

AGENDA

Lower Colorado Regional Water Planning Group Meeting

October 26, 2022, 10:00 a.m.

LCRA Dalchau Service Center
3505 Montopolis Drive
Austin, TX

Regular Meeting:

1. Call to Order – Chair David Van Dresar
2. Welcome and Introductions – Chair Van Dresar
3. Receive public comments on specific issues related to agenda items 4 through 11. (Public comments limited to 3 minutes per speaker.)
4. Planning Group Membership – Secretary Teresa Lutes
 - a. Roll Call Attendance
 - b. Attendance report
 - c. Counties interest category:
 - i. Acknowledge the resignation of Judge Byron Theodosis and determine the need for public posting
 - ii. Take action as appropriate on replacement of Judge Byron Theodosis by Jody A. Fauley, San Saba County Judge Elect (Counties alternate) as a voting member
5. Consider approval of Minutes – Chair Van Dresar
 - a. July 27, 2022
6. Meeting logistics; discussion and possible action on location and platform (in person, online, or hybrid) for future RWPG meetings – Chair Van Dresar
7. Texas Water Development Board (TWDB) Report
 - a. Update on regional water planning activities and schedules – Lann Bookout, TWDB
 - b. Methodology and projections for irrigation demand – Katie Dalberg, TWDB
 - c. Methodology and projections for mining demand - Bob Reedy, BEG
8. Consultant Report – Neil Deeds and Van Kelley, INTERA
 - a. Progress to date
 - b. Upcoming efforts

9. Interregional Coordination Activities – Chair Van Dresar
 - a. Interregional Planning Council meeting, November 9, 2022
 - b. Updates from liaisons to neighboring planning regions
 - i. Liaison to Region G: empty
 - ii. Liaison to Region J: Paul Tybor
 - iii. Liaison to Region L: Ron Fieseler
 - iv. Liaison to Region P: Daniel Berglund
 - v. Liaison to Region F: empty
 - vi. Liaison to Region H: empty
 - c. Consideration of liaison vacancies; take action if necessary on the recommendation of Terry Bray (alternate for Industries interest category) as Liaison to Region G – Barbara Johnson
10. Financial Report – Chair Van Dresar
11. Upcoming meetings:
 - a. Location and date of next RWPG meeting
 - b. Other committee meetings
 - i. Population and Demand Committee meeting, November 2, 2022
12. New / Other Business (time permitting)
13. Public Comments – limit 3 minutes per person
14. Adjourn

Item 4.b.
Attendance Report

Lower Colorado Regional Water Planning Group Meeting Voting Member Attendance Record
for Secretary's LCRWPG Voting Member Attendance Report on 10/26/2022

Voting Members									
<i>Regular meetings held over the past 2 years are shown.</i>									
Name	Interest	County	1/27/2021 Virtual	7/21/2021 Virtual	9/15/2021 Dalchau Service Center Austin	1/26/2022 Dalchau Service Center Austin	4/27/2022 Dalchau Service Center Austin	7/27/2022 Dalchau Service Center Austin	
Berglund, Daniel	Small Business	Wharton	Absent	X	Absent	X	Absent	X	
Brasher, Jim	GMA 15	Colorado	X	X	X	X	X	Absent	
Castleberry, Christianne	Water Utilities	Bastrop				X Elected	X	X	
Fieseler, Ron	GMA 9	Blanco	X	X	Absent - Alternate Attended	X	X	X	
Gillam, Lauri	Municipalities	Travis	X	X	X	X	X	X	
Johnson, Barbara	Industries	Travis	X	X	X	X	X	X	
Lindsay, David	Recreation	Travis	X	X	X	X	X	X	
Loftus, Tim	GMA 10	Travis							Appointed by GMA
Ludwig, Jason	Electric Gen. Utilities	Matagorda	X	Absent	Absent	X	X	X	
Luther, Jim	Counties	Burnet	X	Absent	X	X	Absent	X	
Lutes, Teresa	Municipalities	Williamson	X	Absent - Alternate Attended	Absent - Alternate Attended	X	X	Absent - Alternate Attended	
Masters, Monica	River Authorities	Travis							Elected
McElroy, Ann	Environmental	San Saba	X	Absent	Absent	X	X	Absent - Alternate Attended	
Olewin, Carol	Public	Travis			Elected	X	X	X	
Olfers, Charles	Agriculture	Gillespie	X	X	Absent	Absent - Alternate Attended	Absent	Absent	
Reagor, Mike	Municipalities	Llano	X	X	X	X	X	X	
Ruggiero, Robert	Small Business	Travis	X	X	X	X	Absent	Absent - Alternate Attended	
Sliva, Paul	Agriculture	Matagorda	Absent	Absent	Absent	X	Absent	X	
Sodek, Mitchell	GMA 8	Burnet	X	X	X	Absent - Alternate Attended	X	X	
Theodosis, Byron	Counties	San Saba	X	X	X	X	Absent	X	
Totten, Jim	GMA 12	Bastrop	X	X	Absent	X	X	X	
Tybor, Paul	GMA 7	Gillespie	X	X	X	X	X	Absent - Alternate Attended	
Uecker, Emil	Counties	Blanco				Elected	X	X	
Van Dresar, David	Water Districts	Fayette	X	X	X	Absent	Absent	Absent	
Walker, Jennifer	Environmental	Travis	Absent - Alternate Attended	X	X	X	Absent - Alternate Attended	X	

*Jan. 1/Dec. 31st of previous year (for example, 2021 terms expire Dec. 31st, 2020)

Item 5.a.

Draft Meeting Minutes, 7-26-2022

DRAFT MEETING MINUTES
Lower Colorado Regional Water Planning Group Meeting
July 27, 2022

Hybrid Meeting – conducted over Zoom and In-Person

LCRA Dalchau Service Center
3505 Montopolis Drive
Austin, TX
10:00 a.m.

Members Signed in:

Daniel Berglund, Small Business	Mike Reagor, Municipalities
Christianne Castleberry, Water Utilities	Tim Loftus (Alt. for Michael Redman), GMA 10
Ron Fieseler, GMA 9	Emil Uecker, Counties
Lauri Gillam, Municipalities	Mitchell Sodek, GMA 8
David Lindsay, Recreation	Paul Sliva, Agriculture
Barbara Johnson, Industries	Jim Totten, GMA 12
Jason Ludwig, Electric Gen. Utilities	Byron Theodosis, Counties
Jim Luther, Counties	Kay Wischkaemper(Alt. for Paul Tybor),GMA 7
Marisa Flores Gonzalez (Alternate for Teresa Lutes), Municipalities	Marcus Richardson (Alternate for Robert Ruggiero), Small Business
Jason Homan (Alternate for Ann McElroy), Environmental	Monica Masters (Alternate for David Wheelock), River Authorities
Carol Olewin, Public	Jennifer Walker, Environmental

Voting Members Absent

Jim Brasher, GMA 15	Charles Olfers, Agriculture
David Van Dresar, Water Districts	

Support/Consultants/Visitors

Stephanie Moore, INTERA	Jamie Burke, Black & Veatch
Annette Keaveny, LCRA	Alicia Smiley, Black & Veatch
Jennifer Bassett, LCRA	Helen Gerlach, Austin Water
Lann Bookout, TWDB	Sara Eatman, Austin Water
Stacy Pandey, LCRA	Sarah Hoes, Austin Water
Sarah Backhouse, TWDB	Lauren Mayes
Jack Jones	Josh Becker
David T. Villareal	Sue Thornton, Alternate
Jason Afinowitz, FNI	Dianne Wassenich, Region L
Blake Neffendorf, City of Buda	Robert Adams, Plummer
Andy Wier, SAWDF	Paul Babb, GMA 9-8
Carol Eckelkamp, LWV Austin Area	Laurence Brown, TSSWCB
Earl L. Foster, LMUD	David Bradsby

Quorum

Quorum: Yes

Number of voting members or alternates representing voting members present: 22

Number required for quorum per current voting membership of 25: 13

Number of voting members required for 2/3 vote: 17

Formal Actions Taken:

1. Monica Masters, Vice President of Water Resources at LCRA (River Authorities alternate) was approved as voting member in the River Authorities interest category (replacing David Wheelock, LCRA, who recently resigned from the planning group)
2. Monica Masters was approved to serve as Vice Chair for the planning group (replacing David Wheelock)
3. The minutes from the April 27, 2022 were approved as presented.
4. Revisions to the draft Water User Group list were approved for submittal to the Texas Water Development Board (TWDB).
5. A motion was approved for the October 26, 2022 LCRWPG, the next meeting, to be held in-person at the LCRA Dalchau Center in Austin.

Minutes:

1. Call to Order – Daniel Berglund, Acting Chair, called the meeting to order at 10:04 a.m.
2. Welcome and Introductions – Acting Chair Berglund welcomed attendees.
3. Public Comment:

Andy Wier, Executive Director for Simsboro Aquifer Water Defense Fund (SAWDF):

Mr. Wier described the work that SAWDF does to protect the Carrizo Wilcox Aquifer and private property rights. The speaker expressed that, in Bastrop, the Carrizo Wilcox Aquifer intersects the Colorado River and contributes inflows that sustain the river in drought. The speaker shared that, in terms of current drought conditions and due to the intersection of the Carrizo Wilcox Aquifer and the Colorado River, SAWDF echoes the request made by the Central Texas Water Coalition (CTWC), the Travis County Commissioners Court, and the Burnet County Commissioners Court that the Lower Colorado River Authority (LCRA) accelerate update of its Water Management Plan (WMP). The speaker expressed that conditions have changed since the 2020 passage of the LCRA WMP and that the LCRA WMP should be updated as other demand and supply projections are also updated. Mr. Wier said that SAWDF encourages use of reuse, conservation, and Aquifer Storage and Recovery (ASR) and that sustainable use of groundwater can protect surface water.

4. Planning Group Membership
 - a. Roll Call Attendance - Marisa Flores Gonzalez conducted the attendance roll call.

b. Attendance report - Ms. Flores Gonzalez called attention to the attendance report and reminded members that the goal is to attend at least 50% of the meetings per year.

c. River Authorities interest category

i. Acting Chair Berglund acknowledged the resignation of David Wheelock, LCRA, who retired after 9 years of service on the planning group. A plaque will be presented in recognition of his service.

The relevant bylaws were referenced, which allow for public posting of vacant positions but do not require it. The group determined that a public posting was not needed and decided to consider nomination of Mr. Wheelock's alternate to replace him.

Laurie Gillam made a motion, seconded by Christianne Castleberry, to nominate Monica Masters, Vice President of Water Resources at LCRA (River Authorities alternate) as a voting member in the River Authorities interest category; motion passes.

d. The LCRWPG accepted a nomination from the floor, per the bylaws, for Monica Masters to fill the Vice Chair position on the Executive Committee vacated by David Wheelock.

Motion by Christianne Castleberry for Monica Masters to serve as Vice Chair, seconded by Barbara Johnson; motion passes.

5. Consider approval of Minutes – Acting Chair

A motion to approve the April 27, 2022 minutes as presented was made by Lauri Gillam, seconded by Christianne Castleberry; motion passes.

6. Texas Water Development Board (TWDB) Report

a. Update on regional water planning activities and schedules – Lann Bookout, TWDB

Mr. Bookout reported that contract amendments for additional funding are due to the TWDB soon. Projection data for irrigation and mining are still on target for delivery in August 2022. In February 2023, population and demand data will be delivered to planning groups. Mr. Bookout shared that the Board approved the Interregional Planning Group nominees, and the first meeting will be held soon.

b. Demand Projections presentation– Katie Dalberg, TWDB

Via a prerecorded video presentation, Katie Dalberg provided an overview of the process by which TWDB develops projections, the schedule for data to be released, and specific projection methodologies for non-municipal water demands, population, and municipal water demand.

Carol Olewin asked if the presentation would be part of the minutes— The presentation materials were provided in packets, will be summarized in the minutes, and the full video is posted online ([Sixth Cycle Regional Water Planning Documents | Texas Water Development Board](#)).

Marisa Flores Gonzalez asked about Census 2020 population undercounts. Lann Bookout recommended reaching out to Katie Dalberg for clarification.

7. Committee Reports

- a. Population and Demand Projections Committee Report – Lauri Gillam, Committee Chair

Ms. Gillam reported that the group met in the Spring and the morning of the LCRWPG meeting and indicated that Stephanie Moore, INTERA, would be providing a presentation to cover discussion and recommendations.

Ms. Moore presented slides to the committee and reported that revisions to the Water User Group (WUG) list would be due to TWDB the week of July 25th.

9. Consultant Report – Stephanie Moore, INTERA

- a. Ms. Moore reviewed the projection and review process outlined by Ms. Dalberg as a brief Regional Water Planning 101.

- b. Progress to date

- i. Ms. Moore reported that TWDB released Draft Livestock, Manufacturing and Steam Electric Projections January 2022, and requests for revisions are due July 2023. Ms. Moore provided a brief review of the methodology and Region K data.

- ii. Ms. Moore reported that the recommendations for changes to the Municipal WUG list was due to TWDB by July 29th. Water User Groups (WUGs) are either a retail public utility providing over 100 Acre-Feet per Year (AFY) and owned by political subdivision, or a private, state, or federal utility providing over 100 AFY. Municipal demands that are not included as WUGs are planned for as “County Other.” INTERA’s review of the WUGs, performed at the Population and Demand Projection Committee’s request, indicates that five additional private water utilities meet the threshold to be included as WUGs in the 2026 Regional Water Plan, and a request will be submitted to TWDB.

Potential additional WUGs for inclusion in 2026 are: the Headwaters at Barton Creek, La Ventana, Lakeside MUD 3, The Colony MUD 1A, and Wilbarger Creek MUD 1.

- c. Upcoming efforts

- i. Draft Mining and Irrigation demand projections

Ms. Moore reported that the draft Mining and Irrigation demand projections will be released in August 2022 and revisions will be requested by July 2023.

ii. Draft Municipal demand projections

Ms. Moore reported that the draft municipal demand projections will be released in February 2023 and revisions will be requested by August 2023.

Ms. Moore noted that the consultant schedule is available in the meeting packet.

8. The recommendations from the Population and Demand Projections Committee regarding Water User Group designations were considered.

Lauri Gillam made a motion to approve and submit to TWDB the presented Water User Group (WUG) list with draft revisions; Barbara Johnson seconds; motion passes.

10. Interregional Coordination Activities – Acting Chair

- a. Acting Chair Berglund called for updates as part of the Interregional Planning Council report; no meeting had occurred.
- b. Acting Chair Berglund called for updates from liaisons to neighboring planning regions.
 - i. Liaison to Region G: Tim Loftus, alternate for Michael Redman, will serve as the GMA10 representative in light of Mr. Redman's retirement. He will not be able to serve as the Region G liaison. Barbara Johnson noted that her alternate, Terry Bray, has expressed interest in serving in that role.
 - ii. Liaison to Region J: Kay Wischkaemper, alternate for Paul Tybor, did not have an update.
 - iii. Liaison to Region L: Ron Fieseler noted that there will be a Region L meeting August 4th and Ron will attend; only meeting once a quarter.
 - iv. Liaison to Region P: Daniel Berglund had no news to report at this time regarding Region P
 - v. Liaison to Region F: vacant
 - vi. Liaison to Region H: vacant

11. Financial Report – Acting Chair

- a. Acting Chair Berglund noted that the financial report is included in the packets for members to review.

12. Upcoming meetings:

- a. The location and date of the next Regional Water Planning Group meeting was discussed.

Ron Fieseler made a motion to hold meetings in person from now on; Emil Uecker seconded the motion. Other members expressed their support for the

motion. The motion was withdrawn. The RWPG agreed to add the item to the next agenda for possible action.

Carol Olewin noted that finding an alternate was challenging because folks did not want to make the trip to Austin and she made a request for continued hybrid meetings with the possibility that presenters could be asked to present in person.

David Lindsay noted that broader ability to participate is a consideration when making this decision as well.

Ron Fieseler made a Motion for the October 26, 2022 to be the next meeting and for it to be held in-person at LCRA's Dalchau Center in Austin, Monica Masters seconded; motion passes.

13. New / Other Business (time permitting)

None

14. Public Comments

- a. David Bradsby, who had been the non-voting member representing TPWD, is no longer with TPWD, and is now with Blanton and Associates.

15. Adjourn

- a. Meeting adjourned at 11:29 am

Item 7.a.

Update on regional water planning
activities and schedules

Lann Bookout, TWDB

Projections Timeline

Draft Water Demand Projections	Timeline
Livestock, Manufacturing, Steam-Electric Projections + Supporting Data	January 20, 2022
Water User Group List + Historical Population, Connections, Net Use, GPCD	March 16, 2022
DUE: RWPGs review WUG list + historical WUG data	July 29, 2022
Irrigation, Mining Projections + Supporting Data	August 23, 2022
Non-municipal Basin Splits	August 23, 2022
Population Projections + Plumbing Code Savings + Municipal Demand Projections	February 2023
DUE: RWPGs request revisions for non-municipal demand projections	July 14, 2023
DUE: RWPGs request revisions for population and municipal demand projections	August 11, 2023
TWDB Board Meeting to Adopt Projections	Fall 2023
DUE: Technical Memorandum	March 4, 2024



Important Considerations

- All data released thus far is available online
 - Interactive dashboards
 - Underneath each dashboard is Excel file format + methodology summaries
- <https://www.twdb.texas.gov/waterplanning/data/projections/2027/projections.asp>
- Timeframe for reviewing draft population and municipal demand projections is ~6 months
 - Regions should meet soon after release and develop strategy for meeting the deadline
 - Regions are strongly encouraged to submit non-municipal revisions requests before municipal data release
 - Declines in population will be reflected in the draft population projections



Important Considerations (cont.)

- Planning groups must take action to approve submitting revisions requests
- Planning groups encouraged to coordinate with TWDB as early as possible on potential revisions
- Guidance regarding projections revisions provided in RWP contract Exhibit C, Section 2.2
- TWDB staff available for assistance and to provide projections presentations
- RWP grant funds may not be used for revisions to TWDB **Board-adopted** projections



Item 7.b.

Methodology and projections for
irrigation demand

Katie Dalberg, TWDB

Irrigation Projections in the 2026 Regional Water Plans

Katie Dahlberg
Manager, Projections & Socioeconomic Analysis
Water Supply Planning

October 26, 2022
Lower Colorado Region K Planning Group Meeting

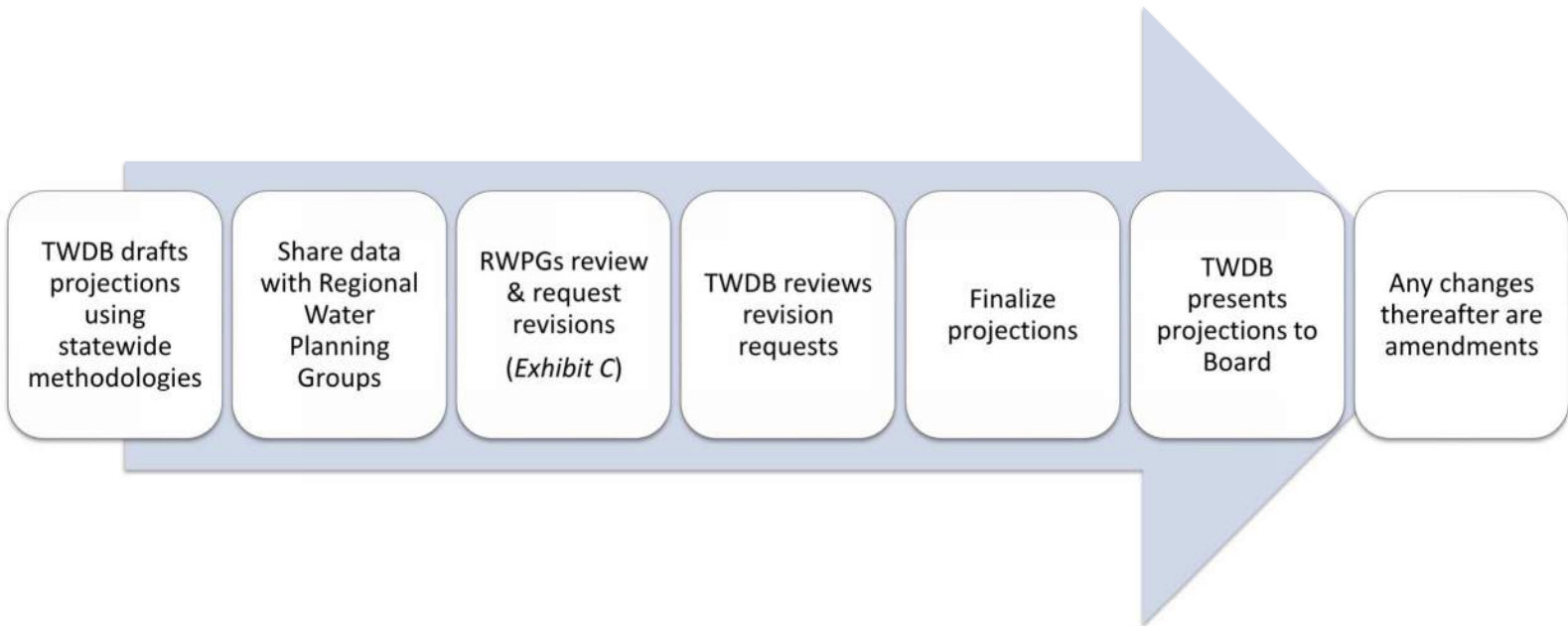


Agenda

- Overview projections process
- Projections data release schedule
- Irrigation projections methodology
 - Historical Water Use Estimates
 - Draft 2026 RWP Projections



Projections Process



Projections Timeline

Draft Water Demand Projections	Timeline
Livestock, Manufacturing, Steam-Electric Projections + Supporting Data	January 20, 2022
Water User Group List + Historical Population, Connections, Net Use, GPCD	March 16, 2022
RWPGs reviewed and revised WUG list	July 29, 2022
Irrigation, Mining Projections + Supporting Data	August 23, 2022
Non-municipal Basin Splits	August 23, 2022
Population Projections + Plumbing Code Savings + Municipal Demand Projections	February 2023
DUE: RWPGs request revisions for non-municipal demand projections	July 14, 2023
DUE: RWPGs request revisions for population and municipal demand projections	August 11, 2023
TWDB Board Meeting to Adopt Projections	Fall 2023
DUE: Technical Memorandum	March 4, 2024

Irrigation

Baseline = 5-year average (2015-2019)

Irrigated crops, self-supplied golf courses

Water sources: groundwater, surface water, reuse

Irrigation

Same methodology as 2021 RWPs

2030 – 2080 held constant

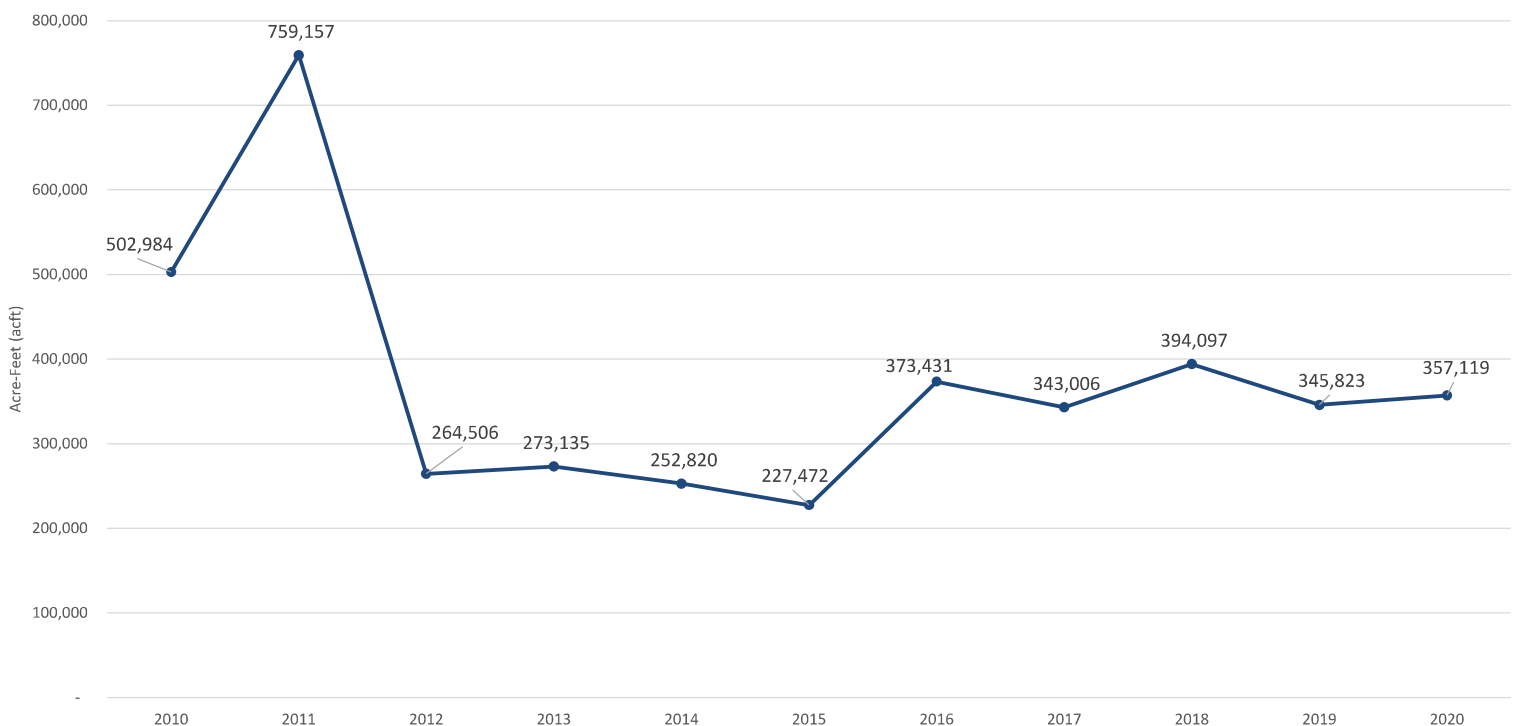
- Except counties where groundwater availability (MAG + Non-MAG) is less than the groundwater-portion of the demand projections
- Decline commensurate with groundwater availability

Annual Irrigation Water Use Estimates

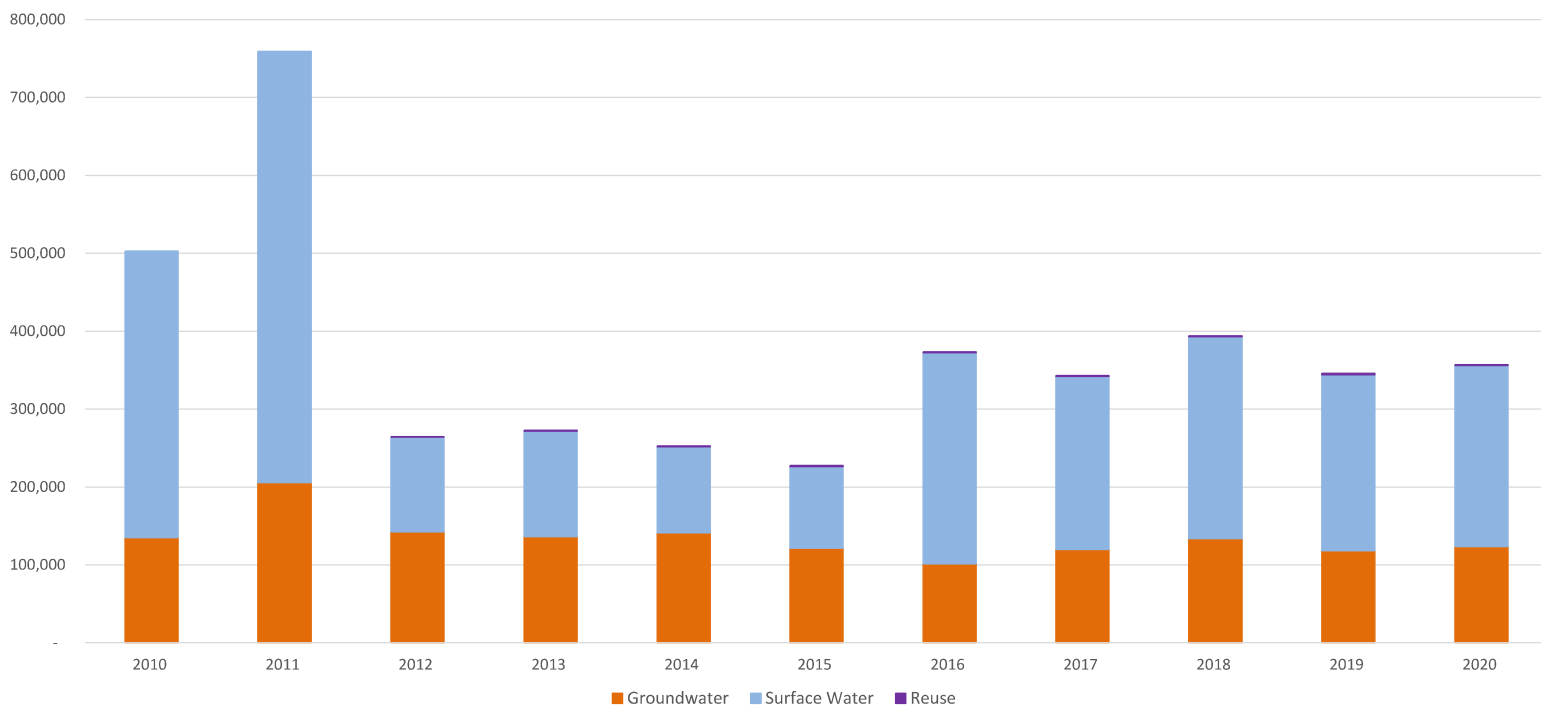
- TWDB Water Science & Conservation – Ag Conservation
- Crop data is collected from U.S. Department of Agriculture - Farm Service Agency
 - + Local sources when available
- Surface water irrigation diversion releases provided by TCEQ Watermasters
- GCDs assist by reviewing the estimates and suggesting revisions based on local expertise

<https://www.twdb.texas.gov/conservation/agriculture/irrigation/index.asp>

Region K - Historical Irrigation Water Use Estimates (acft)



Region K - Historical Water Use by Source (acft)



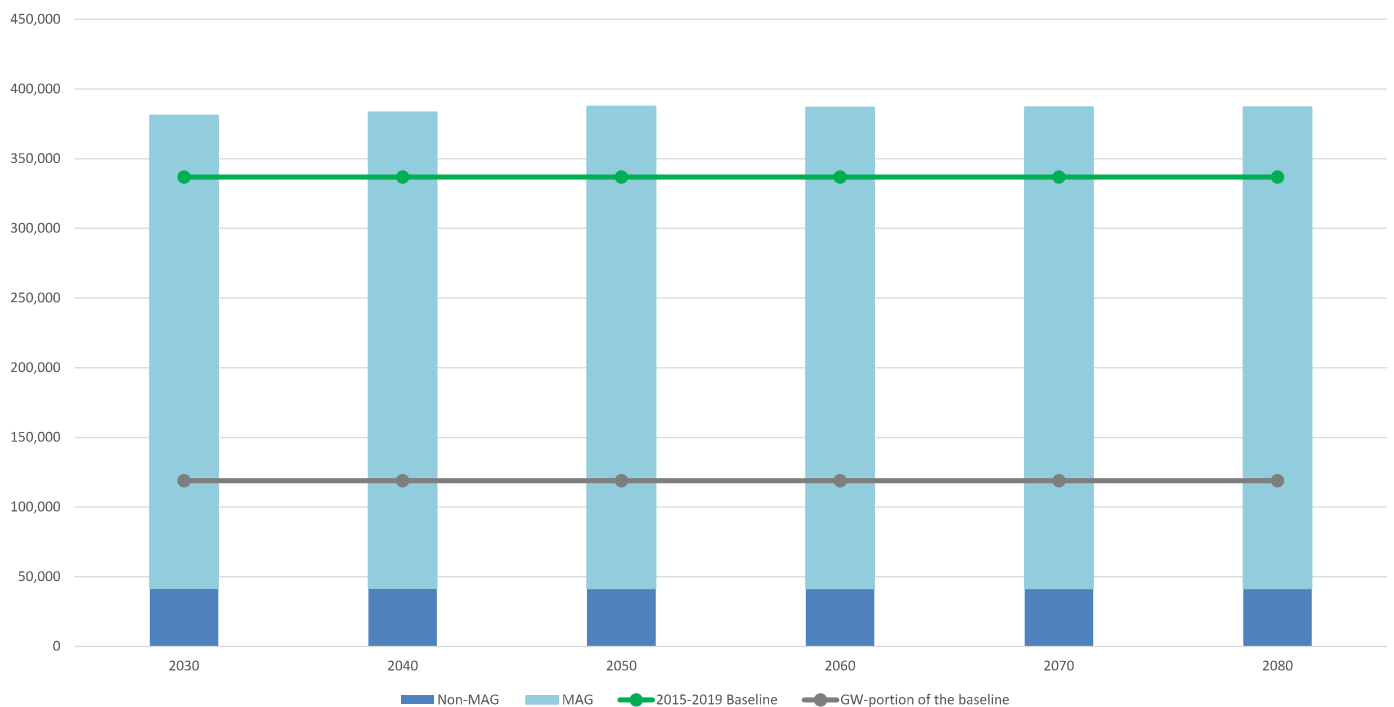
Historical Irrigation Water Use by County (acft)

County	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019
BASTROP	7,049	5,061	3,781	3,064	2,444	3,204	2,872	5,093	5,571	7,066
BLANCO	369	357	2,150	1,825	1,932	1,339	1,398	2,152	2,342	2,338
BURNET	1,500	1,075	1,841	1,477	1,595	2,020	1,733	2,065	2,022	2,114
COLORADO	150,038	214,548	87,518	82,916	83,390	68,956	104,470	94,822	111,140	99,079
FAYETTE	325	1,655	1,167	494	499	472	711	859	732	842
GILLESPIE	1,461	3,465	2,280	2,278	2,429	2,564	2,386	2,463	2,450	2,427
HAYS	510	687	593	357	479	433	346	428	320	386
LLANO	335	2,420	921	714	601	599	683	568	677	715
MATAGORDA	161,116	243,000	47,983	58,303	37,122	43,251	107,370	88,879	104,949	90,304
MILLS	4,233	5,498	5,218	4,238	4,529	5,934	4,622	4,036	3,021	4,964
SAN SABA	5,691	7,900	7,494	6,933	7,975	7,012	7,729	7,501	9,846	8,348
TRAVIS	3,725	5,880	4,526	6,497	9,424	11,327	2,177	2,111	2,289	2,399
WHARTON	166,632	267,611	99,034	104,039	100,401	80,361	136,934	132,029	148,738	124,841
Region K	502,984	759,157	264,506	273,135	252,820	227,472	373,431	343,006	394,097	345,823

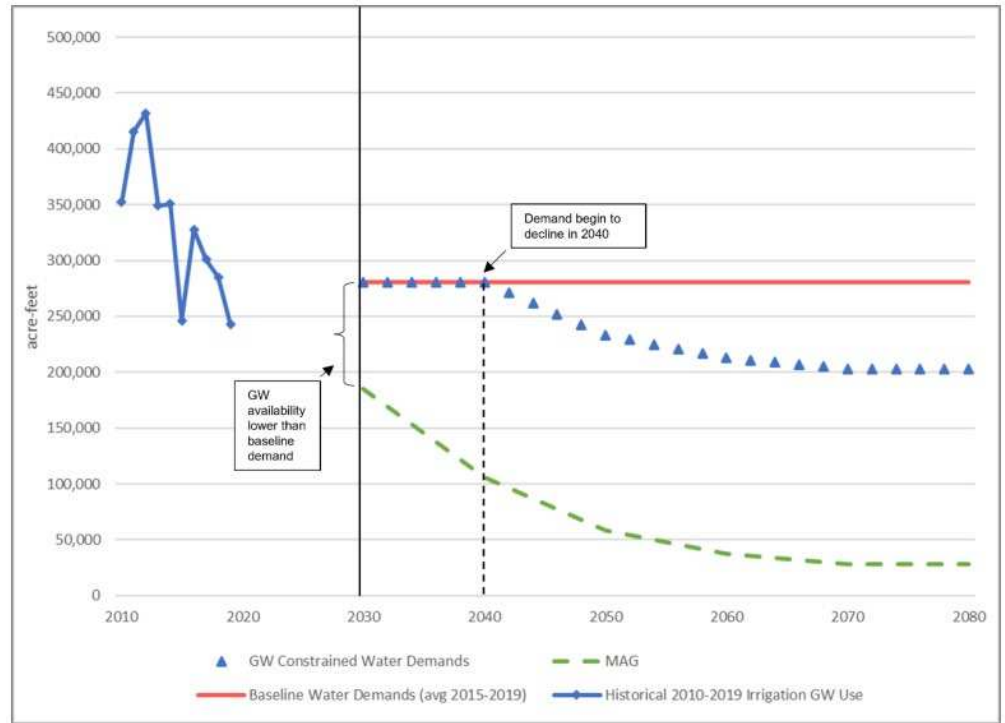
Irrigation Projections

- Develop projections
- Project future use by source, based on historical use
 - Whole county-level
 - Project each decade groundwater use for each county
- Compare to MAG + Non-MAG projected by decade
- Updated MAGs: GMAs 7 & 15
- MAGs in progress: GMAs 1, 8, 9, 10, & 12

Region K - MAGs + Non-MAGs & 5-year average baseline

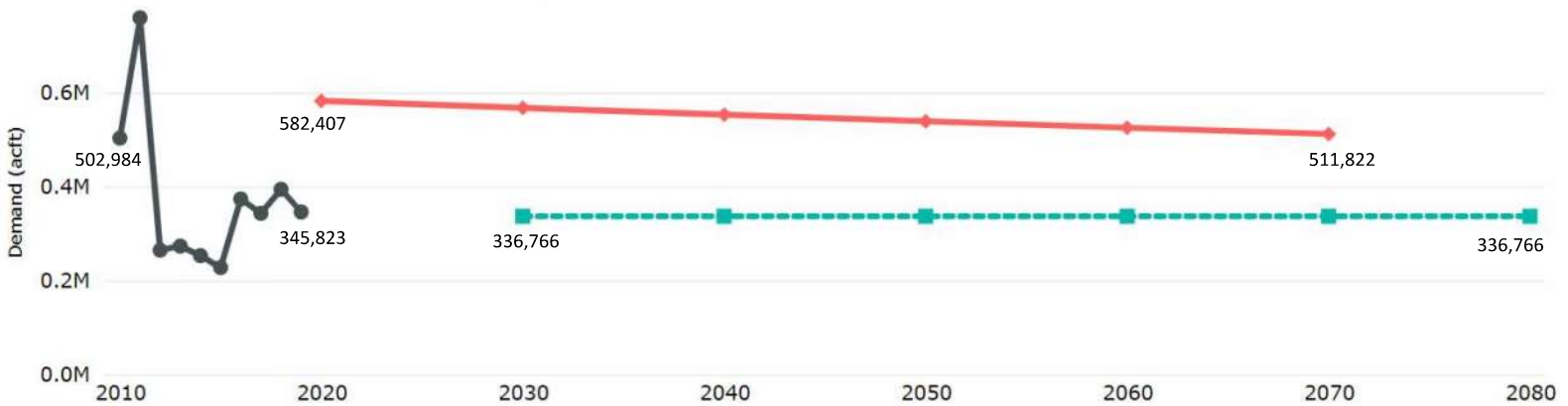


Irrigation Projections Methodology - Example of Constrained Counties



Region K - draft 2026 RWP irrigation projections

Data Source ● Historical ◆ 2022 State Water Plan ■ Draft 2027 State Water Plan



2026 RWP Draft Projections Website

<https://www.twdb.texas.gov/waterplanning/data/projections/2027/projections.asp>

The screenshot shows the Texas Water Development Board website. The header includes the logo, a search bar, and social media icons. The main navigation menu is highlighted, with 'Water Planning' selected. Below the navigation, there are four columns of links: STATE WATER PLAN, REGIONAL WATER PLANNING, PLANNING DATA, and WATER USE SURVEY. The 'Population & Water Demand Projections' link is highlighted in the 'PLANNING DATA' column.

www.twdb.texas.gov

www.facebook.com/twdbboard

[@twdb](https://twitter.com/twdb)



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Questions?

Contact:

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512-463-2449

Stay connected:



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Item 7.c.

Methodology and projections for
mining demand

Bob Reedy, BEG

Mining Water Use in Texas

August 25, 2022

Funded by
United States Geological Survey Cooperative Agreement No. G20AC00339

Prepared for
Texas Water Development Board under Contract 2100012474
Contract period: Sep 2020-Aug 2022

Robert C. Reedy, P.G., and Bridget R. Scanlon, P.G.

Bureau of Economic Geology
Jackson School of Geosciences
The University of Texas at Austin



Acknowledgments & Disclaimers

This study is based on excellent databases maintained by the TWDB, the TCEQ, the TRRC, the US Geological Survey, and the US Energy Information Administration.

We are grateful for thoughtful project management and insights of Katie Dahlberg and Yun Cho of the TWDB. We are also grateful for cooperation provided by C. J. Tredway of the Texas Oil and Gas Association.

This study was funded by the USGS under Cooperative Agreement No. G20AC00339. The views and conclusions contained in this document are those of the authors and should not be interpreted as representing the opinions or policies of the U.S. Geological Survey. Mention of trade names or commercial products does not constitute their endorsement by the U.S. Geological Survey.

Project Overview

Oil and Gas Industry

- Quantify current and historical water use for hydraulic fracturing (HF) and produced water (PW) volumes
- Identify the sources and quality of water for hydraulic fracturing
- Develop projections of future water demand for hydraulic fracturing for oil & gas (2030–2080)

Coal Mining

- Identify locations of operations and quantify current and projected future water use for coal mining

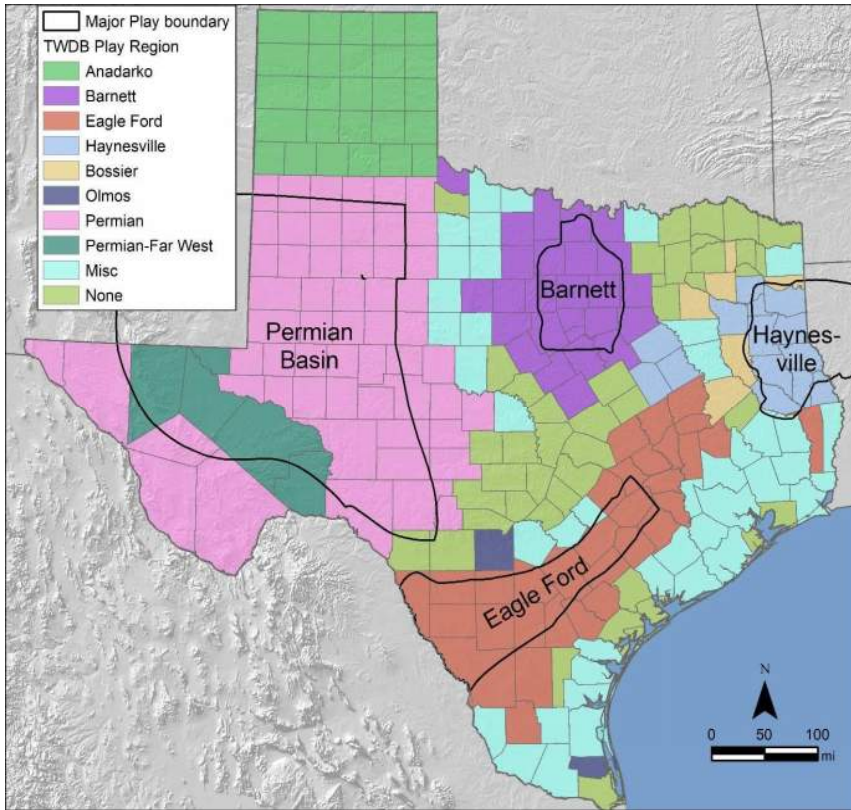
Aggregates Mining

- Identify locations of operations and quantify current and projected future water use for aggregates mining

Hydraulic Fracturing (HF) – Sources & Methods

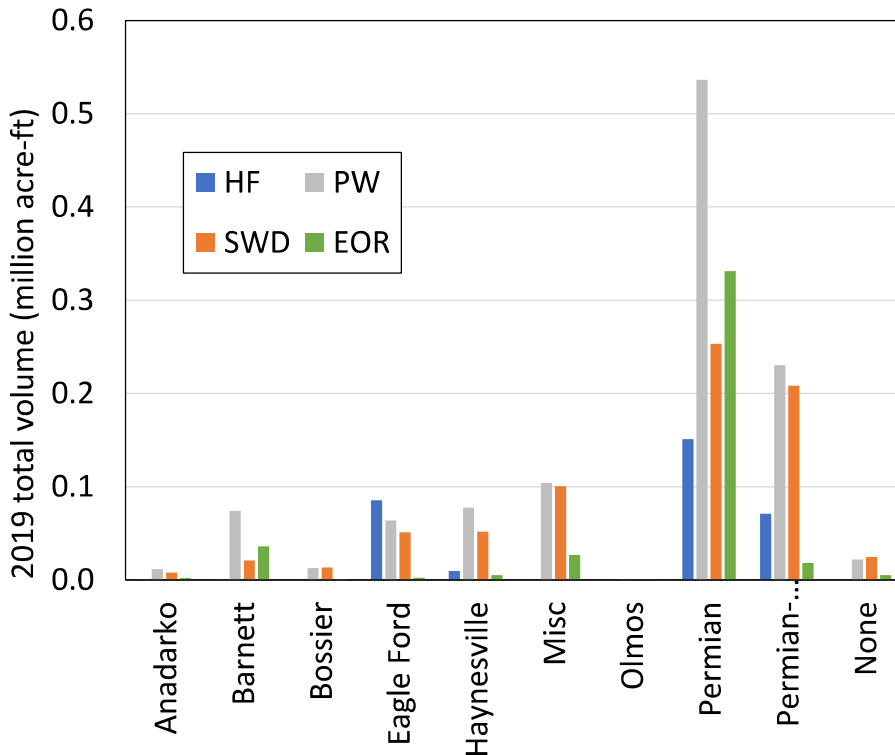
<u>Water Volumes</u>	IHS database, FracFocus database, B3 Insight (all sourced from Texas RRC). Includes HF, Produced Water (PW), Salt Water Disposal (SWD), and Enhanced Oil Recovery (EOR).
<u>HF Water Quality</u>	FracFocus database, TWDB groundwater database, Kriged maps of water quality (probability of TDS > 1000 mg/L) by aquifer from a previous report combined with O&G industry groundwater well locations.
<u>HF SW/GW splits</u>	General water source availability and industry reporting.
<u>Projections</u>	Primarily based on of Total Recoverable Resource (TRR) analysis and population growth trends.

Oil and Gas Play Regions in Texas



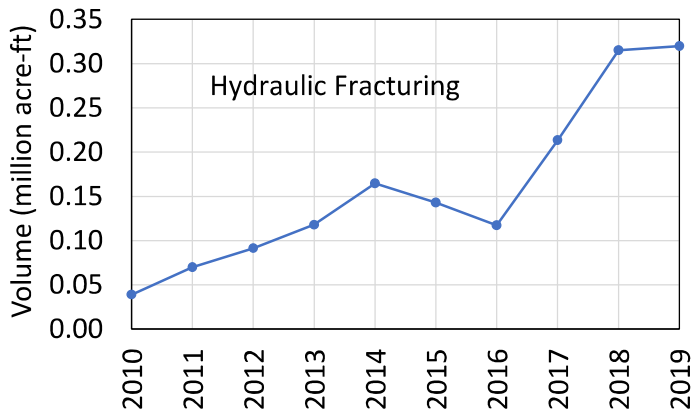
- Distribution of oil and gas plays and regions in Texas for county areas as defined by TWDB (shaded areas).
- Generalized boundaries of the four major unconventional plays (outlined areas).

Oil and Gas Industry Water Volumes in 2019

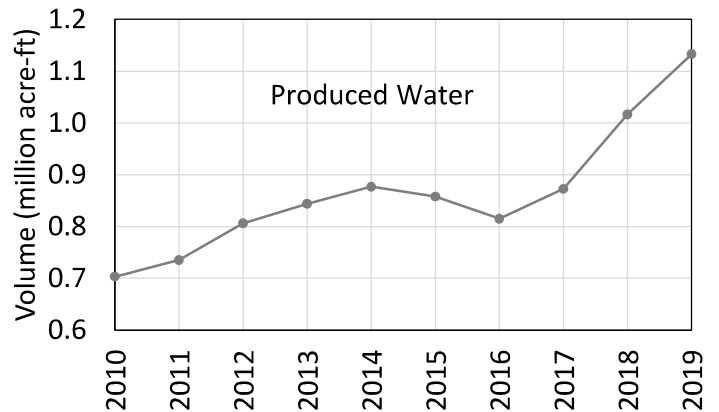


- Relative volumes of HF, PW, SWD, and EOR by play.
- The Permian Basin (including Far West) dominates in all categories.
- This study focused on the four major unconventional plays:
 - Barnett
 - Eagle Ford
 - Haynesville
 - Permian

HF and PW Volumes in Texas for 2010-2019

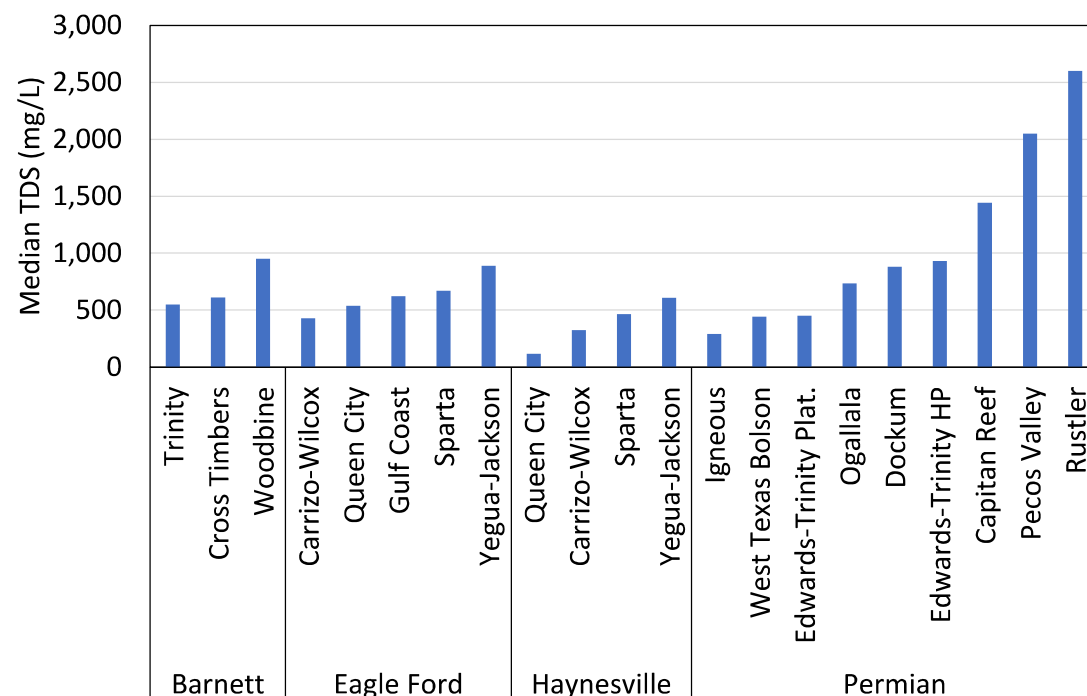


HF increased by ~700%
Currently ~320,000 ac-ft/yr



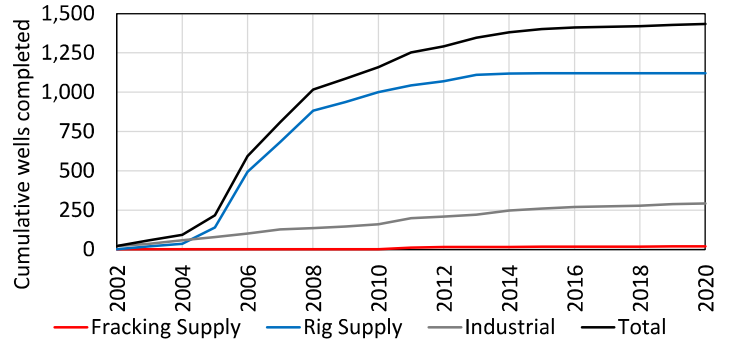
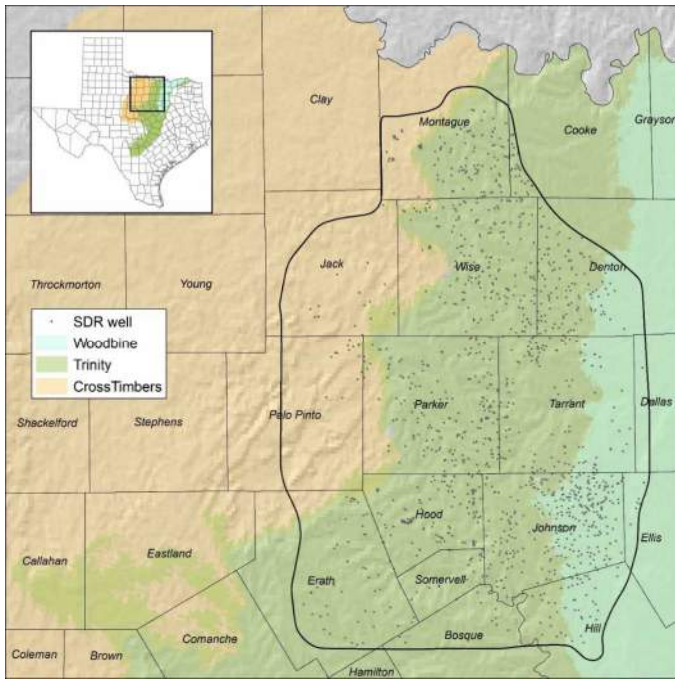
PW increased by about ~60%
Currently ~ 1,133,000 ac-ft/yr

Groundwater Quality Based on TWDB GW Database



- At the play level, most aquifers have median TDS concentrations <1000 mg/L.
- FracFocus database did not contain significant water source or quality information.

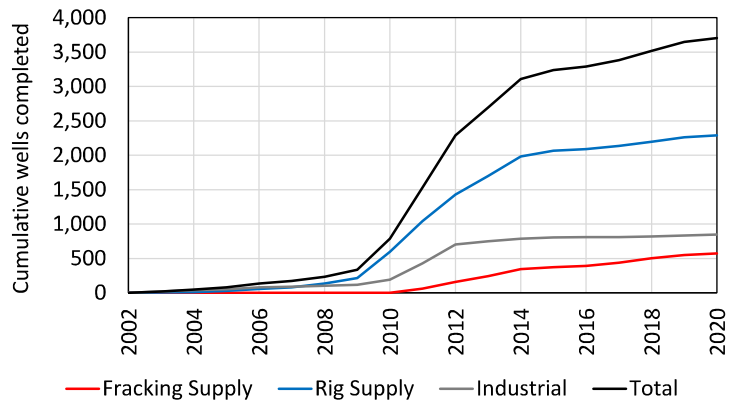
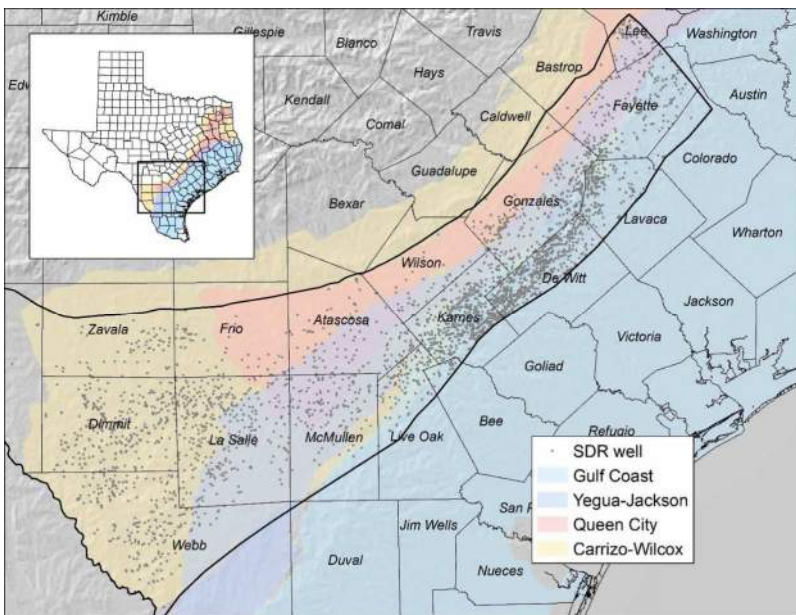
Barnett Play O&G Groundwater Sources



1,448 GW wells completed

- 96% Trinity
- 4% Woodbine & Cross Timbers

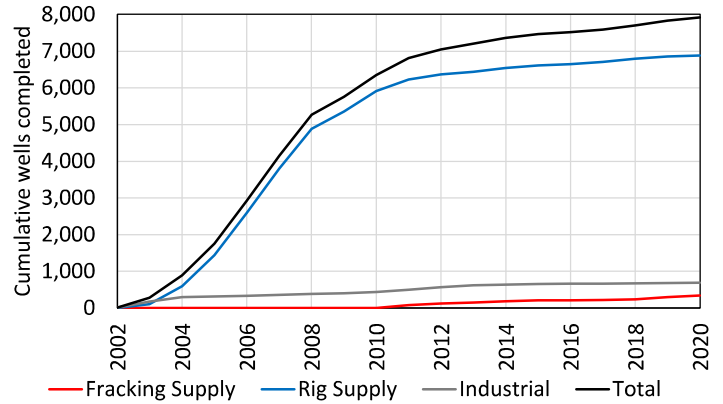
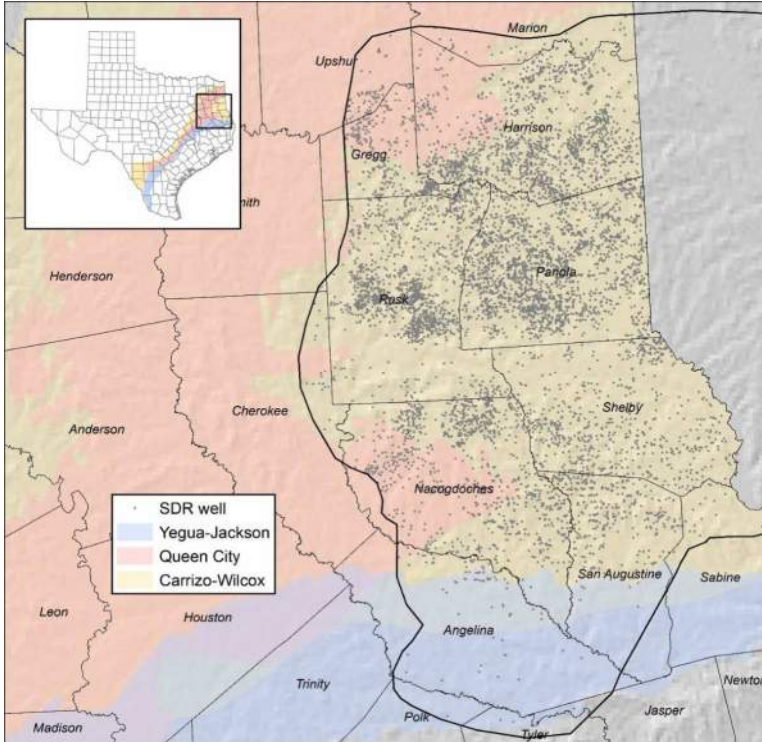
Eagle Ford Play O&G Groundwater Sources



3,707 GW wells completed

- 35% Gulf Coast
- 32% Carrizo-Wilcox
- 26% Yegua-Jackson
- 7% Queen City

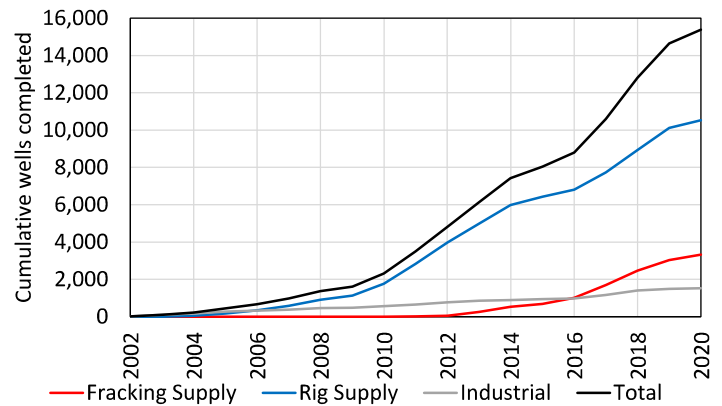
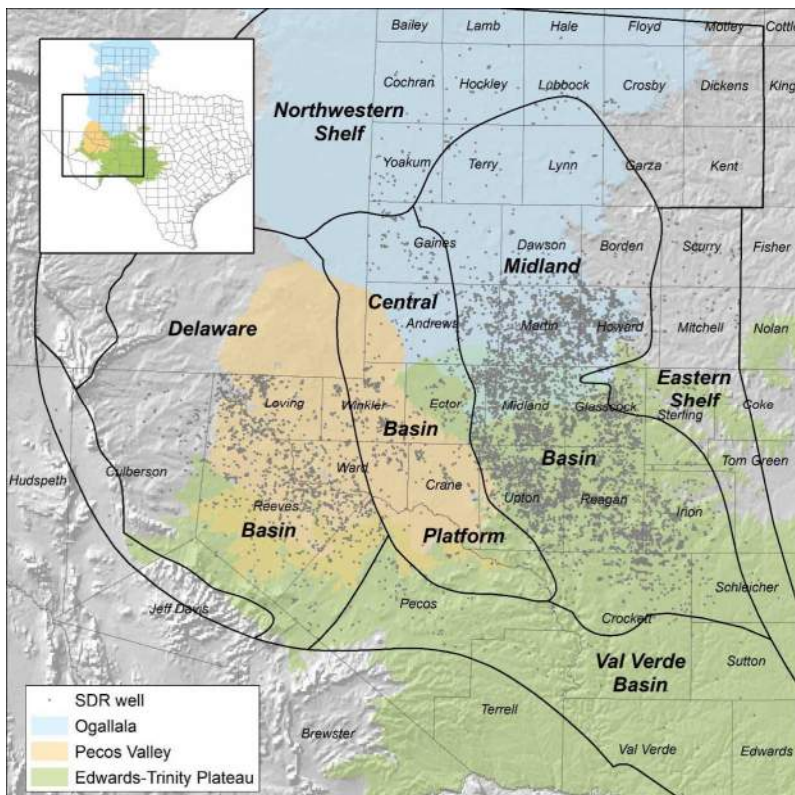
Haynesville Play O&G Groundwater Sources



7,919 GW wells completed

- 96% Carrizo-Wilcox
- 3% Queen City
- 1% Yegua-Jackson

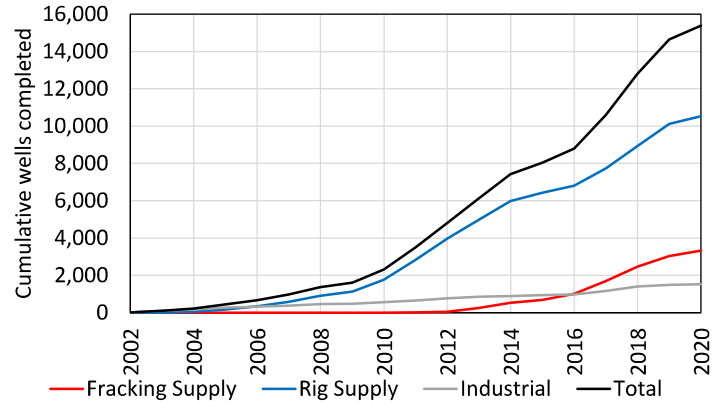
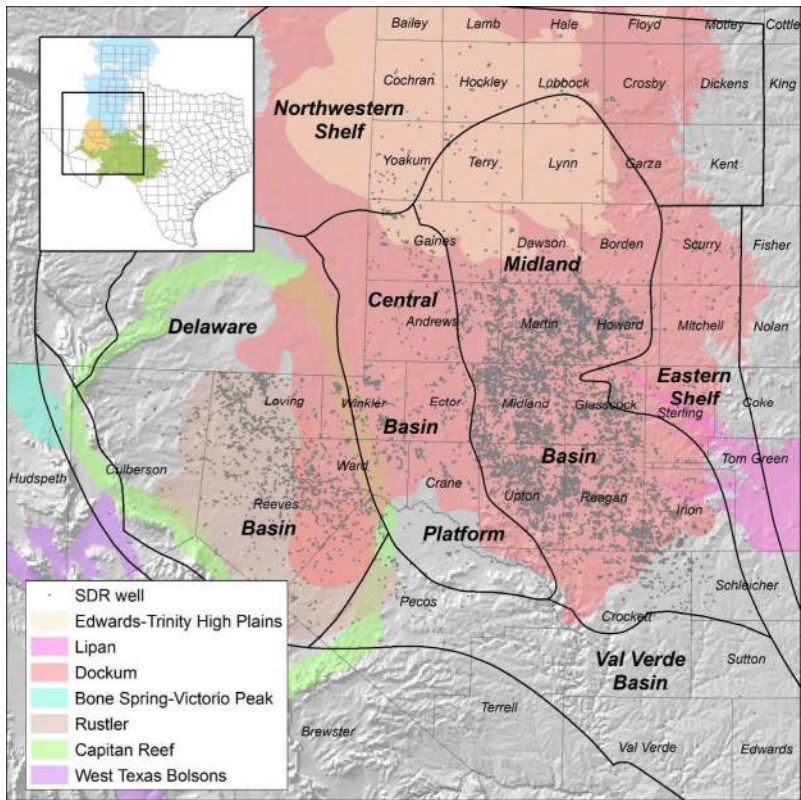
Permian Basin O&G Groundwater Sources



15,440 GW wells completed

- 37% Ogallala
- 32% Dockum
- 12% Edwards-Trinity Plateau
- 9% Permian (not mapped)
- 6% Pecos Valley
- 4% all others

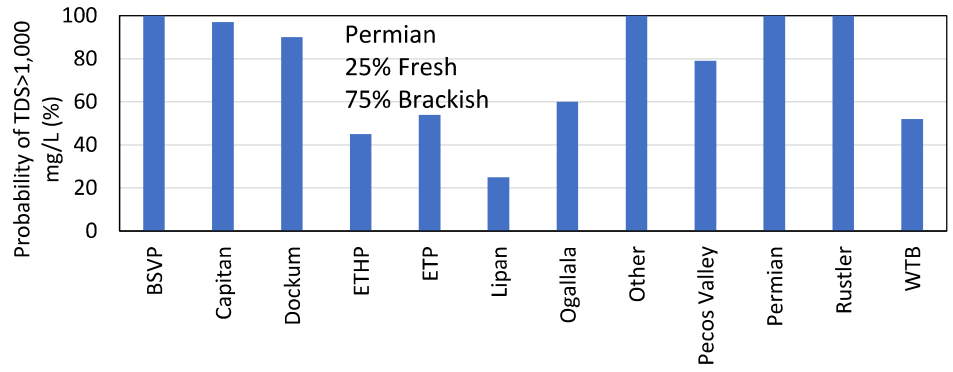
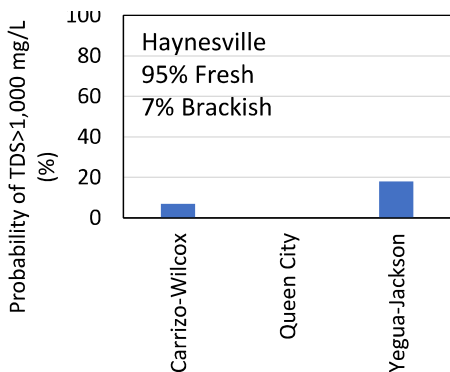
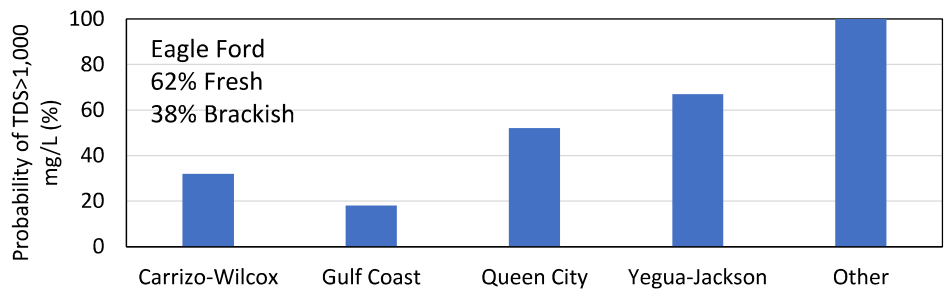
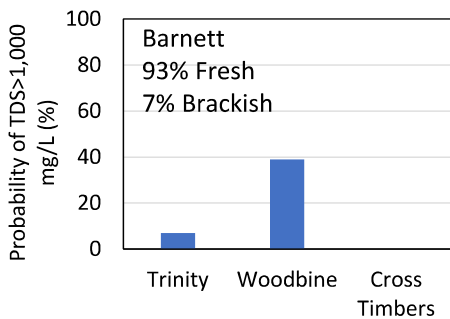
Permian Basin O&G Groundwater Sources



15,440 GW wells completed

- 37% Ogallala
- 32% Dockum
- 12% Edwards-Trinity Plateau
- 9% Permian (not mapped)
- 6% Pecos Valley
- 4% all others

Estimated Groundwater Quality by Play and Aquifer

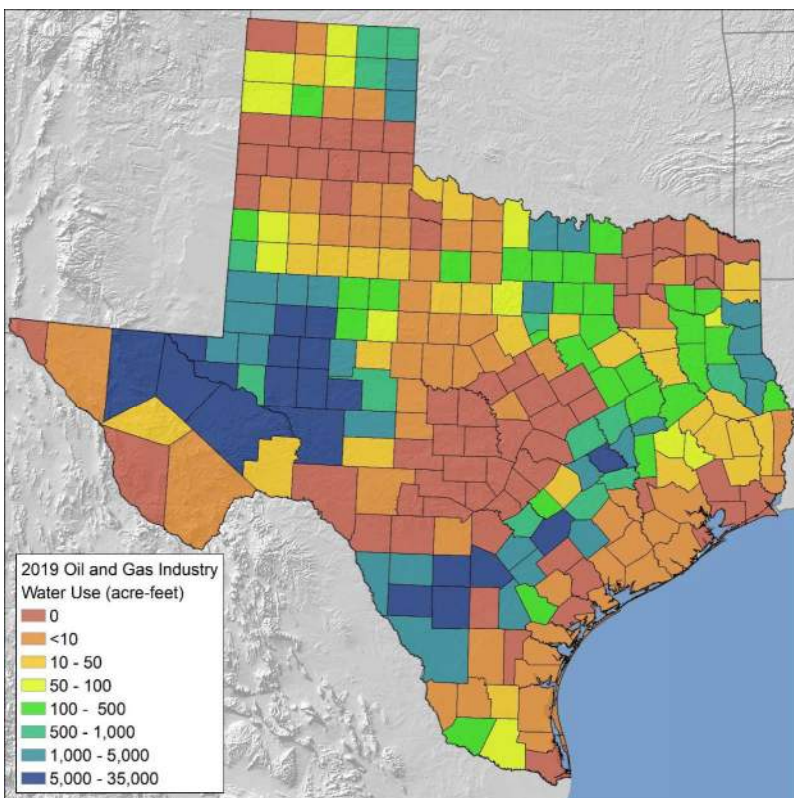


Based on kriged probability values at the locations of the O&G industry groundwater wells.

Estimated HF Water Sources by Play

Play Name	GW (%)	SW (%)	Reuse (%)
Anadarko	100	0	0
Barnett	100	0	0
Bossier	70	30	0
Eagle Ford	100	0	0
Haynesville	70	30	0
Misc	100	0	0
Olmos	100	0	0
Permian	85	0	15
Permian-Far West	85	0	15
None	100	0	0
Statewide	89	1	10

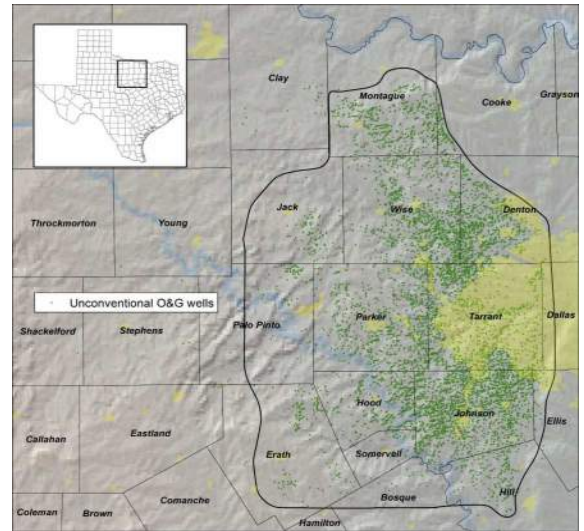
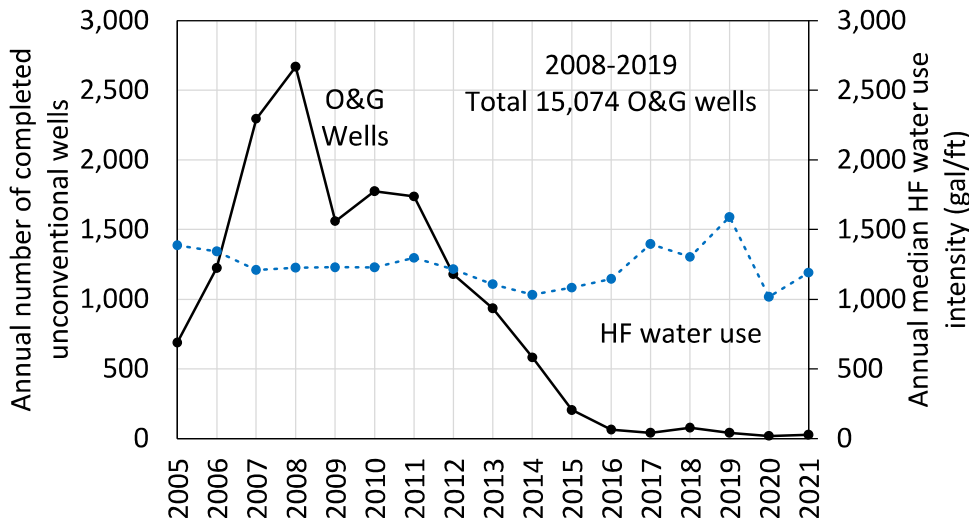
- Groundwater is the dominant source for O&G industry water due to more convenient availability and lower cost relative to surface water.
- Quantification of produced water reuse in the Permian Basin is difficult due to a lack of reporting.



Total O&G Water Use by County Area

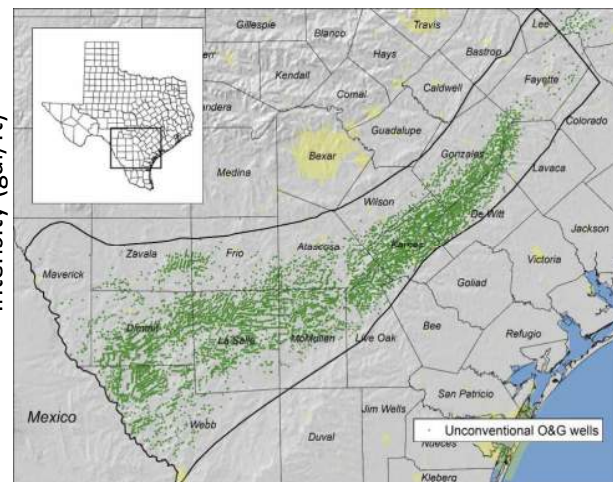
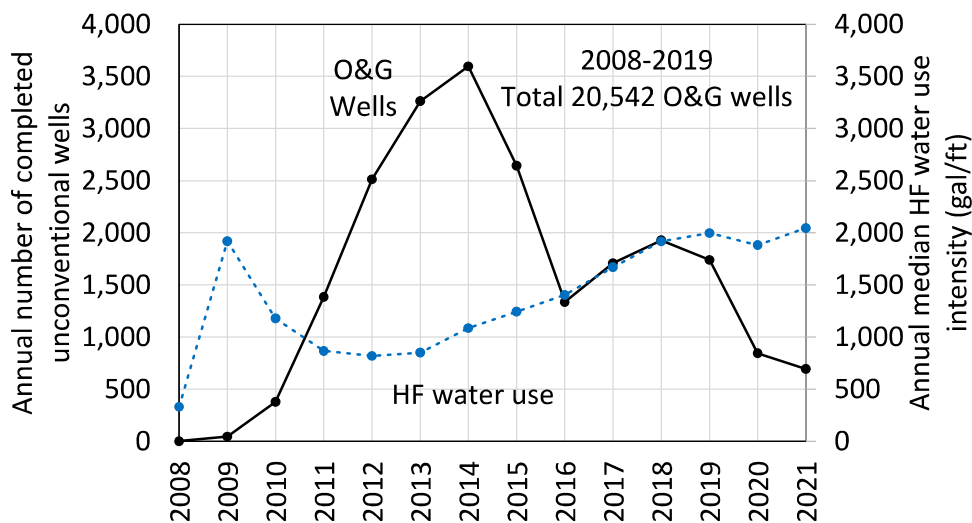
- Statewide total HF water use was 320,000 ac-ft for completion of 11,300 unconventional wells representing 80% of total mining water use.
- Water use was primarily in the Permian Basin (69%) and Eagle Ford Play (27%).
- The Haynesville represented 3% and all other areas combined represented 1%.

Barnett Play HF Water Use Projections



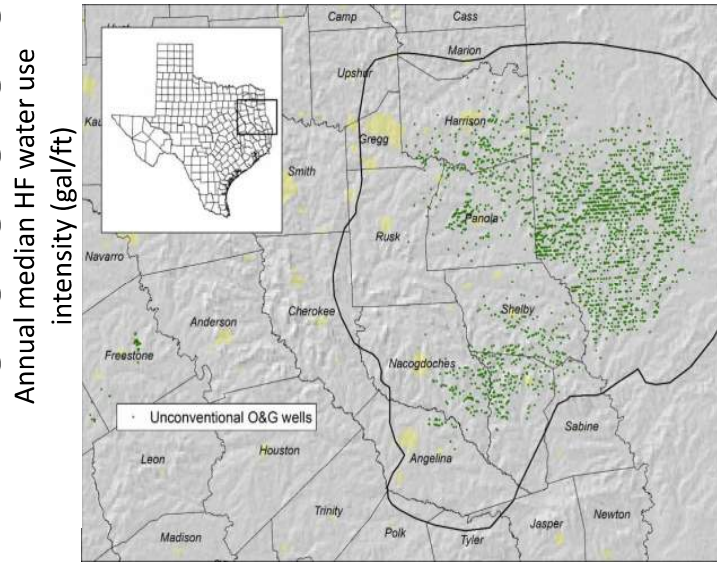
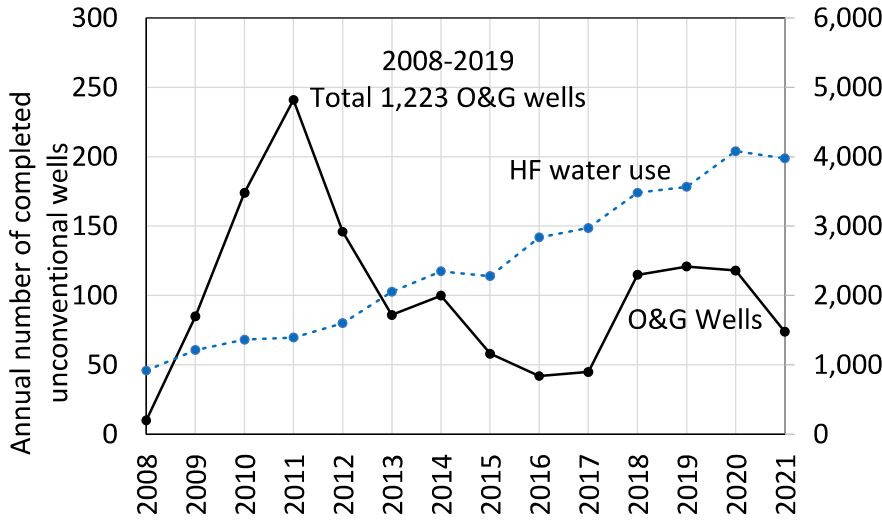
- The Barnett Play is considered largely mature.
- Projected water use is estimated to be ~1,000 ac-ft/yr focused in the core area (Denton, Johnson, Tarrant, and Wise counties).
- Trends since 2015 indicate that new drilling may cease in about 2030 with a total remaining HF water use demand of 11,400 ac-ft.

Eagle Ford Play HF Water Use Projections



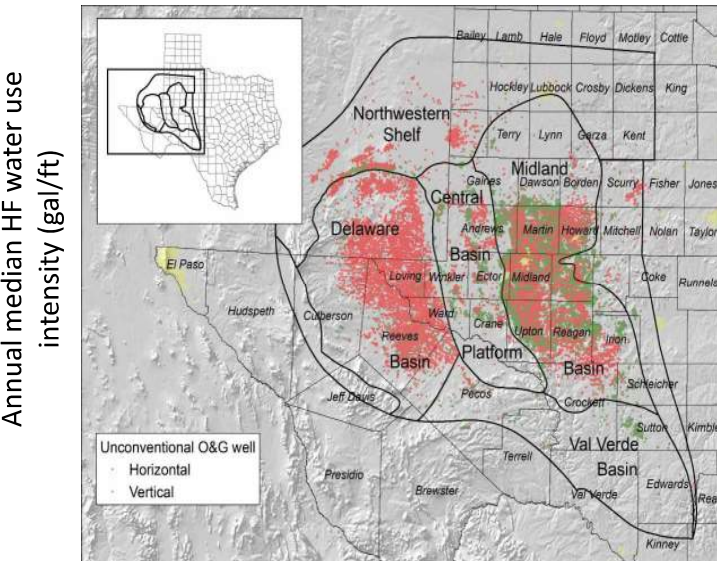
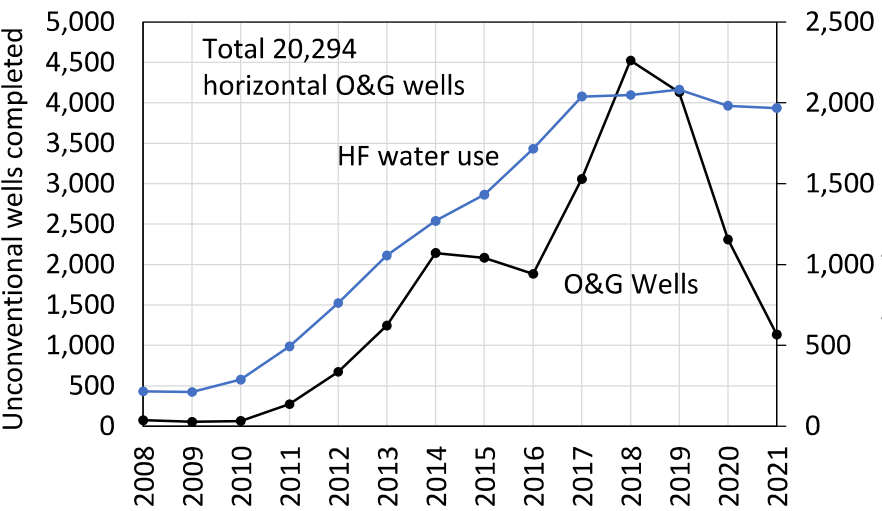
- Based on TRR analysis, the Eagle Ford Play is projected to have ~112,000 O&G wells at maturity. Assuming 1,800 wells/yr, drilling will be complete in 2071.
- Based on a water use intensity of 2,000 gal/ft, projected water use is estimated to be ~56,000 ac-ft/yr with a total of ~2.9 million ac-ft remaining.

Haynesville Play HF Water Use Projections



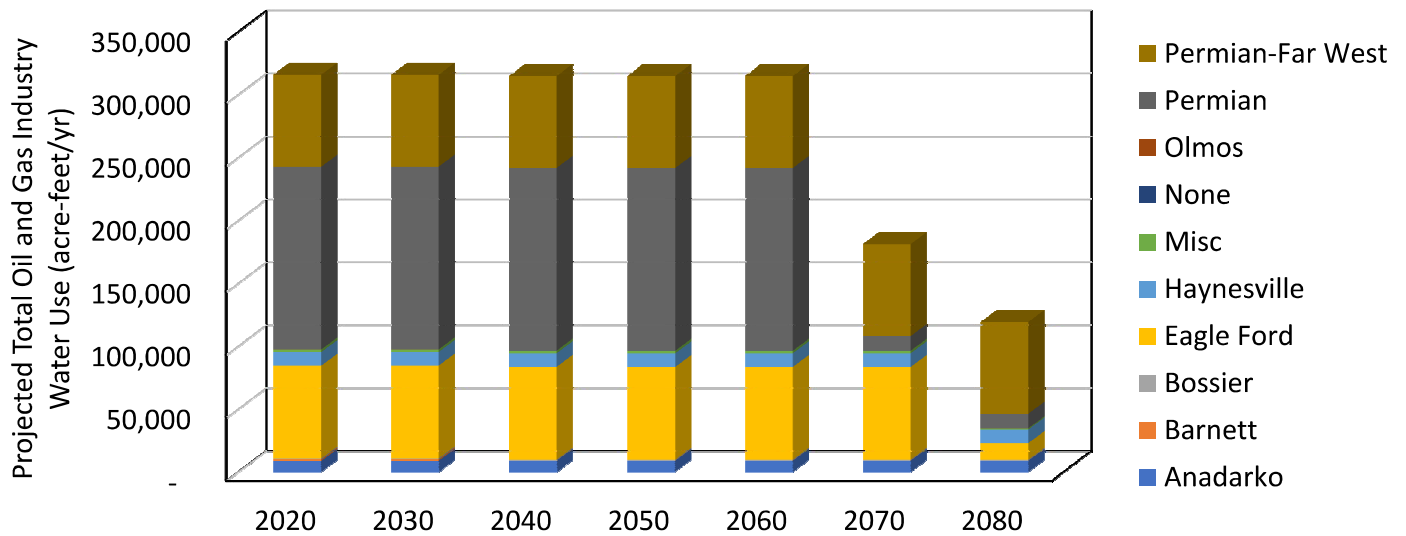
- Based on TRR analysis, the Haynesville Play in Texas is projected to have ~17,600 O&G wells at maturity. Assuming 120 wells/yr, drilling will be completed in 2156.
- Based on a water use intensity of 2,700 gal/ft, projected water use is estimated to be ~7,500 ac-ft/yr with a total of ~1.0 million ac-ft remaining.

Permian Basin HF Water Use Projections



- Based on TRR analysis for only the Wolfcamp A & B formations, the Permian basin in Texas is projected to have ~240,000 O&G wells at maturity. Assuming 1,700 wells/yr in the Delaware Basin and 2,400 wells/yr in the Midland Basin, drilling will be complete in 2096.
- Based on a water use intensity of 2,000 gal/ft, projected water use is estimated to be ~210,000 ac-ft/yr with a total of ~12.1 million ac-ft remaining.

Oil and Gas Industry Water Use Projections

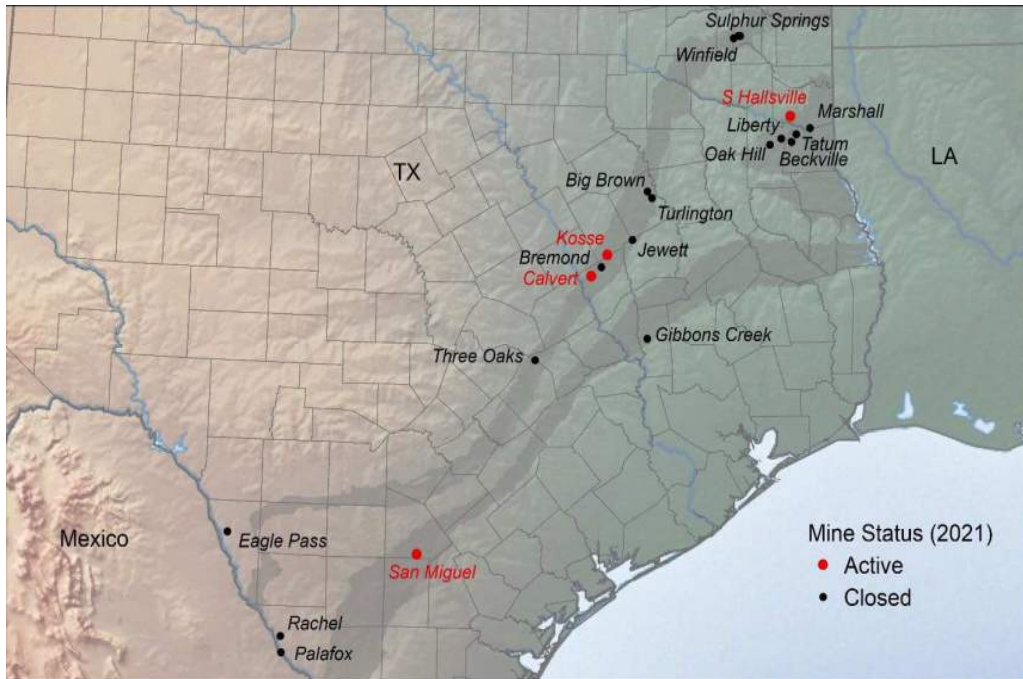


Total annual water use by the O&G industry is projected to be ~315,000 ac-ft/yr for the next several decades. Projections are shown by basin assuming steady drilling rates and median HF water use intensities as described previously.

Coal Mining Water Use – Sources & Methods

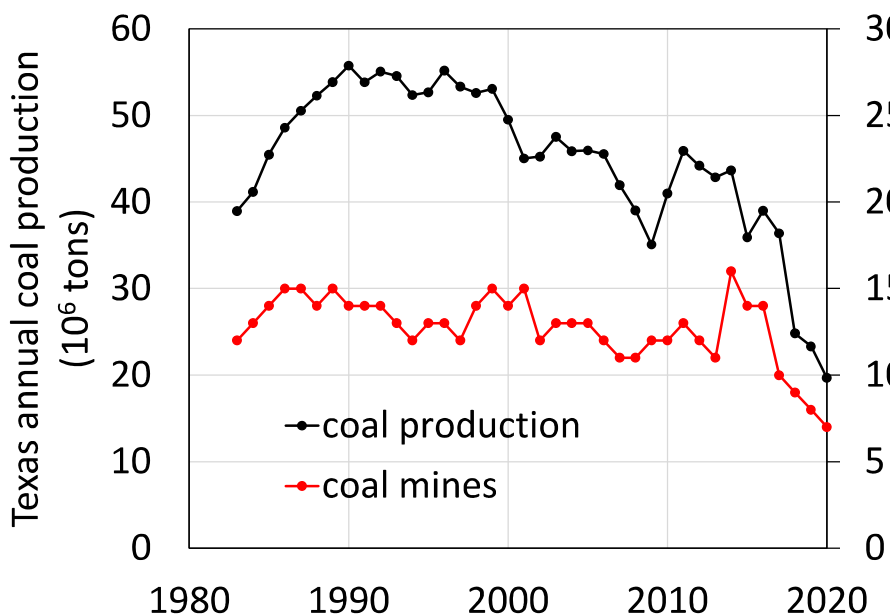
- Water volumes and sources provided by mine operators to TWDB through annual water use surveys with 100% of active coal mining operations responding
- Water use projections are based on current industry plans and/or associated power plant equipment (boiler) life spans.

Coal Mines in Texas



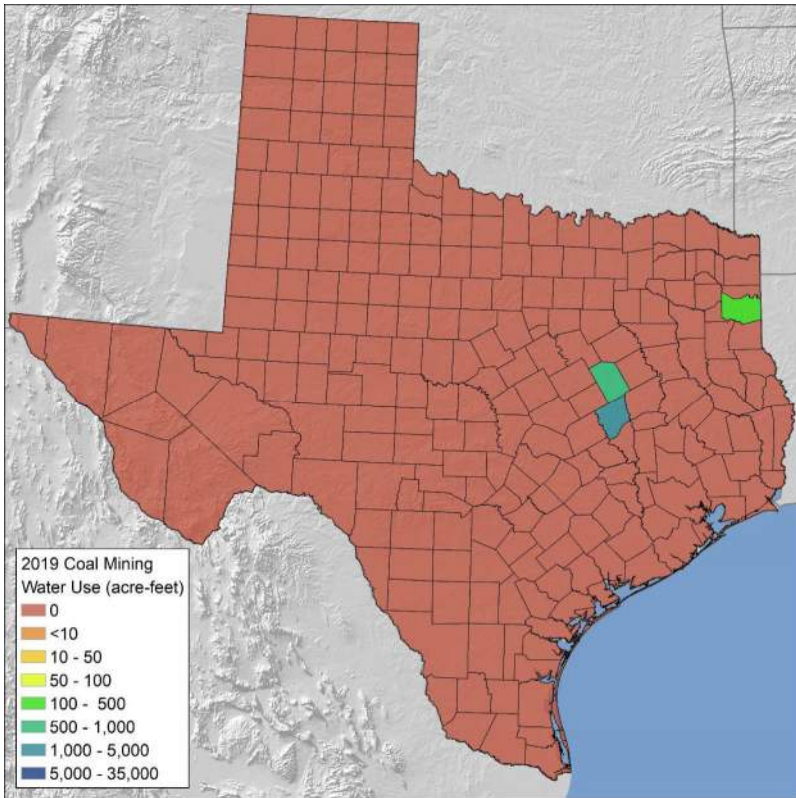
- Locations of active and recently closed coal mines in Texas. Mines are generally associated with either the Wilcox Group or the Jackson Group.
- Texas coal occurs almost completely as lignite, with the exception of bituminous grade coal in the Eagle Pass mine.
- All mines are or were surface operations. Water use is generally for dewatering or depressurizing purposes.

Coal Mining in Texas 1983-2020



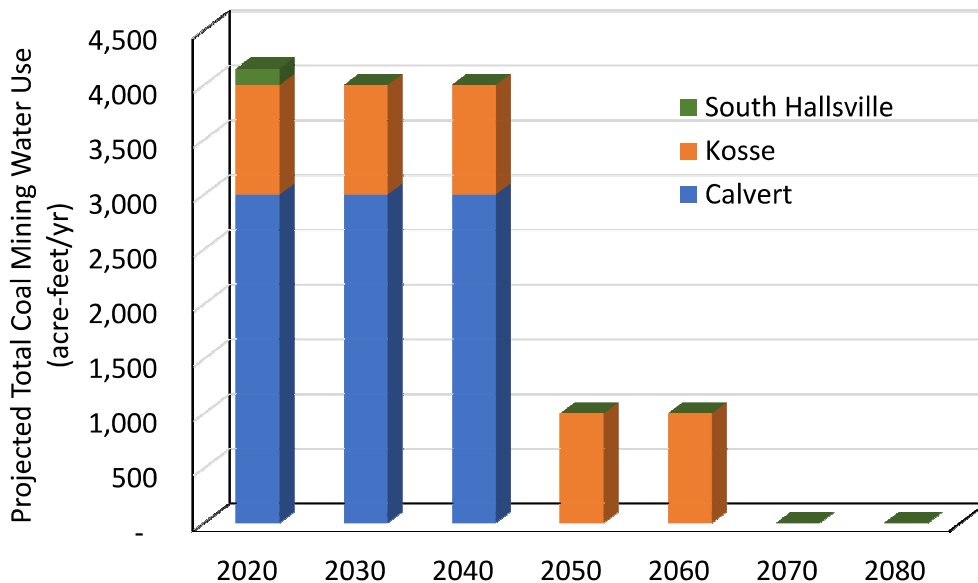
- Coal mining in Texas is in steep decline due to a shift away from Texas lignite to cleaner sub-bituminous coal from the Powder River Basin and also to closures of generation plants due to a general shift away from coal towards natural gas and other energy sources.
- There are currently (2022) four remaining active coal mines in Texas. The South Hallsville Mine and its associated Pirkey Power Plant are scheduled to close in late 2023.

Total Coal Mining Water Use by County Area



- Statewide total HF water use was 4,000 ac-ft associated with three of the remaining active coal mines representing 1% of total mining water use.
- Water use was primarily groundwater (80%) followed by surface water (20%).

Coal Mining Water Use Projections

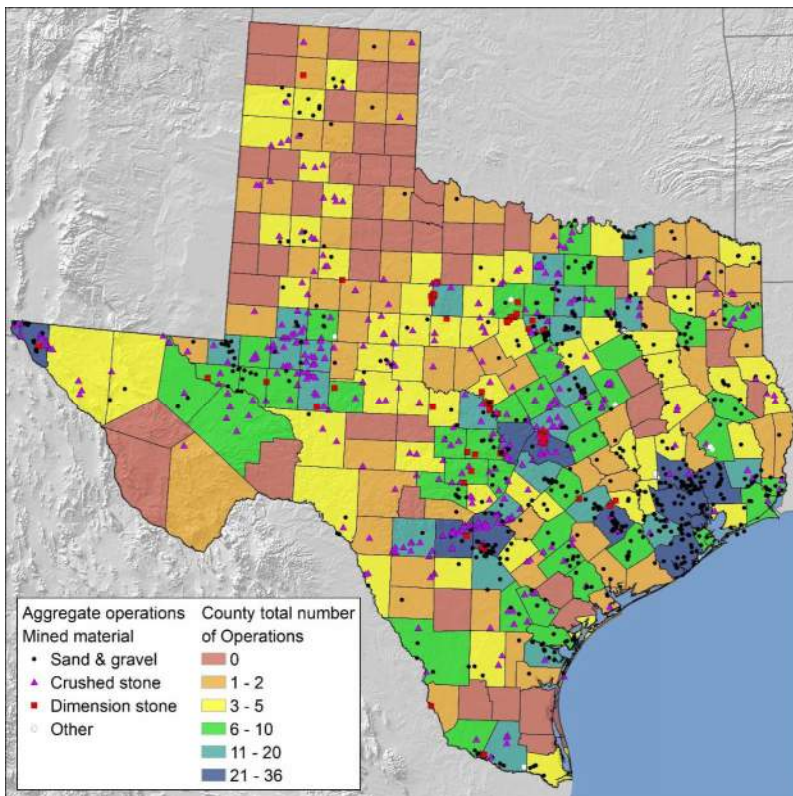


- The South Hallsville mine is scheduled to close in 2023.
- The Kosse and Calvert mines are estimated to close when the associated power plant boilers reach their design life span.
- The San Miguel Mine reported zero water use.

Aggregates Mining Water Use – Sources & Methods

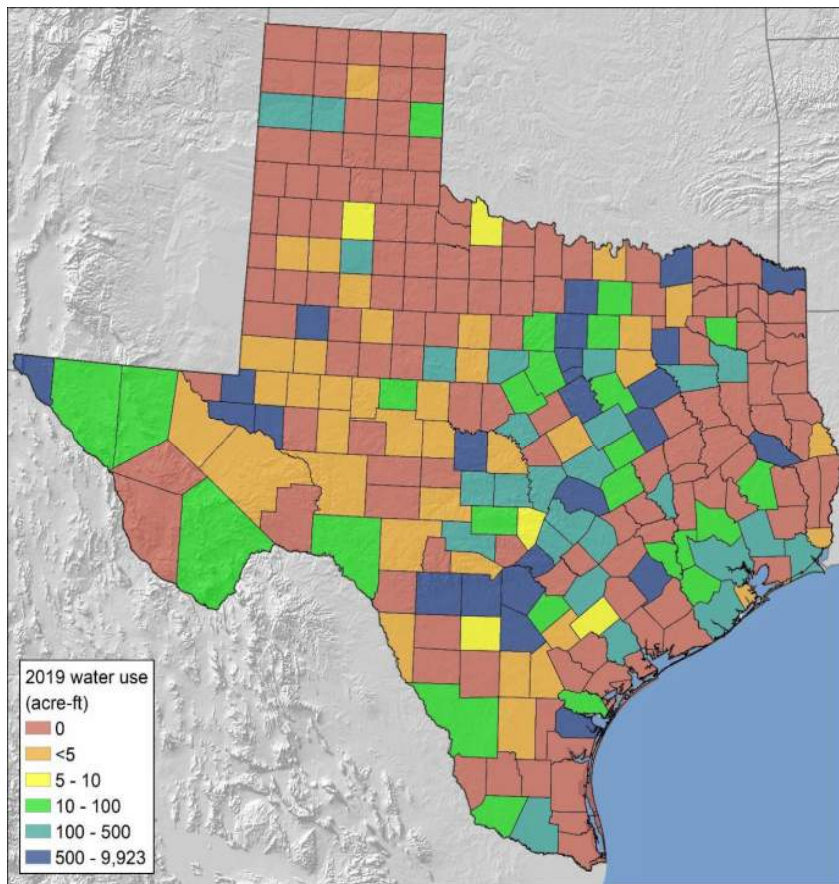
- Water volumes and sources were reported by operators to TWDB and TCEQ in the annual water use surveys. The TCEQ also contacted some operators directly. The two datasets were combined and justified resulting in 1,295 registered aggregate operations.
- For operators that did not respond, water use was estimated based on examination using Google imagery coupled with reported water use volumes per unit disturbed area of similar near-by operations
- Projections of aggregate water use were based on expected population changes by county as defined in the 2022 State Water Plan (TWDB).

Aggregate Mines in Texas



- There were 1,295 registered aggregate operations in the dataset.
- Coordinate or county locations were available for 1,217 (94%) of operations.
- The remaining unlocated 78 operations (6%) were either inactive or reported zero water use.
- Operations tend to cluster near population centers and in the Permian Basin where industrial (fracking) sand mining operations are prevalent.

Aggregate Mining Water Use by County Area



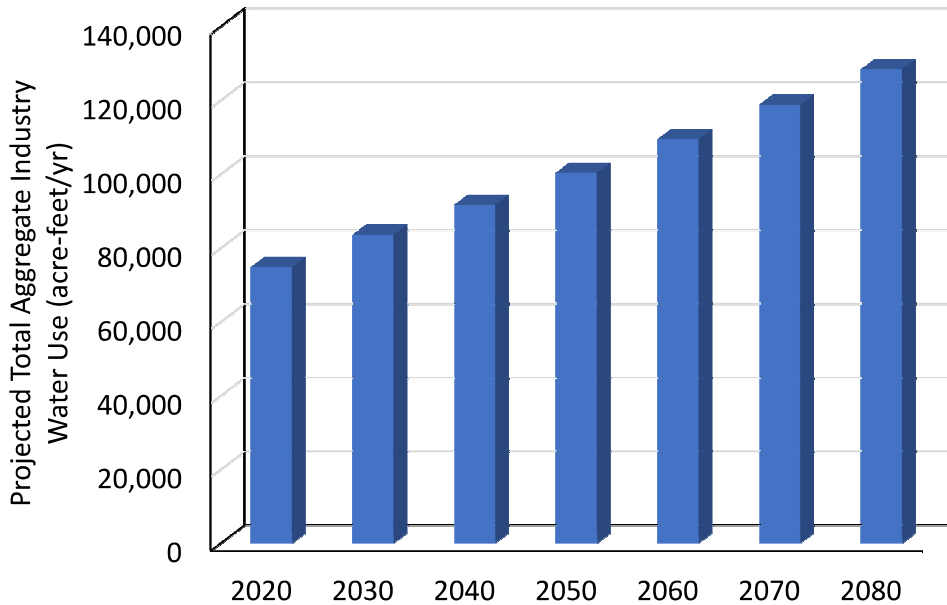
- Total estimated aggregate water use in Texas was ~74,800 ac-ft in 2019, representing 19% of total mining use.
- Reported water use accounted for 96% (71,600 ac-ft) of the total. Water use was reported by 84% of all operations, including zero water use (55%) or positive water use (29%). Zero water use includes inactive or closed operations.
- Estimated water use accounted for 4% (3,200 ac-ft) of the total. Water use was estimated for 16% of all operations, including zero water use (14%) or positive water use (2%).

Estimated Aggregate Water Sources by Subsector

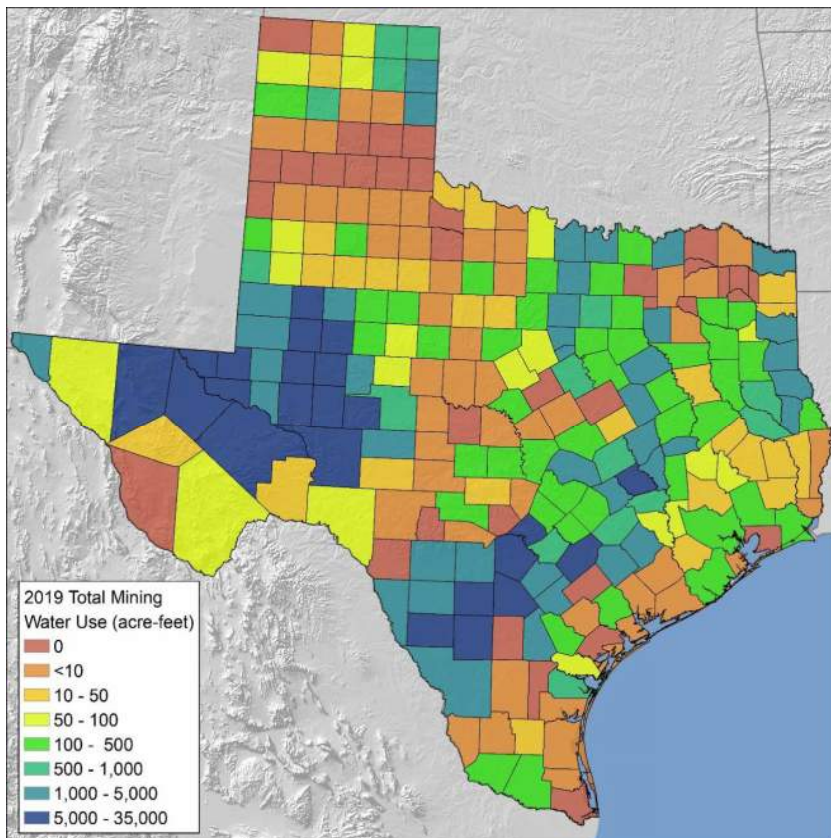
Aggregate Subsector	Number of Operations	Total Water Use		Water Use		
		(ac-ft)	(% of Total)	GW (%)	SW (%)	Reuse (%)
Dimension Stone	87	242	0.3	98.1	1.9	0.0
Crushed Stone	461	26,411	35.3	87.1	12.9	0.1
Sand and Gravel	731	47,965	64.1	74.5	21.9	3.6
Other	16	204	0.3	99.5	0.5	0.0
Combined Total	1,295	74,822	100.0	79.1	18.6	2.3

- Sand and gravel mining represents 64% of water use followed by crushed stone mining at 35%.
- Water use statewide was 79% groundwater, 19% surface water, and 2% reuse.

Aggregate Mining Water Use Projections



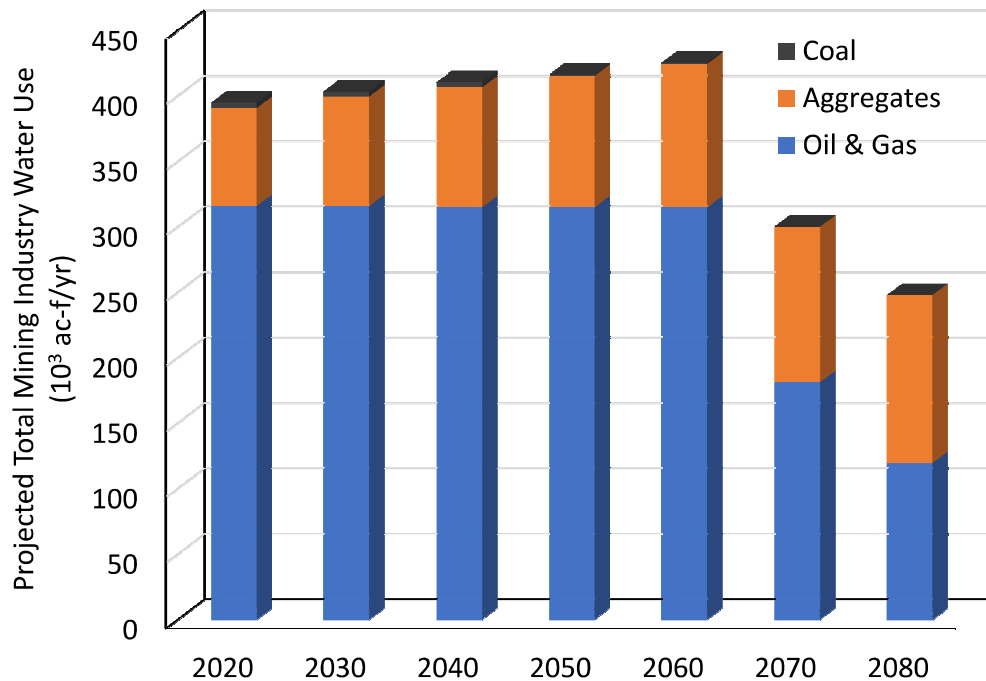
- Total aggregate mining water use is expected to grow by 8-12% per decade in pace with projected population increases (2022 State Water Plan, TWDB).
- Water use is projected to increase by ~70% from the ~75,000 ac-ft/yr currently to ~128,000 ac-ft/yr by 2080.



Summary of Total Mining Water Use in Texas

- Total mining water use was 395,000 ac-ft in 2019 dominated by the oil and gas sector (80%) and followed by the aggregate mining (19%) and coal mining (1%) sectors.
- The greatest water use volumes are associated with counties in the Permian Basin and the Eagle Ford Play areas
- Mining water use represents 2.8% of total use in Texas (~14 million ac-ft)

Summary of Texas Mining Water Use Projections



- Projected to gradually increase through about 2060 due to increasing demand by the aggregate industry with ongoing steady demand by the oil and gas sector.
- Projected to declining steeply overall after 2060 due to decreasing demand by the oil and gas sector as the plays mature.

Data Access

- This final report and the historical and current water use estimates and projections by the Texas mining sector are publicly accessible via an online data dashboard developed by the TWDB and hosted on their website:

<https://www.twdb.texas.gov/waterplanning/data/projections/MiningStudy/index.asp>

Future Work

Future studies of mining water use in Texas would benefit from:

- Detailed reporting by the oil and gas industry regarding water volumes by source (aquifer, surface water body, reuse of produced water) and general water quality (TDS values, fresh, brackish, brine, etc.)
- Improved assessments of Total Recoverable Resources (TRR) that incorporate economic factors may increase or decrease the projected numbers of economically feasible drilling locations.
- There are multiple unconventional oil and gas reservoirs in the Permian Basin that have not yet been evaluated for development.

Item 8.

Consultant Report

Neil Deeds and Van Kelley, INTERA

Agenda Item 8

Consultant Report – Oct 26, 2022 RWPG Meeting



- a. Progress to date: Begin review of Draft Mining and Irrigation demand data
- b. Upcoming efforts: Population and Demand Committee meeting



Agenda Item 8

Progress To Date

- i. Submitted request for revision of WUG list Jan 29
 - Addition of 5 WUGs that are using over 100 acre-feet per year (see next two slides)
- ii. Begin review of Draft Mining Projections
- iii. Begin review Draft Irrigation Projections



Agenda Item 8

Requested Revision to WUG list



- Potential WUGs for inclusion in 2026 RWP:

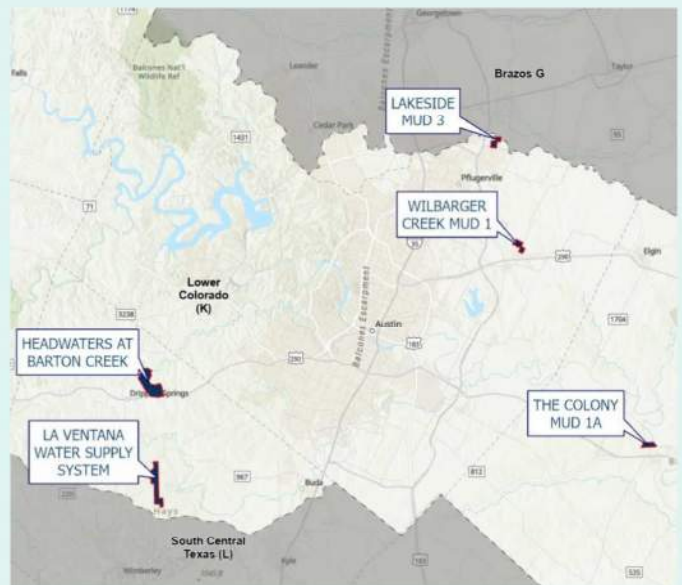
Utility	2017	2018	2019	2020	2021
Headwaters at Barton Creek	99.7	70.3	70.3	148.1	-
La Ventana Water Supply System	93.2	87.7	84.1	101.6	103.2
Lakeside MUD 3	0.0	0.0	0.0	257.9	241.8
The Colony MUD 1A	0.0	0.0	0.0	139.5	170.7
Wilbarger Creek MUD 1	46.9	58.4	80.9	136.0	263.4

Agenda Item 8

Requested Revision to WUG list



- Headwaters at Barton Creek
 - Possible error in 2018/2019 water use
- La Ventana Water Supply System
 - South of Dripping Springs
- Lakeside MUD 3
 - Small portion in Brazos G
- The Colony MUD 1A
 - No usage prior to 2020
- Wilbarger Creek MUD 1
 - North of Manor



Agenda Item 8

Draft Irrigation and Mining Projections

- TWDB released draft data August 2022
- Requests for Revisions due **July 14, 2023**
 - **Strongly encouraged to do so asap!**
- Review of methodology and Region K data
 - Today: Katie Dahlberg and Bob Reedy
 - Nov 2nd meeting of the Population & Demand Committee
 - At next RWPG mtg: closer look at Region K data and hear feedback from Pop & Demand Committee



Agenda Item 8

Upcoming Efforts

- i. Continued review of Draft Mining and Irrigation demand projections
 - Requested revisions due July 2023
- ii. Evaluate availability and existing water supplies
- iii. Draft Municipal demand projections
 - Coming February 2023
 - Requested revisions due August 2023



Supplemental Information



Various public data sources may be referenced during committee meetings, including:

1. Planning Data Dashboard at <http://www.twdb.texas.gov/waterplanning/data/projections/index.asp>
2. Initial Scope of Work for 2026 Regional Water Plans at https://www.twdb.texas.gov/waterplanning/rwp/planningdocu/2026/projectdocs/InitialSOW_2026RWPs.pdf
3. General Guidelines for Development of the 2026 Regional Water Plans at https://www.twdb.texas.gov/waterplanning/rwp/planningdocu/2026/projectdocs/2026RWP_ExC_Initialtasks.pdf

Item 10.
Financial Report

The Lower Colorado River Water Planning Group (Region K)

October 26, 2022

Region K Members Fund Balance 9/30/2022: \$ 2,602.91

Administrative Expenses for Region K Grant Fund approval:

Task 10 – Cycle 6 - Admin Expense Budget \$6,000.00

Prior approved expenses (1/26/22, 4/26/22)

8/31/2021 LCRA – Blue Host Domain Name \$17.99

8/24/2021 LCRA – Texas Press Invoice # 15355 \$4,396.50

8/24/2021 LCRA – Postage for mailout \$244.29

2/15/2022 LCRA – Squarespace Inc. \$233.82
Region K web page

3/29/2022 LCRA – EIG Bluehost.com \$453.86
Three year – Doman name and email hosting
For Region K website

Task 10 – Cycle 6 - Admin Expense Total Remaining
for future public notices/postage/website

\$653.54

Contractor Expenses for Region K Grant Fund:

Technical Consultant Contract Summary: INTERA Team PO#131282

Labor per Task		Budget	Jan-22	May-22	Total	Remaining	% Complete
<i>Task Breakdown</i>			<i>Inv# 02-22-105</i>	<i>Inv# 05-22-16</i>			
Task 1	Planning Area Description	\$11,312.00	\$1,440.00	\$5,542.00	\$6,982.00	\$4,330.00	62%
Task 2A	Non-municipal Water Demand Projections	\$22,016.00	\$90.00	\$5,276.00	\$5,366.00	\$16,650.00	24%
Task 2B	Population & Municipal Water Demand Projections	\$35,116.00	\$180.00	\$7,191.48	\$7,371.48	\$27,744.52	21%
Task 8	Recommendations/Unique Stream Segments/Reservoir Sites and Legislatives/Regional Policy Issues	\$9,633.00	\$0.00	\$0.00	\$0.00	\$9,633.00	0%
Task 10	Public Participation & Plan Adoption	\$77,503.00	\$4,620.32	\$9,152.71	\$13,773.03	\$63,729.97	18%
TOTAL		\$155,580.00	\$6,330.32	\$27,162.19	\$33,492.51	\$122,087.49	22%
Less 5% Retainage		\$(7,779.00)	<u>\$0.00</u>	\$(1,674.63)	\$(1,674.63)	\$(6,104.37)	
TOTAL		\$147,801.00	\$6,330.32	\$25,487.56	\$31,817.88	\$115,983.12	22%

*Note that retainage was not withheld from January invoice, so it is withheld here as requested. Thus, invoice total is \$27,162.19 - 1,358.11 - 316.52 = \$25,487.56.