Best Track Committee Re-Analysis Comments for 1968

Reply to Comments – August 2020 – Chris Landsea, Stacy Stewart, and Sandy Delgado

General comments:

1. Several of the systems that are being removed from HURDAT have write-ups in both the normal re-analysis section and the additional systems/suspects section. Please remove one of the entries, with the entry in the additional suspects being the best to remove.

Agreed.

2. Please make an effort to find satellite imagery for 28 August, which will help in the analysis of two of the systems.

Fortunately, Sandy Delgado found an archive of ATS imagery at the University of Wisconsin including August 28th: http://library.ssec.wisc.edu/spinscan/images/1024/

1968 AL011968, Hurricane Abby:

1. The Committee concurs with the earlier upgrade to a tropical storm. Are there any land station highlights from Cuba during the passage of Abby, or any significant Cuban data that does not appear on the microfilm (MF) maps?

No other additional observations from Cuba were available.

2. Was there a significant minimum pressure measured at the Dry Tortugas as Abby passed?

Unfortunately, this was not recorded at Dry Tortugas.

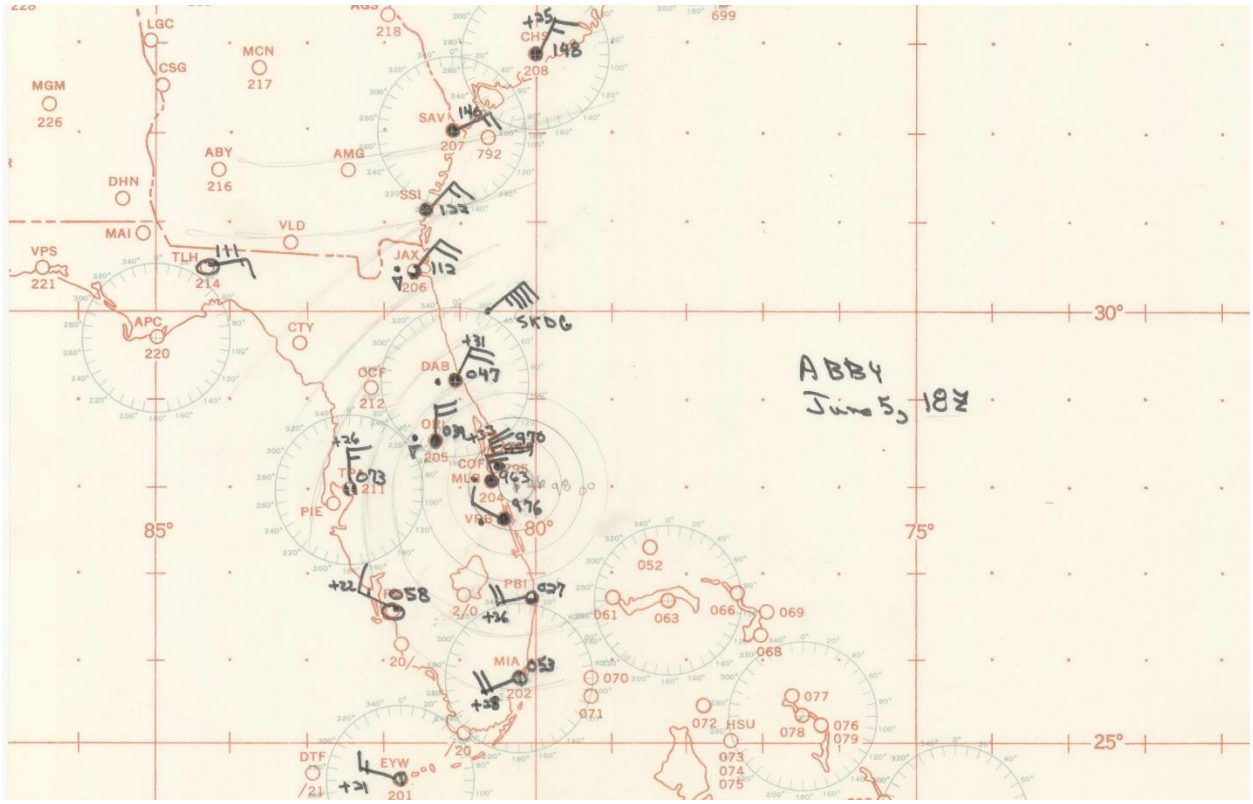
3. The Committee concurs with downgrading Abby to a tropical storm over the Gulf of Mexico and the proposed Gulf coast landfall intensity. The re-analysis write-up should note that the system had a sheared appearance in satellite imagery on 3 June, with the center at least partly exposed. This suggests that the short-lived eye formations in radar data may well have been related to transient convective bursts.

Agreed and so added.

4. The Committee does not concur with the proposed 70 kt peak intensity over the Atlantic, as there is no data to support it, not even aircraft surface wind estimates. The Committee notes that when the aircraft reported a 994 mb central pressure, coastal stations were reporting pressures of 996-997 mb, which suggests that the cyclone lacked a tight inner core despite the satellite appearance and the aircraft report of a 20 n mi wide eye (see below). The Committee consensus

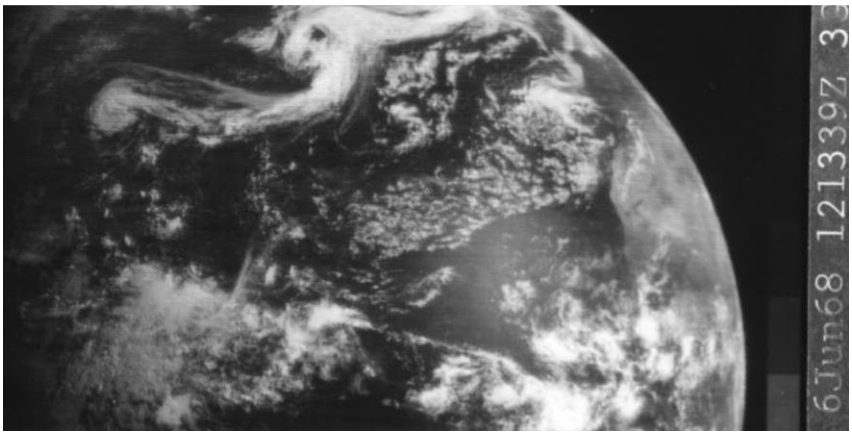
is that a peak intensity of 65 kt is better. However, the write-up should include the possibility that the original HURDAT was correct in not making Abby a hurricane over the Atlantic.

Agreed and so indicated.



5. Please re-assess the intensity near 1200 UTC 6 June, including re-examination of the ATS satellite imagery. First-light ATS visible imagery (see image below) suggests the convection was not symmetric around the eye, suggesting the system may have been weakening by that time.

Agreed to indicate weakening below hurricane intensity at 12Z on the 6th.



6. Are there any land station highlights, particularly low pressures, from Abby's passage across the southeastern United States? If so, please include them in the write-up.

Yes, five central pressures are now added in based upon low pressures over the SE United States.

7. Please re-examine keeping Abby as a tropical depression during its entire passage across the southeastern United States. It appears that a remnant low phase may be more appropriate, particularly on 10 June, followed by re-generation to a tropical depression after the center reached the Atlantic. Also, please see if the best track positions can be smoothed out during the overland phase.

Agreed to indicate a remnant low phase beginning at 00Z the 10th and extending through 06Z on the 11th. Agreed to smooth the best track positions while the system was overland.

8. The Re-analysis discussion for 9 June looks incomplete.

This is now completed.

9. The 10 June write-up has an empty ship highlight section. Please enter the significant ships or delete this section.

There are no significant ships, so this section is now deleted.

10. The Committee concurs with the proposed earlier dissipation.

Agreed.

1968 AL021968, Hurricane Brenda:

1. Please provide the appropriate upper-air maps for this system.

These have been added in for the 19th through the 22nd.

2. Did Brenda form near the southeast coast of Florida as stated in the 18 June Annual Tropical Storm Report (ATSR) excerpt, or near the southwest coast as in the re-analysis write-up? Please clarify this.

MWR suggested Florida Straits, ATSR suggested SE Coast, while the reanalysis concluded near the SW Coast. This is clear in the writeup.

3. The Committee does not concur with genesis at 1200 UTC 18 June. Based on the surface data, it prefers 0000 UTC 18 June.

Agreed to indicate genesis at 00Z on the 18th.

4. Are there any land station highlights from the time Brenda was near Florida?

None.

5. The Committee tentatively concurs with the earlier upgrade to a tropical storm based on the 35 kt ship at 1800 UTC 19 June and a tropical-storm-like appearance in satellite imagery. One caveat, though, is that the surface observations suggests the center is somewhat separated from the center suggested by the convective curvature in satellite imagery. Please provide whatever observations are available from Florida east coast stations like Daytona Beach and St. Augustine to determine whether a new center tried to form near the convection and to see if the central pressure fell below 1012 mb that day.

Agreed. Daytona Beach was available in the NCEI EV2 website and it showed 1012 mb from 2200Z to 2230Z on the 19th with light winds almost the entire day. Daytona Beach was already plotted on the microfilm plots. St. Augustine was not available in either.

6. Do the surface observations suggest that Brenda underwent a partial extratropical or subtropical transition on 20-21 June? The system certainly appears to be tangled up with a front in satellite imagery. Please comment further on this in the re-analysis sections for those two days.

It is agreed that Brenda interacted with the frontal boundary just northeast of it and gained some hybrid characteristics on the 20th and 21st. While the system did become elongated NE-SW with its wind field, no cooler, drier air reached near the center of Brenda. The changes do not appear to be significant enough to indicate a formal subtropical or extratropical stage.

7. The Committee does **not** concur with the proposed reduction in intensity to 50 kt on 22 June. Instead, it recommends keeping the original 60 kt HURDAT intensity as a compromise between the aircraft data and the hurricane-like appearance in satellite imagery.

Agreed. 60 kt is retained at 18Z.

8. While the Committee concurs with the increase in peak intensity to 70 kt, it would like to see a better explanation in the write-up as to why 70 kt was chosen.

A penetration center fix measured a central pressure of 991 mb, estimated surface winds of 70 kt and an eye diameter of 30 nmi at 2330Z on the 23rd. 991 mb suggests an intensity of 58 kt from the north of 25N and 61 kt from the north of 35N pressure-wind relationships. Based on a fast forward speed of about 24 kt, an intensity of 70 kt is analyzed at 00Z on the 24th, up from 65 kt originally shown in HURDAT, a minor intensity change.

9. Please give a better explanation of why the intensity at 0000 UTC 25 June was set at 65 kt given the rising central pressure and the weakening satellite appearance.

Agreed to retain 60 kt intensity from 00Z to 12Z on the 25th.

10. The Committee concurs with showing Brenda undergoing extratropical transition on 25 June.

Agreed.

1968 AL031968, Tropical Storm Candy:

1. In the Significant Revisions section, point 3 should say that Candy weakened to a depression six hours later than originally shown rather than six hours earlier.

Corrected.

2. The Committee concurs with the proposed earlier time of genesis, but also concurs that the timing is very uncertain due to the lack of data.

Agreed.

3. The Committee notes that no exact wind data is available for the time that the lowest pressure was measured in Aransas Pass. However, data available in the wallet show that the station was inside the radius of maximum wind (RMW) during the center passage and the winds were most likely light (see below).

ALCKTS A CRP 232300Z
AT 2230 Z ARANSAS PASS REPORTED @R-- 29.50 RISING WINDS CALM
. END 2300Z/23

This additional information is now added into the writeup.

4. Did the cyclone decay enough to be considered a remnant low on 25 June before extratropical transition occurred?

Unfortunately, the time resolution – one image a day – available to determine the convective evolution is not sufficient to see whether the convection was lost for the system before extratropical transition.

5. The Committee otherwise concurs with the proposed changes for this system.

Agreed.

1968 AL041968, Tropical Depression:

1. The Committee concurs with removing this system from HURDAT.

Agreed.

1968 AL051968, Hurricane Dolly:

1. In point 4 of the Significant Revisions section, please change "Major chances" to "Major changes".

Corrected.

2. The Committee concurs with the proposed later genesis time.

Agreed.

3. A typo in the 12 August ASTR write-up – two periods after a sentence.

Corrected.

4. The Committee does not concur with the proposed 80 kt peak intensity. Instead, it would prefer a 75 kt peak intensity with subsequently slightly reduced intensities through 14 August. (But see the next point.)

Agreed with both.

5. The Committee notes that the fixes at 1300 UTC and 1745 UTC 13 August have extrapolated pressures of 995 mb and 996 mb using today's formulas compared to the reported 1001 mb for both fixes. Unfortunately, the dropsonde data is not available for a quality control check.

Agreed, these are now used in HURDAT2.

6. The Committee notes that the extrapolated pressure for the 1230 UTC 14 August aircraft fix was 986 mb compared to the reported 992 mb. Unfortunately, the dropsonde data is not available for a quality control check.

Agreed, this is now used in HURDAT2.

7. Please re-examine the pressure for the aircraft fix at 1236 UTC 15 August. The minimum pressure was 999 mb from a dropsonde, which is supported by the 850 mb height data on the drop. The 700 mb height and temperature in the vortex message suggest a pressure of 990 mb. However, the post-flight summary says the minimum 700 mb height was 30 n mi southwest of the eye, which makes the 990 mb extrapolation suspect.

This discussion is now added into the writeup.

7a. The displacement between the 700 mb and surface centers suggests the possibility that extratropical transition was underway at the time of the fix.

This is now so noted in the writeup.

8. The Committee concurs with the rest of the proposed changes.

Agreed.

1968 AL061968, Tropical Depression:

1. The Committee notes there is a report of tropical storm force winds on the 1200 UTC 28 August MF map southwest of the center. Can this observation be quality controlled?

40 kt SSW and 1009 mb at 26.3N 84.6W at 12Z (ICOADS). (No ship history is available with this observation. It appears to be erroneous, given the nearby ship and station observations.)

2. If this system was treated as a depression operationally, the data suggests it would be best to keep it as a depression in HURDAT at least for the 27-30 August period.

Agreed to keep the system as a tropical depression. It has now been added back into HURDAT2.

3. Please provide the available satellite for 28 August.

The satellite image was obtained.

1968 AL071968, Tropical Depression:

1. The Committee concurs with removing this system from HURDAT.

Agreed.

1968 AL081968, Tropical Storm Edna:

1.The Committee concurs with removing 11-12 September from HURDAT. However, given the increase in organization noted in satellite imagery on 13 September, it feels that 1200 or 1800 UTC that day would be a better genesis time than 0000 UTC 14 September.

Agreed.

2. Could the ship report of 60 kt and 1008 mb at 0300 UTC 15 September justify a central pressure lower than 1005 mb, or was it too far from the center for a 1 mb/10 kt extrapolation to work?

The approach of 1 mb/10 kt extrapolation over water to obtain the central pressure is only valid if the observation is inside of the RMW. As it's not clear where the measurement was relative to the RMW, obtaining a 1002 mb central pressure value is uncertain, as it could be considerable lower.

3. The Committee notes that while it is possible that Edna briefly became a hurricane on 15 September, the satellite imagery suggests this is unlikely.

This comment is now added into the writeup.

4. The Committee concurs with the earlier proposed degeneration of the system.

Agreed.

1968 AL091968, Unnamed Hurricane/Subtropical Storm:

1. The Committee concurs with the initial extratropical phase for the system.

Agreed.

2. The Committee does not concur with the proposed tropical transition of the cyclone. Even on the days that is looked the most tropical – 18 September when a central dense overcast tried to form and 19 September when there was a hint of an eye – the satellite imagery suggests that it never fully isolated itself from frontal features and baroclinic influences. For this reason, the Committee favors keeping it a subtropical storm. It should be noted that the system looks less tropical at peak intensity on 20 September than it did during the previous two days due to the cold air clouds to the west of the center.

Agreed to retain system as subtropical cyclone (that reaches hurricane strength). Agreed to note how the system appeared on satellite on the 20th.

3. Please include a ship highlights section for 15 September.

There are no ships to highlight on the 15th.

4. Was there a quality control check for the pressure of the ship that reported 992 mb at 1800 UTC 16 September?

This was a single report from a ship via Mariners Weather Log.

5. Should the intensity be raised above 50 kt at 1200 UTC 17 September based on multiple 50 kt ship reports?

Agreed to boost intensity at 06 and 12Z on the 17th to 55 kt.

6. Please discuss the basis for the proposed intensities on 19-20 September.

The intensity is held at 60 kt on the 19th based upon the 55 kt reports at both 00Z and 18Z. A ship reported 40 kt SW and 980 mb at 12Z on the 20th. A peripheral pressure of 980 mb suggests maximum surface winds of at least 73 kt from the north of 25N Brown et al. and north of 35N Landsea et al. pressure-wind relationships. Based on a forward speed of about 29 kt, an intensity of 75 kt is analyzed at 12Z on the 20th, up from 65 kt originally shown in HURDAT, a minor intensity change. This is consistent with the three 70 kt ship reports at 12Z, 15Z and 18Z.

7. Typo in the Mariner's Weather Log summary on 21 September: "reminder" should be "remainder".

Changed.

8. The Committee otherwise concurs with the proposed changes.

Agreed.

1968 AL101968, Tropical Depression:

1. Given the satellite appearance on 18 September, the Committee recommends a 30-kt intensity at 1200 and 1800 UTC that day.

Agreed.

2. Should the system have a remnant low phase on 20 September?

Agreed. Given the lack of convection, the system is downgraded to a remnant low on the 20th.

3. The Committee otherwise concurs with the proposed changes.

Agreed.

1968 AL111968, Tropical Depression:

1. The Committee concurs with removing this system from HURDAT.

Agreed.

1968 AL121968, Tropical Storm Frances:

1. This system never looks very tropical in satellite imagery during 24-27 September. Perhaps the system should be considered subtropical during all or part of this time?

1a. Please provide the appropriate upper-air maps for this system, especially for 24-26 September.

These 200 mb plots are now provided from the 24th through the 27th. Based upon these and the satellite images, a subtropical stage is now added for the 23rd through the 26th.

2. On 27 September, the 1001 mb pressure translates to intensity estimates of 44 and 47 kt using two applicable wind-pressure relationships. Please better explain why the 12 kt motion and small size favors a peak intensity of 45 kt over the current HURDAT peak of 50 kt.

Agreed to indicate keeping a 50 kt intensity on the 27th, which is peak intensity for the system.

3. The Committee does not concur with the proposed deleting of extratropical transition on 29 September. Please keep the transition time from the current HURDAT.

Agreed.

4. The Committee otherwise concurs with the proposed changes.

Agreed.

1968 AL131968, Tropical Depression:

1. The Committee concurs with the proposed changes to this system.

Agreed.

1968 AL141968, Hurricane Gladys:

1. The Committee concurs with the proposed genesis time of 1200 UTC 13 October. However, it notes that a separate short-lived depression (also mentioned in the suspects list) may have existed over the northwestern Caribbean on 11-13 October based on operational warnings

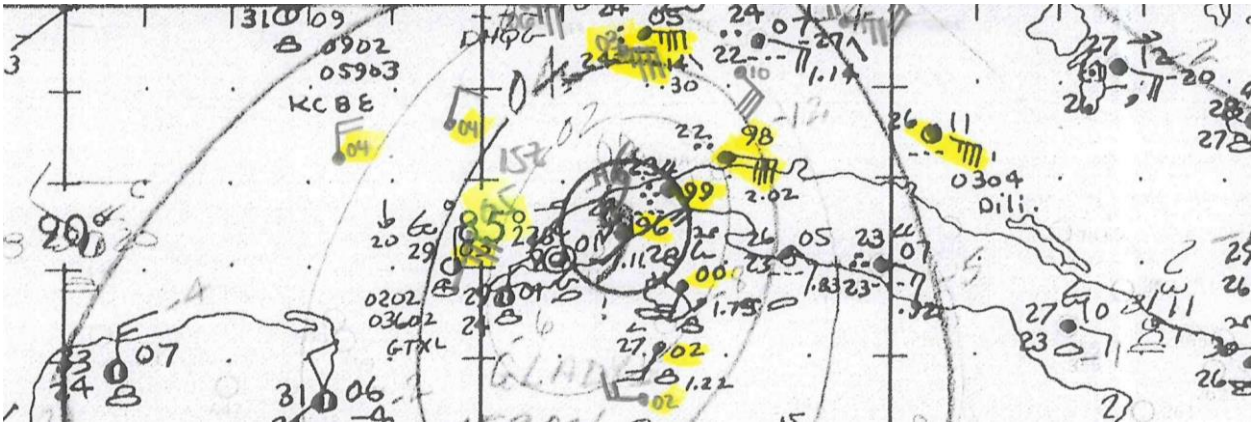
mentioned in the ATSR and on the MF maps. This system should be re-examined to see if it belongs in HURDAT.

Agreed to retain Gladys' genesis time. Satellite and synoptic observations show that the separate system remained disorganized and did not develop a closed circulation before the cloudiness became part of the disturbance that ultimately developed into Hurricane Gladys. Therefore, because the system did not have a well-defined low-level circulation, it is not added to HURDAT.

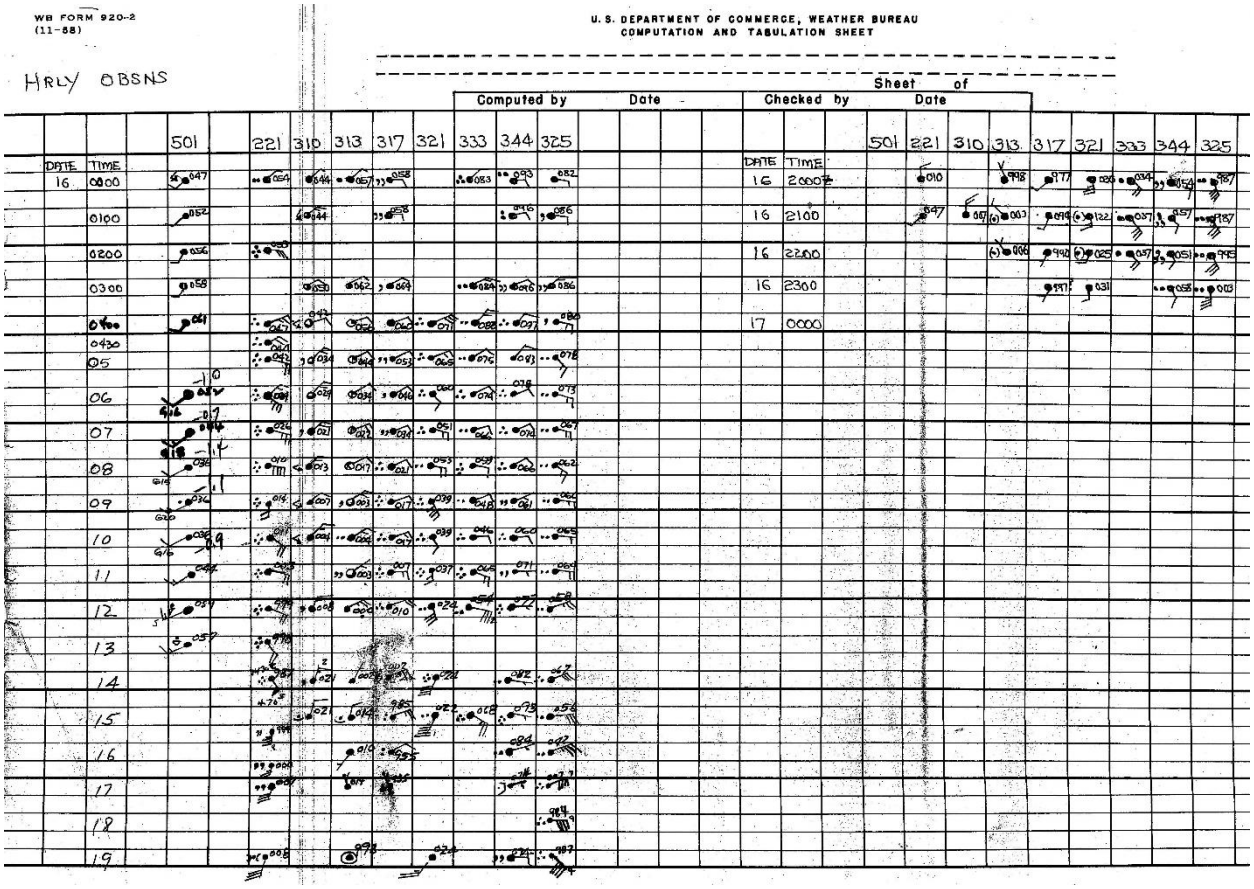
2. Please add land and ship highlight sections for 14 October, including any pertinent data from Swan Island.

These were added into the daily summary.

3. Please re-examine whether Gladys was actually a hurricane when it crossed western Cuba. The aircraft reported central pressures prior to landfall do not directly support hurricane strength, and there are no observations of sustained hurricane-force winds from any Cuban station. In addition, examination of the MF map for 1800 UTC 16 October (see below) suggests that the cyclone lacked an inner pressure core that might support hurricane-force winds.



3a. The 996 mb observation near the center on this map seems to be station 78317. Data in the wallet (see below) suggests the center passed over this station, with a 995.5 mb pressure at 1600 UTC and a pressure of either 993.5 mb or 995.5 mb at 1700 UTC. Either way, the pressure was inside the RMW and is additional evidence that a tight inner pressure core was not present as Gladys crossed Cuba.



3b. Please contact the Meteorological Service of Cuba to see if they have any additional data for Gladys, including but not limited to a minimum pressure for the 78317 station. Also, please see if they think the system was a hurricane or a tropical storm when it crossed western Cuba,

Agreed to indicate a 55 kt tropical storm at landfall in Cuba. The Meteorological Service of Cuba does not have any additional data for Gladys and does concur with the revision of landfall in Cuba to a high-end tropical storm.

4. If Gladys was not a hurricane prior to landfall in Cuba, the data suggests it became one around 0000-0600 UTC 17 October when the central pressure fell in to the mid-980 mb range.

Agreed to indicate hurricane intensity being attained at 12Z on the 17th when the central pressure fell to 986 mb.

5. The ATSR extract for 18 October is confusing, with two mentions of the ridge moving eastward. Was this how it was originally written?

This was transcribed incorrectly. The actual wording in the ATSR is the following: "Late on 18 October, as a polar front approached from the west, the ridge began to move eastward and GLADYS began to move slowly to the northeast."

6. The Committee concurs with adding a Florida landfall point and with the proposed 85-kt landfall intensity based on the observation in Inglis, Florida. It is noted that a quality control check on the last two aircraft pressures before landfall suggests they are reasonable.

Agreed on 85 kt Category 2 intensity at landfall in Florida.

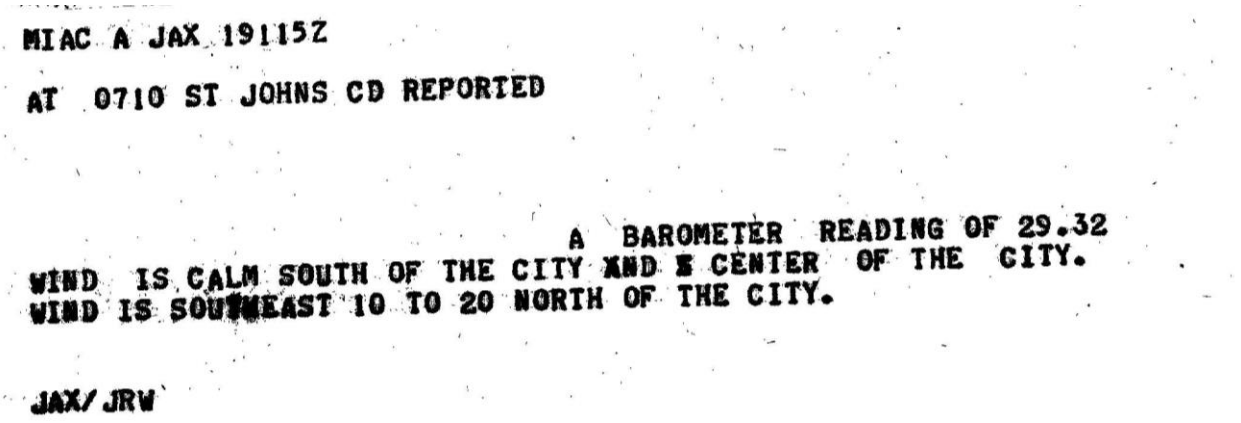
7. The Committee does **not** concur with the proposed deepening of Gladys while crossing Florida. Based on the data shown below, the aircraft fixes near 965 mb on 19 October appear to be seriously in error for reasons undetermined.

7a. For the first fix of 965 mb for Gladys over the Atlantic, the pressure extrapolated from 700 mb would be 984 mb using today's formulas.

7b. Based on the wallet data, the second fix does not seem to be at 1238 UTC as listed in the fix highlights, but seems to be at either 1430 or 1530 UTC based on dropsonde data in the wallet. However, the 850 mb height on the drop supports a pressure of 991 mb, while the 700 mb height and temperature data supports a pressure near 987 mb.

7c. The third fix at 1747 UTC has a 700 mb extrapolated pressure of 981 mb, while the 850 mb data on the drop supports 989 mb.

7d. During the passage of the center near St. Augustine, the St. John's County Civil Defense reported a pressure of 29.32 inches (992.9 mb) that was either near or inside the RMW based on the wind reports in the following image. There is also a wallet note that says the central part of St. Augustine was calm at 1116 UTC. There is nothing in these report that suggests a center with a central pressure on the 965-980 mb range near St, Augustine.



MIAC A JAX 19115Z

AT 0710 ST JOHNS CD REPORTED

A BAROMETER READING OF 29.32
WIND IS CALM SOUTH OF THE CITY AND E CENTER OF THE CITY.
WIND IS SOUTHEAST 10 TO 20 NORTH OF THE CITY.

JAX/JRW

7e. There is a note in the wallet that a barometer in the Ocala (OCF) area had a pressure of 29.26 inches (990.9 mb) at a time where the wind was not calm, but was estimated to be below hurricane strength (see below). No official minimum pressure is available from Ocala in any write-up of Gladys, but please see if one can be determined from whatever hourly data may be found for the area, airport or otherwise. If this pressure is correct, though, it also does not support a central pressure in the 965-980 mb range.

0725Z [redacted] 10/19/68

OCF

wind SSW (EST) 25-30 EST Gusts to 55-70 mph.

B: 29.26

Dunnellon - wind SW.

7f. Please make appropriate adjustments to the intensity over Florida after a better set of central pressures is determined.

Agreed that the central pressure while over Florida did not deepen. Based upon these revised pressures, the system is assessed to have filled to 987 mb at 12Z on the 19th, upon entering the Atlantic Ocean.

8. Given the data from the North Carolina Outer Banks, should Gladys count as a hurricane strike for that area? Also, given the 70 kt at 0500 UTC 20 October, should the intensity be 75-80 kt as Gladys passed the Outer Banks?

Agreed to count Gladys as impacting North Carolina as Category 1 hurricane. Also agree to boost winds at October 20th at 06Z to 75 kt.

9. Based on the satellite imagery and surface observations, the Committee would favor an earlier extratropical transition – preferably 1800 UTC 20 October when the system was still hurricane force.

Agreed to indicate an earlier extratropical transition to October 20th, 18Z.

10. There is a note in the correspondence section of the wallet that states the lowest observed pressure in Nova Scotia was 965 mb. Is this from Gladys or another nearby extratropical low? Please check with Canada on this and make whatever changes are necessary to this portion of Gladys' track.

This pressure was from the large, deep extratropical cyclone that absorbed Glady's circulation. The pressure value is now noted in the daily summary.

As a matter of interest, the lowest central pressure recorded by the hurricane and the storm which developed from it in the Nova Scotia area was 965 mb., which, I believe, is the pressure reported in the centre of the hurricane on the afternoon of 19 October.

Yours very truly,

R. V. Tyner

(R. V. Tyner)

RVT:EAC
Enc.

11. The Committee otherwise concurs with the proposed changes.

Agreed.

1968 AL151968, Subtropical Depression:

1. The Committee concurs with the proposed changes to this system.

Agreed.

2. Please change the description of how the system dissipated from "absorbed by the strong cold front" to "absorbed by the developing low to the north".

So changed.

3. What is the reasoning for the day-by-day description of the extratropical low that absorbed the depression? Was the extratropical low included in HURDAT as part of this system at some point?

These day-to-day descriptions are not needed and have been removed.

1968 AL161968 (now removed), Tropical Depression:

1.If possible, please provide the satellite imagery for 28 August.

Provided.

2. Pending the delivery of the satellite imagery for 28 August, the Committee does **not** concur with adding this system to HURDAT. It more resembles a decaying baroclinic low than it does a tropical cyclone.

Agreed. System is removed from HURDAT and added into the 1968 Additional Notes section.

1968 AL161968 (was originally submitted as AL171968), Tropical Storm (new):

1. The Committee concurs with adding this system to HURDAT as a tropical storm, as it appears likely the system reached tropical storm strength on 11 September before finishing extratropical transition.

Agreed.

1a. What is not quite as clear is whether this system should count as a tropical storm landfall in the United States, as it may have become extratropical before landfall. What do the observations from Islip and other stations near the center show in the way of temperature changes as the center passed?

We have put together a comprehensive surface analysis at 10Z on September 11th. This shows uniformly warm temperatures and moist conditions surrounding the center of the system at landfall, indicating that it does count as a tropical storm landfall.

2. It looks like there is a typo in the Monthly Weather Review excerpt for 10 September – "evenight".

Corrected.

3. Are there any more detailed observation available for the North Carolina coastal stations? In particular, it would be interesting to find out what the peak conditions were at Frying Pan Shoals, which reported 1012 mb and 30 kt at 0600 UTC 10 September.

While the NCEI EV2 website had data for Diamond Shoals, Cape Lookout, and Cape Hatteras for the 9th through the 11th, there was no archived data for Frying Pan Shoals.

4. The Committee otherwise concurs with what is proposed for this system. Please state the full reference for Wagner (1968) somewhere in the write-up.

PICTURE OF THE MONTH: Illustrating the Merger of Tropical and Extratropical Systems, A. JAMES WAGNER, Monthly Weather Review, December 1968, Vol. 96, No. 12

1968 Additional Notes:

1. The January system: The Committee concurs with leaving this system out of HURDAT, but would like the appropriate upper-air maps to be added to the archive,

This request is beyond the scope of this project, given that it is not being added into HURDAT.

2. The March system: The Committee concurs with leaving this system out of HURDAT, but is wondering if any satellite imagery is available for it?

Unfortunately, no. Even the University of Wisconsin site does not have March 1968 imagery.

3. The July systems: The Committee concurs with leaving this system out of HURDAT, but is wondering if any MF maps are available for them?

The microfilm maps are available in the NHC library. These were inspected and no evidence was found for closed surface circulations.

4. The Committee would like to see the MF maps for the August 2-8 system as it looked good in satellite imagery on 5 August.

The microfilm maps were obtained from August 2nd through 7th as well as accessing the COADS ship data. The combination of ships and stations provided a large number of observations near the tropical wave. The system never developed a closed circulation based upon these and is retained in the Additional Notes.

5. The October 10-14 system: This was the system that formed to the northwest of what became Gladys and was operationally called a depression. While it is not certain that the system belongs in HURDAT, please prepare a more detailed track for it.

Operationally, the system was declared "Tropical Depression #20" at 12Z on October 11th, which eventually became Hurricane Gladys. Satellite images show that there was numerous but disorganized convection occurring from the 10th through the 13th. The disturbance gradually lost organization and dissipated early on the 14th, as this system was separate from the disturbance that eventually developed into Hurricane Gladys. (Gladys' first position as a tropical depression was 12Z on the 13th near 15N81W, while this system still remained near 17N85W at the same time.) The system only had one report of at least 10 kt W or SW wind (at 00Z on the 13th) and aircraft reconnassiance investigated it on the 12th and 13th and could not fix a center. Therefore, because the system did not have a well-defined low-level circulation, it is not added to HURDAT.

6. There are MF maps for an October suspect system that don't seem to match the listed suspects.

This system in the central Atlantic is now added into the Additional Notes section. It does not warrant adding into HURDAT.

7. The Committee concurs with leaving the other suspect systems out of HURDAT.

Agreed.