

PRELIMINARY REPORT

Hurricane Greg
5-9 September, 1999

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a. Synoptic History

The southern extension of the tropical wave that triggered Tropical Storm Emily in the Atlantic moved westward through the Caribbean Sea for several days and crossed Central America between 31 August and 1 September (Fig. 1). Satellite imagery revealed a middle-level circulation with a large area of thunderstorms associated with the wave moving westward partially inland over southern Mexico. A large area of disturbed weather associated with a cyclonic monsoon-type flow had prevailed over the eastern Pacific for several days. However, it was not until the tropical wave arrived in the area that tropical cyclone formation began. The thunderstorm activity became concentrated while cloud banding features were developing. Dvorak T-numbers suggested the formation of a 30-knot tropical depression very near Manzanillo, Mexico at 1200 UTC 5 September. It appears that the same tropical wave combined with the strong southwest monsoonal-type flow which extended northward into the Bay of Campeche, led the formation of the Atlantic Tropical Depression Seven in the Gulf of Mexico during that period.

The eastern Pacific depression continued to become better organized, and both satellite images and ship reports indicated that the tropical cyclone reached tropical storm strength by 1800 UTC on the same day. Greg was then moving on a general northwest track very close to the southwestern coast of Mexico. A large area of very deep convection formed near the center of circulation and radar from Los Cabos, Mexico suggested the formation of an ragged eye during the morning of 6 September. Greg was upgraded to hurricane status at 1800 UTC on the same day while approaching the southern portion of Baja California. Figure 2 display the radar presentation of Greg and a visible satellite image of the hurricane near the time of its peak intensity. No significant change in strength occurred for the next 24 hours, and thereafter, Greg weakened to tropical storm status as its center moved over the area of Cabo San Lucas around 2100 UTC 7 September. Greg turned toward the west-northwest and west over cooler waters and weakening began. Greg's track is shown in Fig. 3. Table 1 is a listing, at six-hourly intervals, of the best-track position, estimated minimum central pressure and maximum 1-minute surface wind speed.

b. Meteorological Statistics

The best track pressure and wind curves as a function of time are shown in Fig. 4 and are primarily based on satellite intensity estimates from the Tropical Analysis and

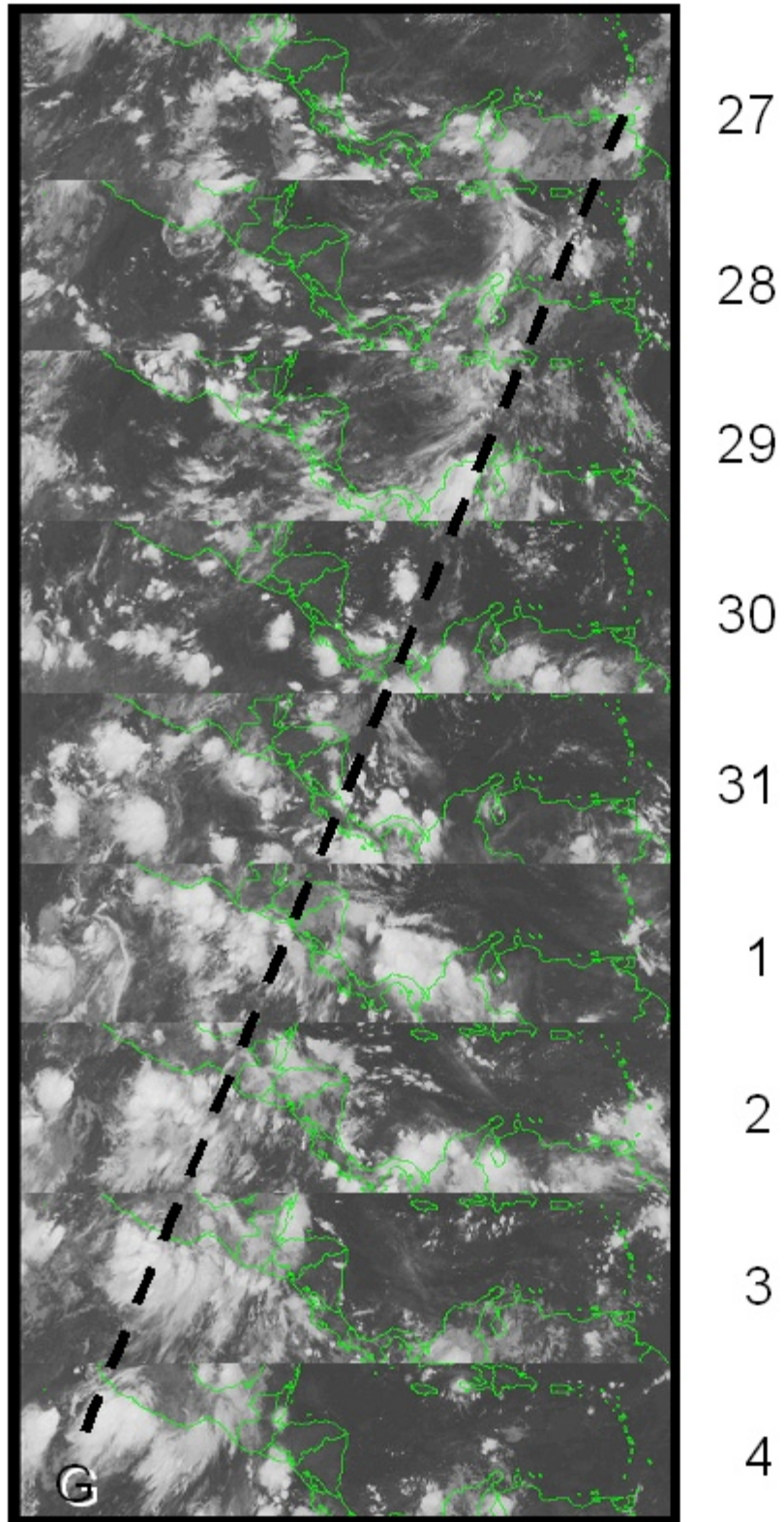


Fig. 1. Sequence of daily GOES 8 satellite images at 1200 UTC from 27 August to 4 September 1999. Dashed line marks the westward propagation of the tropical wave which eventually triggered Hurricane Greg (G).

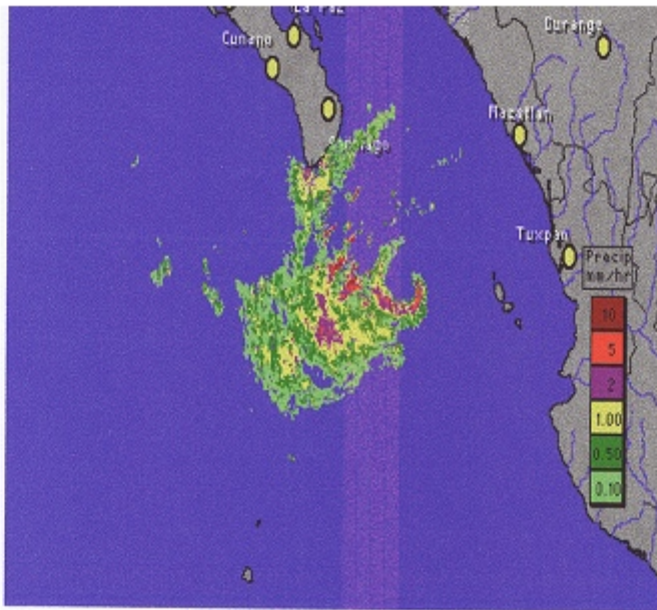


Fig. 2a. View of Hurricane Greg at 1917 UTC September 6 from San Jose del Cabo radar.

Forecast Branch (TAFB), the Satellite Analysis Branch (SAB) and the Air Force Weather Agency, (AFGWC in figures). Operationally, Greg was upgraded to tropical storm based on data from the ship 3EJO6, which reported winds of 230 degrees with 42 knots and a pressure of 1006.5 mb at 1800 UTC 5 September. Greg produced torrential rains over

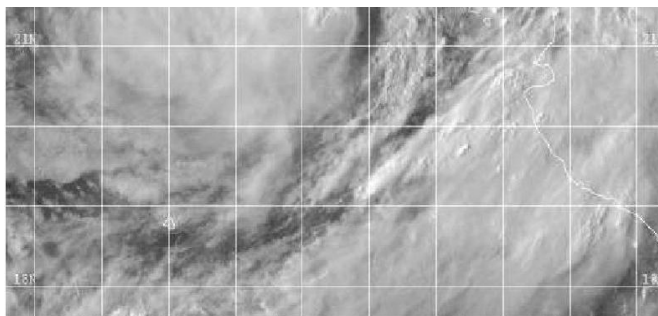


Fig. 2b. Visible satellite image of Hurricane Greg at 0000 UTC 7 September, near the time of peak intensity.

portions of southwestern Mexico. Nearly 9 inches were measured in Manzanillo, about 8 inches in Colima and 5 inches in Islas Marias as Greg moved nearby. San Jose del Cabo, on the southern tip of Baja California, reported sustained winds of 35 knots with gusts to 40 knots and a minimum pressure of 995 mb at 2100 UTC 7 September while the center of Greg was crossing the southwestern tip of Baja California.

c. Casualty and Damage Statistics

Reports from the El Nuevo Herald indicate that torrential rains caused extensive flooding over the states of Colima, Jalisco, Michoacan, Nayarit and Sinaloa. Nine people were killed as a consequence of the rains.

d. Forecast and Warning Critique

Because Greg formed very close to the southwest coast of Mexico, tropical storm warnings were required immediately and were issued in the first advisory. Additional watches and warnings were issued for portions of Baja California. A summary is included in Table 2. Both official forecasts and the Statistical Hurricane Intensity Prediction Scheme (SHIPS) indicated that Greg would peak at 65 knots.

The NHC average official track errors (in n mi) for Greg (excluding the tropical depression stage) were 35 (10 cases), 59 (8 cases), 98 (6 cases), 132 (4 cases), respectively, for the 12-, 24-, 36-, 48-hour forecast periods. There were no 72-hour forecast to verify. These errors for 12, 24, 36 and 48 hour periods are very near the 1989-1998 average official forecast errors.

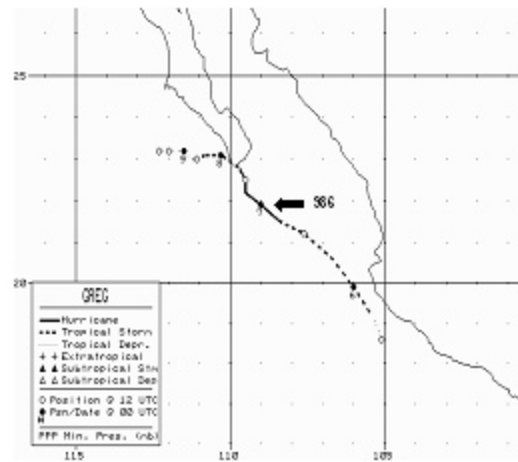


Fig. 3 Best track positions for Hurricane Greg, 5-9 September 1999.

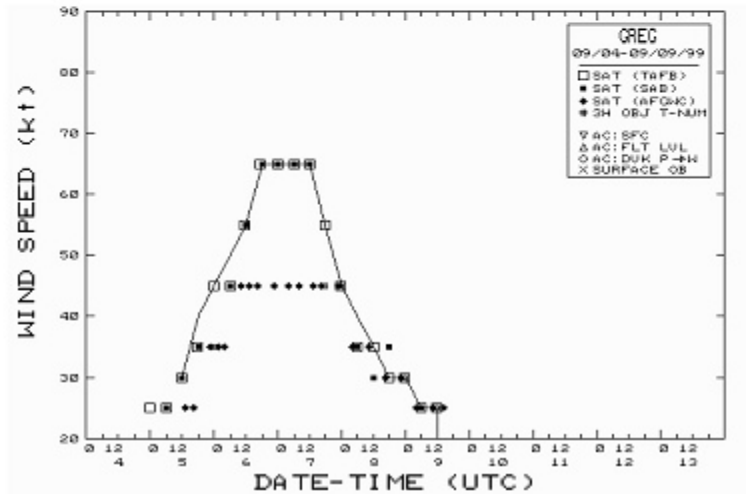
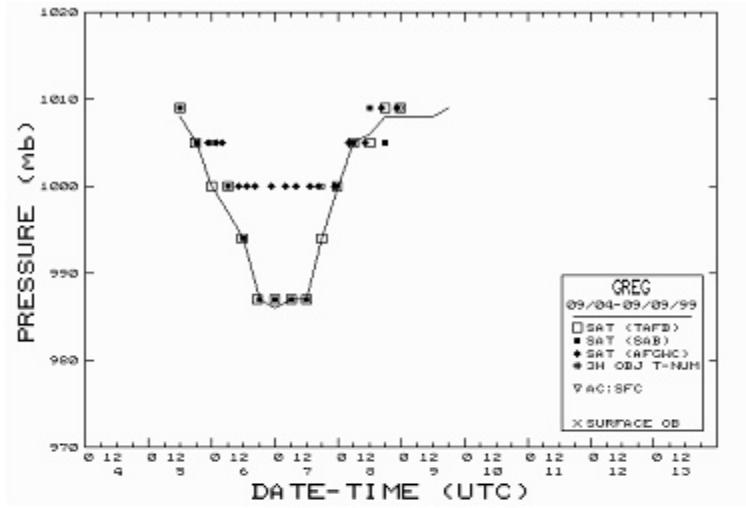


Fig. 4. Best track minimum central pressure and maximum speed curves for Hurricane Greg.

Table 1. Best track, Hurricane Greg, 5- 9 September, 1999

Date/Time (UTC)	Position		Pressure (mb)	Wind Speed (kt)	Stage
	Lat. (°N)	Lon. (°W)			
5/1200	18.6	105.1	1008	30	tropical depression
1800	19.2	105.4	1005	40	tropical storm
6/0000	19.9	106.0	1000	45	"
0600	20.6	106.7	997	50	"
1200	21.2	107.6	994	55	"
1800	21.5	108.4	987	65	hurricane
7/0000	21.9	109.0	986	65	"
0600	22.2	109.5	987	65	"
1200	22.5	109.5	987	65	"
1800	22.8	109.7	994	55	tropical storm
8/0000	23.1	110.3	1000	45	"
0600	23.1	110.8	1005	40	"
1200	23.0	111.1	1006	35	"
1800	23.0	111.3	1008	30	tropical depression
9/0000	23.2	111.5	1008	30	"
0600	23.2	111.8	1008	25	"
1200	23.2	112.0	1008	25	"
1800	23.2	112.3	1009	20	dissipating
7/0000	21.9	109.0	986	65	minimum pressure
7/2100	22.9	110.0	994	50	landfall near Cabo San Lucas

Table 2. Tropical Cyclone watch and warning summary for Hurricane Greg.

Date/Time (UTC)	Action	Location
5/1600	Tropical Storm Warning	for the coast of Mexico from Manzanillo to Cabo Corrientes including Islas Marias.
5/2100	Tropical Storm Warning extended southeastward	to include Lazaro Cardenas.
6/0300	Tropical Storm Warning issued	for the east coast of Baja California south of La Paz.
6/0300	Tropical Storm Watch issued	for the west coast of Baja California south of Punta Abreojos.
6/0900	Tropical Storm Warning issued	for the west coast of Baja California south of Cabo San Lazaro.
6/1500	Hurricane Warning	for the west coast of Baja California from arroyo Seco southward and for the east coast from La Paz southward.
6/2100	Tropical Storm Watch	for the east coast of Baja California from north of La Paz to Loreto.
7/2100	change hurricane warning to tropical storm warning	for Baja California from Arroyo Seco southward and from La Paz southward.
8/0900	Tropical Storm Warning and Watch discontinued	for the east coast of Baja California
8/1500	Tropical Storm Warning and Watch discontinued	all areas.