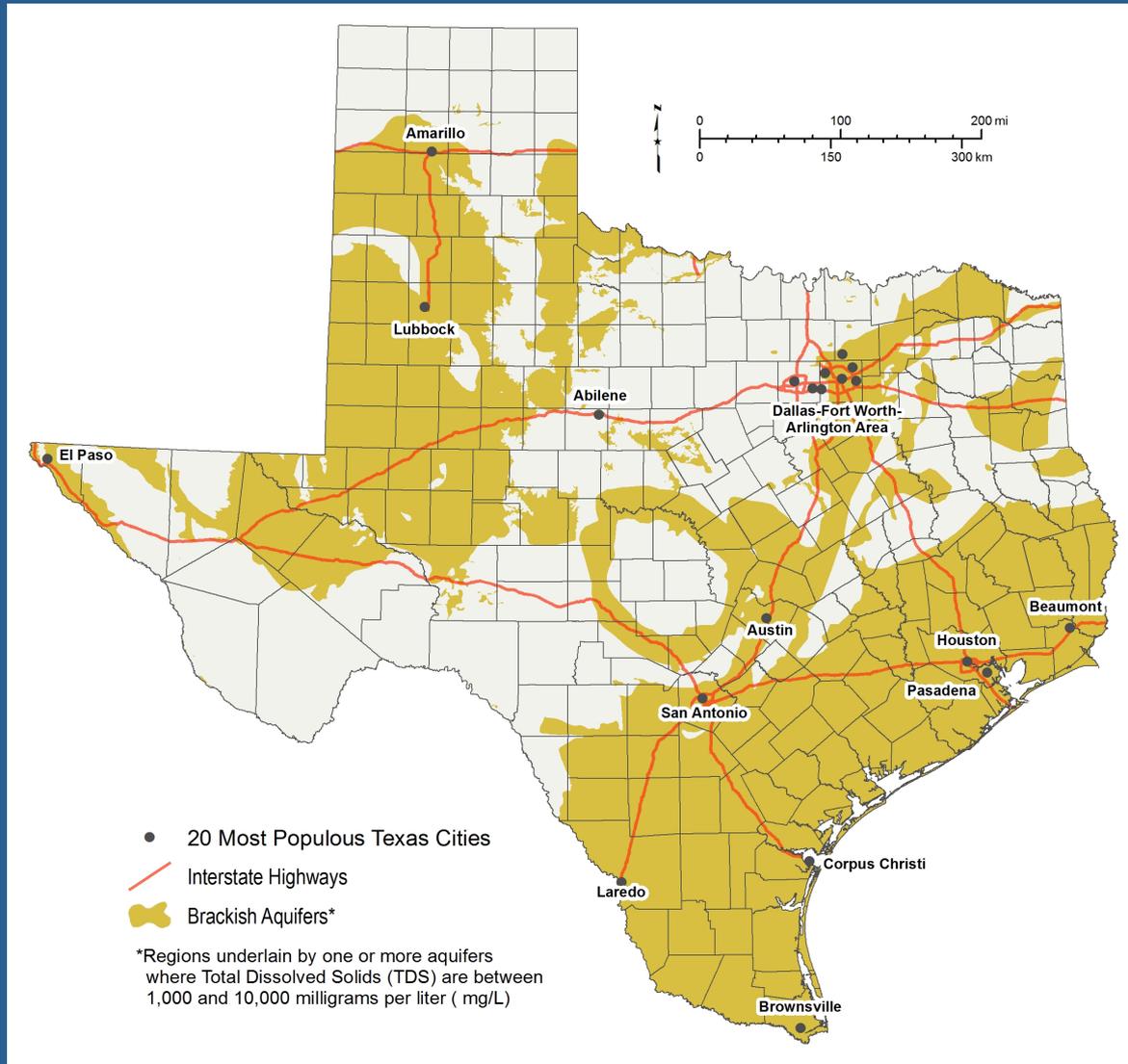


# **TWDB Study: Develop Procedures and Tools to Delineate Areas Designated or Used for Class II Well Wastewater Injectate**

**Erika Mancha, Andrea Croskrey, Juan Acevedo  
Innovative Water Technologies  
Wednesday, December 2<sup>nd</sup>, 2020  
1<sup>st</sup> Workgroup Meeting**



# Brackish Resources Aquifer Characterization System



# Brackish Groundwater

*1,000-10,000 mg/L Total Dissolved Solids*

Groundwater Salinity Classification	Salinity Zone Code	Total Dissolved Solids Concentration (milligrams per liter)
Fresh	FR	0 to 1,000
<b>Slightly Saline</b>	<b>SS</b>	<b>1,000 to 3,000</b>
<b>Moderately Saline</b>	<b>MS</b>	<b>3,000 to 10,000</b>
Very Saline	VS	10,000 to 35,000
Brine	BR	Greater than 35,000

**BRACKISH** (indicated by a yellow bracket on the left side of the table, encompassing the Slightly Saline and Moderately Saline rows)

← Most Major/Minor Aquifer Mapped Limit (indicated by an arrow pointing to the boundary between the Moderately Saline and Very Saline rows)

← Seawater (indicated by an arrow pointing to the boundary between the Very Saline and Brine rows)

*modified from Winslow and Kister (1956) USGS WSP 1365*

# Legislative Directive HB 30 (2015)

- Identify and designate zones in the state;
- Determine groundwater volumes that a zone can produce over 30-year and 50-year periods without causing significant impact to water availability or water quality;
- Make recommendations on reasonable monitoring to observe effects of production within the zone;
- Work with GCDs and stakeholders in general; and
- Provide a summary of zone designations in the biennial report due December 1 of each even-numbered year;

# Statutory Requirements & Exclusion Criteria

Must have brackish water	In areas of the state with moderate to high availability and productivity
Must have hydrogeologic barriers	Sufficient to prevent significant impacts to freshwater availability or quality
Cannot be within these boundaries	Edwards Aquifer within the Edwards Aquifer Authority, Barton Springs-Edwards Aquifer Conservation District, Harris-Galveston Subsidence District, Fort Bend Subsidence District, and Dockum Aquifer
Cannot be already in use	Brackish water already serving as a significant source of water supply for municipal, domestic or agricultural
Cannot be used for wastewater injection	Permitted under Title 2 of Texas Water Code, Chapter 27

# TWDB-Designated Zone Status

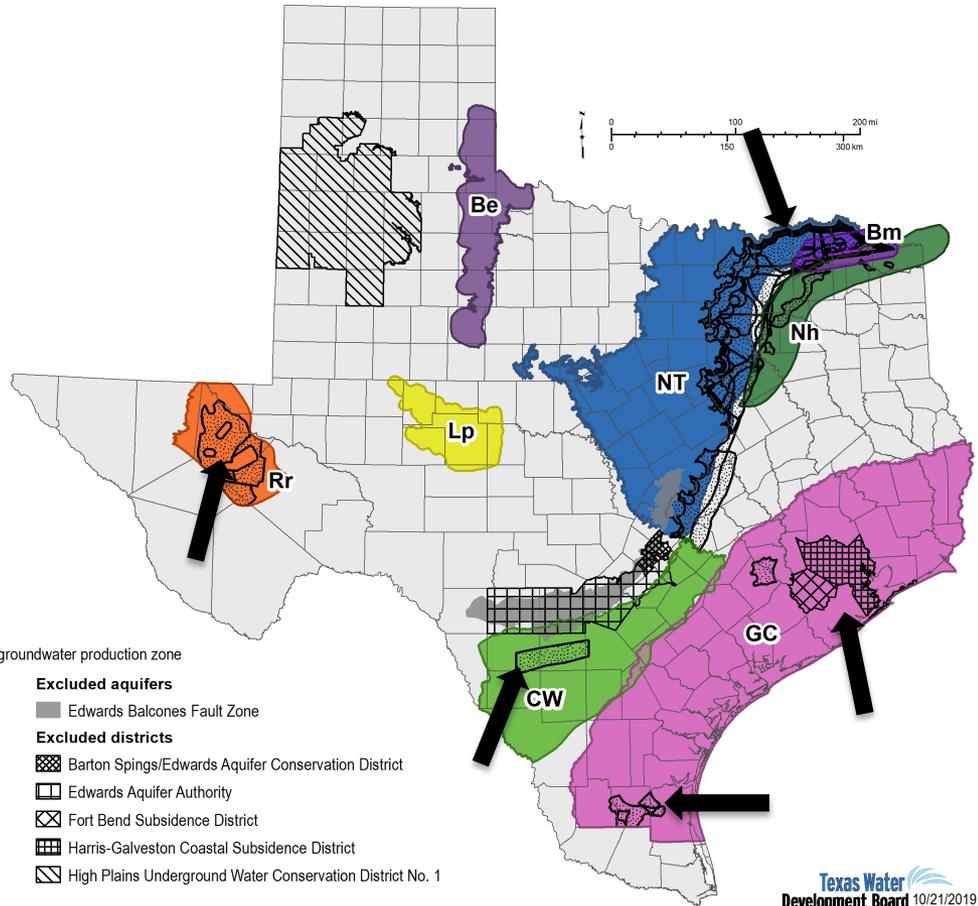
## 31 Total Zones

### October 2016

- 0 Blaine Aquifer
- 1 Carrizo-Wilcox Aquifer
- 4 Gulf Coast Aquifer
- 3 Rustler Aquifer

### March 2019

- 3 Blossom Aquifer
- 0 Lipan Aquifer
- 5 Nacatoch Aquifer
- 15 Northern Trinity Aquifer

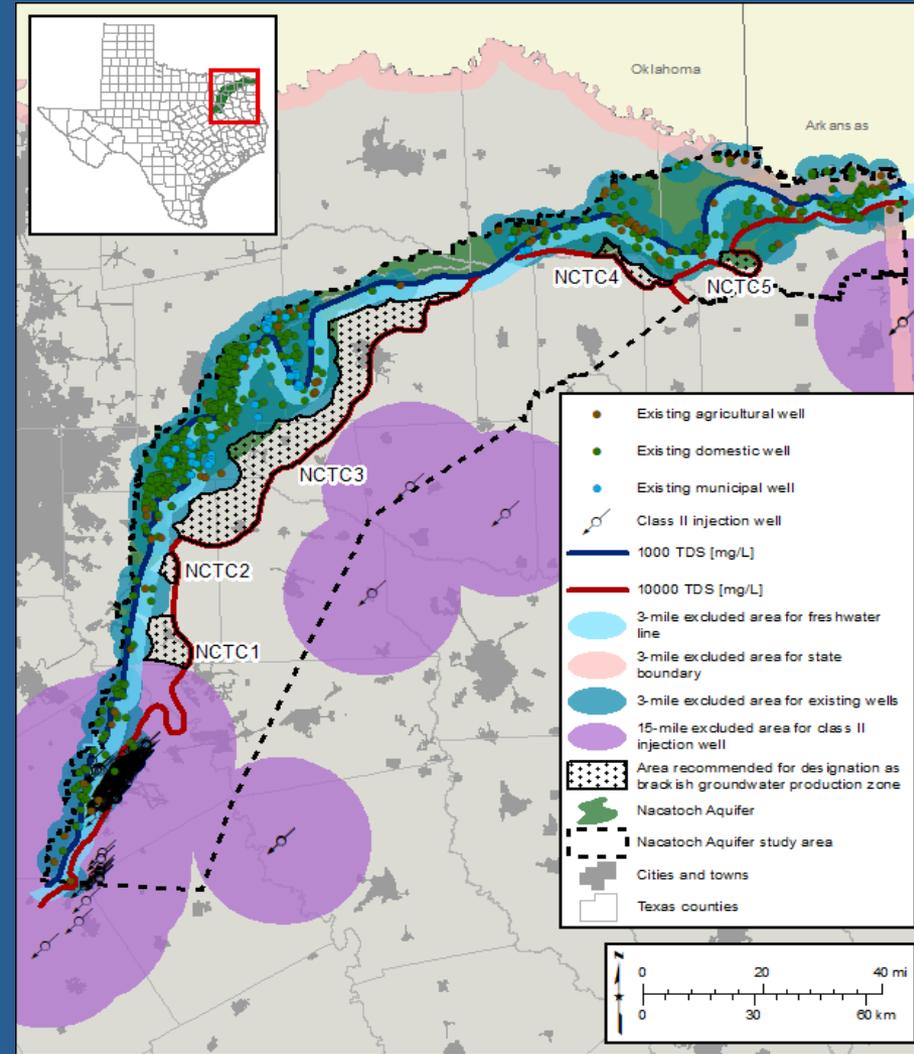


# Step 1 - BRACS aquifer study



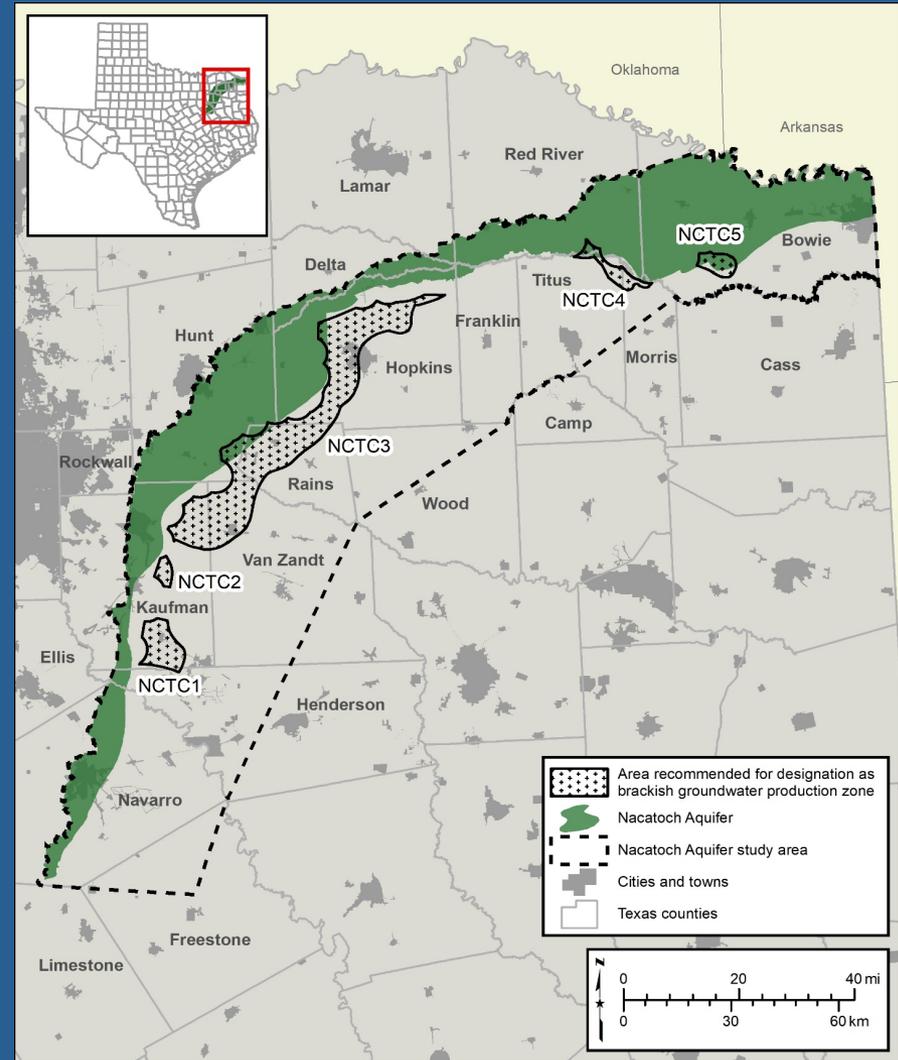
# Step 2 – Apply Statutory Requirements

- Buffer existing well use
  - Agriculture, domestic, and municipal
- Buffer freshwater line
- Buffer injection or disposal wells permitted under TWC Chapter 27
- Buffer state lines
- Ensure hydrogeological barrier exists
- Present results to stakeholders



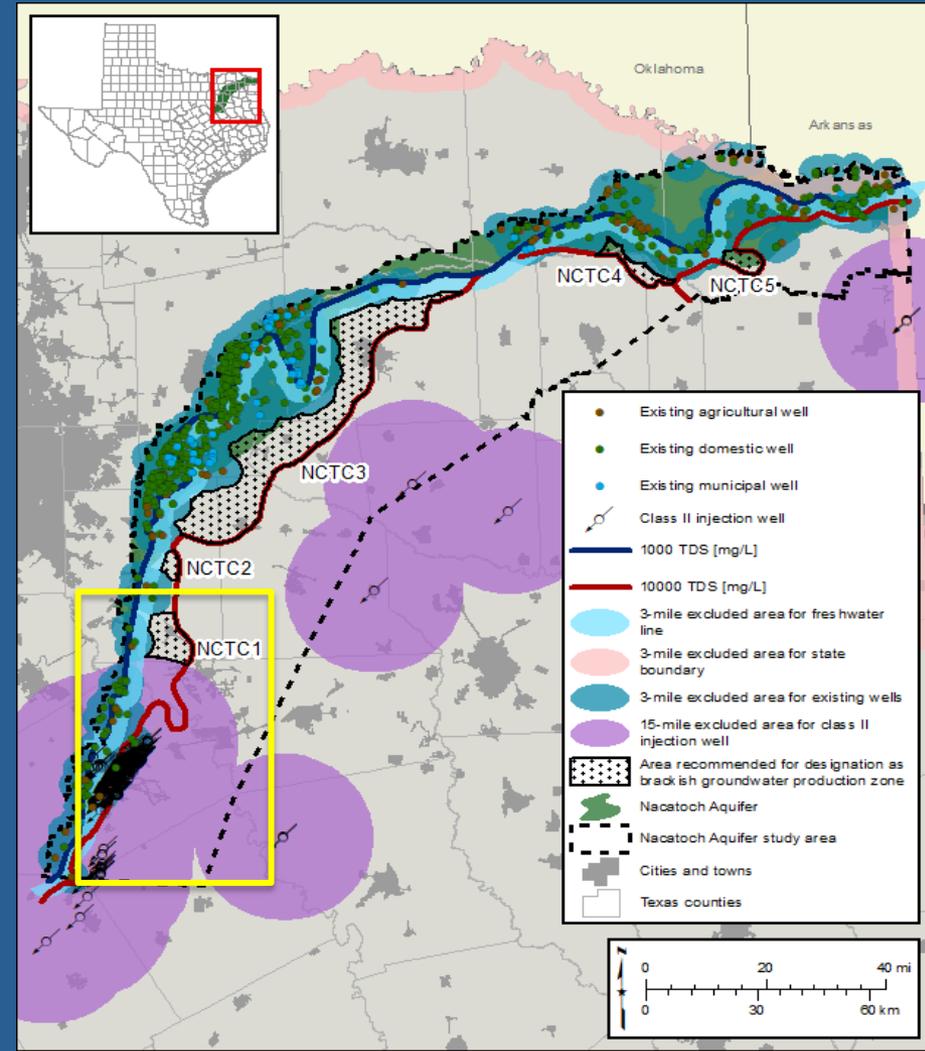
# Step 3 – Board Designation

- Select Board meeting
- Prepare documents
- Route for approval
  - 2.5 months prior to meeting
- Brief management and the Board
- Present recommendations
- Email board designation to stakeholders



# Stakeholder Feedback on Zones

- We applied 15 miles to buffer all Class II injection wells.
- 15 miles too conservative?



# Develop Procedures and Tools to Delineate Areas Designated or Used for Class II Well Wastewater Injectate Study

- Goal from this study:
  - develop a technically defensible methodology for determining an appropriate buffer distance.
  - Buffer per each Injection well
  - Buffer per Aquifer type
  - Default Buffer
- Avoid designation of Brackish Groundwater Production Zones in areas already used for wastewater injection.

# Workgroup Involvement

- Task 1 – Literature Review
- Task 2 – Aquifer Assessment
- **Task 3 – Aquifer Assessment Presentation**
- Task 4 – Class II Well Data Procedures and Tools
- Task 5 – Mapping Techniques Description
- **Task 6 – Techniques Presentation**
- Task 7 – Injectate Mapping Procedures and Tools
- **Task 8 – Case Study**
- Task 9 – Procedures and Tools Testing
- **Task 10 – Final Workgroup Presentation**
- Task 11 – Draft and Final Reports
- Task 12 – Project Management



**Introductory meeting**

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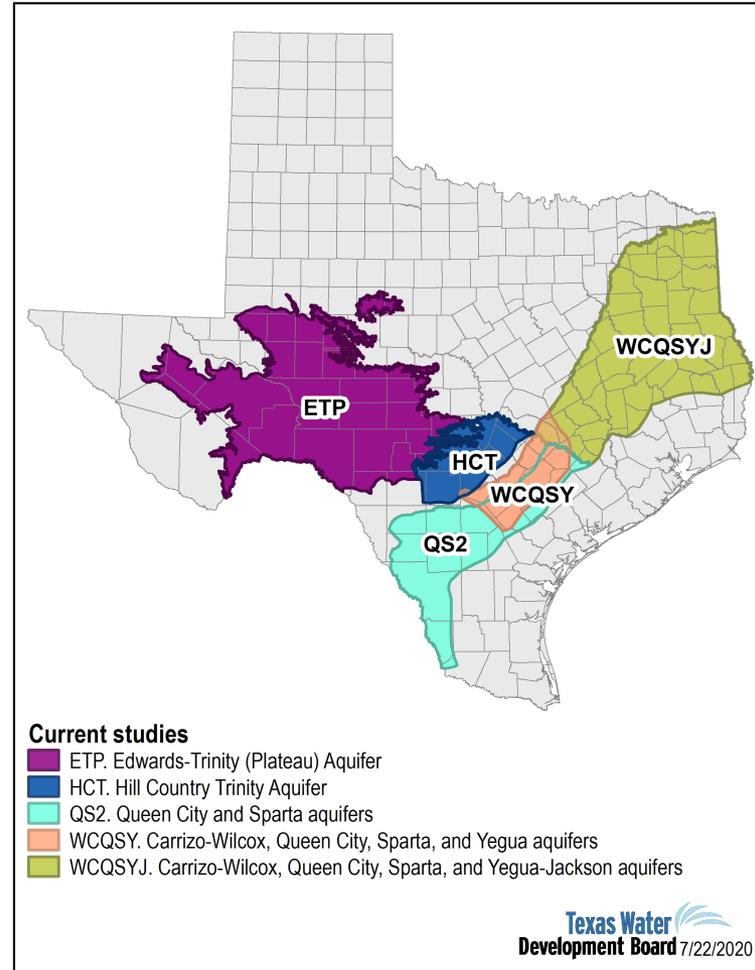
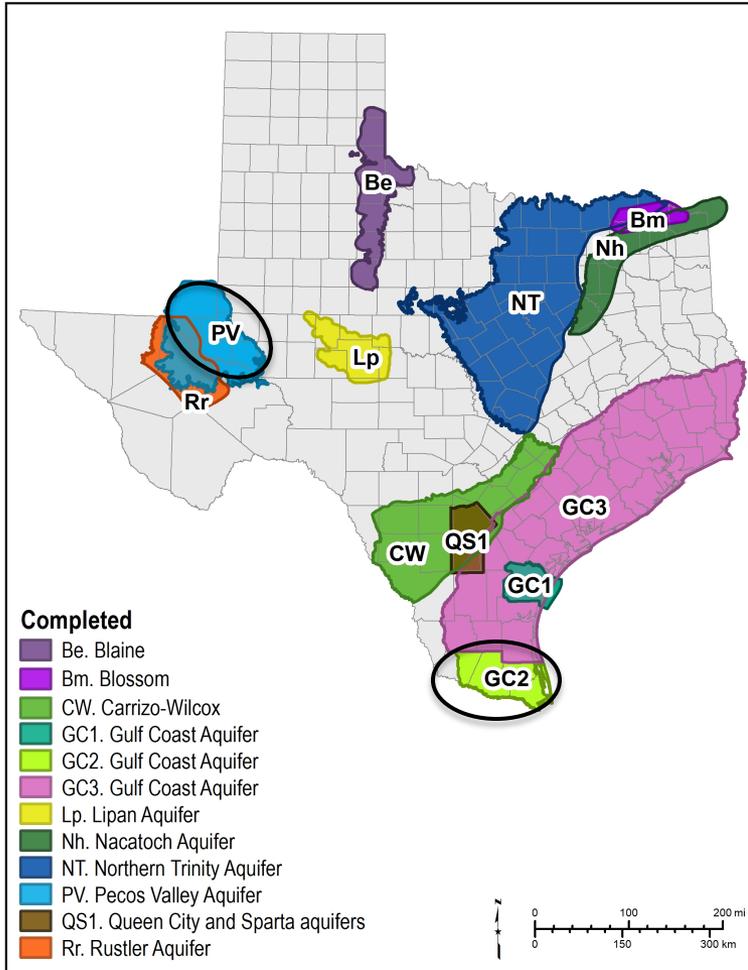
## **Innovative Water Technologies - BRACS**

**<http://www.twdb.texas.gov/innovativewater/bracs/index.asp>**

# WSP & Subcontractors: Update on Project

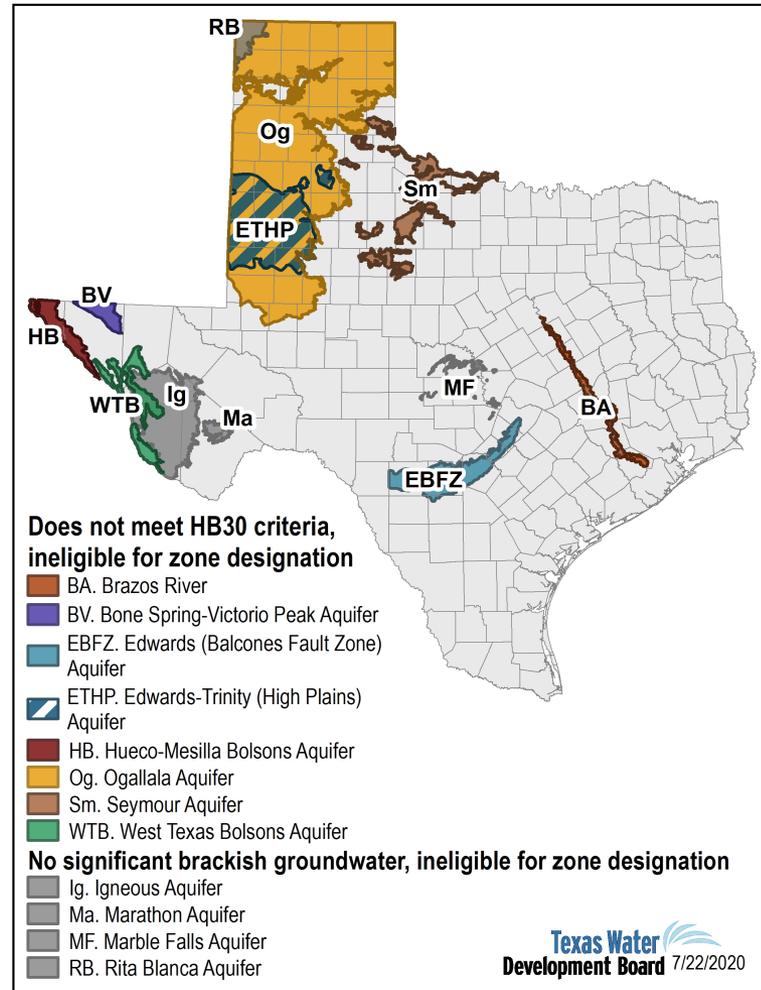
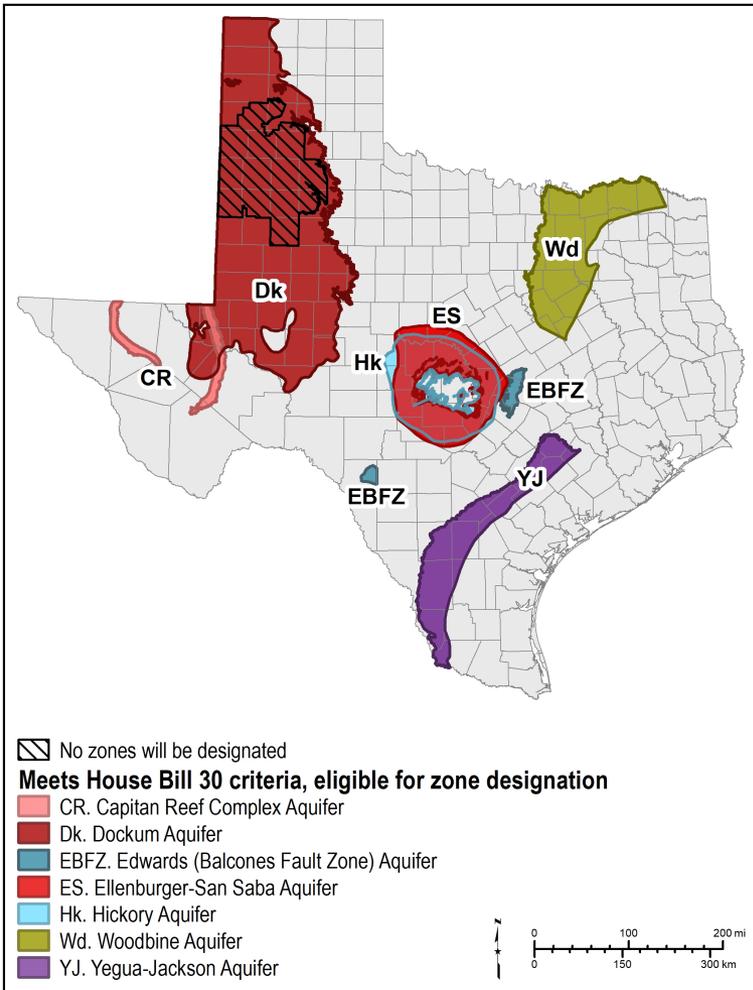


# Current Aquifer Studies



Texas Water  
Development Board 7/22/2020

# Future Aquifer Studies



# Class II Injection Wells in Nacatoch Aquifer study area

