Tropical Cyclone Report
Tropical Storm Iselle
15-20 September 2002

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Tropical Storm Iselle briefly threatened the southern Baja California peninsula of Mexico before weakening and dissipating offshore.

a. Synoptic History

The tropical wave that eventually spawned Tropical Storm Iselle moved off the west coast of Africa on 31 August and was accompanied by well-organized deep convection. However, the wave gradually weakened while it moved westward and became devoid of thunderstorm activity by 4 September. Southwesterly upper-level shear prevented further development of the southern portion of the wave, while the northern portion broke away and eventually developed into Atlantic Tropical Depression Seven on 7 September. The southern portion of the wave continued to track rapidly westward across the tropical Atlantic and northern South America until it emerged over the eastern North Pacific Ocean and Panama on 10 September.

After reaching the eastern Pacific, the wave moved westward at about 17 kt until 13 September, when the forward speed decreased to about 12 kt when the wave encountered southwesterly low-level winds. Some convective organization then occurred around a low-level cyclonic circulation that developed. Early on 15 September, well-defined upper-level outflow became established and convective organization improved enough for both the Tropical Analysis and Forecast Branch (TAFB) and the Satellite Analysis Branch (SAB) to begin Dvorak satellite classifications. It is estimated that at 0600 UTC this system became a tropical depression about 270 n mi south of Manzanillo, Mexico. 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 moved west-northwestward and strengthened into Tropical Storm Iselle at 0000 UTC 16 September about 250 n mi southwest of Manzanillo. Iselle moved northwestward for the next 3 days. During that time, Iselle gradually strengthened and eventually reached a peak intensity of 60 kt late on 17 September about 360 n mi west-southwest of Cabo San Lucas, Mexico. While satellite intensity estimates from the TAFB (Figs. 2 and 3) suggest that the peak intensity may have been closer to 75 kt, the satellite intensity estimates from the SAB and Air Force Weather Agency (AFWA) were 55-65 kt and 45 kt, respectively, at about the same time. Operationally, an average intensity estimate of 60 kt obtained from the three satellite analysis agencies was used. The decision to assign an intensity below hurricane strength (65 kt) was further supported by Special Sensor Microwave/Imager (SSMI) satellite imagery at 1554 UTC 17 September (Fig. 4) and 0117 UTC 18 September (not shown), which indicated that the center of Iselle was displaced near the northeastern edge of the deep convection, rather than being embedded in the center of what appeared

to be a Central Dense Overcast (CDO) feature.

Shortly after reaching peak intensity, Iselle made a sharp turn to the northeast as the mid- to upper-level flow ahead of a deep mid-latitude trough began to affect the tropical cyclone. The vertical shear also increased and, in response, Tropical Storm Iselle began to rapidly weaken and eventually became a tropical depression at 1800 UTC 19 September when it was located about 80 n mi southwest of Puerto Cortes, Baja California Sur, Mexico. Early on 20 September, Iselle degenerated into a non-convective low pressure system and eventually dissipated later that day about 60 n mi southwest of Puerto Cortes.

b. Meteorological Statistics

Observations in Tropical Storm Iselle (Figs. 2 and 3) include satellite-based Dvorak technique intensity estimates from the TAFB, the SAB, and the AFWA.

Manzanillo, Mexico reported a sustained wind of 40 kt at 2300 UTC 15 September, while Ship DEHY (**Leverkusen Express**) reported 43 kt winds at 1800 UTC 19 September. However, this report is believed to be unrepresentative since there was no deep convection in the vicinity of the ship's location and the ship had a history or reporting anomalously high winds. In addition, other nearby ship reports only indicted wind speeds of about 20 kt.

Iselle briefly produced locally heavy rainfall across the southern third of the Baja California peninsula of Mexico on 19 September, but rainfall totals were generally less than 2 inches (50 mm) based on limited observations from San Jose Del Cabo and La Paz.

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c. Casualty and Damage Statistics

There were no reports of damages or casualties associated with Iselle.

d. Forecast and Warning Critique

Average official track errors (with the number of cases in parentheses) for Iselle were 39 (13), 65 (11), 102 (9), 145 (7), and 298 (3) n mi for the 12, 24, 36, 48, and 72 h forecasts, respectively. The errors through 36 h are comparable to the average official track errors for the 10-yr period 1992-2001 of 36, 67, 97, 125, and 182 n mi, respectively (Table 2). However, the errors at 48 h and 72 h are much larger than the 10-year averages, mainly due to the abrupt turn to the northeast not being forecast. The Navy NOGAPS (NGPS) and the GFDL/GFDI models had the lowest errors throughout the forecast period and accurately forecast the abrupt northeastward turn.

Average official intensity errors were 4, 10, 18, 21, and 25 kt for the 12, 24, 36, 48, and 72 h forecasts, respectively. These errors are slightly larger than the average official intensity errors over the 10-yr period 1992-2001 of 7, 12, 16, 18, and 21 kt, respectively, due to a consistent high bias. In addition, the official errors are uncharacteristically higher than the GFDI model, but were only slightly larger than the SHIPS intensity model. The SHIPS moel had a large positive (over intensification) bias similar to the official forecast.

A tropical storm warning was in effect for southwestern Mexico from Lazaro Cardenas to Puerto Vallarta from 0000 UTC until 0900 UTC on 16 September.

Table 1. Best track for Tropical Storm Iselle, 15-20 September 2002.

Date/Time (UTC)	Latitude (°N)	Longitude (°W)	Pressure (mb)	Wind Speed (kt)	Stage
15 / 0600	15.2	103.8	1005	25	tropical depression
15 / 1200	15.6	104.6	1005	25	"
15 / 1800	16.2	105.5	1005	30	"
16 / 0000	16.9	106.8	1001	40	tropical storm
16 / 0600	17.7	107.8	1000	40	"
16 / 1200	18.4	109.0	998	45	"
16 / 1800	19.2	110.4	998	45	"
17 / 0000	20.0	111.6	996	50	"
17 / 0600	20.5	112.5	994	55	"
17 / 1200	21.1	113.2	994	55	"
17 / 1800	21.6	114.0	990	60	"
18 / 0000	21.9	114.6	990	60	"
18 / 0600	22.1	114.3	998	45	"
18 / 1200	22.3	114.1	1002	40	"
18 / 1800	22.5	114.0	1005	35	"
19 / 0000	22.7	113.7	1005	35	"
19 / 0600	23.0	113.3	1005	35	"
19 / 1200	23.5	112.9	1004	35	"
19 / 1800	23.8	112.5	1005	30	tropical depression
20 / 0000	24.1	112.6	1003	25	"
20 / 0600	24.5	112.8	1005	25	remnant low
20 / 1200	24.9	113.0	1006	20	"
20 / 1800					dissipated
17 / 1800	21.6	114.0	990	60	minimum pressure
18 / 0000	21.9	114.6	990	60	"

Table 2. Forecast evaluation (heterogeneous sample) for Tropical Storm Iselle, 15-20 September 2002. Forecast errors for tropical storm and hurricane stages (n mi) are followed by the number of forecasts in parentheses. Errors smaller than the NHC official forecast are shown in bold-face type.

Forecast Technique	Forecast Period (h)				
	12	24	36	48	72
CLP5	60(13)	127 (11)	182 (9)	207 (7)	**180** (3)
GFDI	**25**(13)	**46** (11)	**61** (9)	**85** (7)	**102** (3)
GFDL	**30**(13)	**35** (11)	**51** (9)	**59** (7)	**122** (3)
LBAR	39(13)	79 (11)	125 (9)	176 (7)	249 (3)
AVNI	37(13)	**58** (11)	**78** (9)	**122** (7)	289 (3)
AVNO	52(13)	**60** (11)	**74** (9)	**98** (7)	245 (3)
AEMI	**31**(9)	**44** (8)	**63** (7)	**124** (5)	292 (2)
BAMD	50(13)	100 (11)	137 (9)	199 (7)	376 (3)
BAMM	45(13)	95 (11)	142 (9)	215 (7)	438 (3)
BAMS	37(13)	71 (11)	108 (9)	170 (7)	410 (3)
NGPI	**29**(13)	**41** (11)	**49** (9)	**68** (7)	**125** (3)
NGPS	**30**(13)	**35** (11)	**38** (9)	**47** (7)	**135** (3)
UKMI	40(13)	**72** (11)	109 (9)	137 (7)	311 (3)
UKMO	42 (7)	**54** (6)	**81** (5)	**100** (4)	**162** (2)
GUNS	**26** (13)	**43** (11)	**54** (9)	**74** (7)	**161** (3)
GUNA	**27** (13)	**44** (11)	**58** (9)	**85** (7)	185 (3)
OFCL (Official)	39 (13)	65 (11)	102 (9)	145 (7)	298 (3)
NHC Official (1992-2001 mean)	36 (2203)	67 (1947)	97 (1700)	125 (1472)	182 (1091)

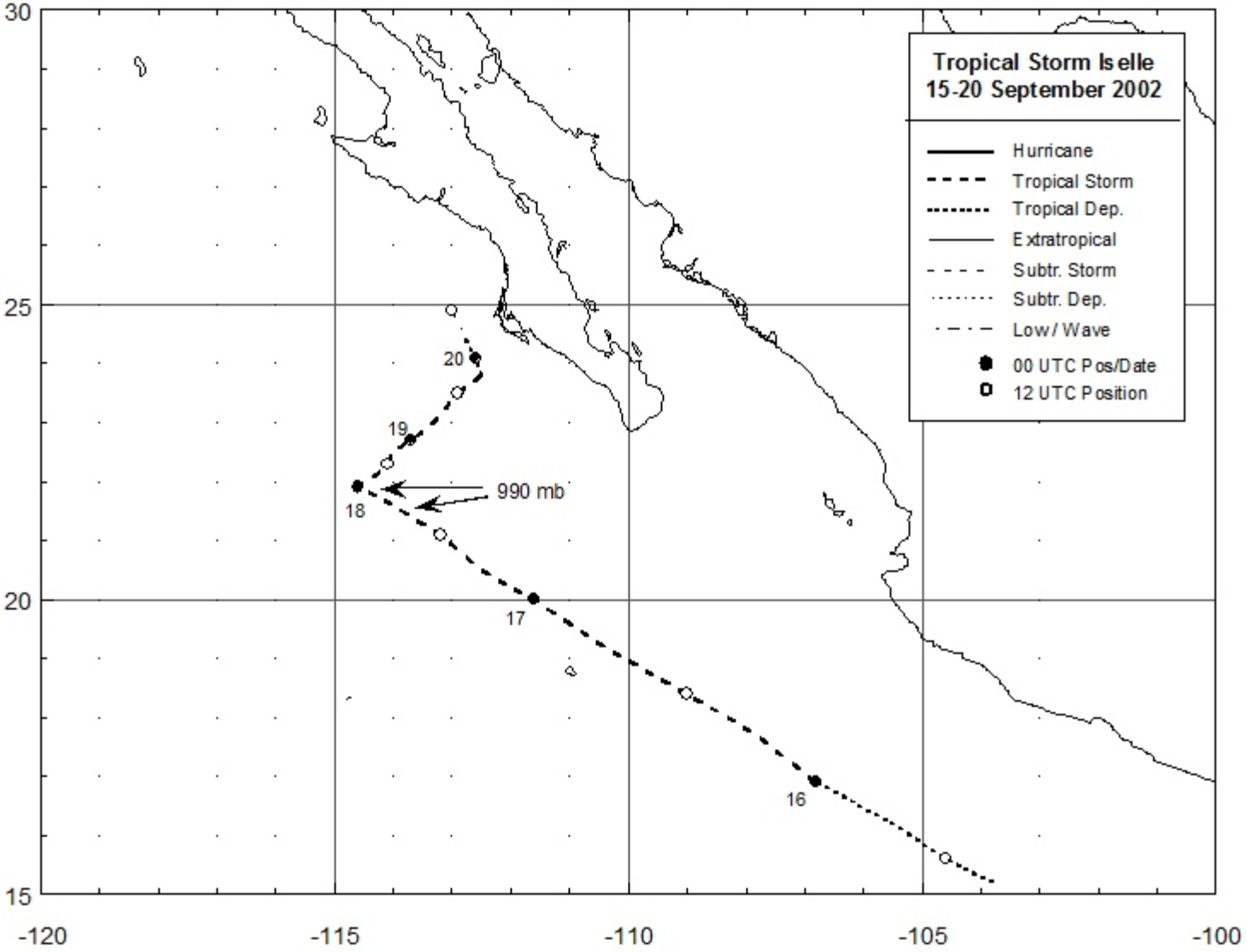

Figure 1. Best track positions for Tropical Storm Iselle 15-20 September 2002, with minimum central pressure.

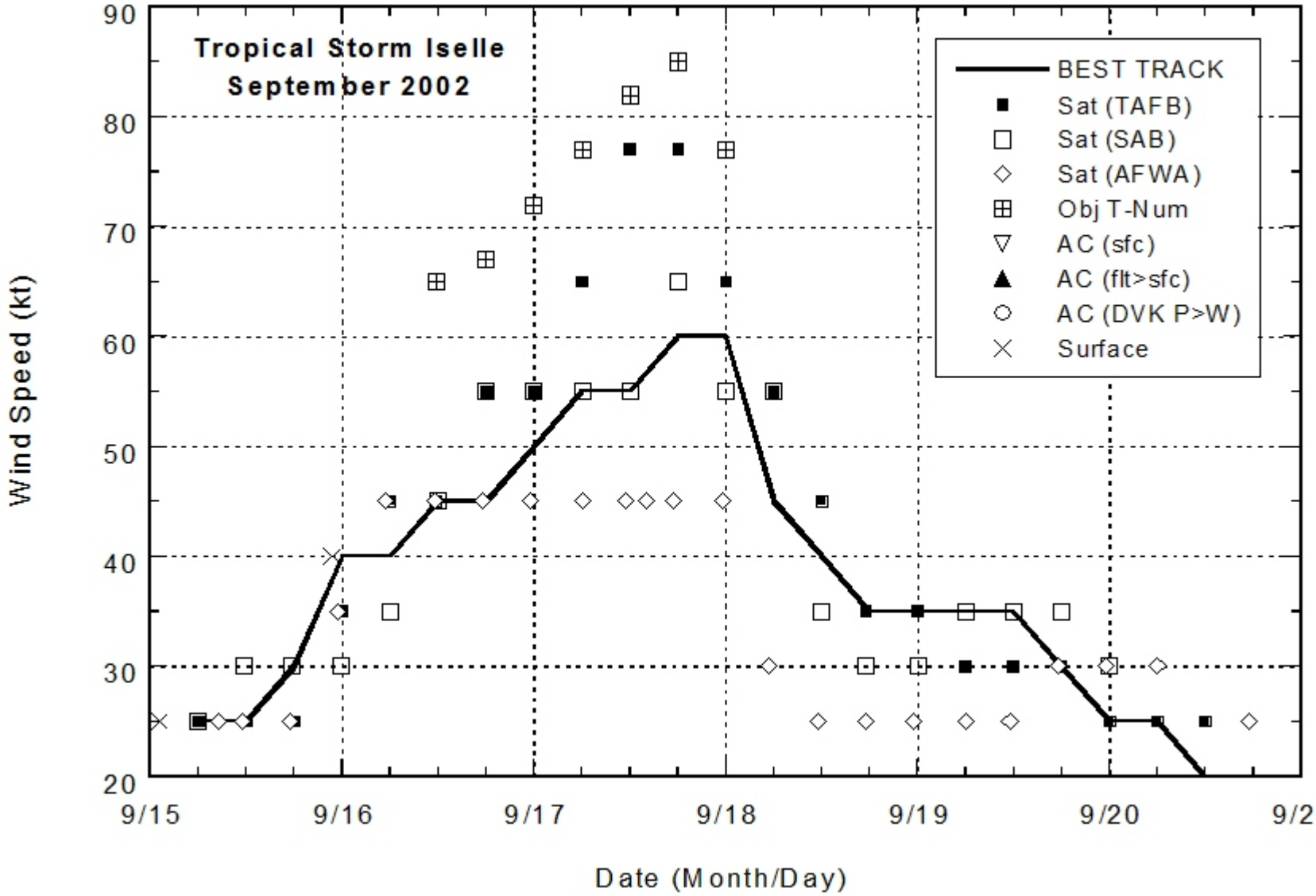

Figure 2. Selected wind observations and best track maximum sustained surface wind speed curve for Tropical Storm Iselle, 15-20 September 2002. Objective Dvorak estimates are 3-h averages, weighted most heavily by the most recent values.

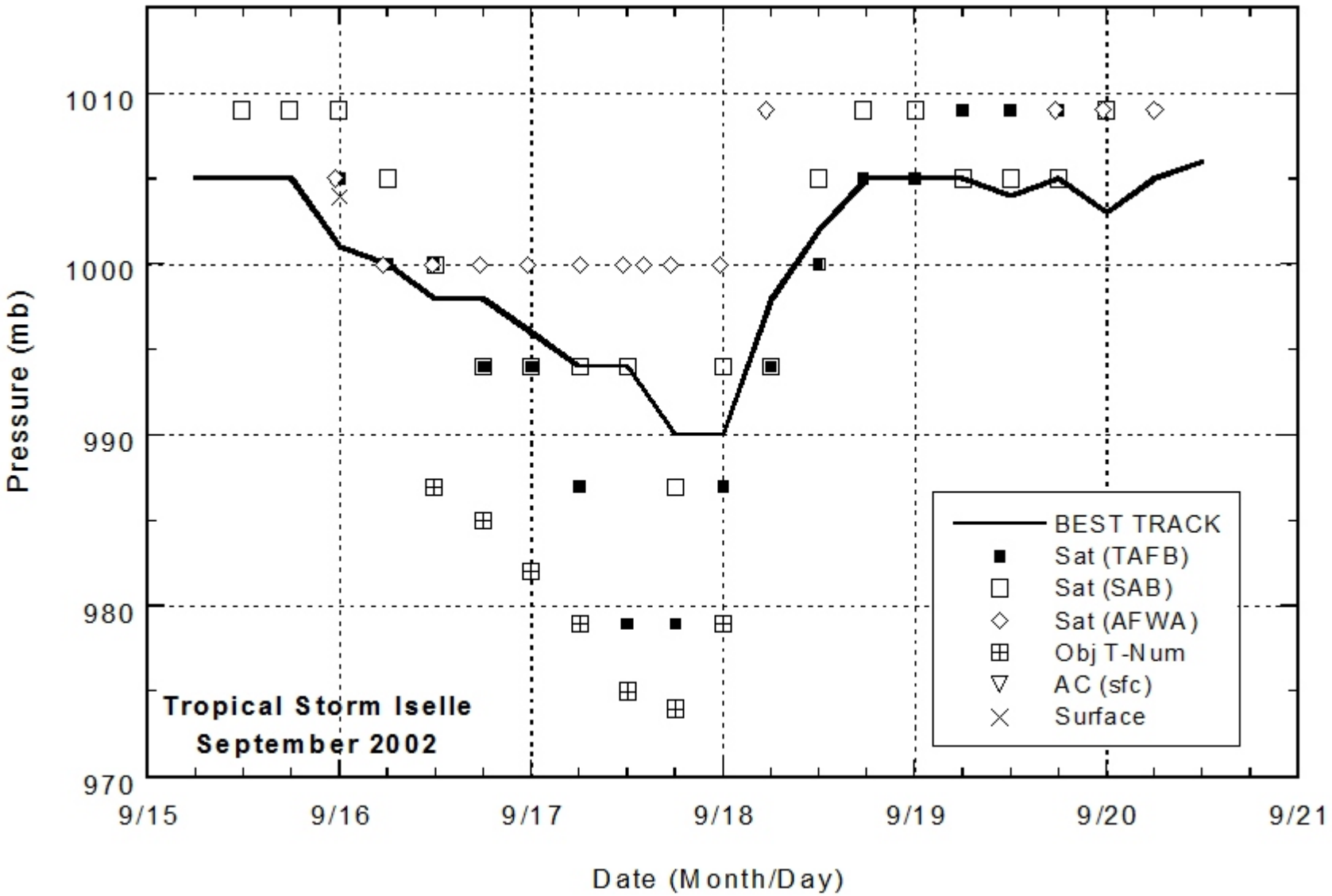

Figure 3. Selected pressure observations and best track minimum central pressure curve for Tropical Storm Iselle, 15-20 September 2002. Objective Dvorak estimates are 3-h averages, weighted most heavily by the most recent values.

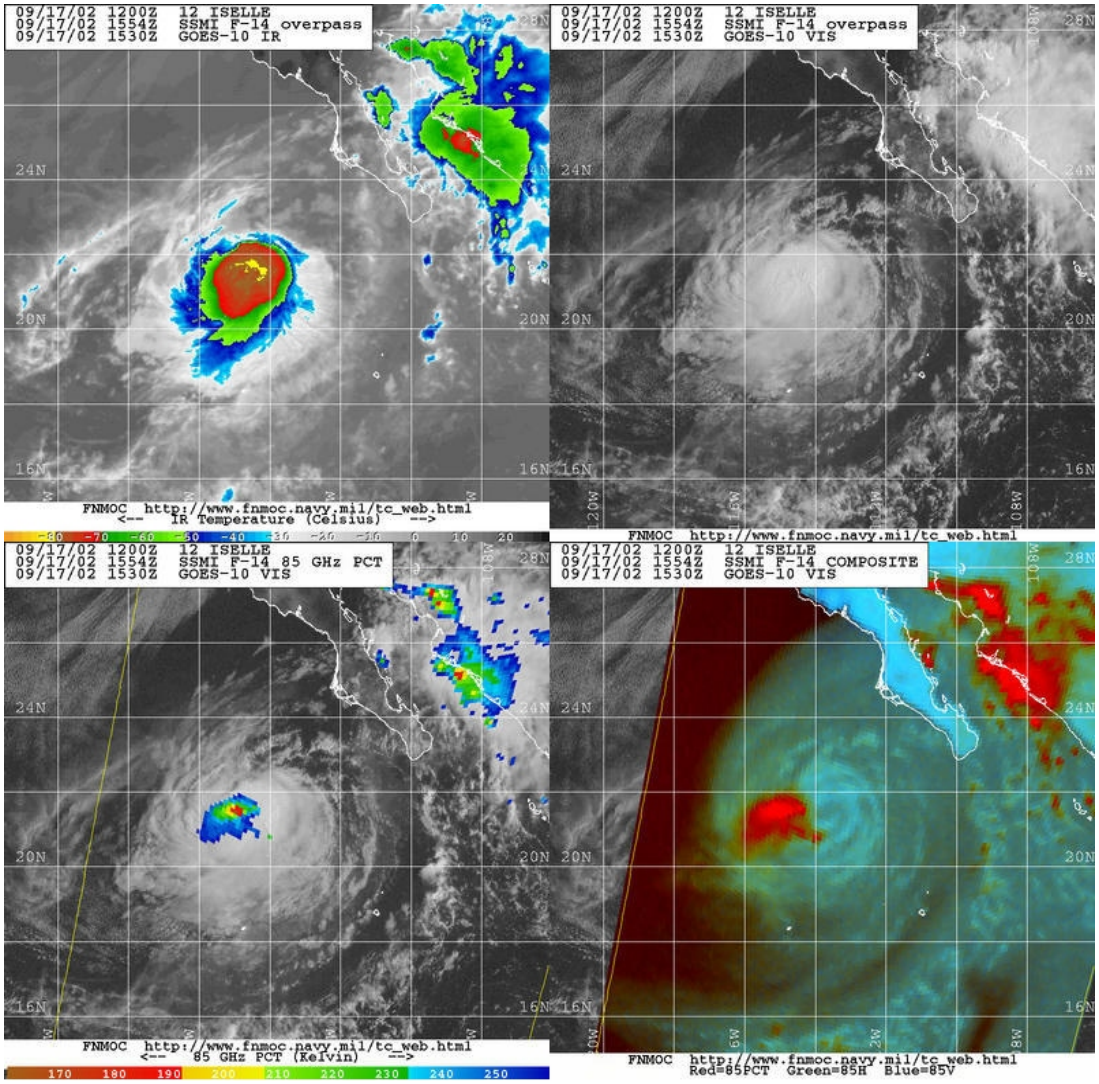

Figure 4. SSM/I satellite overpass at 1554 UTC 17 Sep 2002 depicting color-enhanced infrared (upper-left), visible (upper-right), 85 GHZ Polarized Corrected Temperatures (lower-left), and 85 GHZ Composite (lower-right) imagery. The exposed low-level circulation center (LLCC) in the 85 GHZ Composite microwave data (blue-green swirl just east of red convective area), which is not readily seen in the conventional infrared and visible imagery. The exposed LLCC was the basis for not making Iselle a hurricane, despite the large objective Dvorak intensity estimates noted in Figs. 2 and 3.