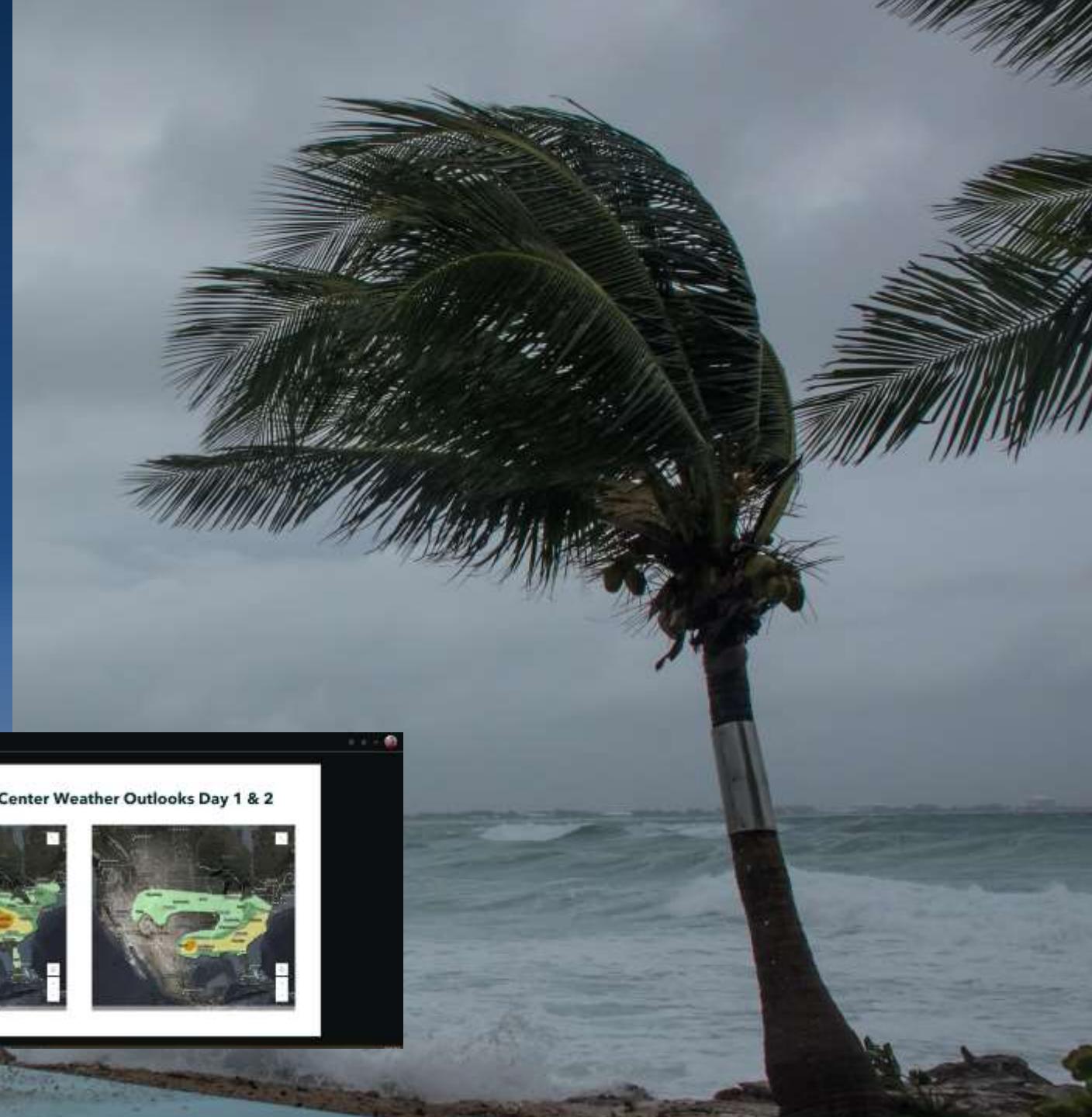
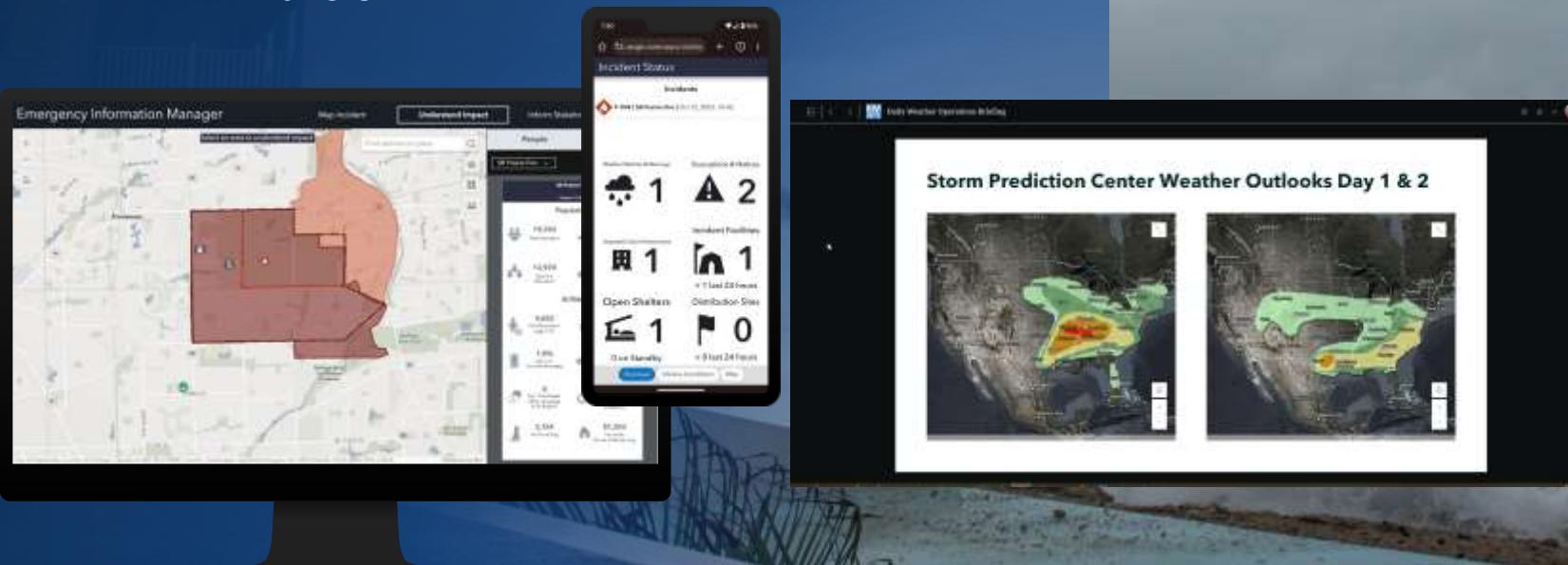


ArcGIS Resources to Prepare for Hurricane Season

Jeff Baranyi

Maintain Situational Awareness

- Understand the potential impact from an incident
- Manage and deploy limited resources
- Monitor rapidly changing conditions
- Provide real-time dynamic, operational briefs



Manage Information Sharing

- Communicate effectively with the public and media
- Share information and collaborate with partners



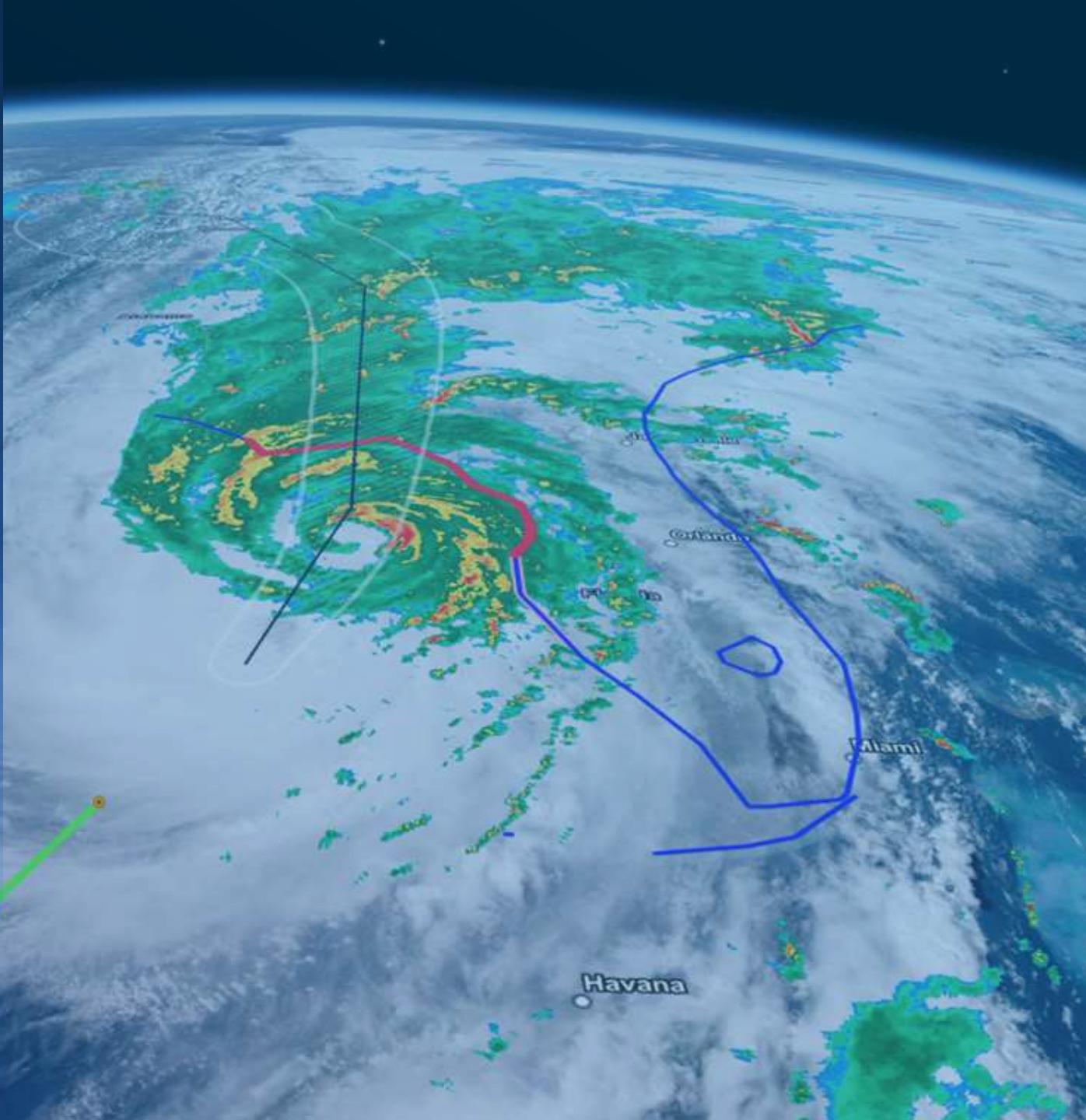
Conduct Damage Assessments more Efficiently

- Streamline damage assessments
- Inform and engage the public
- Follow FEMA standards for Individual Assistance and Public Assistance
- Expedite Recovery Funding
- Return to normalcy faster



Live Feeds

- Esri's Live Feed Catalog Blog - Putting the "Live" in Living Atlas of the World
- NOAA NWS Cloud GIS Services



ArcGIS Supports Emergency Management Workflows



ArcGIS Supports Emergency Management Workflows



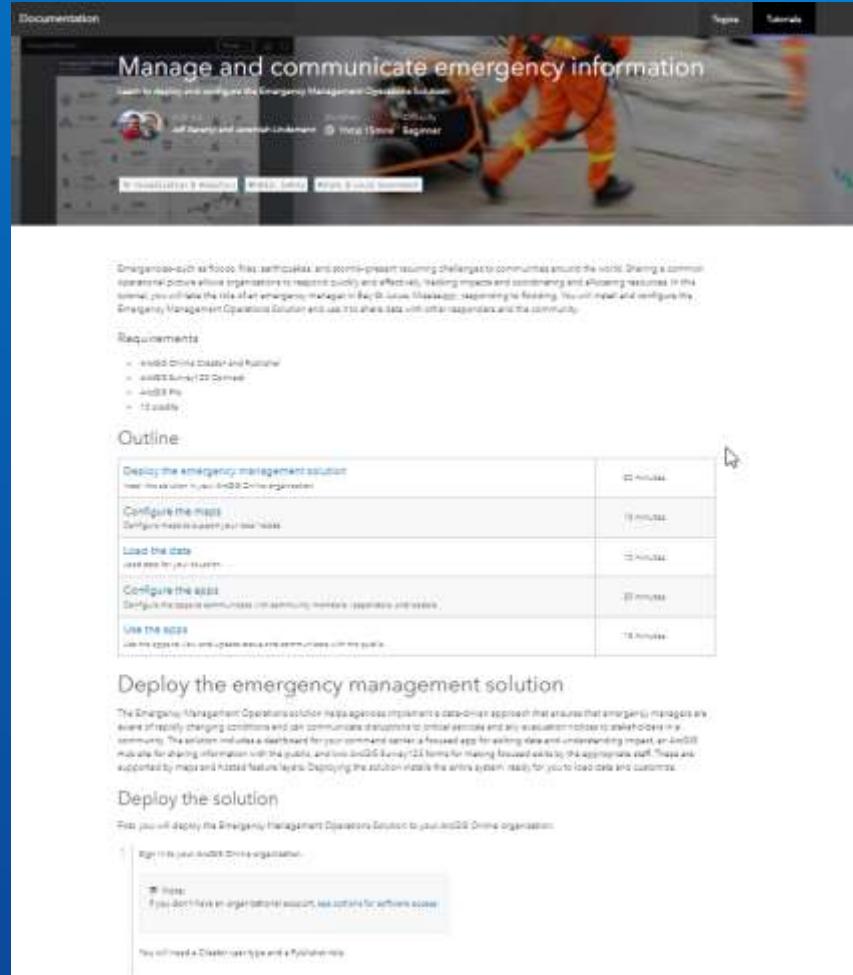
ArcGIS Supports Emergency Management Workflows



Manage and communicate emergency information

Emergency Management Operations Learn Lesson

- Deploy the solution
- Conducting an impact analysis right away
- Configuring the maps
- Loading data
- Configuring the apps
- Scenario



The screenshot shows a Microsoft Learn Lesson page titled "Manage and communicate emergency information". The page features a hero image of a person in an orange safety vest and hard hat working on a map. Below the hero image, a brief description explains that emergencies like floods, fires, earthquakes, and storms present unique challenges to communities around the world. It highlights the solution's ability to support emergency managers in responding quickly and effectively to incidents, sharing information with stakeholders, and preparing for future events. The page includes a "Requirements" section with a bulleted list: "Azure DevOps Organization", "Azure DevOps Service", "Azure DevOps Pro", and "Azure DevOps". A "Outline" table provides a breakdown of the lesson content:

Lesson	Estimated Time
Deploy the emergency management solution	10 minutes
Configure the maps	10 minutes
Load the data	10 minutes
Configure the apps	10 minutes
Use the tools	10 minutes

Below the outline, there are two main sections: "Deploy the emergency management solution" and "Deploy the solution". The "Deploy the emergency management solution" section provides a brief overview of the solution's purpose and key features. The "Deploy the solution" section contains a "Sign in to your Azure DevOps organization" button and a note about prerequisites: "You will need a DevOps user type and a Project Admin role".



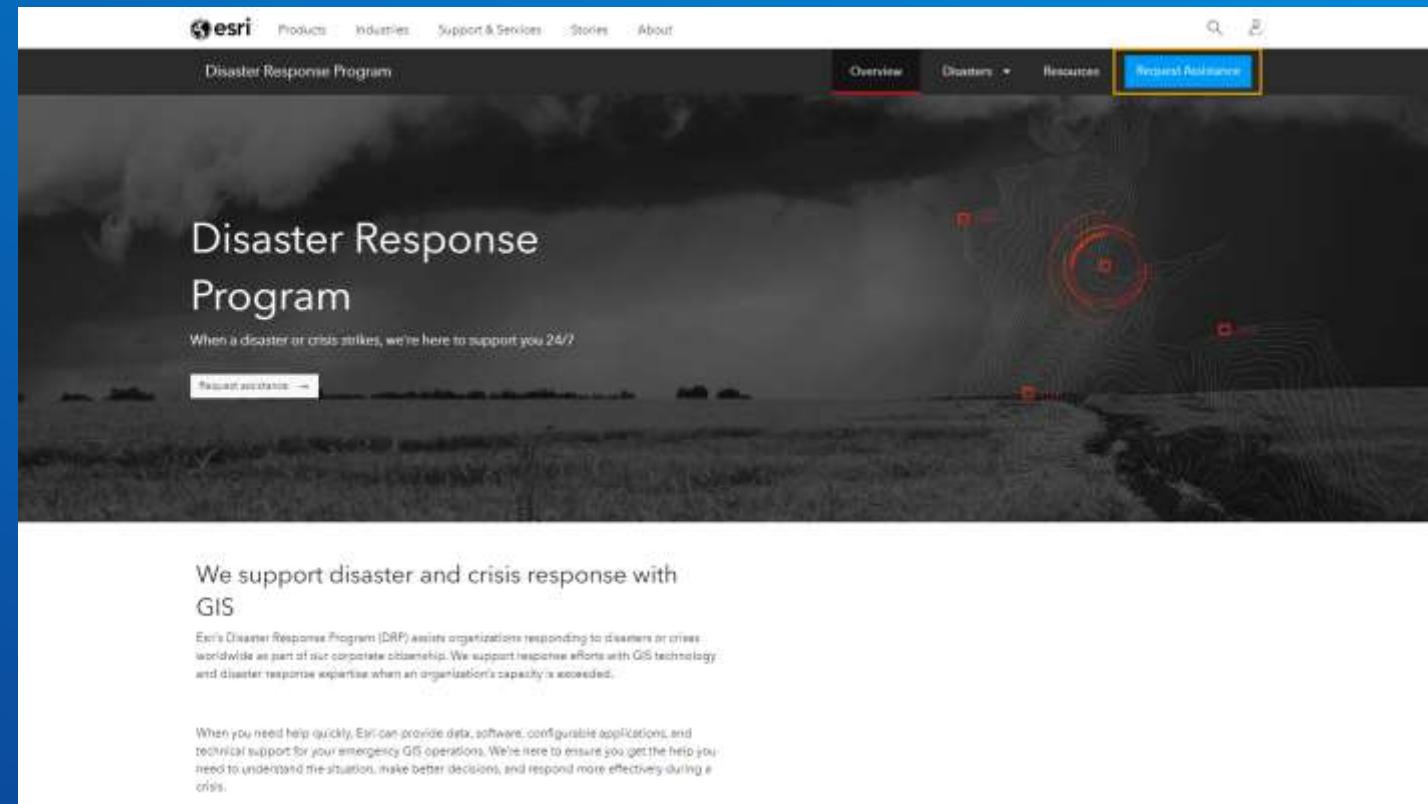
Esri Disaster Response Program (DRP)

We support disaster and crisis response with GIS

- Software
- Workflow Assistance
- Geospatial Data
- Technical Support

Request Assistance:

www.esri.com/disaster



...helping extend **capability** and **capacity**



esri[®]

THE
SCIENCE
OF
WHERE[®]

Hurricane Helene: September 26-27, 2024

- Maximum recorded rainfall: 31.3", Yancey County
 - Winds up to 100 mph
- 1400+ landslides estimated
- 11 evacuation orders issued
- 131 search and rescue teams involved
- 1,600+ survivors rescued
- 120,000+ structures damaged
- 4,800+ pallets of water delivered by NCNG
- ~900,000 without power



I-40, Pigeon River Gorge, Haywood County NC
Credit: NC Department of Transportation



Hurricane Helene: Flooding



Record flooding at 41 gauges in 18 separate counties

Hurricane Helene: Transportation



6000+ miles of roads damaged
1000+ bridges and culverts



Damage Assessment Tools

- Survey123 forms
 - NCSAR
 - NAPSG/SARCOP
- Collected in field by first responders, search and rescue teams, swiftwater teams
- Collected images and locations, classified structure damage
 - Unaffected, Affected, Minor, Moderate, Major, Destroyed

Field Data Collection

Quick Share: Click arrow to left to open QR Code.

Survey instructions: Click arrow to left to open.

Event Details:

Event
This field will be auto-populated with the current event, and will be editable if your availability is for a different event

Daily Operations 2025

Team Type*

USAR

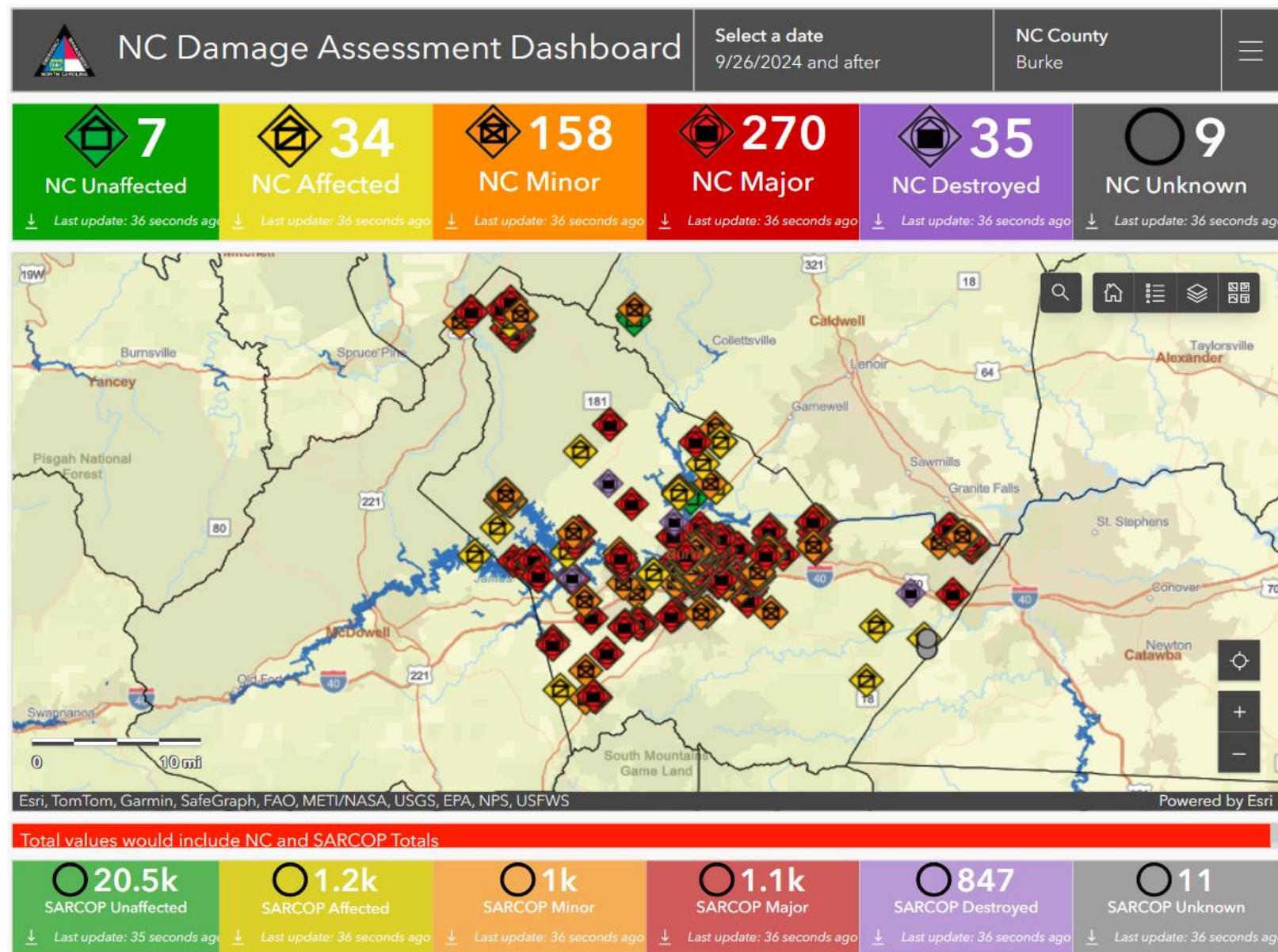
Swift Water

Helicopter

Other

Team Name*
Your Team Name should be your assigned Task Force Identifier I.E. NC TF-6, if a Water Component I.E. NC TF-6 SWR Or use your State postal code and County name I.E. NC Henderson SWR Set as Favorite (using the top right hamburger button) to pre-populate future forms.

Your Name





https://fiman.nc.gov

80%

FIMAN Flood Inundation Mapping & Alert Network

Map About Help Sign In

Showing 627 Gauges

Search by Location or Gauge

FIMAN TOOLS

Overview Layers Legend

Find Gauges

By Area of Interest By Location

Select Category Select Subcategory

Go Clear

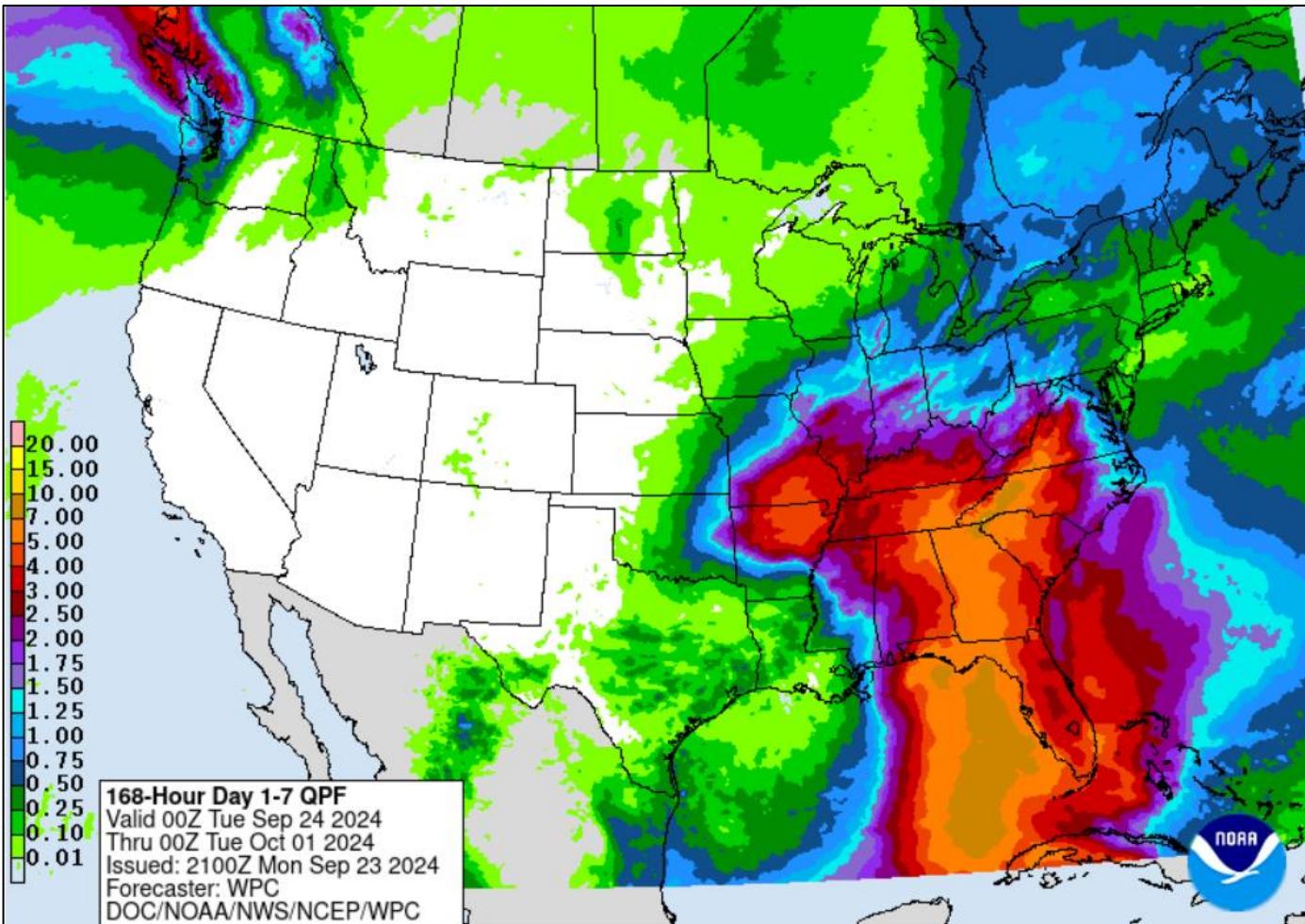
Gauge Overview

Current Forecasted

Category	Rising	Constant	Falling
Major Flooding	0	0	0
Moderate Flooding	0	0	0
Minor Flooding	2	0	0
Monitor	2	2	3
Normal	90	246	279

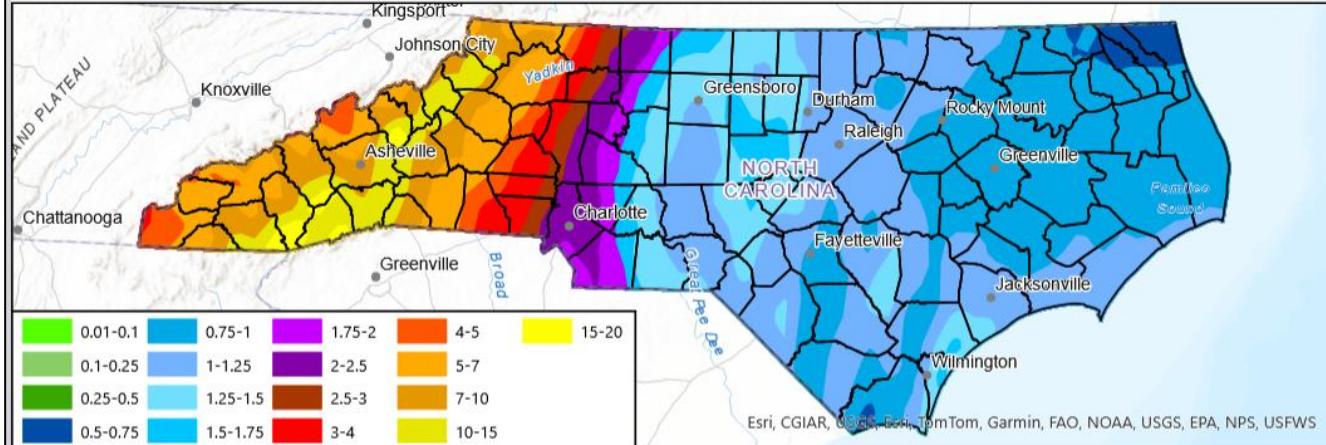


Coordinating with Locals

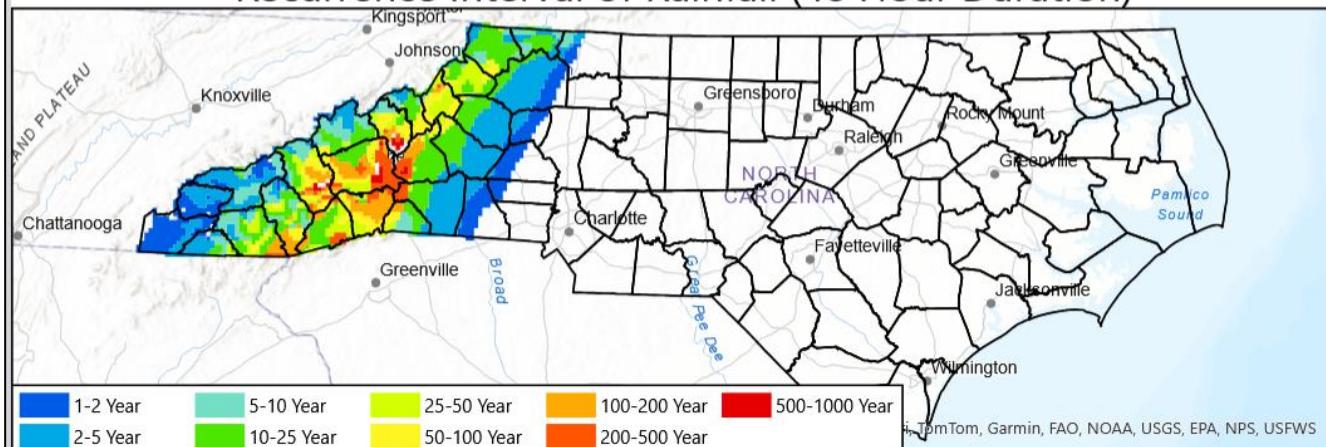




Forecasted Rainfall (in.), Day 1-2 NOAA QPF
9/25/2024 20:00 -- 9/27/2024 20:00 EST



Recurrence Interval of Rainfall (48 Hour Duration)





BridgeWatch Alert Dashboard

September 26-29, 2024

6176 Active Alerts

Watchlist Alerts

- Div. 13 -- Yancey County
500 (990296)
9/29/2024, 3:53 PM
- Div. 13 -- Yancey County
500 (990267)
9/29/2024, 3:52 PM
- Div. 13 -- Yancey County
500 (990049)
9/29/2024, 3:52 PM
- Div. 13 -- Yancey County
500 (990060)
9/29/2024, 3:52 PM
- Div. 13 -- Buncombe County
500 (100529)
9/29/2024, 3:32 PM
- Div. 13 -- Buncombe County
500 (100726)
9/29/2024, 3:32 PM
- Div. 13 -- Buncombe County
500 (100758)
9/29/2024, 2:51 PM

Watchlist Tickets

Dashboard is updated every hour, and may be updated frequently during storm events.

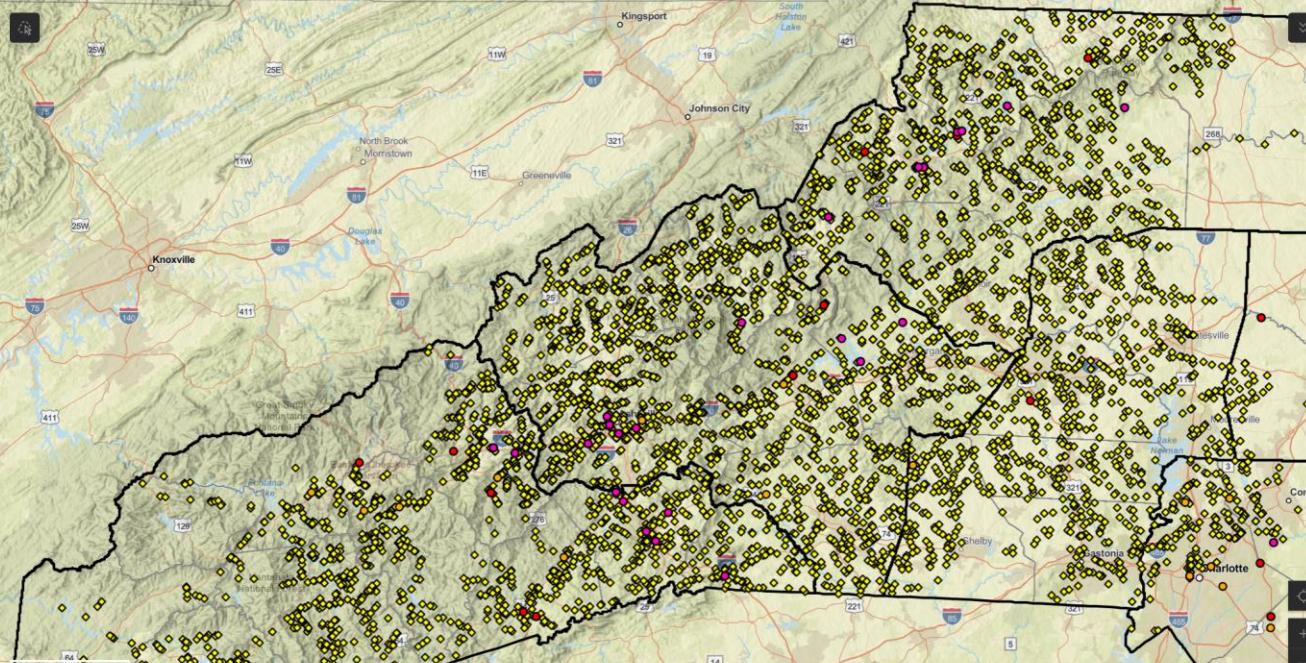
National Hurricane Center
NWS Quantitative Precipitation Forecasts
BridgeWatch
FIMAN

Questions or comments? Contact Alan Coats at alan.coats@ncdps.gov

Disclaimer: BridgeWatch data is provisional.

Alerts Over Time Alerts by Division

Active Archived Gauged Rainfall All Helene



Buncombe County, NC, Esri, TomTom, Garmin, SafeGraph, FAQ, METI/NASA, USGS, EPA, NPS, USFWS | Sources: Airbus, USGS, NGA, NASA, CGIAR, NLS, OS, NMA, Geodatasyseisen, GSA, GSI and the GIS User Community | North Carolina Dep... Powered by Esri



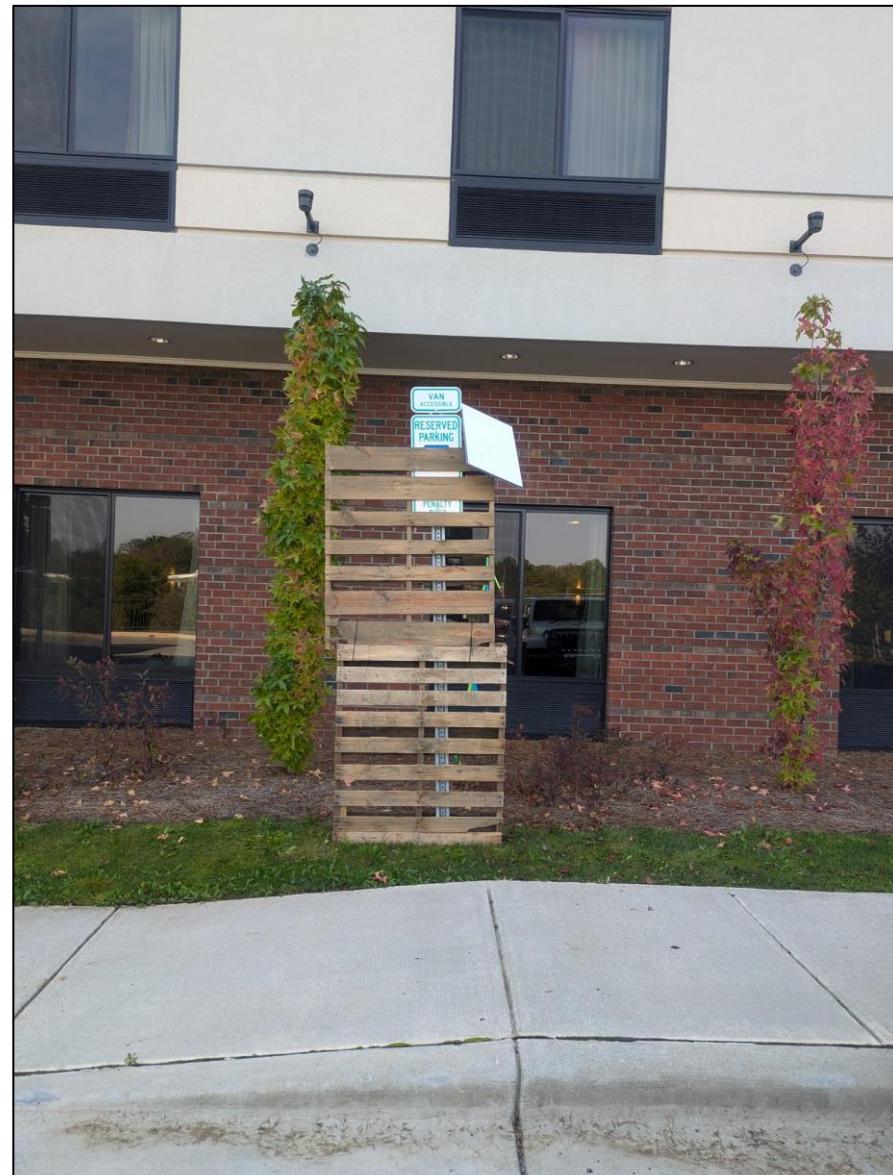
2.5k
2k
1.5k
1k
500
0

1 2 3 4 5 6 7 8 9 10 11 12 13 14

NEXRAD Rainfall Alerts
ADCIRC Storm Surge Alerts
SLOSH Storm Surge Alerts
Gauged Water Elevation Alerts

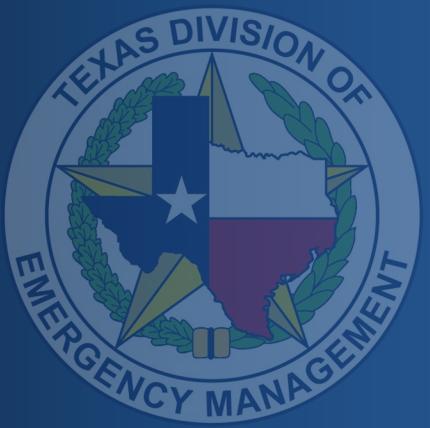
Coordinating with Locals

- Coordinating calls
- Sharing data/resources
- Connecting and aiding county/regional staff
- Volunteers



Lessons Learned

- Helping different counties/agencies in different ways
- Deploying volunteers
- New tools and features



Melissa Ruiz

Unit Chief, Geospatial & Data Analytics

Texas Division of Emergency Management

Melissa.Ruiz@tdem.texas.gov

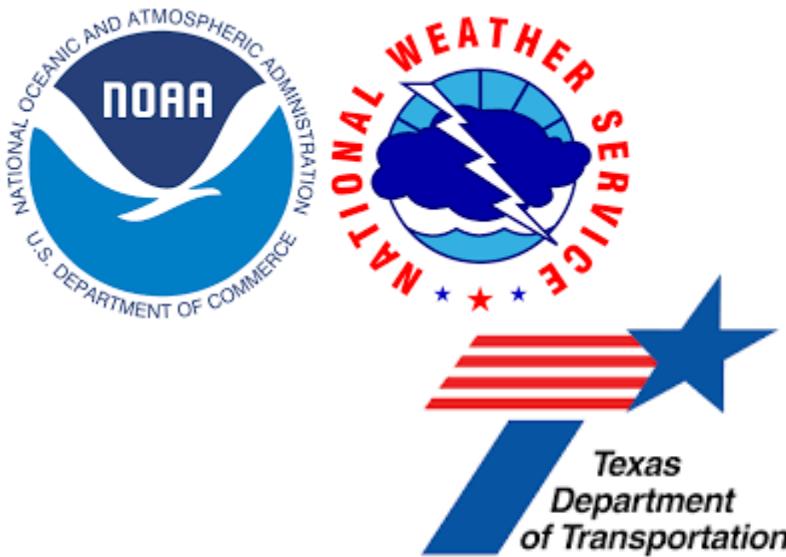
LinkedIn:

<https://www.linkedin.com/in/melissaruizjurrens/>



Emergency Management GIS Data

- SOC EM Council Agencies and Stakeholders
- Data Connectors, APIs, and REST Services
- ArcGIS Online Feature Services
- Mobile Field GIS Data Collection



Common Operating Picture (COP)

 TDEM Portal  TDEM THE TEXAS A&M UNIVERSITY SYSTEM [COP Home Page](#) [Response](#) [Recovery](#) [External Resources](#) [SIGN OUT](#)

TROPICAL STORM AWARENESS

[Active Storms](#) [Recent Tropical Activity](#)

Active Hurricanes, Cyclones and Typhoons - Forecast Position

- Tropical Low
- Tropical Depression
- Tropical Storm
- Hurricane
- Major Hurricane

Active Hurricanes, Cyclones and Typhoons - Observed Position

Active Hurricanes, Cyclones and Typhoons - Forecast Track

Source: Esri, Maxar, Earthstar Geographics, and the GIS User Community | NHC, JTWC

Seven-Day Graphical Tropical Weather Outlook
National Hurricane Center Miami, Florida
www.hurricane-center.gov

TX Active Asset Tracking

Assets Layers

- TXTF Assets
- SC-TF Assets
- TN-TF/MI-TF/FL-TF Assets
- PWRT Assets
- TPWD Assets
- TXDPS Assets
- TFS Assets (WIRES)
- Engine
- Dozer

Map of Texas showing asset locations across various counties, including a detailed inset for the Longview area. A legend on the right side of the map identifies asset types by color and icon.

TFS	TIFMAS
79	29
35	11
22	9
0	12
15	2
Totals	

Texas Parks & Wildlife, CONANP, Esri, TomTom, Garmin, FAO, NOAA, USGS, EPA, NPS, USFWS | NOAA/NWS | Source: USGS, ... Powered by Esri

Field Data Collection

Quick Capture



1:22 4G

← Chrome

X e85059 v8 Deployment Wi...

Team Name: TX-TF1

Read Me - Deployment

Tracklog - Click to Start / Stop

- Recon
- Hasty / Rapid
- Primary
- Secondary, low
- Secondary, high
- Targeted

Damage Assessment

Human Interactions

- Assisted
- Evacuated
- Rescued
- Shelter in place
- ICP/BoO
- V

Hazards

- Animal hazard
- Fire incident
- HAZMAT Incident
- Route blocked
- Flood/water level
- Other Hazard

Other/Support

- SAR
- Location Update
- Targeted Search
- ICP/BoO
- Searched
- Helicopter LZ
- CCP
- Casualty Point





TX-TF Search and Rescue

TX SAR COP Dashboard

Search...

- Structure - Minor
TX-Harris Co FMO Reed1620
Last Edited: 5/17/2024, 2:50 PM
Roof damaged
- Structure - Affected
TX-Harris Co FMO Reed1620
Last Edited: 5/17/2024, 2:48 PM
- Other Hazard
TX-Harris Co Sheriff SheriffEOC
Last Edited: 5/17/2024, 2:48 PM
Fallen trees due to high winds.
- Structure - Affected
TX-Harris Co FMO Reed1620
Last Edited: 5/17/2024, 2:47 PM
- Structure - Minor
TX-Harris Co FMO Reed1620
Last Edited: 5/17/2024, 2:47 PM
Power lines falling over
- Structure - Minor
TX-Harris Co Sheriff SheriffEOC
Last Edited: 5/17/2024, 2:43 PM
Rooftop damage and side windows are shattered. 5214 Queens watchdog Court.
- Structure - Affected
TX-Harris Co FMO Reed1620
Last Edited: 5/17/2024, 2:42 PM
Debris
- Structure - Minor
TX-Harris Co Sheriff SheriffEOC
Last Edited: 5/17/2024, 2:40 PM
Rooftop damage and backyard, fencing blown down. 19106 wild cave

Rescued **29** Assisted **20** Evacuated **45**

SAR COP Strategic Dashboard Deployment - 821c32

Team Status

Plans Team Managers update this via Survey123, as outlined in the IAP/OAP.
To register a new team [fill out a new survey](#).

Search...

SC-TF1 (EMAC)
Swiftwater/Flood Search and Rescue Team (Type 1)

Status: Activated
Personnel: 15
Situation: South Carolina Task Force 1 deployed as a Type 1 Boat Team to Texas. SC-TF1 Boat 1 & 2 currently operating in flash flood conditions in the Riverside area of Huntsville. Boat 3 & 4 are staged at the BoO in Conroe TX

May 16, 2024 at 7:03 PM
400 Conroe Park West Dr, Conroe, Texas, 77303
[Update Status](#)

TN-TF2 TN-TF2(State)
Swiftwater/Flood Search and Rescue Team (Type 1)

Status: Activated

Map

Waypoints **3,464** + 126 Today

Total waypoints across all categories.

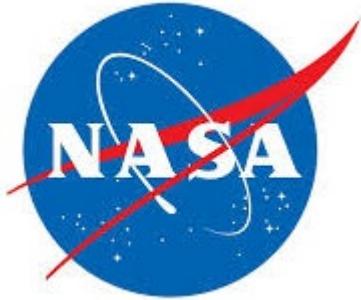
Confirmed Interactions **249** + 24 Today

Count of confirmed persons encountered. (!) Does NOT include unconfirmed detections.

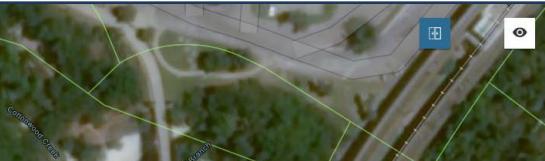
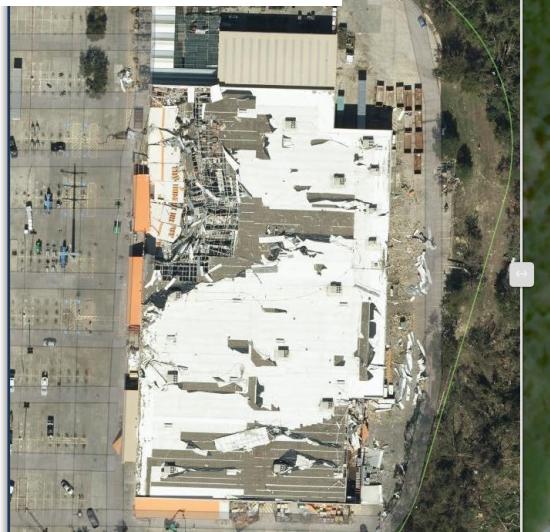
Damage Obs **1.5k** + 49 Today

Total damage observations across all categories.

Damage Obs Progress



Post-Disaster Imagery



PDA Field Team Awareness

SARCO Damage Points

- Structure - Destroyed
- Structure - Major
- Structure - Minor
- Structure - Affected
- Structure - Unaffected
- Structure - Unknown

iSTAT - Citizen Damage Lvl

Damage Level

- Destroyed
- Major
- Minor
- Affected

500 ft

Maxar | FEMA Urban Search & Rescue, NAPSG Foundation, and National Geospatial Coordination Group (NSARGC) | Esri Community Maps Contributed



FEMA



CIVIL AIR PATROL
U.S. AIR FORCE AUXILIARY

TDEM Portal for Local Jurisdictions

TDEM Portal How to Use This Site Training Hub TDEM Website

TDEM Portal

Sign Out

Select a TDEM Support Option

 TDEM Disaster Reporting Dashboard
Step by Step process of disaster summary and recovery reporting forms.
[Open](#)

 Recovery Data
A page with resources, such as damage assessment survey responses, for each county.
[Open](#)

 1 Local Official Verification
 2 Local Disaster Notification
 3 Local Damage Assessment
 4 State Validation of Local Damages
 5 FEMA Request for Assistance and Management
 6 TDEM Grants Management System


Self-Survey Damage Assessments

2020

- Hurricane Hannah
- Hurricane Laura

2021

- Winter Storm Uri

Since Feb 2021

- 50 Incidents



TDEM iSTAT

Individual State of Texas Assessment Tool (iSTAT) Damage Surveys
option below to submit damages and losses to your Residential, Commercial, and/or Agricultural
de incidente a continuación para presentar daños y pérdidas a su propiedad **Residencial, Comer**

Active Incidents / Incidentes Activos



- [**Spring Severe Weather and Flooding Event** \(English\)](#)
 - (April 26 - Ongoing Severe Weather Event)
- [**Evento de Inundaciones y Clima Severo de Primavera** \(Español\)](#)
 - (Evento Climático Severo de 26 de Abril en Curso)

Individual State of Texas Assessment Tool (iSTAT)

The objective of this survey is to help state and local emergency management officials across Texas identify and gain an understanding of damages that have occurred during recent natural disaster activity.

Please submit [one survey](#) per impacted address.

Reporting damages to Emergency Management is a voluntary activity, is not a substitute for reporting damage to your insurance agency, and does not guarantee disaster relief assistance.

Para la encuesta en Español, haga [Cliq Aquí](#)

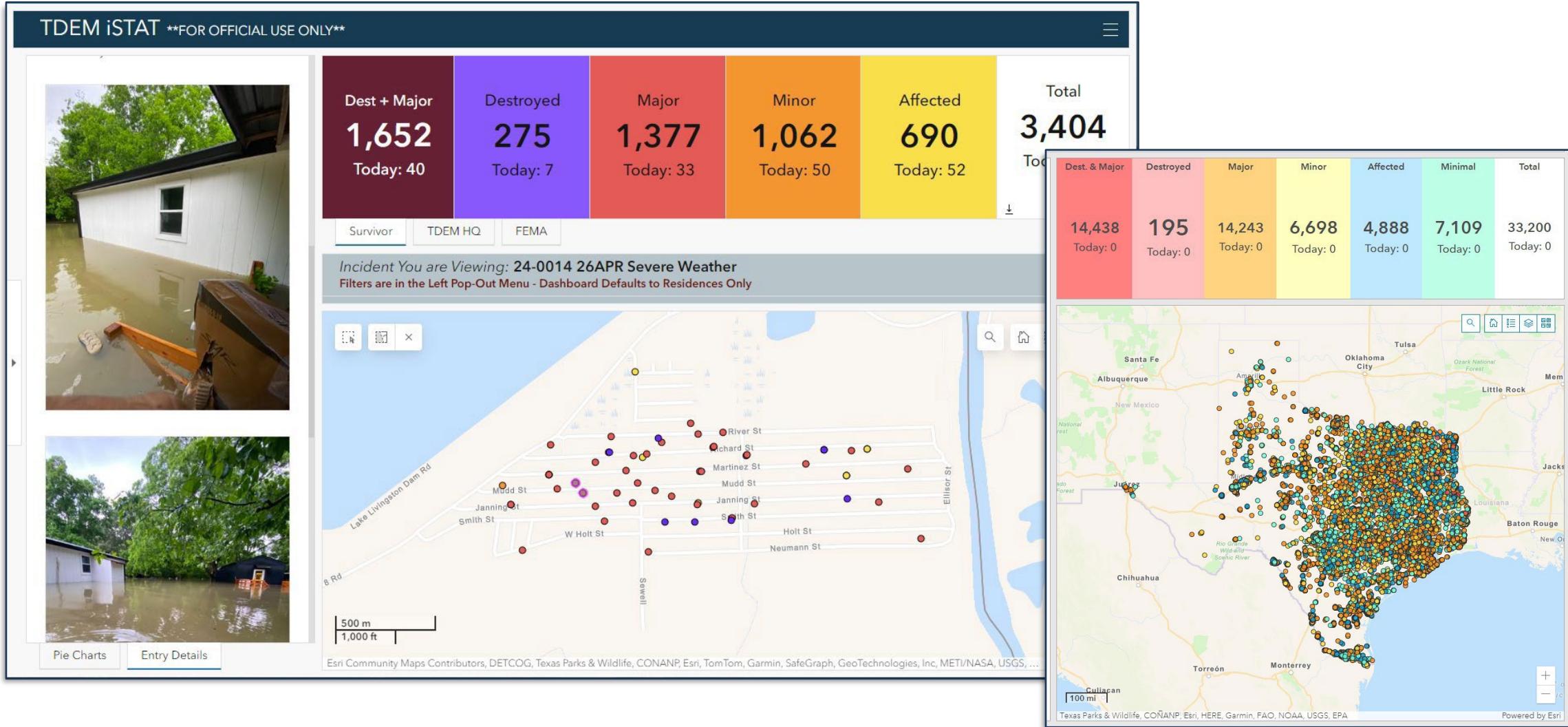
Contact Information:

Is the impacted location a Residence or Business?*

Residence

Business

iSTAT Dashboard



Full Circle - Hazard Mitigation

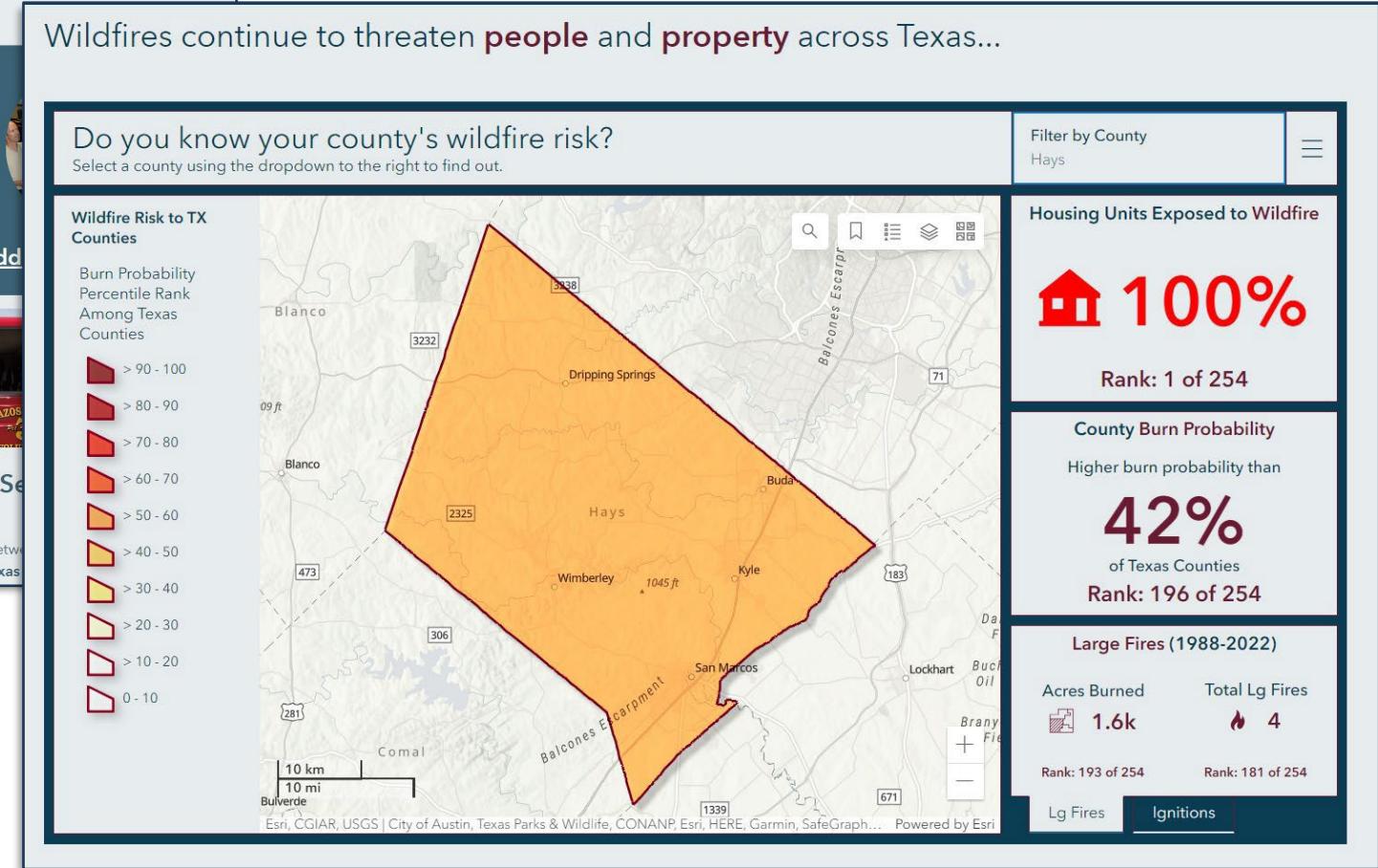
[Why apply for HMGP?](#) [Eligible Activities](#) [How to Apply](#) [Add to My Profile](#)

About the Hazard Mitigation Grant Program (HMGP)

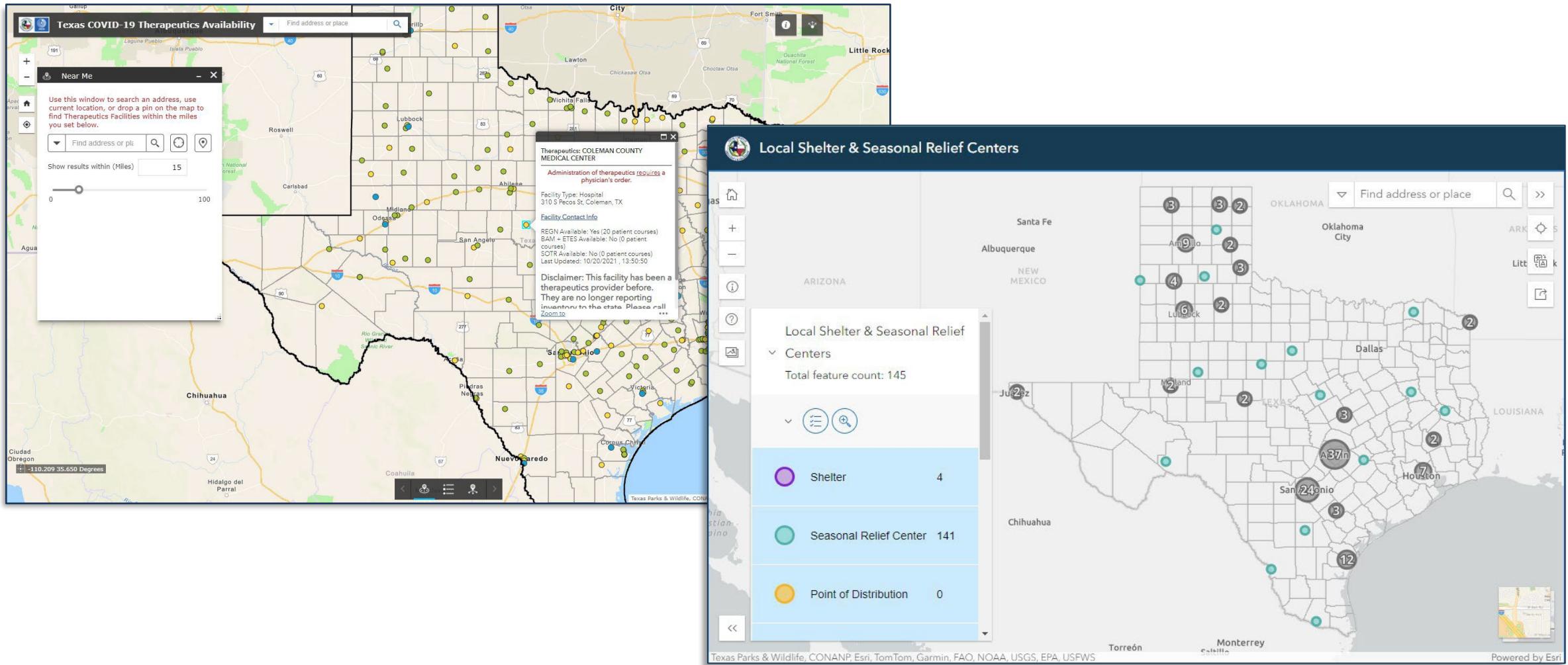
- Governor Abbott and the Texas Division of Emergency Management (TDEM) announce the open application period for the FEMA Hazard Mitigation Grant Program (HMGP) - FY2022 Post Fire. The application period opened on January 27, 2022 and will close on January 20, 2023.
- FEMA's Hazard Mitigation Grant Program (HMGP)-Post Fire assistance helps communities implement hazard mitigation measures after wildfire disasters.

TDEM/Texas A&M Forest Service Partnership

This website was developed in partnership between the Texas Division of Emergency Management (TDEM) and the Texas A&M Forest Service.



Public Outreach



EM GIS Data Resources

National Association of
Public Safety GIS (NAPSG)



FEMA Geospatial
Coordination Group



NASA Disaster Response
Coordination System (DRCS)





ARCGIS FOR COMPREHENSIVE HURRICANE READINESS

HOUSTON PUBLIC WORKS
OFFICE OF EMERGENCY
MANAGEMENT





SPEAKERS:

Anthony Powell - Interim IT Assistant Director

Francesco Carmine – Emergency Management GIS Specialist



ABOUT OEM :

The City of Houston Office of Emergency Management (**OEM**) is the chief coordinating agency for disaster response in the nation's fourth-largest City. **OEM** provides emergency response coordination and communication assistance to City agencies, and serves as liaison to regional, state and federal agencies during times of emergency. In addition, **OEM** engages with the local community to promote emergency preparedness through a variety of initiatives. In 2025 **OEM** was transitioned to operate from within the City of Houston Public Works Department.

SERVICE LINES



DIRECTOR'S
OFFICE



OFFICE OF
EMERGENCY
MANAGEMENT



PLANNING



HOUSTON
WATER



TRANSPORTATION
AND DRAINAGE
OPERATIONS



ENGINEERING



CONSTRUCTION



UTILITY BILLING



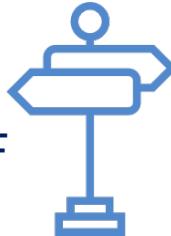
TECHNOLOGY



HOUSTON
PERMITTING CENTER

HOUSTON PUBLIC WORKS

16,000
LANE MILES OF
STREETS



 **3,900**
MILES OF
STORM DRAINS

 **2,450**
TRAFFIC SIGNALS

 **2,800**
MILES OF
ROADSIDE DITCHES

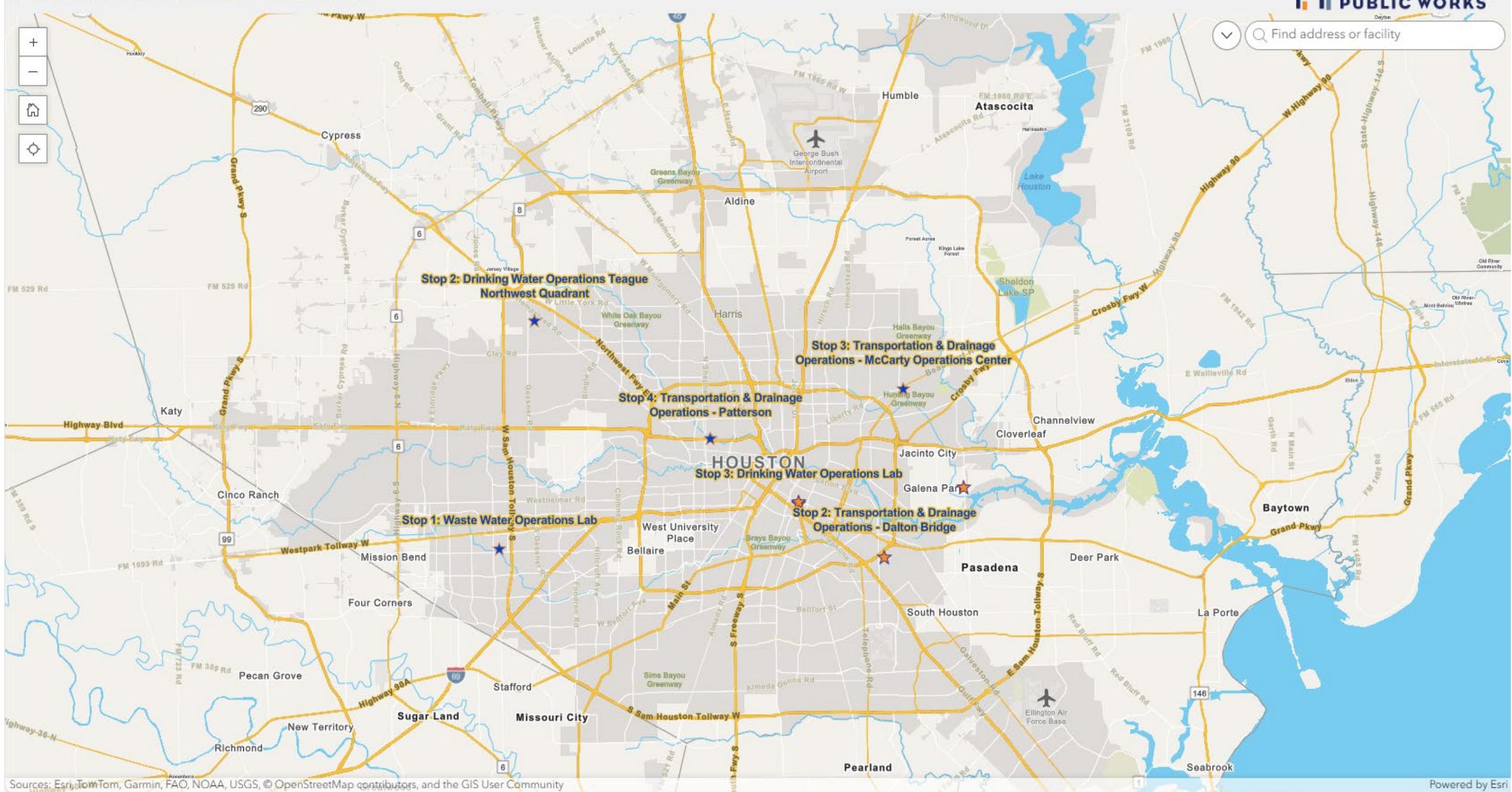
500+ 
TYPES OF PERMITS

 **\$1.8B**
ANNUAL BUDGET

 **163B**
GALLONS OF WATER
TREATED PER YEAR

 **5.8M**
WATERBILLS
SENT PER YEAR

 **3,900**
EMPLOYEES

Houston Public Works Facilities – Tour Navigator




**HOUSTON
PUBLIC WORKS**

Critical Facilities Tracker

Service Line:

0 Selected

LYNCHBURG PUMP STATION

Houston Water - Drinking Water Operations
908 S. Lynchburg Rd-Baytown
(Staffed)

SOUTHEAST WATER PURIFICATION PLANT

Houston Water - Drinking Water Operations
3100 Genoa-Red Bluff Rd
(Staffed)

TRINITY RIVER PUMP STATION

Houston Water - Drinking Water Operations
8419 FM 1409 Dayton-Liberty County
(Staffed)

SOUTHWEST REPUMP PLANT

Houston Water - Drinking Water Operations
4410 Westpark Dr
(Staffed)

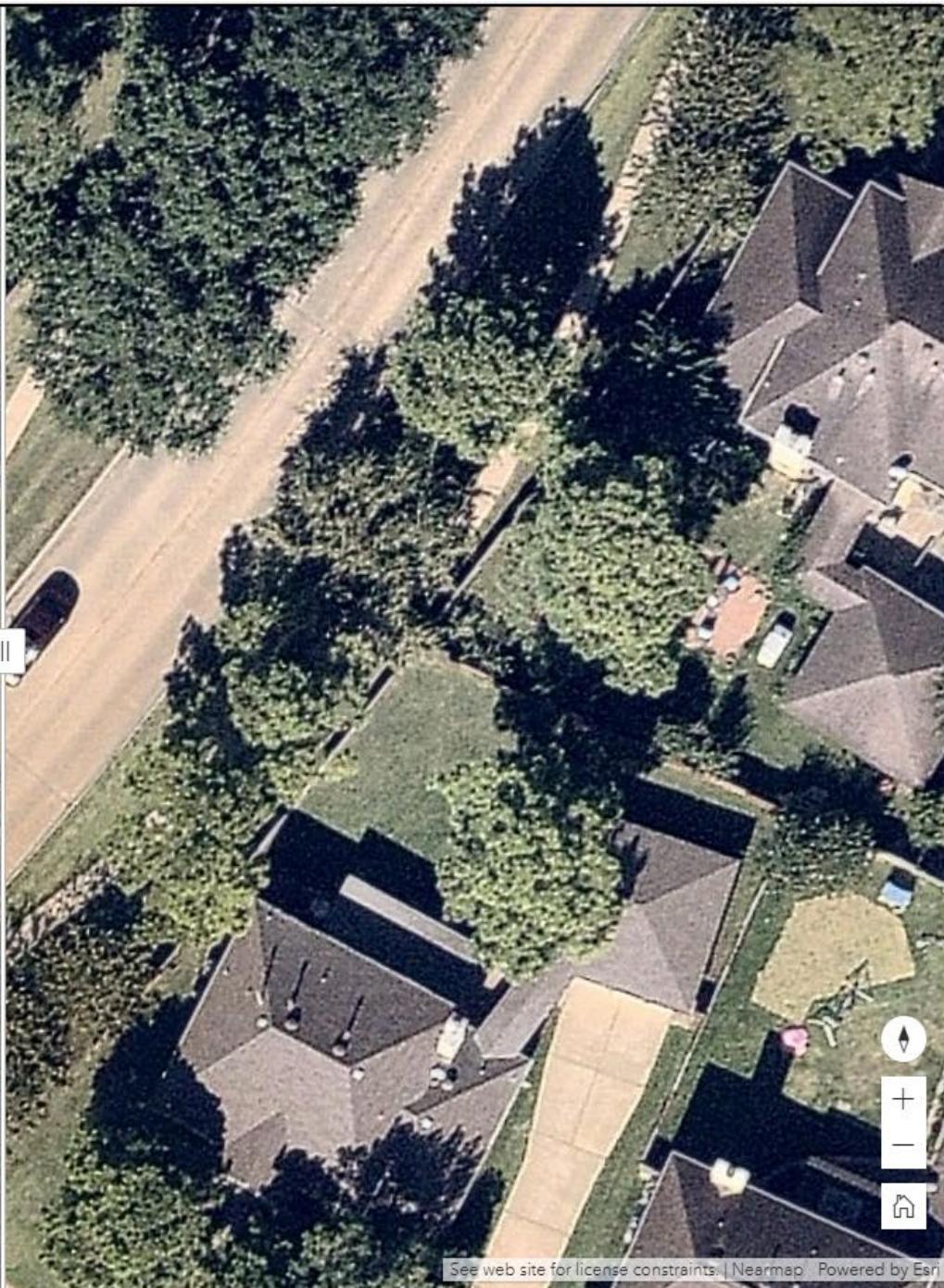
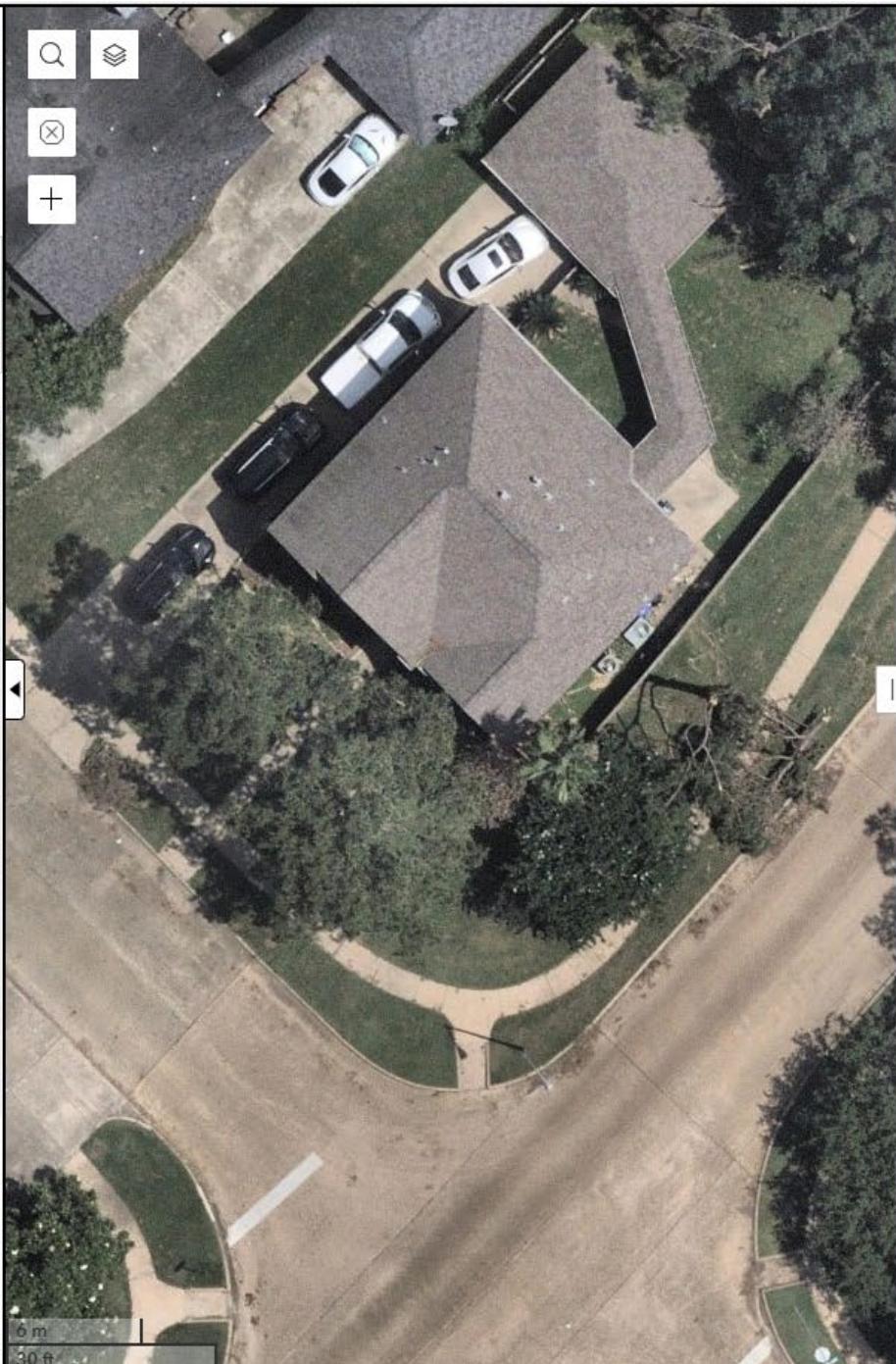
ACRES HOME REPUMP

Houston Water - Drinking Water Operations
1810 Dolly Wright St
(Staffed)

SIMS BAYOU REPUMP PLANT



< Sat May 18 2024 > < Fri Oct 24 2014 >





**HOUSTON
PUBLIC WORKS**

Critical Facilities Tracker

Service Line:

0 Selected

LYNCHBURG PUMP STATION

Houston Water - Drinking Water Operations
908 S. Lynchburg Rd-Baytown
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Houston Water - Drinking Water Operations
1810 Dolly Wright St
(Staffed)

SIMS RAYONII REPUMP PLANT

Houston Water - Drinking Water Operations
1810 Dolly Wright St
(Staffed)

< Sat May 18 2024 >



6 m
30 ft

See web site for license constraints. | Nearmap | Powered by Esri



THANK YOU

