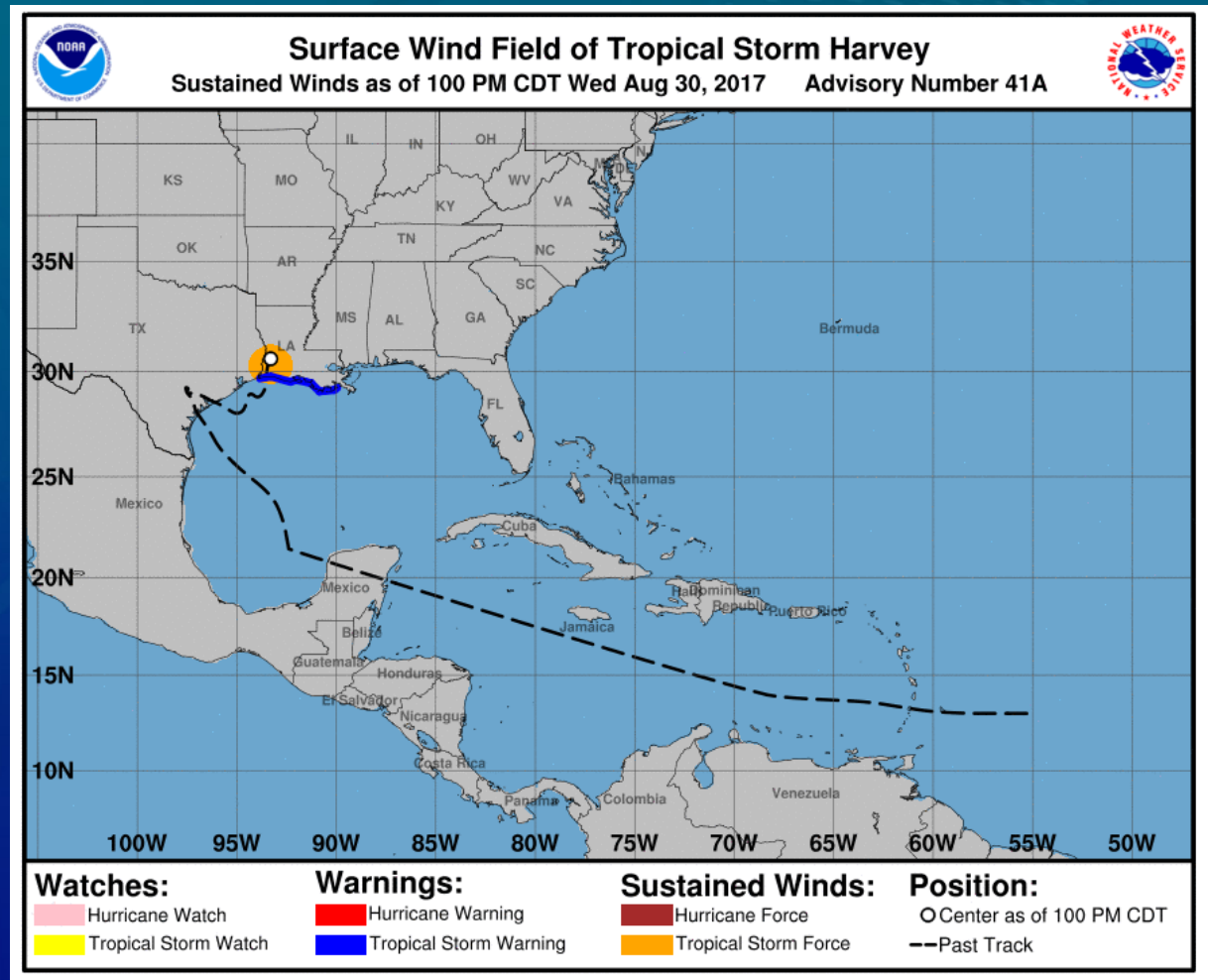




# Hurricane Harvey Preliminary Reconnaissance

Jason D. Averill, Chief  
Materials and Structural  
Systems Division

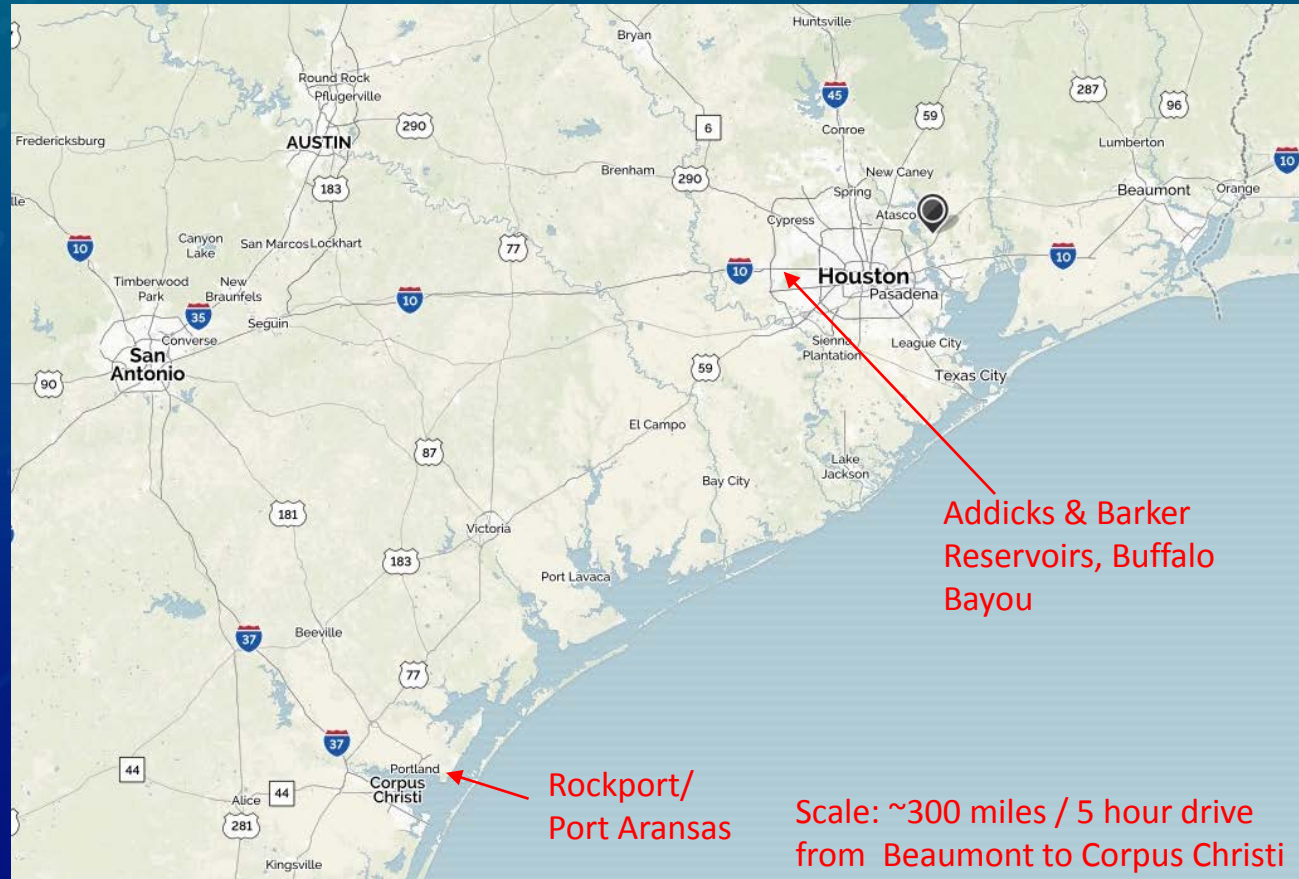
# Harvey Storm Track



- [http://www.nhc.noaa.gov/archive/2017/HARVEY\\_graphics.php](http://www.nhc.noaa.gov/archive/2017/HARVEY_graphics.php)



# Reconnaissance Area



Map from Mapquest.com – Edits by NIST



# Harvey Leadership Team

- Joe Main, Field Lead, Team 1
  - September 8 - 12, 2017
- Jason Averill, Field Lead, Team 2
  - September 11 – 15, 2017
- Judith Mitrani-Reiser, NIST Home Base Lead
  - Point of Contact for NIST Leadership, Field Teams
  - Virtual Team Coordinator



# Field Team 1: Rockport, Port Aransas, Houston

- Joe Main (EL) – Lead
- Jonathan Weigand (EL) – Structural Engineer
- Andrew Mundy (EL) – Data Collection & IT Support

—Partners – FEMA Pre-MAT



# Field Team 2: West Houston

- Jason Averill (EL) – Lead
- Dave Butry (EL) – Economics
- Maria Dillard (EL) – Social Sciences
- Ken Harrison (EL) – Resilience Modeling
- Travis Thonstad (EL) - Structures

—Partners: UT/GEER, Rice, TAMU, ARUP



# Harvey Virtual Team

Judith Mitrani-Reiser (EL)

- Stacy Bruss (Library)
- Jazalyn Dukes (EL)
- Juan Fung (EL)
- Jay Harris (EL)
- Jennifer Helgeson (EL)
- Marc Levitan (EL)
- Steve McCabe (EL)
- Elena Messina (EL)

• Zak Mohamoud (OISM)

- Mike Newman (PAO)
- Long Phan (EL)
- Kamel Saidi (EL)
- Chris Segura (EL)
- Matthew Speicher (EL)
- Justin Susteney (OISM)
- Doug Thomas (EL)
- Kevin Wong (EL)



# Physical inventory for each team

- Data collection

- Cellular phones
- Laptops
- Green books
- Measuring tape
- Hot spot
- GoPro

- Administrative

- Badges
- Business Cards
- Use/transfer agreements

- Safety

- Bug spray / sunscreen
- Hard hat
- Safety glasses
- Flashlight with extra batteries
- Puncture resistant shoes
- First aid kit
- Gloves (leather & nitrile)
- N95 respirators
- Water
- Ear plugs





# **WIND / STORM SURGE DAMAGES IN ROCKPORT / PORT ARANSAS**



# Residential Construction

## Rockport

Credit: Google



Before

Credit: NIST



After

Wind and Storm Surge Damage



# Residential Construction

## Rockport

Credit: Google



Before

Credit: NIST



After

### Wind Damage



# Residential Construction

## Rockport



Before



After

Wind Damage



# Residential Construction

## Rockport



Wind-Driven Rain Penetration



# Windborne Debris

Credit: NIST



Credit: NIST



Credit: NIST



# Windborne Debris



# Failure of Brick Veneer

Credit: NIST



Credit: NIST



Credit: NIST





# Roof-Mounted Solar Panels

## *Rockport*

Credit: Google



Before

Credit: NIST



After



# Pre-Engineered Metal Buildings

## Port Aransas

Credit: Google



Before



After

Credit: Google



Before

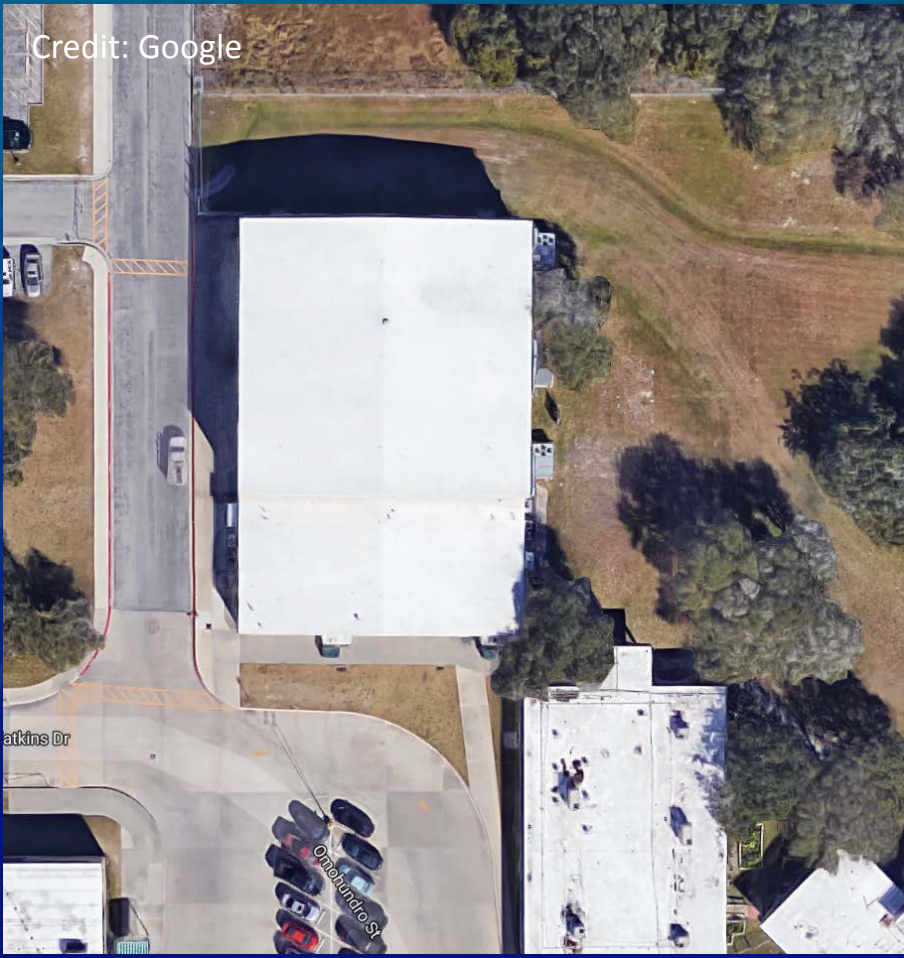


After

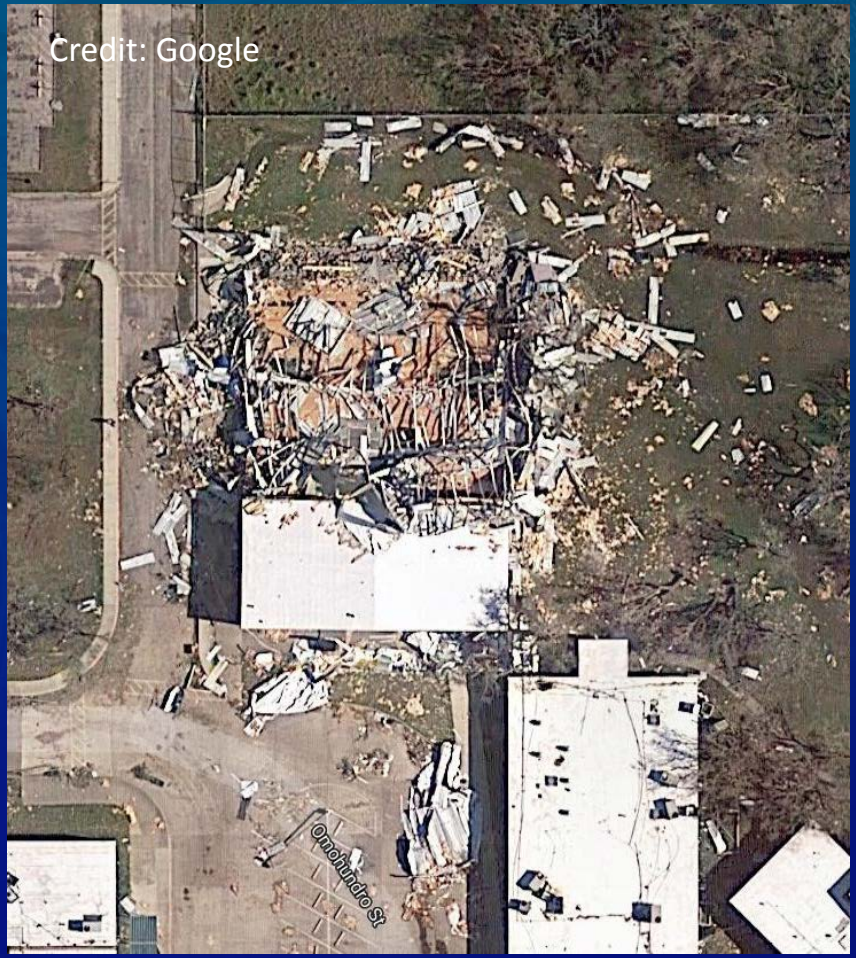


# Gymnasium Collapse

## Rockport-Fulton High School



Before



After

# Metal Boat Storage Facility

## Rockport

Credit: Google



Before

Credit: NIST



After



# Mechanical Equipment

Credit: NIST



Credit: NIST



# Mechanical Equipment



# Dislodgement of Rooftop Equipment *Rockport-Fulton Middle School*

Credit: Google



Before

Credit: Google



After



# Communications Tower Collapse

## Rockport

Credit: Google



Before

Credit: NIST



After

Credit: Google



Credit: Google





# Water Tower Collapse

## Aransas Pass

Credit: Google



Before

Credit: NIST



After



# FLOOD DAMAGES IN WEST HOUSTON



# Observations

- Single Family Residences



- Fences



- Multi-Family Residences



# Observations

- Bridges  
(Buffalo Bayou under Eldridge)

Water Line



- Schools



# Observations

- Wastewater Treatment Plant



- Electrical Substation



# Observations

- Fire Station



# Observations

- Vehicles



- Businesses



# Harvey Summary

- Subsequent deployment decision will be made once observations from Hurricane Irma (possibly Hurricane Maria) are also available.
- Opportunity for team members to evaluate field protocols and technologies.

