Mission Summary 990826H Aircraft 42RF Synoptic Surveillance Dennis

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Mission Briefing:

Hurricane Dennis moving northwest through the central Bahamas a strengthening slowly. Progs show possible landfall between Georgia and Cape Hatteras within three days.

Tropical Storm Emily moving northwestward to the east of the Lesser Antilles. Progs show a possible impact to the U.S Virgin Islands or Puerto Rico within 72 h.

Hurricane Cindy moving northwestward to the southeast of Bermuda. Progs show a possible impact on Bermuda. Also, Emily could possible become entrained in the much larger circulation of Cindy, so the forecast track of Cindy is very important.

As a result, NHC tasked a three-plane synoptic flow. N49RF was to fly eastward from Miami, sample the southern end of Dennis, the southern and eastern sides of Cindy, and fly around Emily before recovering in St. Croix. N43RF was to penetrate Dennis, then fly a pattern to the north in the area between the coastline and 70 W, before recovering in Bermuda. N42RF was to penetrate Dennis in a coordinated cross pattern with N43RF, then fly eastward to penetrate Cindy to sample the western and northern portions of that storm, before recovering in Bermuda.

Mission Synopsis:

Two hours before takeoff time, a nail was found in a tire of N49RF, so that mission was scrubbed. As a result, synoptic surveillance of Emily (and therefore Cindy) was canceled since the two P3s could not reach that system and Dennis was of the greatest immediate importance. The flight track for N43RF was kept the same as before, with N42RF doing 1.5 figure 4 patterns before continuing the synoptic mission around the periphery of the N43RF pattern before recovering in Bermuda.

The N42RF mission was a success. The first pass through was slightly late, a few minutes past the pass by N43RF. The storm at first exhibited a wavenumber one pattern with convection mainly on the eastern side.

By the time of the second pass, very strong convection had developed in the eastern side, with more convection on the western side, for a wavenumber two pattern. A dropwindsonde in the northeastern eyewall reported 65 kt at the surface, confirming that Dennis was a minimal hurricane. S'FMR showed surface winds on the order of 72 kt in this rainband. A dropwindsonde missed the center, but reported pressure of 994 hPa with surface winds of 30 kt.

By the time of the third pass, another batch of convection was developing on the western side, forming a wavenumber three pattern. The eye was clearly becoming encircled with convection. Surface winds in the eyewall drops showed winds below hurricane force, but the eye drop had a pressure of 992 hPa.

AXBTs were dropped at the corner points of the figure 4s. Temperatures were all warm, above 28.3C, with mixed layer depths of 30 to 50 m. This was the case even in the locations of strongest winds. AXBTs dropped later in the synoptic mission in the wake of Dennis showed temperatures of 28.8 and 29.3 C, showing that the weaker Tropical Storm Dennis barely made an impact.

The remainder of the synoptic mission went without incident. The subtropical ridge was sampled, and N42RF recovered in Bermuda.

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 large holes in the flight pattern due to air traffic problems this mission may be compromised.

Problems:

N43RF was blocked out of the air space required to complete their mission by air traffic control. As a result, a huge hole in the flight pattern was left which could negatively impact the operational results of the mission. Because of this, the last leg northward was moved eastward to fly directly to Bermuda to save time and fuel.

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