

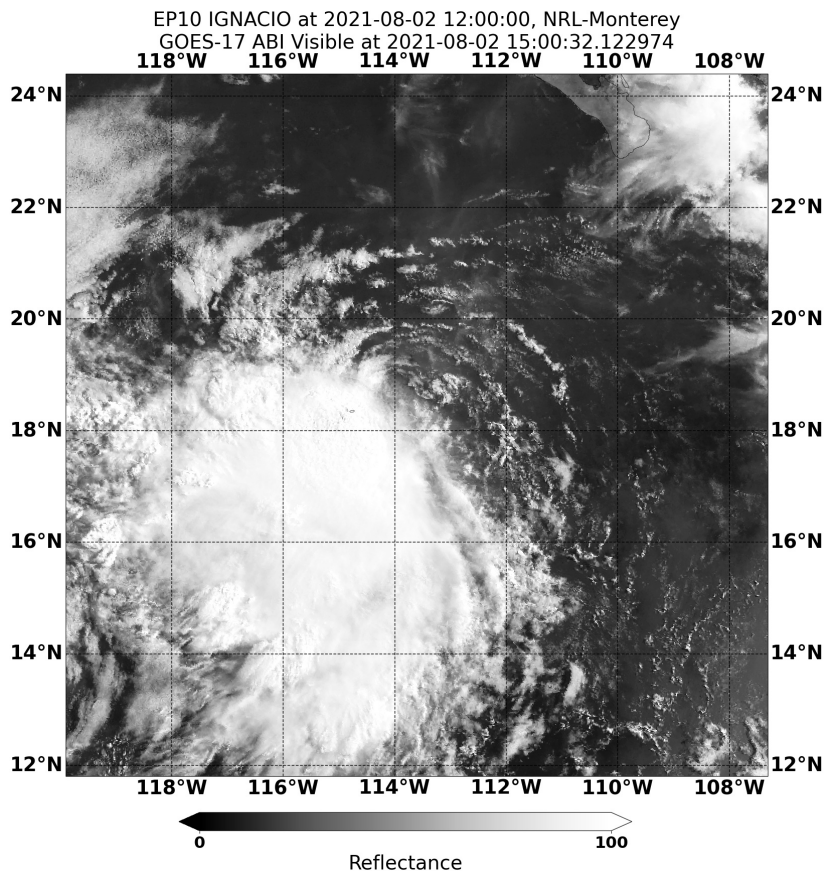


NATIONAL HURRICANE CENTER TROPICAL CYCLONE REPORT

TROPICAL STORM IGNACIO (EP102021)

1–3 August 2021

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TROPICAL STORM IGNACIO AT 1500 UTC 2 SEPTEMBER 2021 FROM GOES-17 VISIBLE IMAGERY DURING PEAK INTENSITY
(IMAGE COURTESY OF NAVAL RESEARCH LABORATORY)

Ignacio was a short-lived, disorganized tropical storm that did not impact land.

Tropical Storm Ignacio

1–3 AUGUST 2021

SYNOPTIC HISTORY

An African easterly wave with limited deep convection moved off of the coast of western Africa on 14 July. This system changed little while reaching the Caribbean Sea on 22 July and the eastern North Pacific on 26 July. Over the next few days, convection became more widespread along the monsoon trough in association with this wave as well as two tropical waves located farther west (on 30 July, Hurricane Hilda developed from the tropical wave located near 113°W, and Tropical Storm Jimena developed from the tropical wave located near 125°W). Scattered moderate and isolated strong convection occurred near the easternmost wave axis on 30 and 31 July leading to the development of a broad area of low pressure. By 1800 UTC 31 July, a well-defined center had formed in association with the system. Around 1200 UTC 1 August, enough organized deep convection was present to indicate that the system had developed into a tropical cyclone, while located around 350 n mi south-southwest of the southern tip of the Baja California peninsula. 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.

After formation until early on 3 August, the tropical cyclone moved steadily west-northwestward to northwestward along the southwestern portion of a mid-level ridge. Despite being over very warm (29°C) waters and embedded within a moist (75% relative humidity) mid-level environment, the system struggled to intensify due to moderate to strong (20 kt) north-northeasterly deep-layer vertical wind shear and a relatively stable atmosphere. The system reached 35-kt tropical storm intensity around 1200 UTC 2 August, while centered around 355 n mi southwest of the southern tip of the Baja California peninsula. This value turned out to be the peak intensity of the system before Ignacio weakened back to a tropical depression only 18 h later. Ignacio succumbed to the combination of strong shear, a stable atmosphere, and increasingly cooler waters as it lost its deep convection around 0000 UTC 4 August and became a remnant low. While weakening, Ignacio turned slowly toward the north on 3 August and then toward the east-southeast on 4 August as it was steered by the weak lower tropospheric flow. Ignacio’s remnant low dissipated by 1200 UTC 4 August about 340 n mi west-southwest of the southern tip of the Baja California peninsula

METEOROLOGICAL STATISTICS

Observations in Tropical Storm Ignacio (Figs. 2 and 3) include subjective satellite-based Dvorak technique intensity estimates from the Tropical Analysis and Forecast Branch (TAFB) and the Satellite Analysis Branch (SAB), objective Advanced Dvorak Technique (ADT) estimates and

Satellite Consensus (SATCON) estimates from the Cooperative Institute for Meteorological Satellite Studies/University of Wisconsin-Madison. Data and imagery from NOAA polar-orbiting satellites including the Advanced Microwave Sounding Unit (AMSU), the NASA Global Precipitation Mission (GPM), the European Space Agency's Advanced Scatterometer (ASCAT), and Defense Meteorological Satellite Program (DMSP) satellites, among others, were also useful in constructing the best track of Tropical Storm Ignacio.

There were no ship, land station, or data buoy reports of winds of sustained tropical storm force associated with Tropical Storm Ignacio. A wind gust of 34 kt was observed at 1630 UTC on 1 August at Socorro Island, Mexico. The center of Ignacio passed 15–20 n mi northeast of Clarion Island, Mexico, where the pressure fell to 1006.5 mb around 1400 UTC 2 August, while the highest sustained winds were 22 kt with a gust to 33 kt according to a Mexican Navy observing station on the island.

Ignacio's estimated peak intensity of 35 kt from 1200 UTC 2 August through 0000 UTC 3 August is based on consensus subjective and objective Dvorak intensity estimates T2.5/35 kt from TAFB, SAB, and UW-CIMSS ADT. The estimated minimum pressure of 1004 mb at 1200 and 1800 UTC 2 August is based on the aforementioned Clarion Island observation.

CASUALTY AND DAMAGE STATISTICS

There were no reports of damage or casualties associated with Tropical Storm Ignacio.

FORECAST AND WARNING CRITIQUE

The genesis of Ignacio was poorly forecast in the long-range but adequately predicted in the short-range NHC Tropical Weather Outlooks (TWOs). The wave from which Ignacio developed was introduced with a low chance of formation in the 5-day and 2-day periods 66 h prior to genesis (Table 2). The 5-day probability was boosted to a medium chance of formation at 60 h and to a high chance at only 42 h before genesis. In the 2-day period, a medium chance of formation was first indicated 42 h before genesis and a high chance 18 h beforehand.

A verification of NHC official track forecasts for Ignacio is given in Table 3a. Official track forecast errors were substantially greater than the mean official errors for the previous 5-yr period. As the climatology and persistence (OCD5) model also had larger than usual errors, this suggests that Ignacio's track was more difficult to predict than is typical. A homogeneous comparison of the official track errors with selected guidance models is given in Table 3b. In a relatively small sample size, the ECMWF (EMXI) and COAMPS-TC (CTCI) models outperformed the NHC official track predictions.

A verification of NHC official intensity forecasts for Ignacio is given in Table 4a. Official intensity forecast errors were zero for all forecast times, which is much lower than the mean official errors for the previous 5-yr period. As the OCD5 model also had smaller than usual errors, this suggests that Ignacio's intensity was easier to predict than is typical. A homogeneous comparison



of the official intensity errors with selected guidance models is given in Table 4b. All intensity model guidance exhibited low forecast errors.

No coastal watches and warnings were required for Ignacio.



Table 1. Best track for Tropical Storm Tropical Storm Ignacio, 1–3 August, 2021.

Date/Time (UTC)	Latitude (°N)	Longitude (°W)	Pressure (mb)	Wind Speed (kt)	Stage
31 / 1800	14.4	107.4	1008	25	low
01 / 0000	15.2	108.1	1008	25	"
01 / 0600	16.0	109.0	1008	25	"
01 / 1200	16.5	110.0	1008	25	"
01 / 1800	17.0	111.1	1007	30	tropical depression
02 / 0000	17.5	112.2	1006	30	"
02 / 0600	17.9	113.1	1006	30	"
02 / 1200	18.2	113.6	1004	35	tropical storm
02 / 1800	18.6	114.3	1004	35	"
03 / 0000	19.2	115.3	1005	35	"
03 / 0600	19.8	116.0	1007	30	tropical depression
03 / 1200	20.2	116.3	1008	30	"
03 / 1800	20.4	115.8	1009	25	"
04 / 0000	20.3	115.2	1009	25	low
04 / 0600	20.1	114.7	1010	25	"
04 / 1200					dissipated
02 / 1200	18.2	113.6	1004	35	maximum intensity and minimum pressure



Table 2. Number of hours in advance of formation associated with the first NHC Tropical Weather Outlook forecast in the indicated likelihood category. Note that the timings for the “Low” category do not include forecasts of a 0% chance of genesis.

	Hours Before Genesis	
	48-Hour Outlook	120-Hour Outlook
Low (<40%)	66	66
Medium (40%-60%)	42	60
High (>60%)	18	42



Table 3a. NHC official (OFCL) and climatology-persistence skill baseline (OCD5) track forecast errors (n mi) for Tropical Storm Ignacio. Mean errors for the previous 5-yr period are shown for comparison. Official errors that are smaller than the 5-yr means are shown in boldface type.

	Forecast Period (h)							
	12	24	36	48	60	72	96	120
OFCL	31.9	55.3	86.9	197.1				
OCD5	46.9	73.0	117.8	237.1				
Forecasts	7	5	3	1				
OFCL (2016-20)	21.3	33.1	44.0	54.6	65.3	76.0	95.9	116.6
OCD5 (2016-20)	33.1	69.4	107.8	147.0	183.4	219.7	280.2	342.0



Table 3b. Homogeneous comparison of selected track forecast guidance models (in n mi) for Tropical Storm Ignacio. Errors smaller than the NHC official forecast are shown in boldface type. The number of official forecasts shown here will generally be smaller than that shown in Table 3a due to the homogeneity requirement.

Model ID	Forecast Period (h)							
	12	24	36	48	60	72	96	120
OFCL	27.3	55.3	86.9	197.1				
OCD5	37.2	73.0	117.8	237.1				
GFSI	31.1	58.5	131.9	310.9				
HWFI	41.5	111.5	196.3	288.4				
HMNI	50.2	109.5	175.6	181.0				
EMXI	16.1	38.3	25.0	30.5				
NVGI	19.3	48.7	99.1	109.3				
CMCI	21.7	18.5	30.0	106.8				
CTCI	26.2	29.6	32.7	24.6				
TVCE	25.9	62.7	101.8	152.0				
HCCA	21.5	46.7	68.0	131.7				
AEMI	28.9	57.1	96.4	212.2				
TABS	29.4	64.2	117.6	246.8				
TABM	42.9	127.8	248.3	443.8				
TABD	50.8	137.9	238.8	401.7				
Forecasts	5	5	3	1				



Table 4a. NHC official (OFCL) and climatology-persistence skill baseline (OCD5) intensity forecast errors (kt) for Tropical Storm Ignacio. Mean errors for the previous 5-yr period are shown for comparison. Official errors that are smaller than the 5-yr means are shown in boldface type.

	Forecast Period (h)							
	12	24	36	48	60	72	96	120
OFCL	0.0	0.0	0.0	0.0				
OCD5	4.0	6.4	9.0	13.0				
Forecasts	7	5	3	1				
OFCL (2016-20)	5.6	9.0	10.9	12.6	14.0	15.3	16.0	16.7
OCD5 (2016-20)	7.2	12.0	15.3	17.6	19.0	20.4	21.2	20.8

Table 4b. Homogeneous comparison of selected intensity forecast guidance models (in kt) for Tropical Storm Ignacio. Errors smaller than the NHC official forecast are shown in boldface type.

Model ID	Forecast Period (h)							
	12	24	36	48	60	72	96	120
OFCL	0.0	0.0	0.0	0.0				
OCD5	4.0	6.4	9.0	13.0				
HWFI	1.7	3.2	8.3	6.0				
HMNI	2.1	2.4	3.0	2.0				
DSHP	2.4	3.6	3.0	1.0				
LGEM	2.9	4.4	2.7	2.0				
ICON	1.9	2.8	1.7	2.0				
IVCN	1.7	2.2	1.3	0.0				
CTCI	2.6	3.8	3.2	4.1				
GFSI	2.6	4.4	4.7	4.0				
EMXI	2.9	5.0	7.3	6.0				
HCCA	1.6	1.8	1.7	3.0				
Forecasts	7	5	3	1				

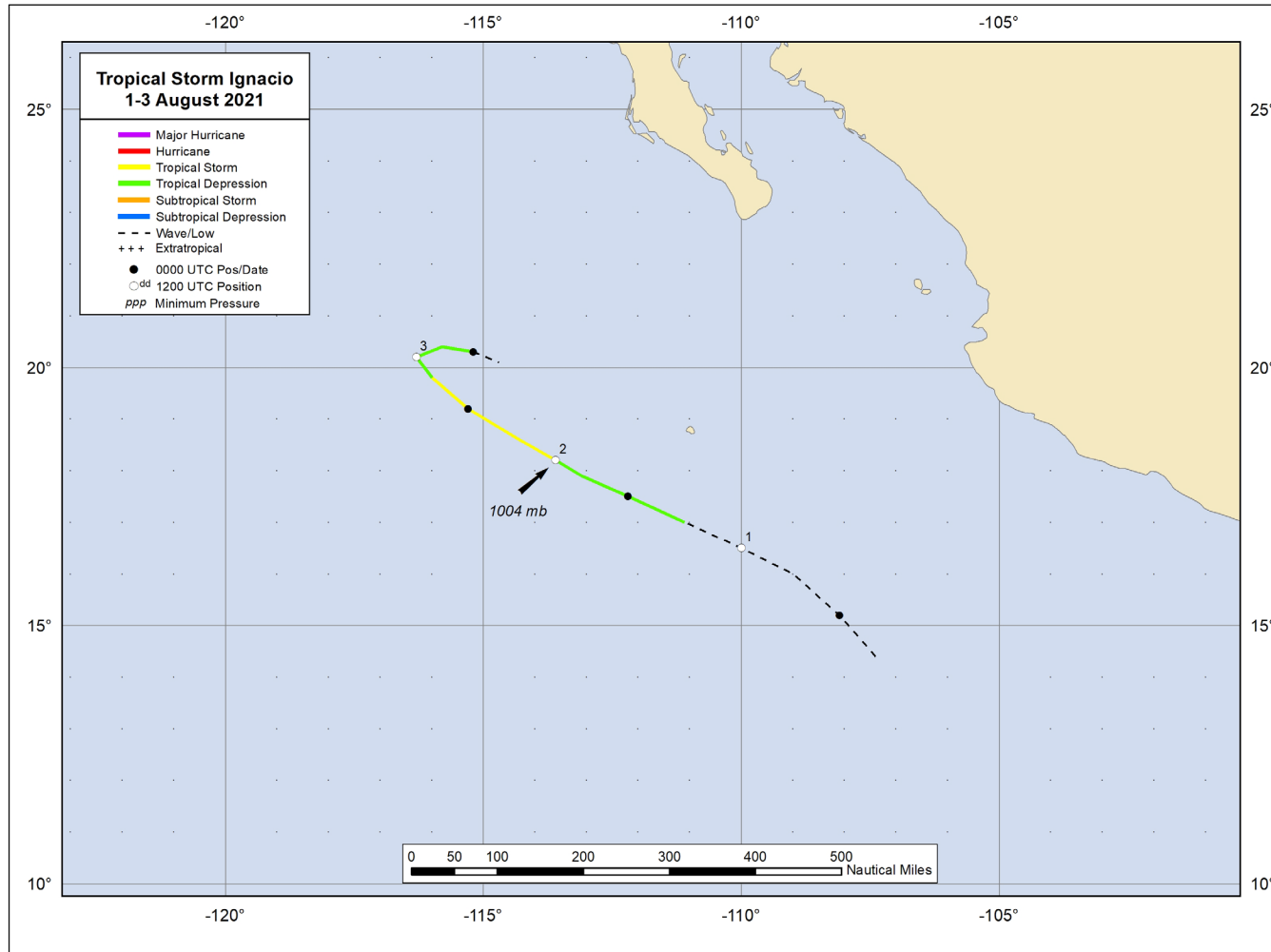


Figure 1. Best track positions for Tropical Storm Ignacio, 1–3 August 2021.

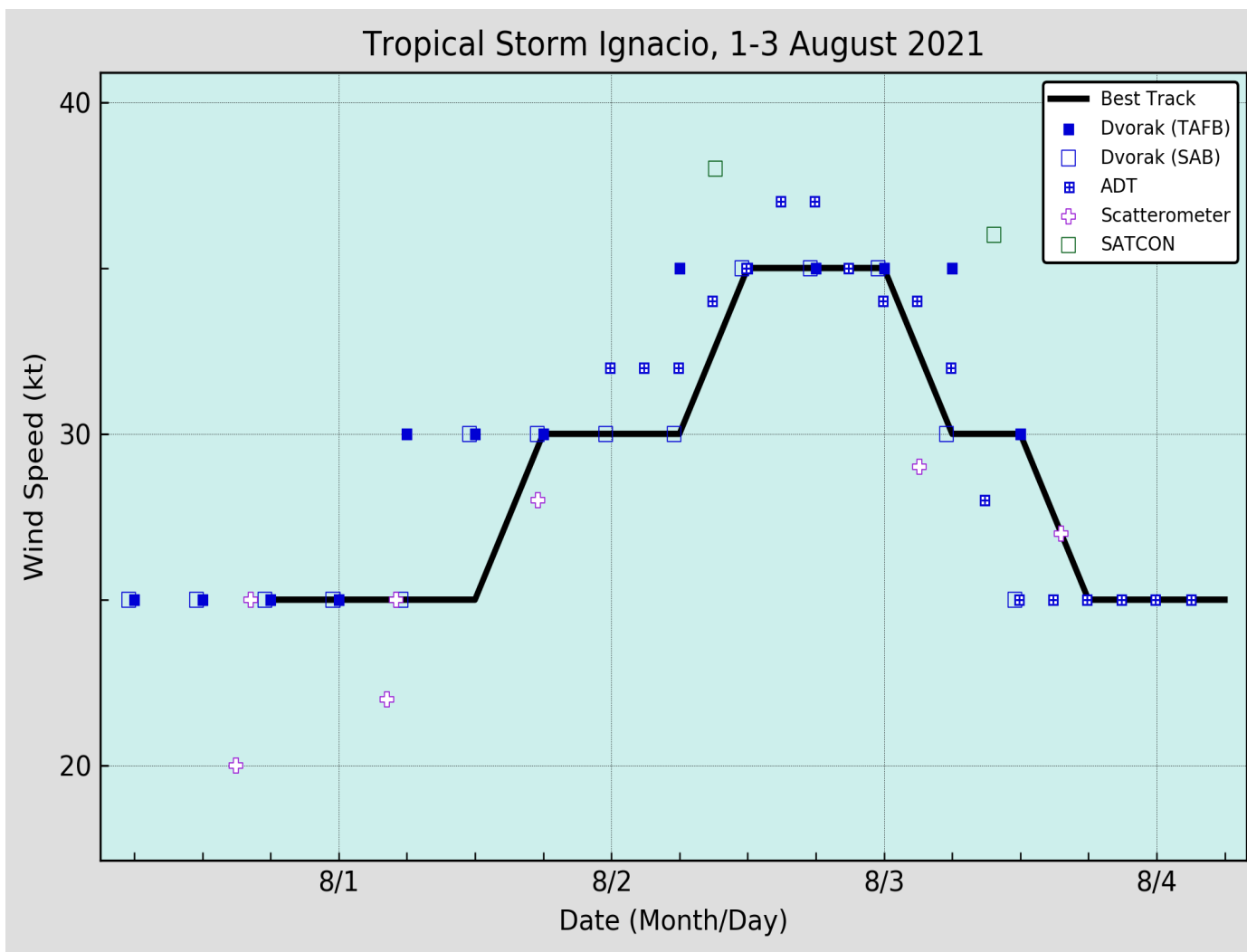


Figure 2. Selected wind observations and best track maximum sustained surface wind speed curve for Tropical Storm Ignacio, 1–3 August 2021. Advanced Dvorak Technique estimates represent the Current Intensity at the nominal observation time. SATCON intensity estimates are from the Cooperative Institute for Meteorological Satellite Studies. Dashed vertical lines correspond to 0000 UTC.

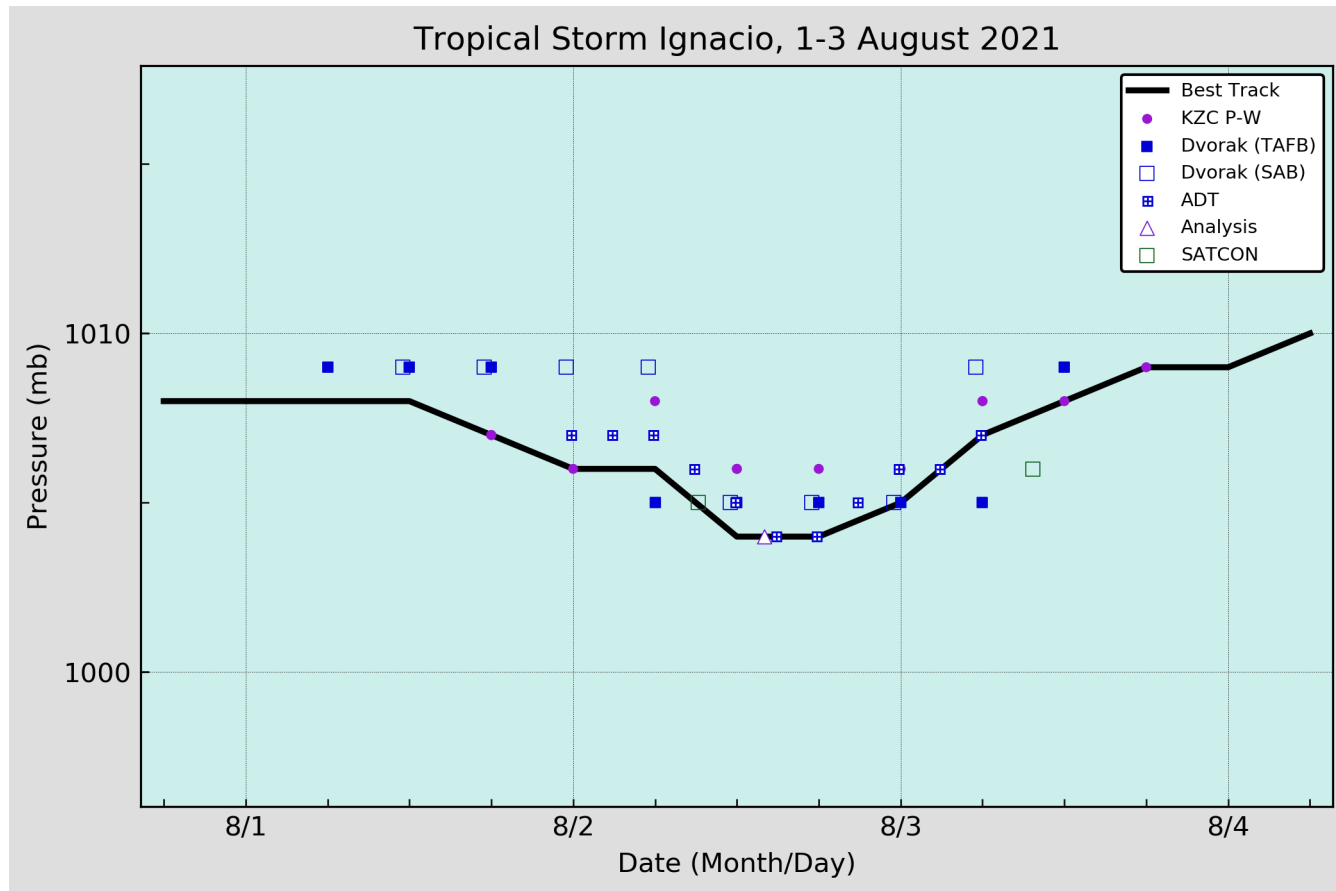


Figure 3. Selected pressure observations and best track minimum central pressure curve for Tropical Storm Ignacio, 1–3 August 2021. Advanced Dvorak Technique estimates represent the Current Intensity at the nominal observation time. SATCON intensity estimates are from the Cooperative Institute for Meteorological Satellite Studies. KZC P-W refers to pressure estimates derived using the Knaff-Zehr-Courtney pressure-wind relationship. Dashed vertical lines correspond to 0000 UTC.