

PRELIMINARY REPORT

Tropical Storm Emily
24-28 August, 1999

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Emily formed about 360 n mi east of the southern Windward Islands and its track and intensity were primarily controlled by the much larger circulation of Hurricane Cindy.

a. Synoptic History

Vertical timesections constructed from RAOB data from Dakar and low-level cloud wind analysis from the University of Wisconsin show three distinct wind-shifts associated with a cluster of tropical waves which moved off the coast of Africa between the 14th and the 19th of August. Figure 1 is a sequence of once a day satellite images which shows the evolution of these tropical waves while moving over the tropical Atlantic and from which Dennis, Emily and Cindy eventually formed. The area of low-cloud cyclonic rotation and thunderstorm activity associated with the pre-Emily tropical wave (marked with E in Fig.1) moved toward the west-southwest and gradually became organized. A post-analysis of satellite images and surface data indicates that a tropical depression formed at 0600 UTC 24 August about 360 n mi east of the southern Windward Islands. An Air Force reconnaissance plane reached the area later on that day and found a small circulation of 1004 mb central pressure and 55-knot winds at 1500 feet. Surface winds were estimated to be 45 knots at this time and this turned out to be Emily's peak intensity.

Emily was in a strong shearing environment resulting from both the outflow and the inflow of the much larger Cindy, which was gradually approaching Emily. Consequently, the deep convection was at times removed from the circulation. However, convective bursts continued to redevelop near the center. Because of the high variability in the convection throughout the entire lifetime of the tropical cyclone, Dvorak T-numbers were up and down. Reconnaissance data indicated that the maximum intensity remained between 35 and 40 knots during that period.

Cindy disrupted the easterly trade-wind flow

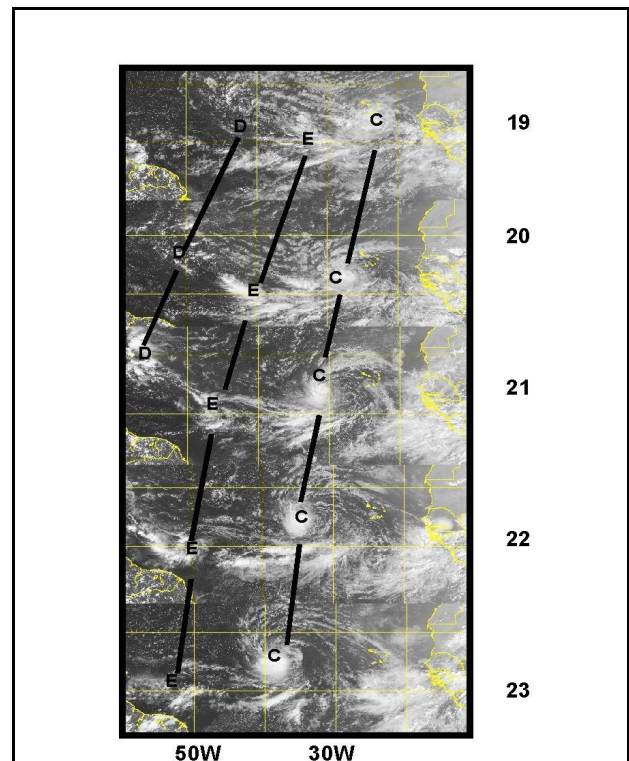


Fig. 1. Sequence of once a day GOES-8 visible satellite images at 1745 UTC from 19 to 23 August 1999 showing the westward propagation of the tropical waves which eventually triggered Dennis (D), Emily (E) and Cindy (C)

around Emily and resulted in Emily moving slowly toward the northwest and north embedded within a weak steering flow. Emily eventually was absorbed by the much larger circulation associated with Cindy on the 28 August.

Emily's track is shown in Fig. 2. 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. 3 and are primarily based on data provided from the six reconnaissance missions flown into Emily by Air Force aircraft. Satellite intensity estimates from the Tropical Analysis and Forecast Branch (TAFB), the Satellite Analysis Branch (SAB) and the Air Force Weather Agency, (AFGWC in the figures) and data from drifting buoys were also included in the analysis.

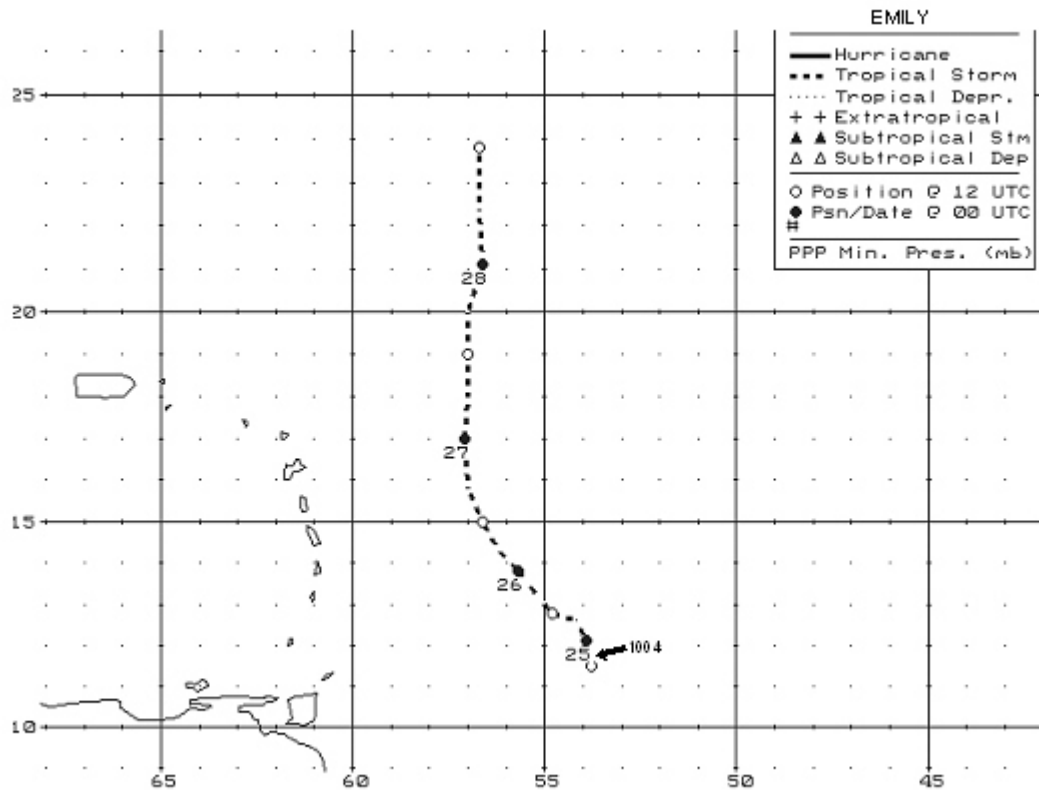


Fig. 2. Best track positions for Tropical Storm Emily , 24-28 August 1999

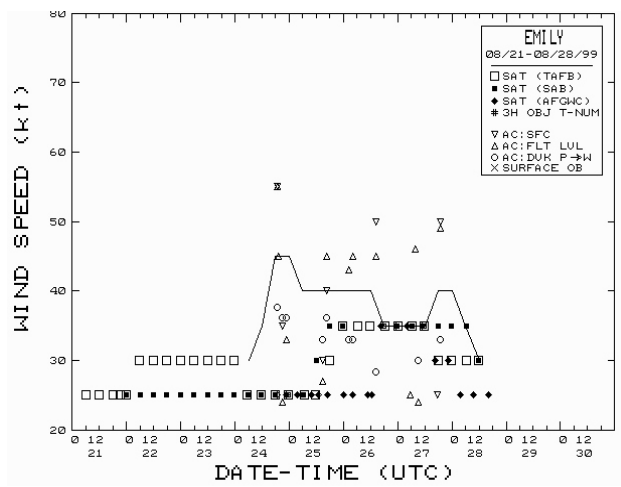
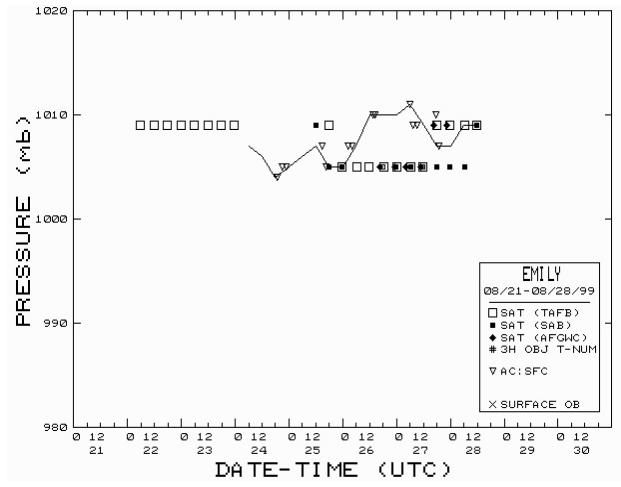


Fig. 3. Best track minimum central pressure and maximum sustained winds speed curves for Tropical Storm Emily.

c. Casualty and Damage Statistics

There are no reports of casualty and damage from Emily.

d. Forecast and Warning Critique

Although the formation of a tropical depression was forecast, advisories on Emily were not initiated until data from the Air Force reconnaissance plane indicated that the system was already a fully developed tropical storm. Due to the high variability on the convection, Dvorak T-numbers were low and did not justify tropical storm or even tropical depression intensity at that time. Emily was forecast to reach hurricane status based on the Statistical Hurricane Intensity Prediction Scheme (SHIPS) and the GFDL models but the storm never acquired winds higher than 45 knots.

The NHC average official track errors in n mi for Emily (excluding the tropical depression stage) were 31 (13 cases), 70 (11 cases), 130 (9 cases), 208 (7 cases) and 332 (3 cases), respectively, for the 12-, 24-, 36-, 48-, and 72-hour forecast periods. These errors for 12, 24 and 36 hour periods are very near the 1989-1998 average official forecast errors. However, the errors for 48 and 72 hours were nearly 30% larger than the average.

Table 1. Best track, Tropical Storm Emily, 24- 28 August, 1999

Date/Time (UTC)	Position		Pressure (mb)	Wind Speed (kt)	Stage
	Lat. (°N)	Lon. (°W)			
24/0600	11.5	53.6	1007	30	tropical depression
1200	11.5	53.8	1006	35	tropical Storm
1800	11.6	53.9	1004	45	"
25/0000	12.1	53.9	1005	45	"
0600	12.6	54.2	1006	40	"
1200	12.8	54.8	1007	40	"
1800	13.2	55.2	1005	40	"
26/0000	13.8	55.7	1005	40	"
0600	14.3	56.2	1007	40	"
1200	15.0	56.6	1010	40	"
1800	15.8	57.0	1010	35	"
27/0000	17.0	57.1	1010	35	"
0600	18.0	57.0	1011	35	"
1200	19.0	57.0	1009	35	"
1800	20.0	57.0	1007	40	"
28/0000	21.1	56.6	1007	40	"
0600	24.4	56.7	1009	35	"
1200	23.8	56.7	1009	30	tropical depression
1800					absorbed by Cindy
24/1800	11.6	53.9	1004	45	Minimum Pressure