

Update on the Joint Hurricane Testbed Activities

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Outline

- **Major activities 2006-2007**
 - **Conclusion of the 2nd round (03-05) projects**
 - **Review, fund, and testing of the 3rd round (05-07) projects**
 - **Preparation for the 4th round (07-09) funding**
- **Implementation**
- **What have we accomplished**
- **Challenges ahead**

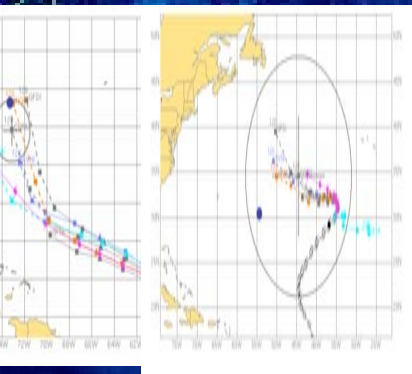
Major Activities 2006-2007 :

Conclusion of the 2nd round (FY03-04) projects

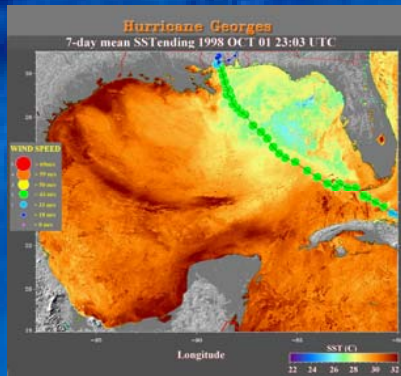
- **Final evaluation of 12 two-year projects (Jan.-Mar. 2006)**
- **Decisions for implementation by TPC and EMC Directors (early April 2006)**
 - 8 accepted, 3 pending, one not accepted
- **Implementation of 8 accepted two-year projects completed (spring/summer 2006)**

Overall, out of 15 second round projects, 10 accepted and implemented.

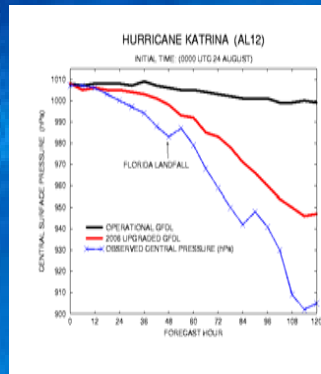
JHT 2nd Round Implemented Projects



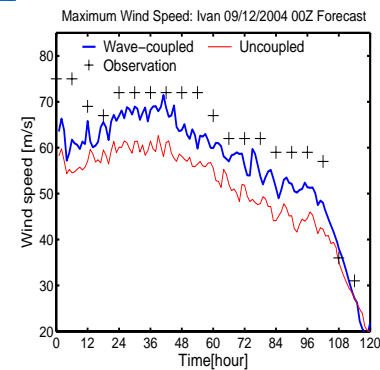
Track Uncertainty Estimates (Goerss)



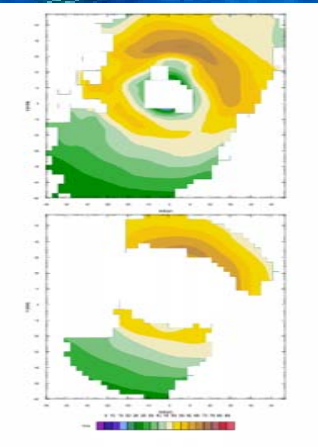
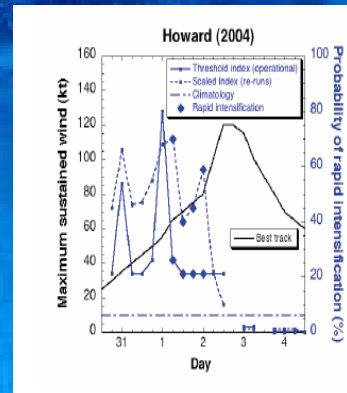
Inner Core SSTs (Cione)



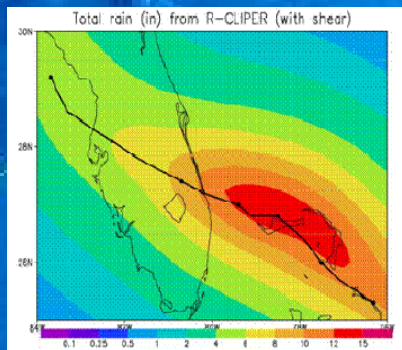
GFDL/URI Hurricane Model upgrades (Bender; Ginis)



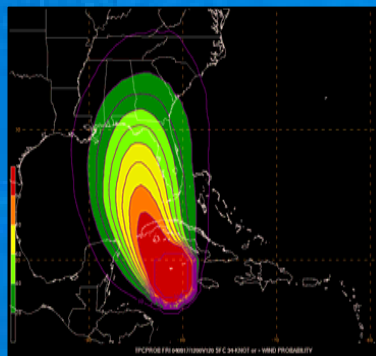
Probability of rapid intensification - ENP (Kaplan)



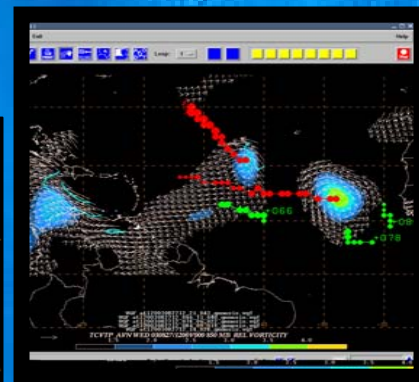
Doppler Winds (Gamache)



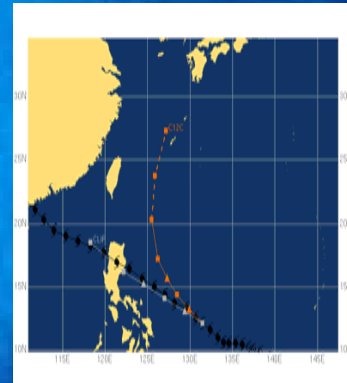
Rain-CLIPER & rainfall verification (Rogers)



SHIPS & Wind Probabilities (DeMaria/Knaff)



Genesis forecasting assessments (Harr)



5 day CLIPER - NWP, ENP, ATL (Aberson)

JHT 2nd Round Projects - Pending

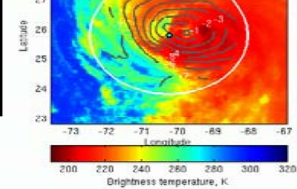
Hurricane

Isabel

16 Sept 2003
00:15UTC

200 220 240 260 280 300 320
Brightness temperature, K

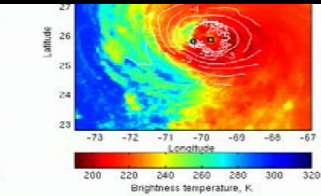
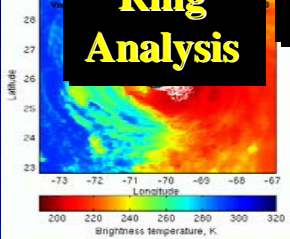
Spiral Analysis



Advanced Objective
Dvorak Technique
(Kossin/Velden)

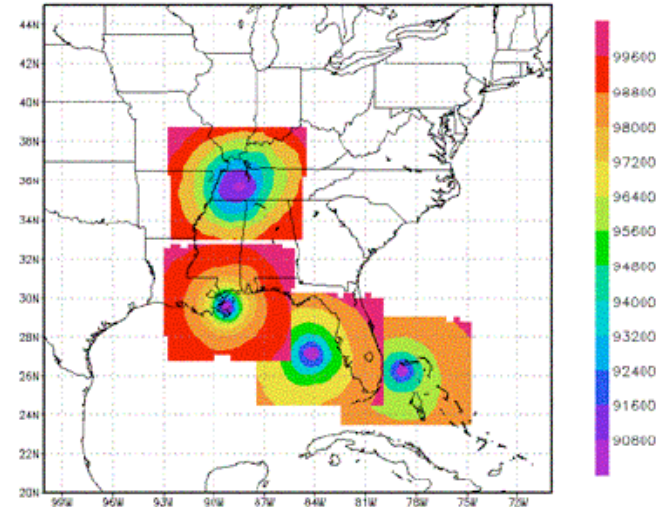
**Ring
Analysis**

Combo Analysis

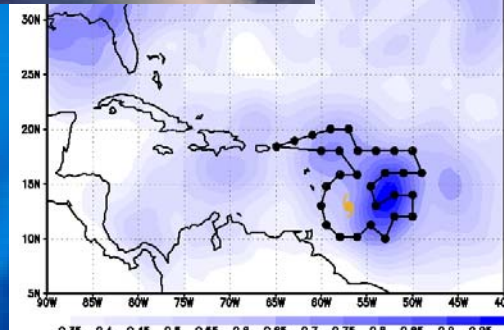


Hurricane-Weather
Research Forecasting
Model (Tuleya)

katrina 2005082512 HWRf(fb1dt) 0,2,4,5 days



Targeted
Observations
(Majumdar/Aberson)



Major Activities 2006-2007 :

Review, fund, and testing of 15
3rd round (FY05-06) year two projects

- Second year funding proposal review (June)
- Second year projects began (April and July)
 - Requested \$1.265M, \$1.15M available
- Real-time testing and evaluation during 2006 hurricane season

JHT Third Round (FY05-06) Projects

Dynamical model upgrades, observational, and assimilation projects

Proposal Title	PIs	NHC POC
Hurricane Model Transition to Operations at GFDL/NOAA	Bender	Pasch, Rhome
Hurricane Model Transition to Operations at GFDL/NOAA	Tuleya	Pasch
Drag Coefficient and Wind Speed Dependence in TCs	Powell	Franklin
Dynamic Initialization to Improve TC Intensity and Structure Forecasts	Liou	Pasch
Operational SFMR-NAWIPS Airborne Processing and Data Distribution Products	Carswell , Black, Chang	Beven, Mainelli, Sisko, Lauer
Mapping of Topographic Effects on Maximum Sustained Surface Wind Speeds in Landfalling Hurricanes	Miller	Beven
Assimilating Moisture Information from GPS Dropwindsondes into the NOAA Global Forecast System	Aberson	Franklin, Blake
WSR-88D-derived Diagnosis of Tropical Cyclone Intensity Changes Near Landfall	Lee, Harasti	Stewart, McAdie

JHT Third Round (FY05-06) Projects

Intensity, structure, and track projects

Proposal Title	PIs	NHC POC
Improved Statistical Intensity Forecast Models	Knaff, DeMaria, Kaplan	Avila, Sisko
Enhancement of SHIPS Using Passive Microwave Imager Data	Cecil	Stewart, Sisko
Eastern Pacific Ocean Heat Content Estimates for SHIPS Forecasts	Shay, DeMaria	Avila, Mainelli
Continued Development of Tropical Cyclone Wind Probability Products	Knaff, DeMaria	Lauer
Estimating Tropical Cyclone Wind Radii Utilizing an Empirical Inland Wind Decay Model	Kaplan	Stewart,
Prediction of Consensus TC Track Forecast Error and Correctors to Improve Consensus TC Track Forecasts	Goerss	Beven
Development and Implementation of NHC/JHT Products in ATCF	Sampson	Sisko

* retired

Major activities 2006-2007 :

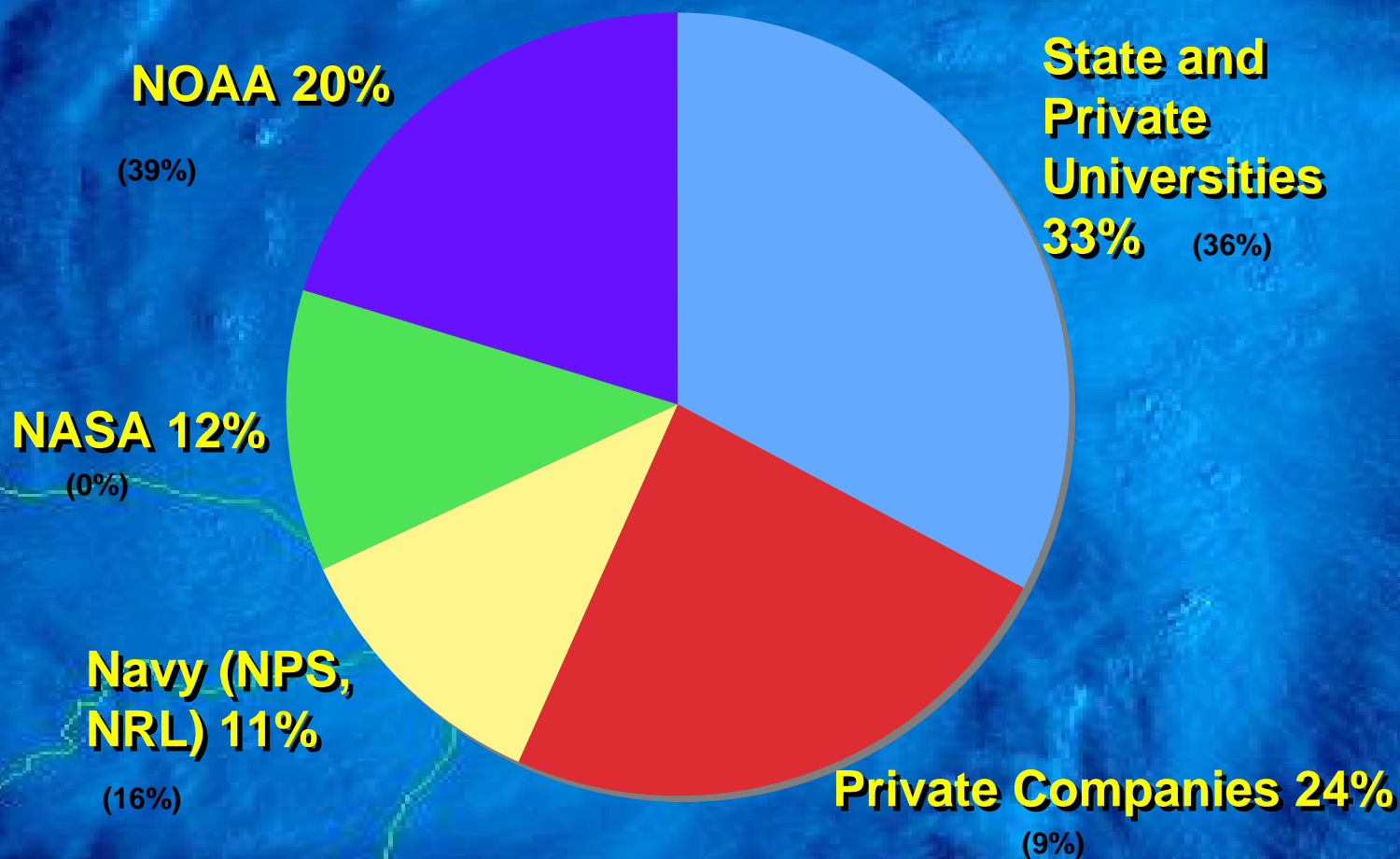
Preparation for the 4th Round (FY07-08) Funding

- **Announcement of Federal Funding Opportunity (June 16th)**
- **43 Letters of Intent received (July 31st)**
- **20 encouraged to submit a full proposal (Sep)**
- **28 Full proposals reviewed (Dec. 2006-Feb. 2007)**
- **NHC & JHT Directors recommend for funding (Late Feb. 2007)**
- **New 4th Round Projects begin (spring 2007?)**

7-8 months for preparation

4th Round (FY07) Recommended Funding Distribution

Total \$1.04M



4th Round Recommended 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
Enhancements to observed data, assimilation	0
Tropical cyclone structure/wind/wave distribution	2
Track forecast guidance	1
Enhancements to operational environment	1
Total	10*

Implementation

- **Some relative easy**
- **Some very complicated**
- **NHC contributes ~0.5 FTE/yr on implementation**
- **JHT IT facilitator assists in the process**
- **NCEP/EMC and NCO also contributed**

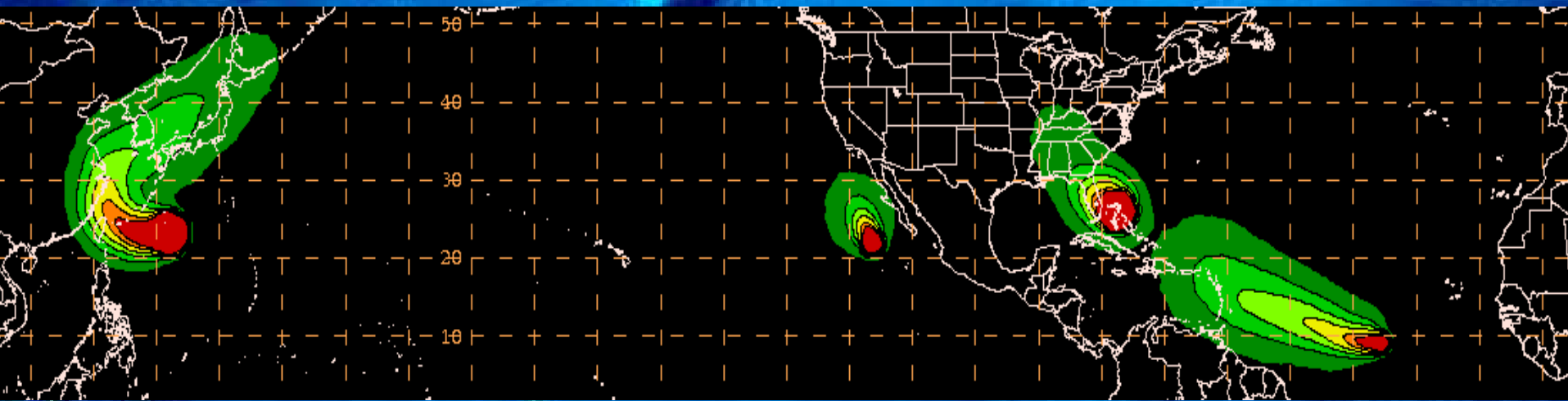
Operational Centers are not funded for this task

A blue-toned satellite map of the world, showing the continents and oceans. A dark, circular spot is visible in the Atlantic Ocean, possibly representing a specific project location. The text is overlaid on the map.

Highlights of projects implemented in 2006

Wind Speed Probabilities (Cumulative & incremental)

- Computed each forecast cycle for all active tropical cyclones in the Atlantic, eastern/central Pacific, and western Pacific basins
- Computed on 2-D grids with 0.5-degree lat/lon spacing
- Provides probabilities of the surface wind speed equal to or exceeding 34, 50, and 64 kt over specified time intervals (cumulative: 0-120 hours in 12-hour intervals)
- Individual interval or cumulative probabilities
- Gridded, graphical, and text products can be produced



**TPC is generating wind prob. for all TCs in the NH east of 90E
Products are available in NWS NDFD**

AMSU (CIRA) Products

 CIRA/NESDIS Experimental AMSU-A TC Intensity,

Tropical Cyclone AL052006 ERNESTQ
 Current date/time: 2006 0829 1813 UTC
 ATCF file date/time: 2006 0829 1200 UTC

AMSU swath date/time: 2006 0829 0640 UTC

Minimum Sea-Level Pressure: 1002 hPa
 Maximum Surface Winds: 35 kt

34 kt wind radii (NE, SE, SW, NW): 86 65 0
 50 kt wind radii (NE, SE, SW, NW): 0 0 0
 64 kt wind radii (NE, SE, SW, NW): 0 0 0

AMSU-retrieved max wind radius: 60 rmi

Storm center is 646 km from AMSU swath center
 0-300 km is optimal
 300-600 km is adequate
 >600 km is marginal

AMSU data is -6 hr from time of ATCF in

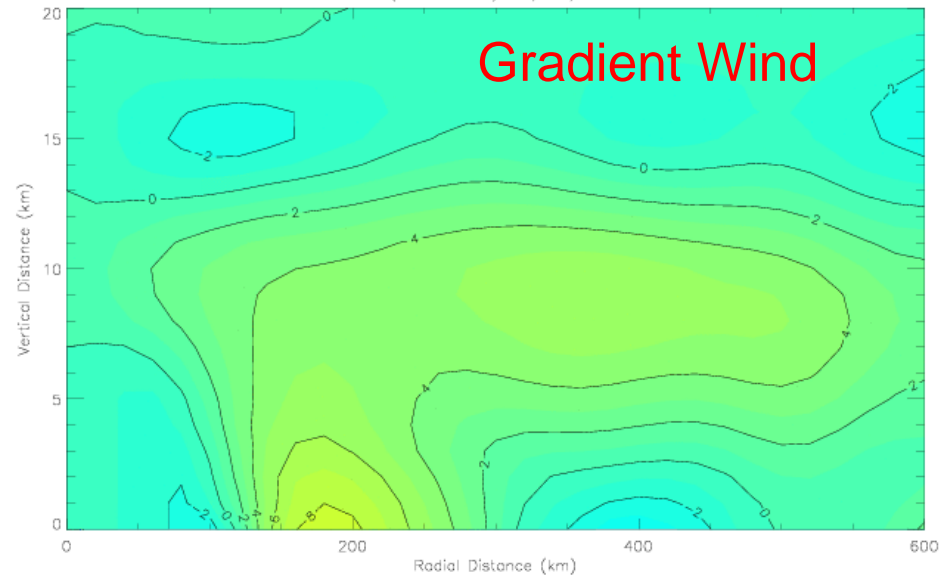
 ATCF File Input:
 AL052006 0829 1200 UTC

Storm lat,lon (t = 0 hr): 22.90 -79.3
 Storm lat,lon (t = -12 hr): 21.40 -77.4
 Storm lat,lon (t = -6 hr): 22.23 -78.4

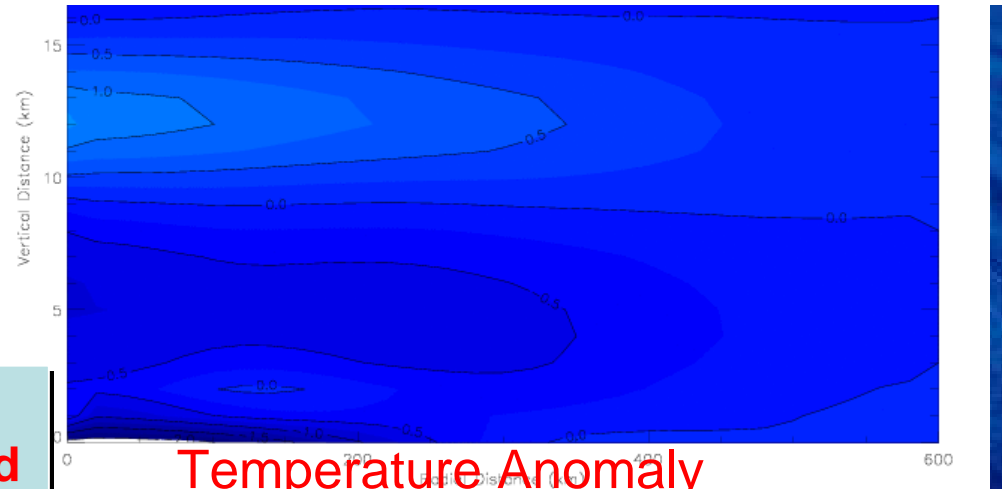
Storm max winds (ATCF): 40 kt
 Storm heading: 310 deg
 Storm translation speed: 11 kt

Note: AMSU wind radii provided for all winds
 to the AMSU swath radius. Max 300

AMSU Gradient Wind (m/s)
 NEST (AL052006) 8/29/2006 12Z



Gradient Wind



Temperature Anomaly

AMSU estimated are operationally generated for TCs all over the world

What Have We Accomplished 2001-2007

- Total projects funded (round 1-3) – **40**
- Number of projects completed (round 1&2) – **24**
(One was denied funding after first year)
- Number of projects accepted for implementation – **16**
- Number of completed projects not accepted – **3**
- Number of completed projects pending further evaluation – **3**
- **Number of projects implemented – 15.5**

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

Current Challenges

- **Grants for projects**
 - **FY01 – \$1,287K**
 - **FY02 – \$1,213K**
 - **FY03 – \$1,350K**
 - **FY04 – \$1,243K**
 - **FY05 – \$1,163K**
 - **FY06 – \$1,058K**
 - **FY07 – \$1,035K (Preliminarily)**
- **Diminishing JHT Infrastructure fund from \$250K for FY02 to \$100K for FY07 – barely enough for a JHT meteorologist/programmer**
 - **Administrative support**
 - **travel**
 - **Supplies**
 - **Director's discretion fund**
 - **Equipment**
- **Limited resources for transition and implementation at the NHC**

JHT Website

www.nhc.noaa.gov/jht/index.shtml

USWRP 

Joint Hurricane Testbed

- [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)

Acknowledgements

- **JHT Steering Committee**
- **JHT administrative assistants**
- **Alison Krautkramer, JHT meteorologist/programmer**
- **JHT principal investigators and other funded participants**
- **John Gaynor (OAR)**
- **OFCM**
- **TPC/NHC management and admin staff**
- **TPC and EMC forecaster and technical points of contact**
- **TPC/TSB staff (implementation!)**

The background is a blue-toned satellite or aerial photograph of a coastal region. A prominent dark, circular feature is visible in the lower-left quadrant, possibly representing a large body of water or a specific geographical landmark. The surrounding terrain shows various textures and patterns, likely representing different land uses or natural features. The overall color scheme is monochromatic, dominated by shades of blue and cyan.

Qusetions?

What does it take to support the JHT

JHT Staff:

- 1. Jiann-Gwo Jiing (JHT Director)**
- 2. Alison Krautkramer/Jose Salazar (JHT IT specialist)**
- 3. Shirley Murillo (JHT Admin. Asst.)**
- 4. Chris Landsea (JHT Admin. Asst.)**

JHT Steering Committee:

- 1. Ed Rappaport (TPC – Co-chair)**
- 2. Bill Frank (Penn State – Co-chair)**
- 3. John Gamache (Hurricane Research Division)**
- 4. Jeff Hawkins (Naval Research Laboratory)**
- 5. Naomi Surgi (Environmental Modeling Center)**
- 6. Ed Fukada (Joint Typhoon Warning Center)**
- 7. Hugh Willoughby (Florida International University)**

John Gaynor (US Weather Research Program)

TPC and EMC forecaster and technical points of contact

TPC/Technical Support Branch IT staff