**Best Track Committee Re-Analysis Comments for 1934**

1934 Storm #1:

1. The committee generally favors the removal of this system due to the likelihood that it was frontal. However, frontal lows of this intensity in this location are unclimatological, and the observations from Charleston suggest there were strong winds close to the center. The committee would like to see a more detailed analysis of the thermal structure near the center. Particularly useful for this would be the Savannah and Charleston Original Monthly Records (OMRs), as the hourly data should give us important information on the temperature contrast near the center. The Savannah OMR data would also be useful in determining if the 988 mb pressure was central of peripheral.

**(Now, storm removed) After performing additional detailed temperature analyses and obtaining more observations, which have been printed out and can be found in the binder, it is agreed that this system was extratropical throughout its lifetime and it will be removed from HURDAT. Although the system was extratropical, winds up to 55 kt occurred on portions of coastal southeastern South Carolina and a 9 ft storm tide was reported.**

**Detailed analyses have now been conducted at 12Z on 5/27, 5/28 and 5/29. On the 27th, an elongated area of low pressure along a frontal boundary was present off the east coast of Florida, but a well-defined closed low was not observed. On the 28th at 12Z, a low center was near 29.4N, 79.5W and central pressure was likely around 998 mb. The analysis reveals a strong temperature gradient across the low on the 28th. The data indicates that a warm front extended eastward from the center of the low and cold front extended southwestward from the low to about 26N, 84W. Therefore, the cyclone was extratropical beginning at the time it became a closed low – 06Z on the 28th – and was also extratropical at 12Z on 28 May. The low moved inland in southeastern South Carolina at 04Z on the 29th at 32.3N, 80.5W. Although the OMRs were not able to be obtained which contain the hourly data, additional information was obtained from stations in Georgia and South Carolina from the state monthly climatological data summaries. The maximum wind at Savannah was 34 kt NW and the minimum pressure at Savannah was 988 mb. The maximum wind at Charleston was 46 kt SE and the minimum pressure at Charleston was 990 mb. The central pressure at landfall may have been around 985 mb. The daily high and low temperatures for dozens of stations in Georgia and South Carolina are available but not the hourly temperatures. The analysis conducted a 12Z on 29 May reveals that although the temperature gradient across the low was not as strong as it was the day before, but the structure was still indicative of an extratropical system with a warm front analyzed by HWM extending to the low’s center. The circulation was very large and asymmetric. The central pressure had only risen to about 992 mb by that time with the center located over west-central South Carolina. All of the data indicates that the cyclone was likely extratropical throughout its lifetime, although the Georgia and South Carolina coasts, especially from Savannah to Charleston, received winds of 50-55 kt and pressures as low as 985 mb. The additional material obtained has been placed in the binder.**

2. If this system is removed, the current metadata needs to be kept in the Other Systems section, and an explanation that this was likely a frontal hybrid storm should be included.

**Agreed.**

1934 Storm #2:

1. The committee thinks the 50 kt intensity for the 5 June landfall is too high. Please state the basis for this increase over the original HURDAT and consider using 40-45 kt instead.

**(Now, Storm #1) The central pressure was likely 1002 mb or lower due to a 1004 mb with simultaneous 20 kt winds. A central pressure of 1002 mb would equal 43 kt according to the southern pressure-wind relationship, but the cyclone might have been deeper than that. A 45 kt intensity is chosen. The following intensities have been changed: 6/5 12Z: decreased from 50 to 45 kt; 6/5 18Z: decreased from 45 to 40 kt.**

2. There is a typo in the 5 June daily metadata: “40 kt tropical storm of 45 mph winds”.

**This has now been corrected.**

3. The committee also has concerns about the intensification shown while the system was over Central America. Is there evidence other than the pressures that the system intensified – winds or damage? The metadata summary talks about the impacts in San Salvador “described above”, but there is no description to be found. Please re-examine the period this system spent over Central America, and investigate the possibility that some of the observed deepening was due to monsoon influences.

**On the 7th, San Salvador reported winds “in excess of 50 mph.” The MWR write-up for this cyclone (page 202-203 in 1934 MWR) discusses the death and destruction caused by this cyclone in Central America. Much of this text has now been added to the metadata. The intensity at 18Z on the 7th is lowered to 45 kt because the system did not emerge over water (see response to comment #4 below) and there is no evidence of 50 kt winds.**

4. Is the evidence conclusive that the center emerged far enough into the Pacific to count as a Pacific coast of Guatemala landfall?

**There is no evidence that it emerged into the Pacific. According to the revised track, the center only reached the Pacific coastline. Mention of this landfall has been removed, but the information about the pressure-wind conversion and the intensity is maintained.**

5. The committee notes that the evidence of hurricane strength at landfall in Yucatan is a little thin. While the metadata summary says hurricane strength is in agreement with “assessments from the Mexican Meteorological Service”, no such assessments are included in the metadata. Indeed, no data from any station on Yucatan is mentioned in the metadata. Please include the relevant information from Mexico in the metadata, and re-examine this part of the track for the possibility that the system was not a hurricane at that time.

**1934 MWR page 202 states: “The Mexican Meteorological Service reported that winds of hurricane force occurred over a portion of the peninsula.” This quote has now been added to the metadata.**

**After conducting a search for more data, the daily Mexican synoptic weather maps were obtained from 5-17 June. Of note are 1002 mb pressures at both Progreso and Merida at 13Z on the 9th. These observations occurred well away from the center and after the cyclone had been over land for about 9 hours. Although it is recommended that the analyzed intensity remain the same, these additional observations call for the longitude at 12Z on the 9th to be moved from 88.0W to 88.4W. The following longitudes are changed: 6/9 06Z: move from 87.5W to 87.7W; 6/9 12Z: move from 88.0W to 88.4W; 6/9 18Z: move from 88.8W to 89.1W. Due to these westward track adjustments, the analyzed Mexican landfall time is now 04Z instead of 05Z. Although the 70 kt landfall intensity is maintained, the 06Z intensity is lowered to 65 kt due to the earlier landfall time.**

**While not related to any comment by the committee, the ship that recorded 35 kt with a 982 mb pressure at 09Z on the 13th is now analyzed to be inside the RMW. A 978 mb central pressure is added to HURDAT at 12Z on the 13th (making use of the 10 kt per mb rule inside the RMW). A central pressure of 978 mb equals 80 kt according to the southern pressure-wind relationship, and this was the same intensity that had been assigned.**

6. The committee concurs with downgrading the system to Category 2. Is there a possibility the intensity was below 90 kt? The metadata summary uses a 27 n mi radius of maximum wind (RMW) (please explicitly state the source if available). However, the data in Cline and the Monthly Weather Review (MWR) suggest that the maximum winds occurred in Baton Rouge at about the same time as the minimum pressure in Jeanerette, which could indicate a much larger RMW. Please re-examine this.

**The 27 nmi RMW estimate is from Ho et al. (1987). An older pressure-wind relationship was used previously because the submission was originally provided several years ago. A landfall central pressure of 966 mb equals 89 kt according to the Brown et al. (2006) north of 25N pressure-wind relationship (not 93 kt according to the Gulf of Mexico pressure-wind relationship). Due to the low environmental pressure and larger than normal RMW, a landfall intensity of 85 kt is chosen.**

**Note that Morgan City recorded 59 kt with 979 mb at nearly the same time (or 20 minutes before) Jeanerette recorded the 968 mb with calm. Morgan City is about 30 nmi ESE of Jeanerette. Morgan City may have been outside the right RMW the entire time and the hurricane may have passed about 5 nmi east of Jeanerette. Jeanerette experienced 45 minutes of calm. If Jeanerette experienced the center of the eye, the eye diameter had to have been at least 10 nmi, so the eye radius was at least 5 nmi, which would mean that the RMW was at least 8 nmi. From all available data, it appears that Jeanerette was in the left part of the calm eye and that the center of the calm may have passed 0.1 degrees east of Jeanerette.**

**The maximum winds at Baton Rouge occurred approximately 23 minutes after the minimum pressure in Jeanerette. The maximum winds at Baton Rouge occurred 1 hour and 25 minutes before the minimum pressure at Baton Rouge. The forward speed of the cyclone was 13 kt so it would have traveled about 5 nmi in 23 minutes and about 20 nmi in 1 hour and 25 minutes. Baton Rouge is 43 nmi NE of Jeanerette. We do not have enough data from Baton Rouge to know whether they experienced the inside of the RMW. Although Baton Rouge was likely inside the RMW when their minimum pressure was recorded, they may have been outside of the RMW at the time their maximum wind was recorded. When the RMW passed over them, the winds could have been weaker since the cyclone was weakening as it moved farther inland. Although perhaps there is enough evidence that the RMW was larger than 27 miles, the RMW at landfall is only increased to 30 nmi because the data from Morgan City suggested a smaller RMW than the data from Baton Rouge.**

**Furthermore, prior to landfall, on the 15th, a 90 kt intensity was assigned based on a ship that record a minimum pressure of 974 mb. It was previously analyzed that the 974 mb observation was recorded simultaneously with 61 kt winds, but further investigation shows that there is no evidence that the observations were simultaneous. Furthermore, the older pressure-wind relationship was used and it yielded at least 84 kt for 974 mb. It is uncertain whether it occurred north of south of 25N. South of 25N, it would yield at least 85 kt and north of 25N it would yield at least 80 kt. This averages at least 82-83 kt. This, combined with that the RMW was larger than climatology a day later at landfall along with below average environmental pressure, gives an intensity of 85 kt on the 15th (not 90 kt as previously analyzed). Therefore, a peak intensity of 85 kt is analyzed from 18Z on the 14th until landfall at 19Z on the 16th. Although it is certainty possible that the intensity reached 90 kt sometime on the 15th or 16th, there is no evidence the hurricane ever reached that intensity.**

7. Please re-examine the proposed track changes over Louisiana and Mississippi. Cline states that the center went east of New Roads (northwest of Baton Rouge), and the observed pressures were lower in Baton Rouge than in New Roads. Thus, the proposed track could be too far west. OMR data for Vicksburg, Mississippi should help resolve this issue.

**After re-examining the data, numerous additional track adjustments have been made:**

**Time HURDAT orig Revised Revised-final**

**6/16 18Z 29.8 91.0 29.7 91.7 29.6 91.7**

**Landfall line Revised: 6/16 18Z 29.7N 91.7W 966 mb 90 kt 27 nmi RMW**

**Landfall line Revised-final: 6/16 19Z 29.7N 91.7W 966 mb 85 kt 30 nmi RMW**

**6/17 00Z 30.9 91.0 31.1 92.0 30.9 91.3**

**6/17 06Z 32.3 90.8 32.3 91.7 32.1 90.9**

**6/17 12Z 33.8 90.2 33.3 91.0 33.3 90.3**

**6/17 18Z 34.9 88.9 34.2 89.8 34.2 89.4**

**6/18 00Z 35.8 87.3 35.1 88.2 35.1 88.1**

**Note: After landfall, the re-runs of the Kaplan and DeMaria inland decay model only changed by 1 kt at each time 00, 06, and 12Z on the 17th. So no additional intensity adjustments to the post-landfall are necessary.**

1934 Storm #3 (new):

1. The committee concurs with adding this system.

**(Now, Storm #2) Agreed.**

2. There is a question about the genesis time, given that the Historical Weather Map (HWM) analyzed pressure was 1017 mb on 10-11 July and there are no reports of strong winds until 14 July. Please re-examine the data to see if the system was actually a weak low instead of a tropical depression on 10-11 July.

**Yes, the system may have been a weak low through 11 July. 11 July is eliminated, and the system is now started as a tropical depression at 00Z on the 12th.**

3. On a related note, what pressures did the HWM analyze on 12 and 14 July?

**On 12 July, HWM analyzes a closed low of at most 1015 mb, and on 14 July HWM does not analyze a closed low. This has been added to metadata.**

1934 Storm #4:

1. Is there sufficient evidence to reduce the intensity even further before the system crosses Florida, including delaying the genesis time and reducing the intensity below tropical storm strength at the Florida landfall? It is notable that there are no gale-force observations over the Atlantic, and that the MWR quote says “little pressure gradient at the surface” on 22 July.

**(Now, Storm #3) After further review, there is sufficient evidence to eliminate 21 July from HURDAT because the wind and pressure observations indicate that it is more likely that a tropical depression did not exist yet on that day. On the 22nd at 12Z, observations are not definitive that a closed circulation existed, but the coverage of observations in the area is somewhat more sparse than on the 21st. However, observations from Jacksonville suggest that at the 00Z/23rd landfall, the system was likely a 30 kt tropical depression due to the pressure changes and wind shifts observed there. Since the observations were somewhat sparse on the 22nd and a closed circulation may have existed then, the system is begun at 06Z on the 22nd with a 25 kt intensity. The intensity increases to 30 kt at 18Z on the 22nd and at the 00Z/23rd landfall. The U.S. landfall line for the Florida landfall has been eliminated.**

2. What is the basis for the 60 kt intensity at 1800 UTC 24 July? There is a ship at 2000 UTC with 50 kt SW and 999 mb, which suggests a central pressure near 994 mb. This might be more consistent with 55 kt at 1800 UTC.

**See response to comment 2a.**

2a. On the other hand, the 50 kt 999 mb ship ob has some issue. The given location is 26.4N 92.1W, which is over 60 n mi south and some distance west of the proposed 1800 UTC position. Either this system was larger and stronger than currently believed, or this part of the track is too far north – and possible too far east as well considering the wind direction. Please re-examine the track on 23-25 July to see if the cyclone pushed farther south than currently believed, and actually had a north of west component of motion at the Texas landfall.

**The data from 24 July and landfall suggest that the system was likely larger on the 24th than previously analyzed, but not necessarily stronger than suggested earlier. Observations suggest that this was a large, somewhat broad system that had winds somewhat below a typical pressure-wind relationship. It is possible that the central pressure by 18Z on the 24th may have already been lower than 990 mb. Another reason for choosing 60 kt is because the 50 kt observation was on the left side of the cyclone. The 60 kt intensity is maintained.**

**It is agreed additionally that position changes of up to 0.2 degrees needed. The longitudes from 7/24 12Z to 7/25 00Z are moved 0.1 degrees W of their previously reanalyzed positions. The latitude at 18Z on the 14th is moved 0.2 degrees S of its originally analyzed position. The latitudes at 12Z on the 14th and 00Z on the 15th are adjusted southward by 0.1 degrees, accordingly. Instead of the position of the TC center being located about 70 nmi N of the 50 kt/999 mb ship, it is now analyzed to be about 60 nmi NNW of the ship. The SW wind from the ship fits better now.**

3. There is a typo in the first paragraph of the metadata summary – “comprise” should be “compromise”.

**The word compromise was deleted anyway when addressing comment #1.**

4. The landfall intensity of this system is problematic. On one side, if Corpus Christi was inside the RMW, the pressure there puts a significant constraint on the landfall pressure and suggests the system was a Category 1 hurricane. On the other hand, a reported 10 ft storm surge suggests a stronger system. Is there any documentation of how Connor and Jarrell derived the proposed 975 mb landfall pressure? Is time and resources permit, SLOSH model data should be created or checked to see if a Category 1 hurricane could produce the observed surge.

**An additional source of information has been obtained – the Monthly State Climatological Data Summary for Texas for July, 1934. This source, along with other sources such as MWR, OMR, and Connor all indicate that the center made landfall between Rockport and Seadrift. Therefore, the landfall point we came up with previously – 28.0N, 96.9W – is adjusted slightly to 28.1N, 96.8W. Because of this change, the analyzed landfall time has been moved up from 18Z to 17Z. Although the lowest official barometer reading from land was 987 mb and the highest official observed wind was 49 kt – both from Corpus Christi (2 hours and 14 minutes apart) – the Texas Monthly Climo Summary states that unofficial barometer readings in the vicinity of the landfall point were as low as 982 mb and winds were estimated at “60 to 75 mph” (52-65 kt). The summary goes on to state that “real property was remarkably free from wind damage, but coastwise property suffered to the extent of $500,000 due to high tides which lashed the coast.” Although Corpus Christi was about 35 nmi from the landfall point, the center made its closest approach to Corpus Christi (about 20 nmi) about 1.5 hours after landfall. Utilizing a forward speed of about 12 kt for the cyclone along with the data that Corpus Christi was inside the RMW for around 3 hours, then the RMW of the cyclone is calculated to be about 25 nmi. However, if Corpus Christi was in the RMW for 3.5 hours, then the cyclone’s RMW would be closer to 30 nmi. The climatological RMW for that latitude and central pressure is 22 nmi. Since the RMW was likely in the range of 25-30 nmi, this would support going 5 kt below the pressure-wind relationship.**

**Based on the RMW calculation, the commentary from the Texas Monthly Climo Summary and the other damage descriptions, the analyzed landfall intensity of 75 kt will be maintained. The central pressure of 979 mb is retained (although it is possible it could have been few mb lower (near 975 mb). Even if the committee likes the 975 mb central pressure better, a 75 kt intensity would be recommended in both cases.**

5. The committee notes that the 44 kt wind in San Antonio, Texas used to help calibrate the intensity at 0000 UTC 26 July was about 100 n mi from the center. This should be noted in the metadata summary.

**Agreed.**

1934 Storm #4 (to possibly be removed):

1. The committee does not yet concur with removing this system, although it agrees that the evidence it was a tropical storm is currently slim. The original track showed that it made landfall on Dominica, and an effort to find observations from that island should be made.

**(Now, Storm #4) Yes, the current track has it making landfall on Dominica around 10Z-11Z on 21 August. We have observations of pressure and temperature for Dominica at 13Z and 19Z on 20 August as well as daily rainfall for 20 August, but we have no observations from 21 August. At 19Z on the 20th, the pressure was 1013 mb. 0.71” of rain were recorded on 20 August. We have the 21 August observations from Antigua, where the 13Z observation was NE winds with a 1015 mb pressure. The winds were stronger in Antigua on the 20th then the 21st, with a daily averaged wind of 9 mph on the 20th and 4 mph on the 21st.**

**As per the committee’s comments, perhaps there is not enough evidence to eliminate this from HURDAT as a 35 kt tropical storm. Here are two reasons why:**

**-We have no observations from Dominica, Guadeloupe, or Martinique on 21 August.**

**-Observations at 00Z on 22 August show significant curvature along with an observation of 30 kt and 1010 mb from a ship, so there may have been a 35 kt TS present.**

**Also, after reanalyzing every observation again in as much detail as possible, it is found that there is not enough evidence to remove the system from HURDAT. Although there are no gales and no west winds observed for this entire system, there were two (possibly three) 30 kt observations. There were no observations both south of the center and within 2 degrees longitude of the center until 12Z on the 22nd. Therefore, the possibility that west winds existed and thus a closed circulation cannot be ruled out. Even though the observation at 12Z on the 22nd was a 5 kt south wind, it was located about 35 nmi ESE of the center. Therefore, even on the 22nd, the possibility that west winds existed south of the center cannot be ruled out. The two 30 kt observations occurred at 21Z on the 21st and 06Z on the 23rd. There is another observation on HWM at 12Z on the 22nd – it is uncertain whether this observation is 25 kt or 30 kt. No intensity changes are made to the intensities from the original HURDAT. The genesis time is not changed. Observations plotted on the 23rd at 12Z are sufficient in coverage to indicate that the circulation is likely not closed, so no changes are made to the dissipation timing. Southward track changes of 1.5 degrees are implemented from 18Z on the 20th through 18Z on the 21st based on the data that is available. Track changes are less than 1 degree from 06Z on the 22nd through 06Z on the 23rd.**

1934 Storm #5:

1. The committee concurs with the proposed changes.

**Thank you.**

2. The track map does not seem to have the initial tropical storm stage.

**This will be corrected with the creation of the final track map.**

3. In the last paragraph of the metadata discussion, there is the following sentence: “At this point, the cyclone turned toward the west, and thereafter the southwest moving slowly so that the center and the RMW stayed offshore.” Something needs to be modified here, since it is implied that the reason the RMW stayed offshore is that the cyclone was moving slowly.

**This sentence has now been modified.**

1934 Storm #6 (new):

1. The committee is split on whether to accept this system as a new tropical or subtropical cyclone, as the data is currently ambiguous over whether the cyclone became non-frontal enough to be considered tropical or subtropical. The committee would like to see a detailed thermal analysis to help answer this question.

**An isothermal analysis in increments of 5°F have been plotted at 12Z each day from 31 August – September 3. On September 1 at 12Z, there was no cold air near the cyclone. The observations suggest that there were likely no fronts within about 250 nmi of the center. There might have been a weak cold or stationary front well southwest of the cyclone with the northeastern end extending to near 26N, 74W, but this boundary is only marked by winds shifts, as temperatures were in the 80s on the northwest side. There may have been a weak warm from well northeast of the cyclone with southwest end near 32N, 65W. But the cyclone was near 30N, 71.5W and the wind structure appears symmetric enough that this system should be considered a tropical cyclone (or a subtropical cyclone) on 1 September. On 2 September, temperatures well north and west of the center were about 78°F while they were about 82°F on the southeast side. The cyclone was centered near 31.6N, 73.6W. There appears to be a weak WSW-ENE warm front extending ENE of the cyclone with WSW end perhaps 100-150 nmi from the cyclone. However, there does not appear to be a cold front anywhere near the cyclone. The circulation appears larger and broader on the 2nd, but within 100 nmi of the center the structure was slightly tighter with stronger winds. This was likely either a tropical or subtropical cyclone on the 2nd. On the 3rd at 12Z, the cyclone just made landfall and was located near 35.4N, 76.5W. There is a significant temperature gradient across the cyclone from SE to NW, but this may be more forced because of the underlying sea surface temperature structure of warm over the Gulf Stream to cool over the shelf waters west of the Gulf Stream along the coast of New Jersey through New England. Therefore, it is difficult to tell if the cyclone is tropical or extratropical on the 3rd just by looking at temperature. The structure is symmetric enough to be considered a tropical cyclone (or subtropical) with cyclonic winds within 4 degrees of the cyclone (no true fronts appear to be located within 4 degrees of the cyclone either). The strongest winds were located within 120 nmi of the center. The cyclone contained a distinct minimum in surface pressure with higher pressures surrounding the cyclone on all sides. Taking all of these factors into account, the cyclone is analyzed as tropical from genesis through landfall. Observations on the 4th indicate the cyclone remained tropical until dissipation, which occurred before a strong cold front reached that longitude late on the 4th.**

2. The MWR table of ship reports (page 304) shows a force 8 observation near 30N 68W on 30-31 August that may be related to this system. Please include in the daily metadata if relevant. Since the MWR track chart has a low present before 31 August, should the track be extended further back as an extratropical low?

**This ship, listed in the MWR table as the Princeton, Am. S.S., was located at 29.9N, 68.3W at 13Z on 30 August. The same ship is also listed in COADS with ship identifier US105576. This ship was enroute to New York City (40.7N, 74.0W) and was therefore was traveling north-northwestward. The 35 kt NE gale was recorded on the 31st at 12Z at 32.5N, 70.2W according to COADS. In the daily metadata paragraph for the 31st, the 35 kt NE wind from this ship is already listed.**

**Regarding the comment whether to extend the track back in time before 00Z on 1 September: At 12Z on 31 August, the winds on the southeast side of the front/boundary are mostly mainly SW, and the winds on the northwest side of the front/boundary are mostly mainly NE. The observations at 12Z on the 31st depict an elongated front/trough oriented SW-NE extending from the northwest Bahamas near 26N, 78W to Bermuda near 32N, 65W to 36N, 61W. On 1 September at 00Z, observations show that a closed low was forming near 29N, 72W. Even though there is only a slight temperature gradient across this front/boundary (about 5 degrees), the wind structure in the region is indicative of a frontal structure. The timing of the first point in HURDAT will remain 00Z on 1 September; however, the first point will be shown as extratropical, transitioning to tropical at 06Z on the 1st. The analysis conducted at 00Z on 1 September indicates a position near 28.8N, 72.0W (we had previously analyzed 29.7N, 70.5W at that time). The following positions are changed: Sep 1 00Z: change from 29.7N, 70.5W to 28.8N, 72.0W. Sep 1 06Z: change from 29.8N, 71.0W to 29.4N, 71.5W.**

3. What was the basis of the 45 kt peak intensity?

**The basis for the 45 kt peak intensity is that there were two different ships that recorded winds of force 9 (40 kt) in association with the cyclone. The latter of the two 40 kt observations occurred at 09Z on the 2nd. The first one occurred sometime during the 1st (EST). Therefore, it might have occurred as late at 04Z on the 2nd, but it might have occurred earlier. Taking into account under-sampling, we typically choose the intensity 5 kt higher than the highest observed winds. Later on the 2nd and on the 3rd there were a few more 35 kt observations.**

1934 Storm #7 (originally #6):

1. In the 7 September daily metadata, what is the significance of the “A like force (force 10)…” sentence? Please clarify.

**It was copied as a quote from MWR. This has now been edited and clarified.**

2. There are several places in the daily metadata where the quotations from the MWR are not included in quotations marks (possibly including point 1 above). Please fix this here and wherever else it may occur.

**Quotes have now been added.**

3. Can any more information be found about the 967 mb observation from the *Albert Watts*? There are two ships near or inside the RMW on 7 September that suggest a higher central pressure, and they are not in good agreement with the 967 mb ob. In addition, if the 967 mb ob was not a central pressure, then the peak intensity could be higher that currently analyzed.

**The table on p. 457 of the 1934 MWR agrees with the MWR September 1934 tracks of cyclones chart in that both indicate a pressure of 967 mb. The Chart of p. 457 indicates that the lowest pressure recorded during the lifetime of this tropical cyclone was from the ship *Albert Watts* and the value was 967 mb. The September tracks of cyclones chart shows a 967 mb pressure on 7 September. Therefore, we are reasonably certain that the 967 mb pressure value occurred on the 7th and that it was measured from the ship *Albert Watts*. However, there is no more information on the ship *Albert Watts* other than the value (967 mb), and that it occurred in association with this tropical cyclone (likely on 7 September).**

4. Even if the 967 mb ob is a good central pressure, the committee has mixed feeling about the peak intensity. On one side, it is noted that the N of 25N wind-pressure relationship gives an 88-kt intensity for 967 mb, while the intensifying subset gives 92 kt. Why was 85 kt chosen instead of 90 kt? On the other side, there are apparently no reports of hurricane-force winds from the ships with 982 mb and 979 mb pressures, which argue for a less intense cyclone. Please re-examine the intensity on 7 September, with emphasis on how far the observations were from the center/RMW and the size of the RMW.

**It is indeed intriguing that neither of the two ships that reported 982 and 979 mb at 15 and 16Z on the 17th reported any winds higher than 45 kt. There is a very small possibility that neither of the two ships traveled inside the RMW. A more likely scenario is that the reported wind speeds from both ships might have been too low. An analysis at 12Z on the 7th indicates an OCI of about 1011 mb with an ROCI of 150-175 nmi. The forward speed of the cyclone was 10 kt. The ship data suggests that the RMW may have been about 25 nmi with a relatively large uncertainty. The climatological RMW for that latitude/central pressure is about 22 nmi. Because the wind data looks a little bit suspiciously low with these two ships, it is rather difficult to estimate a central pressure from them with too much confidence. There probably is enough reliable data from the ship Orizaba to say that the 979 mb observation occurred inside the RMW, but it may have occurred just inside the RMW, and perhaps the central pressure was already close to 967 mb by 16Z on the 7th. It may be that the MWR table stating that the lowest pressure experienced by the ship Orizaba was 979 mb is incorrect. At 14Z, winds were reported as 45 kt E with missing pressure. At 16Z, winds were reported as 30 kt W with 979 mb pressure. The 180 degree wind shift in 2 hours suggests that the Orizaba likely passed near or through the center. The missing pressure at 14Z suggests the possibility that the ship did not begin reporting its pressure until 16Z, when the 979 mb was recorded, which is why the MWR table lists 979 mb as the lowest pressure for this ship. The Orizaba likely experienced a pressure lower than 979 mb around 15Z. Because of this, it is recommended that the intensity should not be decreased from this submission.**

**As for the 967 mb pressure from *Albert Watts*, it is uncertain whether this is a central pressure value. Because of this, we will choose 90 kt for the peak intensity rather than 85 kt as previously shown.**

**The following intensities have been changed:**

**9/7 06Z: changed from 75 to 80 kt**

**9/7 12Z: changed from 80 to 85 kt**

**9/7 18Z: changed from 85 to 90 kt**

5. There is a typo in the 8 September daily metadata: “Sand hook” should be “Sandy Hook”.

**This has now been corrected.**

6. It is noted that the minimum pressure in New Haven, Connecticut, was 1005 mb, and this occurred during a period of light winds between stronger easterly and southwesterly winds. Is this good enough to be considered a center passage, and, if so, what does this mean for the intensity at that time? Are there lower pressures available from other stations in New England near New Haven?

**After a reassessment of the data, New Haven is analyzed to be inside the RMW when its minimum pressure of 1005 mb was recorded at 0415Z on the 9th. Also, the wind data from New Haven (41.3N, 72.9W) suggests that the center passed west of that station. We previously listed the CT landfall at 41.2N, 72.7W, but this landfall longitude is changed to 73.0W because the winds appeared to have veered at New Haven from east to southwest. From this data, a 1003 mb central pressure is analyzed for the 04Z landfall on the 9th. This central pressure equals 44 kt according to the Landsea et al. (2004) north of 35N pressure-wind relationship. The speed of the cyclone was 18 kt and the environmental pressure was very high, so the 50 kt intensity assessed before is not changed.**

7. On a related note, is it possible that extratropical transition occurred earlier that the proposed track indicates? The thermal structure of the cyclone near New England is not well documented in the metadata.

**More temperature observations were obtained. At 00Z on the 9th, extratropical transition was likely underway but not yet complete. The temperature at 00Z was 71F in Philadelphia, 64 in New York City, 73 in New Haven, CT, 63 in Boston, and 71 to 73 from ships near 40.5N, 72.5W. Although there appears to be a 5 to 10 degree temperature gradient across the cyclone by 00Z, strong winds are still found close to the center at that time, such as the winds recorded from New York City. An analysis at 12Z on the 9th reveals that the system should definitely be considered extratropical at that time. The temperature at Quebec City was 54 degrees while temperatures at Boston and New York City were 68 degrees. After this additional data was obtained and the additional analyses were conducted, the time of extratropical transition is changed to 06Z on the 9th.**

8. Even if the proposed intensities are approved, the track map currently shows the system remaining a hurricane until well into Connecticut. This should be corrected.

**The track map will be revised once the final version of HURDAT is approved.**

1934 Storm #8 (originally #7):

1. The MWR (page 351) mentions a ship with force 9 winds on 17 September. In the post-season summary table on page 457, the MWR mentions a 50 mph report from the ship *Selene*, but does not give a time or a location. (Note: This is the same ship that encountered the next storm!) Since this the main observation in determining that this is a tropical storm, is there any way to find out whether they are one and the same?

**It appears likely that the force 9 report received by mail mentioned on p. 351 is likely the same report as the Selene as listed on p. 457. The table on p. 457 is published at the end of the year, so they would have had time to receive the mail report by then, but perhaps it was not received in time to make it into the table of ocean gales and storms for September, 1934. Going under the assumption that they are the same report, p. 351 mentions that the report occurred on the 17th of September. There is no other way to find out with 100% certainty whether it is the same report. It is quite coincidental that this is the same ship that encountered the next storm.**

2. Two of the committee members have concerns that this system was never a tropical storm. However, the data distribution does not appear to be good enough to justify overturning the existing HURDAT record.

**West winds of 10-15 kt at San Martin on the 18th with a pressure that appears to be around 1008.5 mb strongly suggest that the tropical cyclone was located north of St. Martin at 12Z on the 18th. Back on the 16th, there were west winds at Barbados. The force 9 report occurred on the 17th. The pressure at Dominica was 2.5 mb lower on the 17th at 19Z than on the 18th at 19Z. There appears to be enough data to justify keeping the system in HURDAT. Additional, during the times when the data distribution is not as complete, there is not enough evidence to justify overturning the existing HURDAT record.**

3. The committee concurs with the changes in the track during the latter part of the cyclone’s life. Is it possible to smooth the track a little bit on 19-20 September?

**Yes, it is possible to smooth the track some. The following positions are changed:**

**9/20 00Z: change from 22.0N, 67.8W to 21.9N, 67.9W.**

**9/20 06Z: change from 23.2N, 68.6W to 23.0N, 68.8W.**

**9/20 12Z: change from 24.3N, 69.5W to 24.0N, 69.8W.**

**9/20 18Z: change from 24.5N, 70.7W to 24.4N, 70.9W.**

4. A better binder map is needed for 21 September, which is centered on the wrong area.

**Agreed. A new HWM map for September 21 has been printed out for the correct area.**

5. In the metadata summary, 10th line from the last, change “cyclone contained a weak…” to “cyclone maintained a weak…”

**Done.**

1934 Storm #9 (originally #8):

1. The committee concurs with the proposed changes. The metadata should include some note about a higher than normal uncertainty about this system due to the lack of data, especially on and before 1 October.

**(Now, Storm #10) A sentence has now been added to the metadata summary that addresses this point.**

2. In the metadata discussion, lines 17-19, there is an incomplete or misprinted sentence “Backtracking to the first point for this storm (…).” Was there an intention to include some additional points prior to the first one in the original HURDAT, which showed an initial intensity of 60 kt?

**There was no intention to include any points prior to the original HURDAT genesis time. What was meant was that since a 70 kt intensity is analyzed at 00Z on the 2nd based on a piece of data, the 60 kt intensity listed in HURDAT originally 12 hours earlier seems reasonable, and thus should not be changed. This has been made clearer in the metadata.**

3. Is the 1022 mb pressure for the ship report on 3 October possibly too high? This possibility should be reflected in the metadata.

**After analyzing a time series of this ship again, it has been determined that COADS likely contains an error – this ship observation likely occurred at 03Z on 2 October, not 03Z on 3 October as listed in COADS. The position reported for this observation is where the ship was likely located at 03Z on the 2nd. At 03Z on the 2nd, with the ship located at 30.9N, 45.2W and reporting 30 kt ENE with 1022 mb, the cyclone was located near 28.6N, 41.9W. This highlight has been corrected in the daily metadata. Since there is already a much bigger highlight listed on the 2nd, this observation is simply eliminated from the highlights on 3 October. No changes have been made to the HURDAT track or intensity based on the realization that this observation occurred on the 2nd rather than the 3rd.**

1934 Storm #10 (originally #9):

1. The committee generally concurs with the downgrade of the intensity south of Cuba, with one reservation: Is the data good enough to rule out the possibility that a small center moved through the Yucatan Channel without tropical-storm-force winds affecting land?

**(Now, Storm #11) There were approximately 18 observations within 2 degrees lat/lon of the center between 12Z on the 1st through the end of the day on 2 October. The strongest wind of all these observations was 15 kt and the lowest pressure was 1010 mb. If the cyclone had already been a tropical storm by the 1st or the 2nd, it would have been likely that one of those ships would have recorded somewhat higher winds and somewhat lower pressures. Also, US Weather Bureau Daily Weather Maps did not mention that the low was definitely closed until 4 October, suggesting that it was likely very weak before that time. Therefore, no additional changes are made to the intensity.**

2. There are issues with the ship reports on 3 October. The report of 1005 mb with winds W 10 kt is well to the northwest of the proposed track, and the 35 kt observation is at best several hundred n mi from the proposed track. Are the ship reports correct? Is it possible that the center is farther north? Please re-examine the data to make sure the cyclone is in the right place and actually became a tropical storm on this day.

**It is possible that the 35 kt NE winds could be correct but it is not certain if that is directly part of the cyclone circulation. A time series of the ship that reported the 1005 mb with 10 kt west winds contains observations that do not match nearby observations and they are judged to be unreliable. Both the Daily Weather Maps and the Mexican Maps show the center was south of 24N at 12Z on the 3rd. Other observations that are available suggest that the position is farther south, and it is not north of that the west wind observation. The intensity at 12Z on the 3rd is lowered from 40 to 35 kt due to the exclusion of both of these observations from the analysis. But there are not enough observations near enough to the center of the 3rd to apply a further decrease in intensity.**

3. The HWM show a baroclinic zone in close proximity to the storm from 3 October onward. Yet, this is not mentioned in either the daily metadata or the metadata summary. Please analyze the thermal structure to make sure this system did not become extratropical before landfall, and include comments on this in the appropriate metadata sections.

**The daily summary with the frontal analyses of the HWM has been added in. Thermal analyses have been performed at 12Z each day from the 3rd – 5th in increments of 5F. It appears that on the 3rd, there might have been a weak WSW-ENE front located ENE of the cyclone. The WSW end of this front appears to have extended to a couple hundred nmi ENE of the cyclone. By the 4th, the front moves further away from the cyclone and weakens.**

4. What is the source of the 56 m anemometer height at Pensacola?

**MWR p. 392 says that the anemometer at Pensacola is 185 ft above ground level, which converts to 56 m. A book that we have that lists all of the anemometer heights indicates that the anemometer at the Pensacola WBO was at 185 ft from 1916 to 1939.**

5. There is no data that directly supports a peak intensity of 50 kt. Is the data density sufficient to rule out the 50 kt peak intensity in the original HURDAT?

**A 45 kt wind was recorded from a ship at 18Z on the 5th. A 50 kt intensity is therefore selected at that time due to under sampling and the likelihood that the strongest winds were not measured.**

**Based on comments # 2 and 5, the intensity is lowered on 3 and 4 October. After reassessing the data from 4 October, the intensity at 12Z on the 4th is decreased to 45 kt. There is enough evidence and observational coverage to say that the intensity did not reach 50 kt until the 5th. The peak intensity of 50 kt is now analyzed from 06Z-18Z on the 5th. The previously analyzed intensities from 12Z on the 3rd through 00Z on the 5th are all decreased by 5 kt. The following intensities for this cyclone have been changed:**

**10/3 12Z: decreased from 40 to 35 kt.**

**10/3 18Z: decreased from 45 to 40 kt.**

**10/4 00Z: decreased from 45 to 40 kt.**

**10/4 06Z-18Z: decreased from 50 to 45 kt.**

**10/5 00Z: decreased from 50 to 45 kt.**

1934 Storm #11 (originally #10):

1. The committee has concerns about the genesis time. The HWM for 1200 UTC 19 October show a broad and elongated low pressure area without strong winds, and there is good data coverage on the eastern side of the low. Please examine the possibility that genesis occurred later on 19 October, or even on 20 October.

**(Now, Storm #12) After a re-examination of the data, it has been determined that there is not enough evidence that genesis occurred prior to the time shown in HURDAT originally to begin this cyclone early. Therefore, instead of showing genesis at 12Z on the 19th (as shown previously), the original HURDAT genesis time of 18Z on the 19th is retained.**

2. On 20 October, the binder map shows west winds 20 mph and 1007.5 mb at Montego Bay, Jamaica, southwest winds 20 mph near Guantanamo Bay, Cuba, and northeast winds 25 mph from a ship near the Cayman Islands. This suggests the possibility of a circulation near southeastern Cuba at the time of the 1001 mb ship report southeast of Jamaica. Is this the actual circulation of the cyclone, or another system?

**After further analysis, it is found that the cyclone was not located near southeastern Cuba and there wasn’t another system near southeastern Cuba either. The observation of 20 mph SW winds near Guantanamo Bay, Cuba is either erroneous or incorrect. Winds are southeasterly 1 degree east of that location. A reexamination of all the observations on the 20th indicates that the center is definitely some distance south of eastern Cuba. The question that still remains uncertain is whether the center is north or south of Jamaica. The observation from Kingston and the 1001 mb ship suggest it is south of Jamaica at 12Z. The other observations north and west of there suggest the center is north of Jamaica. There is a greater chance that the Kingston observation is correct more than the Negril Point observation, especially since Negril Point did not report the day before or the day after. If the Negril Point wind direction was 180 degrees in the wrong direction, then all of the data would support the cyclone being located south of Jamaica. It is possible that the position of the pressure of the 1001 mb observation is slightly in error, but there is no evidence that would provide reasoning as to what/how this observation is in error, and it might be correct.**

3. The 1001 mb observation is the only data that currently supports calling this system a tropical storm. Are there any other observations available from that ship to determine how good that pressure might be?

**There is no other data available from that ship or other ships to determine how good that pressure might be. It might be good. It might not be.**

4. The 21 October metadata quotes Perez as stating this system had tropical storm impacts in Cuba. Please try to find out what data Perez had in making that determination.

**Perez has been contacted for some additional information regarding this system.**

5. Give the broad nature of the system, it is possible that the winds could be less than 45 kt even for a central pressure near 1000 mb. Please re-evaluate this.

**Given the broad nature of the system, along with the lack of observed tropical storm force winds, and the possibility that the 1001 mb observation might be bad, agreed to reduce peak intensity to 40 kt, as shown in the original HURDAT.**

6. Is it possible that the system never had tropical-storm intensity after leaving Cuba?

**It is possible that this system never had tropical storm intensity after leaving Cuba, but the observational coverage is not as good during that time, so there is not enough evidence to decrease the original HURDAT intensity of 35 kt. However, this possibility has now been mentioned in the metadata summary.**

7. Is the track adjustment on 23 October an eastward or a southeastward adjustment?

**It is a southeastward adjustment. From 06-18Z on the 23rd, southeastward adjustments of approximately 1.5 degrees are implemented.**

1934 Storm # 12 (originally #11):

1. The committee has concerns about the 955 mb from the ship *Malacca* and the lack of documentation over the exact time and location. While it is certainly possible that the report is correct, it is suggesting a very unclimtatological intensity and thus needs to be closely examined. Is there any other data available on this ship that would help determine the accuracy of this ob? The committee notes that no ship other than the *Malacca* reported data that unambiguously supports calling this cyclone a hurricane. Even if the ob is good, we need to have a better idea of when it was made to determine the time of the peak intensity.

**(Now, Storm #13) As stated in the metadata, since we know that the *Malacca* recorded a 955 mb pressure in this hurricane (MWR p. 457) and we know that the day this observation was recorded was 23 November (MWR November tracks of cyclones chart), that is enough information to increase the original HURDAT intensity on the 23rd. There is no reason to believe that the MWR table is fabricated. Unfortunately, that table did not list the position of the ship or the exact time on the 23rd when it was recorded. A likely reason why it was not included in the monthly gale table could be because the report was not radioed to the Weather Bureau in real time; that is, perhaps the report was received later by mail. Regarding the 2nd half of the committee’s comment, the HWM observation at 12Z on 25 November near 32N, 67.5W is force 12 (70 kt) N with 996 mb. Previously, the metadata paragraph for 25 November called this observation “>=50 kt”. This has now been corrected. This provides additional evidence of hurricane intensity.**

2. While the binder map for 30 November suggests a closed circulation still existed, it appears to be very weak – something that today we would call a remnant low. Perhaps a 20 kt intensity might be better near the end of the cyclone’s life on 29-30 November.

**On 29 November at 12Z, there is one 25 kt observation that is analyzed to be directly associated with the circulation. But after that, the highest observed winds are only 15 kt. Based on this, the 25 kt intensity is held on the 29th, but a 20 kt intensity is now analyzed beginning at 00Z on the 30th.**

3. In the metadata summary, line 18, change “is association” to “in association”.

**Done.**

1934 Additional Notes:

1. System #5: The committee thinks there is sufficient evidence to justify writing this up as a potential new tropical storm. Please provide the committee with all the appropriate binder maps, obs table, and metadata for this system.

**(Now, Storm #9) HWM maps were scanned and printed out. The COADS was plotted onto the HWM maps. Further analysis indicates that this system was likely a tropical storm. Therefore, it is recommended that this system is added to HURDAT. It has been added to the metadata as a new storm.**

**The analysis indicates that on the 18th, there is a closed low near the Cape Verde Islands and the system is begun as a tropical depression at 00Z. A single 35 kt gale was observed on this day at 18Z about 150 nmi north of the center. A 20 kt SSW wind with 1010 mb had been observed earlier on the 18th less than 100 nmi from the center. Observations on the 19th suggest the cyclone was located between 15-19N, 27-33W. Observations on the 20th suggest the cyclone was likely located between 18-22N, 33-38W. A 15 kt west wind on the 21st suggests the cyclone was likely located between 21.5-24.5N, 38.5-41.5W at 12Z. On 22 September, the front analyzed by HWM probably did not extend as far south as they plotted. The northeasterlies northwest of where the center is believed to be and the southeasterlies east of where the center is believed to be help place the center of the cyclone between 24-27.5N, 41-43.5W. On the 23rd, data is sparse, as on the 22nd; however, available observations suggest that the cyclone may have been located between 31.5-35N, 39-43.5W. On the 24th, a time series from a ship indicates that the cyclone was located near 39.8N, 39.7W at 12Z with a 1000 mb central pressure and a 4 degree temperature gradient across the low. The ship measured winds of 45 kt. The cyclone is analyzed to still be tropical on the 24th at 12 and 18Z, but likely undergoing extratropical transition. The cyclone is analyzed to have become extratropical at 00Z on the 25th with a 50 kt intensity near 42.0N, 38.8W. The cyclone is analyzed to have dissipated or merged with another system after 06Z on the 25th.**

**Two important points about this system are:**

1. **It is not certain that the cyclone near 40N, 40W on the 24th is the same cyclone as the one near the Cape Verde Islands on the 18th, but the analysis indicates they are likely the same system.**
2. **Regarding the timing of extratropical transition, if this cyclone had become extratropical by 12Z on the 24th, then this system could not be added to HURDAT because there would only be one piece of evidence of tropical storm intensity during the tropical portion of the lifetime (on the 18th). Since we have evidence on the 24th between 11Z-23Z of gales and low pressures, and since extratropical transition is analyzed at 00Z on the 25th, there are multiple pieces of evidence of tropical storm intensity.**

2. System #4: The committee would also like to see this system written up as a possible tropical or subtropical storm.

**HWM maps were scanned and printed out. COADS data was obtained and plotted on HWM maps. After further analysis, it is recommended not to add this system into HURDAT because the cyclone is analyzed as extratropical throughout its lifetime.**

**This system was a closed low from 14-18 September, and it is analyzed to have been an extratropical low throughout its lifetime. It was frontal from the 14th through at least the 15th and maybe to the 16th. On the 16th, very light winds prevailed within a couple degrees of the center and the structure was too broad. On the 17th and 18th the structure was broad and elongated as well. Even though the low may not have been frontal from the 16th-18th, there was still a significant temperature gradient across this large, broad, elongated low. There were three gales, but no low pressures observed for the entire lifetime of the system. 35 kt (COADS) on the 16th located 170 nmi from analyzed center; 35 kt (COADS) on the 17th located 310 nmi from analyzed center; 60 kt (MWR ship gale table) on the 18th located 360 nmi from analyzed center. The most important reason why this cannot be considered a tropical cyclone is the structure.**

3. System #6: The committee concurs with leaving this system out. However, the metadata should note that the MWR on pages 386-387 documents a ship that encountered storm-force winds on 7 October.

**Done.**

4. The committee concurs with leaving the other additional systems out of HURDAT.

**Agreed.**

5. There are a couple of typos in this section. For system #2, “COADS indicate that low existed” seems to be missing something. For system #3, all of the coordinates include .0, which is a departure from the format for the rest of these systems.

**For system #2, the word “a” was added between the words “that” and “low.”**

**For system #3, all of the .0s have been deleted.**