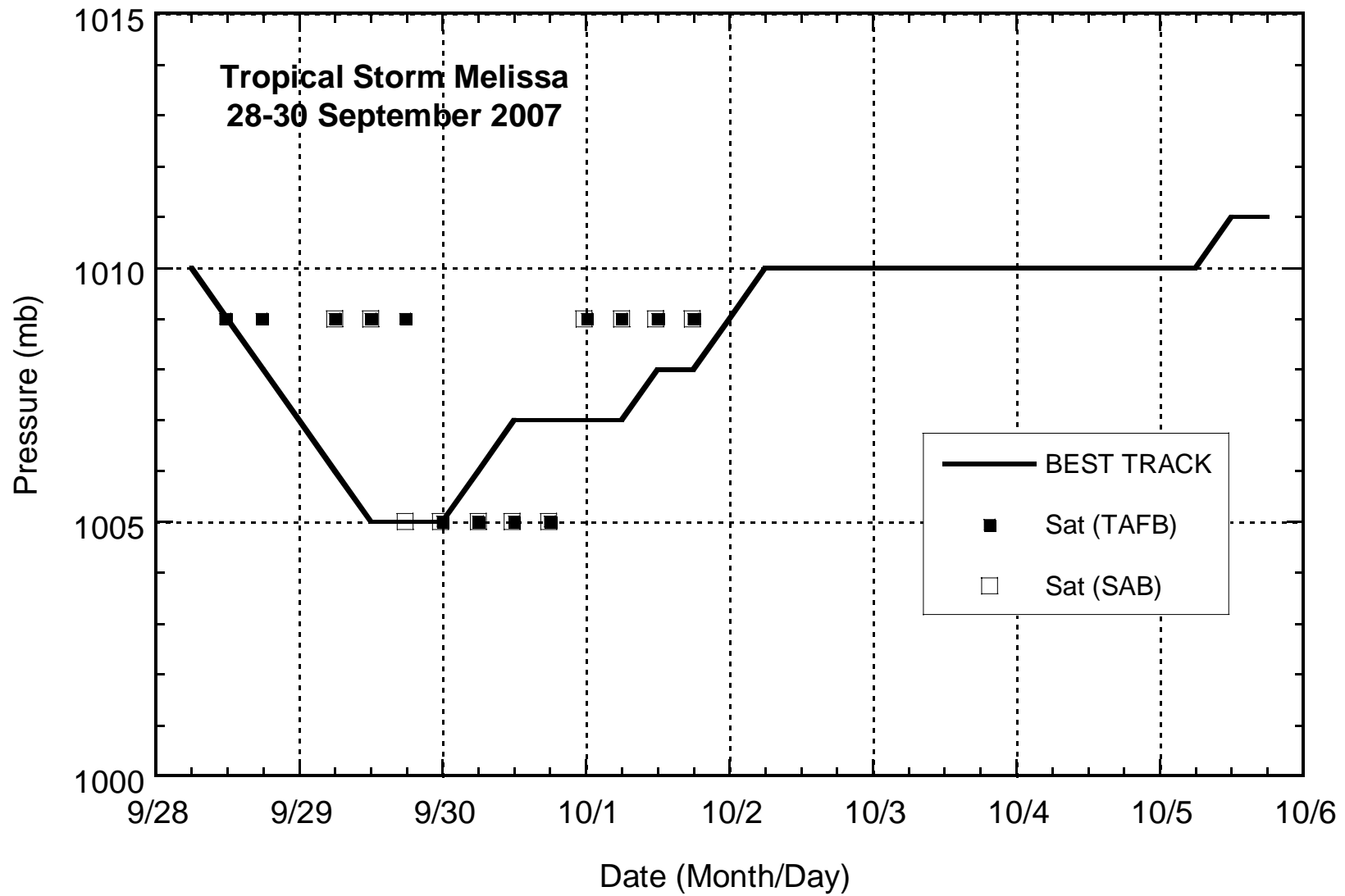


Figure 3. Selected pressure observations and best track minimum central pressure curve for Tropical Storm Melissa, 28-30 September 2007. Best track includes the remnant low stage during 30 September-5 October.