

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 the Hurricane Analysis and Forecast System (HAFS), 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. Ground personnel collect the parameters for the radar analysis, initiate the on-aircraft radar processing software, verify receipt of data at the operational centers, and suggest pattern adjustments to on-aircraft personnel to ensure the best-quality radar data set. On-aircraft personnel communicate TDR instrument issues to the aircraft crew and ground personnel, communicate pattern deviations to ground personnel, request pattern adjustments to maximize radar coverage of the storm for NWS, and work with aircraft crew and ground personnel to ensure timely transmission of TDR products, if needed.

Dropsonde Support

A second field-based HRD employee will quality-control dropsondes on the aircraft in support of operational missions. HRD personnel 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. If NOAA AOC's TAG ground-based system for real-time dropsonde processing is available during the 2024 HFP, ground-based dropsonde quality-controlling could supplement real-time field-based dropsonde quality-controlling efforts. In this event, HRD personnel would be trained by NOAA AOC to use the TAG ground-based system.

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

HRD SUPPORT OF NOAA OPERATIONS

reference purposes, the number of employees *typically* provided on HRD research-tasked missions are listed as well.

Aircraft (Mission Freq)	Employee Count					
	Minimum		Operations-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	5	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

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

Synthetic Aperture Radar Wind Inspection with NOAA-P3 Data (SARWIND) Module: This experiment seeks to use aircraft observations to better validate high-resolution surface wind speed measurements becoming more frequently available with Synthetic Aperture Radar (SAR) polar orbiting passes. This will be accomplished by coordinating NOAA P-3 flights to occur simultaneously with an orbiting SAR pass near a TC or other ocean environments deemed research relevant to sample the wind and wave interface near the surface.

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.