WELCOME & INTRODUCTIONS
Welcome and Introductions

- Thank you for attending!
- Please introduce yourself in the chat box.
- Please mute your line until you are ready to speak.
  - We will also watch the chat box for questions
DISCUSSION ITEMS
Trinity Common Vision
Trinity River Corridor Interlocal Agreement - 1989

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

FOUR COUNTIES
Dallas County
Denton County
Kaufman County
Tarrant County

TWO SPECIAL DISTRICTS
Tarrant Regional Water District
Trinity River Authority

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

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.
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

- Benbrook
- Joe Pool
- Lavon
- Grapevine
- Lewisville
- Ray Roberts
- CDC Corridor
Common Vision Work Program and Activities Update

- CDC Permitting
- FEMA L-273 Four Day Course
- Elected Officials Seminar
- FY20 Work Program – Additional Technical Item Outcomes
CDC Permits in Fiscal Year 2020

- 2 Applications Received This Fiscal Year
- 218 Total Applications Since CDC Inception
L-273 FEMA NFIP Course and the Elected Officials Seminar

**Floodplain Management through the NFIP**
- 24th annual Class held November 2019 – Class was full with a wait list!
- In lieu of L-273 during COVID-19, NCTCOG is partnering with FEMA to offer a “4x2” Floodplain Mgmt Course.

**Annual Combined Elected Officials Seminar/CRS Users Group**
- Held virtually July 30, 2020. [View the presentation here.]
- Guest speakers from the TWDB discussed the State Flood Plan and other floodplain initiatives.
FY 20 Work Additional Work Program Items: NFIP-CDC Model Consolidation Update

- The NFIP-CDC Model Consolidation Team has created an updated process for submitting CDC applications for the future release of the Consolidated Model. Pending approval of the FY21 Work Program, they will continue to meet to incorporate these changes into a 5th Edition Manual.

Team Members
- Stephanie Griffin, Team Chair, Halff Associates (formerly City of Grand Prairie)
- Jim Keith - Freese and Nichols
- Amy Cannon - City of Arlington
- Kim Dewailly - City of Dallas
- Lisa Biggs - City of Fort Worth
- Craig Ottman - TRWD
- Mike Danella - USACE
- Landon Erickson - USACE
- Alan Johnson – FEMA
- Jacob LeSue - Dewberry
- Mia Brown - NCTCOG
Why is Model Consolidation Needed and What Does it Mean?

- The CDC model looks at current and future conditions
- The NFIP maps look at current conditions only
- Consolidation reduces fragmentation in the CDC process, reducing the burden for communities and developers.
- The Common Vision/CDC program is expanding to the East Fork Trinity and Denton Creek, bringing in more communities.

NCTCOG and the Team brought together two federal agencies (FEMA and USACE) at the request of the FMTF to agree on a consolidated process, a huge accomplishment for all parties involved.

FEMA contributed $2 million to georeference the NFIP model and USACE is contributing $215,000 to bring the existing CDC model up to date.
FY 20 Work Additional Work Program Items: NFIP-CDC Model Consolidation Update

November 2020: Preliminary FEMA NFIP maps will be issued for Dallas and Tarrant counties, including the georeferenced FEMA model for the CDC area.

Early 2021: Preliminary FEMA NFIP maps will be issued for Kaufman and Ellis counties, including the detailed study for the East Fork Trinity.

Throughout FY 2021, the USACE will:

- Update the FEMA model with CDC projects since 2017 and consolidate with future flows.
- Create the CDC future flows for the FEMA detailed study on the East Fork Trinity and the Trinity mainstem to extend the consolidated model.

One request from FMTF and the Team was for NCTCOG to serve as the CDC Model Repository. With the completion of the FY20 Work Program, NCTCOG is launching a new website that allows users to download the latest model and streamlines and automates the CDC application process.
FY 20 Work Additional Work Program Items: Website for the CDC Application Process

www.trinityrivercdc.com
FY 20 Work Additional Work Program Items: Website for the CDC Application Process

www.trinityrivercdc.com
FY 20 Work Additional Work Program Items:
Website for the CDC Application Process

www.trinityrivercdc.com
FY 20 Work Additional Work Program Items: NFIP-CDC Consolidation and New Website

Next Steps - Website

- A tutorial document with instructions and screenshots is coming out this month to both the Trinity Common Vision/CDC programmatic websites and the new CDC website at www.trinityrivercdc.com. This document and information will also be emailed to the Common Vision members and the region.

- Pending approval of the FY21 Work Program, NCTCOG staff will create video tutorials for the new CDC website application and review process.
FY 20 Work Additional Work Program Items: NFIP-CDC Consolidation and New Website

Next Steps – Changes to CDC Process

- A Summary of Changes document will be posted to the NCTCOG programmatic websites and the new CDC website. The biggest changes are detailed here.

- The **CDC Cost Recovery Fee** funds the USACE technical review, NCTCOG administration costs, and the upkeep of [www.trinityrivercdc.com](http://www.trinityrivercdc.com).
  - Project is located within both the 100-year and SPF ineffective flow areas
    - Previous fee: $3,250
    - **Updated fee: $4,000**
  - Or, Project is located within a 100-year ineffective flow area but within the SPF effective flow area
    - Previous fee: $5,750
    - **Updated Fee: $6,000**

- The **new Model Maintenance Fee** will fund the USACE technical review of the finished project as-built condition for incorporation into the CDC model, keeping the Consolidated Model up to date with each project. This fee will be required when the CDC applicant submits their Letter of Map Revision (LOMR) to the community. 100% of the fee will be deposited into the USACE review account.
  - **New Fee: $2,500**
FY 20 Work Additional Work Program Items: East Fork Trinity & Denton Creek Integration

Grapevine
Flower Mound

Mesquite (membership tentative)
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.
FY 20 Work Additional Work Program Items: 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.

- **September 2020**: Mesquite is tentatively working toward taking the East Fork Resolution to their council.

Pending approval of the FY21 Work Program, outreach will continue to these communities, as expanding the Common Vision program is an ongoing process.
Members requested a regional flood early warning software in FY17 because of challenges with individual systems already in place.

A cooperative contract with OneRain for Contrail software launched on North Texas SHARE in August 2018.

Communities can set pre-defined alerts and see each other’s gauge readings to better prepare for storms.

Arlington, McKinney, Frisco, and TRWD are currently on the contract; Fort Worth and Grand Prairie feed data to the website.

NCTCOG staff are working with OneRain to negotiate a contract renewal that allows any community to join regardless of system size. Proposed terms for pending renewal include six service tiers. These proposed terms are shown in draft form.
<table>
<thead>
<tr>
<th>Entry Tier</th>
<th>Intermediate Tier</th>
</tr>
</thead>
<tbody>
<tr>
<td>Single, view-only client in a shared resource for agencies <strong>without</strong> a gauging network</td>
<td>Single client in a shared resource for agencies with a gauging network with less than 100 sensors</td>
</tr>
<tr>
<td>✓ <strong>Agency-branded website</strong> to direct the public</td>
<td>Everything in Entry tier, plus:</td>
</tr>
<tr>
<td>✓ <strong>Visualize</strong> and <strong>download</strong> regional data as CSV, Excel, or tab formats</td>
<td>✓ Collect, visualize, store, and alarm on <strong>agency-owned gauging network data</strong></td>
</tr>
<tr>
<td>✓ <strong>Alarm</strong> on shared regional rain, stream level, and air temperature gauges</td>
<td>✓ Access to <strong>regional gauges</strong> to visualize and alarm</td>
</tr>
<tr>
<td>✓ Easily edit <strong>dashboards</strong> or the <strong>homepage</strong> to deliver important information</td>
<td>✓ <strong>Download</strong> regional and local gauge data as CSV, Excel, or tab formats</td>
</tr>
<tr>
<td>✓ Understand an <strong>approaching storm intensity</strong> with gauge-adjusted radar rainfall</td>
<td>✓ <strong>Agency-branded website</strong> to direct the public</td>
</tr>
<tr>
<td>✓ <strong>Easily edit dashboards</strong> or the <strong>homepage</strong> to deliver important information</td>
<td>✓ Access to <strong>API</strong> for integration into third-party websites for $500/year</td>
</tr>
<tr>
<td>✓ <strong>Save bookmarks</strong> for quick links to graphs and webpages</td>
<td>✓ <strong>Send data to NWS</strong></td>
</tr>
<tr>
<td>✓ <strong>Save bookmarks</strong> for quick links to graphs and webpages</td>
<td>✓ <strong>No advanced reporting</strong></td>
</tr>
<tr>
<td><strong>X</strong> No agency-owned gauging networks</td>
<td><strong>X</strong> No advanced options</td>
</tr>
<tr>
<td><strong>X</strong> No API access</td>
<td><strong>X</strong> No advanced options</td>
</tr>
</tbody>
</table>

**X** No advanced reporting

**X** No advanced options

**X** No two-way control

$1,579 (5% off) $1,500/year

$4,684 (5% off) $4,450/year
DEDICATED TIER

Advanced Tier
*Dedicated resource for agencies with a gauging network*

- ✓ Dedicated cloud resource for maximum performance, flexibility, and resiliency
- ✓ Collect, visualize, store, and alarm on **agency-owned gauging network data**
- ✓ Access to **regional gauges** to visualize and alarm
- ✓ **Download** regional and local gauge data as CSV, Excel, or tab formats
- ✓ **Agency-branded website** to direct the public
- ✓ API access for integration into third-party websites
- ✓ Send data to **NWS**
- ✓ **Advanced reporting** for network maintenance and full data download
- ✓ **Two-way control** module to remotely activate barrier gates or lights
- ✓ Collect **additional data sources** via generic data agent
- ✓ Configure the software to meet agency’s needs

X No locally-hosted instance

<table>
<thead>
<tr>
<th>Under 100 sensors</th>
<th>Unlimited sensors</th>
</tr>
</thead>
<tbody>
<tr>
<td>$12,000 (5% off)</td>
<td>$12,000 (5% off)</td>
</tr>
<tr>
<td>$6,650/year</td>
<td>$11,400/year</td>
</tr>
</tbody>
</table>
## Mission Critical Tier

**Redundancy Tier**  
*Dedicated cloud resource and local instance for agencies with mission critical need*

- Dedicated **cloud resource** and **local instance** for maximum flexibility, resiliency, and redundancy  
- Ideal for agencies that need to view data during power outage or internet failure  
- Collect, visualize, store, and alarm on **agency-owned gauging network data**  
- Access to **regional gauges** to visualize and alarm  
- **Download** regional and local gauge data as CSV, Excel, or tab formats  
- **Agency-branded website** to direct the public  
- **API** access for integration into third-party websites  
- Send data to **NWS**  
- **Advanced reporting** for network maintenance and full data download  
- **Two-way control** module to remotely activate barrier gates or lights  
- Collect **additional data sources** via generic data agent  
- Configure the software to meet agency’s needs

<table>
<thead>
<tr>
<th>First Year</th>
<th>Starting Year 2</th>
</tr>
</thead>
<tbody>
<tr>
<td>$32,000 (5% off)</td>
<td>$17,000 (5% off)</td>
</tr>
<tr>
<td>$30,400</td>
<td>$16,150/year</td>
</tr>
</tbody>
</table>

## High Redundancy Tier

**Two dedicated cloud resource and local instance for agencies with mission critical need**

- Two **cloud resources** are run in **separate data centers**, as well as a **local instance** for ultimate flexibility, resiliency, and redundancy  
- Ideal for agencies that need to view data during power outage or internet failure  
- Collect, visualize, store, and alarm on **agency-owned gauging network data**  
- Access to **regional gauges** to visualize and alarm  
- **Download** regional and local gauge data as CSV, Excel, or tab formats  
- **Agency-branded website** to direct the public  
- **API** access for integration into third-party websites  
- Send data to **NWS**  
- **Advanced reporting** for network maintenance and full data download  
- **Two-way control** module to remotely activate barrier gates or lights  
- Collect **additional data sources** via generic data agent  
- Configure the software to meet agency’s needs

<table>
<thead>
<tr>
<th>First Year</th>
<th>Starting Year 2</th>
</tr>
</thead>
<tbody>
<tr>
<td>$44,000 (5% off)</td>
<td>$29,000 (5% off)</td>
</tr>
<tr>
<td>$41,800</td>
<td>$27,550/year</td>
</tr>
</tbody>
</table>
The regional flood warning software platform provides a comprehensive look at rainfall and water levels across the North Texas region through a connected network of flood gauges made possible through partnerships with local municipalities and agencies.

**Rainfall Map**
View live data of rainfall across the region.

**Current Stage Level Map**
View live data of the current stage level of flood gauges across North Texas.

**How to Join**
Communities of North Texas can join the program for a cost savings on flood warning hardware and software. Communities can view and integrate other community data for a comprehensive look at the region as a storm moves across.

**Disclaimer:** FloodDataTX is an interactive mapping application developed by the North Central Texas Council of Governments through a cooperative contract with Cheyenne, Inc. The data and information presented may not be presented in real-time and should not be assumed to be asset conditions in the indicated area on the map. Neither FloodDataTX nor the sponsoring agencies including the North Central Texas Council of Governments and member municipalities and participating in this program assume any legal (liability or responsibility) or make any guarantees or warranties as to the accuracy, completeness, or suitability of the information for any specific purpose. The public is urged to closely monitor information provided by local emergency management organizations during emergency situations.

weather for Arlington, TX

www.flooddatantx.com
Action Items
NCTCOG staff are seeking approval of the 2019 Trinity Common Vision Steering Committee Meeting Summary.
FY21 Trinity River Common Vision Draft Work Program Vote

- NCTCOG is seeking the Steering Committee’s approval of the Draft FY21 Work Program, recommended by the Flood Management Task Force on August 14th, 2020.

- Additions to existing Ongoing Support Activities
  - Maintenance of CDC Application and Tracking Website

- Additional Technical Activities
  - Participation in the Model Consolidation Committee
  - Update the CDC Manual to the 5th Edition
  - East Fork Trinity and Denton Creek Integration

- No change in the annual cost shares; total program cost of $100,000
  - East Fork Communities will not be invoiced this year since CDC products are not yet available.
Presentation Items
Related Activities Update
The Trinity Coalition (formerly Trinity Nature Conservancy) has worked with NPS on designation for the Trinity River.

Designation was anticipated in June 2020, but all applications this year have been delayed.

This effort was awarded the Conservation Wrangler designation by Texan By Nature.

Trinity Coalition is working with communities on signage and possible additional launches.

Thank you to the Trinity River communities for your efforts and support!
Cooperating Technical Partners Grant - FEMA

<table>
<thead>
<tr>
<th>Year</th>
<th>Projects</th>
</tr>
</thead>
</table>
| 2004 | • Joined CTP  
      | • Created Master Plan |
| 2009 | • NCTCOG Participates in Map Modernization |
| 2012 | • West Fork Trinity and Elm Fork Trinity Discovery |
| 2013 | • Village Creek Flood Risk Project |
| 2014 | • Bear Creek Flood Risk Project |
| 2015 | • Cedar and Denton Watershed Discovery  
      | • Lynchburg and Irving Creek Flood Risk Studies |
| 2016 | • East Fork Trinity Discovery  
      | • Silver Creek and McAnear Creek Flood Risk Studies |
| 2017 | • Richland-Chambers Watershed Discovery  
      | • Town Creek and Clear Fork Tributary Flood Risk Studies |
| 2018 | • Marys Creek Flood Risk Study |
| 2019 | • Waxahachie Creek and Harriet Creek Flood Risk Studies |
| 2020 | • Catherine Branch Flood Risk Study and a Communications & Outreach grant for the Transportation-Stormwater Planning Study Area (western area). |
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
• Denton (Silver)
• Grand Prairie (Silver)
• Kennedale (Silver)
• Frisco (Silver)
• Fort Worth (Silver)
• Irving (Silver)

Applications Under Consideration as of this meeting 9/10/20:
• Celina (Gold)
• Corinth (Silver)
Many resources are available through iSWM:

- New website: www.iswm.nctcog.org
- Program Guidance
- Technical Manual
- Criteria Manual
- Proprietary Device Guidance
- Instructional Videos
  - Bioretention Facility Installation and Maintenance
- iSWM Criteria Community Inventory
  - City (PDF)
  - County (PDF)

Example of the Community Inventory by city for the Site 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.
Texas Water Development Board’s State Flood Plan

- The 2019 Legislature gave the TWDB the role of creating and administering the first State Flood Plan, modeled after the State Water Planning Process.
- In Spring 2020, the TWDB approved boundaries for Flood Planning Regions based on major river basins and adopted flood planning rules.
- The TWDB Executive Administrator will name the members and sponsors of the Regional Flood Planning Groups sponsors in late 2020.
- 1/10/23: Each flood planning group shall submit a regional flood plan to TWDB
- 9/1/24: A state flood plan must be prepared and adopted by TWDB
  - An updated flood plan will be prepared and adopted every 5 years
- Updates are posted to TWDB’s Flood Planning website: http://www.twdb.texas.gov/flood/planning/index.asp
NCTCOG Participation in the TWDB Flood Planning Process

- Edith Marvin submitted a nomination for membership in the Environmental Interests category for the Trinity River RFPG.
- NCTCOG has nominated itself for sponsor of the Trinity River RFPG.
- NCTCOG will do everything possible to help bridge disconnects and overlaps of effort, just like our participation in the Region C Water Planning Group.
CDBG-MIT Funding

- $4.3 billion has been set aside in different funding pots for Texas from CDBG-DR funds for mitigation.
- Certain NCTCOG counties are eligible for the 2015 and 2016 Floods State Mitigation Competitions.
- While at least 50% of funds must be spent in HUD Most Impacted & Distressed Areas (MID), the eligible NCTCOG counties are State MID and can still compete for funds.
- 50% of all CDBG-MIT funds must benefit low-to-moderate income (LMI) persons.
- No requirement for a tie-back to the qualified disaster.
- The application period for the 2015 and 2016 competitions is open; it closes 5 p.m. on October 28th, 2020.
- The GLO/TDEM webinar series about these funds can be viewed here: https://www.hudexchange.info/news/cdbg-dr-and-cdbg-mit-webinar-series-spring-2020/
CDBG-MIT Funding

https://recovery.texas.gov/mitigation/competitions.html
16-County Watershed Management Effort

- Menu of Regionally Recommended Standards in Watershed Management for New Development Within County Regulated Areas.
- Developed by our counties at a March 2017 Roundtable.
- Presented to the 16-County Watershed Management Forum on July 12, 2017.
- NCTCOG Executive Board endorsed this effort in October 2017.
- Dallas, Denton, and Kaufman Counties have fully or partially adopted these standards.

Menu of Regionally Recommended Standards in Watershed Management For New Development Within County Regulated Areas

1. Design infrastructure to fully developed conditions with approved land-use maps if data is available
2. Begin protection at the most upstream end of the watershed above Federal Emergency Management Agency Limit of Detention Study
3. Maintain unafflicted valley storage areas
4. Protect against and reduce erosive velocities
5. Match pre-developed site runoffs
6. Verify there is adequate downstream conveyance
7. Require biofurnace from fully developed (if data is available) and changing watershed conditions
8. Define written operation and maintenance responsibilities
9. Size conveyance of street and storm systems adequately to safely convey traffic
10. Create stream buffers and preserve open space, limit clearing and grading
11. Consider regional (on or off-stream) detention incentives
12. Implement Conservation and/or Cluster Development incentives
13. Encouraging low impact development techniques and/or green infrastructure

These regionally recommended standards in watershed management were developed by the North Central Texas Council of Governments’ Watershed Management Roundtable held on March 14, 2017.

https://www.nctcog.org/envir/watershed-management/floodplain-management
Integration of Transportation & Stormwater Planning

This initiative will target undeveloped and developing communities in the Upper Trinity River watershed. The goal is to limit the increase in future flooding associated with growth and development by providing resources to communities to plan for transportation and stormwater infrastructure together. Outreach will begin in early 2021.

NCTCOG website for this initiative: https://www.nctcog.org/envir/watershed-management/upper-trinity-river-transportation-and-stormwater

June 18th webinar recording: https://www.youtube.com/watch?v=eXGJTHLiRbg
### Other Program Related Efforts

**Funding Application Update for Integrated Transportation and Stormwater Planning**

<table>
<thead>
<tr>
<th>Funding Agency/Funding Opportunity Name</th>
<th>SUBMITTED APPLICATIONS</th>
<th>ANTICIPATED/REQUESTED FUNDS OR APPLICATIONS*</th>
</tr>
</thead>
<tbody>
<tr>
<td>TWDB (Flood Infrastructure Fund)</td>
<td>USACE (Various Authorities)</td>
<td>FEMA (Community Outreach and Mitigation Strategies)</td>
</tr>
<tr>
<td><strong>Requested Funding</strong></td>
<td>$3.0 Million</td>
<td>$3.0 Million</td>
</tr>
<tr>
<td><strong>Current Status</strong></td>
<td>Submitted Abridged Application June 15th; will know in the fall if invited to submit complete application.</td>
<td>Submitted to USACE Fort Worth District in March/Expect to hear in late 2020.</td>
</tr>
</tbody>
</table>

*Anticipate applying to additional funding opportunities as they become available (ex. FEMA BRIC, GLO, TDEM, etc.) and working with partner organizations to identify project funding.*
The Interagency Flood Risk Management (InFRM) Team

Collaboration of Federal Agencies → One Mission

- Pilot Program began in 2014 within FEMA Region 6
- Purpose to develop actionable information to reduce long-term flood risk in the region
- Leverages information, expertise, programs and resources across the federal agencies
- Operates under the umbrella of Integrated Water Resources Science and Services (IWRSS)
Purposes of the InFRM Watershed Hydrology Assessments (WHAs)

- Design flows, e.g. 1% annual chance (100-yr)
- Larger streams and rivers
- Replaces dated and obsolete information
- Employs a Comprehensive Approach to Hydrology:
  - Multi-agency science team
  - PEER reviewers from agencies within each watershed
  - Employs multiple methods and compares their results
  - Uses state-of-the-art technics
  - Leverages more detailed studies and data
  - Considers non-stationary factors like regulation, land use & climate variation
  - Provides future land use condition design flows
  - Tells the story of how the 1% flow has changed over time
  - Significant shifts are possible
- Outcomes provide design data and suggest areas where FEMA flood hazard information may need to be updated
Trinity River Watershed Hydrology Assessment

- Trinity WHA began Sept. 2015
- Drainage Area – 18k square miles
- Watershed Length – 700 miles
- 8 USACE Reservoirs
- Fort Worth and Dallas Levees
- 100 Active USGS Gages
- HMS Subbasins – 289 (60 sq. mi avg.)
- Planning and design guidance for more resilient communities
- What is my risk?
- Have there been nearby events that would adversely impact communities?
Tools, Analysis and Data for Federal Agencies/Projects

- Planning and design guidance for federal agencies/projects
- Planning, design and operational data for dams and levees
- Evaluation criteria for 408 actions, real estate actions, risk assessments, dam and levee safety studies

What level of protection does this federal levee provide?
Community Adoption and Use - San Marcos, TX Example

Guadalupe InFRM Study Subbasin Boundaries

City of San Marcos Detailed Subbasin Boundaries
Shifting Nearby Observed Storms

- **Waco, TX completed**
  - Issue: Uncertainty associated with determination of flood potential (dams)
  - Shifted several storms (30+ mi)
  - Examined different operational constraints, multiple scenarios
  - Outcome: showed flood potential is greater than 100-year

- **Mary’s Creek, DFW, TX area**
  - Issue: Uncertainty associated with determination of flood potential
  - Shifted 2010 100-year± storm 10 miles
  - Outcome: Flood potential is greater than previously understood

- **San Marcus underway**

- **Future**
  - InFRM product
  - DFW Airport
Tools, Analysis and Data for Communities

- Planning and design guidance for more resilient communities
- What is my risk?
- Have there been nearby events that would adversely impact communities?
Questions?

Jerry L. Cotter, P.E.
Chef Water Resources
US Army Corps of Engineers
Fort Worth District
Charles.Erickson@usace.army.mil
817-886-1692 (office)

www.infrm.us

FEMA

Integrated Water Resources Science and Services
SUMMIT TO SEA

USGS
science for a changing world

InFRM
INTERAGENCY FLOOD RISK MANAGEMENT
Roundtable
Contact

**Mia Brown, CFM**  
Sr. Planner, Environment & Development  
mbrown@nctcog.org  
817.695.9227

**Tamara Cook, AICP**  
Sr. Program Manager, Environment & Development  
tcook@nctcog.org  
817.695.9221

**Edith Marvin, P.E., CFM**  
Director, Environment & Development  
emarvin@nctcog.org  
817.695.9211

Connect

Facebook.com/nctcogenv  
@nctcogenv  
nctcogenv  
youtube.com/user/nctcoged  
EandD@nctcog.org  
nctcog.org/envir