

## YEAR 1907

Five storms were found to have occurred in 1907. Tracks for these storms are presented in Fig. 3.

### Storm 1, 1907 (Jun. 24-29), T. S.

The following information was found in relation to this storm: 1) Data extracted from 8 A.M. (E.S.T.) Historical Weather Maps: Jun. 24, ship near 19 N., 81 W., E.N.E. f.4, 29.91; ship near 17 N., 75 W., S.E. f. 5, 30.06 (too high), ship near 16 N., 76 W., S.S.E. f. 6,; no center drawn on map. Jun. 25, ship near 20 N., 83 W., E. f. 5, 29.94, rain; ship near 14 N., 77 W., E.S.E. f. 6, 29.97; no center drawn on map. Jun. 26, ship near 23 N., 85 W., E. f. 9, 29.86; center placed 19.5 N., 84.5 W., probably a bit S. and E., in the vicinity of 20.5 N., 85.5 W. would be better. Jun. 27, Port Eads, E.N.E. f. 3, 29.89; ship near 26 N., 86 W., S.S.E. f. 8, 29.86; ship near 27 N., 85 W., E.S.E. f. 4, 29.97; center placed 25.5 N., 89.5 W.. Jun. 28, ship near 28 N., 91 W., N. f. 2, 29.88; Port Eads, E. f. 4, 29.80; ship near 28 N., 87 W., S.E. f. 6, 29.88; ship near 27.7 N., 86 W., S.S.E. f. 9; center placed 27 N., 88.5 W. (maybe closer to Port Eads). Jun 29, Wilmington, E. f. 2, pressure could not be read; Charleston, N.W. f. 3, 29.85; extratropical low placed 36 N., 79 W.; however, data on map suggested the true center of tropical origin to be just off the coast; from a Savannah observation (not plotted on map), it was found to be just S. of Savannah. Jun 30; center of occluded low over E. New England coast (Historical Weather Maps, Jun. 1907) Author's note: Wind forces (f) are on Beaufort scale; pressures are in inches. 2) Washington, Jun. 29. The southern disturbance has reached the New Jersey coast, increased somewhat in strength. It has caused heavy rains and considerable fall in temperature in the Middle Atlantic States (The New York Times, Jun. 30, 1907, p.12, col.4). Author's note: The above statement was probably issued in the evening of Jun. 29. 3) Some observations taken at New Orleans: Jun. 28, 8 A.M., 29.80, S. 3; 8 P.M., 29.75, S.E. 7; Jun. 29, 8 A.M., 29.83, N. 7 (Weather Bureau, 1909). Author's note: Pressures are in inches, apparently without being reduced to sea level; wind speeds are in mph. 4) Some observations taken at Savannah: Jun 28, 8 P.M., 29.88, S.W. 12; Jun. 29, 8 A.M., 29.59, N.E. 26; 8 P.M., 29.80, W. 5 (Weather Bureau, 1909) Author's note: Pressures are in inches, apparently without being reduced to sea level, wind speeds are in mph. 5) Some maximum wind velocities were as follows: Pensacola, S.E. 36 mph on Jun. 28; Thomasville, E. 24 mph on Jun. 28; Tampa, S.W. 44 mph on Jun. 29; Jacksonville, S.W. 62 mph on Jun. 29; Hatteras, S.W. 50 mph on Jun. 29 (Monthly Weather Review, Jun. 1907). 6) Map showing a track for this storm . Some positions along the track were: near New Orleans in the evening of Jun. 27; over S.E. Mississippi in the morning of Jun. 28; just N. of Mobile in the evening of Jun. 28; near 31.3 N., 80.5 W. in the morning of Jun. 29; just S. of Atlantic City in the evening of Jun. 29; just S. of Boston in the morning of Jun. 30; just W. of Portland, Me., in the evening of Jun. 30 (Monthly Weather Review, Jun. 1907). Author's note: The first three locations along the track were found to be in error.

On the basis of information in the above items, the author of this study decided to introduce some modifications along the storm track which is shown in Neumann et al. (1993) and to extend it to Jun. 30. 7 A.M. positions for Jun. 24-25 in the above publication could not be rigorously checked because of insufficient information for those days in item 1); however, such positions were accepted by the author of this study. 7 A.M. positions for Jun. 26-27 in Neumann

et al. (1993) were found to be supported by information from those days in item 1) and, therefore, were kept unchanged. The author's 7 A.M. Jun. 28 position was estimated near 23.3 degrees N., 89.0 degrees W. on the basis of information in item 1) and was found to be about 140 miles to the W.S.W. of the corresponding one in the above publication. The 7 A.M. Jun. 29 position was estimated near 31.5 degrees N., 81.0 degrees W. on the basis of information in items 1), 4) and 6); this position was found to be about 120 miles to the W.S.W. of the corresponding one in Neumann et al. (1993). As a result of extending the storm track in the above publication to Jun. 30, an author's 7 A.M. Jun. 30 position was estimated near 41.5 degrees N., 71.0 degrees W. on the basis of information in items 1) and 6). The author's track for Storm 1, 1907 is shown in Fig. 3.

The tropical storm status which Neumann et al. (1993 gave to this storm was found to be supported by information in items 1) and 5). Tropical storm intensity was denoted along the author's track for the period Jun. 24-29 and the extratropical stage was introduced in the afternoon of Jun. 29.

### Storm 2. 1907 (Sept. 19-23), T. S.

The following information was found in relation to this storm: 1) Data extracted from 8 A.M. (E.S.T.) Historical Weather Maps: Sept. 16-17, no data in the area between the Bahamas and Cuba; however, the low-level flow is indicated to be easterly with no evidence of a closed circulation. Sept. 18, Key West, N.E. f. 3, 29.89, ship or Dry Tortugas (24.5 N., 83 W.), N.E. f. 5; ship near 26 N., 76 W., S. f. 5, 29.94; ship near 25 N., 74 W., S.E. f. 4, 30.03; Jupiter, E. f. 4, 29.92; weak low center placed 21 N., 80 W., but it was not supported by data; however, a tendency for a low in incipient stages over the N.W. Bahamas was indicated by data. Sept. 29, Tampa, N.E. f. 3, 29.96; Jupiter, S.W. f. 1, 29.96; ship near 26.2 N., 79 W., S.E. f. 3; 30.00; ship near 25 N., 79 W., S. f. 4; Key West, S. f. 4, 29.91; Dry Tortugas or ship near 24.5 N., 83.2 W., S. f. 5; center placed 26 N., 85.5 W (probably too far to the S.W.). Sept. 20, Pensacola, N.E. f. 4, 29.86; Tampa, S.E. f. 3, 29.98; ship near 25 N., 84 W., S.S.W. f. 4; Key West, S. f. 3, 29.97; low placed near 27 N., 88 W. (probably too far to the S.W.). Sept. 21, New Orleans, N. f.3, 29.82; Pensacola, S. f. 5, 29.90; low placed 28 N., 92 W.; however, data indicated to be just to the E. of New Orleans. Sept. 22. Montgomery, S.E. f. 3, 29.85, rain; Pensacola, W.S.W. f. 4, 29.82; New Orleans, W. f. 2; pressure could not be read; ship near 28 N., 86 W., W.S.W. f. 4, showers; center placed over S.E Mississippi as extratropical, but S.W. Alabama seems to be a better location. Sept. 23, center placed over western portion of North Carolina, extratropical; Charlotte, S.W. f. 5, 29.62, rain (Historical Weather Maps, Sept. 1907). Author's note: Wind forces (f) are on Beaufort scale; pressures are in inches. 2) Some observations taken at New Orleans: Sept. 20, 8 P.M., 29.76, N.E. 15; Sept. 21, 8 A.M., 29.76, N. 11; 8 P.M., 29.76, S.W. 8 (Weather Bureau, 1909). Author's note: Pressures are in inches, apparently without being reduced to sea level; wind speeds are in mph. 3) Maximum velocities associated with this storm: Charlotte, N.C., S.W. 39 mph on Sept. 23; Cape Henry, S. 39 mph on Sept. 23 (Monthly Weather Review, Sept. 1907). 4) Storms warnings were displayed on the Louisiana and Mississippi coasts on account of a disturbance on the central Gulf but no gales occurred on those coasts. I.M. Cline, (New Orleans) District Forecaster (Monthly Weather Review, Sept. 1907). 5) Storm of Sept. 21, 1907. Louisiana. Minor (Dunn and Miller, 1960). 6) Map showing a track for this storm. The initial position (with a question mark) was near 28 N., 92.5 W. in the morning of Sept. 21; the center was placed just N.W. of New Orleans in the

evening of Sept. 21 and over extreme E. of central Mississippi in the morning of Sept. 22; the Sept. 23 morning position was near 37 N., 81.5 W. and the storm center was shown near 42 N., 73 W. in the evening of that day (Monthly Weather Review, Sept. 1907). Author's note: The morning and evening positions for Sept. 21 were found to be in error. 7) A storm was first observed near 22 N., 73 W. on Sept. 16, 1907 and lasted 7 days; it recurred near 29 N., 89 W. and it was last observed near 39 N., 77 W. (Mitchell, 1924). Author's note: A storm track for this storm in the above publication was found to be similar to the one in Tannehill (1938) and also quite similar to the track in Neumann et al. (1993), except for the fact that the latter authors started their track on Sept. 17.

On the basis of information contained in the above items, the author of this study introduced some modifications along the track for Storm 2, 1907 in Neumann et al. (1993). As an easterly flow without indications of a closed circulation was apparently prevalent on Sept. 16-17 and only a tendency for the formation of a cyclonic center could be inferred on Sept. 18 (item 1), the author of this study decided to start his track on Sept. 19 or two days latter than in Neumann et al. (1993). On the basis of information in item 1), the author's 7 A.M. Sept. 19-20 positions were estimated as follows: Sept. 19, near 26.7 degrees N., 84.0 degrees W.; Sept. 20, near 28.3 degrees N., 87.0 degrees W. Such positions were found to be about 140 and 110 miles to the N.N.E. of the of the respective positions in Neumann et al. (1993). The author's 7 A.M. Sept 21 position was based on information in items 1) and 2) and was estimated near 30.0 degrees N., 89.0 degrees W.; this position was found to be about 60 miles to the N.N.E. of the corresponding one in the above publication. In order to fit better information in item 1), the 7 A.M. Sept. 22 position in Neumann et al. (1993) was adjusted by some 30 miles to the S.E. to near 32.0 degrees N., 88.0 degrees W.. Similarly, their 7 A.M. Sept 23 position was adjusted by about 50 miles to the W. to near 35.7 degrees N., 31.3 degrees W., based on information in item 1). The author's track for Storm 2, 1907 is displayed in Fig. 3.

Information in item 3) showed winds of tropical storm strength (39 mph) but these winds were reported during the extratropical stage of this weather system. No tropical storm winds were found in the marine or land observations before landfall on the Louisiana and Mississippi coasts and, according to information in item 4), no gales occurred on those coasts. Therefore, the author of this study is somewhat skeptical about the merit of classifying this system as a tropical storm. Nevertheless, he decided to accept that classification as shown on Neumann et al. (1993) and to denote tropical storm intensity along his track over the period Sept. 19-22. The extratropical stage was introduced around noon Sept. 22 and continued on Sept. 23.

#### Storm 3, 1907 (Sept. 27-29), T. S.

The following information was found about this storm: 1) Data extracted from 8 A.M. (E.S.T.) Historical Weather Maps: Sept. 23, Veracruz, N.N.W. f. 2, 29.88; ship near 19 N., 94.8 W., S.W. f. 3. Sept. 24, Veracruz, W. f. 2, 29.88; low placed 22 N., 95.5 W. Sept. 25, Tampico, N. f.2, 29.93; Veracruz, N. f. 4, 29.88. Sept. 26, Tampico, N.N.W. f. 2; Veracruz, W. f. 2, 29.88; ship near 21 N., 91.5 W., S.E. f. 5, 29.94; Brownsville, N. f. 2, 29.87. Sept. 27, Brownsville, N.N.W. speed could not be read, 29.78; Tampico, calm, 29.77; ship near 22 N, 91 W., S.S.E. f. 5, 29.86; Merida, S.S.E. f. 2, 29.94; ship near 19 N., 92 W., S. f. 3. 29.91, showers; Veracruz, W.S.W. f. 2, 29.87; ship near 21.7 N., 94 W., W. f. 2, 29.88; center placed 24 N., 95 W. (probably too far W.). Sept. 28, New Orleans, N.E. f. 4, 29.74, rain; Pensacola, N.E. f. 4, 29.80; ship near 24 N., 89 W., W. f. 7, 29.77; ship near 23 N., 88

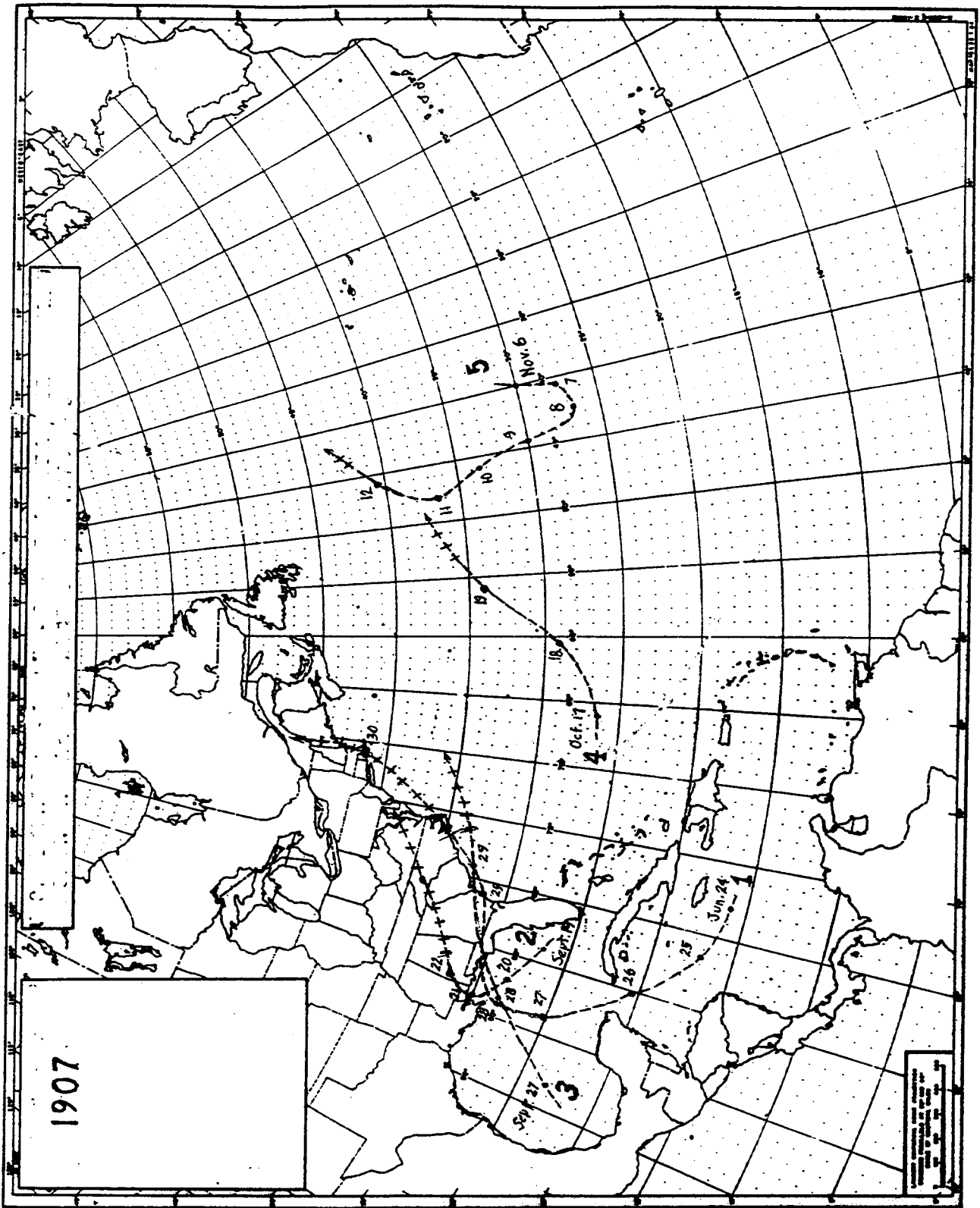


Fig. 3

W., S. to S.S.W. f. 6, 29.86; center placed 28.5 N., 89.5 W. (probably a bit W.). Sept. 29, Charleston, N. f. 3, 29.77, temp. 74 F; Wilmington, N.E. f. 2, 29.86 (not clearly read), temp. 67 F; center to the E. of Charleston and S. of Wilmington, probably moving still ahead of a cold front associated with an extratropical low to the S. of New York. Sept. 30, cyclone of tropical origin was absorbed in cold front (Historical Weather Maps, Sept. 1907). Author's note: Wind forces (f) are on Beaufort scale; pressures are in inches. 2) Some observations taken at New Orleans: Sept. 27, 8 A.M., 29.89, S.E. 7; 8 P.M., 29.80, E. 9; Sept. 28, 8 A.M., 29.67, N.E. 17; 8 P.M., 29.74, N. 3; Sept. 29, 8 A.M., 29.90, N.E. 4 (Weather Bureau, 1909). Author's note: Pressures are in inches, apparently without reduction to sea level, wind speeds are in mph. 3) Storm warnings were displayed on Sept. 28 along the Louisiana and Mississippi coasts on account of a disturbance in the central Gulf, but no gales occurred on the coasts. I.M. Cline, District Forecaster, New Orleans (Monthly Weather Review, Sept. 1907). 4) Some maximum wind velocities were as follows: Pensacola, N.E. 46 mph on Sept. 28; Savannah, W. 24 mph on Sept. 29; Charleston, S. 36 mph on Sept. 29 (Monthly Weather Review, Sept. 1907). 5) Storm of Sept. 28, 1907. N.W. Florida. Minor (Dunn and Miller, 1960). 6) Map showing a track for the storm as follows: Morning of Sept. 28, near 29.7 N., 88.7 W.; evening of Sept. 28, near Tallahassee, Fl.; morning of Sept. 29, near 32.5 N., 78.7 W. (Monthly Weather Review, Sept. 1907). 7) A storm was first observed near 23 N., 93 W. on Sept. 27, 1907 and lasted 2 days; it was last observed near 35 N., 76 W. (Mitchell, 1924). Author's note: Tracks for this storm in Tannehill (1938) and Neumann et al. (1993) were found to be similar to the corresponding track in Mitchell (1924).

On the basis of information in the above items, the author of this study introduced some minor changes along the storm track in Neumann et al. (1993). While the 7 A.M. Sept. 27 position in their publication was kept unchanged, new 7 A.M. positions as estimated by the author for Sept. 28-29 were as follows: Sept. 28, near 28.3 degrees N., 88.5 degrees W, which represented an adjustment to the N.E. by about 50 miles to fit better information for that day in item 1); Sept. 29, near 32.7 degrees N., 79.0 W., which represented an adjustment to the S.S.W. by about 40 miles in order to fit better information for that day in items 1) and 6). The author's track for Storm 3. 1907 is shown in Fig. 3.

The tropical storm status which Neumann et al. (1993) gave to this storm was found to be supported by the maximum wind velocity of 46 mph reported at Pensacola (item 4). Tropical storm status was denoted along the author's track from Sept. 27 through the morning of Sept. 29 and was changed to the extratropical stage in the afternoon of Sept. 29.

#### Storm 4, 1907 (Oct. 17-19), T. S.

The following information was found about this storm: 1) Data extracted from 8 A.N. (E.S.T.) Historical Weather Maps: Oct. 17, ship near 28 N., 67 W., N.E. f. 8, 29.62; center placed 24 N., 66 W. (too far S., near 26.5 N. looks more reasonable). Oct. 18, ship near 27 N., 60 W., S.W. f. 7; ship near 33 N., 66 W., N.E. f. 6, 29.86; ship near 25 N., 67.5 W., N.N.W. f. 4, pressure could not be read; ship near 21 N., 64 W., S.W. f. 2, 29.80; center placed 27 N., 60.5 W. (probably too far S., near 29 N. would be better. Oct. 19, ship near 33 N., 53 W., 29.80 (not clearly read); ship near 34 N., 49 W., S. f. 7, 30.18 (probably too high); center placed 32.5 N., 56 W. (probably too far S., near 34 N. would be better). Oct. 20, extratropical storm placed 50 N., 40 W., the tropical system having been absorbed by the low circulation (Historical Weather Maps, Oct. 1907). Author's note: Wind forces (f) are on Beaufort scale;

pressures are in inches. 2) A storm was first observed near 28 N., 62 W. on Oct. 17, 1907 and lasted 4 days; it recurred near 31 N., 62 W. and it was last observed near 58 N., 40 W. (Mitchell, 1924). Author's note: Tracks in Tannehill (1838) and Neumann et al. (1993) were found to be similar to the corresponding track in Mitchell (1924).

Based on information in item 1), the author of this study introduced a number of modifications along the track in Neumann et al. (1993). The author's 7 A.M. Oct. 17 position was estimated near 26.5 degrees N., 66.0 degrees W., which was about 270 miles to the W.S.W. of the position for that day in Neumann et al. (1993). The author's 7 A.M. Oct. 18 position was estimated near 29.0 degrees N., 60.5 degrees W., which was about 200 miles to the S.S.E. of the corresponding position in the above publication. Finally, the author's 7 A.M. Oct. 19 position was estimated near 34.0 degrees N., 56.0 degrees W., which was about 370 miles to the S. of the position in Neumann et al. (1993). The author's track was ended late on Oct. 19 in order to comply with information in item 1) which indicated that the tropical system had been absorbed by the circulation of an extratropical low by the morning of Oct. 20. The author's track for Storm 4, 1907 is shown in Fig. 3.

The tropical storm status which Neumann et al. (1993) gave to this storm was found to be rigorously supported by the N.E. f. 8 with a pressure of 29.62 inches reported by a ship on Oct. 17 (item 1), and was also hinted by winds of force 7 on the Beaufort scale reported by ships on Oct. 18-19. Therefore, tropical storm intensity was denoted along the author's track over the period Oct. 17-19. The extratropical stage was introduced late on Oct. 19 in order to indicate the absorption of the tropical system by the circulation of the extratropical one.

#### Storm 5, 1907 (Nov. 6-12), T. S.

This storm has been recently documented by the author of this study. Therefore, this storm is not included in Neumann et al. (1993).

Documentation of this storm was based on the following information: 1) Data extracted from 8 A.M. (E.S.T.) Historical Weather Maps: Nov. 6, ship near 29 N., 39 W., S. f. 4, 29.71; ship near 31 N., 41 W., N.E. f. 5, 29.77; ship near 34 N., 33 W., E.S.E. f. 8; extratropical low placed 30 N., 40 W., temp. in the 70's F around the low suggested a mild environment. Nov 7, ship near 28 N., 49 W., N. f. 2, 29.74; ship near 24 N., 40 W., W. f. 4, 29.88; ship near 26 N., 36 W., S.W. f. 4; ship near 32.7 N, 36.6 W., E. f. 8; low placed 27.5 N., 41.5 W. (probably a bit W.). Nov. 8, ship near 32 N., 40 W., E. f. 9; ship near 23 N., 42 W., S.W. f. 1; low placed near 24.7 N., 42.3 W. (probably too far S.). Nov. 9, ship near 31 N., 44 W., S.E. f. 9; ship near 32.3 N., 40.3 W, E. f. 9, 30.09; closed 1005 millibar (29.68) isobar drawn; center of low placed 30 N., 44.5 W., temp. in the 70's around the center; cold front about 400 miles to the W. Nov. 10, low placed 35.5 N., 46 W. at the southern end of a front (too far N., near 33.5 N., 46 W. appears to be a better location). Nov. 11, three ships with E. to S.E. winds f. 6-9; center placed 36.5 N., 48 W., still at the southern end of a front. Nov. 12, a weak center still prevalent near 40.5 N., 46 W., based on curvature of isobars and ship reports, with a new extratropical system to the N.W. Nov. 13, system practically absorbed in a cold front (Historical Weather Maps, Nov. 1907) Author's note: Wind forces (f) are on Beaufort scale; pressures are in inches.

On the basis of information in item 1), the author of this study prepared a track for Storm 5, 1907. Author's 7 A.M. positions were estimated as follows: Nov. 6, near 30.0 N., 40.0 W.; Nov. 7, near 27.5 degrees N., 40.5 degrees W.; Nov. 8, near 26.7 degrees N., 42.5 degrees W.;

Nov. 9, near 30.0 degrees N., 44.5 degrees W.; Nov. 10, near 33.5 degrees N., 46.0 degrees W.; Nov. 11, near 36.5 degrees N., 48.0 degrees W.; Nov. 12, near 40.5 degrees N, 46.0 degrees W. The author's track for Storm 5, 1907 is displayed in Fig. 3.

The tropical storm status which the author of this study has given to this weather system was based on force 8-9 winds reported by ships in the relatively warm environment of the 70's F for several days (item 1). The author's track denoted tropical storm intensity for the period Nov. 6-12. The extratropical stage was introduced late on Nov. 12 in compliance with information for Nov. 13 in item 1).

#### Special statement.

In addition to the five storms which were fully discussed above, four other cases were found to exhibit a possibility to have attained tropical character and/or tropical storm intensity in 1907. These four cases are presented next.

#### A) Case of Mar. 25- Apr. 1, 1907.

This case is included in Ortiz-Hector (1975) as an off-season hurricane and said author mentioned the Anuarios del Observatorio de Belen and a 1923 article by Jose Carlos Millas in the Boletin del Observatorio Nacional as information sources about this case. According to Ortiz-Hector (1975), the hurricane was first detected by the "Manuel Calvo" near 21.6 N., 49.7 W. (probably W. of San Fernando, Cadiz, and not of Greenwich) on Mar. 26. The Spanish steamer "Manuel Calvo" experienced S.W. force 5 winds and swells on Mar. 26 and then very heavy seas on Mar. 27-28, with N. and N.W. winds, having had difficulties to enter the San Juan harbor on the northern coast of Puerto Rico. The alleged hurricane is said to have moved to the S.W., approaching the Virgin Islands and Puerto Rico, and then to the N.W. to the area N. of the Bahamas, where it was encountered by the "Havana", sailing from New York to Havana, during the night of Apr. 1. According to her captain, the wind reached 180 kilometers per hour (about 112 mph) and veered from S.E. to N.N.W., and the minimum barometer reading taken on the "Havana" was 993 millibars (29.32 inches). Examination of Historical Weather Maps (Apr. 1907) revealed, however, that the weather and sea conditions encountered by the "Manuel Calvo" and the hurricane winds reported by the "Havana" were associated with two different systems and that the latter ship was caught in a rather explosive extratropical development off the U.S. southeast coast on Apr. 2, while the low pressure area which affected the "Manuel Calvo" was losing its identity near Bermuda. According to the Monthly Weather Review (Mar. 1907), a "tropical depression" made its appearance between Bermuda and Puerto Rico on Mar. 26, in which the "Epsom" and the "Tampico" were involved on Mar. 27 (both British ships were coming from England to ports in the Gulf of Mexico). According to a report by officer Williams of the "Epsom", a slow initial fall of the barometer set in at noon Mar. 25. At 4 A.M. Mar. 26 the barometer rose slightly and the wind became variable, finally setting from the N.E. while a heavy N.W. swell at the same time made itself felt. The position of the vessel at Greenwich mean noon (Mar. 26) was 33 N., 69 W. (it should read 59 W.), barometer 29.44 inches. Fifteen minutes later a squall of wind heralded the break of a threatening gale from the N.. Fierce squalls of hurricane force were frequent and a very high and dangerous sea soon rose. The hurricane continued to rage throughout the day, the barometer meanwhile rising, although very slowly. At Greenwich mean noon Mar. 27, the position of the "Epsom" was 30 30 N., 63 10 W., wind N.

12 (on Beaufort scale), barometer 29.71, weather overcast and squally. At 1 P.M. the sky cleared and the wind and sea soon moderated. The first day this weather system appeared in Historical Weather Maps (Mar. 1907) was on Mar. 25 when a 1000 millibar (29.53 inches) low was placed near 36 N., 62.5 W., with 2 ships showing E.N.E. force 10 winds to the N. and N.E. of the center; temperatures in the 60's F were found around the low. The low was placed near 32 N., 59 W. on Mar. 26, but two ship observations, one of them near 33 N., 59 W. (probably corresponding to ship "Epsom") with N.E. wind (no force given) and pressure 29.44 inches and the second one near 32 N., 57 W. with a S. force 2 wind and pressure of 29.56 inches suggested a very broad center some distance to the N.E. of the position shown on the map.; temperatures reported by both ships were in the upper 60's F. and a closed 1000 millibar (29.53 inches) low was drawn on the map; maximum winds plotted on the map were N.E. force 8-9 on the Beaufort scale well to the N. of the low center. The inner isobar drawn around the low center on the map corresponding to Mar. 27 was the one of 1005 millibars (29.68 inches) and the center was placed near 31.5 N., 58 W., which could have been a bit far to the N. and E. Maximum winds to the N. and N.W. of the center did not exceed force 7 on the Beaufort scale and there was a report of S.S.E. force 3 wind to the E. of the center; there were two ships reporting pressures as low as 29.21 and 29.00 inches, but such readings were obviously too low because they were not supported by the above winds and other nearby observations; temperatures near the low pressure center continued in the middle and upper 60's F. The Mar. 28 map showed the center near 30 N., 60 W. with only one ship reporting a N.N.E. f. 8 wind near Bermuda; the inner isobar drawn on the map was the one of 1010 millibars (29.83 inches) and temperatures around the low continued in the middle and upper 60's F, even as far S. as the 27 N. parallel. Mar. 29 was the first day when fronts were not drawn on the map in association with this weather system; the lowest pressure related to this low pressure area was shown by a ship near 27 N., 60 W. with 29.65 inches, accompanied by the highest wind (W.S.W. force 6) which was plotted around this system on Mar. 29; temperatures reported by ships continued in the middle and upper 60's F and the low center was placed near 28 N., 60 W. on that day. Based on peripheral data, the low center was placed near 25 N., 60.5 W. on Mar. 30 and the closest ship to the center showed a temperature of 66 F, with a pressure of 29.80 inches and a N. force 6 wind on the Beaufort scale. The center was placed near 26.5 N, 59.5 W. on Mar. 31 and temperatures were found to have risen to the low 70's F near the center; however, winds appeared to have diminished to force 4-5 on the Beaufort scale. The map in Historical Weather Maps (Apr. 1907) for Apr. 1 showed the low center near 25 N, 62.5 W., although peripheral data suggested a position about 200 miles to the N. of the one given; temperatures were in the low 70's F. A frontal trough containing two low pressure areas was found to extend from about 35.5 N., 68 W. to central Cuba. One of these lows was placed in the above mentioned location and the second and more prominent one was placed off the northern Bahamas. This later low was found to have developed quite rapidly and by the morning of Apr. 2 winds up to force 10 on the Beaufort scale were reported by ships. This development was in line with the weather conditions reported by the steamship "Havana" (Ortiz-Hector, 1975). Historical Weather Maps (Apr. 1907) showed a movement to the E.S.E. of the weather system which had been to the E. and S.E. of Bermuda for several days but such a motion was not found to be supported by the available data. The author of this study believes that the low pressure area of previous days should have moved northward during Apr. 1, while weakening and finally being absorbed by the expanding circulation of the storm off the U.S. coast on Apr. 1 or early Apr. 2. Except for the last two days (Mar 31- Apr. 1) of its life-span, air temperatures in the inner circulation of this system remained in the 60's F,



which is somewhat lower than what is expected for the latitude where the weather system was evolving and the time of the year (late March- early Apr.) when it was occurring. By the time some warning was occurring into the 70's F, the reported winds had diminished to force 4-5 on the Beaufort scale. The system was, therefore, lacking at its peak intensity the warm core structure which is typical of tropical storms. In addition, at its peak intensity, which occurred on Mar. 26-27 when the "Epsom" reported hurricane force winds (Monthly Weather Review, Mar. 1907), a very broad low pressure center apparently existed and the strongest winds were blowing some 200 miles to the west of said center. This pattern opened the possibility of considering this weather system as a subtropical storm evolving in a cooler than normal environment that occurred off the hurricane season. However, the subtropical storm classification was not introduced in Neumann et al. (1993) until 1968, and it would have probably been confusing to bring this case as such in 1907. This was the main reason why the author of this study decided to keep this one as a possible case.

B) Case of Sept. 11-15, 1907.

This possible case was found in Historical Weather Maps (Sept. 1907). Data shown on the morning map for Sept. 11 allowed one to place a low center near 37 N., 40 W. This center moved to the S.S.W. to the vicinity of 33 N., 42 W. on Sept. 12 and then on a W. to W.N.W. course to near 33.5 N., 45 W. on Sept. 13. Two ships reported N.E. winds in the northern semicircle of the low on Sept. 11 and Sept. 12, but only one ship reported a S. force 8 wind near 32 N., 40.5 W. on Sept. 12. By the morning of Sept. 14, the system had turned northward and its center was placed at the southern end of a front in a location near 39 N., 48 W.; a ship just a short distance to the W.N.W. of the center reported a N. f. 2 wind and a pressure of 29.88 inches. The pressure was still identified near 46 N., 41 W. on the morning map for Sept. 15. In the author's opinion, this case had a fairly good chance to have become a tropical storm on Sept. 12; however, he decided to keep this case as a possible one because he thought that it was too risky to ascertain tropical storm intensity on the basis of only one ship report showing a force 8 wind on the Beaufort scale.

C) Case of Oct. 3-17, 1907.

This case was presented in Tannehill (1938) as Storm 3, 1907 in his publication; he mentioned that the storm occurred over the period Oct. 3-17 and it was obvious that his track was a short version of the one in Mitchell (1924) who stated that a storm was first observed near 10 N., 52 W. on Oct. 3, 1907 and lasted 16 days, it recurred near 20 N., 74 W. and it was last observed near 55 N., 11 W. However, the examination of Historical Weather Maps (Oct. 1907) did not reveal evidence of a closed cyclonic circulation until Oct. 12 when a low over the southeastern Bahamas could be inferred from a S.W. force 3 wind at Santiago de Cuba, a S. force 3 wind at Turks Is. and a ship near 20.5 N., 74 W. showing a N.N.W. f. 3 wind on the Beaufort scale. A ship reported a N. force 6 wind and pressure of 29.71 inches near 27.5 N., 71 W. on Oct. 13; another ship reported a S.E. f. 8 wind near 28.5 N., 65 W. on the morning of the same day and a weak frontal wave was shown near 27 N., 70 W. on the weather map for Oct. 13. The position of this wave could be debatable because the temperature contrast shown by ship reports was aligned along the 75 W. meridian and not near the 70 W. meridian. The system apparently moved eastward and was identified as a frontal wave about 26 N., 64 W. on Oct. 14 and near 27 N., 60 W. by Oct. 15. Because of the force 8 wind reported on Oct. 13 and the

debatable nature of the frontal wave shown on the weather map for that day, the author believes that this weather system had some probability of having become briefly a tropical storm, and this is why he decided to keep this one as a possible case.

#### D) Case of Oct. 30, 1907.

The following information was found in the Monthly Weather Review (Oct. 1907): The most important local storm reported for the month moved northeastward over Galveston, Texas at 12:30 A.M. of Oct. 30, with a wind velocity, at the Weather Bureau station, of 64 mph for a five-minute period and an extreme velocity for 2 minutes of 76 mph. The barometer fell and rose three tenths of an inch in 15 minutes. Many buildings were wrecked, and one person was reported killed and many injured. The above description strongly suggested that this disturbance was of a meso-scale or smaller scale nature, and not a tropical cyclone. However the map for 8 A.M. (E.S.T.) Oct. 30 in Historical Weather Naps (Oct. 1907) showed a very well marked cyclonic curvature of the isobar corresponding to 1015 millibars (29.97 inches), Galveston showing a N.E. force 2 wind with rain and a pressure of 29.95 inches, having dropped from 30.05 inches in the past 24 hours; in addition, a ship near 27 N., 91 W. reported a S. f. 4 wind and a pressure of 30.03 inches, and Corpus Christi reported a N.W. force 2 wind with a pressure of 29.98 inches, having risen from 29.94 inches in the past 24 hours. Plotted data on the same weather map for Oct. 30 showed a total precipitation of 4.18 inches at Galveston in the previous 24 hours, and of 1.25 inches at San Antonio over the same period. Most information on the above weather map suggested the presence of a synoptic-scale low pressure area off the Texas coast at 8 A.M. (E.S.T.) Oct. 30. This finding is not necessarily in contradiction with what was inferred about the nature of the weather conditions at Galveston described in the Monthly Weather Review (Oct. 1907); the finding, however, prevents one from entirely ruling out the possibility that it could have been a small-size tropical cyclone what affected Galveston early on Oct. 30. Although the probability that this is what actually happened is extremely small, this is why the author decided to keep this case as a possible one.

Two other weather systems were mentioned in the literature as having occurred in Sept. 1907. One of these systems was a perturbation which the Belen College Observatory announced as being between Curacao and Puerto Rico on Sept. 12 (Diario de la Marina, Havana, Sept. 13, 1907, morning edition, p.3, col.4) and that the Meteorological Central Station (of Cuba) indicated that it apparently was to the S. of Santiago de Cuba on Sept. 13 (Diario de la Marina, Havana, Sept. 14, 1907, morning edition, p.4, col.2). The second of these systems was also a cyclonic perturbation which the Belen College Observatory started to talk about as being to the E. of Dominica on Sept. 16 (Diario de la Marina, Havana, Sept. 16, 1907, evening edition, p.4, col.1) and that, according to the same observatory, the Weather Bureau of Washington confirmed on Sept. 17 as being in the eastern Caribbean Sea; the Belen College Observatory placed the perturbation about 180 miles S.W. of St. Croix at 2 P.M. Sept. 17 (Diario de la Marina, Havana, Sept. 18, 1907, morning edition, p.4, col.5). Apparently in relation to this weather system a dispatch from St. Vincent, dated on Sept. 20, stated the following: "Recent advices from the Weather Bureau at Washington verified in a remarkable manner. A disturbance E. of the Windward Islands, which has been announced as probable, developed yesterday as a thunderstorm of great severity. Exceedingly low thunderclouds hung over St. Vincent, and the lightning was fearfully vivid. Several casualties occurred. Similar storms have been experienced

in the northern islands" (Monthly Weather Review, Sept. 1907). The author of his study believes that these two weather systems practically did not have a chance to have become tropical storms and, therefore, he decided not to include them as possible cases.