HRD SUPPORT OF NOAA OPERATIONS

This document outlines the support HRD provides for operationally-tasked (EMC/NHC) NOAA hurricane aircraft missions.

In the event of an operationally-tasked mission, HRD will provide support to ensure the mission achieves its goals. The tasks are outlined below.

Tail Doppler Radar Support

HRD will provide real-time quality-controlled airborne Doppler-radar radial velocities to EMC for assimilation into HWRF, as well as Doppler wind and reflectivity fields in the form of three dimensional Cartesian analyses to NHC and CPHC through AWIPS.

The tasks required to process TDR data are divided between on-aircraft and ground-based personnel. The ground radar scientist collects the parameters for the radar analysis, initiates the on-aircraft radar processing software, verifies receipt of data at the operational centers, and suggests pattern adjustments to on-aircraft personnel to ensure the best-quality radar data set. On-aircraft personnel monitor the progress of the radar processing software, communicate to ground personnel the status of data transfer scripts, communicate pattern deviations to the ground radar scientist, request pattern adjustments to ensure proper radar coverage of the storm for EMC, and work with aircraft crew to perform hardware adjustments, if needed. A critical aspect of the on-aircraft radar scientist is to be the backup to the ground radar scientist and will produce the operational files in the event the ground scientist cannot complete them.

Dropsonde Support

A second field-based HRD employee will quality-control dropsondes on the aircraft in support of operational missions. This employee will have been trained on the latest quality control procedures and be in contact with CARCAH during the flight to ensure only the highest quality data is sent off the plane. HRD also plays an important role in providing feedback to NCAR on ASPEN development and updates to improve upon quality controlling and processing for future versions of software. HRD personnel also regularly attend NCAR's annual AVAPS User Group Workshops to facilitate these interactions with NCAR.

Personnel

The number of field and ground support personnel will depend on the aircraft and frequency of missions. Details of the minimum and ideal numbers of personnel are displayed in Table 1. For reference purposes, the number of employees *typically* provided on HRD research-tasked missions are listed as well.

Aircraft (Mission Freq)	Employee Count					
	Minimum		Operation-Tasked		Research-Tasked	
	Field	Ground	Field	Ground	Field	Ground
P-3 (24 h)	1	1	2	1	3	1
P-3 (12 h)	2	2	4	2	6	2
G-IV (24 h)	0	1	0	1	1	1
G-IV (12 h)	0	2	0	2	2	2

Research to Operational Links within the HFP-APHEX Plan

Analysis of Intensity Change Processes Experiment (AIPEX): this experiment is motivated by the operational need to improve prediction of tropical cyclone intensity change as it seeks to characterize the structure (e.g., winds, moisture, and precipitation) of tropical cyclones experiencing environments with moderately unfavorable winds, and to understand how changes in these physical processes govern whether a storm will intensify or not.

Impact of Targeted Observations on Forecasts (ITOFS) Experiment: This experiment will use advanced guidance from multiple sets of forecast models to determine locations where aircraft observations could potentially improve forecasts of tropical cyclone track, intensity and structure.

Satellite Validation to Enhance Operational Utilization of Satellite Data within the HFP-APHEX Plan

NESDIS JPSS Satellite Validation Experiment: This experiment seeks to use aircraft observations to validate satellite measurements of temperature and moisture in a variety of environments that can affect tropical cyclone intensity and structure. This will be accomplished by coordinating NOAA's G- IV jet to fly below the NOAA-20 and Suomi-NPP satellites when they are passing overhead.

TROPICS Satellite Validation Module: This experiment is designed to calibrate and validate temperature, moisture, and precipitation measurements obtained from the new NASA TROPICS smallsat satellites. These profiles will be compared to NOAA P-3 and G-IV aircraft observations, whose flight patterns will be coordinated in space and time with overpasses from the satellites.