



# R20 and Testbed Activities at NHC: Past, Present and Future

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



# Agenda

- **Joint Hurricane Testbed (JHT) Overview**
  - History and Current Status
  - Ongoing JHT Projects
  - Operational Transition Decisions: Metrics & Process
- **Introduction to the Hurricane and Ocean Testbed (HOT)**



# Joint Hurricane Testbed

Bridging the gap between hurricane research & operations

- JHT began in 2001 under the USWRP
  - Currently in 10th round of projects
  - 98 projects funded to date, pending new FY22 projects
- **JHT Mission:** successfully transfer new technology, research results & observational advances from research groups to operational centers
- Testing is primarily done at the National Hurricane Center, Central Pacific Hurricane Center, or Joint Typhoon Warning Center



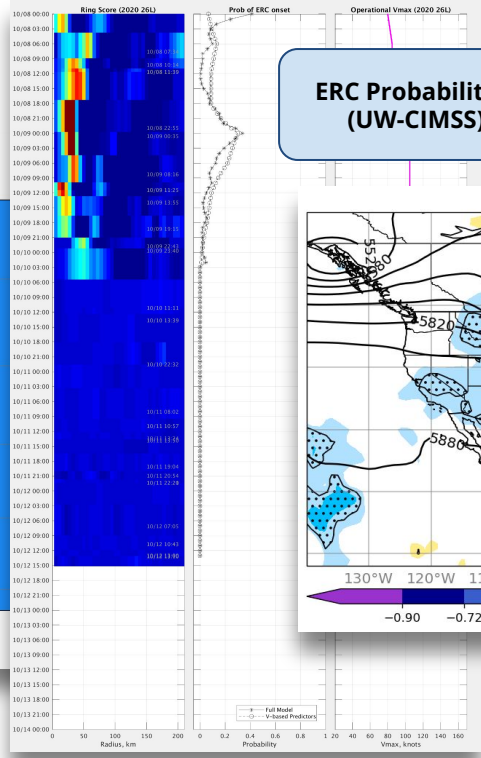
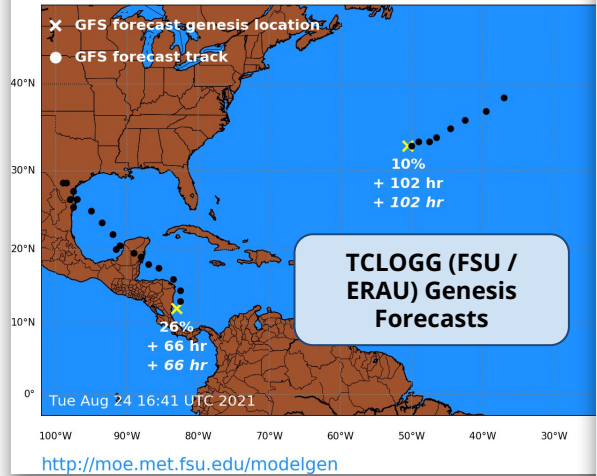
# JHT Project Overview - 2015-22

- **Round 8 (FY15-17):** 8 projects completed
  - 5 accepted for operational implementation
  - 1 deferred pending additional evaluation
  - 2 not accepted for operational implementation
- **Round 9 (FY17-19):** 6 projects completed
  - 2 accepted for operational implementation
  - 4 not accepted for operational implementation
- **Round 10 (FY19-22):** 3 projects in progress
- **Round 11 (FY22-24):** New round of projects

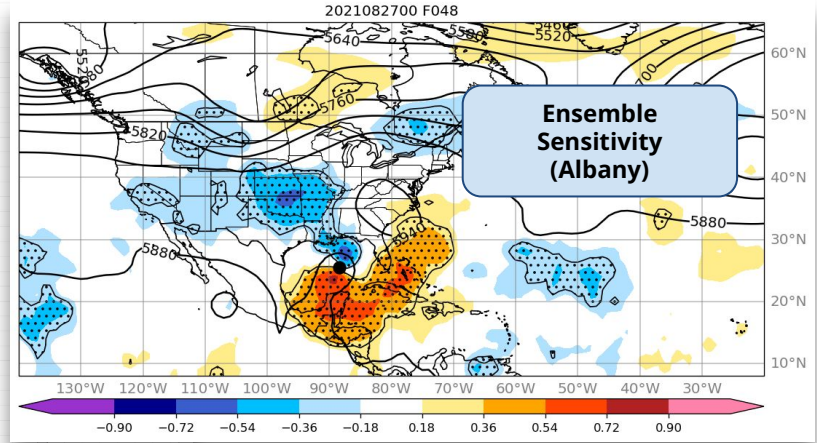


# JHT - Current Projects

Experimental 0-48 h TC genesis probability  
GFS model output initialized 2021-08-24 12Z



**ERC Probabilities (UW-CIMSS)**





# Operational Implementation Metrics

- **Forecast or Analysis Benefit:** expected improvement operational forecasts and/or analysis benefit
- **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 (O&M)



Project Title: \_\_\_\_\_

Funded Project Period: \_\_\_\_\_  
Principal Investigators: \_\_\_\_\_  
NHC Points of Contact: \_\_\_\_\_  
JHT Staff: \_\_\_\_\_  
Final Report Provided: \_\_\_\_\_

Assessments (Not Favorable, Neutral, Favorable):

1. Forecast or Analysis Benefit: \_\_\_\_\_
2. Efficiency: \_\_\_\_\_
3. Compatibility: \_\_\_\_\_
4. Sustainability: \_\_\_\_\_

JHT Staff Recommendation:  
 Accept  Defer  Decline  N/A

Notes: \_\_\_\_\_

NHC Director Decision for Operational Implementation:  
 Accept  Defer  Decline  N/A

Comments:  
X \_\_\_\_\_  
Kenneth E. Graham  
National Hurricane Center Director

\_\_\_\_\_



# JHT Implementation Summary

- 98 projects supported in 10 funding rounds since 2001
  - 63 accepted for operational implementation
  - 31 not accepted
  - 1 deferred
  - 3 projects ongoing
- **High R2O success rate** - 66% of completed JHT projects have been accepted for operational implementation
- A firm foundation of R2O to build upon...



# JHT Lessons Learned: Evolving R2O at NHC

Areas where we want to evolve:

- **Casting a wide net** to consistently transition all R2O projects aligned with operational mission (JHT, HFIP, JTTI, non-NOAA, supplementary funding, etc)
- **Integrating the full spectrum of disciplines**, including social and other natural sciences (e.g. oceanography) & taking a holistic view of improving forecasts - e.g., FACETS, IDSS
- **Enabling physical and virtual collocation** of forecasters, researchers, users, and R2O experts
- **Providing an isolated test environment** that mimics operations, to remove technical barriers and gain speed





# Evolving R2O/O2R





# The Hurricane and Ocean Testbed (HOT)

- The William Lapenta Laboratory at NHC, Home of the HOT:
  - A **physical**, collaborative environment to consider all aspects of the forecast continuum - from observations, to forecasts and warnings, to end-user decisions
  - A **virtual** technology ecosystem to test hurricane and ocean R&D in a quasi-operational environment
- HOT is a home for all projects, testbeds, etc. that require NHC T&E across the forecast/warning value chain
  - Establishes efficient pathways to rapidly progress Readiness Levels (RLs) of tropical and marine innovations



The William Lapenta Laboratory at NHC:  
Home of the Hurricane and Ocean Testbed (HOT)

Isolated Virtual  
AWIPS Cloud  
Environment

Whiteboard  
and Video Wall

A/V Demonstrations

Experiment  
Workstations

Development  
Workstations

Collaboration Area



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