



Joint Hurricane Testbed Administrative Update



Brian Zachry – NOAA/NWS/NCEP/National Hurricane Center
Jason Sippel – NOAA/OAR/AOML Hurricane Research Division

The JHT is funded by the US Weather Research Program in
NOAA/OAR's Weather Program Office

75th Interdepartmental Hurricane Conference

Joint Hurricane Testbed (JHT)

- Bridges gap between hurricane research & operations
- Began in 2001 under the USWRP
 - Currently in year 2 of the 10th round of projects
- **Our Mission:** successfully transfer new technology, research results & observational advances from research groups to operational centers
- Testing is done at the National Hurricane Center, Central Pacific Hurricane Center or at their institutions

JHT Staff and Funding

- Brian Zachry: JHT Director, NHC Science and Operations Officer, Acting Technology & Science Branch Chief
- Jason Sippel: JHT Assistant Director and HRD Meteorologist
- Alan Brammer: JHT R2O Facilitator/Programmer
- Current funding for FY19-22:
 - Roughly 600K for current projects
 - ½ time support for JHT Facilitator/Programmer
 - 0.2 FTE support and HRD for admin support
 - ~15K for JTTL project support (real-time demonstration and evaluation)
- FY23 funding round is just around the corner

JHT Project Overview

- Round 8 (FY15-17): 8 projects completed
 - 5 accepted for operational implementation
 - 1 deferred until additional evaluation can be conducted
 - 2 not accepted for operational implementation
- Round 9 (FY17-19): 6 projects in total (awaiting decision letters)
 - 5 projects completed
 - 1 project in no-cost extension
- Round 10 (FY19-22): 3 new projects in progress
 - 2 projects FY19-21
 - 1 project FY19-22

NHC Procedure for Operational Decision

- JHT staff receive final project reports from PI(s)
- Distribute interim and final project reports to NHC forecaster points of contact (POCs), TSB Chief, HSU Chief, and JHT Staff for comments and feedback
- Collect feedback from project POCs from real-time demonstrations
- Author NHC Operational Implementation Reports for each project
- Brief NHC Director on each project and JHT staff recommendation
- NHC Director makes final decision and signs recommendation report
- Send final decision reports and formal letter to PI(s)
- NHC/TSB adds JHT transitions to O&M and annual development priorities

Metrics for Operational Implementation

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

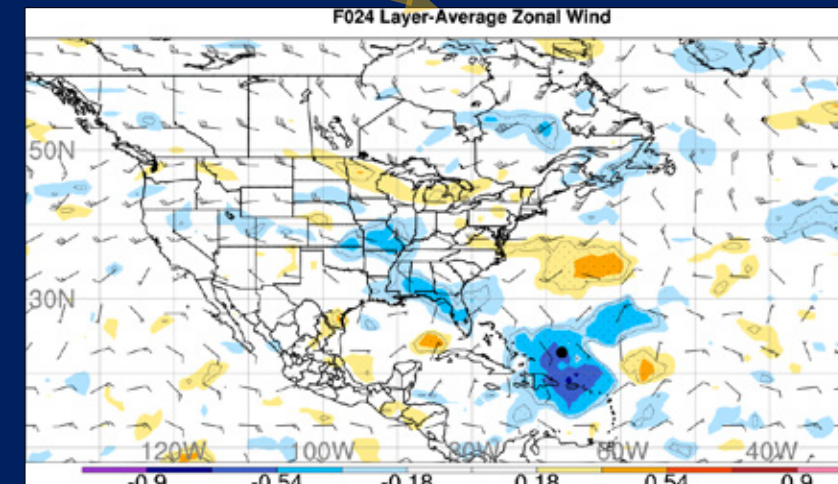
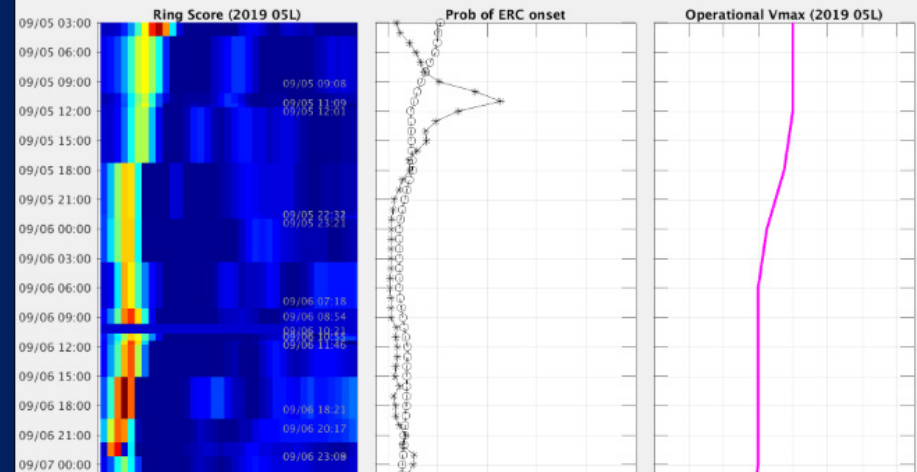
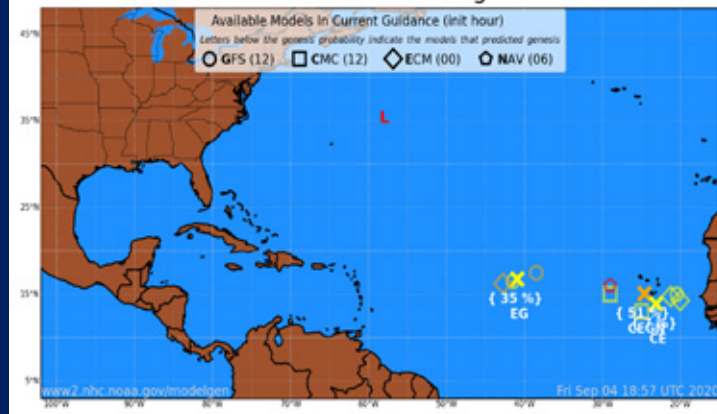
JHT Operational Implementation Summary

- 98 projects supported in 10 funding rounds
 - 59 accepted for operational implementation
 - 24 not accepted
 - 6 deferred
 - 4 projects ongoing (3 current round and 1 NCE)
- Currently writing NHC Operational Implementation Reports for FY17 and previously deferred projects

FY19-22 JHT Projects

Project Title (FY19-22)	Principal Investigator(s)
Further improvements and extensions to the tropical cyclone logistical guidance for genesis (TCLOGG) FY19-22	Robert Hart (FSU) Dan Halperin (Embry-Riddle)
Upgrades to the M-PERC and PERC Models to Improve Short Term Tropical Cyclone Intensity Forecasts FY19-21	Derrick Herndon (UW Madison)
Transitioning Ensemble-based TC Track and Intensity Sensitivity to Operations FY19-21	Ryan Torn (Albany)

Experimental 0-48h TC genesis probability
20-09-04 12Z consensus guidance



NHC Internal Webpage

Experimental Websites

Open in Seperate Tab

Overview Slides

Submit Feedback

Overview

JHT - Active

TCLOGG | Model-indicated Genesis Potential

Ensemble Sensitivity Analysis

M-PERC | Microwave - Probability of Eyewall Replacement Cycle

UWM RI | Evolutionary Programming To Generate Improved Intensity Forecasts

MSU RI | Machine-Learning Based Rapid Intensification Forecasts

Other - Active

NUCAPS TC Direct Broadcast Visualization (new tab)

NUCAPS TC Radial Profile Anomalies and Diurnal Cycle

RIPA | Rapid Intensification Predication Aid

SATCON Proving Ground Demonstration

HAFSv0.1a Forecast Guidance for Current Active Storms (new tab)

Internal (VPN only)- Active

TCLOGG (internal)| Model-indicated Genesis Potential

JHT - In-Active

Microwave Intensity Estimation Model in AL/EP/CP Basins

Experimental Data Portal

Use links on the side to load external realtime demonstration projects.

Please leave [feedback](#) (positive and negative) when you have time so we can monitor and assess the experimental projects.

If a website isn't behaving within this page, right click the link in the side bar and open in a new tab or click the "open in a new tab" link in the header.

JHT - Active

TCLOGG | Model-indicated Genesis Potential

Model calibrated genesis forecasts with trained model consensus probability

moe.met.fsu.edu

FSU -- Hart

JHT 17-19,19-21, Genesis, Forecast

Ensemble Sensitivity Analysis

Real-time sensitivities & target locations to reduce ensemble forecast uncertainty

www.atmos.albany.edu

Albany -- Torn

JHT 19-21, Forecast

M-PERC | Microwave - Probability of Eyewall Replacement Cycle

Analysis and probabilities of Eye Wall Replacements Cycles utilising Microwave Data

tropic.ssec.wisc.edu

UW-CIMSS -- Herndon

JHT 19-21, Forecast

UWM RI | Evolutionary Programming To Generate Improved Intensity Forecasts

RI, RW forecasts produced from a deterministic "evolutionary programming" (EP) intensity forecast through selecting the best-performing EP algorithm.

derecho.math.uwm.edu

UWM -- Roebber

JHT 17-19, RI

MSU RI | Machine-Learning Based Rapid Intensification Forecasts

Rapid Intensification forecasts using AI based ensemble

arashi.geosci.msstate.edu

MSU -- Mercer

JHT 17-19, RI

Other - Active

NUCAPS TC Direct Broadcast Visualization

weather.msfc.nasa.gov

Current JTIT Projects

- FY18: 1 Project in JHT Evaluation
 - Dan Halperin: Adding tropical cyclone genesis verification capabilities to the Model Evaluation Tools – Tropical Cyclone (MET-TC) software
- FY19: 2 Projects in JHT Evaluation
 - Nate Hardin & Taylor Trogon: Generating Storm Surge Hazards using Hazard Services
 - Galina Chirokova: Use of Ocean Stability Data and Machine Learning to Improve Tropical Cyclone Situational Awareness and NHC Statistical-Dynamical Intensity Guidance

Tropical and Marine Transition Lab (TMTL)

- Kickoff at the HRD-NHC Science Meeting (2/11) with Ken Graham and John Cortinas
- Support from OAR for construction, remodeling, IT equipment, furniture, etc.
- TMTL potential projects:
 - Various testbed and/or projects related to tropical (JHT, JTTI, HFIP, Satellite, SBES, observations, marine, etc.)
 - Short-fused operational issues or media graphics
 - Parallel AWIPS system for testing and data ingest
 - Tropical product testing with partners
 - Dream it up!
- Working to partner with GSL to establish AWIPS Cloud environments to enable an efficient R2O pathway
- Potential participants involved in lab include staff from various testbeds, AOML/HRD staff and scientists, social scientists, emergency managers, visiting scientists, core partners, private sector, university scientists, etc.

Prototype TMTL Layout





Joint Hurricane Testbed Administrative Update



Brian Zachry – NOAA/NWS/NCEP/National Hurricane Center
Jason Sippel – NOAA/OAR/AOML Hurricane Research Division

The JHT is funded by the US Weather Research Program in
NOAA/OAR's Weather Program Office

75th Interdepartmental Hurricane Conference