

# Technical Guidelines Webinar

**June 1, 2021  
2:00 pm to 3:30 pm**

**You can also dial in using your phone.**  
You must select "Use Telephone" after joining the webinar and call in using the numbers below.

**United States: +1 (562) 247-8321**

**Access Code: 886-899-920**

# Agenda Item 1: Agenda Overview

1. Introductions, Opening Comments, and Agenda Overview
2. Director Jackson Opening Remarks
3. Presentation: Regional Flood Planning Technical Guidelines
4. Presentation: Regional Flood Planning Data
5. Questions

# Agenda Item 1: Introductions



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**Steven Richter**  
Team Lead, Flood Data  
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# TWDB Flood Planning Staff



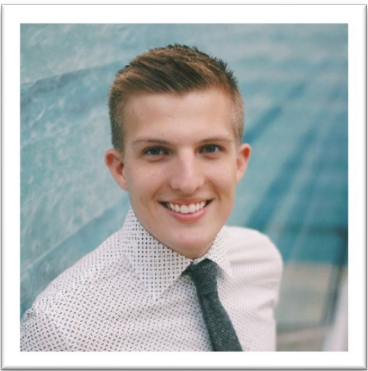
**Morgan White**  
Team Lead , Region 11



**Anna Gonzalez**  
Executive Assistant



**Cynthia Roush**  
Flood Data Team



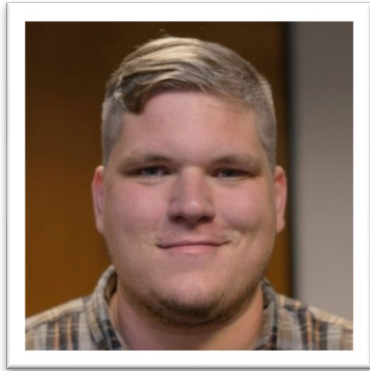
**Richard Bagans**  
Regions 3, 5, 14



**Hayley Gillespie**  
Regions 9, 10, 13



**Megan Ingram**  
Regions 6, 15



**Ryke Moore**  
Regions 4, 7, 8



**Anita Machiavello**  
Regions 1, 2, 12

# Agenda Item 2: Opening Remarks by Director Kathleen Jackson



Brooke T. Paup  
Chairwoman

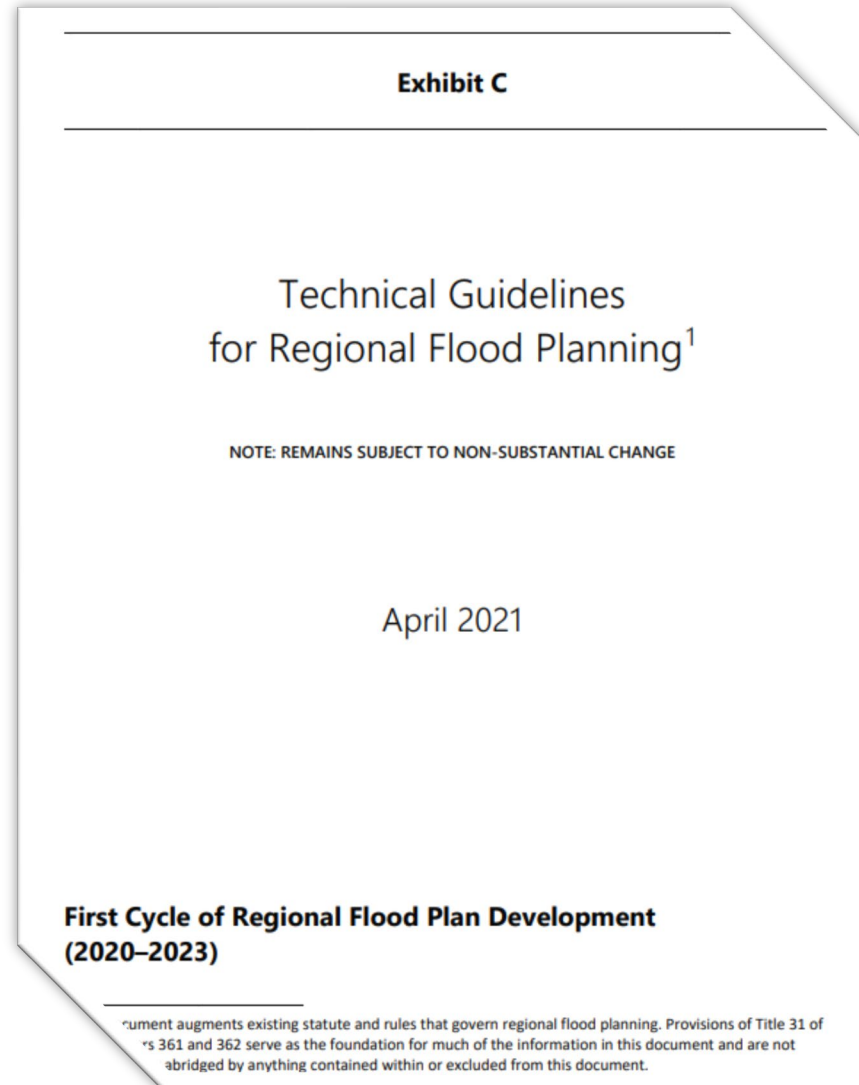


Kathleen Jackson  
Board Member

# Agenda Item 3: Technical Guidelines for Regional Flood Planning

Downloads Available:

<https://www.twdb.texas.gov/flood/Planning/planningdocu/2023/index.asp>



# Flood Planning Guidelines

- Final guidelines posted on TWDB website on April 30<sup>th</sup>, 2021.  
<https://www.twdb.texas.gov/flood/planning/planningdocu/2023/index.asp>
- [Technical Guidelines for Regional Flood Planning](#) provides technical guidelines and submittal requirements for each scope item and additional technical guidance regarding population estimates, hydraulic and hydrologic modeling, benefit-cost ratio analysis, etc.
- [Data Submittal Guidelines for Regional Flood Planning](#) provides data submittal guidelines for regional flood planning.
- Benefit-Cost Analysis Input Tool and Instructions

# Purpose

While each regional plan will be unique the technical guidance is intended to ensure that the 15 regional flood plans are consistent and at the state level, to support the development of a meaningful and credible state flood plan.





# Organization of the Technical Guideline

1. Part 1: Orientation
2. Part 2: Scope of work task-specific general guidelines
3. Part 3: Technical Guidelines

# Task 1 – Planning Area Description

*Goal: In general, the goal of this task is for RFPGs to describe the flood planning region, inventory and assess natural features and constructed major flood infrastructure, and describe proposed or ongoing flood mitigation projects in the region.*

## Primary deliverables:

- Chapter 1 of Regional Flood Plan
- Existing flood infrastructure summary table and GIS layers
- Proposed or ongoing flood mitigation projects summary table and GIS layers



Llano dam on the Llano river sits on the banks of the county seat.

Image: TWDB

# Task 2A & 2B – Existing & Future Condition Flood Risk Analyses

*Goal: The goal of these tasks is for RFPGs to perform existing and future condition flood risk analyses (hazard, exposure, vulnerability) for the region.*



Primary deliverables:

- Chapter 2 of Regional Flood Plan
- Existing condition flood risk summary table, GIS layers, and maps
- Future condition flood risk summary table, GIS layers, and maps

# Task 3A – Eval. & Recommendations on Floodplain Mgmt. Practices

*Goal: The goal of this task is for RFPGs to evaluate and make recommendations on floodplain management practices within the flood planning region. The intent of regional flood planning is twofold:*

- 1) identify and reduce the risk and impact to life and property that already exists and, importantly,*
- 2) avoid increasing or creating new flood risk by addressing future development within the areas known to have existing or future flood risk.*



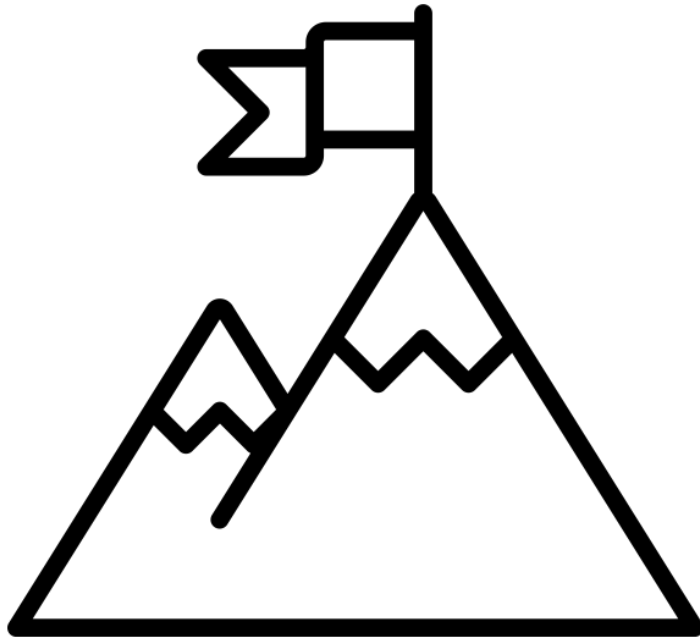
West Fork San Jacinto River near Humble, Texas after Hurricane Harvey  
Image: Steve Fitzgerald, Harris County Flood Control District

Primary deliverables:

- Chapter 3 of Regional Flood Plan
- Existing floodplain management practices summary table and GIS layer
- Qualitative assessment and adopted recommendations or region-specific minimum standards for floodplain management practices

# Task 3B – Flood Mitigation & Floodplain Management Goals

*Goal: The goal of this task is for RFPGs to define the overarching flood mitigation and floodplain management goals for their regional flood plans. These goals will guide the overall approach and recommendations in the plan and, to ensure the coherence of the entire plan, may also be used in developing the recommendations for floodplain management in the previous task.*



Created by Birckhead Creative  
from Noun Project

Primary deliverables:

- Chapter 3 of Regional Flood Plan
- Flood mitigation and floodplain management goals summary table and GIS layer

# Key Terms for Tasks 4 & 5: FME, FMP, FMS

## Flood Management Evaluation (FME)

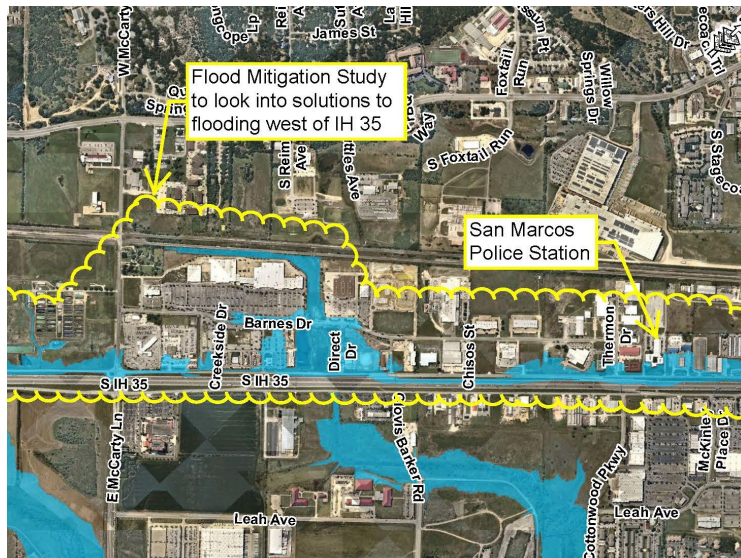
- A proposed flood study of a specific, flood-prone area that is needed in order to assess flood risk and/or determine whether there are potentially feasible FMSs or FMPs.

## Flood Mitigation Project (FMP)

- A proposed project (structural and non-structural) that when implemented will reduce flood risk, mitigate flood hazards to life or property.

## Flood Management Strategy (FMS)

- A proposed plan to reduce flood risk or mitigate flood hazards to life or property (may or may not require associated FMPs to be implemented).



Cottonwood Creek Flood Study, San Marcos, TX.

Image: City of San Marcos



El Paso storm water project, El Paso, TX

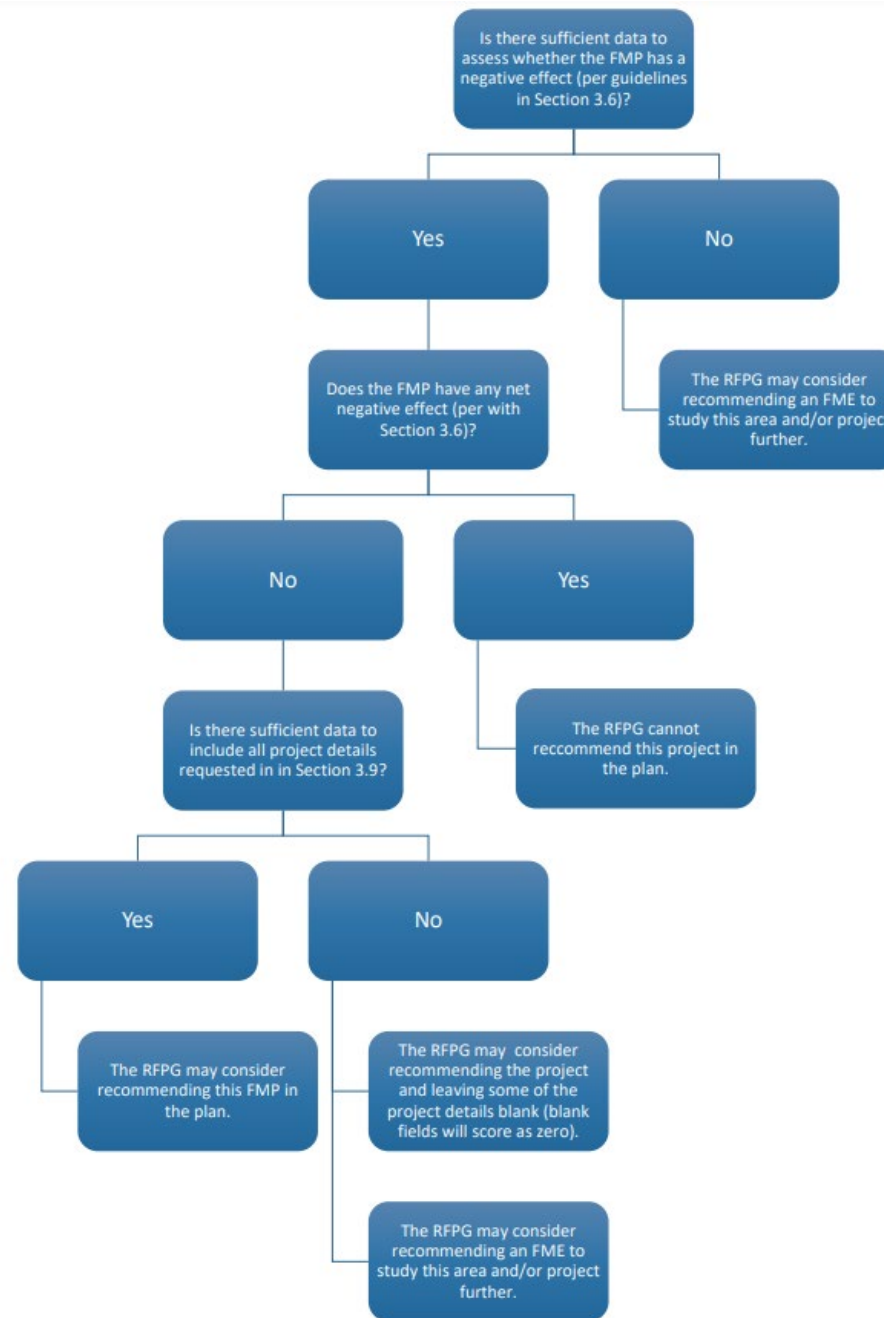
Image: El Paso Water



Exploration Green project, Clear Lake City, TX

Image: Texas Water Resources Institute

# Flood Mitigation Project Flowchart



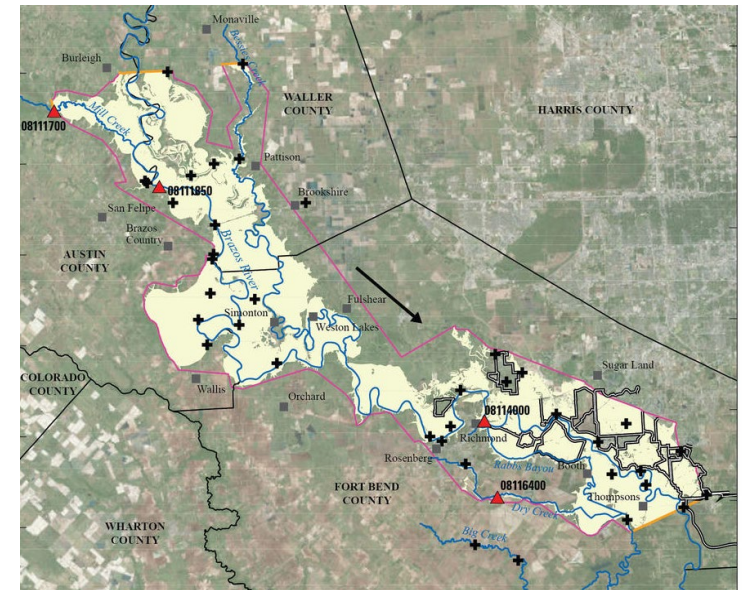
# Task 4A – Flood Mitigation Needs Analysis

*Goal: The goal of this task is for RFPGs to conduct a two-piece, big picture analysis to guide the RFPG's subsequent efforts (under Task 4B) by identifying:*

- *The region's flood prone areas where the greatest **flood risk knowledge gaps** exist and where the RFPG should consider identifying potentially feasible flood risk studies as **FMEs**. (See Task 4B), and,*
- *The areas of greatest **known flood risk** and flood mitigation needs in the regions and resulting need of potential strategies and projects, as **FMSs and FMPs**, to reduce those known risks. See Task 4B).*

Primary deliverable:

- Chapter 4 of Regional Flood Plan, including summaries, descriptions, and maps



Map of inundated areas (yellow areas) on the lower Brazos River after Hurricane Harvey  
Image: USGS

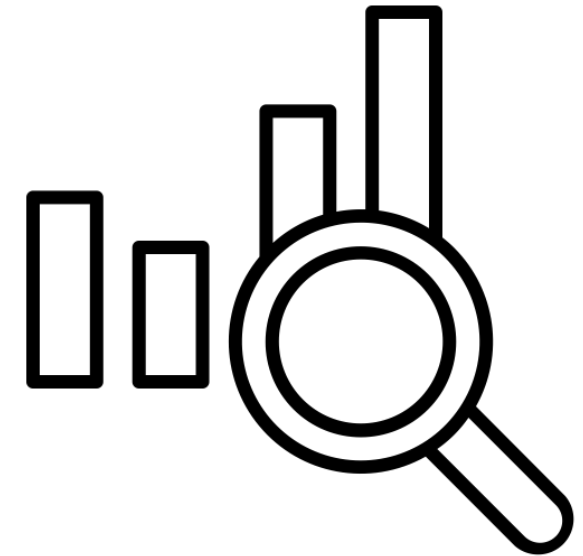


# Task 4B – Identification and Evaluation of Potential FMEs & Potentially Feasible FMSs and FMPs

*Goal: The goal of this task is for RFPGs to identify and evaluate potential FMEs, and potentially feasible FMPs, and FMSs. While the evaluation of FMEs, FMSs, and FMPs can be initiated in Task 4, they will be completed during Task 5.*

## Primary deliverables:

- Chapter 4 of Regional Flood Plan
- Quantitative analysis and evaluation of FMEs, FMSs, and FMPs
- Potential FMEs, FMSs, and FMPs summary tables, GIS layers, and maps



Created by Pascal Heß  
from Noun Project

## Task 4C – Prepare and Submit Technical Memorandum

*Goal: The goal for this task is for RFPGs to submit their mid-point deliverable, the Technical Memorandum.*

Due date: January 7, 2022

Required Information (Deliverables)	RFPGs Must Provide
<ul style="list-style-type: none"> <li>• A list of existing political subdivisions within the FPR that have flood-related authorities or responsibilities;</li> <li>• A list of previous flood studies considered by the RFPG to be relevant to development of the RFP;</li> </ul>	<p>Information in written format and <u>may provide a limited version of</u> associated GIS data or deliverables.</p>
<ul style="list-style-type: none"> <li>• A geodatabase and associated maps for: region-wide 1.0% annual chance flood event and 0.2% annual chance flood event inundation boundaries, and the source of flooding for each area, for use in its risk analysis, including indications of locations where such boundaries remain undefined;</li> <li>• A geodatabase and associated maps that identifies additional flood-prone areas not described in (c) based on location of hydrologic features, historic flooding, and/or local knowledge;</li> <li>• A geodatabase and associated maps in accordance with TWDB Flood Planning guidance documents that identifies areas where existing hydrologic and hydraulic models needed to evaluate FMSs and FMPs are available;</li> <li>• A list of available flood-related models that the RFPG considers of most value in developing its plan;</li> </ul>	<p><u>Required</u> to provide associated GIS data and feature layers identified in Exhibit D</p>
<ul style="list-style-type: none"> <li>• The flood mitigation and floodplain management goals adopted by the RFPG per §361.36;</li> <li>• The documented process used by the RFPG to identify potentially feasible FMSs and FMPs;</li> <li>• A list of potential FMEs and potentially feasible FMSs and FMPs identified by the RFPG, if any; and</li> <li>• A list of FMSs and FMPs that were identified but determined by the RFPG to be infeasible, including the primary</li> </ul>	<p>Information in written format and are <u>required to provide a limited version of</u> associated GIS data or deliverables</p>

# Task 5 – Recommendation of FMEs, FMSs & FMPs

*Goal: The goal of this task is for RFPGs to recommend FMEs, FMSs, and FMPs for inclusion in the regional flood plan.*

Primary deliverables:

- Chapter 5 of Regional Flood Plan
- Continued quantitative analysis and evaluation of FMEs, FMSs, and FMPs
- Recommended FME, FMP, and FMS summary tables, GIS layers, and maps



Created by Kwesi Phillips  
from Noun Project

# Regional & State Flood Planning Long-Range Planning Process



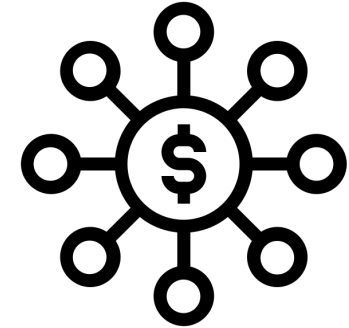
Created by Andrejs Kirma  
from Noun Project

Regional Flood Plans will identify flood risk and recommend FMEs, FMSs, and FMPs within regions.



Created by Creative Stall  
from Noun Project

State Flood Plan will rank recommended FMEs, FMSs, and FMPs statewide.



Created by Alice Design  
from Noun Project

Future state financial assistance may be allocated using a to-be-determined prioritization criteria.\*

\*Funding to implement projects can also come from local, federal, or other sources.

# Task 6A/6B – Impact and Contributions of the Regional Flood Plan and Water Supply

*Goal: The goal of this task is for RFPGs to summarize the impacts of implementation of the regional flood plan.*

Primary deliverables:

- Chapter 6 of Regional Flood Plan
- Summaries, descriptions, tables, and other quantifications of impacts



Crops in the lower Rio Grande Valley  
Image: TWDB



Recreational boating.  
Image: TWDB



Dolan Falls

Image: TWDB

# Task 7 – Flood Response Information and Activities

*Goal: The goal of this task is for RFPGs to summarize existing flood response and recovery activities in the region.*

Primary deliverable:

- Chapter 7 of Regional Flood Plan, including qualitative analysis and summaries



Texas State Guard Hurricane Harvey emergency response.

Image: Texas State Guard

# Task 8 – Administrative, Regulatory, and Legislative Recommendations

*Goal: The goal of this task is for RFPGs to develop legislative, regulatory, administrative, or other recommendations.*

Primary deliverable:

- Chapter 8 of Regional Flood Plan, including qualitative analysis and summaries



Image: TWDB



# Task 9 – Flood Infrastructure Financing Analysis

*Goal: The goal of this task is for RFPGs to indicate how sponsors will propose to finance recommended FMPs, and FMEs.*

Primary deliverable:

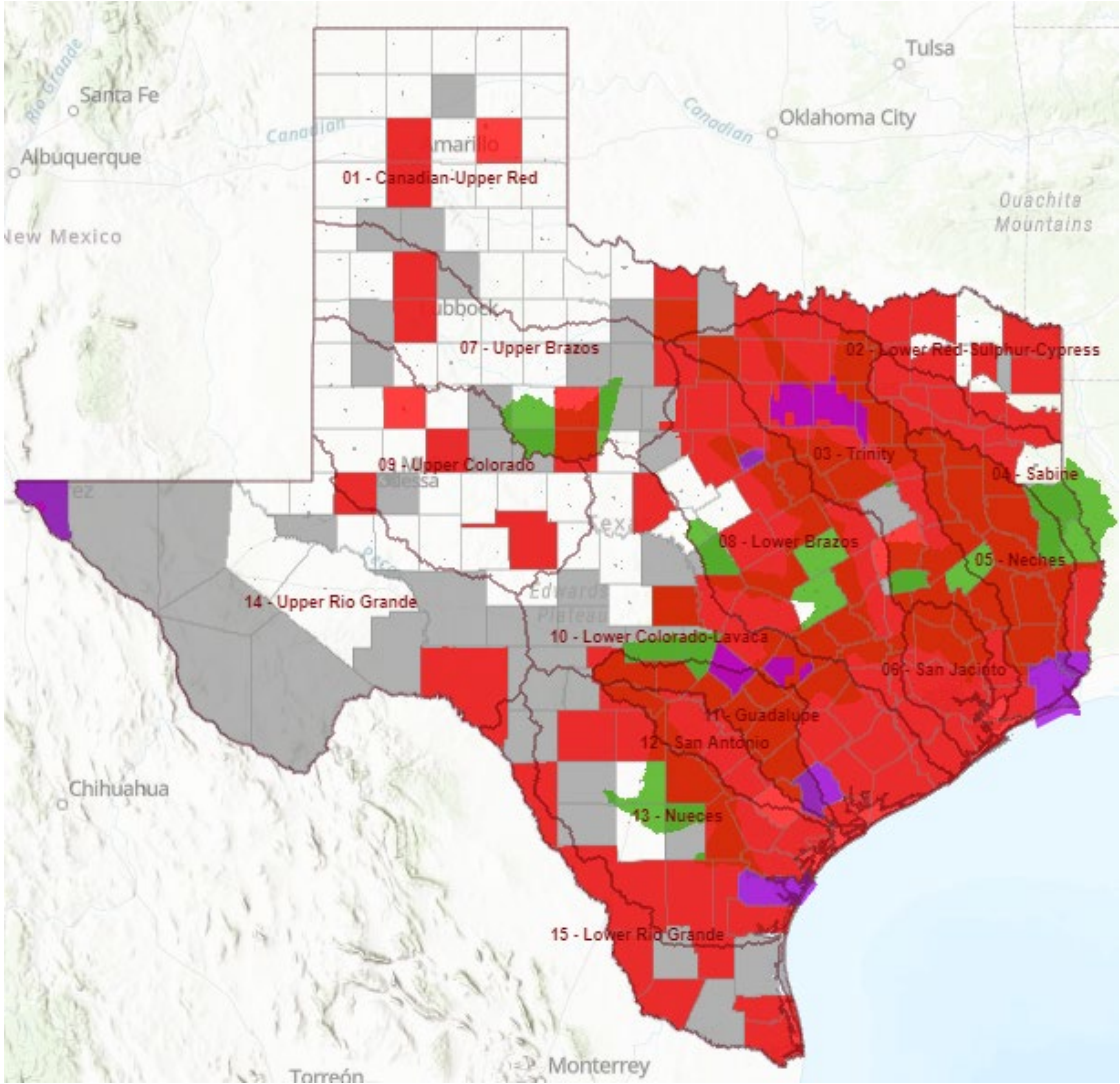
- Chapter 9 of Regional Flood Plan
- Survey results, methodology documentation, and summaries



Dam on the Llano River under Hwy 16 in Llano, Texas.

Image: TWDB

# Agenda Item 4: Regional Flood Planning Data Presentation



This map shows the layers that are used as inputs to the TWDB Flood Quilt.

# Flood Planning Data HUB

The screenshot shows the 'GIS Resources' page for Texas Flood Planning. The header includes navigation links for 'Sources', 'GDB Template', 'Floodplain Quilt', 'What's New', 'TWDB', 'Flood Planning', and 'Contacts'. A search bar is located in the top left. The main heading is 'GIS Resources' with the subtitle 'Texas Flood Planning'. A dark blue banner contains the text: 'The following GIS resources have been gathered to assist the Texas Regional Flood Planning Groups (RFPGs). Many of the referenced layers are intended for cartographic purposes. Before using layers for engineering or modeling, check the intended use on the original site.' Below this banner is a grid of ten icons representing different GIS data layers: Critical Infrastructure, Flood Infrastructure, Flood Risk, Hydrology, Jurisdiction Boundaries, Parks, Population, Property, Terrain, and Transportation.

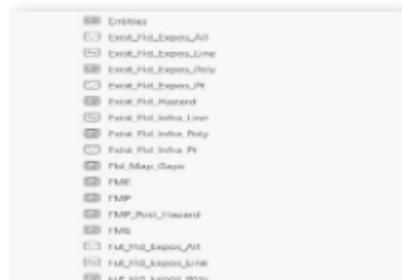
The screenshot shows the 'Critical Infrastructure' page, which lists various infrastructure types: Hospitals, Schools, Fire Stations, Shelters, Electric and Gas Lines. The page features six map tiles showing the distribution of these infrastructure types across Texas. The first row includes: Fire Stations (HIFLD) - Filtered for Texas; Hospitals (HIFLD) - Filtered for Texas; National Shelter System (HIFLD) - Filtered for Texas; and Schools (TEA). The second row includes: Natural Gas Pipelines and Electric Power Transmission.

# Geodatabase Template

Last updated: May 19, 2021

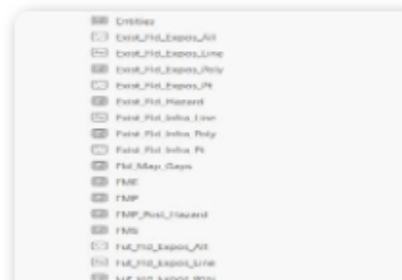
The TWDB generated template GIS geodatabases with multiple feature classes and tables for the Regional Flood Planning Groups (RFPGs). Each planning group must fill the template geodatabase with relevant regional flood planning data.

The following template file geodatabases are populated with feature classes and fields to match the specifications in [Exhibit D Data Submittal Guidance Document](#). Feature classes are empty except for the Entities feature class which has been prepopulated to include the Counties, Municipalities, various types of Water Districts, Flood Districts, and Councils of Government (COGs) which intersect the flood planning region. A table of feature classes is available [here](#).



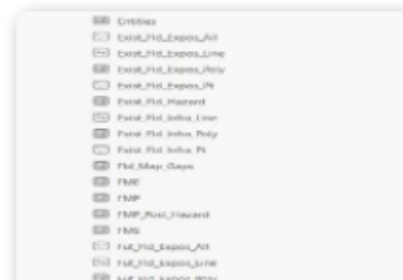
## Region 01 Geodatabase Template

(5/19/21 Update) Template gdb with structure specified in Exhibit D. Entities populated.



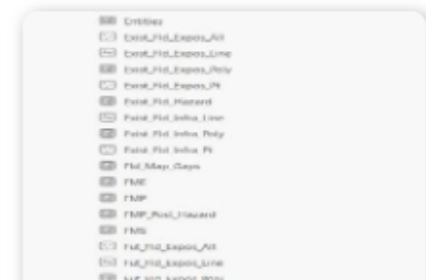
## Region 02 Geodatabase Template

(5/19/21 Update) Template gdb with structure specified in Exhibit D. Entities populated.



## Region 03 Geodatabase Template

(5/19/21 Update) Template gdb with structure specified in Exhibit D. Entities populated.



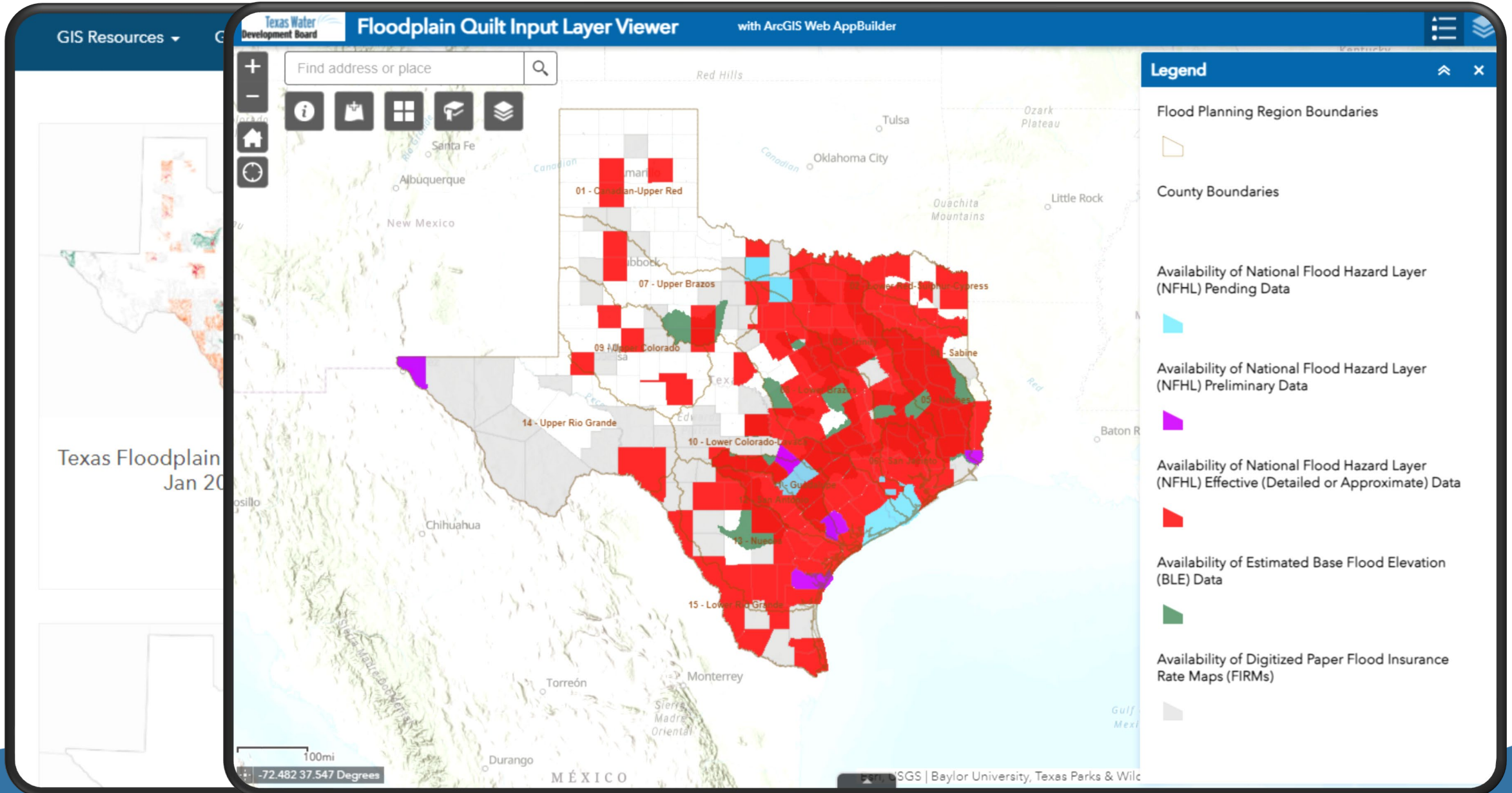
## Region 04 Geodatabase Template

(5/19/21 Update) Template gdb with structure specified in Exhibit D. Entities populated.

## Geodatabase Template

<https://twdb-flood-planning-resources-twdb.hub.arcgis.com/pages/fpr-templates>

# Draft Floodplain Quilt



# 'Where is My Flood Planning Region?'

The screenshot displays the Texas Water Development Board website. On the left, a map interface shows a zoomed-in view of a region with a search bar and navigation controls. The main content area features the TWDB logo and a navigation menu. The central focus is the 'Regional Flood Planning Groups' section, which includes a map of Texas divided into 15 numbered regions. Below the map is a search bar with the text 'Search by address to find your Flood Planning Region'. A list of links for each region is provided, including Region 1 (Canadian-Upper Red), Region 2 (Lower Red-Sulphur-Cypress), Region 3 (Trinity), Region 4 (Sabine), Region 5 (Neches), Region 6 (San Jacinto), Region 7 (Upper Brazos), and Region 8 (Lower Brazos). On the right side, there are several dark blue buttons for navigation, such as 'What to Do? Before, During, and After a Flood', 'Flood Infrastructure Fund (FIF)', 'Flood Planning', 'Flood Financial Assistance Programs', 'National Flood Insurance Program (NFIP)', 'Flood Mapping', and 'Floodplain Management Training'. A sidebar on the far left contains additional navigation options like 'Home Board', 'Regional Planning', and 'About'.

twdb.texas.gov/flood/planning/regions/index.asp

## Texas Water Development Board

Home Board Financial Assistance Water Planning Groundwater Surface Water Flood Conservation Innovative Water GIS Data

### Regional Flood Planning Groups

The TWDB hosts a region-specific webpage for each planning group that contains a general description of the region, the list of counties that lie within the regional boundary, and meeting updates. To view a region of interest, please click the region's name in the list.

[Search by address to find your Flood Planning Region](#)

- [Region 1 Canadian-Upper Red](#)
- [Region 2 Lower Red-Sulphur-Cypress](#)
- [Region 3 Trinity](#)
- [Region 4 Sabine](#)
- [Region 5 Neches](#)
- [Region 6 San Jacinto](#)
- [Region 7 Upper Brazos](#)
- [Region 8 Lower Brazos](#)

What to Do? Before, During, and After a Flood  
Flood Infrastructure Fund (FIF)  
Flood Planning

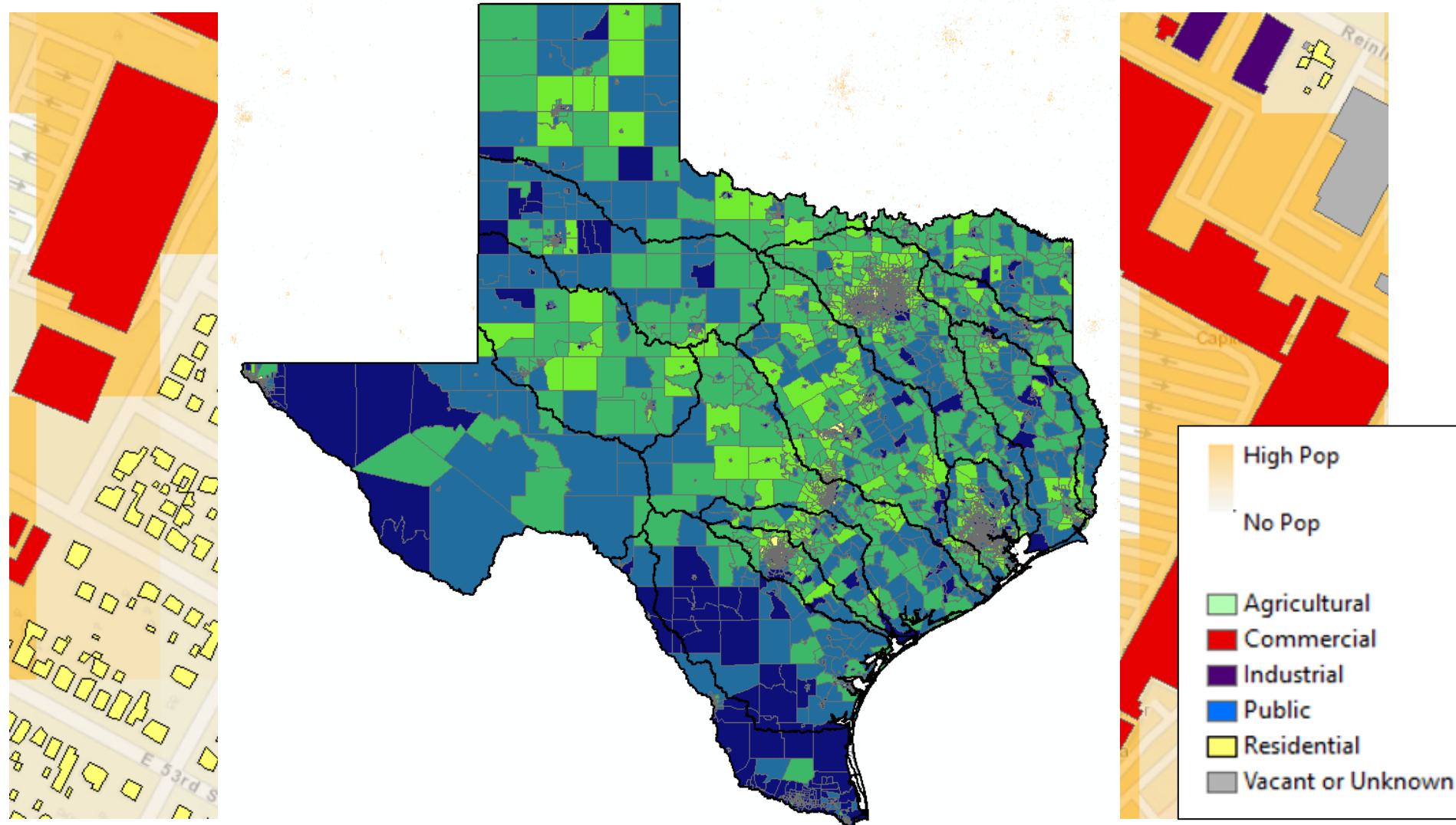
- Flood Planning Group Meeting Schedule
- 1st Planning Cycle Documents (2020-2023)
- Planning Group Information
- New Members Resources
- Frequently Asked Questions
- Flood Planning Useful Links and Resources
- Flood Planning Data

Flood Financial Assistance Programs  
National Flood Insurance Program (NFIP)  
Flood Mapping  
Floodplain Management Training

# Statewide Buildings Data

## Building Attributes:

- ~10million footprints
- Land Use
- Improvement Value (from tax records)
- Night Population
- Day Population
- Social Vulnerability Index (SVI)
- To be published in June on the Data Hub



# Flood Data Next Steps

- Fathom Flood Risk Data
  - June – coarse terrain, 30m raster
  - Fall – LIDAR terrain, raster/polygon TBD

## Questions or Comments?

Send an E-mail to:  
[FloodPlanningData@TWDB.Texas.gov](mailto:FloodPlanningData@TWDB.Texas.gov)



# Agenda Item 5: Questions



Image: Brent Hanson, U.S. Geological Survey. Public domain.

