

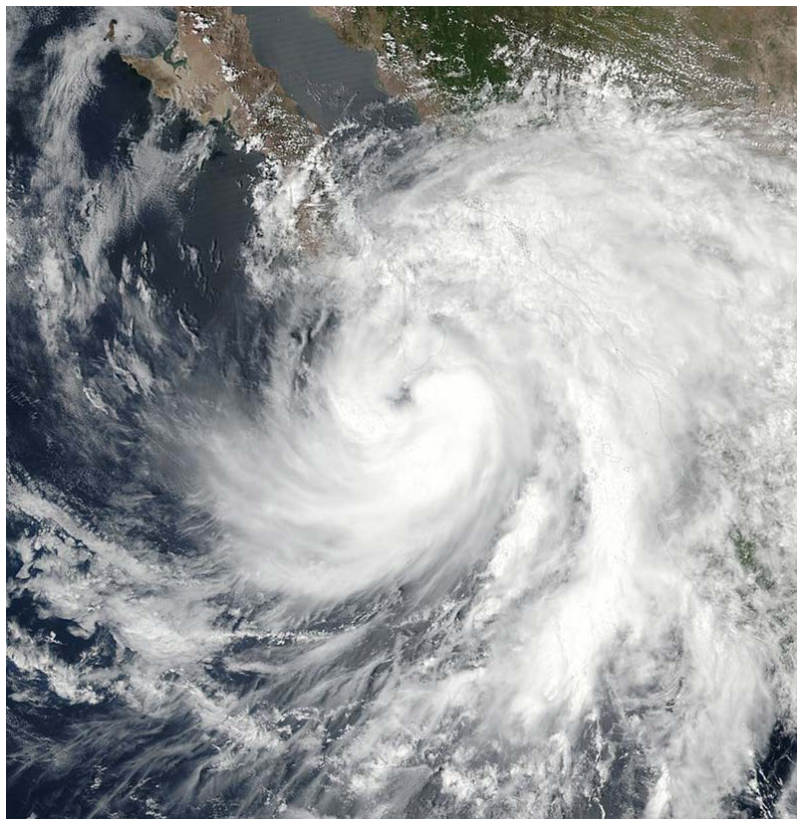


NATIONAL HURRICANE CENTER TROPICAL CYCLONE REPORT

TROPICAL STORM LIDIA (EP142017)

30 August – 3 September 2017

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National Hurricane Center
20 December 2017



NASA-NOAA'S SUOMI NPP SATELLITE IMAGE AT 2024 UTC 31 AUGUST WHEN TROPICAL STORM LIDIA WAS LOCATED TO SOUTHWEST OF THE SOUTHERN TIP OF BAJA CALIFORNIA.

Lidia was a large cyclone that spread tropical-storm-force winds and heavy rains across a portion of the Baja California peninsula and mainland Mexico.

Tropical Storm Lidia

30 AUGUST – 3 SEPTEMBER 2017

SYNOPTIC HISTORY

A tropical wave moved off the west coast of Africa on 16 August accompanied by a large mass of cloudiness and cyclonic rotation in the mid-levels. As the wave moved westward across the Atlantic, it encountered unfavorable upper-level winds associated with a strong upper-level trough, and by the time the wave axis was near the Lesser Antilles on 21 August, most of the deep convection had vanished. The wave continued westward across the Caribbean Sea and moved over Central America on 25 August. Once in the eastern Pacific, the shower activity markedly increased, and a few low-level swirls developed within a large cyclonic gyre. As the gyre moved west-northwestward, its cloud pattern was disrupted by strong northeasterly shear associated with the outflow of intense Hurricane Harvey which was located in the northwestern Gulf of Mexico. The system was already producing tropical-storm-force winds, and once Harvey weakened and the shear decreased, a well-defined center formed, and the thunderstorm activity consolidated around it. It is estimated that a tropical storm formed at 1800 UTC 30 August about 275 n mi south 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 1¹.

Lidia moved north-northwestward to northwestward toward the Baja California peninsula, steered by the flow around the western edge of a subtropical high and an upper-level trough to the west. There was some increase in strength, and Lidia reached its peak intensity of 55 kt at 1800 UTC 31 August just south of the peninsula. Lidia then passed very close to Cabo San Lucas and moved along the west coast of the peninsula. The interaction of the storm’s circulation with the high terrain caused some slight weakening before landfall which occurred near the small town of Punta Marquez located on the west coast of the peninsula, west of La Paz, near 1200 UTC 1 September. Lidia’s maximum winds were 50 kt with a minimum pressure of 990 mb at landfall. The cyclone moved up the spine of the peninsula for the next several hours and the center then briefly moved back over water. Lidia continued toward the northwest and the center crossed the coast again near Punta Abreojos around 0600 UTC 2 September with an estimated intensity of 40 kt. The weakening cyclone moved toward the northwest and became a remnant low at 0600 UTC 3 September, and dissipated at 1800 UTC that day over the cold waters west of Baja California peninsula.

¹ A digital record of the complete best track, including wind radii, can be found on line at <ftp://ftp.nhc.noaa.gov/atcf>. Data for the current year’s storms are located in the *btk* directory, while previous years’ data are located in the *archive* directory.

METEOROLOGICAL STATISTICS

Observations in Lidia (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). A special flight of the NASA Global Hawk provided numerous dropsonde data while surface observations from both the Servicio Meteorológico Nacional de México (SMN) and the Mexican Navy (SEMAR) were very useful in determining the structure of Lidia. 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 Lidia.

Lidia's peak intensity of 55 kt at 1800 UTC 31 August was based on Dvorak estimates. During that time, the cloud pattern showed the best organization with the hint of an eye feature. As the center of Lidia moved near Cabo San Lucas, an elevated station near that site reported sustained winds of 54 kt. Lidia was a large tropical cyclone and its tropical-storm-force winds extended well to the east of the center. These winds reached the towns of Los Mochis and Topolobambo on mainland Mexico. A selection of surface observations during Lidia is provided in Table 2. Lidia brought torrential rains primarily to the southern portion of the Baja California peninsula where a peak rainfall amount of 18.9 inches (479.8 mm) was measured at Sierra Laguna (Figure 4).

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

CASUALTY AND DAMAGE STATISTICS

According to media reports and Mexican officials, there were five direct deaths² in association with Lidia. One woman drowned after being swept into a canal, and a two-year-old child died after being separated from his mother and swept away by floodwaters. Details on the other 3 direct deaths were not provided. Two indirect deaths occurred as the result of electrocution by downed power lines.

The storm affected various states particularly in western Mexico, and cut off power and damaged homes and roads in Baja California Sur, where some 3,000 people were taken to shelters (Figure 5).

² Deaths occurring as a direct result of the forces of the tropical cyclone are referred to as "direct" deaths. These would include those persons who drowned in storm surge, rough seas, rip currents, and freshwater floods. Direct deaths also include casualties resulting from lightning and wind-related events (e.g., collapsing structures). Deaths occurring from such factors as heart attacks, house fires, electrocutions from downed power lines, vehicle accidents on wet roads, etc., are considered indirect" deaths.

FORECAST AND WARNING CRITIQUE

The genesis of Lidia was well forecast. The disturbance from which the cyclone developed was introduced with a low chance of formation in the 5-day portion of the Tropical Weather Outlook 114 h prior to genesis. The 5-day genesis probability was raised to the medium and high categories 96 h and 84 h, respectively, in advance of formation (Table 3). A high chance of genesis in the 2-day period was introduced 42 h in advance. In fact, given the high chance of tropical cyclone formation, and the likelihood that the system would bring tropical storm conditions to the Baja California peninsula, Potential Tropical Cyclone advisories were initiated at 2100 UTC 29 August, about 21 h before genesis.

A verification of NHC official track forecasts for Lidia is given in Table 4a. Official forecast track errors were lower than the mean official errors for the previous 5-yr period, except at 72 h. A homogeneous comparison of the official track errors with selected guidance models is given in Table 4b. The HFIP corrected consensus (HCCA) model in general performed better than most of the models and better than the official forecast during Lidia.

A verification of NHC official intensity forecasts for Lidia is given in Table 5a. Official forecast intensity errors were much lower than the mean official errors for the previous 5-yr period. A homogeneous comparison of the official intensity errors with selected guidance models is given in Table 5b. With few exceptions, the official forecast outperformed all the intensity guidance.

Watches and warnings associated with Lidia are given in Table 6.



Table 1. Best track for Tropical Storm Lidia, 30 August - 3 September 2017.

Date/Time (UTC)	Latitude (°N)	Longitude (°W)	Pressure (mb)	Wind Speed (kt)	Stage
29 / 1800	17.0	107.0	1006	25	disturbance
30 / 0000	17.5	107.7	1006	25	"
30 / 0600	18.2	108.2	1005	25	"
30 / 1200	19.0	108.5	1003	30	"
30 / 1800	19.8	108.7	1001	35	tropical storm
31 / 0000	20.4	109.0	998	35	"
31 / 0600	21.0	109.3	996	40	"
31 / 1200	21.8	109.6	994	45	"
31 / 1800	22.4	110.0	991	55	"
01 / 0000	22.9	110.3	986	55	"
01 / 0600	23.4	110.7	987	55	"
01 / 1200	24.0	110.9	990	50	"
01 / 1800	25.1	111.6	991	50	"
02 / 0000	26.0	112.4	993	45	"
02 / 0600	26.8	113.2	995	40	"
02 / 1200	27.6	113.9	997	35	"
02 / 1800	28.3	114.7	1000	35	"
03 / 0000	28.9	115.4	1002	30	tropical depression
03 / 0600	29.3	115.9	1003	30	low



Date/Time (UTC)	Latitude (°N)	Longitude (°W)	Pressure (mb)	Wind Speed (kt)	Stage
03 / 1200	29.9	116.9	1003	30	"
03 / 1800					dissipated
01 / 1200	24.0	110.9	990	50	landfall near Punta Marquez
02 / 0600	26.8	113.2	995	40	landfall near Punta Abreojos
31 / 1800	22.4	110.0	991	55	maximum winds
01 / 0000	22.9	110.3	986	55	minimum pressure

Table 2. Selected surface observations for Tropical Storm Lidia, 30 August - 3 September 2017

Location	Minimum Sea Level Pressure		Maximum Surface Wind Speed		
	Date/time (UTC)	Press. (mb)	Date/time (UTC) ^a	Sustained (kt)	Gust (kt)
Baja California Sur					
Cabo San Lucas (CSLB7) 224 meters (735 feet)			31/1340	54	83
Cabo San Lucas (MMSL) 140 meters (459 feet)			31/1048	50	
Cayo Pulpo			1/0600	47	59
Puerto Cortes			1/1330	31	38
Loreto			1/2100*	46	
La Paz			1/0415		40
Santa Rosalia			2/0130		46
Sinaloa					
Los Mochis			1/1800*	39	
Tobolobambo			1/1900*		39
Sonora					
Guaymas			2/1015		35
Others					
Isla Cedros			2/2100		34
Bahia de los Angeles (BCN)			2/1500		41

^a Date/time is for sustained wind when both sustained and gust are listed.

* Observation estimated time.

Table 3. 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	114
Medium (40%-60%)	54	96
High (>60%)	42	84

Table 4a. NHC official (OFCL) and climatology-persistence skill baseline (OCD5) track forecast errors (n mi) for Tropical Storm Lidia. 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	72	96	120
OFCL	13.9	15.5	18.2	32.9	99.3		
OCD5	23.7	62.7	108.6	153.4	226.0		
Forecasts	12	10	8	6	2		
OFCL (2012-16)	22.2	33.9	43.8	54.8	80.0	108.9	145.1
OCD5 (2012-16)	35.7	72.0	112.2	150.2	217.0	271.0	340.2



Table 4b. Homogeneous comparison of selected track forecast guidance models (in n mi) for Tropical Storm Lidia. Errors smaller than the NHC official forecast are shown in boldface type.

Model ID	Forecast Period (h)						
	12	24	36	48	72	96	120
OFCL	13.9	15.5	18.2	32.9	99.3		
OCD5	23.7	62.7	108.6	153.4	226.0		
NVGI	20.6	21.5	25.3	38.3	99.5		
TABS	20.4	55.9	97.9	107.6	225.0		
TABM	29.1	70.3	97.8	93.5	181.5		
TABD	27.3	68.9	108.9	136.0	282.4		
TVCE	13.8	19.3	18.9	31.4	83.4		
TCON	17.1	24.8	24.5	34.0	53.7		
GFEX	15.5	24.9	30.1	57.3	156.3		
HCCA	13.1	14.4	16.8	39.0	84.8		
TVCX	13.9	16.2	19.7	37.8	93.5		
AEMI	17.0	31.4	36.1	47.5	116.9		
CMCI	18.4	32.9	39.6	42.9	94.0		
EMXI	17.2	21.4	39.5	78.5	139.2		
EGRI	22.9	40.9	38.2	43.9	82.8		
HWFI	22.7	48.8	66.8	82.4	66.3		
HMNI	19.8	34.1	40.9	49.3	149.5		
GFSI	25.2	50.4	62.6	94.1	207.3		
Forecasts	12	10	8	6	2	0	0

Table 5a. NHC official (OFCL) and climatology-persistence skill baseline (OCD5) intensity forecast errors (kt) for Tropical Storm Lidia. 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	72	96	120
OFCL	1.7	1.5	3.1	2.5	5.0		
OCD5	4.8	5.9	8.0	6.8	4.0		
Forecasts	12	10	8	6	2		
OFCL (2012-16)	5.8	9.4	11.8	13.2	15.0	15.7	14.9
OCD5 (2012-16)	7.6	12.2	15.7	18.1	20.6	21.8	20.0

Table 5b. Homogeneous comparison of selected intensity forecast guidance models (in kt) for Lidia. Errors smaller than the NHC official forecast are shown in boldface type.

Model ID	Forecast Period (h)						
	12	24	36	48	72	96	120
OFCL	1.7	1.5	3.1	2.5	5.0		
OCD5	4.8	5.9	8.0	6.8	4.0		
HWFI	3.3	5.8	4.9	4.3	15.5		
IVCN	2.8	3.9	4.0	2.2	8.5		
HCCA	2.6	2.6	3.0	3.8	11.0		
DSHP	3.7	3.2	3.8	4.8	0.5		
LGEM	3.4	4.9	6.8	7.0	1.5		
GFSI	4.2	5.3	5.5	6.7	10.0		
EMXI	5.8	8.7	9.6	9.7	6.0		
ICON	2.9	3.9	4.9	3.7	5.0		
HMNI	4.4	4.9	6.1	4.3	9.0		
EGRI	7.5	13.5	12.3	10.8	1.0		
Forecasts	12	10	8	6	2	0	0

Table 6. Watch and warning summary for Tropical Storm Lidia, 30 August to 3 September 2017.

Date/Time (UTC)	Action	Location
29 / 2100	Tropical Storm Warning issued	Todos Santos to Los Barriles
29 / 2100	Hurricane Watch issued	Todos Santos to Los Barriles
30 / 0300	Hurricane Watch changed to Tropical Storm Warning	Todos Santos to Los Barriles
30 / 0300	Tropical Storm Watch issued	Los Barriles to San Evaristo
30 / 0300	Hurricane Watch issued	Puerto Cortes to Los Barriles
30 / 1500	Tropical Storm Watch discontinued	Los Barriles to San Evaristo
30 / 1500	Tropical Storm Watch issued	La Paz to Loreto
30 / 1500	Tropical Storm Watch issued	Bahia Tempehuaya to Huatabampito
30 / 1500	Tropical Storm Warning discontinued	Todos Santos to Los Barriles
30 / 1500	Tropical Storm Warning issued	Santa Fe to La Paz
30 / 1500	Hurricane Watch modified to	Puerto Cortes to La Paz
30 / 2100	Tropical Storm Watch changed to Tropical Storm Warning	Bahia Tempehuaya to Huatabampito
30 / 2100	Tropical Storm Watch modified to	San Evaristo to Loreto
30 / 2100	Tropical Storm Watch issued	Puerto Cortes to Puerto San Andresito
30 / 2100	Tropical Storm Warning discontinued	Santa Fe to La Paz
30 / 2100	Tropical Storm Warning issued	Puerto Cortes to San Evaristo
31 / 0900	Tropical Storm Watch modified to	Loreto to Bahia San Juan Bautista
31 / 0900	Tropical Storm Watch modified to	Puerto San Andresito to Punta Abrejos
31 / 0900	Tropical Storm Watch issued	Guaymas to Bahia Kino
31 / 0900	Tropical Storm Warning discontinued	Puerto Cortes to San Evaristo
31 / 0900	Tropical Storm Warning modified to	Bahia Tempehuaya to Guaymas
31 / 0900	Tropical Storm Warning issued	Puerto San Andresito to Loreto



31 / 1500	Tropical Storm Watch modified to	Punta Abreojos to Punta Eugenia
31 / 1500	Tropical Storm Watch discontinued	Loreto to Bahia San Juan Bautista
31 / 1500	Tropical Storm Watch modified to	Bahia Kino to Puerto Libertad
31 / 1500	Tropical Storm Watch issued	Mulege to Bahia de Los Angeles
31 / 1500	Tropical Storm Warning discontinued	Puerto San Andresito to Loreto
31 / 1500	Tropical Storm Warning modified to	Bahia Tempehuaya to Bahia Kino
31 / 1500	Tropical Storm Warning issued	Punta Abreojos to Mulege
31 / 2100	Tropical Storm Watch modified to	Punta Eugenia to San Juan de Las Palomas
31 / 2100	Tropical Storm Watch discontinued	Mulege to Bahia de Los Angeles
31 / 2100	Tropical Storm Watch issued	Bahia San Juan Bautista to Isla San Luis
31 / 2100	Tropical Storm Warning discontinued	Punta Abreojos to Mulege
31 / 2100	Tropical Storm Warning issued	Punta Eugenia to Bahia San Juan Bautista
1 / 0900	Tropical Storm Watch discontinued	All
1 / 0900	Tropical Storm Warning discontinued	Punta Eugenia to Bahia San Juan Bautista
1 / 0900	Tropical Storm Warning discontinued	Bahia Tempehuaya to Bahia Kino
1 / 0900	Tropical Storm Warning issued	San Jose de Las Palomas to Isla San Luis
1 / 0900	Tropical Storm Warning issued	Altata to Puerto Libertad
1 / 0900	Hurricane Watch discontinued	All
1 / 2100	Tropical Storm Warning modified to	San Jose de Las Palomas to Todos Santos
2 / 0300	Tropical Storm Warning modified to	San Jose de Las Palomas to Puerto Cortes
2 / 0300	Tropical Storm Warning modified to	Isla San Luis to San Evaristo
2 / 0300	Tropical Storm Warning modified to	Huatabampito to Puerto Libertad



2 / 0900	Tropical Storm Warning modified to	Puerto San Andresito to San Jose de Las Palomas
2 / 0900	Tropical Storm Warning modified to	Loreto to Isla San Luis
2 / 0900	Tropical Storm Warning modified to	Guaymas to Puerto Libertad
2 / 1500	Tropical Storm Warning modified to	Punta Abreojos to San Jose de Las Palomas
2 / 1500	Tropical Storm Warning modified to	Mulege to Isla San Luis
2 / 2100	Tropical Storm Warning discontinued	Punta Abreojos to San Jose de Las Palomas
2 / 2100	Tropical Storm Warning modified to	Bahia San Juan Bautista to Isla San Luis
2 / 2100	Tropical Storm Warning discontinued	Guaymas to Puerto Libertad
3 / 0300	Tropical Storm Warning discontinued	All

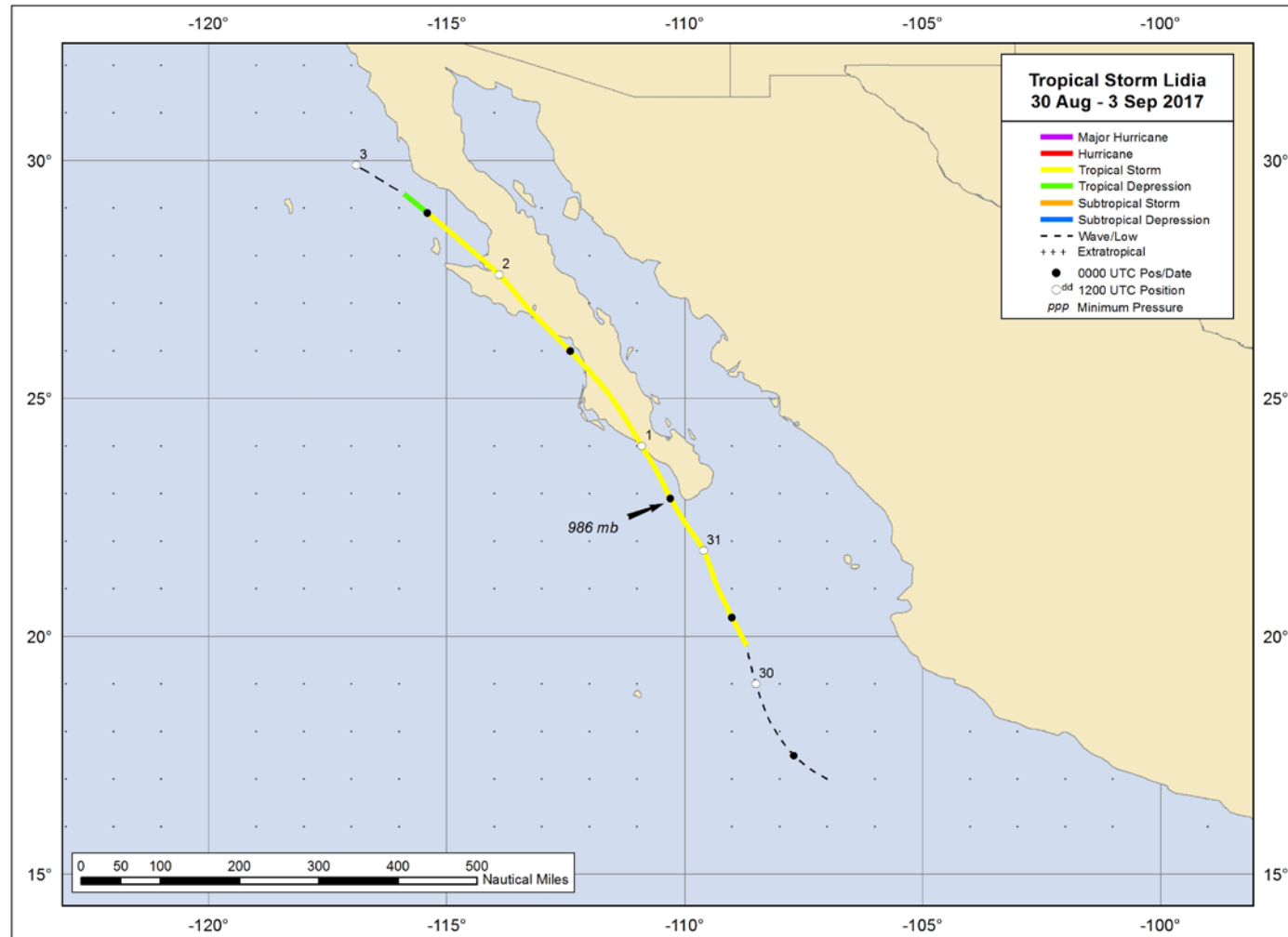


Figure 1. Best track positions for Tropical Storm Lidia, 30 August–3 September 2017.

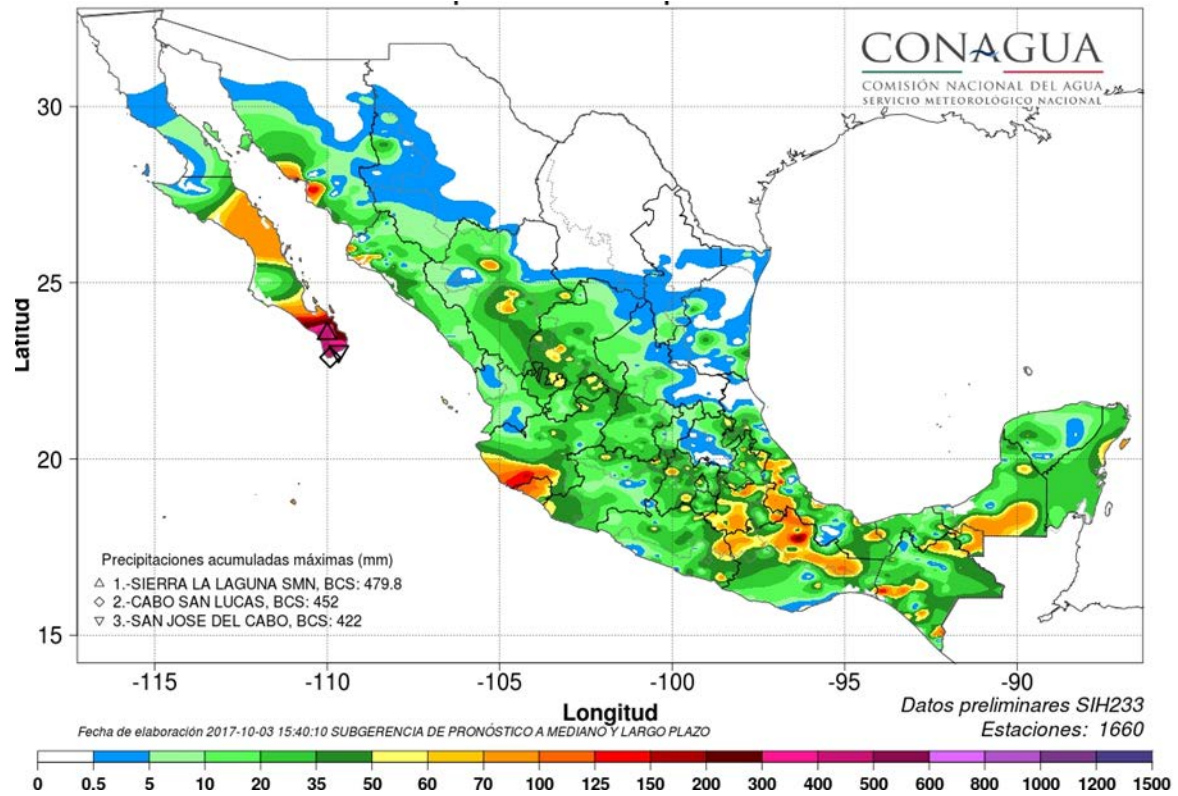


Figure 4. Observed rainfall (mm) in Mexico from 30 August–2 September 2017 associated with Tropical Storm Lidia. Image courtesy of the National Meteorological Service of Mexico (SMN).



Figure 5. Residents remove debris in the aftermath of Tropical Storm Lidia in Los Cabos, Mexico (Image courtesy of Reuters).