

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: 7th round)
 - 8 projects started 1 Sep. 2015 (FY15-17: 8th 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

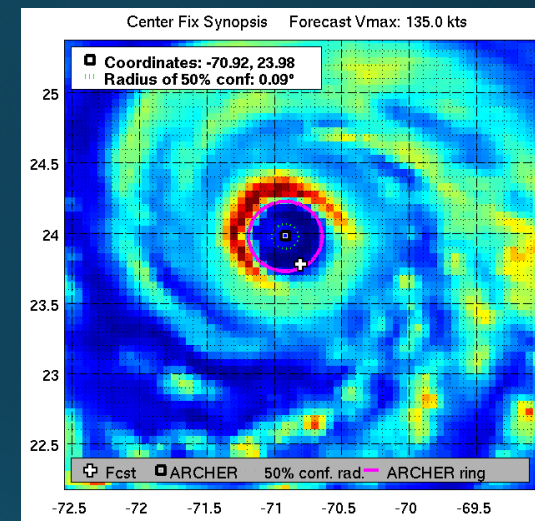
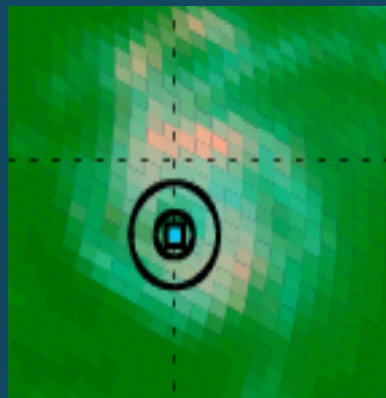
Our process

- 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: 8th round

Tropical Cyclone Genesis Index: Dunjon

TIME (hr)	ATLANTIC TC GENESIS INDEX												
	AL972013 10/01/13 18 UTC												
TCGI (%)	0	6	12	18	24	36	48	60	72	84	96	108	120
							45.1						65.0
HDIV (x10-7s-1)	-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 (x10-6s-1)	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 (x10-6s-1)	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	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
TNUM	1.00	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	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



Prob. Prob. **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														
AMSR2	95.2														
TRM	33.9														
WINDSAT	49.9														
HWI	100.0														

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%	70.6%
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

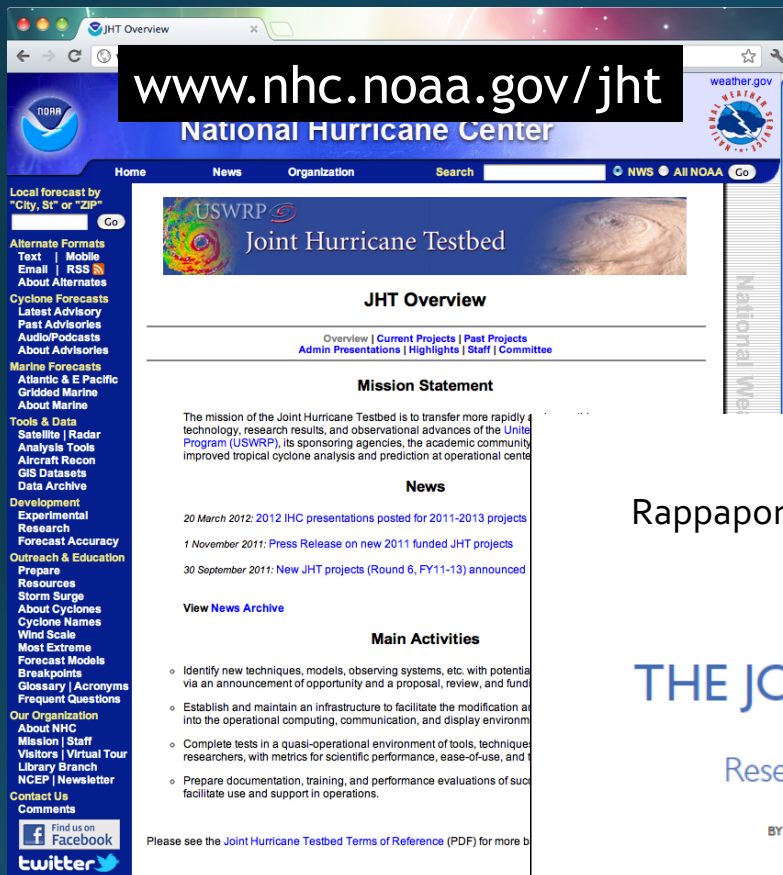
2017 and 2018 Plans

- Continued testing during the 2017 hurricane season of 8 currently funded projects (8th 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 (9th 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



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 benefiting forecast operations.