

Mission Summary
990825H Aircraft 42RF
Synoptic Surveillance
Dennis/Emily

Scientific Crew (42RF)

Lead Project Scientist:	Sim Aberson
Radar/AXBT Scientist:	Frank Marks
Cloud Physics/Dropsonde Scientist:	Neal Dorst
Dropwindsonde Scientist:	Chris Landsea,
Workstation Scientist:	Paul Leighton

Mission Briefing:

Tropical Storm Dennis located east of the central Bahamas, expected to strengthen and become a hurricane before impacting the U. S. East Coast. Tropical Storm Emily located east of Barbados, also expected to become a hurricane and possibly impact the U. S. Virgin Islands and Puerto Rico. NHC tasked the G-IV and one P3 to conduct the first two-storm synoptic flow. The G-IV was to fly from St. Croix, around Emily in a counter-clockwise loop, to the northwest off the North Carolina coast, and down to Miami. N42RF was to fly from Miami, along the Cuban coast, do a figure 4 in Dennis, and then fill in the region left by the G-IV before returning to Miami.

Mission synopsis:

By takeoff time, it became apparent from recent Air Force fixes that Dennis had redeveloped underneath the convection that had been to the east of the center for the last two days. Thus, Dennis was much further south and east than expected. As a result, holes were left to the northwest of the center in the dropwindsonde pattern. This was alleviated by moving the last leg back to Miami southward, and moving the last G-IV dropwindsonde south as well. Only a small hole to the northwest of Dennis remained.

Dennis was found to be half a storm, with convection mainly on the eastern side, and stratiform rain all around. The center was difficult to pinpoint on the radar, but the second pass produced a visible low-level center. However, a dropwindsonde dropped near that location produced a pressure of 998 hPa and 35 kn winds at the surface. With pressure thus estimated at 996 hPa, the storm had deepened 10 hPa in the last four or five hours. With that fix and later Air Force fixes of the same center, the estimated motion was 270/08, and Dennis is therefore a threat to the U. S. eastern seaboard.

Environmental dropwindsondes were able to establish the strength of the subtropical ridge (not very), and of the midlatitude trough off the North Carolina Coast that was the primary target for this experiment. The G-IV was to sample most of this target.

AXBTs dropped in front of Dennis showed sea surface temperatures of 29.1 to almost 30 C, very warm, allowing for strengthening in the upcoming days.

Evaluation:

This mission will be evaluated in the near future for the ability of the dropwindsondes to improve the forecasts of both Dennis and Emily. With only very small holes left in the flight pattern, it is expected that this mission will be considered a success.

Problems:

No scientific problems were encountered. Dropwindsondes that failed to provide winds were quickly replaced. All dropwindsondes were processed by dropwindsonde scientists and transmitted for use in the models.

Sim Aberson