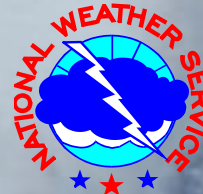
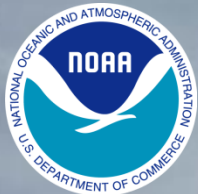


WELCOME TO THE 2018 RA-IV WORKSHOP ON HURRICANE FORECASTING AND WARNING

**Richard J. Pasch and Daniel P. Brown
Senior Hurricane Specialists
National Hurricane Center**





Workshop Introduction Outline



- **ORIENTATION**

- Use of PCs
- NHC Facility
- Campus Map
- Overview of Workshop



- **INTRODUCTION OF PARTICIPANTS**

- **OVERVIEW OF NHC ORGANIZATION**

- **ENHANCEMENTS TO NHC PRODUCTS**

- **TOUR**





Use of PCs:



- Presentations available on Google Drive in folder WMO2018; to access this drive, click on “WMO2018-Google Drive” icon on your PC desktop
- Download to your PC desktop folder WMO2018 for viewing in PowerPoint by right clicking on files and selecting download
- Should you get logged off of Google, get back on with username raivworkshop and password 20Cloud13 (this is also our WiFi password)

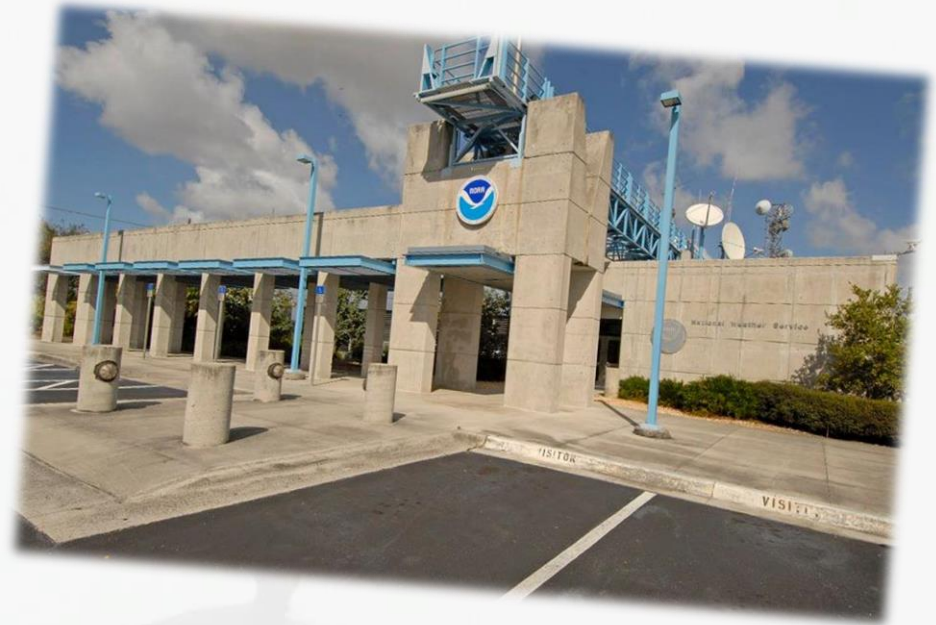




NHC Facility



- **Sign in/Sign out**
- **Restrooms**
- **Breaks & Food**
- **Campus map**





Introduction of Participants

21 countries & WMO Represented

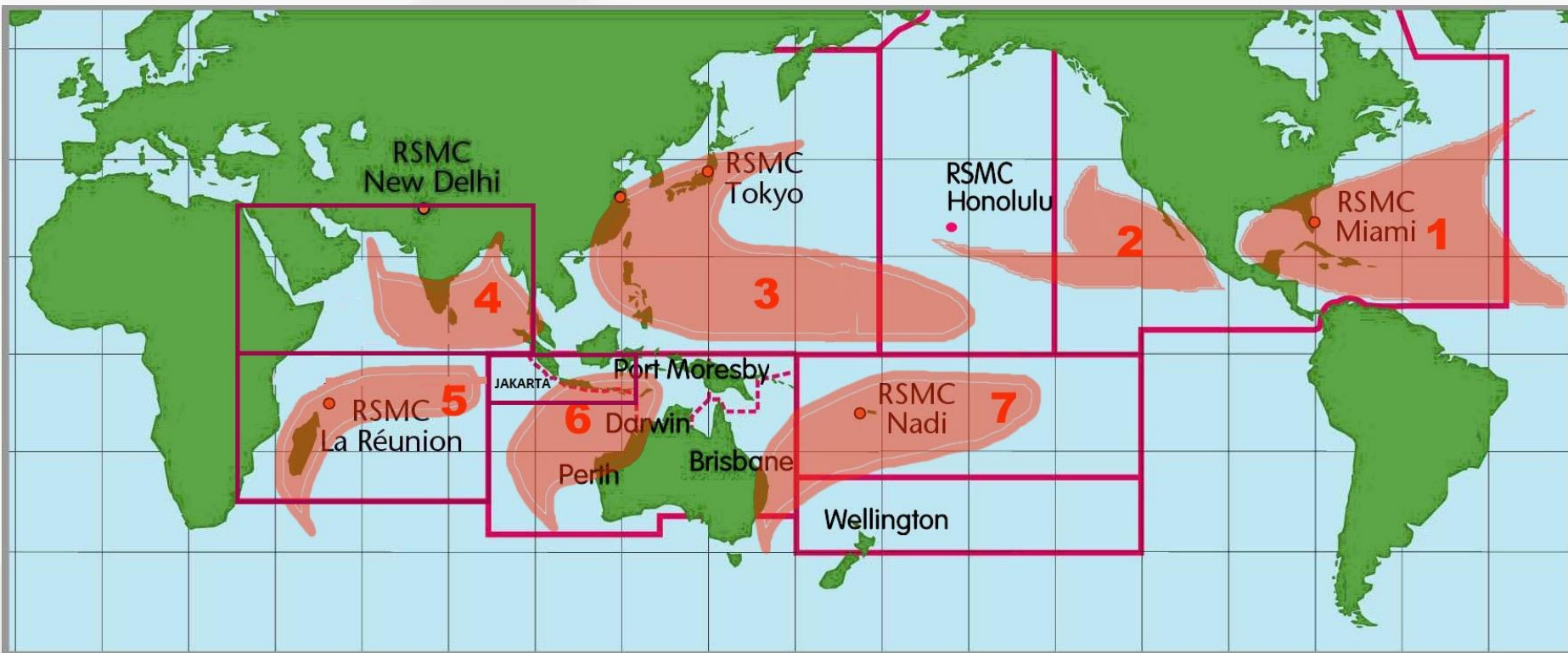
- **NAME**
- **ORGANIZATION**
- **CITY, COUNTRY**
- **DUTIES**
- **WHAT WOULD YOU LIKE TO GET FROM THIS WORKSHOP?**

A name tag template with a red top section containing the word "HELLO" in large white letters and "my name is" in smaller white letters below it. The bottom section is a large white rectangular area for writing, framed by a red border at the top and bottom.



World Meteorological Organization

Regional Specialized Meteorological Centers (RSMC)



- NHC is one of 7 RSMCs that produce and coordinate tropical cyclone forecasts for various ocean basins.
- NHC is responsible for both the Atlantic and eastern North Pacific Ocean basins.



National Hurricane Center Organizational Structure



Hurricane Specialist Unit

Develop, coordinate (domestically and abroad), and issue tropical cyclone warnings, forecasts, and outlooks in text and graphical formats (~700 full advisory packages/yr)

“Off-season” outreach and public awareness programs

Applied research

Tropical Analysis and Forecast Branch

Marine/ocean and satellite analyses, forecasts and warnings in text and graphical formats, 24x7, (~100 products/day)

Conduct tropical cyclone (Dvorak) analyses for the hurricane specialists

Augments operational support staffing

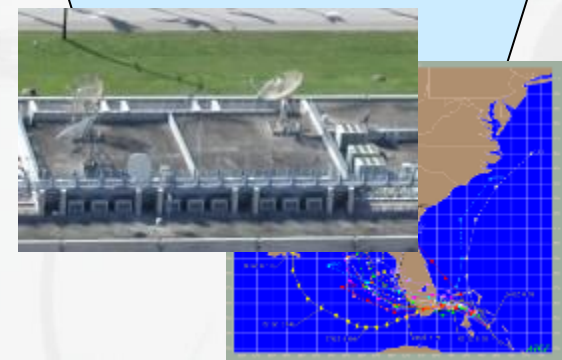
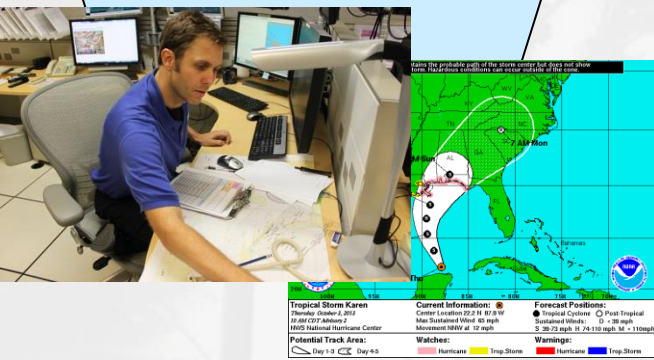
Technology and Science Branch

Computer systems support 24x7

Applications development and technology infusion

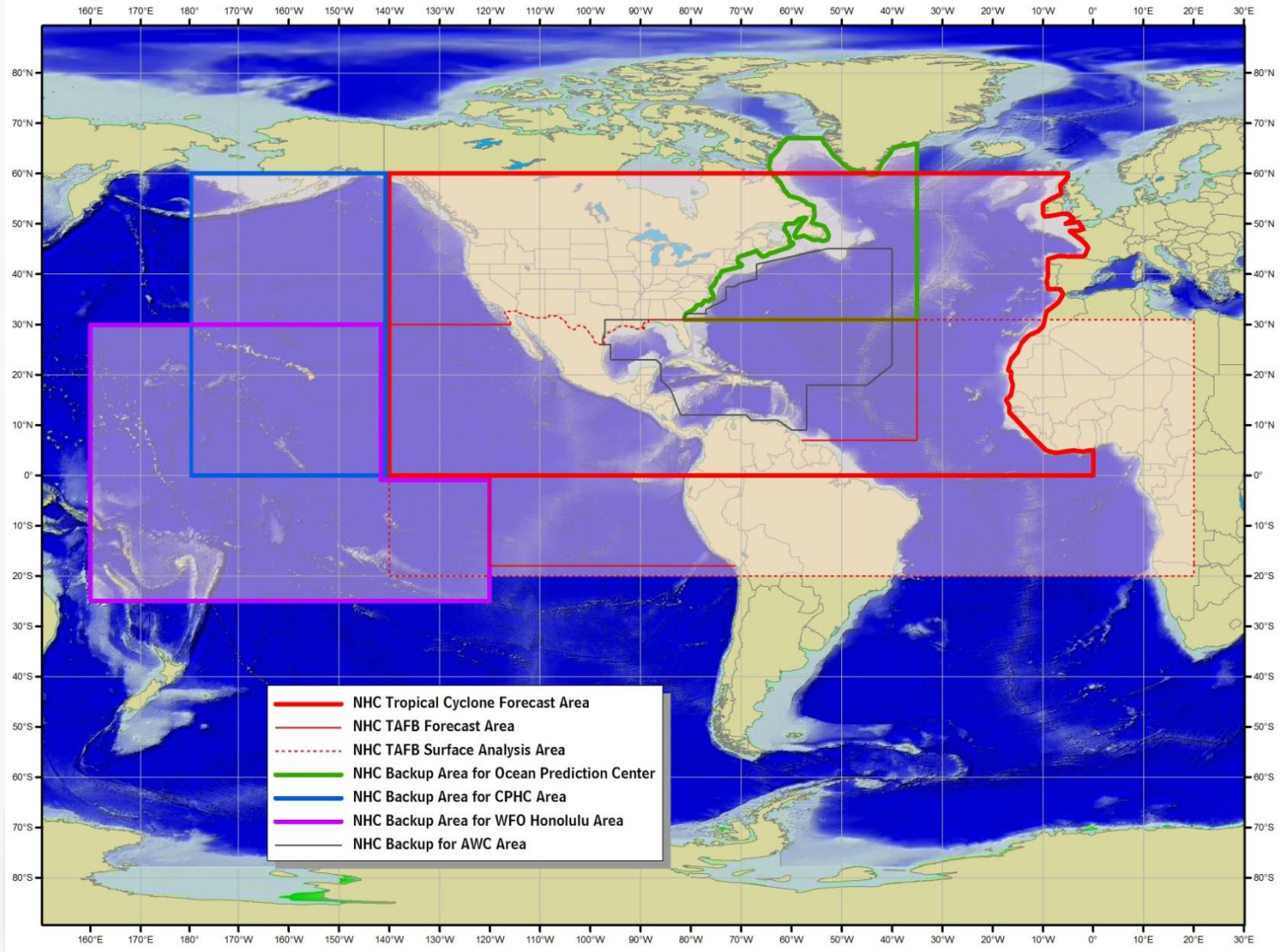
Storm surge guidance (real time; community planning; preparedness)

Emergency operational support staffing





NHC Areas of Responsibility

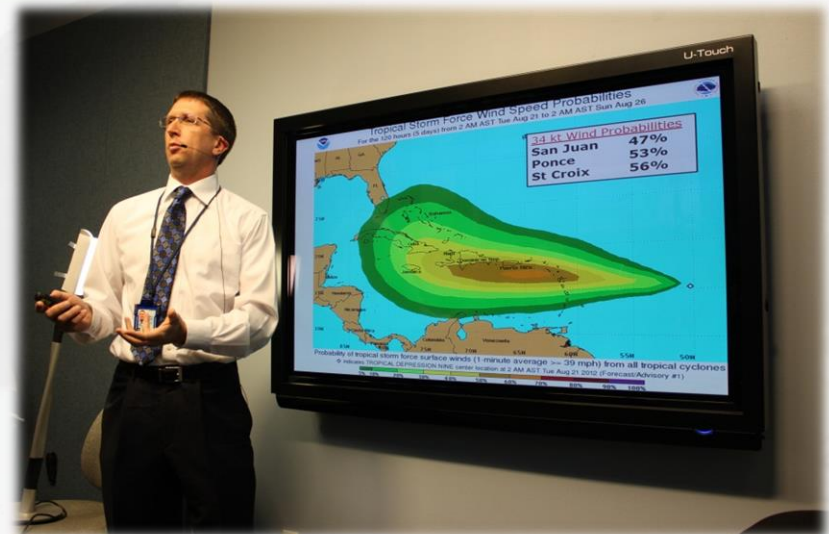




Briefing Responders



- Briefings conducted shortly after the release of the forecasts- 5 & 11 AM/PM
 - FEMA's Hurricane Liaison Team (HLT)
 - State Department briefings
 - U.S. and international media interviews & press briefings
 - Local and State emergency management briefings

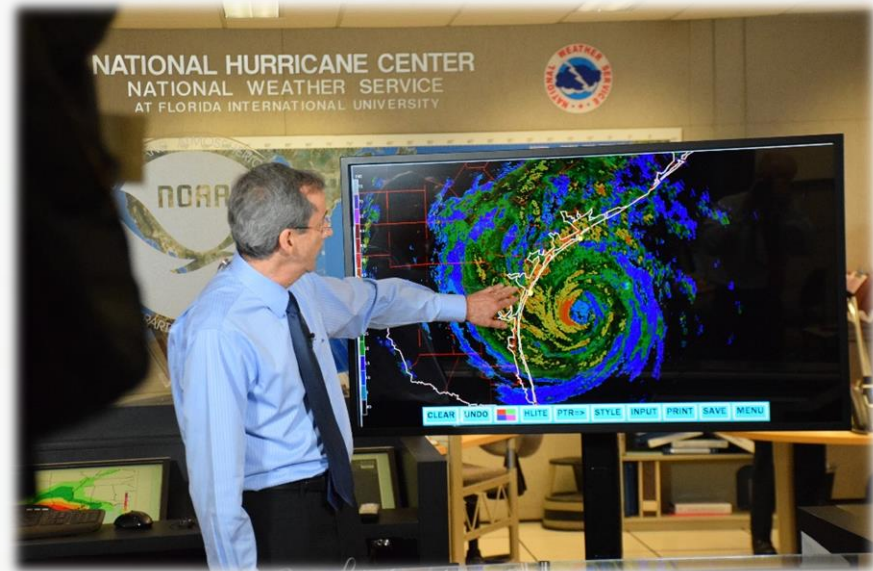




Briefing the Media



- Media “pool” opens whenever there is a hurricane watch/warning in effect for the U.S.
- NHC Director or spokesperson provides interviews to local or national media outlets in 5 minute “windows”
- Top of the hour “generic” briefings and podcasts are available





International Collaboration Highlights

- **Open exchange of meteorological data among countries**
- **NHC provides forecasts and guidance on watches and warnings to 30 WMO member nations**
- **NHC hosts and teaches two-week workshop on tropical cyclones for international government meteorologists.**
- **NHC Director serves as Chairman of the WMO RA-IV Hurricane Committee. Annual meeting updates the Region's "Hurricane Operational Plan"**
- **U.S. conducts annual Caribbean Hurricane Awareness Tour**
- **Storm surge demonstration project for Hispaniola**





2018 Caribbean Hurricane Awareness Tour

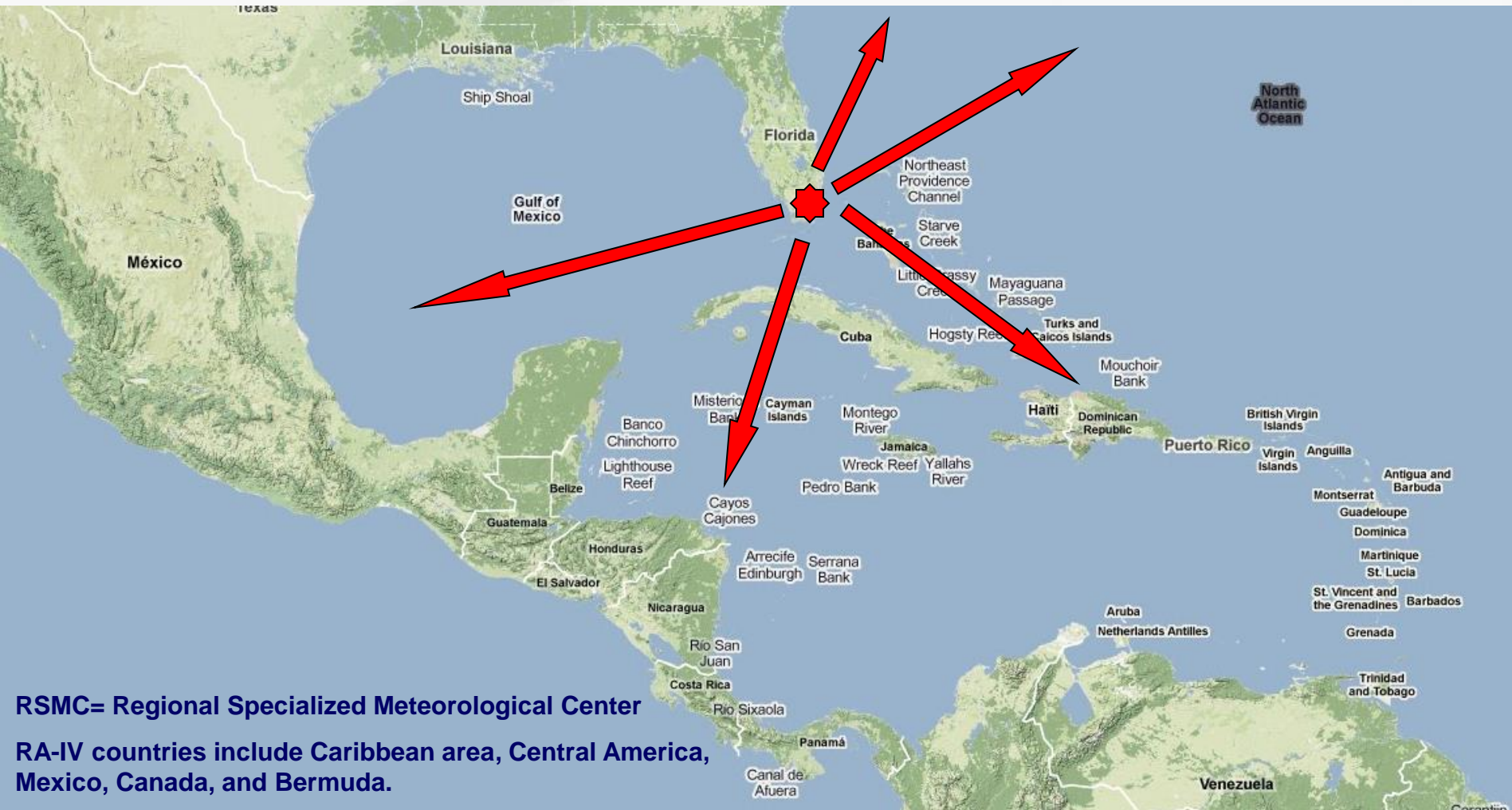
- Expected Stops
 - La Paz, Mexico - April 23
 - Zihuatanejo, Mexico - April 24
 - Panama City, Panama - April 26
 - Montego Bay, Jamaica - April 27
 - Aquadilla, Puerto Rico - April 28
- Opportunity to increase hurricane awareness by meeting with emergency managers, media, and general public
- Tour of hurricane hunter aircraft





NHC's International Coordination

World MET. ORGANIZATION - Regional Association IV Coordination

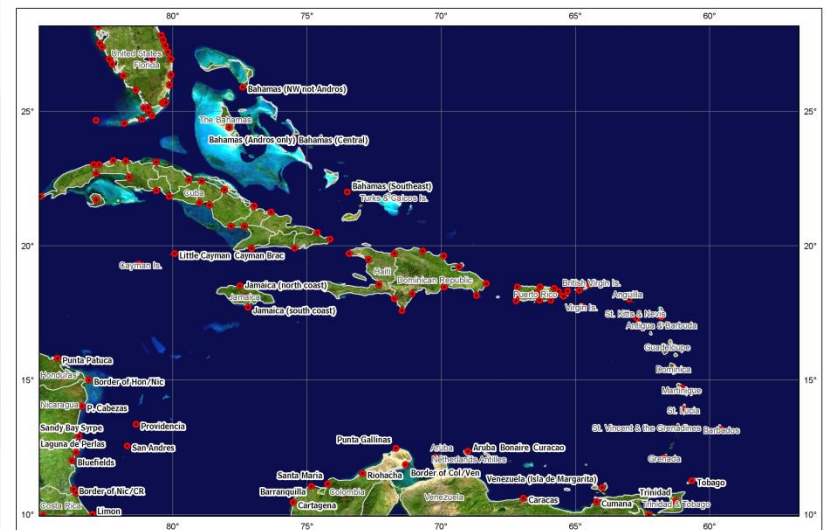


RSMC= Regional Specialized Meteorological Center

RA-IV countries include Caribbean area, Central America, Mexico, Canada, and Bermuda.

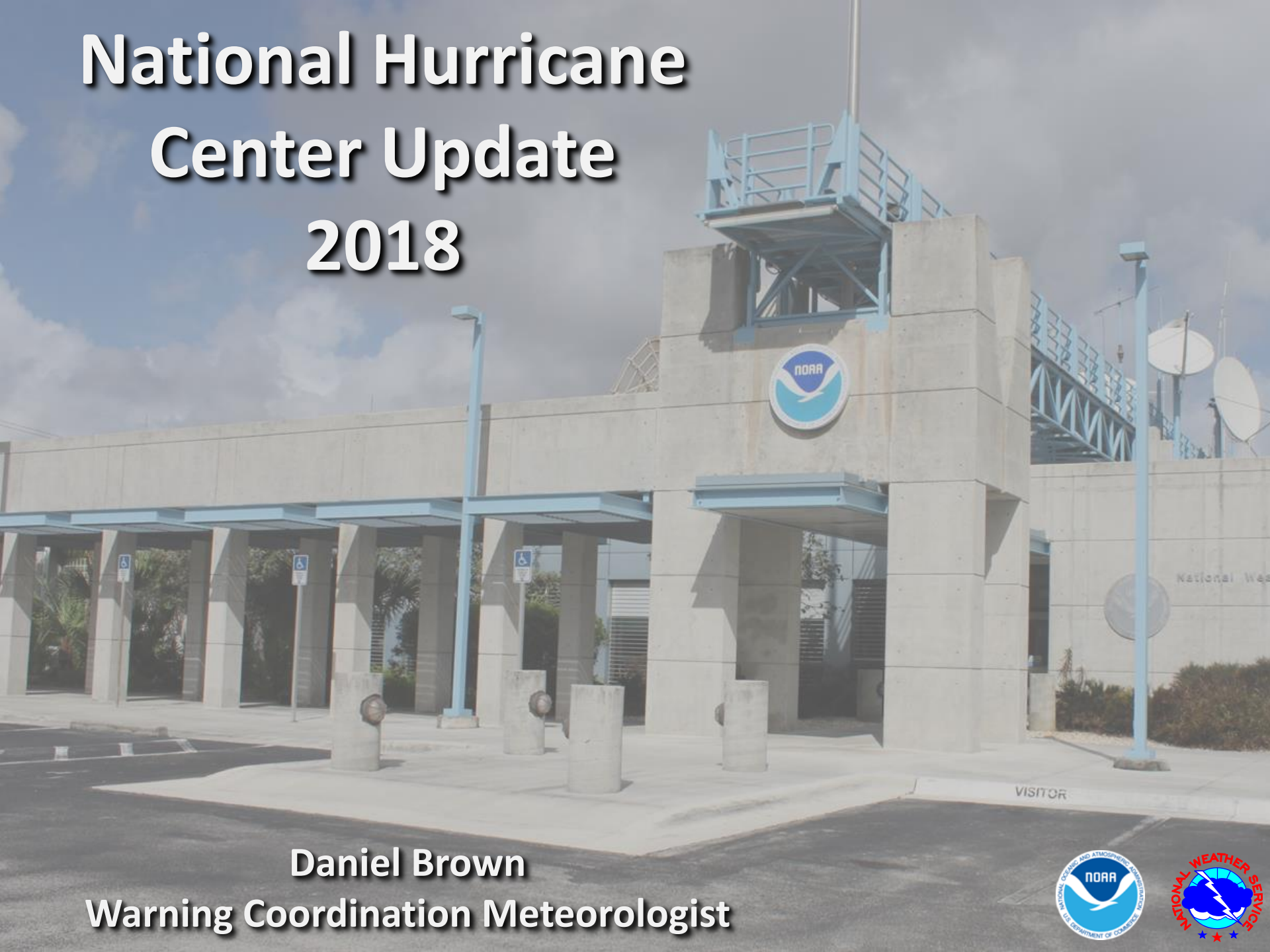
Coordination of International Watches & Warnings

- Each country is responsible for issuing watches/warning for their respective country or jurisdiction
 - NHC issues watches/warnings for Haiti
- NHC will recommend the placement of watches/warnings
- Coordinated via phone with Met. Offices throughout the region
- Tropical Storm or Hurricane Watches and Warnings are currently not issued prior to the formation of a tropical depression



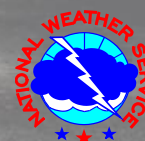
Tropical Cyclone Breakpoints - Caribbean

National Hurricane Center Update 2018



Daniel Brown

Warning Coordination Meteorologist





NHC Public Advisory



Hurricane Maria Advisory #2 5 PM Saturday September 16

DISCUSSION AND OUTLOOK

At 500 PM AST (2100 UTC), the center of Tropical Storm Maria was located near latitude 12.3 North, longitude 52.6 West. Maria is moving toward the west near 20 mph (31 km/h). A slower west-northwest motion is expected during the next **several** days. On the forecast track, Maria is expected to pass over portions of the Leeward Islands late Monday, **and be near the Northern Leeward Islands on Tuesday. Maria is forecast to pass near or over the Virgin Islands and Puerto Rico on Wednesday, and could be near the Dominican Republic later this week.**

Maximum sustained winds have increased to near 50 mph (85 km/h) with higher gusts. Additional strengthening is expected during the next **several** days, and Maria is forecast to be a hurricane when it approaches the Leeward Islands. **Maria could be a major hurricane when it is near the Northern Leeward Islands, the Virgin Islands, and Puerto Rico next week.**

New format provides forecast information to 72 h and beyond

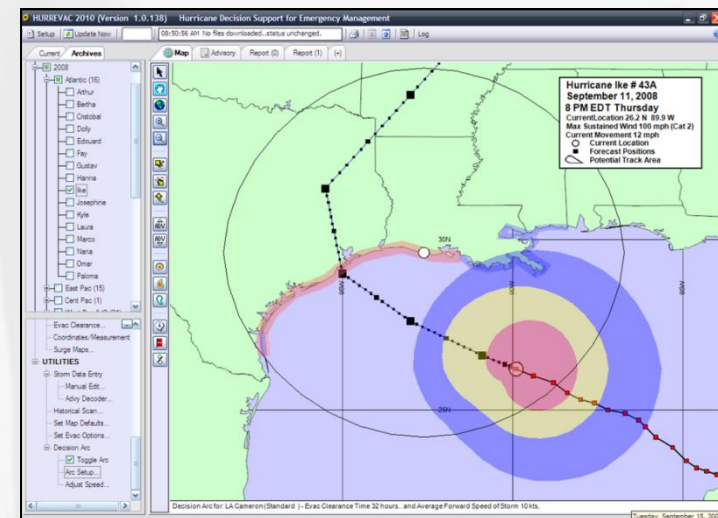


Extension of Hurricane-Force Wind Radii Forecasts



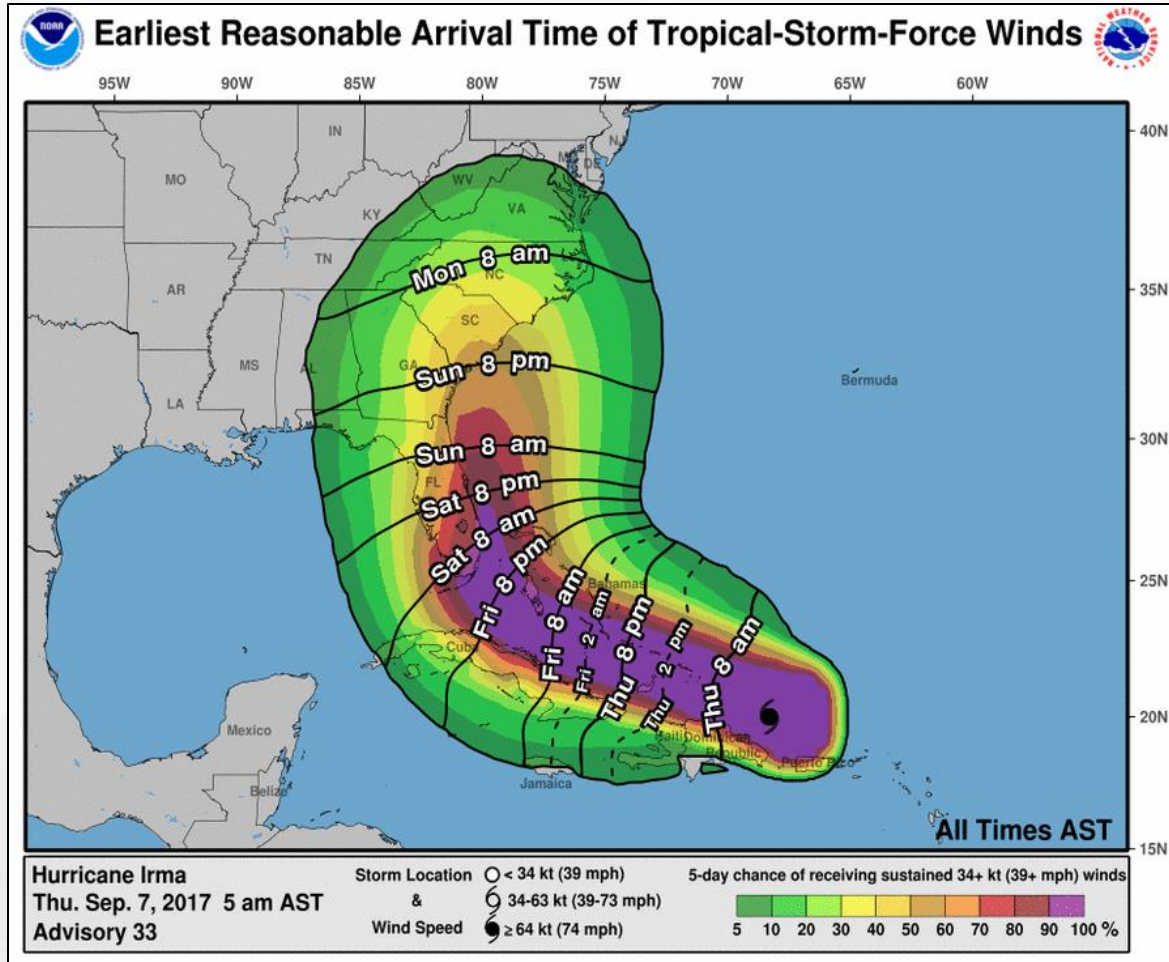
- Beginning in 2018, NHC will provide 48-h hurricane-force (64 kt) wind radii forecasts (in quadrants)
- This change should assist forecasters in placing hurricane watches and warnings
- Previously, NHC provided hurricane-force wind radii forecasts out to 36 hours

Forecast Time	34 kt	50 kt	64 kt
12 hr			
24 hr			
36 hr			
48 hr			
72 hr			N/A
96 hr	N/A	N/A	N/A
120 hr	N/A	N/A	N/A



Time of Arrival Graphics

Become Operational in 2018

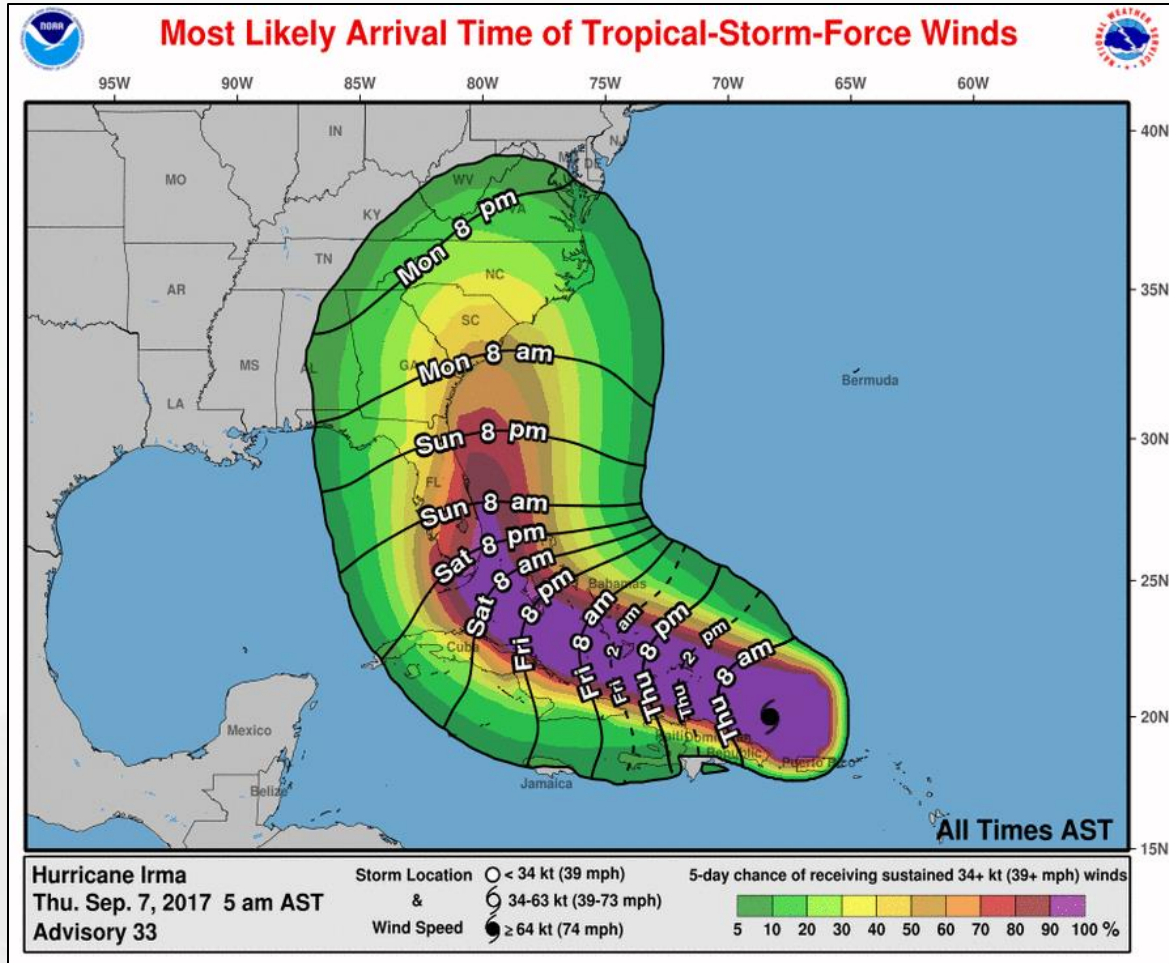


- Shows earliest reasonable arrival time of TS winds (black contours) and cumulative TS wind speed probabilities (colors)
- Identifies the time window that users at individual locations can safely assume will be free from TS winds
 - Based on the time that has $\leq 10\%$ chance of seeing sustained TS winds before the indicated time
- Best for users with low tolerance for risk

Earliest Reasonable Arrival of TS Winds

Time of Arrival Graphics

Become Operational in 2018



- Shows most likely arrival time of TS winds (black contours) and cumulative TS wind speed probabilities (colors)
- Shows the time before or after which the onset of sustained TS winds is equally likely
- Best for users that are willing to risk not having completed preparations before TS winds arrive

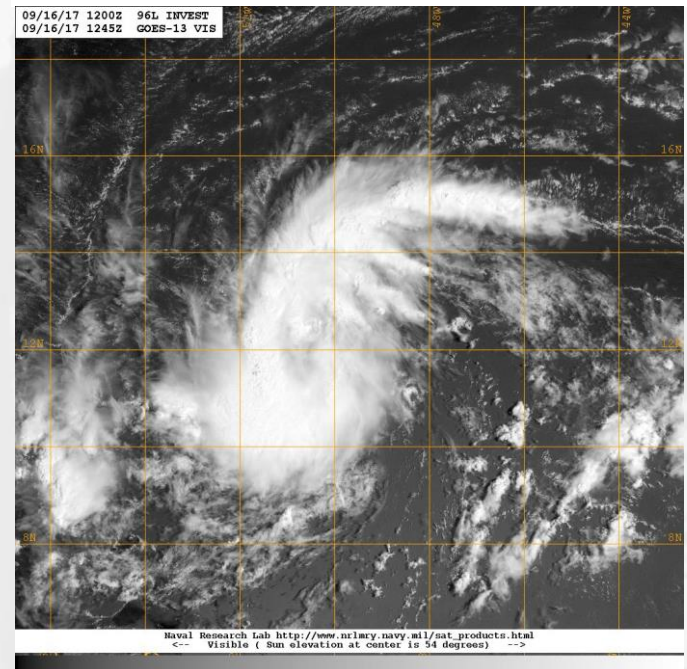
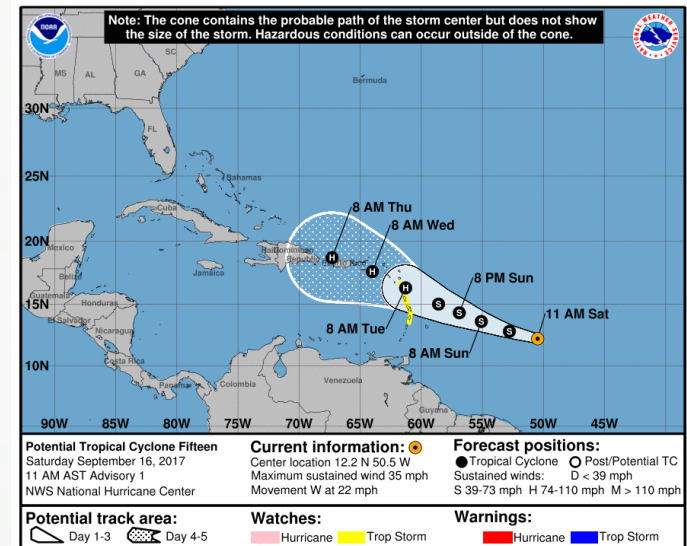
Most Likely Arrival of TS Winds



Potential Tropical Cyclone Advisories



- Allows the timely issuance of watches/warnings before a tropical cyclone has formed
- Used before the formation of 7 systems in the Atlantic basin in 2017, 6 of those became tropical cyclones
- Was used for the very first time in the Caribbean region, for the systems that became Tropical Storm Bret and Hurricane Maria





Key Message Graphic and Initial Wind Field on Cone Graphic



- **NHC Key Message Graphic**
 - Combines Key Messages from the NHC Discussion and pertinent advisory graphics
 - Available via NHC social media accounts and on NHC website
- **Storm size information (initial wind field) was added to the cone graphic in 2017**
 - Helped to illustrate hazardous wind conditions that occur outside the cone

Key Messages for Hurricane Irma
Advisory 29: 5:00 AM AST Wed Sep 06, 2017

1. Irma is a potentially catastrophic category 5 hurricane and will bring life-threatening wind, storm surge, and rainfall hazards to portions of the northern Leeward Islands, including the Virgin Islands and Puerto Rico, today. Preparations should be rushed to completion.
2. A Hurricane Warning is in effect for the northern coast of the Dominican Republic, as well as the southeastern Bahamas and the Turks and Caicos, with hurricane watches for portions of Haiti and the central Bahamas. Irma is likely to bring dangerous wind, storm surge, and rainfall to these areas from Wednesday night through Friday.
3. Irma could directly affect the remainder of the Bahamas and Cuba as an extremely dangerous major hurricane later this week. Residents in these areas should monitor the progress of Irma and listen to advice given by officials.
4. The chance of direct impacts from Irma beginning later this week and this weekend from wind, storm surge, and rainfall continues to increase in the Florida Keys and portions of the Florida Peninsula. However, it is too soon to specify the timing and magnitude of these impacts.

For more information go to hurricanes.gov

Note: The cone contains the probable path of the storm center but does not show the size of the storm. Hazardous conditions can occur outside of the cone.

Tropical Storm Isaac Monday August 27, 2012 4 PM CDT Advisory 27 NWS National Hurricane Center	Current information: x Center location 26.4 N 86.2 W Maximum sustained wind 70 mph Movement NW at 12 mph	Forecast positions: ● Tropical Cyclone ○ Post-Tropical Sustained winds: D < 39 mph S 39-73 mph H 74-110 mph M > 110 mph	
Potential track area: Day 1-3 Day 4-5	Watches: Hurricane Trop Stm	Warnings: Hurricane Trop Stm	Current wind extent: Hurricane Trop Stm

Tour of NHC, CARCAH, WFO, and HLT

