Best Track Committee Re-Analysis Comments for 1942

[Replies to Comments given in brackets, boldface, and indented – CWL/March 2013]

General comments:

1. The 1942 Monthly Weather Reviews (MWRs) has less than normal information on maritime storms, hurricanes, or ship data. Please check all the storms (e. g. the proposed new storm #1) to see how much the MWR contributed to the write-ups and remove the MWR reference from those systems where it did not contribute.

> **[While the Monthly Weather Review has less than usual information because of the World War, it is important to indicate that this source has been thoroughly vetted for potential information. Additionally, nearly all of the storms at the very least had the monthly Tracks of Lows figure with the rudimentary track information available.]**

1942 Storm #1 (new):

1. Does enough evidence exist to justify adding this storm to HURDAT? While the evidence is strong that a tropical cyclone existed, the criterion is to have two independent pieces of evidence that the system was a tropical storm. During the proposed life cycle, there is only one piece – the low pressure at Tampico on 5 August. If 1 August is taken as the genesis date, then the wind at Puerto Cabezas could be used as the second piece.

> **[The combination of the low pressure in Tampico and the described impacts in Mexico as reported in the Brownsville Herald are sufficient evidence that a moderate tropical storm (at the least) impacted northeastern Mexico on the 5th.]**

1a. On a related note, there are issues with these data. First, it is uncertain if the 40 kt wind at Puerto Cabezas was representative of a tropical cyclone or transitory. The other data in the area does not support a TC near Puerto Cabezas at that time. In addition, the Historical Weather Map (HWM) for 5 August shows a 40 kt/mph observation at Chetumal, Mexico which appears unrelated to any tropical cyclone. That raises questions as to what actually caused the Puerto Cabezas wind.

> **[It is agreed that the Puerto Cabezas wind is not sufficient to begin genesis of this system on the 1st due to the uncertainties mentioned which are now described in the metadata.]**

Second, the Mexican weather map in the binder does not have a Tampico pressure on the table at the bottom – even though the map shows a low with a pressure below 1002 mb over Tampico. While there is no obvious reason to question the HWM pressure, it is interesting that the Mexican report does not list it as well.

[It is unknown why the Tampico pressure was not listed. However, the low pressure and impacts described in the Brownsville Herald are quite consistent with (at least) a moderate tropical storm making landfall in northeastern Mexico.]

1b. It is recommended that the Mexican Weather Service be contacted for more detailed data from Tampico and any other information they have on this system.

[The Mexican Weather Service does not have any additional information beyond the daily synoptic maps which have already been utilized.]

1c. The binder contains a newspaper clipping (misfiled with storm #2) about a "hurricane" that made landfall near Tampico that corresponds to this storm. This is suggestive that the system was of tropical storm strength at landfall, but is not the quantitative data needed to justify this addition.

[The impacts described in the newspaper article are consistent with the system being (at least) a moderate tropical storm at landfall. Keep in mind that the reason for two independent pieces of information to establish a system as a tropical storm is in case one (either a low pressure or a high wind) was simply a typographic error or an unrepresentative value. In this particular case, the impacts described in the newspaper article are consistent with the pressure value being valid. Thus we can be very confident that a tropical cyclone of moderate tropical storm intensity made landfall in Mexico on the 5th of August, 1942.]

2. Is it possible the proposed track is too quick to re-intensify this system over the Bay of Campeche? Please re-examine this in light of recent storms such as Harvey of 2011.

[Agreed.]

3. The committee withholds a decision on this system pending the resolution of point 1.

[Upon further review of the available information, this system very likely was a moderate tropical storm.]

1942 Storm #2 (old #1):

1. The committee is of two minds on the earlier genesis time. The surface maps show a closed circulation at 1200 UTC 17 August, and that combined with the 35 kt intensity at 1800 UTC supports an earlier start. However, there is no data to show the low was actually a tropical cyclone at 1200 UTC. The committee approves this change, but the uncertainty should be highlighted in the metadata.

[Agreed.]

1a. It should be noted that this system is very similar to several systems during the 1933 season – it is called a tropical storm in the original HURDAT even though the evidence for it is thin. If a track was being created from scratch, it probably wouldn't start until 19 August. However, there is insufficient data to justify changing or dropping the early parts of the track.

[Agreed.]

2. How far was the center from Port Arthur at the time of peak winds at the station? The maps suggest the station was not in the RMW, which means the 61 kt would support calling it a hurricane at landfall.

[The peak winds likely occurred around 15Z with Port Arthur being about 60 nm from the center of the hurricane. Given that the station was outside of the RMW (no lull occurred in the hourly winds), this also supports Category 1 hurricane intensity at landfall.]

2a. The Port Arthur Original Monthly Record (OMR) states that special reports on storm #2 and storm #3 were sent to the Climate and Crop Section of the Weather Bureau Offices in New Orleans and Houston. Have these reports been used in the re-analysis?

[Yes, these were included within the Texas and Louisiana Climatological Data and have now been incorporated within the metadata writeup for both storm #2 and #3. However, no additional quantitative information was obtained.]

3. The committee concurs with the new extratropical transition (ET) and the other proposed changes.

[Agreed.]

1942 Storm #3 (old #2):

1. The committee concurs with removing 21 August from HURDAT.

[Agreed.]

2. The almost total lack of data makes the time of genesis and how much more to remove from HURDAT problematic. It is noted that on the microfilm map for 0000 UTC 24 August, there is a note about a ship south of the Dominican Republic which encountered force 6 winds and lower than normal pressures. This suggests that genesis may have occurred on 23 August, although this is thin evidence.

[Agreed to begin genesis at 12Z on the 23rd, though it is acknowledged that the exact genesis time remains substantially uncertain.]

3. Could you please comment further on the "special plane report" seen on the 0000 UTC 26 August microfilm map and in the 25 August daily metadata? How much weight was this given in the re-analysis?

[This report is now transcribed in full in the daily section of the metadata and may have been one of the first – if not the first – quantitative aircraft measurement within a tropical cyclone. The 40-45 kt winds and 1000 mb pressure are consistent with the revised intensity estimate of 50 kt.]

4. It is noted that the 989 mb pressure at Cozumel at 0000 UTC 28 August has simultaneous 40 kt winds. Please note this where appropriate in the metadata. Has the Mexican Weather Service been contacted for more detailed information on the Cozumel obs?

[This has been noted within the metadata. The Mexican Weather Service has no further information on these Cozumel observations.]

5. Is the 1200 UTC 28 August HWM showing 10 kt at Merida, Mexico or 50 kt? The isobar covering the wind barb makes this hard to interpret. The binder table says 10 kt.

[The value is 10 kt, as is more easily seen in the microfilm for the same/date/time.]

6. While it appears likely that the minimum pressure in Seadrift was measured in the eye, is there any report that explicitly states this, or that it was calm at the time of the measurement?

[As described in the MWR: "Seadrift, in Calhoun County, where a fairly complete calm occurred, reported the lowest pressure along the coast, 951.6mb, August 30, at 4:55am." Thus while not explicitly stated, it is likely that this pressure value was measured at the time of "fairly complete calm".]

7. Where in the OMR is the documentation of the 64 kt wind at San Antonio, Texas? It shows in two different places that the maximum winds was 63 **mph**, with a text description stating this was an all-time record for the station. Place clarify this.

[The traditional metric for comparing long-term records in the 1940s was with the 5 min wind. This is in part because the old style anemometers that were phased out in the 1920s could not accurately record a shorter term time interval. But the anemometers in use from the 1930s onward were able to measure 1 min (and gusts) with more accuracy. In the OMR, the key page has hourly averaged winds with peak 5 min winds exceeding 25 miles per hour written in small notation above the hourly winds. (See 13 such entries on the 30th of August in the San Antonio OMR.) The "maximum velocity" for the day (fourth column from the right side) was 63 mph and these are the peak 5 min winds. The "extreme velocity" for the day (second column from the right side) was 74 mph and these are the peak 1 min winds. Thus it is true that the 63 mph set a new 5 min wind speed record for the station, it is also true that 74 mph (64 kt) for 1 min winds were also observed on this date.]

8. Is the proposed 85-kt intensity at 1200 UTC 30 August possibly too high? It should be noted that the Kelly Air Force Base, where a 77 kt wind was reported, is southwest of the San Antonio Airport and downtown San Antonio. This would put it closer to the center than the San Antonio ob and might support the higher intensity.

[Agreed that the Kelly Air Force Base observation supports the 85 kt intensity three hours after landfall of the 100 kt major hurricane. This is now so noted in the metadata writeup.]

9. Is there any evidence to justify calling the cyclone a tropical storm as far west as the Texas-New Mexico border? This seems to have been done strictly from extrapolating the previously increased intensities.

[Pecos, Texas recorded 1000 mb with NW 15 kt at 12Z on the 1st. This peripheral pressure suggests maximum winds of at least 44 kt from the Brown et al. north of 25N pressure-wind relationship. Given that this is valid over a water exposure, a lower intensity value of 35 kt is analyzed at this time. The system weakened to a tropical depression – as no extratropical transition occurred – around 18Z on the 1st and continued through 12Z on the 2nd. Thus an additional 24 hours are added to the lifetime of this system.]

1942 Storm #4 (old #3):

1. The HURDAT text for 26-27 August seems to be missing a line – either the new values or the old values. Please include them.

[No changes were introduced on the 26th and 27th of August. Thus the line is only shown once for each date.]

2. The HWM shows this system as a tropical storm as early as 24 August. While the HWM does not show a closed circulation, it does show two observations of northerly winds suggesting at least a trough near or northeast of the Leeward Islands. Please re-examine the genesis, and at the very least add a sentence or two on the 24 August HWM to the metadata discussion.

[The limited observations are somewhat suggestive that the system became a tropical storm as early as August 24th. However, without data showing a closed circulation (or strong winds or low pressures), providing an earlier genesis is not justified. Some additional discussion is added to the metadata.]

3. Are the obs that support a closed circulation on 3 September plotted on any map in the binder? The HWM for that day shows a closed low, but without any supporting evidence. The committee would like to see this before approving the track extension.

[Definitive observations of a closed circulation do not exist on the 3rd of September. However, with Bermuda showing N 20 kt with 1012 mb (down from 1014 mb the day before), it is very likely that the system did continue as a tropical cyclone on the 3rd.]

1942 Storm #5 (old #4):

1. Is it possible that the first part of this track needs to be moved farther south in light of the northeasterly winds at Barbados at 1200 UTC 25 August? Can other information be found from Barbados to help pinpoint this part of the track?

[Agreed to adjust the track farther south late on the 15th and early on the 16th. No other additional observations were taken from Barbados.]

2. Could you please add a sentence or two about the plane report on 20 September to the metadata summary?

[Done.]

3. The committee otherwise concurs with the proposed track and intensity.

[Agreed.]

1942 Storm #6 (old #5):

1. The committee does not concur at this time with adding the extra day at the start of the life cycle. The metadata summary states that observations suggest the system was non-frontal, but the only available observation on 17 September is a ship with an 80F temperature – not sufficient by itself to analyze a frontal structure. Please make a better case for this.

[Agreed to remove late on the 17th and early on the 18th from the best track. The HWM analyzed frontal boundary still looks quite erroneous, with an 80F ship measurement at 12Z on the 17th supposedly north of a cold front boundary.]

2. The committee concurs with the rest of the proposed track, including the new time of extratropical transition.

[Agreed.]

1942 Storm #7 (old #6):

1. The committee concurs with the proposed track and changes.

[Thank you.]

1942 Storm #8 (old #7):

1. The committee does not currently concur with the proposed earlier genesis. It is noted that a 15-20F temperature gradient existed between southern and northern Florida on the 1200 UTC 30 September HWM, suggesting that a significant baroclinic zone was present in or near the circulation. In addition, there appears to be insufficient data to the north and east of the low to make a definitive statement about the frontal nature of the system. Please re-examine this and make a stronger case, if possible.

[While it is the case that a significant temperature gradient existed over Florida, this temperature gradient/cold air advection did not extend to the vicinity of the cyclone. As seen in the microfilm map for 12Z on the 30th, the Bahamian observations and the couple of available ships show that the temperatures across the system were isothermal in the low 80s. Thus it is likely that the front did not reach the location of the cyclone and that the cold air advection remained substantially farther west.]

1a. The 1200 UTC 29 September HWM shows a low east of the Bahamas with some data to justify the analysis. Please examine this to see if it helps resolve the genesis issue.

[The HWM and COADS data were obtained for the 29th. While a low pressure may be in place on this date, the data is too ambiguous to conclusively close the system off. It is of note that the Bahamian pressures subsequently show a 3-4 mb drop on the next – 30th – day, consistent with genesis occurring then.]

2. Could you please add some amplifying detail about the observations that show ships #59049 and #22002 have low pressure biases? Also, please make sure that these biases were also taken into account at all times when these ships were used to help estimate the intensity.

[The bias for ship #59049 was determined at 12Z on the 2nd with two very closely located ships and Turks and Caicos station. The bias for ship #22002 was determined by the average of multiple close observations from Bermuda at 00 and 12Z on the 2nd and 00Z and 12Z on the 3rd. These biases have been taken into account in the reanalysis.]

3. Please re-examine the position at 1200 UTC 4 October. The ship data on both the HWM and the microfilm maps suggest the center is east of 55W.

[Agreed. The position is adjusted significantly more eastward to 54W.]

4. In the metadata summary, there is a statement about scarcity of observations and how the storm may have been a hurricane. Please re-write this to something of the effect of "Due to the lack of observations, it cannot be ruled out that this system became a hurricane".

[Agreed.]

5. The committee concurs with the remainder of the proposed changes.

[Agreed.]

1942 Storm #9 (old #8):

1. Please include a more detailed description of the large position changes on 10 October. Both the HWM and the microfilm maps suggest there is insufficient data to justify changes 2-3 degrees latitude. If a better case cannot be made, please use the original positions.

[Agreed to adjust the position 2-3 degrees latitude to the south on the 10th. Moreover, the initial position is adjusted now slightly northwestward for a more realistic motion.]

2. Please re-examine the time of the extratropical transition once the position for 10-11 are October are better refined. While the committee concurs on an earlier ET than originally shown, it is currently shown as occurring at 30-31N. This would be somewhat unclimatological.

[Agreed to have ET occur at 12Z on the 11th at 33N, which is 24 hours earlier than shown in HURDAT, but 12 hours after the draft reanalysis indication.]

3. Please remove the use of the tropical cyclone wind-pressure relationships for an extratropical system in the metadata summary. Instead, please try to better use the existing wind data to justify the 45 kt intensity as an extratropical cyclone.

[Agreed.]

4. The committee concurs with the rest of the proposed changes.

[Agreed.]

1942 Storm #10 (old #9):

1. The committee does not concur with the proposed new genesis time and early track for this system. The available observations show only a broad low pressure area, which is a common occurrence in the Caribbean in October. There is also a comment in the Jamaica summary stating there were no significant disturbances during the month. Please make a stronger case that this low was actually a depression on 12-13 October (see point 1a below).

[Agreed to not begin genesis on the 12th. Genesis is now shown at 12Z on the 13th, six hours earlier than that shown in HURDAT. The key piece of evidence is the 1006 mb and 10 kt SSW in Santiago de Cuba at 18Z on the 13th, which indicates that

the system was just making landfall a couple of hours before this time. Rather than showing the first point over Cuba, a position between Cuba and Jamaica is indicated at 12Z.]

1a. Looking at the observations, it is difficult to reconcile them with either the proposed new track or the original HURDAT track. On the microfilm map at 1800 UTC 12 October, the northwest winds in the Cayman Islands suggest a center between there and Cuba. On the 0000 UTC 13 October map, the southwest winds on the south coast of Cuba suggest a center near that station. On the 0600 UTC 13 October map, the north winds at Kingston, Jamaica are not at all consistent with a tropical storm northwest of the island. On the 1200 UTC 13 October map, the winds over southeastern Cuba are southerly for the most part, which is not consistent with a center to the southwest. It is only when the system reaches southeastern Cuba at 1800 UTC 13 October than the data shows it well. However, even then the winds north of the storm over the Bahamas are from the south, which is not consistent with a tropical storm over southeastern Cuba. Please re-examine every aspect of the genesis of this system, including the possibility it formed farther north and had a more eastward component of motion originally.

[It is agreed that the system still was somewhat elongated at 12Z on the 13th. But given the evidence for a tropical cyclone (over Cuba) is strong at 18Z, genesis at 12Z on the 13th appears to be the best solution given the uncertainties. It is also mentioned in the metadata writeup that another possibility is that the system became a tropical cyclone on the 14th over the Bahamas, instead of just south of Cuba on the 13th.]

2. Is there any evidence that the system was actually a tropical storm over Cuba other than the 1006 mb pressure? What evidence does Perez have? It is noted that a 1006 mb low in the environment this system was embedded in does not guarantee it was a tropical storm.

[It is agreed that given the slow movement and low environmental pressures that beginning the system as a tropical depression and having it make landfall as a tropical depression in Cuba is reasonable. Perez did not have any additional information on this system.]

3. Please re-examine the proposed extratropical transition scenario. The microfilm maps clearly show a baroclinic low moving northeastward over the Carolinas on 16-17 October. The data does not allow subsequent tracking until the 0600 UTC 18 October map, where it is shown near southern New England. That is not unreasonable given where it was at 0600 UTC 17 October. Due to this, the MWR scenario may be correct. Unfortunately, there may be insufficient data to determine the actual evolution. Note that changing the ET scenario could significantly change the time of dissipation in both the proposed and original tracks.

[It is agreed to go with the scenario depicted by the MWR. Absorption of the system after 18Z on the 18th is indicated (same as in HURDAT), but with positions on the 18th close to that suggested by the MWR. The significant uncertainty in the exact evolution in the system is described in the metadata.]

1942 Storm #11 (old #10):

1. Are microfilm maps available for this system? The metadata says they were used, but there are none in the binder. Please provide them if available.

[Unfortunately, the microfilm maps are not available for November 1942. The metadata writeup is now corrected.]

2. As with the previous system, is there really sufficient evidence to say this was a tropical depression on 4 November? The data suggests a low pressure area was there – more of one than analyzed on the HWM. However, there is only one report of a wind as high as 25 kt on 4 November, and that is at 00Z well to the north of the proposed center. Please re-examine the data to make a stronger case for the earlier genesis.

[It is agreed to retain genesis at 00Z on the 5th as originally shown in HURDAT. It is mentioned that the system may have begun on the 4th, but that the data are inconclusive.]

3. In the 9 November metadata, there is a passage about the system emerging into the bay of Campeche. This probably needs to go after the passage about the Belize landfall. Alternatively, should the Belize landfall passage be moved to the 8 November section?

[Agreed to the primary suggestion.]

4. The committee does not concur with the proposed upgrade to major hurricane status at landfall in British Honduras/Belize. While the description of the damage is impressive, that does not readily translate into a quantifiable measure of the intensity. Has the Meteorological Service of Belize been contact for additional information on the hurricane? Also, would it be possible to check the SPLASH surge model data against the observed storm surge to see if that helps with the landfall intensity determination?

[It is agreed to not upgrade the intensity to Category 3. A Category 2 intensity is retained, though it is mentioned that the cyclone may have been stronger. The Belize Meteorological Service does not have any additional information regarding this hurricane. Without additional quantitative information on the storm surge heights, utilizing SPLASH will not be of use in determining the intensity.]

1942 Additional Notes:

1. For the June system in the Gulf of Mexico, the surface maps show that the pressures are low (~1005 mb), and the MWR shows 25-30 mph winds at Appalachicola, Florida and New Orleans, Louisiana (monthly highs). These should be mentioned in the write-up. Are microfilm maps available for this system?

[Agreed to mention these pressures and winds. The microfilm maps are not available for June 1942.]

2. For the October system in the Atlantic, the HWM for 16 October shows data from the northeastern Caribbean islands that support the system having a closed circulation with a central pressure near 1008 mb. This should be mentioned in the write-up.

[Agreed.]

3. The MWR mentions a disturbance near the Bahamas on 12 September. The HWM shows a trough/tropical wave, which may have featured a weak low pressure area for a time. This system was not likely a tropical storm, but it should have a write-up in the suspects section.

[Agreed.]

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

[Agreed.]