

Texas Water Development Board Science and Infrastructure

18th Annual Bell County Water
Symposium

November 15, 2018
Killeen, Texas

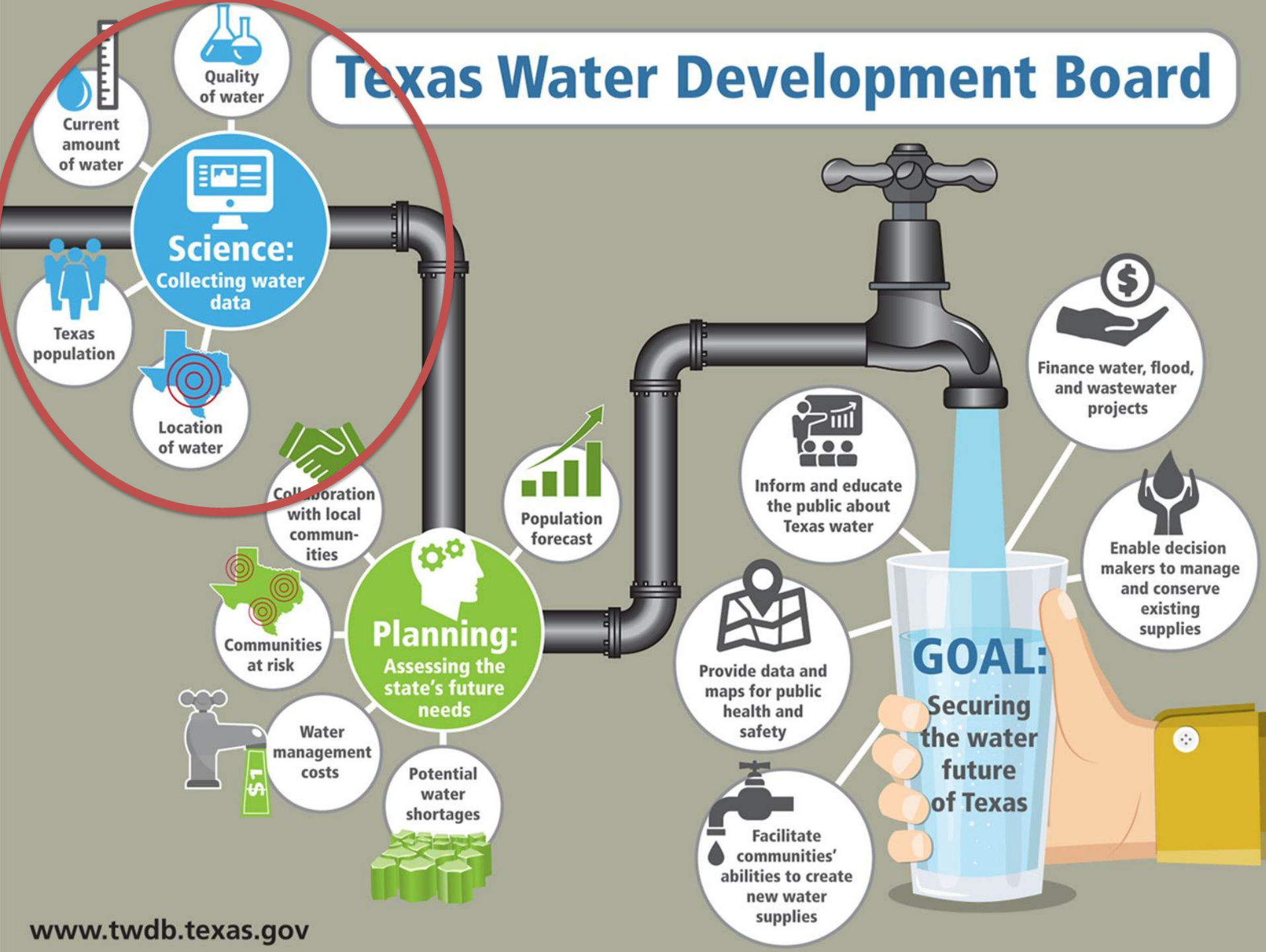
Larry French, P.G.

Groundwater Division

Legend

- Pecos Valley
- Seymour
- Gulf Coast
- Carrizo - Wilcox (outcrop)

Texas Water Development Board



GROUNDWATER DIVISION

MISSION:

To collect, interpret, and provide accurate, objective information on the groundwater resources of Texas.

VISION:

For the people of Texas to understand their groundwater resources.

FUNDING

PLANNING/PROJECTS

SCIENCE/DATA

Legend

- Pecos Valley
- Seymour
- Gulf Coast
- Carrizo - Wilcox (outcrop)
- Carrizo - Wilcox (subcrop)
- Hueco - Mesilla Bolson
- Ogallala
- Edwards - Trinity Plateau (outcrop)
- Edwards - Trinity Plateau (subcrop)

Credit: TWDB

Photo of the weather station site along the Little Blanco River about 5.5 miles south-southwest of the City of Blanco.

Groundwater Division - Key Functions

Groundwater Monitoring

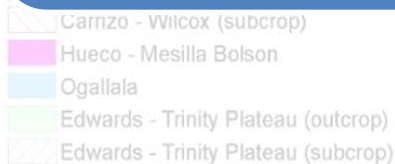
- Collect water level and water quality data, maintain water well database

Groundwater Availability Modeling

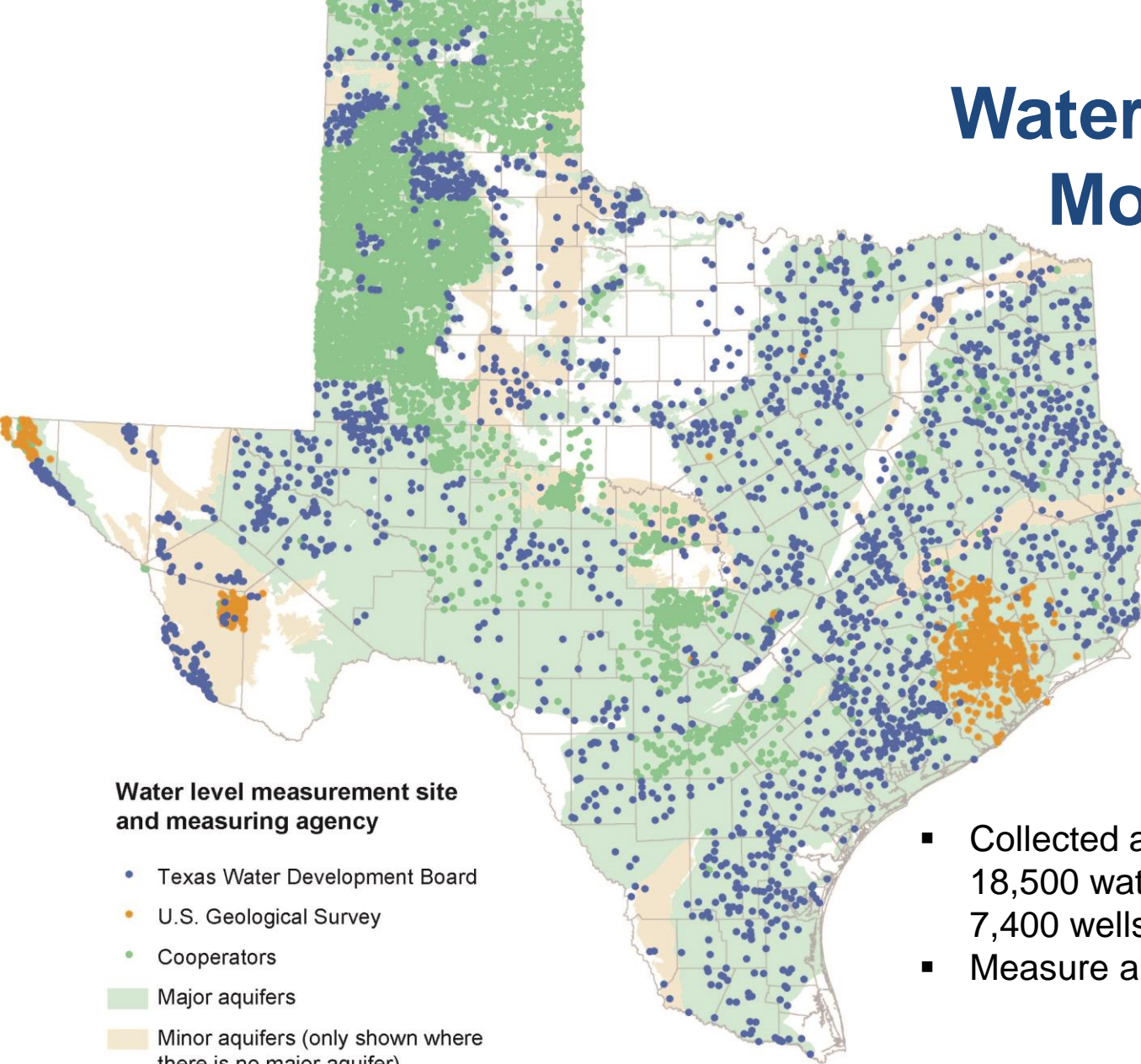
- Develop, maintain, and update regional numerical flow models of aquifers; provide information from the models for planning purposes

Groundwater Technical Assistance

- Respond to public inquiries, review groundwater management plans, support joint planning, conduct research, review loans



Water Well Level Monitoring

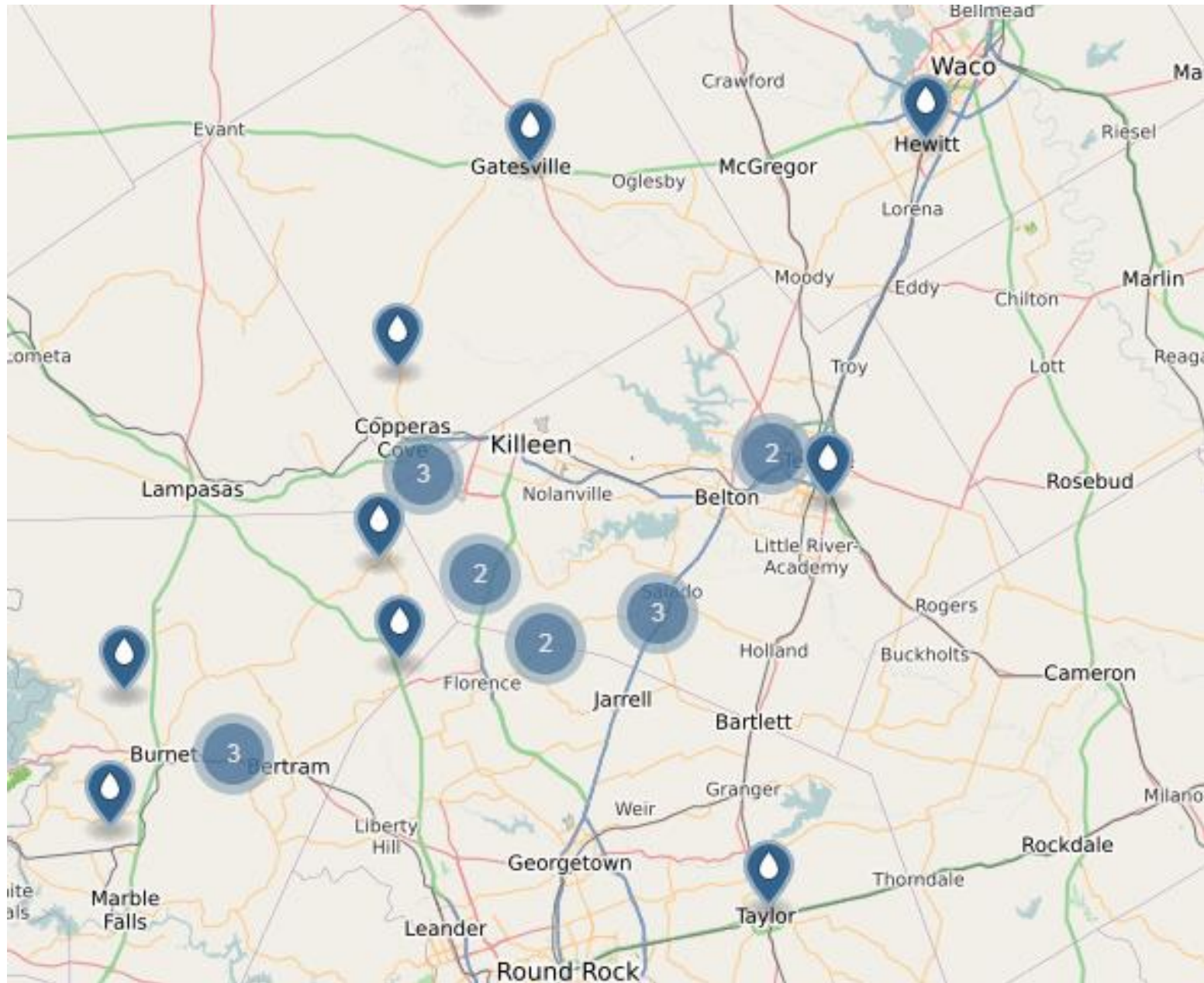


Water level measurement site and measuring agency

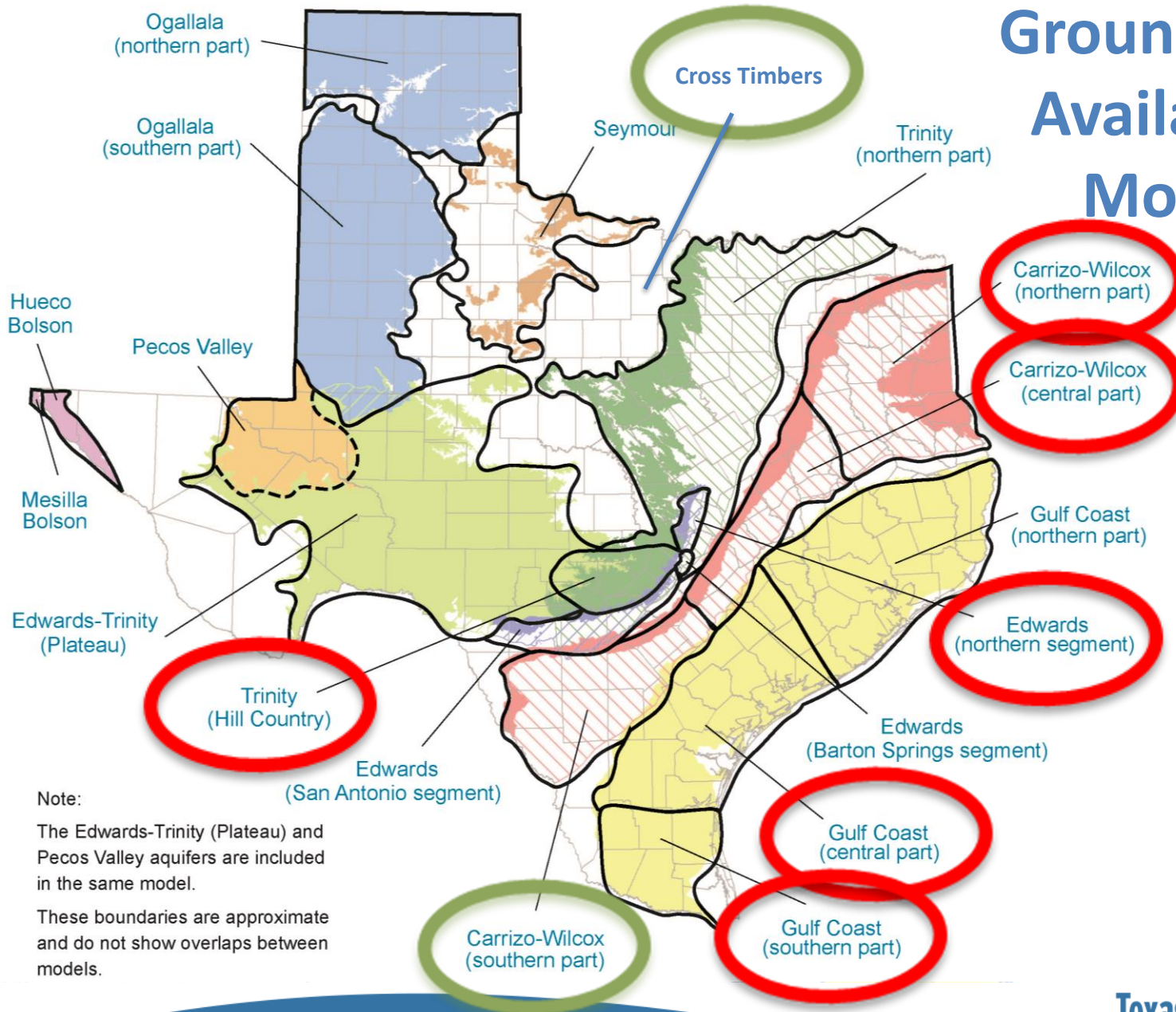
- Texas Water Development Board
- U.S. Geological Survey
- Cooperators
- Major aquifers
- Minor aquifers (only shown where there is no major aquifer)

- Collected and compiled more than 18,500 water level measurements in 7,400 wells.
- Measure about 2,000 wells a year

Recorder Wells in Central Texas



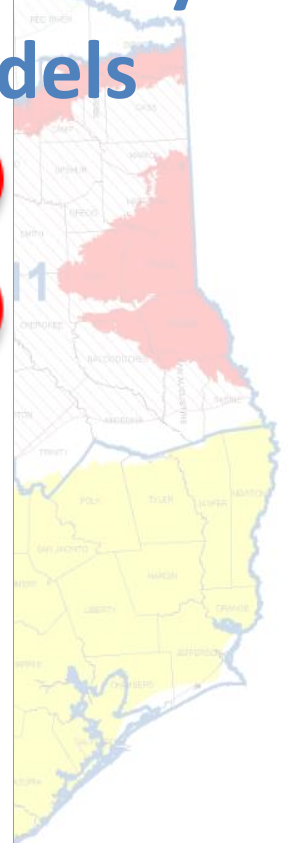
Groundwater Availability Models



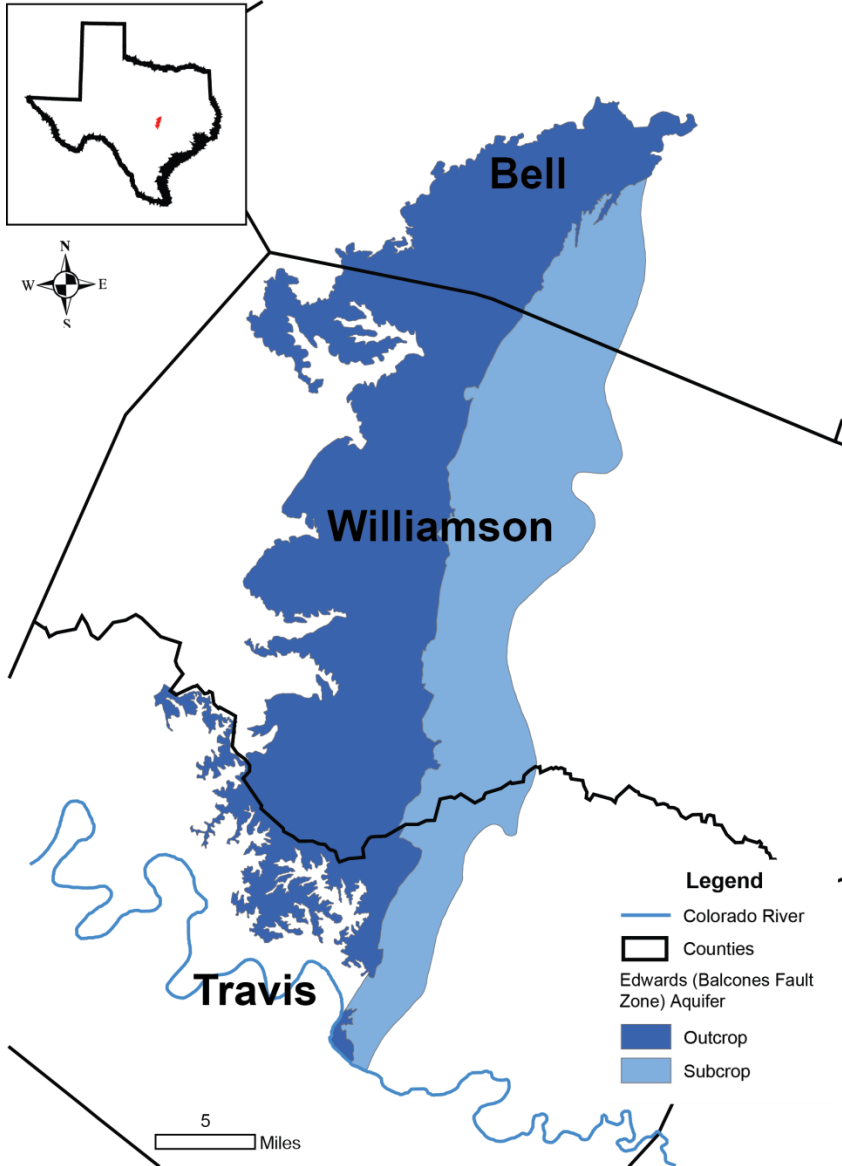
Note:

The Edwards-Trinity (Plateau) and Pecos Valley aquifers are included in the same model.

These boundaries are approximate and do not show overlaps between models.

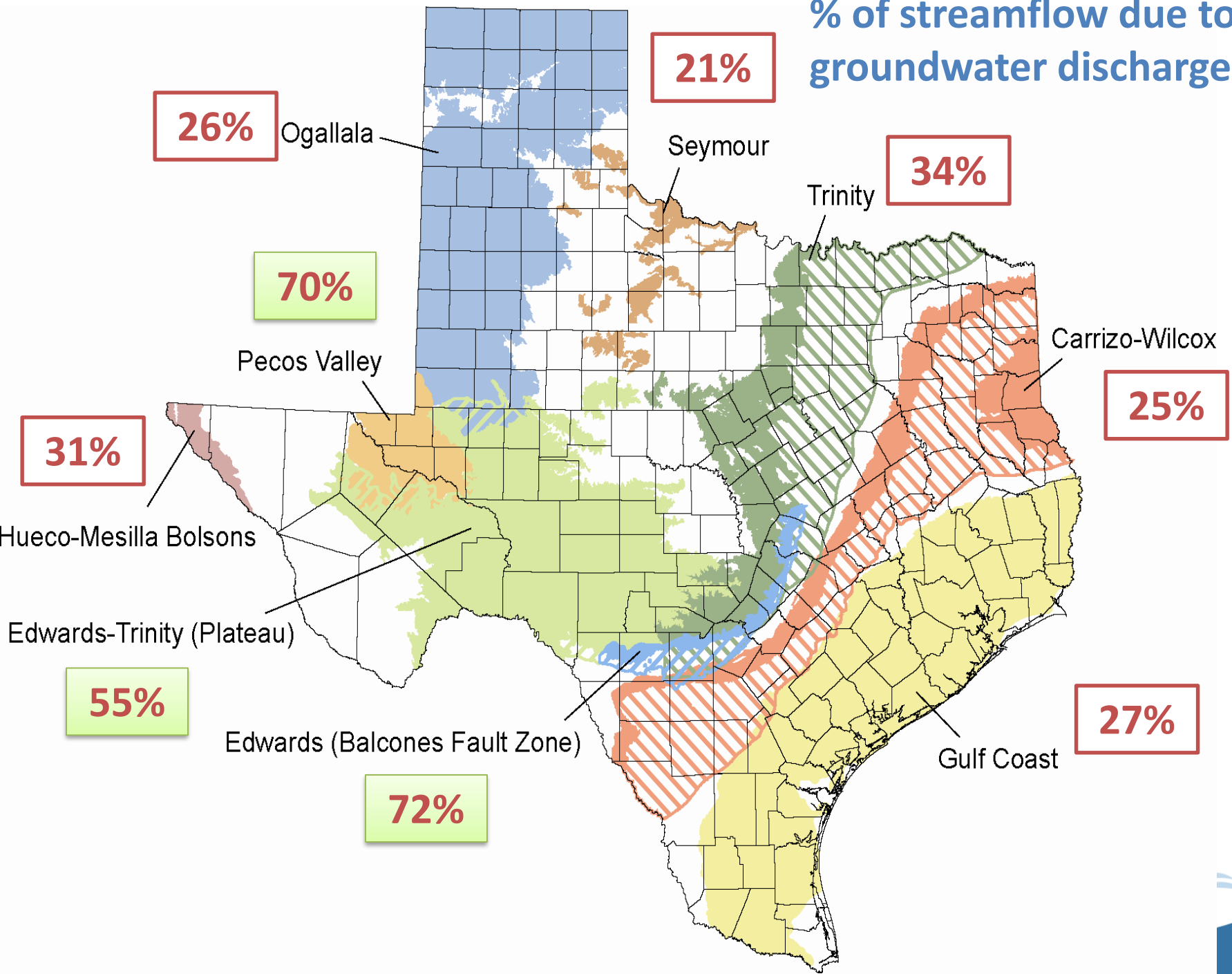


Edwards (Balcones Fault Zone) Aquifer



- **Revise conceptual model**
 - Interaction with the Trinity Aquifer
- **Review input data**
 - Review other aquifer-related studies
 - Fill data gaps, where possible
 - Pumping volumes per well, where feasible
- **Extend calibration period**
- **Current version of MODFLOW**

% of streamflow due to groundwater discharge



Groundwater-Surface Water Relationships

- An estimated 9.3 million acre-feet per year, on average, discharges from aquifers to surface water. This is about 30% of all surface water flow in Texas.²
- Percentage of streamflow attributable to inflows of groundwater ranges from 14 percent (several aquifers) to 72 percent (Edwards [Balcones Fault Zone] Aquifer).
- Average estimated flow from groundwater to surface water (acre-feet per year)

	Bell County	Williamson County
Edwards (BFZ) Aquifer	5,578	20,212
Trinity Aquifer	4,274	5,795
Total	9,852 ac-ft/yr	26,007 ac-ft/yr

Legend

- Pecos Valley
- Seymour
- Gulf Coast
- Carrizo - Wilcox
- Carrizo - Wilcox
- Hueco - Mesilla E
- Ogallala
- Edwards - Trinity
- Edwards - Trinity Plateau (subcrop)

N

Draft Final Report for the Study of Brackish Aquifers in Texas – Project No. 4 – Trinity Aquifer

Prepared by

Editors

Leanne M. Stepchinski

Ronald T. Green, Ph.D., P.G.

F. Paul Bertetti, P.G.

Ronald M. McGinnis

Nathaniel J. Toll

From Southwest Research Institute®

Neil E. Deeds, Ph.D., P.E.

Daniel Lupton, P.G.

From INTERA Incorporated

Contributors

Beth Fratesi, Ph.D.

Rebecca R. Nunu

Kirk D. H. Gulliver

Mauricio E. Flores

From Southwest Research Institute®

Jevon Harding, P.G.

From INTERA Incorporated

Marcus O. Gary, Ph.D., P.G.

Steven Johnson, P.G.

From The Edwards Aquifer Authority

Brian B. Hunt, P.G.

Brian Smith, Ph.D., P.G.

From Barton Springs Edwards Aquifer Conservation District

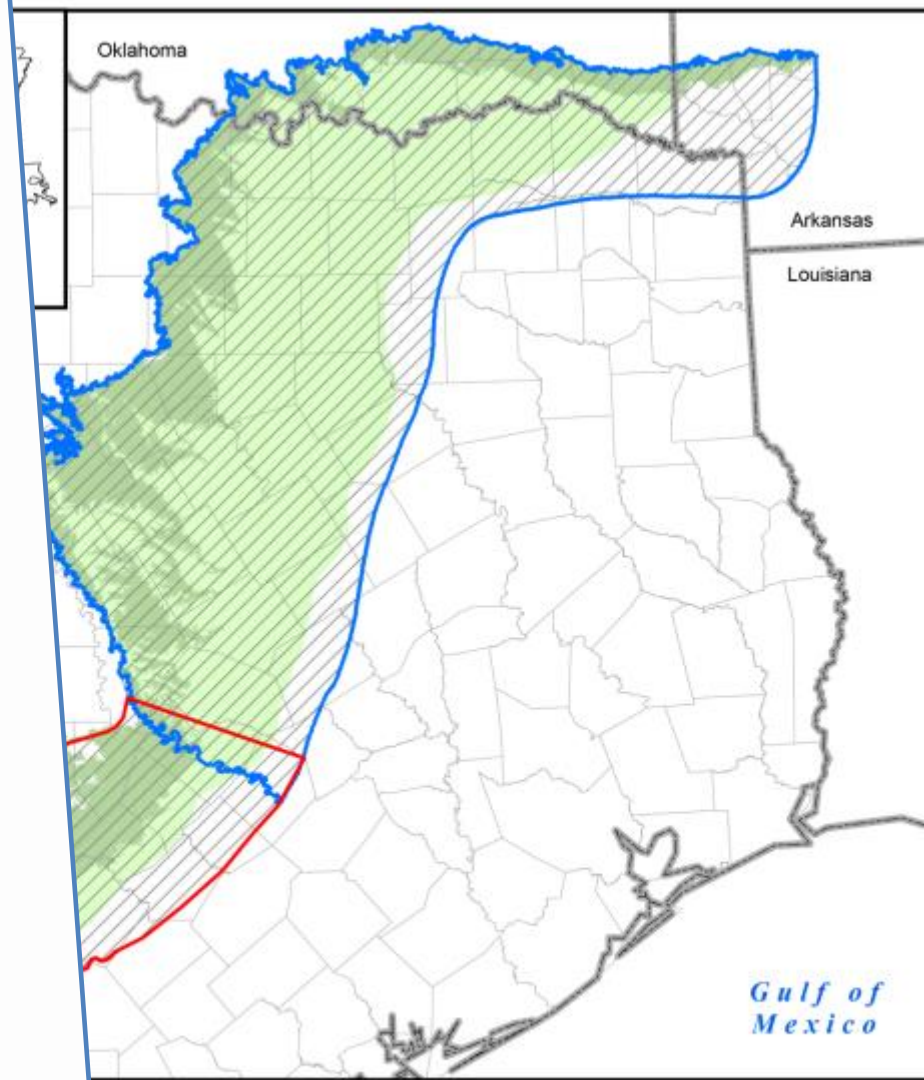
Prepared for:

Texas Water Development Board

P.O. Box 13231, Capitol Station

Austin, Texas 78711-3231

June 30, 2017



Northern Trinity Aquifer Study Area

Hill Country Trinity Aquifer Study Area

Framework Domain

Trinity Aquifer Outcrop

Trinity Aquifer Downdip

State Boundary

County Boundary



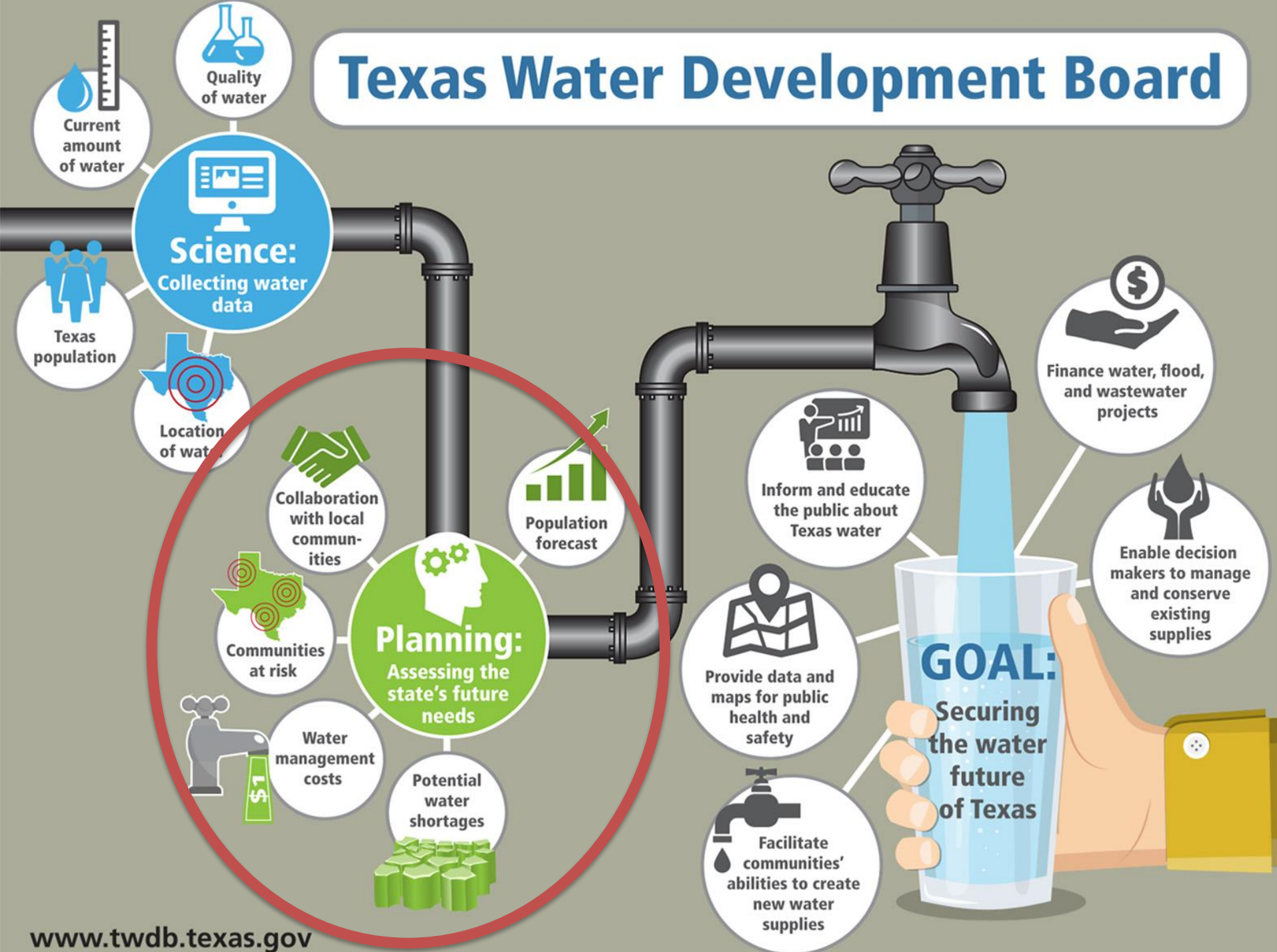
0 25 50
Miles

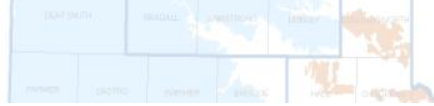
Ogallala

Edwards - Trinity Plateau (outcrop)

Edwards - Trinity Plateau (subcrop)

Texas Water Development Board





The 2017 State Water Plan

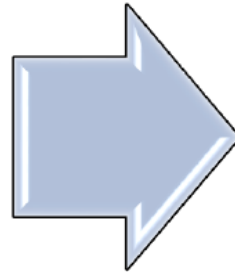
Water Supply Strategies 2020-2070

**5,500
strategies**

\$63 billion

2012 Plan

- Total Cost: \$55.6 billion
- Strategies: 3,750
- Conservation: \$1 billion
- Conservation and Reuse: 34% of plan



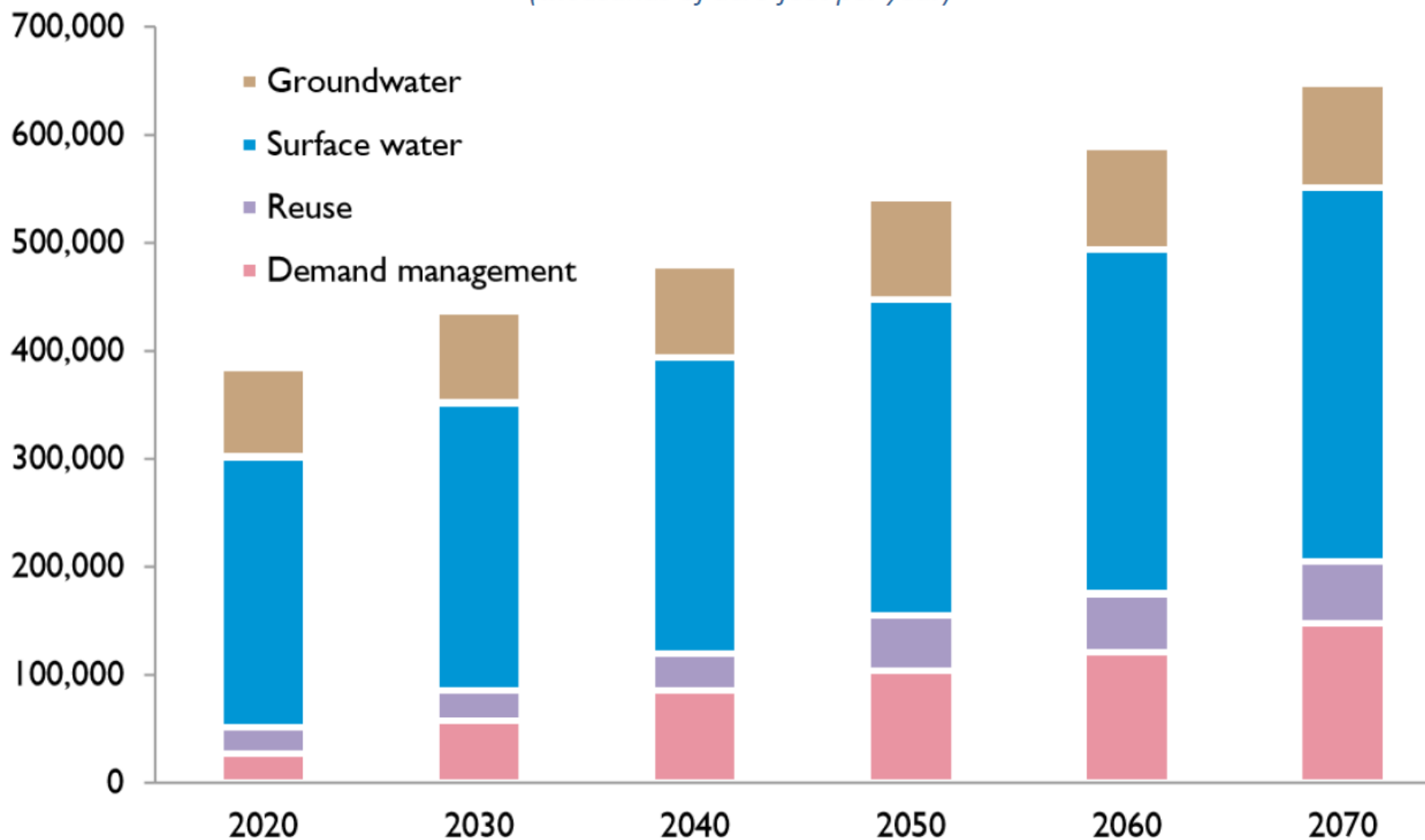
2017 Plan

- Total Cost: \$63 billion
- Strategies: 5,500
- Conservation: \$4.4 billion
- Conservation and Reuse: 45% of plan

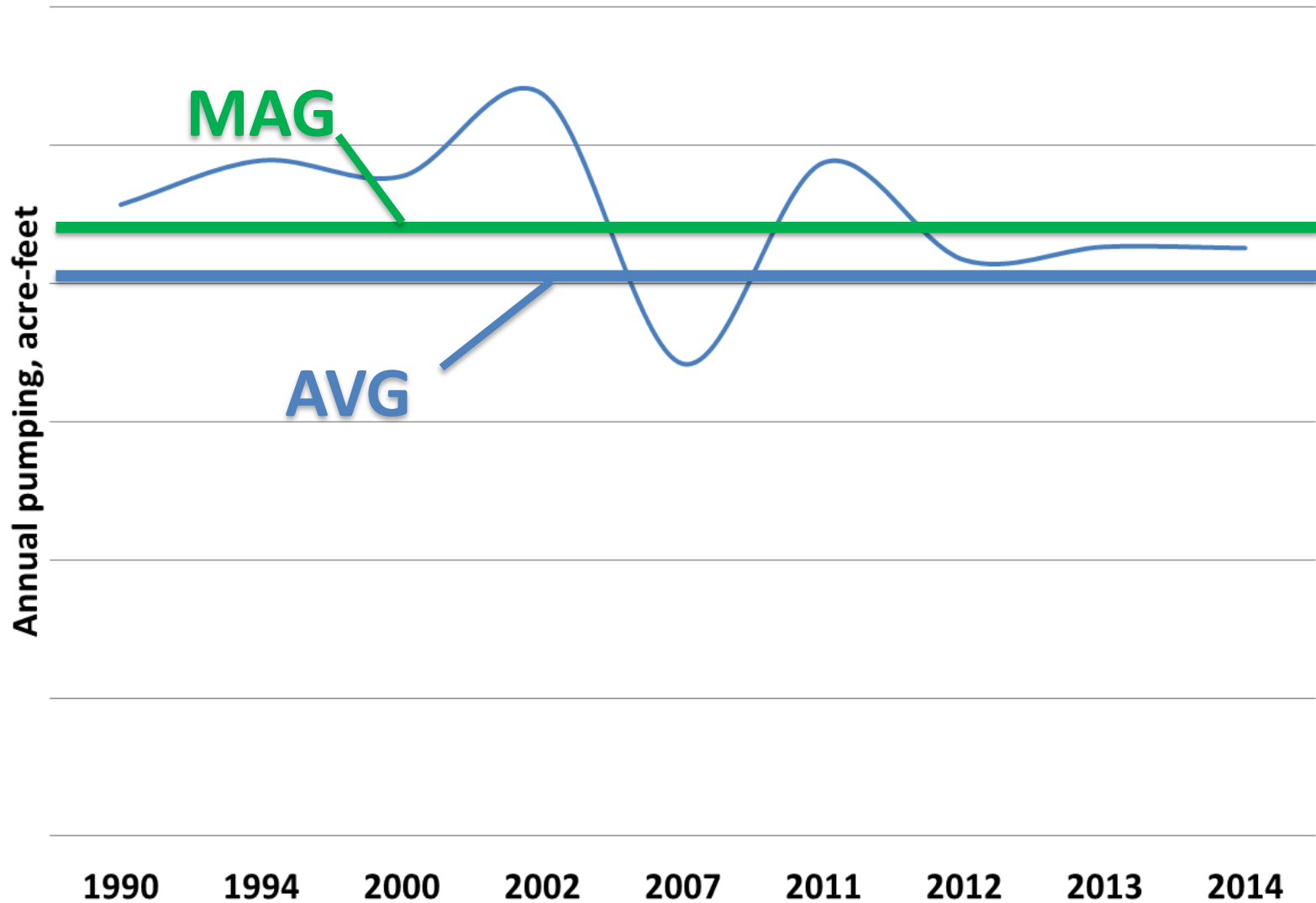


Region G: Volume of Recommended Water Projects by Water Resource

(thousands of acre-feet per year)



MAG Peak Factor





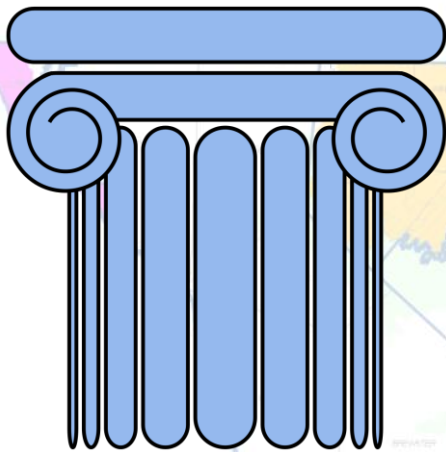
STATE FLOOD ASSESSMENT

- 1. Assess risk and roles**
- 2. Estimate flood mitigation costs**
- 3. Envision the future of flood planning in Texas**

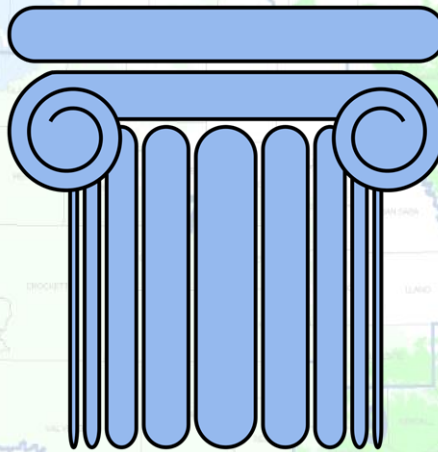
Legend

- Pecos Valley
- Seymour
- Gulf Coast
- Carrizo - Wilcox (outcrop)
- Carrizo - Wilcox (subcrop)
- Hueco - Mesilla Bolson
- Ogallala
- Edwards - Trinity Plateau (outcrop)
- Edwards - Trinity Plateau (subcrop)

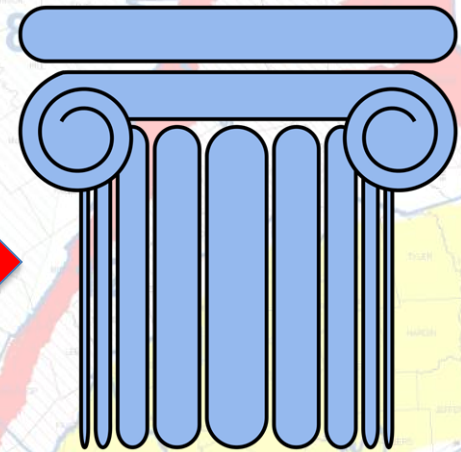
Three Pillars of Flood Risk Management



Mapping



Planning

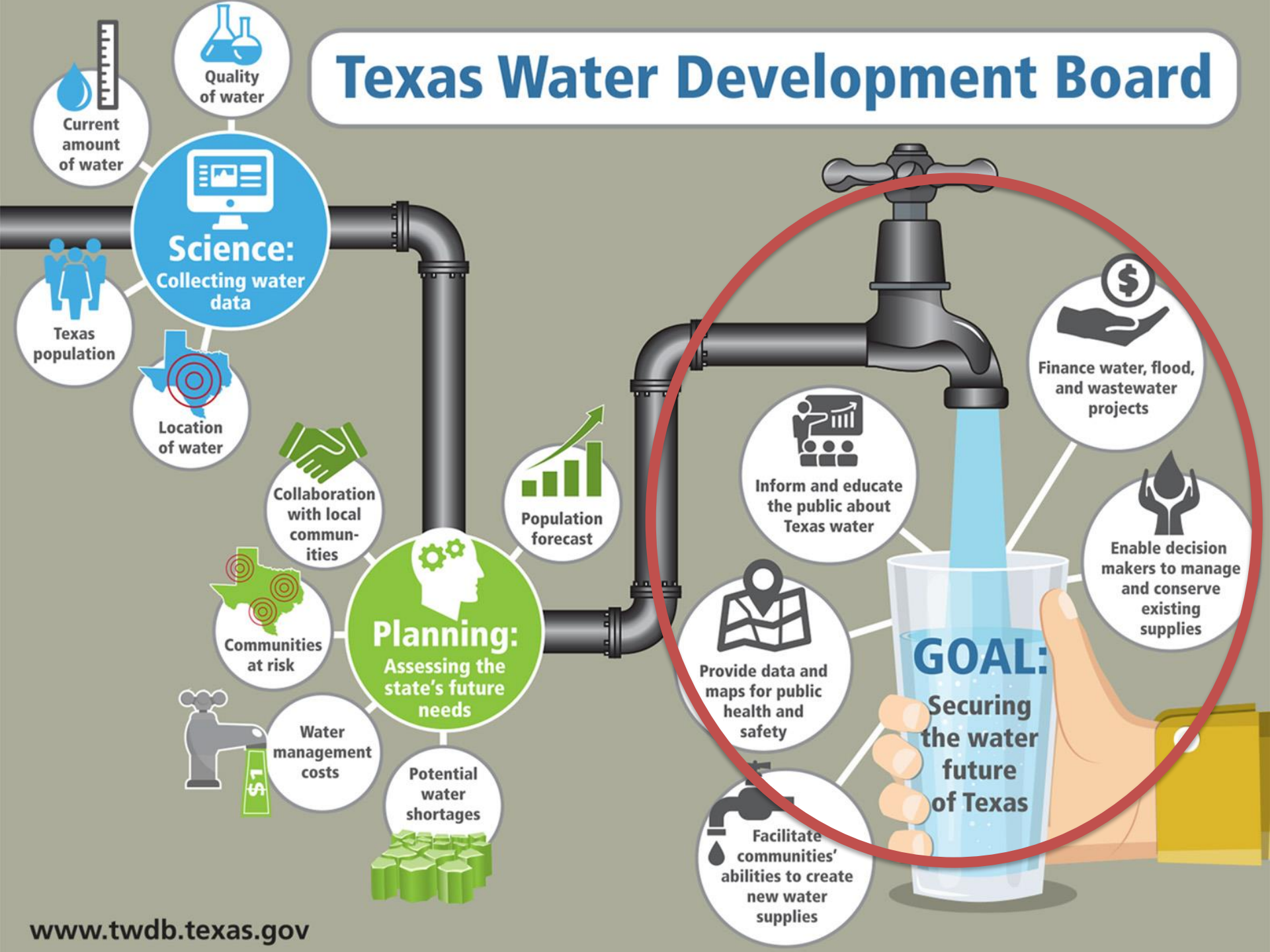


Mitigation

Legend

- Pecos Valley
- Seymour
- Gulf Coast
- Carrizo - Wilcox (outcrop)
- Carrizo - Wilcox (subcrop)
- Hueco - Mesilla Bolson
- Ogallala
- Edwards - Trinity Plateau (outcrop)
- Edwards - Trinity Plateau (subcrop)

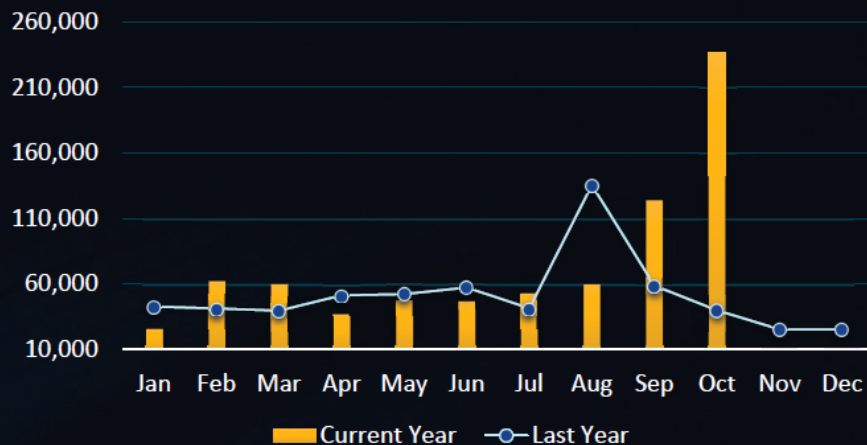
Texas Water Development Board



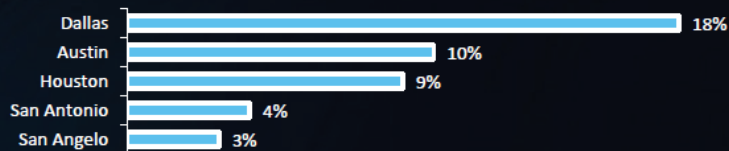
Provide data and maps for public health and safety

Water Data for Texas

Visitor Traffic Year-to-Date (YTD)



October Visitor Traffic Breakdown (Top 5)

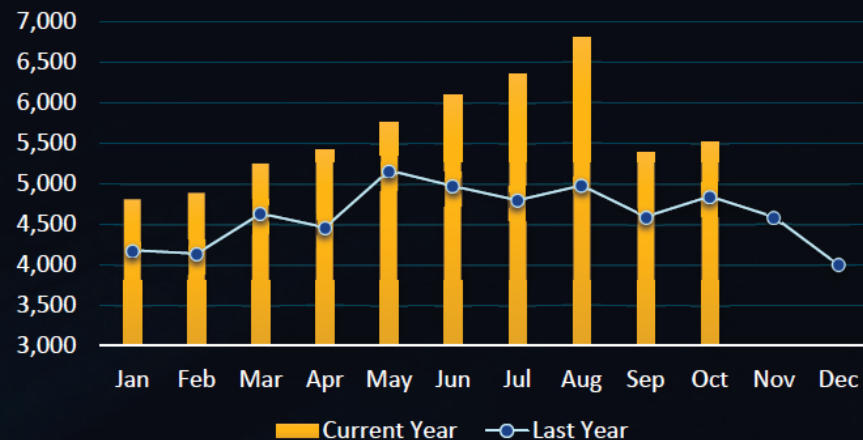


October 2018 Numbers:

- 236,727 Users (Visitors)
- Peaked on October 17th with 48,985 visitors

Groundwater Data Viewer

Visitor Traffic Year-to-Date (YTD)



October Visitor Traffic Breakdown (Top 5)



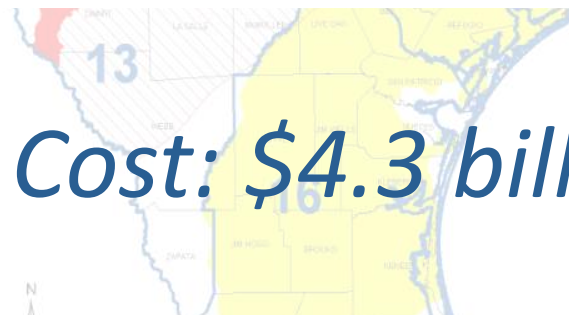
October 2018 Numbers:

- 5,517 Users (Visitors)
- Peaked on October 2nd with 565 visitors

Region G: Top 10 Projects with Largest Capital Cost



Recommended water management strategy project	Online decade	Sponsor(s)	Associated capital cost
Lake Granger Augmentation-Phase 2-BRA	2020	Brazos River Authority	\$637,057,000
Little River OCR-BRA	2030	Brazos River Authority	\$487,611,000
Brushy Creek RUA Water Supply	2020	Cedar Park	\$69,666,000
Brushy Creek RUA Water Supply	2020	Leander	\$142,186,000
Brushy Creek RUA Water Supply	2020	Liberty Hill	\$3,555,000
Brushy Creek RUA Water Supply	2020	Round Rock	\$102,995,000
Cedar Ridge Reservoir	2020	Abilene	\$290,868,000
Chloride Control Project-BRA	2020	Brazos River Authority	\$172,652,000
BRA System Ops Infrastructure- Somervell SE	2020	Steam Electric Power, Somervell	\$128,162,000
Carrizo Aquifer Development-Robertson County Irrigation	2020	Irrigation, Robertson	\$128,018,000
Carrizo Aquifer Development-Hutto (Heart of Texas-Lee co.)	2020	Heart of Texas Water Suppliers LLC	\$127,086,000
Lake Granger ASR	2020	Brazos River Authority	\$99,820,000
Lake Granger Augmentation-Phase I-BRA	2020	Brazos River Authority	\$85,170,000
Other recommended projects	various	205 various	\$1,846,238,000
Total capital cost			\$4,321,084,000



Total Capital Cost: \$4.3 billion

Central Texas Area Water Supply Projects: currently over \$37 M in TWDB Funding



Organization	Project	County	Commitment	Funding Program
Brushy Creek Regional Utility Authority	Water Treatment and Distribution Project	Williamson	\$32,735,000	SWIFT
Buckholts	Water Meter Replacement	Milam	\$200,000	DWSRF
Lone Star Regional Water Authority	East Williamson County Regional Water Transmission System	Williamson	\$1,500,000	WDF
Rogers	Water System Improvements	Bell	\$2,405,000	DWSRF
Whitewater Springs WSC	New Well #4	Burnet	\$500,000	DWSRF

- Carrizo - Wilcox (subcrop)
- Hueco - Mesilla Bolson
- Ogallala
- Edwards - Trinity Plateau (outcrop)
- Edwards - Trinity Plateau (subcrop)



Larry French, P.G.
(512)463-5067
larry.french@twdb.texas.gov
www.twdb.texas.gov

 **WATER** *for* **TEXAS**
2019 conference

January 23-25, 2019

Legend

- Pecos Valley
- Seymour
- Gulf Coast
- Carrizo - Wilcox (outcrop)
- Carrizo - Wilcox (subcrop)
- Hueco - Mesilla Bolson
- Ogallala
- Edwards - Trinity Plateau (outcrop)
- Edwards - Trinity Plateau (subcrop)

