

An Overview of the Joint Hurricane Testbed (JHT)

Shirley Murillo

NOAA/AOML/Hurricane Research Division



USWRP

30th National Hurricane Conference
April 3, 2008
Orlando, FL



JHT mission

- The mission of the Joint Hurricane Testbed is to **transfer** more rapidly and smoothly new technology, research results, and observational advances of the United States Weather Research, its sponsoring agencies, the academic community and other groups into improved tropical cyclone analysis and prediction at operational centers.

JHT Process

- Principal Investigators apply for funding through NOAA
- A seven member Steering Committee rates all proposals
- Funded projects are tested during one or two hurricane seasons in conjunction with NHC/Environmental Modeling Center (EMC) points of contact
- At the project's end, each are evaluated by NHC/EMC staff
- Implementation of successful projects are then carried out by NHC/EMC staff/Pis

Factors Considered in NHC Decisions on Operational Implementation

- **Forecast or Analysis Benefit:** expected improvement in operational forecast and/or analysis accuracy
- **Efficiency:** adherence to forecaster time constraints and ease of use needs
- **Compatibility:** IT compatibility with operational hardware, software, data, communications, etc.
- **Sustainability:** availability of resources to operate, upgrade, and/or provide support

JHT Accomplishments: 2001-2008

- Total projects funded (round 1-4): 50
- Number of projects completed (round 1-3): 39
- Number of projects accepted for implementation: 28
- Number of completed projects not accepted: 3
- Number of completed projects pending further evaluation: 8
- Number of projects implemented: 21

Dedicated NHC & JHT staff, and close collaborations between the PIs, NHC forecasters and support staff is the key.

What does it take to support the JHT?

JHT Staff:

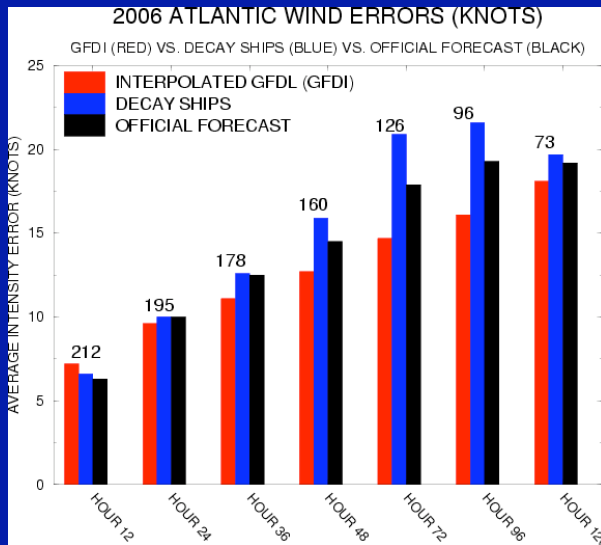
- Jiann-Gwo Jiing (JHT Director)
- Jose Salazar (JHT IT specialist)
- Shirley Murillo (JHT Admin. Asst.)
- Chris Landsea (JHT Admin. Asst.)

JHT Steering Committee:

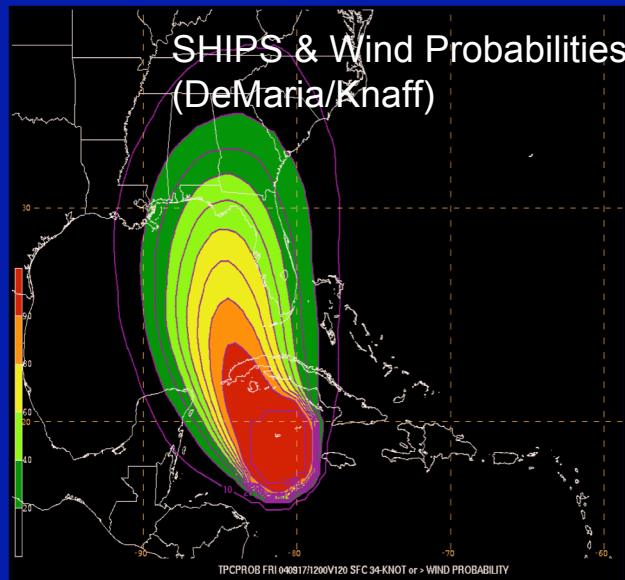
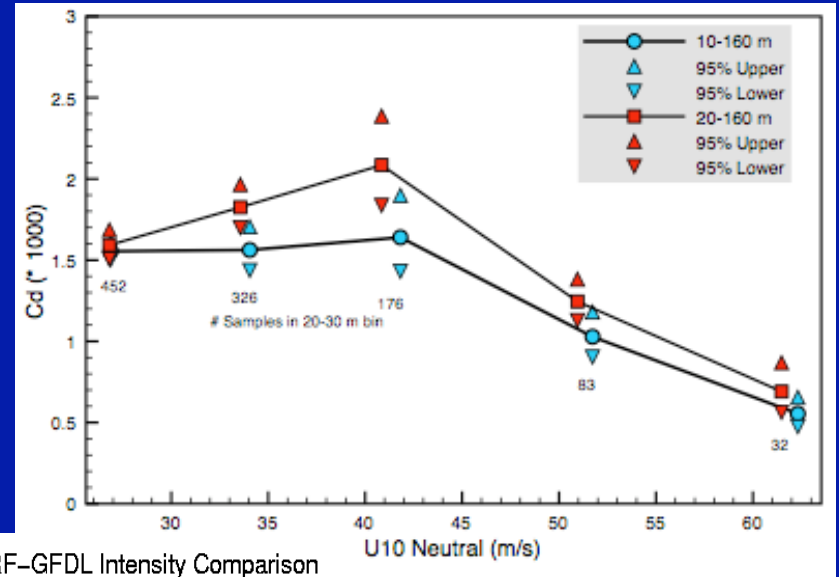
- Ed Rappaport (NHC – Co-chair)
 - Ed Fukada (Joint Typhoon Warning Center)
 - Jeff Hawkins (Naval Research Laboratory)
 - John Gamache (Hurricane Research Division)
 - Liz Ritchie (University of Arizona)
 - Naomi Surgi (Environmental Modeling Center)
 - Hugh Willoughby (Florida International University)
-
- JHT Principal Investigators and other funded participants
 - John Gaynor and staff (US Weather Research Program)
 - NHC and EMC forecaster and technical points of contact
 - NHC/Technical Support Branch IT staff

JHT Third Round (FY05-07) Projects

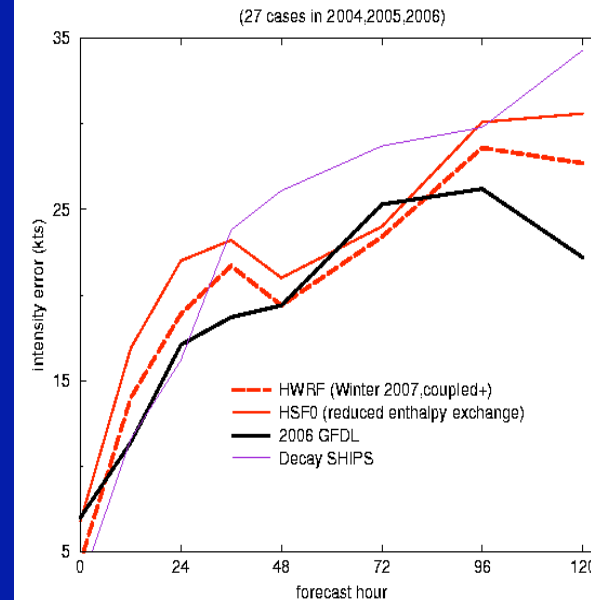
Dynamical model upgrades, observational, and assimilation projects



GFDL model upgrades (Bender)



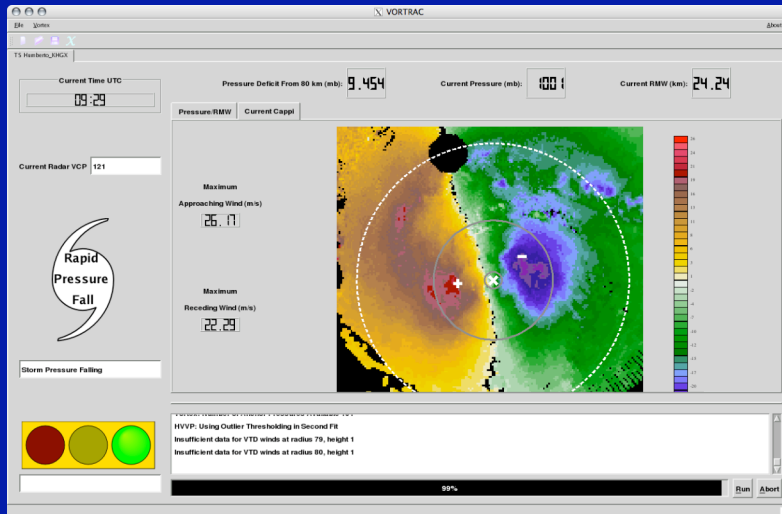
Preliminary HWRF-GFDL Intensity Comparison



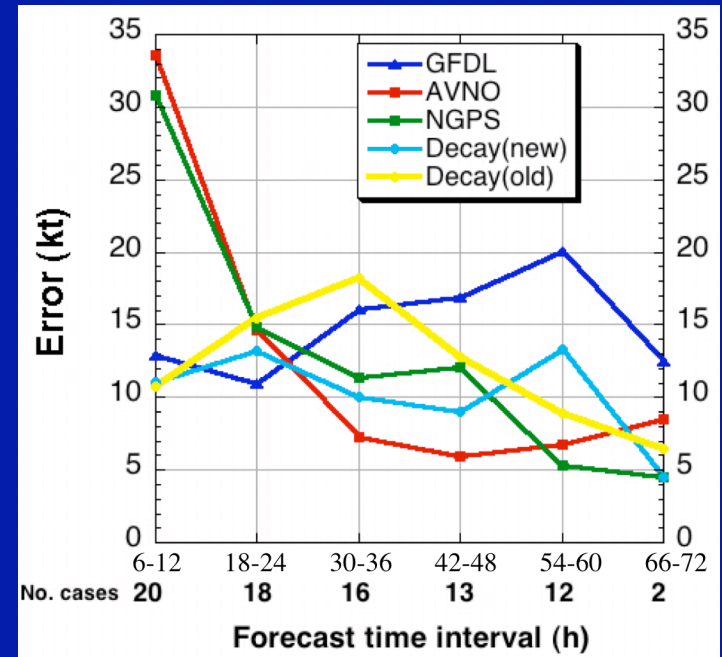
Drag coefficients (Powell)

Hurricane Weather Research Forecasting Model (Tuleya)

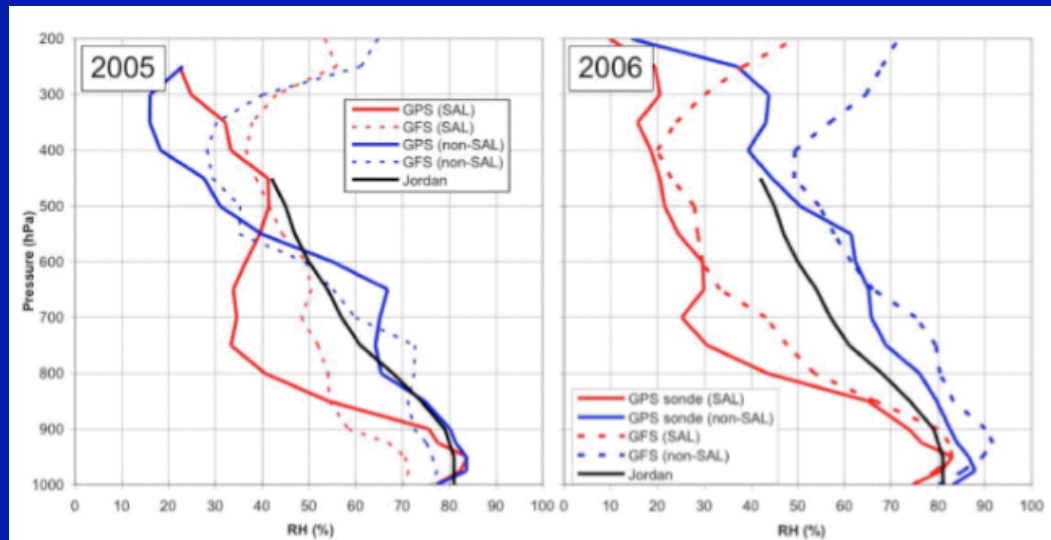
JHT Third Round (FY05-07) Projects



VORTRAC (Lee/Harasti)

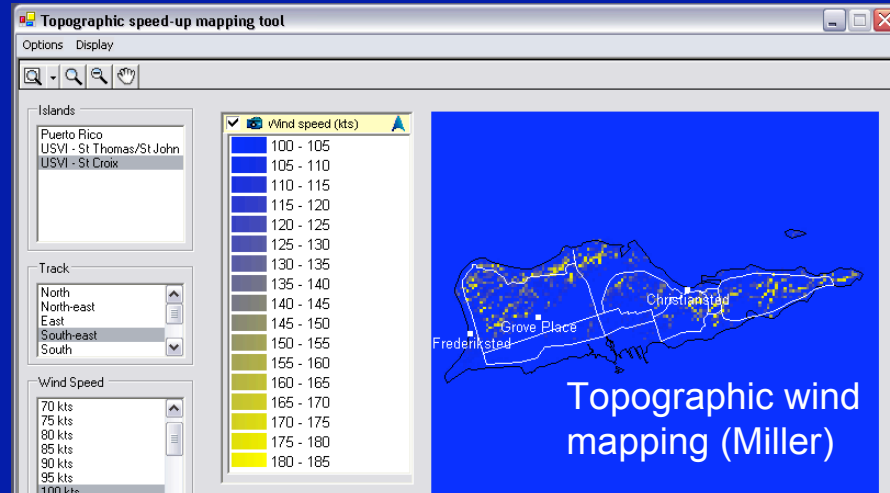
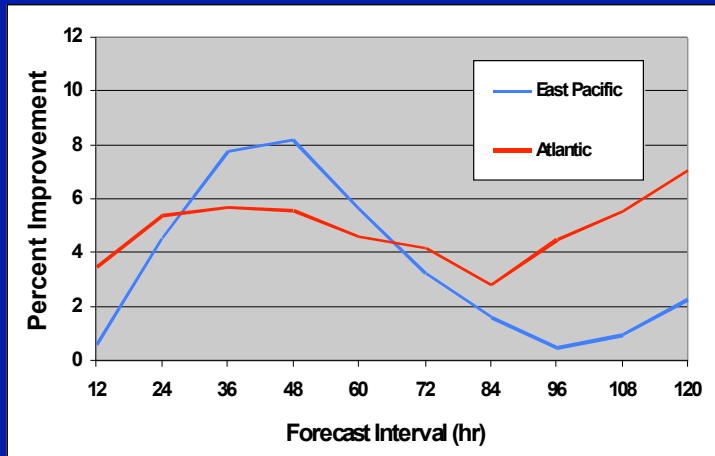


Inland wind decay model (Kaplan)



GPSsonde moisture into GFS (Aberson/Dunion)

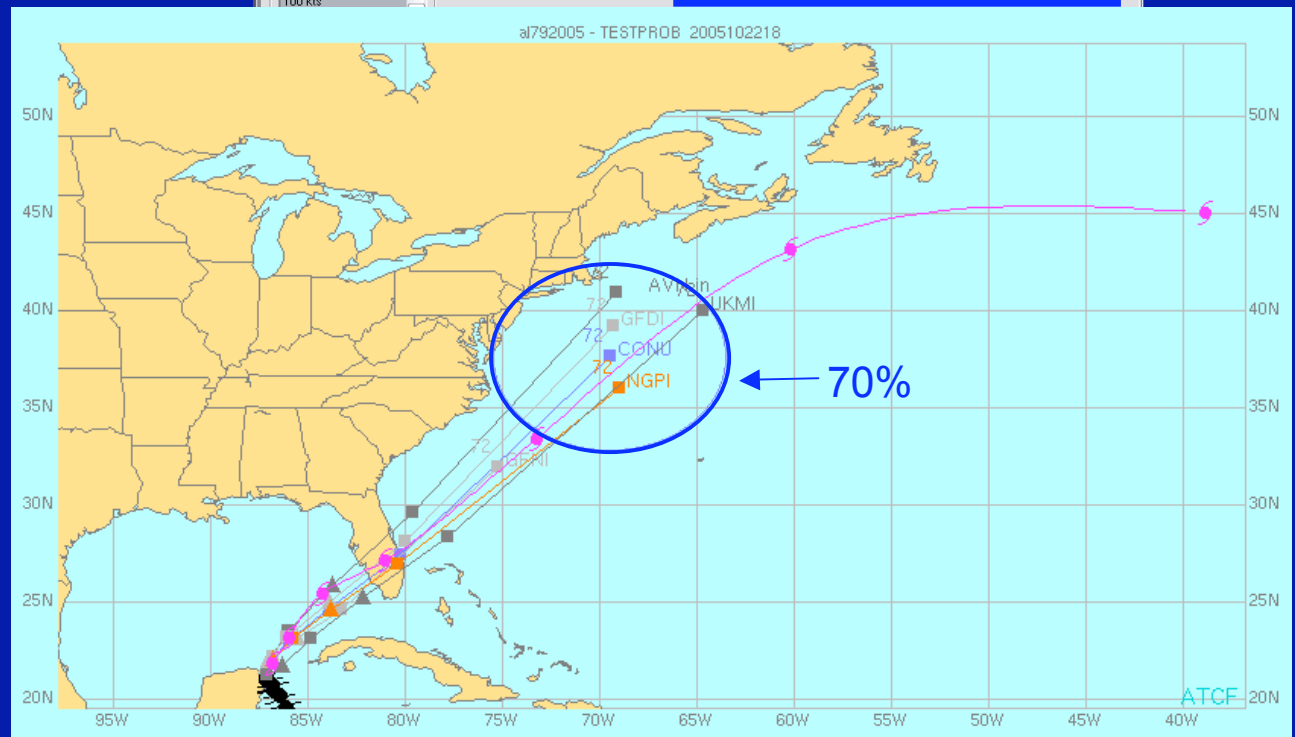
JHT Third Round (FY05-07) Projects



Topographic wind mapping (Miller)

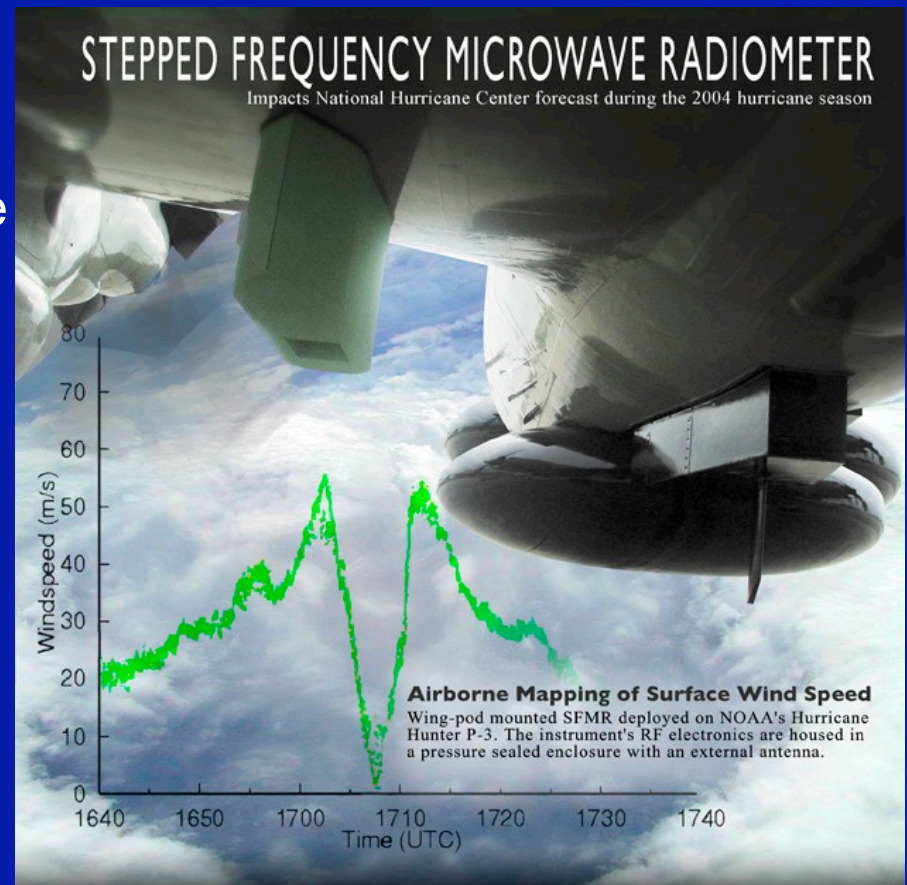
Improve Stats Intensity Forecast Models (Knaff, DeMaria and Kaplan)

Track uncertainty estimates GPCE (Goerss)



Stepped-Frequency Microwave Radiometer

- Measures nadir brightness temperature at 6 C-band frequencies.
- Geophysical model function relates emissivity to wind speed. Emissivity depends on surface foam coverage and rain rate.
- Calibrated with GPS dropsonde data.
- First data from C-130s in 2007.





C130s Now Equipped with SFMR

Thanks to: HRD,
AOC, RSS,
NESDIS,
ProSensing,
CARCAH, AF 53rd
Reconn. Squad.



4th round (2007-09) of JHT Projects

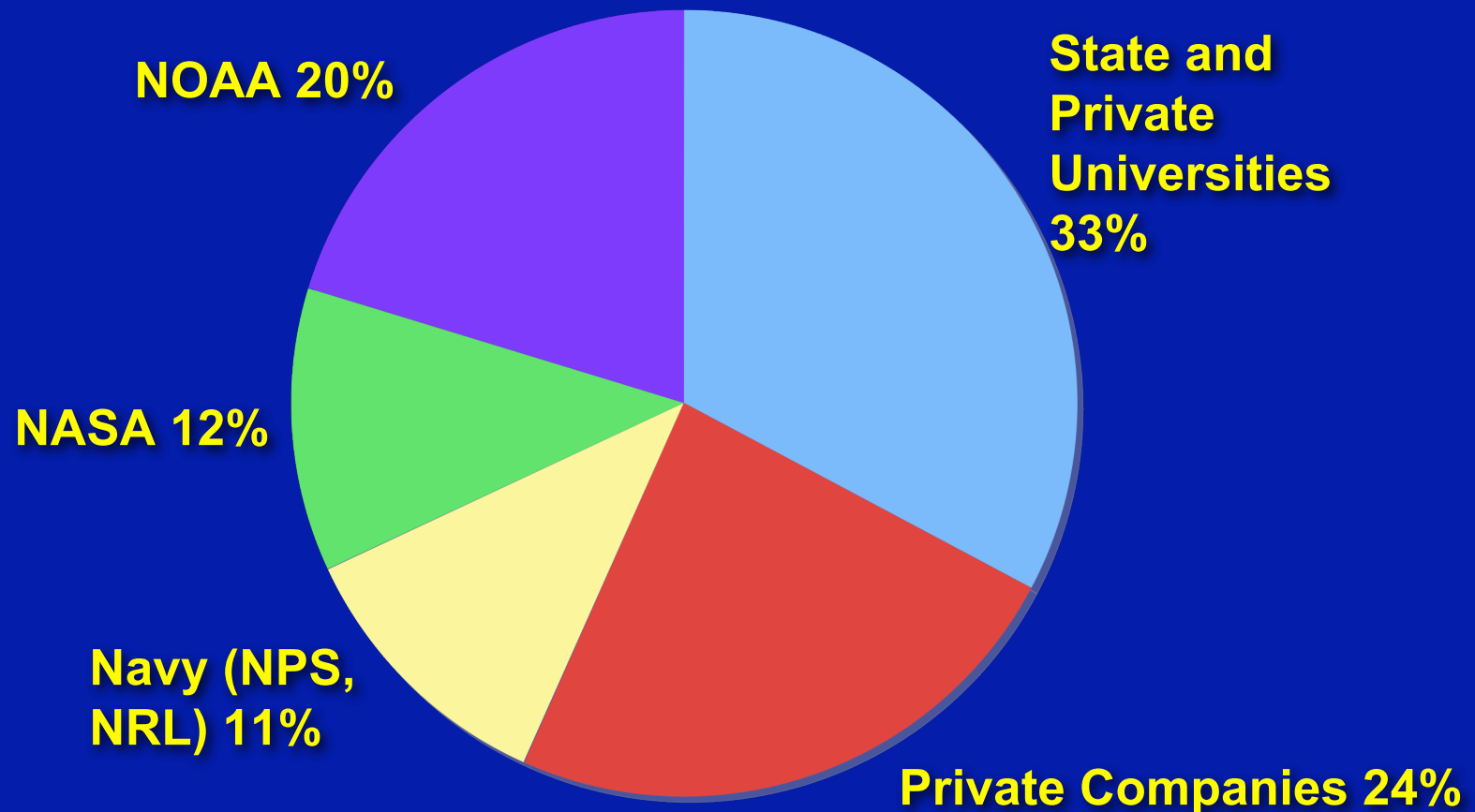
- Drafted of Federal Funding Opportunity (Spring 2006)
- Announcement of Federal Funding Opportunity (June 16th)
- 43 Letters of Intent received (July 31st)
- 20 encouraged to submit a full proposal (Sep)
- Full proposals due (December 6th)
- 27 Full proposals reviewed (Dec. 2006-Feb. 2007)
- NHC/JHT Directors' recommend for funding (Mar. 1, 2007)
- New 4th Round Projects began (Summer 2007)

4th Round Project: Focus Areas

Primary Area of Focus	# of Projects
Improvements to dynamical models (for track, intensity, and precipitation forecasts)	5
Statistical intensity forecast guidance	1
Tropical cyclone structure/wind/wave distribution	2
Track forecast guidance	1
Enhancements to operational environment	1
Total	10

4th Round (FY07) Funding Distribution

Total \$1.04M (\$1.5M announced)



Challenges for FY08

- Managing 10 projects with wide spread starting dates
- Review 4th round two-year projects for second year funding
- Preparation of the Announcement of Opportunity for the 5th round (FY09-10)
- Real-time testing and evaluation
- Implementation of new projects (NHC)
- Uncertain future funding

JHT Website

Go to www.nhc.noaa.gov/jht



- [JHT Home](#)
- [Terms of Reference \(PDF\)](#)
- [Staff](#)
- [Steering Committee](#)
- [Main Activities](#)
- [Highlights - 2001 to present](#)
- [Current Projects \(2005-2007\)](#)
- [Past Projects](#)
- [Administrative Presentations and Information](#)

Mission Statement

The mission of the Joint (National Oceanic and Atmospheric Administration - NOAA, Navy, and National Aeronautics and Space Administration - NASA) Hurricane Test Bed is to transfer more rapidly and smoothly new technology, research results, and observational advances of the United States Weather Research Program (USWRP), its sponsoring agencies, the academic community and other groups into improved tropical cyclone analysis and prediction at operational centers.

WHAT'S NEW

Updated January 31, 2006:

- 2005-2007 [Projects and Goals](#)
- The 2005 Midyear Reports are available in the [Project Table](#)

Added February 10, 2006:

- [The Joint Hurricane Testbed \(JHT\): Progress and Future Plans](#), Chris Landsea (TPC/NHC) - American Meteorological Society's Annual Meeting, February 2006 presentation. (PDF format)

JHT Fourth Round (FY07-08) Projects

Proposal Title	PI	TPC POC
Improving the Hurricane WRF-Ocean Coupled System for Transition to Operations	Ginis, Isaac (Univ. of Rhode Island)	Pasch, Mainelli, Cangialosi Lozano/Tolman (EMC)
An Improved Wind Probability Estimation Program	Stan Kidder (CSU), DeMaria, Mark (NESDIS) Harr, Pat (NPS)	Knabb, Lauer, Mainelli
Hurricane Model Transitions to Operations at NCEP/EMC	Tuleya, Bob (SAIC)	Pasch, Fiorino, Rhome, Surgi (EMC)
Web-ATCF, user Requirements and Intensity Consensus	Sampson, Charles (NRL)	Knabb, Franklin, Sisko
Evaluation and Improvement of Ocean Model Parameterizations for NCEP Operations	Shay, Nick (UM)	Avila, Rhome, Baig, Lozano(EMC)

JHT Fourth Round (FY07-08) Projects

Proposal Title	PI	TPC POC
Operational Use of Near-Real Time Surface Directional Wave Spectra Generated from NOAA Scanning Radar Altimeter Range Measurements	Walsh, Edward (NASA/GFSC)	Beven, Willis, Brown, Baig
High Wind Drag Coefficient and Sea Surface Roughness in Shallow Water	Powell, Mark (NOAA/AOML)	Franklin, Blake, Tolman (EMC)
Validation and Processing Tools for the AF Reserves Command 53rd Weather Reconnaissance Squadron WC-130J Multi-Aircraft SFMR Systems	J. Carswell (RSS, Inc.) P. Black (AOML)	Beven, Brown, Sisko, Christensen
Evaluation and Improvement of Spray-Modified Air-Sea Enthalpy and Momentum Flux Parameterizations for operational Hurricane Prediction	J. Bao, C. Fairall, J. Wilczak (ESRL)	Pasch, Berg, Fiorino, Surgi/Kwon (EMC)
TC Dressing: A Probabilistic Approach to Providing State Dependent, Non-Isotropic Forecast Track Error Guidance	J. Hansen J. Goerss (NRL)	Franklin, Blake, Sisko, Mundell