

Mission Summary
Gabrielle
010915n1 Aircraft 49RF

Scientific Crew (49RF)
Lead Project Scientist Sim Aberson
Dropwindsonde Scientist Jason Dunion

Mission Briefing:

010915n.gif

Synoptic surveillance mission for Tropical Storm Gabrielle, possibly threatening the east coast of the United States (Fig. 1). Important points were around Gabrielle, and to get the strength of the southwesterly winds extending from southeast of Gabrielle and converging into the longwave trough to the northeast. See Fig. 2.

Mission Synopsis:

Flight track flown exactly as planned.

Synoptic findings:

1. Because the storm was further east than forecast, the G-IV flew within 100 km of the center (to the southeast). See Fig. 3a and 3b for pictures taken from over the center of Gabrielle during the closest point of approach. The center is difficult to find, though a low-level swirl was seen on satellite pictures.
2. Dropwindsondes 2 and 4 had 31 and 35 kt winds at the surface. An early call was made to the NHC specialist to relay this information. Dropwindsonde 4 was especially interesting since the winds were so far from the center of the storm.
3. Dropwindsondes 8, 11, and 26 had super-adiabatic layers near the surface, showing the cold air above the warm sea surface in these areas behind the cold front associated with the strong trough that had passed off the U. S. east coast. The sondes showed the cold front, but were unclear whether the storm was separated from it.
4. Upper-level winds were not as strong as the previous day, and the outflow was improving, especially on the east side. This suggests a chance of intensification for the next day. The upper-level winds well to the north were hostile to any development.
5. A confluence zone was evident to the northeast of the center at mid-levels. Winds to the east were southerly, and they met easterly winds further north, somewhat reminiscent of a warm-front scenario at the surface. This was in the regions of the frontal zones.
6. A 700 hPa ridge was evident extending from the U.S. out to about 32.5N 77W, building in from the west. This should not be strong enough to turn the storm back to the west, and does not extend much higher than 700 hPa.

7. A circulation at 850 hPa was seen at 32.5N 73W. This may have been a frontal low.

Evaluation:

1. Jason Dunion was fully trained to run HAPS and process dropwindsondes. He was able to process the last sondes, make plots, archive the data, and shut down HAPS on his own.
2. The data showed a stronger asymmetry across Gabrielle than expected, suggesting more rapid movement to the northeast. The impact on the models is currently unknown. See Fig. 4.

Problems:

1. There was only minor SATCOM difficulty, especially around sunset.
2. Only one dropwindsonde (17) was replaced due to fast fall.

Sim Aberson

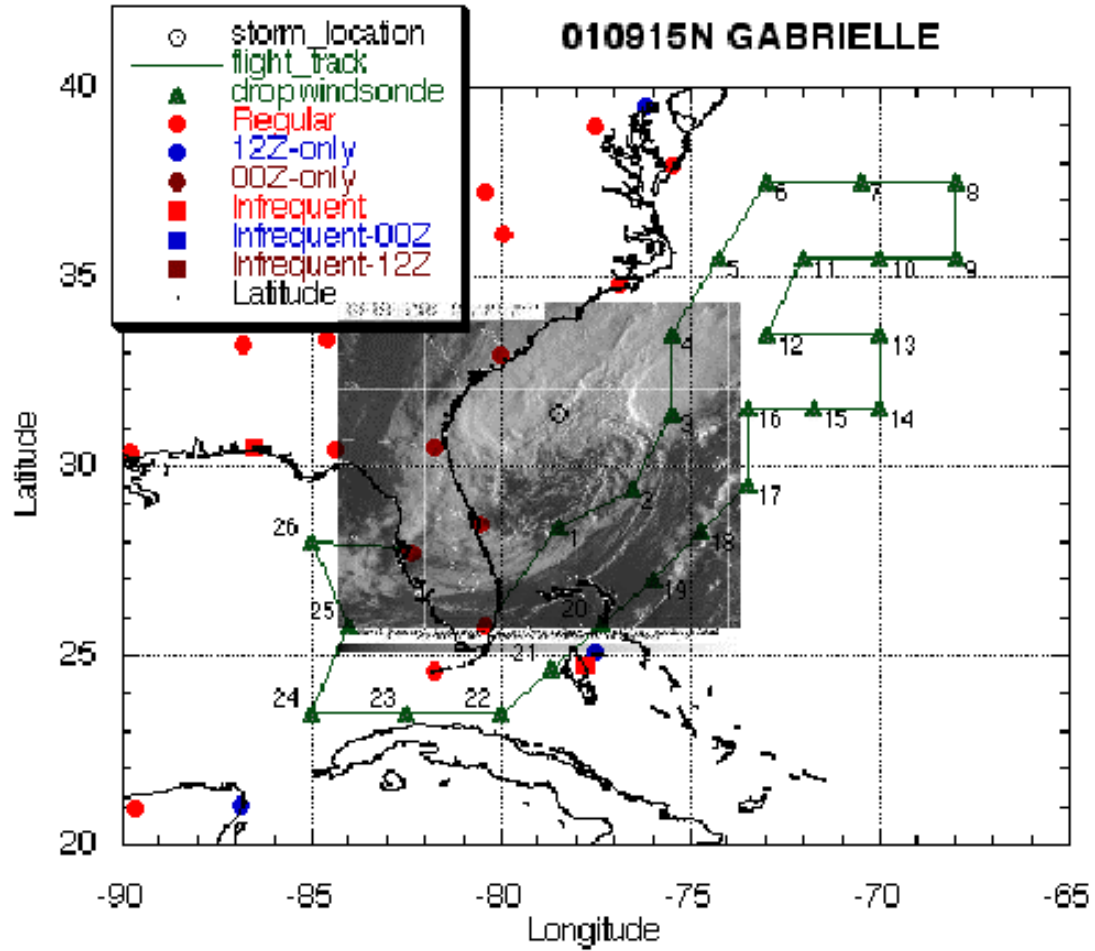


Fig. 1.

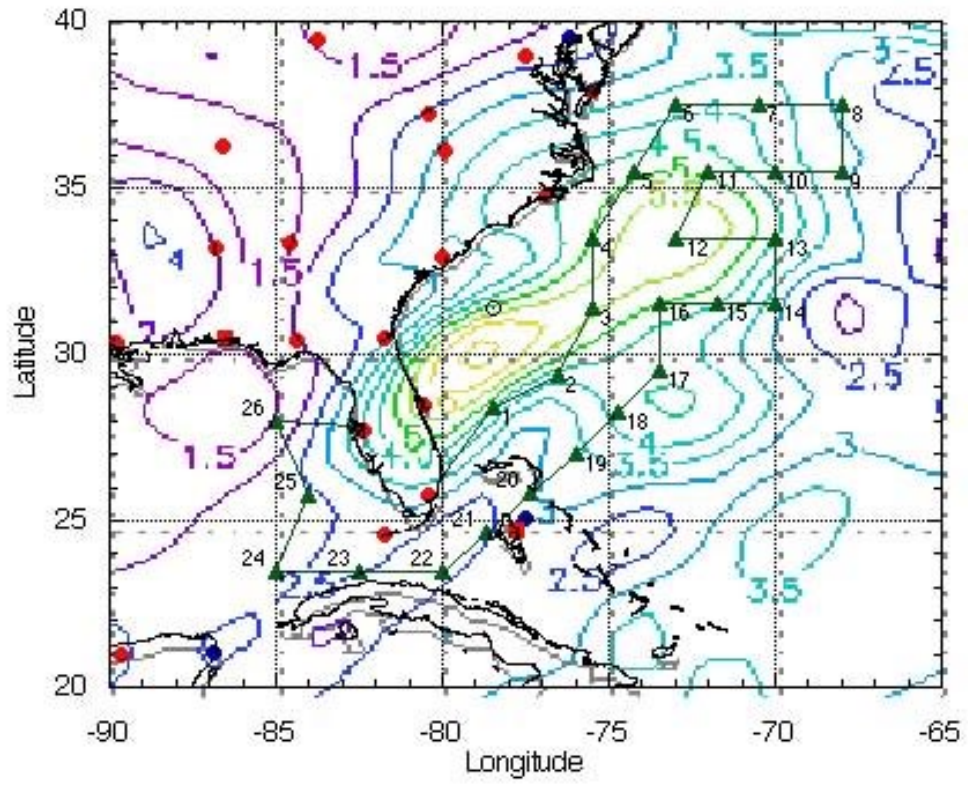


Fig. 2.



Fig. 3a



Fig. 3b

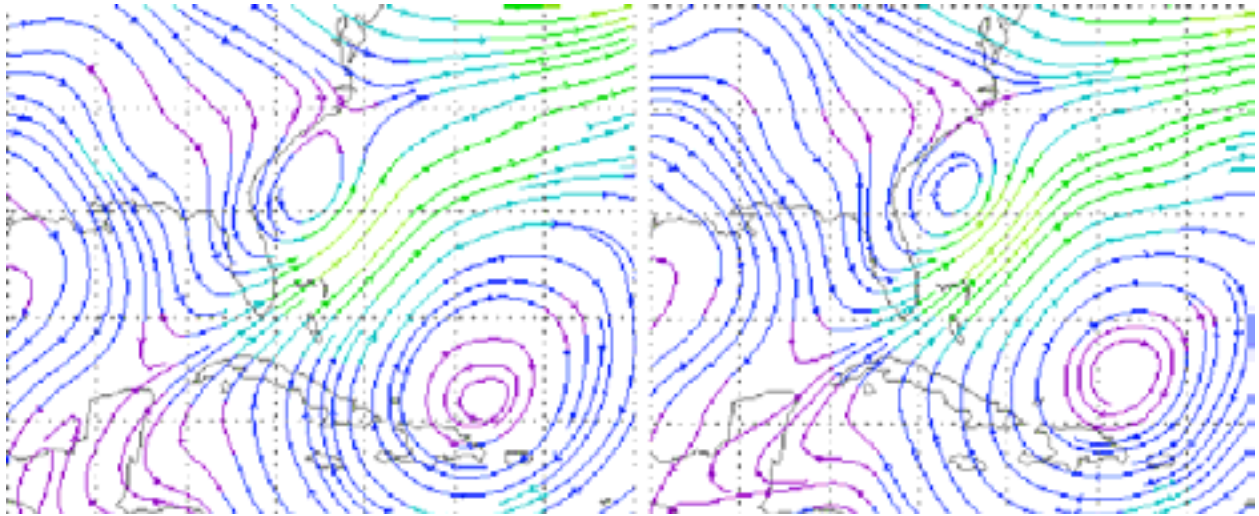


Fig. 4