

Preliminary Report  
Hurricane Isis  
1 - 3 September, 1998

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Isis made two landfalls in Mexico, one in southern Baja California as a tropical storm, and another near Los Mochis as a category one hurricane on the Saffir/Simpson Hurricane Scale.

a. Synoptic History

A tropical wave, which on 19 August produced the tropical depression that became Atlantic Hurricane Bonnie, moved westward across the Caribbean Sea from 21-24 August and crossed Central America on 25 August. As the wave moved into an area covered by a large lower-tropospheric cyclonic circulation (or, at least, cyclonic turning) covering southern Mexico and the adjacent waters, its forward speed slowed. A broad area of disturbed weather, associated with these atmospheric features, persisted over the tropical eastern north Pacific between  $90^{\circ}\text{W}$ - $110^{\circ}\text{W}$  from 26-29 August. A more localized area of low-level cyclonic rotation became evident on 29 August a little over 500 n mi south-southeast of Cabo San Lucas. There was little change in organization for the next day or two. On 31 August, the system was characterized by two main areas of dense cloudiness located a few degrees northeast and southwest of the center of circulation. By 0000 UTC 1 September, even though deep convection was still not well-organized, the low-cloud circulation was sufficiently well-defined so that the system could be designated as a tropical depression, centered slightly less than 300 n mi south of Cabo San Lucas (Table 1). The overall track of this tropical cyclone is displayed in Figure 1.

As the cyclone moved slowly northward to north-northwestward, it gradually intensified. Ship observations indicate that the cyclone strengthened into Tropical Storm Isis by 1800 UTC 1 September, located about 170 n mi south of Cabo San Lucas. With a 500 mb trough, extending south-southwestward from the California/Arizona border, providing a southerly steering flow, Isis moved northward at about 10 knots. Its center made a first landfall, over extreme southeastern Baja California, at 1200 UTC 2 September. Isis then moved slightly east of north, over the Gulf of California while strengthening to a 65-knot hurricane, an eye becoming apparent on visible satellite imagery. The hurricane more or less maintained this strength until the center made its final landfall in Mexico at Topolobampo, close to Los Mochis, around 0300 UTC 3 September. Isis weakened to a tropical storm a few hours

after landfall, and to a depression by 1800 UTC 3 September. The system dissipated over the mountains of Mexico soon thereafter.

#### b. Meteorological Statistics

Figures 2 and 3 depict the curves of 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, consisting of Dvorak-technique estimates (from TAFB, the Synoptic Analysis Branch, SAB, and the U.S. Air Force Global Weather Agency, AFGWC in the figures) using satellite imagery.

Islas Marias reported south-southwesterly winds at a ten-minute average speed of 40 knots at 0000 UTC 2 September. San Jose del Cabo reported 270°/20 knots (ten-minute average) with gusts to 40 knots at 1445 UTC 2 September.

The following 24-hour rainfall totals were reported: 12.99 inches at Los Cabos, Baja California Sur; 8.86 inches in Sinaloa; and 4.72 inches in Sonora.

Table 3 lists ship reports of 34-knot or greater winds associated with Isis.

#### c. Casualty and Damage Statistics

According to information provided by the government of Mexico to the World Meteorological Organization, Isis caused 14 deaths in Mexico, and destroyed 769 houses.

#### d. Forecast and Warning Critique

Mean official track forecast errors for Isis at 12, 24, and 36 hours were 36, 79, and 87 n mi, respectively. Although these errors are low, there were too few cases (six, four and two respectively) for them to be considered statistically meaningful. In any case, the cyclone moved fairly close to the track predicted in the NHC advisories.

The average official absolute wind speed forecast errors were also rather low; nonetheless, the slight strengthening of Isis to a hurricane was not forecast.

Table 3 lists the watches and warnings that the government of Mexico issued for their country. The center of Isis reached Baja California 15 hours after the issuance of a tropical storm warning. There was only about six hours between the time of issuance of a hurricane warning on the coast of mainland Mexico and the time of arrival of the center.

Table 1. Best track, Hurricane Isis, 1 - 3 September, 1998

Date/Time (UTC)	Position		Pressure (mb)	Wind Speed (kt)	Stage
	Lat. (°N)	Lon. (°W)			
1/0000	18.3	109.2	1004	25	tropical depression
0600	18.8	109.3	1004	25	"
1200	19.3	109.5	1002	30	"
1800	20.0	109.6	995	45	tropical storm
2/0000	21.2	109.6	990	60	"
0600	22.2	109.5	990	60	"
1200	23.3	109.4	990	60	"
1800	24.1	109.2	988	65	hurricane
3/0000	25.1	109.0	990	65	"
0600	26.1	109.1	992	60	tropical storm
1200	27.0	109.2	998	45	"
1800	28.0	109.5	1001	25	tropical depression
4/0000					dissipated

2/1800	24.1	109.2	988	65	minimum pressure
2/1200	23.3	109.4	990	60	landfall 20 n mi east-northeast of San Jose del Cabo, Mexico
3/0300	25.5	109.0	990	65	landfall at Topolobampo (near Los Mochis), Mexico

Table 2. Ship reports of 34 knot or higher wind speeds associated with Hurricane Isis, September, 1998.

date/time (UTC)	ship call sign	latitude (°N)	longitude (°W)	wind dir/ speed(knots)	pressure (mb)
1/1800	TCFC	17.4	107.5	230/40	1006.5
2/0000	3FOC5	22.3	108.5	090/55	1002.5
2/0000	MVXQ8	19.3	108.6	300/45	998.0
2/0000	SHIP	21.5	106.0	160/35	
2/0000	TCFC	17.9	108.3	300/45	1004.0
2/0300	MVXQ8	18.8	107.7	230/41	1002.7
2/0300	TCFC	18.1	108.7	300/42	1004.6
2/0600	3FOC5	21.5	107.3	190/45	1001.0
2/0600	MVXQ8	18.6	106.7	230/35	1005.8
2/0600	SHIP	21.6	106.1	150/40	1001.5
2/0600	SHIP	21.7	106.2	150/40	1001.5
2/0600	TCFC	18.4	109.2	240/40	1006.0
2/0900	3FOC5	20.9	106.5	220/42	1006.0
2/0900	SHIP	21.7	106.2	150/40	1002.0
2/1200	OYSN2	22.7	110.5	340/38	1000.1
2/1200	TCFC	18.8	110.1	240/45	1005.5
2/1800	TCFC	19.4	111.2	240/35	1008.0
3/0600	TCFC	20.6	113.2	240/36	1009.0
3/1200	TCFC	21.2	114.4	240/36	1008.5

Table 3. Watch and warning summary, Hurricane Isis, September, 1998.

Date/time (UTC)	Action	Location
1/2100	tropical storm warning issued	Baja California south of a Dolores to Puerto Cortez line
2/0300	tropical storm warning extended	Baja California south of a line from Santa Rosalia to Punta Abreojos
2/0300	tropical storm warning issued	coast of Mexico from El Dorado to Guaymas
2/2100	hurricane warning issued	coast of Mexico from El Dorado to Bahia Kino and east coast of Baja California from Dolores to Punta San Gabriel
2/2100	tropical storm warning shifted northward	west coast of Baja California from Puerto Cortez to Punta Eugenia
3/0900	all warnings discontinued	Baja California
3/0900	hurricane warning replaced by tropical storm warning	coast of Mexico from Los Mochis to Guaymas
3/1800	tropical storm warning discontinued	coast of Mexico from Los Mochis to Guaymas



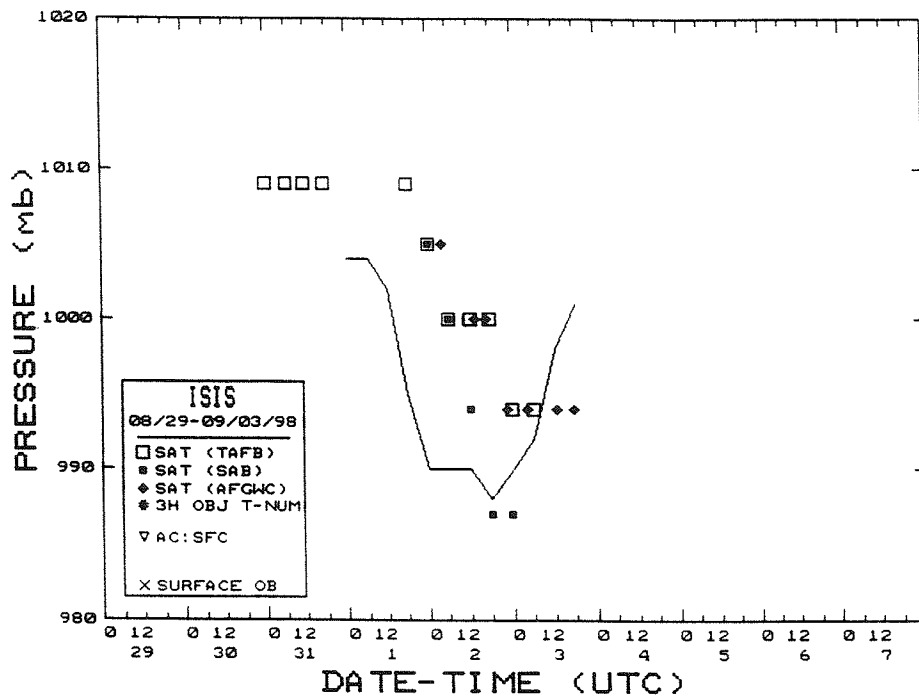


Figure 2. Best track minimum central pressure curve for Hurricane Isis.

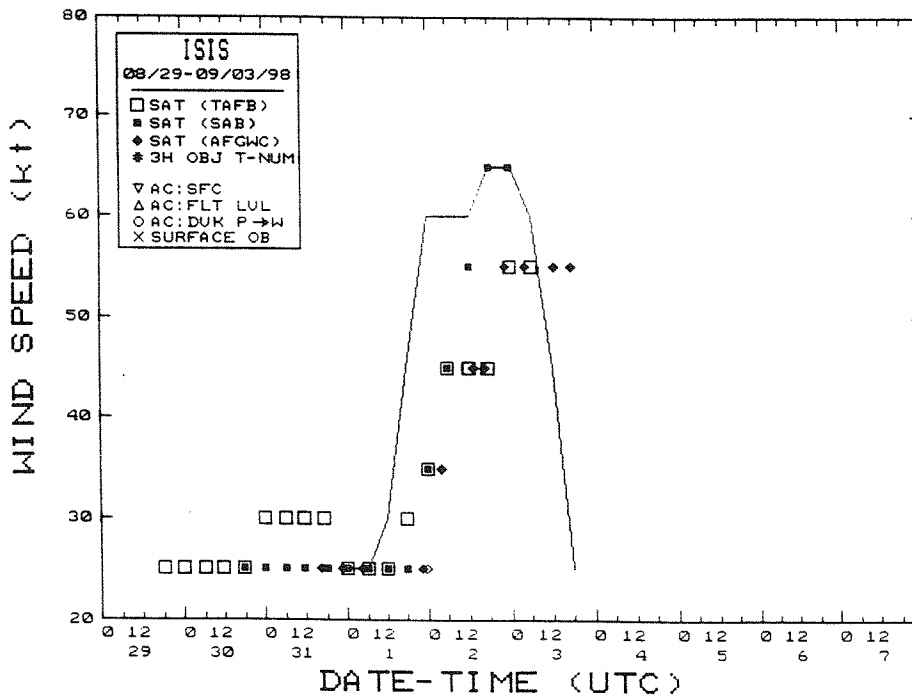


Figure 3. Best track maximum sustained wind speed curve for Hurricane Isis.