



# **USEPA Region 6 Environmental Justice Forum 2018**



# **Hurricane Harvey The State and Federal Response**

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Critical Infrastructure Division  
Office of Compliance and Enforcement  
Texas Commission on Environmental  
Quality**

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Emergency Response Branch –  
Region 6  
U.S. Environmental Protection Agency**

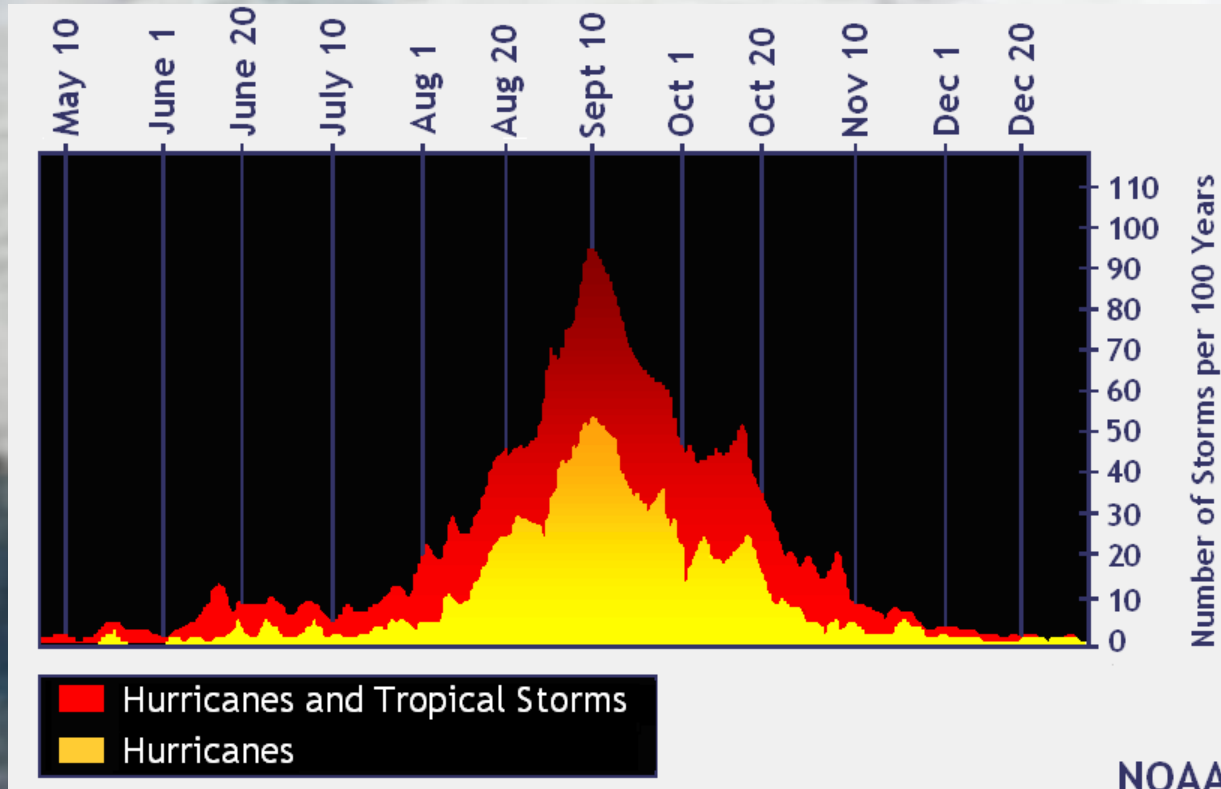


# USEPA Region 6 Environmental Justice Forum



## Hurricane Season

Hurricane season officially begins on June 1 and ends on November 30, but tropical cyclones do form outside of those dates



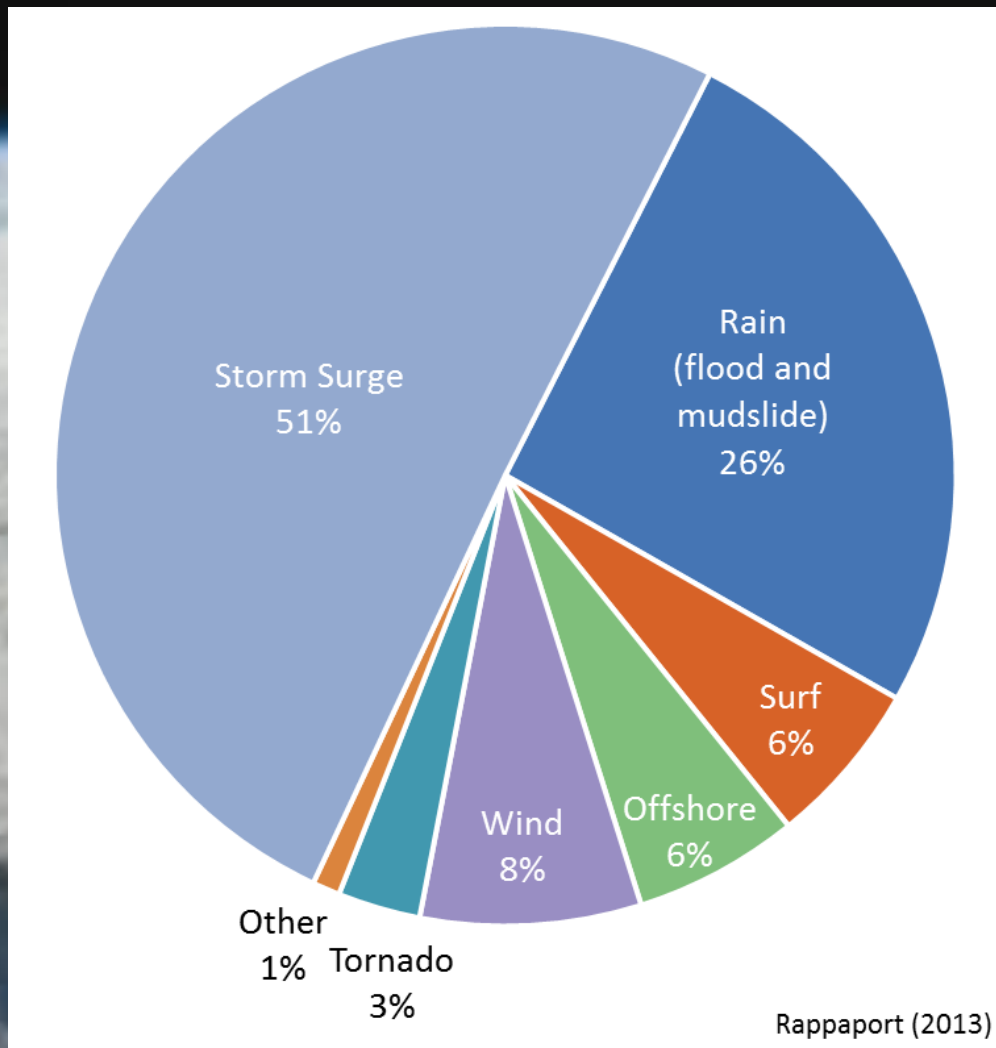
This chart shows hurricane and tropical storm activity in the Atlantic and Gulf of Mexico







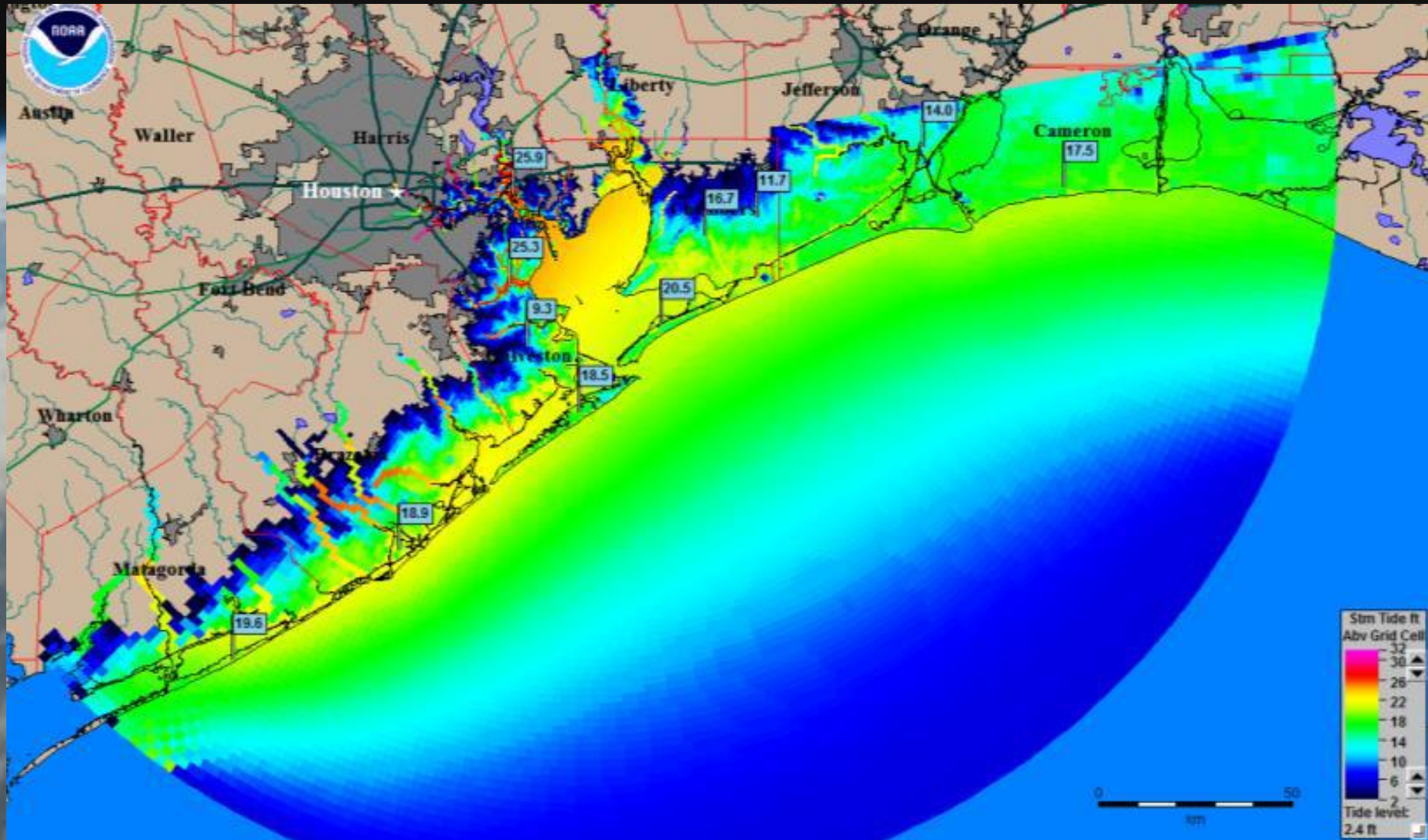
## Hurricane Impacts







# Storm Surge



Maximum expected surge, for a category 5 storm at high tide



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## Hurricane Annex



[www.txdps.state.tx.us/dem/documents/planState/annexHurricane.pdf](http://www.txdps.state.tx.us/dem/documents/planState/annexHurricane.pdf)

### Texas Commission of Environmental Quality (TCEQ)

Phase	TCEQ Responsibilities
<b>Hurricane Preparedness</b>	<ul style="list-style-type: none"><li>▪ Contact refineries in hurricane evacuation zones to make inquiries regarding facilities.</li><li>▪ Coordinate with NDOW partners. Initiate incident in Response Manager data management system.</li><li>▪ Storm debris management planning.</li><li>▪ Fuel waiver coordination.</li></ul>
<b>Response</b>	<ul style="list-style-type: none"><li>▪ Process fuel waivers</li><li>▪ Conduct rapid needs assessments in conjunction with NDOW partners (TGLO, TPWD, USCG, US EPA).</li><li>▪ Coordinate and process fuel waiver requests (EPA, DOE and Fuel Coordination Team).</li><li>▪ Assess and provide technical infrastructure assistance to public water supply systems and wastewater systems.</li><li>▪ Assess dams.</li><li>▪ Authorize temporary debris management sites.</li><li>▪ Support interoperable communications.</li><li>▪ Provide a mobile command post to support ESF 3 and ESF 10 operations.</li><li>▪ Coordinate HAZMAT and oil spill recovery operations.</li></ul>



# A LOOK AT HURRICANE HARVEY



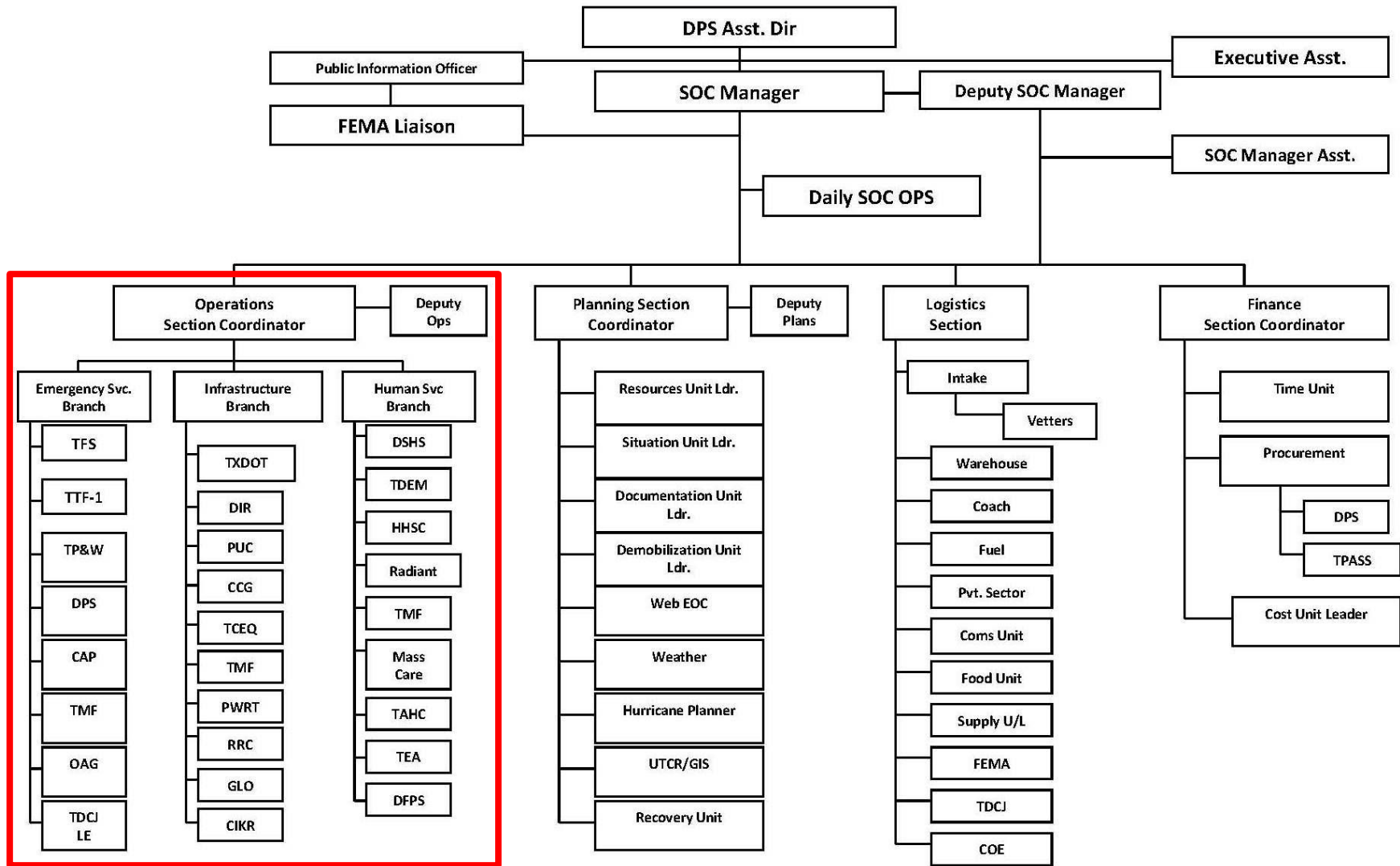
**FLOOD IMPACT ZONE**  
SR ROC  
Purple squares represent points that are forecast to reach MAJOR or RECORD flooding.  
Green areas are areas that have created and are below major. This area while still potentially inundated is receding below major impact levels.

EMAN SOTO JENSEN



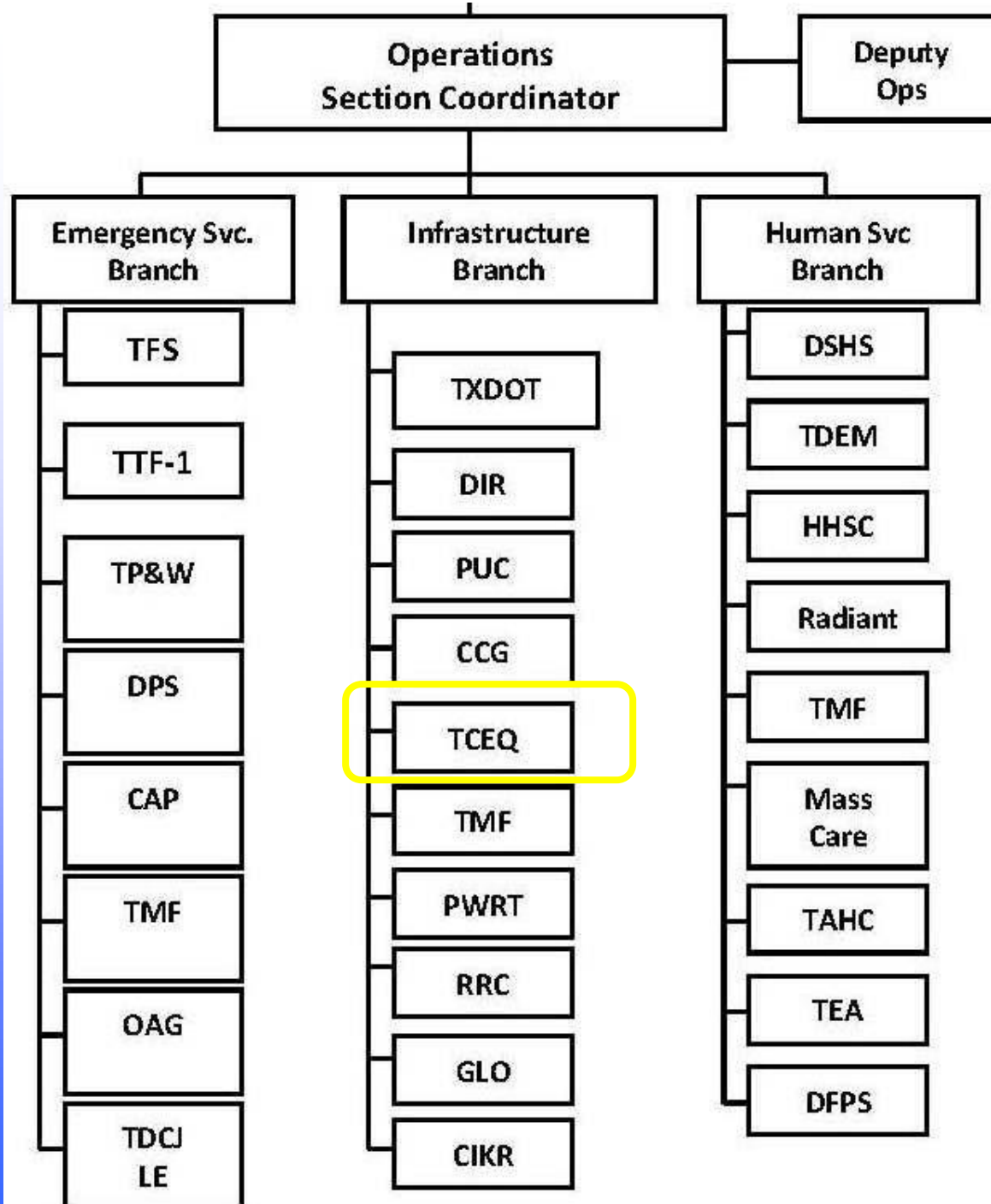


# State Management Team



2012







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


## H-120 Clock Countdown

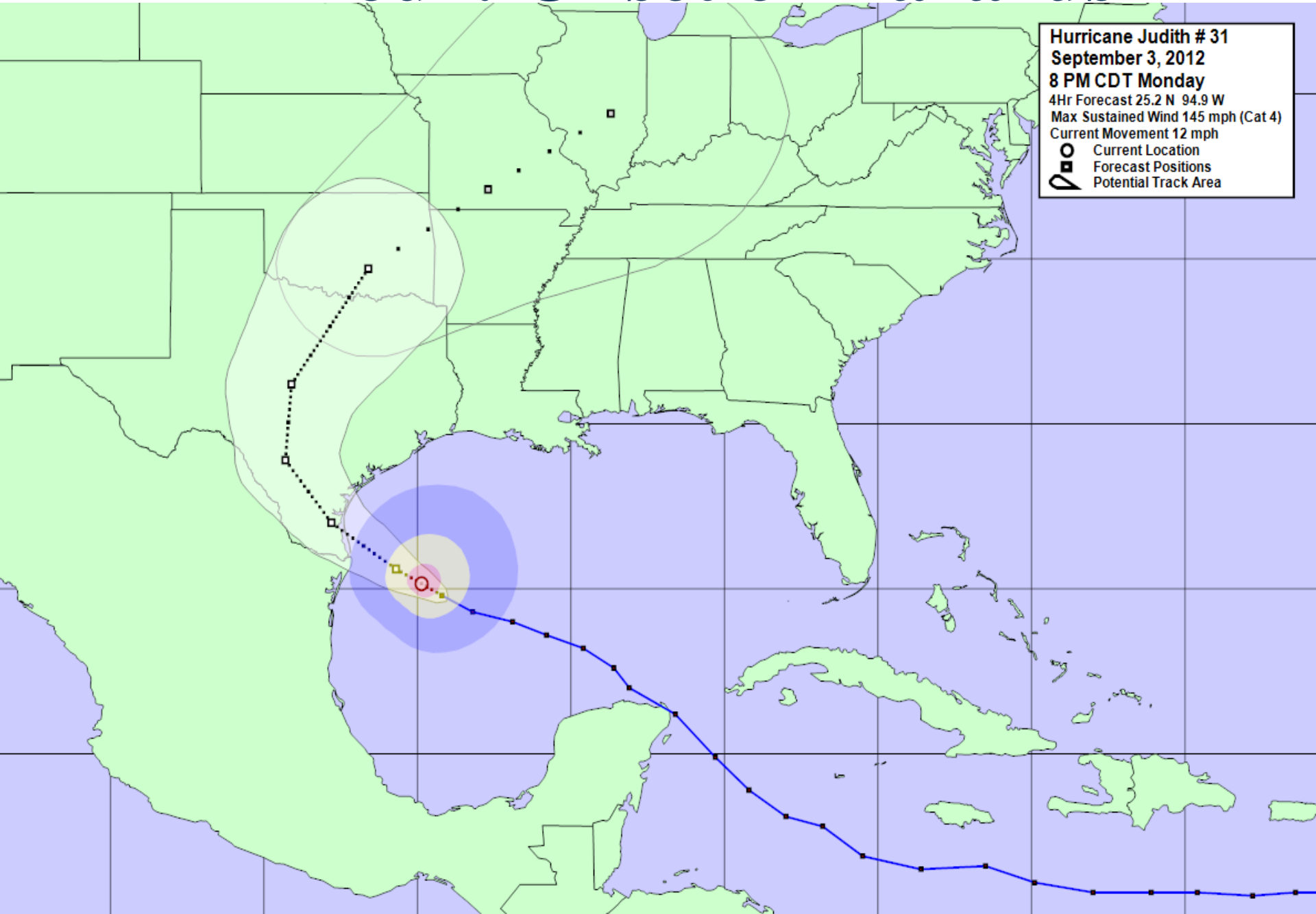
- **H-0 is when tropical storm-force winds ( $\geq 39$  mph) reach the coast**
- **The countdown clock starts at H-120 hours**
- **The clock will adjust according to the prediction of landfall (*i.e.*, we may not get 120 hours to begin with)**



# H-Hour: Onset of Hazards

**Hurricane Judith # 31**  
**September 3, 2012**  
**8 PM CDT Monday**  
4Hr Forecast 25.2 N 94.9 W  
Max Sustained Wind 145 mph (Cat 4)  
Current Movement 12 mph

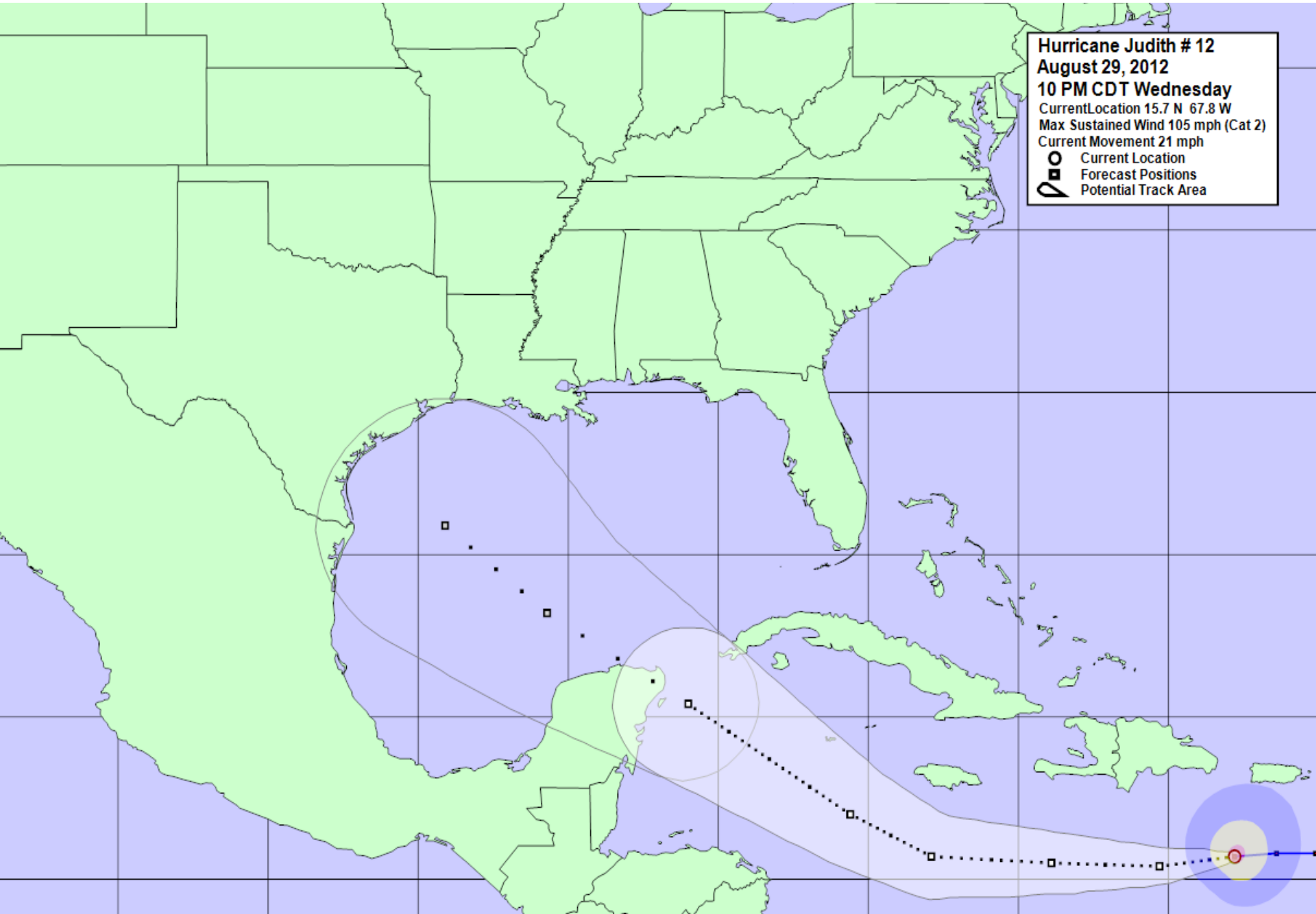
 Current Location  
 Forecast Positions  
 Potential Track Area



# H-120

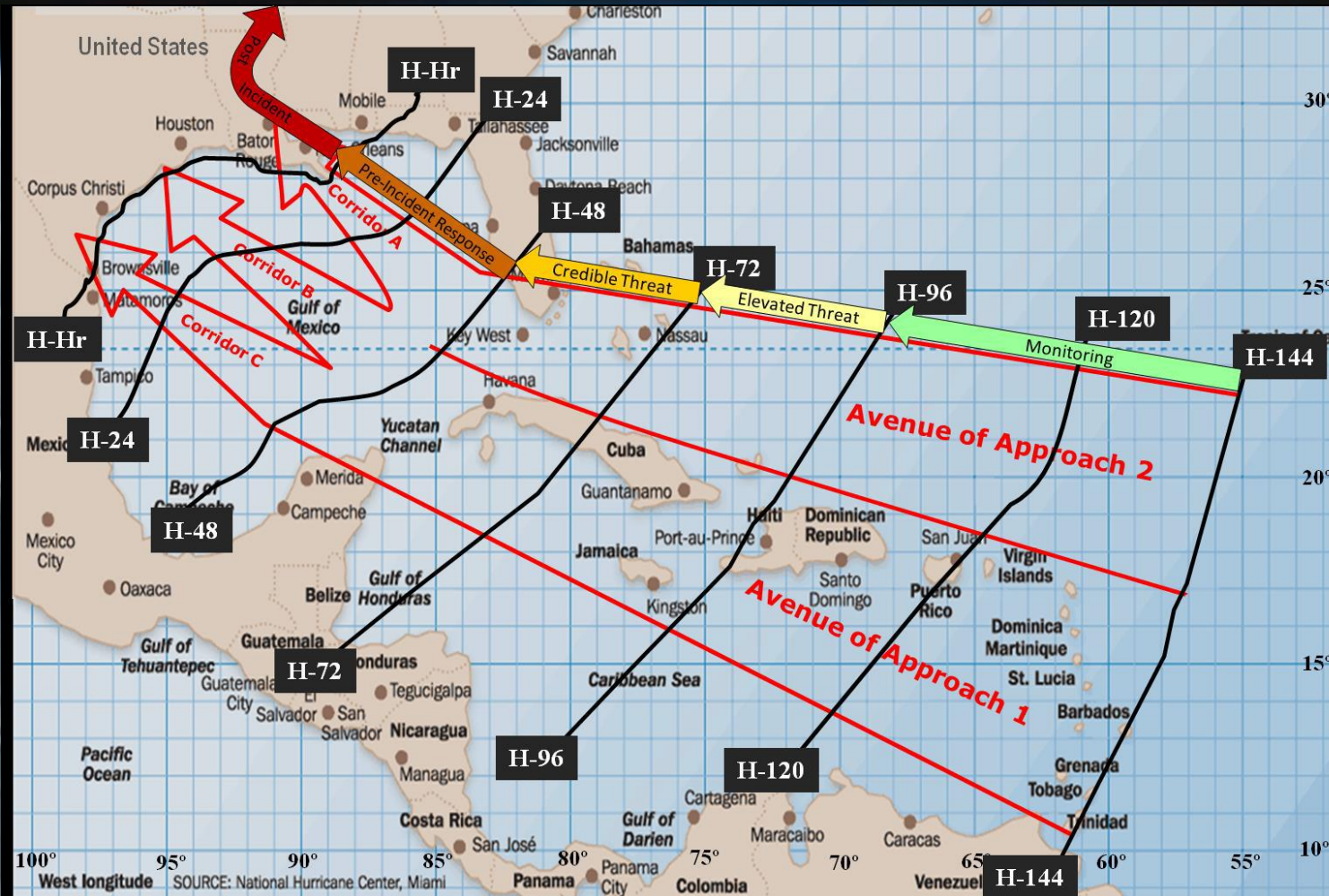
**Hurricane Judith # 12**  
**August 29, 2012**  
**10 PM CDT Wednesday**  
Current Location 15.7 N 67.8 W  
Max Sustained Wind 105 mph (Cat 2)  
Current Movement 21 mph

- Current Location
- Forecast Positions
- Potential Track Area





# Tropical Cyclone Location and Timing



Average or possible distances that tropical cyclones can travel as they approach the coast of the Gulf of Mexico



# TCEQ H-120 Countdown Activities Example

Refinery, Petrochemical Industry and Other Production Facilities Status

Remediation Facilities Evaluation

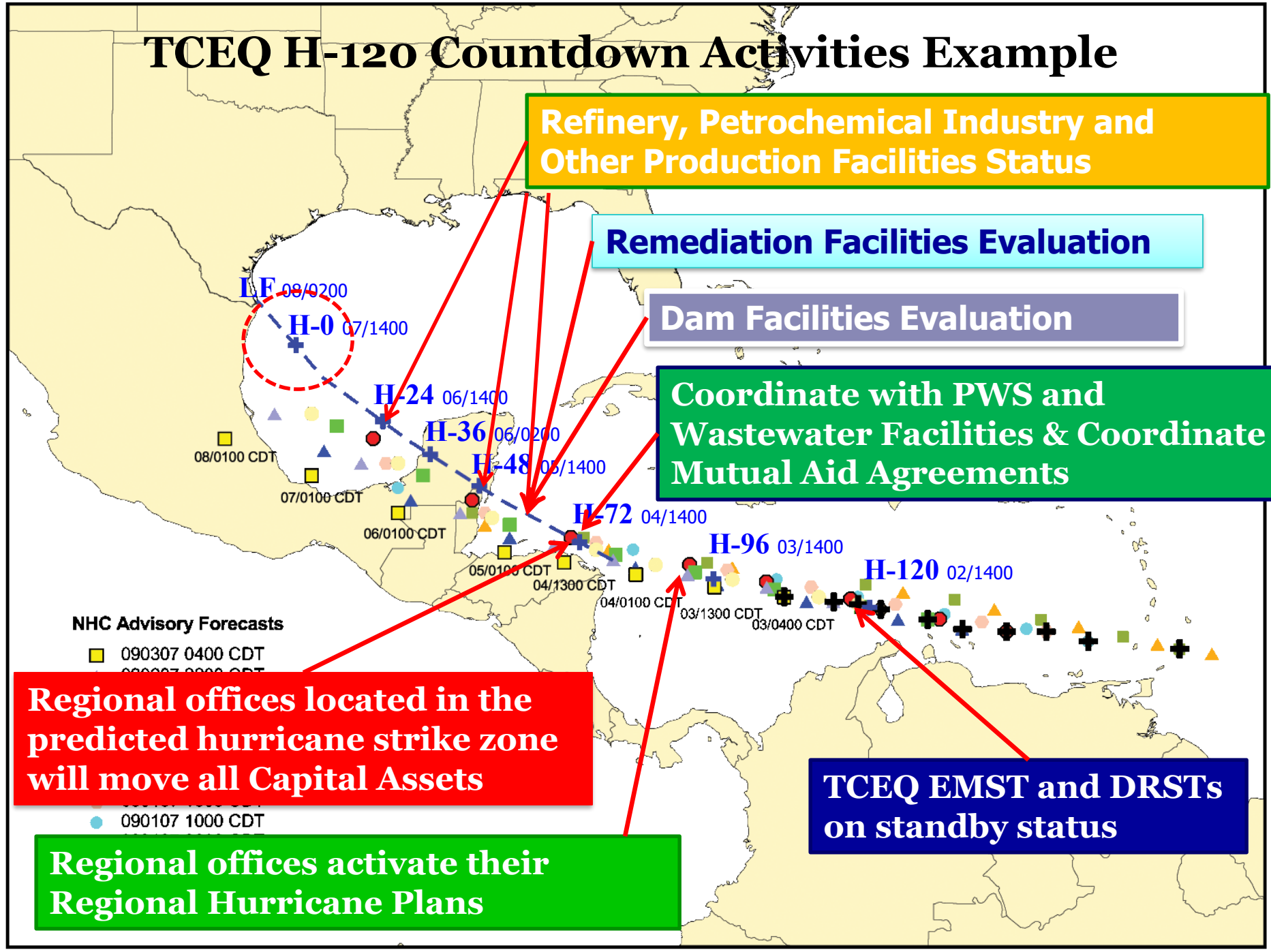
Dam Facilities Evaluation

Coordinate with PWS and Wastewater Facilities & Coordinate Mutual Aid Agreements

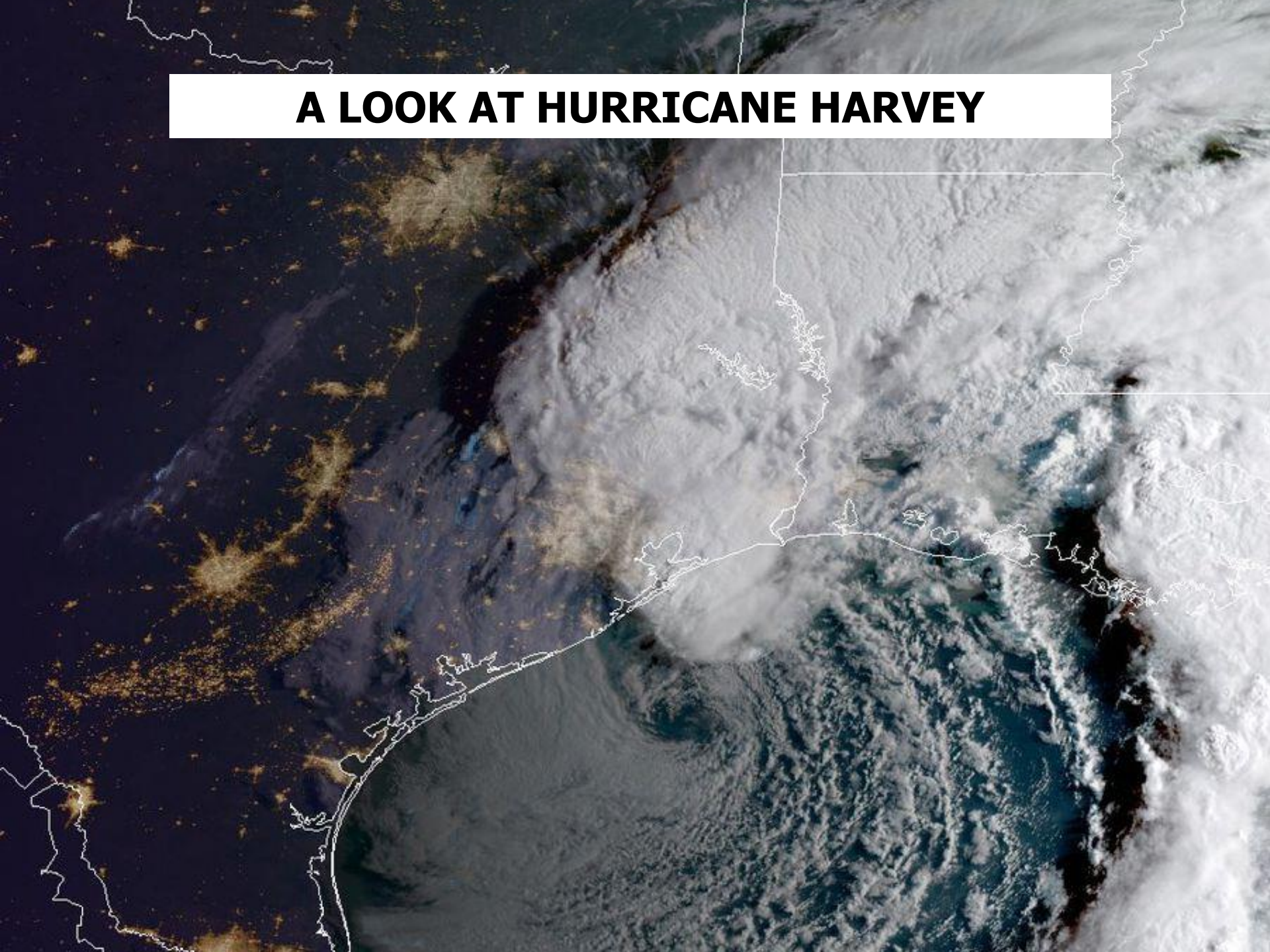
Regional offices located in the predicted hurricane strike zone will move all Capital Assets

TCEQ EMST and DRSTs on standby status

Regional offices activate their Regional Hurricane Plans



# A LOOK AT HURRICANE HARVEY







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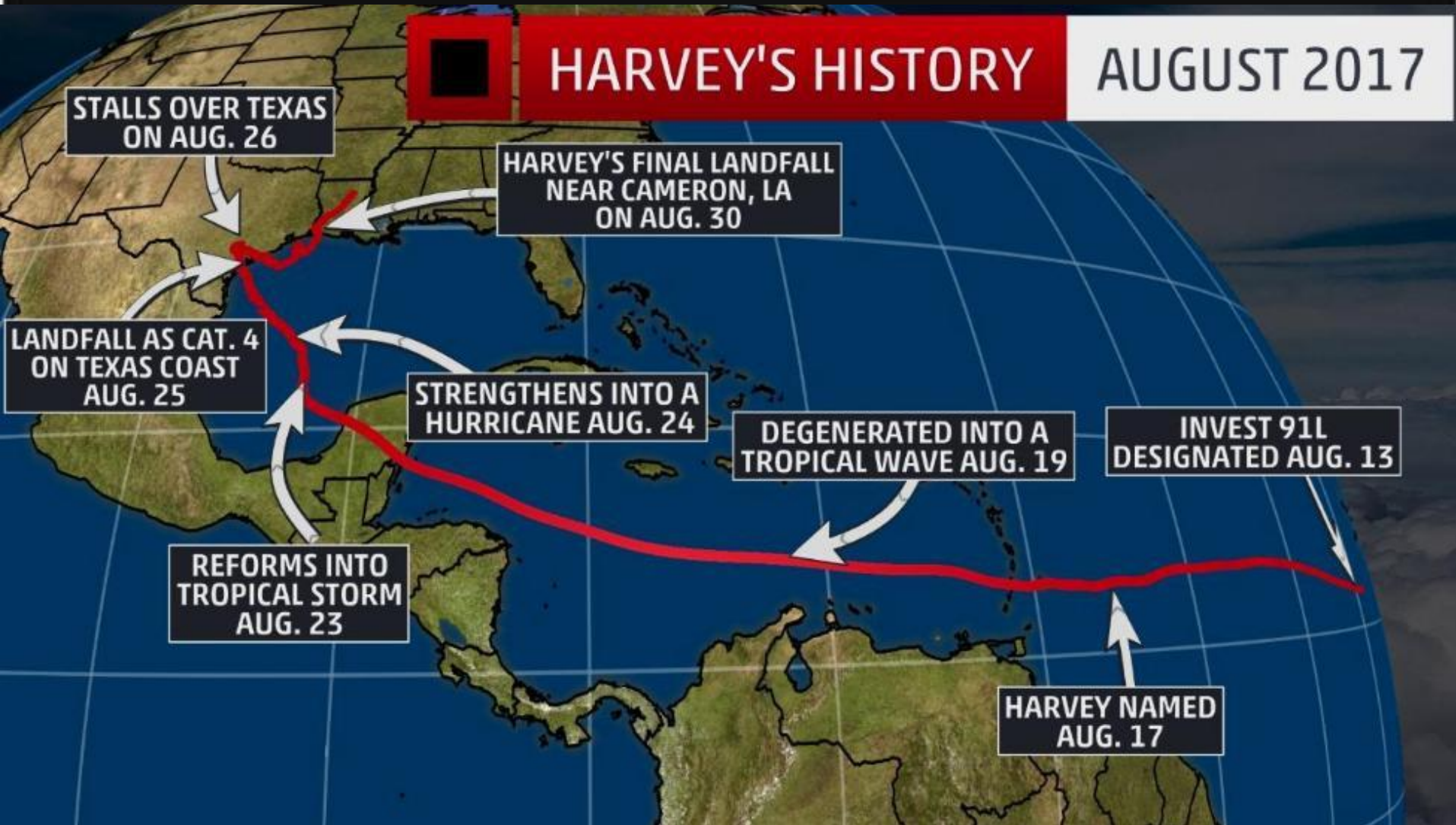
## Hurricane Harvey Highlights

- August 23<sup>rd</sup> - Within 56 hours, Harvey grew from a regenerated Tropical Depression over the Gulf of Mexico to a Category 4 Hurricane.
- August 25<sup>th</sup> - Hurricane Harvey made landfall as a Category 4 with winds 130 mph at Rockport, TX
- August 26<sup>th</sup> to 30<sup>th</sup> - As a weakened Hurricane and a Tropical Storm, Harvey meandered through Texas dropping 41 to 61 inches of rain.
  - Harris County Flood Control District estimated 1 trillion gallons of rain dumped on Harris County and the City of Houston in 4 days.



# HARVEY'S HISTORY

AUGUST 2017



Effected 275 miles of coast line





FRI 9:50 PM CDT





# Harvey Rainfall Overview

Harvey – 7 Day Precipitation through 9/1/17



West Gulf  
River Forecast Center

## Observed Precipitation

National Weather Service

Valid Ending Friday September 1st, 2017 at 3 PM CDT



Graphic Created  
September 1st, 2017  
3:59 PM CDT

- Estimates for Texas alone...Harvey dumped an estimated 53.4 million acre-feet of water on Texas
- Gage reports in excess of 50 inches in the Houston area
- Heavy rainfall from just east of the Austin/San Antonio area to the Texas/Louisiana border
- Numerous new flood records on area rivers

9/1/2017 4:05 PM

[www.weather.gov/wgrfc](http://www.weather.gov/wgrfc)

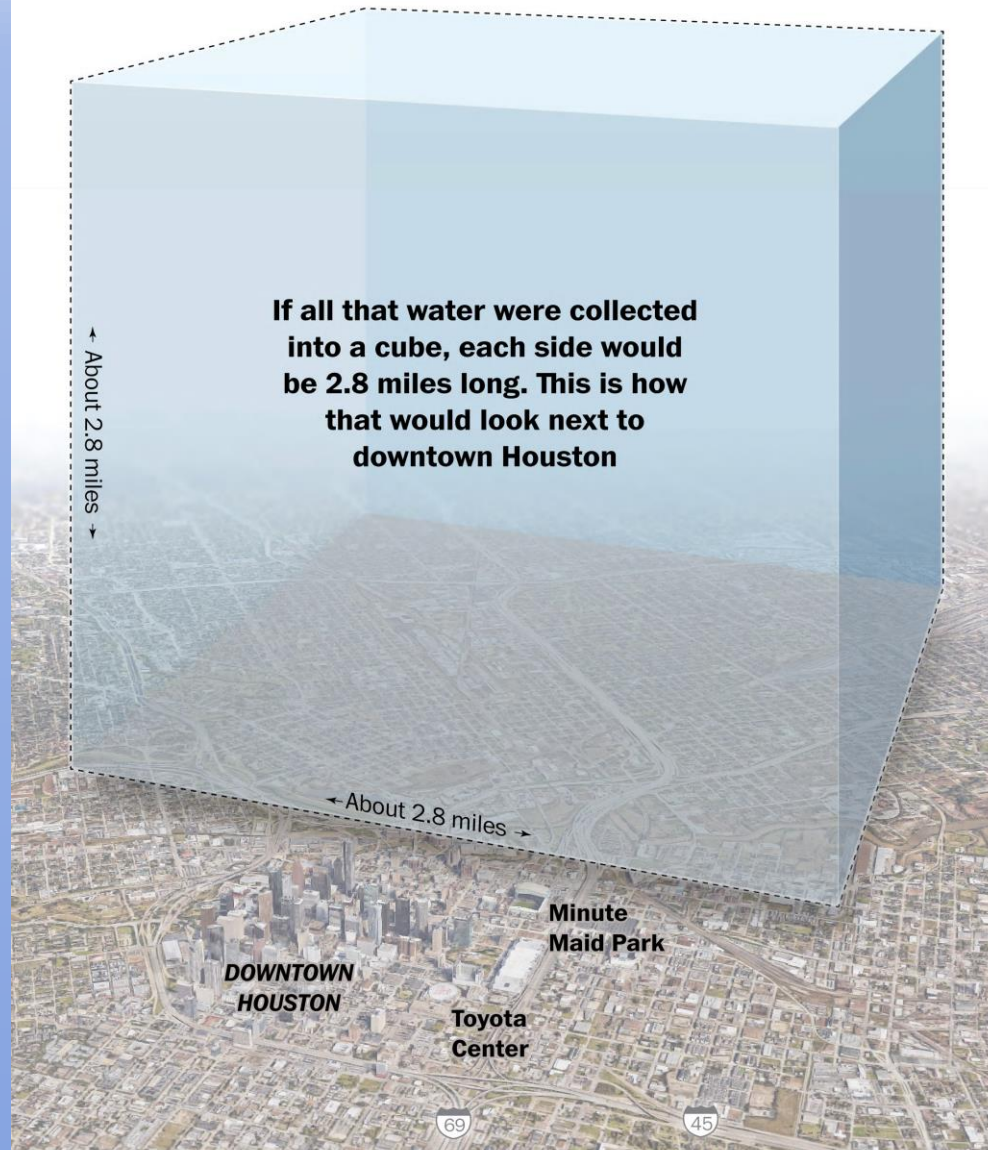
## State Weather Call:

- Weather Service projected 18 inches or rain
- State Emergency Manager said to plan for 36 inches of rain



## What would 24.5 trillion gallons of water look like?

As of Wednesday morning, about 24.5 trillion gallons of rain have fallen along the Gulf of Mexico. About 19 trillion gallons across the greater Houston area and Southeast Texas, as well as an additional 5.5 trillion in Louisiana.



Hurricane Harvey has dumped 21 trillion gallons of rain as of midnight, according to WeatherBell Meteorologist Ryan Maue. That amount of water could...

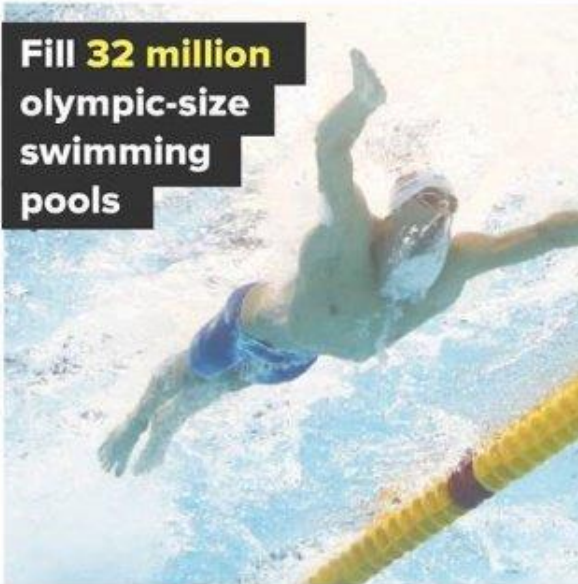
Fill the Great Pyramid of Giza nearly **31,000 times**



Fill **more than half** of Lake Tahoe



Fill **32 million** olympic-size swimming pools



Flow over Niagara Falls for **321 days**





# A LOOK AT HURRICANE HARVEY



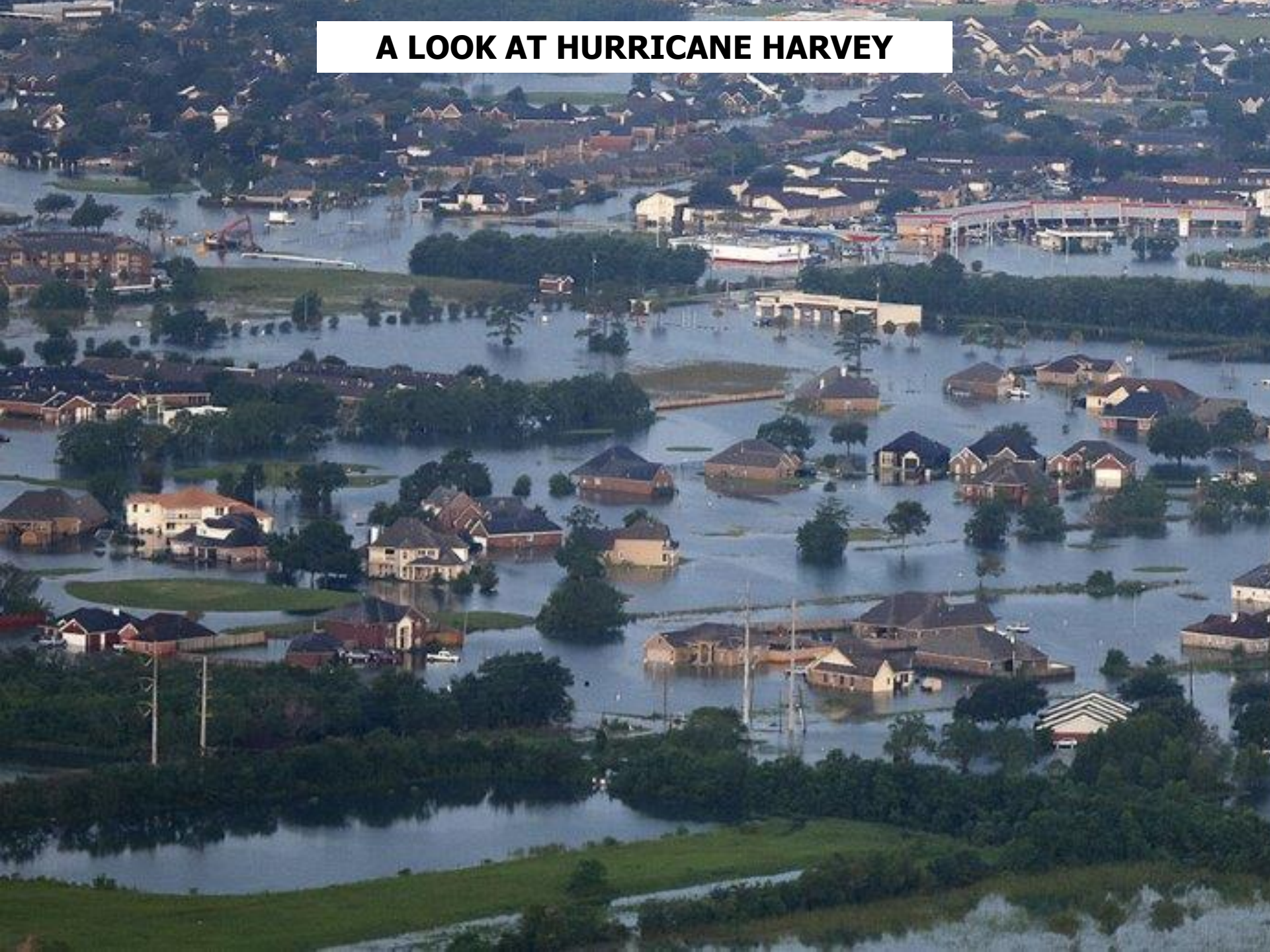


# A LOOK AT HURRICANE HARVEY





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# USEPA Region 6 Environmental Justice Forum

# Natural Disaster Operational Workgroup (NDOW)



<http://eparesponsemanager.net/ndow/>

The screenshot shows a web browser window with the URL <http://eparesponsemanager.net/ndow/>. The page title is "NATURAL DISASTER OPERATIONAL WORKGROUP". On the left side, there is a vertical navigation menu with buttons for Home, Calendar, Contacts, Documents, Photos, Links, RM Support, Coastal Spill Plans, and Login. The main content area features a "Mission Statement" section, followed by a list of agencies comprising the NDOW. At the bottom of the page, there is a footer with logos for EPA Region Six, the Gulf Coast District Eight, TCEQ, the Texas General Land Office, Texas Parks & Wildlife, and NOAA. The text "Established April 2009" is centered at the bottom.

## NATURAL DISASTER OPERATIONAL WORKGROUP

**Home**  
**Calendar**  
**Contacts**  
**Documents**  
**Photos**  
**Links**  
**RM Support**  
**Coastal Spill Plans**  
**Login**

**Mission Statement :**

The Natural Disaster Operational Workgroup (NDOW) was created as a result of the Hurricane Ike Texas response to improve coordination between State and Federal Agencies operating under Emergency Support Functions (ESF)s 3 and 10. Like the NRF, NDRF, and NIMS the NDOW seeks to establish an operational structure and common planning framework. The NDOW established a framework of standard operational procedures, standardized data quality objectives, one common database system, training and exercises for effective coordination of multi-agency response to man-made and natural disasters. The NDOW framework is a concept of operations and not intended to impose new, additional or unfunded net resource requirements on State or Federal agencies. In support of the National Incident Management System (NIMS) the framework optimally engages existing State and Federal resources and authorities, incorporating the full capabilities of all sectors. The NDOW intends to institutionalize and expand use of standardized procedures throughout all Gulf Coast Regional Response Team (RRT) agencies to ensure effective incident response in support of community recovery.

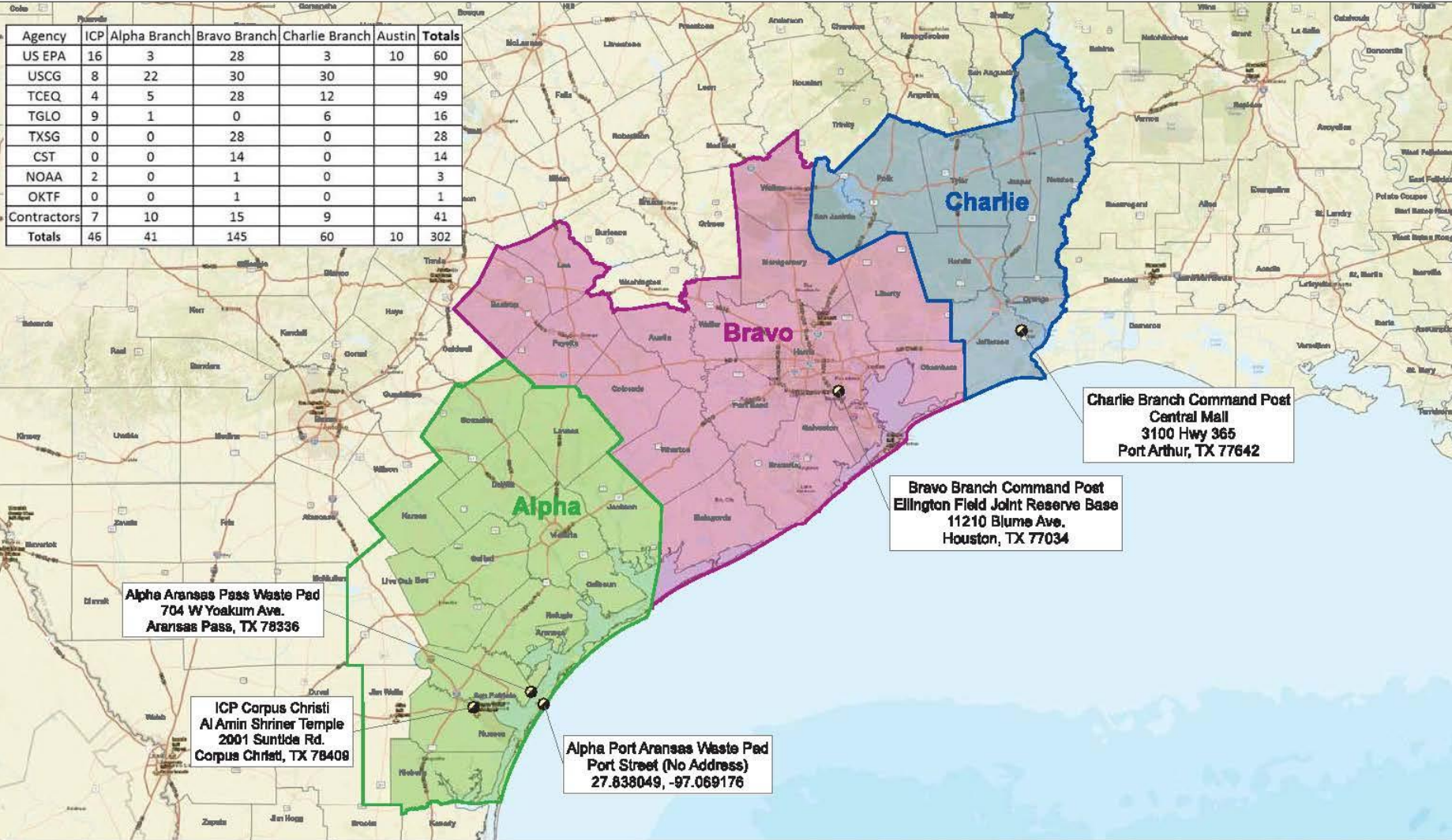
**The NDOW is comprised of the following Agencies:**

- United States Environmental Protection Agency Region Six
- United States Coast Guard District Eight
- Texas Commission on Environmental Quality
- Texas General Land Office
- Texas Parks and Wildlife Department

EPA Response Manager is currently on version 6.0.9. To download the latest install package, [click here.](#)

Established April 2009



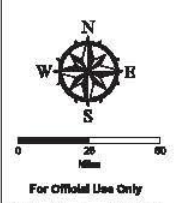


**Legend**

Federally Declared Counties

- Alpha Branch
- Bravo Branch
- Charlie Branch
- Incident Command Post (ICP) /Staging Area
- County Boundary

**USA EPA REGION 6  
Overview Map  
Alpha, Bravo, Charlie  
Hurricane Harvey Response**



EPA GIS  
Printed: 5:42:50 PM 8/6/2017



# A LOOK AT HURRICANE HARVEY



# A LOOK AT HURRICANE HARVEY







STATE  
OF TEXAS

# TCEQ and USEPA Unified Command for Hurricane Harvey Response





# TCEQ and USEPA Unified Command for Hurricane Harvey Response





# TCEQ and USEPA Unified Command for Hurricane Harvey Response







# USEPA Region 6 Environmental Justice Forum



## TCEQ Disaster Response Strike Teams (DRSTs):

- 16 DRSTs, one in each TCEQ region
- Approximately 129 members
- Team size is dependent on the Region size
- NIMS/ICS trained (ICS-100, 200, 300, 400, 700, 800 courses)
- Each team is comprised of regional staff from various disciplines (air, waste, water)
- Provides the agency adequate staff to conduct extended responses and on multiple fronts if needed





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## Public Water Supply (PWS) Assessments:

- The TCEQ Regional offices conduct outreach (first, by phone) to PWS facilities in the impacted area to determine operational status, provide technical assistance and guidance.
- For those systems not available by phone, TCEQ may conduct site visits as flood waters recede.
- Determine issues and track Boil Water Notices (BWN).
- Coordination with the Public Works Response Team (PWRT) and TXWARN who is also able to provide needed assistance.
- Coordination as appropriate with USEPA.
- Report this information back to the SOC and included in the statewide Daily Situation Report for the State of Texas.



TCEQ testing chlorine levels while conducting PWS recons along the Rio Grande.

TEXAS  
COMMISSION  
ON  
ENVIRONMENTAL  
QUALITY





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## Drinking Water Facilities

- **Drinking Water Facility issues at the peak of the event,**
  - 2,238 Drinking Water Facilities serving a population of 11 million people were being tracked
  - 61 Drinking Water Facilities inoperable
  - 203 Boil Water Notices for population of 376,245 people
  - 625 on-site drinking water assessments completed
- **Current Drinking Water issues, as of 6/13/2018**
  - 1 Drinking Water Facility inoperable (will not be rebuilt)
  - 0 Boil Water Notices

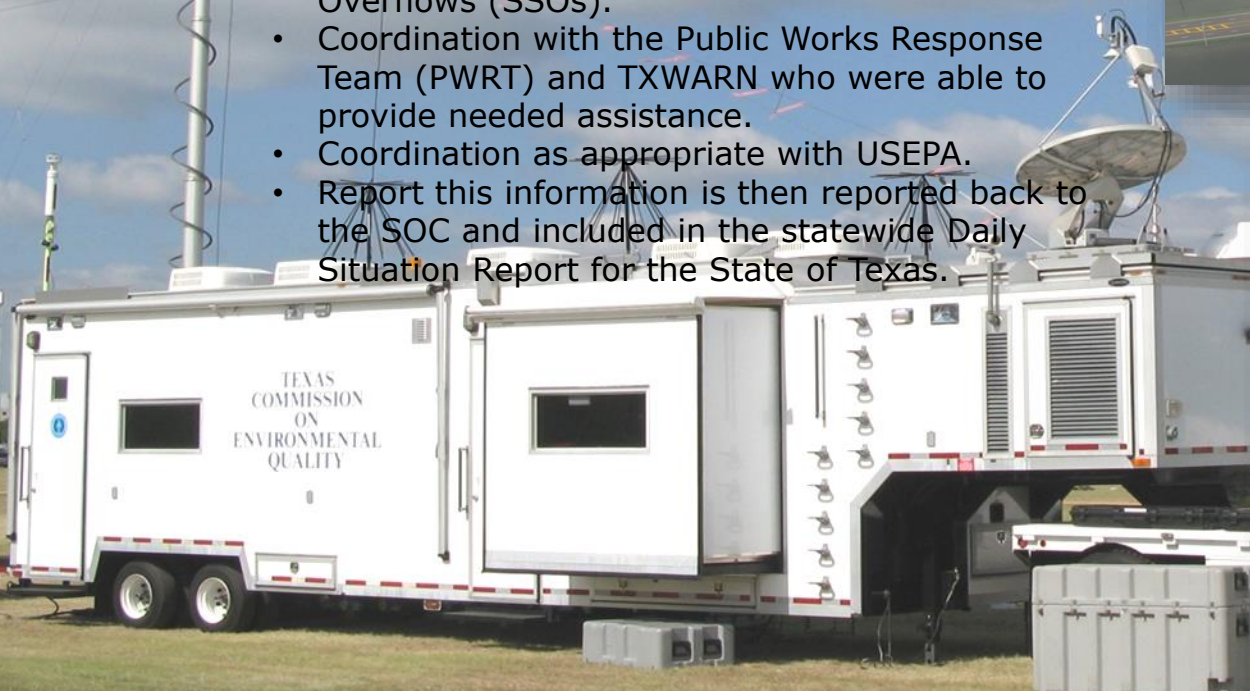


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## Wastewater Treatment Plants (WWTP) Assessments:

- The TCEQ Regional offices conduct outreach (first, by phone) to WWTP facilities in the impacted area to determine operational status, provide technical assistance and guidance.
- For those systems not available by phone, TCEQ may conduct site visits as flood waters recede.
- Determine issues and track Sanitary Sewer Overflows (SSOs).
- Coordination with the Public Works Response Team (PWRT) and TXWARN who were able to provide needed assistance.
- Coordination as appropriate with USEPA.
- Report this information is then reported back to the SOC and included in the statewide Daily Situation Report for the State of Texas.







# USEPA Region 6 Environmental Justice Forum



## Wastewater Facilities

- **Wastewater Facility issues at the peak of the event,**
  - 1,743 Wastewater Facilities serving a population of 10 million people were being tracked
  - 40 Wastewater Facilities inoperable
  - 441 wastewater assessments completed
- **Current Wastewater Facility issues, as of 6/13/2018**
  - 0 Wastewater Facilities inoperable



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## Sanitary Sewer Overflows

- **Sanitary Sewer Overflows/ WW Discharges**
  - 1,262 Domestic – 24 million gallons
  - 45 Industrial – 125 million gallons



# TCEQ and USEPA Unified Command for Hurricane Harvey Response





# TCEQ and USEPA Unified Command for Hurricane Harvey Response







# USEPA Region 6 Environmental Justice Forum



## Hazardous Materials:

- Under the State of Texas Emergency Management Plan, TCEQ is the primary agency for Hazardous Materials and Oil Spill Response (Annex Q).
- Activities related to hazardous materials spill response include:
  - Responding to, tracking and monitor releases of hazardous materials during the floods.
  - Locating, identifying and removing "orphan drums and containers", dislocated by the flood to protect the health and safety of citizens returning to the flood-impacted areas.
  - Overseeing the staging of household hazardous waste resulting from flooding.
  - Overseeing disposal of hazardous materials.





# USEPA Region 6 Environmental Justice Forum



## Hazardous Materials

- **Orphan Container Recovery**
  - Recovered and disposed of 1,155 drums, containers and cylinders
- **Spills and Discharges**
  - Tracked and/or responded to 266 spills/discharges



# TCEQ and USEPA Unified Command for Hurricane Harvey Response



UNKNOWN  
CONTAINERS

TB-004

COPPER STREET

DR-014



# TCEQ and USEPA Unified Command for Hurricane Harvey Response



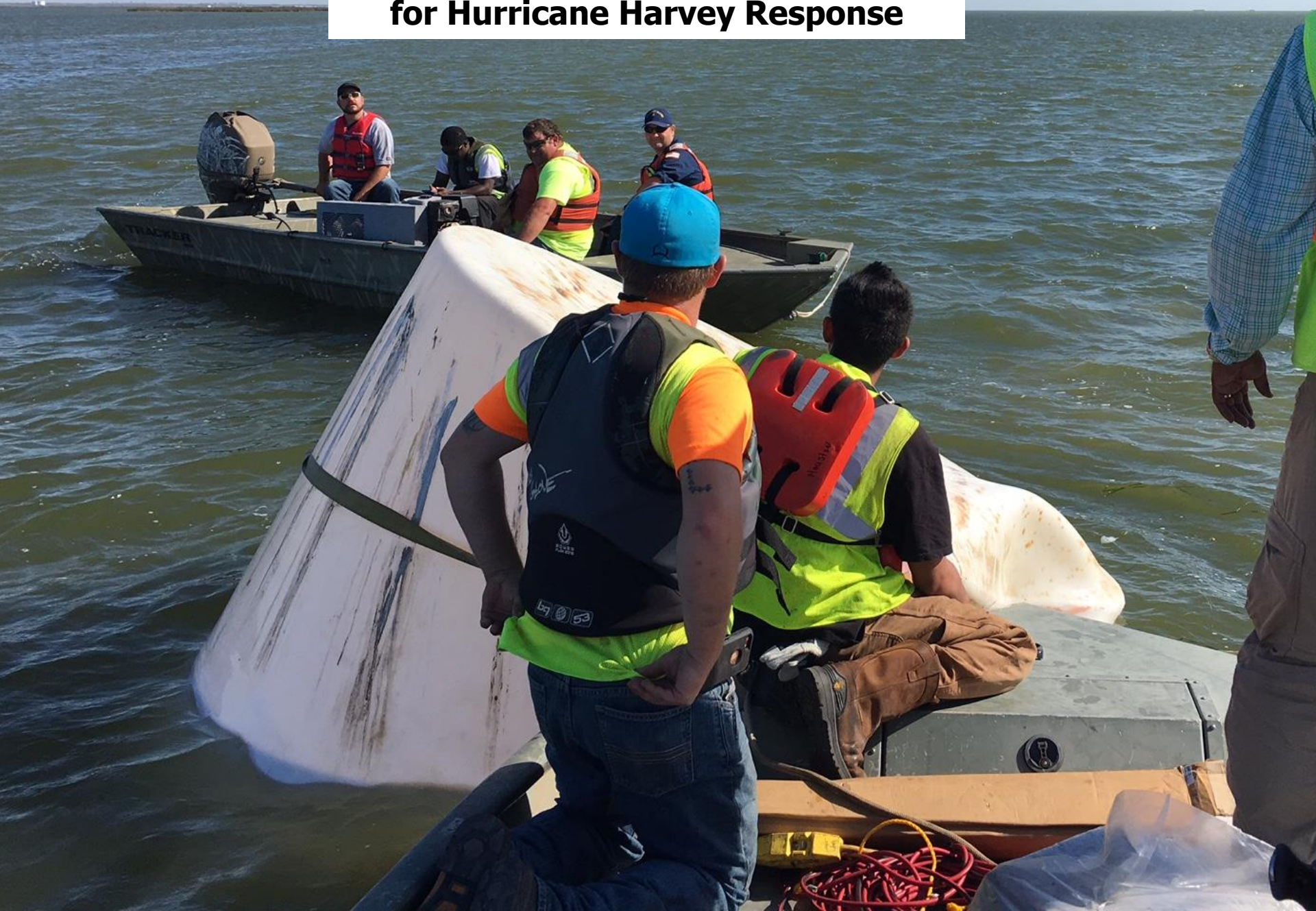


# TCEQ and USEPA Unified Command for Hurricane Harvey Response





# TCEQ and USEPA Unified Command for Hurricane Harvey Response





# TCEQ and USEPA Unified Command for Hurricane Harvey Response







# USEPA Region 6 Environmental Justice Forum



## Debris Management:

- TCEQ provides oversight of appropriate disposal of storm waste.
- Ensure that debris management sites are operated in a manner not to create a human health threat or threat to the environment
- Ensure proper separation of Household Hazardous Waste (HHW) and white goods (i.e. refrigerators, washers & dryers) from storm debris prior to disposal
- Ensure proper disposal of HHW and white goods
- Provide authorizations for temporary debris management sites.
- Provide debris management/disposal guidance.
- Issuing "burn" letters to local jurisdictions as appropriate.
- Assisting with animal carcass disposal issues.
- When needed, the TCEQ will set up and staffed a Debris Management Hotline in coordination with the Regional Offices to address and process requests regarding temporary debris management sites.







# USEPA Region 6 Environmental Justice Forum



## TEXAS COMMISSION ON ENVIRONMENTAL QUALITY (TCEQ)

### REQUEST FOR APPROVAL OF TEMPORARY DEBRIS MANAGEMENT SITE FOR DEBRIS RESULTING FROM DECLARED STATE OR FEDERAL DISASTER

#### REQUIREMENTS:

- The owner of the property should submit this request to temporarily store debris to the appropriate TCEQ Regional Office: <http://www.tceq.texas.gov/about/directory/region/reglist.html>. Material stored for longer than the approval period may be considered solid waste and the site may be subject to permitting requirements and Texas Administrative Code (TAC) Chapter 330 rules, including providing financial assurance for the site.
- Requests may be submitted prior to a disaster; however, the owner or operator of the property may not store or process debris on the site until a state or federal declared natural disaster occurs. Once the owner or operator of the property decides to use the site, notice must immediately be made to the local TCEQ Regional Office. **If this request is submitted prior to a declared disaster, the owner/operator must resubmit this form to the TCEQ once a disaster has been declared to confirm the site General Conditions.**
- **IT IS THE RESPONSIBILITY OF THE OWNER/OPERATOR TO MEET ALL GENERAL CONDITIONS AT THE TIME OF USE.** This notice does not allow any activity that creates or contributes to a nuisance condition and only applies to the management of debris generated by a declared natural disaster.

NAME OF DECLARED DISASTER: \_\_\_\_\_

(To be updated during site activation notification)

REQUESTING AUTHORIZATION FOR A (Check all that apply):

Staging/Stockpiling Site  Emergency Burial Site  Emergency Burn Site  Wood Chipping Site

#### SITE INFORMATION:

Site Name: \_\_\_\_\_

Site Address: \_\_\_\_\_

Location and/or Directions to Site: \_\_\_\_\_

Nearest City: \_\_\_\_\_ County: \_\_\_\_\_

Site Lat/Long (in digital degrees to 5 decimal places): \_\_\_\_\_

Site Legal Description: \_\_\_\_\_

#### SITE OWNERSHIP INFORMATION:

Site Ownership (Check one):  Local Government  State or Federal Government  Private Landowner

Site Owner Name: \_\_\_\_\_

Site Owner Address: \_\_\_\_\_

Site Owner Phone: \_\_\_\_\_ Site Owner E-Mail: \_\_\_\_\_

Approximate Size of Property: \_\_\_\_\_

#### REQUESTOR INFORMATION (If different from property owner):

Requestor Name: \_\_\_\_\_ Title: \_\_\_\_\_

Requestor Company Name: \_\_\_\_\_

Requestor Address: \_\_\_\_\_ City: \_\_\_\_\_ Zip Code: \_\_\_\_\_

Requestor Telephone: \_\_\_\_\_ Fax: \_\_\_\_\_ E-mail: \_\_\_\_\_

Requestor Affiliation to Site: \_\_\_\_\_

Requestor Contact Person/Project Manager Name (If different): \_\_\_\_\_

Requestor Contact Person/Project Manager Phone: \_\_\_\_\_ E-mail: \_\_\_\_\_

#### SITE CONTRACTOR INFORMATION:

Site Contractor Name: \_\_\_\_\_ Company Name: \_\_\_\_\_

Site Contractor Address: \_\_\_\_\_

Site Contractor Phone: \_\_\_\_\_ E-mail: \_\_\_\_\_



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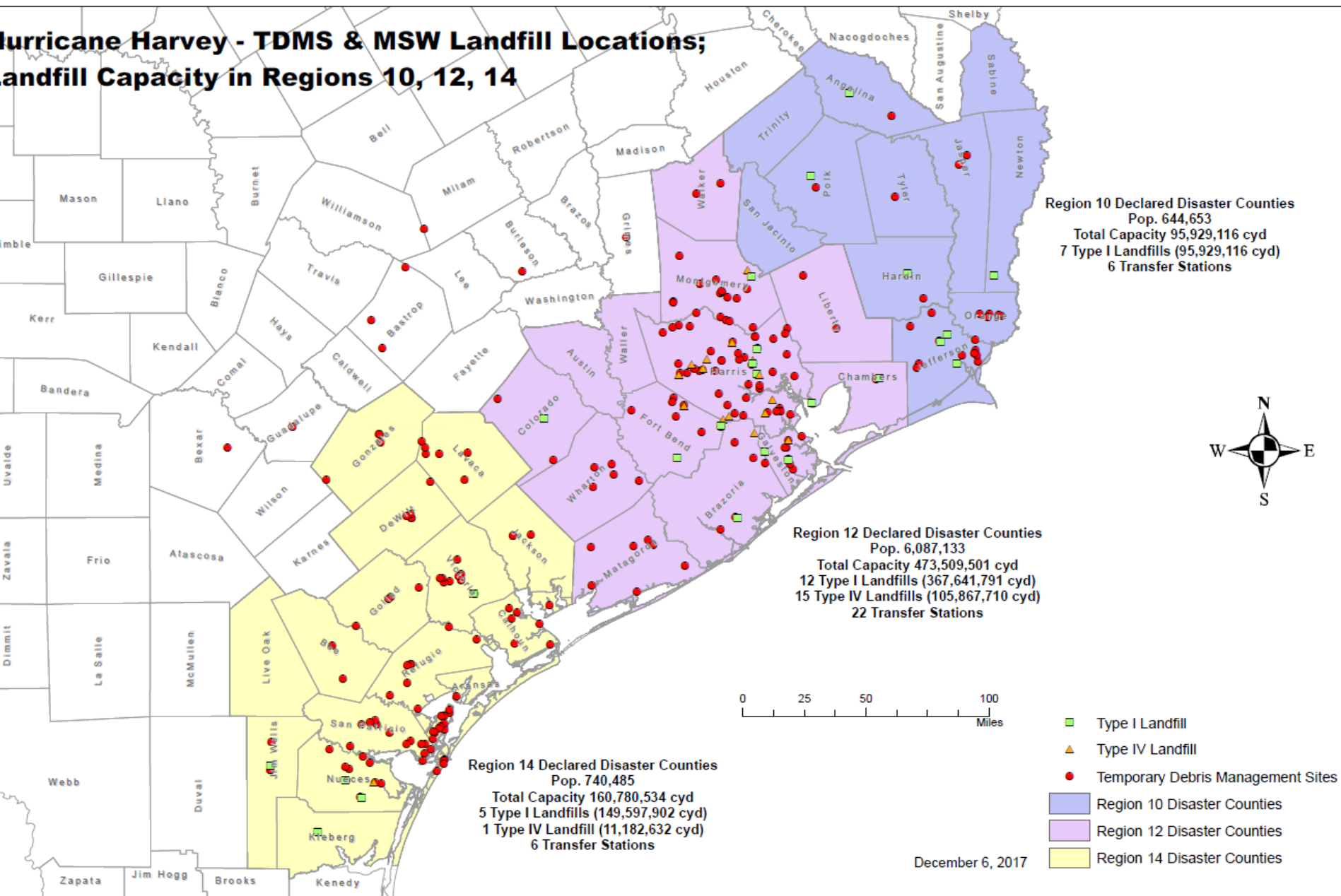


## Hurricane Debris

- 228 Approved Temporary Debris Management Sites (TDMSs)
- 19 TDMSs remain active
- 2,297 Inspections of TDMSs
- Estimated amount of debris currently being processed at TDMSs is 98,021 cubic yards
- FEMA estimates the revised total quantity of debris from Hurricane Harvey is 13,112,033 cubic yards
- Estimated quantity of debris removed so far is 12,654,654 cubic yards
- Debris collection is estimated to be 97% complete



# Hurricane Harvey - TDMS & MSW Landfill Locations; Landfill Capacity in Regions 10, 12, 14





# A LOOK AT HURRICANE HARVEY



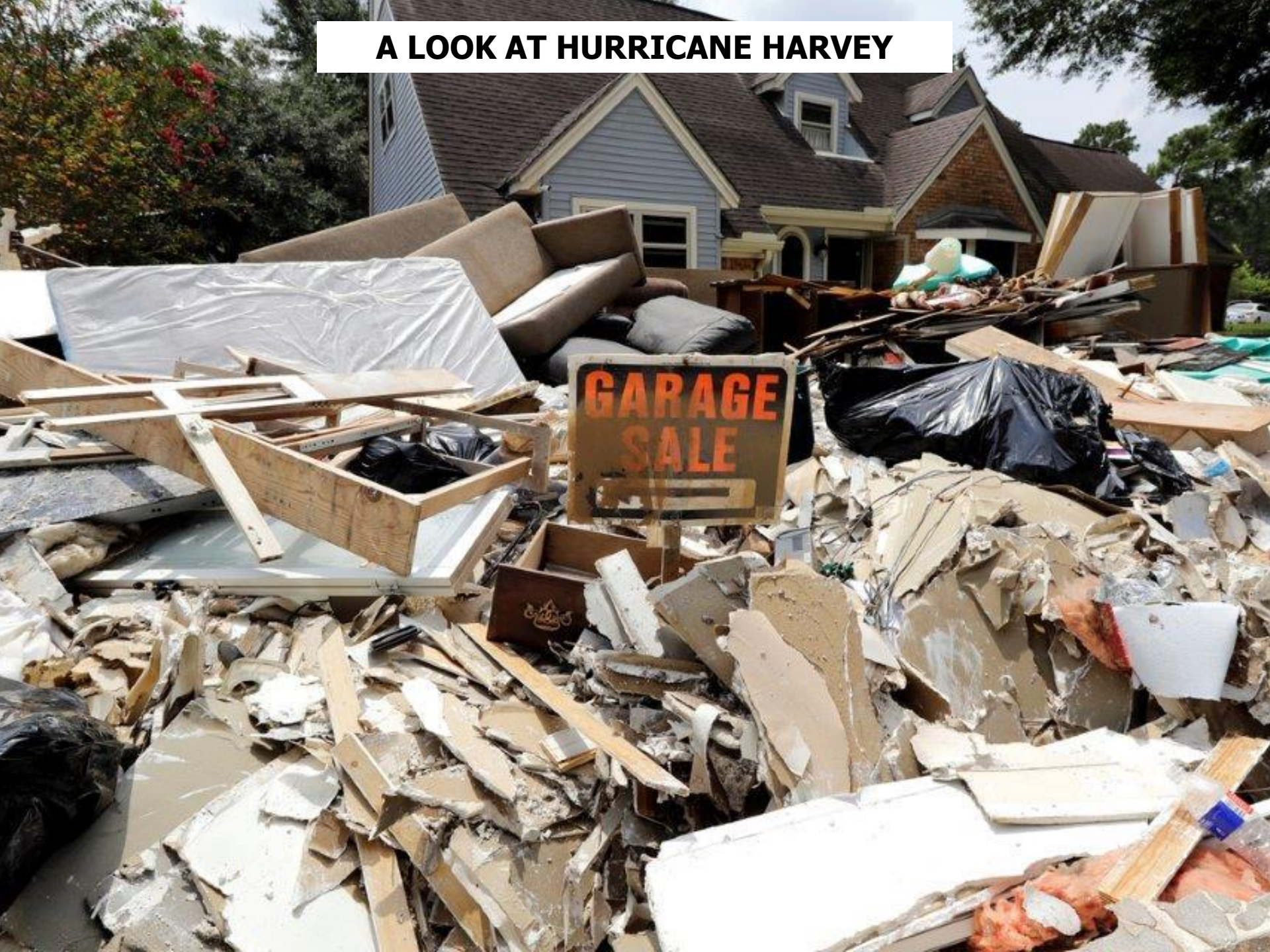


## A LOOK AT HURRICANE HARVEY





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# TCEQ and USEPA Unified Command for Hurricane Harvey Response





# A LOOK AT HURRICANE HARVEY

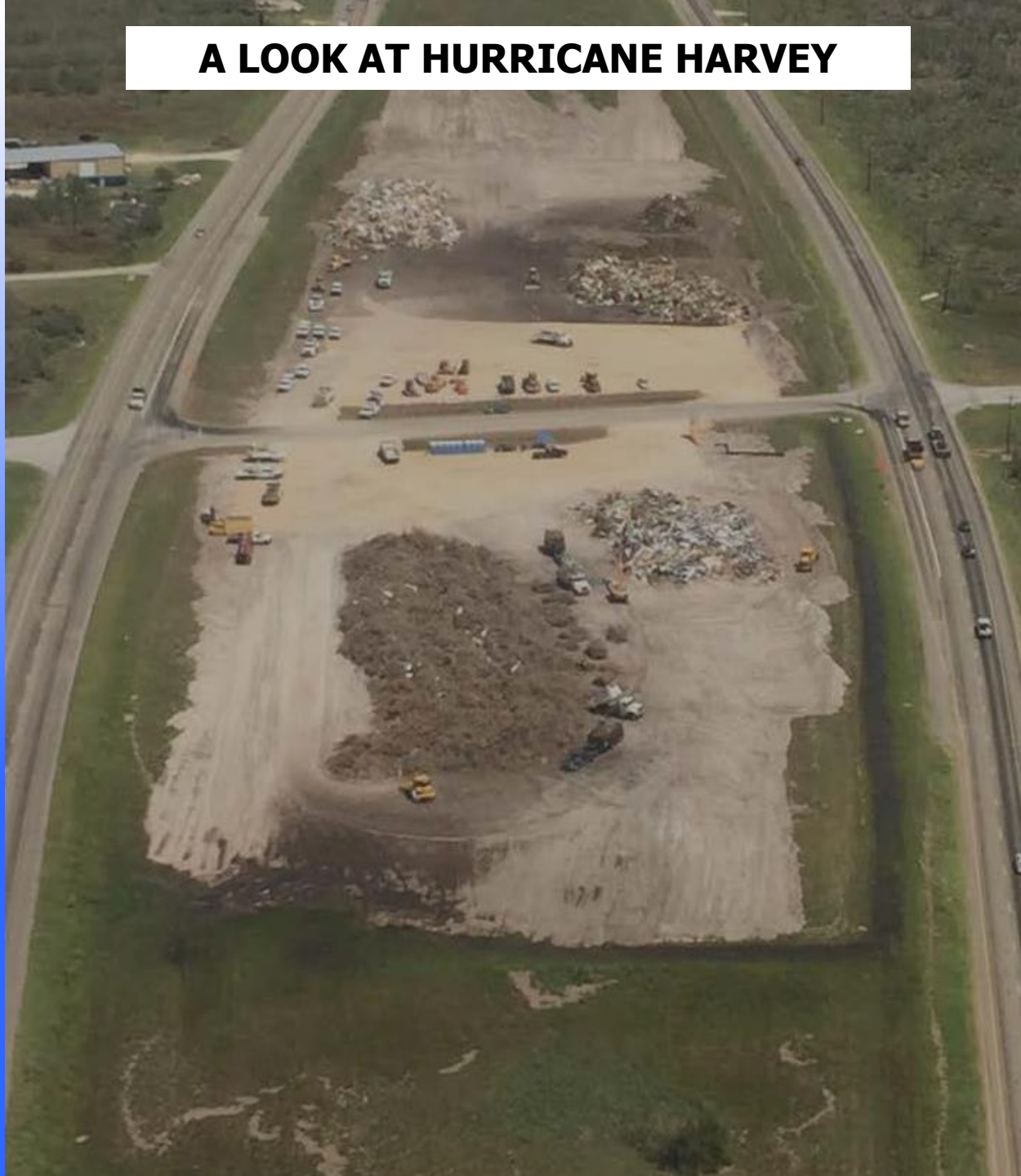




# A LOOK AT HURRICANE HARVEY



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# A LOOK AT HURRICANE HARVEY





# A LOOK AT HURRICANE HARVEY







# USEPA Region 6 Environmental Justice Forum



## Dam Safety:

- TCEQ Dam Safety Engineers track reported issues with dams and provide the dam owner/engineer with technical assistance and guidance.
- TCEQ Dam Safety Engineers conduct site investigations for impacted dams as appropriate.
- Determine and track dam issues.
- Report this information is then reported back to the SOC and included in the statewide Daily Situation Report for the State of Texas.







# USEPA Region 6 Environmental Justice Forum



## Refinery and Industrial Facilities:

- TCEQ verifies and reports on operational status of refinery and industrial facilities as needed.
- TCEQ may conduct site visits to industrial facilities as flood waters recede to determine the integrity of facilities which handle hazardous materials, including petrochemical production facilities, hazardous waste disposal facilities, fuel storage tanks, etc.







# USEPA Region 6 Environmental Justice Forum



## Landfills:

- TCEQ may conduct site visits to landfill facilities as flood waters recede to determine the integrity of those facilities.

## Air Quality Monitoring:

- TCEQ may conduct air monitoring for particulate matter downwind of debris burning sites as necessary.

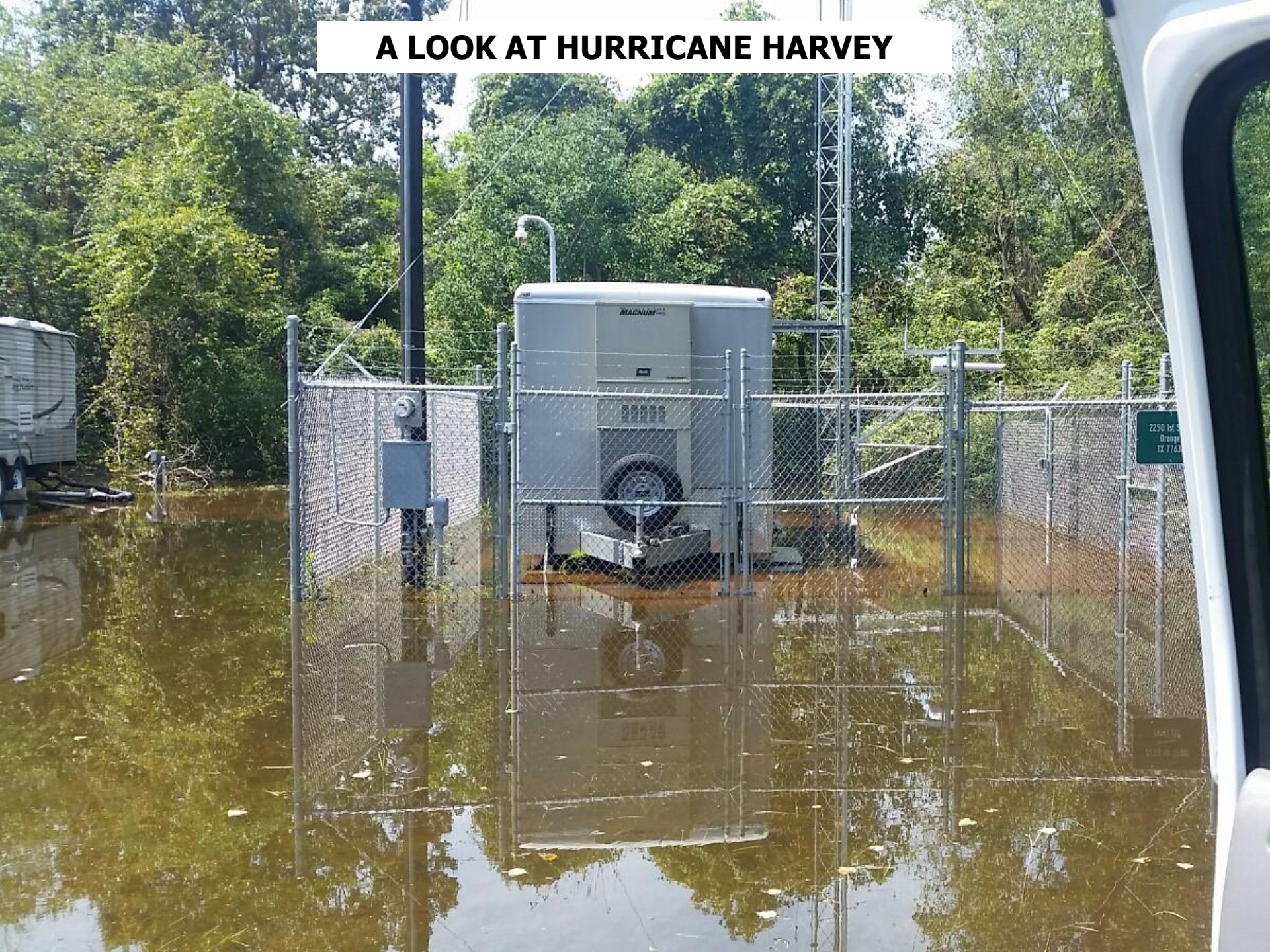
## Outreach to Local Officials:

- Regional office staff will reach out to County Emergency Management Contacts, County Judges, and Mayors to offer assistance/guidance with flood related activities including: authorizations for temporary debris management sites, burn guidance and animal carcass issues.





# A LOOK AT HURRICANE HARVEY





# A LOOK AT HURRICANE HARVEY







# USEPA Region 6 Environmental Justice Forum



## Air Monitoring

- The TCEQ used every appropriate means of air monitoring available to support our mission to protect human health and the environment.
- One of the many preparations for Harvey included the TCEQ, the EPA, and other monitoring entities temporarily shutting down several air monitoring stations from the greater Houston, Corpus Christi, and Beaumont areas to protect valuable equipment from storm damage
- After the storm passed, TCEQ staff and contractors began conducting damage assessments of monitoring stations and bringing monitors back online as soon as possible. Monitoring stations not damaged from Harvey were back to operational status in Corpus Christi, Houston, and Beaumont by September 2, 6, and 8, respectively.
- By September 29, the stations damaged by Harvey were repaired or replaced and the TCEQ's air monitoring network was restored to 100% operational status.
- In a coordinated effort to monitor storm-impacted areas, both TCEQ and EPA investigators spent numerous hours, both day and night, monitoring neighborhoods and industrial fence lines with hand-held instruments, such as optical gas imaging cameras (OGIC), toxic vapor analyzers, summa canisters, and portable multi-gas monitors.





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## Air Monitoring

Additional Harvey related air monitoring activities included:

- TCEQ conducting aerial surveys in the Houston and Beaumont areas using a helicopter equipped with an OGIC that can image VOCs and other hydrocarbons invisible to the eye;
- EPA's Airborne Spectral Photometric Environmental Collection Technology (ASPECT) aircraft conducted real-time sampling of potential emission targets over facilities impacted by Harvey;
- EPA's Trace Atmospheric Gas Analyzer (TAGA) mobile monitoring system conducted air quality analyses in neighborhoods surrounding facilities impacted by Harvey; and,
- Results from the available air monitoring data collected from August 24 through September 24, (i.e. continuous air monitors, hand-held instruments, ASPECT and TAGA) all measuring air toxics concentrations below levels of health concern.

# Governor's Commission to Rebuild Texas





# Governor's Hurricane Preparedness and Readiness Meeting for 2018





# A LOOK AT HURRICANE HARVEY



PHOTO COURTESY OF FEMA





# USEPA Region 6 Environmental Justice Forum





# Experienced Staff







# Exercises

Natural Disaster Operational Workgroup  
(NDOW Texas)







# USEPA Region 6 Environmental Justice Forum



## NDOW Partner Agencies



- USEPA R6
- TCEQ
- TGLO
- TXDPS
- TPWD
- TRRC
- USFWS
- USCG DISTRICT 8 & SECTOR CORPUS/HOUSTON/TEXAS CITY/PORT ARTHUR
- NOAA
- DOT PHMSA (New partner as of April 2018)
- Civil Support Team (CST)





# USEPA Region 6 Environmental Justice Forum



## NDOW OBJECTIVES

- **Conduct Multi-Agency ESF-10 & 3 Response Planning**
- **Create Standard Operating Procedures (SOP) and forms (Field Evaluation & Recovery Procedures, ICS forms for both State and Feds) for field personnel**
- **Standardize one Centralized Data Management system with agreed upon Data Quality Objectives (DQOs) that are scalable to fit each agency's needs per disaster**
- **Formalize and deliver NDOW products via training and exercises including Data Management system training and software delivery to agencies and to field**







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## NDOW Annual Planning/Training Activities

- Quarterly meeting between NDOW agencies to prepare for disasters
- Three NDOW refresher trainings with disaster tabletop exercise delivered to coastal TCEQ/TGLO/USCG regions/sectors (all prior to August of each year)
- Three Response Manager trainings offered to NDOW agencies per TCEQ/TGLO request (all prior to August of each year)
- One Full Scale exercise with NDOW agencies to practice command and control and field operations for responding to a disaster (conducted in Spring of each year)
- One Full Scale Communication Exercise to practice field communications
- Provide NDOW training to USCG Strike Team in Mobile-AL
- Provide Water Infrastructure support to TCEQ
- Response Manager technical support for all NDOW agencies





## Standard Operating Procedures(SOPs)

NDOW has created eight SOPs for State and Federal agencies operating under ESF-10/ESF-3 to follow while responding to a natural disaster.

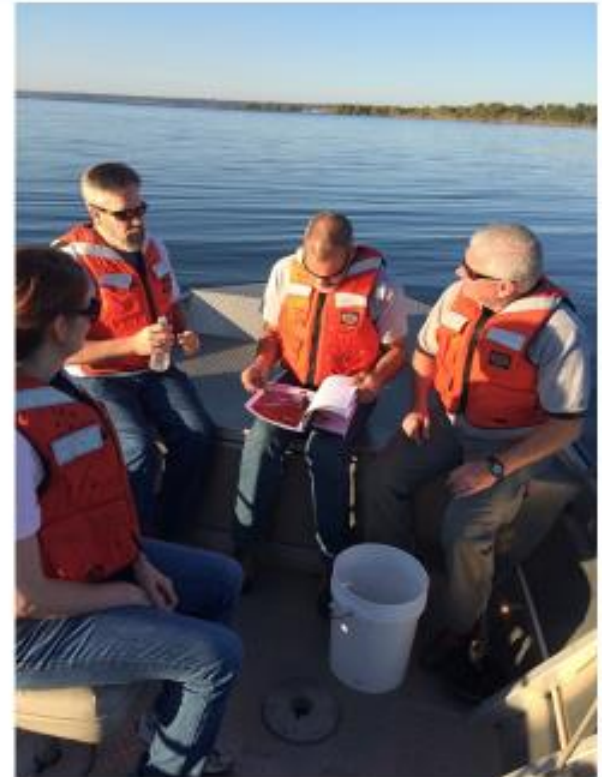
- Rapid Needs Assessment (RNA)
- Orphan Container Hazard Evaluation
- Orphan Container Recovery
- Facility/Vessel Oil Discharge Assessment
- Facility/Vessel Oil Discharge Removal
- Photo Documentation of field targets
- Waste Collection Pad Set-up and Management
- Infrastructure Evaluation ESF-3

**8 TOTAL SOP's created and trained on to date**



## NDOW Hazard Evaluation Form-IPAD app

- NDOW App for RNA activities on IPAD
- Target information uploads automatically in the field to a viewer at the ICP
- Operations can work directly off the viewer for assessment and removal operations







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Multi-Agency  
Annual Field Hurricane Exercise  
(Example: Houston Galveston NDOW Full Scale Exercise- April 2018)  
200 personnel from 12 different agencies

**Unified Command- ICP**



**Operational Branches**





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## NDOW Accomplishments to Date

- Trained over **2,000** field personnel from eight different State and Federal Agencies
- Facilitated 18 Tabletop Hurricane Exercises using NDOW tools and products
- Facilitated 5 Full Field Hurricane Exercises utilizing NDOW products and tools
- Facilitated 2 Full Scale Communication Exercises
- Integrated NDOW products into the **TGLO Toolkit and into the TDEM Annex Q**
- Provided NDOW Products for Hurricane Issac, Irene, Sandy, Harvey, Maria
- Completed IPAD NDOW Hazard Evaluation Form for field use



# Response Manager Field Reporting

**Hurricane Ike TX Recon Targets**

- ALPHA Operations Area**
  - Open Recon target
  - Closed Recon target
- BRAVO Operations Area**
  - Other Open
  - Referred to RP (Open)
  - Closed Recon target
- CHARLIE Operations Area**
  - Open Recon target
  - Closed Recon target
- TX GR Reference Grid

**TXGLO ESI Priority Protection Areas**

- TX GLO boatramp
- TX GLO marina
- Gulf Intercoastal Waterway Ship Channel

**PRIORITY**

- RED: HIGH
- ORANGE: MEDIUM
- YELLOW: LOW
- TX GLO Other Lease Areas
- TX GLO ESI National Mobile Refuges

**Hurricane Ike Response - Operational Areas**

- ALPHA
- BRAVO
- CHARLIE

Location Name:	TCEQ-12-092008-1033-057
Location Type:	Single Point
Address:	Sabine River
City Name:	
County:	ORANGE
Latitude:	30.0208333333333
Longitude:	-93.7476666666667
Location Description:	could not be recovered by airboat or road, need bigger equipment.
Item Name:	Conex container
Item Type:	
Item Condition:	
Item Size:	
Item Measure:	
Unit Of Measure:	
Total Items:	1
Item Contents:	
Item Comments:	Conex container (GPS N30° 01'25" W93° 44'56")
Status:	Recovery Required (Open)

San Bernard    STARTWATERSTRIKETEAM02-081004-1095-002

Map labels: Moody, Michoud, WicPaddin, WicPaddin

Map data: Data: R10 NOAA, U.S. Navy, NGA, GEBCO, Texas Orthoimagery Program, Image: Houston/Houston Area Council  
30 22'43.81" N, 93 07'51.08" W, elev: 173 ft

Google earth    Eye alt: 119.46 m



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## Prior Coordination

- EPA, USCG and FEMA Hurricane Coordination Discussion
- EPA, USCG, TCEQ, TGLO, and TRRC Hurricane Coordination Discussion
- Pre-Landfall Hurricane Coordination Discussion





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## Right Equipment

## ASPECT Activities

- RMP & FRP assessments
- Pipelines
- Refineries
- Releases at chemical and oil facilities
- Releases and orphan containers







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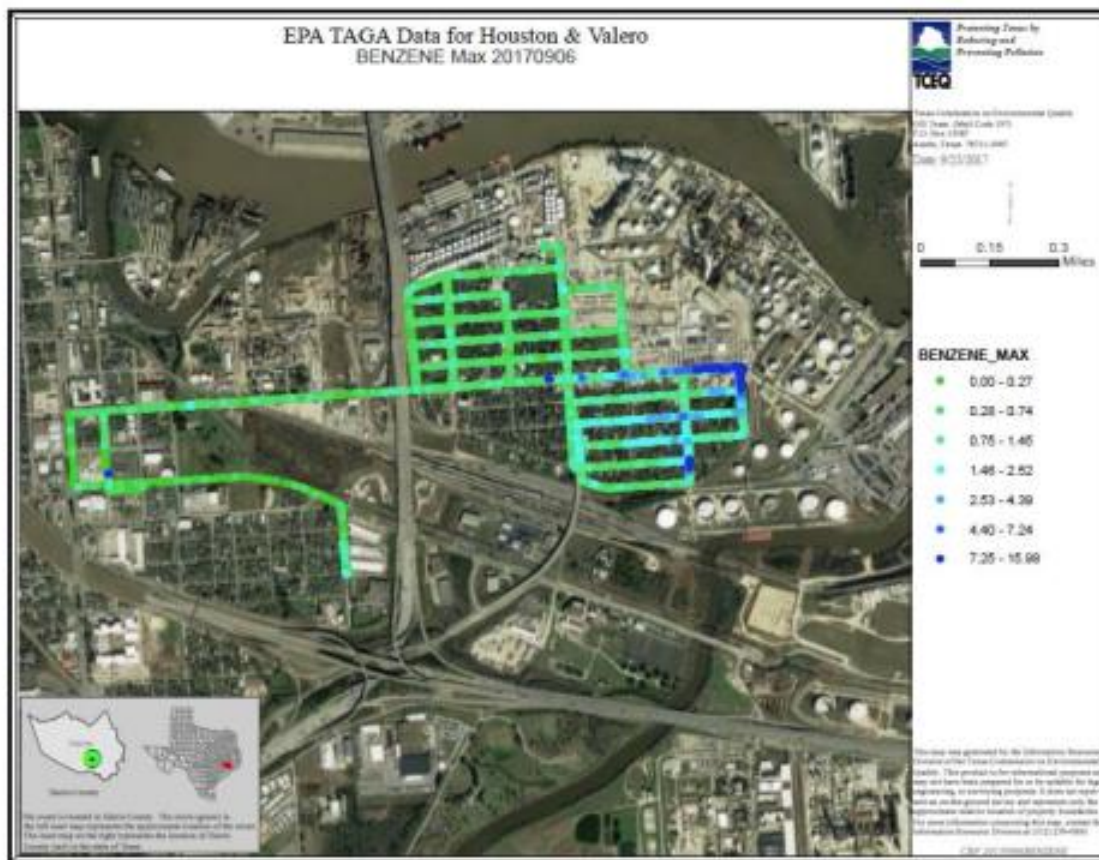
## TAGA Monitoring Activities



- Refineries
- Sensitive communities
- Chemical manufacturing



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## PHILIS Analytical Activities

- On- Site Releases
- Staging area sampling
- Superfund sites





# USEPA Staff







# USEPA Region 6 Environmental Justice Forum Hurricane Preparedness



## Questions?

