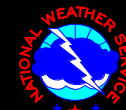
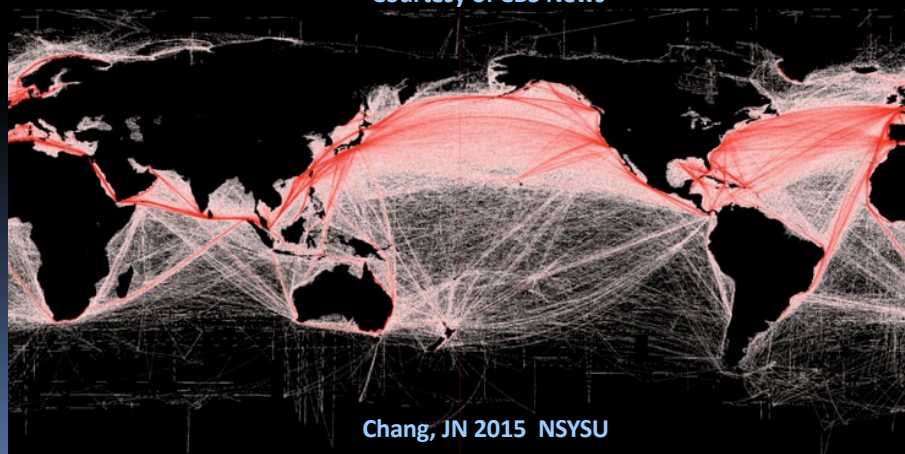




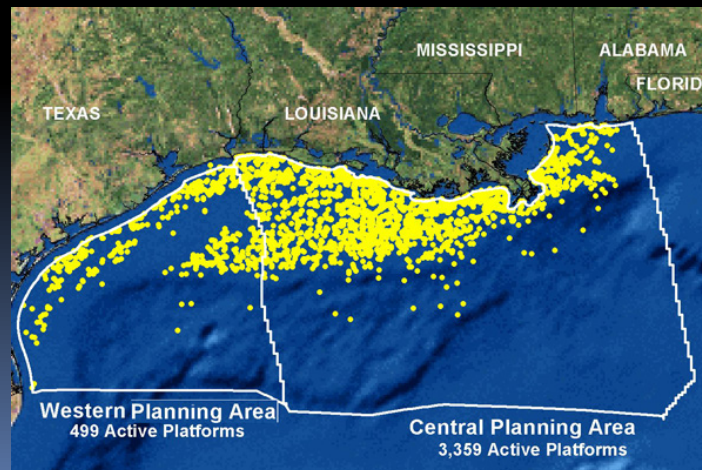
# Hazards Over the Oceans



Courtesy of CBS News



Chang, JN 2015 NSYSU





# Location of Tropical Cyclone Direct Deaths

(1492-present quantified from storms resulting in 25 or greater deaths)

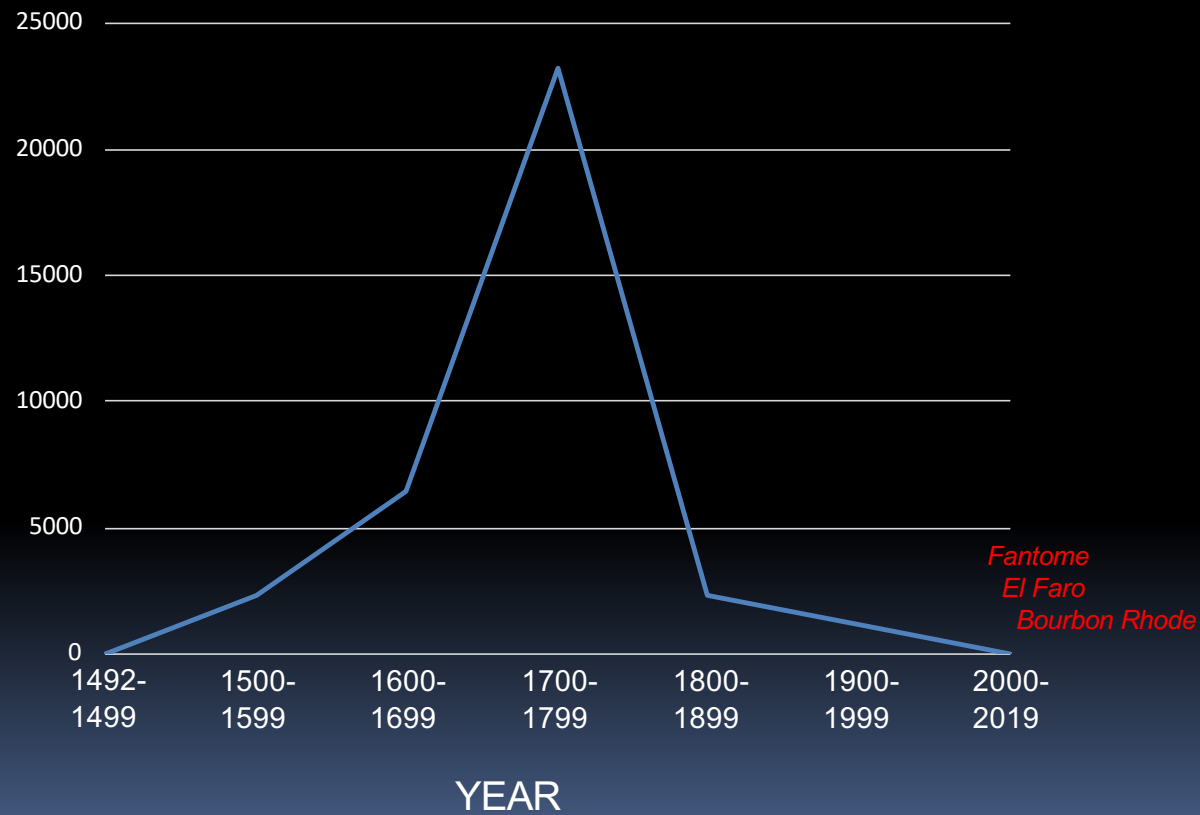


Total = 179,000



# Atlantic Tropical Cyclone Marine Deaths by Year

(quantified cases only)







# Goal: Improve Safety of Life at Sea



Photo Courtesy of NOAA





# Goal: Improve Safety of Life at Sea



## National Hurricane Center Hosts Mariner's Decision Maker's Workshop

- Two and half days, once a year, at the National Hurricane Center
- Invitation sent to all marine partner contacts we have available
- 20-30 individuals representing various maritime organizations in attendance
- Several representatives from NOAA outside NHC in participation



# NHC Marine Workshop



## Day 1: Products and Agency Overview

- Purpose of workshop
- Who Does What? (TAFB, HSU, OPC, WFOs)
- Product Uncertainty
- Office Tour





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# NHC Marine Workshop



## Day 2: Breakout Sessions and Exercises

- Groups spent time in TAFB observing how marine analyses and forecasts are made





# NHC Marine Workshop



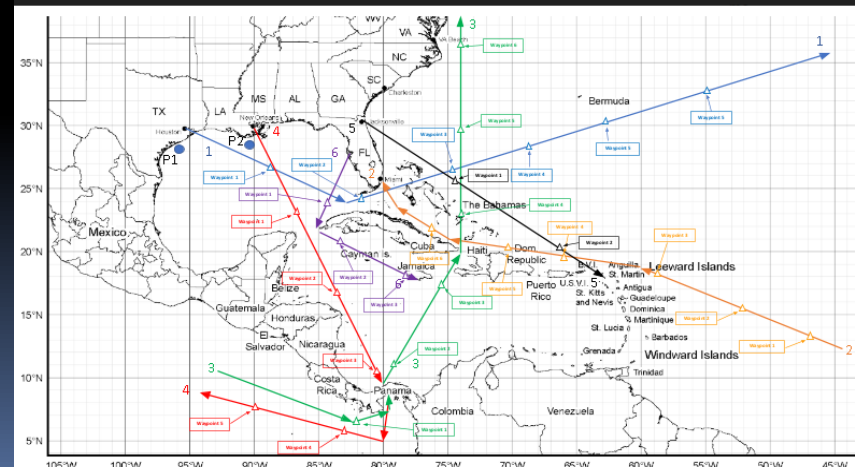
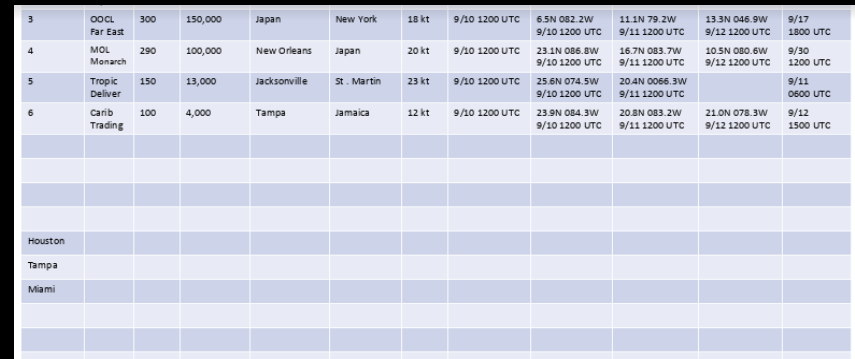
## Day 2: Breakout Sessions and Exercises

- Groups spent time in the hurricane specialist unit to learn how a forecast package is made for a tropical cyclone





- Groups had to make quick decisions during an exercise on whether or not to reroute ships due to approaching storms







# NHC Marine Workshop



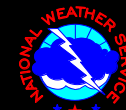
## Day 3: Upcoming Product Changes and Feedback

- Opportunity to get direct input about our products and get ideas and feedback about our future products





# Goal: Improve Safety of Life at Sea



National Team Developing Mariner's Virtual Weather Hazard Avoidance Training



**Mariner Weather  
Hazard Avoidance Training**

Observations. Analyses. Non-Tropical Forecast Uncertainty

**National Weather Service**

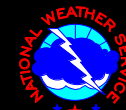
National Hurricane Center –  
Andy Latta, Hurricane Specialist  
John Cangialosi, Senior Hurricane Specialist

Central Pacific Hurricane Center–  
John Bravender, Warning Coordination Meteorologist

Ocean Prediction Center –  
Casey Joseph, Senior Marine Forecaster

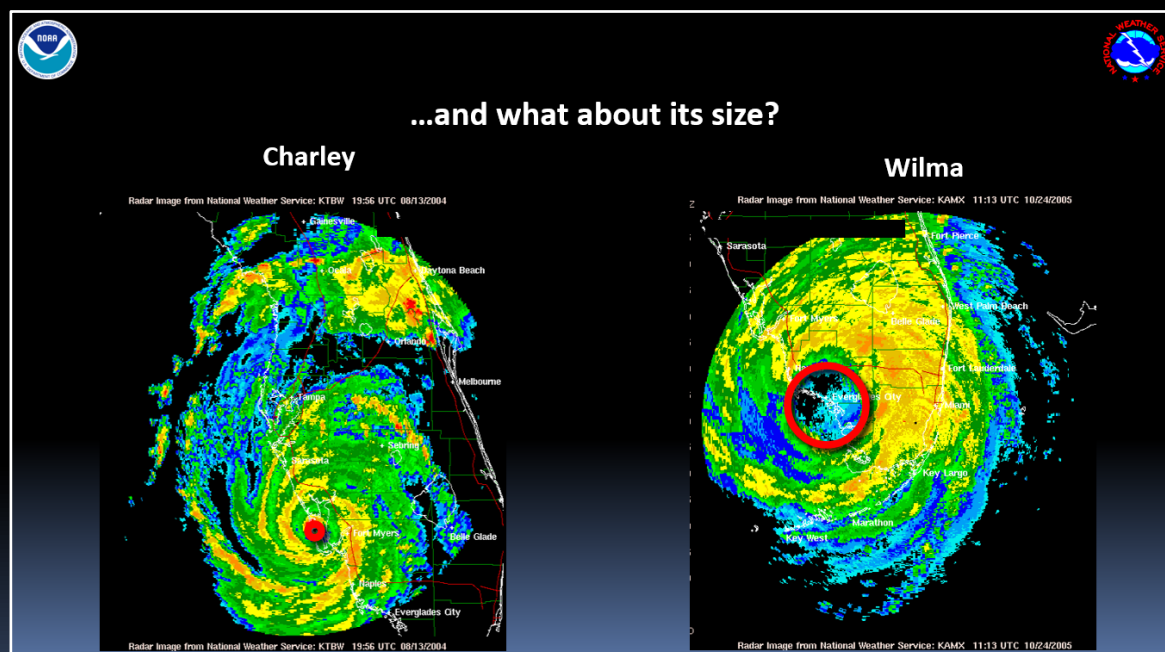


# Goal: Improve Safety of Life at Sea



## National Team Developing Mariner's Virtual Weather Hazard Avoidance Training

- 4 modules, approximately 45min – an hour in length each
- 2 modules focus on tropical cyclone hazards
- 2 modules focus on other marine hazards and marine observations
- Special sections devoted to learning about forecast and observational uncertainty





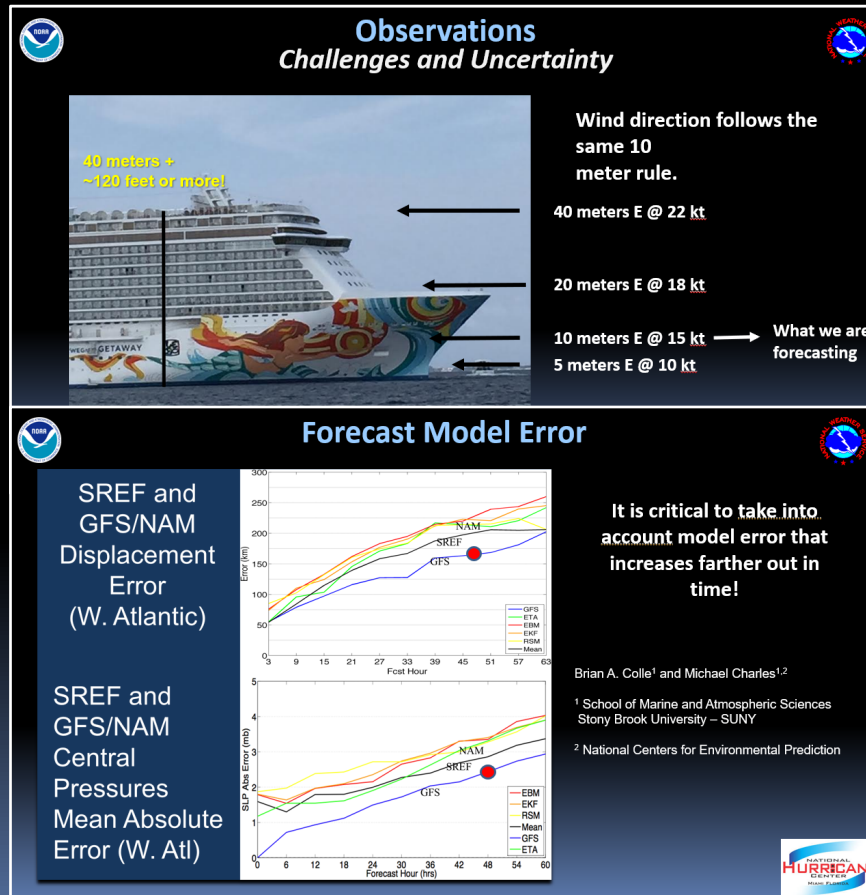


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# Thank You! Any Questions?



Photo Courtesy of NOAA