EXPERIMENT DESCRIPTION

5. East Pacific Decay Experiment

Principle Investigators: Ed Rappaport/James Franklin (NHC)

HRD Point of Contact: Eric Uhlhorn

Primary IFEX Goal: 3 - Improve understanding of the physical processes important in intensity change for a TC at all stages of its lifecycle

Experiment Objectives:
The observational objective is to obtain SST and flight-level, surface, and profile wind observations in tropical cyclones over several days during the decay process over cold water. Observations must be sufficient to obtain a reliable estimate of the cyclone's maximum sustained surface wind.

Links to Operations:
In-situ observations are rarely, if ever, available in eastern North Pacific tropical cyclones decaying over cooler waters. The intensity of these systems is typically estimated by the Dvorak technique, supplemented by scatterometer observations, however, there is some evidence that the Dvorak technique overestimates the intensity of weakening systems, thus overstating the hazard to marine interests. The purpose of this experiment is to obtain in-situ observations of decaying tropical cyclones to better calibrate existing methods of estimating tropical cyclone intensity over cold water.

Mission Description:
The flight strategy is to obtain two standard (105 n mi radius) alpha patterns (rotated) on each of 3 flights over a 3-4 day period. Each flight requires the SFMR, 18 AXBTs for measuring SST, and about 10 dropsondes. AXBTs are to be deployed at turn points, mid-radial points, and in combination with dropsondes at the maximum wind. Drops would be made at the corner points of one alpha pattern and in the max wind band of two of the four penetrations of each alpha pattern. In addition, a center drop would be made during each penetration to provide surface pressure. If the storm were too far away to do two, one alpha pattern would be acceptable. SFMR is critical for the success of the mission, but should it fail or be otherwise unavailable a mission could be conducted with a significantly enhanced number of dropsondes.

Three flights would occur over a 3-4 day period. First flight is in a hurricane just prior to reaching the SST gradient. Second flight is in or just beyond the gradient (presumably now TC is a TS), and last flight is over the cold water as the TS is decaying toward TD status. Depending on forward speed, flights would occur on consecutive days, or perhaps there would be a down day. Flights would likely take off at the same time of day each day, but no particular take off time is required. If possible, flight levels should be constant over the course of the flights - 850 mb is the preferred level.

No real-time transmission of data is required, although it is presumed that the HDOBs would be transmitted as a matter of course. Transmission of dropwindsonde data is desired, but not required.