



Joint Hurricane Testbed (JHT) 2006 IHC Update

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Outline

- 1. Status of Second Round Projects (FY03-04)**
- 2. Status of Third Round Projects (FY05-06)**
- 3. Major JHT Activities in 2006**

Status of 15 Second Round Projects

(FY03-04 Funding)

- **Background information**
 - 15 projects were initially funded late in FY03: 3 one-year and 12 two-year projects
 - Three one-year projects concluded (Aug 2004)
 - Decisions on operational implementation by TPC Director in December 2004
 - Two projects accepted for operational implementation and were implemented before 2005 Hurricane Season started
- **2005-present activities**
 - 12 two-year projects completed in August 2005
 - Final stage of evaluation
 - Decisions on operational implementation for 8 projects in late March 2006 by TPC Director
 - Decisions on operational implementation for 4 model related projects in April 2006 by EMC Director

Status of 15 Third Round Projects

(FY05-06 Funding)

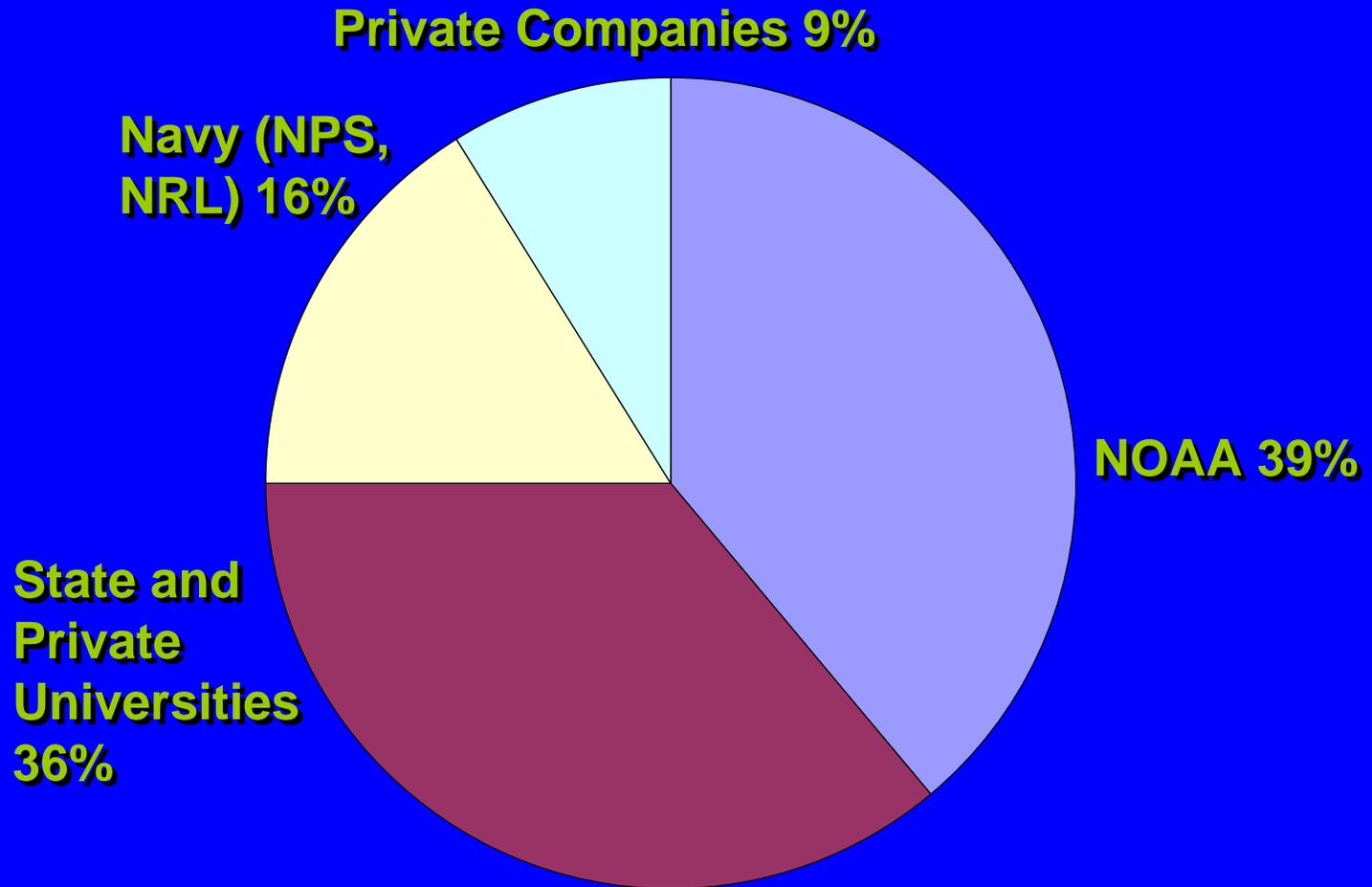
- **Background information:**
 - **Announcement of Opportunity (30 June 2004)**
 - **Review of proposals completed and recommendations made in late January 2005**
 - **Total available funding: ~\$1.2 Million**
- **PIs from federal labs received funding in late March (OAR) and June (DOD) 2005**
- **Non-federal PIs received funding between late June and August 2005**
- **JHT and project point of contacts coordinated with PIs to develop timelines**
- **Testing and evaluation during 2005 hurricane season**

Third Round Project Focus Areas

Primary Area of Focus	# of Projects
Improvements to dynamical models (for track, intensity, and precipitation forecasts)	4
Intensity forecast guidance	4
Enhancements to observed data, assimilation	3
Tropical cyclone structure/wind distribution	2
Track forecast guidance	1
Enhancements to operational environment	1
Total	15

3rd Round (FY05) Funding Distribution

Total \$1.2M



Implementation

First round:

- 10 projects, one was not continued after first year
- Two projects continued into 2nd round
- Out of the seven accepted, 6.5 were implemented

• **Second round:**

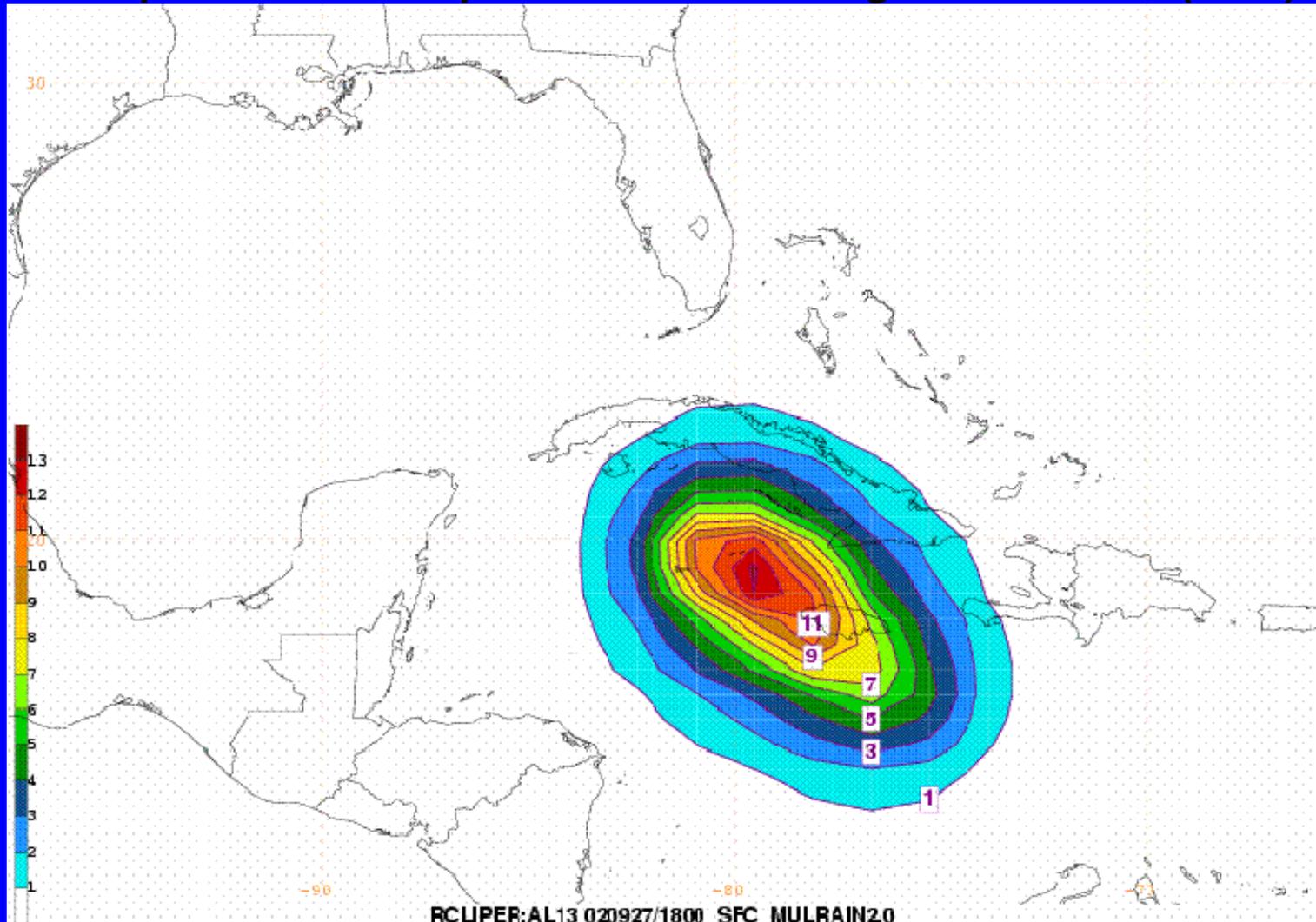
- Three one-year projects, 2 implemented, one not accepted
- 12 two-year projects being evaluated (some already implemented)

Implementation

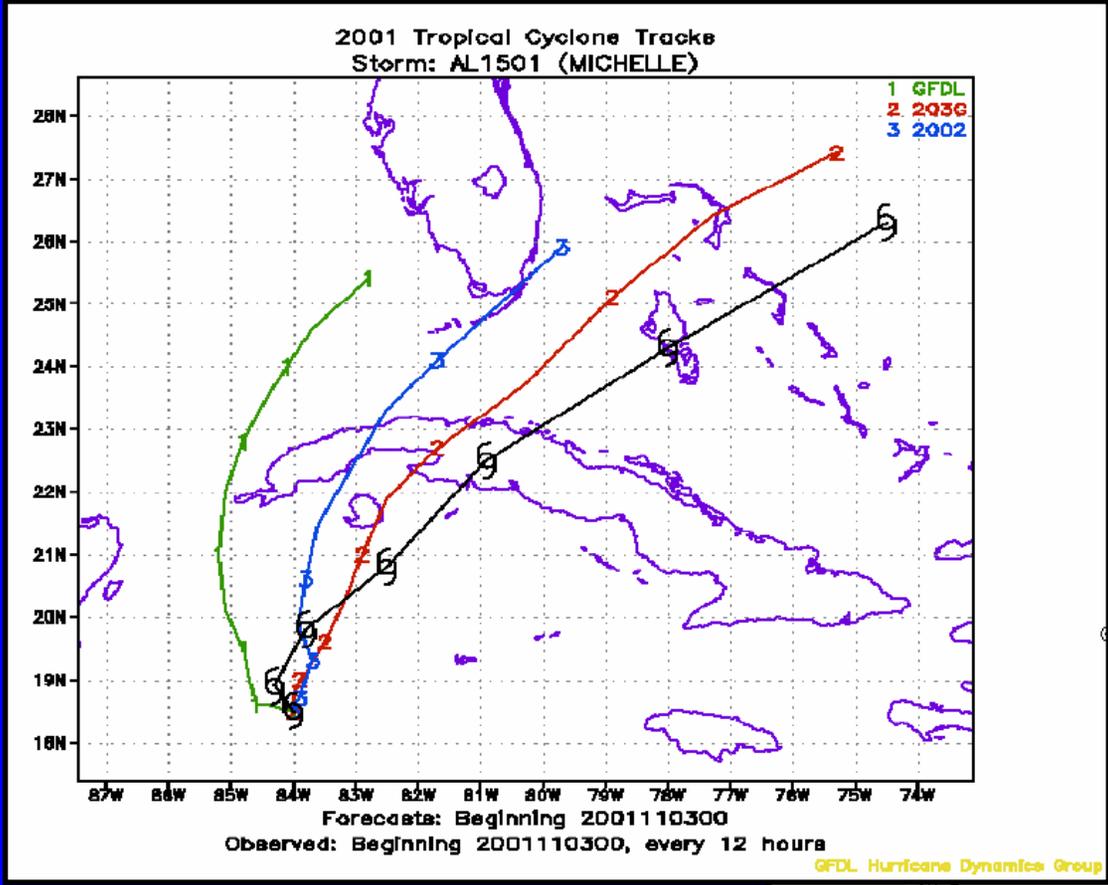
- **Some relative easy**
- **Some very complicated**
- **Some implemented by the PIs/other Centers**
- **Some implemented by TPC staff/PIs**
- **Some implemented by JHT staff/PIs**

Tropical Cyclone Rainfall Climatology and Persistence (R-CLIPER) Model

Example real-time output in NAWIPS during Hurricane Lili (2002)

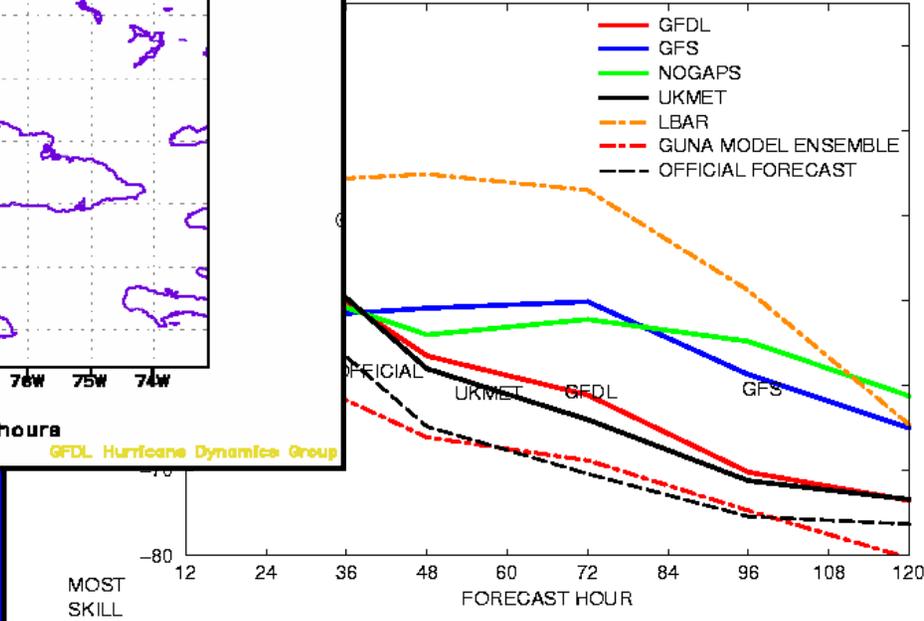


GFDL



RMSE ERROR FOR HURRICANE ISABEL

NUMBER OF CASES: (49,47,45,43,39,35,31)



MOST SKILL

AMSU Intensity/Size Estimation

CIMSS/NESDIS-USAF/NRL Experimental AMSU TC Intensity Estimation:

Storm position corresponds to AMSU-A FOV 25 [1<--->30]

Raw Ch8 (~150 hPa) Tb Anomaly: 1.40 C

Raw Ch7 (~250 hPa) Tb Anomaly: 1.70 C

Ret Ch7 (~250 hPa) Tb Anomaly: 6.90 C

AMSU-A MSLP (Ch7 Ret): 96

Eye size (RMW) source: ATCF ,value: 54.86 K

TROPICAL STORM GUSTAV

Tuesday 10sep02 Time: 1852 UTC

Latitude: 34.94 Longitude: -75.7266

Satellite: NOAA-16

ATCF data for Month: 09 Day: 10 Time (UTC):

For fine-scale position and eye size adjustn

For imagery, go to <http://amsu.ssec.wisc.edu>

For all comments and questions <mailto:chrisv>

CIRA/NESDIS Experimental AMSU-A TC Intensity/Size Estimation - NOAA15

Tropical Cyclone AL082002 GUSTAV
Current date/time: 2002 0911 1808 UTC
ATCF file date/time: 2002 0911 1200 UTC

AMSU swath date/time: 2002 0911 1220 UTC

Minimum Sea-Level Pressure: 970 hPa
Maximum Surface Winds: 76 kt

34 kt wind radii (NE,SE,SW,NW): 131 216 150 98 nmi
50 kt wind radii (NE,SE,SW,NW): 56 77 61 45 nmi
64 kt wind radii (NE,SE,SW,NW): 0 41 0 0 nmi

AMSU-retrieved max wind radius: 40 nmi

Storm center is 180 km from AMSU swath center
0-300 km is optimal
300-600 km is adequate
>600 km is marginal

AMSU data is 0 hr from time of ATCF input

ATCF File Input:
AL082002 0911 1200 UTC

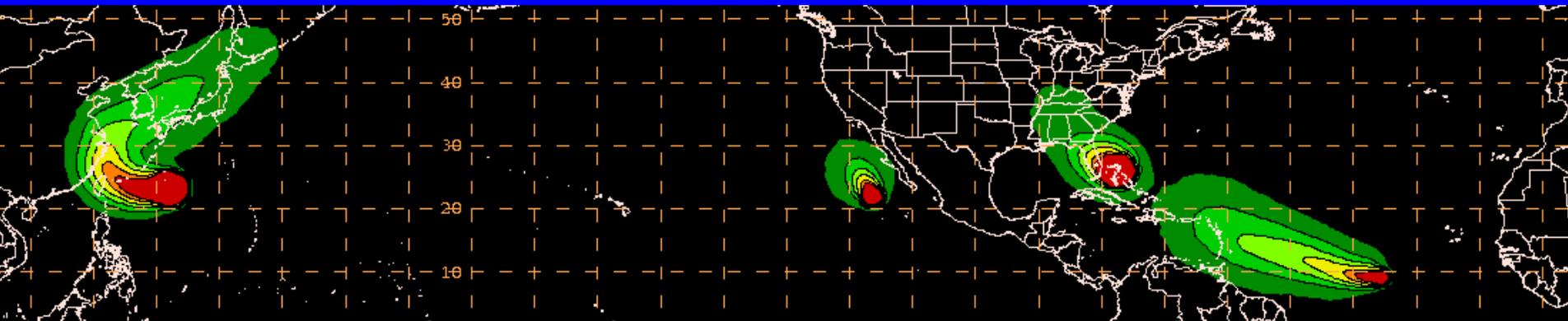
Storm lat,lon (t = 0 hr): 38.10 -70.80
Storm lat,lon (t = -12 hr): 35.70 -74.70
Storm lat,lon (t = 0 hr): 38.17 -70.69 (AMSU swath time)

Storm max winds (ATCF): 65 kt
Storm heading: 055 deg
Storm translation speed: 20 kt

Note: AMSU wind radii provided for all wind thresholds
up to the ATCF max winds. Thus, AMSU wind radii
may be provided for thresholds that exceed the
AMSU max wind estimate.

Experimental Cumulative Wind Speed Probabilities

- 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 (0-120 hours in 12-hour intervals)
 - Individual interval or cumulative probabilities
- Gridded, graphical, and text products can be produced



This product will be operational in 2006

Major Activities for 2006

- Present final reports on eight 2nd round non-EMC related projects to TPC Director (mid-March)
- Rounds 3 PI presentations at the 60th IHC in Mobile, AL (March 20-24)
- Decisions for implementation of eight 2nd round projects by TPC Director (March 31)
- Decisions on implementation of four 2nd round model-related projects by EMC (April)
- Second year funding proposals for 3rd round projects due for SC review (April and July 2006)
 - Requested \$1.265M, \$1.15M available
- Real time testing and evaluation

Major Activities for 2006

(Preparing for the next round of funding)

- **Revise Announcement of Opportunity (AO) for round 4 (FY07-08) projects. Send to DOC legal counsel for review in early April**
- **Round 4 AO released (June 30)**
- **Pre-application for round 4 proposals due July 31**
- **Full proposals due October 30**
- **Receive final scores from the SC (January 8, 2007)**
- **TPC and JHT Directors' decision on which proposals to recommend for funding (January 29, 2007)**

Changes

- **Russ Elsberry** retired from the JHT Steering Committee (SC)
- **Jeff Hawkins (NRL)** elected to the SC
- **Frank Marks** retired from the SC
- **Chris Landsea** retired from the JHT adm. Assist. position (HRD)
- **Shirly Murillo** replaces **Chris Landsea** as the JHT adm. Assist. (HRD)
- **Chris Landsea** elected to the JHT SC (HRD)
- **Rich Knabb** retired from the JHT adm. assist. position (TPC)
- **Chris Landsea** joined the TPC and became the JHT adm. Assist. (TPC)
- **John Gamache** elected to the SC (HRD)

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**
- **Ward Seguin and John Gaynor (OAR)**
- **TPC/NHC management and admin staff**
- **TPC and EMC forecaster and technical points of contact**
- **TPC/TSB IT staff**

Thank you

Supplemental Slides

Input for JHT Project Reports to the TPC Director

- **Project PI final report**
- **JHT staff members' assessments**
- **TPC Point of Contact (POC) feedback**
- **JHT IT Facilitator report**
 - **IT transfer status**
 - **Compatibility and support issues**
 - **Estimates of costs to implement and support**
 - **Input from TPC Technical Support Branch Chief**

FY05 JHT Proposal Review Criteria

(Condensed)

- **Relevance to program goals (40 pts)**
 - Research maturity (10 pts)
 - Priority-to-payoff factors (25 pts)
 - Other agency use (5 pts)
- **Technical merit (40 pts)**
 - Risk-to-payoff factors (10 pts)
 - Testing (10 pts)
 - Operational usage (10 pts)
 - Technical compatibility (10 pts)
- **Overall qualification of applicants (10 pts)**
- **Project costs (10 pts)**

FY05 Review Process

- **Preapplications (Letters of Intent) reviewed in Aug 2004**
 - 40 preapplications reviewed
 - 18 recommended to submit a full proposal
- **Full proposals reviewed during Nov 2004 – Jan 2005**
 - 19 proposals reviewed
 - Proposals independently reviewed and scored by 7 JHT Steering Committee members based upon review criteria listed in the AFFO

JHT Second Round (FY03-04)

Project Focus Areas

Primary Areas of Focus	# of Projects
Improvements to dynamical models (for track, intensity, and precipitation forecasts)	4
Track forecast guidance algorithms	3
Intensity forecasting algorithms	3
Enhancements to observed data, assimilation	2
Initial intensity estimation	1
Tropical cyclogenesis	1
Rainfall	1
Total	15

Second Round (FY03-04) Projects

Dynamical model upgrades, obs/assimilation projects

Proposal	PIs	TPC POC	Yrs
Upgrades to the operational GFDL hurricane prediction system	Bender (GFDL)	Pasch Rhome	2
Improving the GFDL/URI coupled hurricane-ocean model	Ginis (U. RI)	Pasch Rhome	2
Hurricane model transitions to operations at NCEP/EMC	Pan (NCEP)	Pasch Rhome	2
Evaluation of upper ocean mixing parameterizations	Jacob (U. MD) Shay (U. M) Halliwell (U. M)	Lawrence Mainelli	2
Real-time dissemination of hurricane wind fields determined from airborne doppler	Gamache (HRD)	Franklin, McAdie, Blake EMC: several	2
Targeting strategies to improve hurricane track forecasts	Majumdar(UM) Aberson (HRD) Toth (NCEP)	Franklin	2

Second Round (FY03-04) Projects

Cyclogenesis and track forecasting projects

Proposal	PIs	TPC POC	Yrs
Objective and automated assessment of operational global forecast model predictions of tropical cyclone formation and life cycle	Harr (NPS)	Pasch Avila Blake	2
An updated baseline for track forecast skill through five days for the Atlantic and Northeastern and Northwestern Pacific basins	Aberson (HRD)	Franklin Gross	1 Accepted and implemented
Quantifying tropical cyclone track forecast uncertainty and improving extended-range tropical cyclone track forecasts using an ensemble of dynamical models	Goerss (NRL)	Beven Gross	1 Accepted and implemented
Transition of revised dynamical model track prediction evaluation expert system (DYMES)	Boothe (NPS)	Stewart Roberts	1 Not accepted

Second Round (FY03-04) Projects

Intensity and rainfall projects

Proposal	PIs	TPC POC	Yrs
Improving the validation and prediction of tropical cyclone rainfall	Pan (NCEP) Black (HRD) Marchok (NCEP)	Stewart Molleda	2
Implementation of the Advanced Objective Dvorak Technique (AODT) and Tropical Cyclone Intensity Estimation (TIE) algorithms at TPC	Kossin (U. WI) Velden (U. WI)	Beven, Rhome, Mainelli, Cobb, Brown	2
Improvements in Deterministic and Probabilistic Tropical Cyclone Surface Wind Predictions	Knaff (U. Co) DeMaria (NESDIS)	Lawrence Gross Sisko	2
Development of a rapid intensification index for the eastern Pacific basin	Kaplan (HRD)	Avila Sisko	2
Developing an inner-core SST cooling predictor for use in SHIPS	Cione (HRD) Gentemann Kaplan (HRD)	Avila, Berg, Sisko, Blake	2

JHT Third Round Projects

Dynamical model upgrades, observational, and assimilation projects

	Proposal Title	PIs	TPC POC
Fed →	Hurricane Model Transition to Operations at GFDL/NOAA	Bender	Pasch, Rhome
	Hurricane Model Transition to Operations at GFDL/NOAA	Tuleya	Pasch
Fed →	Drag Coefficient and Wind Speed Dependence in TCs	Powell	Franklin
Fed →	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
Fed →	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 Projects

Intensity, structure, and track projects

Proposal Title	PIs	TPC 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	“Lawrence”, Gross
Estimating Tropical Cyclone Wind Radii Utilizing an Empirical Inland Wind Decay Model	Kaplan	Stewart, Gross
Prediction of Consensus TC Track Forecast Error and Correctors to Improve Consensus TC Track Forecasts	Goerss	Beven, Gross
Development and Implementation of NHC/JHT Products in ATCF	Sampson	“Lawrence”, Sisko, Gross

Fed

Fed

Fed