Preliminary Report
Hurricane Jeanne
21 September - 1 October, 1998

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Jeanne remained over the eastern Atlantic. It brushed the Cape Verde Islands, and also caused some gusty winds over the Azores just before losing tropical characteristics.

a. Synoptic History

Jeanne formed from a tropical wave that was slow to emerge from western Africa. The associated disturbed weather lingered near the African coast from the 19th through the 20th of September, and gradually became better organized. An initial Dvorak classification was made by the Tropical Prediction Center's Tropical Analysis and Forecast Branch (TAFB) at 1800 UTC 19 September, locating a center about 120 n mi offshore of the coast of Guinea. Only a slight increase in organization and little motion was noted during the following 24 hours. By 0600 UTC 21 September, deep convection had increased and it is estimated that the system had become a tropical depression, while centered about 140 n mi southwest of the coast of Guinea-Bissau. Table 1 lists the best track positions and intensities every six hours, and the track is plotted in Figure 1. According to National Hurricane Center (NHC) records beginning in 1886, only Tropical Storm Christine of 1973 formed farther east than Jeanne in the Atlantic basin.

The cyclone moved generally west-northwestward, gradually strengthening into a tropical storm later on the 21st. Jeanne was situated in an environment of slight east to southeasterly shear, which is typical for systems in the eastern tropical Atlantic. Early on the 22nd, Jeanne began to intensify at a faster pace, and by 1800 UTC that day is estimated to have become a hurricane while centered about 120 n mi southwest of the Cape Verde Islands. This was the closest point of approach to those islands. For the next couple of days, Jeanne continued moving toward the west-northwest, strengthening to its estimated peak intensity of 90 knots while located about 580 n mi west of the westernmost Cape Verde Islands. The forward speed slowed, from 13-17 knots the previous couple of days, to near 10 knots, and the hurricane turned toward the northwest, and then north, on 25-27 September. Jeanne weakened, mainly due to increased southwesterly vertical shear, on 25-26 September. These events were likely caused by an amplifying mid- to upper-tropospheric trough located about 10 degrees of longitude to the west, a feature which assured that Jeanne would remain in the eastern Atlantic for its life cycle.

Under the continued influence of the trough, Jeanne accelerated toward the north-northeast on 28 September. The hurricane re-intensified somewhat, to near 80 knots, while located about 550 n mi west-southwest of the Azores. As the system turned toward the northeast and east-northeast on the 29th, its forward speed slowed and it weakened to a tropical storm. Jeanne continued toward the east-northeast while gradually weakening. Around 0000 UTC 1 October, the cyclone reached the Azores, but had degenerated to a depression that was losing tropical characteristics. After leaving the Azores, the extratropical low moved eastward, generating an area of gale force winds until reaching the coast of Portugal just north of Lisbon around 0000 UTC 4 October. Jeanne's extratropical remnants became unidentifiable over Spain later that day.

b. Meteorological Statistics

Figures 2 and 3 depict the curves of the best track minimum central sea-level pressure and maximum one-minute average "surface" (10 meters above ground level) wind speed, respectively, as a function of time. Also plotted are the observations on which the curves are based. These consist of Dvorak-technique estimates from the TAFB, the National Environmental Satellite, Data, and Information Service's Satellite Analysis Branch (SAB), and the U.S. Air Force Weather Agency (AFGWC in the figures) using satellite imagery, and position/intensity estimates from surface synoptic data.

Jeanne's peak intensity of 90 knots on 24 September is based on subjectively-derived Dvorak T-numbers of 5.0 from the TAFB and the SAB. A French drifting buoy, identifier 41599, reported winds of 060°/55 knots, 060°/48 knots, 110°/75 knots near 23.3°N 40.6°W at 1000, 1100, and 1900 UTC, respectively, on 26 September. Although this buoy's data are considered questionable, the 75 knot wind was used for the best track intensity, since it was reported very near the center of the hurricane where a burst of deep convection was occurring at the time. A ship, call sign **GQVJ**, reported winds of 170°/36 knots at 30.1°N 37.9°W at 1200 UTC 28 September. Another ship, with call sign **C6KV2**, also reported winds of 170°/36 knots, at 32.4°N 35.4°W at 1800 UTC 28 September.

The island of Horta in the Azores reported wind gusts to 35 knots around 1800 UTC 30 September.

c. Casualty and Damage Statistics

There were no known casualties or damages caused by Jeanne.

d. Forecast and Warning Critique

Table 2 lists the average track forecast errors for Jeanne for the official forecast

and for various guidance models. Official track forecast errors were, on average, less than the most recent ten-year averages. It can be seen that the mean official errors were, in most cases, less than those from the models. However, the U.K. Met. Office model (UKMI) forecasts had smaller average errors than the official forecasts at all time periods. As Jeanne turned toward the north, the official forecasts called for the system to accelerate too much in the latter part of the period, which led to some rather large 72-hour position errors.

In the early stages of Jeanne, the NHC intensity forecasts were rather conservative, with the intensity underpredicted by as much as 30 knots in the 36-72 hour forecasts. The strength was slightly underforecast prior to Jeanne's second intensity peak. Otherwise, the official intensity forecasts had a positive bias in most cases with overforecasts of maximum winds by as much as 25 knots in the 36-72 hour forecasts.

There was a statement in the NHC advisories that Jeanne could cause tropical storm force winds in the southernmost Cape Verde Islands and in the Azores. The system passed far enough to the south and southwest of the former islands to not seriously impact them (no reports of tropical storm force winds), and it weakened below storm strength by the time it passed through the Azores.

Table 1. Best track, Hurricane Jeanne, 21 September - 1 October, 1998

| Date/Time (UTC) | Position | | Pressure (mb) | Wind Speed (kt) | Stage |
|---|---|---|---|---|---|
| | Lat. (°N) | Lon. (°W) | | | |
| 21/0600 | 9.6 | 17.4 | 1008 | 30 | tropical depression |
| 1200 | 10.5 | 18.2 | 1006 | 30 | " |
| 1800 | 11.0 | 19.4 | 1004 | 35 | tropical storm |
| 22/0000 | 11.5 | 20.7 | 1002 | 40 | " |
| 0600 | 12.1 | 22.2 | 1000 | 45 | " |
| 1200 | 12.7 | 23.8 | 994 | 55 | " |
| 1800 | 13.1 | 25.2 | 987 | 65 | hurricane |
| 23/0000 | 13.6 | 26.7 | 983 | 70 | " |
| 0600 | 14.1 | 28.1 | 980 | 75 | " |
| 1200 | 14.5 | 29.5 | 975 | 80 | " |
| 1800 | 15.0 | 30.8 | 973 | 85 | " |
| 24/0000 | 15.4 | 32.1 | 972 | 85 | " |
| 0600 | 15.9 | 33.4 | 971 | 90 | " |
| 1200 | 16.4 | 34.4 | 970 | 90 | " |
| 1800 | 17.0 | 35.4 | 969 | 90 | " |
| 25/0000 | 17.5 | 36.3 | 971 | 90 | " |
| 0600 | 18.0 | 37.2 | 973 | 90 | " |
| 1200 | 18.6 | 37.9 | 975 | 85 | " |
| 1800 | 19.3 | 38.6 | 977 | 80 | " |
| 26/0000 | 20.0 | 39.4 | 979 | 75 | " |
| 0600 | 20.8 | 40.0 | 983 | 70 | " |
| 1200 | 21.6 | 40.6 | 983 | 70 | " |
| 1800 | 22.4 | 41.2 | 980 | 75 | " |
| 27/0000 | 23.4 | 41.6 | 980 | 75 | " |
| 0600 | 24.4 | 42.0 | 983 | 70 | " |
| 1200 | 25.6 | 41.8 | 983 | 70 | " |
| 1800 | 27.1 | 41.5 | 983 | 70 | " |
| 28/0000 | 28.8 | 41.2 | 983 | 70 | " |
| 0600 | 30.6 | 40.7 | 983 | 70 | " |
| 1200 | 32.3 | 39.6 | 980 | 75 | " |
| 1800 | 33.8 | 38.4 | 977 | 80 | " |
| 29/0000 | 35.0 | 37.2 | 977 | 80 | " |
| 0600 | 35.8 | 36.2 | 980 | 75 | " |
| 1200 | 36.2 | 35.3 | 985 | 65 | " |
| 1800 | 36.6 | 34.6 | 990 | 60 | tropical storm |
| 30/0000 | 36.9 | 33.4 | 997 | 50 | " |
| 0600 | 37.2 | 32.1 | 1000 | 45 | " |
| 1200 | 37.6 | 30.7 | 1002 | 40 | " |

Table 1 (continued). Best track, Hurricane Jeanne, 21 September - 1 October, 1998

| | | | | | |
|---|---|---|---|---|---|
| 30/1800 | 38.0 | 29.4 | 1006 | 35 | tropical storm |
| 1/0000 | 38.2 | 28.0 | 1008 | 30 | tropical depression |
| 0600 | 38.3 | 26.3 | 1008 | 30 | extratropical |
| 1200 | 38.5 | 24.5 | 1006 | 35 | “ |
| 1800 | 38.7 | 22.5 | 1005 | 35 | “ |
| 2/0000 | 38.8 | 21.0 | 1003 | 35 | “ |
| 0600 | 38.9 | 19.5 | 1003 | 35 | “ |
| 1200 | 39.0 | 18.2 | 1003 | 40 | “ |
| 1800 | 39.0 | 16.8 | 1003 | 40 | “ |
| 3/0000 | 39.0 | 15.5 | 1003 | 40 | “ |
| 0600 | 39.0 | 14.3 | 1003 | 40 | “ |
| 1200 | 39.0 | 13.0 | 1003 | 40 | “ |
| 1800 | 39.0 | 11.0 | 1003 | 35 | “ |
| 4/0000 | 39.1 | 9.0 | 1003 | 30 | “ |
| 0600 | 39.3 | 7.0 | 1004 | 30 | “ |
| 1200 | 39.5 | 5.0 | 1004 | 25 | “ |
| 1800 | | | | | dissipated |

| | | | | | |
|---|---|---|---|---|---|
| 24/1800 | 17.0 | 35.4 | 969 | 90 | minimum pressure |

Table 2.

**Preliminary forecast evaluation of Hurricane Jeanne**
**Heterogeneous sample**

(Errors in nautical miles for tropical storm
and hurricane stages with number
of forecasts in parenthesis)

| **Technique** | **Period (hours)** | | | | |
|---|---|---|---|---|---|
| | **12** | **24** | **36** | **48** | **72** |
| CLIP | 42 (35) | 90 (33) | 143 (31) | 191 (29) | 304 (25) |
| GFDI | 53 (32) | 90 (30) | 117 (28) | 145 (26) | 276 (22) |
| GFDL* | 50 (19) | 90 (17) | 119 (15) | 141 (14) | 225 (12) |
| LBAR | 42 (35) | 78 (33) | 115 (31) | 146 (29) | 215 (25) |
| AVNI | 63 (26) | 102 (24) | 137 (22) | 193 (20) | 437 (16) |
| BAMD | 50 (35) | 86 (33) | 123 (31) | 178 (29) | 339 (25) |
| BAMM | 65 (35) | 124 (33) | 176 (31) | 232 (29) | 384 (25) |
| BAMS | 79 (35) | 159 (33) | 228 (31) | 287 (29) | 356 (25) |
| A98E | 42 (35) | 82 (33) | 107 (31) | 122 (29) | 176 (25) |
| NGPI | 48 (28) | 85 (26) | 110 (22) | 137 (20) | 180 (14) |
| UKMI | 34 (32) | 56 (30) | 77 (28) | 87 (26) | 126 (20) |
| | | | | | |
| NHC OFFICIAL | 38 (35) | 67 (33) | 91 (31) | 127 (29) | 236 (25) |
| NHC OFFICIAL 1988-1997 10-year average | 47 (1838) | 88 (1633) | 127 (1449) | 165 (1284) | 248 (1006) |

* GFDL output not available until after forecast issuance.

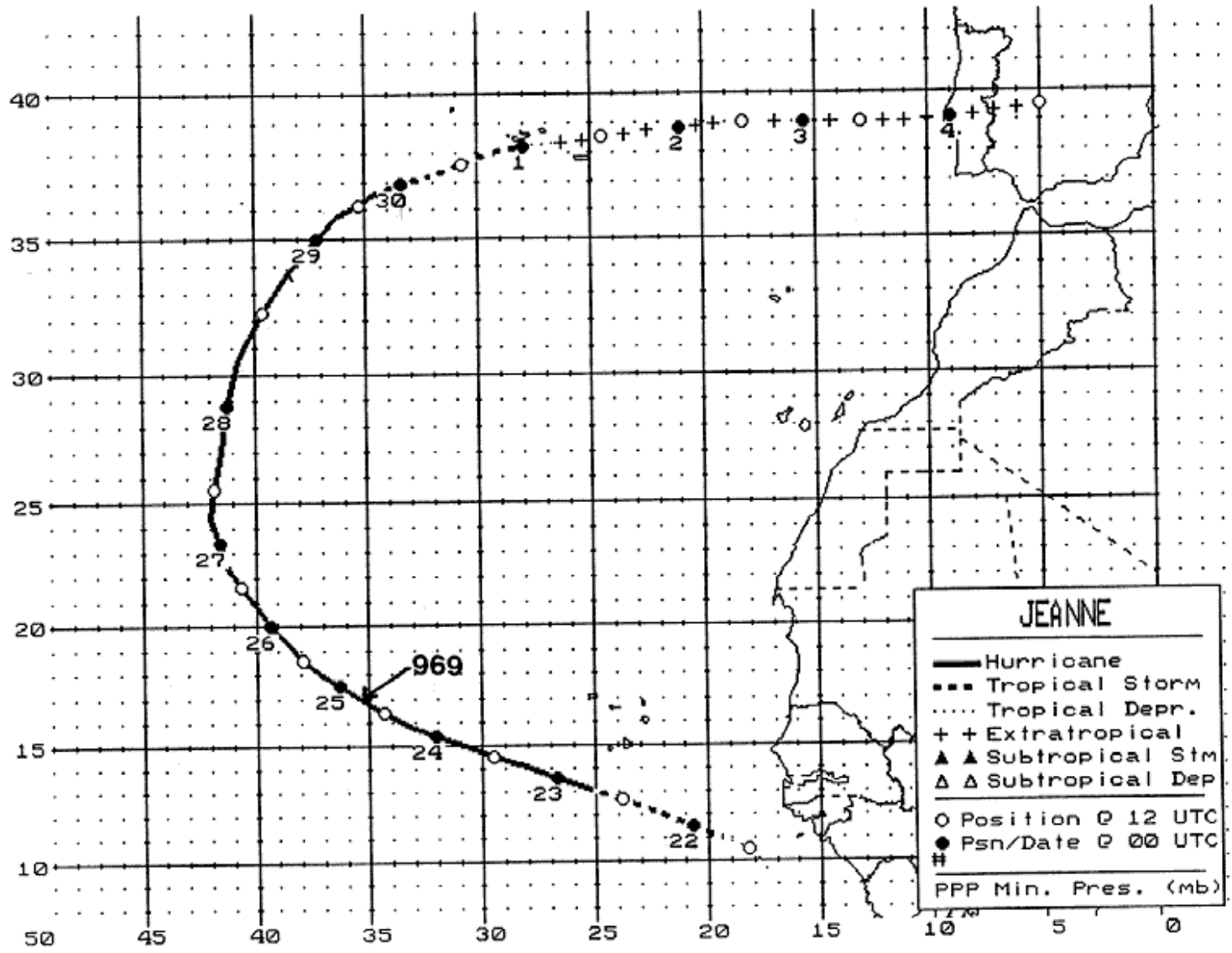


Figure 1. Best track positions for Hurricane Jeanne, 21 September - 1 October, 1998.

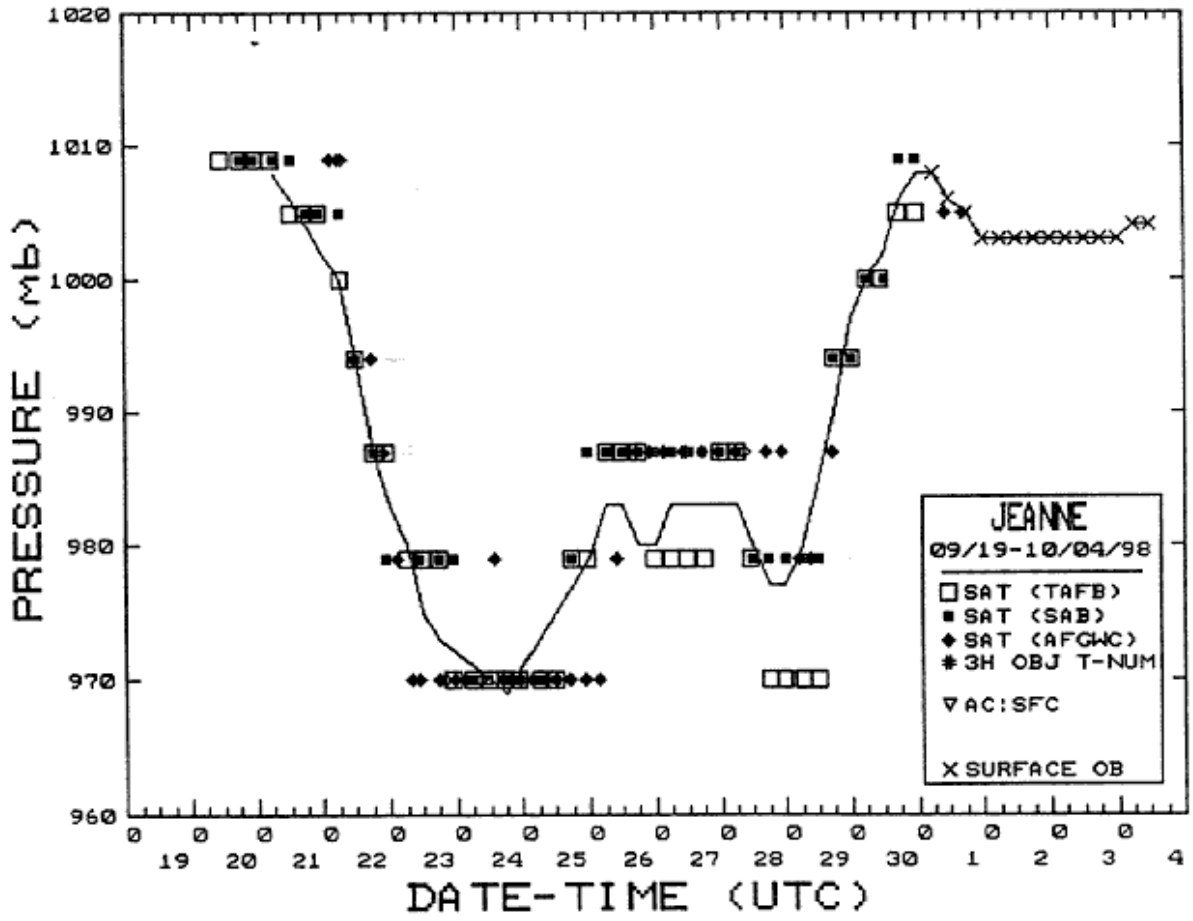


Figure 2. Best track minimum central pressure curve for Hurricane Jeanne.

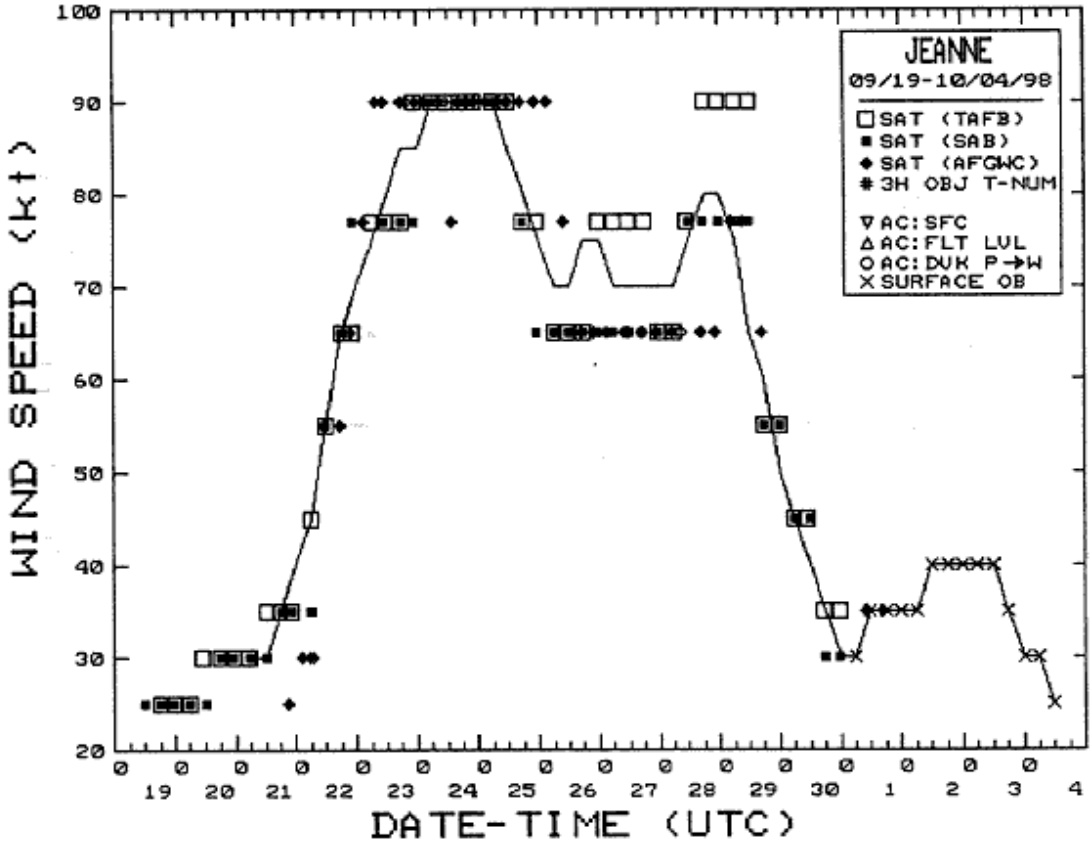


Figure 3. Best track maximum sustained wind speed curve for Hurricane Jeanne.