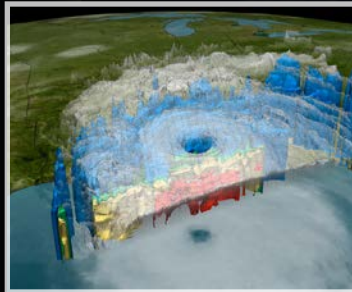
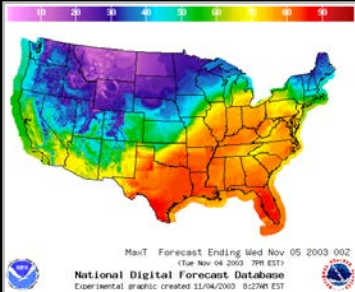
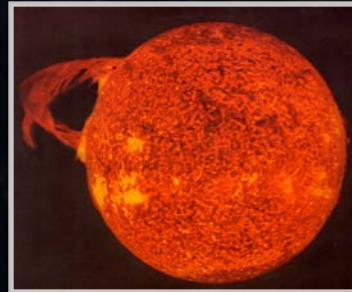
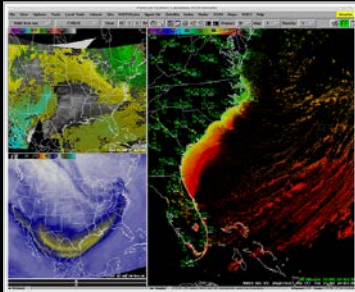


The National Centers for Environmental Prediction (NCEP): Enabling a Weather Ready Nation



Dr. William M. Lapenta

Director, National Centers for Environmental Prediction

NOAA/National Weather Service

Updated 06 November 2017



NWS Strategic Outcome: *A Weather- and Water-Ready Nation*



<https://www.facebook.com/NWS/videos>



“Ready, Responsive, Resilient”

Becoming a Weather-Ready Nation is about
building community resiliency in the face of increasing vulnerability to
extreme weather, water and climate events

Better forecasts and warnings

Consistent products and services

Actionable environmental intelligence

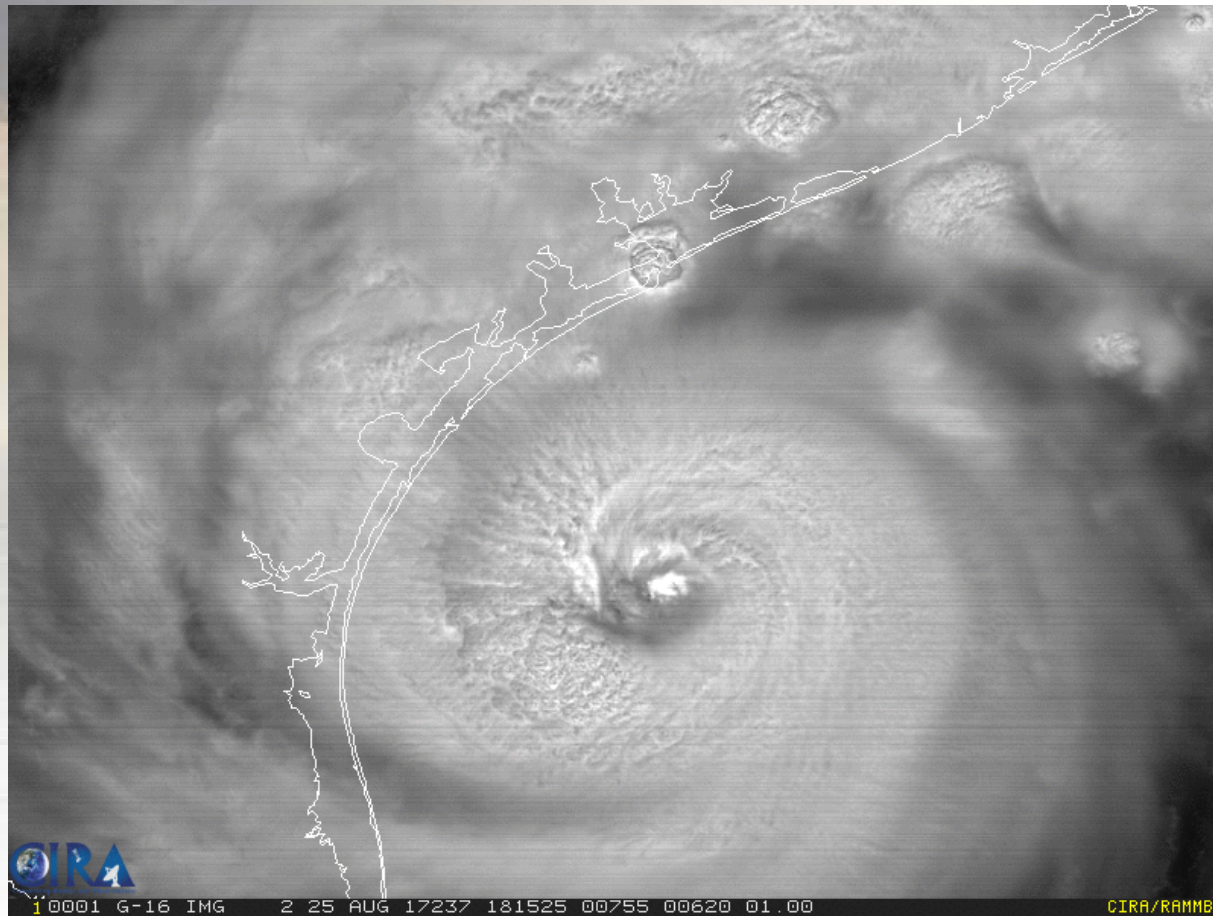
Connecting forecasts to decisions

Involves the entire US Weather, Water and Climate Enterprise WORKING TOGETHER

We have 6500+ WRN Ambassadors

Observation Improvements

GOES 16 – Harvey Intensification



GOES 16 is “redefining mesoscale meteorology”

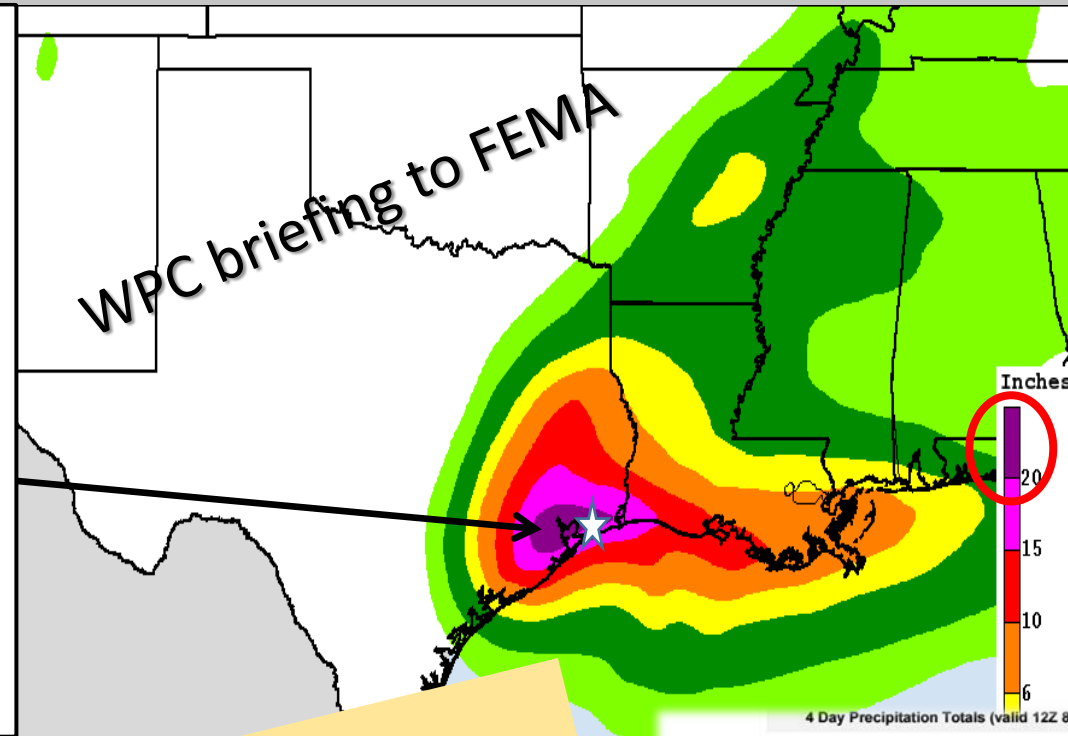
Harvey: WPC 5-Day Rainfall Forecast

Issued Monday, Aug. 28, 2017

The breadth and intensity of this rainfall are beyond anything experienced before and catastrophic flooding is now underway and expected to continue for days.

50 inches will be possible by end of the week.

And the forecast verified!



Event totals (inches):

Houston: 25-45

Port Arthur: 14-18

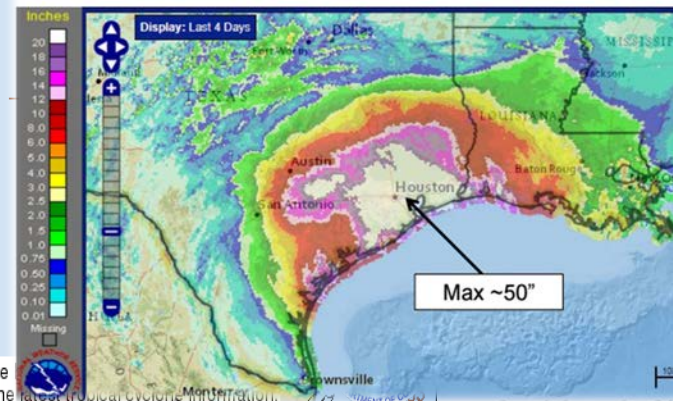
Victoria, TX: 12-15

Lake Charles: 14-18

New Orleans: 5-7

Tropical Storm HARVEY
120-hour Day 1-5 Rainfall Forecast (inches)
Created 7:17 AM CDT Mon Aug 28 2017
Valid 7:00 AM CDT Mon Aug 28 2017
through 7:00 AM CDT Sat Sep 2 2017
NOAA/NWS/NCEP/WPC

Local point maximum rainfall may be
See the NHC public advisories for the latest tropical cyclone information.

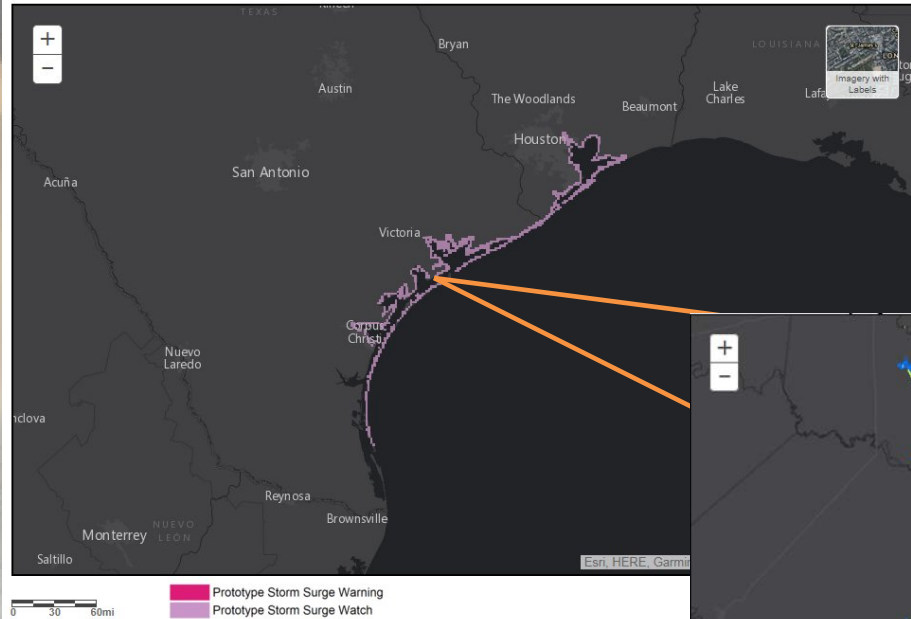


Max reported -
51.88" at Cedar
Bayou at FM 1942
(as of 5:00 pm EDT)

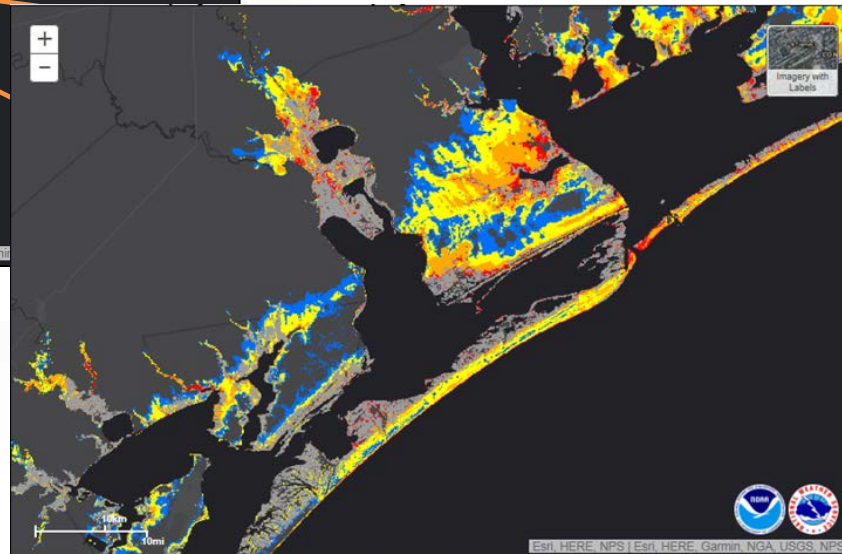
Harvey: Storm Surge Forecasts

Storm Surge Watch/Warning Graphic*

Tropical Depression Harvey
Advisory 012 Issued: 10:00 AM CDT Wed Aug 23

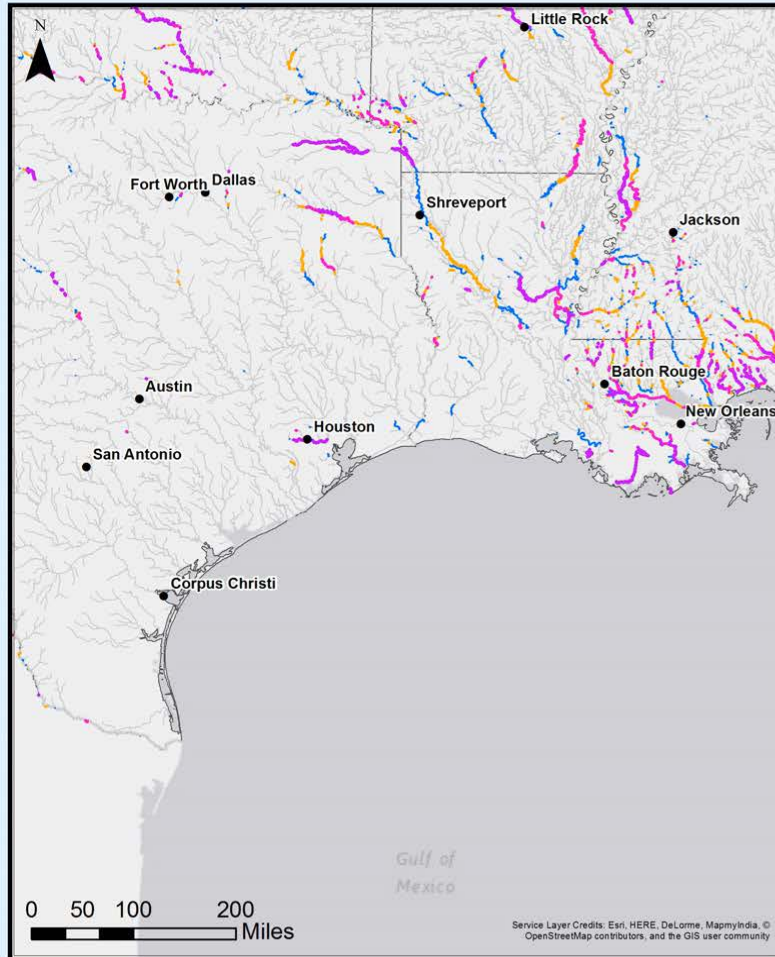


First ever Operational Storm Surge Watches and Warnings

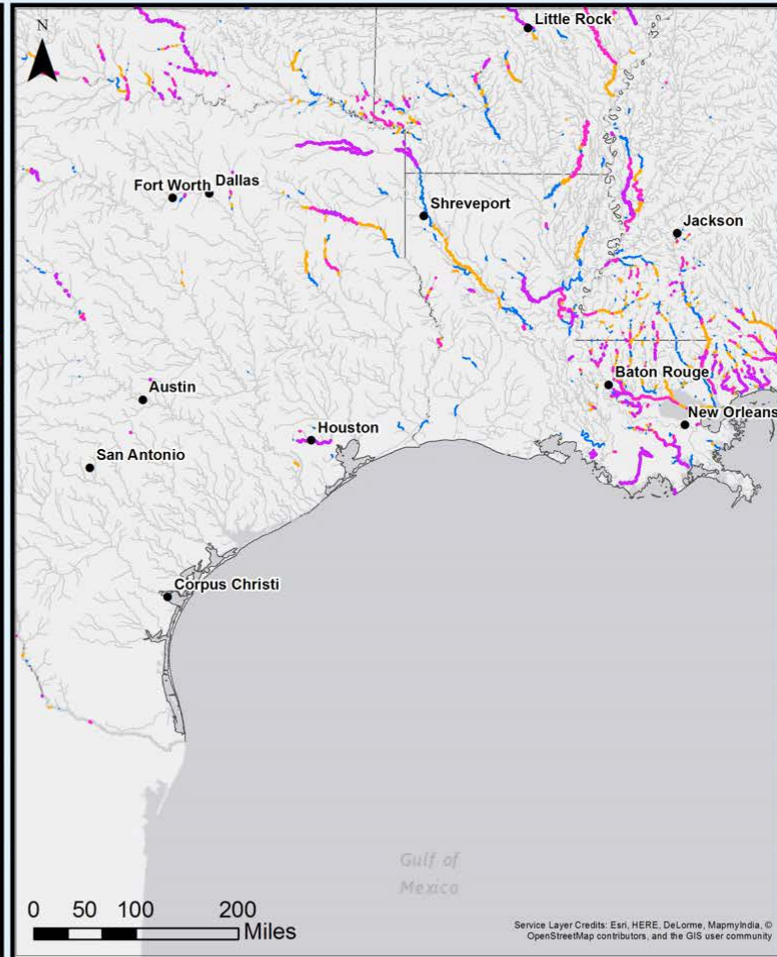


Harvey: NWS Streamflow Animation

National Water Model Medium-Range Forecast



National Water Model Analysis



Hurricane Harvey

These maps present a comparison of the Medium-Range Forecast (left panel) and Analysis (right panel) from the National Water Model.

High Flow Potential

- Major Potential for High Flow (> 200% over bankfull flow)
- Moderate Potential for High Flow (100 - 200% over bankfull flow)
- Minor Potential for High Flow (50 - 100% over bankfull flow)
- Near Bankfull Flow (0 - 50% over bankfull flow)
- National Water Model Streams
- Major U.S. Cities
- U.S. State Boundaries



OWP OFFICE OF WATER PREDICTION

Reference Time: 2016-08-22 12:00 UTC

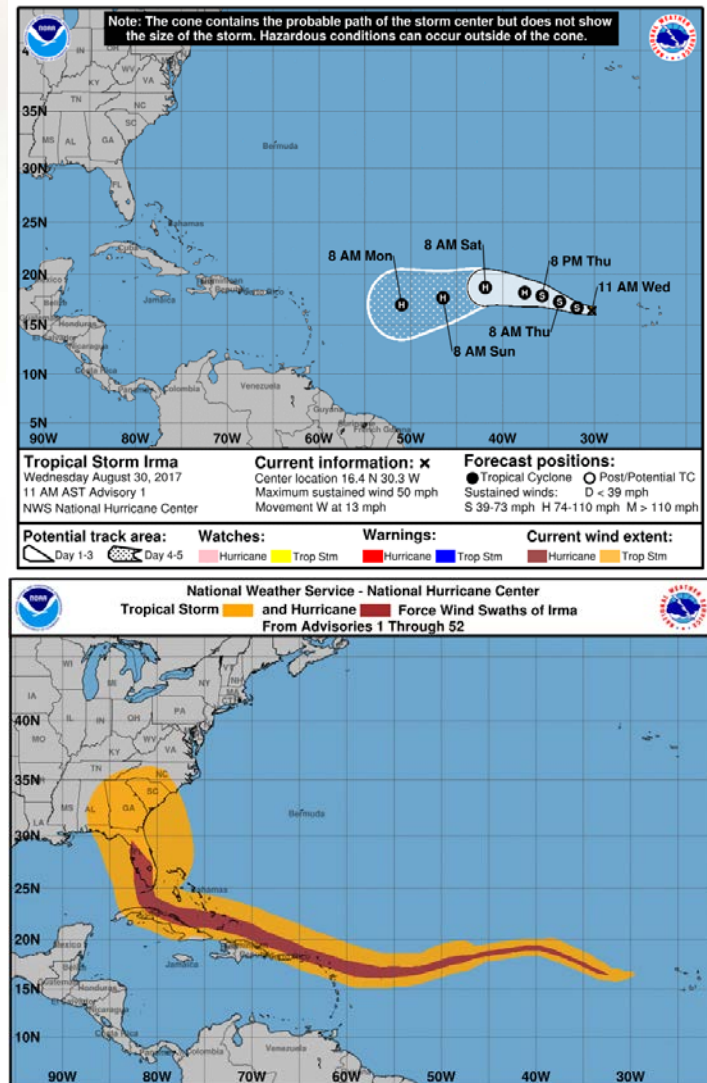
Valid Time: 2016-08-22 12:00 UTC

Valid Time: 2016-08-22 12:00 UTC

Overall extreme streamflow pattern forecast several days in advance by NWM

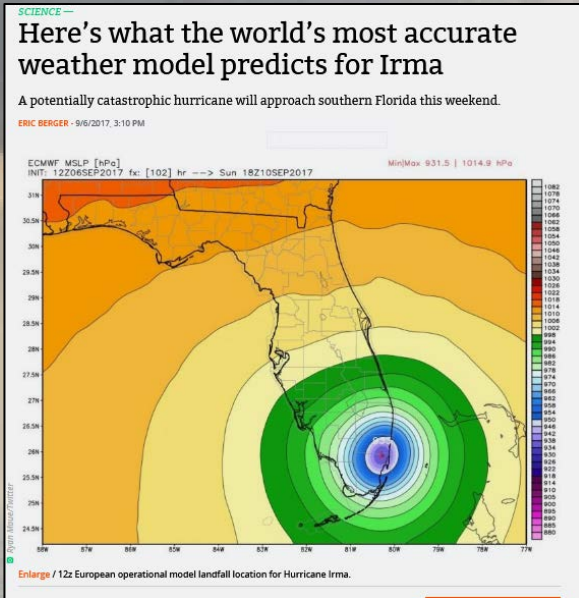
Irma: Forecast Improvements

- Models picked up on Irma before it formed in the Atlantic
- Indicated Southeast US threat 8-10 days in advance
- Sharp right turn to the north was expected based on good model (ensemble) agreement.
 - Exactly where it would occur was uncertain but confidence was high enough to alert Southeast US
- The forecast verified

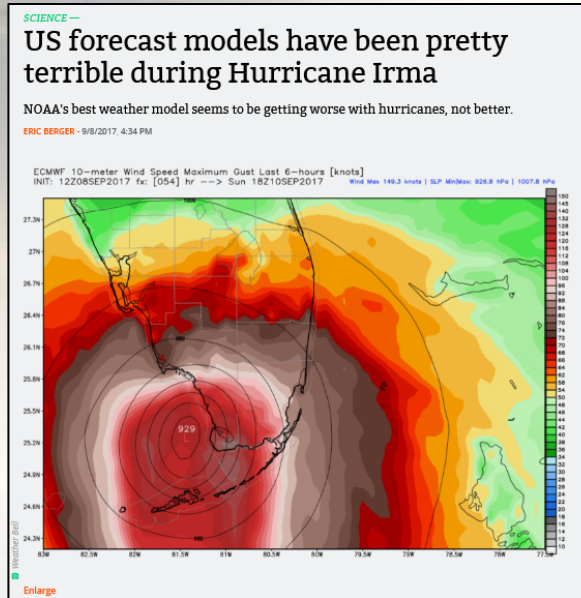


Focus on the Official Forecast

Changing Models Confuses the Public



September 5th



September 8th



September 10th

- We as an enterprise have avoid the “windshield wiper” forecasts
 - Trust our skills and forecasters
 - Improve our ensemble capabilities and understanding of ensemble forecasts
 - ***Don't chase model runs***

Historical Aspect: Provision of Impact Based Decision Support Services

Andrew 1992



- NHC connects with National and State EMs
- FEMA/National Recovery not prepositioned
- Slow to react to natural disasters
- National response tempo took 4 days to rise up and meet the challenges

Katrina 2005



- NHC connection with National and State EMs vastly expanded
- Variable connectivity with local, state/parish EM community
- Coordination beforehand problematic
- Recovery, supplies overwhelmed

Harvey/Irma 2017



- Entire NWS connected to National, State, Local EMs/WRMs
- Strong connection (embedding) at every level, especially at local level
- CONSISTENT messaging of forecasts and impacts
- Ready-Set-Go 7 days in advance
- All hands on deck to support field structure before, during, and after events