

Mission Summary

Pre-Genesis IFEX Research Mission Summary 050715I Aircraft: N43RF

Scientific Crew:

Lead Project Scientist	Michael Black
Radar Scientist	Peter Dodge
Workstation Scientist	Krystal Valde
Cloud Physics	Aaron Dansamer
AXBT/SFMR Scientist	Brandon (Student of Ed Zipser)
Guest	Ed Zipser

Aircraft Crew:

Pilots	Randall TeBeest, Mark Nelson
Flight Engineers	Dewie Floyd
Navigators	Devin Brakob
Flight Director	Marty Mayeaux
Engineers	Jim Baar, Mark Rogers

Mission Brief:

This mission on N43 was a follow on to the one flown about 10 hours earlier on N42. It was designed to document changes in the wind field and convective structure associated with a shear zone and, possibly, a weak tropical wave that was near 12° N, 92° W in the far eastern Pacific. The flight track would be identical to the one flown on N42 (Fig. 1) and would be coordinated with the NASA ER2 departing and recovering in San Jose, Costa Rica. The flight altitude would be 14,000 ft, takeoff was planned for 0500 UTC with recovery about 8 hours later. We planned on dropping about 20 GPs sondes and 7 AXBTs.

Mission Synopsis:

Takeoff from San Jose was at 0455 UTC and NOAA43 headed westward for the Initial Point (IP) at 10° N, 89° W, about 300 miles west of San Jose. On the way to the IP, we crossed a convectively active rainband locates just offshore from Costa Rica and which was oriented SE-NW. We reached the IP at 0600 UTC, releasing a sonde and AXBT (28.8° C) and continued west along our planned track. We were flying just north of an impressive rainband complex that was probably associated with the ITCZ. After discussion with the onboard scientist, the navigator directed the ER2 pilot to fly over top of the band while he headed westward. The ER2 would rejoin the P3 track later on the

westward run. We released 8 more GPS sondes and 2 more AXBTs on the westward leg which we extended to be at 10° N, 97° W and was reached at 0750 UTC.

There was a large area of convection about 100-150 nmi to our north and we decided to track straight north rather than NE to intercept the convection and coordinate a run through it with the ER2. At 0815 UTC we were positioned at 12° N, 97° W, just on the western edge of the convective band and began tracking to the east through it with the ER2 scheduled to be over top of us near the middle of the band. We were in a large area of stratiform rain at 0835 UTC and finished our west-east run on the eastern side of the band at 0848 UTC near 12° N, 95°W. From there we tracked to the NW, reaching 14°N 97° W about 1000 UTC with the Er2 just behind us and just south of a large convective band near the Guatemala coast (which the ER2 should pass through on their longer leg). An AXBT dropped at this NW point of the track measured 29° C SSt but with a mixed-layer depth of only 15 m.

We then headed back toward the east along 14° N and reached 14° N, 93° W at 1039 UTC where we headed SE to finish our pattern. Our final point was at 11° N, 89° W which we intercepted at 1149 UTC and released our 24th GPS sonde. We headed back to San Jose and landed at 1303 UTC.

The wind field was weak and complex. The dropsonde coverage was adequate to resolve some of the wind features. There was evidence of a distinct shear line near 93° W but no typical signature of a tropical wave. Imagery from the tail Doppler radar indicated strong NE shear near the tops of the convection on the south side of the pattern but lessening in the northern convection. Convection was disorganized but active along the ITCZ, near the western extent of our pattern, and along the Central American Coast.

Problems:

A few 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 and AXBTs worked well.

Michael Black

7/13/05

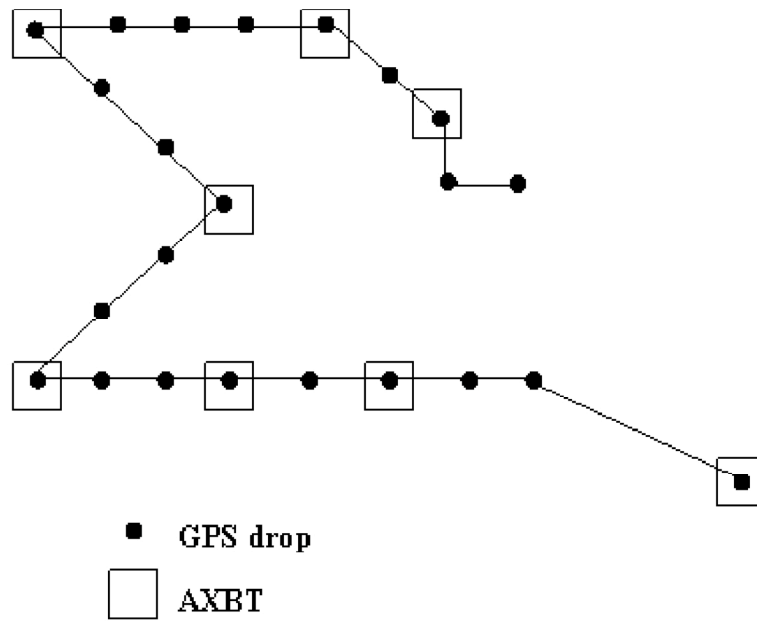


Fig. 1: Proposed flight track of NOAA43.

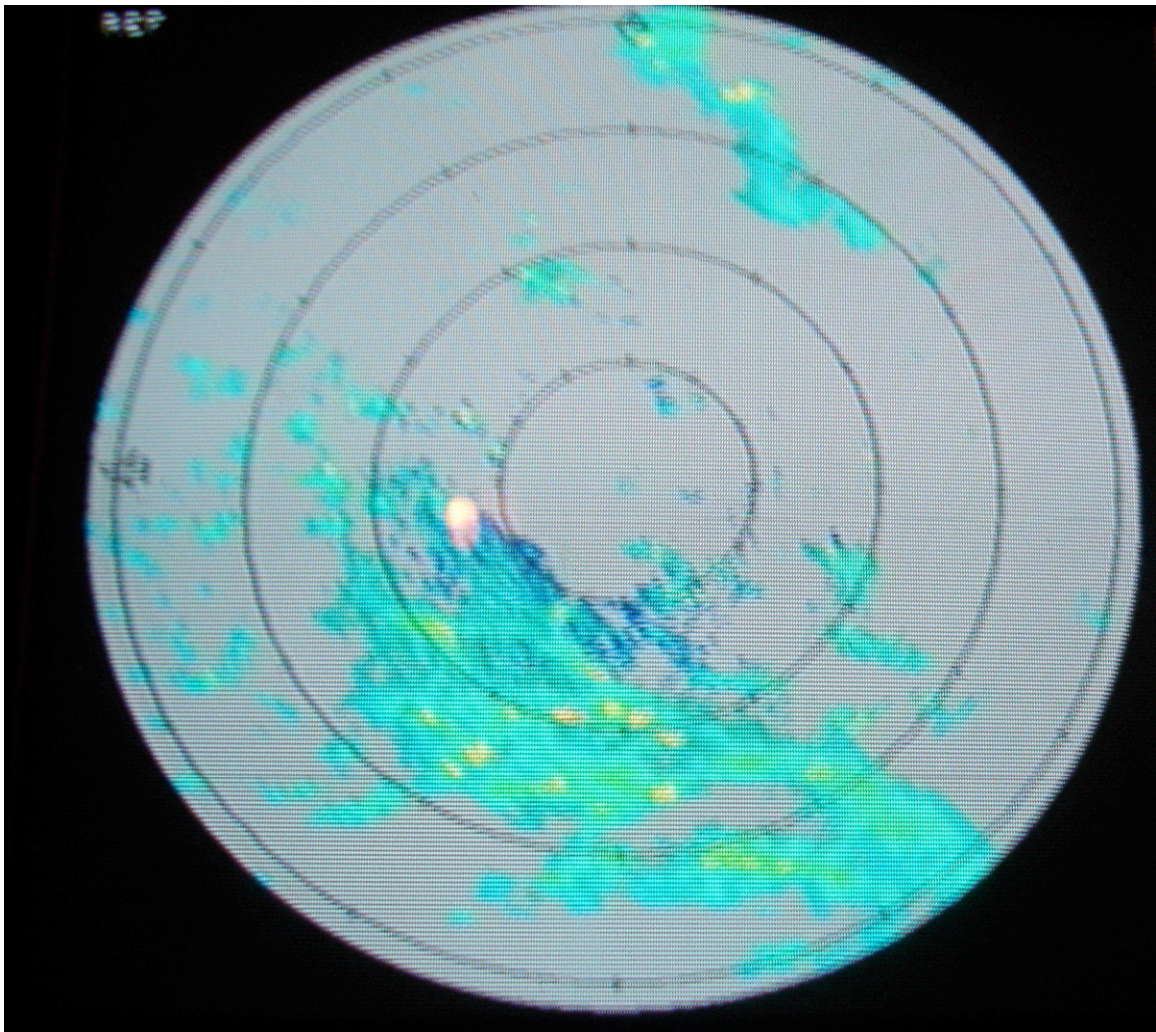


Fig. 2: LF radar image (screen photo) at 0603 UTC as N43 headed westward along 10° N. Range rings are 50 nmi.

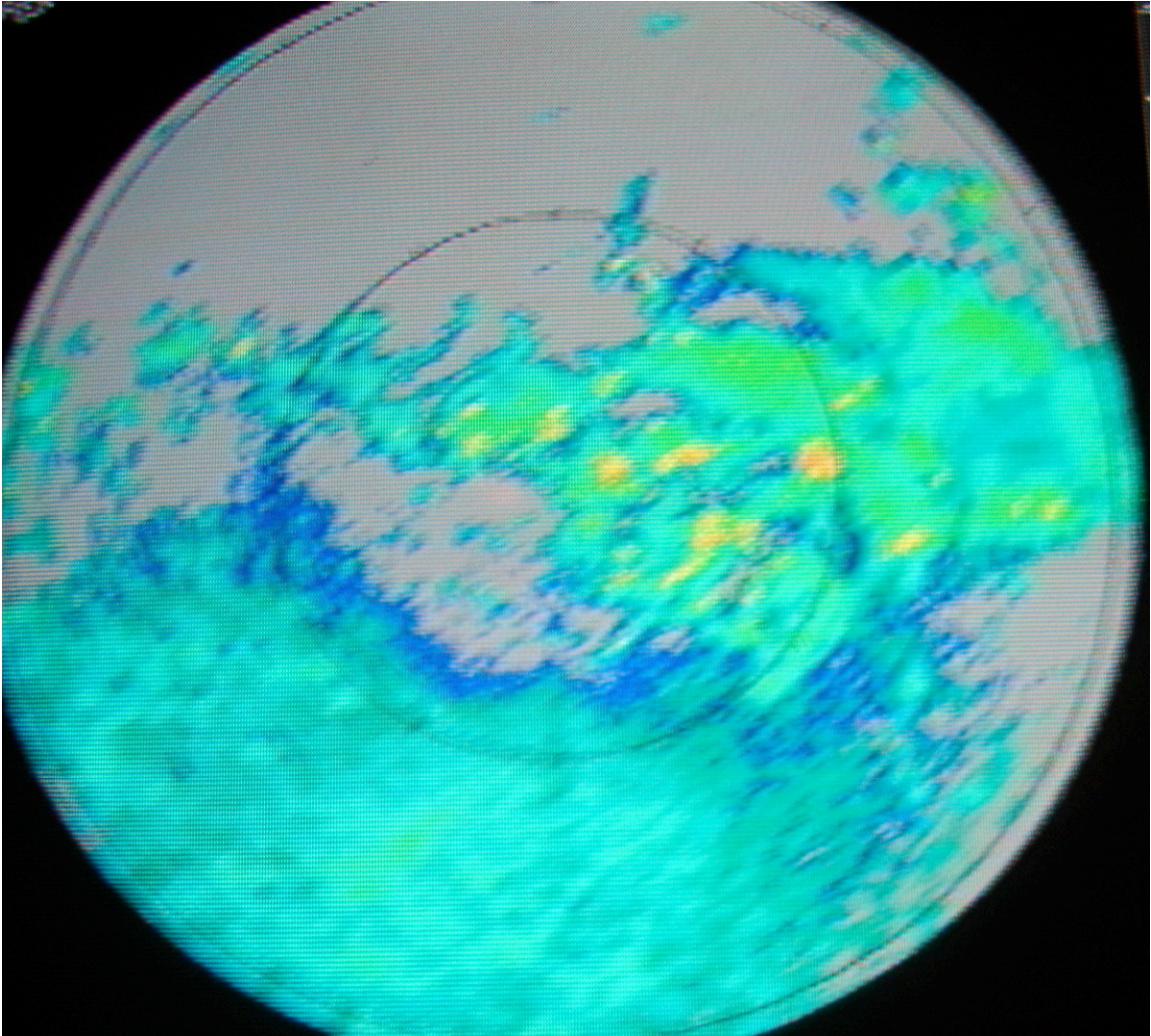


Fig. 3: LF radar image (screen photo) at 0813 UTC showing convective complex along 12° N. Range rings are 50 nmi

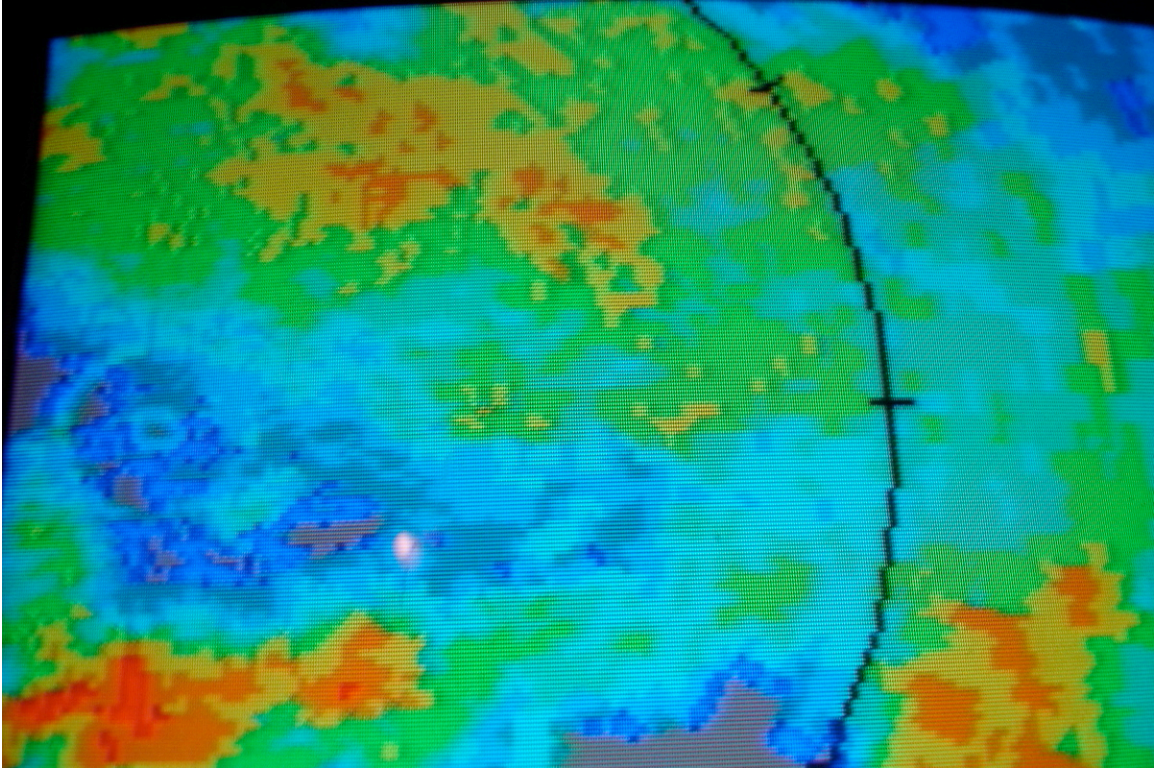


Fig. 4: Zoomed LF radar image (screen photo) at 0820 UTC showing a portion of the convective complex along 12° N.

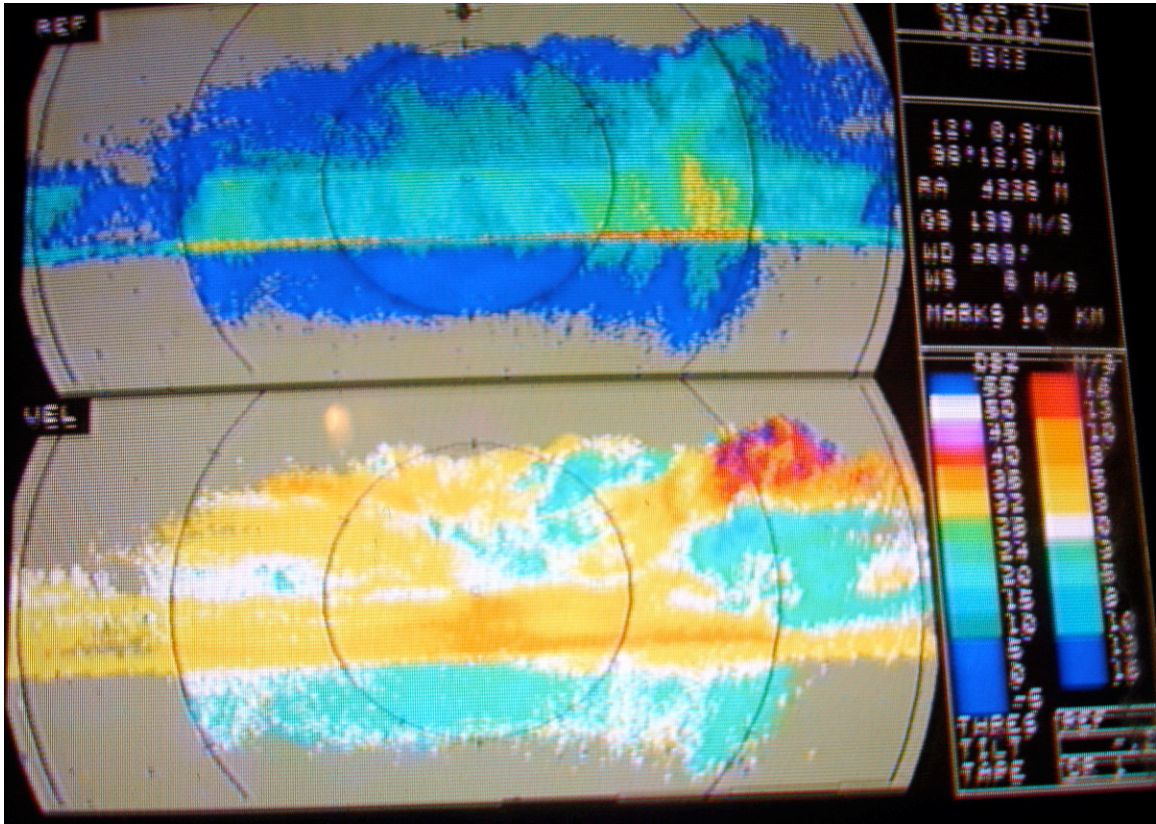


Fig. 5: Tail radar image (screen photo) at 0825 UTC showing a portion of the convective complex along 12° N. The top panel is a vertical cross section of reflectivity while the bottom panel are the raw Doppler velocities showing the strong outflow (shear?) near the convective tops.

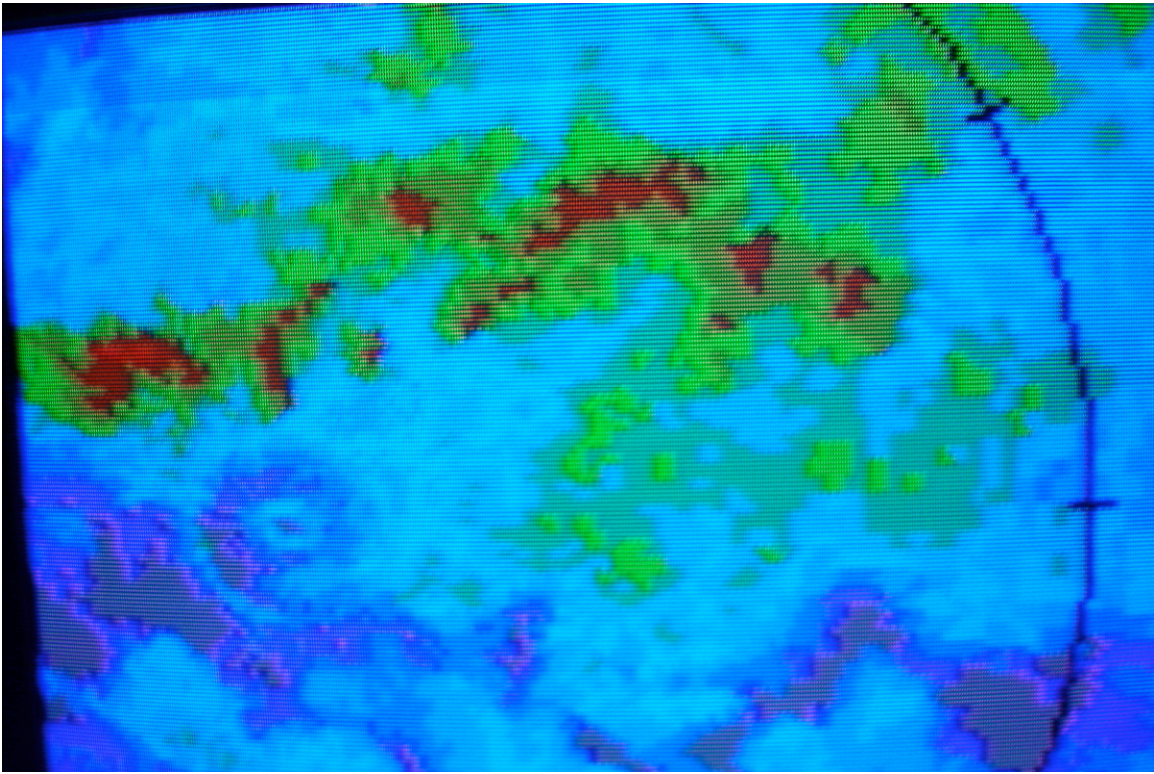


Fig. 6: Zoomed LF radar image (screen photo) at 1000 UTC showing a portion of the convective rainband along the Central American coast.

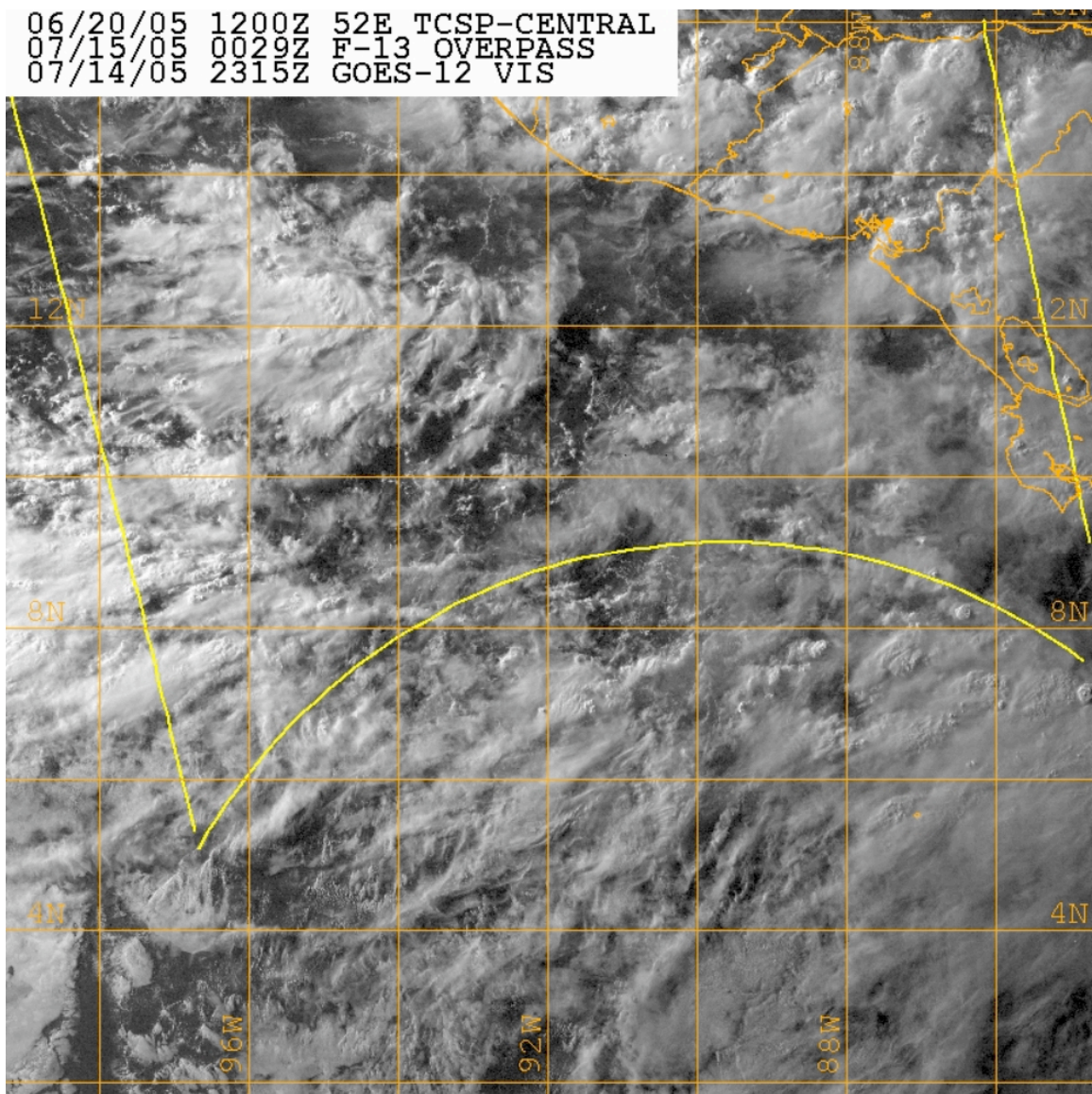


Fig. 7: GOES visible satellite imagery at 2315 UTC 14 July, a few hours before N43's flight.

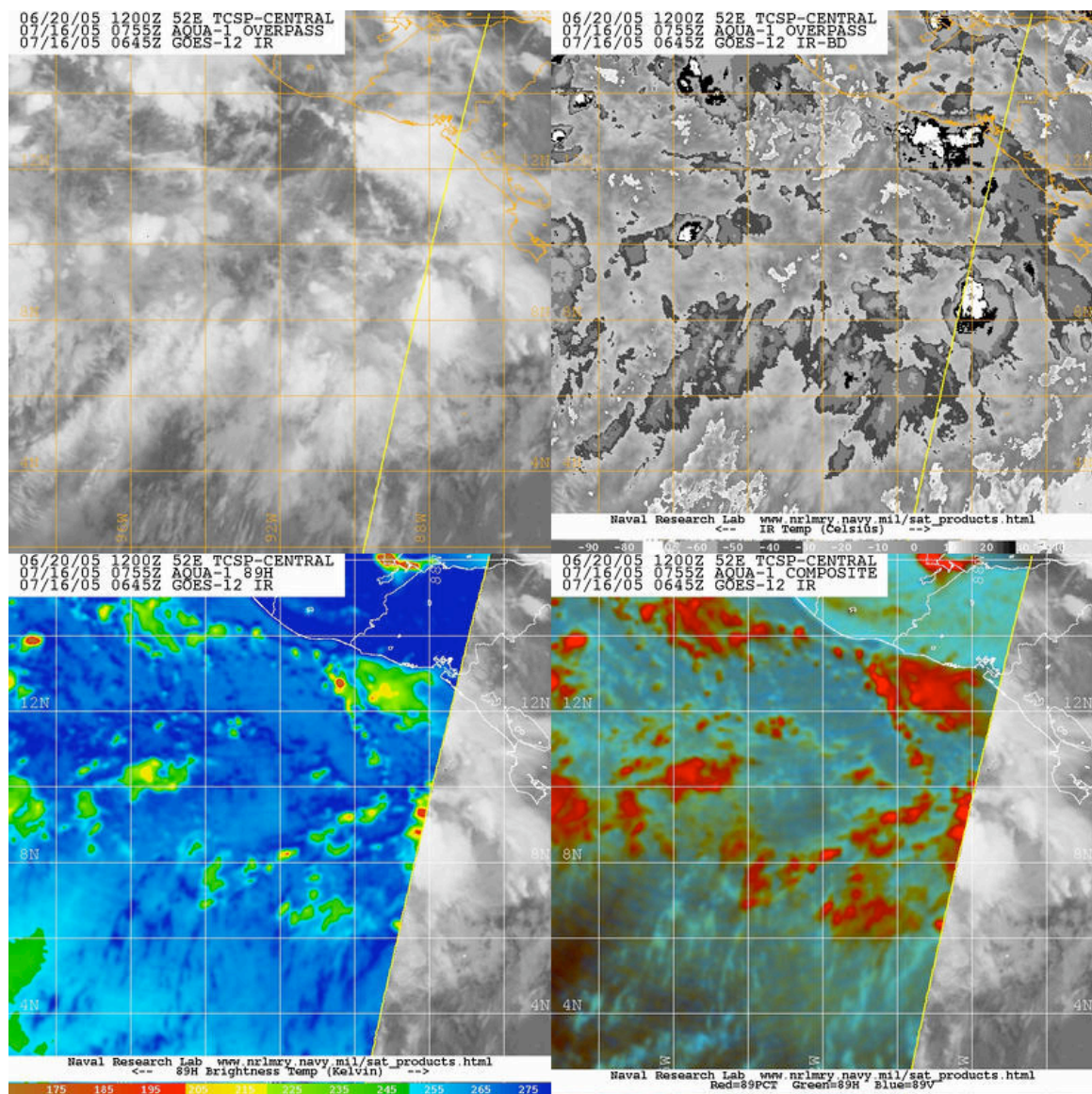


Fig. 8: IR satellite imagery at 0645 UTC and microwave imagery at 0755 UTC 15 July during N43's flight.

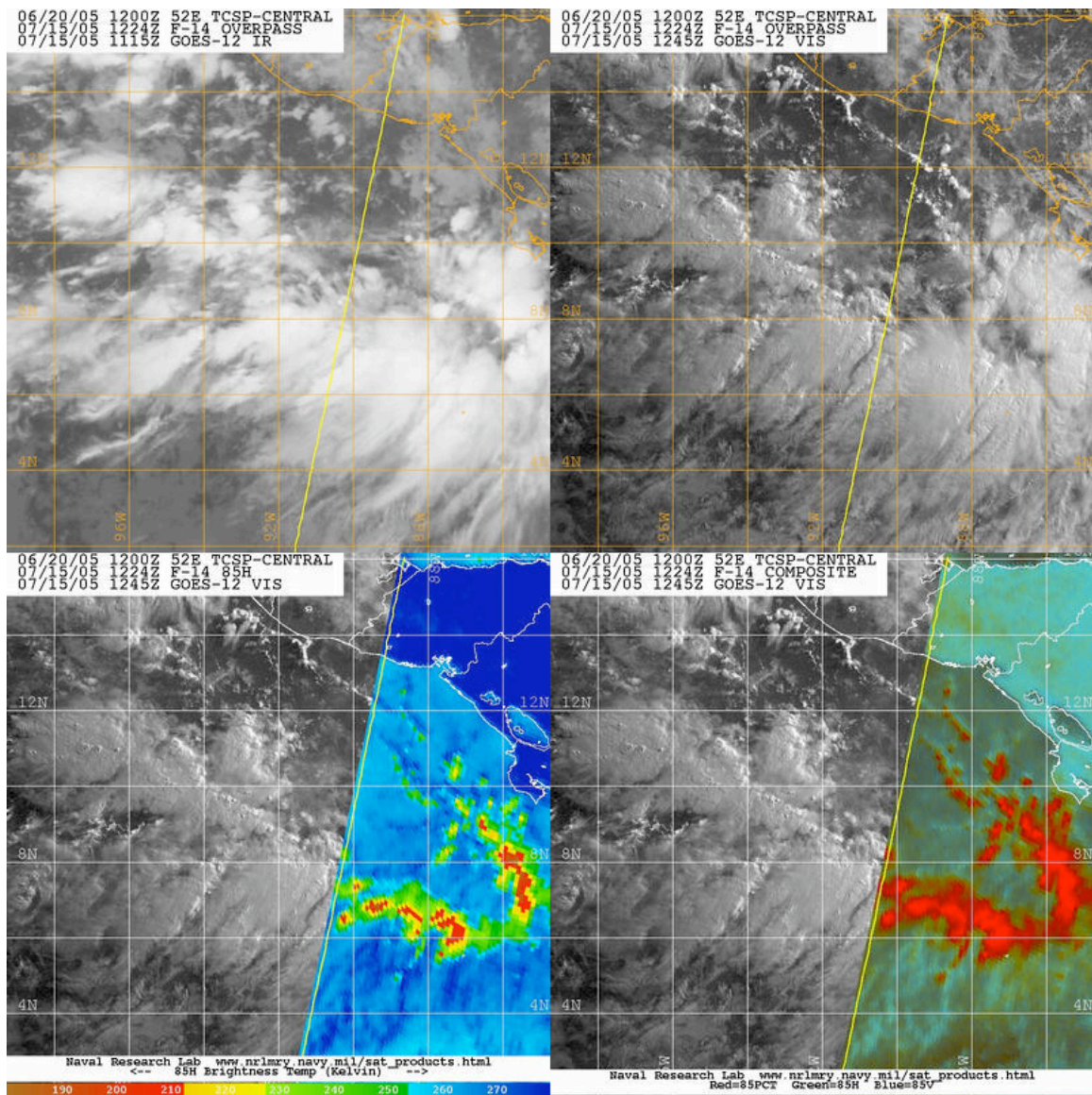


Fig. 9: IR satellite imagery at 1115 UTC and microwave imagery at 1224 UTC 15 July right after N43's flight..