

Mission Summary

Pre-Genesis IFEX Research Mission Summary 050716I Aircraft: N43RF

Scientific Crew:

Lead Project Scientist	Michael Black
Radar Scientist	Peter Dodge
Workstation Scientist	Krystal Valde
Cloud Physics	Paul Willis
AXBT/SFMR Scientist	Carlos Lopez
Guests	Gerry Heymsfield and Jeffrey Halverson

Aircraft Crew:

Pilots	Randall TeBeest, Mike Silo
Flight Engineers	Dewie Floyd
Navigators	Devin Brakob
Flight Director	Marty Mayeaux
Engineers	Jim Barr, Damon San Souci

Mission Brief:

This mission on N43 was the second of 3 missions (two with N42) to investigate an area of wind shear and convergence near 9° N, 89° W, a couple of hundred miles west of Costa Rica. Convection had been persistent in this area and was associated with a northerly extension of the ITCZ and a shear axis that had some potential for development. The mission would be conducted in the nighttime hours with a proposed takeoff at 0500 UTC from San Jose and duration of about 8 hours. The flight track would consist of a modified diamond pattern, oriented east to west, covering an area between 6.5°-9.5° N and 85°-93° W, and would be coordinated with the NASA ER2. The flight altitude would be 14,000 ft and we planned on dropping about 30 GPS sondes and 10 AXBTs.

Mission Synopsis:

Takeoff from San Jose was at 0523 UTC and NOAA43 headed southwestward for the Initial Point (IP) at 9° N, 85° W, just west of Costa Rica. We reached the IP at 0545 UTC and were already in the rain shield associated with the convection to our south and west. Flight-level winds in this region were from the south at 20-25 kt compared to the NE flow found in this area 24 h earlier. We cut our southbound leg short at 6° N by 1/2 of a degree in order to set up the coordination with the ER2 for the rest of the flight. At 0700 we noticed that the vertical winds from the flight-level data system was reading

erroneous and spurious values. It turned out that for much of the flight, the winds, both horizontal and vertical were, at times, suspect. The ER2 reported a strong easterly jet (at 65,000 ft altitude) with 55 kt winds near 8.5° N and 86° W.

At 0845 UTC we decided to modify the flight plan to exclude the western most portion of the planned track and to fill in gaps north to 11° N centered on 88° W longitude. This decision was based on a combination of data from the GPS dropsondes and the LF radar imagery.

Except for southerly winds near the coast of Costa Rica, the winds in the lower troposphere were from the west or WSW. It became evident that we had been flying a northerly extension of the ITCZ passing through a series of convective and stratiform bands that were oriented N-S or E-W along the ITCZ axis itself. We saw no evidence of the shear zone that had been sampled farther west on the flight the day before.

The convection we encountered was not particularly vigorous and most of the precipitation was stratiform rain. There were large areas of clear air in between the disorganized rainbands.

At 1130 UTC, when the aircraft was near 9.5° N, 89° W, the main data systems failed after experiencing some short duration failures earlier and we decided to abort the rest of the mission and return to San Jose. We released a total of 23 GPS sondes on the flight and 6 AXBTS. We landed at about 1230 UTC.

Problems:

Two of the sondes did not have launch detects (no data) which we backed up with additional sondes. The radars system had to be reset several times resulting in a loss of data for a few minutes on each occurrence. The main data system had intermittent problems with erroneous winds and had to be reset several times before totally failing near the end of the mission. The wind data will need to be carefully scrutinized in order to be useful.

Michael Black

8/14/05

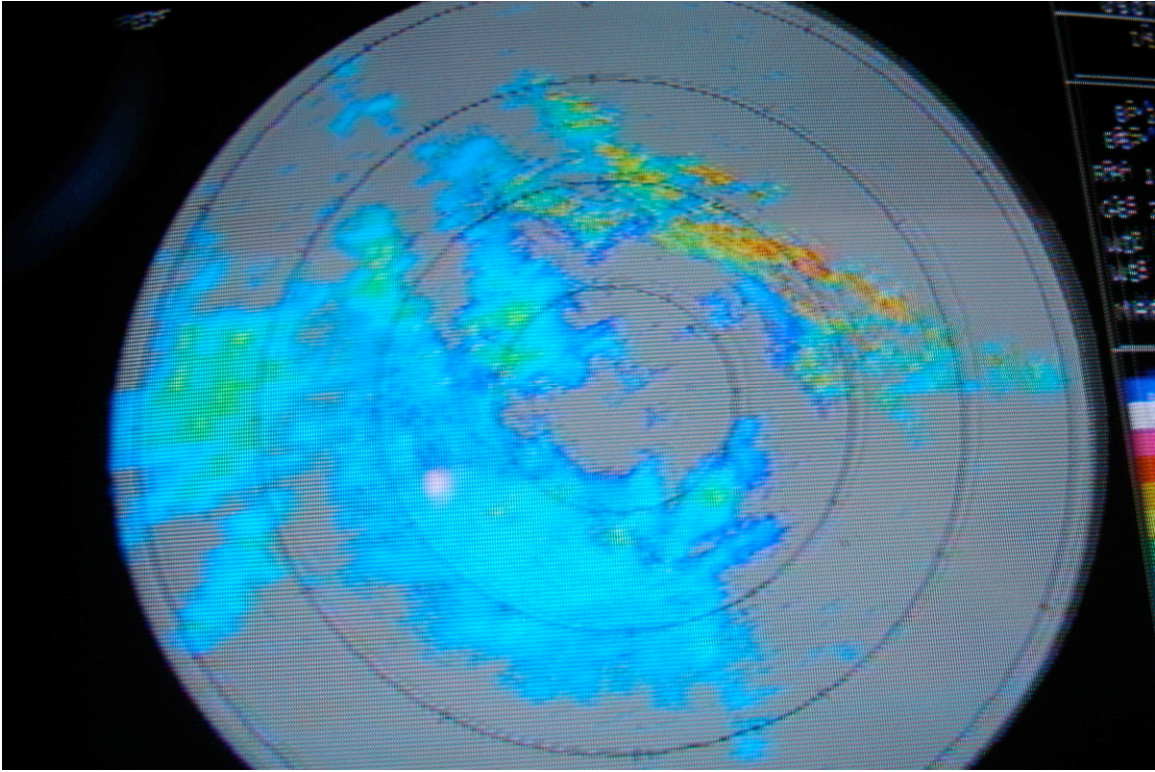


Fig. 1: LF radar image (screen photo) at 0554 UTC. Range rings are 50 nmi.

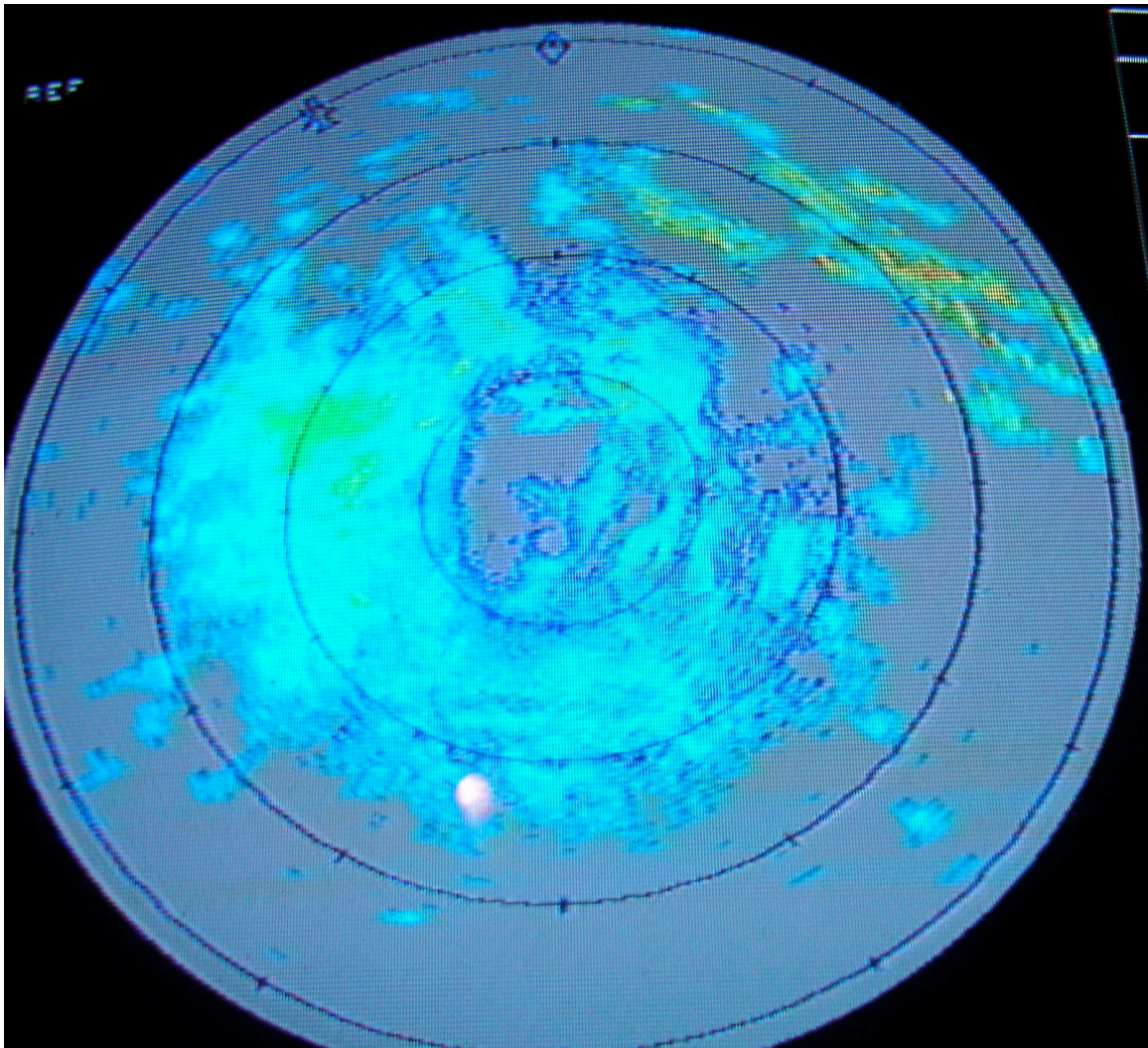


Fig. 2: LF radar image (screen photo) at 0715 UTC showing the large area of stratiform precipitation near 10° N. Range rings are 50 nmi

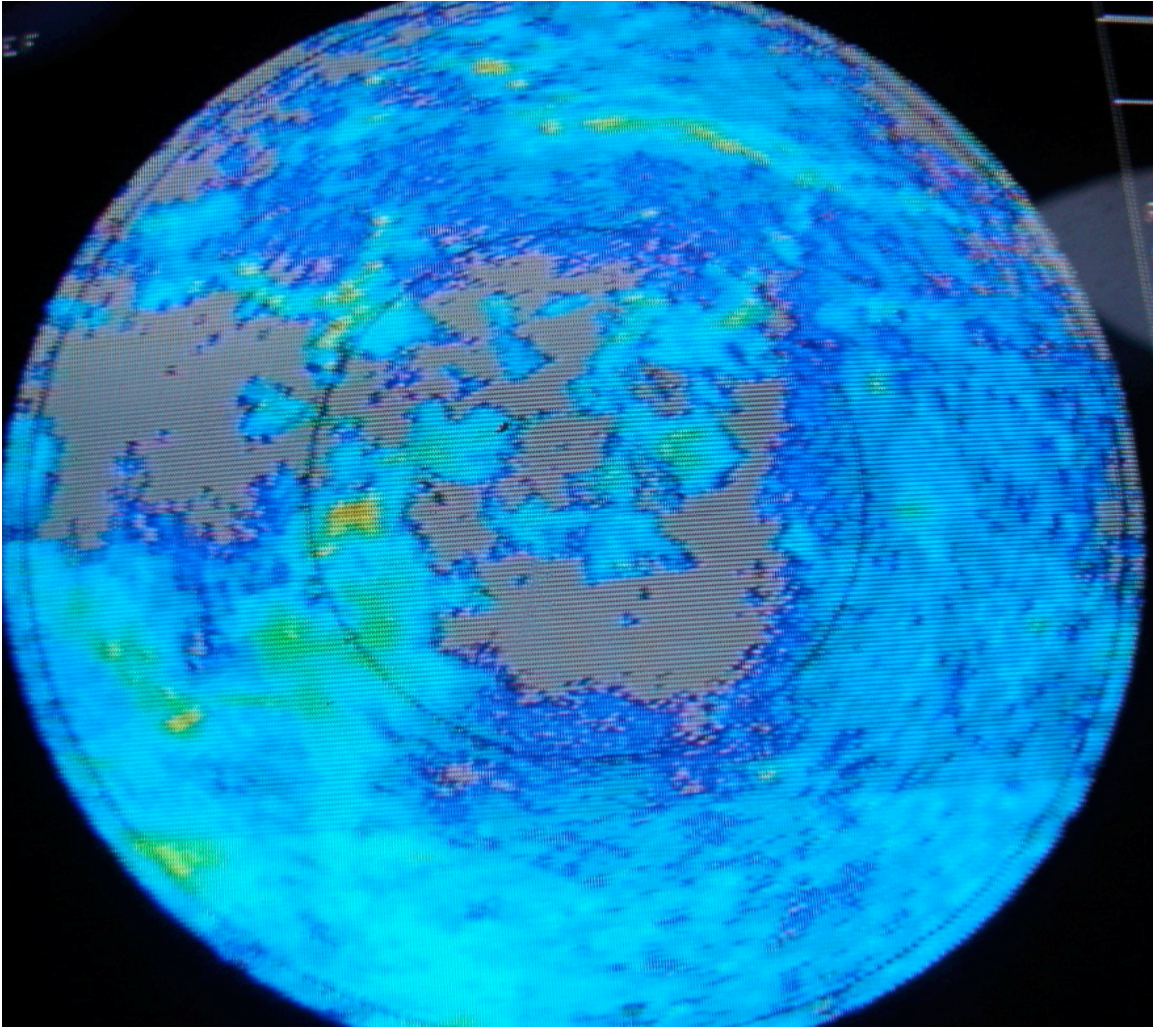


Fig. 3: LF radar image (screen photo) at 1146 UTC showing the disorganized nature of the convection offshore from Costa Rica. Range rings are 50 nmi.

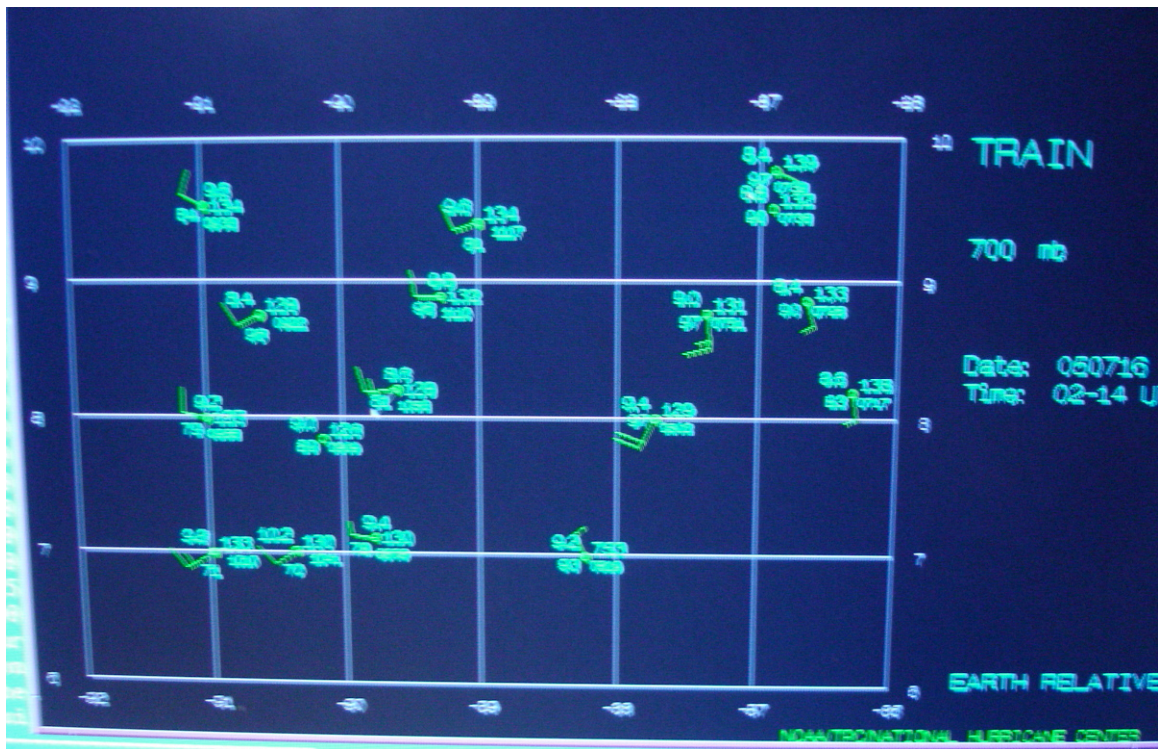


Fig. 4: 700 mb dropsonde observations (screen photo).



Fig. 5: 850 mb dropsonde observations (screen photo).

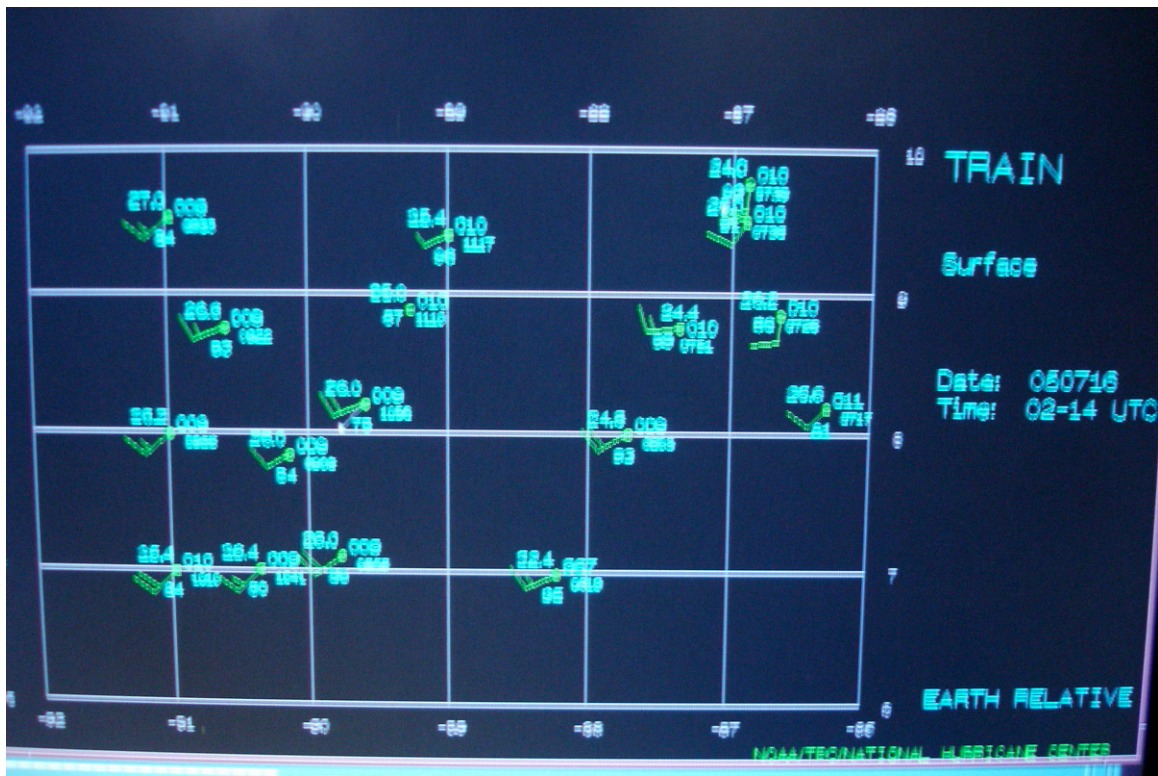


Fig. 6: Surface dropsonde observations (screen photo).

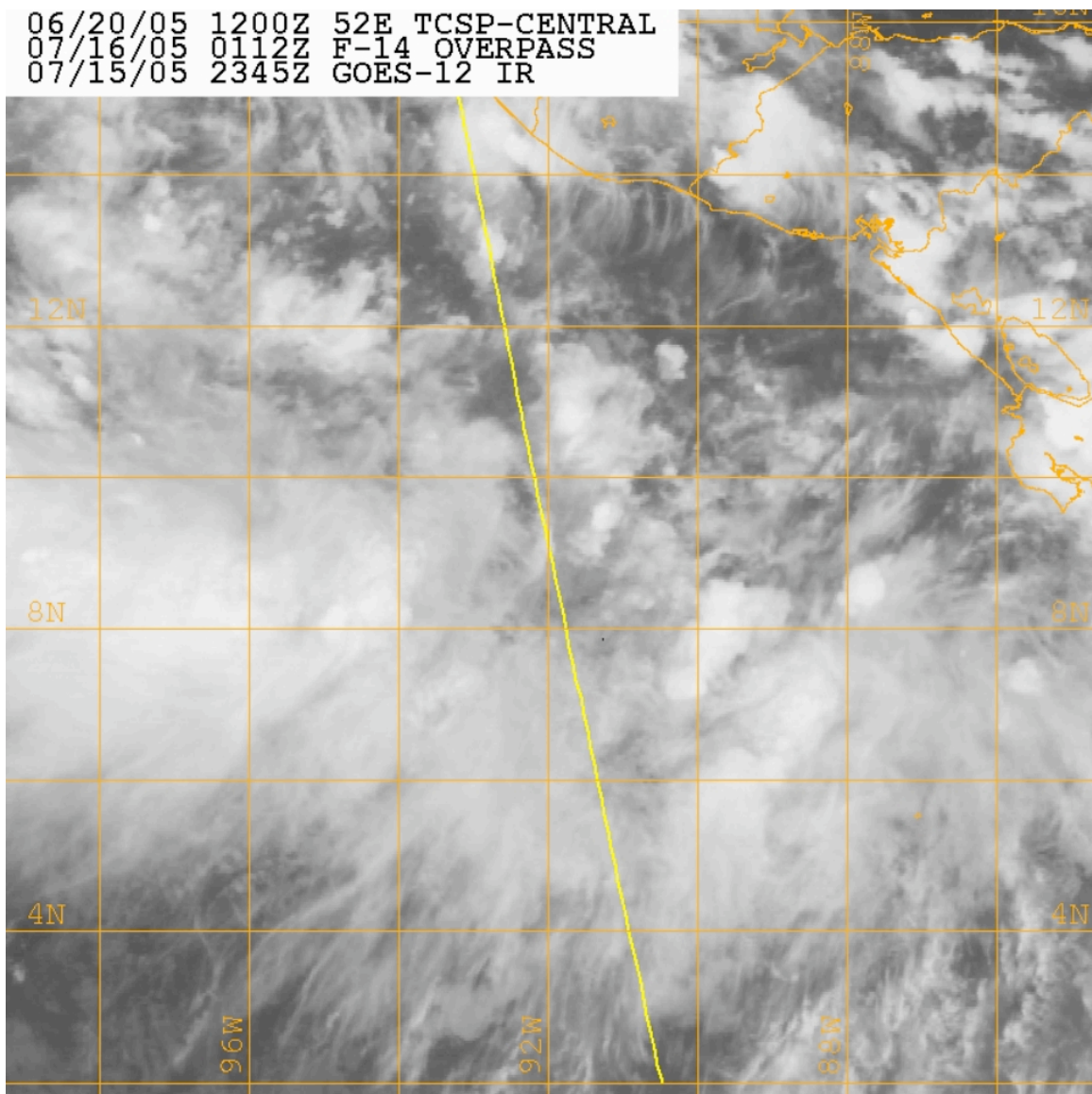


Fig. 7: GOES IR satellite imagery at 2315 UTC 14 July, a few hours before N43's flight.

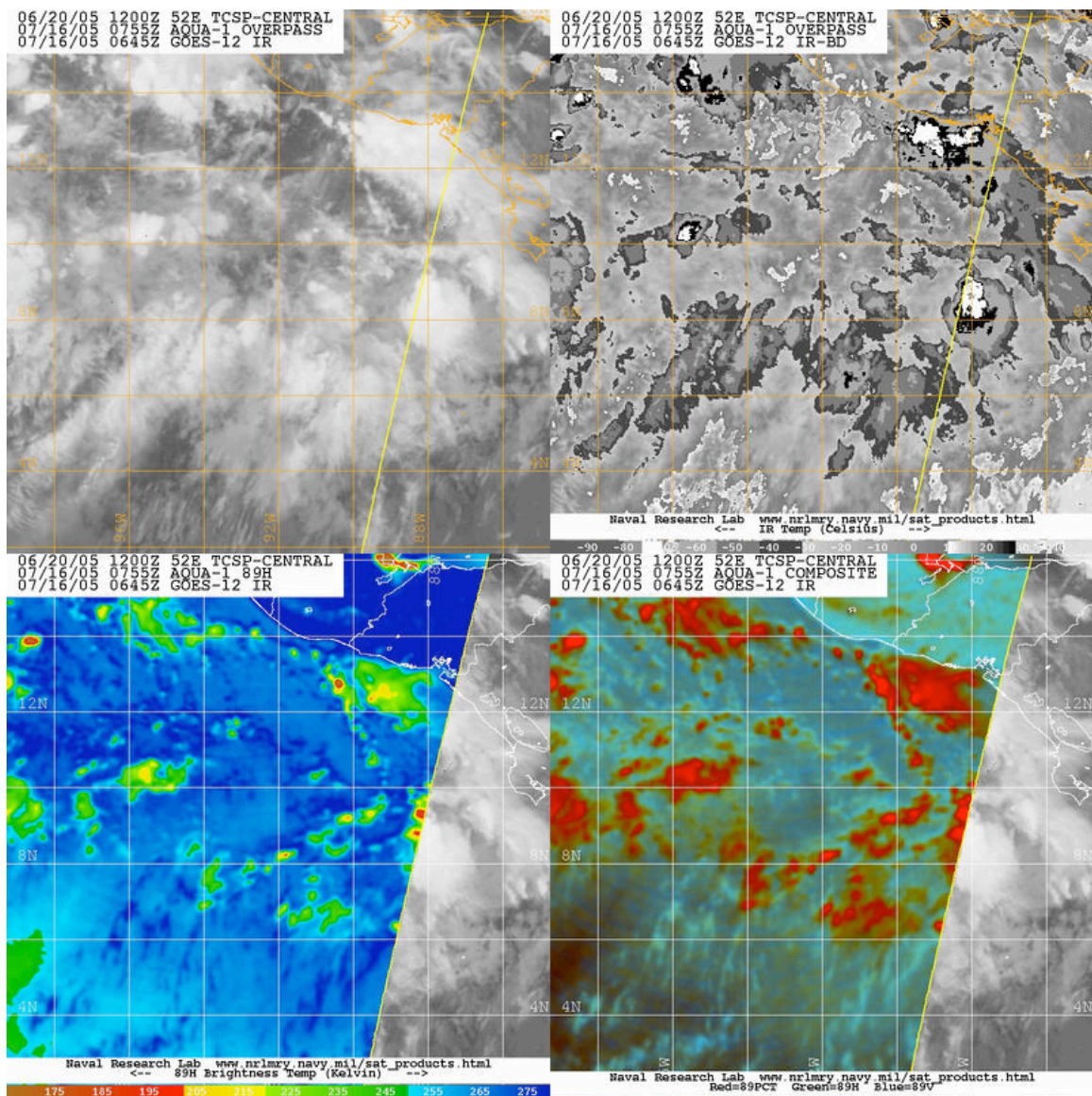


Fig. 8: IR satellite imagery at 0645 UTC and microwave imagery at 0755 UTC 16 July during N43's flight.

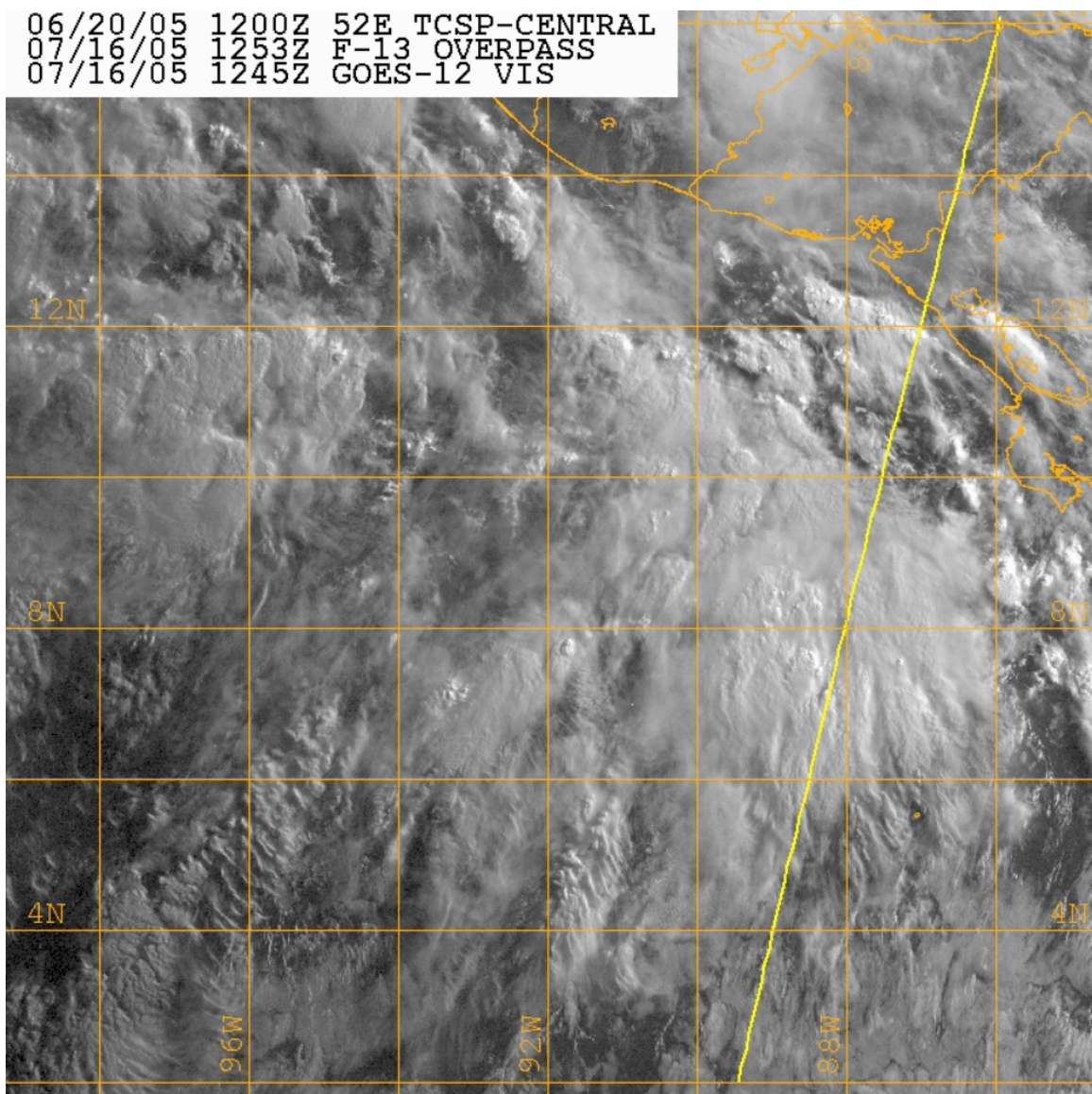


Fig. 9: Visible satellite imagery at 1245 UTC 16 July right after N43's flight.