Preparing the Armada

NOAA's Hurricane Field Program

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National Oceanic and Atmospheric Administration
U.S. Department of Commerce

Advancing the Prediction of Hurricanes Experiment (APHEX)

Goals & Partnerships

Goal 1: Collect observations that span the tropical cyclone life cycle

Goal 2: Develop measurement strategies and technologies

Goal 3: Improve understanding of physical processes

Partnerships

Collaborations

Hurricane Field Program Personnel

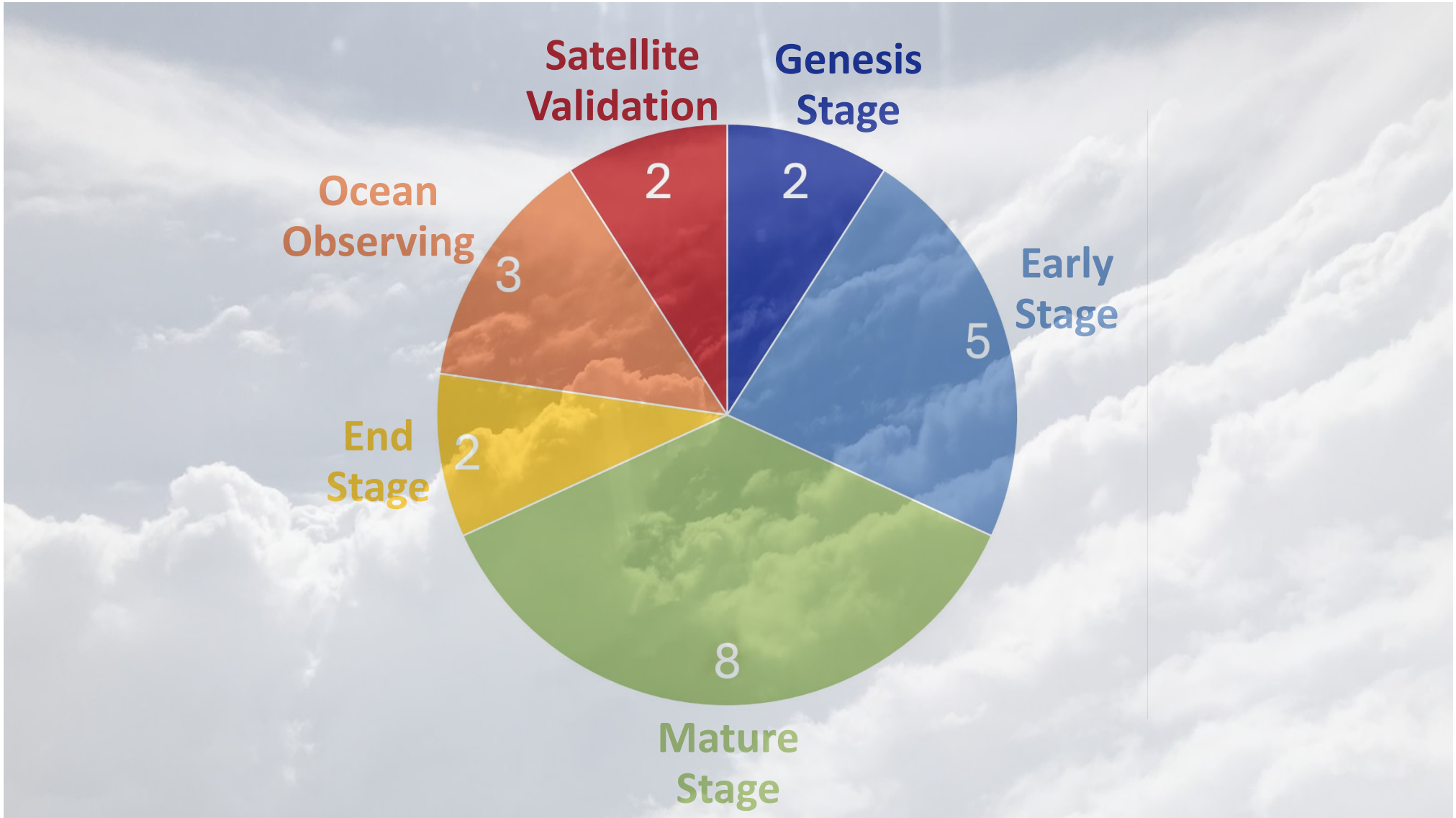
AOML/Hurricane Research Division & University of Miami

The People

- ~20 AOML & Univ. of Miami scientists
- A variety of support
  - Crewing & ground-based
  - Modeling & data assimilation
  - Map discussions
- A marathon, not a sprint
- Flexibility

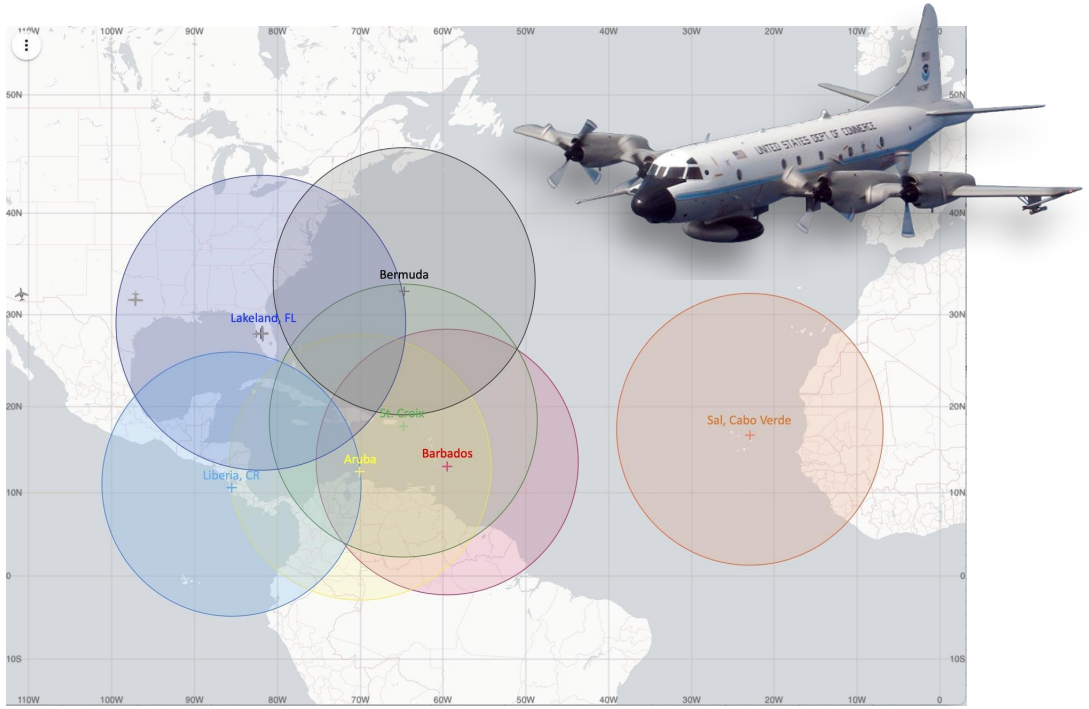
2024 APHEX Hurricane Field Program Plan

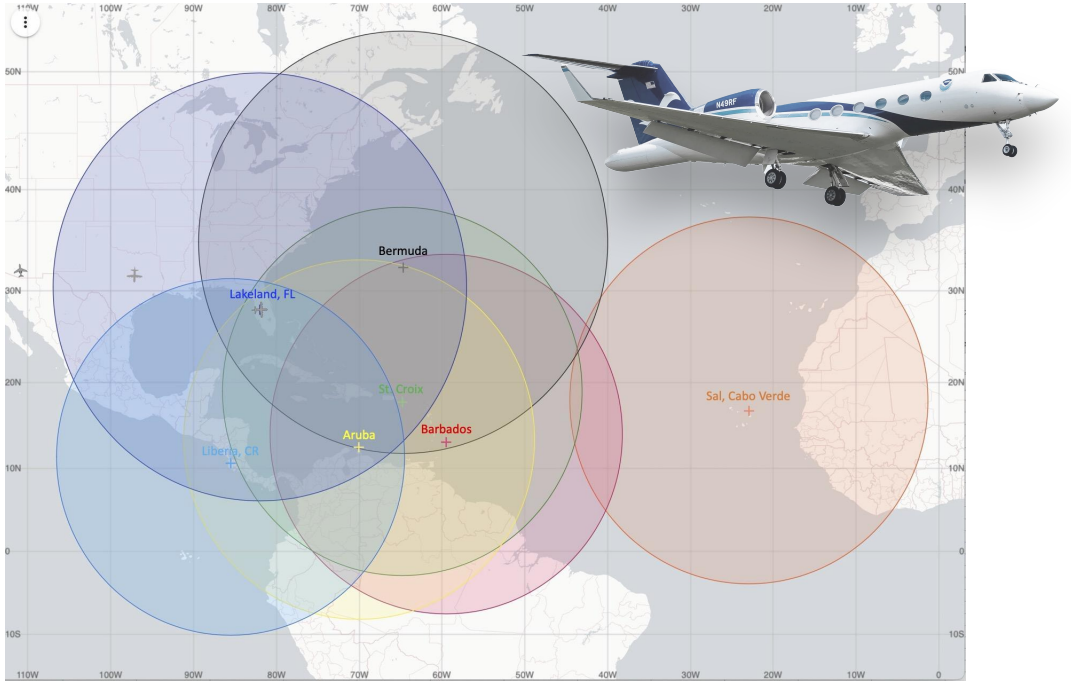
Experiments & Modules



Operations & Logistics

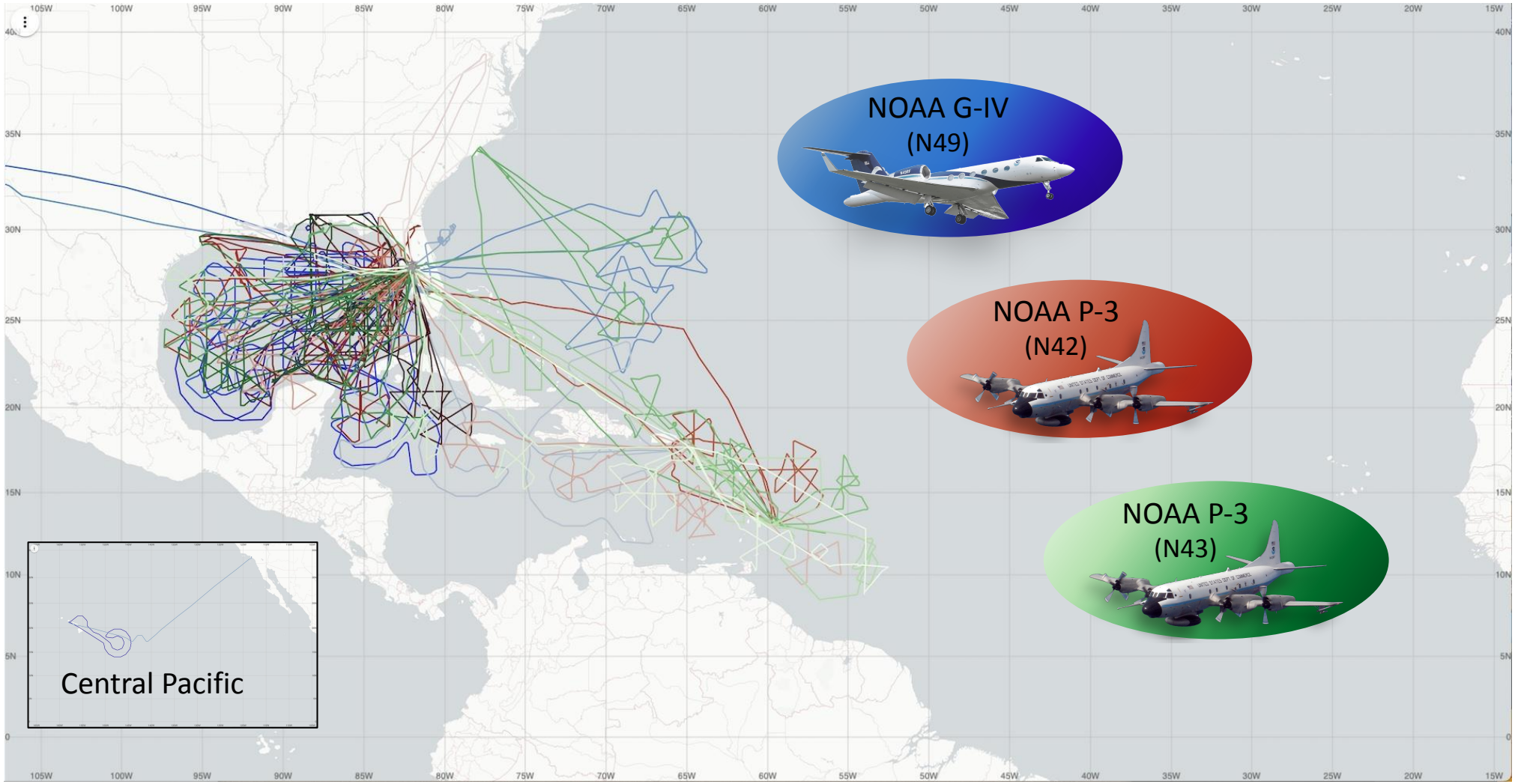
Primary Atlantic Operating Bases and Ranges (2-h on-station time)





2024 Hurricane Field Program

P-3 and G-IV Flight Tracks

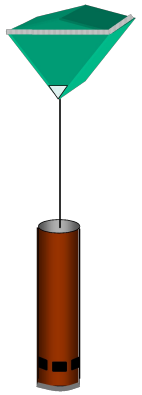


Unique Aircraft Observations

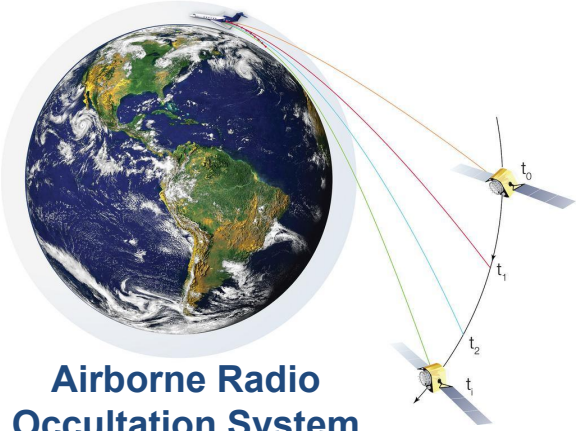
Benefits to Operations* & Research

Aircraft Observations

- Pressure, temperature, moisture, & wind
- Doppler reflectivity & winds
- Aerosol & precipitation size distributions
- Ocean wave heights

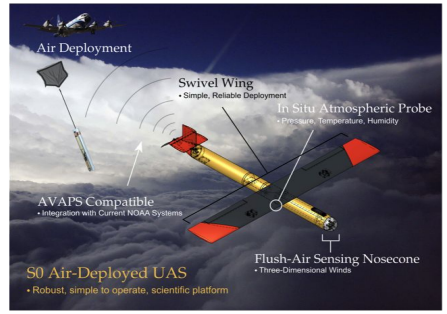


GPS Dropsondes*



Airborne Radio Occultation System
Scripps

P-3 Flight-Level Data*



Black Swift S0 small UAS*

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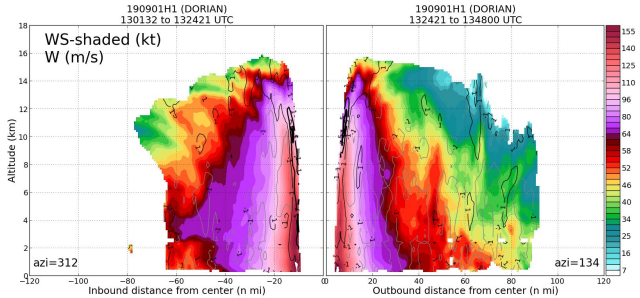
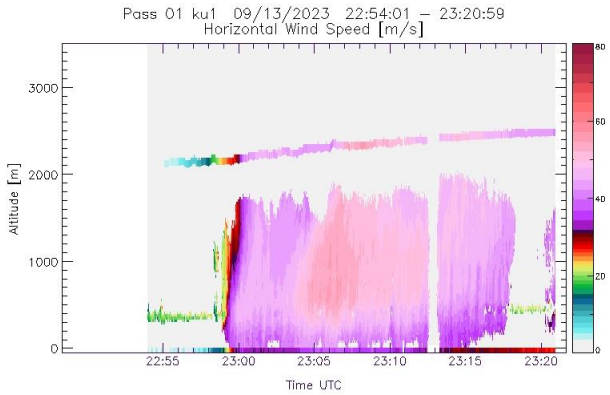


Tail Doppler radar (TDR)*



Imaging Wind and Rain Airborne Profiler (IWRAP)*

NESDIS

Unique Aircraft Observations

Benefits to Operations* & Research

Aircraft Observations

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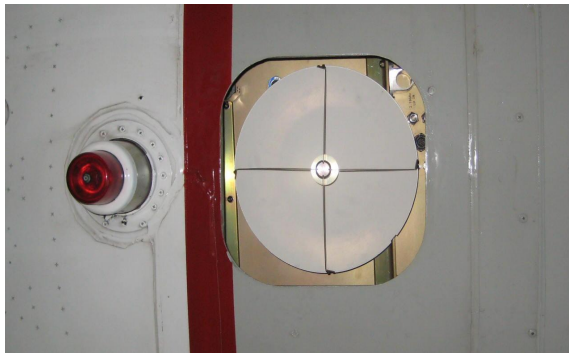
- Ocean wave heights

Cloud Microphysics



95 GHz W-band Radar
NOAA Phys. Sciences Laboratory

Unique Aircraft Observations

Benefits to Operations* & Research

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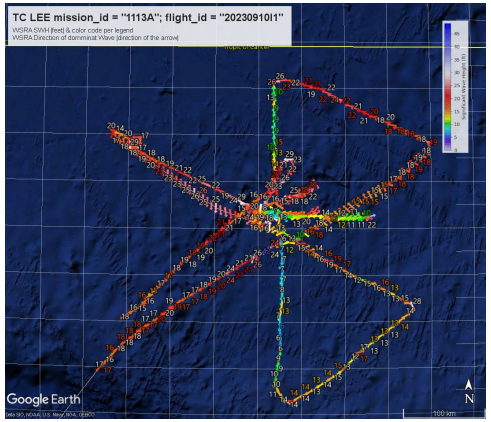
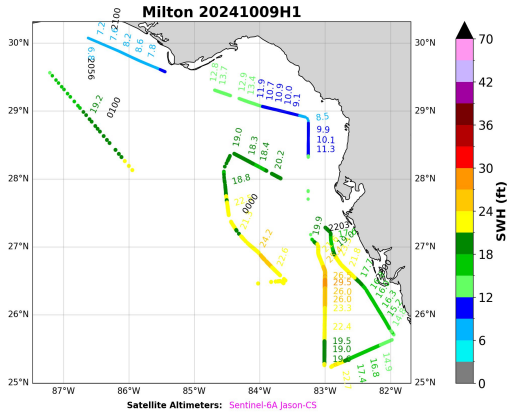


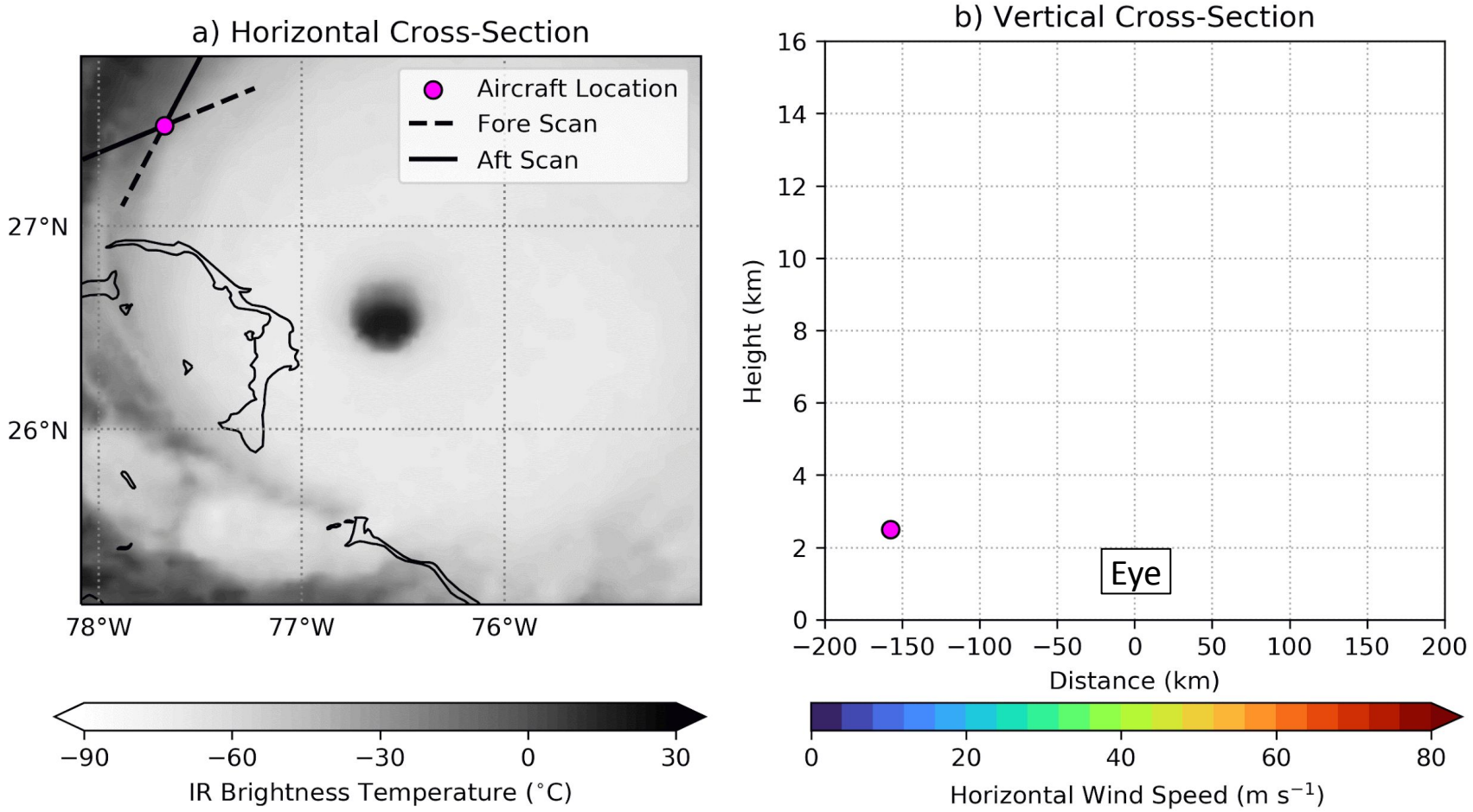
Wide Swath Radar Altimeter (WSRA)*



Ka-band Interferometric Altimeter (KaIA)*
NESDIS

Aircraft Observations

P-3 Tail Doppler Radar (TDR)



2024 NOAA Hurricane Field Program Support

AOML/Hurricane Research Division – Univ of Miami

NOAA P-3 & GIV Missions

Operational Missions: 60

Research Missions: 7

Time

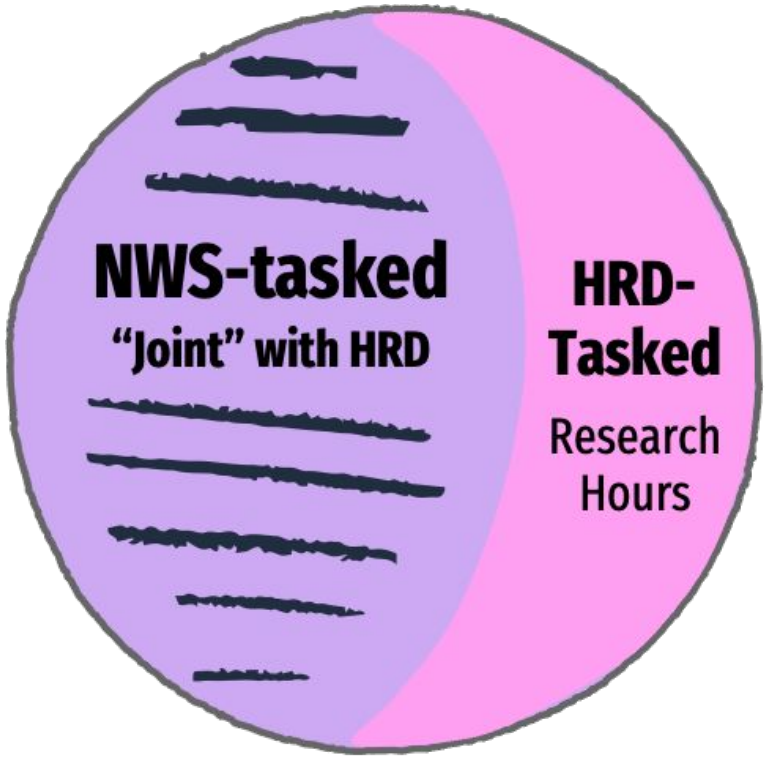
3,000 hr (75 wks)

90% operations

Personnel

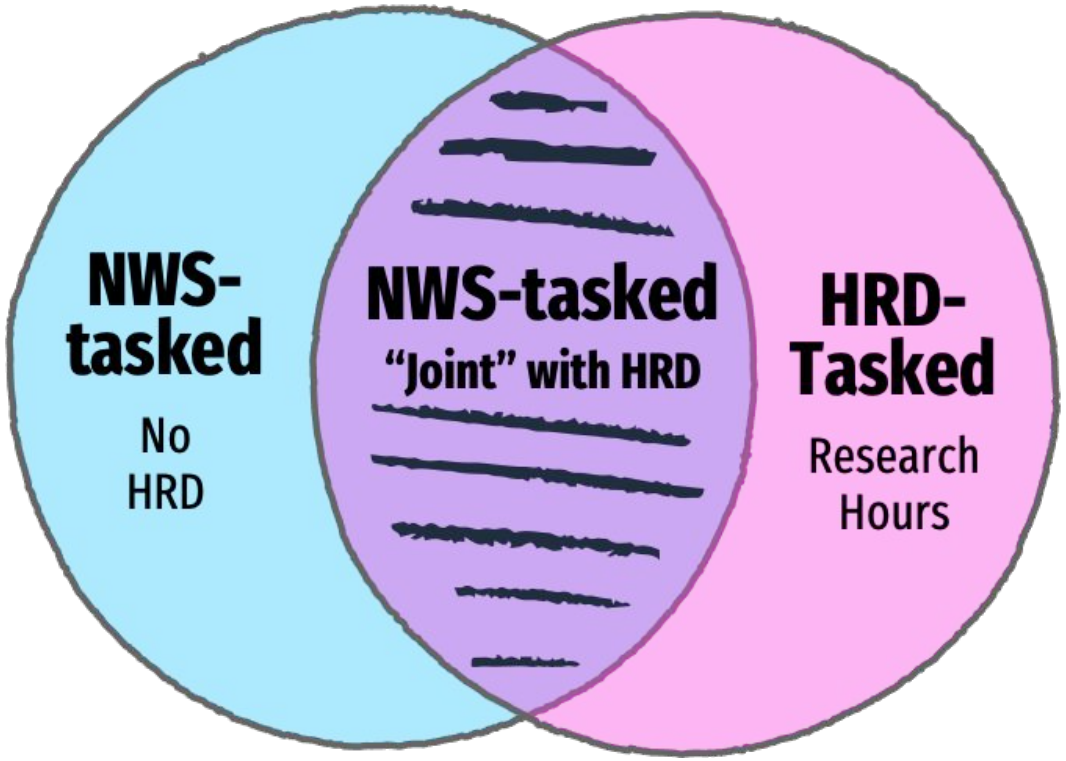
10 scientists provided 80% of the 2024 HFP support

AOML Goals for Tail Doppler Radar Missions



2013-2024

AOML Goals for Tail Doppler Radar Missions



2025/2026 and beyond

- Better research-operations balance
- Retain capability for joint missions
- Prioritize & streamline mission staffing
- More time to focus on next-generation science needs

Closing Summary

Key Takeaways

- APHEX collects unique observations that advance:
  - *Forecasts, R&D, emerging tech, satellite validation*
- HRD APHEX R2O efforts – stories of success
  - *G-IV Synoptic Surv. support: 1997-2008*
  - *Tail Doppler radar support: 2013-?*

Future Outlook

- APHEX of the future >> more streamlined
  - *Less operational support*
  - *Support <u>new</u> R20 efforts*
  - *More focus on basic research, emerging tech*
- More time for AOML to focus on R&D