



# **SUPPORTING RESILIENT COMMUNITIES THROUGH DATA, TECHNOLOGY, COLLABORATIVE WORKSHOPS, & EDUCATION**

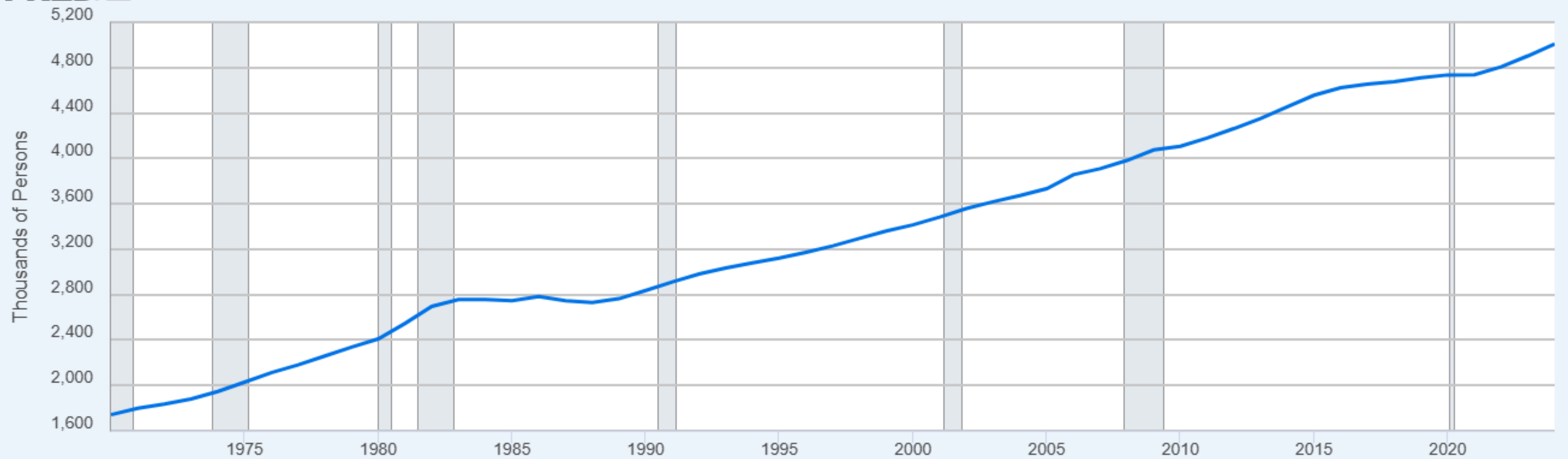
Pam Nerurkar, Marketing & Communications  
Phoenix Rogers, DAR Specialist

# Resilience Challenges Facing the Houston Region

- Rapid population growth and development pressure
- Flood risk and extreme rainfall events
- Infrastructure and land-use planning challenges
- Need for accessible data to support planning decisions



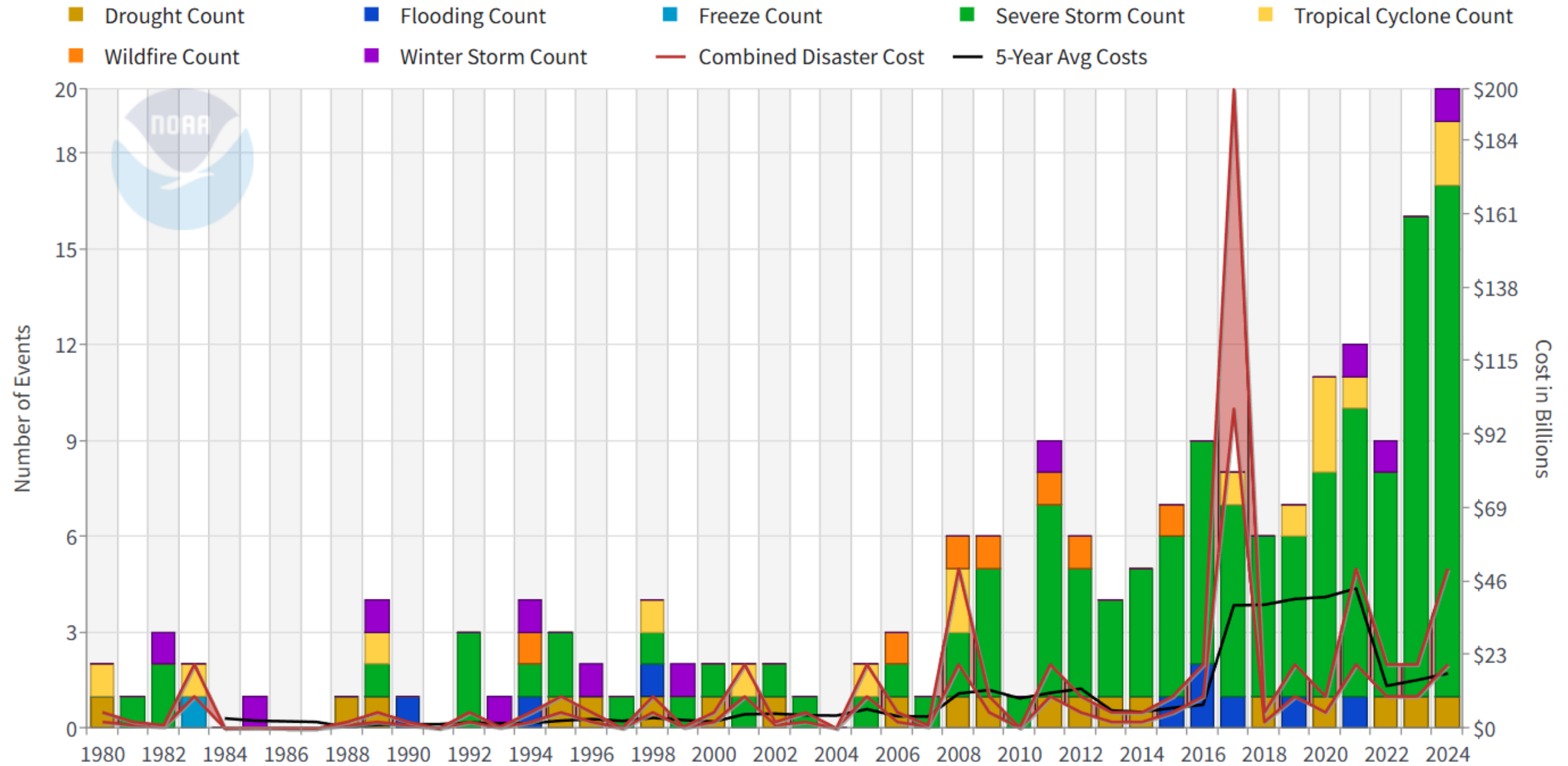
Resident Population in Harris County, TX



Source: U.S. Census Bureau via FRED®  
Shaded areas indicate U.S. recessions.

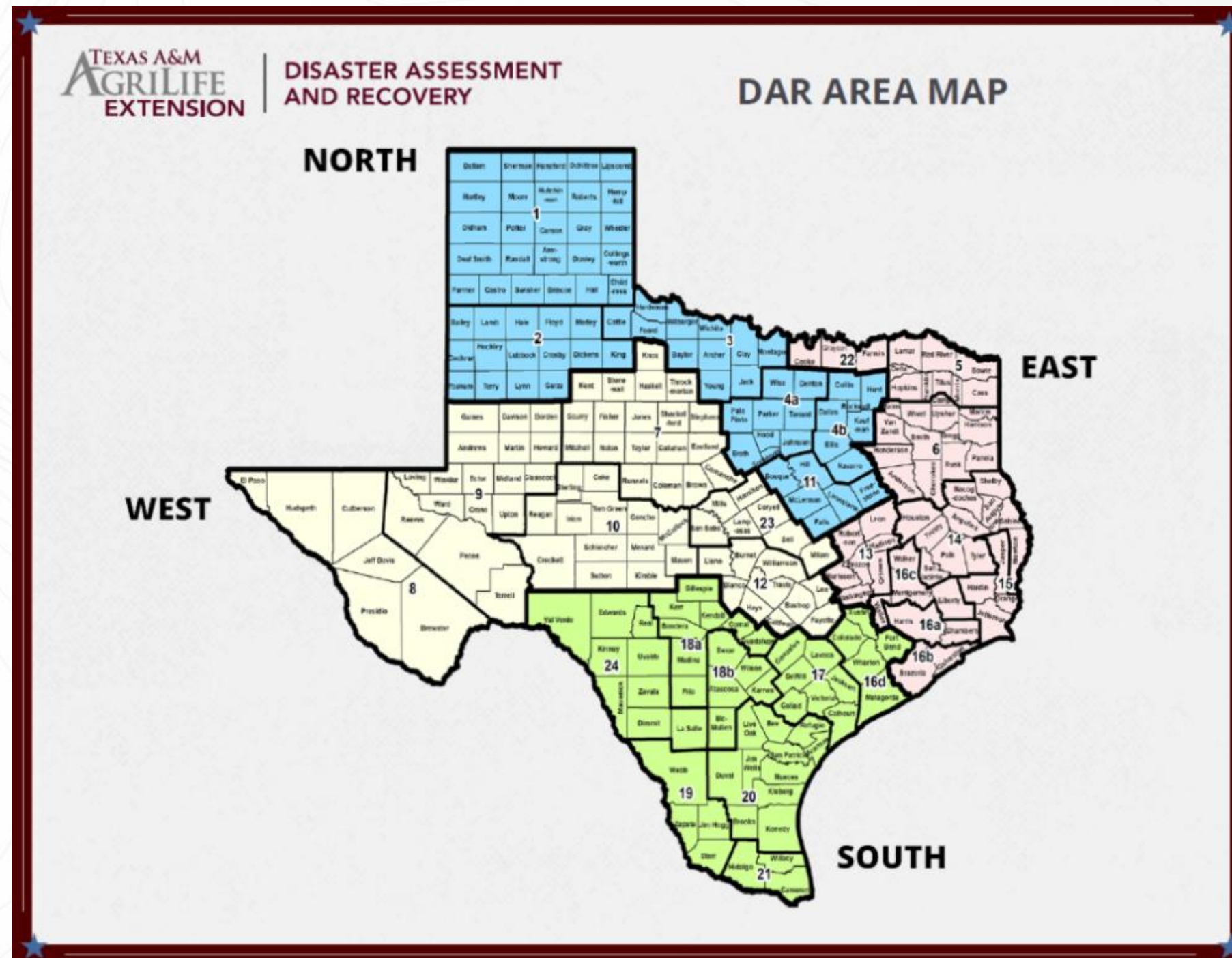
fred.stlouisfed.org

### Texas Billion-Dollar Disaster Events 1980-2024 (CPI-Adjusted)



Updated: January 10, 2025

Powered by ZingChart



**Mitigation**

**Preparedness**

**Response**

**Recovery**

# Community Hazards and Resource Management

## Mitigation

- Collaborative community planning tools, workshops, education, and knowledge to promote resiliency and safety
- Support for hazard mitigation, land use planning, zoning, and natural resource management



# CHARM Tools



**CHARM Studio**

CHARM Studio is a user-friendly mapping tool that enables everyday citizens and local officials to create complex and dynamic planning scenarios.



**DataGrid**

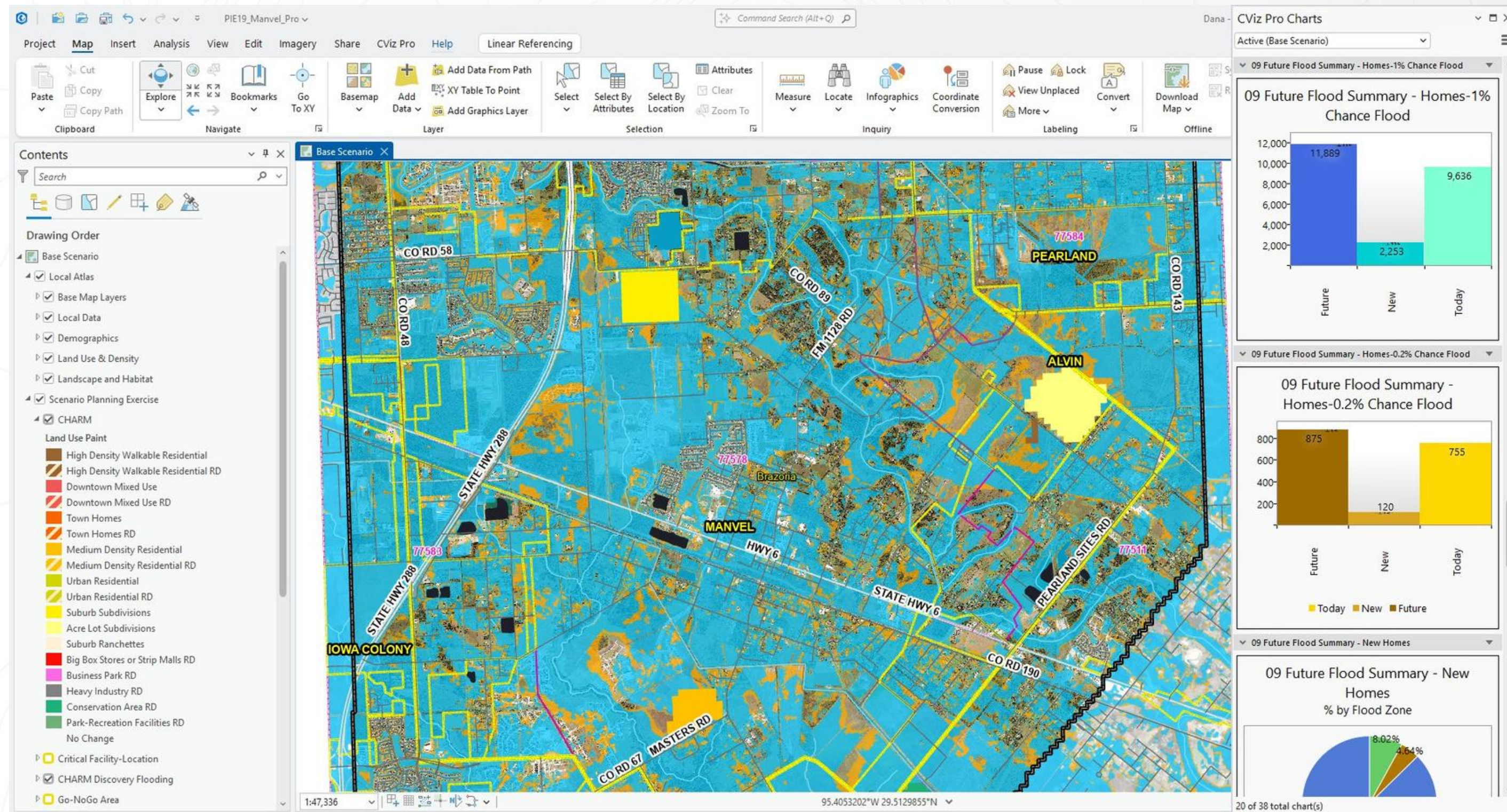
By quickly and efficiently aggregating relevant data sets from multiple sources, the DataGrid empowers communities to make informed decisions.



**CommunityViz®**

CommunityViz®, an award-winning plugin for ArcGIS, generates custom analytics for GIS analysts and planners.

# CHARM Tools

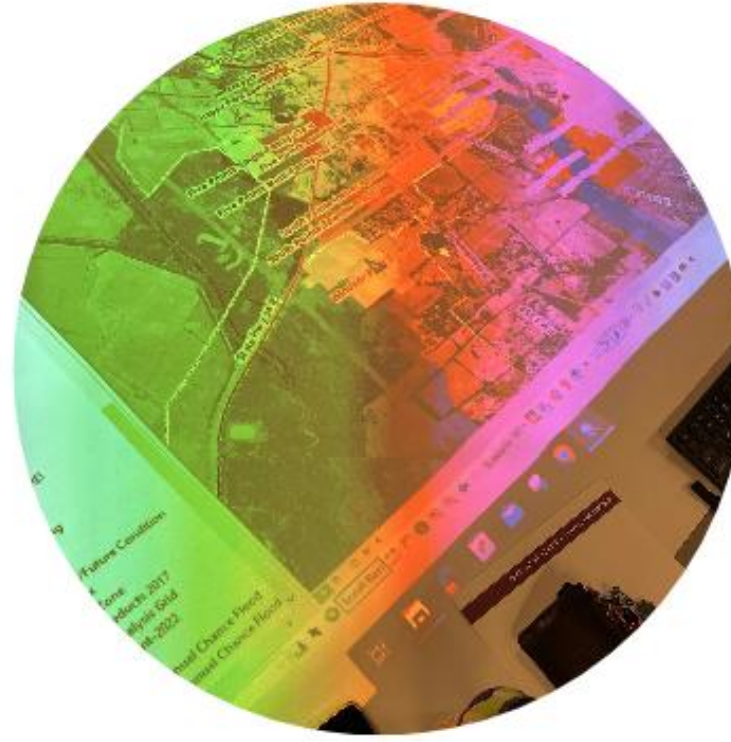


# CHARM Workshops



## CHARM Resiliency

CHARM Resiliency workshops build risk awareness and disaster resiliency at the local level, helping local officials and citizens make sense of the many challenges and opportunities involved in growth planning.



## Project Identification Exercise (PIE)

PIE utilizes data-driven, map-based exercises with the goal of identifying project opportunities related to mitigation, risk awareness, planning, and other risk reduction activities.



## Community Technical Assistance Program (CTAP)

CTAP facilitates project scoping exercises to identify relevant and achievable technical assistance activities that are in line with local mitigation needs and planning priorities.

# CHARM Education: Texas Citizen Planner

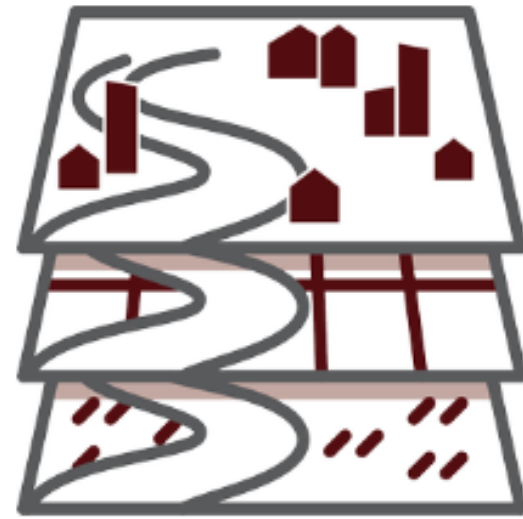


- Educational program that equips local officials and community leaders with practical knowledge of planning, zoning, and hazard mitigation
- Builds local capacity for resilient growth, flood planning, and informed land-use decision-making

# CHARM Impact



**75**  
Workshops



**133**  
Models



**150+**  
Communities



**2,000+**  
Attendees

# Green Infrastructure for Texas

## Mitigation

- Advances community resilience through green infrastructure education, workshops, and technical assistance
- Supports communities with planning guidance, project development, and applied research on nature-based solutions



# GIFT Approach



## Site-scale

Address runoff from a single site. Is appropriate for both new developments and retrofits. Bioswales, pervious pavement, bioretention.



## Mid-scale

Neighborhood sized projects that reduce stormwater quantity and improve water quality. Construct wetlands, conservation subdivisions.



## Large-scale

Conservation, restoration, and preservation of large tracts of land that provide ecological services.

# GIFT in Action



## Education

Online course for community leaders, workshops, and a high school student career development program



## On-the-Ground Projects

Rain gardens, vegetated filter strips (seen here), permeable parking areas, stormwater wetlands, and associated amenities like Exploration Green



## Applied Research

Continued monitoring of installed practices to benefit future designs

# Preparedness

Resilient Houston Target 1 – Preparedness Training for Houstonians

**BUILDING  
EMERGENCY KITS**



**PROTECTING YOUR  
HOME**



**MAKING A PLAN**



**STAYING INFORMED**



Numerous other outreach education opportunities, including MyPI, which is a Teen CERT program (Resilient Houston Actions 1.2 and 7.4)

# Preparedness

Various Resilient Houston Goals



**GOAL 03**

**SUPPORT SMALL BUSINESSES TO BETTER WITHSTAND ANY DISRUPTION.**



**GOAL 10**

**PROACTIVELY CARE FOR HOUSTONIANS' MENTAL HEALTH**



**GOAL 19 GROW EQUITABLE ACCESS TO QUALITY FOOD TO NOURISH HOUSTON'S STATUS AS A CULINARY CAPITAL.**

# Response

Primarily Resilient Houston Goal 19

We are the LEAD agency, state-wide, for **Agriculture & Natural Resources Response** (Emergency Support Function 11)

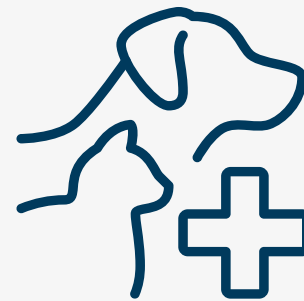
ANIMAL  
SUPPLIES



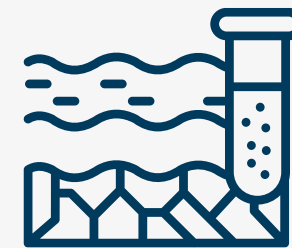
ANIMAL  
SHELTERING



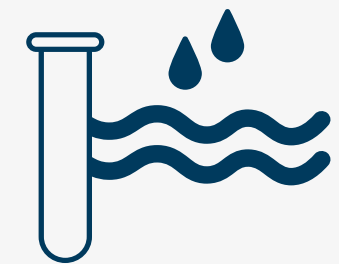
ANIMAL  
HEALTH



SOIL  
TESTING



WATER  
TESTING



Our unit is also a deployable asset for other support response activities.

# Recovery

Primarily Resilient Houston Goal 19

We are the LEAD agency, state-wide, for **Agriculture & Natural Resources Recovery**  
(Emergency Support Function 11)

AG LOSSES



EDUCATIONAL  
SUPPORT



LAND & WATER  
REMEDIATION



Our unit is also a deployable asset for other support recovery activities, such as city-wide damage assessments, donations management, and others.

# Partnering With Communities



- Resilience and hazard planning
- Spatial data and mapping support
- Scenario planning and modeling
- CHARM and GIFT workshops
- Community education initiatives



“Participating in the CHARM workshop gave me concrete and actionable information. The major takeaway came from comparing our regulatory flood plain maps with additional data that highlighted greater risk exposure: this validated concerns we had previously had and gave us tools to communicate these needs to the development community. I can’t overstate this, as we’ve had serious flood problems in the past that the regulatory maps did not predict.... I recommend the CHARM process very highly.”

*- Megan Henderson, City Manager, City of Hillsboro, TX*



**THANK YOU**

<https://tcwp.tamu.edu/>

<https://agriflifeextension.tamu.edu/assets/environment-natural-resources/disaster-preparedness-recovery/>