

Tropical Cyclone Report  
Hurricane Ignacio  
22-27 August 2003

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Ignacio impacted the southern portion of the Baja California peninsula with torrential rains and hurricane-force winds. Two deaths were reported.

a. Synoptic History

Ignacio is believed to have originated from a tropical wave that moved from Africa to the tropical Atlantic Ocean on 6 August. The wave continued westward without distinction and moved across Central America to the Pacific Ocean on 16 August. Cloudiness associated with the wave gradually increased and became organized into a distinct area of disturbed weather by 20 August over Pacific waters just south of Manzanillo, Mexico.

It took an additional two days for the disturbed weather to become well-enough organized to be classified as a tropical depression. At that time, it was centered about 100 n mi west of the Mexican mainland and also about 190 n mi southeast of the southern tip of Baja California. The "best track" chart of the tropical cyclone's path starts on 22 August and is plotted on Fig. 1. Best track wind and pressure histories are shown in Figs. 2 and 3, respectively. The best track positions and intensities are listed in Table 1.

A mid-level sub-tropical ridge lay to the north of Ignacio throughout its lifetime. However Ignacio was embedded in a weakness within the ridge and this resulted in a slow, mostly northwestward motion, with a forward speed of 5 kt or less.

The depression quickly strengthened, to Tropical Storm Ignacio early on 23 August and to a hurricane early on 24 August. It reached a peak intensity estimated at 90 kt later that day, when the center came within 25 n mi of the coast of the southeastern tip of Baja California. The center moved inland on 25 August, just east of La Paz, on the southern Gulf of California coast of Baja California with winds having decreased to an estimated 70 kt by the time of landfall. This weakening is likely the result of Ignacio's interaction with high terrain. Weakening continued while Ignacio moved over Baja California. Ignacio weakened to a tropical depression on 26 August and was dissipated by 28 August over central Baja California.

b. Meteorological Statistics

The observations used to determine the best track wind speeds are plotted in Figs. 2 and 3 and consist of satellite-based subjective 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 imagery showed a well-defined ring of convection during the period that Ignacio is assigned hurricane status and visible imagery also showed evidence of an embedded eye (Fig. 4).

Only one ship reported tropical storm force winds in connection with Ignacio. The ship *Elation* reported 51-kt winds on 26 August at 0000 UTC, while located about 270 n mi northwest of the center and on the other side of the peninsula from the center of Ignacio. It is not likely that tropical storm force winds extended so far from the center.

c. Casualty and Damage Statistics

Hurricane force winds blew down trees, signs and power lines in La Paz and elsewhere in southern Baja California, but the strongest winds bypassed Cabo San Lucas. Rainfall totals were large because of Ignacio's slow movement and caused serious inland flooding. Two rescue workers were swept to their deaths by fresh-water floods.

d. Forecast and Warning Critique

Official track forecast errors for Ignacio averaged 20, 29, 48, 66, 92, 121, and 266 n mi for the 12-, 24-, 36-, 48-, 72-, 96-, and 120-h forecasts, respectively. The number of cases ranged from 21 at 0 h to 2 cases at 120 h. Except for the two 120-h forecasts, these errors are much smaller than the average official track errors for the 10-yr period 1993-2002 (39, 72, 103, 131, 186, 197, and 223 n mi, respectively)<sup>1</sup> These small errors are likely the result of a very slow and steady storm track along with excellent guidance from the global models.

Average official intensity errors were 8, 15, 25, 33, 28, 5, and 0 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 1993-2002 are 6, 11, 15, 17, 20, 18, and 19 knots, respectively. The official errors were larger than the previous 10-year averages for the 0-through 72-h forecasts. These large errors were the result of Ignacio's quick strengthening to 90 kt and also the result of the storm weakening over land when the official forecast track kept the center over the warm Gulf of California waters. The SHIPS intensity model had even larger intensity errors than the official forecasts.

Table 2 lists the watches and warnings associated with Ignacio.

<sup>1</sup> Errors for the 96- and 12-h forecasts are averages for the two-year period 2001-2002.

Table 1. Best track data for Hurricane Ignacio, 22-27 August 2003.

Date/Time (UTC)	Latitude (°N)	Longitude (°W)	Pressure (mb)	Wind Speed (kt)	Stage
22 / 1200	20.5	107.0	1008	30	tropical depression
22 / 1800	20.7	107.3	1007	30	"
23 / 0000	21.0	107.5	1005	35	tropical storm
23 / 0600	21.3	107.8	1002	40	"
23 / 1200	21.5	108.2	1000	45	"
23 / 1800	21.8	108.6	992	55	"
24 / 0000	22.2	108.7	989	60	"
24 / 0600	22.6	108.8	984	70	hurricane
24 / 1200	23.1	108.9	970	90	"
24 / 1800	23.5	109.0	970	90	"
25 / 0000	23.7	109.2	973	85	"
25 / 0600	23.9	109.5	976	80	"
25 / 1200	24.1	109.8	980	75	"
25 / 1800	24.2	110.1	985	70	"
26 / 0000	24.4	110.4	989	65	"
26 / 0600	24.6	110.8	991	60	tropical storm
26 / 1200	24.9	111.0	998	50	"
26 / 1800	25.2	111.3	1000	30	tropical depression
27 / 0000	25.5	111.6	1001	30	"
27 / 0600	25.9	112.1	1007	25	"
27 / 1200	26.4	112.5	1007	25	"
27 / 1800	26.9	113.0	1008	20	remnant low
28 / 0000	dissipated				
24 / 1200	23.1	108.9	970	90	minimum pressure
25 / 1800	24.2	110.1	985	70	landfall 20 n mi east of La Paz

Table 2. Watch and warning summary for Hurricane Ignacio.

Date/Time (UTC)	Action	Location
22/1200	tropical storm watch	Santa Fe to La Paz
22/2100	tropical storm warning	“
23/1500	tropical storm warning extended	Bahia Magdalena to San Evaristo
23/1800	hurricane warning	Santa Fe to La Paz
24/1500	hurricane warning extended	Bahia Magdalena to San Evaristo
24/1500	tropical storm warning extended	Loreto to San Evaristo
24/2100	tropical storm warning	Altata to Topolobampo
24/2100	tropical storm watch	Huatabampito to Topolobampo
26/0300	tropical storm warning replaces hurricane warning	Bahia Magdalena to La Paz
26/0300	discontinue tropical storm warning	Altata to Topolobampo
26/0300	discontinue tropical storm watch	Huatabampito to Topolobampo
26/1200	hurricane warning discontinued	San Evaristo to La Paz
26/1200	tropical storm warning	Loreto to La Paz, Puerto San Adresito to Santa Fe
26/2100	all warnings discontinued	

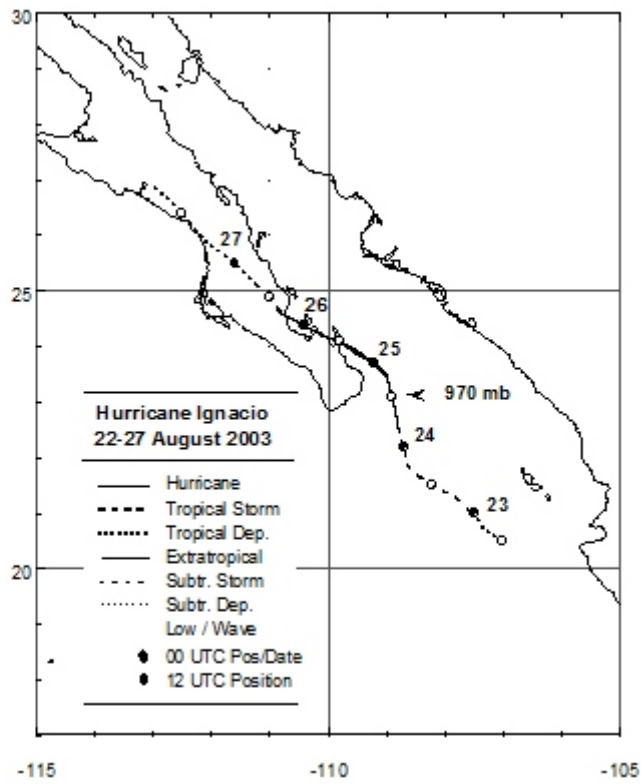


Figure 1. Best track positions for Hurricane Ignacio, 22-27 August 2003.

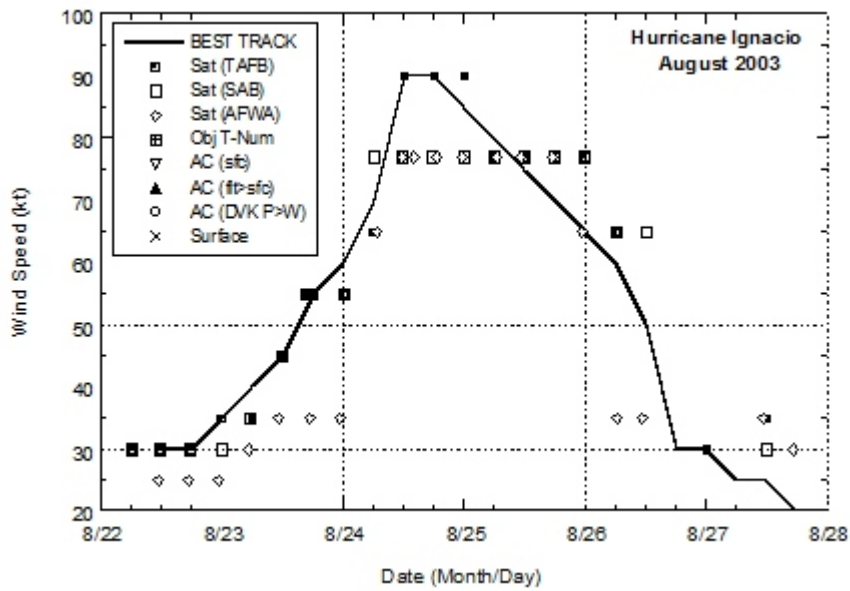


Figure 2. Selected wind observations and best track maximum sustained surface wind speed curve for Hurricane Ignacio.

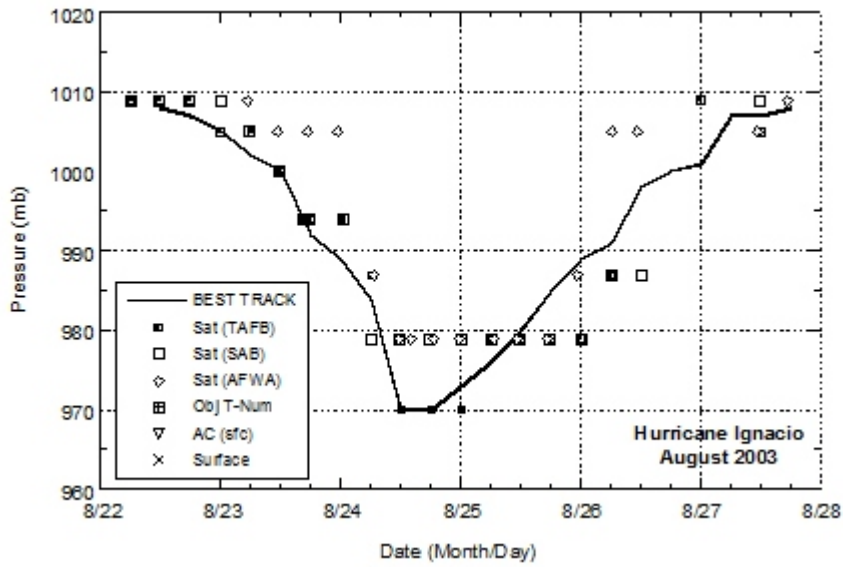


Figure 3. Selected pressure observations and best track minimum central pressure curve for Hurricane Ignacio.

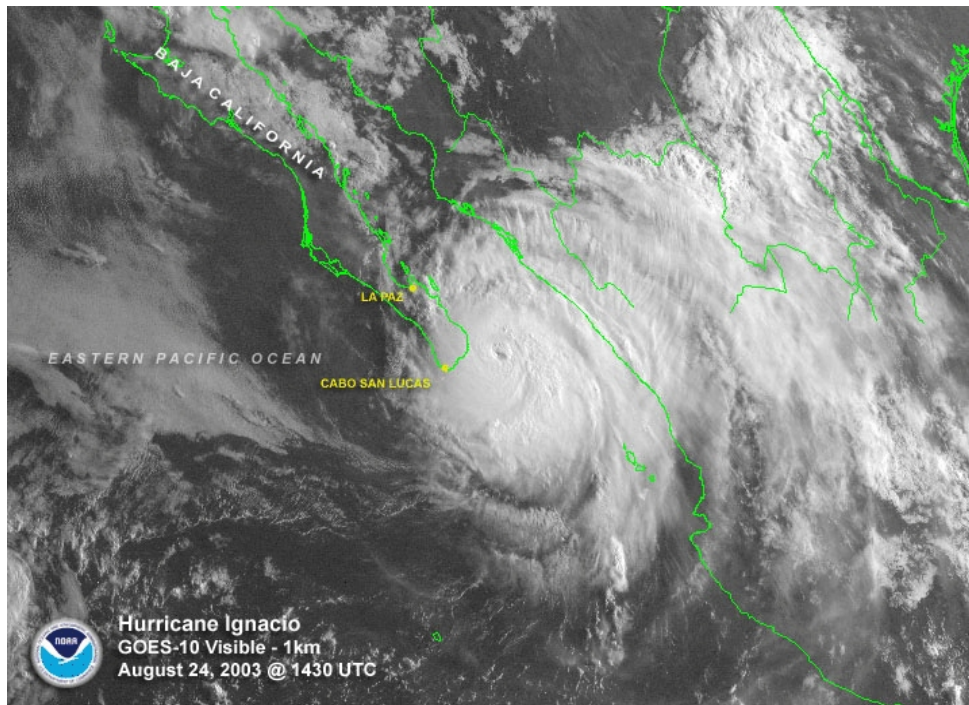


Fig. 4. GOES-10 visible image of Hurricane Ignacio at 1430 UTC, 24 August 2003. Note the appearance of an eye-type feature. Maximum 1-min surface wind speeds were estimated at 90 kt at this time.