

PRELIMINARY REPORT

Hurricane Erin (18 - 27 August, 1989)

a. Synoptic history

A well-organized tropical wave was observed on METEOSAT imagery to emerge from the African coast about mid day on 16 August. Once over the cool waters of the eastern Atlantic, the extensive convective activity associated with the system over Africa diminished, leaving a well-organized, but small, low-level circulation center. Slowly the tropical wave regained its convective activity so that by 0000 UTC 18 August, the system became a tropical depression based upon Dvorak satellite classifications near the Cape Verde Islands. Figure 1 is a map of the best track positions and Table 1 lists the best track center position, wind, and pressure values.

At the same time another well-organized, larger-scale tropical wave was located in the tropical mid Atlantic and was moving westward. The interaction between this wave and the developing depression caused the system to move north-northwestward. This course was maintained for almost three days as the depression appeared to be steered by the larger-scale tropical wave ahead of it and the eastern portion of the subtropical ridge to the north. Based on analysis of satellite imagery using the Dvorak technique, at 1800 UTC 19 August, the depression was upgraded to Tropical Storm Erin. The storm was then near 18.5°N 32.7°W or about 420 n mi west of the northwesternmost Cape Verde Islands.

About 1200 n mi to the northwest of the tropical storm, the southern portion of an upper-level trough began to cutoff near 27°N 45°W . As this practically stationary low pressure system began to grow in size and intensity, it also began working its way down to mid-levels. The upper-level low controlled Erin with respect to track and intensity for the next four days. Initially, as Erin approached the upper-level low from the southeast, it was adversely affected by strong upper-level southwesterly flow. By 21 August Erin began moving more north-northwest as the system was near enough to be steered by the level low. As Erin moved northward into the northeast quadrant of the upper-level low, the flow aloft became weaker and more divergent. In this environment Erin strengthened in 24 hours from a 45-knot storm to a hurricane by 1200 UTC 22 August.

Now northeast of the upper-level low's center, Erin slowed and began a more northwestward course. This motion was short-lived as a short-wave trough moving eastward from the northwest began affecting the track of the hurricane. By 23 August Erin's course returned to north and then north-northeast as the hurricane's forward speed began to increase. Erin weakened to tropical storm strength by 0600 UTC 27 August and shortly afterwards became extratropical.

b. Meteorological statistics

Figures 2 and 3 show the best track wind and pressure curves as a function of time, along with the observations on which they are based. All the observations used in these figures are based on satellite data, except for the single ship observation which was the basis for upgrading Erin to hurricane status. It was at 1200 UTC 22 August that Portuguese ship Montemuro (CSDN) reported a west wind of 65 knots just to the south of Erin's center. Although the surface pressure observation accompanying the 65-knot wind was 1000.3 mb, the same report stated a 13-millibar rise had occurred during the previous three hours. Before this observation and for some time after it, the Dvorak technique as used by analysts at three independent locations did not imply wind speeds of hurricane force. Table 2 lists all ship reports with tropical storm force winds or greater associated with Erin.

c. Casualty and damage statistics

Although the tropical depression that spawned Erin passed through the Cape Verde Islands during 18 August, only thunderstorms and gusty winds were observed. There were no reports of casualties or damage reported to the National Hurricane Center related to Erin.

d. Warning and forecast critique

Since Erin remained over the open Atlantic, there were no coastal watches or warnings issued.

The two major external systems to affect Erin were the cutoff upper-level low which had a pronounced effect on its track and intensity and the short-wave trough which eventually recurved and accelerated it to the northeast. The objective track forecasts provided by NHC83 ranked second or third poorest for all time periods when compared to its other forecasts for storms this season. This demonstrates the difficulty in forecasting the interaction between upper-level lows and tropical cyclones. As a result the official forecasts associated with Erin also ranked second or third poorest for all time periods for storms of this season. In addition, the nowcast and forecast of Erin's intensity posed a major problem. Because the storm was located far from the GOES and METEOSAT subpoints, satellite location and intensity estimates were difficult. Until a ship observed hurricane-force wind and a correspondingly low pressure associated with the system, Erin was thought to be weak and disorganized. Nowcasts and forecasts always benefit when other observations corroborate satellite position and intensity estimates.

Final draft
12/04/89
Jim Gross

Table and Figure captions:

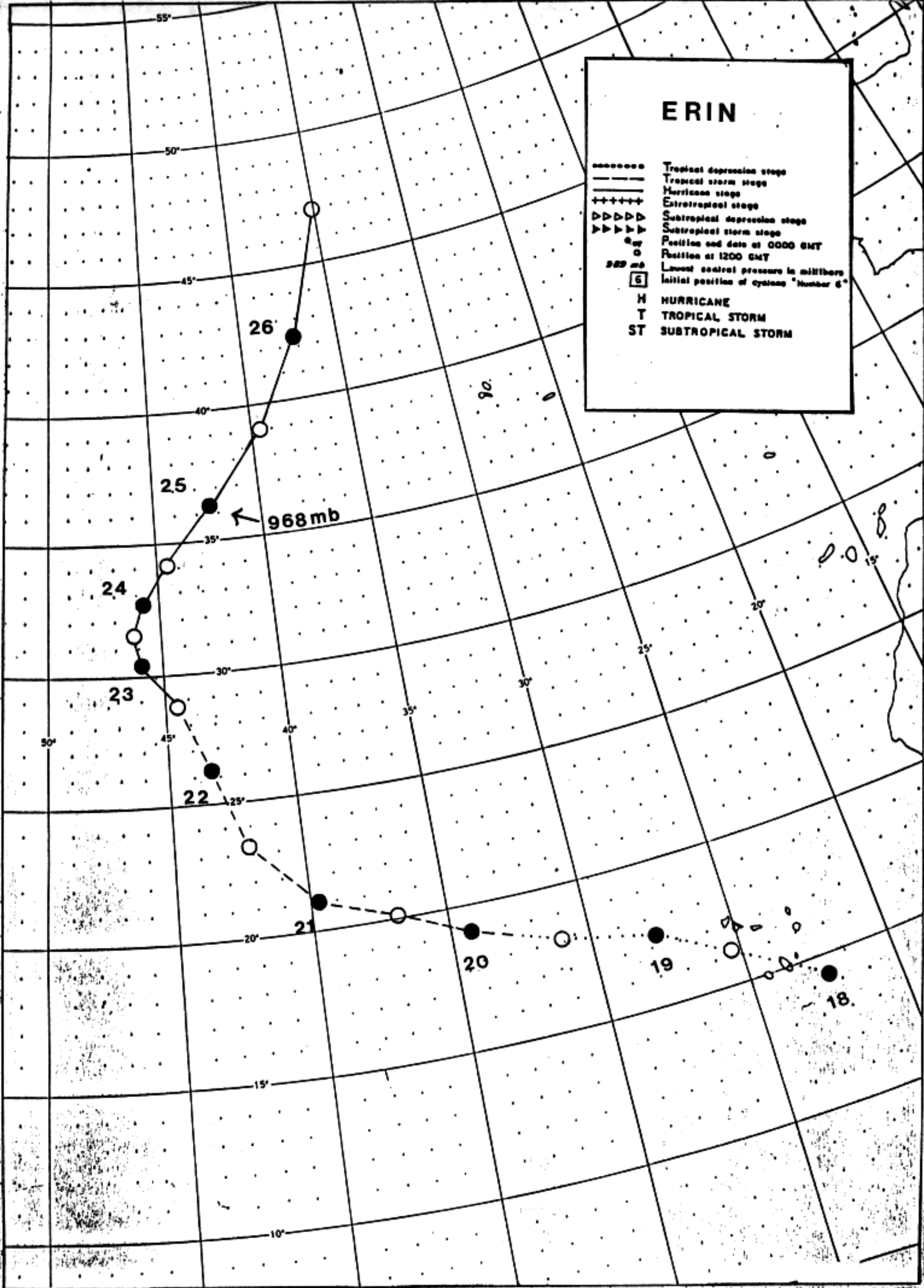
- Table 1. Preliminary best track, Hurricane Erin, 18 - 27 August, 1989.
- Figure 1. Best track positions for Hurricane Erin, 18 - 27 August, 1989.
- Figure 2. Best track maximum sustained wind speed curve for Hurricane Erin, 18 - 27 August, 1989.
- Figure 3. Best track minimum central pressure curve for Hurricane Erin, 18 - 27 August, 1989.
- Table 2. Ship reports associated with Hurricane Erin, 22 - 26 August, 1989.

TABLE 1. Preliminary Best Track -- Hurricane Erin

DATE	TIME (UTC)	POSITION		PRESSURE (mb)	WIND (kt)	STAGE	
		LAT. (°N)	LON. (°W)				
8/18	0000	14.3	22.4	1012	25	Tropical Depression	
"	0600	15.2	23.8	1012	25	"	"
"	1200	16.2	25.2	1011	25	"	"
"	1800	17.0	26.5	1010	30	"	"
8/19	0000	17.4	27.8	1009	30	"	"
"	0600	17.7	29.4	1008	30	"	"
"	1200	18.1	31.1	1007	30	"	"
"	1800	18.5	32.7	1005	35	Tropical Storm	
8/20	0000	19.1	34.3	1004	35	"	"
"	0600	19.6	35.6	1003	40	"	"
"	1200	20.1	36.9	1002	40	"	"
"	1800	20.6	38.3	1001	40	"	"
8/21	0000	21.1	39.7	1000	45	"	"
"	0600	22.0	41.1	998	45	"	"
"	1200	23.3	42.1	997	45	"	"
"	1800	24.7	42.8	994	50	"	"
8/22	0000	26.2	43.3	992	55	"	"
"	0600	27.6	43.8	989	60	"	"
"	1200	28.8	44.5	986	65	Hurricane	
"	1800	29.7	45.2	983	70	"	"
8/23	0000	30.3	45.9	981	70	"	"
"	0600	30.9	46.3	979	75	"	"
"	1200	31.5	46.2	977	80	"	"
"	1800	32.0	46.0	975	80	"	"
8/24	0000	32.6	45.6	973	85	"	"
"	0600	33.3	45.2	971	85	"	"
"	1200	34.1	44.5	970	90	"	"
"	1800	35.1	43.6	969	90	"	"
8/25	0000	36.3	42.4	968	90	"	"
"	0600	37.6	41.1	969	90	"	"
"	1200	39.0	39.7	971	90	"	"
"	1800	40.6	38.3	973	85	"	"
8/26	0000	42.3	37.2	976	80	"	"
"	0600	44.4	36.2	980	75	"	"
"	1200	47.0	35.1	983	70	"	"
"	1800	49.5	33.5	986	65	"	"
8/27	0000	51.9	31.8	991	60	Tropical Storm	
8/25	0000	36.3	42.4	968	90	Minimum Pressure	

ERIN

- Tropical depression stage
- Tropical storm stage
- Hurricane stage
- +++++ Extratropical stage
- ▽▽▽▽ Subtropical depression stage
- ▽▽▽▽ Subtropical storm stage
- Position and date at 0000 GMT
- Position at 1200 GMT
- 968 mb Lowest central pressure in millibars
- 6 Initial position of cyclone "Number 6"
- H HURRICANE
- T TROPICAL STORM
- ST SUBTROPICAL STORM

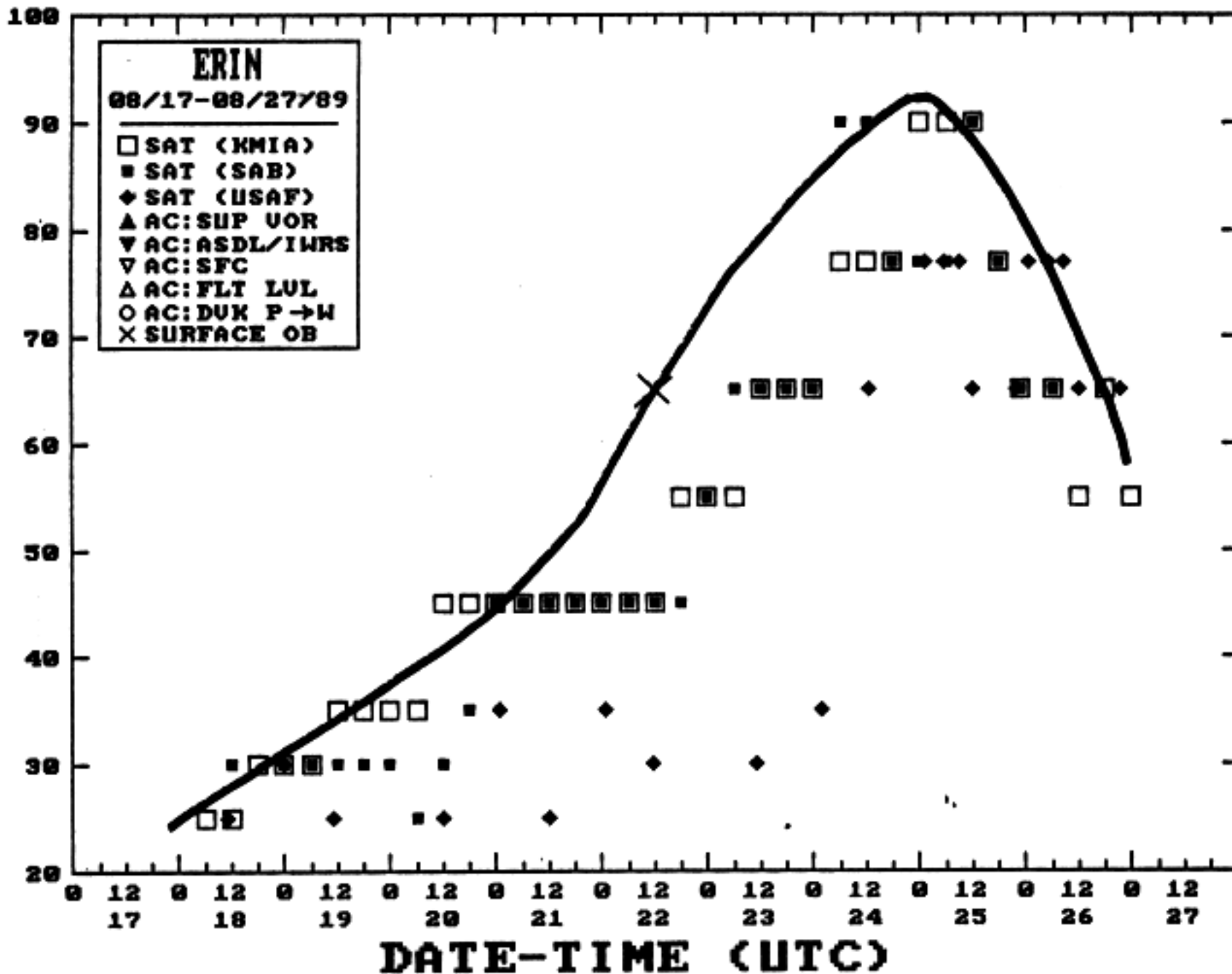


ERIN

08/17-08/27/89

- SAT (KMIA)
- SAT (SAB)
- ◆ SAT (USAF)
- ▲ AC: SUP UOR
- ▼ AC: ASDL/IWRS
- ▽ AC: SFC
- △ AC: FLT LUL
- AC: DUK P → W
- × SURFACE OB

WIND SPEED (kt)



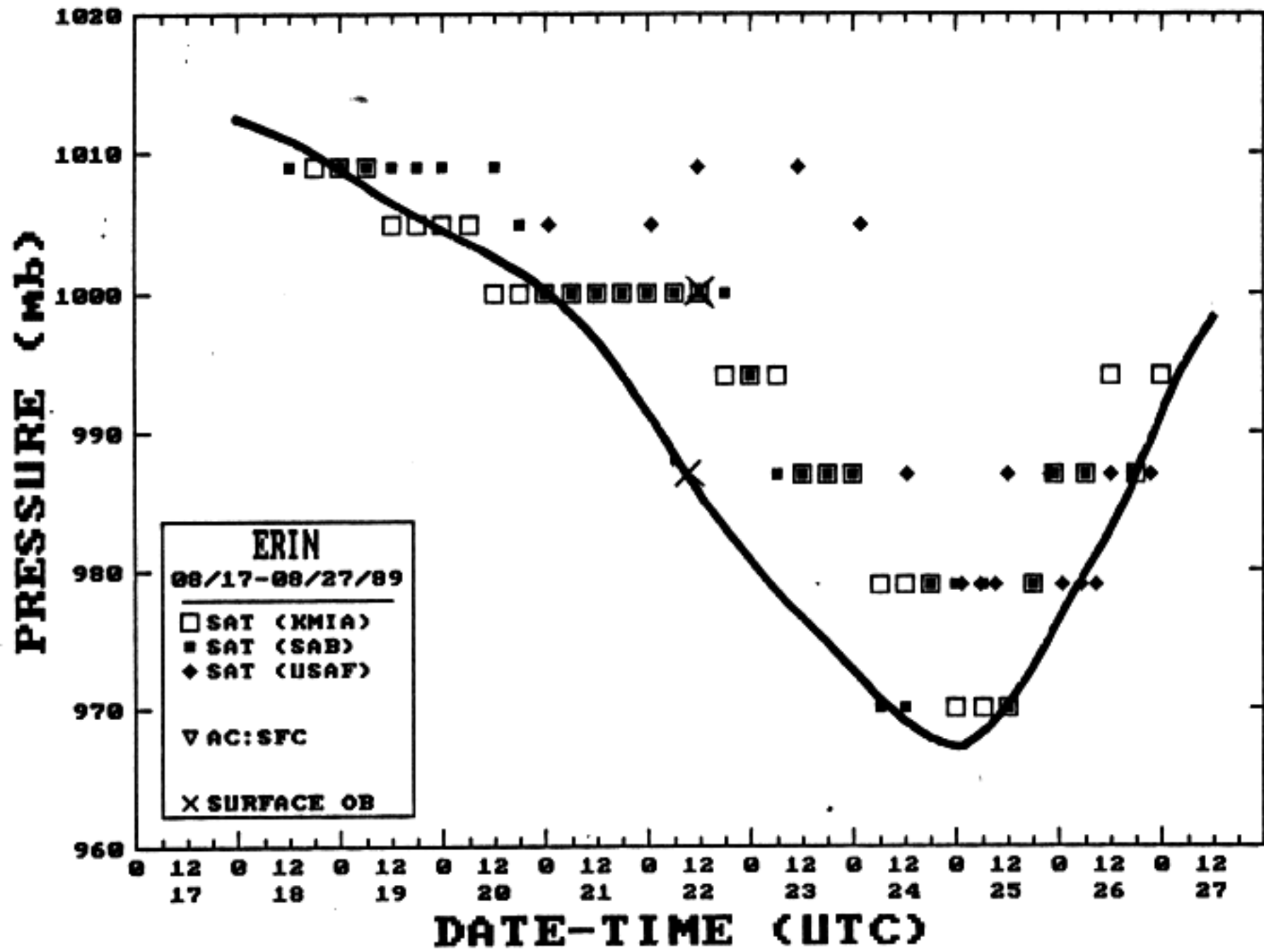


TABLE 2. Ship reports associated with Hurricane Erin

<u>DATE</u>	<u>TIME</u> <u>(UTC)</u>	<u>STATION</u>	<u>POSITION</u>		<u>PRESSURE</u> <u>(mb)</u>	<u>WIND</u> <u>(dir/kt)</u>
			<u>LATITUDE</u>	<u>LONGITUDE</u>		
8/22	1200	CSDN	28.5	45.0	1000.3	270/65
8/22	1200	FNSL	31.9	41.5	1017.2	160/40
8/24	0000	EWJR	30.7	43.8	1013.4	170/35
8/24	1200	XCIE	32.1	43.5	1011.5	200/55
8/25	0000	DOQS	35.8	39.7	1015.0	160/37
8/26	0000	YSGN	45.5	35.6	1012.5	110/37
8/26	0600	YSGN	46.1	33.6	1010.5	120/45
8/26	1200	YSGN	46.7	31.4	1012.0	130/43
8/26	1800	C6DN3	49.0	32.0	1003.5	160/50
8/26	1800	ELDM3	49.4	31.9	1002.1	160/37