

Tropical Cyclone Report
Hurricane Isis
8-16 September 2004

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17 November 2004

Isis took a track far from any land areas and briefly maintained hurricane strength.

a. Synoptic History

The disturbance that developed into Isis was a tropical wave that entered into the eastern North Pacific basin on 3 September. The wave is difficult to follow prior to that point, but may have been the same one that spawned Hurricane Frances in the Atlantic basin. The system acquired its first Dvorak classification near 0000 UTC 7 September a few hundred miles southwest of Manzanillo, Mexico, and continued to organize during the day. By 0600 UTC 8 September, when the disturbance was located about 460 n mi south of Cabo San Lucas, Mexico, it had sufficient circulation and convective organization to be considered a tropical depression.

The “best track” chart of the tropical cyclone’s path is given in Fig. 1, with the wind and pressure histories shown in Figs. 2 and 3, respectively. The best track positions and intensities are listed in Table 1. The depression strengthened and became a tropical storm at 1800 UTC 18 September, about 525 n mi south of Cabo San Lucas. Isis moved generally westward for the next several days but was unable to develop significantly under easterly shear, and weakened back to a depression on 10 September when its deep convection temporarily evaporated. Isis re-strengthened to a tropical storm on 12 September about 725 n mi west-southwest of Cabo San Lucas, and its maximum winds reached 45 kt later that day. There was little change in strength until 14 September, when the convection again sputtered and Isis’s winds dropped to 35 kt. However, the easterly shear had been decreasing, and late in the day Isis again re-strengthened – this time rapidly. Isis developed a ragged eye, and satellite-based Dvorak classifications suggest that Isis reached hurricane strength at 1200 UTC 15 September, about 1260 n mi west of Cabo San Lucas.

As quickly as the eye had developed, it disappeared. During its rapid development, Isis had turned northwestward toward cooler waters (roughly 25EC) and a more stable low-level environment before becoming stationary. Within 24 h of becoming a hurricane, Isis had weakened to a depression, and by 1800 UTC 16 September it had lost all deep convection and become a remnant low, about 1300 n mi west of Cabo San Lucas. The remnant low drifted southwestward and then westward for a few days, generating intermittent convection before dissipating on 21 September about 875 n mi east of the Hawaiian Islands.

b. Meteorological Statistics

Observations in Isis (Figs. 2 and 3) include satellite-based Dvorak technique intensity estimates from the Tropical Analysis and Forecast Branch (TAFB), the Satellite Analysis Branch (SAB) and the U. S. Air Force Weather Agency (AFWA). Microwave satellite imagery from NOAA polar-orbiting satellites, the NASA Tropical Rainfall Measuring Mission (TRMM), and the NASA QuikSCAT were also useful in tracking Isis.

Isis is assumed to have become a hurricane at 1200 UTC 15 September, based on T4.0 Dvorak classifications from TAFB and SAB. However, given that the satellite appearance immediately and rapidly began to deteriorate, it is quite possible that Isis never reached that threshold.

There were no ship reports of winds of tropical storm force associated with Isis.

c. Casualty and Damage Statistics

There were no reports of damage or casualties associated with Isis.

d. Forecast and Warning Critique

Average official track errors for Isis are given in Table 2. In general, these errors are lower than the average official track errors for the 10-yr period 1994-2003¹ through 72 h, but considerably higher than the long-term means at longer periods. These longer range track errors were almost exclusively in the along-track direction. Early model guidance called for the maintenance of a strong subtropical ridge to the north of the cyclone, but this ridge turned out to be considerably weaker than forecast. In addition, Isis was unable to maintain persistent deep convection and therefore did not respond to upper-level easterly flow as strongly as expected.

Average official intensity errors were 6, 10, 12, 13, 10, 10, and 9 kt for the 12, 24, 36, 48, 72, 96, and 120 h forecasts, respectively. For comparison, the average official intensity errors over the 10-yr period 1994-2003¹ are 6, 11, 15, 17, 20, 18, and 19 kt, respectively. Initial forecasts were too aggressive in calling for intensification.

The possibility of tropical depression formation was first noted in the Tropical Weather Outlook 18 h prior to cyclogenesis.

¹ Errors given for the 96 and 120 h periods are averages over the three-year period 2001-3.

Table 1. Best track for Hurricane Isis, 8-16 September 2004.

| Date/Time (UTC) | Latitude (EN) | Longitude (EW) | Pressure (mb) | Wind Speed (kt) | Stage |
|-----------------|---------------|----------------|---------------|-----------------|---------------------|
| 08 / 0600 | 15.1 | 109.9 | 1005 | 30 | tropical depression |
| 08 / 1200 | 15.1 | 110.4 | 1004 | 30 | " |
| 08 / 1800 | 15.4 | 110.8 | 1004 | 35 | tropical storm |
| 09 / 0000 | 16.0 | 111.3 | 1003 | 35 | " |
| 09 / 0600 | 16.5 | 111.8 | 1003 | 35 | " |
| 09 / 1200 | 16.9 | 112.4 | 1003 | 35 | " |
| 09 / 1800 | 17.2 | 113.3 | 1003 | 35 | " |
| 10 / 0000 | 17.3 | 114.1 | 1002 | 40 | " |
| 10 / 0600 | 17.3 | 114.9 | 1003 | 35 | " |
| 10 / 1200 | 17.3 | 115.7 | 1004 | 30 | tropical depression |
| 10 / 1800 | 17.4 | 116.6 | 1004 | 30 | " |
| 11 / 0000 | 17.4 | 117.7 | 1004 | 30 | " |
| 11 / 0600 | 17.4 | 118.8 | 1004 | 30 | " |
| 11 / 1200 | 17.4 | 119.7 | 1004 | 30 | " |
| 11 / 1800 | 17.4 | 120.5 | 1004 | 30 | " |
| 12 / 0000 | 17.4 | 121.3 | 1003 | 35 | tropical storm |
| 12 / 0600 | 17.4 | 122.2 | 1002 | 40 | " |
| 12 / 1200 | 17.4 | 123.1 | 1000 | 45 | " |
| 12 / 1800 | 17.3 | 124.0 | 1000 | 45 | " |
| 13 / 0000 | 17.2 | 125.0 | 1000 | 45 | " |
| 13 / 0600 | 17.0 | 126.0 | 1000 | 45 | " |
| 13 / 1200 | 16.7 | 127.0 | 1000 | 45 | " |
| 13 / 1800 | 16.6 | 128.0 | 1000 | 45 | " |
| 14 / 0000 | 16.6 | 128.9 | 1000 | 45 | " |
| 14 / 0600 | 16.6 | 129.5 | 1002 | 40 | " |
| 14 / 1200 | 16.8 | 129.9 | 1003 | 35 | " |
| 14 / 1800 | 17.0 | 130.4 | 1000 | 40 | " |
| 15 / 0000 | 17.2 | 130.9 | 997 | 50 | " |
| 15 / 0600 | 17.5 | 131.4 | 994 | 55 | " |
| 15 / 1200 | 17.8 | 131.8 | 987 | 65 | hurricane |
| 15 / 1800 | 18.2 | 132.0 | 991 | 60 | tropical storm |
| 16 / 0000 | 18.4 | 132.0 | 994 | 55 | " |
| 16 / 0600 | 18.4 | 132.2 | 1000 | 45 | " |
| 16 / 1200 | 18.2 | 132.2 | 1003 | 30 | tropical depression |
| 16 / 1800 | 18.0 | 132.3 | 1006 | 30 | remnant low |
| 17 / 0000 | 17.9 | 132.5 | 1006 | 30 | " |
| 17 / 0600 | 17.7 | 132.8 | 1007 | 30 | " |
| 17 / 1200 | 17.6 | 133.0 | 1008 | 30 | " |
| 17 / 1800 | 17.4 | 133.3 | 1008 | 30 | " |
| 18 / 0000 | 17.2 | 133.6 | 1008 | 30 | " |

| | | | | | |
|-----------|------|-------|------|----|------------------|
| 18 / 0600 | 17.0 | 133.9 | 1009 | 25 | " |
| 18 / 1200 | 16.8 | 134.2 | 1009 | 25 | " |
| 18 / 1800 | 16.6 | 134.7 | 1009 | 25 | " |
| 19 / 0000 | 16.4 | 135.2 | 1009 | 30 | " |
| 19 / 0600 | 16.3 | 135.7 | 1009 | 30 | " |
| 19 / 1200 | 16.2 | 136.2 | 1009 | 30 | " |
| 19 / 1800 | 16.1 | 136.7 | 1009 | 30 | " |
| 20 / 0000 | 16.0 | 137.4 | 1009 | 30 | " |
| 20 / 0600 | 16.0 | 138.2 | 1009 | 30 | " |
| 20 / 1200 | 16.0 | 139.0 | 1010 | 30 | " |
| 20 / 1800 | 16.0 | 139.5 | 1011 | 30 | " |
| 21 / 0000 | 16.0 | 140.0 | 1011 | 30 | " |
| 21 / 0600 | | | | | disposition |
| 15 / 1200 | 17.8 | 131.8 | 987 | 65 | minimum pressure |

Table 2. Preliminary forecast evaluation (heterogeneous sample) for Hurricane Isis, 8-16 September 2004. Forecast errors (n mi) are followed by the number of forecasts in parentheses. Errors smaller than the NHC official forecast are shown in bold-face type. Verification includes the depression stage, but does not include the extratropical stage.

| Forecast Technique | Forecast Period (h) | | | | | | |
|-------------------------------------|---------------------|----------------|----------------|----------------|-----------------|-----------------|-----------------|
| | 12 | 24 | 36 | 48 | 72 | 96 | 120 |
| CLP5 | 40 (32) | 71 (30) | 105 (28) | 146 (26) | 243 (22) | 372 (18) | 436 (14) |
| GFNI | 38 (29) | 64 (27) | 85 (25) | 103 (23) | 153 (17) | 243 (13) | 349 (11) |
| GFDI | 36 (32) | 57 (30) | 80 (28) | 102 (24) | 160 (20) | 252 (15) | 440 (11) |
| GFSI | 36 (30) | 58 (28) | 89 (26) | 125 (24) | 221 (20) | 361 (15) | 625 (10) |
| AEMI | 31 (30) | 48 (28) | 74 (26) | 102 (24) | 167 (20) | 235 (16) | 367 (12) |
| NGPI | 36 (32) | 62 (30) | 82 (28) | 107 (26) | 151 (22) | 212 (18) | 324 (14) |
| UKMI | 43 (30) | 72 (28) | 102 (26) | 141 (24) | 214 (18) | 335 (14) | 651 (8) |
| BAMD | 51 (32) | 90 (30) | 135 (28) | 183 (26) | 279 (22) | 368 (18) | 563 (14) |
| BAMM | 44 (32) | 78 (30) | 120 (28) | 167 (26) | 285 (22) | 471 (18) | 771 (14) |
| BAMS | 46 (32) | 77 (30) | 114 (28) | 163 (26) | 304 (22) | 512 (18) | 793 (14) |
| CONU | 32 (32) | 49 (30) | 63 (28) | 81 (24) | 141 (20) | 251 (16) | 439 (12) |
| GUNA | 30 (30) | 46 (28) | 61 (26) | 84 (24) | 145 (18) | 254 (13) | 504 (7) |
| OFCL | 34 (32) | 55 (30) | 72 (28) | 98 (26) | 155 (22) | 271 (18) | 502 (12) |
| NHC Official (1994-2003 mean) | 39 (2746) | 72 (2474) | 103 (2196) | 131 (1928) | 186 (1476) | 197 (283) | 223 (179) |

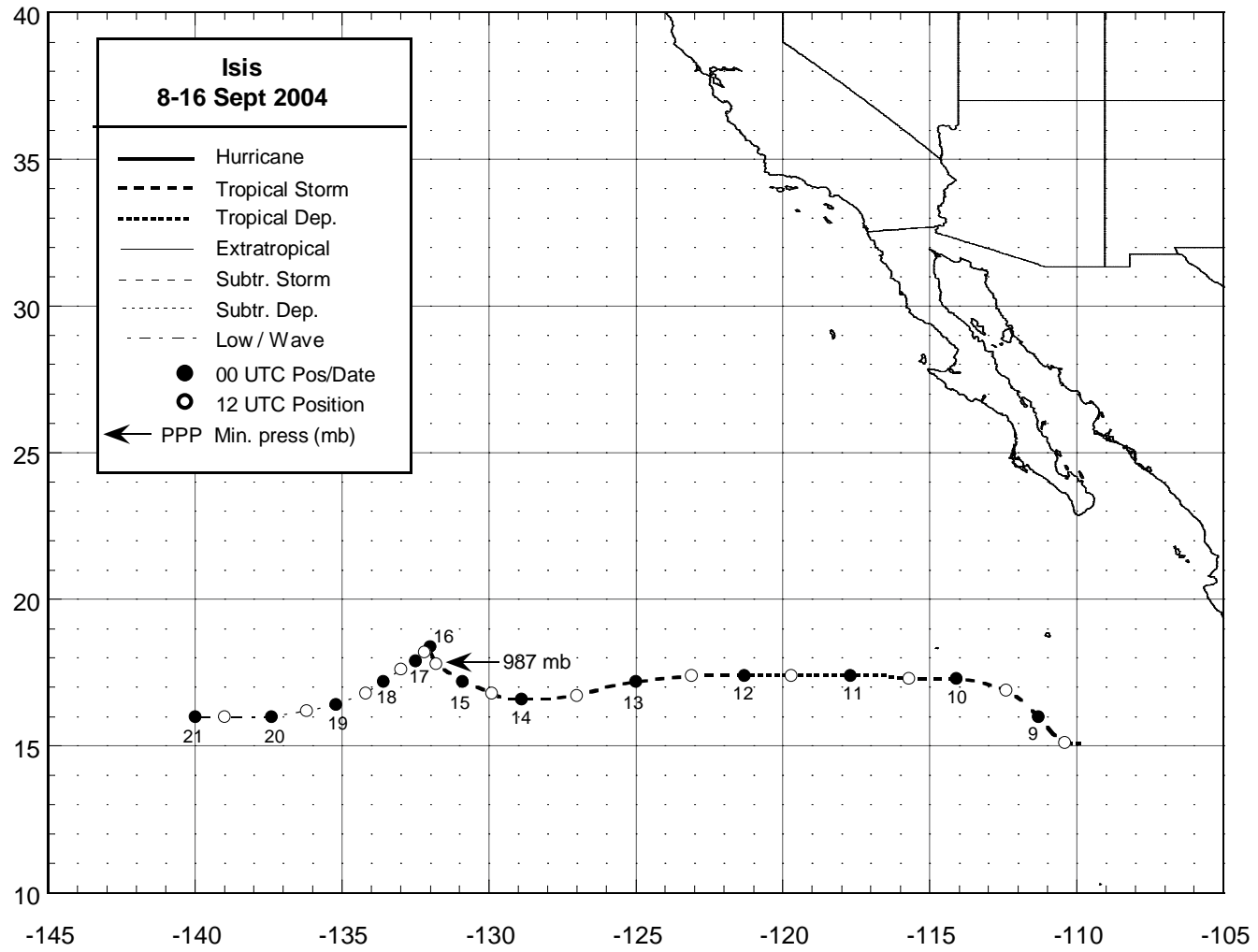


Figure 1. Best track positions for Hurricane Isis, 8-16 September 2004.

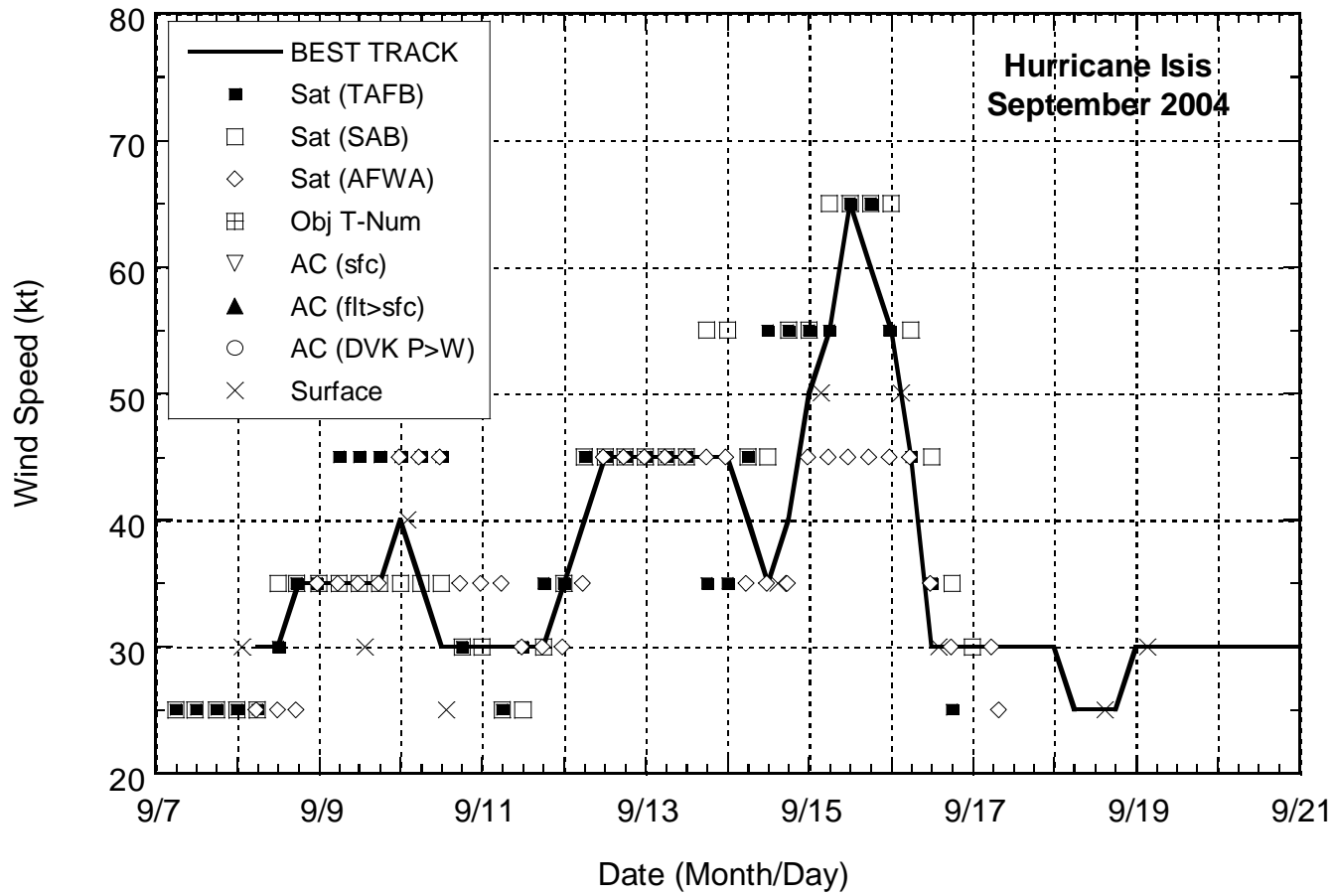


Figure 2. Selected wind observations and best track maximum sustained surface wind speed curve for Hurricane Isis, 8-16 September 2004.

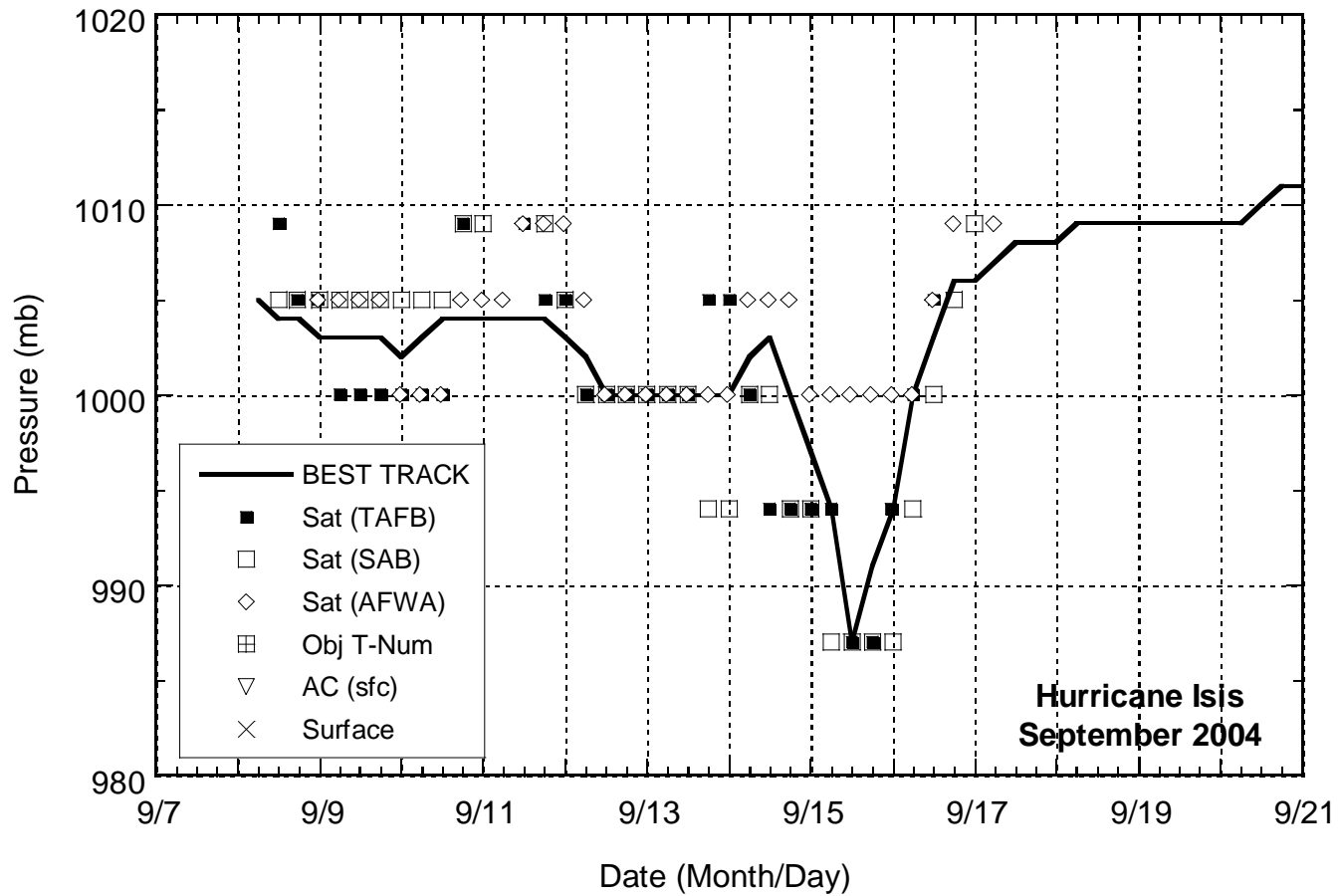


Figure 3. Selected pressure observations and best track minimum central pressure curve for Hurricane Isis, 8-16 September 2004.