

T/C

No. Date & Name

Details

San Juan observations on Aug. 31st:  
12 Noon bar. falling, winds variable but mostly south-easterly 25 mph. Our last storm during the Spanish regime. (1), (3).

59 1899  
Aug. 8-9  
San Ciriaco  
H

Severe hurricane, destructive in Puerto Rico, with the greatest death toll of record in Puerto Rico: 3,369 deaths. \$20 millions damages. First tropical cyclone for which hurricane warnings were issued by the U. S. Weather Bureau (now National Weather Service) for Puerto Rico and the Lesser Antilles. This hurricane has record of greatest amount of rainfall in a 24-hour period, 23.00 inches recorded at Adjuntas on August 8, 1899. Trajectory of Hurricane San Ciriaco: It formed southwest of Cape Verde Islands on Aug. 2nd, near 11N 30W and moved northwestward across the Atlantic. Entered Guadeloupe on Aug. 7th, afternoon (great destruction), and passed some 50 to 75 miles south of St. Kitts (barometer 29.26 at 5:00 p.m., wind gusts of 120 mph), then turned northnorthwest towards Puerto Rico. Crossed Puerto Rico on Aug. 8th, northeast and north coasts of Santo Domingo on Aug. 9th, eastern part of Cuba on the 10th, moving slowly through the Bahamas Aug. 12th, close to Eastern Florida coast on the 13th, near Cape Hatteras on the 17th, east coast of the United States on the 18th, recurved to the Atlantic waters on the 19th and 20th, and dissipated. There is a discrepancy in this respect, as other sources maintain "San Ciriaco" crossed the Atlantic towards Europe and was near the Azores on Sept. 2nd, and dissipated near the Mediterranean Sea about Sept. 10th. "San Ciriaco" crossed Puerto Rico from southeast to northwest, from Arroyo (8:00 a.m. barometer 27.75 inches, winds over 100 mph) to Aguadilla (2:00 p.m.). The vortex remained over the island for 6 hours, and moved at 13 mph; the diameter of hurricane winds was 80 to 85 miles, and the rainfall area 385 miles. At Arroyo, point of entrance, the hurricane began to be felt at 5:30 a.m. of Aug. 8th, barometer 27.75, north wind 100 mph; central calm from 8:30 to 8:45 a.m. The wind then shifted south, with greater violence. Storm surge (tide) at Humacao destroyed all housing at the port. The center passed between Ponce and Juana Díaz (bar. 28.11, at 9:15 a.m.; 24-hour rainfall 11.20 inches). At Aguadilla, point of exit, hurricane conditions began at 8:00 a.m. on Aug. 8th, then central calm observed between 1:00 to 2:00 p.m., south winds until 7:00 p.m., then conditions began to improve. San Juan observations, on north edge of the hurricane:

Aug. 3-4: wind calm, up to 4 mph.

Aug. 7, 6:30 a.m. bar. 29.86, wind calm

1:00 p.m. bar. 29.83, wind northeast 12 mph, hazy.

5:25 p.m. Rain began, bar. falling.

10:00 p.m. Gusty variable winds.

T/C

No. Date & Name

Details

Aug. 8, 5:00 a.m., 40 mph winds began; hurricane conditions

8:30 a.m., Bar. 29.23, winds 75 mph; bar. oscillated, then began to rise.

10:00 a.m. 40 mph winds that began at 5:00 a.m. ceased at 10:00 a.m.

12 Noon Bar. 29.55, heavy rain continued until night.

24-hour rainfall, 6.37 inches, of which 4.18 fell that afternoon. San Juan lowest bar. 29.17.

Mayaguez observations:

Aug. 6, afternoon, north winds, hot

Aug. 7, north winds continued all day.

7 p.m. Bar. 29.74, showers from northeast, warm, heavy seas.

Aug. 8, 4 a.m. Bar. 29.69, strong north wind, temp. 79°F, relative humidity 60%, very rough and noisy seas.

8 a.m. Bar. 29.65, north wind est. 28-38 mph

9 a.m. Bar. 29.53, wind north 38-58 mph (est.); storm conditions

9:20 a.m. Bar. 29.53, wind northeast 45-67 mph (est.)

11:33 a.m. Bar. 29.17

1:06 p.m. Bar. 28.86 (lowest), wind northeast 112 mph (est.)

1:40 p.m. Bar. 28.94

5:40 p.m. Bar. 29.68, intensity diminishing.

7:15 p.m. Bar. 29.80

At Mayaguez the initial north winds shifted to northeast, south, and then northwest. Rainfall 8.40 inches.

Worst hit towns were Ponce (500 deaths) and Utuado; also Patillas, Maunabo and Yabucoa, where scarcely a couple of houses remained standing. Least affected town was Trujillo Alto. "San Ciriaco" caused minor damages at San Juan. Deaths were mostly due to drowning. Heavy rainfall of 23.00 inches at the Cordillera Central, which accounted for the floods of enormous proportions. The Arecibo River flood reached such magnitude that old people had no recollection of anything to equal it, and drowned 500 to 1,000 residents. As it continued raining after the hurricane, the second flood was worst than the first. Residents near the river beds, been evacuated by the local authorities, returned to their homes after the winds ceased, but efforts for their return back to the shelters were unheeded, and it is reported that a great proportion of the drowned was due to their stubbornness. This sad episode occurred at Ponce and repeated itself again at Humacao during Hurricane Donna of 1960. Total loss of the coffee crop, tremendous damages to agriculture and cattle, especially the banana crop. Total damages were estimated at \$35.8 million dollars. Two earthquakes were felt from 11:00 a.m. to noon. (1), (3), (4), (5).

T/C No.	Date & Name	Details
60	1901 July 7 San Cirilo H	<p>Appeared July 5 east of Barbados, 13N 59W, moving northwestward and passed between St. Lucia and Martinique, and over St. Kitts on July 6th, then moved westward and passed south of Puerto Rico the night of July 6 and close or over Cabo Rojo, Puerto Rico on July 7th. Then moved northwestward over Mona Passage into the Atlantic and reached the U. S. mainland (South Carolina) on the 11th, in what has been described as a rate track. Hurricane was felt mostly in southwestern Puerto Rico. Floods were reported in the Rio Grande de Loiza and Caguas rivers. San Juan recorded 1.33 inches of rain on July 7th, and 4.05 inches from 8:00 p.m. July 6 to 8:00 p.m. July 7th. Maximum wind northeast at 52 mph 2-3 p.m., bar. 29.52; other rainfall readings July 6-7: Canóvanas 6.27 inches; Fajardo 7.88; Humacao 6.50; Hacienda La Perla 17.22. (1), (4), (5).</p>
61	1901 Sept. 11-2 San Vicente T/S	<p>Second storm of the year. Storm of small diameter and intensity. Appeared on Sept. 8 near 17N 49W, moving westward and passed south of Barbuda and near St. Kitts on the 11th, over St. Thomas, and over north coast of Puerto Rico the night of Sept 11-12; crossed Hispaniola east-west Sept. 12-13th, south of Cuba Sept. 13-14th, near Havana on 15th, entered the Gulf of Mexico on Sept. 15, 16, and 17th, and the U. S. mainland near Pensacola on the 17th, moved northeastward towards the Carolinas into the Atlantic, and dissipated. San Vicente crossed the island along the north coast causing minor damages, but mostly to the citrus crop. No deaths in Puerto Rico. San Juan received southeast winds at 52 mph for about 45 minutes. Rainfall Sept. 12-13: San Juan 2.47 inches; Fajardo 6.89; Morovis 9.45; Mayaguez 6.24; San Salvador 10.43; Adjuntas 10.00</p> <p>San Juan observations:</p> <p>Sept. 11, 2:00 p.m. Bar. 29.39, wind north 16 mph 7:53 p.m. rain began; rainfall 0.56</p> <p>Sept. 12, 3:46 a.m. Bar. 29.89, wind southeast 40 mph 9:45 a.m. Rain ceased. Lowest bar. 29.49; maximum winds southeast 52 mph. (1), (3), (5).</p>
62	1910 Sept. 6-7 San Zacarías H	<p>Appeared on Sept. 5 near 17.5N 59W, moving westward, reached the vicinity of Antigua that afternoon, and passed 20 miles south of Ponce, Puerto Rico the night of September 6-7; touched the southern tip of Barahona, Dominican Republic, on the 7th; close to the south coast of Haiti on the 8th; close to north coast of Jamaica on the 9th; south of Cuba on the 9-10th; was on the Gulf of Mexico on Sept. 11-14; entered the southern Texas coast on the 14th; dissipated in the Mexican border. No reports of damages to the south coast of Puerto Rico during the passage of San Zacarías are available; however, a squall or possibly a rain band from the hurricane affected that night northeastern Puerto Rico and the</p>



T/C  
No.      Date & Name

Details

Caguas-San Juan area (winds at San Juan northeast 72 mph, bar. 29.76, copious rains of 10-18 inches, great floods in E Puerto Rico, and great damages at San Juan). This was a limited condition as other parts of the island had normal weather, but gave the impression that there were two tropical cyclones instead of one. As no warnings were issued, this was the subject of adverse and bitter criticism against the Weather Bureau. Greatest 2-day rainfall readings: Naguabo 19.11 inches; Humacao 15.62; Rio Blanco 14.83; San Juan 6.55; Central Ingenio 10.54; Caguas 6.50; Canóvanas 8.45; Cidra 9.40

Thunder and lightning reported in most Puerto Rico that night. San Juan observations:

Sept. 6, early morning, clear skies.

10:00 a.m. Overcast

4:00 p.m. Wind northeast 44 mph

6:00 p.m. Bar. 29.93, wind northeast 42 mph, heavy rain

7:20 p.m. Bar. 29.76 (min), maximum winds occurred between 7:00-8:00 p.m. and secondary max between midnight and 2:00 a.m.

8:00 p.m. Bar. 29.92, wind northeast 72 mph, rain

8:30 p.m. Wind veered to east

10:30 p.m. Bar. 29.98 (entire period of fall and rise of barometer was 2 1/2 hours).

Sept. 7, 1:00-2:00 a.m. wind southeast 50 mph, no marked bar. variation. (1) (3) (4) (5)

63      1915  
Aug. 11  
San Tiburcio  
H

Hurricane of great size and intensity. Formed Aug. 2 on the Cape Verde Islands, moved due west across the Atlantic, arrived between Guadeloupe and Dominica Aug. 10th as a full-fledged hurricane. On a west track and forward speed of 18 to 20 mph passed close to St. Croix during the night, and about 20 miles south of Ponce, Puerto Rico on the 11th; close to the south coast of Hispaniola on 12th; very close to the north coast of Jamaica on 13th; south of Cuba 13-14th; crossed southwest tip of Cuba on 14th (sunk SS Maurowinje, 93 drowned); crossed the Gulf of Mexico 15-17th; reach the Texas coast on the 17th (275 deaths, \$50 millions damages); crossed the U. S. to the Great Lakes area and dissipated in Canada on the 22nd. The hurricane passed east-west over the Caribbean to the south of Puerto Rico, causing mountainous seas along the south coast. Damages were mostly to coffee and banana crops. 2 deaths (drowned at sea) at Cabo Rojo. San Juan lowest barometer 29.77 at 8:50 a.m., wind east at 62 mph, but winds were higher on the south coast and the Central Cordillera. San Juan observations: winds began to increase at noon of 10th (19 mph); reached northeast 30 mph by midnight, gusts of northeast 40 mph at 1:00 a.m. of Aug. 11th; northeast 60 mph at 3:00 a.m.;

T/C

No. Date & Name

Details

northeast 60 mph at 8:00 a.m.; southeast 19 mph at 2:00-3:00 p.m. (1), (3), (4).

64 1916  
Aug. 22  
San Hipólito  
H

Storm of small diameter. Formed east of the Leewards, near 18N 60W, passed near St. Martin on 21st and on a west to westnorthwest trajectory crossed the north coast of Puerto Rico, then off the north coasts of Santo Domingo on the 22-23rd and of Cuba on the 24th, dissipated close to the east coast of Florida on the 25th. The vortex entered near Naguabo and left near Aguada. The area Humacao-Aguadilla received hurricane force winds, and the north and east coasts suffered damages, and shipping at San Juan harbor. Destructive winds extended over an area 50 miles wide. No warnings were issued due to World War I censorship, for which the Weather Bureau was adversely criticized. 1 death, \$1 million damages. Copious rains began at Fajardo at 3:00 a.m. and the peak of the storm was at 5:00 a.m. San Juan observations: Aug. 21, 10:00 a.m. winds northeast 18 mph, continued northeast that day.  
Aug. 22, 4:00 a.m. winds northeast 37 mph  
6:40 a.m. winds northeast 92 mph, bar. 29.52 (lowest), winds then shifted south-east.

6:00-7:00 a.m. The peak of the storm with 90 mph winds

Rainfall readings Aug. 22: Cayey 9.00 inches; Coamo 5.10; El Verde 5.84; Aibonito 8.10; San Juan 1.91; Jayuya 7.10; Carite 6.97. (1), (3), (4), (5).

65 1921  
Sept. 9-10  
San Pedro  
H

Was of tropical storm intensity in Puerto Rico. Appeared east of Trinidad on Sept. 8th near 10N 55W (Tobago rainfall 12.02 inches, Grenada bar. 29.40); entered St. Lucia on the 8th, moved slowly northwestward at 12.5 mph to the south of Puerto Rico (bar. 29.40 at 9:00 p.m.). (SS Farrallon near Mona Island, bar. 29.35). The hurricane then moved north crossing south-north over eastern half of Santo Domingo on 10-11th (Central Italia, 10.00 inches of rain), and continued moving north over the Atlantic, and dissipated on the 18th. San Pedro passed near Cabo Rojo near midnight Sept. 9th (Cabo Rojo bar. 29.68, winds about 60 mph; Ponce bar. 29.70), caused heavy surf along the south and west coasts, and general rains in Puerto Rico. 1 death. San Juan observations: Sept. 8th, midnight winds southwest 5 mph  
Sept. 9th, 11:00 a.m. winds north 7 mph  
12:00 noon winds northeast 9 mph  
3:00 p.m. winds southeast 30 mph  
Rainfall, 0.89 inch, smooth sea all day, bar. 29.90  
Sept. 10th, midnight, winds south 3 mph  
2:00 a.m. winds began to increase  
8:52 a.m. winds south 44 mph (highest)  
9:00 a.m. winds southeast 19 mph; continued southeast that day; bar. 29.82  
rainfall 0.98 inch.

T/C

No.

Date & Name

Details

Rainfall readings Sept. 9-10th:

Cabo Rojo 16.10 inches; Mayaguez 9.95; San Juan 1.87;  
San Germán 9.03; Toro Negro 7.25. (1), (3), (4), (5).

66

1926

July 23-24

San Liborio

H

Hurricane of great diameter and moderate intensity. The entire island experienced high winds and damages were general. Was discovered July 22nd near 14.5N 58.7W, and passed between St. Lucia and Martinique (hurricane tide) beginning at sunset. Entered the Caribbean on the 23rd moving northwestward, passed south of St. Croix and east-west along or near the south coast of Puerto Rico and over Cabo Rojo, beginning at sunset July 23rd and continuing through the night until the early morning hours of the 24th. Then entered Mona Passage and crossed over Cabo Engaño, D. R., on 24th, the Bahamas on 25-26th, east of Florida on 27-28th, entered the U. S. mainland near Jacksonville on the 28th, through various states and disintegrated near the Lake Ontario area on Aug. 2nd. San Liborio battered southern Puerto Rico with hurricane force winds. Floods of the Arecibo, Guacio, Loíza, Bayamón, La Plata, Yauco, Poñuelas, Manatí, and all rivers in southern Puerto Rico. \$5 million damages. 25 deaths. San Juan observations:

July 22nd: winds east 17 to 22 mph, rainfall 0.08

23rd: 12:43 a.m. winds northeast 30

10:39 a.m. winds east 46 mph

12:12 p.m. winds east 54 mph

6:00 p.m. winds east 66 mph

9:11 p.m. winds decreased to east 29 mph;  
lowest bar. 29.62, max wind  
east 66 mph, rainfall 3.66 inches.

24th: 12:33 a.m. wind gusts east 30 mph

3:38 a.m. wind southeast 30, continued  
southeast, decreasing; max wind  
southeast 30 mph; rainfall 2.16  
inches.

Other rainfall amounts July 23-24th:

Canóvanas 9.68 inches; Naguabo 9.69; Peñuelas 9.00;  
Orocovis 9.90; Cidra 10.47; Lares 11.90; Maricao 13.00;  
Río Grande 14.41. (1), (3), (4), (5).

67

1928

Sept. 13

San Felipe

H

Severe hurricane. Up to this time the greatest and more intense and destructive hurricane of record in Puerto Rico. The lowest barometer (27.50 inches) and highest wind velocity (measured 160 mph, estimated 200 mph), and greatest 48-hour rainfall amount (29.60 inches) of record in Puerto Rico. Hurricane warnings were first radiobroadcast in Puerto Rico during San Felipe. This major hurricane of great size and intensity formed southeast of Cape Verde Islands near 14N 21W, on Sept. 6. Crossed the Atlantic and arrived at Guadeloupe on Sept. 12 (vortex passed over Pointe-a-Pitre at noon, bar. 27.76 inches), moved to St. Kitts on a westnorthwest



T/C  
No.

Date & Name

Details

track (great destruction at St. Kitts and Montserrat), and passed 10 miles south of St. Croix where SS Matura barometer reading of 27.50 was recorded at 11:00 a.m.; 48-hour rainfall at Bonne Esperance, St. Croix, 17.68 inches; St. Thomas wind 90 mph. Much destruction at the Virgin Islands. San Felipe was then a hurricane of tremendous force. The hurricane crossed Puerto Rico southeast-northwest on the 13th, Cabo Engaño, D. R. on the 14th, the Bahamas 15-16th (Nassau bar. 28.08); over southern Florida on the 16th (Lake Okocchobee Hurricane, and Palm Beach famous lowest barometer reading of record in the U. S. of 27.43 inches); crossed eastern U. S. on Sept. 17-19th (1836 deaths), and dissipated over Lake Ontario on Sept. 20th. In Puerto Rico, the eye (15-20 miles diameter) remained 8 hours over the island, and moved westnorthwestward at 10 mph. The eye entered the Guayama-Arroyo area at 2:30 p.m. and left Aguadilla at 10 p.m. Lowest barometer at Guayama 27.50 inches at 2:30 p.m., while San Juan, 30 miles distant, at the same time recorded 28.74 inches, winds 160 mph when the anemometer failed at 11:44 a.m. Other barometer readings:

- 1:50 p.m. Humacao 28.04 inches
- 3:30 p.m. Arecibo 28.75 "
- 4:00 p.m. Barranquitas 27.10 inches
- 4:30 p.m. Ponce 28.27 inches
- 6:00 p.m. Lares 28.10 "
- 8:00 p.m. Cabo Rojo 28.46 inches
- 8:00 p.m. Mayaguez 28.60 "
- 9:00 p.m. Isabela 27.80 "

Hurricane winds were felt at Guayama for 18 hours (from 4:00 a.m. to 10:00 p.m.), and at San Juan for 12 hours (from 4:00 a.m. to 4:00 p.m.). The central calm passed over Aibonito, Cayey, Adjuntas. Rainfall ranged from 10 inches in the coastal areas to 15-20 inches in the Adjuntas-Utuado and El Tongo sections. Greatest 48-hour rainfall, 29.60 inches, recorded at Adjuntas. Damages were enormous, with total loss of coffee, citrus, and banana crops, 1/3 of cane crop. Damages to agriculture, housing, communications, public works, were estimated from \$50 to 85 millions. 312 deaths in Puerto Rico. San Juan observations:

Sept. 12, midnight winds east 19 mph  
 2:37 p.m. gusts east 36 mph  
 6:15 p.m. gusts east 27 mph  
 7:20 p.m. wind northeast 46 mph  
 11:00 p.m. winds northeast 11 mph  
 Rainfall 0.26 inch, lowest bar. 29.91

Sept. 13, 12:52 a.m. winds northeast 30 mph  
 2:28 a.m. wind northeast 40 mph  
 3:45 a.m. wind east 52 mph  
 7:30 a.m. wind east 64 mph  
 10:08 a.m. wind east 72 mph  
 11:42 a.m. wind northeast 150 mph

T/C

No. Date & Name Details

12:00 noon to 2:00 p.m. winds northeast  
160-165 mph est.; extreme 180 mph  
(anemometer failed). Height of  
the storm at San Juan 11:30 a.m. to  
3:30 p.m.; lowest bar. 28.74

3:00 p.m. wind east 75 mph.

6:00-7:00 p.m. wind southeast 30 mph

San Juan rainfall, 9.37 inches, but gage  
overturned. It rained for 40 hours at San  
Juan. The amount recorded is believed to  
be about one-half of actual rainfall.

Sept. 14,

winds southeast diminishing all day long  
rainfall 1.98, bar. 29.71

Rainfall Sept. 13-14: Fajardo 12.26 inches;  
Caguas 18.00; Cidra 14.69; Lares 14.00; Rio  
Grande 24.50. (1), (3), (4), (5).

68 1931  
Sept. 10-11  
San Nicolás  
H

Hurricane of small diameter. Appeared east of northern  
Leeward Islands on Sept. 9th, near 17N 57W, moving west-  
ward. Passed in the afternoon of Sept. 10 to the north  
of St. Martin (bar. 29.72), no high winds) and closer to  
north coast of St. Thomas near sunset (bar. 29.52, wind  
60 mph), then raked the north coast of Puerto Rico the  
night of Sept. 10th (San Juan barometer 29.17, wind north-  
west 90 mph) and continued its west course crossing  
Hispaniola on the 11th, Jamaica on the 12th, Yucatán  
Peninsula on the 14-15th, Veracruz on the 16th (bar.  
29.43, wind 95 mph), and dissipated over Mexico on the  
16th. The hurricane entered north of Fajardo at 8:00 p.m.,  
San Juan at 10:00 p.m., remained over the island that  
night for 6 hours, moved west at 17 mph, and left Agua-  
dilla at 2:00 a.m. of Sept. 11th. Destruction extended  
over an area 10 to 12 miles wide, and damages were  
mostly to crops, estimated at \$200,000. 2 deaths. The  
vortex of San Nicolás was over San Juan for 15 minutes,  
from 9:55 p.m. to 10:10 p.m., lowest bar. 29.17, preceded  
by northwest winds 90 mph, followed by squally violent  
winds from southwest 80 mph, then from the southeast.  
Duration of hurricane over San Juan, 2 hours, rainfall  
1.85 inches. San Juan observations:

Sept. 9th winds east 16 mph at midnight changed to  
northeast 15 mph at 2:00 a.m.

Sept. 10th winds northeast shifted to north 15 mph at  
noon; rain

8:45 p.m. winds north 50 mph, bar. 29.73,  
defective anemometer spring

9:47 p.m. winds northwest 90 mph est.; bar.  
29.25 lowest at 10:00 p.m.

10:11 p.m. winds southwest 80 mph est.

11:02 p.m. winds southeast 26 mph; bar. 29.76;  
rainfall 1.85 inches.

11:00 p.m. to 1:00 a.m. winds southeast 14 mph,  
decreasing; bar. 29.80

Greatest rainfall amounts: Maricao 5.85 inches; Orocovis  
4.50; Aguas Buenas 5.25. (1), (3), (4), (5).



T/C

No. Date & Name

Details

69 1932  
Sept. 26-27  
San Ciprián  
H

Slow moving hurricane. Appeared east of the Leeward Islands near 17.5N 62.5W moving northwestward as a full-fledged hurricane. Swept Antigua at 3:00 a.m. on the 26th. Passed at 8:00 a.m. between St. Martin, St. Kitts, and St. Bartholomew (bar. 29.65, winds 60-90 mph est.), then moved westnorthwestward at 10 mph. Crossed the Caribbean between St. Thomas (bar. 28.58) and St. Croix (bar. 29.54) during the day with winds of 80 mph at both islands. Crossed Puerto Rico east-west from Ceiba 10:00 p.m. to Aguadilla-Mayaguez area 5:00 a.m. of 27th; then followed a west course barely touching the south coast of Santo Domingo on the 27th (San Pedro de Macoris winds 90 mph; Santo Domingo City 50 mph); Haiti on 28th, intensity diminished; Jamaica on the 29th; crossed Yucatán Oct. 1-2, and dissipated at the mountains of Mexico on Oct. 3. The vortex passed between Río Piedras and San Juan (over Hato Rey) at 1:00 a.m. of the 27th (San Juan barometer 28.95, wind northeast 120 mph est., anemometer collapsed at 12:08 a.m. after recording northeast 66 mph winds). Two ships at Ensenada Honda (Ceiba) reported readings of 27.70 and 28.00 inches. Damages were mostly to agriculture, especially to the citrus, coffee and minor crops. Damages to housing and public works. Total damages estimated at \$30 millions. 225 deaths in Puerto Rico, but historian Miller claims number of deaths reached 257. The vortex remained 7 hours over the island, moved at 15 mph. San Ciprián affected 46 municipalities.

San Juan observations:

Sept. 25, winds light and variable mostly southwest in morning hours.

4:00 p.m. winds changed to west 2 mph.

Sept. 26, 3:00 a.m. winds southwest 4 mph

4:00 a.m. winds northeast 11 mph until noon.

2:00-4:00 p.m. winds west 7-10 mph

5:00 p.m. winds north 16 mph, increasing

10:55 p.m. winds north 45 mph

11:55 p.m. winds northeast 66 mph; bar. 29.74, rainfall 1.12 inches

Sept. 27, 12:55 a.m. winds northeast 120 mph

1:00 a.m. winds east 118 mph, lowest bar. 28.95

2:00 a.m. winds east 69 mph

3:00 a.m. winds southeast 42 mph

5:00 a.m. winds became east 22 mph decreasing and continued east until 7:00 p.m.

8:00 p.m. winds southeast 5-7 mph.

Lowest bar. at San Juan 29.87 inches. Greatest rainfall, 16.60 inches at Maricao. Other rainfall amounts: San Lorenzo 11.25 inches and Orocovis 10.28 inches. (1), (3), (4), (5).

70 1943  
Oct. 14  
San Calixto  
H

Hurricane of small size and intensity. First tropical cyclone covered by aircraft reconnaissance from the San Juan Hurricane Forecast area. The hurricane formed near Barbados on Oct. 11th, passed south of St. Lucia, and

T/C No.	Date & Name	Details
		<p>moved slowly westward through the Central Caribbean Sea on Oct. 11-13th, remaining stationary for 12 hours on the 13th some 300 miles south of Puerto Rico. Then recurved to a true north direction, passed on the night of the 14th through Mona Passage 70 miles west of Mayaguez. The hurricane passed near Cabo Engaño, Dominican Republic, continued its northward movement reaching the New Brunswick-St. Lawrence Bay area on the 17th, and dissipated. Western Puerto Rico recorded 60 mph winds, high seas, and flooding the night of Oct. 14th. Houses were unroofed at Cabo Rojo, Mayaguez, Aguadilla. Heavy rains after the passage of hurricane produced floods at Salina, Ponce, Caguas, Bayamón. The coffee crop in central and western parts of Puerto Rico, that was ready for harvest, suffered great losses. No deaths in Puerto Rico, and no damages in eastern Puerto Rico. San Juan observations:</p> <p>Oct. 13th, 8:00 p.m. Bar. 29.75; wind southeast 8 mph Midnight Winds east 5 mph</p> <p>Oct. 14th, 8:00 a.m. Bar. 29.68; wind east 20 mph 8:00 p.m. Bar. 29.59; wind south 14 mph</p> <p>Lowest bar. 29.59; maximum wind southeast 26 mph at 9:20 a.m.; rainfall 3.69 inches. Rainfall readings Oct. 14-15: Yauco, 7.20 inches; Coamo, 9.78; Aguirre, 10.53; Cidra, 11.16; Adjuntas, 11.27; Guayabal, 15.43; Toro Negro, 17.60. (1) (4) (5).</p> <p>Formed the night of Sept. 20 from an easterly wave in the Caribbean some 150-200 miles southsoutheast of St. Croix. Passed a short distance south of St. Croix on the 21st, moved westnorthwest at 12 mph and passed 50 miles off the south coast of Puerto Rico from 4:00 p.m. to 10:00 p.m. on Sept. 21st, much closer to Cabo Rojo, and dissipated in the mountains of central Dominican Republic on the 22nd. St. Croix experienced hurricane force winds and great damages. Highest winds in southern and southwestern Puerto Rico, and Ramey AFB recorded winds east 64 mph. San Juan recorded winds east at 38 mph at 10:00 p.m.; lowest bar. 29.83 inches at 4:30 p.m. Most rivers were in flood, including the rivers of northern Puerto Rico. Damages were reported in Yabucoa, Santa Isabel, Ponce, Guayanilla, Cabo Rojo, Mayaguez, Cidra, Jayuya, and Toa Alta. Ponce experienced high gusts. Damages were minor. San Juan rainfall, 1.41 inches; max wind east 41 mph. 48 hour rainfall, Sept. 21-22: Yauco 8.70 inches; Coamo 7.55 inches; Santa Rita 9.07; Carite 9.81; San Lorenzo 13.56. (1), (3), (4).</p>
71	1949 Sept. 21 San Mateo H	
72	1956 Aug. 12 Santa Clara (Betsy)	<p>First hurricane for which hurricane warnings were given television, and first tropical cyclone observed by the San Juan weather radar. Originated from an easterly wave off the west coast of Africa on Aug. 4th, and moved westward between latitudes 11N and 13N with slow intensification. Developed into a tropical storm on Aug. 9th and reached hurricane force on Aug. 10th. Crossed over</p>

T/C

No.

Date & Name

Details

Marie Galante and Guadeloupe at 2:00 to 4:00 p.m. on Aug. 11th (16 deaths, \$10 million damages). Dominica, bar. 29.82; wind westnorthwest at 69 mph. Passed about 30 miles south of St. Croix 4:00 a.m. (bar. 29.61, winds eastsoutheast 86 mph, rainfall 3.00 inches). The center entered the southeast coast of Puerto Rico near Maunabo-Yabucoa area at 8:00 a.m., crossed the island southeast-northwest, reaching the Atlantic near Camuy at 11:00 a.m. The hurricane continued on a northwest track, reached Turks Island at 6:00 p.m., skirted the Bahamas on the 13-14th, recurved towards the North Atlantic waters where it dissipated. PUERTO RICO: The oscillating vortex, as observed by radar, was of 12-14 miles diameter, remained over the island for 3 hours, moved at 21 mph. Upon entering the island, the high mountains of southeastern Puerto Rico presented such a formidable barrier that made the vortex move southwestward on two occasions. The first time, the vortex moved from the Cuchilla de Pandora and Sierra Guardarraya to the port of Patillas, reaching the sea again. Another attempt to find a pathway through the Patillas Lake resulted in the second southwest movement towards Guayama, and the hurricane finally penetrated through the Carite Lake gorge and reached the top of the Cordillera Central near Cayey at 9:30 a.m. It took 1-1/2 hours to find an entrance through the mountains. This accounts for the severe destruction at Yabucoa. The path of greatest damage was from a line Humacao to Dorado, and from Salinas to Yabucoa. All towns within a 20 mile radius of the center were severely hit, but the southwest coastal area west of Ponce, protected by the Cordillera Central, did not experience hurricane winds. Extensive damages at Yabucoa, Humacao, Aibonito, Guaynabo, Ramey AFB. 16 deaths; 15,023 houses destroyed; \$40 millions damages. Observational data: Guayama: lowest barometer 28.78 inches; Rio Grande (El Verde): greatest 24-hour rainfall, 8.72 inches, followed by 8.55 inches at Matrullas. Ramey AFB: wind westsouthwest 115 mph, bar. 28.88 at 12:12 p.m., rainfall 4.60 inches. San Juan: wind eastnortheast 92 mph at 8:35 a.m., lowest bar. 29.56 inches at 9:12 a.m., rainfall 3.19 inches. St. Croix: lowest bar. 29.61; wind east 81 mph. St. Thomas: lowest bar. 29.76 at 5:00 a.m., wind northeast 58 mph at 4:00 a.m., rainfall 2.34 inches at the airport and 4.77 inches at Dorothea. Santa Clara or Betsy was the last hurricane to cross the island at the time of this writing. Rainfall readings on Aug. 12th: Adjuntas 6.00 inches; Caguas 7.66; Utuado 6.25; Josefa 6.90; Matrullas 8.55; Rio Blanco 7.65; Rio Grande 8.72; Toro Negro 8.10. (3), (4).



<u>T/C</u> <u>No.</u>	<u>Date &amp; Name</u>	<u>Details</u>
73	1960 Sept. 5-6 Donna H	<p>Originated near the Cape Verde Islands on Aug. 29th, and discovered on Sept. 2 near 14N 48W as a fully developed hurricane, with surface winds of 140 mph and central pressure of 28.73 inches. On a persistent westnorthwest track arrived at the Northern Leeward Islands the evening of Sept. 4. The eye passed over the islands of Barbuda, St. Barthelemy, St. Martin and Anguilla; continued moving westnorthwest and passed within 35 miles of St. Thomas on Sept. 5 (wind west-southwest at 46 mph at 1:25 a.m., northnorthwest 60 mph at 3:15 a.m.). Passed 70 miles northeast of Fajardo, Puerto Rico, moving northwest, and reached the Bahamas on Sept. 8-9, and entered Southwest Florida on Sept. 10; crossed the peninsula towards Jacksonville on Sept. 11, on and off the U. S. Atlantic coastline on Sept. 11-12, crossed Long Island and Connecticut on Sept. 12 and Northeast Canada provinces and dissipated in the North Atlantic waters on Sept. 13. At 8:00 p.m. Sept. 5, Donna was about 100 miles north of San Juan moving northwest about 17 mph. Hurricane Donna showed a double eye at 6:15 p.m. on Sept. 6. (Other cases of double eye are Typhoon Sarah of March 1956 in the Pacific, Hurricane Beulah of Sept. 9, 1967, and Hurricane Debbie on Aug. 20, 1969). A lightning display was noted some 40 to 50 miles to the south and southwest of San Juan. The heavy rains that resulted in floods were caused by two converging currents of moist air, one directly associated with the hurricane circulation (rain band). These heavy rains began over Eastern Puerto Rico about 9:00 p.m. and continued until 4:00 a.m. By 3:00 a.m. the Humacao River was on a rampage and severe floods in all streams of south and east coastal sections, especially the Río Grande de Loíza and its tributaries in the mountains. At Trujillo Alto the flood waters rose 42 feet and La Plata River 29 feet. Donna's storm clouds poured 17.76 inches of rain over the Sierra de Luquillo in 24 hours. There were 107 deaths caused by the floods, mostly at Humacao. The people were warned by the authorities to move from the river bed--the floods were coming--but they paid no attention to the warnings, and it is reported they stoned the Civil Defense workers who tried to move them out of danger. The effects of Donna in Puerto Rico were similar to San Gil of Sept. 1-2, 1888. Rainfall readings Sept. 6: Naguabo 14.60; Aibonito 10.68; Calero Camp 11.40; Carite Plant 13.97; Cayey 14.97; Gurabo 11.20; Río Blanco 13.64. (3), (4).</p>

SOME "NEAR-MISSES" IN THE 1961-1970 DECADE

1961 Oct. 2-3 Frances H	Formed east of the Leeward Islands on Sept. 30th and passed between Guadeloupe and Dominica on October 1st., then weakened. Passed over the Caribbean, about 40 miles southwest of Cabo Rojo on Oct. 2nd, moving north-
----------------------------------	---

Date & NameDetails

west. Frances crossed the eastern tip of the Dominican Republic on Oct. 3rd, moved north towards Nova Scotia, where it dissipated on Oct. 6th. Rain bands reached southern part of Puerto Rico, causing floods. This was principal effect of Hurricane Frances. The Rio Grande de Loiza reached flood stage on Oct. 2nd, and the rivers along the south coast, from Ponce westward, were in flood on Oct. 3rd. Highest recorded winds 35 mph. No deaths. (3), (4).

1963  
Sept. 26  
Edith  
H

Formed east of the Lesser Antilles on Sept. 23 and devastated Martinique on the night of Oct. 24-25 (10 deaths). Passed 30 miles southwest of Cabo Rojo and close to Mona Island; moved northwestward damaging shore installations along the south coast of Puerto Rico, bridges, roads, and agriculture in southwest areas where 4,000 acres of sugar cane were affected. Crossed the eastern part of the Dominican Republic south-north (winds at La Romana 63 mph), weakened, moved north, made a loop and a second and greater loop in the Atlantic; then moved north dissipating in the Canadian northeast provinces. (3), (4).

1964  
Aug. 23  
Cleo  
H

Formed east of the Leeward Islands on Aug. 21st, crossed over Guadeloupe on the 22nd, passed 100 miles south of Ponce, Puerto Rico, moving west, close to Barahona, Dominican Republic on the 24th (7 deaths), crossed the extreme southwest peninsula of Haiti, passed over Cuba on Aug. 25-26th, and along the east coast of Florida on Aug. 27-28th; left the U. S. mainland over Virginia on Sept. 1st. In Puerto Rico, Cleo caused heavy surf along the south coast. Maximum winds 52 mph at Point Tuna, Maunabo. (3), (4).

1966  
Aug. 26  
Faith  
H

Formed near Cape Verde Islands on Aug. 21; moved westward and passed close to the northernmost islands of the Lesser Antilles on the 26th; and 90 miles north of San Juan, Puerto Rico on the 26th moving westnorthwest, caused rough seas along the north coast of Puerto Rico; minor damages. Moved across the Atlantic, reaching northern Europe. Damages were minor. San Juan recorded gusts of 45 mph. (3), (4).

1966  
Sept. 28  
Inez  
H

Formed near 10N 35W on Sept. 21st; passed over Guadeloupe on the 27th; about 70 miles south of Ponce and Cabo Rojo on Sept. 28th moving west. While passing south of Cabo Rojo reconnaissance aircraft measured the strongest winds ever recorded in a Caribbean hurricane, 197 mph. Crossed over Barahona (major disaster) and southwest peninsula of Haiti on the 29th, entered Cuba, near Guantanamo on Sept. 30th, crossed along south coast of Cuba on Oct. 1st, then north through Cuba towards the Bahamas on Oct. 2-3, recurved, and then moved west close to South Florida coast, then came close to north coast of

Yucatán; entered Mexico and dissipated. Maximum winds measured in Puerto Rico were 52 mph in Tallaboa Bay (Peñuelas), but winds were estimated 70-80 mph at Mona Island. Hurricane Inez affected the south coast of Puerto Rico, but damages were minor. (3), (4).

1967  
Sept. 9  
Beulah  
H

The famous double-eye hurricane. One of the most destructive hurricanes on record. Appeared as a perturbation on Sept. 2nd east of the Lesser Antilles, formed on Sept. 7th as a tropical storm; affected the islands of Martinique and St. Lucia (13 deaths at Martinique, 2 deaths at St. Vincent), most damages and casualties due to floods, as the highest winds recorded by reconnaissance aircraft were only 58 mph. Beulah intensified to hurricane force on Sept. 8th in the Caribbean, then moved slowly westnorthwestward at 5 mph, passed 70 miles south of Puerto Rico during the afternoon and night of Sept. 9th, and 50 miles west of the island according to the radar record. Reconnaissance aircraft recorded winds of 130 mph during Beulah's passage to the south of Puerto Rico, and photographs taken by the San Juan radar at 6:00 p.m. showed an inner eye inside the eye. The inner eye was 6 miles in diameter, and the regular eye 25 miles. Other examples of double eyes are Typhoon Sarah of March 1956 in the Pacific; Hurricane Debbie on August 20, 1969, and Hurricane Donna of 1960. 1 death in Puerto Rico. Most damages occurred in the south coast between Ponce and Cabo Rojo, to roads, bridges, small craft, beach homes. Beulah's fringe broke on Ponce with an electrical storm, and floods. An unexpected west movement spared the Dominican Republic, except the tip of Barahona, then Beulah passed 40 to 50 miles south of Haiti, then took a southwest course sparing Jamaica. Crossed over Northern Yucatán on Sept. 17th (winds 125 mph, 11 deaths). Reintensified in the Gulf of Mexico, entered the U. S. mainland near Brownsville on Sept. 20th, moved inland on the 21st, recurved towards Mexico on the 22nd and dissipated. (1 death). Beulah spawned 65 tornadoes in Texas. Total deaths, 49, and \$1 billion damages. (3) (4).

1968

None.

1969

None.

1970

None.