2011 NOAA's Intensity Forecasting Experiment (IFEX)

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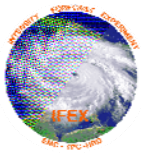
Intensity Forecasting Experiment (IFEX; Rogers et al., BAMS, 2006)

THE INTENSITY FORECASTING EXPERIMENT

A NOAA Multiyear Field Program for Improving Tropical Cyclone Intensity Forecasts

IFEX Goals



- Intended to improve prediction of TC intensity change by:
  1. collecting observations throughout the TC life cycle for model initialization and evaluation
  2. developing and refining measurement technologies for real-time monitoring of TC intensity, structure, and environment
  3. improving understanding of physical processes important in TC intensity change

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2011 IFEX Plans

- Continue addressing IFEX/HFIP goals
- Sustain our partnerships with EMC and NESDIS
  - Continue TDR missions and real-time Doppler data transmission
  - Collaborate with NESDIS – Ocean Winds Experiment
  - Coordinate with 53rd on float/drifter deployments
- Strengthen our interactions with NHC
- Fly operationally tasked missions
  - Based on EMC's and/or NHC's operational need
  - Selected modules may be attempted
- Encourage greater awareness in broader TC community

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NOAA42 Built in 1975 at Lockheed-Martin, Marietta, Georgia

NOAA43 Built in 1976 at Lockheed-Martin, Marietta, Georgia

G-IV Built in 1994 at Gulfstream Aerospace Corporation in Savannah Georgia

NOAA Gulfstream-IV jet flies at high altitudes in the hurricane environment


UNITED STATES DEPT. OF COMMERCE

Inside the P-3 Aircraft

Hurricane Isabel 2003

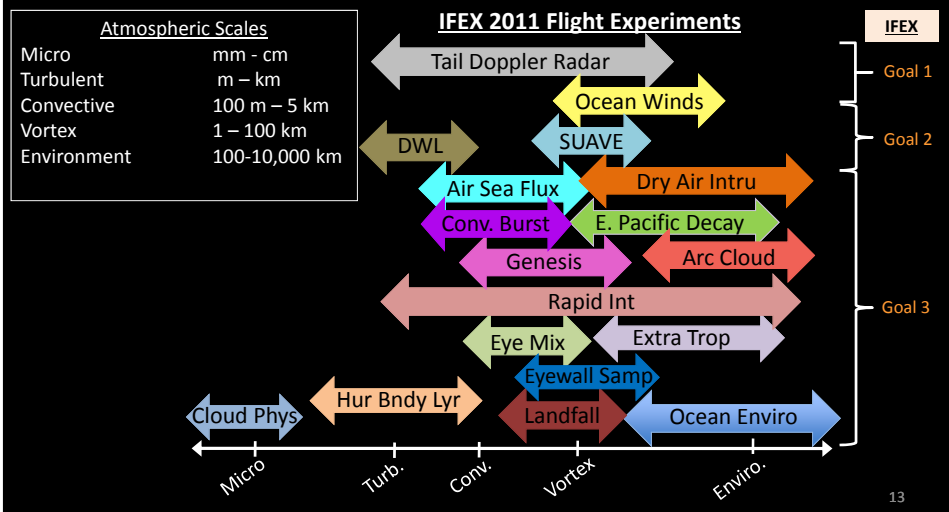
NOAA P-3 Flight Crew

Pilots Flight Engineers Meteorologists Flight Director
Co-Pilots Data Technicians Flight Navigator Flight Mechanics
Electronic Technicians Science Engineers

Intensity change is a multi-scale process

- Sample TCs and the environment on all scales

Atmospheric Scales	
Micro	mm - cm
Turbulent	m – km
Convective	100 m – 5 km
Vortex	1 – 100 km
Environment	100-10,000 km



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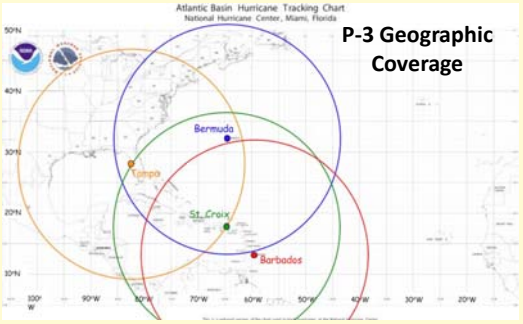

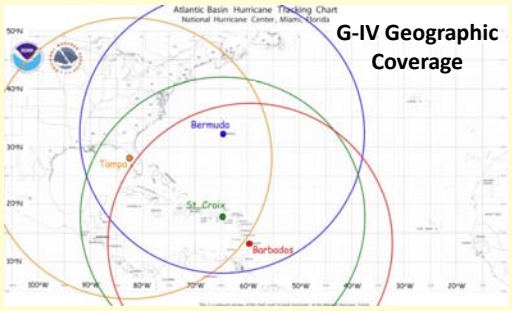

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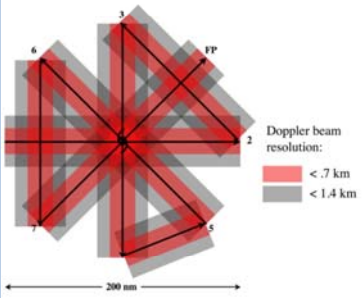
Tail Doppler Radar Experiment (TDR)

- Provide a comprehensive wind data set for initialization and evaluation of hurricane models (e.g. HWRF)
- Provide data sets to increase understanding of intensity change, using regular, periodic, collection
- 2 P-3 Flights per day--on-station time centered on 0 and 12 UTC analysis periods (8 and 20 UTC take-off)
- -optimum 3 days of flights in a row starting at tropical depression or maybe pre-depression stage



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Resulting data analyses from TDR missions

- Assimilation development at HRD
- Composite storm-structure studies
- Observing System Experiments (OSEs)
- Evaluation of error characteristics of airborne Doppler data and analyses

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New for this season…

Doppler Wind Lidar SAL Module

PI: Jason Dunion

Detect winds and aerosols both above (up to ~14 km in the presence of high level cirrus) and below (down to ~100 m above the ocean surface) the aircraft flight level (typically 3 -5 km)

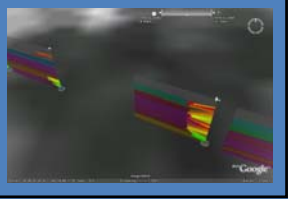
Purpose: Characterize the suspended Saharan dust and mid-levels and its affects on TCs

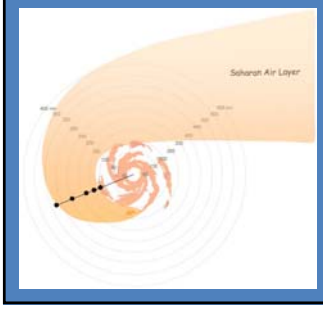
Plan: On outbound and inbound legs (19k ft) or higher

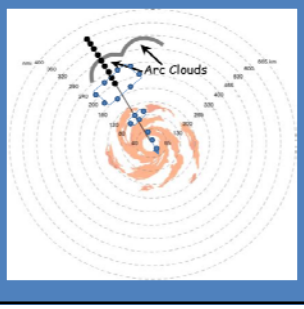
Set DWL to downward looking and full scan mode

Drop sondes at 25-50 nmi increments in the SAL region

Doppler Wind Lidar







New this season

UAS – Small Unmanned Aerial Vehicle Experiment (SUAVE)

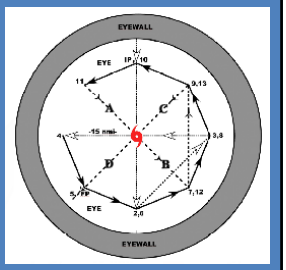
PI: Joe Cione

Purpose: Continuously monitor TC intensity & capturing an RI change event.

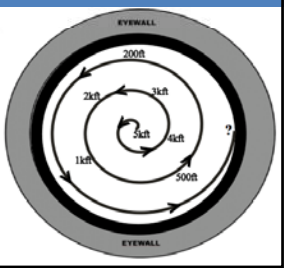
Plan: GALE released from P-3 free–fall AXBT chute (10,000 ft)

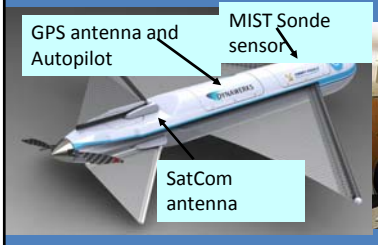
- P-3 performs a fig-4 in eye dropping sondes and BTs, then circumvents the eye
- GALE will loiter in the eye or eyewall region in mature storms
- Provide high-res near surface obs of (V, P, T and RH)
- Module flight duration: ~1 hr

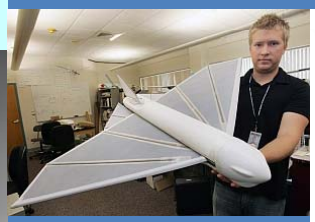
P-3 Mature Storm Pattern



GALE -UAS Flight Pattern







Logistics

Daily Schedule

- 9AM Conf call/meeting with IFEX participants *(if needed)*
- noon Wx Discussion
- 1PM issue alert to AOC *(if needed)*

• HRD daily map discussions (25 July-29 October)

- noon start time
- goto meeting info available

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Communicating in the field

• Our blog
http://noaahrd.wordpress.com
• HRD Web page
http://www.aoml.noaa.gov/hrd
• Facebook
http://www.facebook.com/noaahrd
• Twitter
http://twitter.com/#!/HRD_AOML_NOAA

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Thank you!