



# The Joint Hurricane Testbed – 2017 Update

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Testbed Proving Ground Workshop – April 25, 2017

# Joint Hurricane Testbed (JHT)

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

# JHT: By the numbers

- Number of projects supported: 89
  - 81 completed
    - 52 implemented into operations at NHC or EMC
    - 1 to be implemented
    - 22 not accepted
    - 4 deferred
    - 2 decisions soon forthcoming (FY13-15: 7<sup>th</sup> round)
  - 8 projects started 1 Sep. 2015 (FY15-17: 8<sup>th</sup> round)

# Metrics for Operational Implementation

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

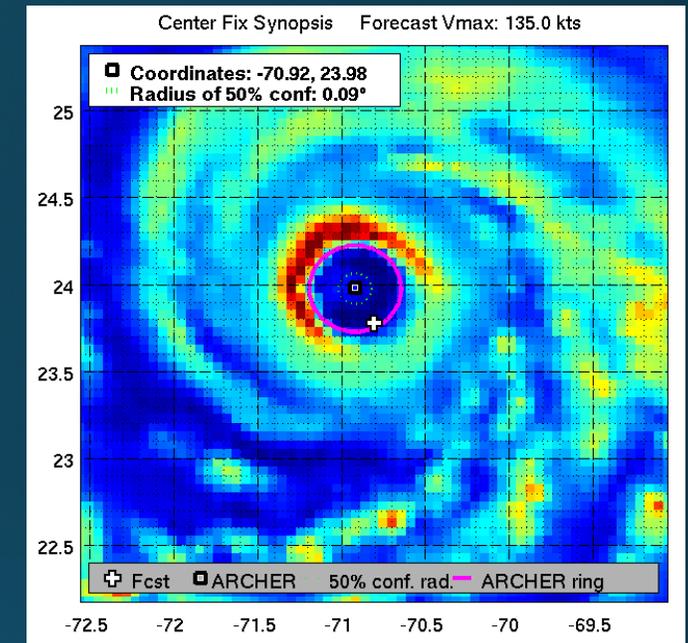
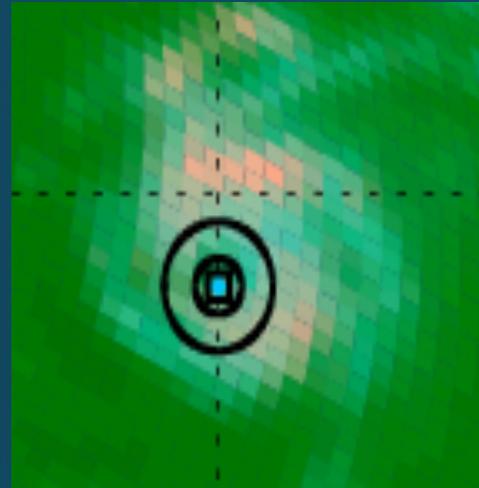
# Our process

- Call for Proposals – drafted and disseminated (bi-annually)
- Principal Investigators apply for funding through NOAA
- Seven 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

# Current Project Highlights - FY15-17: 8<sup>th</sup> round

## Tropical Cyclone Genesis Index: Dunjon

	* ATLANTIC TC GENESIS INDEX *												
	* AL972013 10/01/13 18 UTC *												
TIME (hr)	0	6	12	18	24	36	48	60	72	84	96	108	120
TCGI (%)							45.1						65.0
HDIV (x10 <sup>-7</sup> s <sup>-1</sup> )	-3.0	-4.0	-1.0	-3.0	-5.0	0.0	-6.0	1.0	-5.0	0.0	-4.0	0.0	0.0
VORT (x10 <sup>-6</sup> s <sup>-1</sup> )	1.3	1.6	1.6	1.7	1.6	1.5	1.1	0.8	1.0	0.5	1.1	1.1	1.1
DV24 (x10 <sup>-6</sup> s <sup>-1</sup> )	0.3	0.0	-0.1	-0.7	-0.5	-0.7	-0.1	-0.3	0.1	0.6	0.0	-0.1	-0.3
VSHD (kt)	5	9	11	9	9	17	19	19	19	26	24	28	27
MLRH (%)	67	67	64	63	67	64	68	62	64	52	54	52	54
PCCD (%)	42	N/A											
TNUM	1.00	N/A											
LAT (deg N)	16.8	17.2	17.8	18.5	20.3	22.9	25.0	26.3	27.6	28.3	29.2	30.1	31.4
LON (deg W)	83.0	83.5	84.4	85.1	85.8	87.0	87.4	87.5	86.8	86.5	85.5	84.4	82.9
DTL (km)	169	172	217	259	132	154	382	358	270	188	56	-5	-140
TRACK SOURCE	AVNO	AVNO	AVNO	AVNO	AVNO	AVNO	AVNO	AVNO	AVNO	AVNO	AVNO	AVNO	AVNO



U.S. NAVAL RESEARCH LABORATORY

### NRL Tropical Cyclone Page

Storm Home | Microwave | Scatterometry | Vis/IR | ATCF | Environment

Pass Mosaic | Mosaic | List | Instant Loop | Animated Gif

Storm List

Sensor	% Cov	89H	89 Diff	89 Color	37H	37 Diff	37 Color	19H	19 Diff	Vis	IR Color	IR Dvorak	RGB Test 1	RGB Test 2	RGB Test 3
F08 SSM/I	55.7	■													
F16 SSM/I	62.7	■													
AMS R3	99.9	■													
TMI	33.9	■													
WINDSAT	49.9	■													
MWI	66.0	■													

Currently: Saturday, August 13, 2016 18:44:14 UTC (Z)

Switch | Reverse | Rock | Next | Previous | Speedup | Slowdown | Refresh | Zoom In | Zoom Out

Speed bar for animations

GCOM-W1 AMSR2 89H 2016/07/25 22:11:00Z NRL-Monterey

Rapid Intensity Forecasting: Jiang

Eyewall Replacement Cycle  
ARCHER: Wimmers

### Matrix of RI probabilities

RI (kt / h)	20/12	25/24	30/24	35/24	40/24	45/36	55/48
SHIPS-RII:	17.4%	64.3%	54.0%	37.1%	30.9%	62.9%	78.6%
Logistic:	7.1%	42.6%	43.0%	19.6%	12.3%	55.7%	56.8%
Bayesian:	0.9%	47.6%	34.5%	8.3%	3.5%	10.1%	36.4%
Consensus:	8.5%	51.5%	43.9%	21.6%	15.6%	42.9%	54.6%

NRL web page upgrades: Cossuth

RI SHIPS improvement: Rozoff

# 2017 and 2018 Plans

- Continued testing during the 2017 hurricane season of 8 currently funded projects (8<sup>th</sup> round – next 8 talks)
- Final reports provided by Principal Investigators – late 2017 and early 2018
- Operational implementation decision made by NHC – 2018
- New proposals funded starting 1 July 2017 (9<sup>th</sup> round)
- Testing conducted during the 2018 hurricane season

# Best Practices/Lessons Learned

- **Dedicated Admin. Staff**
  - JHT Director and Admin. Assistant: work closely with ops center and PIs
  - IT computer programmer for JHT projects
- **Process is proposal driven**
  - Includes NHC/CPHC/JTWC and EMC's areas of priority
  - Provide info on operational center's IT environment
- **Seven member Steering Committee**
  - Representatives from the Tropical Cyclone community
  - Review and rank proposals
- **When projects begin, PIs are partnered with forecasters**
  - Continuous interaction throughout transition process
  - PI provide semi-annual progress reports

# The Joint Hurricane Testbed

The screenshot shows the website for the Joint Hurricane Testbed (JHT) at [www.nhc.noaa.gov/jht](http://www.nhc.noaa.gov/jht). The page features a navigation menu with links for Home, News, Organization, and Search. A prominent banner at the top reads "USWRP Joint Hurricane Testbed". Below this, the "JHT Overview" section includes a "Mission Statement" and a "News" section with several recent updates. The "Main Activities" section lists key goals of the testbed. A sidebar on the left provides additional resources such as local forecasts, alternate formats, and various tools and data.

**www.nhc.noaa.gov/jht**  
National Hurricane Center

Home News Organization Search [input] NWS All NOAA Go

Local forecast by "City, St" or "ZIP" [input] Go

Alternate Formats  
Text | Mobile  
Email | RSS  
About Alternates

Cyclone Forecasts  
Latest Advisory  
Past Advisories  
Audio/Podcasts  
About Advisories

Marine Forecasts  
Atlantic & E Pacific  
Gridded Marine  
About Marine

Tools & Data  
Satellite | Radar  
Analysis Tools  
Aircraft Recon  
GIS Datasets  
Data Archive

Development  
Experimental  
Research  
Forecast Accuracy

Outreach & Education  
Prepare  
Resources  
Storm Surge  
About Cyclones  
Cyclone Names  
Wind Scale  
Most Extreme  
Forecast Models  
Breakpoints  
Glossary | Acronyms  
Frequent Questions

Our Organization  
About NHC  
Mission | Staff  
Visitors | Virtual Tour  
Library Branch  
NCEP | Newsletter

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**USWRP**  
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 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 centers.

**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 potential via an announcement of opportunity and a proposal, review, and funding.
- Establish and maintain an infrastructure to facilitate the modification and integration of tools, techniques, and data into the operational computing, communication, and display environment.
- Complete tests in a quasi-operational environment of tools, techniques, and data, with metrics for scientific performance, ease-of-use, and data integration.
- Prepare documentation, training, and performance evaluations of successful tools, techniques, and data to facilitate use and support in operations.

Please see the [Joint Hurricane Testbed Terms of Reference](#) (PDF) for more details.

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.