

Preliminary Report  
Hurricane Juliette  
16-26 September 1995

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Juliette had the distinction of being the strongest eastern north Pacific hurricane of 1995. Its one-minute winds reached an estimated 130 knots.

a. Synoptic History

Juliette can be traced back to a tropical wave which exited west Africa on 31 August. This system trailed behind Hurricane Luis, which formed over the eastern Atlantic. The upper-level outflow (and possibly subsidence) to the east of Luis apparently inhibited development of the wave as it propagated westward across the Atlantic. Even though the cloud pattern associated with this system was not well defined, continuity (using a westward motion of  $6^{\circ}$  longitude per day) puts the wave axis near Panama on 11 September.

The wave crossed central America on the 12th, and caused increased thunderstorm activity in the vicinity of the Gulf of Tehuantepec on the 13th, and near  $100^{\circ}\text{W}$  on the 14th. Late on the 15th (2330 UTC) when the system was near  $103^{\circ}\text{W}$ , the cloud pattern became sufficiently organized so that an initial Dvorak technique classification was performed. The development trend continued, and based on intensity estimates by the Tropical Analysis and Forecast Branch (TAFB) and the Synoptic Analysis Branch (SAB) of a T2.0 on the Dvorak scale, it is estimated that a tropical depression, Eleven-E, formed a little over 250 n mi to the south of Manzanillo Mexico at 1800 UTC 16 September. The subsequent track is shown in Figure 1.

The developing tropical cyclone was rather small in size, with a central area of deep convection only 50-100 n mi in diameter. Based on Dvorak estimates from TAFB and SAB, tropical storm intensity was reached at 1200 UTC 17 September. Further strengthening, at a rather rapid rate, occurred, and Juliette is inferred to have reached hurricane strength by 1200 UTC on the 18th, when satellite images revealed that an eye was forming. Continued rapid development took place on the 18th; by 1800 UTC Juliette's eye was well-defined.

A narrow, weak, deep-tropospheric ridge lay to the north of the strengthening hurricane, steering Juliette slowly in a general west-northwestward direction. On the 19th, satellite imagery suggested that the strengthening trend practically ceased, and maximum winds levelled off near 105 knots. On that day, it is possible that upper level outflow was being interfered with by environmental northeasterly winds in the upper troposphere.

However on the 20th, as Juliette turned toward the west, further intensification took place, with a fairly symmetrical mass of very cold cloud tops seen around the eye on satellite pictures. Juliette reached its peak intensity, with estimated maximum winds of 130 knots, at 1200 UTC 20 September.

Later on the 20th, as a gradual weakening trend set in, the hurricane turned back to the west-northwest, at a reduced forward speed. This general motion continued for the next couple of days. By 1200 UTC on the 22nd, maximum winds were down to 85 knots. Satellite images during the previous 24 hours or so indicated the presence of concentric eyewalls, and the inner eyewall gave way to an outer wall, resulting in a large eye, about 70 n mi in diameter. Around 0000 UTC on the 23rd, the eye shrank to about half that size, and a minor restrengthening, back to 90 knots, was noted. These intensity changes are roughly consistent with an eyewall replacement cycle.

Steering currents around a mid-tropospheric low in the vicinity of 27°N 130°W caused the hurricane to turn northward on the 23rd. On the 24th, as the low opened up into an eastward-moving trough, Juliette was steered north-northeastward with some increase in forward speed. Shearing winds from the southwest and cooler sea surface temperatures took their toll, and Juliette weakened to a tropical storm late on the 24th. By 0000 UTC on the 25th, the storm consisted of a swirl of lower-tropospheric clouds, devoid of deep convection. With the influence of upper-level steering removed, the dissipating cyclone's motion became a south to southeastward drift. Juliette weakened to a depression around 0000 UTC 26 September, and later on the 26th, the then-meandering tropical cyclone dissipated.

#### b. Meteorological Statistics

The post-analysis best track intensities for Juliette are listed in Table 1 and displayed in Figs. 2 and 3, which show the estimated minimum central pressure and maximum one-minute wind speed, respectively, versus time. As is usual for eastern north Pacific tropical cyclones, these intensity estimates were derived mainly from analyses of satellite images, using the Dvorak technique, performed by meteorologists at the SAB and TAFB (formerly the Tropical Satellite Analysis and Forecast unit, TSAF, as in the figures) and at the Air Force Global Weather Central (AFGWC). The estimated peak intensity of Juliette, 130 knots at 1200 UTC 20 September, is consistent with a subjective Dvorak T-number of 6.5 and a 3- to 6-hourly mean objective T-number between 6.5 and 7.0 near that time. No ship reports of wind speeds greater than 33 knots associated with Juliette have been received at the NHC.

#### c. Casualty and Damage Statistics

Juliette remained over water throughout its existence, and no reports of casualties or damage have been received at the NHC.

#### d. Forecast and Warning Critique

The track forecasts for Juliette were, for the most part, very good. The mean 12-, 24-, 36-, 48- and 72-hr position errors were 35, 67, 78, 71, and 104 n mi, respectively. These are well below the 1988-1994 averages. Overall, the intensity of Juliette was underforecast. In particular, on the 17th and 18th of September the NHC forecast/advisories and accompanying cyclone discussions recognized that conditions were favorable for strengthening, but they did not anticipate that Juliette would intensify beyond 100 knots. This is typical, considering the state of the art in tropical cyclone intensity prediction.

A tropical storm watch was issued for a portion of Baja California after Juliette had turned north-northeastward, and some of the track forecast models predicted the cyclone to move over that peninsula. It appeared likely that shearing and weakening would nullify the effects of steering by the higher level winds, and reduce the threat to Baja. However, since there was a possibility that Juliette would maintain enough of its intensity and reach land, the watch was issued as a precautionary measure. When the hurricane weakened rapidly and its forward motion slowed, it became obvious that the watch was unnecessary.

Table 1. Post-analysis best track, Hurricane Juliette,  
16-26 September, 1995.

Date/Time (UTC)	Position		Pressure (mb)	Wind Speed (kt)	Stage
	Lat. (°N)	Lon. (°W)			
16/1800	14.8	105.0	1008	30	Tropical Depression
17/0000	15.1	105.8	1006	30	" "
0600	15.4	106.3	1006	30	" "
1200	15.6	106.7	1005	35	Tropical Storm
1800	15.8	107.0	1000	45	" "
18/0000	16.1	107.5	997	50	" "
0600	16.2	108.1	994	55	" "
1200	16.3	108.6	985	70	Hurricane
1800	16.4	109.1	974	85	"
19/0000	16.6	109.4	960	100	"
0600	16.7	109.8	958	105	"
1200	16.9	110.4	955	105	"
1800	17.2	111.2	955	105	"
20/0000	17.5	111.6	950	110	"
0600	17.8	112.4	942	120	"
1200	17.8	113.5	930	130	"
1800	17.8	114.3	933	130	"
21/0000	18.0	114.7	942	120	"
0600	18.2	115.3	950	110	"
1200	18.3	115.9	960	100	"
1800	18.5	116.5	963	95	"
22/0000	18.8	117.1	965	95	"
0600	18.9	117.6	970	90	"
1200	19.1	118.5	975	85	"
1800	19.3	118.9	974	85	"
23/0000	19.6	119.2	970	90	"
0600	20.2	119.3	970	90	"
1200	20.6	119.4	970	90	"
1800	21.4	119.2	971	90	"
24/0000	22.3	118.5	972	85	"
0600	23.2	118.0	977	80	"
1200	23.9	117.7	983	70	"
1800	24.1	117.6	987	65	"
25/0000	24.2	117.5	994	55	Tropical Storm
0600	24.0	117.5	997	50	" "
1200	23.7	117.4	1000	45	" "
1800	23.3	117.3	1005	35	" "
26/0000	23.0	117.3	1006	30	Tropical Depression
0600	22.9	117.2	1006	30	" "
1200	22.9	117.1	1006	25	" "
1800	23.1	117.0	1007	25	" "
27/0000					Dissipated
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20/1200	17.8	113.5	930	130	Minimum Pressure

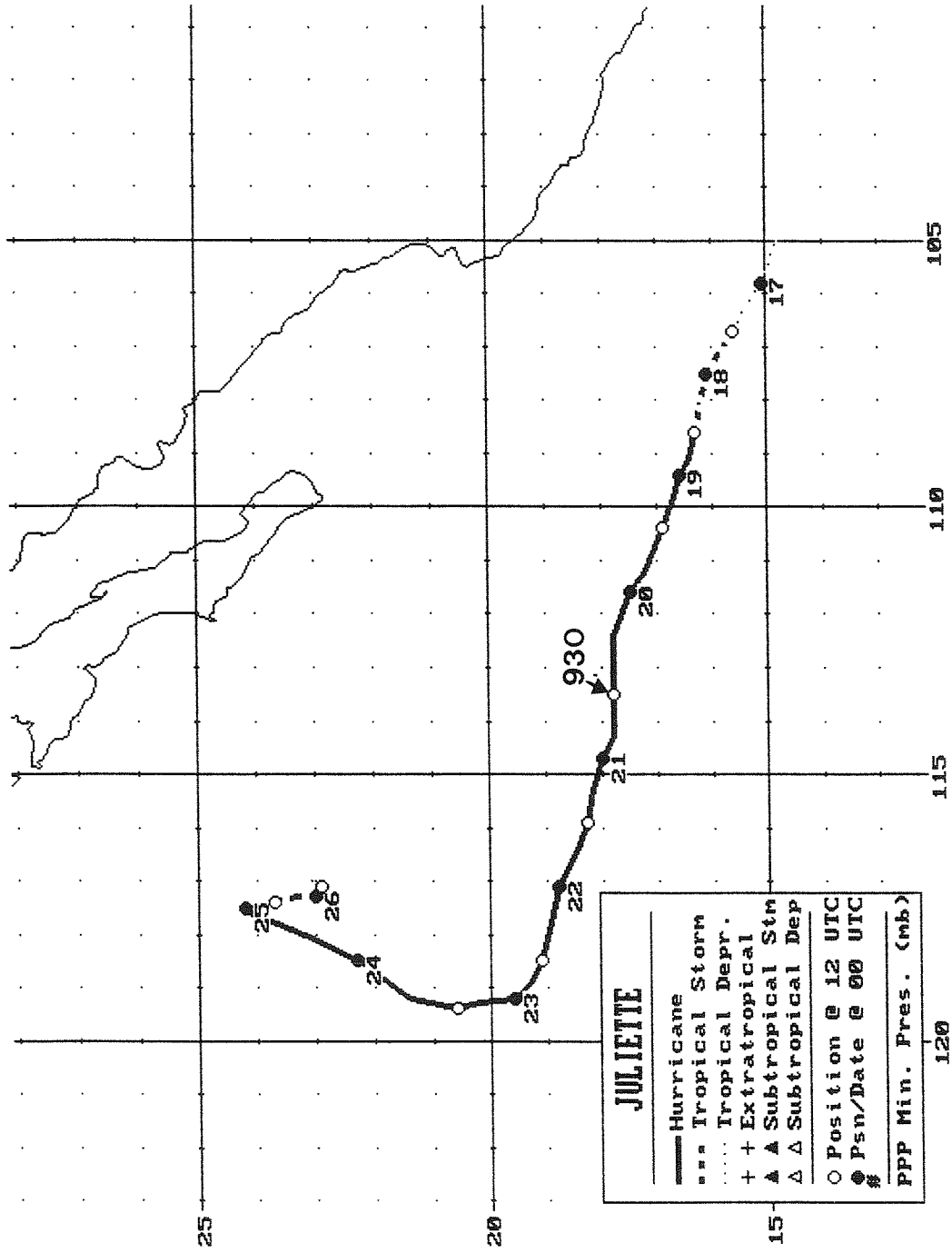


Figure 1. Post-analysis best track positions for Hurricane Juliette, 16-26 September, 1995.

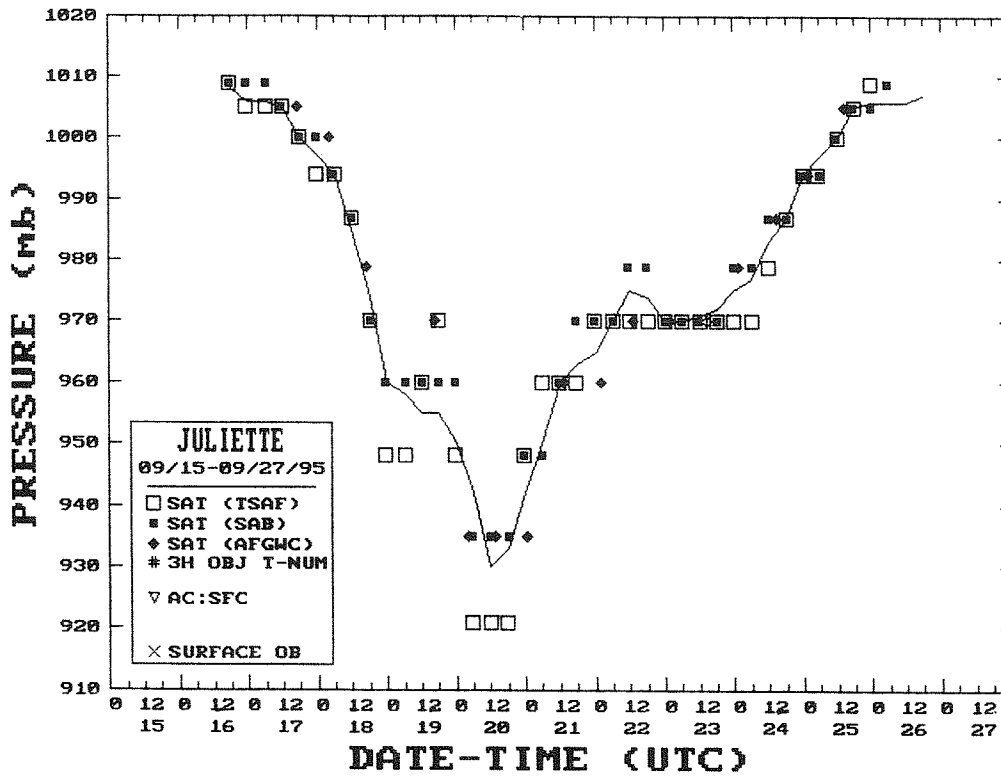


Figure 2. Best track minimum central pressure curve for Hurricane Juliette, 1995.

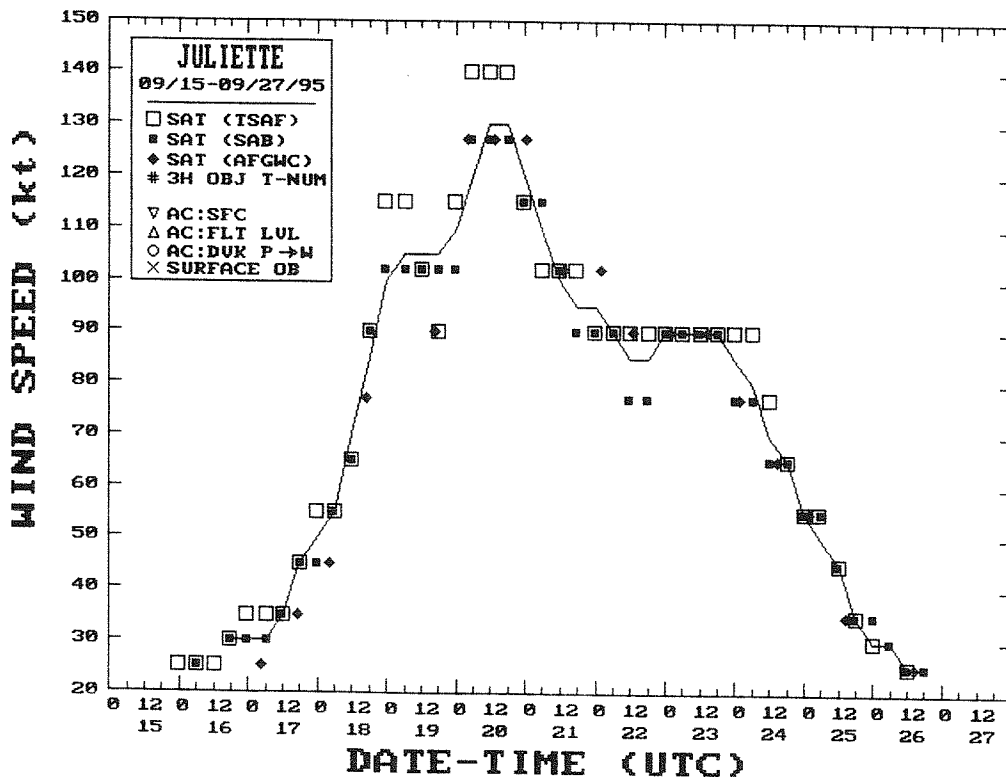


Figure 3. Best track maximum one-minute wind speed curve for Hurricane Juliette, 1995.