



The Joint Hurricane Testbed

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2014 Interdepartmental Hurricane Conference

The Forecasters (Us)





The Researchers (Them)

How to bridge the "valley of death"?



Joint Hurricane Testbed (JHT)

- Bridge hurricane research and operations
- Began in 2001 under the USWRP
- Our Mission: successfully <u>transfer</u> new technology, research results & observational advances from research groups to operational centers
- Testing is done at National Hurricane Center or Environmental Modeling center

Wind Speed Probabilities Hurricane Bill 20 Aug 2009 00 UTC



al032009 082000 BILL 34kt 1000 Realizations Cumulative 0 - 120hrs



1000 Track Realizations

34 kt 0-120 h Cumulative Prob.





ZCZC MIAPWSAT4 ALL TTAAOO KNHC DDHHMM HURRICANE WILMA PROBABILITIES NUMBER 20 NWS TPC/NATIONAL HURRICANE CENTER MIAMI FL 0900Z THU OCT 20 2005

... THIS IS AN EXPERIMENTAL PRODUCT FOR 2005...

AT 0900Z THE CENTER OF HURRICANE WILMA WAS LOCATED NEAR LATITUDE 18.3 NORTH... LONGITUDE 85.0 WEST WITH MAXIMUM SUSTAINED WINDS NEAR 130 KTS...150 MPH...240 KM/HR.

CHANCES OF EXPERIENCING WIND SPEEDS OF AT LEAST ...34 KT (39 MPH... 63 KPH)... ...50 KT (58 MPH... 93 KPH)... ...64 KT (74 MPH...119 KPH)... FOR LOCATIONS AND TIME PERIODS DURING THE NEXT 5 DAYS

PROBABILITIES FOR LOCATIONS ARE GIVEN AS IP(CP) WHERE

- IP IS THE PROBABILITY OF THE EVENT BEGINNING DURING AN INDIVIDUAL TIME PERIOD (INDIVIDUAL PROBABILITY)
- (CP) IS THE PROBABILITY OF THE EVENT OCCURRING BETWEEN 06Z THU AND THE FORECAST HOUR (CUMULATIVE PROBABILITY)

PROBABILITIES ARE GIVEN IN PERCENT X INDICATES PROBABILITIES LESS THAN 0.5 PERCENT LOCATIONS SHOWN WHEN THEIR TOTAL CUMULATED 5-DAY PROBABILITY IS AT LEAST 2.5 PERCENT

Z INDICATES UNIVERSAL COORDINATED TIME (GREENWICH)

- - - WIND SPEED PROBABILITIES FOR SELECTED LOCATIONS - - - -

	FROM						
TIME	06Z THU	18Z THU	06Z FRI	18Z FRI	06Z SAT	06Z SUN	06Z MON
PERIODS	TO						
	18Z THU	06Z FRI	18Z FRI	06Z SAT	06Z SUN	06Z MON	06Z TUE
FORECAST HOU	R (12) (24)	(36)	(48)	(72)	(96)	(120)
LOCATION	KT						
MIAMI FL	34 X	X(X)	X(X)	2(2)	16(18)	23(41)	5(46)
MIAMI FL	50 X	X(X)	X(X)	X(X)	6(6)	11(17)	3(20)
MIAMI FL	64 X	X(X)	X(X)	X(X)	2(2)	5(7)	1(8)
KEY WEST FL	34 X	X(X)	2(2)	7(9)	26(35)	18(53)	3 (56)
KEY WEST FL	50 X	X(X)	X(X)	1(1)	14(15)	11(26)	1(27)
KEY WEST FL	64 X	X(X)	X(X)	X(X)	8(8)	5(13)	1(14)
MARCO ISLAND	34 X	X(X)	X(X)	5(5)	20(25)	23 (48)	4(52)
MARCO ISLAND	50 X	X(X)	X(X)	1(1)	10(11)	12(23)	2(25)
MARCO ISLAND	64 X	X(X)	X(X)	X(X)	5(5)	6(11)	X(11)



JHT: The Process

- Call for Proposals drafted and disseminated (biannually)
- Principal Investigators apply for funding through NOAA
- 7 member Steering Committee rates all proposals
- Funded projects are tested during 1 or 2 hurricane seasons in conjunction with NHC/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

JHT: The statistics

- Number of projects supported: 81
 - 74 completed
 - 46 accepted for operational implementation
 - 7 projects completed but rejected
 - 9 projects completed, deferred pending further investigation at EMC
 - 12 projects with decisions soon forthcoming
 - 7 projects started in fall 2013

Implementation

- 41 projects implemented:
 - 11 numerical modeling projects implemented by EMC/NCO
 - 30 projects implemented by NHC
- 3 projects accepted but not yet fully implemented by NHC
- 2 projects unable to be implemented after acceptance

2013-2014 Major JHT Activities - 6th round

June - November 2013

- Final season to test of projects

December 2013 – February 2014

- Final reports provided by PIs
- Feedback obtained by points-of-contact
- Implementation evaluation and decision

March-June 2014

Implementation of accepted projects at NHC and EMC

Project Highlights - 6th round





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

2012-2014 JHT Activities - 7th round

- August 2012
 - Announcement of Opportunity released
- October 2012
 - 36 Letters of Intent reviewed
- December 2012 January 2013
 - 22 Full proposals reviewed
- February April 2013
 - Rank and select proposals for funding
 - Point-of-contacts established among NHC/EMC staff
 - Work with PIs to setup timelines for their projects
- August November 2013
 - Begin real-time testing during hurricane season
- December 2013 March 2014
 - PI refine their projects and interact with points-of-contact
 - Present progress at Interdepartmental Hurricane Conf.

7th Round JHT Projects - 2013 to 2015

Project Title	Principal Investigator(s)	NHC Point of Contact
A Visualization Application for Distributed ADCIRC- based Coastal Storm Surge, Inundation, and Wave Modeling	Brian Blanton, Rick Luettich (Univ. of N Carolina)	Feyen (NOS), Rhome, Berg, Schauer, Landsea
Improving the GFDL/GFDN Operational Tropical Cyclone Models at NOAA/NCEP and Navy/FNMOC	Isaac Ginis (Univ. of Rhode Island), Morris Bender (NOAA/GFDL)	Pasch, Mattocks, Tallapragada (EMC), Landsea
A Probabilistic TC Genesis Forecast Tool Utilizing an Ensemble of Global Models	Bob Hart, Henry Fuelberg (Florida State Univ.)	Pasch, Mattocks, Kimberlain, Blake, Landsea
Improvement to the Satellite-based 37 GHz Ring Rapid Intensification Index	Haiyan Jiang (Florida Intl Univ.)	Stewart, Cangialosi, Landsea
Guidance on Intensity Guidance	Dave Nolan (U of Miami/RSMAS), Andrea Schumacher (CSU/CIRA)	Avila, Blake, Landsea
Upgrades to the Operational Monte Carlo Wind Speed Probability Program	Andrea Schumacher (CSU/CIRA)	Brown, Brennan, Mattocks, Landsea
Integration of an Objective, Automated TC Center- fixing Algorithm Based on Multispectral Satellite Imagery into NHC/TAFB Operations	Tony Wimmers, Chris Velden (Univ. of Wisc./CIMSS)	Beven, Mundell, Landsea

The Joint Hurricane Testbed



JHT Overview

Overview | Current Projects | Past Projects Admin Presentations | Highlights | Staff | Committee

Mission Statement

The mission of the Joint Hurricane Testbed is to transfer more rapidly a technology, research results, and observational advances of the Unite Program (USWRP), its sponsoring agencies, the academic community improved tropical cyclone analysis and prediction at operational center

News

20 March 2012: 2012 IHC presentations posted for 2011-2013 projects 1 November 2011: Press Release on new 2011 funded JHT projects 30 September 2011: New JHT projects (Round 6, FY11-13) announced

View News Archive

Main Activities

 Identify new techniques, models, observing systems, etc. with potentia via an announcement of opportunity and a proposal, review, and fund

 Establish and maintain an infrastructure to facilitate the modification ar into the operational computing, communication, and display environment

 Complete tests in a quasi-operational environment of tools, technique researchers, with metrics for scientific performance, ease-of-use, and

Prepare documentation, training, and performance evaluations of suc facilitate use and support in operations.

Please see the Joint Hurricane Testbed Terms of Reference (PDF) for more b

Rappaport et. al., 2012 - BAMS

THE JOINT HURRICANE TEST BED

Its First Decade of Tropical Cyclone Research-To-Operations Activities Reviewed

BY EDWARD N. RAPPAPORT, JIANN-GWO JIING, CHRISTOPHER W. LANDSEA, SHIRLEY T. MURILLO, AND JAMES L. FRANKLIN

Collaboration between researchers, forecasters and technology specialists facilitated the development and implementation of numerous projects benefitting forecast operations.

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