



# Joint Hurricane Testbed (JHT) 2011 Update

Transition from Research to Operations

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# Joint Hurricane Testbed Mission Statement

The mission of the Joint Hurricane Test Bed is to transfer more rapidly and smoothly new technology, research results, and observational advances of the United States Weather Research (USWRP), 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 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

# Summary of JHT projects 2001-2010

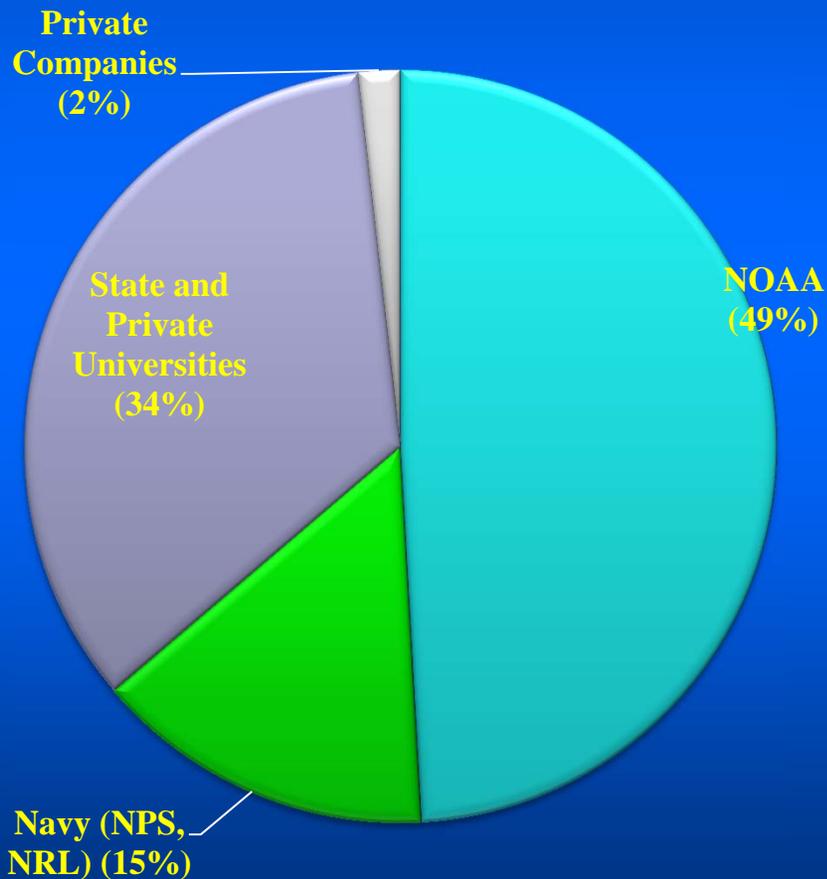
- **1) Number of projects supported: 62**
  - 51 completed
    - 35.5 accepted for operational implementation
    - Number of projects completed but rejected: 6
    - Number of projects completed but pending further investigation (decisions deferred): 9.5
  - Number of projects in process: 11
- **2) Implementation**
  - Number of projects implemented: 31.5
    - Number of numerical modeling related projects implemented by EMC/NCO: 10
    - Number of projects implemented by NHC: 21.5
  - Number of projects accepted but not yet fully implemented by NHC: 4

Note:

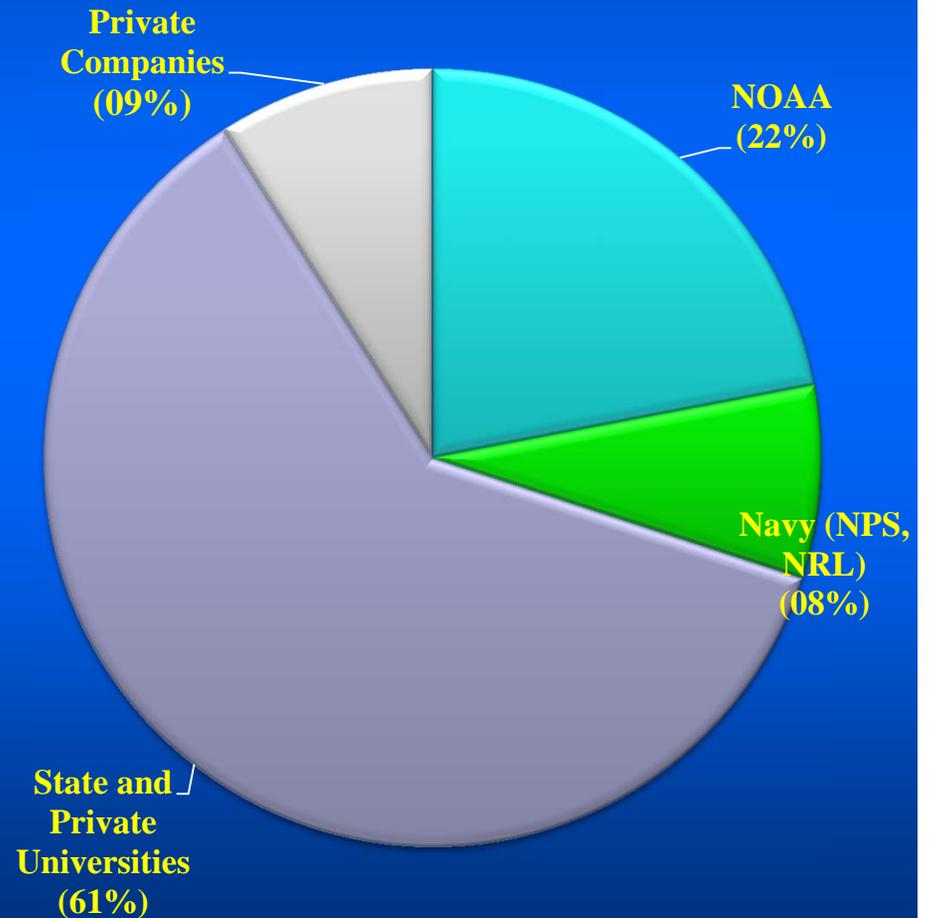
- 1) Implementation is defined when a project is completed, accepted, and the technique installed on NCEP/NCO or NHC operational systems and runs on operational time frame.
- Some techniques were “implemented” on JHT platform for testing.

# Changes in Funding Distribution

**Second Round (2003-2005)**  
**\$1.35M**



**Fifth Round (2009-2011)**  
**\$1.15M**



# Current (5th Round) Project Focus Areas

<b>Primary Area of Focus</b>	<b># of Projects</b>
Improvements to dynamical models (for track, intensity, and precipitation forecasts)	5
Statistical intensity forecast guidance	3
Enhancements to observed data, assimilation	1
Tropical cyclone structure/wind/wave distribution	1
Enhancements to operational environment	1
<b>Total</b>	<b>11</b>

# 2010 Major Activities

- **Completion of the fourth round (2007-2009) projects**
  - Completed in August (December) 2009
  - JHT final evaluation/report on 4<sup>th</sup> round projects
    - February 2010
  - Decision on acceptance for implementation (NHC and EMC Directors)
    - 4 criteria for acceptance
    - Decisions made April 2010
      - 4 projects accepted
      - 6 projects deferred pending further evaluation
      - 1 no decision
  - Implementaton
    - 4 implemented: 1 by EMC/NCO & 3 by NHC

# 2010 Major Activities

- Second year funding renewal for 5<sup>th</sup> round projects – April - June 2010
- Testing of 5<sup>th</sup> round projects
  - Collaboration with PI
  - Programming
  - Establishing data flow
  - Generating output for forecaster use/evaluation

# 2010 Major Activities

- Preparation for 6<sup>th</sup> round projects
  1. Draft Federal Funding Opportunity (FFO)
    - Update Centers priorities
    - Evaluation criteria
    - FFO published early July
    - SC Review of Pre-applications (how many)
    - PIs submitting full proposals (how many)
    - SC Review of full proposals (completed)

# Forecaster Priorities

## Second Round (2003)

1. Intensity change, rapid intensification
2. "Guidance on guidance" for track, intensity and precipitation – probabilistic
3. Precipitation amount and distribution
4. Reduce the occurrence of guidance and official track outliers
5. Implement improved observational systems in the storm and its environment

## Sixth Round (2011)

1. intensity change, rapid intensification
2. Improved observational systems in the storm and its environment
3. Guidance on guidance for track, intensity and precipitation
4. Storm surge, coastal inundation modeling/applications
5. Improved and extended track guidance) and identify and removal of outliers

# Modeling Priorities

(Provided by EMC)

## Second Round (2003)

1. Improved model development to advance track and intensity forecasts
2. Improved boundary layer representation for coupled air/sea/land models-hurricane rainfall and inland flooding problem
3. Improved targeting strategies for hurricane surveillance missions
4. Transforming results from field programs, e.g., Coupled Boundary Layers/Air-Sea Transfer (CBLAST), into tangible results for NWP models.
5. Diagnostic studies of storm scale structure changes from high resolution models

## Sixth Round (2011)

1. General model improvements to advance NCEP global model track forecasts, improve 5-7 day
2. Diagnostic techniques to further increase the utility of global models in forecasting tropical cyclone genesis
3. Improvements specific to operational HWRF modeling system

# Challenges for FY11

- **Sixth round funding recommendation**
  - 35 LOI and 25 full proposals
  - Steering committee review proposals – Complete Feb 2011
  - Rank and select proposals for funding
  - Work with Grants Office to fund selected projects
  - Find Point of contacts among NHC forecasters and support staff
  - Work with PIs to setup timelines for their projects
- **Test and evaluation**
  - Prepare real-time testing & evaluation for 5<sup>th</sup> round projects
  - Set up necessary software code and data flow.
- **Completion of 5<sup>th</sup> round projects**
  - Final reports for 5<sup>th</sup> round projects
  - POC feedback
  - JHT final review/reports to NHC Director for acceptance
- **Implement newly accepted projects (NHC)**

# Acknowledgements

- JHT Steering Committee
- Shirley Murillo, JHT Admin. Asst.
- Chris Landsea, NHC SOO and JHT Admin. Asst.
- Jose Salazar, JHT meteorologist/programmer
- NHC and EMC forecaster and points of contact
- NHC/Technical Support Branch staff
- JHT principal investigators and other funded participants
- USWRP
- NOAA/OAR Office of Weather and Air Quality
- NHC admin staff

# NHC Contributions to JHT

## *Logistics*

- Dedicated physical space in operations, offices

## *Personnel*

- NHC dedicating about 1.5 FTE spread across ~12 people
  - 0.5 FTE reimbursed by USWRP for quarter-time JHT Director and one quarter-time JHT administrative assistant
  - NHC contributing 1.0 FTE, including NHC member on JHT Steering Committee, forecasters, and technical support staff
- Forecaster and technical points of contact (POC)
- Programming, system administration, and network support
- Administrative support

## *Computing Resources*

- Network connectivity
- Operational data flow

# JHT Website

Go to [www.nhc.noaa.gov](http://www.nhc.noaa.gov)

Joint Hurricane Testbed - Home - Mozilla Firefox

File Edit View History Bookmarks Tools Help

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

NCEP Systems Monitor

## USWRP Joint Hurricane Testbed

- JHT Home
- Terms of Reference (PDF)
- Staff
- Steering Committee
- Main Activities
- Highlights - 2001 to present
- New Projects (2007-2009)
- Current Projects (2005-2007)
- Past Projects
- Administrative Presentations and Information

### Mission Statement

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### WHAT'S NEW

**Updated May 8, 2006:**  
Please read about the new projects for 2007-2009

**Updated November 21, 2006:**  
The JHT FY07 AFFO Application Deadline has been reopened.

**Updated June 16, 2006:**  
The JHT FY07 Announcement of Federal Funding Opportunity has been released.

**Added April 26, 2006:**

- The 2005 First Year Reports are available in the Project Table
- Joint Hurricane Test Bed (JHT): 2006 IHC Update, Dr. Jiann-Gwo Jiing, JHT Director, Technical Support Branch Chief, TPC/NHC, Interdepartmental Hurricane Conference, 22 March 2006 presentation. (PDF format)

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Done

Thank you

# Supplemental Slides

# JHT Infrastructure

## *Personnel*

- Quarter-time Director (NOAA FTE)
- 7-member Steering Committee
  - Three from NOAA (one TPC), two from DOD, and two from the academic community
  - TPC member serves as co-Chair
- Two quarter-time administrative assistants (NOAA FTE)
- One IT Facilitator (meteorologist/programmer)

## *Computing Resources*

- Server and workstations
- Software

## JHT 5<sup>th</sup> Round Projects - Dynamical model upgrades

<b>Proposal Title</b>	<b>PIs</b>	<b>POC</b>
<b>Hurricane Model Transitions to Operations at NCEP/EMC</b>	<b>Tuleya (SAIC)</b>	<b>Pasch, Blake, Landsea</b>
<b>Improving the Hurricane WRF-Ocean Coupled System for Transition to Operations</b>	<b>Ginis (U Rhode Island) Bender (NOAA/GFDL)</b>	<b>Pasch, Cangialosi, Landsea</b>
<b>Evaluation and Improvements of Cloud and Precipitation Physics in the Operational Hurricane WRF Model at NOAA/EMC</b>	<b>Wang (U Hawaii) Phillips (U Hawaii)</b>	<b>Brennan, Landsea</b>
<b>Evaluation and Improvement of Ocean Model Parameterizations for NCEP Operations</b>	<b>Shay (U Miami) Halliwell (U Miami)</b>	<b>Avila, Schauer, Landsea</b>
<b>Improving Predictability of the Atlantic Warm Pool in Ocean Model for Assistance to Operational Hurricane Forecast</b>	<b>Wang (NOAA/AOML) Lee (NOAA/AOML)</b>	<b>Pasch, Schauer, Landsea</b>

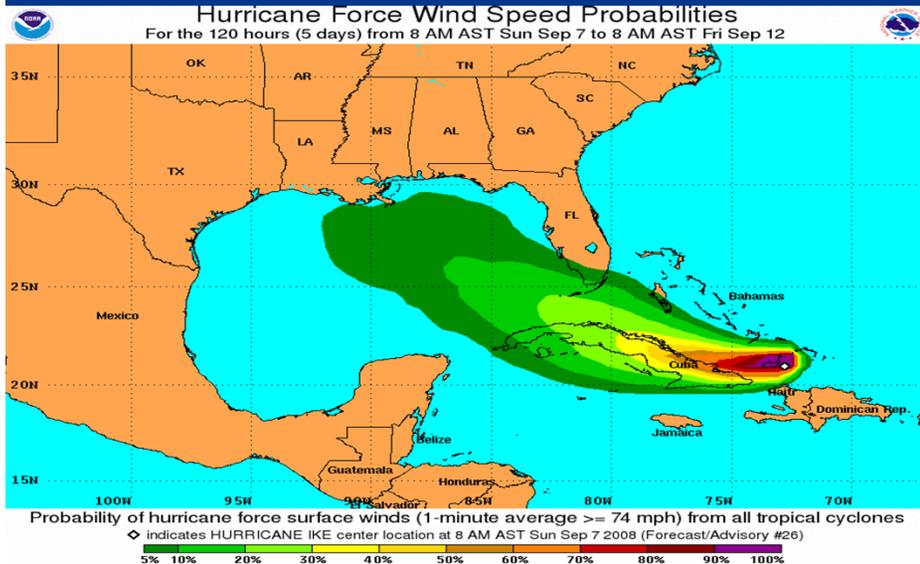
# JHT 5<sup>th</sup> Round Projects -

Statistical intensity forecast guidance, Tropical cyclone structure/wind/wave distribution,  
Enhancements to operational environment

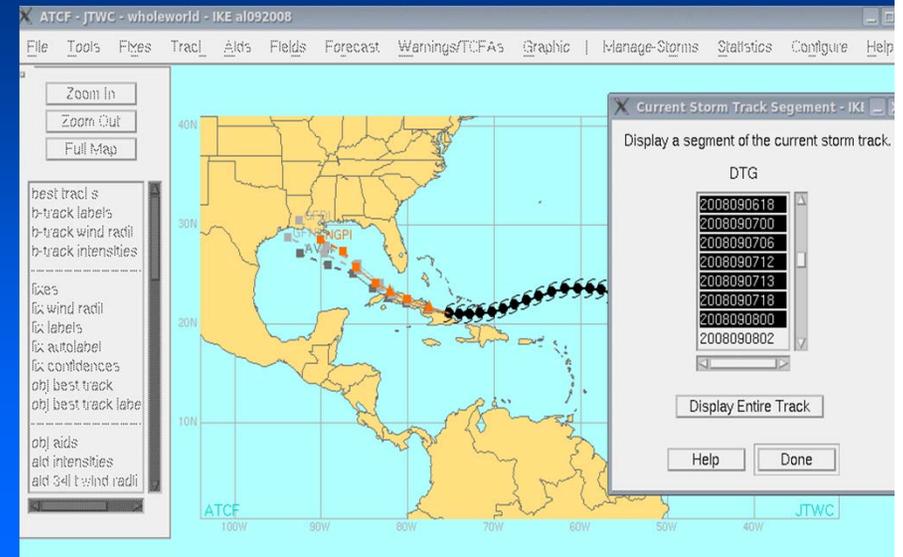
<b>Proposal Title</b>	<b>PIs</b>	<b>POC</b>
Advanced Applications of the Monte Carlo Wind Probability Model	Kidder (CSU) DeMaria (NOAA/NESDIS)	Brennan, Berg, Lauer, Landsea
ATCF Requirements, Intensity Consensus and Sea Heights Consistent w/ NHC Forecasts	Sampson (NRL)	Avila, Brown, Sisko, Christensen, Landsea
In-Flight Data Processing for the Wind Swath Radar Altimeter (WSRA) for Real-Time Reporting of Directional Ocean Wave Spectra from the NOAA WP-3D Hurricane Reconnaissance Aircraft	PopStefanjia (ProSensing)	Beven, Brown, Lauer, Landsea
Improvement in the Rapid Intensity Index Incorporation of Inner Core Information	Kaplan, Cione, Dunion (NOAA/AOML) Dostalek (CIRA/CSU) DeMaria, Knaff (NOAA/NESDIS) Lee (NRL)	Avila, Kimberlain, Blake, Sisko, Landsea
Improved Real-Time Hurricane Ocean Vector Winds from QuikSCAT	Jones (U Central Florida) Uhlhorn (NOAA/AOML) Chang, Zelenak (NOAA/NESDIS)	Brennan, Beven, Landsea
A New Secondary Eyewall Formation Index: Transition to Operations and Quantification of Associated Intensity Changes	Kossin (U Wisconsin/CIMSS)	Kimberlain, Berg, Sisko, Landsea
Development of a Unified Dropsonde Quality Assurance and Visualization Capability	Black (NOAA/AOML) M... (NOAA/ES&P)	Franklin, Landsea



# Highlights of 4th Round Completed Projects

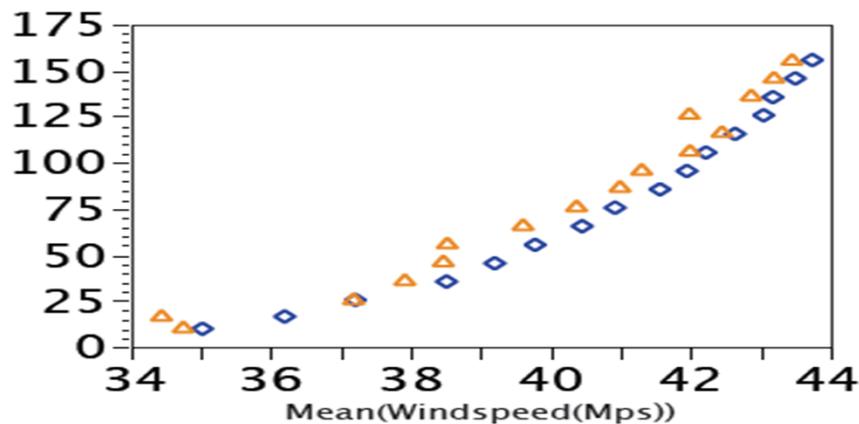


Improved Wind Probabilities – DeMaria/Knauff

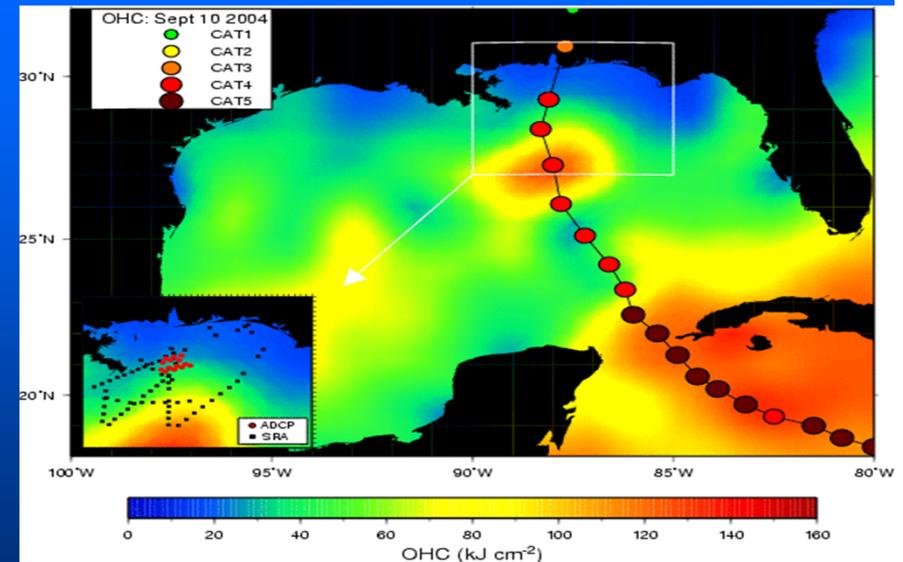


Enhanced ATCF - Sampson

## 40-49 MBL

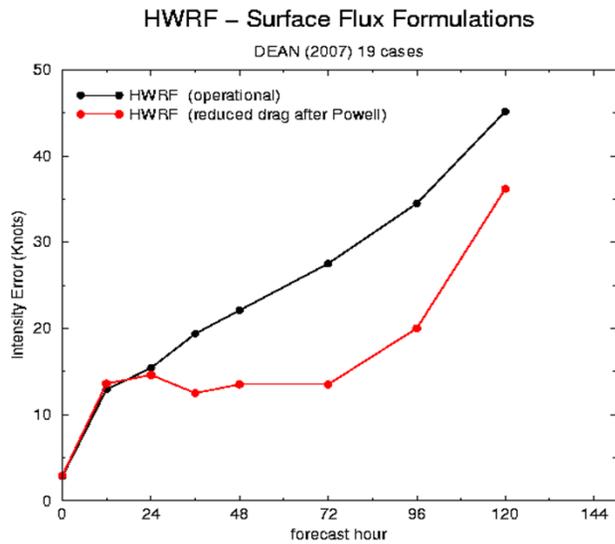


Drag Coefficient in Shallow Water - Powell

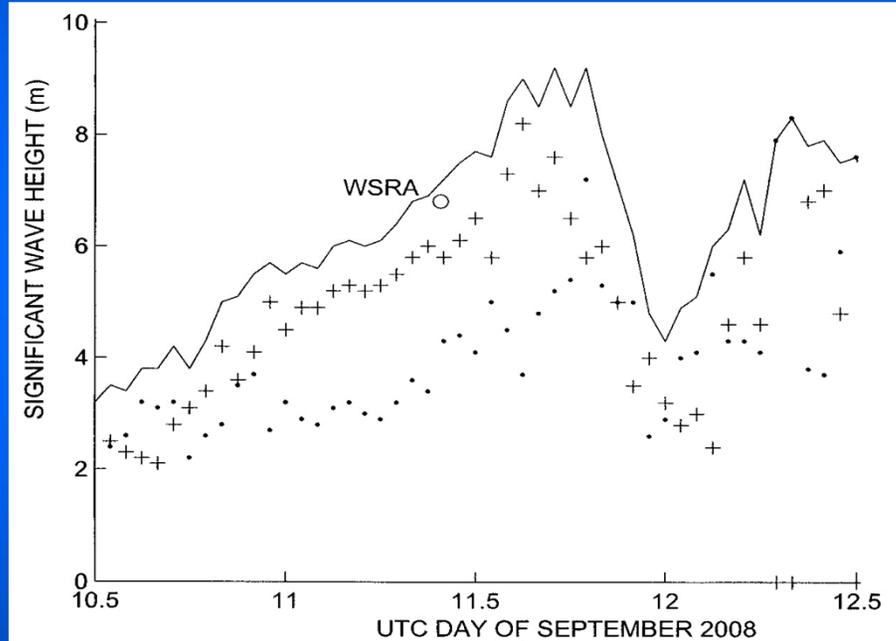


Ocean Model Parameterizations - Shay

# Highlights of 4th Round Completed Projects



## HWRF Transition - Tuleya



## Waves from Aircraft - Walsh