Best Track Committee Re-Analysis Comments for 1970

Responses **in boldface** by Chris Landsea, Sandy Delgado, Andrew Hagen, and Brandon Moses – January 2022

General comments:

1. The difference in standards of numbering tropical depressions from 1970 to now is causing some confusion for the Committee. For example, Becky is cataloged as AL021970, meaning it was the second tropical cyclone of the season. However, in the write-up, it is listed as the 12th or 13th depression of the season based on operational designations. The Storm Wallets also have some different numbering, which has been noted in these comments. Please do a more formal job of documenting the operational depression numbers then in use in the appropriate write-ups.

It is agreed that the operational numbering used in 1970 was confusing, given that they very readily considered many more systems to be tropical depressions than we do now but only a handful of these made it into the original HURDAT. (Most are not considered today to be tropical depressions and are not included in HURDAT2 now.) Where it can be determined what the original number was used by NHC, this is included.

2. There are multiple instances of assessments of tropical storms affecting certain locations (e. g. Alma in the Cayman Islands or the proposed Tropical Storm #5 in Cabo Verde) where it is unclear whether the local meteorological services were consulted in the re-analysis process. Whenever a change is being made that would affect the tropical cyclone climatology of a country, please check with the meteorological service of that country to make sure they concur.

We have reached out to the affected local meteorological services when a revision that affects the TC climatology of the country for feedback. Most of the time, however, they have little to no comments.

1970 AL011970, Hurricane Alma:

1. In regards to the proposed 65-kt peak intensity for Alma, which is the estimated intensity using the intensifying subset of the wind-pressure relationships?

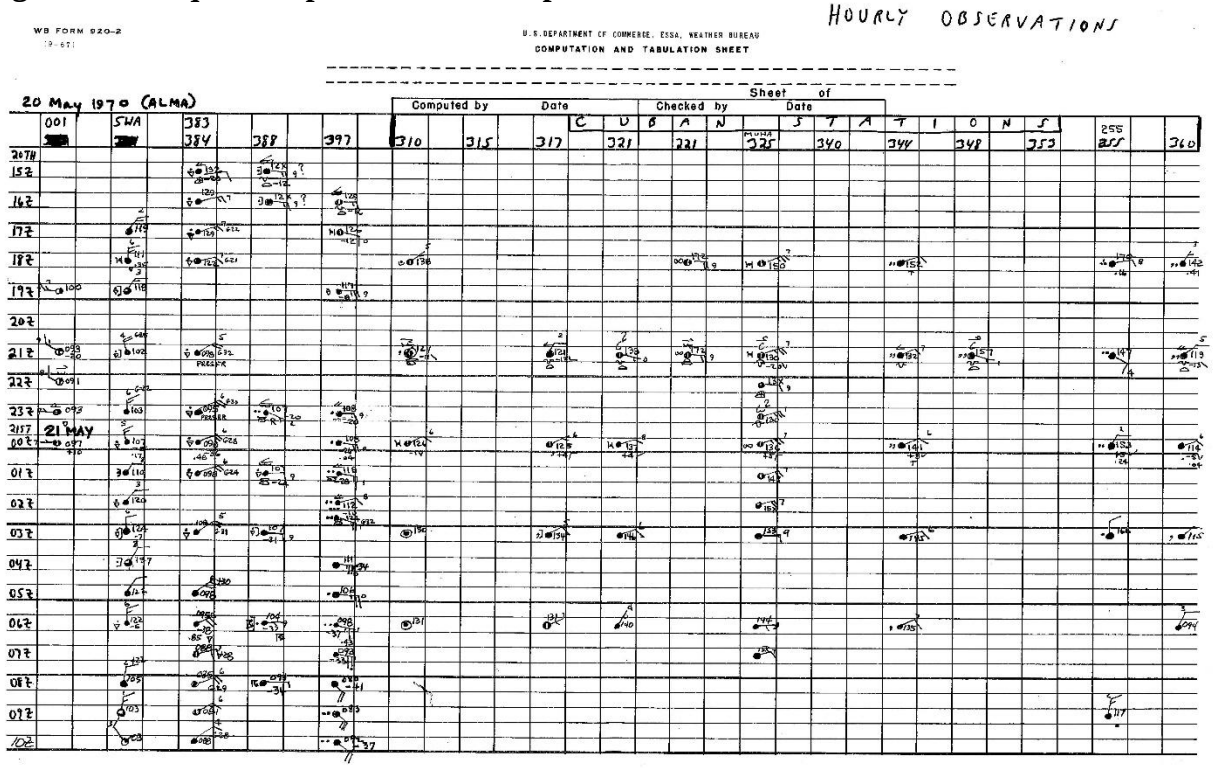
Both South of 25N and South of 25N intensifying suggest 59 kts for a central pressure of 993 mb.

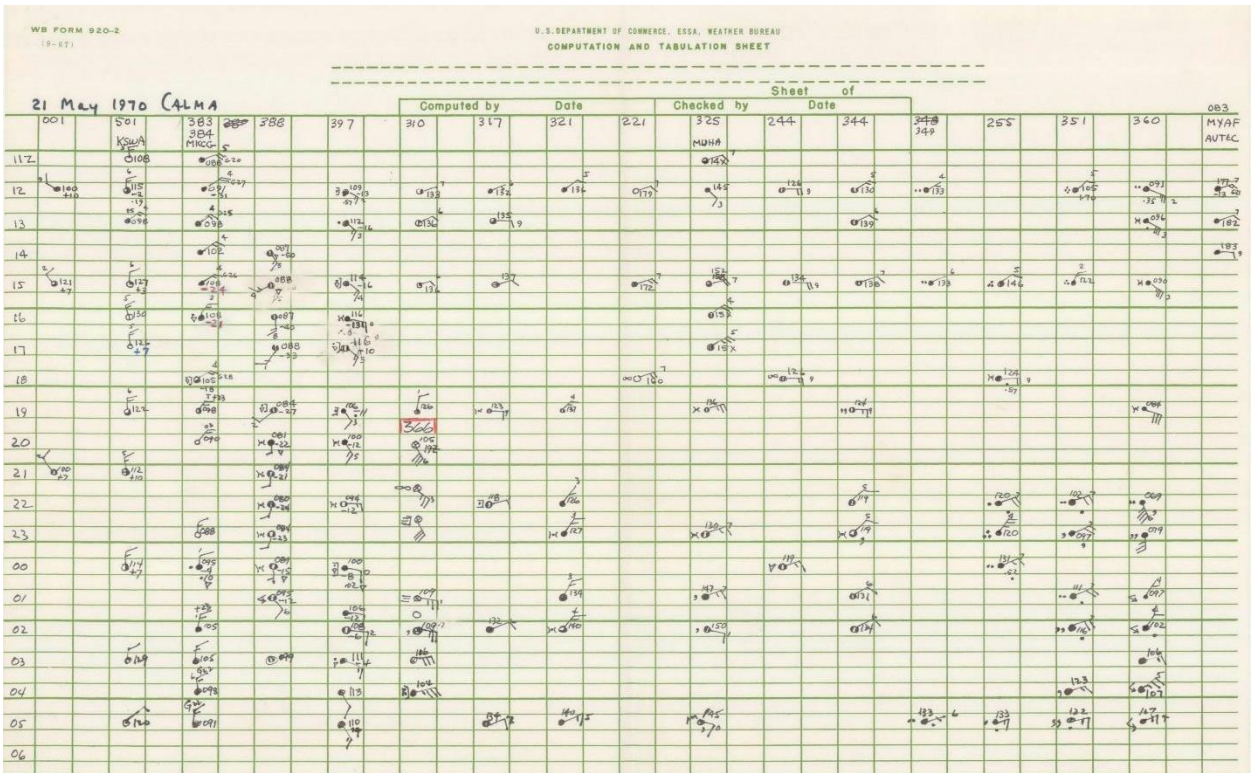
2. For the aircraft fix at 1736 UTC 20 May, the extrapolated central pressure from flight-level using today's formula's is 1003 mb, and that is also the pressure extrapolated from the 850 mb data on the center drop sonde. This suggests the 998 mb pressure was too low. Please re-calculate the intensity for a 1003 mb central pressure.

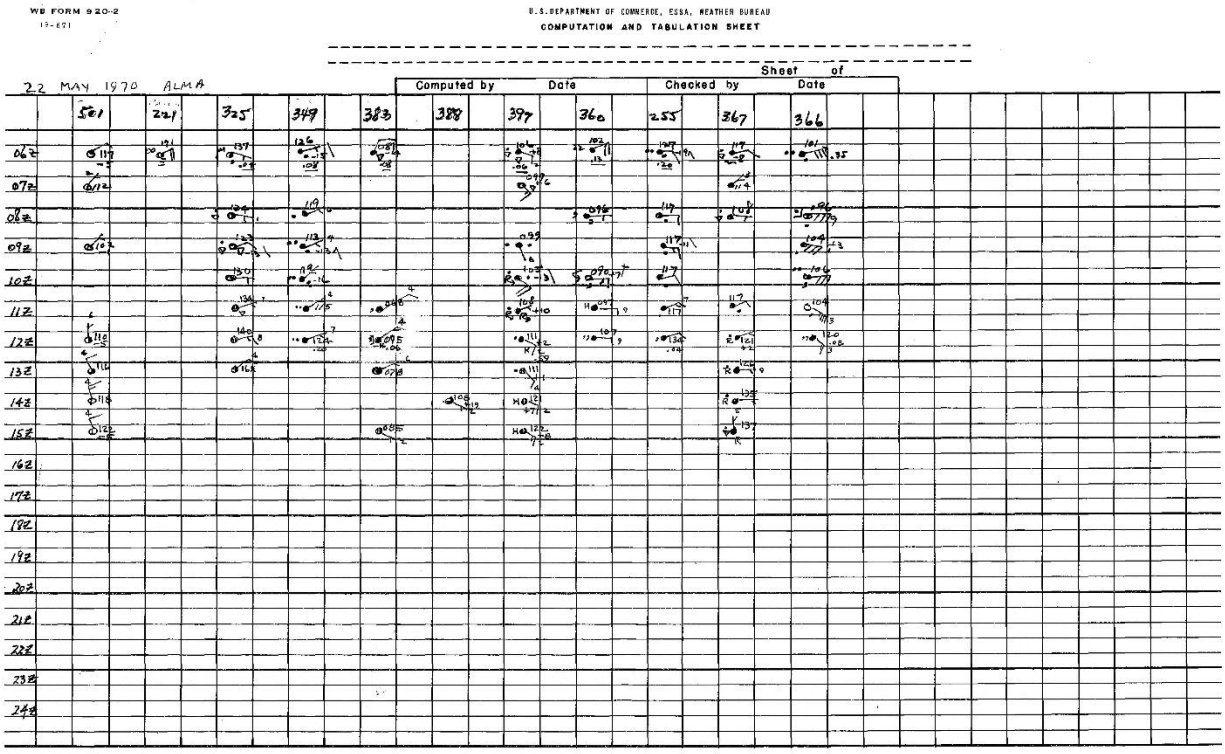
The central pressure has been changed to 1003 mb and the intensity estimate reduced to 45 kts.

3. Do the Cayman Islands concur with the assessment of tropical-storm impacts there? It is noted that there are surface obs in the Storm Wallet for the Cayman Islands (see below) that do not explicitly show tropical-storm conditions in the islands during Alma's passage.

An email has been sent to the National Weather Service of the Cayman Islands in regards to the question presented. No response was received.







3. The 55-kt gust on Cayman Brac is found in this observation in the Storm Wallet:

ZCZC
SXCA 8273 211700

HUREP
1500
MKCG W12 BRKN 95 OVCST 8/71/73/0416G26/984 975 176 GS/8-15E
1600 MKCG E12 BRKN 90 OVCST VIS 7MLS RW MINUS MINUS
108/79/73/0315G27/984 RB45/ CAYMAN BRAC REPORTS WND 0925G35
HIGHEST WND SO FAR 65 MPH ABOUT 6AM NO BRM REPORT@
KSWA 1700 25@300@15 126/82/74/3516

Thanks. This is now annotated as a wind gust in the metadata, it was previously unclear as it was written.

4. On a related note, please better explain why 45 kt was chosen for the intensity at 0000 UTC 22 May as compared to 40 kt.

Explanation added to the metadata to describe blending the RECON surface estimated winds and the pressure-wind relationship estimate.

5. Has the ship report of 40 kt winds at 0600 UTC 22 May been quality controlled? If it is correct, can it be used to establish a central pressure of near 1006 mb?

There are a few observations near the center at 06Z on 22 May that suggest a central pressure of 1005-1006 mb. Particularly the ship "59890" that reported 15 kt SSW and 1007 mb, suggesting a central pressure of 1005 mb. The ship has several entries in the excel file and pressure reports appear reasonably accurate in reference to surrounding obs. Thus, a central pressure of 1005 mb has been added at 06Z on 22 May.

6. Could a central pressure of 1006 mb be assigned at 0600 UTC 24 May based on the Dry Tortugas obs?

Dry Tortugas reported 30 kt and 1011 mb at 06Z on 24 May, suggesting a central pressure of 1008 mb, which has been added.

7. In the write-up for 25 May, is the ship report on the 26th supposed to be on the 25th?

Corrected.

8. Are there any other data that support upgrading Alma back to a TS on 25 May? It is noted that on the microfilm (MF) maps the central pressure was falling while the system was over land. Perhaps this needs some land station highlights to support the upgrade? While the Committee concurs with the upgrade, it notes that the stated evidence of one ship is a little thin. Has the ship in question been quality controlled?

Savannah, GA, reported 15 kt SSW and 1006 mb at 20Z on 25 May, suggesting a central pressure of 1003. A central pressure of 1003 mb suggests 38 kt from the N of 25N Brown et al. pressure-wind relationship. The ship "22910" is trackable for several days and the reported winds and pressures are reasonably in agreement with the surrounding data.

A better explanation for the 35 kt at 18Z on May 25 has been added to the metadata, along with adding 1003 mb as a central pressure.

9. The Committee otherwise concurs with the proposed changes.

Agreed.

1970 AL021970, Tropical Storm Becky:

1. Please re-check the "Significant Revision" section where it states that a couple of central pressures were removed. Only one pressure seems to have been removed in the data block.

Corrected.

2. The MF map for 1800 UTC 15 July seems to be missing, and several other MF maps near that time have dates mismatched from their file names.

Corrected.

3. Are there any MF maps around 16 July for the portion of the pre-Becky disturbance that came north from Panama?

These have been provided.

4. A typo at the end of the 18 July re-analysis section – "showed" instead of "show".

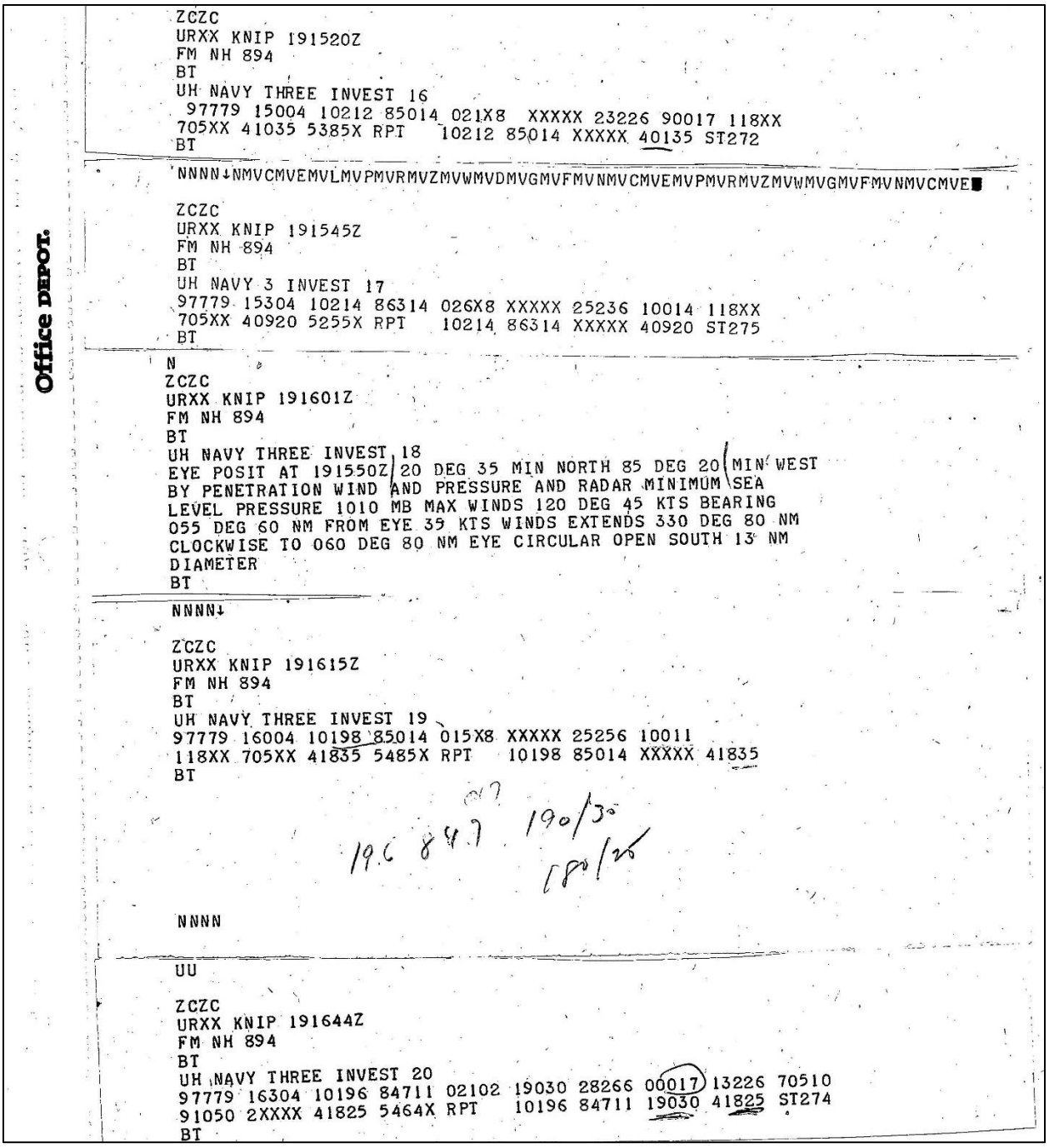
Corrected.

5. Can central pressures be added at 0000 and 0600 UTC 19 July and 1200 UTC 20 July based on the available ship reports and some aircraft data?

Central pressures have been added at the recommended dates and times.

6. The Committee notes there is a Navy aircraft fix at 1550 UTC 19 July that reports tropical-storm-force winds along with a pressure of 1010 mb (see below). Was this fix considered in the intensity estimates for this day?

Yes. Please note that not all fixes are included in the daily summaries. Typically, only one fix per synoptic time is listed. In this case, the 1550Z fix was nearly identical to that near the 1200Z and 1739Z fixes already listed.



```
ZCZC
URXX KNIP 191520Z
FM NH 894
BT
UH NAVY THREE INVEST 16
 97779 15004 10212 85014 021X8  XXXXX 23226 90017 118XX
705XX 41035 5385X RPT    10212 85014 XXXXX 40135 ST272
BT

NNNN↓NMVCMVEMVLMVPMVRMVZMVWMVDMVGMVFMVNMVCMVEMVPMVRMVZMVWMVGMVFMVNMVCMVE

ZCZC
URXX KNIP 191545Z
FM NH 894
BT
UH NAVY 3 INVEST 17
97779 15304 10214 86314 026X8 XXXXX 25236 10014 118XX
705XX 40920 5255X RPT    10214 86314 XXXXX 40920 ST275
BT

N
ZCZC
URXX KNIP 191601Z
FM NH 894
BT
UH NAVY THREE INVEST 18
EYE POSIT AT 191550Z 20 DEG 35 MIN NORTH 85 DEG 20 MIN WEST
BY PENETRATION WIND AND PRESSURE AND RADAR MINIMUM SEA
LEVEL PRESSURE 1010 MB MAX WINDS 120 DEG 45 KTS BEARING
055 DEG 60 NM FROM EYE 35 KTS WINDS EXTENDS 330 DEG 80 NM
CLOCKWISE TO 060 DEG 80 NM EYE CIRCULAR OPEN SOUTH 13 NM
DIAMETER
BT

NNNN↓

ZCZC
URXX KNIP 191615Z
FM NH 894
BT
UH NAVY THREE INVEST 19
97779 16004 10198 85014 015X8 XXXXX 25256 10011
118XX 705XX 41835 5485X RPT    10198 85014 XXXXX 41835
BT

19.6 84.7  190/30
            180/25

NNNN

UU

ZCZC
URXX KNIP 191644Z
FM NH 894
BT
UH NAVY THREE INVEST 20
97779 16304 10196 84711 02102 19030 28266 00017 13226 70510
91050 2XXXX 41825 5464X RPT    10196 84711 19030 41825 ST274
BT
```

7. Are there any Monthly Weather Review (MWR) comments for 19 July?

There were no comments on the MWR for 19 July.

8. In the re-analysis section for 19 July, should “high large bias” be “large high bias”?

Corrected.

9. The re-analysis section for 20 July does not include any reasoning on why the proposed intensities were chosen. Please provide the necessary discussion.

A proper discussion on the intensity estimates for 20 July has been added.

10. The Committee notes there is an aircraft fix at 2011 UTC 21 July that states the 700 mb center is 35 n mi east of the surface center.

This information has been added to the reanalysis section of 21 July.

11. The Committee otherwise concurs with the proposed changes.

Thank you.

1970 AL031970, Tropical Depression:

1. The write-up says there is Storm Wallet information for this system. What is the Storm Wallet identifier for it?

Looks like indicating that a Storm Wallet existed for this system was a mistake. It has been removed from the write-up.

2. The Committee concurs with the proposed changes and notes that the one report of 35-kt winds on 1 August does not justify an upgrade.

Agreed.

3. Is the ship data sufficient to justify adding the following central pressures:
29/12z, 1013 hPa

30/18z, 1011 hPa

01/00z, 1010 hPa

01/06z, 1010 hPa

01/12z, 1010 hPa

02/00z, 1009 hPa?

Agreed to add several central pressures based on nearby ship data.

1970 AL041970, Hurricane Celia:

1. The Committee concurs with the proposed changes in the first part of Celia's life through 1800 UTC 1 August.

Thank you.

2. There are **serious** issues with the pressures of the Navy aircraft mission from 0000-0600 UTC 2 August. The fix of 965 mb at 2344 UTC 1 August was made at low level, and in theory it should be reliable. However, the fix at 0551 UTC 2 August has 700 mb heights and temperatures that extrapolated to a pressure of 998 mb – far above the 975 mb reported on the dropsonde (see below). Indeed the 700 mb height is 90-120 m higher than on the subsequent Air Force mission that got pressures near 986 mb. Unfortunately, the dropsonde from the second fix is not available in the Storm Wallet. To add to the confusion, there is a dropsonde in the Storm Wallet with a pressure of 976 mb near 01Z. However, the drop position does not match the center location for that time, and the 976 mb is well below the pressures extrapolated from the 700 mb data (1003 mb) and the 850 mb data (993 mb) on the drop.

A. NAVY ONE CELIA TWENTY TWO
B. 020551Z
C. 24 DEG 37 MIN N
D. 88 DEG 24 MIN W
E. 124
F. 3NM
G. 975 MB
H. 700 MB 3084M
I. NA
J. NA
K. DOPPLER INOP
L. NA
M. 14 DEG
N. 07 DEG
O. 3169M/ 3138M
P. 24 DEG 37 MIN N 88 DEG 24 MIN W 020551Z
Q. C30
R. NA
S. EYE WALL OPEN N PORTION FROM 310 DEG TO 020 DEG ELSW EYE WALL FOUR MILES THICK
BT

2a. The pressures from the preceding and subsequent Air Force missions look far more reliable, as they pass the bulk quality control checks.

2b. The Navy data does support some amount of intensification followed by weakening. The eye diameter was 20 n mi on the fix with 965 mb, and there are multiple later reports that the eye had expanded to 30 n mi wide. This might have been an eyewall replacement or some type of core re-organization.

2c. However, given how severe the data problems are, there are more questions than answers. Is the 965 mb pressure reliable, or did it suffer from the instrumentation errors like the subsequent fix seems to have done? Was the 965 mb pressure measured in an eyewall mesovortex and perhaps not representative? Should all of the data, and the estimated intensities, from this mission be tossed out? The Committee currently has no answers to these questions, but it recommends that the non-vortex/dropsonde obs from this flight in the Storm Wallet be decoded and examined to see if a systematic error can be found and corrected.

2d. Since the 965 mb pressure is a rather important point in the intensity evolution of the hurricane, the HURDAT entry for Celia cannot be updated until there is some resolution of this issue.

It is agreed that all of the intensity data from this mission be tossed out and not used in the reanalysis. Thus the 965 mb central pressure listed at 00Z and the 975 mb at 06Z on the 2nd have been removed. As the visually estimated winds were quite high and that the eye diameter did shrink to 20 n mi, intensification from 65 kt at 1st/18Z to 80 kt at 2nd/00Z and 06Z is indicated. This is a major downward revision from the 100 kt originally shown in HURDAT at 00Z.

3. The Committee concurs with the proposed upgrade of the landfall intensity to 120 kt based on the 944 mb pressure at Ingleside.

Agreed.

4. Can the Del Rio data be used to estimate a central pressure as the center passed nearby?

The center of Celia passed a few degrees south of Del Rio and at the time of the lowest pressure, the sustained winds in the city were around 40 kts and the city was outside of the RMW. Thus one cannot make a reasonable estimate of the central pressure.

5. The Committee otherwise concurs with the rest of the proposed changes, pending the resolution of the problem noted in point 2.

Agreed.

1970 AL051970, Unnamed Tropical Storm:

1. The Committee does **not** concur with upgrading this system to a tropical storm at this time. First, despite the statement in the Significant Revisions section that synoptic observations played a role in the upgrade, there are no synoptic observation used to justify the upgrade. Indeed, the only observation of 35 kt winds is dismissed as incorrect. Second, there was no attempt to quantify the satellite imagery. Third, and most importantly, this system apparently went through the Cabo Verde Islands and there are no reports of high winds or low pressures from any of those islands on the MF maps. The bottom line is there the only current basis of an upgrade is that the system looks good in satellite imagery, and there are no quanitative data to justify it.

Please contact the Meteorological Service of Cabo Verde to see what information they have on this system, and whether they think it was a tropical storm while passing through the islands. If they do not concur with the proposed upgrade, or do not provide data to support it, the system should remain a tropical depression.

An email has been sent to the Meteorological Service of Cabo Verde in regards to the question presented. No response was received. As recommended, the system is retained as a tropical depression, with discussion included that it may have reached tropical storm intensity.

2. Whether or not this system gets upgraded, please provide a track map for it.

Track map has been provided.

1970 AL061970, Tropical Depression:

1. The Committee concurs with removing this system from HURDAT. Please add the operational depression number assigned at the time to the write-up, and please provide the MF maps for this case.

Done.

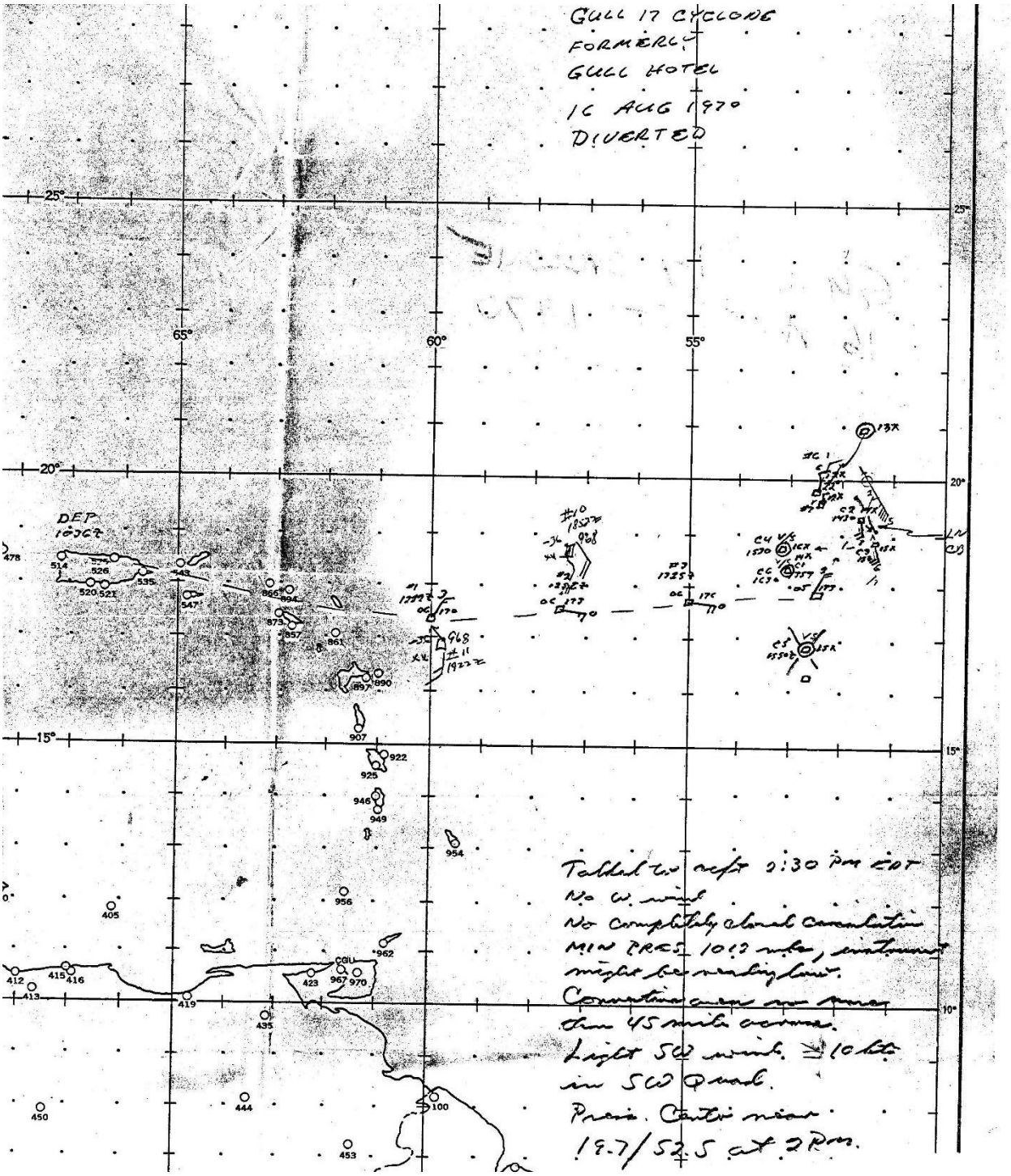
1970 AL071970, Tropical Depression:

1. The Committee concurs with the proposed changes.

Thank you.

2. The Committee notes that an aircraft mission was flown into this system on 16 August, with the data plot shown below. This mission was found in the Storm Wallet for Dorothy.

Details added to the write-up.



1970 AL081970, Unnamed Tropical Storm/now Unnamed Hurricane:

1. Please provide explicit references for the Anderson and Spiegler papers referenced for this storm.

Added. Spiegler 1971: The Unnamed Atlantic Tropical Storms of 1970, Anderson 1969: Application of Meteorological Satellite Data in Analysis and Forecasting

2. Please check the MF maps for this system. After 12Z 7 August, there are many files with a date in the file name containing a map with a different date and time.

These have now been corrected.

3. On 13 August, due to the fast forward motion of the system, there may be a need for caution with the usual 10 kt/1 mb pressure reduction of the aircraft data at 22Z.

We are unaware of any specific caution that is needed when using the 10 kt/1 mb rule to obtain central pressure in the case of fast-moving systems.

4. Should the aircraft fix at 22Z 13 August be used to establish the intensity at pressure at 00Z 14 August instead of 18Z 13 August.

Agreed. Intensities for surrounding positions were adjusted accordingly to fit the time of the 1003 mb central pressure.

5. The Committee concurs with the weakening to a trough on 14 August.

Thanks

6. There are many surface observations in the Storm Wallet regarding the impact of this system as it crossed North Carolina, with three standing out (see below). The first is a 48 mph sustained wind at Frying Pan Shoals at 03Z 17 August, implying at least a 40 kt intensity at that time. The second is a report of 50 kt sustained with a gust to 65 kt at Atlantic Beach between 1140-1150 UTC 17 August. The third is a 55 mph sustained wind with a pressure of 1009.1 mb at Ocracoke at 15Z 17 August. Please modify the best track intensities to match these observations. (Is it noted that these winds are probably in mph, although there is a chance they could be in knots.)

Thank you for locating these additional observations, which have been added into the daily summary. Based upon these, the intensity has been boosted slightly higher to 45 kt at 06Z, 50 kt at 12Z, and 55 kt at 18Z.

SI A ORF 170300Z
COAST GUARD REPORTS

PARRAMORE BEACH
WX CLR VSB 6 TMP 80 WND SSW 11 PRS 30.08

OCEAN CITY
WX PC VSB 8 TMP 78 WND S 12 PRS 30.10 SWT 74 SEA E 2

FRYING PAN
WX OVC/R VSB 1 TMP 73 WND SE↑48 PRS 30.00 SWT 80 SEA SE↑6 SWLS
SSE↑6↑8

OAK ISLAND
WX OVC/R VSB 5 WND NE↑12 PRS 30.02 SEA E↑2

CAPE LOOKOUT
WX PC/R VSB 5 WND S↑8 PRS 29.689

DIAMOND SHOALS
WX CLDY VSB 12 TMP 81 WND S 12 PRS 30.13 SWT 78 SEA S 7
SWELL SE 2

OCRACOKE
WX OVC VSB 8 TMP 80 WND SSW 8 PRS 30.09

OREGON INLET
WX PC VSB 5 TMP 77 WND SW 12 PRS 30.11

COVE PT
WX CLR VSB 8 TMP 80 WND CLM PRS 30.05 SWT 78 SEA CLM

[illegible]TMP 81 WND S 12 PRS 30.12 SWT 79 SEA S 2

CHESAPEAKE
WX PC VSB 10 TMP 80 WND S14 PRS 30.08 SWT 78 SEA S1 SWELLS SE3

WOLF TRAP
WX CLR VSB 10 TMP 82 WND SE15 PRS 30.08 SWT 74 SEA SE2

SMITH POINT
WX CLR VSB 10 TMP 80 WND SW15 PRS 30.08 SWT 78 SEA SW1 1/2

August 18, 1970

OFFICE
R.F.D. #6, Box 50
Wilmington, North Carolina 28401

MIC

Report on Coastal Storm - August 17, 1970

Director, WBERH, Garden City, New York

Because of the favorable wind fetch preceding the storm tiptides were in evidence on Suday August 16 and a warning statement was issued by the Wilmington office. This undoubtedly saved lives because people at the local beaches were ordered out of the water.

Even so, three lives were lost at nearby beaches, two in the sounds and one in an inlet. Information available shows these drownings were not associated with the storm or the rip currents.

The highest wind at Wilmington (ILM) associated with the depression was less than 20 miles and hour and the tides at the nearby beaches were about one foot above normal. There was no reported damage at the local beaches. In the city of Wilmington several streets were temporarily flooded from the heavy rainfall.

We believe the storm was about 35 miles east of Wilmington at 5:30 AM EDT on August 17, and may have increased in intensity before reaching the Atlantic Beach-Morehead City area between 7:30 and 8:00 AM EDT. About 7 AM we made a special broadcast over the radio station in Morehead City about the storm. In this broadcast we stated that winds in the storm approaching the area would likely reach between 20-40 miles and hour with somewhat higher in gusts in the squals. We certainly did not expect winds as high as reported by our CHURN observer at Atlantic Beach. Our estimate of the weather and tides were good.

The heaviest squall followed by the center of the storm must have passed over or very near the Atlantic Beach area. Our CHURN observer at Atlantic Beach reported the following:

Lowest pressure 29.95 inches at 7:45 AM EDT; highest wind 65 knots at 7:45 AM EDT; steady wind around 50 knots between 7:40 and 7:50 AM EDT; tide one foot above normal. Minor damage from wind confined to house shingles, television antenne and signs. Some small boats swamped by rain. In Morehead City two or three trees blown to the ground. In the city and on the beach he reported isolated electric power failures.

Although the observer heard no unusual noise he thinks the sudden and brief gust of wind along with the spotty damage may have been associated with a twister. In his own words, "It was a good mullet blow."

Sam F. D. Duke
Meteorologist in Charge

cc: NHC, Miami; WBFO, Raleigh; State Climatologist, N.C.

```
SI A ORF 171500Z
COAST GUARD REPORTS

CAPE LOOKOUT
WX PC/R VSB 5 WND WSW 25↑32 PRS 29.58

FRYING PAN
WX PC VSB 6 TMP 79 WND WSW 20 PRS 30.10 SWT 80 SEA WSW 4↑5
SWELLS SSE 6↑8

OAK ISLAND
WX PC VSB 8 WND WSW 10 PRS 30.08 SEA WSW 1↑2

OCRACOKE
WX OVC R VSB 300 YDS TMP 73 WND SSW 55 PRS 29.80 1008

DIAMOND SHOALS
WX OVC R VSB 1/2 TMP 81 WND SW 30 PRS 30.03 SWT 78 SEA S 8

OREGON INLET
WX OVC H VSB 4 TMP 78 WND S 20 PRS 30.01D

CHESAPEAKE
WX OVCL VSB 10 TMP 78 WND SE 12 PRS 30.04 SWT 77 SEA SE 3

WOLF TRAP
WX OVC VSB 10 TMP 82 WND SE 10 PRS 30.04 SWT 74 SEA SE 2

SMITH POINT
WX OVC VSB 10 TMP 81 WND S 15 PRS 30.07 SWT 30.07 SWT 78 SEA S 2

CAPE HENRY
WX PC VSB 10 TMP 77 WND SE 15 PRS 30.09

PARRAMORE BEACH
WX OVC VSB 6 TMP 77 WND S 10 PRS 30.07

OCEAN CITY
WX OVC VSB 7 TMP 77 WND S 14 PRS 30.07 SWT 74 SEA E 2D

CRISFIELD
TMP 80 WND S 12

COVE PT
WX PC VSB 8 TMP 81 WND S 8 PRS 30.03 SWT 79 SEA S 1

THOMAS PT
WX CLR VSB 7 TMP 81 WND S 6 PRS 30.09 SWT 79 SEA S 1
```

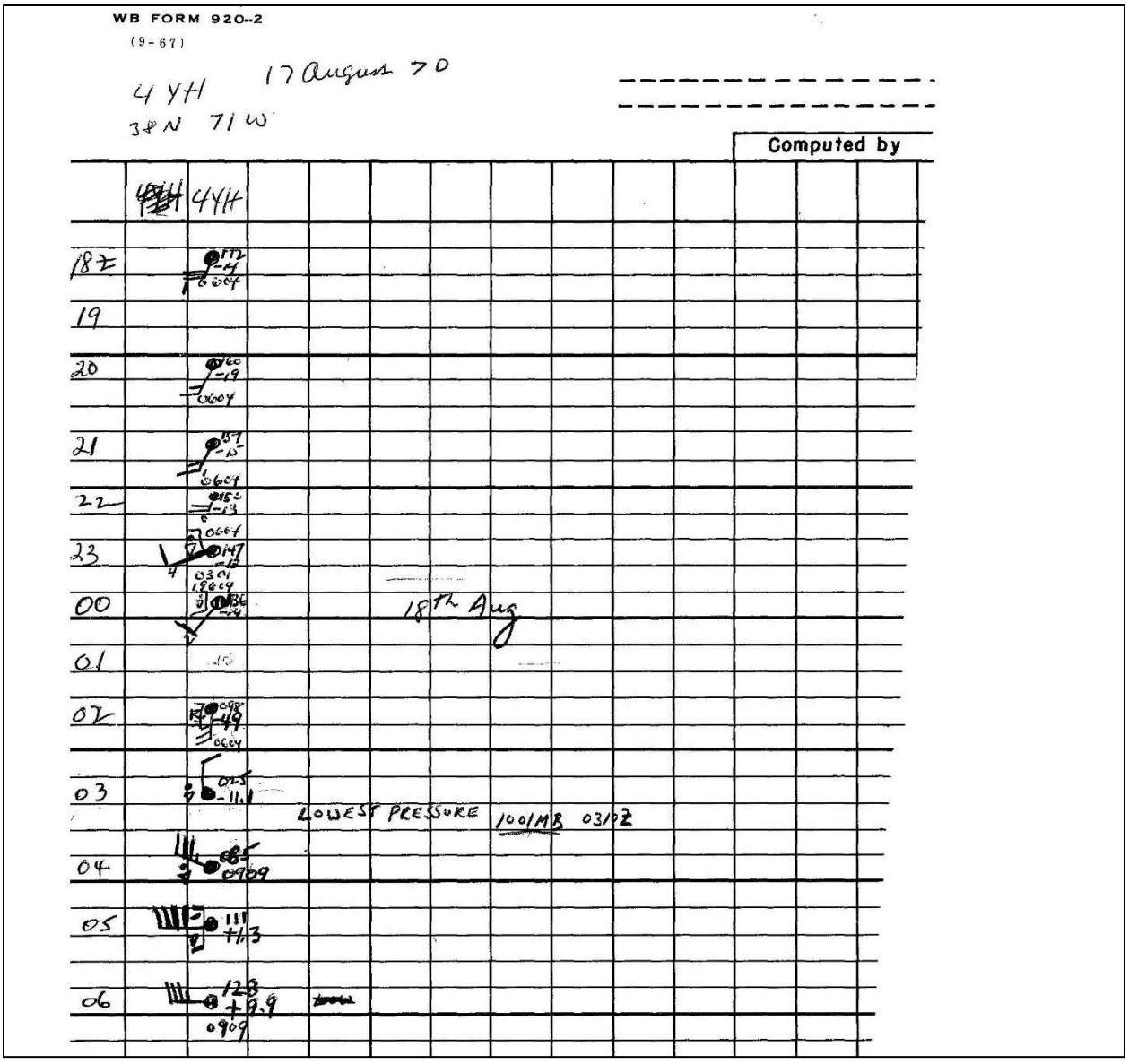
6a. While the actual 48 kt ob from Oregon Inlet is not available in the Storm Wallet, since it is included in the collectives with apparent sustained winds shown above it is likely to be a sustained wind.

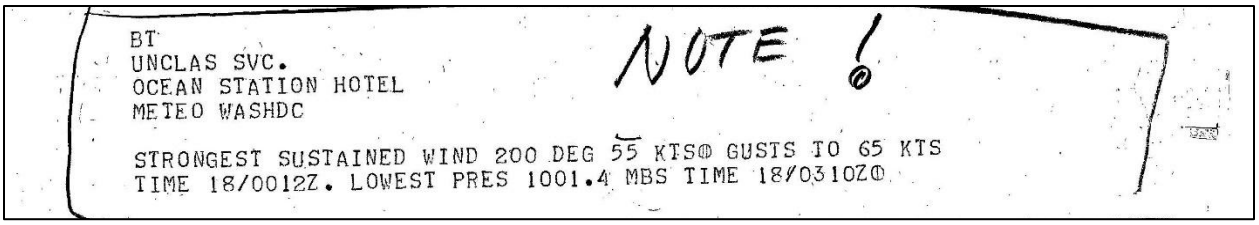
Agreed. This is now so indicated.

7. The time series of observations from weather ship HOTEL is in the Storm Wallet and included below. Note that the center seems to have passed almost directly over the ship with a pressure of 1001 mb, which may help establish at least one central pressure for 18 August. Also

note that the data here does not agree with Spiegler's assertion that there were 65 kt sustained winds before the center arrived. Please obtain the ship's log to see if there is peak wind data that was not included in these hourly observations. That will help resolve the discrepancy.

The 1001 mb reading with 10 kt N winds at 0310Z justifies a 1000 mb central pressure. However, because the system was intensifying steadily, it would not be appropriate to indicate a central pressure at either the 00Z or 06Z slots. Unfortunately, obtaining an original ship log for this reanalysis is beyond the scope of this project. Fortunately, the change to hurricane intensity did not rely upon Spiegler's assertation.




BT
UNCLAS SVC.
OCEAN STATION HOTEL
METEO WASHDC

NOTE 6

STRONGEST SUSTAINED WIND 200 DEG 55 KTS@ GUSTS TO 65 KTS
TIME 18/0012Z. LOWEST PRES 1001.4 MBS TIME 18/0310Z@

8. The Committee otherwise concurs with the proposed changes.

Agreed.

1970 AL091970, Tropical Storm Dorothy:

1. There is a Navy aircraft fix at 0940Z 19 August that is the basis for the 1000 mb pressure included in the Annual Tropical Storm Report (ASTR) and Monthly Weather Review (MWR) excerpts. Please include this fix in the aircraft highlights to match the two excerpts.

Done.

2. Was the aircraft radar fix at 0615Z 20 August used for the best track position for 06Z?

No, the aircraft radar center fix from 0615Z 20 August of 13.6N 57.0W was disregarded. The position analyzed at 20/06Z (13.8N 58.0W) was based on an extrapolation of the two center fixes from 19/2330Z (13.9N 56.4W) and 20/0806Z (13.8N 58.5W).

3. It is noted that while the 1006 mb aircraft pressure at 1804Z 20 August may look erroneous, it passes the quality control checks compare to the flight-level and dropsonde extrapolations.

Agreed.

4. MeteoFrance wrote an extensive report for Dorothy's passage over Martinique, which is available in the online Storm Wallet and needs to be explicitly referenced in the write-up. The key takeaway is that Caravelle reported sustained winds of 94 km/h and a peak gust of 138 km/h (see below). This translates to 51 kt gusting to 74 kt and 58 mph gusting to 86 mph. It appears that the MWR report of 58 kt gusting to 86 kt is from a unit translation error. Please note the error in the write-up and include the time of the observation.

The translation error and the time of the wind observation have been noted in the write-up. The MeteoFrance report has also now been referenced in the write-up.

On observait au large de la côte atlantique une masse de nuages très dense. On devait s'attendre à des orages violents dans la soirée accompagnés de pluies torrentielles. Le service météorologique diffusait un bulletin spécial en attirant l'attention de la population sur les risques d'inondations et de crues des cours d'eau et en rappelant que l'alerte cyclone était toujours en vigueur.

La zone pluvio orageuse a abordé de plein fouet le relief central de la Martinique ce qui a amplifié son développement vertical et l'a freiné. Pendant 6 heures elle a deversé près de 300 mm d'eau en donnant des orages d'une intensité exceptionnelle. Elle était accompagnée de coups de vent de secteur SE dépassant la force cyclone (64 noeuds) à la caravelle et en plusieurs points.

Après son passage sur la Martinique, DOROTHY perdait sa vigueur et devait dégénérer rapidement en dépression tropicale.

PLUIES

DOROTHY a donné des pluies torrentielles au Nord d'une ligne LAMENTIN - ROBERT, de 1h30 à 5 heures le 21 (voir figure 5) .
Elles étaient accompagnées d'orages d'une violence exceptionnelle.

1°/ Les précipitations des plus en 24 h, recueillies dans cette zone le 21 à 8 heures légales dépassent dans certains postes les normales mensuelles du mois d'août (voir tableau I)

2°/ Les intensités des précipitations à FORT-DE-FRANCE DESAIX ont dépassé les valeurs enregistrées depuis la création du service en 1935 et correspondent à des valeurs supérieures à celles de l'averse centenale estimée (voir tableau II)

VENTS

I - Vitesses enregistrées

LAMENTIN

-Vitesse maximale 50 Km/h le 20 à 1040 (heures légales)

FORT-DE-FRANCE

- Vitesse moyenne de 59 Km/h le 20 de 0810 à 0817
- Pointe de 93 Km/h à 0815

CARAVELLE

1°) de 23h50 le 20 à 01h50 le 21

- vitesse moyenne 90 Km/h avec de nombreuses rafales atteignant 115 Km/h

2°) de 02h10 à 03h50

vitesse moyenne 94 Km/h avec pointe à 138 Km/h à 02h50

II - Vitesses estimées

Les avions USA spécialisés dans la reconnaissance des cyclones indiquaient le 20 Août des vitesses de 120 à 137 Km/h dans la zone la plus active de la tempête tropicale.

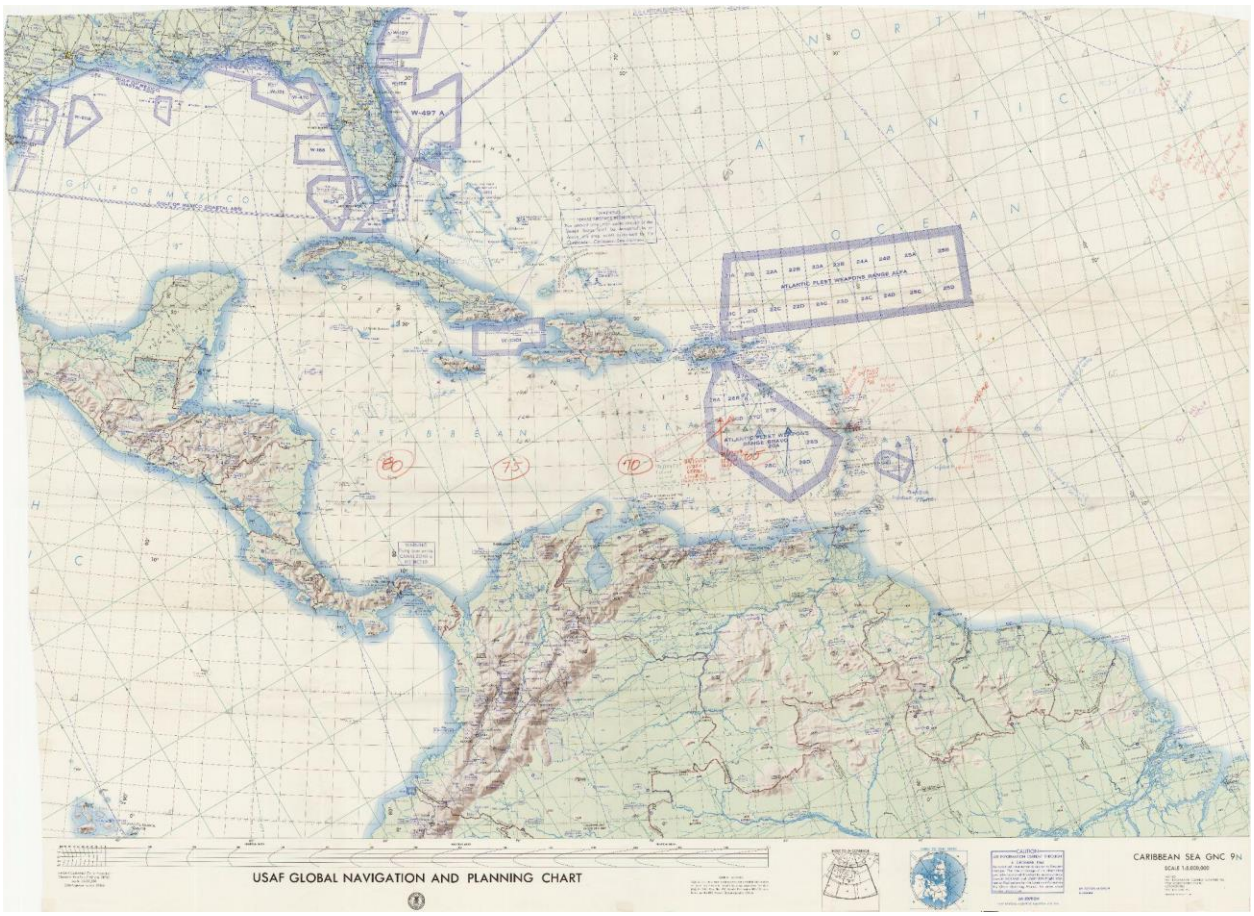
Il est probable que ces vitesses ont été atteintes au cours de la

5. Please re-examine all of the aircraft fixes on 21 August and better summarize them in the write-up. The fix at 0540Z has 700-mb data showing an extrapolated pressure of 1007 mb. The 1130Z fix is a penetration fix with an extrapolated pressure of 995 mb (see below) – a pressure that looks anomalously low with that anomaly being apparent to the crew. And finally, where does the 1005 mb pressure for the 1809Z fix come from, since no such pressure is included in the vortex message?

A	SQUADRON CALL SIGN: NAVY	MISSION NUMBER: 3	CYCLONE/STORM NAME: DOROTHY	OBS NUMBER: 19
B	21 / 1130 Z			B. DATE AND TIME OF FIX (Zulu)
C	14 DEG 50 Min N S			C. LATITUDE CENTER FIX (Degrees/Minutes) (Circle N or S)
D	64 DEG 36 Min W			D. LONGITUDE CENTER FIX (Degrees/Minutes) (Circle E or W)
E	2 4 5			E. CENTER DETERMINED BY: (Enter appropriate number) 1 - Penetration; 2 - Radar (indicate aircraft position and wall cloud data in Sec. S, REMARKS); 3 - Wind; 4 - Pressure; 5 - Other.
F	5 NM			F. NAVIGATION FIX ACCURACY (in nautical miles).
G	EXTRAPOLATED 995 MB			G. MINIMUM SEA LEVEL PRESSURE (in millibars). (Computed, unless otherwise stated).
H	700 MB 3042 M			H. MINIMUM HEIGHT AT STANDARD LEVEL (millibars/meters).
I	25 K			I. ESTIMATE OF MAXIMUM SURFACE WIND OBSERVED (in knots).
J	130 ° / 80 NM			J. BEARING AND RANGE FROM CENTER OF MAXIMUM SURFACE WINDS (Degrees, nautical miles).
K	230 DEG 18 K			K. MAXIMUM FLIGHT LEVEL WINDS NEAR CENTER (Degrees and knots).
L	130 ° / 10 NM			L. BEARING AND RANGE OF MAXIMUM OBSERVED FLIGHT LEVEL WINDS FROM CENTER (Degrees and Nautical Miles).
M	13.3 °			M. MAXIMUM FLIGHT LEVEL TEMP INSIDE THE EYE (degrees Centigrade)
N	10.7 °			N. MAXIMUM FLIGHT LEVEL TEMP OUTSIDE THE EYE (degrees Centigrade).
O	2966 M / 2 957 M			O. ABSOLUTE ALTITUDE OUTSIDE/INSIDE EYE (meters)
P	14 ° / 50 Min 6 N S : 21 64 ° / 36 Min ° E W : 1130 Z			P. CONFIRMATION OF FIX. Position (Degrees/Minutes); Date and Time (Zulu)
Q	C 25			Q. EYE SHAPE/ORIENTATION/DIAMETER. Code eye shape as: C - Circular; CO - Concentric; E - Elliptical. Transmit orientation of major axis in tens of degrees, i.e., 01-010 to 180; 17-170 to 350. Transmit diameter in nautical miles. Examples: C8 - Circular eye.8 miles in diameter. E09/15/5 - Elliptical eye, major axis 090-270, length of major axis 15 NM, length of minor axis 5 NM. CO8-14 - Concentric eye, diameter inner eye 8 NM, outer eye 14 NM.
R	CLOSED			R. EYE CHARACTER: Closed Wall, Poorly Defined, Open SW, etc.
S	HVYR CLDNS WITH NOTABLE INCR. IN PCPN FM PREV. 3 PENETRATIONS. PRES. CNTR VRY SML.		RECHECKED 700 MB HGT SVRL TIMES.	S. REMARKS
T	° / Min N S ° / Min E W			T. AIRCRAFT POSITION IF RADAR FIX (Degrees/Minutes).

INSTRUCTIONS: 'Make every effort to eliminate ambiguous or misleading statements. Use authorized contractions. Transmit in flight only that portion beginning with "Message Heading." Significant clouds observed in the Eye/Center should be reported under "Remarks" or be summarized in the written Post-Flight Report. Enter "N/A" for items that are not available

700 mb height and temperature data from the 21/0540Z fix suggests a pressure near 1006 mb. However, 700 mb height and temp data from a 21/0654Z fix suggests a pressure near 1003 mb. This data is consistent with a weakening of 5 kt from 00Z (when the central pressure was 1002 mb) to 06Z. Added a sentence to metadata about the 1130 UTC fix, and stated that the 995 mb pressure (extrapolated from 700 mb) is anomalously low and is disregarded.



The 1005 mb central pressure for the 1809Z fix was written down on the track map, as seen above and also at https://www.nhc.noaa.gov/archive/storm_wallets/cdmp/dvd0032-jpg/1970/atlantic/dorothy/opltrack/track4.jpg

6. The Committee otherwise concurs with the proposed changes.

Thank you.

1970 AL101970, new Unnamed Tropical Storm:

1. It should be explicitly noted in the Significant Revisions section that this is an upgrade to a tropical storm.

Corrected.

2. Please add a ship highlights section for 5 September. At 00Z, the MF maps show a 40 kt ob northeast of the center, which needs to be explained even if it turns out to be wrong. And at that same time, there is a ship with 1009 mb and 25 kt near the center, suggesting a central pressure of 1007 mb. Given the high external pressures, this may help justify the upgrade.

Added.

3. If possible, please provide more detailed data for the aircraft flight on 5 September.

Unfortunately, the only information available on this fight was what was recorded in the microfilm.

4. The Committee otherwise concurs with the proposed changes.

Thank you.

1970 AL111970, Tropical Depression:

1. The Committee concurs with the proposed changes. This is a weak system, but there was no consensus on removing it.

Agreed.

1970 AL121970, Hurricane Ella:

1. The Committee concurs with the proposed changes in intensity on 10 September. However, it would like the intensity discussion to be re-written to include the intensifying subset of the wind pressure relationships and the use of the 1005 mb non-central pressure at Valladolid.

Thank you. Intensifying subset added and the use of the Valladolid observation.

2. The 72 kt intensity estimate on 11 September is based on which wind-pressure relationship?

The south of 25N Brown et al. pressure-wind relationship.

3. For the landfall intensity on 12 September, which wind pressure relationship was used to get the 99 kt estimate? Given the 130 kt wind gust reported in La Pesca, and that only a 5 kt adjustment to the original HURDAT intensity is being proposed, the Committee would prefer to keep the original 110 kt landfall intensity.

Rewrote the 99 kt estimate sentence and added the intensifying subset. Agreed on keeping 110 kt at landfall. Also added an addendum to include the landfall intensity as a separate point.

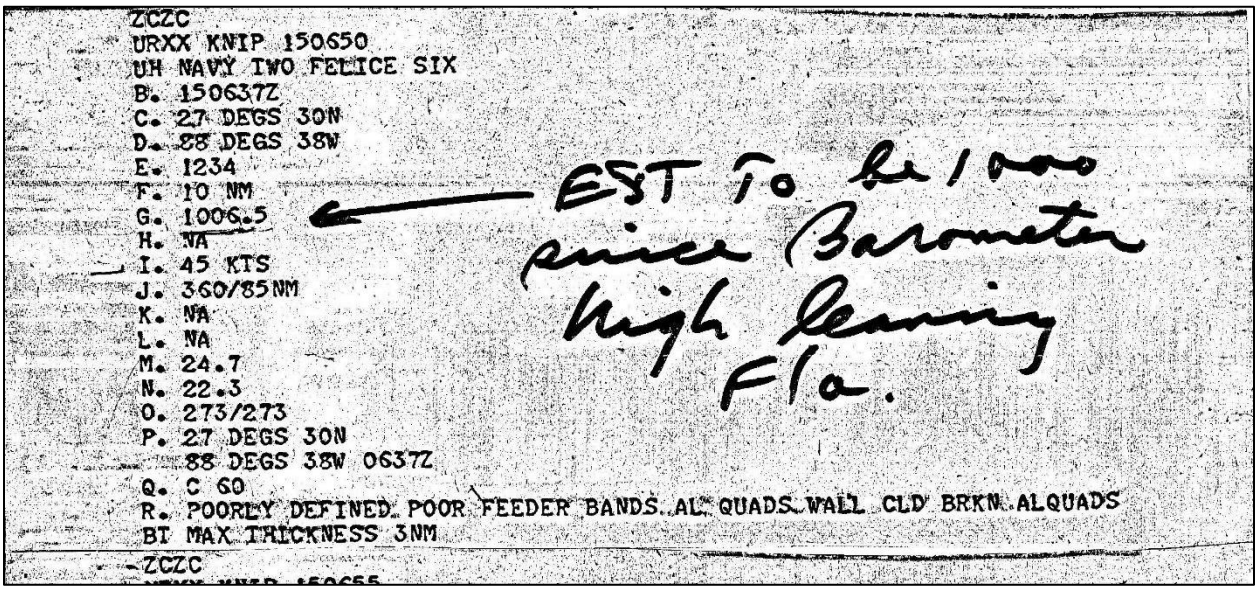
4. The Committee otherwise concurs with the proposed changes.

Thank you.

1970 AL131970, Tropical Storm Felice:

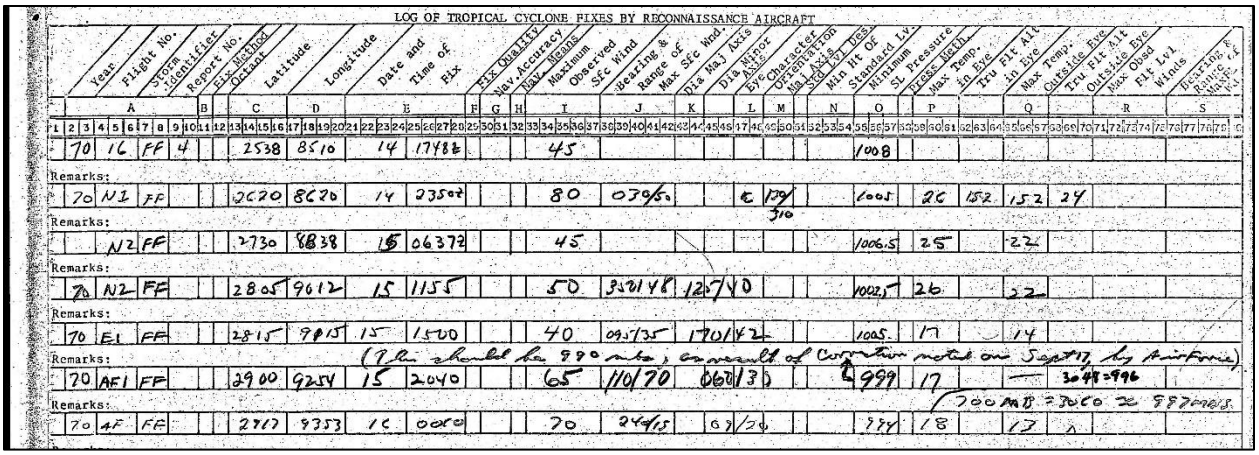
1. Regarding the aircraft fix of 1007 mb at 0637Z 15 September, there is a hand-written note on the fix suggesting the aircraft had a high bias to its pressure when leaving Florida (see below). Note that this same aircraft made the fix at 1155Z 15 September.

Based upon this, the fixes have been adjusted 6.5 mb lower than report. So the 0637Z is 1000 mb and the 1155Z is 998 mb.



2. There seems to be a lot of confusion over what the pressure was on the 2040Z 15 September fix. The actual vortex message in the Storm Wallet says 999 mb via dropsonde, and pre-vortex eye message said 1000 mb (not shown). However, the 700-mb height (3048 m) and temperature (17C) extrapolates to a pressure of 990 mb using today's formulas. On the fix log, it states that the 700-mb height of 3048 m extrapolates to 996 mb. However, right above the fix, there is a hand-written note that says the pressure should have been 990 mb based on some late correction sent by the Air Force (see below). To further not bring clarity to the issue, the dropsonde is not available in the Storm Wallet. Please sort out the actual pressure as best as you can. Note that the proposed intensity for 18Z 15 September may need changing after this investigation.

Agreed to use 990 mb as the central pressure at 18Z from this 2040Z fix, though with only moderate confidence. The intensity at 18Z is set at 60 kt, though it is possible that the system reached minimal hurricane intensity just before and at landfall in Texas.



3. Please explicitly reference the Jessup paper in the write-up.

Agreed.

4. The Jessup paper is very suggestive that Felice at least somewhat re-intensified over Oklahoma, and the Committee concurs with the proposed extension of Felice's lifetime. However, there is not enough data in the Jessup paper by itself to justify an upgrade back to a tropical storm. The paper does not mention what the central pressure was, and whether it fell during this time. It mentions winds of 40-50 kt near the eye, but it does not mention what stations measured them, under what circumstances they were measured, and whether they were sustained or gusts. Finally, the paper mentions 40-kt flight-level winds at 10,000 ft, which using today's reduction standards **over water** would be a marginal call on making the system a tropical storm – and these winds were measured well inland. Before this upgrade can be approved, please find the available surface obs near the track in Oklahoma, create a land stations highlight section from them, and re-write the intensity analysis for this day based on them. That way, there will be more rigorous quantitative data to justify this very unusual upgrade.

XXX Still need to get EV2 Data…XXX

5. Please coordinate with David Roth at WPC to see if it is appropriate to add the following points to the currently proposed best track for Felice:

AL1370 FELICE 091818 1970 35.6 92.5 20 1011 -99 -99 1018 135 0 0 0 0 0 0 0 0 0 0 0 0 0 0 E

AL1370 FELICE 091900 1970 35.5 91.4 20 1012 -99 -99 1014 70 0 0 0 0 0 0 0 0 0 0 0 0 0 0 E

AL1370 FELICE 091906 1970 35.4 90.4 15 1013 -99 -99 1016 125 0 0 0 0 0 0 0 0 0 0 0 0 0 0 E

AL1370 FELICE 091912 1970 35.8 89.8 15 1014 -99 -99 1016 75 0 0 0 0 0 0 0 0 0 0 0 0 0 0 E

AL1370 FELICE 091918 1970 36.2 89.2 15 1014 -99 -99 1016 65 0 0 0 0 0 0 0 0 0 0 0 0 0 0 E

AL1370 FELICE 092000 1970 37.3 88.5 15 1014 -99 -99 1015 45 0 0 0 0 0 0 0 0 0 0 0 0 0 0 E

AL1370 FELICE 092006 1970 39.4 89.4 10 1014 -99 -99 -99 -99 0 0 0 0 0 0 0 0 0 0 0 0 0 0 E

Agreed to extend Felice's lifetime through 18Z on the 19th based upon these analyses.

1970 AL141970, Tropical Depression:

1. Please re-check the proposed positions on 22-23 September. Given the current data, the Committee would prefer the original HURDAT positions instead of the proposed new positions.

Agreed to keep the original positions.

1970 AL151970, Unnamed Hurricane:

1. The Committee concurs that the HURDAT positions during the early part of the cyclone's life look wrong. However, the WPC data base had alternate positions that fit the satellite imagery better (see below), although they probably don't answer the question of whether the system was actually a depression on those days. Please coordinate with David Roth at WPC on the WPC data:

AL1570 NINETEEN 092712 1970 11.0 37.5 30 0 -99 -99 -99 -99 0 0 0 0 0 0 0 0 0 0 0 0 *
AL1570 NINETEEN 092718 1970 11.2 39.2 30 0 -99 -99 -99 -99 0 0 0 0 0 0 0 0 0 0 0 0 *
AL1570 NINETEEN 092800 1970 11.4 40.9 30 0 -99 -99 -99 -99 0 0 0 0 0 0 0 0 0 0 0 0 *
AL1570 NINETEEN 092806 1970 11.6 42.5 30 0 -99 -99 -99 -99 0 0 0 0 0 0 0 0 0 0 0 0 *
AL1570 NINETEEN 092812 1970 11.9 44.1 30 0 -99 -99 -99 -99 0 0 0 0 0 0 0 0 0 0 0 0 *
AL1570 NINETEEN 092818 1970 12.2 45.5 30 0 -99 -99 -99 -99 0 0 0 0 0 0 0 0 0 0 0 0 *
AL1570 NINETEEN 092900 1970 12.5 46.8 30 0 -99 -99 -99 -99 0 0 0 0 0 0 0 0 0 0 0 0 *
AL1570 NINETEEN 092906 1970 12.8 48.1 30 0 -99 -99 -99 -99 0 0 0 0 0 0 0 0 0 0 0 0 *
AL1570 NINETEEN 092912 1970 13.1 49.4 30 0 -99 -99 -99 -99 0 0 0 0 0 0 0 0 0 0 0 0 *
AL1570 NINETEEN 092918 1970 13.5 50.7 30 0 -99 -99 -99 -99 0 0 0 0 0 0 0 0 0 0 0 0 *
AL1570 NINETEEN 093000 1970 14.0 52.0 35 0 -99 -99 -99 -99 0 0 0 0 0 0 0 0 0 0 0 0 *
AL1570 NINETEEN 093006 1970 14.5 53.3 35 0 -99 -99 -99 -99 0 0 0 0 0 0 0 0 0 0 0 0 *
AL1570 NINETEEN 093012 1970 15.0 54.5 40 1001 -99 -99 -99 -99 0 0 0 0 0 0 0 0 0 0 0 0 *

System is definitively not a tropical cyclone on the 28th and 29th due to aircraft recon missions on both dates. First position in HURDAT2 is set at 12Z on the 30th.

2. On 28 September, the Ship highlight section needs to be re-titled Aircraft highlights. Note that the mission data is on a MF map that is not available to the Committee.

Corrected.

3. Given the impacts on Martinique, please contact MeteoFrance to see if they wrote a report on this system similar to the one they wrote for Tropical Storm Dorothy.

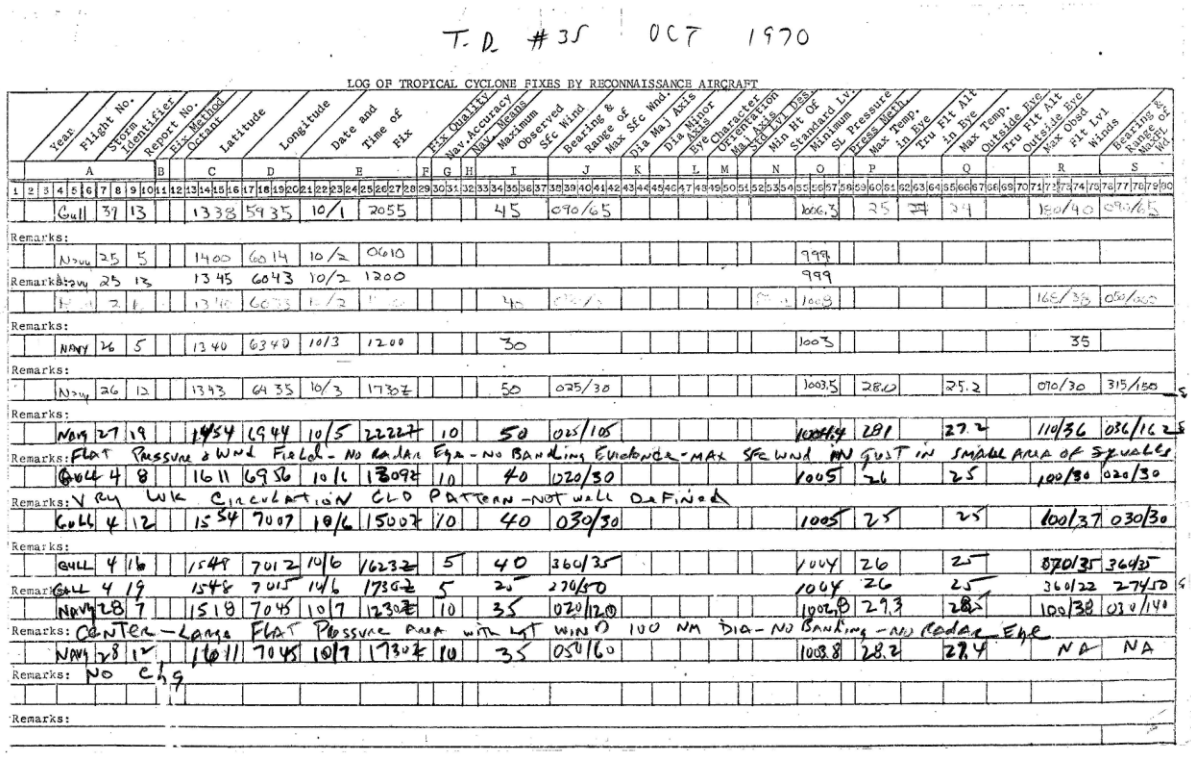
An email has been sent to MeteoFrance in regards to the question presented. No response was received.

4. The Committee notes that the aircraft fix for 2055Z 1 October was found in the online Storm Wallet in the Greta section.

This observation was already documented in the metadata.

5. Does the Storm Wallet fix log have a 12Z 2 October fix?

This observation is now included in the daily summary.



T.D. #35 OCT 1970

LOG OF TROPICAL CYCLONE FIXES BY RECONNAISSANCE AIRCRAFT

Year	Flight No.	Storm Identifier	Report No.	Fix Method Ocean	Latitude	Longitude	Date and Time of Fix	Fix Quality	Nav. Accuracy	Meas. Maximum Observed Sfc Wind	Bearing & Range of Max Sfc Wind	Dia Maj Axis	Dia Minor Axis	Eye Character	Orientation	Major Axis	Min Rt Of Standard Lvl.	Minimum Sl. Pressure	Dropsn Meth. Max Temp. in Eye	Trcu Fit Alt in Eye	Max Temp. Outside Eye	Trcu Fit Alt Outside Eye	Max Obsd Flt Lvl Winds	Bearing & Range of Max Flt Lvl Winds
A				B	C	D	E	F	G	H	I	J	K	L	M	N	O	P		Q			R	S
1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16 17 18 19 20 21 22 23 24 25 26 27 28 29 30 31 32 33 34 35 36 37 38 39 40 41 42 43 44 45 46 47 48 49 50 51 52 53 54 55 56 57 58 59 60 61 62 63 64 65 66 67 68 69 70 71 72 73 74 75 76 77 78 79 80																								
	Gull	37	13		1338	5935	10/1 2055			45	090/65						1006.3		25	27	29		150/40	090/65
Remarks:																								
	NOAA	25	5		1400	6014	10/2 0610										999							
Remarks:	NOAA	25	13		1345	6043	10/2 1200										999							
	[illegible]	2	6		1316	6033	10/3 [illegible]			40	[illegible]						1008						165/35	090/105
Remarks:																								
	NAVY	26	5		1340	6340	10/3 1200			30							1003						35	
Remarks:																								
	NOAA	26	12		1343	6435	10/3 1730Z			50	025/30						1003.5	28.0		25.2			070/30	315/150
Remarks:																								
	NAVY	27	19		1454	6944	10/5 22227		10	50	025/105						1004.4	28.1		27.2			110/36	036/16
Remarks:	FLAT PRESSURE & WND FIELD - NO RADAR EYE - NO BANDING EVIDENCE - MAX SFC WND IN GUST IN SMALL AREA OF SQUALLS																							
	GULL	4	8		1611	6956	10/6 1730Z		10	40	020/30						1005	26		25			100/30	020/30
Remarks:	VRY WK CIRCULATION CLD PATTERN - NOT WELL DEFINED																							
	Gull	4	12		1554	7007	10/6 15007		10	40	030/30						1005	25		25			100/37	030/30
Remarks:																								
	GULL	4	16		1549	7012	10/6 162332		5	40	360/35						1004	26		25			070/35	360/35
Remarks	GULL	4	19		1548	7015	10/6 1736Z		5	20	270/50						1004	26		25			360/22	270/10
	NAVY	28	7		1518	7045	10/7 1230Z		10	35	020/120						1002.8	29.3		28.2			100/38	030/140
Remarks:	CENTER - LARGE FLAT PRESSURE AREA WITH LT WIND 100 NM DIA - NO BANDING - NO RADAR EYE																							
	NAVY	28	17		1611	7045	10/7 1730Z		10	35	050/60						1003.8	28.2		28.4			NA	NA
Remarks:	NO CHG																							
Remarks:																								

6. Typo: On 3 October, “bear” should be “near” in the maps section.

Corrected.

7. Please add a central pressure at 12Z 6 October based on the available aircraft data.

Done.

8. Please re-examine the data on 10 October. First, the use of the wind-pressure relationships may be problematic in a system as poorly organized as this one was on that day. Second, the MF maps indicate a second center to the NE of the proposed HURDAT position, and the available satellite imagery seems to better match that center.

The outer closed isobar for this system is around 1008-1009 mb at 12 and 18Z with a very large radius of outer closed isobar. Thus any suggested intensity (47 kt in this case) from the wind-pressure relationship needs to be adjusted downward significantly. An intensity of 40 kt is chosen for 12Z and 18Z based on observed 35-40 kt winds as well as the pressure data. The satellite imagery indicates an exposed center on the 10th with substantial convection present well east of the system in association with a frontal boundary. The system certainly was stretched WSW-ENE toward the frontal boundary, but the center remained exposed and well west of the convection.

9. The Committee concurs with keeping the cyclone as a single system across the possible dissipation on 11 October. However, it disagrees with the assertion that 30 kt is a reasonable speed of motion at that time and place. A forward speed of 30 kt is quite unclimatological at 25-31N in mid-October. Please re-write this part of the discussion.

Agreed.

10. Are there any other significant surface obs from the Azores?

No other noteworthy observations have been obtained from the Azores.

11. Please quantitatively show why the peak intensity was set at 75 kt on 18 October.

Satellite imagery depicts improved organization, including a large banding eye feature. Such a feature typically corresponds with Dvorak classifications of a range from 4.0-5.0, or 65-90 kt. Based on the improved structure, the system is roughly estimated to have attained peak winds of 75 kt.

12. The Committee otherwise concurs with the proposed changes. Please add a sources section for this system.

Added.

1970 AL161970, Tropical Storm Greta:

1. In the land station highlights on 27 September, are there any notable low pressures?

The minimum pressures reported by stations in the Florida Keys are consistent with the pressure values observed by the RECON on 27 September, which have already been added to HURDAT.

2. On 27 September, the highlights section says 48-kt gusts at Tavernier, while the MWR excerpt says 49-kt sustained winds. Please clarify this, and please better explain the chosen intensities in the re-analysis section.

W B Form 612-22
(5-57)

U. S. DEPARTMENT OF COMMERCE, WEATHER BUREAU

COOPERATIVE HURRICANE REPORTING NETWORK OBSERVATIONS

STATION	MONTH	YEAR
Tournier	Sept	1976

Standard of time in use:
EASTERN ☒ OR CENTRAL ☐

If Daylight Time is used locally, the times in Col. 2 should be one hour less.

DAY OF MONTH (1)	TIME (LST) (2)	SKY (3)	WEATHER (4)	STATION PRESSURE (5)	WIND DIRECTION (6)	WIND SPEED (7)	PRECIPITATION (8)	REMARKS (9)
1	6AM	PC		30.16	E	15	12	
2		PC		30.09	E	10	02	
3		PC		30.06	E	15		
4		PC		30.05	E	10		
5		PC		30.04	E	5		
6		Cldy		30.02	N	3		
7		PC		29.xx	SE	5		
8		Cldy		29.99	S	2		
9		PC		30.08	E	C	04	
10		PC		30.05	E	12		
11		C		30.04	ENE	8		
12		C		29.98	NNW	4	04	
13		PC		29.99	NW	12	32	
14		Cldy		30.00	SE	20	3.6	
15		Cldy		30.02	N	5	1.65	
16		PC		30.05	ESE	12	T	
17		PC		30.18	N	8	13	
18		Cldy		30.12	SE	18	42	
19		PC		30.03	N	3	02	
20		PC		30.02	NE	12	16	
21		C		30.02	E	5	35	
22		Cldy		29.98	N	4	25	
23		C		29.99	E	12	19	
24		PC		30.02	ESE	18	02	
25		Cldy		30.05	ENE	18	T	
26		Cldy		30.08	E	15	09	
27		Cldy		29.96	NE	20	193	Wind to 55 MPH for 15 MIN
28		Cldy		29.93	SE	15	06	at 12 1258 PM
29		Cldy		29.94	SE	8	04	
30		Cldy		29.93	NE	10	T	

Commerce-Weather Bureau, Washington, D. C.

☆GPO : 1961 O - 620091

Signature of Observer Eugene Lodge

Squalls produced wind gusts up to 55 mph (48 kt). These are not considered to be representative of the system's circulation.

3. The Committee has a question regarding the ship observations used to justify Greta's re-intensification to a tropical storm on 29 September and later: The reports may pass QC checks, but are they representative of the strength of the system? Many of the significant obs appear to be well away from the center in what may be the gradient flow behind the frontal boundary. In addition, the satellite imagery on 1 October does not lend confidence that Greta was a tropical storm at that time. Please better show how the reported gales are representative of the actual strength of the cyclone, or let's keep the depression status originally shown in HURDAT.

Agreed to not show a re-intensification to a tropical storm.

4. The Committee otherwise concurs with the proposed changes.

Thank you.

1970 AL171970, Tropical Depression:

1. The Committee does not concur with removing this system at this time. The MF maps for this case are not available, and the Committee needs to see them before making a final decision. Please supply these maps. Also, if the data are as sparse as implied in the write-up, they may not be sufficient to justify the removal.

Microfilm and HWM maps and COADS have been sent to Jack Beven. The data still suggests that a closed circulation was not present with most of the observations corresponding to the developing extratropical cyclone along the frontal boundary and not a low pressure ahead of the front. Satellite imagery does depict an intriguing system, but it seems likely that it was mostly at the mid-levels and that a well-defined, low-level circulation did not develop. It is interesting to mention that a TD was not present in the Microfilm maps, thus it was not analyzed operationally to have been a TD.

1970 AL181970, Unnamed Hurricane:

1. Is there a need for a pre-cursor extratropical low phase in the best track?

Satellite imagery and synoptic maps indicate that a frontal boundary extended from the central Atlantic to the Bahamas on October 10th. The trough persisted over the next few days and allowed for a low pressure to develop north of Hispaniola and become better organized. There was no discernable temperature gradient in the surface observations when the low pressure developed, but it did have a large circulation and the 500 mb HWM suggested that a trough extended from the central Atlantic to the Bahamas, thus the system was started as a subtropical cyclone. No extratropical low phase existed.

2. Given how far the 35 kt ship was from the center at 18Z 12 October, was it truly representative of the intensity?

The broad nature of the system suggests that the various 30-35 kt ship reports late on the 12 and 13 October are likely representative of the intensity as the system is a subtropical storm. If this was a tropical cyclone, then it would be quite suspect.

3. Extrapolation of the 700 mb data on the aircraft fix at 0603Z 16 October suggests a central pressure of 994 mb.

Added in to daily summary/HURDAT2.

4. Extrapolation of the 700 mb data on the aircraft fix at 1020Z 17 October suggests a central pressure of 975 mb.

Added in to daily summary.

5. The analyzed intensity at 12Z 17 October is 85 kt, down from the 85 kt originally in HURDAT? Looks like this should say unchanged from the original HURDAT.

Corrected.

6. The Committee otherwise concurs with the proposed changes.

Thank you.

1970 AL191970, Unnamed Hurricane:

1. One of the 55-kt ship reports on 23 October was from a U. S. Coast Guard ship at Weather Station D, which suggests it was an official weather ship. Given that, it calls into question the assertion that its reported winds were too high. Please review this and re-write the analysis section, if necessary.

The reanalyzed HURDAT intensity is nudged up by 5 kt from what we had before (changed from 50 kt to 55 kt on the 23rd beginning at 06Z).

2. Since the satellite imagery for 24 October still shows cold-air clouds south of the center, it might be better to delay the transition to a tropical cyclone 6-12 h. 12Z 24 October may be too soon.

Agreed. The tropical transition is now indicated to have occurred at 00Z on 25 October.

3. Has the pressure of the ship that reported 991 mb on 25 October been quality controlled?

There are only two entries to the ship "DHHD," thus it's difficult to quality control the data. However, it appears reasonable compared to nearby data.

4. Please show the quantitative reasons for the choice of an 85 kt peak intensity on 26 October. The current write-up does not have a sufficient explanation.

Added the phase: "suggesting a Dvorak T number near the T-5.0 range" to a sentence in the Oct 26 reanalysis metadata. This adds quantitative reasoning to the choice behind the 85 kt peak intensity.

5. Is there any land station data from the Azores for this system?

A very fruitful email to Carlos Ramalho in the Azores indicate peak winds of 50 kt and gusts to 70 kt at Flores island on 27 October at 18Z. This information was added to the metadata.

6. The Committee otherwise concurs with the proposed changes.

Thank you.

1970 AL201970, New Tropical Depression:

1. The MF maps for this case need to go into their own separate directory.

Agreed.

2. The Committee concurs with the addition of this system.

Thank you.

1970 AL211970, New Tropical Storm:

1. It is noted that on the MF map for 18Z 29 November there is a ship near the center with 990 mb and 30 kt winds. This could be used to establish a central pressure, and it may be an indicator that an inner core had formed by that time.

Agreed and added 987 mb as a central pressure. However, this system is AL23.

2. The Committee otherwise concurs with the addition of this system.

Thank you.

1970 AL221970, New Tropical Depression:

1. Typo: In the significant revisions section, please change “tropical storm” to “tropical depression”.

Corrected.

2. The Committee concurs with the addition of this system.

Thank you.

1970 Additional Notes:

1. Except as noted above, the Committee concurs with leaving the suspect systems out of HURDAT. However, it would like to have the MF maps for these cases (when available) added to and organized in the electronic archive.

This request is beyond the scope of this project, unfortunately.