

Tropical Cyclone Report
Hurricane Greg
(EP072011)
16-21 August 2011

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Greg moved parallel to the coast of southwestern Mexico and intensified to a category 1 hurricane (on the Saffir-Simpson Hurricane Wind Scale) before it turned westward and weakened over colder waters.

a. Synoptic History

Greg formed from a tropical wave that moved across the west coast of Africa on 3 August. The wave was accompanied by a large area of convection with some cyclonic rotation in the middle levels of the atmosphere. As the system moved westward across the tropical Atlantic, the convection decreased significantly, and it was not until the wave approached the Lesser Antilles on 8 August that the shower activity began to gradually regenerate. The wave continued westward across the Caribbean Sea and crossed Central America on the 14 August. Once the system was in the eastern Pacific, a low pressure center formed south of the Gulf of Tehuantepec and the convection increased significantly. The low moved toward the west-northwest while the thunderstorm activity increased in organization, and it is estimated that a tropical depression formed about 150 n mi south-southeast of Acapulco, Mexico, at 1800 UTC 16 August. The depression slowly intensified within an easterly shear environment of about 15 kt and became a tropical storm at 0600 UTC 17 August. The “best track” chart of Greg’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 1¹.

A strong mid-level ridge to the north of Greg steered the cyclone toward the west-northwest on a track parallel to the coast of Mexico. The shear relaxed somewhat late on 17 August, and Greg became a hurricane at 0000 UTC 18 August about 200 n mi south-southwest of Cabo Corrientes, when a small eye embedded within a central dense overcast was observed in microwave data and conventional satellite imagery. There was a short period of additional strengthening and Greg reached its peak intensity of 75 kt and a minimum pressure of 979 mb at 1200 UTC 18 August. Greg continued to move toward the west-northwest for about another day and then westward thereafter. By then, a portion of the circulation had reached increasingly cooler waters and a more stable environment. The convection became intermittent, and the eye disappeared from the available satellite imagery. Greg weakened to tropical storm status and then

¹ 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* directory, while previous years’ data are located in the *archive* directory.

degenerated into a non-convective remnant low by 1200 UTC 21 August. The low continued to move westward and dissipated two days later.

b. Meteorological Statistics

Observations in Greg (Figs. 2 and 3) include subjective satellite-based Dvorak technique intensity estimates from the Tropical Analysis and Forecast Branch (TAFB) and the Satellite Analysis Branch (SAB). Data and imagery from NOAA polar-orbiting satellites (including UW-CIMSS Advanced Microwave Sounding Unit [AMSU] intensity estimates), the NASA Tropical Rainfall Measuring Mission (TRMM) and Aqua, the European Space Agency's Advanced Scatterometer (ASCAT), and Defense Meteorological Satellite Program (DMSP) satellites, among others, were also useful in constructing the best track of Greg.

Greg's estimated peak intensity was primarily based on subjective Dvorak estimates of 77 kt at around 1200 UTC 18 August from both TAFB and SAB. Due to Dvorak constraints these numbers were maintained for 6 to 12 hours, but the cloud pattern gradually deteriorated after the time of the peak intensity.

There were no ship reports of tropical-storm-force winds in association with Greg. A Mexican Navy automated station located at Socorro Island reported sustained winds of 38 kt with gusts to 46 kt when Greg moved south of that island around 0900 UTC 18 August.

c. Casualty and Damage Statistics

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

d. Forecast and Warning Critique

The genesis of Greg was not particularly well forecast. The precursor disturbance was first mentioned in the Tropical Weather Outlook at 0000 UTC 15 August with a "low" (0 to 20%) chance of genesis over the next 48 h. This was 2 days before the system became a tropical depression. The disturbance was given a 70% (high) chance of development 12 h before genesis, and the genesis probability was raised to 100% (high) about 6 h before formation.

A verification of NHC official track forecasts for Hurricane Greg is given in Table 2a. Official forecast track errors were lower than the mean official errors for the previous 5-yr period through 48 hours but larger than average at 72 and 96 h. A homogeneous comparison of the official track errors with selected guidance models is given in Table 2b. Only the European Center for Medium Range Weather and Forecasting (ECMWF) and the consensus models had lower errors than the official forecast from 24 to 48 h.

A verification of NHC official intensity forecasts for Hurricane Greg is given in Table 3a. The intensity of Greg was more difficult to forecast than the average tropical cyclone in the past

5 yr given that the OFD5 errors were much larger than the mean. Nevertheless, the official forecast intensity errors were lower than the 5-yr mean official errors though 48 hours. A homogeneous comparison of the official intensity errors with selected guidance models is given in Table 3b. Many of the intensity models had lower errors than the official forecast.

There were no watches and warnings associated with Hurricane Greg.

Table 1. Best track for Hurricane Greg, 16-21 August 2011.

Date/Time (UTC)	Latitude (°N)	Longitude (°W)	Pressure (mb)	Wind Speed (kt)	Stage
16 / 1800	13.9	99.0	1006	30	tropical depression
17 / 0000	14.7	100.1	1006	30	"
17 / 0600	15.5	101.5	1004	35	tropical storm
17 / 1200	16.3	103.4	1000	45	"
17 / 1800	16.9	105.6	994	55	"
18 / 0000	17.3	107.5	987	65	hurricane
18 / 0600	17.8	109.2	980	70	"
18 / 1200	18.3	110.8	979	75	"
18 / 1800	18.6	112.0	980	75	"
19 / 0000	18.8	113.3	983	70	"
19 / 0600	19.0	114.5	987	65	"
19 / 1200	19.3	115.5	990	60	tropical storm
19 / 1800	19.5	116.5	994	50	"
20 / 0000	19.6	117.6	997	45	"
20 / 0600	19.7	118.6	1000	40	"
20 / 1200	19.8	119.5	1004	35	"
20 / 1800	19.9	120.1	1008	30	tropical depression
21 / 0000	20.0	120.7	1008	30	"
21 / 0600	20.1	121.5	1008	30	"
21 / 1200	20.2	122.4	1008	30	low
21 / 1800	20.0	123.4	1008	25	"
22 / 0000	19.8	124.3	1008	20	"
22 / 0600	19.6	125.0	1008	20	"
22 / 1200	19.6	125.6	1008	20	"
22 / 1800	19.6	126.2	1008	20	"
23 / 0000	19.6	126.8	1009	20	"
23 / 0600					dissipated
18 / 1200	18.3	110.8	979	75	minimum pressure

Table 2a. NHC official (OFCL) and climatology-persistence skill baseline (OCD5) track forecast errors (n mi) for Hurricane Greg, 16-21 August 2011. Mean errors for the 5-yr period 2006-10 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	25.5	45.6	64.6	84.2	126.4	196.3	
OCD5	35.8	75.3	119.2	163.8	279.3	413.5	
Forecasts	17	15	13	11	7	3	
OFCL (2006-10)	29.7	49.9	69.0	86.6	119.0	155.8	
OCD5 (2006-10)	38.4	74.8	115.3	155.9	226.3	273.7	

Table 2b. Homogeneous comparison of selected track forecast guidance models (in n mi) for Hurricane Greg, 16-21 august 2011. Errors smaller than the NHC official forecast are shown in boldface type. The number of official forecasts shown here will generally be smaller than that shown in Table 2a due to the homogeneity requirement.

Model ID	Forecast Period (h)						
	12	24	36	48	72	96	120
OFCL	22.2	42.5	57.0	77.6	66.2		
OCD5	31.4	61.3	93.6	137.6	191.9		
GFSI	22.0	48.2	85.9	166.8	206.1		
GHMI	34.4	50.8	66.5	112.5	81.2		
HWFI	24.0	45.6	70.0	104.7	75.0		
GFNI	31.0	54.2	70.2	99.1	157.0		
NGPI	37.0	72.2	106.5	141.3	65.9		
UKMI	46.8	97.7	139.4	184.3	167.3		
EGRI	46.8	97.7	139.4	184.3	167.3		
EMXI	24.6	34.1	44.8	61.3	74.2		
AEMI	25.9	56.4	89.6	133.3	246.5		
FSSE	24.0	65.0	97.8	122.5	235.6		
TCON	24.7	47.1	71.0	115.8	106.2		
TVCA	21.6	41.1	59.8	96.1	117.1		
TVCE	22.6	40.5	57.8	94.8	100.1		
TVCC	23.4	38.5	50.8	85.2	61.1		
GUNA	27.5	52.9	76.7	126.2	117.1		
BAMD	36.1	64.7	95.6	120.6	100.6		
BAMM	29.1	52.9	72.4	106.0	239.4		
BAMS	45.2	72.5	97.9	141.0	279.3		
Forecasts	13	10	8	6	1		

Table 3a. NHC official (OFCL) and climatology-persistence skill baseline (OCD5) intensity forecast errors (kt) for Hurricane Greg, 16-21 August 2011. Mean errors for the 5-yr period 2006-10 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	4.1	10.0	11.9	12.7	25.0	31.7	
OCD5	5.9	12.8	20.0	22.1	25.6	28.3	
Forecasts	17	15	13	11	7	3	
OFCL (2006-10)	6.3	10.5	13.7	15.1	17.1	18.6	
OCD5 (2006-10)	7.3	11.9	15.3	17.6	19.0	20.3	

Table 3b. Homogeneous comparison of selected intensity forecast guidance models (in kt) for Hurricane Greg, 16-21 August 2011. Errors smaller than the NHC official forecast are shown in boldface type. The number of official forecasts shown here will generally be smaller than that shown in Table 3a due to the homogeneity requirement.

Model ID	Forecast Period (h)						
	12	24	36	48	72	96	120
OFCL	4.6	9.6	11.4	14.4	25.0	25.0	
OCD5	6.1	13.1	20.9	25.1	29.2	23.0	
DSHP	4.7	11.0	17.3	23.9	36.0	34.0	
LGEM	4.4	9.0	12.9	16.0	21.4	14.0	
ICON	4.6	7.7	9.5	11.0	19.8	22.0	
IVCN	5.0	8.2	9.9	11.3	17.8	20.0	
GHMI	4.9	9.1	10.3	10.9	12.0	22.0	
HWFI	5.5	9.7	9.5	6.9	17.0	17.0	
FSSE	3.3	4.5	5.7	7.7	11.8	26.0	
Forecasts	14	13	11	9	5	1	

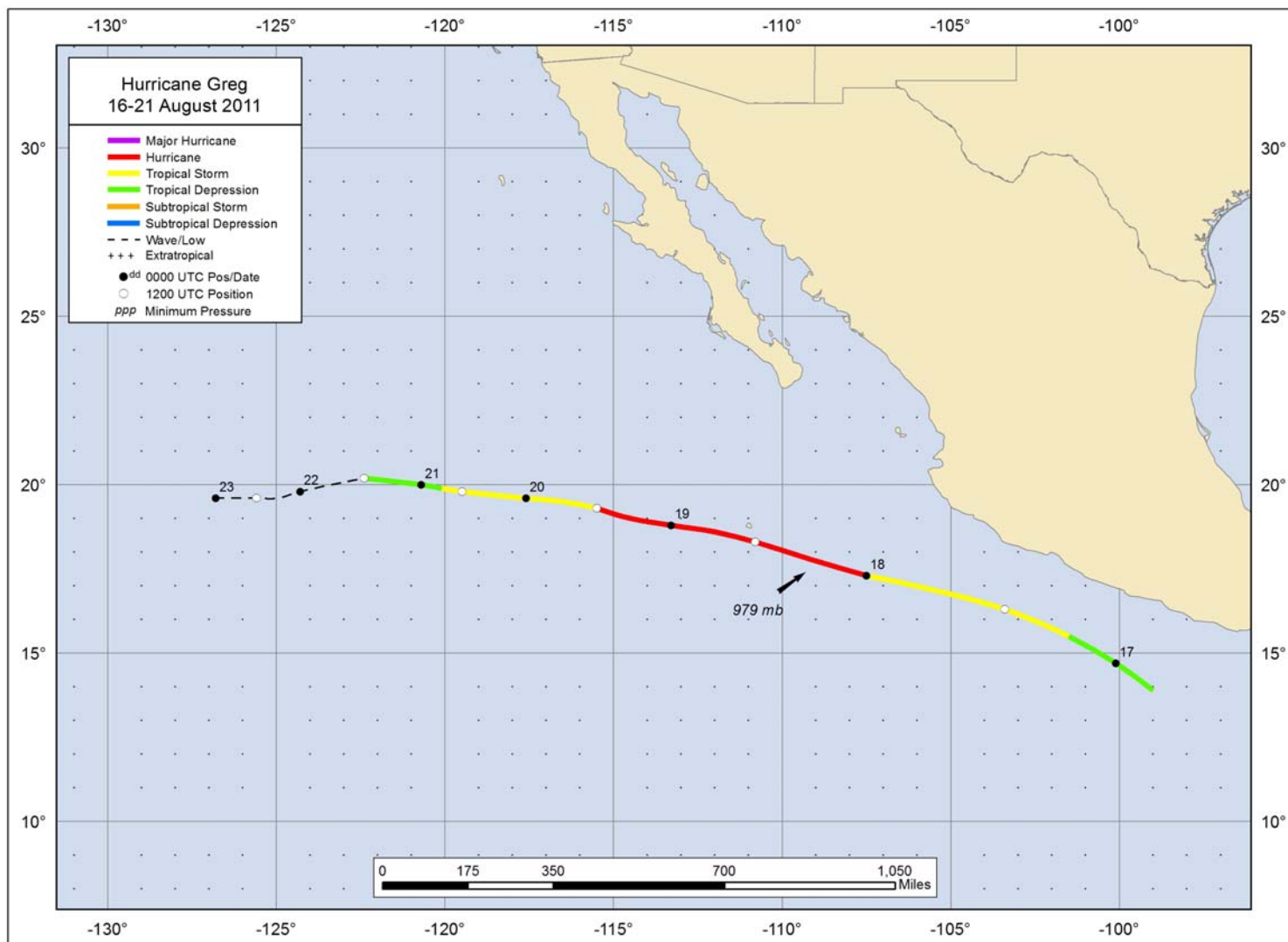


Figure 1. Best track positions for Hurricane Greg, 16-21 August 2011.

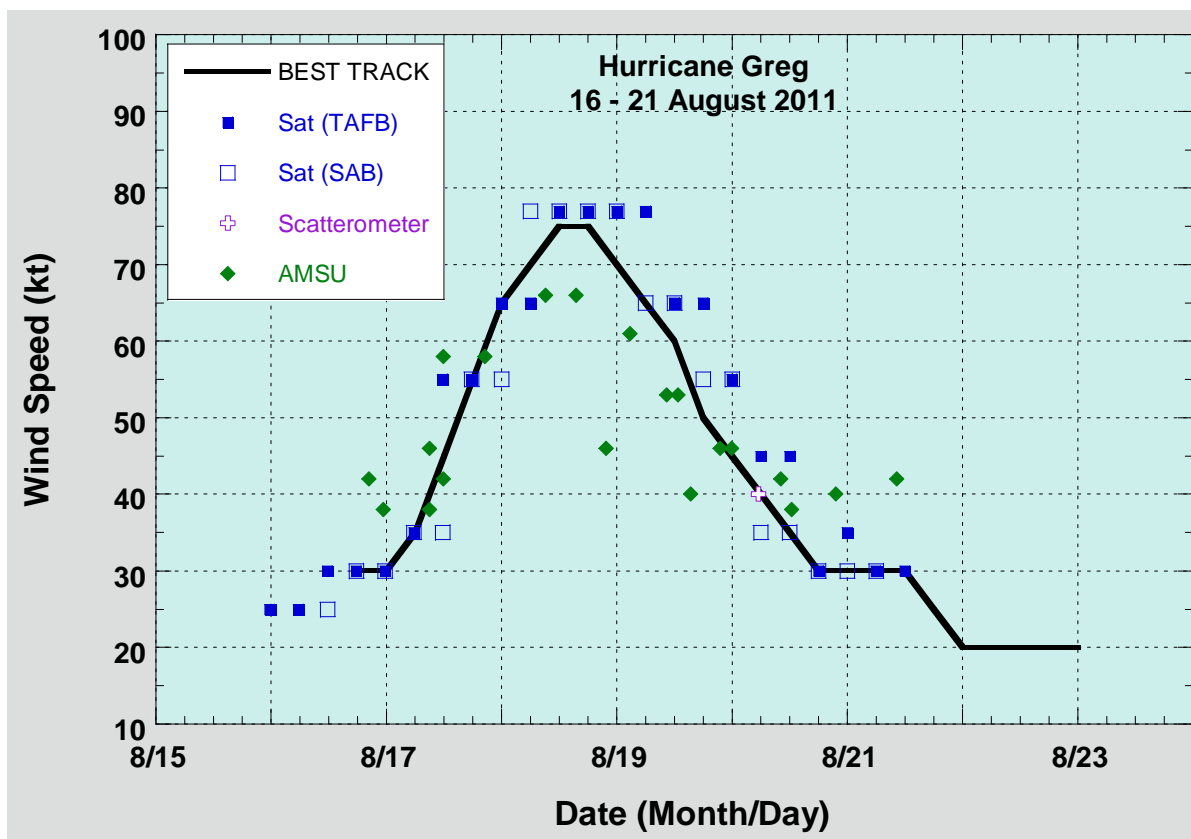


Figure 2. Selected wind observations and best track maximum sustained surface wind speed curve for Hurricane Greg, 16- 21 August 2011. AMSU intensity estimates are from the Cooperative Institute for Meteorological Satellite Studies technique. Dashed vertical lines correspond to 0000 UTC.

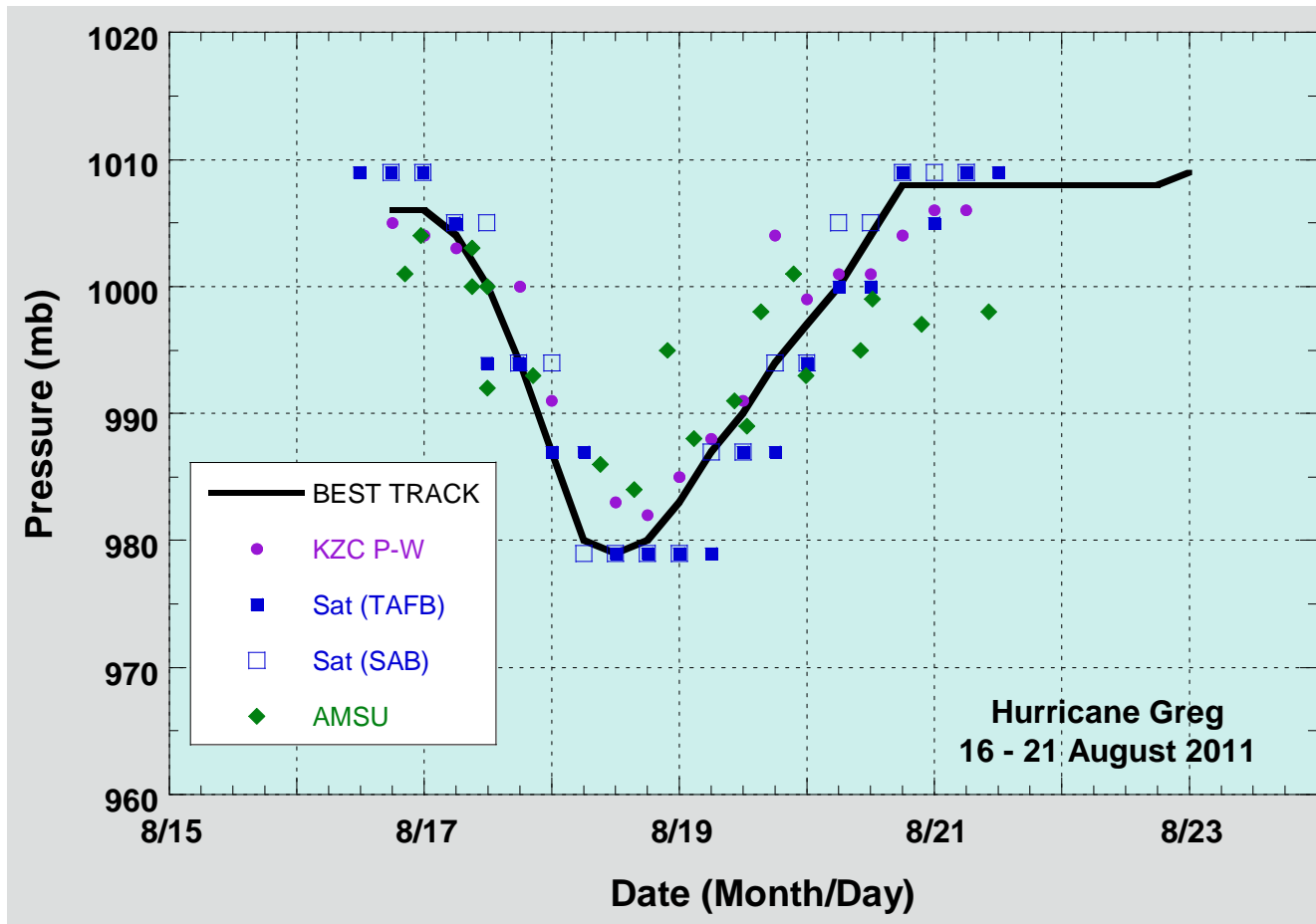


Figure 3. Selected pressure observations and best track minimum central pressure curve for Hurricane Greg, 16 – 21 August 2011. AMSU intensity estimates are from the UW-CIMSS technique. KZC P-W refers to pressure estimates using the Knaff-Zehr-Courtney pressure-wind relationship. Dashed vertical lines correspond to 0000 UTC.