

Preliminary Report  
Hurricane Felicia  
14 - 22 July 1997

Miles B. Lawrence  
National Hurricane Center  
23 August 1997

a. Synoptic History

The first indication of Hurricane Felicia was the detection of a large area of increasing thunderstorms centered several hundred miles south of Manzanillo, Mexico on July 13th. On the 14th, this disturbed weather became better organized with a banding-type cloud pattern and developed into Tropical Depression Eight-E. Fig. 1 shows a plot of the best track of Felicia and this track is tabulated in Table 1. Felicia's movement during its existence was toward the west-northwest at forward speeds varying from 5 to 15 knots.

For the first day or so, there was little additional development as the depression experienced northeasterly wind shear, partially associated with the outflow from Hurricane Enrique. But on the 15th, the system was upgraded to Tropical Storm Felicia as Enrique's outflow retreated. A burst of deep convection on the 16th was evidence of further development and Felicia became a hurricane on the 17th when there was a suggestion of the formation of an eye between two interlocking convective bands. Felicia leveled off as a 65-knot hurricane for 24 hours under northwesterly shear caused by a nearby upper-level trough.

On the 18th, an eye became better defined and a period of intensification began that culminated with estimated 115-knot sustained wind speeds on the 19th. The hurricane's maximum wind speed remained 115 knots for most of the 19th and then began a continuous decrease as a result of colder sea surface temperatures and a hostile synoptic environment caused by another approaching upper-level trough.

Felicia moved west of 140 degrees west longitude on the 21st and the responsibility for issuing advisories was transferred to the National Weather Service's Central Pacific Hurricane Center at Honolulu at that time. Felicia was reduced to a swirl of low clouds on the 22nd in the central Pacific Ocean.

b. Meteorological Statistics

Figures 2 and 3 show curves of minimum sea-level pressure and maximum one-minute surface wind speed, respectively, as a function of time. Satellite data plotted in these figures are based on the Dvorak satellite intensity estimating technique as applied at the Tropical Analysis and Forecast Branch (TAFB), the Satellite Analysis Branch (SAB) and the U.S. Air Force Global

Weather Center (AFGWC). As is the case for most eastern Pacific tropical cyclones, all of the tracking and intensity estimates of Felicia were based on satellite data.

c. Casualty and Damage Statistics

Felicia did not affect land and there were no known casualties or damage.

d. Forecast and Warning Critique

Average official track forecast errors were 8, 33, 66, 95, 125, and 210 nautical miles, respectively, for the 0-, 12-, 24-, 36-, 48-, and 72-hour forecast periods. These errors are slightly smaller than the 1988-1995 average errors except at 72 hours where the errors are slightly larger. The wind speed forecast errors were rather large for the two days preceding the strengthening to 115 knots. The 48-hour forecast error for the forecast issued at 0300 GMT on the 18th was -55 knots, as there was a failure to recognize the potential for the significant strengthening that subsequently occurred.

**Table 1. Best track, Hurricane Felicia, 14 - 22 July 1997.**

| Date/Time (UTC) | Latitude (°N) | Longitude (°W) | Pressure (mb) | Wind Speed(kt) | Stage               |
|-----------------|---------------|----------------|---------------|----------------|---------------------|
| 14/1200         | 9.7           | 109.0          | 1006          | 30             | tropical depression |
| 1800            | 10.4          | 110.1          | 1006          | 30             | "                   |
| 15/0000         | 10.9          | 111.1          | 1006          | 30             | "                   |
| 0600            | 11.3          | 112.0          | 1005          | 30             | "                   |
| 1200            | 11.7          | 112.5          | 1005          | 30             | "                   |
| 1800            | 12.1          | 113.0          | 1004          | 35             | tropical storm      |
| 16/0000         | 12.4          | 113.7          | 1003          | 35             | "                   |
| 0600            | 12.5          | 114.5          | 1000          | 40             | "                   |
| 1200            | 12.5          | 115.1          | 996           | 50             | "                   |
| 1800            | 12.6          | 115.5          | 990           | 55             | "                   |
| 17/0000         | 12.9          | 116.0          | 988           | 60             | "                   |
| 0600            | 13.4          | 116.9          | 987           | 65             | hurricane           |
| 1200            | 13.9          | 117.9          | 987           | 65             | "                   |
| 1800            | 14.4          | 119.0          | 987           | 65             | "                   |
| 18/0000         | 14.8          | 120.1          | 985           | 65             | "                   |
| 0600            | 15.1          | 121.3          | 979           | 75             | "                   |
| 1200            | 15.3          | 122.5          | 968           | 95             | "                   |
| 1800            | 15.4          | 123.9          | 960           | 100            | "                   |
| 19/0000         | 15.5          | 125.3          | 956           | 110            | "                   |
| 0600            | 15.6          | 126.7          | 951           | 115            | "                   |
| 1200            | 15.7          | 128.1          | 948           | 115            | "                   |
| 1800            | 15.8          | 129.5          | 951           | 115            | "                   |
| 20/0000         | 16.0          | 131.0          | 954           | 110            | "                   |
| 0600            | 16.3          | 132.5          | 957           | 105            | "                   |
| 1200            | 16.6          | 134.1          | 960           | 100            | "                   |
| 1800            | 16.9          | 135.6          | 965           | 95             | "                   |
| 21/0000         | 17.1          | 137.2          | 972           | 90             | "                   |
| 0600            | 17.3          | 138.9          | 980           | 70             | "                   |
| 1200            | 17.4          | 140.8          | 990           | 55             | tropical storm      |
| 1800            | 17.5          | 143.0          | 995           | 45             | "                   |
| 22/0000         | 17.6          | 145.4          | 1000          | 40             | "                   |
| 0600            | 17.6          | 147.9          | 1005          | 30             | tropical depression |
| 1200            | 17.7          | 150.2          | 1007          | 25             | "                   |
|                 |               |                |               |                |                     |
| 19/1200         | 15.7          | 128.1          | 948           | 115            | minimum pressure    |

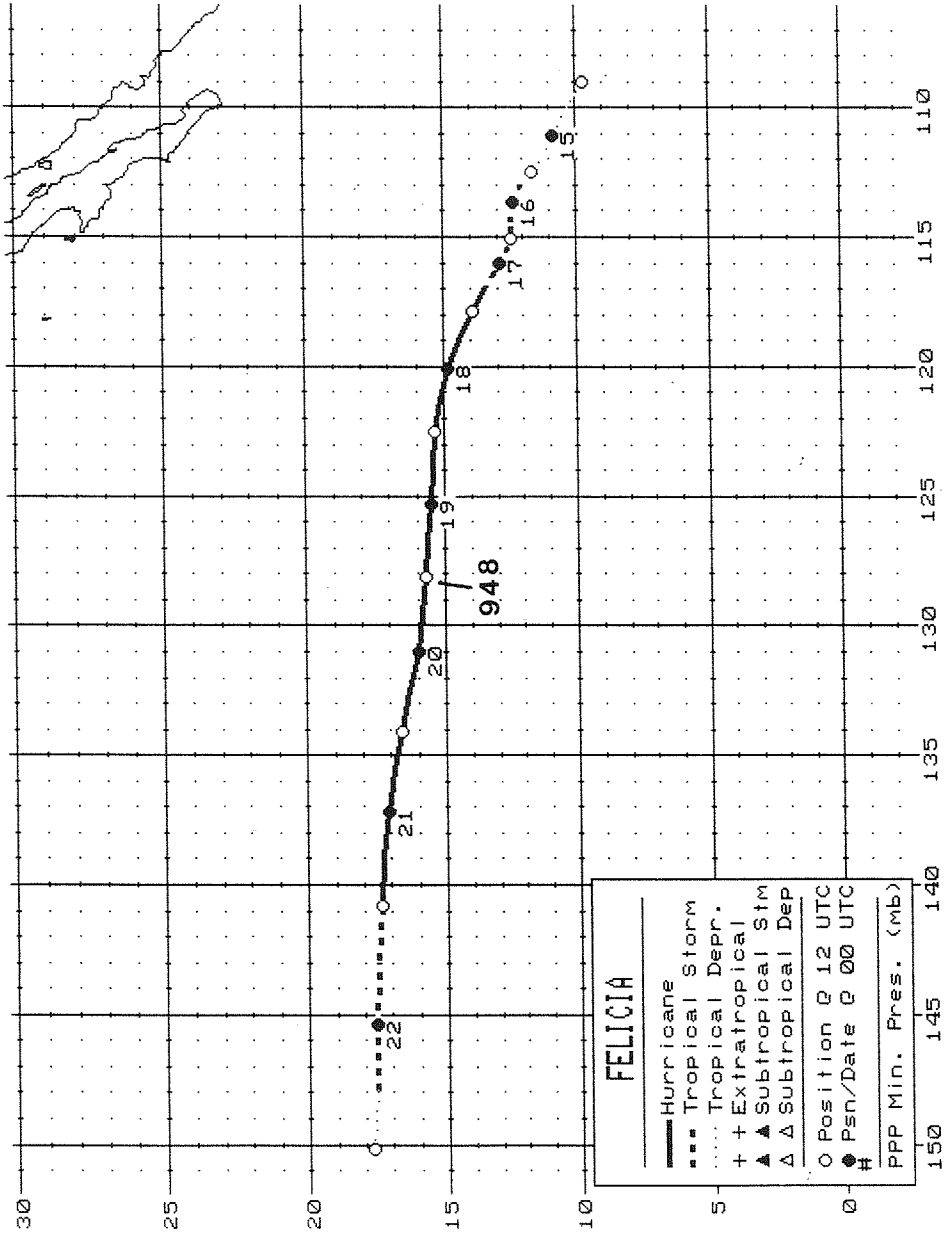


Fig. 1. Best track positions for Hurricane Felicia, 14-22 July 1997.

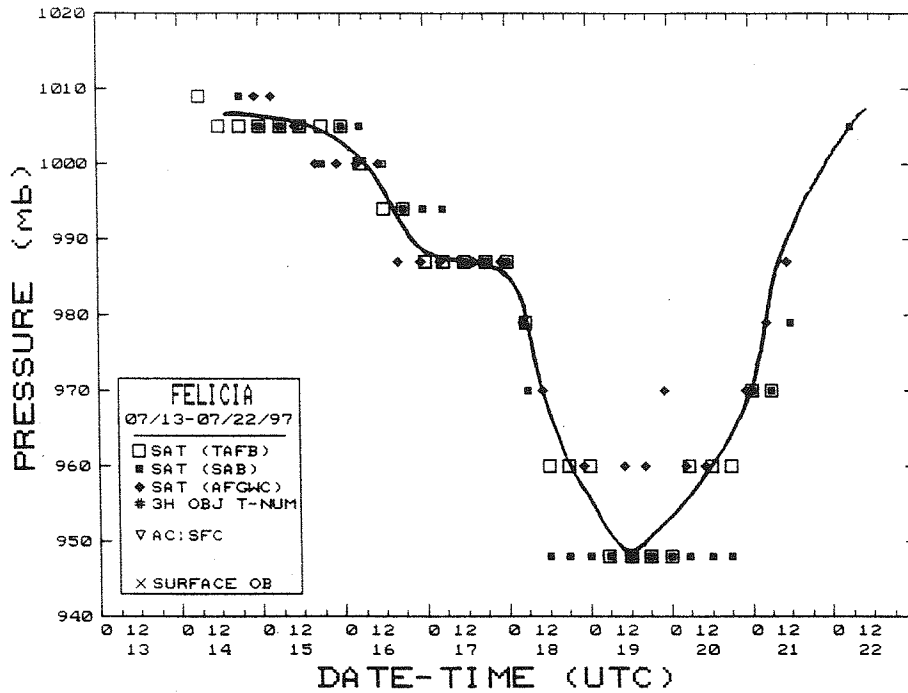


Fig. 2. Best track minimum sea level pressure curve for Hurricane Felicia.

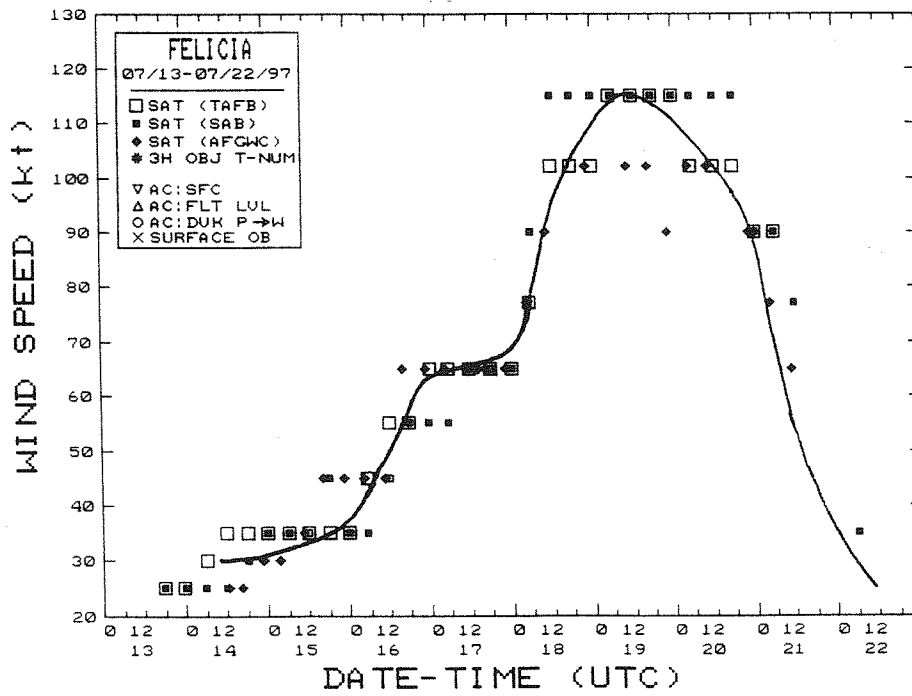


Fig. 3. Best track maximum one-minute wind speed curve for Hurricane Felicia.