



Draft Regional Flood Plan
Open House Informational Session
Arlington, Texas
August 31, 2022



Welcome and Introductions

Glenn Clingenpeel

Chair, Trinity Regional Flood
Planning Group

Executive Manager, Technical
Services and Basin Planning,
Trinity River Authority

**DRAFT
2022**

REGION 3 TRINITY REGIONAL FLOOD PLAN

Prepared for the Region 3 Trinity Regional
Flood Planning Group

July 2022

TECHNICAL CONSULTANT TEAM
Halff Associates, Inc. (Prime)
Freese and Nichols, Inc.
Nick Fang, Ph.D., P.E.
H2O Partners
Cooksey Communications

REGION 3 TRINITY
REGIONAL FLOOD PLANNING GROUP

The Trinity Regional Flood Planning Group

Voting Members

Chad Ballard
Sano Blocker
Melissa Bookhout
Glenn Clingenpeel
Scott Harris
Rachel Ickert
Andrew Isbell
Jordan Macha
Galen Roberts
Matt Robinson
Lissa Shepard
Sarah Standifer

Interest Represented

Small business
Electric-generating utilities
Agricultural interests
River authorities
Water utilities
Flood districts
Public
Environment
Water districts
Industries
Counties
Municipalities



The Trinity Regional Flood Planning Group



Non-Voting Members

Richard Bagans

Rob Barthen

Steve Bednarz

Justin Bower

Ellen Buchanan

Todd Burrer

Jerry Cotter

Bert Galvan

Diane Howe

Lonnie Hunt

Edith Marvin

Lisa McCracken

Kris Robles

Andrea Sanders

Greg Waller

Adam Whisenant

Organization Represented

Texas Water Development Board

Texas Department
of Agriculture

Texas State Soil and Water
Conservation Board

Houston-Galveston Area Council

Region 5 Neches Flood Planning
Group (liaison)

Region 6 San Jacinto Flood Planning
Group (liaison)

US Army Corps of Engineers, Fort
Worth Rep.

Texas Commission on
Environmental Quality

Federal Emergency
Management Agency

Deep East Texas Council
of Governments

North Central Texas Council
of Governments

US Army Corps of Engineers,
Galveston Rep.

General Land Office

Texas Division
of Emergency Management

National Weather Service /
West Gulf River Forecast Center

Texas Parks and Wildlife Department



Agenda

1.

2.

3.

4.

EVENT AGENDA

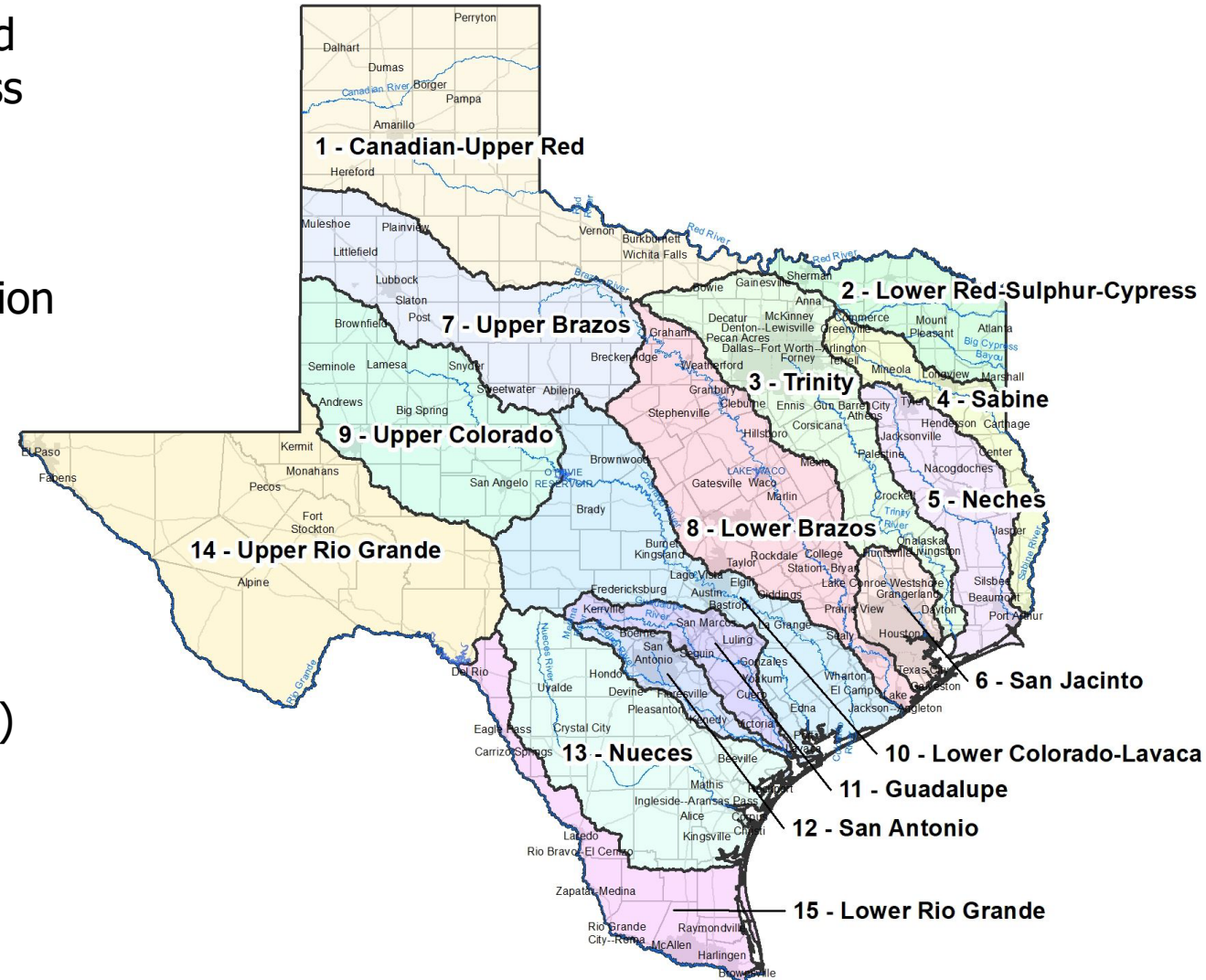
- Regional Flood Planning Overview
- Region 3 Trinity RFPG Accomplishments to Date
- Highlights of Draft Regional Flood Plan, Recommended Local Solutions
- Upcoming Schedule: Planning Milestones, Public Comment Opportunities
- General Q&A
- Breakout Stations: Learn More About Draft Plan, Visit With RFPG Representatives, Share Input

The background of the slide is an underwater scene. A horizontal line across the upper third of the image represents the water's surface, with a wave crest visible on the right. Below this line, the water is a deep, dark teal color, with some faint, blurry light patterns suggesting sunlight filtering down from above.

What is State and Regional Flood Planning?

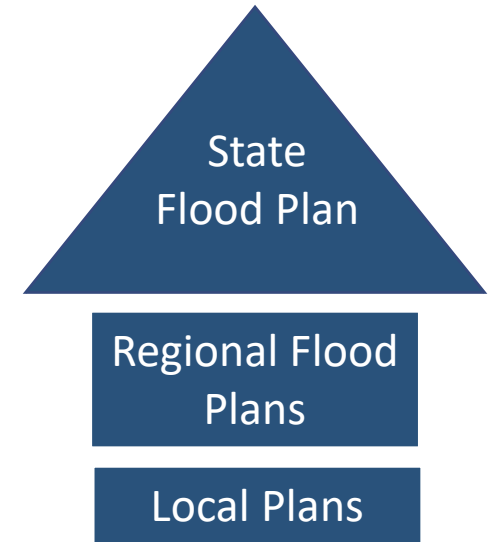
Texas' State Flood Planning Process

- 2019: 86th Texas Legislature passed Senate Bill 8, providing new process for statewide flood planning
- Texas Water Development Board (TWDB) charged with implementation
- 15 regional flood planning groups (RFPGs)
- 12 interest categories represented
- First planning cycle started 2020, nearing end (future cycles: 5 years)
- Regional Plans to become part of State Flood Plan Sept. 2024



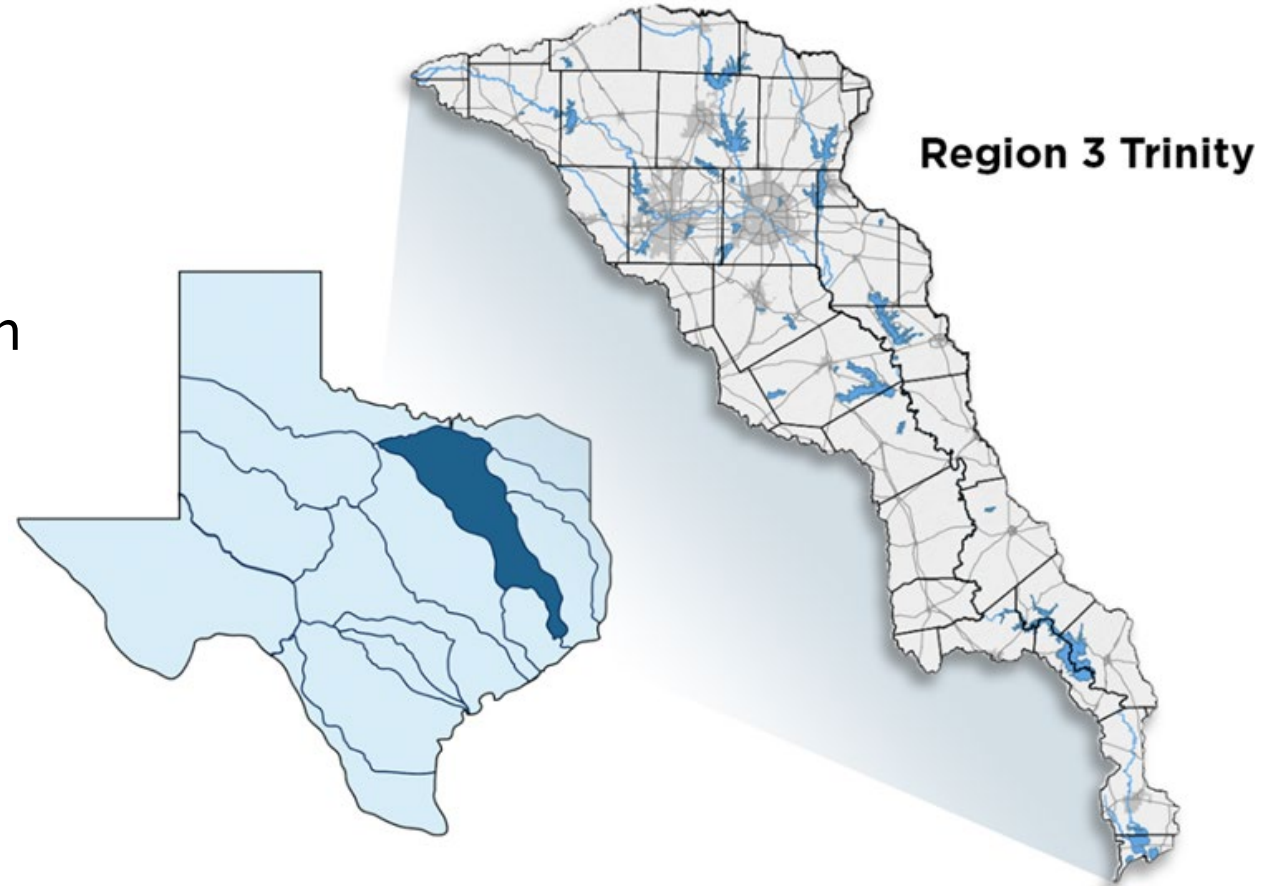
Regional Flood Planning Process


- Approach modeled after regional water planning
- Grassroots ("bottom up") approach
- Same scope of work for each RFPG
- Regional flood plans will roll up to become State Flood Plan
- Public process



Region 3 Trinity River Basin

- From Cooke County in north to Chambers County on Gulf Coast
- All or part of 38 counties
- Nearly 18,000 square miles, with almost 16,000 stream miles
- 30+ major lakes and reservoirs
- Population approximately 8 million and rapidly growing



The background of the slide is an underwater scene. In the upper half, there are dark, textured waves on the surface of the water. Below the surface, the water is a deep teal color, and there are faint, out-of-focus bubbles or light rays filtering down from above. The overall mood is calm but slightly somber, fitting the theme of a flood plan.

Draft Regional Flood Plan Overview

Regional Flood Plan Components

Existing & Future Conditions

Task 1

Introduce region

Task 2

Determine current and future flood risk

Task 3

Establish planning goals

Task 4

Identify potential solutions

Recommended Solutions

Task 5

Select recommended solutions

Task 6

Identify potential impacts

Task 7

Summarize flood response info

Task 8

Recommend improvements

Task 9

Identify funding sources

Task 10

Encourage public participation

Amended to Include

Task 11

Perform additional outreach

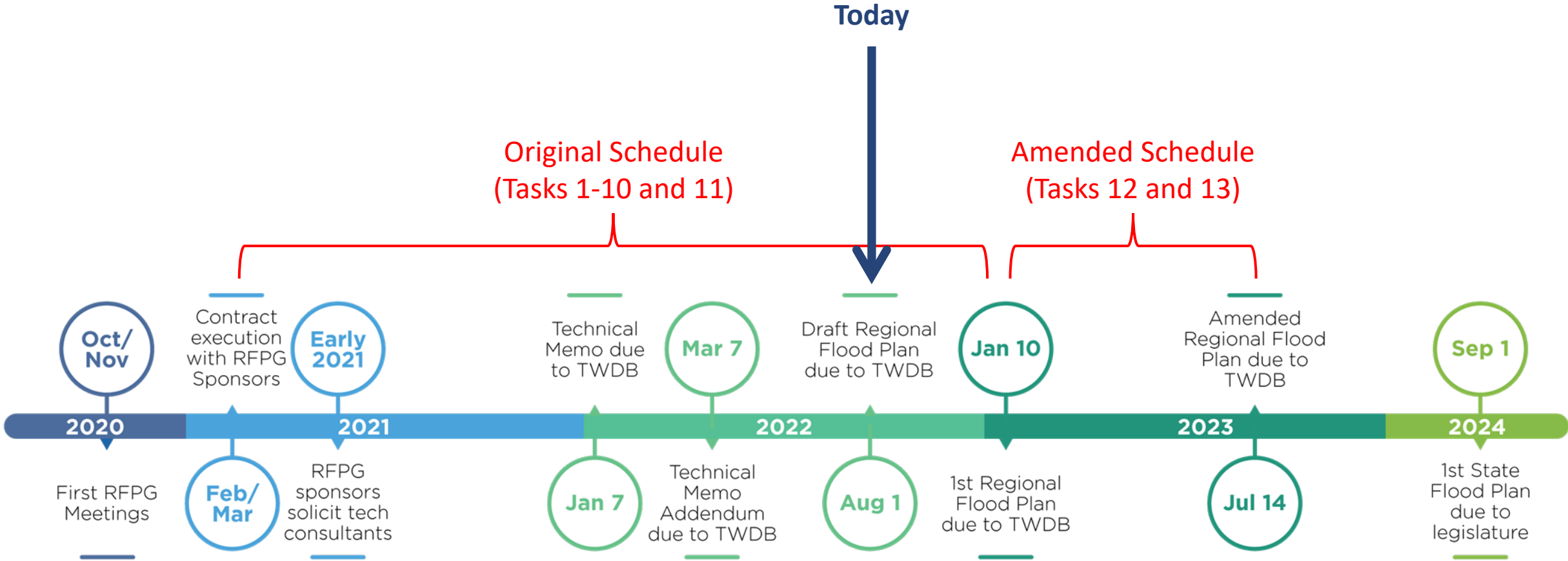
Task 12

Advance FMEs to FMPs

Task 13

Adopt amended plan

Schedule





Chapters 1 through 3

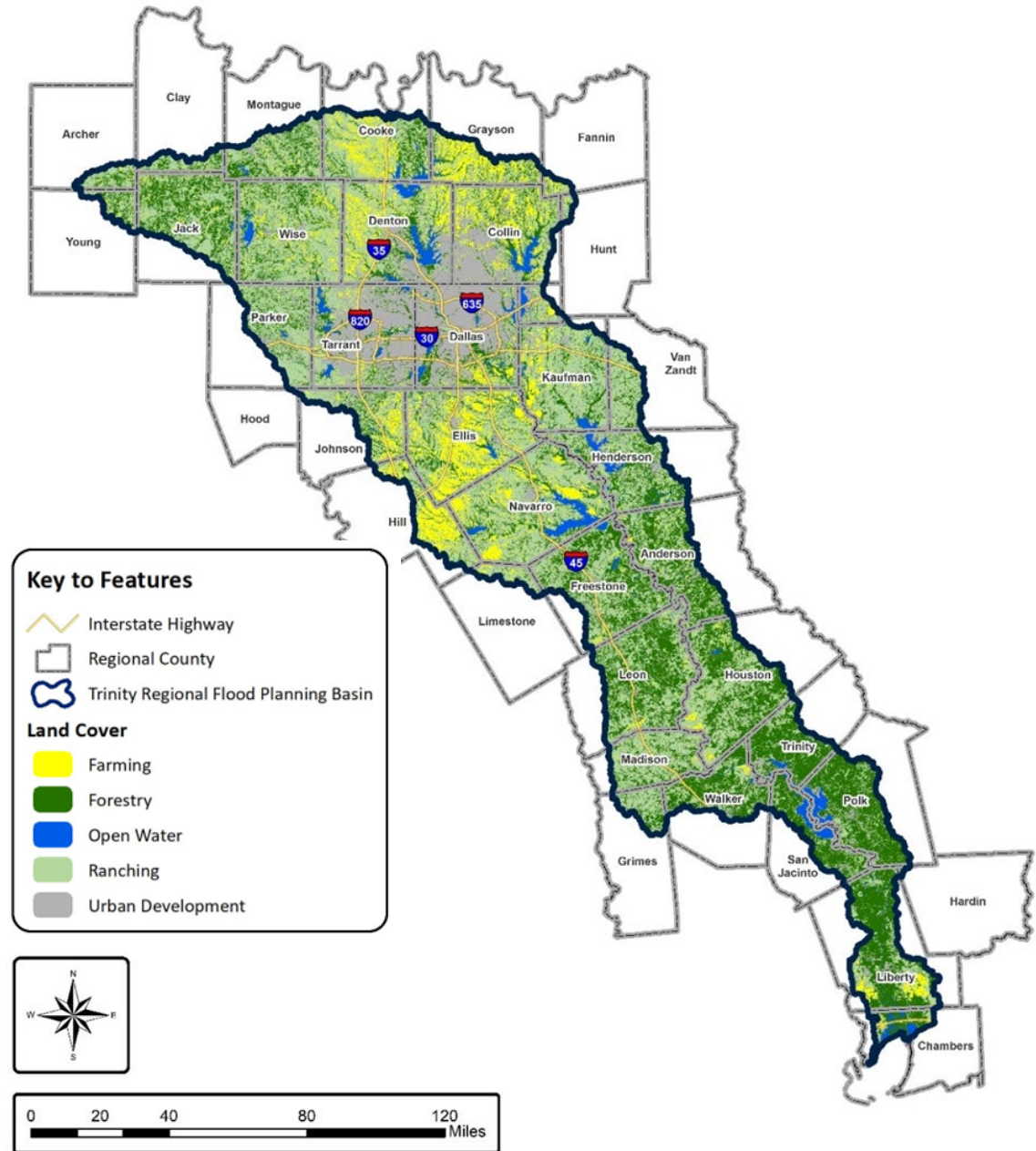
Overview of Region

Current and Future Flood Risk

Planning Goals

Basin-by-Basin: Working Lands

- Farming/ Crop Production
 - Predominant in Upper and Mid Basin areas
 - Concentrations of farming area in Liberty Co.
- Forestry
 - Predominant working land type in Lower Basin
 - Relationship to national forests and preserves
- Ranching
 - Prominent land use throughout basin
 - Largest concentration of ranching areas to NW of Metroplex and in Mid Basin area



Data Collection Website & Outreach

Community Representative?

Community Stakeholders in the RFPG process include individuals with flood-related responsibilities, such as County and Community officials and Staff as well as Federal, State, regional, and local authorities, utilities and districts.

By logging on with your email address and the password provided, you can help provide the RFPGs with localized knowledge of flood planning resources and validate a wide array of flood risk data. Through this data collection effort the RFPG is requesting community stakeholders:

- Provide information about your contact information and flood-related responsibilities.
- Verify collected flood information through an entity-specific backgrounder.
- Respond to questions to support the development of the regional flood plan.
- Verify and provide geospatial data through data uploads and web maps.

The RFPG appreciates any information you are able to verify and provide with the understanding that it may not be possible to provide response to all items.

[Entity Login](#)

Member of the Public?

Public Stakeholders in the RFPG process include general public individuals, groups, and organizations including non-profit and non-governmental organizations with an interest in providing information to support flood planning efforts.

By providing your name, address, and email address, you can help provide the RFPG with localized knowledge of flood prone areas and areas where flood mitigation is needed. Your contact information is used to document who is providing information in case we have any follow-up questions.

Name

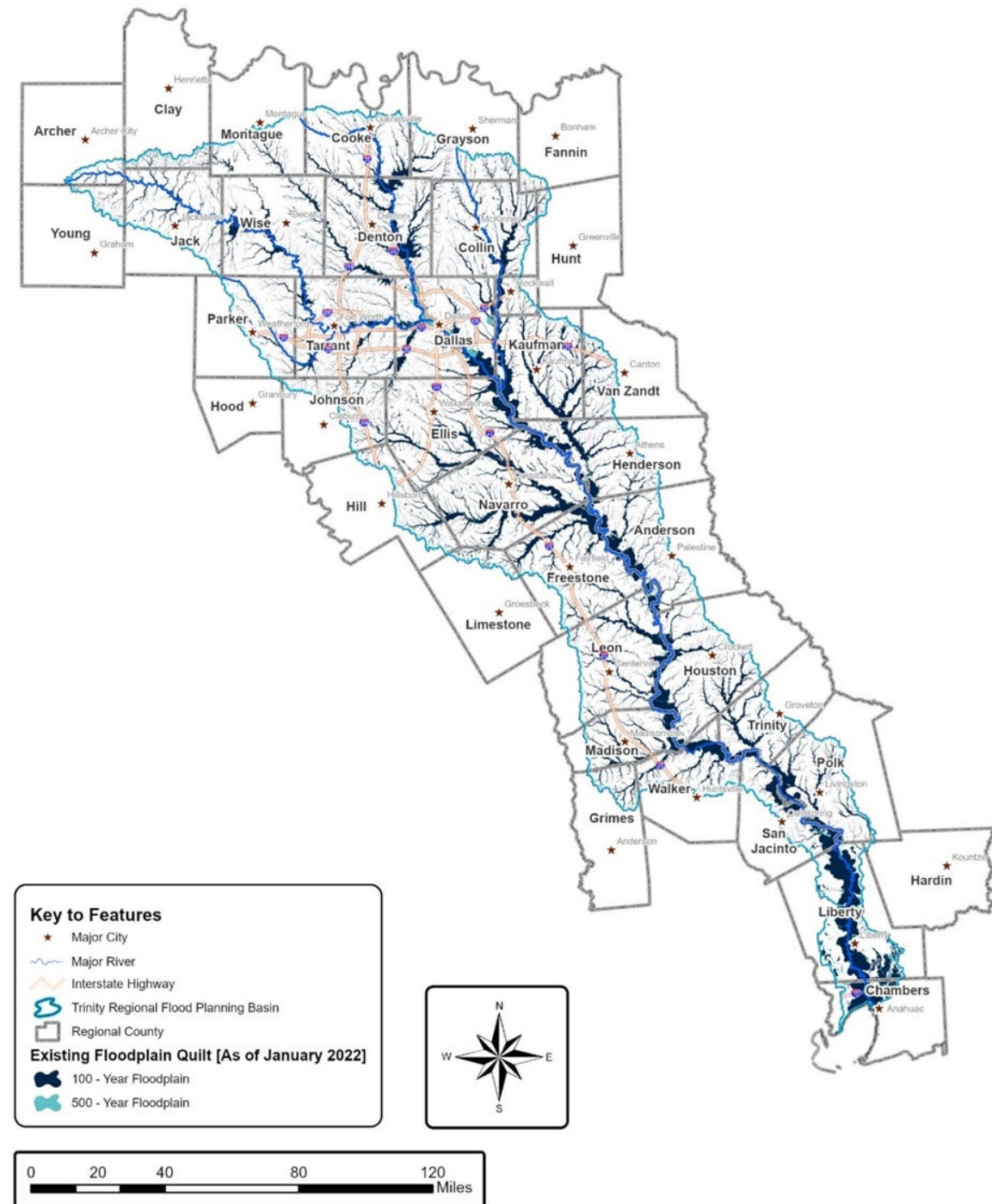
Address

Email

[Take me to the map](#)

Key Findings: Existing Conditions


- Region-wide 1.32 million people displaced by 1% Annual Chance Event (ACE)
- Total value of exposed buildings > \$636 billion
- Even more impact from 0.2% ACE
- Assessed impacts of flooding on socially vulnerable populations and community's ability to recover





Key Findings: Future Conditions

- Hard to assess because few communities map or model
 - RFGP recommended future 1% ACE floodplain as range between current 1% and 0.2% ACE events
 - RFGP recommended 40-foot max buffer for future 0.2% ACE floodplain
- Result: *29% more structures and 25% more people would be potentially impacted by future flood risk conditions*


Key to Features


 Stream Centerline


 Existing 100-Year Limit


 Existing 500-Year Limit

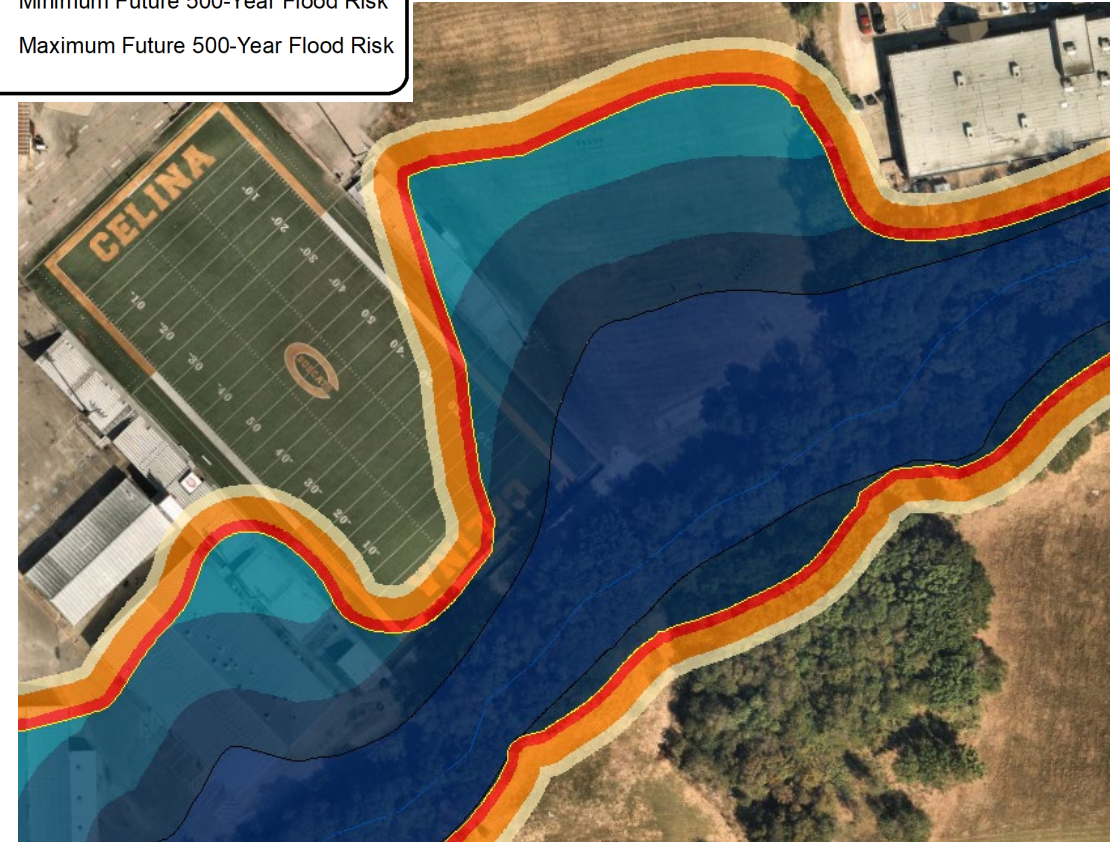
Zone of Potential Expanded Risk

 Minimum Future 100-Year Flood Risk

 Maximum Future 100-Year Flood Risk

 Minimum Future 500-Year Flood Risk

 Maximum Future 500-Year Flood Risk





Regional Flood Planning Goals

- (1) Improve flood warning and public safety
- (2) Improve flood analyses
- (3) Reduce property damage and loss
- (4) Preserve the floodplain
- (5) Improve flood infrastructure
- (6) Expand flood education and outreach
- (7) Expand funding

The background of the slide is a deep blue, monochromatic image of an underwater scene. A horizontal line across the upper third of the image represents the water's surface, with gentle ripples and light reflecting off it. Below this line, the water is dark and still, with some faint, blurry light patterns suggesting depth and light rays filtering down.

Chapters 4 and 5

Potentially Feasible Actions
Recommended Actions



Potential Actions

Flood Management Evaluations = FME = *studies*

Flood Mitigation Projects = FMP = *projects*

Flood Management Strategies = FMS = *plans*

The Draft Plan includes a variety of recommendations for each category, totaling over \$1 billion in recommended solutions.

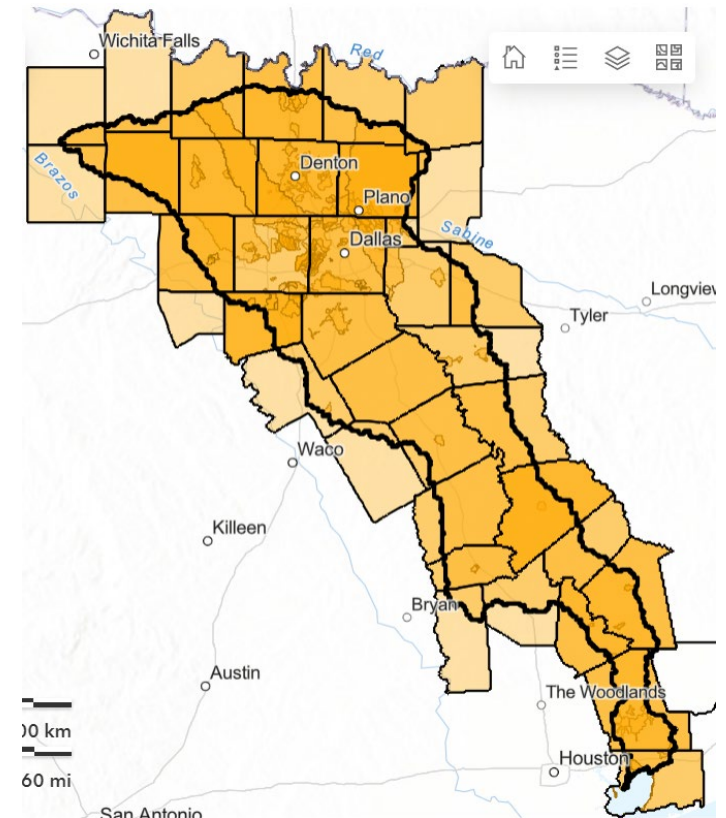
FME: Region-Wide

- 342 out of 356 recommended and included in Draft Plan

FME Type	FME Description	# of FMEs Recommended	Total Cost
Preparedness	Studies on Flood Preparedness	5	\$3,150,000
Project Planning	Previously Identified Drainage Projects and Flood Studies	228	\$60,937,000
Watershed Planning	Flood Mapping Updates, Drainage Master Plans, H&H Modeling, Dam and Levee Failure	108	\$79,879,000
Other	Dam Studies	1	\$2,000,000
Total		342	\$145,966,000

Regional Flood Planning Goals

- (1) Improve flood warning and public safety
- (2) Improve flood analyses**
- (3) Reduce property damage and loss
- (4) Preserve the floodplain
- (5) Improve flood infrastructure
- (6) Expand flood education and outreach
- (7) Expand funding



FMP: Region-Wide

- 7 FMP fully evaluated
- All recommended and included in Draft Plan

Regional Flood Planning Goals

- (1) Improve flood warning and public safety
- (2) Improve flood analyses
- (3) Reduce property damage and loss**
- (4) Preserve the floodplain**
- (5) Improve flood infrastructure**
- (6) Expand flood education and outreach
- (7) Expand funding**

FMP Name	Sponsor	Total Cost
Spring Meadows Estates Detention Pond Design	Sachse	\$1,868,000
West Irving Creek Phases 2, 3, and 4	Irving	\$98,746,000
Arlington VC(A)-1 Drainage and Erosion Improvements	Arlington	\$2,601,000
Lancaster/Foch Area Mitigation	Fort Worth	\$11,771,000
Linwood Park Flood Mitigation (Western Arlington Heights)	Fort Worth	\$50,523,000
Sunnyvale Urban Flooding Reduction Improvements - Area 1	Sunnyvale	\$4,560,000
Sunnyvale Urban Flooding Reduction Improvements - Area 2	Sunnyvale	\$5,701,000
		\$175,770,000



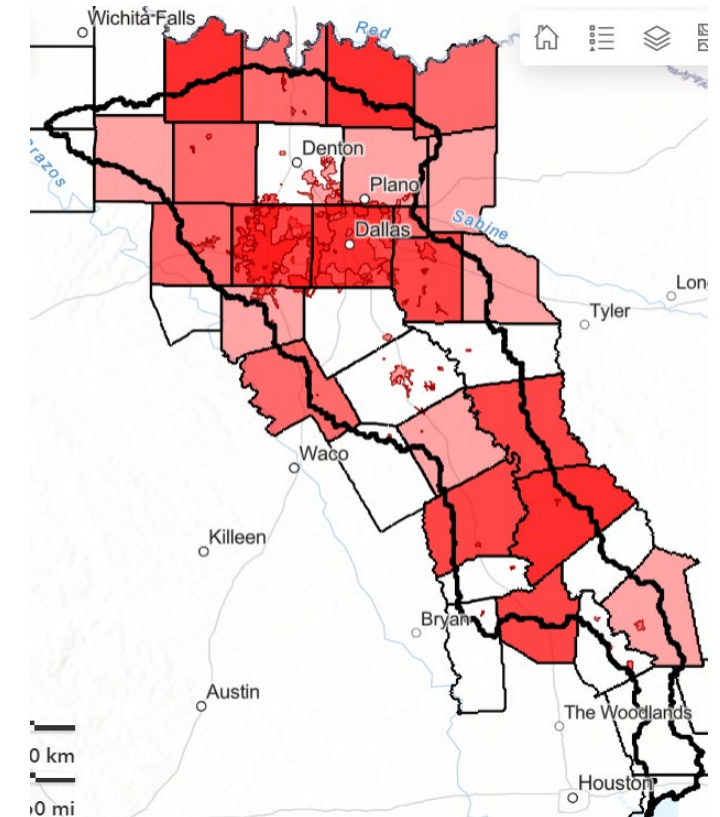
FMS: Region-Wide

- 136 out of 143 recommended and included in Draft Plan

Regional Flood Planning Goals

- (1) **Improve flood warning and public safety**
- (2) Improve flood analyses
- (3) Reduce property damage and loss
- (4) **Preserve the floodplain**
- (5) Improve flood infrastructure
- (6) **Expand flood education and outreach**
- (7) **Expand funding**

FMS Type	FMS Description	# of FMSs Recommended	Total Cost
Education and Outreach	Turn Around, Don't Drown Campaigns; NFIP Education; Flood Education; Dam Safety Education; Floodplain Regulatory Awareness	19	\$975,000
Flood Measurement and Warning	Flood Warning Systems; Rain/Stream Gauges and Weather Stations; Low Water Crossings (LWCs)	20	\$5,300,000
Infrastructure Projects	Hazardous Roadway Overtopping Mitigation Program; Citywide Drainage Improvements; Flood-Proofing facilities	5	\$430,000,00
Other	Debris Clearing Maintenance; Channel Maintenance and Erosion Control; Dam Inspections; Levee Inspections; City Parks; Green Infrastructure; Open Space Programs	12	\$8,525,000
Property Acquisition and Structural Elevation	Acquire High Risk and Repetitive Loss Properties; Acquire and Preserve Open Spaces; Flood-Proofing Facilities	28	\$295,500,000
Regulatory and Guidance	City Floodplain Ordinance Creation/Updates; Zoning Regulations; Land Use Programs; Open Space Regulations	52	\$6,600,000
Total		136	\$746,900,000



FME Status: Upper Basin

- 293 out of 306 recommended and included in Draft Plan

FME Type	FME Description	# of FMEs Recommended	Total Cost
Preparedness	Studies on Flood Preparedness	4	\$2,150,000
Project Planning	Previously Identified Drainage Projects and Flood Studies	208	\$55,357,000
Watershed Planning	Flood Mapping Updates, Drainage Master Plans, H&H Modeling, Dam and Levee Failure	80	\$57,068,000
Other	Dam Studies	1	\$2,000,000
Local Area Total		293	\$116,575,000

FMP Status: Upper Basin

- 7 FMPs fully evaluated
- 7 recommended and included in Draft Plan

FMP ID	FMP Name	Sponsor	Identified in Tech Memo and/or prior to 4/13/22?	All required data available prior to Cutoff Date? (4/13/2022)	Total Cost
033000007	Spring Meadows Estates Detention Pond Design	Sachse	Y	Y	\$1,868,000
033000008	West Irving Creek Phases 2, 3, and 4	Irving	Y	Y	\$98,746,000
033000016	Arlington VC(A)-1 Drainage and Erosion Improvements	Arlington	Y	Y	\$2,601,000
033000030	Lancaster/Foch Area Mitigation	Fort Worth	Y	Y	\$11,771,000
033000031	Linwood Park Flood Mitigation (Western Arlington Heights)	Fort Worth	Y	Y	\$50,523,000
033000033	Sunnyvale Urban Flooding Reduction Improvements - Area 1	Sunnyvale	Y	Y	\$4,560,000
033000036	Sunnyvale Urban Flooding Reduction Improvements - Area 2	Sunnyvale	Y	Y	\$5,701,000
Local Area Total					\$175,770,000

FMS Status: Upper Basin

- 110 out of 116 recommended and included in Draft Plan

FMS Type	FMS Description	# of FMSs Recommended	Total Cost
Education and Outreach	Turn Around, Don't Drown Campaigns; NFIP Education; Flood Education; Dam Safety Education; Floodplain Regulatory Awareness	15	\$765,000
Flood Measurement and Warning	Flood Warning Systems; Rain/Stream Gauges and Weather Stations; Low Water Crossings (LWCs)	18	\$4,800,000
Infrastructure Projects	Hazardous Roadway Overtopping Mitigation Program; Citywide Drainage Improvements; Flood-Proofing facilities	5	\$430,000,000
Other	Debris Clearing Maintenance; Channel Maintenance and Erosion Control; Dam Inspections; Levee Inspections; City Parks; Green Infrastructure; Open Space Programs	11	\$8,425,000
Property Acquisition and Structural Elevation	Acquire High Risk and Repetitive Loss Properties; Acquire and Preserve Open Spaces; Flood-Proofing Facilities	21	\$235,500,000
Regulatory and Guidance	City Floodplain Ordinance Creation/Updates; Zoning Regulations; Land Use Programs; Open Space Regulations	40	\$5,400,000
Local Area Total		110	\$684,890,000

The background of the slide is a photograph of ocean waves, with the water surface visible in the upper half and the deeper, darker water below. The waves are rolling in from the right, creating a sense of movement. The overall color palette is a range of blues, from light turquoise to deep navy.

Chapters 6 through 9

Potential Impacts of Actions

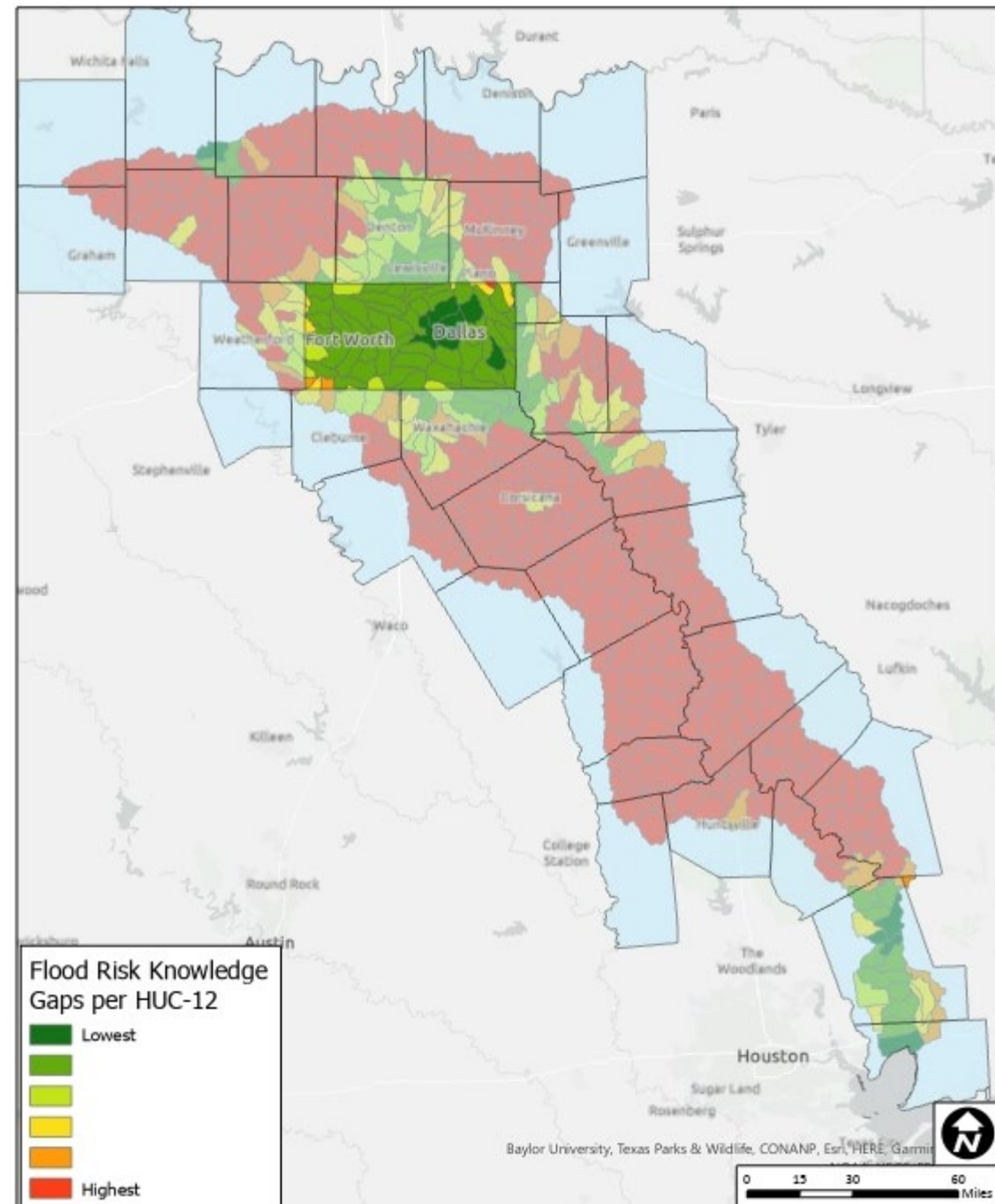
Flood Response Summary

Recommended Planning Process Improvements

Potential Funding

Impacts of the Regional Flood Plan

- Total area in need of flood risk identification vs. total area to be evaluated by recommended FMEs
- ~**70%** of mapped areas considered outdated and/or approximate
- ~**38,000** stream miles classified as outdated and/or approximate
- Draft Plan includes **35** county-wide FMEs to improve mapping coverage



Impacts of the Regional Flood Plan - FMP

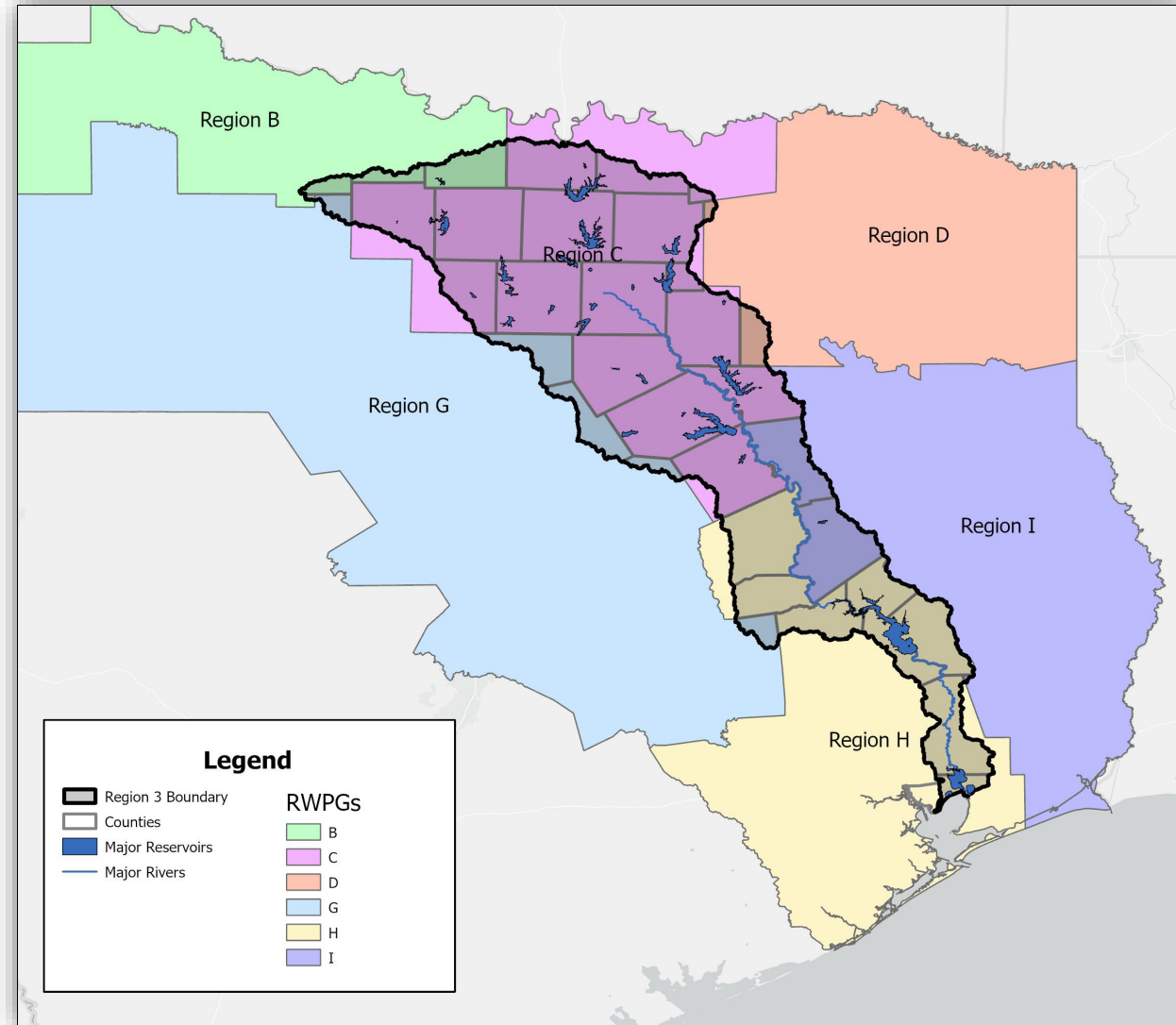
- Exposure reduction after FMP implementation
- More FMPs to be included in the Amended Plan

Flood Exposure	Existing Conditions	After FMP Implementation	Exposure Reduction from FMPs
	1% ACE	1% ACE	1% ACE
Exposed Structures	1,500	1,108	392
Exposed Population	37,593	33,421	4,172
Exposed Low Water Crossings	9	2	7
Number of Road Closure Occurrences	253	192	61
Road Length (Mi.)	31	23	8

Contributions/Impacts on State Water Plan

Impacts of State Flood Plan on State Water Plan

- Recommended FMSs or FMPs will not have measurable contribution or have negative impact on water supply or water availability
- None of recommended FMSs or FMPs impact operation of existing water supply reservoirs
- Recommended FMSs and FMPs not anticipated to have measurable impact on water supply, water availability, or projects in State Water Plan



Financing Analysis – Who will pay?



Funding surveys sent to Sponsors on 6/7/2022 and 6/14/2022



14% Sponsor response rate (22 of 158) (as of 7/5/2022)



Overall, total cost of **\$1,076,686,000** needed to implement recommended FMEs, FMSs, and FMPs



From total cost, projected **\$961,274,000** of state and federal funding is needed

The background of the slide is a deep teal color with a subtle, wavy texture that resembles water. A horizontal line of ripples or waves runs across the upper third of the image, creating a sense of depth and movement. Below this line, the water appears calm but textured with fine, vertical lines.

Chapter 10

Public Participation

Public Participation

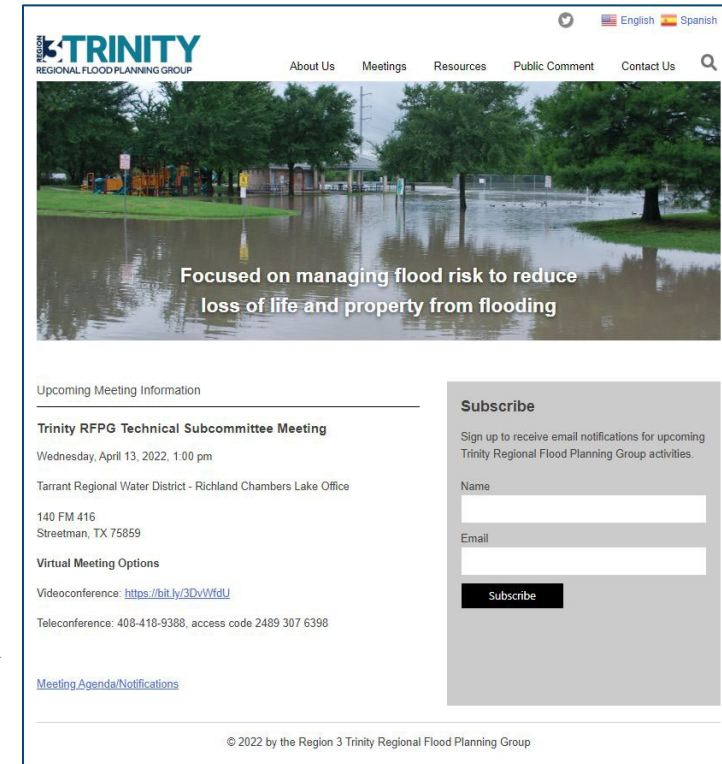
Numerous public meetings of RFPG and Technical Subcommittee, including hybrid meetings across region

Meeting notices and materials posted to website and Texas SOS, and sent via MailChimp to regional stakeholders / interested parties

Maintenance of stakeholders / interested parties database with nearly 850 unique email addresses and nearly 1,100 individual contacts

- City and county officials
- State, federal and other entities with flood planning responsibilities
- Public / interested party sign-ups from website

Development / use of award-winning website



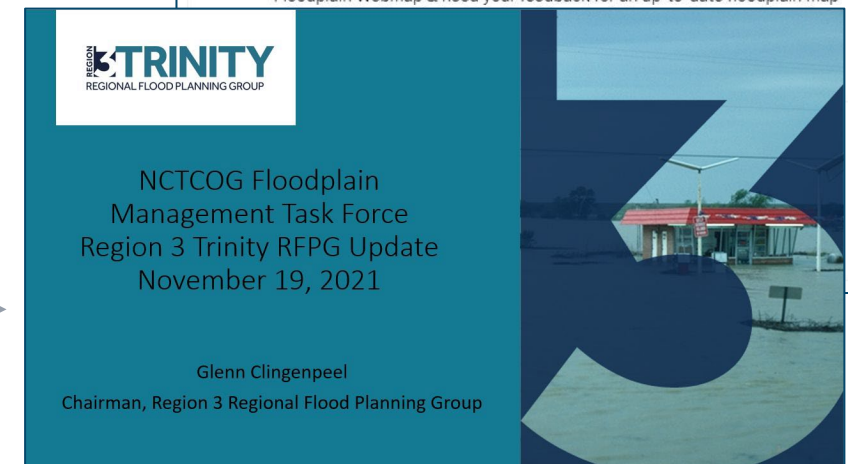
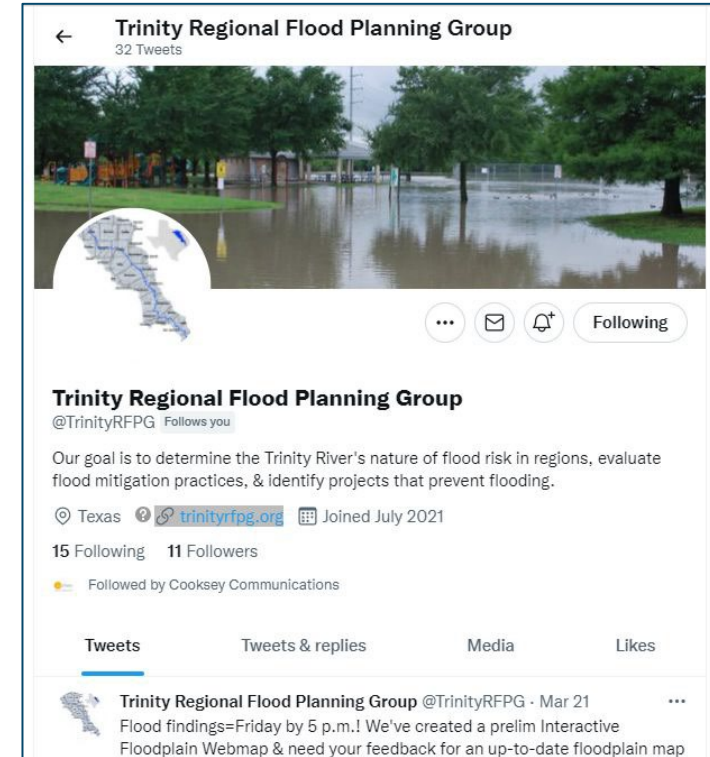
Public Participation

Social media (Twitter) content posted regularly

Press releases and regional media outreach

Development of PowerPoint overview presentation

Presentations to various regional organizations



Public Participation

Postcard mailers to augment email outreach

Follow-up phone calls to stakeholders

Online data gathering survey/tool with interactive webmaps to confirm current flood risk, identify gaps

Handout materials – flyers and one-pagers

Postcard Aug. 2022 encouraging review of Draft Plan, promoting upcoming events and public comments

In-person, open house "roadshow" to showcase Draft Plan, answer questions, at region-wide sites

Public meeting to take public input on Draft Plan

Subsequent public meetings to consider public and TWDB input, revise and finalize Regional Flood Plan



The Trinity Regional Flood Planning Group (Trinity RFPG) needs you!



This newly formed group is responsible for developing the first-ever Regional Flood Plan for the Trinity River Basin and needs your help. We recently sent you an email with a link to our electronic data collection tool. We need your input and local flood-related data to develop a flood plan that accurately represents flood planning resources and flood-related risks in your area. We have also developed an interactive web map on which you can identify specific flood-prone areas.



The Trinity Regional Flood Planning Group (Trinity RFPG) needs you!



This newly formed group is responsible for developing the first-ever Regional Flood Plan for the Trinity River Basin. We need your help! Ultimately, this planning effort is important and relevant for you because projects included in the Regional Flood Plan will be better able to access future State funding.

The Trinity RFPG (aka Region 3) is among 15 regional flood planning groups statewide designated by the Texas Water Development Board. Spanning a region from Cooke County in the north to Chambers County on the Gulf Coast, the Trinity RFPG is responsible for creating its first Regional Flood Plan by January 2023, which will become part of Texas' first-ever State Flood Plan in 2024. The Trinity Flood Plan will comprise local flood mitigation studies and projects that represent the plans of the local jurisdictions.

We have prepared an **electronic data collection tool** that is available at <https://trinity.half.com/> and through the Public Comment page on our website, www.trinityrfg.org. We need your input and local flood-related data to develop a flood plan that represents your flood planning resources and flood-related risks in your area. We have also developed an **interactive web map** (also available through the links above) on which you can identify specific flood-prone areas.

The data collection effort is designed for you to input whatever flood-related data and information you may have. Reports, maps and models can be uploaded to the site. Alternatively, this information can be mailed to the Trinity lead consultant, Half Associates, Inc. at 4000 Fossil Creek Blvd, Fort Worth, TX 76137-1422. The data collection tool is designed to be a "come and go" type tool where you can answer questions one day and come back and answer other questions another day. You can also "divide and conquer" by sending coworkers who have the relevant data the link and asking them to answer specific questions.

In order to be ready to participate in the data collection effort, we encourage you to gather up the following information (if available):

- Floodplain ordinance
- Development regulations
- Land use plans
- Watershed studies or flood studies
- Hydraulics and hydrology models
- Flood maps
- Flood early warning system information
- Drainage criteria manual
- Capital improvement projects (flood-related)
- Planned flood studies

To ensure you receive the survey and other future e-updates, we ask that you be sure to add info@trinityrfg.org to your approved or recognized list of email addresses. As the Trinity RFPG begins this data collection effort, we encourage you to stay informed and participate.

If you have any questions or concerns about the data collection tool and/or interactive web map, please contact Project Manager **Stephanie Griffin with Half Associates, Inc.** at (817) 813-5704 or sgriffin@half.com, or you can also email us at info@trinityrfg.org.

Also please feel free to share this information and future e-updates with others who may have an interest in Trinity Regional Flood Planning and encourage them to visit the website when it launches.

Thank you for your interest and participation in this critical regional planning effort!

Regional Flood Plan Adoption Timeline



Upcoming Public Participation Opportunities

Submit comments on Draft Regional Flood Plan by Oct. 10

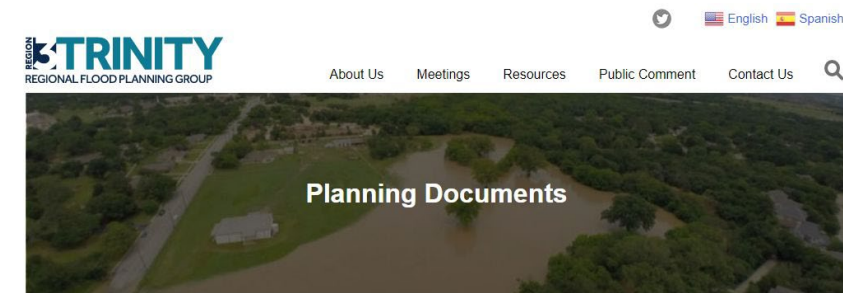
Web: www.trinityrfpg.org

- Review Draft Plan on Planning Documents page (sort by "2022 Draft Plan")
- Submit comments via form on Public Comment page

Email: info@trinityrfpg.org

Mail:

Halff Associates, Inc.
Attn: Stephanie Griffin
4000 Fossil Creek Blvd.
Fort Worth, Texas 76137-1422



Categories: 2022 Draft Plan, Bylaws, Draft Appendices, Draft Chapter 1

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Document	Category	Size	Meeting Date	Upload Date
Draft Trinity Regional Flood Plan – Cover and Table of Contents	2022 Draft Plan	1.53MB	-	07/12/2022
Draft Trinity Regional Flood Plan – Executive Summary	2022 Draft Plan	1.52MB	07/21/2022	07/12/2022
Draft Trinity Regional Flood Plan – Chapter 1	2022 Draft Plan	8.25MB	07/21/2022	07/12/2022
Draft Trinity Regional Flood Plan – Chapter 2	2022 Draft Plan	19.14MB	07/21/2022	07/12/2022
Draft Trinity Regional Flood Plan – Chapter 3	2022 Draft Plan	2.51MB	07/21/2022	07/12/2022
Draft Trinity Regional Flood Plan – Chapter 4	2022 Draft Plan	1.92MB	07/21/2022	07/12/2022
Draft Trinity Regional Flood Plan – Chapter 5	2022 Draft Plan	1.42MB	07/21/2022	07/12/2022
Draft Trinity Regional Flood Plan – Chapter 6 – revised	2022 Draft Plan	1.02MB	-	07/12/2022
Draft Trinity Regional Flood Plan – Chapter 7	2022 Draft Plan	1.44MB	07/21/2022	07/12/2022
Draft Trinity Regional Flood Plan – Chapter 8	2022 Draft Plan	1.34MB	07/21/2022	07/12/2022

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Regional Planning Process Questions?



Breakout Stations

- Visit with consultant team and RFBG members, ask questions
- Review interactive floodplain webmap, mark local flooding issues
- Review maps / tables of local recommended flooding solutions
- Review hard copy of Draft Regional Flood Plan
- Access RFBG website to view Draft Plan, sign up for e-updates, complete Public Comment form
- Submit written comment cards



Contact Us

Web: www.trinityrfpg.org

Email: info@trinityrfpg.org

Twitter: @TrinityRFPG

Technical Consultant:

Halff Associates, Inc.

Attn: Stephanie Griffin

4000 Fossil Creek Blvd.

Fort Worth, Texas 76137-1422

sgriffin@halff.com

817-813-5704

Planning Group Chair:

Glenn Clingenpeel

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817-467-4343