

Trinity River COMMON VISION Steering Committee

September 22, 2022



North Central Texas
Council of Governments
Environment & Development

Welcome and Introductions

Thanks for attending!

- Please introduce yourself in the chat box.
- Please mute your line.
- Unmute your line when you would like to speak during question and discussion time.
 - We will also watch the chat box for questions

Trinity River COMMON VISION

Trinity River Corridor Interlocal Agreement - 1989

TEN CITIES

Arlington	Fort Worth
Carrollton	Grand Prairie
Coppell	Irving
Dallas	Lewisville
Farmers Branch	Seagoville

PROGRAMMATIC PARTNERS

NCTCOG Environment & Development
U.S. Army Corps of Engineers
Federal Emergency Management Agency
Texas Water Development Board



FOUR COUNTIES

Dallas County
Denton County
Kaufman County
Tarrant County

TWO SPECIAL DISTRICTS

Tarrant Regional Water District
Trinity River Authority

Trinity River COMMON VISION Program

Timeline & Background

1990 Upper Trinity River Basin Reconnaissance Report

Interlocal Agreements signed by member cities & Congress authorizes the Upper Trinity River Feasibility Study (UTRFS). These studies by the United States Corps of Engineers simulated the cumulative impacts of flooding in the Dallas-Fort Worth area based on different levels of floodplain development.

1990 Flood Management Task Force

Flood Management Task Force formed and CDC criteria developed based on ROD.

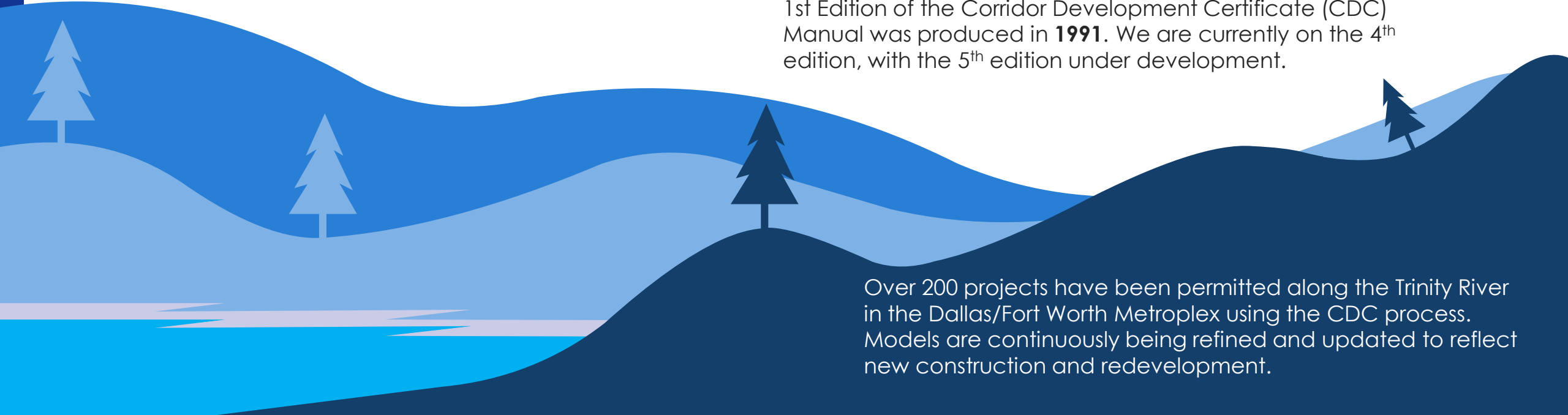


Record of Decision

Results suggest that damages from a major flood could total more than \$11 billion if floodplain development is unregulated. A comprehensive floodplain management program could cut losses to \$4 billion.

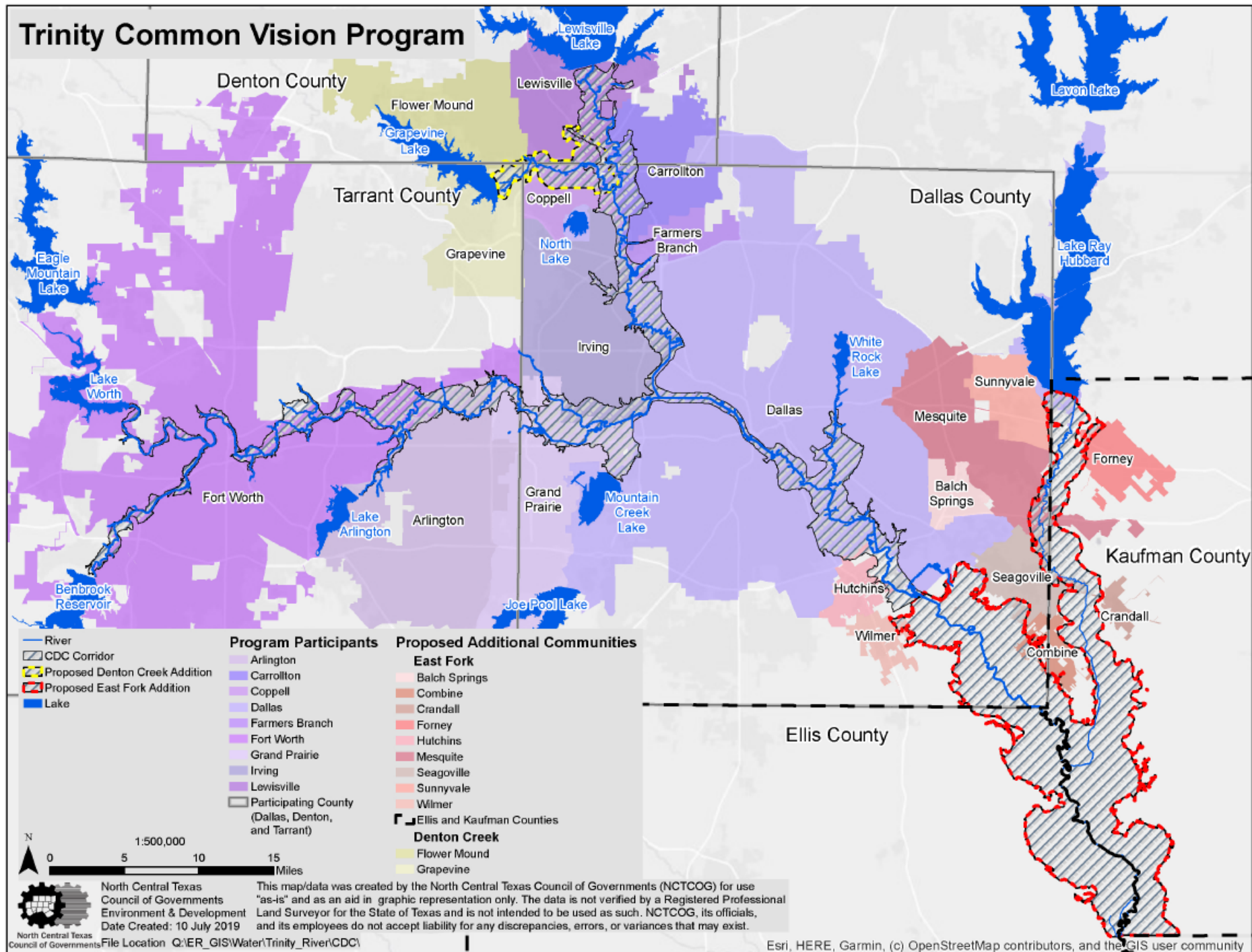
Corridor Development Certificate (CDC) Manual

1st Edition of the Corridor Development Certificate (CDC) Manual was produced in **1991**. We are currently on the 4th edition, with the 5th edition under development.



Over 200 projects have been permitted along the Trinity River in the Dallas/Fort Worth Metroplex using the CDC process. Models are continuously being refined and updated to reflect new construction and redevelopment.

Trinity Common Vision Program



CDC Program Goals

Corridor Development Certificate Program



Limits Impact

Limits (but does not eliminate) the impact of floodplain encroachments for regulated streams on downstream areas

Review Process

Establishes a consistent regional criteria and review process

Funding Stream

Provides a funding stream for updates and state-of-the-art models and modeling tools

CDC Program Goals

Corridor Development Certificate Program



Provides Oversight

Provides oversight for projects constructed in the 100 year floodplain



Allows Development

Allows development in the floodplain

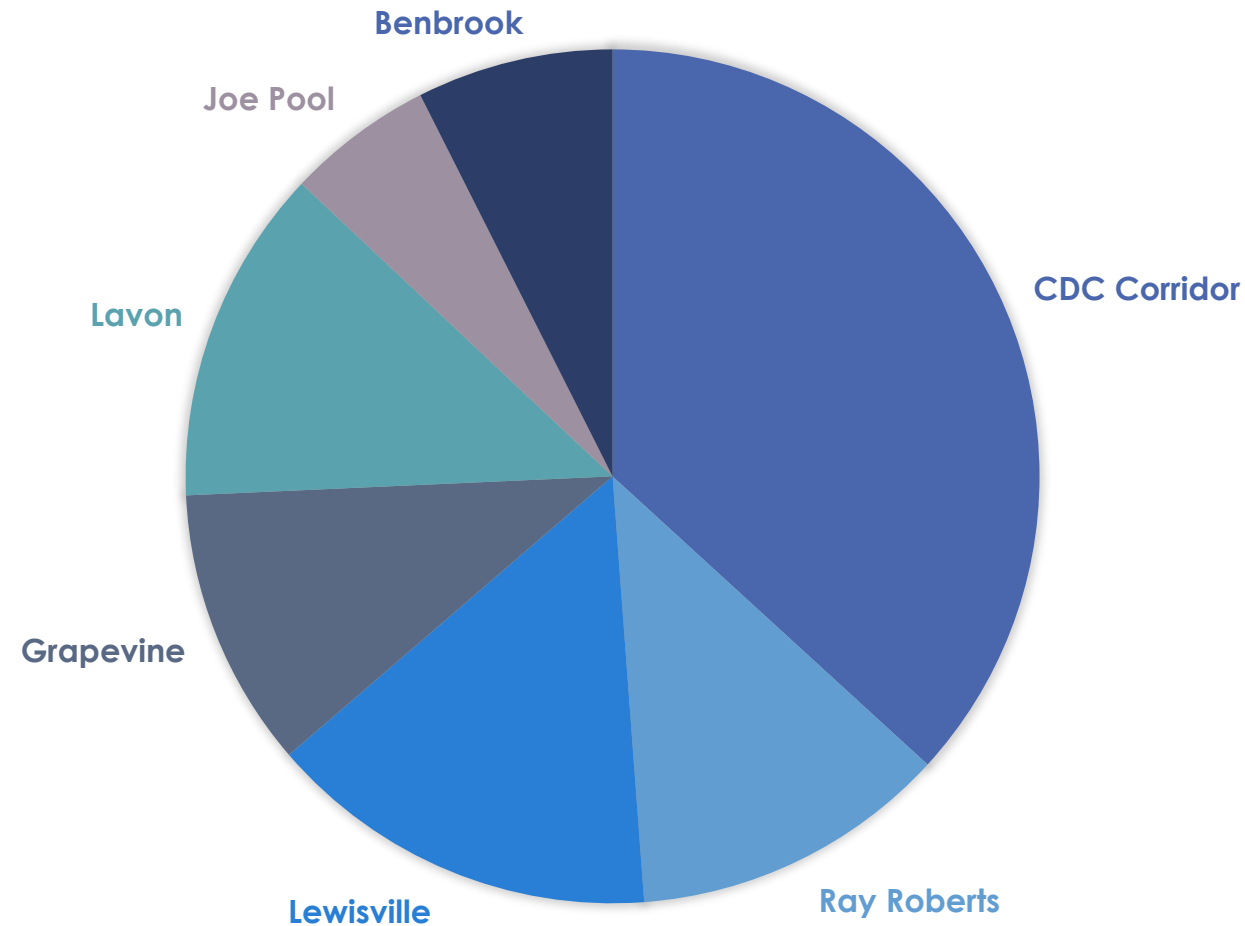


Project Review

Allows all Flood Management Task Force (FMTF) members to review projects for the entire regulatory footprint

Why is the Trinity River Corridor So Important to Flood Prevention?

ACTIVE FLOOD STORAGE



Trinity River COMMON VISION Work Program & Activities Update



FY2022 Trinity River Common Vision Work Program

CDC Manual Update to the 5th Edition

- Following last years efforts, the NFIP-CDC Model Consolidation Team has continued to meet almost monthly to incorporate those changes into the 5th Edition Manual.

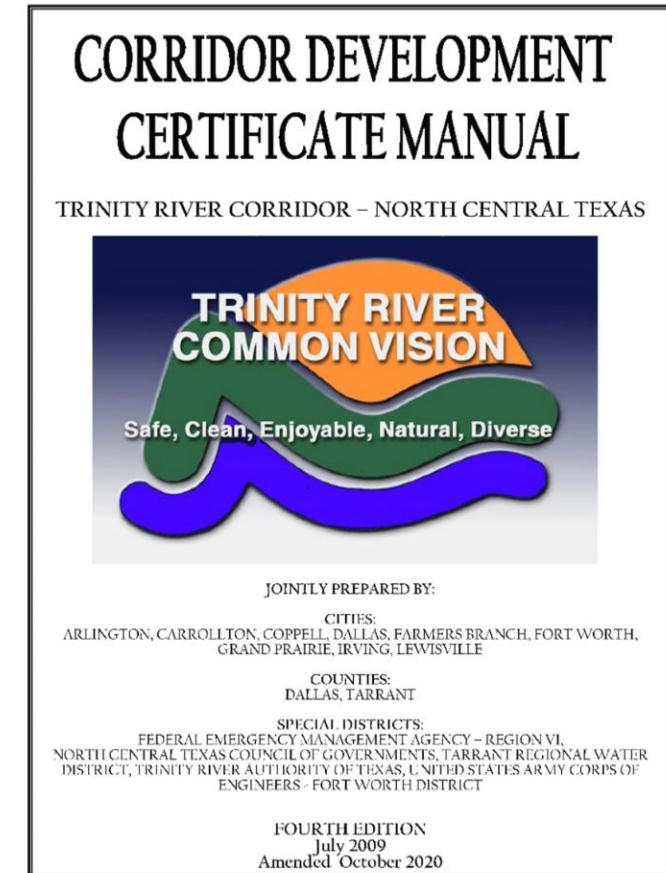
- Team Members

- Lisa Biggs, Team Chair – City of Fort Worth
- Amy Cannon – City of Arlington
- Olivia Whittaker – City of Dallas
- Mike Danella, Matt Lepinski – USACE
- Cameron Cornett – FEMA
- Craig Ottman -TRWD
- Stephanie Griffin – Halff Associates
- Jake Lesue – Dewberry
- Chris Johnson – FNI
- Edith Marvin, Jai-W Hayes-Jackson - NCTCOG

FY2022 Trinity River Common Vision Work Program

CDC Manual Update to the 5th Edition

- Main Updates and Revisions included in the new manual
 - Updating the CDC Process to include the NFIP-CDC Consolidated Model.
 - Inclusion of new Trinity River CDC website
 - CDC will be valid for two years instead of current five years and one year extensions given instead of three years with a maximum of three extensions allowed
 - Addition of Model Maintenance Fee following completion of project during LOMR process
 - Revised format of chapters to clarify requirements and process
 - Developed FAQs for community and public audiences



FY2022 Trinity River Common Vision Work Program

CDC Manual Update to the 5th Edition

Current Manual

Chapter 1 General Information

Chapter 2 CDC Common Permit
Criteria

Chapter 3 CDC Application
Requirements

Chapter 4 The CDC Process

Appendices

Revised Manual

Summary of Changes

Glossary

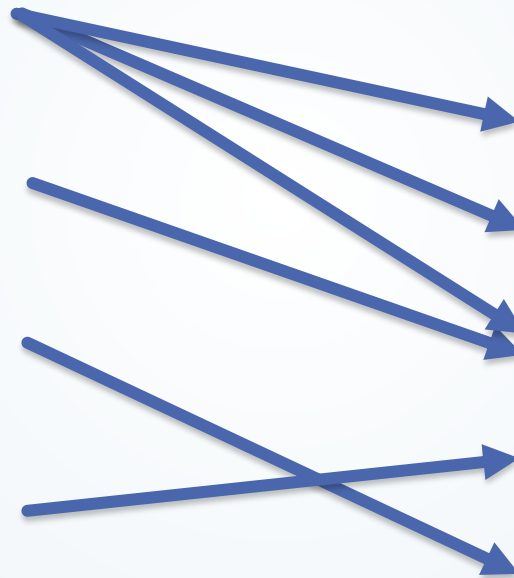
Section 1 Introduction

Section 2 CDC Regulation and
Criteria

Section 3 The CDC Process

Section 4 CDC Application

Appendices



FY2022 Trinity River Common Vision Work Program

CDC Manual Update to the 5th Edition

➤ Other Revisions:

- **CDC Cost Recovery Fee** renamed to **CDC Application Fee**
- **100-year flood** will now be called **CDC 1% annual chance exceedance flood** and **FEMA 1% annual chance flood**
- **Grandfathered projects** will now be called **Specific Prior Development Projects** or **Legacy Projects**
- **CDC Model** will become the **Consolidated NFIP-CDC Model** or just **NFIP-CDC Model**
- **CDC Application Form** will consist of four parts: Submittal Checklist, Part 1- General Project Information, Part 2 – Hydrologic and Hydraulic Information, and Application Certification

FY2022 Trinity River Common Vision Work Program

CDC Manual Update to the 5th Edition

➤ Next Steps

- Team will complete final revisions of all sections, appendixes and forms
 - Compile those into a draft of entire manual document
 - Provide the complete revised manual to FMTF for review
 - Address any comments and finalize the updated manual
- Final Goal to have revised CDC Manual completed at same time new consolidated NFIP-CDC Model is ready this fall

USACE Updates on CDC Model Improvement Efforts

September 2022

Trinity River Common Vision Steering Committee

Jerry L. Cotter, P.E.

Chief, Water Resources

US Army Corps of Engineers

Fort Worth District



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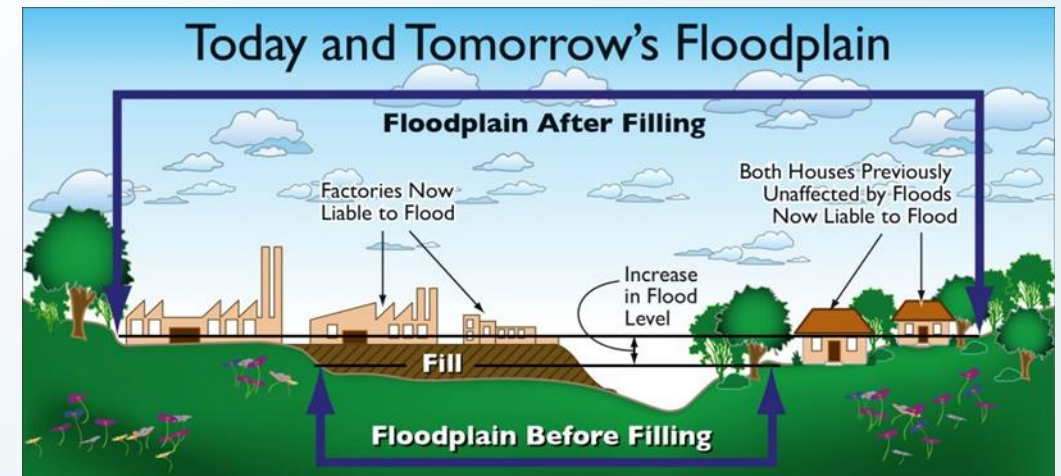
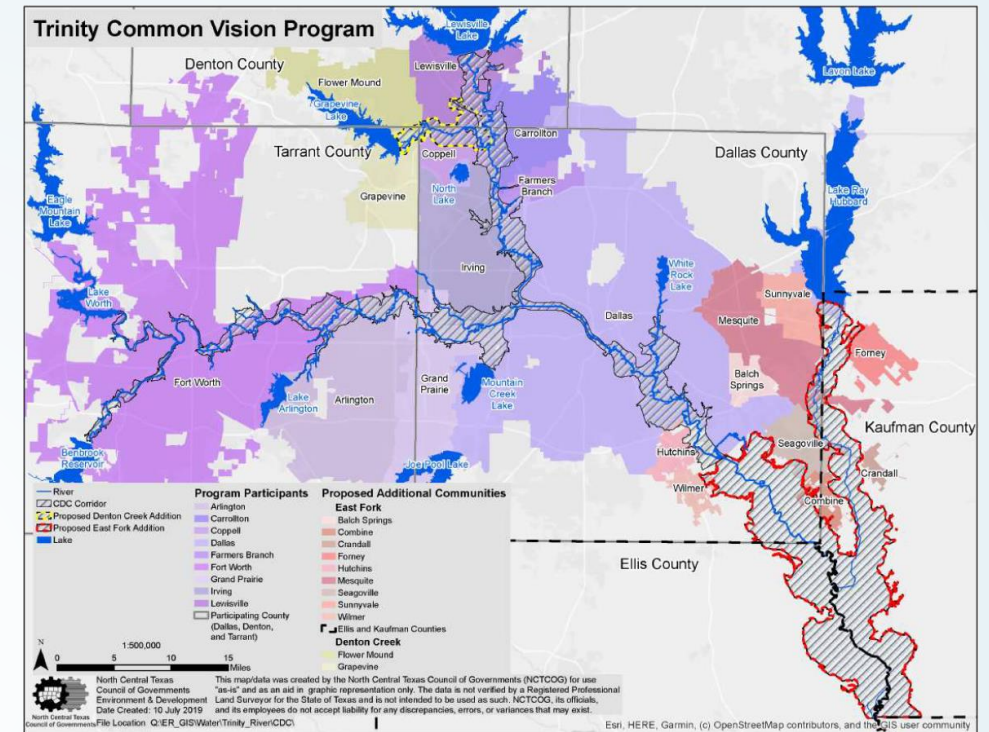
What Is Model Consolidation

2 Models, 2 Purposes (Goals, Objectives, Criteria)

- **FEMA NFIP model(s)**
 - Used for the National Flood Insurance program
 - Existing conditions
 - Projects must be constructed
- **FMTF/NCTCOG CDC model(s)/tool(s)**
 - Used to manage growth and development
 - Loss of storage and WS elevations
 - Has prevented billions in damages
 - Future conditions
 - Constructed and planned (permitted) projects

One Model (Consolidated) – Many Purposes

- Managed by the NCTCOG w/ technology
- Captures watershed/floodplain changes
- Transparency in both processes
- Consolidated review process
- Satisfies and supports NFIP and CDC
- Manages storage, WS elevations and...
- Simplified and streamlined
- Promotes flood risk awareness and resiliency
- Incorporates new technologies, tools and data (decreased uncertainty)
- Other purposes



FY2022 Trinity River Common Vision Work Program

NFIP/CDC Model Consolidation Highlights

Common actions

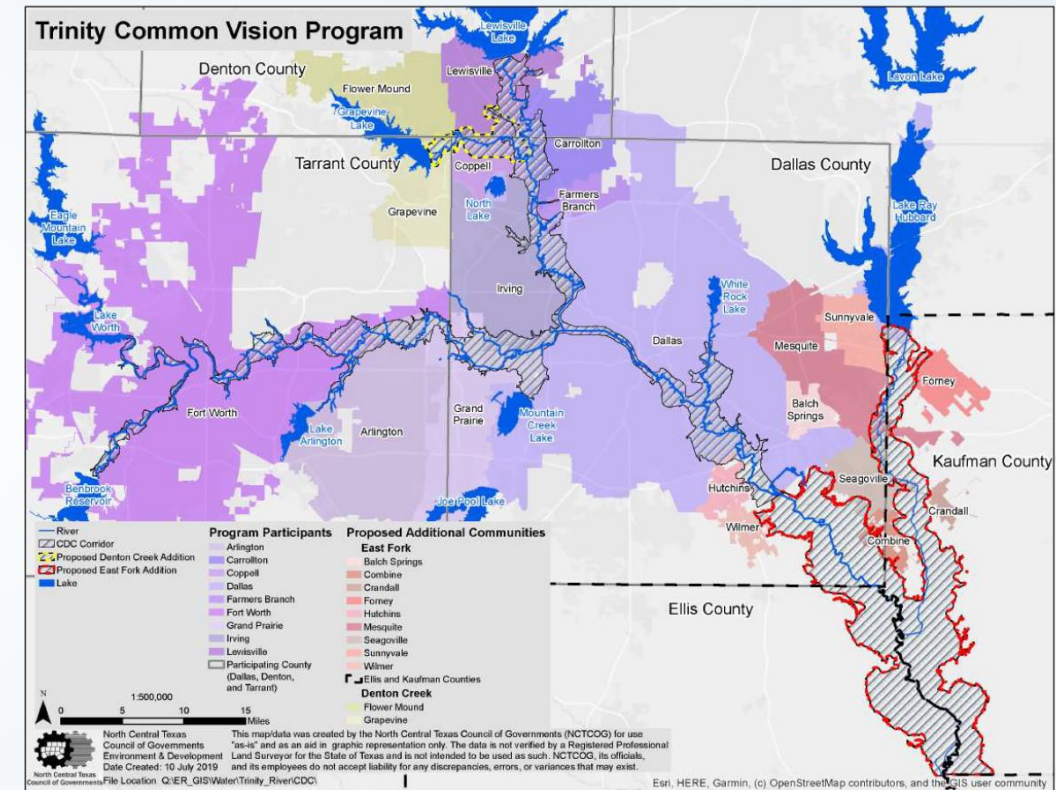
- Incorporate new georeferencing technologies (FEMA funded \$2 M)
- Restructured for multi-purpose
- Future conditions
- Leverages Trinity River WHA meteorological and hydrologic models (FEMA & USACE funded \$1 M)
- Collaboration with member communities

Main stem Trinity River

- Integration of floodplain actions (FEMA)
- Integration of CDC projects since last update
- Schedule & cost – imminent \$0.25 M

East Fork Trinity River

- NFIP model completed, all floodplain actions incorporated (FEMA funded \$1.5 M)
- CDC model under development
- Collaboration with member communities
- Met with NCTCOG and currently reviewing their future land use data to inform subsequent hydraulic modeling
- Discussed strategy with NCTCOG and FEMA Region 6.
- Schedule and Cost – late 2023, \$0.25 M



CDC Model Extension Project

Study extents:

East Fork Trinity - 30 miles

Lake Ray Hubbard to Trinity River

Trinity Main Stem - 38 miles

South of IH 20 to Henderson County

3 Impacted Counties:

Dallas

Ellis

Kaufman



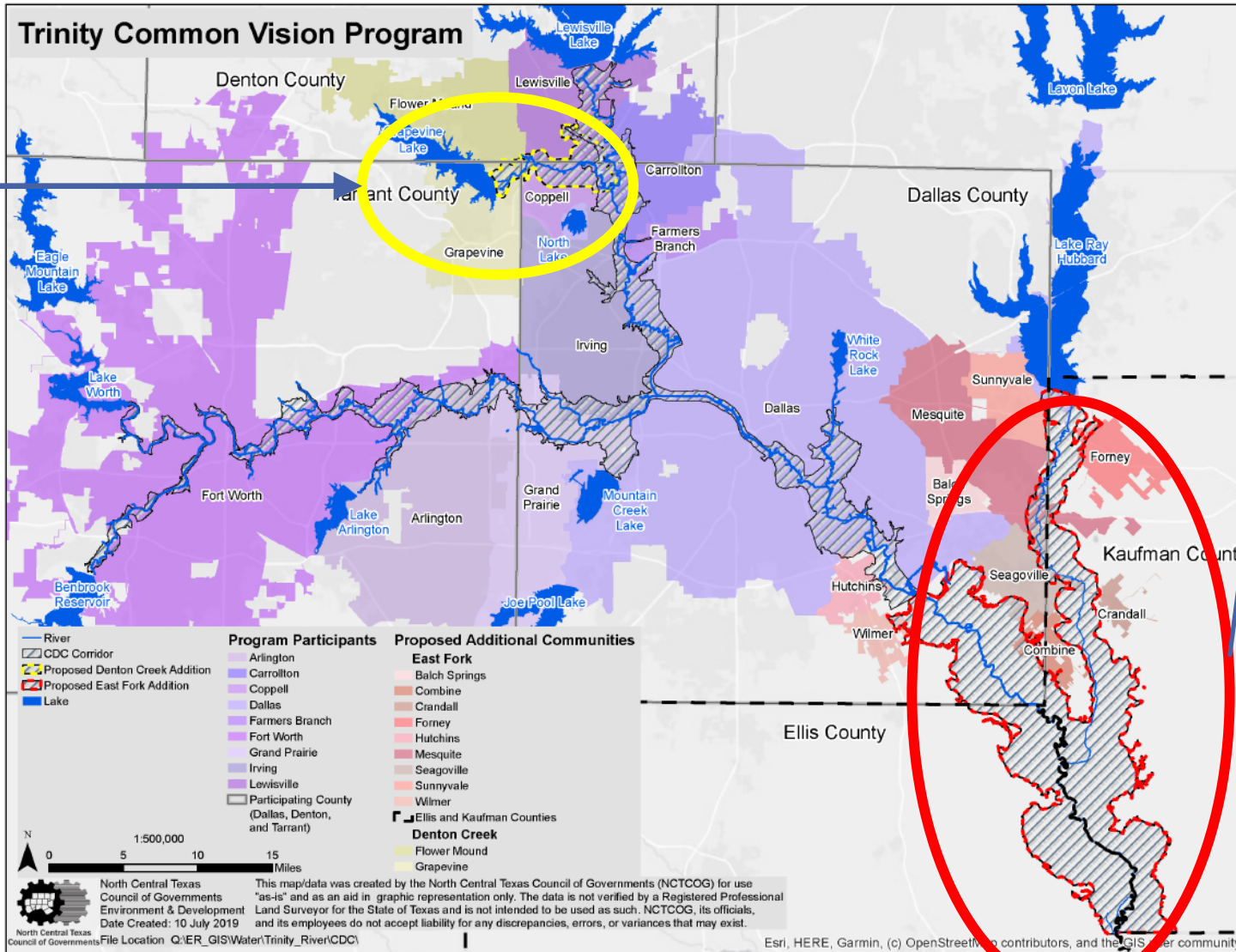
FY2022 Trinity River Common Vision Work Program

NFIP/CDC Model Consolidation Effort

- The USACE funded two ongoing studies related to CDC model consolidation.
 - Updating the newly georeferenced CDC model with approved but not yet constructed CDC project geometries from 2017 onward and future flows.
 - Draft model is being coordinated with FEMA Region 6.
 - Working collaboratively to generate a consolidated CDC/NFIP model.
 - Will share draft model for FMTF review and feedback soon (Estimate Summer/Fall 2022).
 - Working to generate CDC future flows for the FEMA detailed study on the East Fork Trinity and the Trinity mainstem to ultimately extend the consolidated CDC/NFIP model.
 - Met with NCTCOG and currently reviewing their future land use data to inform subsequent hydraulic modeling
 - Discussed strategy with NCTCOG and FEMA Region 6.
 - Anticipate sharing with FMTF for review in 2023.
- The USACE set aside \$485,000 from the Floodplain Management Services (FPMS) fund to complete these scopes. Internal coordination at the USACE is occurring and additional data and information will continue to be shared with FMTF members.

East Fork Trinity & Denton Creek Integration

Grapevine
Flower Mound



Mesquite
Sunnyvale
Crandall
Combine
Forney
Hutchins
Wilmer

Seagoville (joined July 2019)
Balch Springs
Kaufman County (joined Dec. 2019)
Ellis County

FEMA contributed \$1.5 million to develop the East Fork and Mainstem extension model. USACE is contributing \$270,000 to develop East Fork CDC flows.

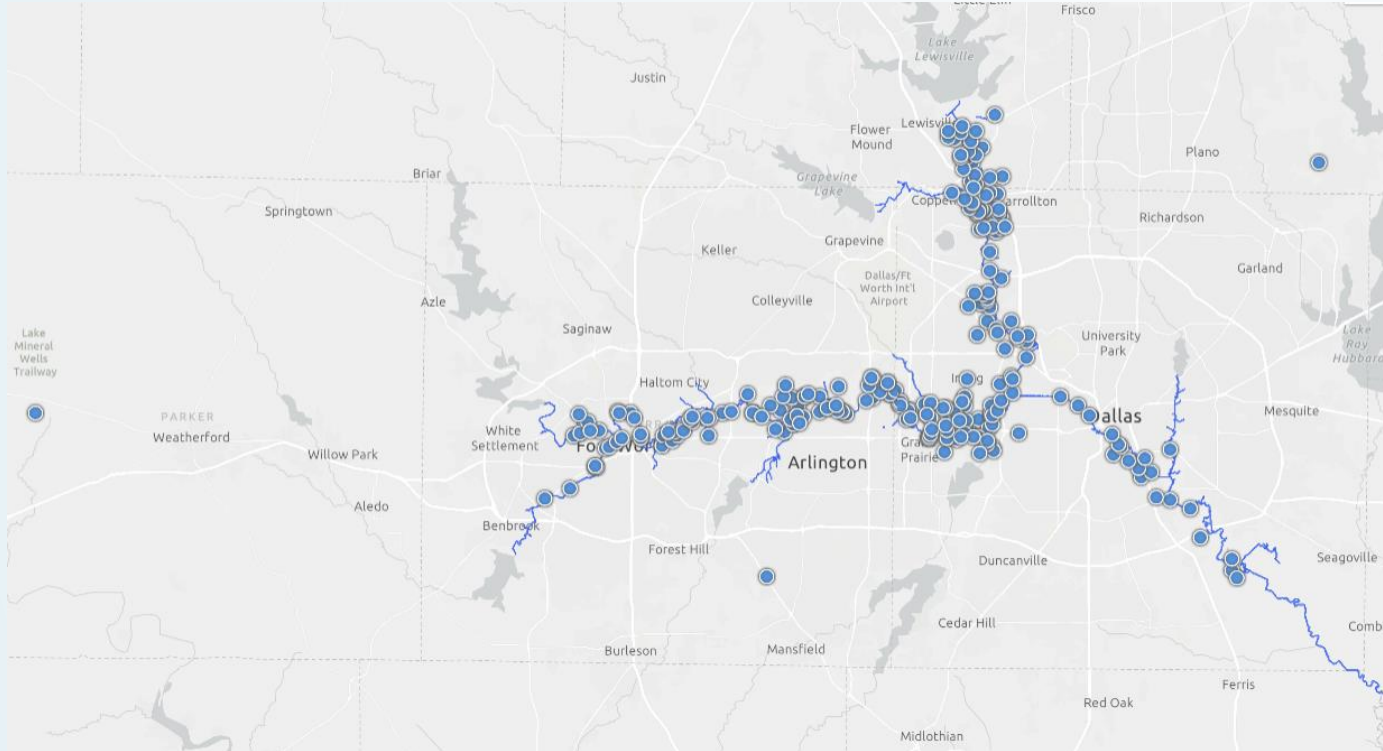


East Fork Trinity & Denton Creek Integration

- **April 2016 – August 2019:** Interest meetings held with East Fork Trinity communities throughout this period. TCV Steering Committee approves pursuit of the East Fork Addition. CDC program training held in Mesquite for prospective communities.
- **July 2019:** City of Seagoville joins the program.
- **December 2019:** Kaufman County joins the Program.
- **February 2020:** NCTCOG staff meet with City of Grapevine and Town of Flower Mound.
- **July 2020:** NCTCOG staff send formal letters of invitation to Grapevine and Flower Mound.
- **May 2021:** NCTCOG staff presented at a meeting of Dallas County Southern Cities.
- **July 2021:** NCTCOG staff presented to the Ellis County Commissioners Court.

Pending approval of the FY23 Work Program, outreach will continue to these communities, as expanding the Common Vision program is an ongoing process.

CDC Permits in Fiscal Year 2022



- 19 Applications Received This Fiscal Year
- 249 Total Permits Issued Since CDC Inception

L-273 FEMA NFIP Course

- The Annual L-273 Course for floodplain managers, hosted by FEMA and NCTCOG, will return this fall for the 26th year!
- This four-day course will be held this **November 14-17, 2022**, at NCTCOG's offices in Arlington.
 - [Register for the L-273 course here.](#)
 - Spots will be limited. Early registration for Trinity River COMMON RIVER members is open until October 3rd.
- TFMA Certified Floodplain Manager (CFM) exam to be held on Friday, November 18, 2022, following the four-day course.
 - [Register for the CFM exam here.](#)

Questions? Contact Jai-W Hayes-Jackson at jhayes-jackson@nctcog.org or (817) 695-9212

Annual Combined CRS Users Group/ Elected Officials Seminar

➤ Community Rating System Users Group

- The next CRS Users Group/Elected Officials Meeting will cover the following topics:
 - Reaching a CRS Rating of 4 – City of Dallas' experience
 - Regional Flood Planning Effort Update
 - Transportation and Stormwater Infrastructure Project
- Date: October 25, 2022
- Time: 9:30 AM – 11:30 AM
- Location: NCTCOG Transportation Council Room
- For questions about the CRS Users Group, or to suggest future meeting topics, please contact Erin Blackman at Eblackman@nctcog.org or (817) 608-2360

Keep up with NCTCOG E&D meetings and events here:

<https://nctcog.org/envir/events>

Regional Flood Early-Warning Software

www.flooddatantx.com



Regional Flood Warning Software Program

Cooperative regional solution to offer a cost-effective software package for all agencies to assist in flood warning and hydrology related challenges in the area.



Regional View

Understand approaching storms across the DFW area with access to the regional data set



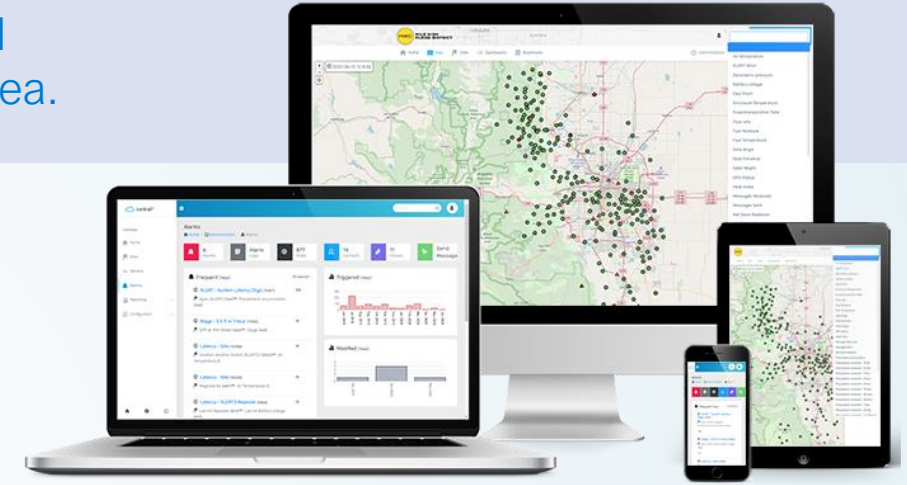
Impacts

Monitor the impacts on your agency with alarming, dashboards, and graphing of water and rainfall data



Branded Website

Provide your constituents with information through their own branded website that they can see and download data



FEATURES

- ✓ Collect, visualize & alarm on critical flood and rainfall data
- ✓ Use your own gauges or utilize the surrounding agencies' gauges
- ✓ See surrounding agency rainfall data
- ✓ View information on any device
- ✓ Easily share your data with the public
- ✓ Website branding to match your agency
- ✓ Flexible tiers and deployments for all needs



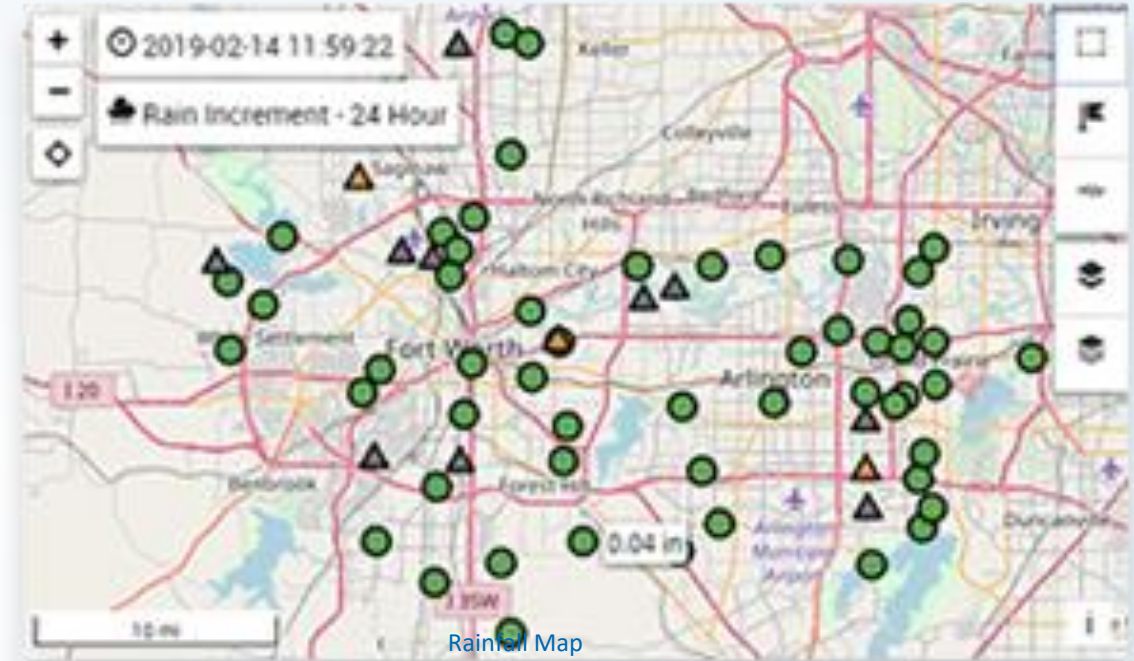
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North Texas
SHARE
Your Public Sector Solutions Center

OneRain
The Rainfall Company

Participating Communities

- City of Arlington
- City of McKinney
- City of Frisco
- Tarrant Regional Water District
- Dallas County Utility & Reclamation District
- City of Grand Prairie
- Town of Highland Park
- City of Fort Worth feeds data to website



Contact Information:
Sue Swenor – Sales Manager – Texas & Oklahoma
Sue.Swenor@AEM.eco
512-931-9530

Action Items



2021 Trinity Common Vision Steering Committee Meeting Summary

- NCTCOG staff are seeking approval of the 2021 Trinity Common Vision Steering Committee Meeting Summary.
- A [link to the 2021 summary](#) is available in the chat.



North Central Texas Council of Governments

AGENDA

Trinity River COMMON VISION Steering Committee
Tuesday, September 21, 2021
2:00 p.m., Virtual Meeting via Microsoft Teams
<https://teams.microsoft.com/join/19%3ameeting-Y2FjMTVMzUODkwOS00M2YxLWlyMWYlMGVhY2UxZGM5NGU5%40thread.v2/0?context=-%7b%22id%22%3a%22f5e7ebc-22b0-4fbc-934c-aabddb4e29b1%22%2c%22oid%22%3a%22cab28b78-d671-4384-9c8e-6035f7c46b7d%22%7d>
Audio will come through your computer speakers/microphone, or you can call in at:
+1 903-508-4574, Conference ID: 147 112 51#

1. **Welcome and Introductions** (Tamara Cook)

PROGRAM UPDATES

2. **Presentation on COMMON VISION**
 - a. Overview of COMMON VISION and the Corridor Development Certificate (CDC) Program (Edith Marvin)
3. **COMMON VISION Work Program Overview and Activities Update.** NCTCOG staff will provide an overview and update of the listed activities of the Trinity River COMMON VISION Program:
 - NFIP/CDC Model Consolidation Team (Matt Lepinski and Lisa Biggs)
 - Trinity River CDC Permit Website (Brian Geck)
 - East Fork Trinity and Denton Creek Community Integration (Tamara Cook)
 - CDC Permitting Update (Tamara Cook)
 - FEMA 4-day National Flood Insurance Program (NFIP) Course (Breanne Johnson)
 - Elected Officials Seminar and Community Rating System (CRS) Meeting (Breanne Johnson)
 - OneRain Flood Early Warning System (Sue Swenor)

ACTION ITEMS

4. **Summary of 2020 Common Vision Steering Committee Meeting.** The summary of the 2020 meeting is [available online](#) for review. (Tamara Cook)
5. **Approval of FY2022 Trinity River COMMON VISION Work Program.** The FMTF met June 11th and assisted NCTCOG with the selection of work program items presented for the upcoming fiscal year. The FMTF approved the FY2022 work program on August 13th and recommended Trinity River COMMON VISION Steering Committee approval. The

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FY2023 Trinity River Common Vision Draft Work Program Vote

- ➡ NCTCOG is seeking the Steering Committee's approval of the Draft FY2023 Work Program, recommended by the Flood Management Task Force on August 19, 2022.
- ➡ A link to the final [Draft FY2023 Work Program](#) is available in the chat.

Related Activities Update



Other Program Related Efforts

Trinity River National Water Trail Task Force



➤ What is the Task Force?

- Coordinated effort between the Trinity Coalition, NCTCOG, and the communities and organizations situated on the Upper Trinity River to support the Paddling Trail's National Water Trail designation by the National Park Service.
- Goal: to advance recreation, tourism, and economic development along the Trinity River and to maintain and expand the physical features of the Water Trail.
- Past meeting materials and presentations can be viewed on the Task Force website.
 - Discussed launch sites under development, trail maintenance needs, Trail Ribbon Cutting Ceremonies, and the 2023 National Recreation and Park Association Annual Conference.
- **The next Task Force meeting will be held November 1, 2022.**



Other Program Related Efforts

Efforts Toward Integrated Transportation & Stormwater Planning

➤ What is the TSI project?

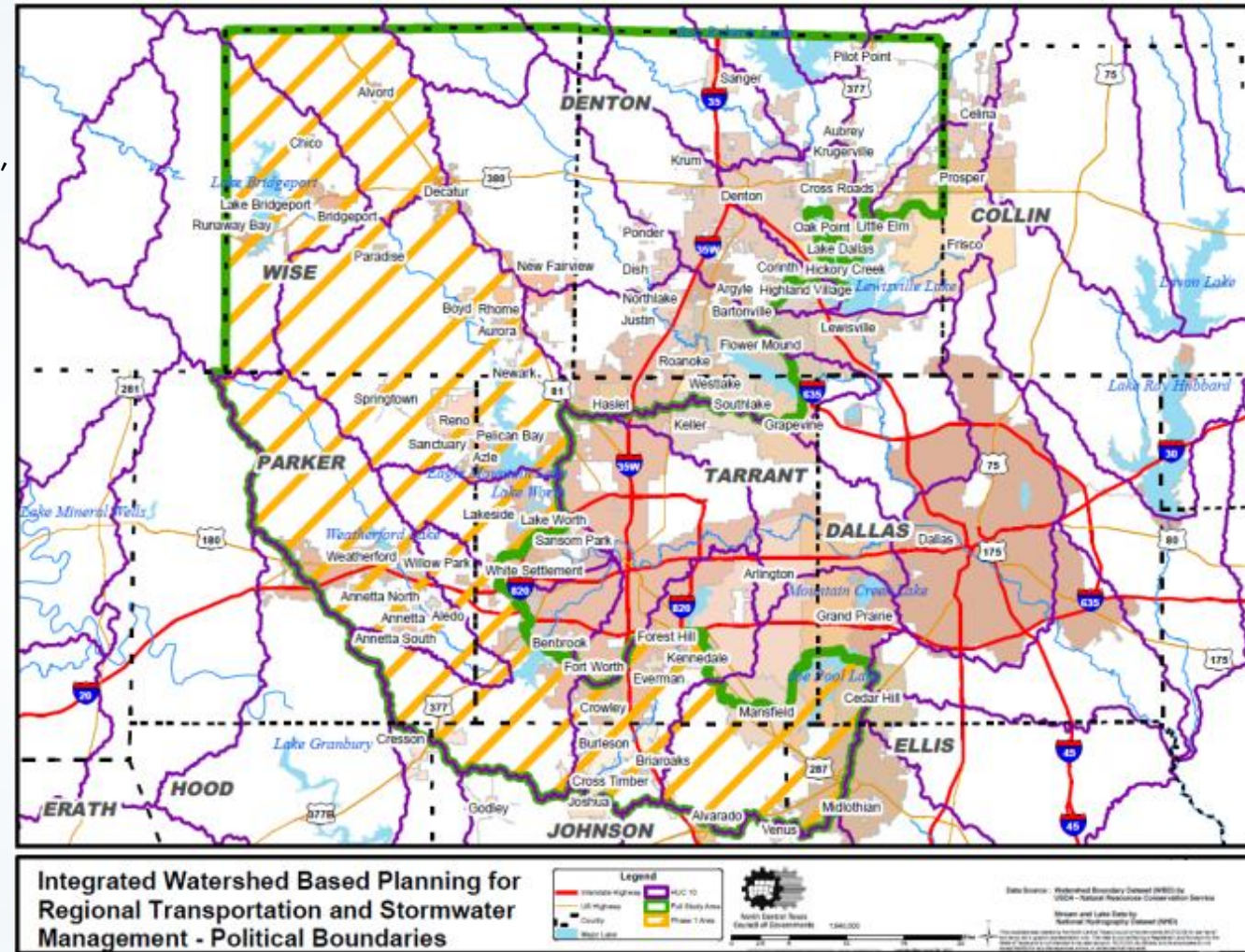
- Integration of regional stormwater management, urban development, transportation, and environmental planning: a collaborative effort with regional Transportation planners
- Proactive Prevention vs. Response

➤ Project Kickoff

- Project lead and partner organization meetings ongoing to discuss project
- NCTCOG conducted community kickoff meetings in August 2022 for four subareas of the overall study area.

Project Website:

<https://www.nctcog.org/envir/watershed-management/upper-trinity-river-transportation-and-stormwater>



Phase One Project Area hatched in yellow - TWDB Commitment No. G1001314, North Central Texas COG Grant Agreement coverage area (remaining balance of Full Study Area to be undertaken with alternate funding sources/TxGLO provided to USACE)

Cooperating Technical Partners Program - FEMA

2004 – NCTCOG Joined CTP Program and created master plan

2009 – NCTCOG Participated in FEMA Map Modernization Initiative

Completed Discovery Projects

2012 – Lower West Fork Watershed

2012 – Upper Trinity Watershed

2012 – Elm Fork Watershed

2015 – Cedar Watershed

2015 – Denton Watershed

2016 – East Fork Watershed

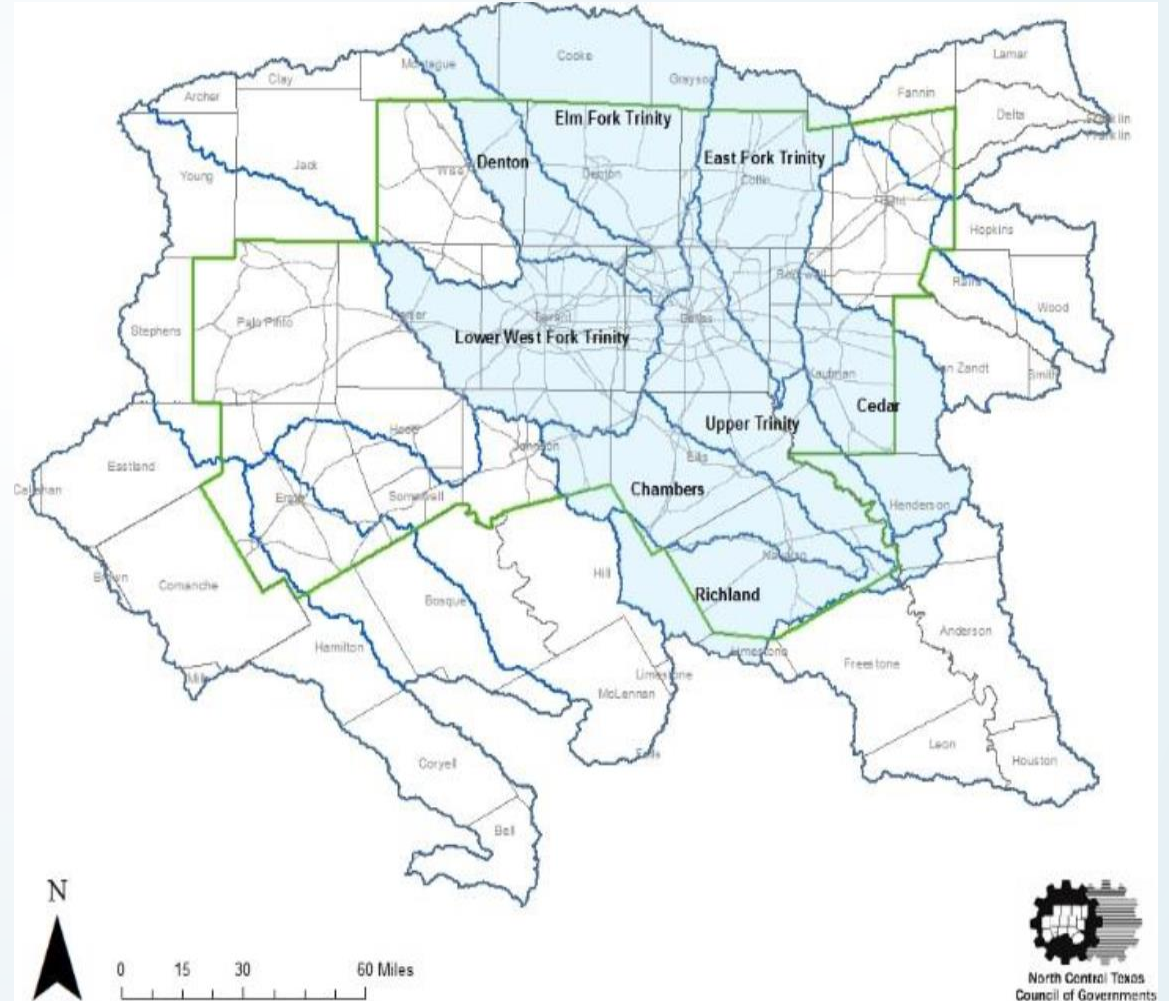
2017 – Richland and Chambers Watershed

Upcoming Discovery Projects

2021 – Upper West Fork Watershed

NCTCOG CTP Discovery Website:

<https://www.nctcog.org/envir/watershed-management/cooperating-technical-partners/discovery>



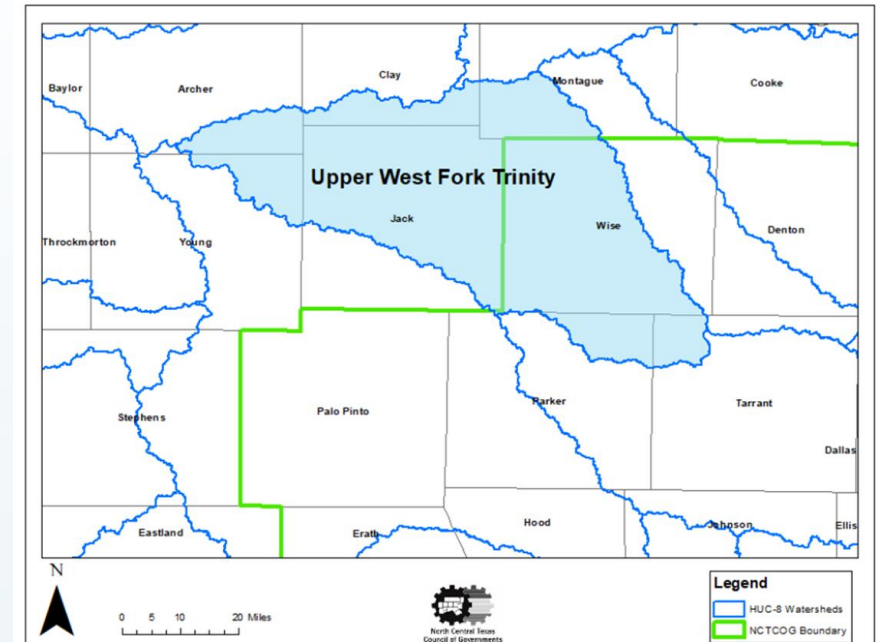
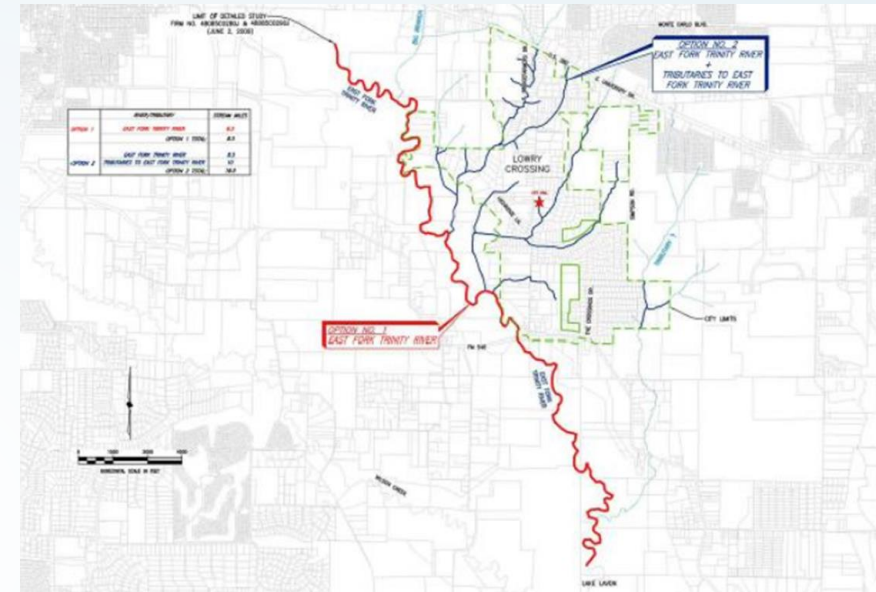
Cooperating Technical Partners Program - FEMA

Completed Flood Risk Identification Studies

2013 – Village Creek
2014 – Big Bear and Little Bear Creek
2015 – Lynchburg Creek
2015 – West Irving Creek
2016 – Silver Creek
2016 – West Buffalo/McAnear Creek
2017 – Town Creek
2018 – Mary's Creek
2019 – Harriet Creek
2019 – Waxahachie Creek

Ongoing or New Flood Risk Projects

2020 – Catherine Branch
2021 – East Fork (Lowry Crossing)
2021 – Hog Branch



Integrated Stormwater Management - iSWM

Why iSWM?

- Flooding and streambank erosion due to increased runoff
- Water quality concerns / stormwater regulations
- Loss of natural features
- Interest in green infrastructure
- Provide a comprehensive approach
- Regional consistency and equity

Certified Communities

- Celina (Gold)
- Corinth (Silver)
- Denton (Silver)
- Grand Prairie (Silver)
- Kennedale (Silver)
- Frisco (Silver)
- Fort Worth (Silver)
- Irving (Silver)
- Plano (Silver)

What does iSWM certification mean?

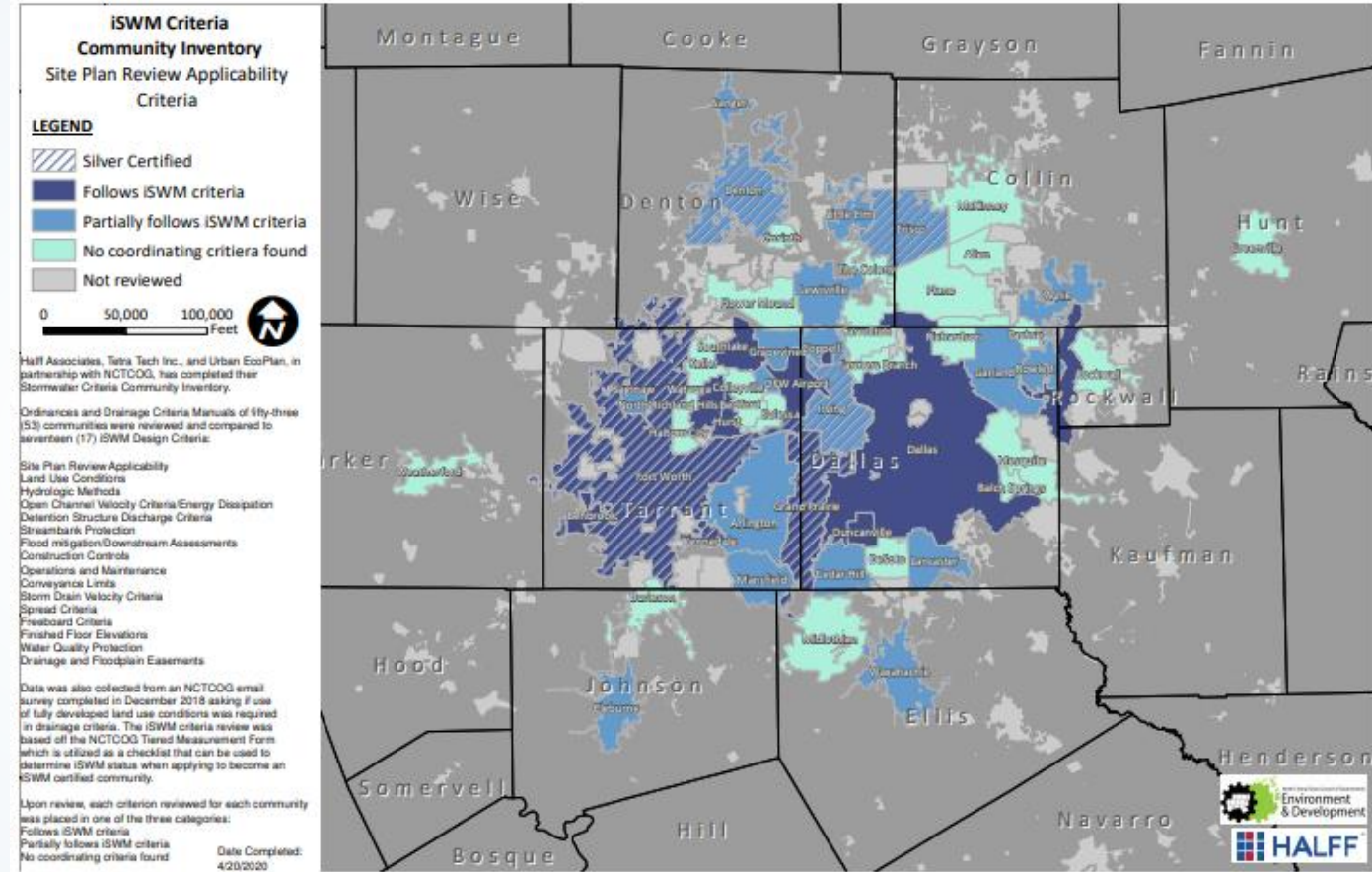
- A community can become certified by documenting their implementation of iSWM practices and applying to be reviewed by the iSWM Implementation Subcommittee.
- Benefits of achieving Bronze, Silver, or Gold certification: road signs and plaques designating their iSWM status; free training for community staff; and assistance in complying with State MS4 permit requirements and lowering FEMA Community Rating System ratings, which reduce insurance rates for residents.



Integrated Stormwater Management - iSWM

Many resources are available through iSWM

- Website: www.iswm.nctcog.org
- [Program Guidance](#)
- [Technical Manual](#)
- [Criteria Manual](#)
- [Proprietary Device Guidance](#)
- Instructional Videos
 - Permeable Pavement – Design, Construction, Inspection, and Maintenance
- iSWM Criteria Community Inventory
 - [City](#) (PDF)
 - [County](#) (PDF)



Example of the Community Inventory by city for the Site Plan Review Applicability Criteria. There are 16 criteria. You can also view each criteria on an interactive map at <http://iswm.nctcog.org/participating-cities.html>.

Why Common Vision?

September 2022

Trinity River Common Vision Steering Committee

Jerry L. Cotter, P.E.

Chief, Water Resources

US Army Corps of Engineers

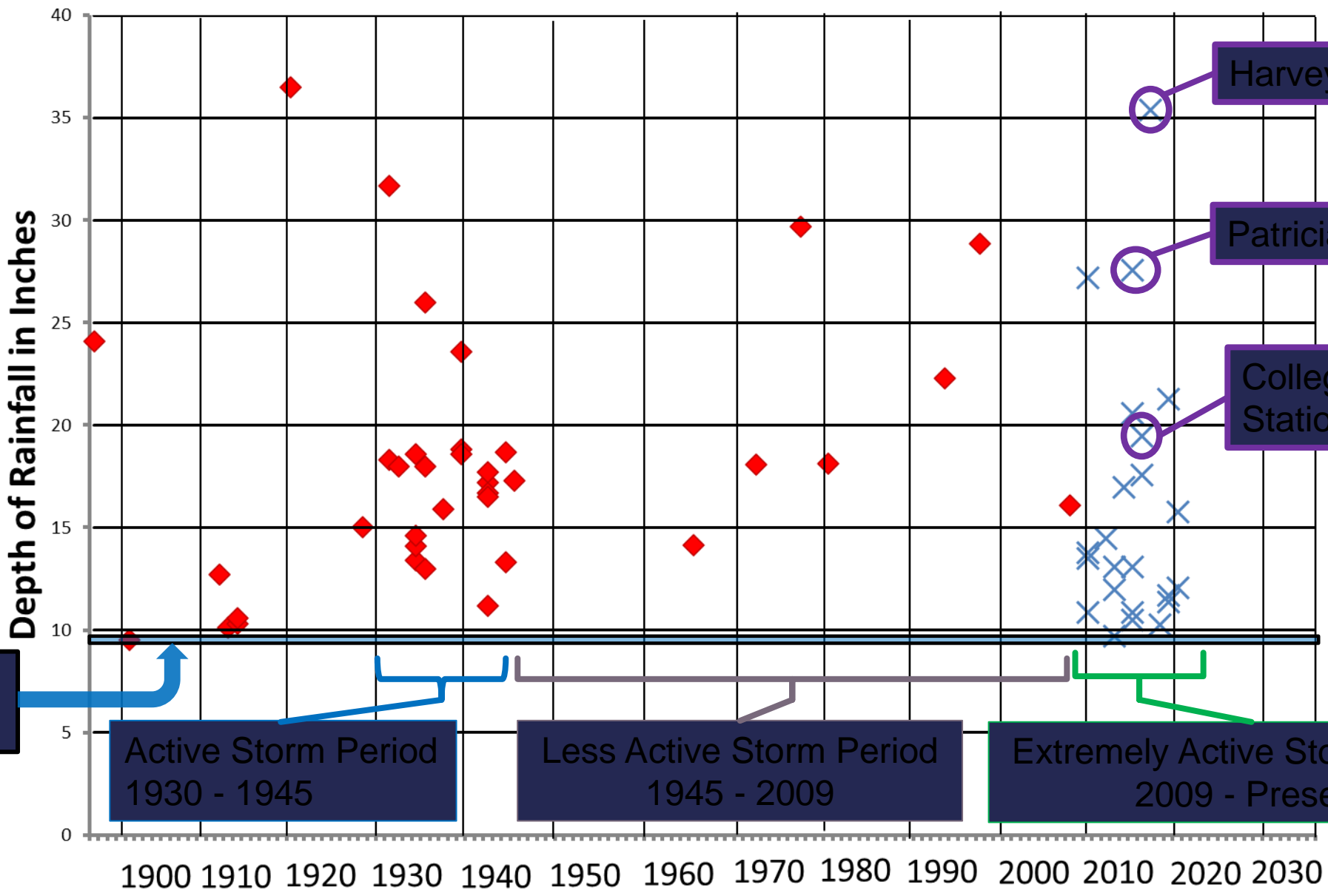
Fort Worth District



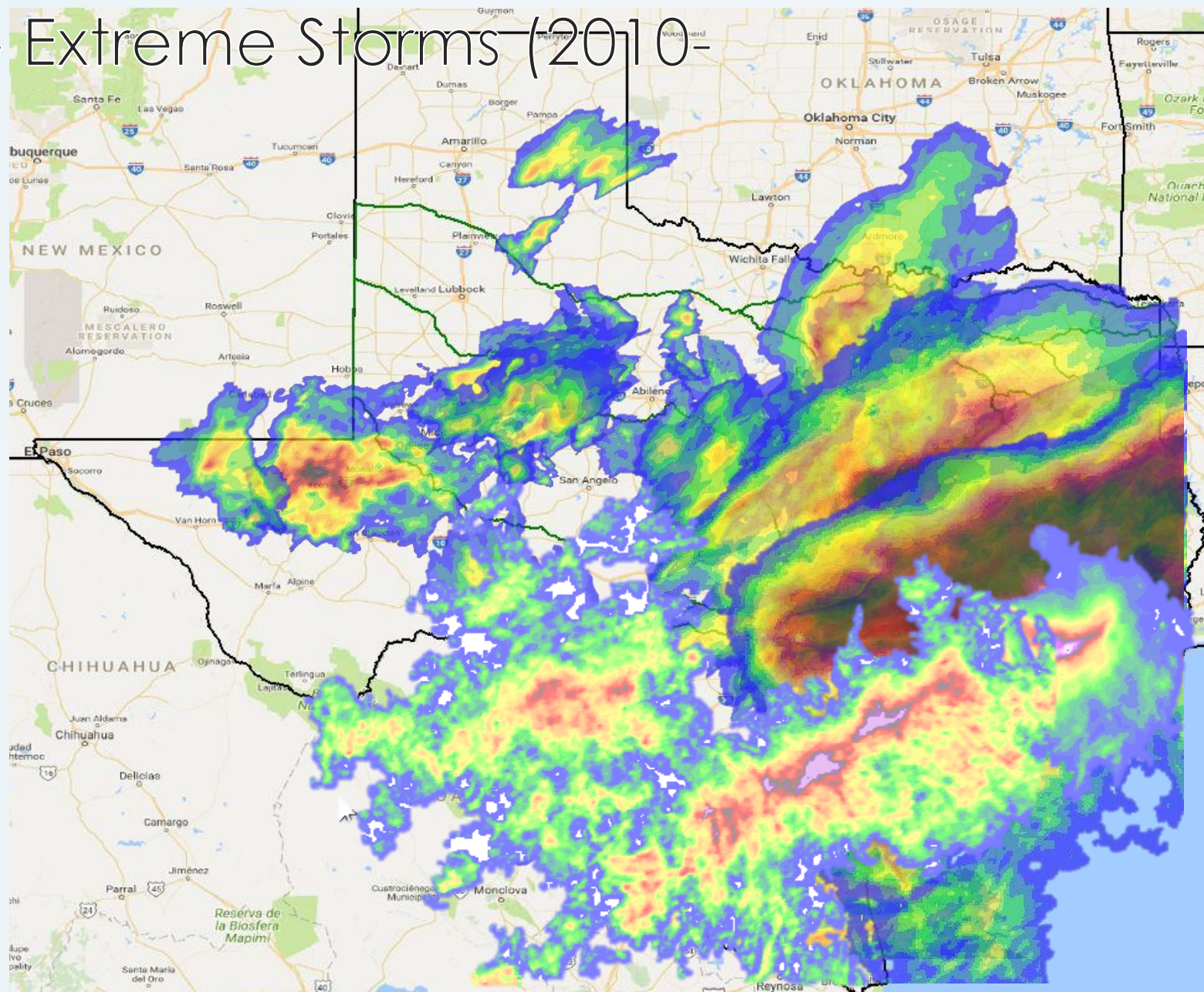
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24 Hour Rainfall Total



Why - Extreme Storms (2010-2019)



How Well are we doing? What is the Factor of Safety?

- **2010 Rush Creek Flooding (< 100-yr event)**

- 2010 Tropical Storm Hermine
 - Less than 100-year event
- Extensive flooding
- Buy-outs for 150 residences
- \$17+ M



- **Wimberley, TX (~ 100-yr event)**

- 11 fatalities, including 2 6-yr old and 1 4-yr old
- 100's homes damaged

- **Hurricane Harvey (rare)**

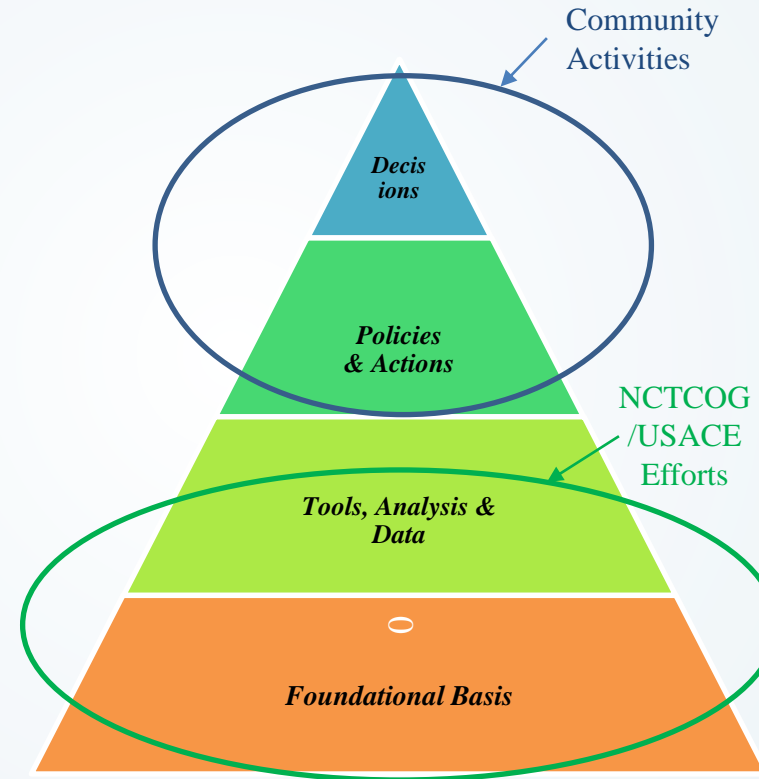
- 63 fatalities
- \$100+B damages
- Societal impacts still persistent today
- Increased funding

- **160 fatalities in 3 years 2015-2017**

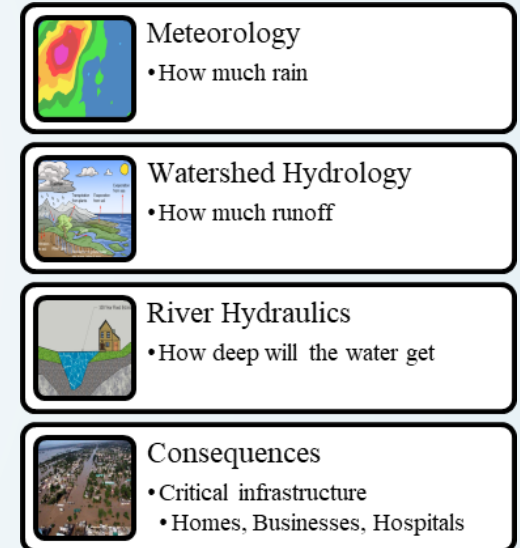


Common Vision - Flood Risk Products and Uses

- Historical knowledge (30+ year program)
- Latest data and analysis
- Tools with state-of-the-art technologies
- Planning/preparedness/response
- Scenario planning
- Emergency response (real-time mapping)
- Environmental
- Communities have an opportunity to better understand flood risk, not just the 100-year
- Communities can take actions and shift policy
- Can be leveraged for other purposes

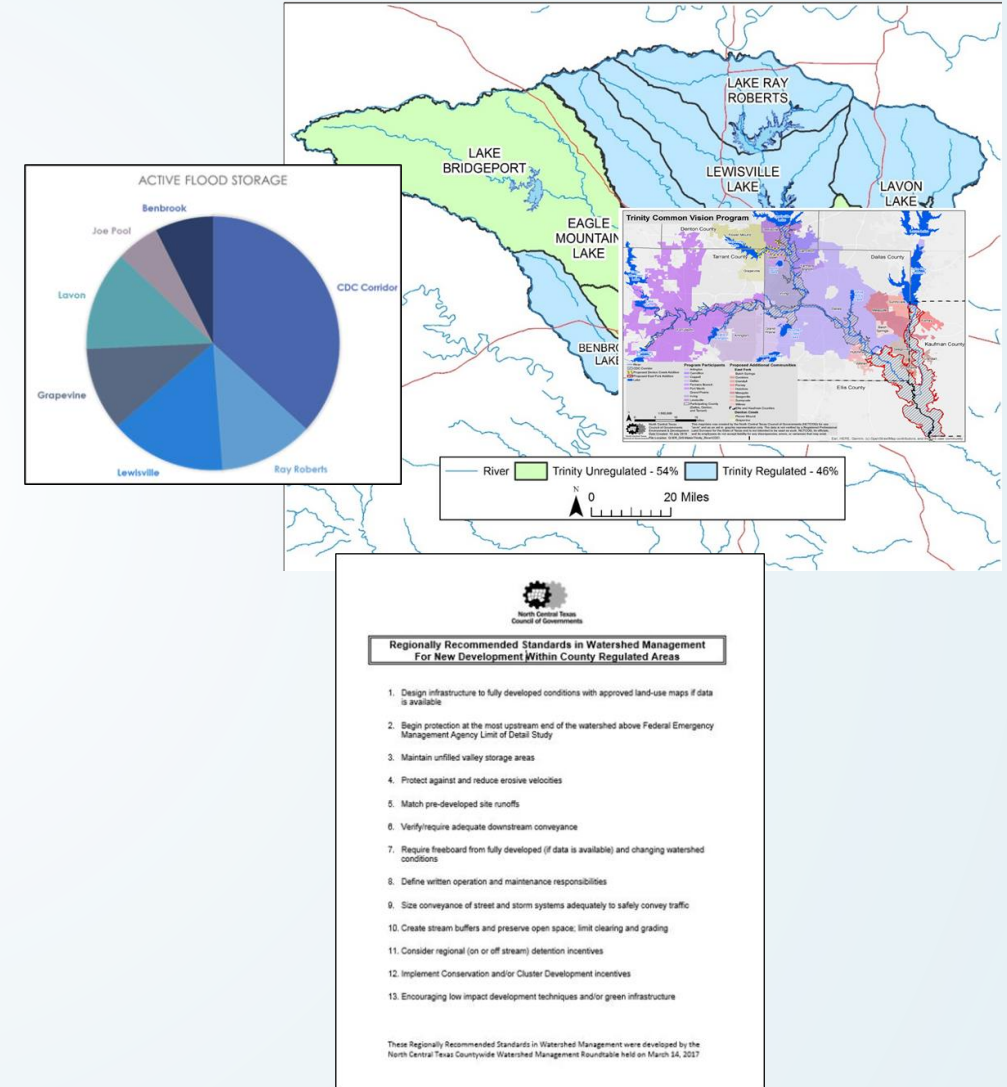


USACE as a Technical Advisor



NCTCOG Common Vision Program

- Administered by NCTCOG
- Supported by – communities along Trinity River Corridor
- The only regional floodplain management program
- Resources
 - FMTF
 - Steering Committee
 - Technical advice and reviews– USACE
- Goals
 - Oversight
 - Reduced community risk
 - Increase resources, funding, personnel
 - Bring 160+ communities together
- Status
 - More communities joining
 - Many spinoff programs
 - Tools, analysis and data





State-of-the-art Technologies



What?

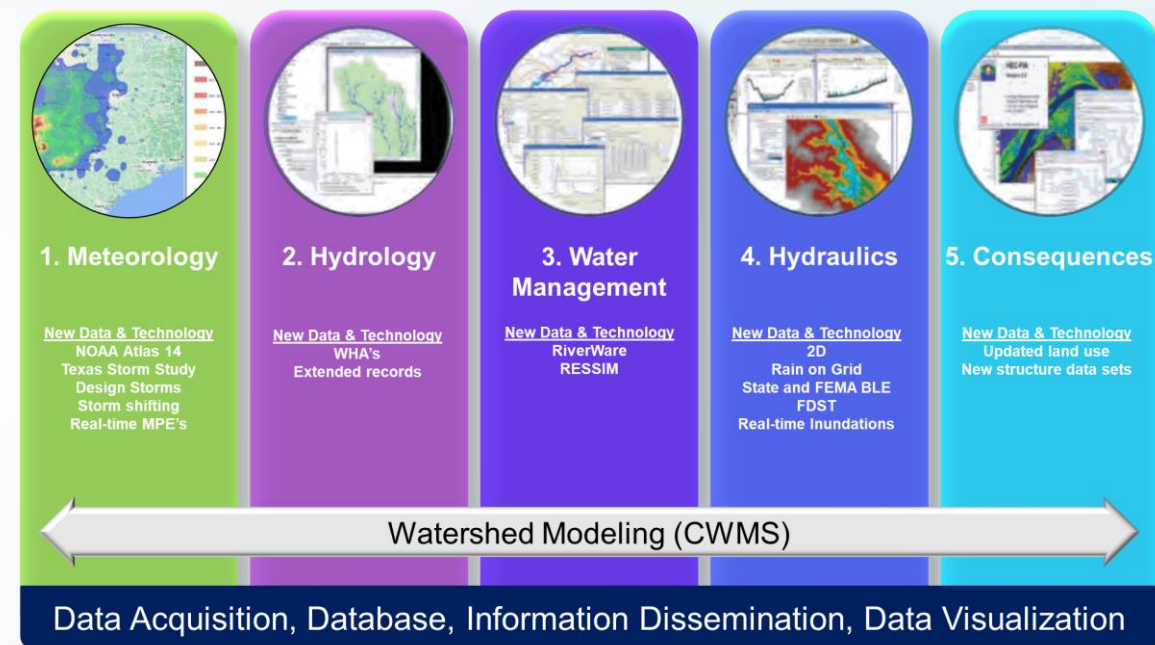
- Updates and enhancement of flood models
- Basis for Common Vision Models
- System of applications
- National standard

Why?

- To ensure models that are used for critical flood studies & emergency management reflect latest development & technological improvements
- Integration of other tools and data
- Supports planning and operations

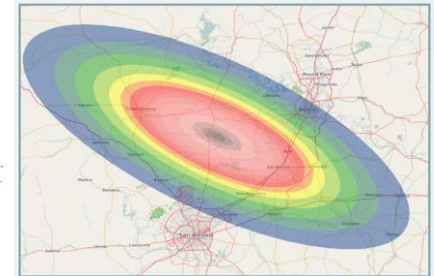
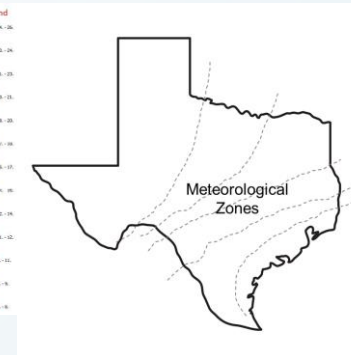
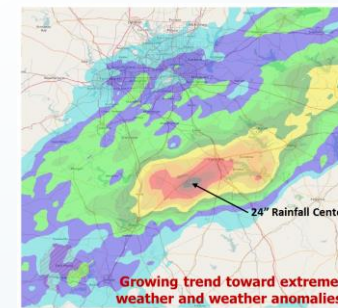
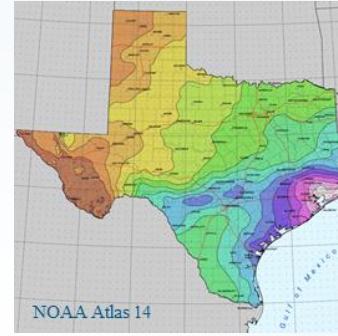
Outcome:

- Collaborative and enhanced flood models
- FMTF influences application capabilities
- Available to communities, other infrastructure groups and the development community
- Best available tools, analysis, and data with many flood risk awareness and resilience applications
- Communities can take actions and set policies related to flood risk
- Decreased uncertainty and more resilient communities



Precipitation Studies – How Much Precipitation

- NOAA Atlas 14
- Texas storm study



Storm Inventory



Regional Storm Shifting

What?

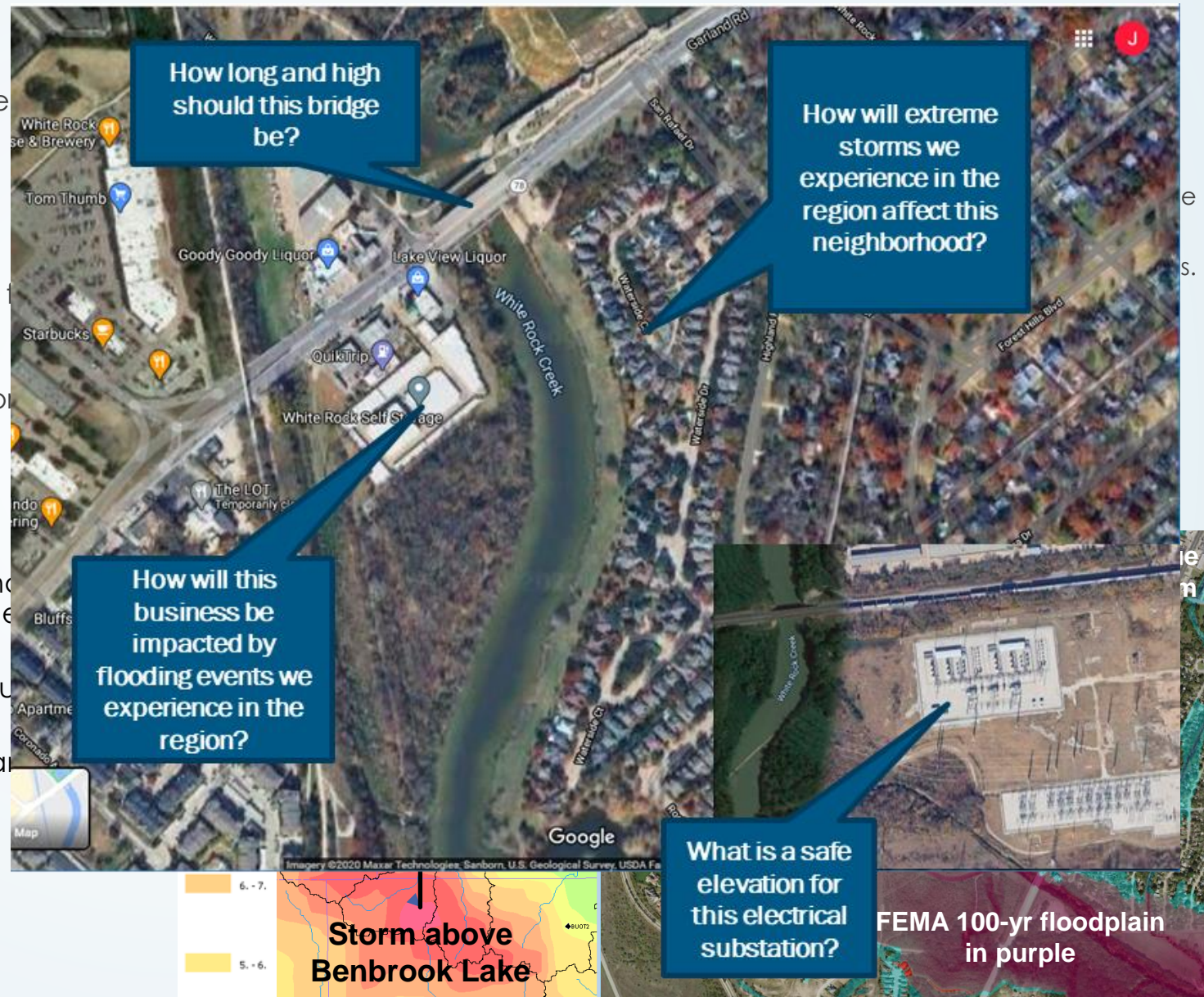
- Storm shifting to simulate the impact of actual regional storms if they occurred somewhere else
- Makes science of meteorology more **relatable**

Why?

- Questionable historic records and lack of safety factors
- Validate the 100-yr estimates
- A watershed may have experienced a disproportionate number of small or large historic rainfall events
- No factor of safety in Flood Risk Management

Outcome:

- Storm shifting provides informative, relatable, and regulatory data to help communities better understand and mitigate their flood risk
- Valuable non-regulatory planning and design guidance for more resilient communities
- Can be used in EM Action/Hazard Mitigation Plans
- Technology is free of charge





Watershed Hydrology Assessment (WHA)

What? Latest & state of the art best estimate for the potential of flooding

- Meteorology and Hydrology study (i.e., determines how much water)
- Significantly reduces uncertainty
- Integrates NOAA Atlas 14, TSS, storm shifting, BLE & other tools and data
- Existing and future land use impacts
- Accounts for regulated flow from dams
- Scientist from USACE, USGS, NWS and FEMA, using newest techniques and data

Why?

- Hydrology remains the single largest source of uncertainty in our understanding of flood risk
- Available hydrology information is generally dated and obsolete
- Available to all communities

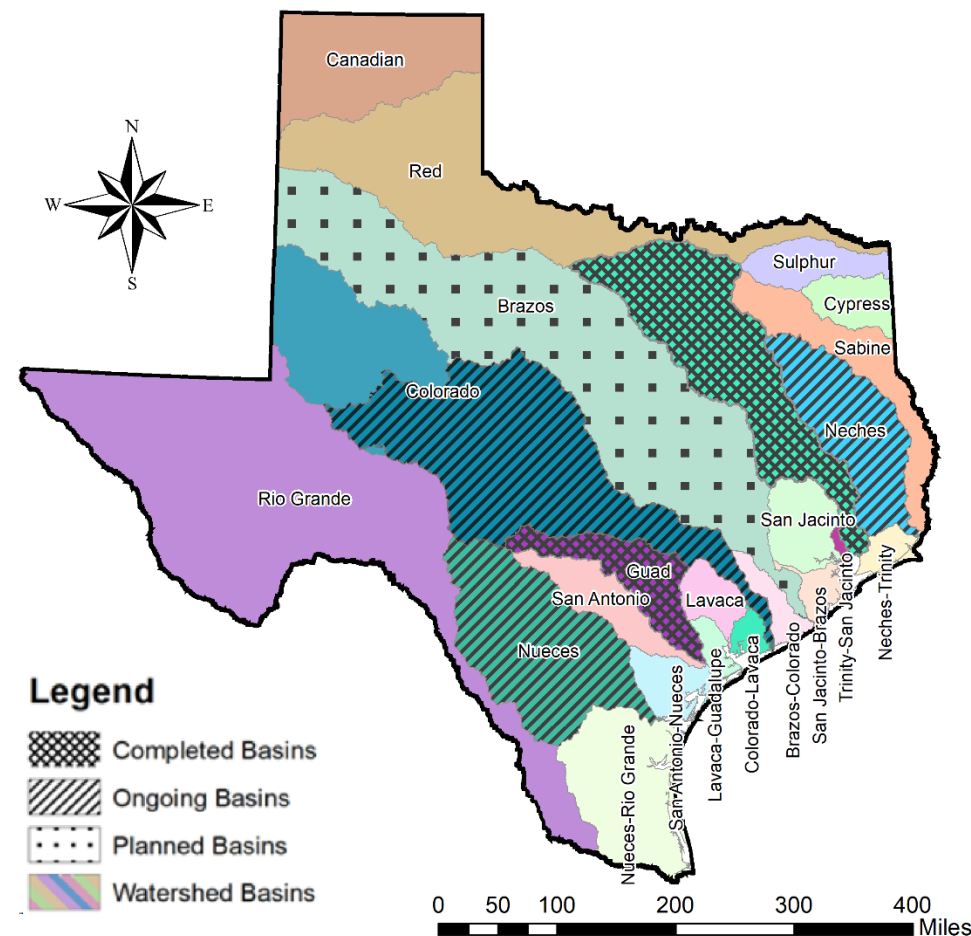
Outcome:

- WHA produce consistent 100-yr and other frequency flows across the river basin, based on all available hydrologic information
- Provides design data, comparative data and suggests areas where flood hazard information may need to be updated
- **Trinity River Watershed Hydrology Assessment**
 - Objective: Recently completed high quality hydrology study of 700-mile-long Trinity River Basin (18,000 square miles)
 - Outcome: Innovative and quality information for use in regional flood studies



North Central Texas
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InFRM Watershed Hydrology Assessment (WHA) Status Map



WHA Status Table

Guadalupe	Brazos	Cypress	Red	San Jacinto
Trinity	Brazos-Colorado	Lavaca	Rio Grande	San Jacinto-Brazos
Neches	Canadian	Lavaca-Guadalupe	Sabine	Sulphur
Lower Colorado	Upper Colorado	Neches-Trinity	San Antonio	
Nueces	Colorado-Lavaca	Nueces-Rio Grande	San Antonio-Nueces	
	Completed	Ongoing	Funded	Not Funded





Base Level Engineering (BLE)



What?

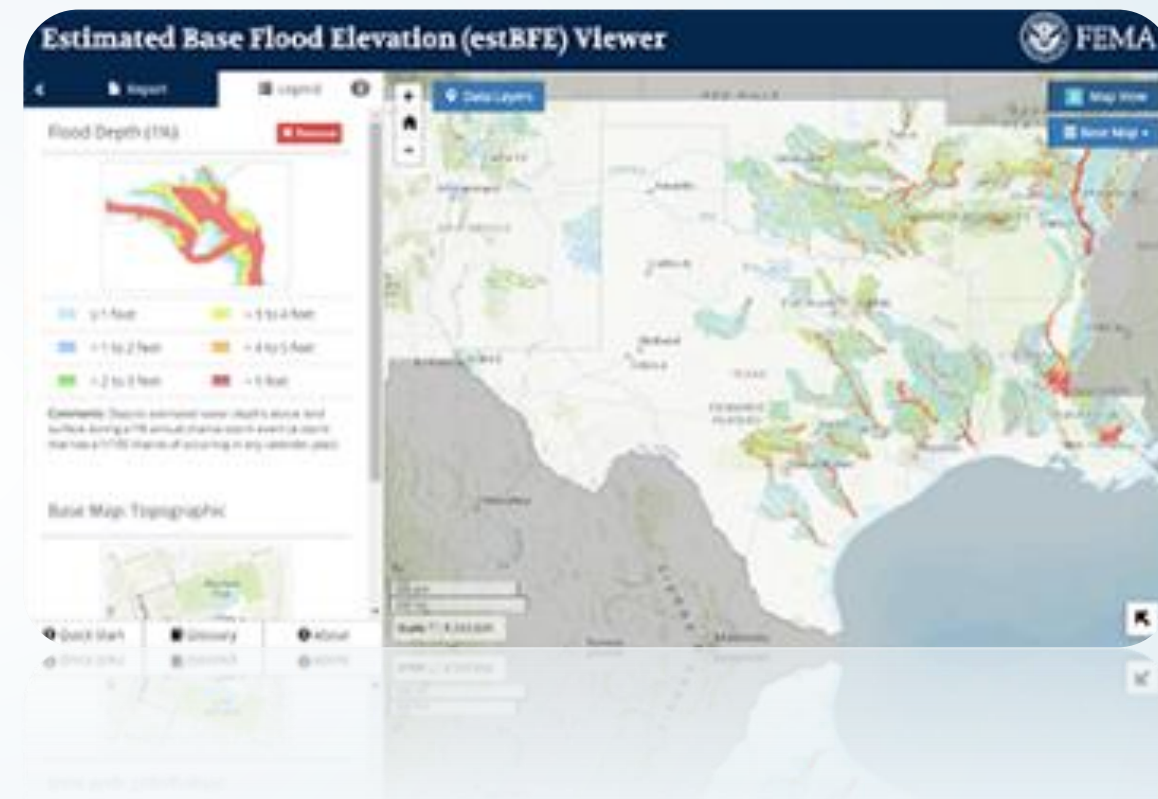
Watershed-wide engineering modeling method that leverages high resolution ground elevation, automated model building techniques, and manual model review to prepare broad and accurate flood risk information.

Why?

Centralized and available flood hazard analysis to support floodplain management activities and development review, while increasing risk awareness for individuals.

Outcome:

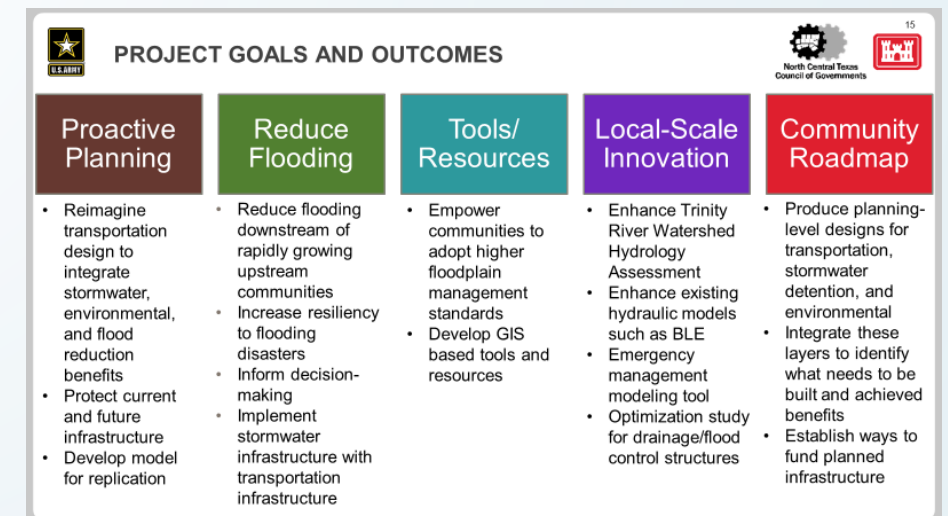
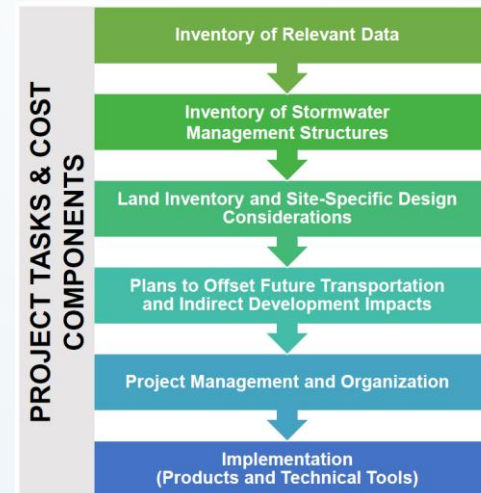
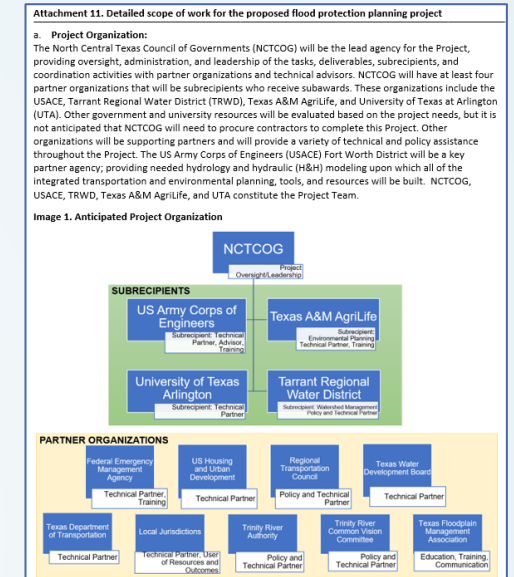
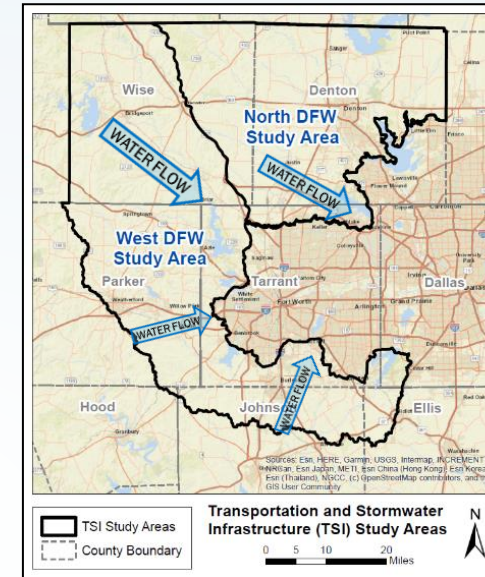
- Quickly determine the flood risk for various events throughout multiple watersheds at various recurrence intervals (i.e., 10yr, 100yr, 500yr).
- Allows Federal, State, and local governments, as well as individuals, to access and use flood risk information.



<https://webapps.usgs.gov/infrm/estBFE/>

TSI Project Summary

- **Project Organization:** NCTCOG is lead agency for project with subrecipients including (but not limited to) USACE, Tarrant Regional Water District (TRWD), Texas A&M AgriLife, and University of Texas at Arlington (UTA).
- **Purpose:** Minimize overall life cycle costs, **decrease flood risk**, and **reduce impacts** to the natural environment as a result of future population growth in study area.
- **Scope: Proactive vs. Reactive** through integration of regional stormwater management, urban development, transportation, and environmental planning: **a collaborative effort with regional Transportation planners**
- Identify impacts and alleviate risks from severe weather events such as flooding in (and downstream of) rapidly developing study areas 100-yr and alternative hydrologic loading
- Develop a comprehensive and transferrable plan for risk awareness and resiliency
- **Timeline & Budget:** 3-5 years and \$10 million (via NCTCOG, TWDB, transportation & GLO)
- Yes, opportunities for the AE community





Questions & Contact



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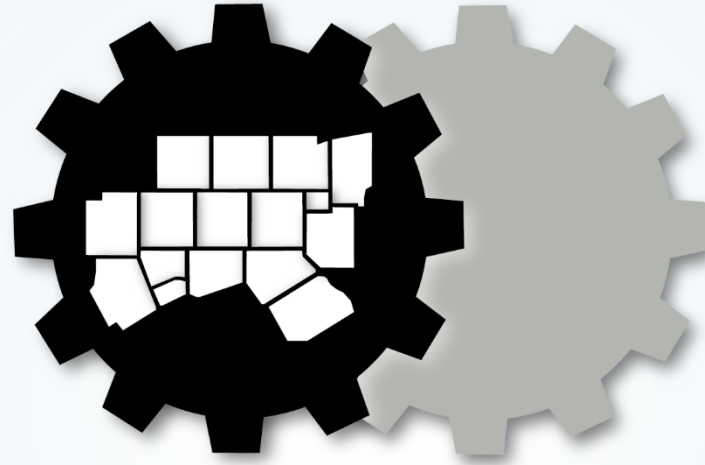
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