Best Track Committee Re-Analysis Comments for 1948
Replies to comments provided by Andrew Hagen/Chris Landsea in boldface – Dec. 2013

General comments:

1. For the suspect cases, could you please explicitly state whether COADS has been checked? I suspect that the answer is yes in all cases, but many of the write-ups do not explicitly state it.

All of the suspect cases except the last one (#15) did include a search of the COADS database. This has now been explicitly mentioned in the first 14 suspects.

2. There are many examples through the submission where the changes are proposed, yet there is no evidence or arguments included to justify the changes. There is quite noticeable in the metadata summary for Storm #1, in which several significant changes are made without providing any information about the basis for the changes. Please review the submission and add an explanation for each proposed change that does not already have an explanation included.

The substantial changes are now explicitly discussed and justified for each tropical cyclone.

1948 Storm #1:

1. Given the lack of evidence that this system was a tropical storm other than the estimated winds from an aircraft, is it possible that the 45 kt peak intensity is too high?

On the 25th, two separate ships measured 30 kt with 1004 mb and 1007 mb, while located 90 and 150 nm from the storm's center, respectively. Given the aircraft's visually estimated winds were 45 kt, along with these two peripheral ship observations, as well as a preexisting 45 kt in HURDAT, this 45 kt intensity is retained.

2. What is the basis for keeping the system as a tropical storm for an extra 18 hours on 28-29 May given the total lack of gale reports either day?

It is agreed to retain the original weakening to a tropical depression by 06Z on the 28th.

3. (Pasch) Please include the justification for the large westward adjustments to the track on 23 May (assume they were based on surface observations from Grand Turk or elsewhere).

The position was altered two degrees to the west on the 23rd – a major change - when it is was in the vicinity of the Turks and Caicos Islands based upon ship and station observations.

1948 Storm #2:

1. The committee notes there is a ship report of northwest winds 25 kt/mph at 1200 UTC 7 July south of the central coast of Louisiana. Is this an indication of a possible earlier genesis?

The ship observation of 25 mph NW does not appear to be an indication of an earlier genesis time. Looking at the observations from around 12Z as well as the observations prior to 12Z on the 7th, there appear to be no observations with easterly wind components in the northern semicircle during the entire time (with the exception of a weak SSE wind from Mobile, AL at 12Z) The weak SSE wind from Mobile does not appear to be enough evidence to close off a circulation. Therefore, there does not appear to be enough evidence to indicate an earlier genesis time.

2. It is not clear from the current data that this system was actually a tropical storm. There are no observations of tropical-storm-force winds, and the strongest winds at Pensacola may have been a convective gust. Please look for more data in the area affected, including the Mobile OMR, any available report from the Pensacola Naval Air station, and any available report from the various other civilian and military stations in the western Florida Panhandle. Is it known under what circumstances the 32-kt winds in Apalachicola was measured? The committee does not favor downgrading the system to a depression, but it is concerned about the lack of evidence about the intensity.

Data from Mobile OMR is available (below), but data from Pensacola NAS could not be found. The 32 kt 1 min maximum wind at Apalachicola was within an hourly averaged wind of only 17 kt, so it may have been a convective gust. The Mobile OMR shows a wind shift consistent with a potential TC passing to their east, but the winds are relatively light and the pressures are not very low.

Mobile OMR (Bates Field):
7/8 12Z: 6 kt ESE with 1013
7/8 18Z: 15 kt ESE with 1014
7/9 00Z: 13 kt E with 1012
7/9 03Z: 13 kt NE
(max 5-min wind between 7/9 03Z – 7/9 05Z: 17 kt NE)
7/9 06Z: 9 kt NE with 1012
7/9 08Z: 11 kt N
7/9 09Z: 12 kt NW
7/9 12Z: 14 kt NW with 1013
7/9 18Z: 17 kt WNW with 1015

Thus it is mentioned that the system could have been a high end tropical depression, rather than a 35 kt tropical storm at landfall.

3) (Pasch) Agree with the westward shift of the track to show landfall over Pensacola based on the surface observations from there. Shouldn't the 1007 mb pressure observed at Pensacola be considered a central pressure, and included in the revised HURDAT?

The 1007 mb pressure was accompanied by 30 kt SE wind (max for that station). Given that we do not know if it was at or inside the RMW, it would be preferable to not add in a central pressure value here.

1948 Storm #3:

1. The 26 August metadata summary is confusing. There is a reference to a 0330 UTC ship report of 997 mb and 40 kt, but no 0330 UTC map in the binder. Is this comment supposed to be for the 0030 UTC map? Please clarify this.

The 0330Z time is correct for the observation. The 0030Z map plots the observation with notation of "2230 E", which is 0330Z.

2. While the committee concurs with the earlier first time in HURDAT, it is puzzled as to how 60 kt was chosen as the initial intensity. Neither of the ship winds were that high, and the pressure wind-relationships (even using a possible 993 mb central pressure) does not justify it. Is 50-55 kt more appropriate? Please clarify this.

It is agreed to begin the system as a 55 kt tropical storm at 00Z on the 26th, with the realization that the system began in reality earlier than this time.

3. The binder has a list of coded messages from the reconnaissance aircraft on the afternoon of 29 August. Have these been decoded to see if they contain information, especially pressure information that was not plotted on the microfilm maps?

These observations had all been plotted on the microfilm map. We were able, moreover, to decipher the code for the messages:

NAVY SEVENTEEN 94449 00001 10290 74865 01116 61364 00455 11000 01299 22699 51013 68749

"290" in "10290" – 29.0N latitude
"748" in "74865" – 74.8W longitude
"11" in "01116" – 1,100′ flight level
"04" in "00455" – 40 degree (NE) flight level winds
"55" in "00455" – 55 mph flight level winds
"1013" in "51013" – sea level pressure
"8" in "68749" – surface wind direction, 1=NE, 2=E, 3=SE,…8=N
"7" in "68749" – Beaufort surface wind scale, 7=40 mph

4. Please remove the statement in the metadata summary that says "This tropical cyclone is an example of one of the many cases in HURDAT in which genesis is not captured".

This was changed to: "The actual genesis of this event began earlier, perhaps substantially before 00Z on the 26th."

5. (Pasch) Although the time of extratropical transition for this storm was delayed by 6 hours, I believe it should be delayed even more. 39N is a very low latitude for extratropical transition at the beginning of September. I suggest keeping the system tropical through 1200 UTC 1 September, since the surface data at that time are not conclusive that the cyclone was actually frontal.

Agree to delay extratropical transition by twelve more hours to 18Z on 1 September.

1948 Storm #4:

1. The committee has a concern that this system was a fast-moving open wave rather than a tropical cyclone, even though there were clearly closed isobars in the pressure data. Has there been a search for data from the Lesser Antilles to see if westerly winds and low pressures were officially reported? It is noted in the 1 September daily metadata that Dominica reported "heavy westerly squalls", so at the very least that station should be checked for additional data.

The NCDC site was checked for Caribbean data, but detailed data is not available - only monthly averaged climate data. However, on the Aug 31 1830Z microfilm map, there is a light NW wind from Grenada. It is agreed to mention that this system may have been a fast-moving open wave, but given that the observations are ambiguous, the tropical storm is retained in HURDAT.

1948 Storm #5:

1. What is the basis for the earlier genesis on 31 August? The system looks more like a broad low pressure area than a tropical cyclone on that day.

Agreed to keep the time of genesis as shown in HURDAT originally, but to indicate the possibility of the system forming either on the 31st or early on the 1st.

2. Are detailed observations from Grand Isle available? In particular, it is important to know what the wind was at the time of the 990 mb minimum pressure. This would help determine the central pressure, the radius of maximum winds (RMW), and the landfall intensity.

Detailed observations were obtained for both Grand Isle and Burrwood. These were of limited assistance, given the somewhat sparse accounts and distance from the hurricane's center.

3. Please find whatever observations are available from the Belle Chasse Naval Air station, which likely was in the eastern or southeastern eyewall of the cyclone. They may help refine the track and intensity over southeastern Louisiana.

The Belle Chasse Naval Air station was not built until 1957. The base's predecessor, NAS New Orleans, occupied the current location of the University of New Orleans's principal campus until 1957. Observations from NAS New Orleans were obtained. These

measurements were quite helpful and have indicated a slight upward intensity (to 70 kt) boost is needed at landfall.

1948 Storm #6:

1. Does Tucker contain all of the official data from Bermuda during this storm? Please contact the Meteorological service of Bermuda to ensure all of the pertinent data has been collected.

Tucker is considered a secondary source. Bermuda (Director Kimberley Zuill) have provided additional observations from both Kindley Air Force Base as well as Fort George. These confirm that Category 2 conditions occurred in Bermuda, but did not necessitate any track or intensity changes.

2. While the committee concurs with the reduced intensities during the first part of this storm's life, it is wondering why the early intensities were set at 90 kt to begin with? Have Charley Neumann or other older forecasters been contacted for more information on this?

It is uncertain why intensity estimates were set at 90 kt to begin with on the 9th after the recon found a weak tropical storm on that day. Charlie Neumann has previously provided the project with all of his notes and relevant information and he has no additional information regarding this system.

3. Please better explain the basis for the addition of one full day during the extratropical phase.

The system remained in existence as a separate extratropical cyclone through 12Z on the 17th, based upon twelve hourly synoptic analyses. After 12Z on the 17th, the system merged with another extratropical low. This led to the addition of eighteen additional hours to HURDAT (from 00Z on the 17th through 12Z on the 17th).

4. Typo: In the second to last paragraph of the metadata summary, "New Foundland" should be one word.

This has been fixed. Thank you.

5. Please re-write the last sentence of the metadata summary. If the 135 mph and 940 mb were estimated, it is expected that the values were not measured.

This has been fixed. Thank you.

1948 Storm #7:

1. The committee has not yet reached a consensus on whether this system should be added to HUTDAT.

2. The proposed best track starts at the time the cyclone is proposed to have become tropical. Should the earlier extratropical phase be included as well?

It is agreed to include an extratropical phase at 12Z on the 7th. The system did not develop a well-defined closed low until that time, so the ET phase at the beginning of the cyclone's life cycle only lasted six hours.

1948 Storm #8:

1. Please contact the Meteorological Service of Cuba to obtain more detailed data, particularly whatever low pressures that may have been measured. These could help determine how much filling occurred while the eye was crossing Cuba.

Cuba (Ramon Perez) has been contacted to provide additional information, but as of yet have no extra measurements to add.

2. The microfilm map for 2130 UTC 20 September has a written note on it about a 969 mb pressure at 2030 UTC. What is this observation and why isn't it reference anywhere in the metadata?

The "969" on the metadata map is not a pressure. It is referring to station number 969. Station number 969 appears to be near 22.9N, 82.6W.

3. On a related note, there is a mystery observation on the microfilm map for 21 September 0230 UTC, which looks like it could be saying a pressure of 943.8 mb as well as "winds N force 11". What is this ob, and is this a correct interpretation of what is written?

It is unclear from the microfilm map whether the pressure was 943.8 mb or 993.8 mb. This observation is a land station observation from Cuba near 22.9N, 82.6W (station 969). The Cubans have been contacted to clarify this observation, but as they have not responded, we are interpreting the observation conservatively as 993.8 mb.

4. Is there any text write-up of this system in the OMRs for Key West and Miami?

Neither the Miami nor the Key West OMRs contained a text write-up. However, there is a text write-up in the Florida Climatological Data, which is in the binder.

5. The October OMR for Key West has a discussion of the tracking of the hurricane by the Boca Chica radar that implies the operators did not really know what they were tracking. Have the radar fixes been checked against other data to gauge their accuracy?

Yes. Boca Chica reported their max wind from the NNW at the same time the radar report stated that the center was 14 miles northeast of Boca Chica. For this storm, there were no aircraft fixes simultaneously with land based radar center fixes. However, for a storm in 1950 (Hurricane Easy) there were simultaneous land based and aircraft radar center fixes. For Easy (1950), sometimes they were 0.1 or 0.2 degrees latitude different, but most of them were within 0.2 degrees (12 NM). Easy was with the land-based radar in Gainesville, FL.

6. Please re-do the analysis of the central pressure, and the associated intensity, as the eye passed Boca Chica. The Florida Climatological Data states that Boca Chica had a 30 minute lull, which is consistent with the radar tracking that brought the eye over the island and with the Monthly Weather Review (MWR) text stating the station experienced the eye. Thus, the 963 mb reading should be at least somewhat close to a central pressure. While data from the 1947 Fort Lauderdale hurricane shows that there could be a significant pressure gradient in the eye, the use of the Schloemer equation to derive a central pressure from an external pressure appears unwarranted here given the available inside-the-RMW pressure.

Agreed. The central pressure for the Keys landfall is adjusted upward to 955 mb, which equals 106 and 100 kt, respectively, according to the Brown et al. southern and north of 25N pressure-wind relationships. 105 kt is chosen (no change from HURDAT originally). We went with 950 mb/110 kt before.

7. What is the basis for saying that Everglades City was inside the RMW given the lack of detailed wind data from the station? Please clarify this.

Everglades City had to have at least been near the RMW because the pressure at Everglades City got down to 948 mb. Perhaps it is possible they were at or near the RMW, but not inside it. This has now been clarified in the metadata summary.

8. On the back of the 22 September 0030 UTC microfilm map there is detailed data from several stations near Lake Okeechobee. What is the source of this data? It is noted that the Florida Climatological Data says no lull occurred at Clewiston. That is contradicted by this data, which shows the wind decreasing to 10 kt near the time of lowest pressure.

The source of this data is the microfilm. This is from the Sep 22 1130 UTC microfilm map. This is what appears to be a 5 kt NNE wind barb with 964.8 mb pressure plotted. The 964.8 mb pressure is clear. However, it is uncertain whether this is a 5 kt wind barb or whether the winds were stronger.

9. There is a conundrum regarding the passage of the hurricane across Florida. The data from Everglades City suggests that the central pressure was in the 940-948 mb range at landfall. Six hours after the low pressure at Everglades City, the eye apparently passed over Clewiston, where the pressure was 964-965 mb. Six hours after that, the eye apparently passed over Stuart with a pressure of 965-966 mb. These data imply that the pressure filled 15-25 mb during the first six hours over Florida, and only 1-2 mb during the second six hours. Does this make meteorological sense?

No, this does not make meteorological sense. It is certainty possible that the center passed south of Clewiston and that the winds were stronger there when the 964.8 mb pressure was observed (see question #8 above). We have made an adjustment of 0.1S and 0.1E from the previously analyzed lat/lon at 12Z. This track is now a little bit closer to the original HURDAT track. This track indicates that the center passed slightly farther south of Clewiston.

10. Please re-run the Inland Pressure Decay Model using the data from Clewiston to see if it produces a result consistent with the Everglades City data.

Re-ran model for Stuart and we got a landfall central pressure of 946 mb assuming ~12 hr duration over land and 965 mb central pressure at Stuart. We keep 940 mb, which is in the ballpark. It is more likely that the center passed farther south of Clewiston (see responses to questions 8 and 9 above).

11. Please better explain the basis for extending the extratropical portion of the track. It looks like the cyclone leaves the domain of the microfilm maps by 0000 UTC 26 September, so it is hard to see where this comes from.

A synoptic analysis has been performed for 00Z September 26th, which is consistent with the extratropical cyclone being located at 47.5N 39W and soon to be absorbed into another extratropical low.

12. If it is inappropriate to use the tropical wind-pressure relationship after extratropical transition (the last paragraph of the metadata summary), why is it mentioned? Please remove the reference.

This reference has been removed.

1948 Storm #9:

1. There are missing lines in the HURDAT summary at the start of the metadata for 11-12 October.

These are not missing. The lack of a second line means that there were no changes made on those dates.

2. As with the previous hurricane, please contact the Meteorological Service of Cuba to obtain more data, especially pressure data.

Cuba (Ramon Perez) has been contacted to provide additional information, but as of yet have no extra measurements to add.

3. The Boca Chica radar fix mentioned in the 5 October daily metadata says "Radar report #12". Have the other 11 reports been found and incorporated into the data set?

Only one other Boca Chica radar fix was obtained: 17Z 5th via the NHC advisory. The remaining 10 reports are not available.

4. The committee does not concur with the proposed inclusion of a 963 mb pressure at 1800 UTC 5 October. This is based on an estimate by Ho and not based on hard data. Indeed, the nearby text shows how difficult it is to determine whether the 975 mb pressure measured at Sombrero Key near that time was inside the RMW or not. This HURDAT entry should be left blank.

Agreed.

5. Is there a text summary of the storm in the Miami OMR?

No there is not.

6. Please contact the Meteorological Service of the Bahamas for more data, especially on what were the winds at the time of the minimum pressure at Grand Bahama Island.

The Bahamas (Trevor Basden and Wayne Neely) have been contacted to provide additional information, but as of yet have no extra measurements to add.

7. As with Storm #3, there are coded reconnaissance aircraft messages that could provide more data on what the flight(s) found on 6 October.

All of the relevant data (position, winds-flight level, winds-surface, time, sea level pressure, flight level) are already plotted up from these messages.

8. There are more coded observations on the 1230Z UTC 7 October microfilm map? What obs are these and have they been decoded? It is noted that one of them includes "HURRICANE".

These Bermuda observations are plotted on the next page and have already been included in the analysis.

9. There appears to be a typo in the 7 October daily metadata: "winds in excess of 100 were experienced".

Corrected.

10. The committee does **not** concur with the proposed tropical-extratropical-tropical transitions on 8-9 October. Looking at the HWM for 1200 UTC 8 October, there is no obvious evidence of surface fronts in the system, either on the analyzed map or in the ship reports. What

is the basis for the proposed evolution? Please make a **much** stronger case for this evolution or come up with a different scenario of what happened.

Agreed to retain the system as a tropical cyclone for all of 8-9 October, with discussion included in the metadata writeup about the structural changes that occurred along with a possible reason why.

11. Was the ship report at 0000 UTC 15 October really close enough to the center to properly estimate a central pressure?

Yes. The key is whether the ship was inside the RMW to conduct this analysis of central pressure from a peripheral pressure. In this case, a distinct lull occurred at 00Z between peaks at 18Z and 06Z at the time of the lowest pressure (992 mb). The distance to the center was about 30 nm, which is consistent with being inside the RMW for a cyclone near 35N.

1948 Storm #10:

1. Please provide whatever maps are available for 7 November.

The 12Z HWM and the 18Z microfilm have been included. These do not alter the earlier conclusion of keeping genesis at 18Z on the 8th. An entry for 7 November has been added to the daily summary.

2. Are the reports from ship #1413 the basis for the significant track changes on 8-9 November? Please clarify this. Also, does this adjustment include a realistic speed?

These significant track changes were based upon ship #1413 and other nearby ships. This change also corrected the unrealistically fast initial movement originally shown in HURDAT. This is discussed in the metadata now.

3. Have the aircraft coded observation for 10 November in the binder been decoded?

Yes, this information is in the same format as seen for other storms during 1948 and was already plotted and incorporated within the reanalysis.

4. In the metadata summary, it is stated that if the system started earlier, it may have originated from the south and moved northward. Please provide a basis for this, or remove it.

This sentence has been removed.

1948 Additional Notes:

1. Suspect #4: Please obtain the Savannah OMR to see if it contains any useful data on this marginal system.

Savannah's peak observations for the month of May 1948 were 1006 mb on the 21st and 33 kt E on the 6th, neither of which were associated with this system. Thus these data do not support adding the system into HURDAT.

2. Suspect #5: While the committee concurs with keeping this system out of HURDAT, it is possible that this system evolved differently than currently shown. Atlanta, Georgia reported 33 mph SE winds on 1 August, suggesting the possibility this system moved inland rather than remaining over the Gulf of Mexico as depicted in the Historical Weather Maps (HWM). Please re-examine this.

It is agreed that this scenario is possible and is added into the discussion.

3. Suspect #6: Please re-examine this system. A central pressure at-or-below 1003 mb with pressures of 1015-1020 mb to the east suggests a strong possibility that tropical-storm-force winds were present. Please contact the Canadian Hurricane Center to see what data they can provide on this system from Nova Scotia and Sable Island. Also, please perform detailed temperature analyses to better determine the time of extratropical transition.

The Canadian Hurricane Center has been contacted for additional information, but they have no observations indicating tropical storm force winds. The time of extratropical transition appears to be around 00Z on the 14th.

4. Suspect #8: Please re-examine this system. First, the strong winds in Trinidad were apparently from the southwest. Second, the microfilm map for 0000 UTC 31 August shows a west wind near 12N 74w, and the HWM for 1200 UTC 1 September shows north to northwest near the coast of Nicaragua. These data suggest the possibility that a tropical cyclone did exist. Please contact the meteorological services of the various countries near the possible track, especially Trinidad and Tobago and those in the Windward Islands, for more detailed data from this period.

A single west wind (10 kt W with 1002 mb) was recorded from a ship at 13N 74.5W at 00Z 31 August. However, earlier and subsequent measurements in that vicinity show only east winds and high pressures, so this observation may be suspect. This single NW wind HWM observation for 12Z 1 September is actually a Nicaraguan coastal station, which has been misplotted on the map (likely due to the analyst making multiple carbon copies). This wind observation with 1014 mb pressure appears to be a land breeze, not part of a tropical cyclone. The Trinidad and Tobago Weather Service has been contacted for additional information, however, they have not responded.

5. Suspect #10: The HWM suggest some sort of low pressure area was present during 7-9 September. While it likely was not a tropical storm, please check COADS on 7 and 9 September for completeness.

Agreed. The HWM and COADS data were obtained. The lowest pressure obtained was 1008 mb and strongest wind was 20 kt for the 7th through the 9th of September in the Caribbean.

6. Suspect #14: Please include maps for this system in the binder.

Agreed.

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

Agreed.