Floodplain Management meets Emergency Management at the Local and Regional Level

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Executive Director

Focus - Outline

- Talk about the WHY
- Historical events and how they differ
- Attention to Flood(s) at the state and local level
- Floodplain Manager Role(s)
- Emergency Manager Role(s)
- Communication
- Improved Resiliency

WHY

- Flooding is the most common disaster in Texas
- Better identification and understanding of risk aids in improving the focus for planning and response
- Increased coordination improves planning around flood events which aids our preparation and response
- Interpreting data and converting that to normal terminology happens best when time allows
- Creating a seamless communication strategy prior to any event can maintain the calm and builds trust and confidence in the community
- Our core mission is the preservation of life and property

Historical Texas Floods

- Thrall (Sept. 1921) – over 39.7 inches fell in 36 hours
- D'Hanis (May 1935) – Total of 14 inches fell with 12.5 inches in 75 minutes
- Fort Worth (May 1949) – over 10 inches fell in a short period
- New Braunfels (May11, 1972) – 16.5 inches fell with 12 inches falling in a two-hour period
- Austin (May 4, 1981) – 10 inches fell within 4 hours
- Guadalupe River Flood (1987) – 11.5 inches of rain fell in Hunt
- Central Texas 1998 Hill Country Flood (October 17-19) – over 20 inches fell in areas, isolated reports of 30 inches (BRA)
- Marble Falls (June 27, 2007) – over 19 inches fell in 6 hours

Historical Texas Floods

- Wimberley (May 26, 2015) – 10 – 13 inches fell in Blanco County in a few hours
- Houston 2016 (Tax Day Flood) – approximately 17 inches fell with intensities of up to 4 in/hr
- Rio Grande Valley flooding Spring 2025 – Over 20 inches fell over the course of two days
- San Antonio Beitel Creek Bomb Cyclone Flood June 2025 – around 7 inches total with 3.9 inches in one hour
- Kerr County Flood July 2025 – Rainfall rates from 2-4 inches with approximately 19.5 inches falling in the upper most reach of the south fork of the Guadalupe River

Historical Texas Floods

- Hurricane Allen (August 1980) – Over 20 inches fell in Kingsville
- Hurricane Alicia (August 1983) – Over 11 inches fell in a short timeframe in Galveston and Houston
- Tropical Storm Francis (Sept 1998) – Up to 15 inches fell in portions of the Houston region
- Tropical Storm Allison (June 2001) – Up to 35 inches fell over several days
- Hurricane Dolly (July 2008) – Heavier rains up to 16 inches fell in the lower Rio Grand Valley
- Tropical Storm Hermine (September 2010) – Produced 10-15 inches over a large area of Texas
- Hurricane Harvey (August 25-28) – Between 30 and 60 inches fell over a three-day period across southeast Texas that set a new national record for rainfall total

History of Floodplain Mapping in the Region

Historical Floodplain Mapping

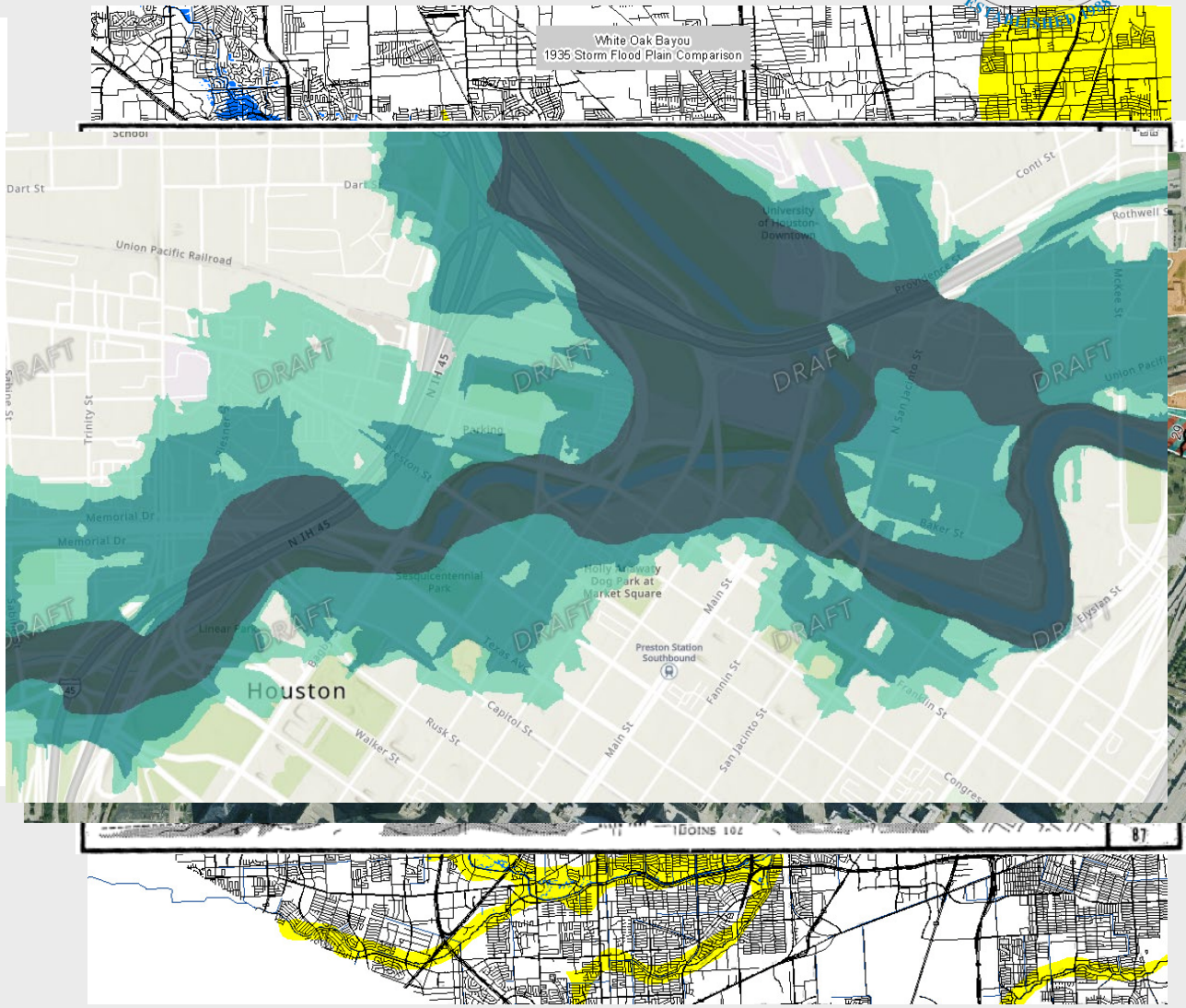
- Pre-NFIP (1951 and 1970)
- Flood Hazard Boundary Maps (early 1970s)
- Flood Insurance Rate Maps (late 1970s to present)
  - Initial conversion of FIRMs (late 1970s)
  - Publication of BFEs/Profiles/Floodway Data (mid 1980s)
  - First Countywide FIRM (1990)

Advancing Technology

- TSARP (2002 to 2007) – updated hydrologic methods, initial use of HEC-RAS, initial use of LiDAR and GIS for mapping
- MAAPnext (2018 to present) – Atlas 14 rainfall, overhaul of hydrologic methods, use of HEC-RAS 1D/2D, more detailed LiDAR, new floodway methods to describe risk in terms of depth times velocity

Uses and Limitations

- Floodplain maps support planning and risk communication but represent modeled scenarios, not exact predictions.



Evolution of Floodplain Management

Flood Protection

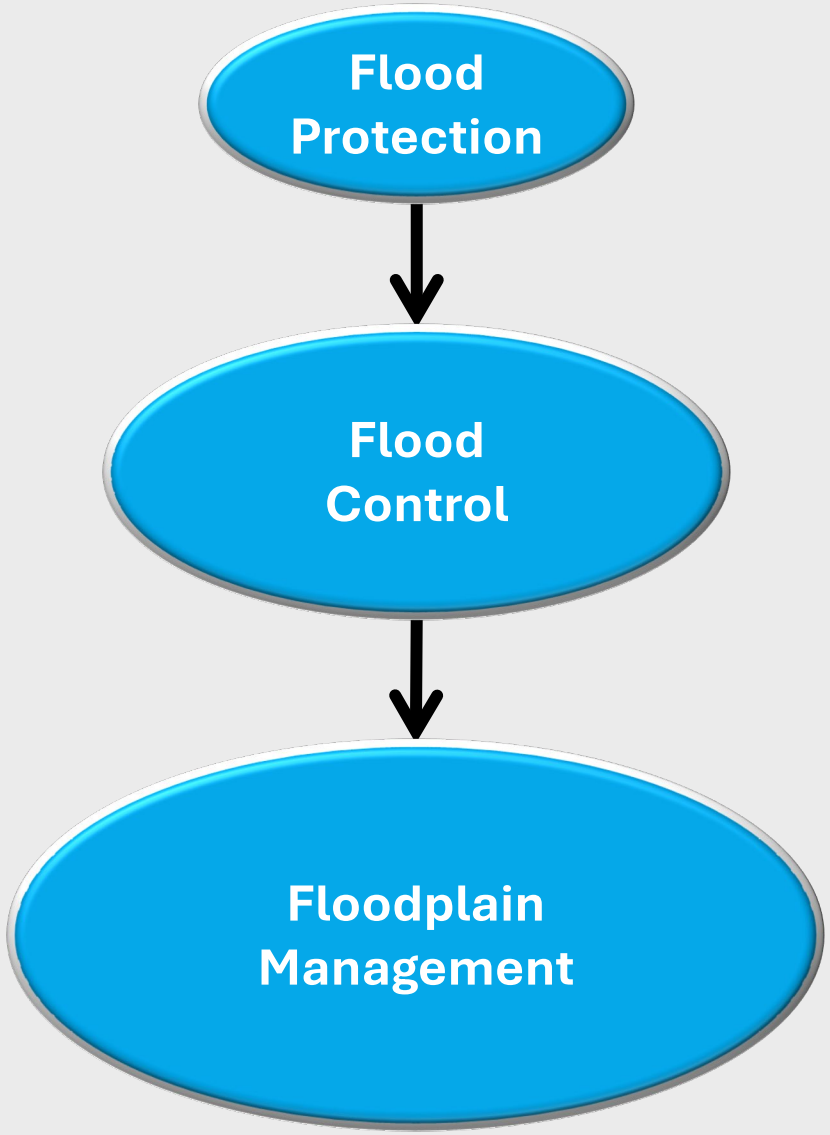
- Going it alone.

Flood Control

- Benefit of communities pooling resources.
- Large public works projects to try to eliminate flood damages
- Realization that land use, soil type and saturation, land slopes, and timing of rainfall all critically influenced flood impacts and severity.

Floodplain Management

- Realizing the benefit of respecting floodplains.
- No single solution, but groups of alternatives to address flooding.
- Need to adapt planning efforts highlighted by flood events often exceeding design assumptions.



Attention To Floods

- TWDB – RFPG and More
- GLO
- TxDOT
- FEMA
- NOAA Atlas 14 and 15
- Flood Assessment System for TXDOT / U.T.
- TexMesonet Expansion Texas Tech
- Regional Models
- Texas A&M Institute for Disaster Resilient Texas
- NWS Flood Inundation Mapping
- ISWMM Sugar Land
- FBC Watershed Studies
- MAAPNext – Harris County
- Local Modeling/Mapping
- Riverine Models

TWDB Regional Flood Planning Group State Flood Plan Outcomes

Existing Flood Risk Statewide – In the 1% and 0.2% chance flood hazard

- 5,886,000 Population
- 1,789,800 Buildings
- 13,099,990 Ac Ag Land
- 66,000 Road Miles
- 1,402,000 Residential Buildings
- 6,659 Critical Facilities

$54.52 B identified in first phase

Floodplain Management

- NFIP – National Flood Insurance Program
- Local Ordinance Expert - Regulatory Role
  - Permitting of floodplain related work
- Community Rating System program
- Elevation Certificates
- FEMA Coordination
- Flood inundation models and maps
- Substantial Damage Estimates
- Repetitive loss tracking
- Data availability

Emergency Management

- Preparedness, Response, Recovery, Mitigation
- Local collaboration specialist
  - Regional support
  - State support
- Trained to prepare and respond to disasters
- National Incident Management System experts
- Communication and nomenclature
  - Forms
  - Asset/Assistance request
- Resource management
- Access to support and assets

Floodplain Management + Emergency Management Coordination

Floodplain Management
- Hydrology
- Modeling
- Infrastructure

Emergency Management
- EOC Operations
- Resource Coordination
- Public Warning

Integrated Flood Response
- Situational Awareness
- Evacuations
- Recovery

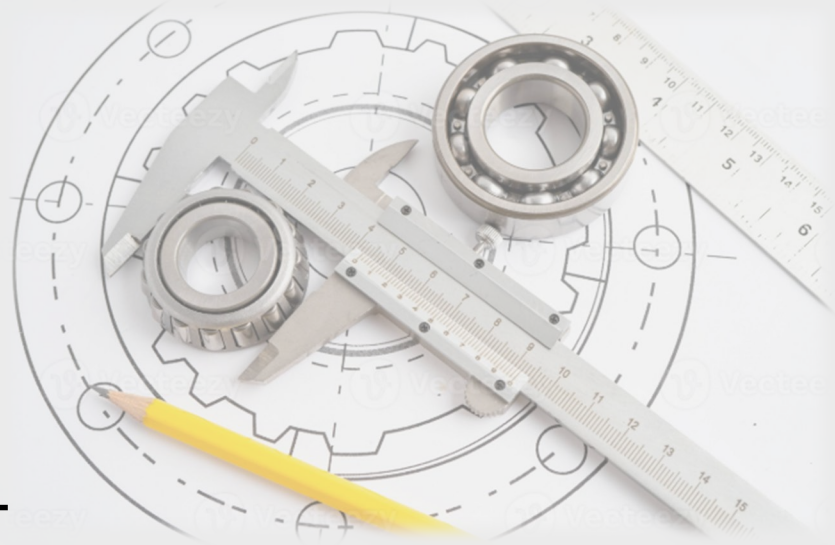
Why Flood Managers & Emergency Managers Must Work Together

FLOOD SCIENCE + OPERATIONAL COORDINATION = *EFFECTIVE DISASTER MANAGEMENT*

Changing Landscape

- Texas Legislature
  - Increasing emphasis on resilience and coordination
  - Flood planning increasingly requires collaboration between local governments, drainage authorities, and emergency management
  - Push for warning systems
- FEMA Review Council Considerations
  - Push immediate response to the states and communities
  - Federal level serve in more of a funding capacity
  - Locally led, state supported and federally funded

Developing Tools

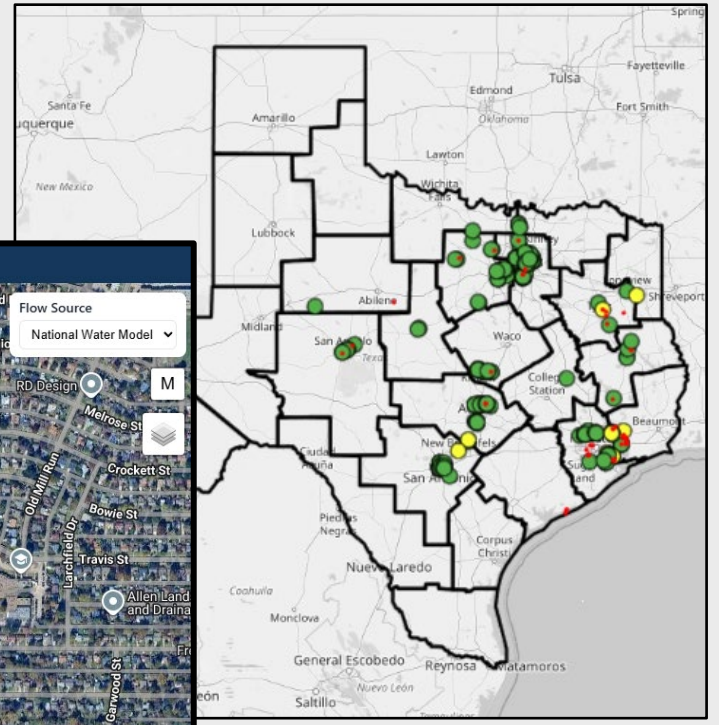


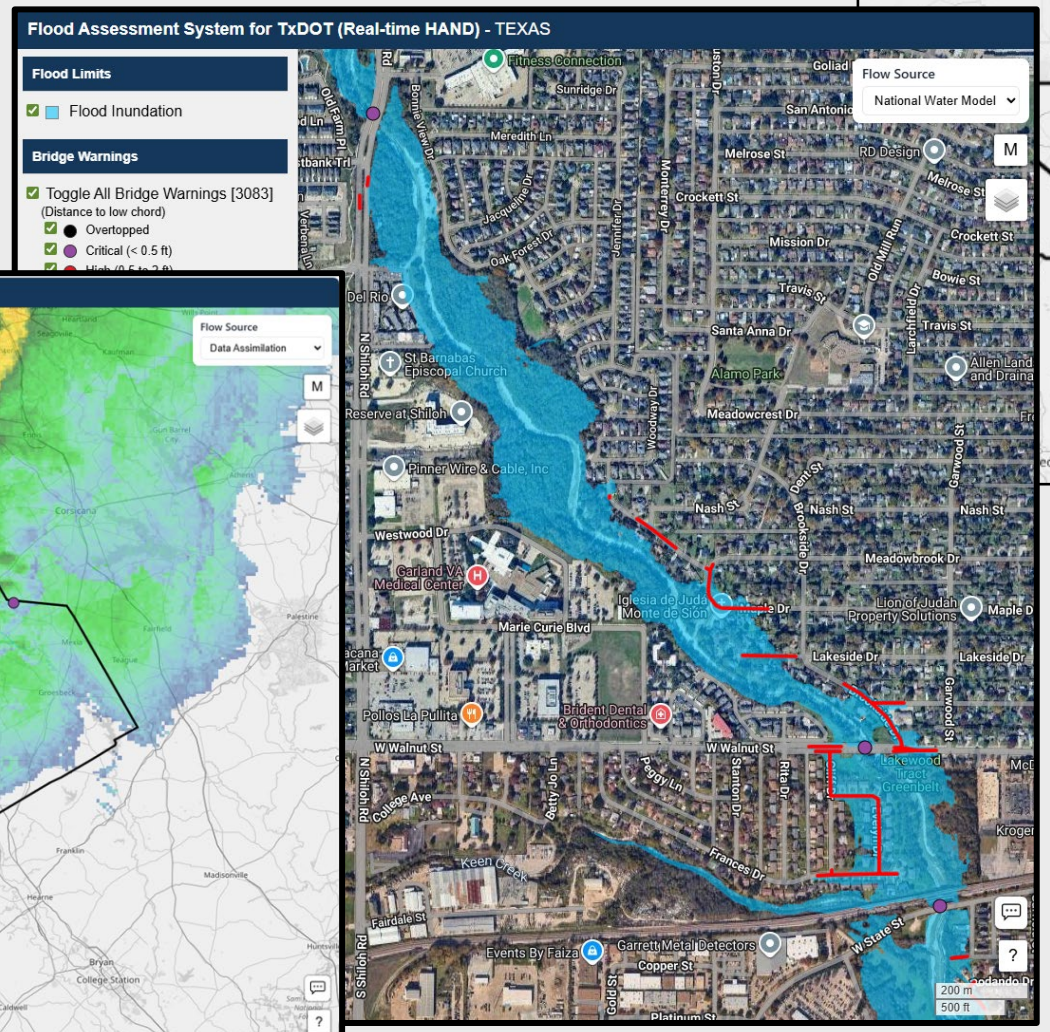
- BLE – Base Level Engineering
- MAAPNext
- FAST – Flood Assessment System for TxDOT
- TWDB – Effective Flood Awareness Communication
  - Dr. Stevens from University of Texas work on flood communications
- NWS Flood Inundation Mapping
- GLO - TDIS

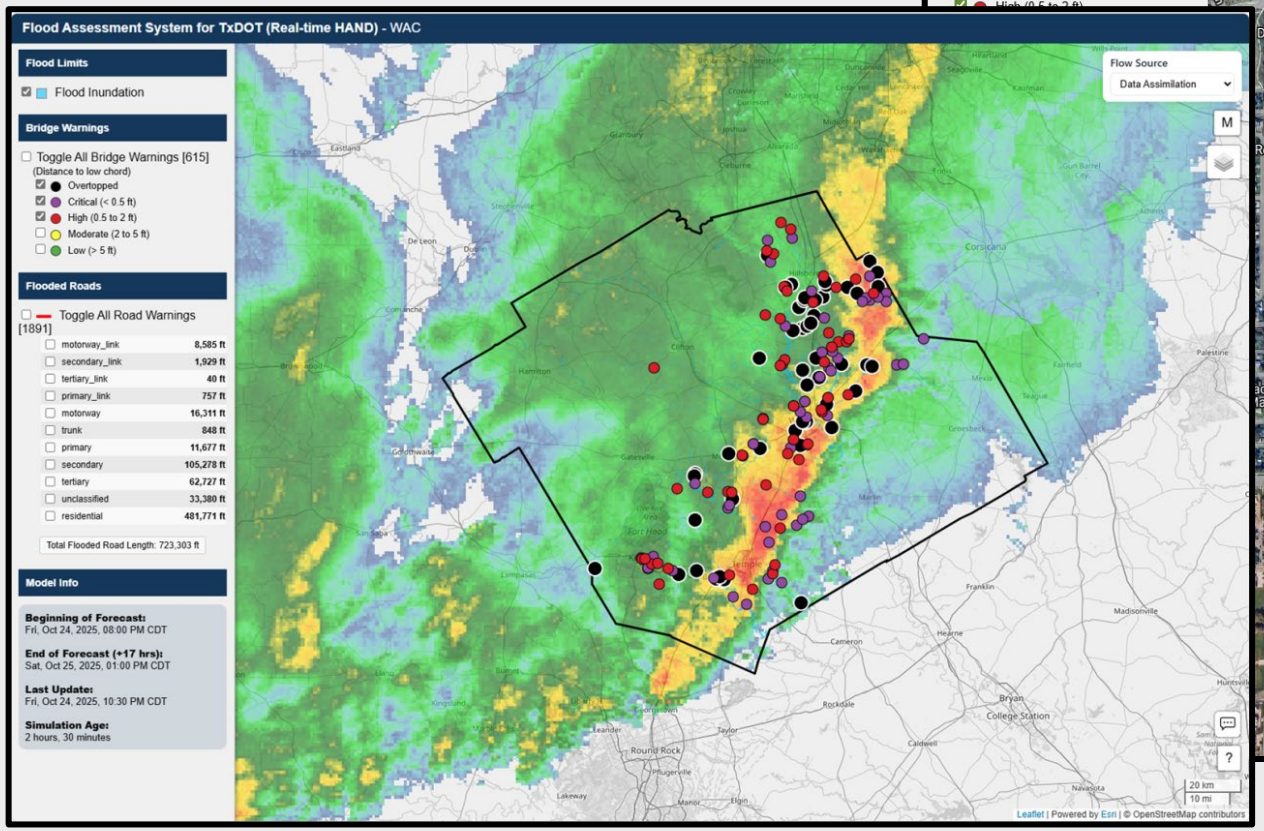
Texas-wide Real-time flood forecast system

FAST

Flood Assessment System for TxDOT



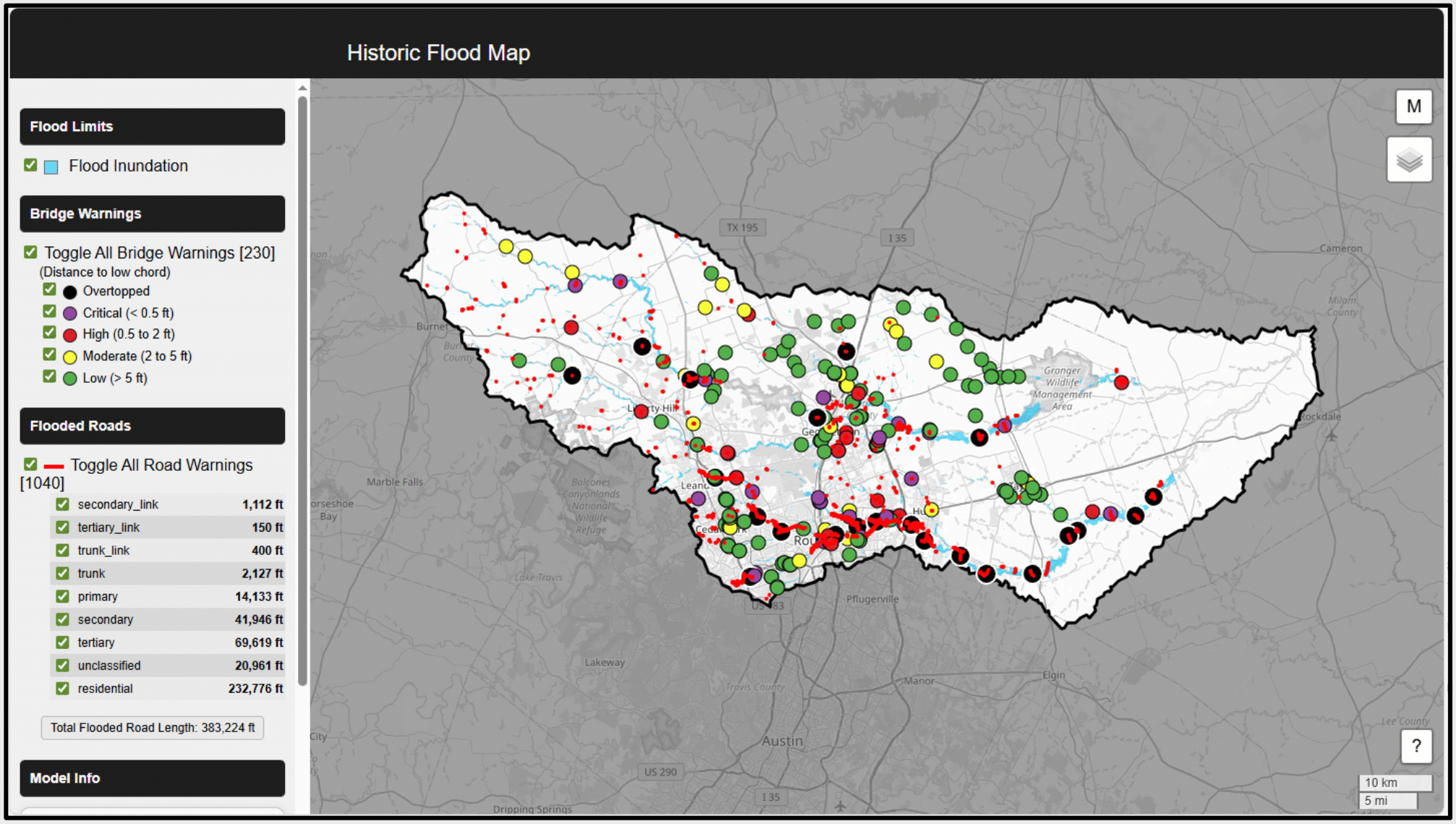




TEXAS FLOODPLAIN MANAGEMENT ASSOCIATION
ESTABLISHED 1988

Texas-wide Real-time flood forecast system

FAST
Flood Assessment System for TxDOT



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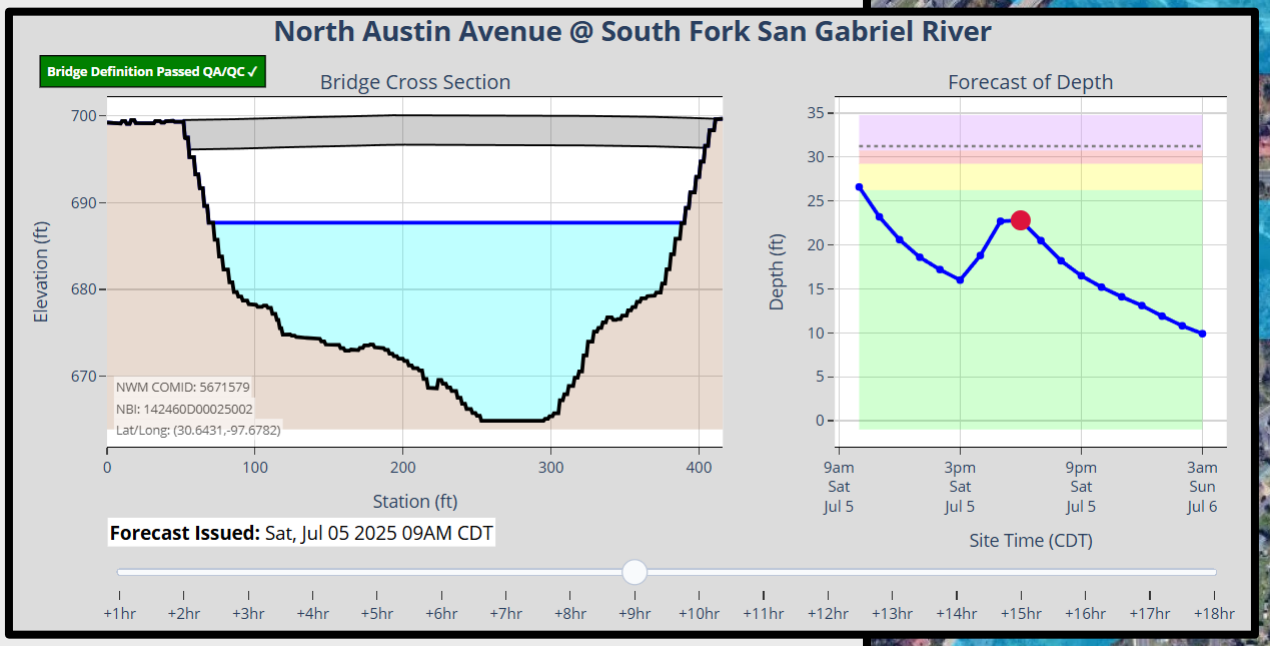

Why This Matters

- Coordination saves lives and protects infrastructure
- Population growth and urban development increase flood risk.
- Communities that integrate engineering, planning, and operational coordination are more resilient.
- Floodplain managers and emergency managers share the same mission: protecting people, property, and communities.

Floodplain Management + Emergency Management = A More Resilient Texas

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