COORDINATION AND PROJECTS

HRD coordinates its programs with other NOAA organizations, e.g., **AOC**, **NESDIS**, and **NCEP**, in particular with **EMC** and **NHC**. Our highest priority is the NOAA Intensity Forecast Experiment (**IFEX**) developed through a partnership involving HRD, TPC, EMC, and NESDIS. The goals of IFEX are the collection of data to directly aid the development and evaluation of the next generation operational tropical cyclone forecasting model system (Hurricane Weather Research and Forecast model system, **HWRF**).

HRD maintains active research programs with, and receives funding from other governmental agencies, in particular, the Department of the Navy's Office of Naval Research (**ONR**) and the National Aeronautics and Space Agency (**NASA**). In program areas where it is beneficial to NOAA, HRD arranges cooperative programs with scientists at the National Center for Atmospheric Research, and at a number of universities. HRD is working with these non-NOAA partners to integrate their hurricane research into IFEX.

Our current research staff consists of 24 full-time employees and 12 employees working under a cooperative joint agreement with the University of Miami (CIMAS).

The Hurricane Research Division of NOAA's
Atlantic Oceanographic and Meteorological Laboratory

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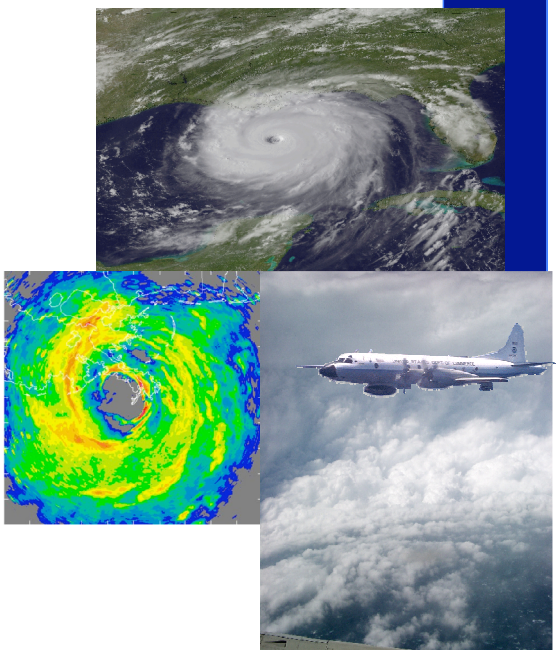
noaaresearch

NOAA/AOML Hurricane Research Division



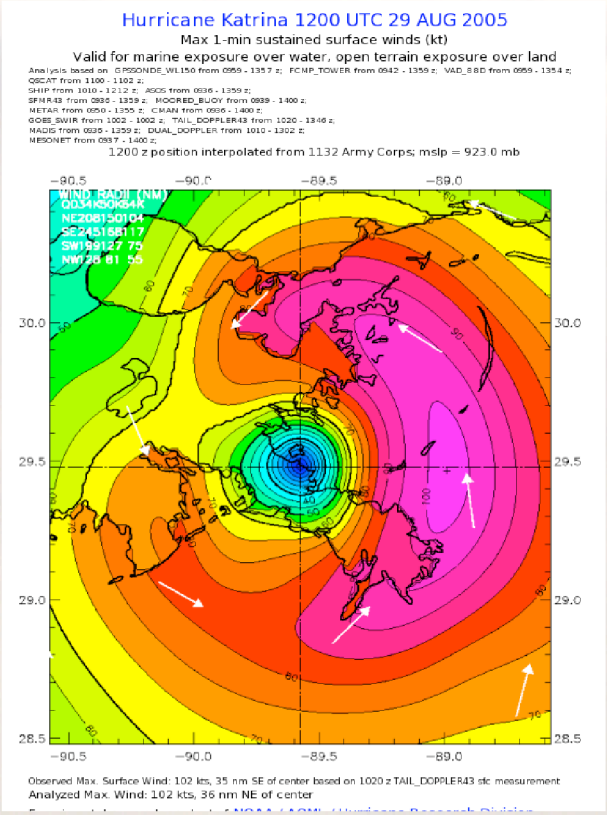
MISSION

The Hurricane Research Division's mission is to advance the understanding and prediction of hurricanes and other tropical weather. HRD's research is based on a combination of models, theories, and observations, with particular emphasis on data obtained with research aircraft. The goals of this research are to:

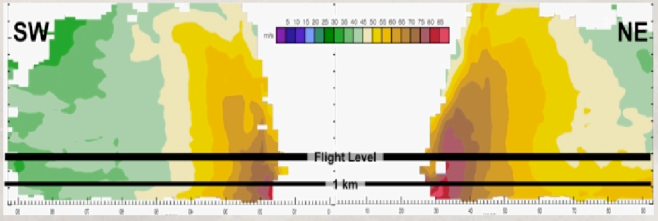
- Advance the prediction of **tropical cyclone intensity and structure change** by improving understanding of the processes that modulate internal storm dynamics and storm interactions with the atmosphere and ocean;
- Improve the prediction of **tropical cyclone tracks** by enhancing understanding of the interactions between a tropical cyclone and its environment through an optimal analysis of field observations;
- Improve the understanding of and ability to **predict tropical cyclone frequency, intensity, and structure** on intraseasonal, interannual, decadal and longer time scales; and
- Enhance the ability to diagnose and predict the **impact of tropical cyclones on life and property** through wind, rain, waves, and storm surge.

These goals are accomplished by:

- designing **research experiments in the hurricane** to collect and provide data for research and operational applications;
- analyzing these data sets and **publishing the research** in the refereed literature;
- developing **new technology and applications** based on this research to improve NOAA's products;
- developing and testing hurricane models to improve their ability to simulate nature, improve forecasts, and to optimize hurricane observing through the development of improved observing strategies, and
- providing **outreach to the public** through the WWW, conferences, presentations, and other means.



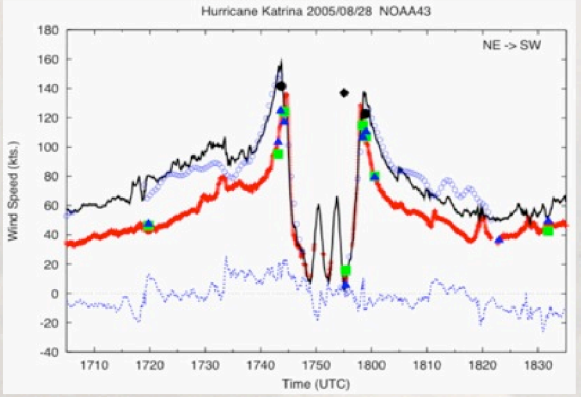
Experimental H*Wind surface wind analysis for Hurricane Katrina landfall in Louisiana at 1200 UTC 29 August 2005.



Doppler radar analysis of the tangential component of the wind (m s^{-1}) in Hurricane Katrina on 28 August 2005.

FIELD RESEARCH

Much of HRD's research is based on in situ and remotely-sensed observations in the inner core of tropical cyclones and their surrounding environment. These observations are primarily collected during the hurricane season using two NOAA turboprop aircraft and a Gulfstream-IV jet operated by NOAA's Aircraft Operations Center (AOC). The field program is used to carry out scientific experiments designed to address the goals stated above. Data sets gathered on these flights in all stages of the storm's lifecycle are used to support operational needs and form the cornerstone of research in HRD. Because of this extensive field experience, HRD scientists are recognized internationally for their knowledge of tropical cyclones, as well as their expertise in technological areas such as airborne Doppler radar, dropsondes, cloud microphysics, and air-sea interaction, to name a few. **These assets make HRD unique worldwide, and provide NOAA a unique capability**.



Aircraft observations from 28 August 2005 in Hurricane Katrina indicating close agreement between SFMR surface wind estimates (red), dropsonde peak wind estimates (green dot) and surface winds estimated from standard flight level (black) reduction from 3-km altitude (blue circles).