Evergreen Underground Water Conservation District

ANNUAL REPORT

January 2024-December 2024

Abstract

Report on District activities in support of the District Management Plan.

Evergreen Underground Water Conservation District

www.everrgreenuwcd.org

Objective 1 : Providing for the Most Efficient Use of Groundwater

1a. Objective – Require existing and new non-exempt wells constructed within the boundaries of the District to be permitted by the District and operated in accordance with District Rules. In addition, the District will require all exempt wells constructed within the District boundaries to be registered with the District.

- **Performance Standard** – The number of exempt and permitted wells registered within the District will be reported annually in the District's Annual Report submitted to the District's Board of Directors.

- **Table 1**.a. Breakdown of permitted and registered wells within the District.

	Frio	Atascosa	Wilson	Karnes
Total Active Wells	761	968	955	945
Exempt	213	432	661	470
Unclassified	19	20	4	55
Non-Exempt Wells	529	516	290	420
Edwards	5	0	0	0
Carrizo	248	223	123	49
Wilcox	1	9	6	0
Wilcox- Calvert Bluff	0	0	0	0
Wilcox- Simsboro	0	1	0	0
Wilcox- Hooper	0	0	0	0
Queen City	11	56	11	1
Cook Mountain	0	0	0	0
Recklaw	2	0	0	1
Sparta	1	1	0	0
Weches	0	0	0	0
Yegua	0	5	6	51
Jackson	0	1	0	56
Gulf Coast-Catahoula	0	0	0	68
Gulf Coast-Jasper	0	0	0	114
Gulf Coast-Burkville	0	0	0	1
Gulf Coast-Evangeline	0	0	0	1
Gulf Coast	0	0	1	11
Missing Aquifer Classification	261	220	143	67

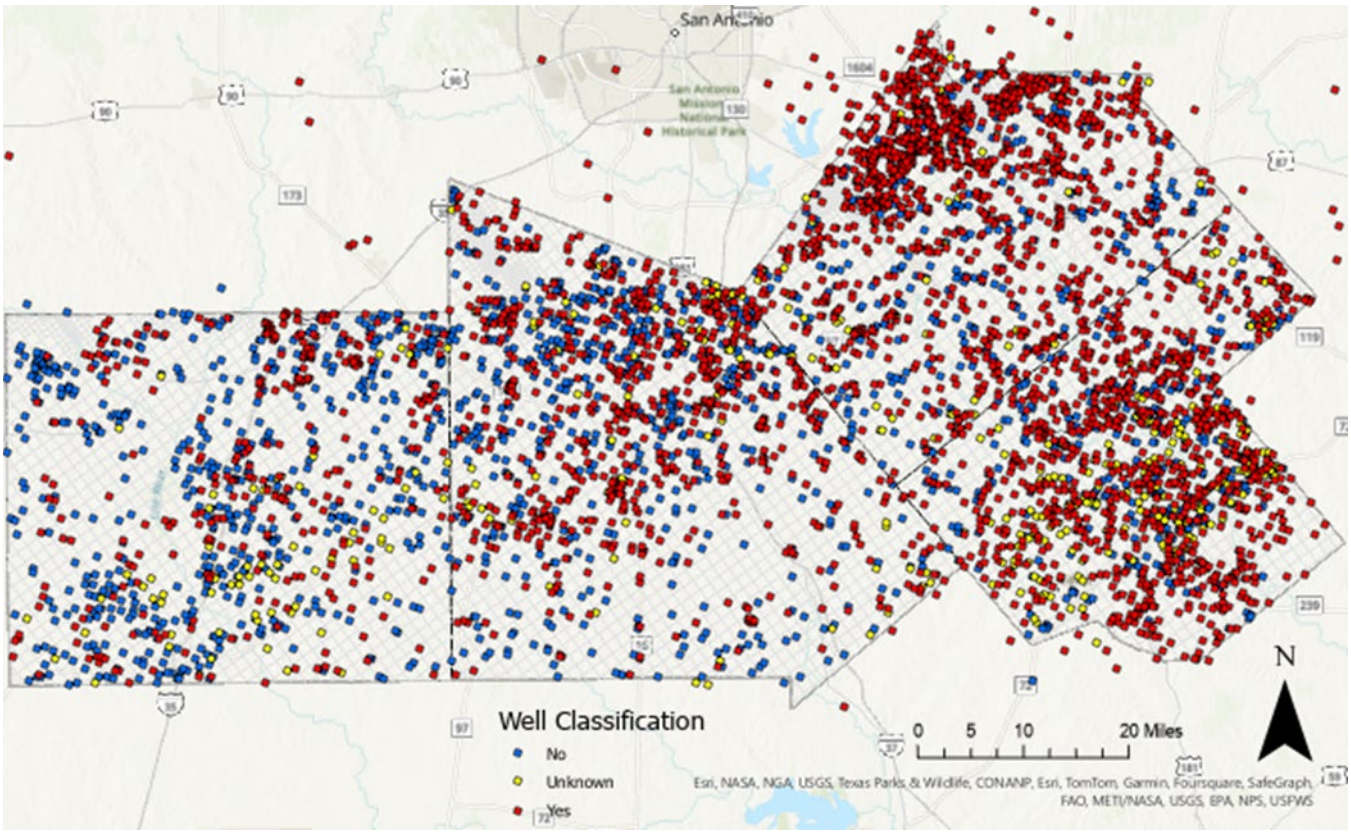


Figure 1.a. Map of Exempt Classification of Wells within the District

1a. Objective

Require existing and new non-exempt wells constructed within the boundaries of the District to be permitted by the District and operated in accordance with District Rules. In addition, the District will require all exempt wells constructed within the District boundaries to be registered with the District.

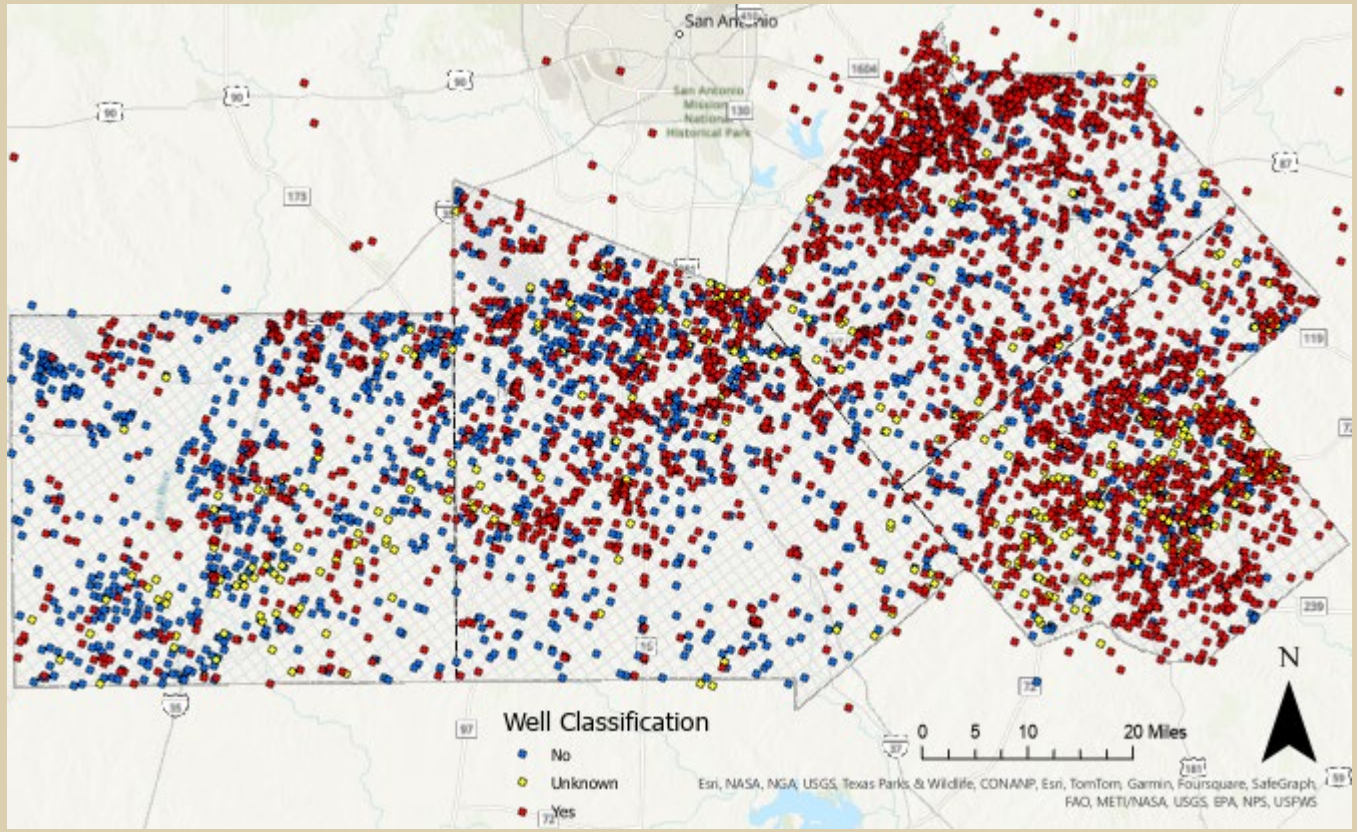
	Frio	Atascosa	Wilson	Karnes
Total Active Wells	761	968	955	945
Exempt	213	432	661	470
Unclassified	19	20	4	55
Non-Exempt Wells	529	516	290	420

6,464 Total Well Records

3,684 Active Wells

1,801 Active Exempt

1,833 Permits

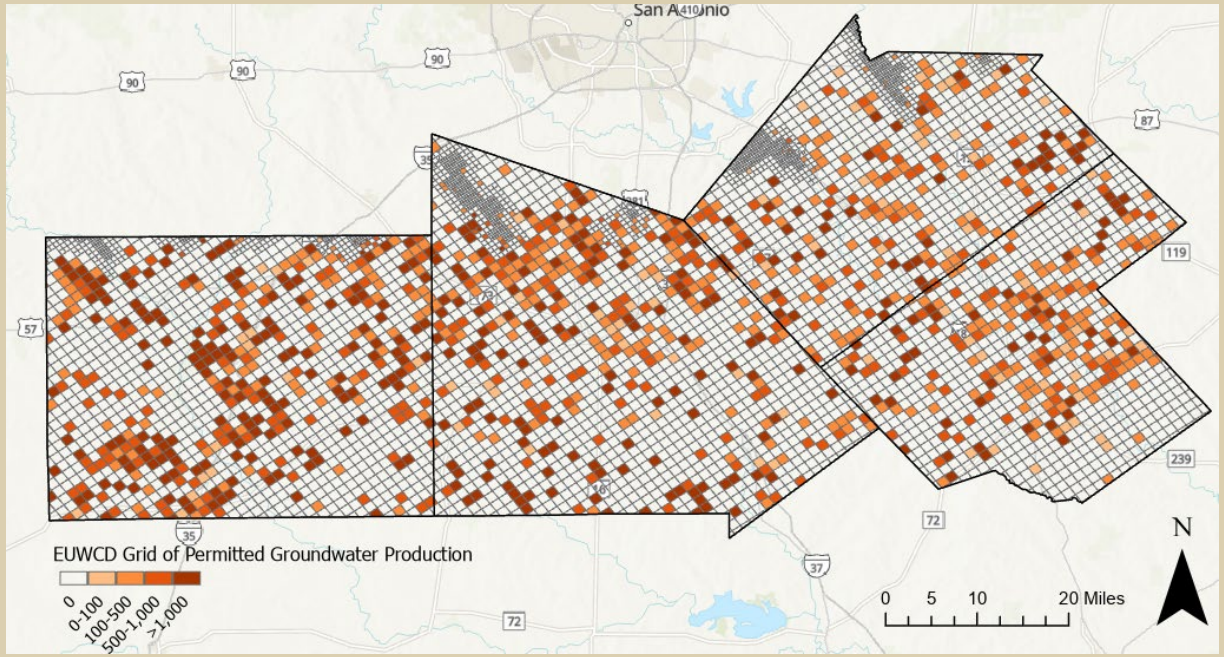


Permitted Production= 1,000,839 ac-ft/yr

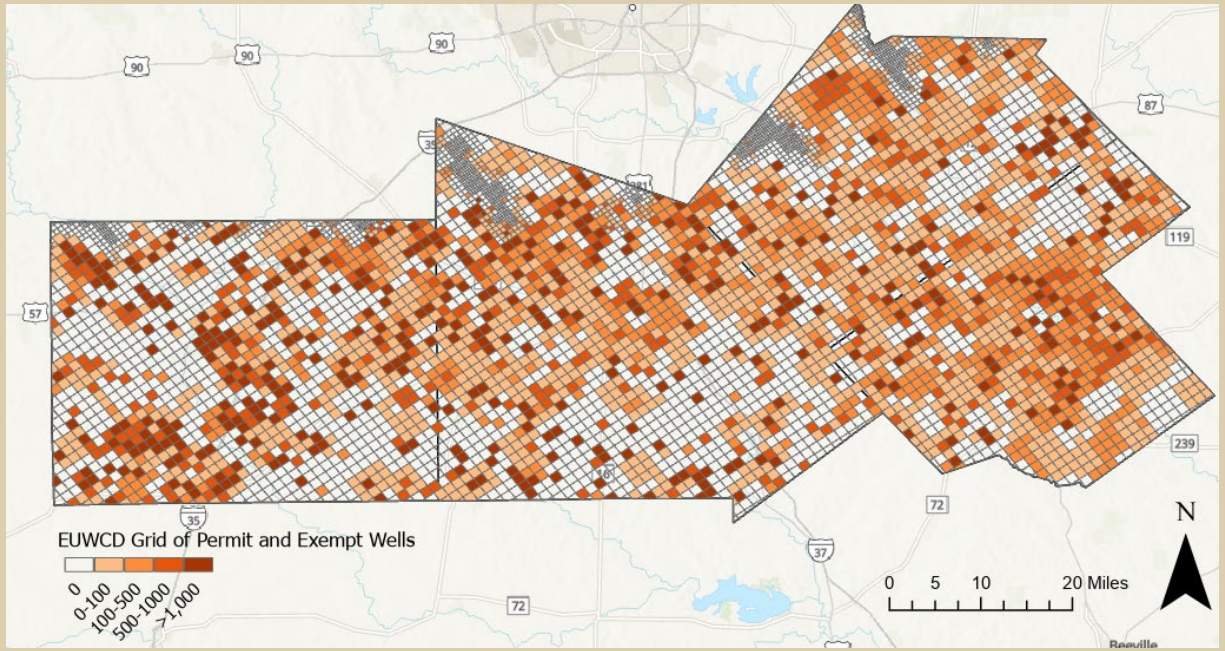
Active Exempt Wells = 49,734 ac-ft/yr

Distribution of Well Production Allocation

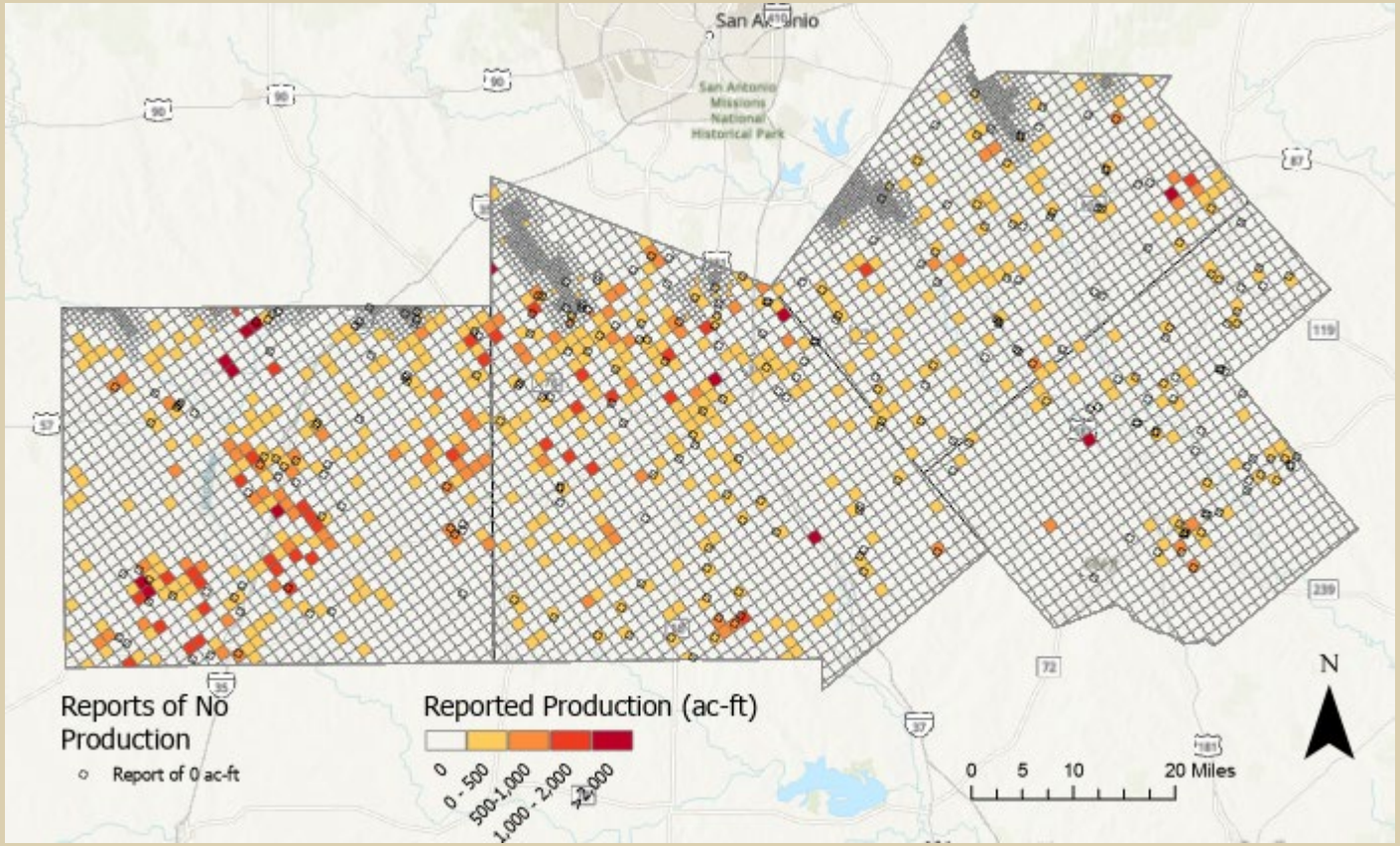
Permitted Volume



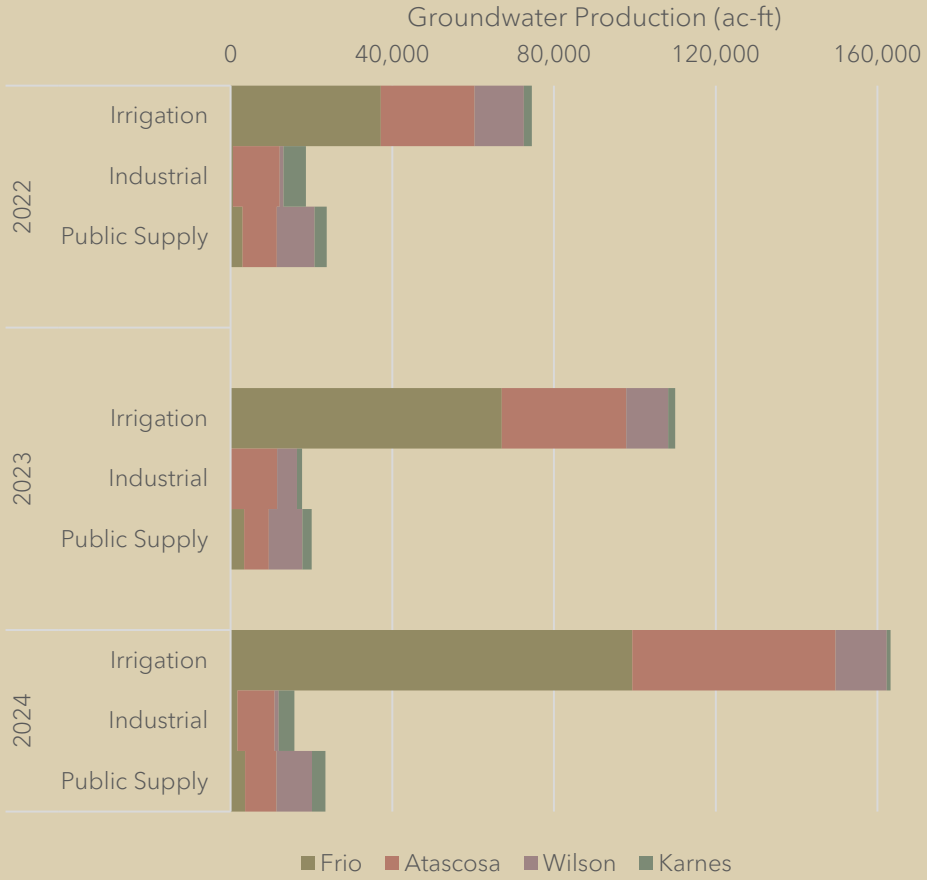
Permitted Volume + Exempt Well Estimates



Total Groundwater Production

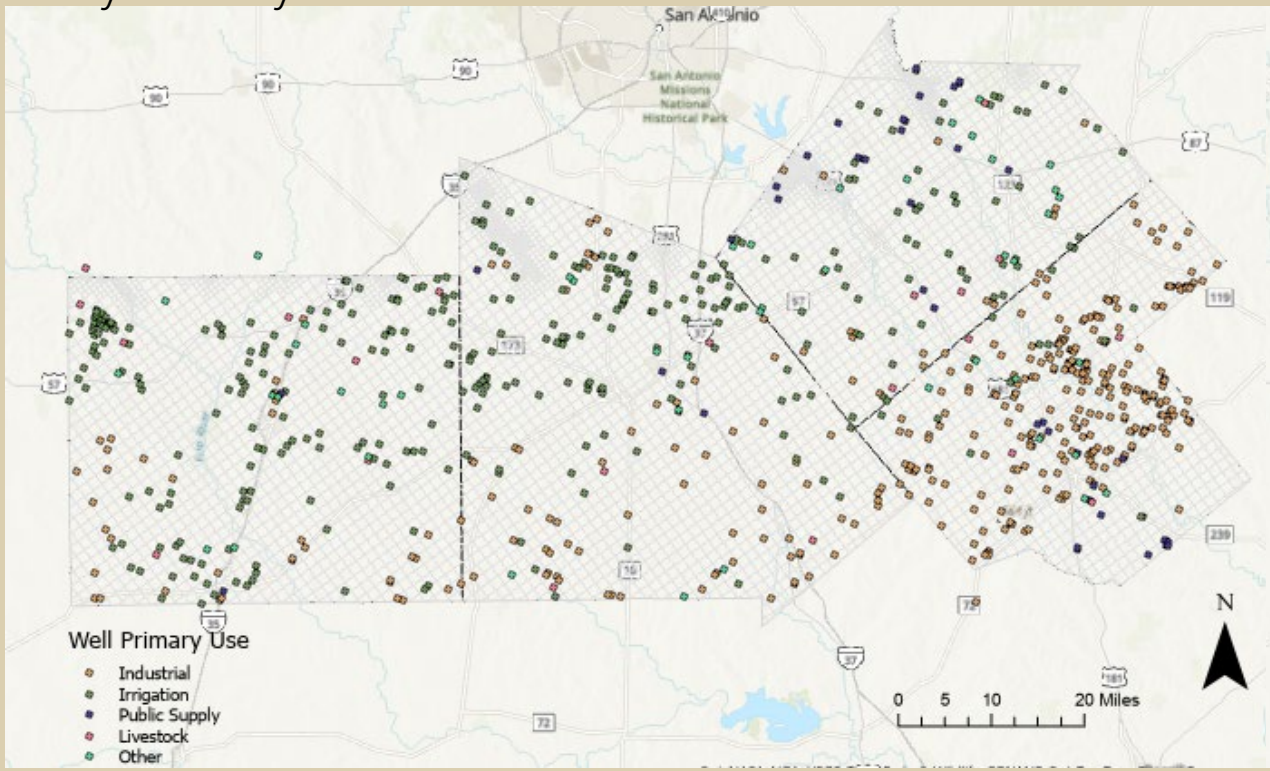


Reported Production by County, and Primary Use

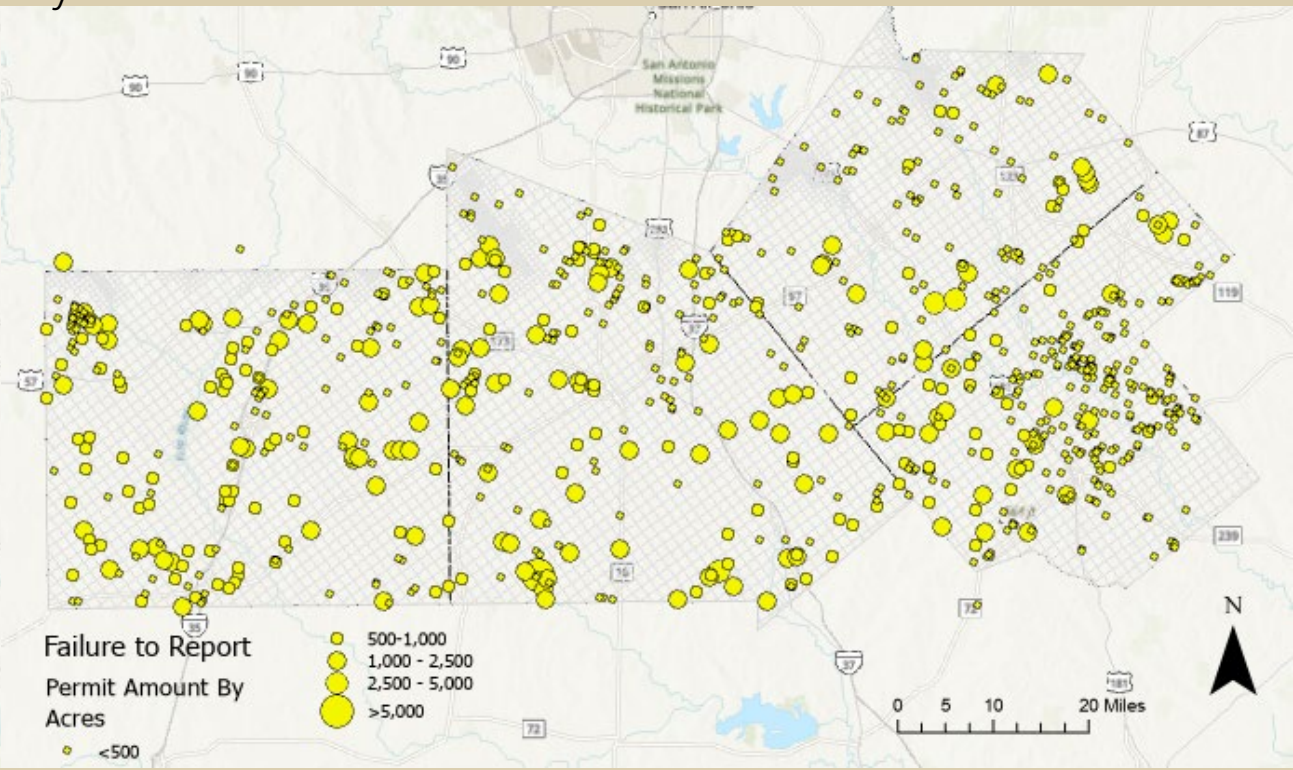


Did not report…

By Primary Use

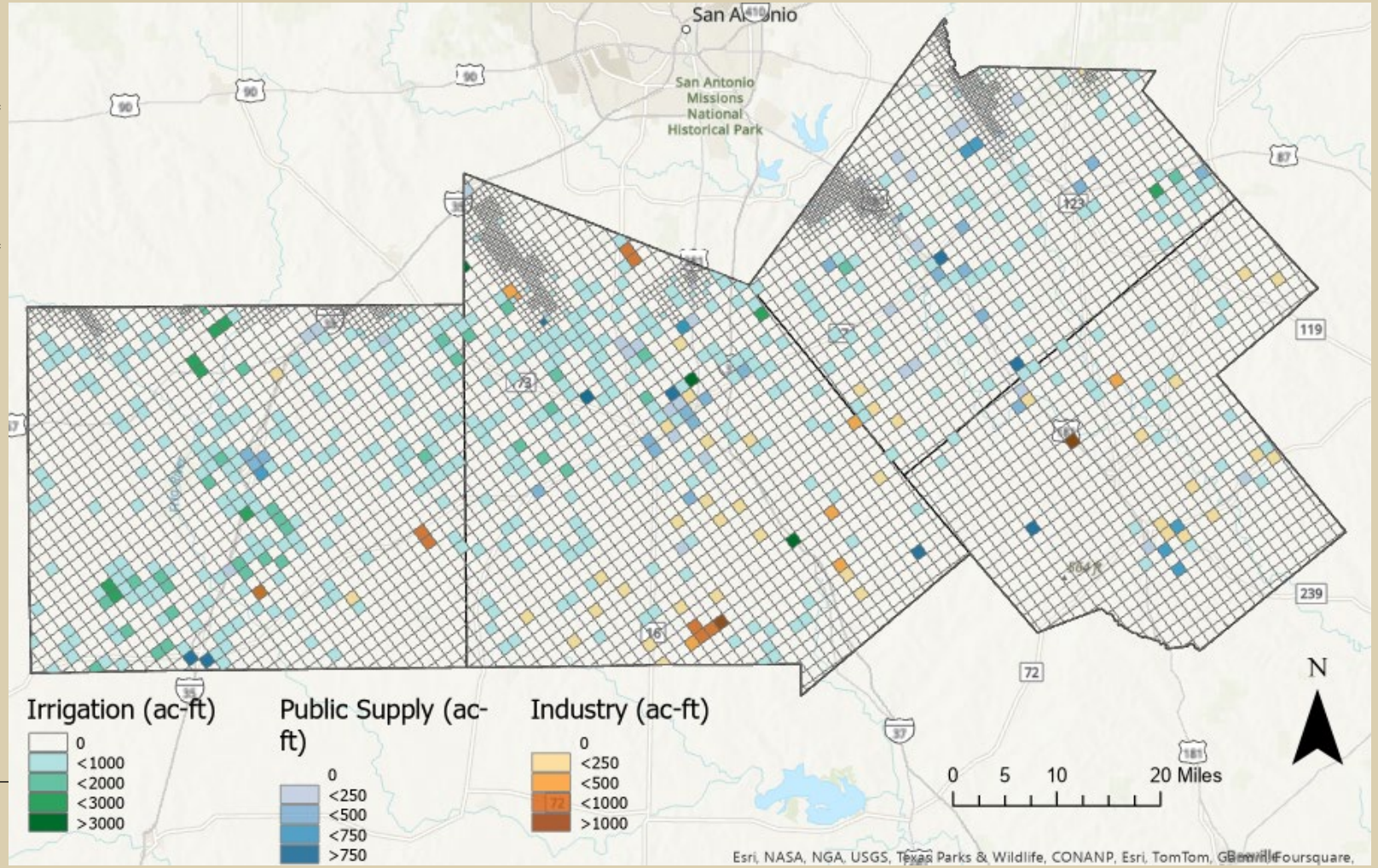


By Permitted Volume



Groundwater Production by Permitted Use

	Irrigation	Livestock	Industrial	Public Supply	Total
Frio	99,354	58	1,734	3,581	104,726
Atascosa	50,269	5,003	9,136	7,801	72,209
Wilson	12,712	931	1,049	8,731	23,422
Karnes	918	95	3,882	3,372	8,267
Total	163,253	6,086	15,800	23,484	208,624



1.b. Objective – Each month the District will monitor the volume of water produced from all municipal and Rural water supply entities in the District.

➢ **Performance Standard –** A table showing the annual production volumes reported to the District by the Municipal and Rural water supply entities in the District will be included in the Annual Report of District Activities made to the Board of Directors each year.

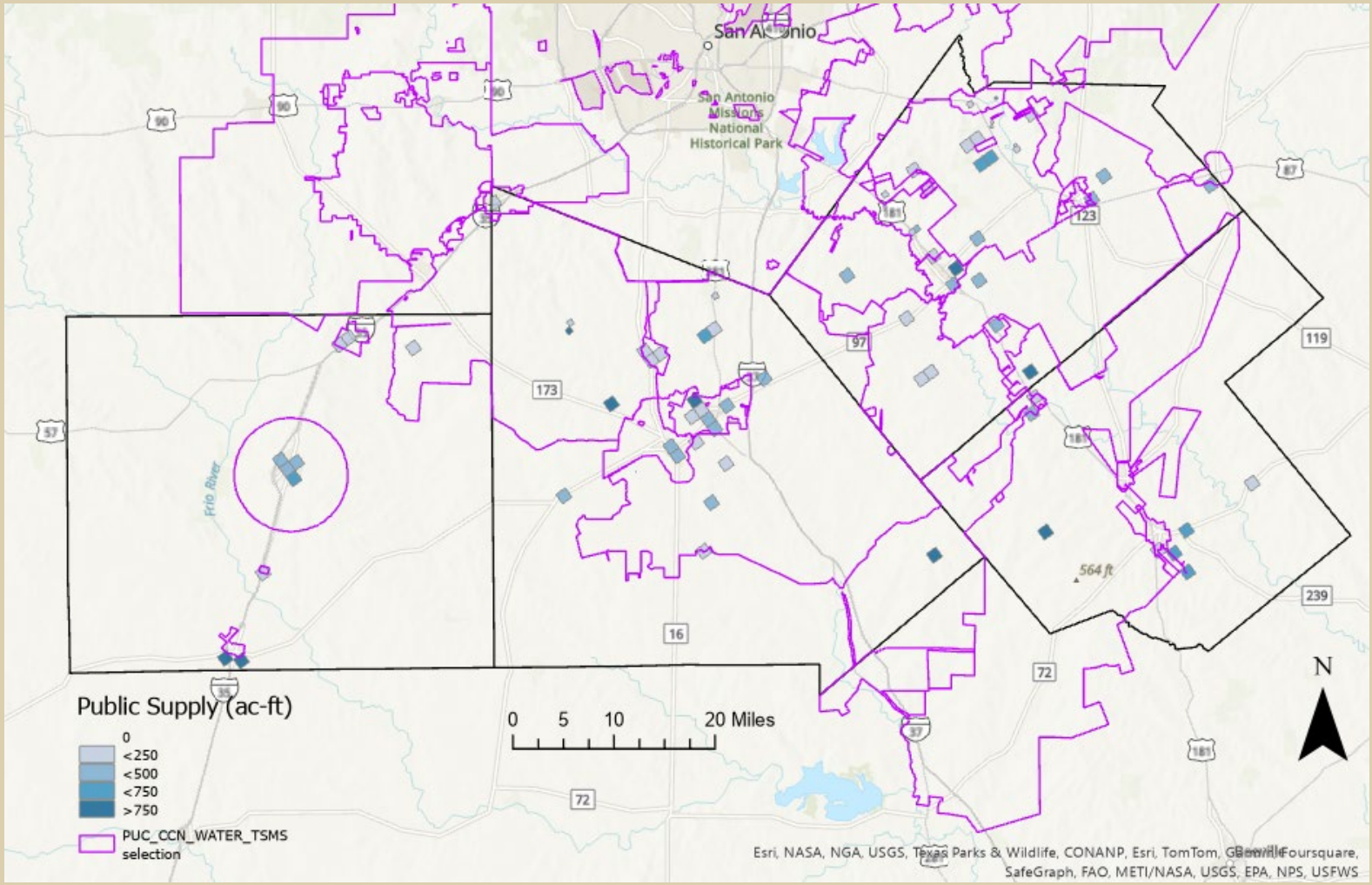
PWS ID	UTILITY	County	# Residential Connection	# Active Wells	# Permits	Permit (ac-ft)	State Water Plan 2030 Existing Supply (ac-ft)	2022 Total Reported Production (ac-ft)	2023 Total Reported Production (ac-ft)	2024 Total Reported Production (ac-ft)
TX2470022	Aqua Texas Inc.	ATASCOSA, BEXAR, FRIO, MEDINA	794	3	3	1,079		283	215	176
TX2470025	ARROWHEAD WATER SYSTEM (CSWR)	WILSON	45	2	2	30		23	22	21
TX1630034	Benton City W.S.C.	WILSON	3980	7	8	5,150	1612	2,892	2,274	2,265
TX2470019	C WILLOW WATER (CSWR)	BEXAR, GUADALUPE, WILSON	285	2	2	192	0	103	88	74
	Canyon Regional Water Authority			1	1	266	0			0
TX0070016	City of Charlotte	ATASCOSA		2	2	503	1098	301	275	314
TX0070017	City of Christine	ATASCOSA		2	2	123	0	49	35	43
TX0820001	City Of Dilley	ATASCOSA, BEXAR, MEDINA	1837	3	4	1,543	2147	1,223	1,207	1,544
TX1280004	City of Falls City	WILSON	306	2	2	217	220	130	138	133
TX2470001	City of Floresville	ATASCOSA	2830	3	3	2,380	2486	1,016	1,189	1,389
TX0070002	City of Jourdanton	ATASCOSA	1907	4	4	1,282	2250	675		883
TX1280001	City of Karnes City	KARNES	1423	3	4	1,753	289	422	397	344
TX1280002	City of Kenedy	KARNES	2910	11	11	11,978	0	1,979	1,728	1,822
TX2470004	City of La Vernia	BEXAR, GUADALUPE, WILSON		4	4	765	699	476	386	474
TX0890002	City of Nixon	GONZALES, WILSON	921	1	1	1,534		453		419
TX0820002	City of Pearsall	FRIO	2995	4	4	1,410	1410	1,761	2,013	1,752
TX0070003	City of Pleasanton	ATASCOSA	5995	7	12	4,661	5028	2,204	1,984	1,916
TX0070005	City of Poteet	ATASCOSA	1132	3	3	806	806	386	380	369
TX2470002	City of Poth	WILSON	998	3	4	814	630	345	363	302
TX1280003	City of Runge	KARNES		3	3	332		143	119	246
TX2470003	City of Stockdale	WILSON	712	2	3	479	920	734	721	329
TX1280007	El OSO Water Supply Corporation	KARNES	2781	5	5	2,063	274	906	947	1,739
#N/A	Fashing/Peggy W.S. Corp.	ATASCOSA, BEE, KARNES, LIVE OAK, WILSON		2	2	169				777
TX2470018	HICKORY HILL WATER (CSWR)	WILSON	114	2	2	77		48	30	29
TX0070023	McCoy Water Supply	ATASCOSA, BEXAR, KARNES, WILSON		8	8	2,184	1991	1,310	1,205	1,360
TX0820012	Moore WSC	FRIO	310	2	2	208	4033	2,985	105	89
TX0820016	New Water Systems, Inc (Formerly Derby WSC)	FRIO	38	1	1	28	0	129		9
TX2470009	Oak Hills WSC	BEXAR, WILSON	2075	4	4	1,395	453	1,005	944	906
TX2470026	PICOSA WSC.	WILSON	993	2	2	632	306	266	304	260

TX2470015	S S Water Supply	BEXAR, WILSON		1	1	184	1778	2,561	2,293	0
TX2470017	Shady Oaks Water (CSWR)	WILSON	114	4	5	97		44	39	33
TX2470015	SS Water Supply Corporation	BEXAR, WILSON		9	9	3,061				2,420
TX2470005	Sunko Water Supply Corp.	KARNES, WILSON	1688	6	6	1,107	1525	719	748	589
TX2470007	Three Oaks W. S. C.	ATASCOSA, KARNES, WILSON	629	3	3	446		382	347	397
TX470016, TX2470021	W&W Water Inc.	WILSON	347	4	4	151				0

1b. Objective

Each month the District will monitor the volume of water produced from all municipal and Rural water supply entities in the District.

- 44 CCNs for Public Water Supply within the District
  - 30,752 ac-ft Annual Demand
- 32 TCEQ Permitted Public Water Supply Entities with permits
- 9 Public Water Supply Permits without TCEQ PWS ID
- 49,430 ac-ft/yr Permitted (156 Permits)
- 23,423 ac-ft Produced in 2024
- Average Use = 73%



1c. Objective – Each year the District will request production reports from the operators of 600 agricultural **irrigation wells in the District.**

➢ **Performance Standard –** A table showing production volumes reported to the District from the agricultural irrigation well operators in the District will be included in the Annual Report of District Activities made to the Board of Directors each year.

➢ **Table 1.**c.1. Breakdown of reported production by primary use and county

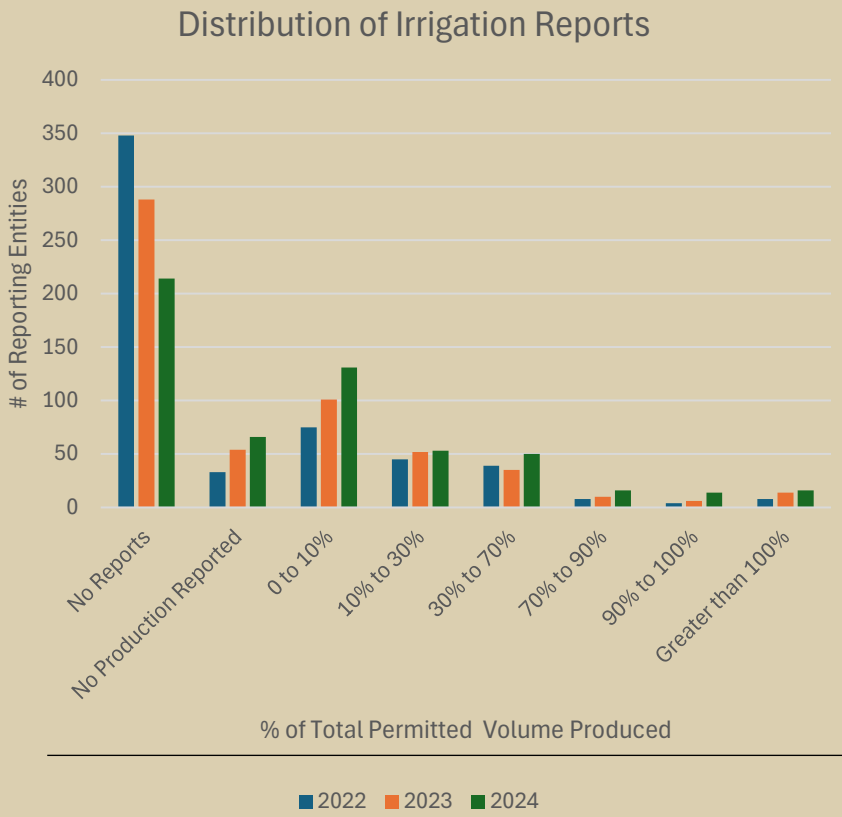
	Irrigation	Livestock	Industrial	Public Supply	**Total**
Frio	203,585	58	2,492	4,188	210,323
Atascosa	104,290	5,018	10,650	9,372	129,330
Wilson	35,239	956	2,103	12,778	51,075
Karnes	4,699	276	4,705	3,386	13,066
Total	347,813	6,308	19,950	29,724	403,795

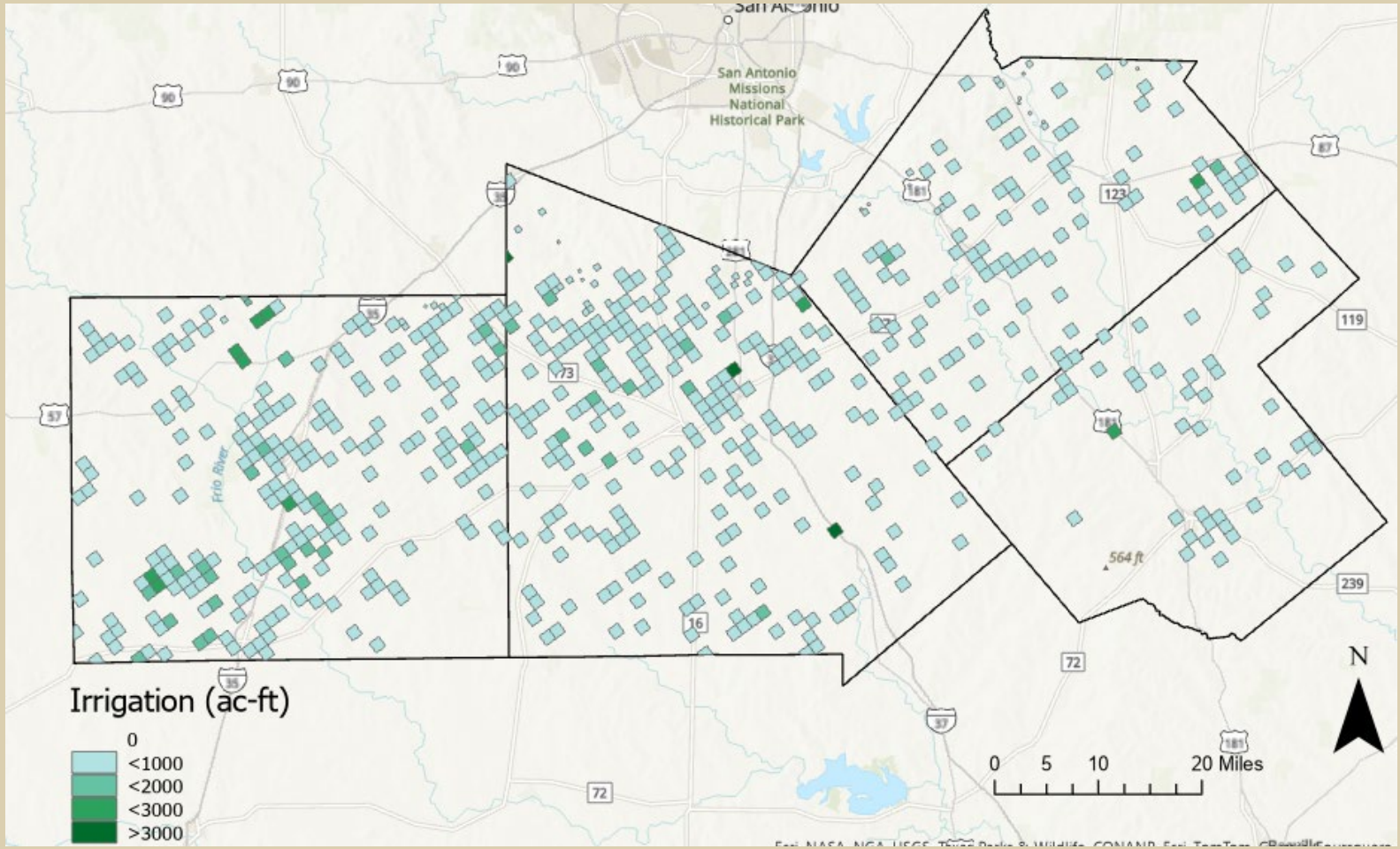
Table.1.c.2. Reported production for Irrigation use by county and identified aquifer.

		Frio	**Atascosa**	**Wilson**	**Karnes**	**Total**
Total Permitted Amount		335,842	210,842	91,966	17,250	655,899
# Permits		469	367	185	48	1,069
2024 Production		99,354	50,269	12,712	918	163,253
	Carrizo	46,559	31,253	7,524	278	85,614
	Queen City	230	2,372	32	0	2,634
	Gulf Coast	0	0	745	351	1,097
	Yegua-Jackson	0	125	133	279	537
	Other	52,566	16,519	4,278	10	73,372
Total Number of Reports Submitted		321	256	134	34	745
Number of Owners Reported		114	152	87	25	378

1c. Objective

Each year the District will request production reports from the operators of 600 agricultural **irrigation wells in the District.**





- 69.7% of Wells have reports submitted
- Producers used, on average, 34% of their total permitted allocation.

Objective 1c

Objective – Each year the District will request production reports from the operators of 600 agricultural **irrigation wells in the District.**

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Total Permitted Amount	335,842	210,842	91,966	17,250	655,899
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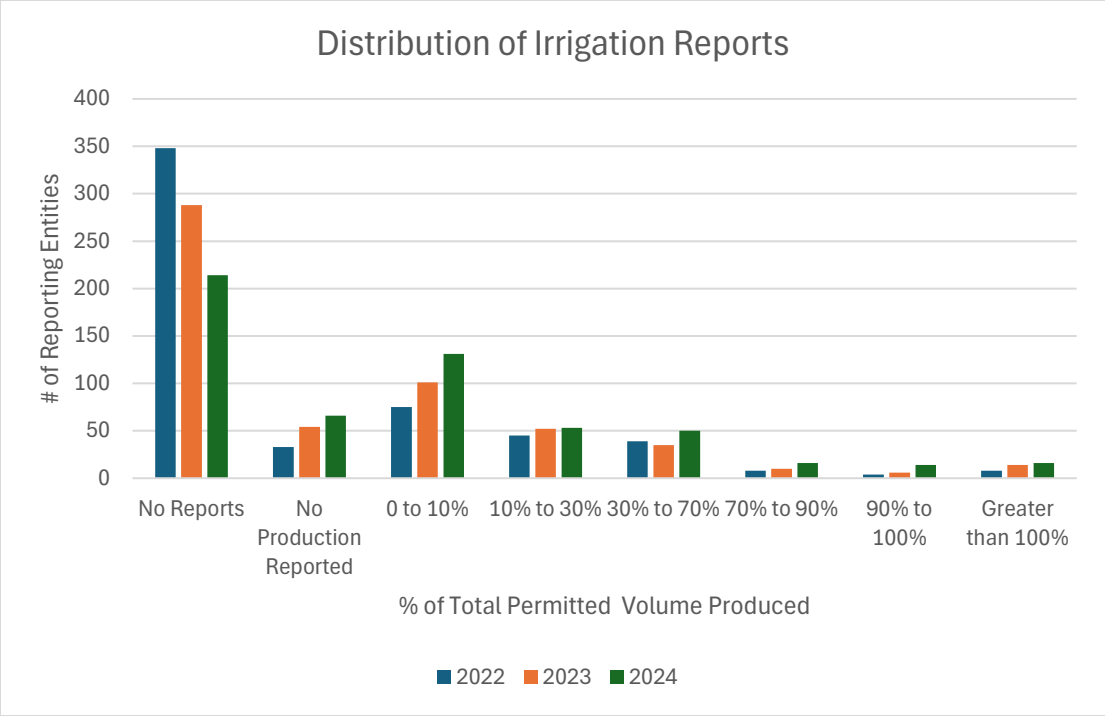


Figure 1.c.1. Distribution of percentage of permitted volume produced by irrigation producers (by entity)

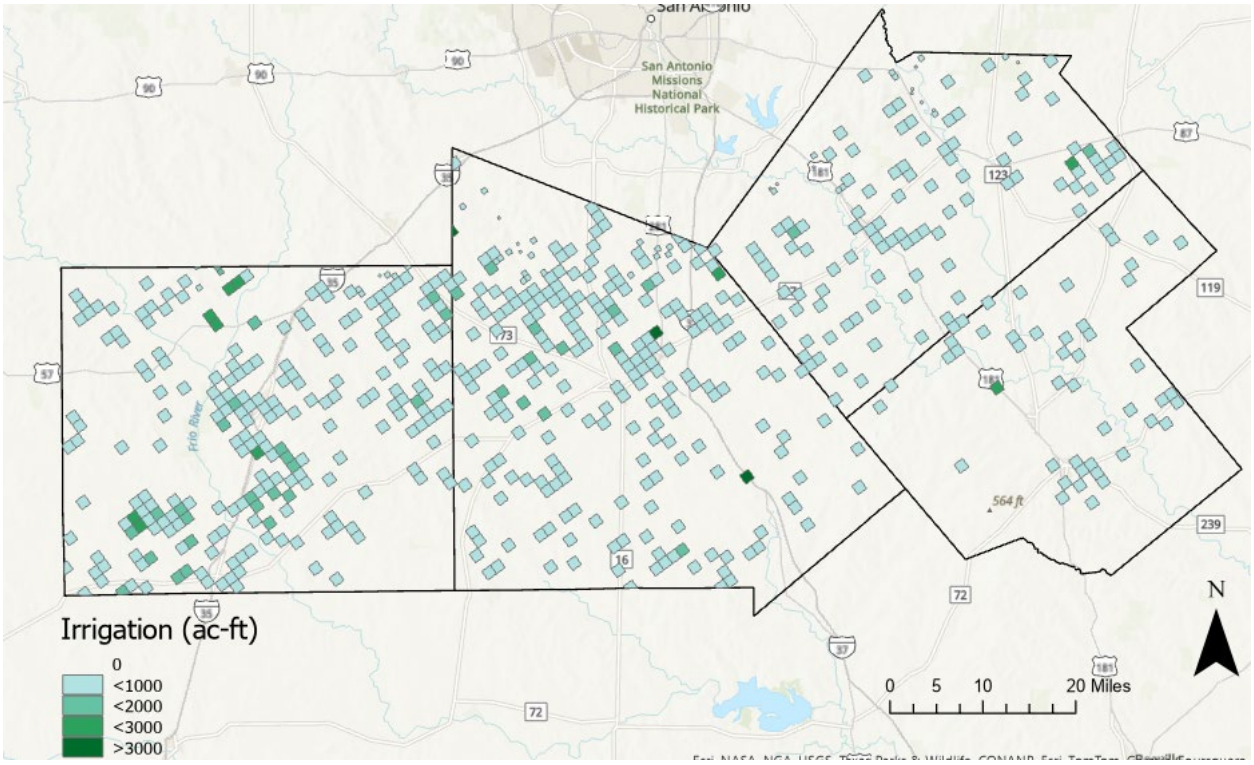


Figure 1.c.2. Groundwater produced for irrigation use throughout the District

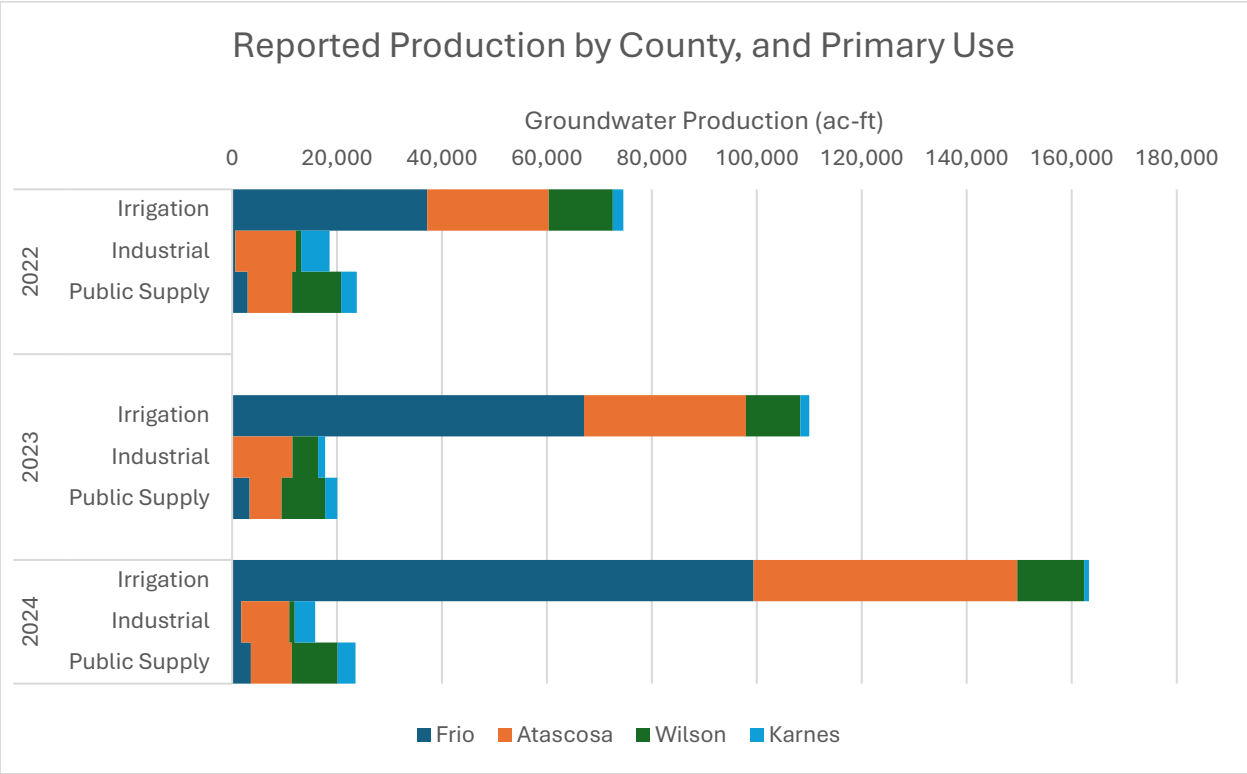
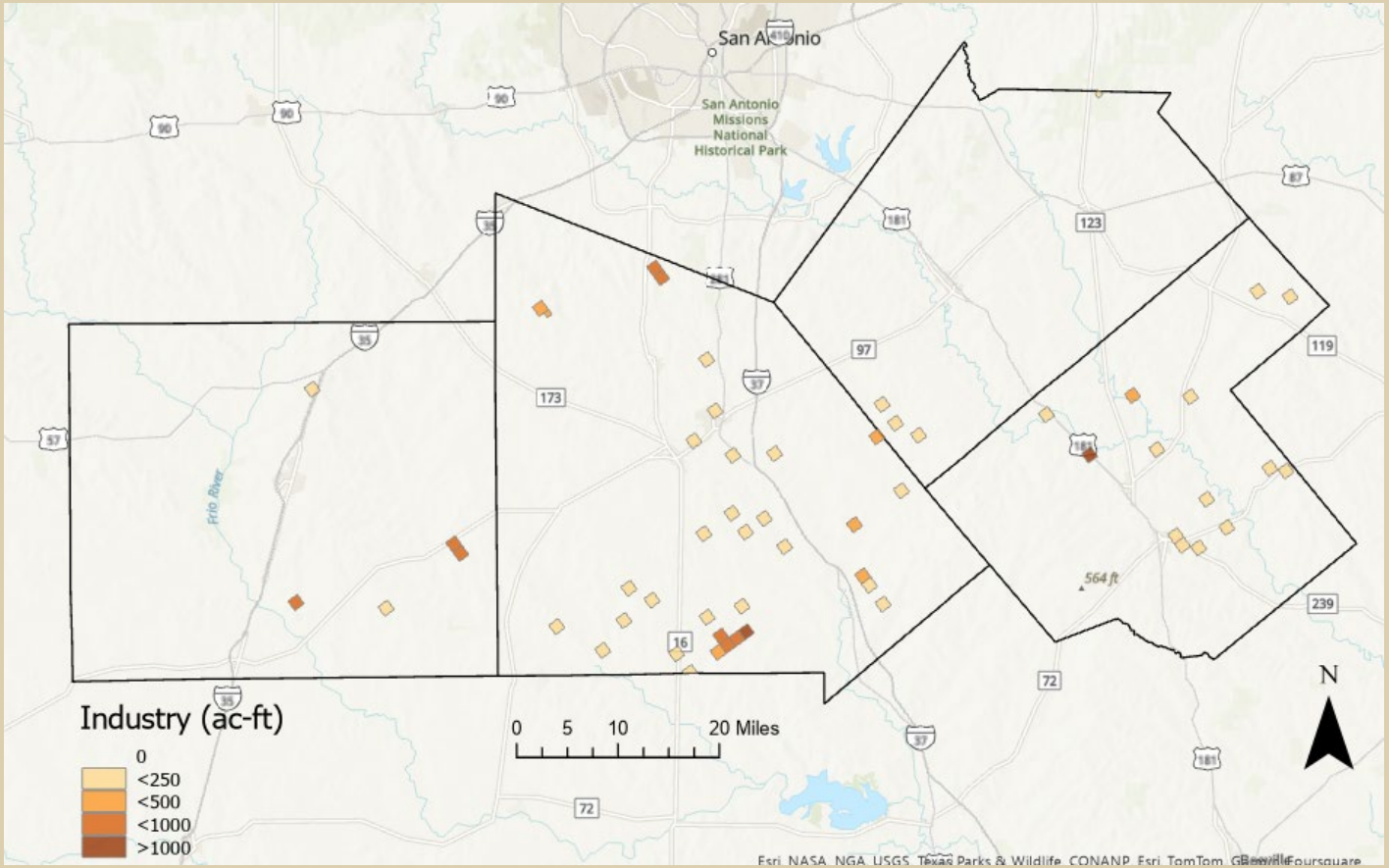


Figure 1.c.3. Production of groundwater by use and county from 2022 to 2024

Groundwater Production for Industrial Use

- 219,754 ac-ft permitted
  - 513 permits
  - 200 Entities
- 15,800 ac-ft production
  - 745 Monthly Reports Submitted
  - By 33 Entities
- Average Use = 21%



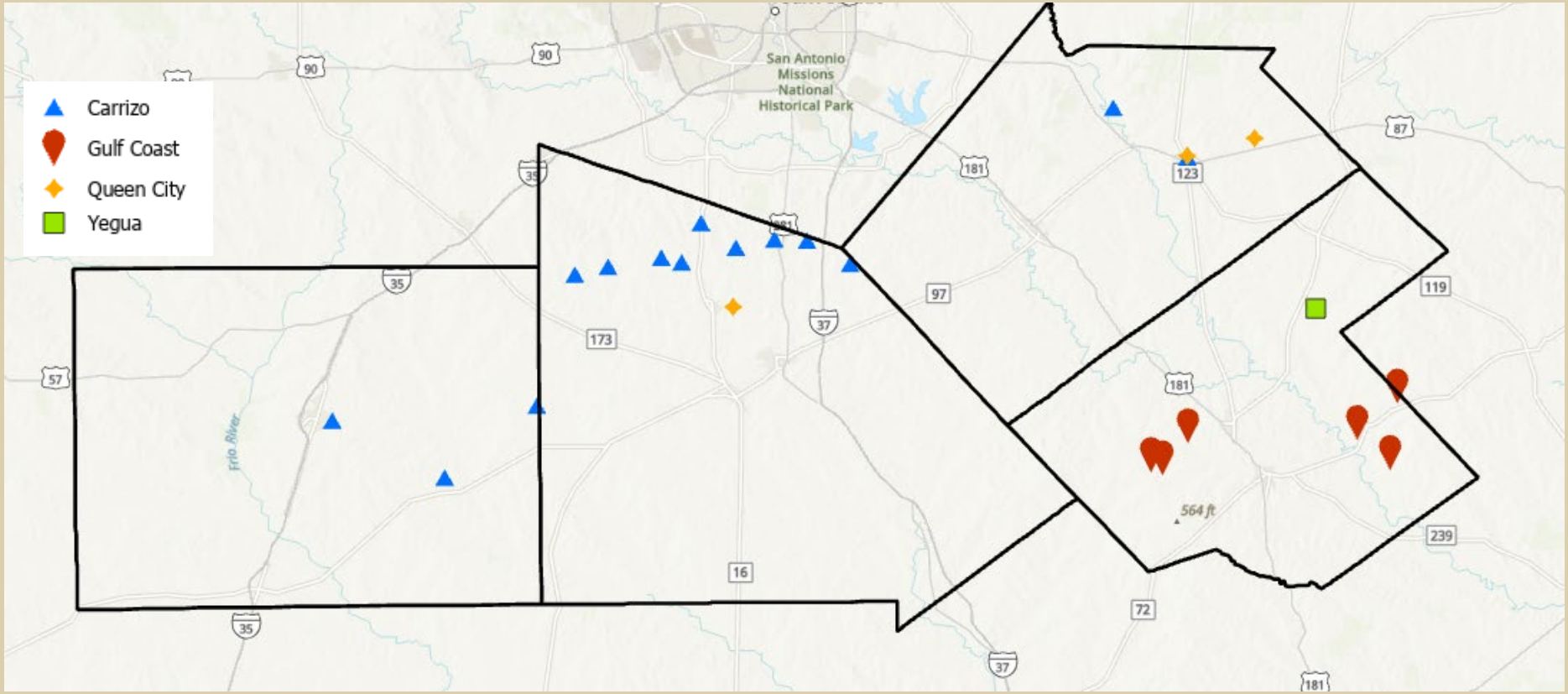
1d. Objective – Each month the District will measure the water levels in 20 water wells.

➢ **Performance Standard –** A table showing the monthly water level measurements made by the District will be included in the Annual Report of District Activities made to the Board of Directors each year.

District ID	Well Name	County	Aquifer	Lattitude	Longitude	Surface Elevation (MSL)	2024 Observed Water Level Measurement (ft MSL)													Year to Year Change in WSE (ft)
							Dec-23	Jan	Feb	Mar	April	May	June	July	Aug	Sept	Oct	Nov	Dec	
EUWCD-09463	Clifton Stacy Home	Frio	Carrizo	28.89029	-99.075	662	177.5	177.5	181.0	178.7	176.2	175.6	175.7	176.1	176.4			177.9	177.5	0.0
EUWCD-03951	STACY - KEYSTONE #1	Frio	Carrizo	28.8156	-98.9277	610	210.9	211.8	223.1	213.7	222.7	214.4	208.5	206.5	207.0	208.6	210.2	210.4	210.6	0.3
EUWCD-04288	Glenn Neuman	Frio	Carrizo	28.90967	-98.807	528	200.6	205.0	218.4	211.2	202.5	202.4		176.2	169.4	162.1	145.5	182.3	201.0	-0.3
EUWCD-08496	Old Divine Rd.	Atascosa	Carrizo	29.08157	-98.7572	604	372.4	372.6		372.0	371.5	371.5	370.8		370.2	370.4	367.1	369.4	376.2	-3.8
EUWCD-08497	River Oaks Dr.	Atascosa	Carrizo	29.09184	-98.7136	604	392.2	392.5		391.3	390.5	390.8	389.9	389.8	389.2	389.9	389.7	389.6	389.8	2.4
EUWCD-04269	Jarret Akers	Atascosa	Carrizo	29.10375	-98.644	563	369.3	369.8											362.0	7.3
EUWCD-08498	Bailee Circle	Atascosa	Carrizo	29.09763	-98.6173	577	365.7	366.2		366.1	365.7	365.8	365.0	366.6	364.1	360.5	360.4	360.4	359.5	6.2
EUWCD-09462	TWDB HWY 16 SAND PIT/ Palo Alto Sands	Atascosa	Carrizo	29.14924	-98.5919	640	462.8	461.2	461.0	460.8	460.2	460.2	459.4	459.8	460.0	460.4	460.9	460.9	460.8	2.0
EUWCD-08499	Old Applewhite	Atascosa	Carrizo	29.11676	-98.5462	624	446.9	447.4		447.4	447.1	446.8	444.5	443.9	444.9	445.0	445.2	445.1	445.4	1.5
EUWCD-08500	Old Pleasanton Road	Atascosa	Carrizo	29.12763	-98.4958	620	465.6	462.5		462.6	462.3	462.4	461.5	460.8	460.3	460.1	460.0	460.2	460.8	4.8
EUWCD-04277	Michael Korus	Atascosa	Carrizo	29.12589	-98.4531	520	336.6	334.8	336.6	336.4	337.1	336.5	334.8	332.9	331.2		329.7	330.6	352.3	-15.7
EUWCD-09461	Milton Palmer	Atascosa	Carrizo	29.0956	-98.3965	512	292.0	279.3	291.3	292.7	297.1	293.1	291.8	288.5	282.7	279.4	274.1	285.0	310.1	-18.1
EUWCD-09464	SS Water	Wilson	Carrizo	29.30031	-98.0521	433	390.7	390.3			388.8					387.6	388.9	382.0	388.8	1.9
EUWCD-04313	CITY OF STOCKDALE #3 Carrizo	Wilson	Carrizo	29.23515	-97.9549	470	324.4	325.7								323.8				
EUWCD-01893	Davilla Transducer	Karnes	Gulf Coast-Jasper	28.91056	-97.6801	378	228.4	218.4			230.8					224.6	230.9		234.7	-6.3
EUWCD-02612	Slaughter #2	Karnes	Gulf Coast-Jasper	28.86274	-97.7324	264	191.1	190.2	189.8	190.1	189.9	187.2		189.8	190.7	189.8	188.4	187.6	192.7	-1.6
EUWCD-09465	CR 115	Karnes	Gulf Coast-Jasper	28.82355	-97.6893	260	196.1		196.9	194.2	197.2	197.0		196.5	197.7	196.5	195.7	194.8	196.4	-0.3
EUWCD-04355	Yosko Ranch	Karnes	Gulf Coast-Catahoula	28.85848	-97.9542	386	276.1	283.8			283.8								261.5	14.6
EUWCD-04307	Russell Labus	Karnes	Gulf Coast-Catahoula	28.8165	-97.9876	452	218.9	218.5		214.6	221.4	221.0	217.5	209.9	207.6	202.1	200.8	198.2	199.5	19.4
EUWCD-04297	EL OSO WSC Transducer	Karnes	Gulf Coast-Catahoula	28.82084	-98.0025	410	144.4	143.4			153.1				124.8	123.9	118.5	115.9	120.7	23.7
EUWCD-07456	Janysek-Eclleto (Magnolia)	Karnes	Yegua	29.03534	-97.7867	354	264.6	264.8								225.6	231.2	231.9	233.3	31.3
EUWCD-04281	RED BARN RD - KR GRASS	Atascosa	Queen City	29.0375	-98.5499	475	443.4	443.4		444.0	444.0	445.0				254.8	447.2	447.0	446.6	-3.2
EUWCD-04312	CITY OF STOCKDALE #2 QC	Wilson	Queen City	29.23541	-97.955	483	430.9	430.9	386.5	387.1	387.0	386.9	385.4	384.6	384.5	430.6	430.2		429.8	1.1
EUWCD-09466	Kay Love	Wilson	Queen City	29.25841	-97.8669	437	369.8	371.1	373.0	374.4	365.2	374.0	362.6	370.8	372.0	368.9	367.7	366.5	369.3	0.5

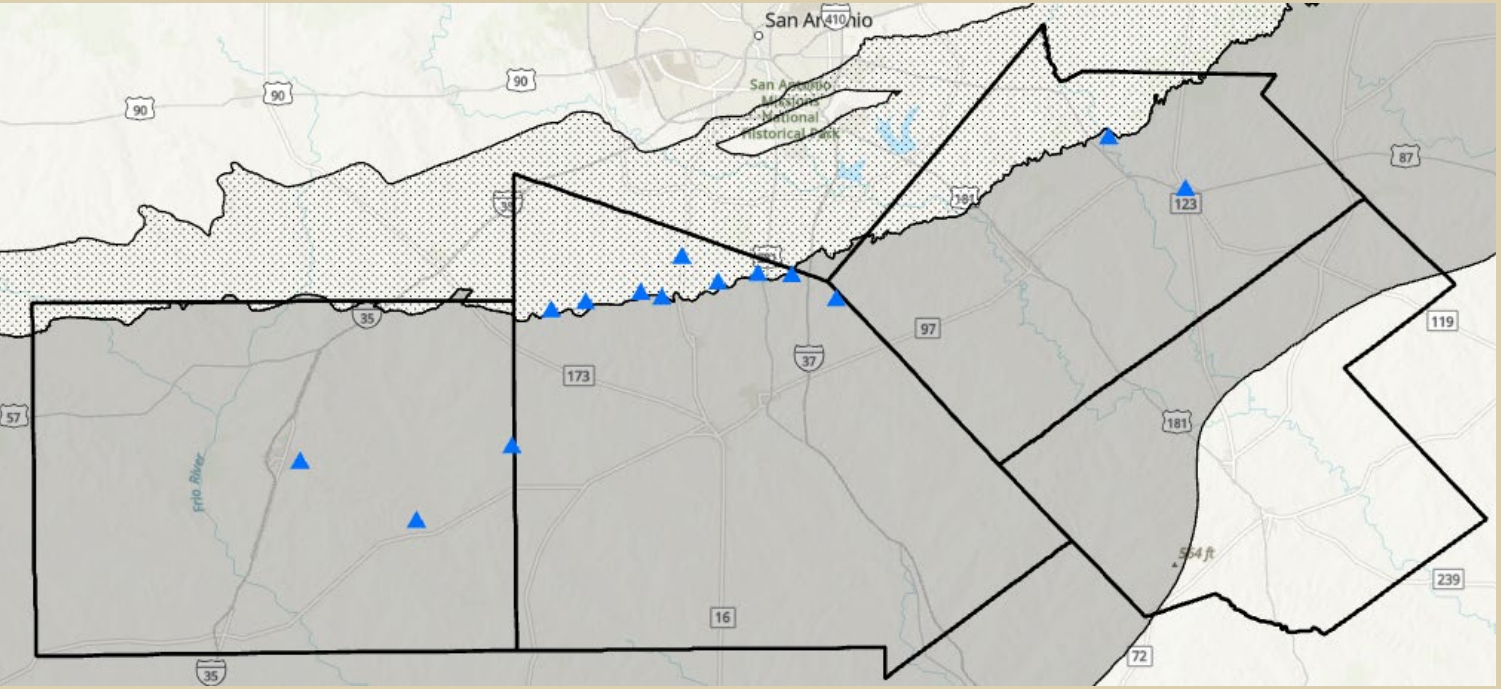
1d. Objective

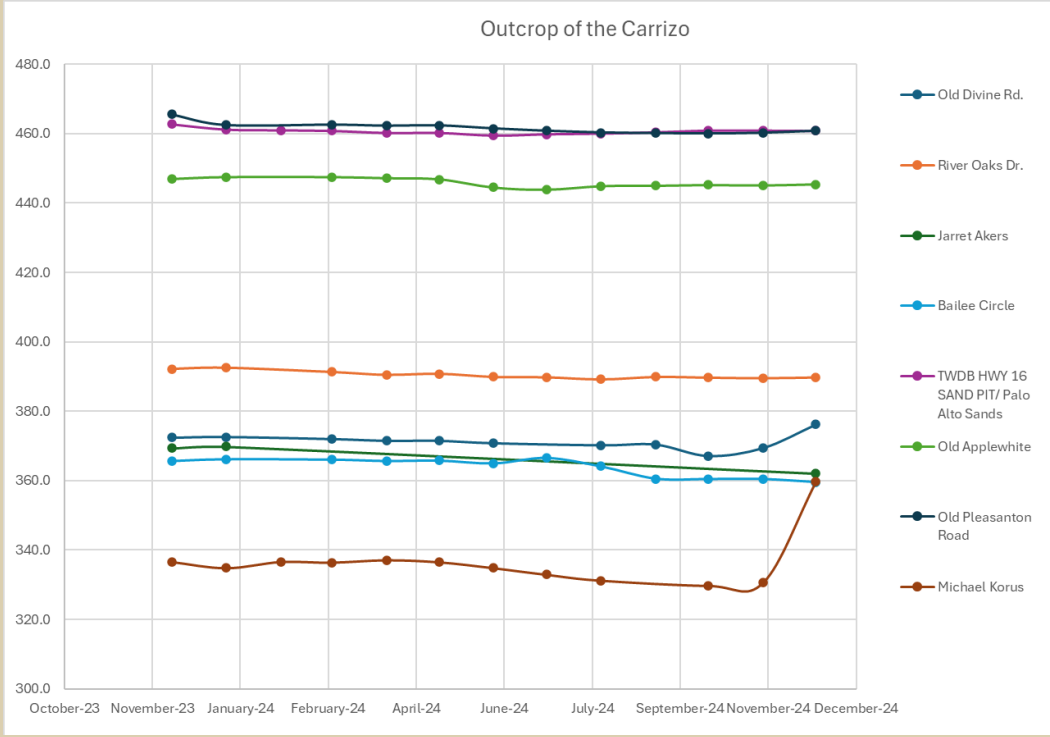
Each month the District will measure the water levels in 20 water wells.

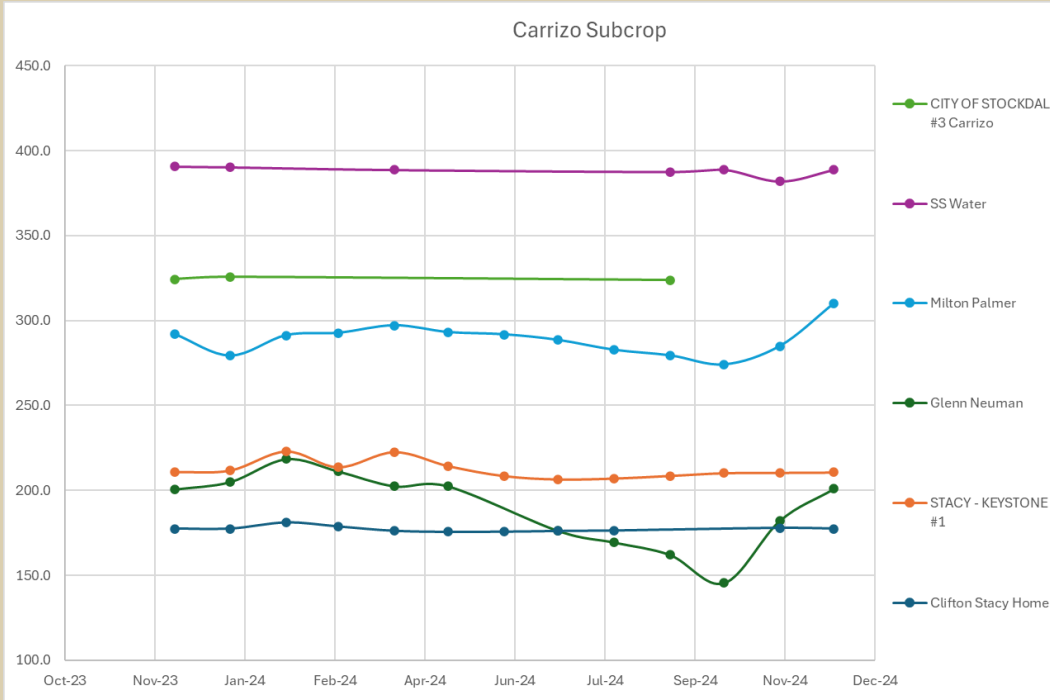


Carrizo Aquifer

- Outcrop
  - Year- Year Drawdown Average =2.9’
- Subcrop
  - Year-year Drawdown Average = 0.5’

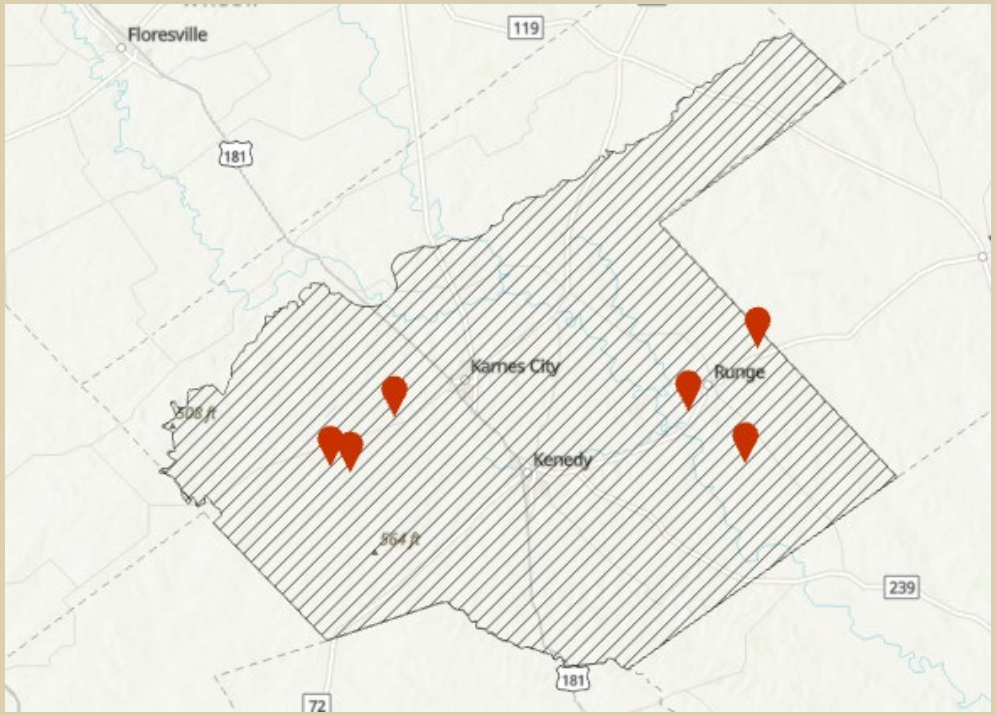


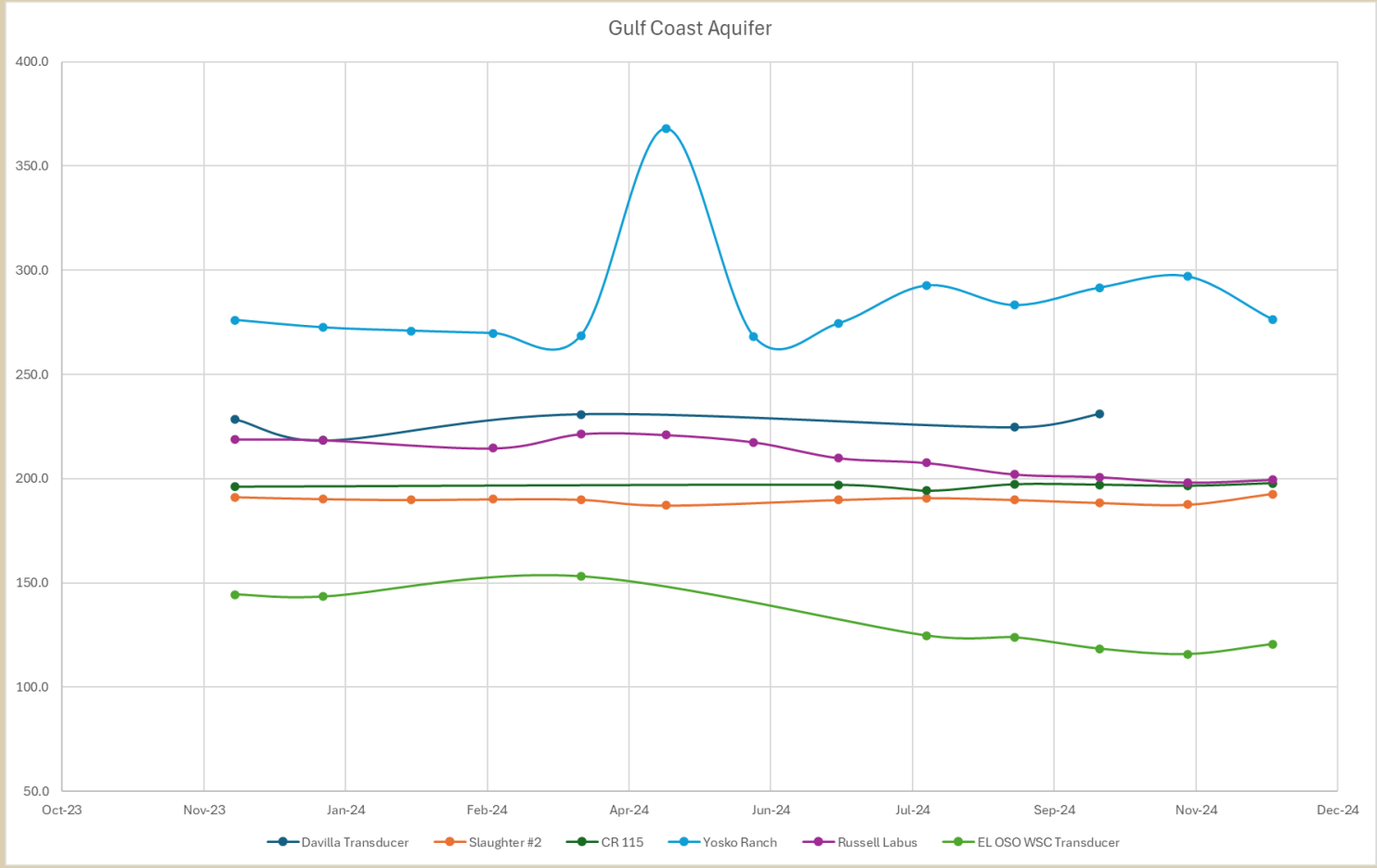




Gulf Coast Aquifer

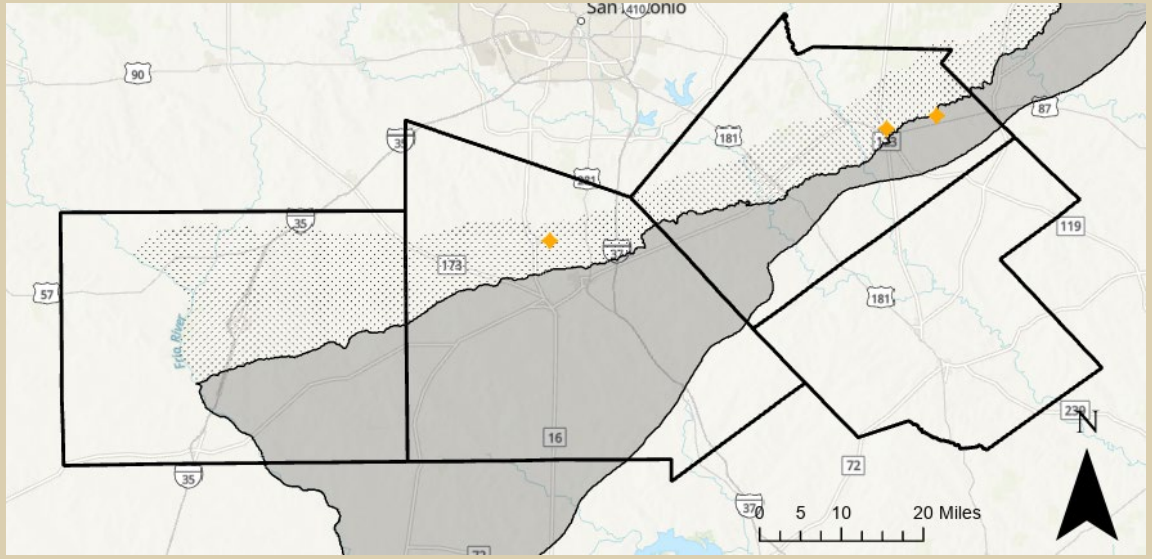
- Jasper Group (East)-
  - Year- Year Drawdown Average= 2.7’ Recovery
- Catahoula Group –
  - Year- Year Drawdown Average 14.3’ Drawdown

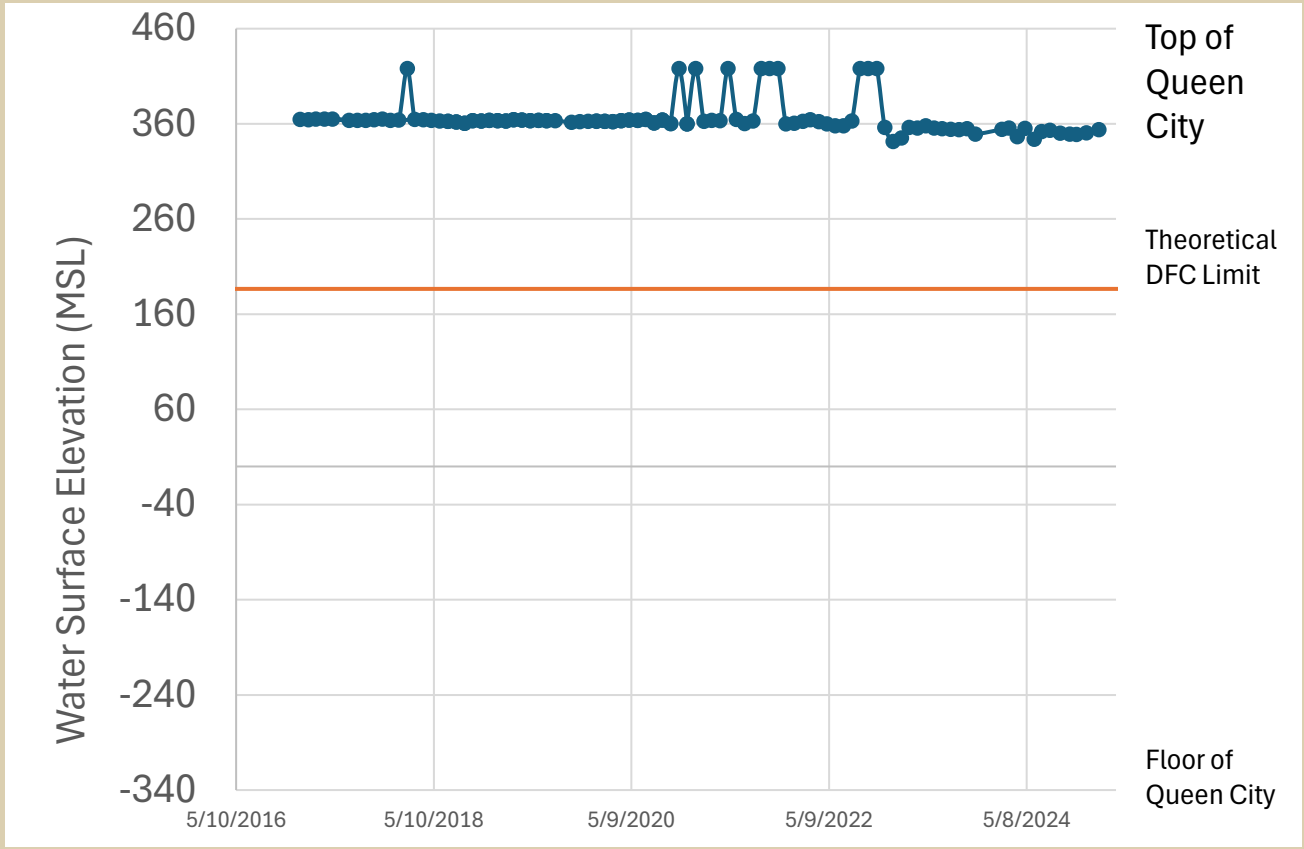




Queen City Aquifer

- Drawdown Range (from 2012)
  - Eastern – 9’ Drawdown
  - Middle – 42’ Recovery





2. <u>Controlling and Preventing Waste of Groundwater</u>:

2a. Objective – Each year the District will conduct an on-site investigation of all reports of waste of groundwater within two working days of the time of the receipt of report to the District.

- **Performance Standard –** A discussion of the waste of groundwater observed by the District each year, including the number of reports of the waste of groundwater received by the District and the District response to the report, will be included in the Annual Report of District Activities made to the Board of Directors each year.

Table 2.a.On-site investigation log.

County	Aquifer	Date Orginanlly Contacted	Description	Category	Follow Up	Follow Up 2
Atasocsa		4/23/2024	Landowner expressed concern regarding pesticide encroachment on their property. Requested follow up with their garden well. Well is currently unregistered.	Water Quality		
Wilson		4/17/2024	Ms. Azzaro indicated that she has observed an increase in scaling in her water and the deposition of black substance.	Water Quality	Staff Following up with Registration for other wells on property, Staff contacting for WQ sample	
Karnes	Yegua Jackson	4/11/2024	Landowners legal contacted district about anyone in Karnes County around Hwy 80 and 792 called in with well water being flamable. Legal sent video via text to LY.	Water Quality	Followed up with status of well registration on 4/24/24 and update on conversation with all parties.	
Atasocsa	Carrizo	7/11/2024	Landowner ranches in the Bigfoot area of Frio County. She expressed concern about the falling water tables in the area because a number of neighbors had to either lower the pump or re-drill wells. Her specific concern was the impact of continuous irrigation practices to support turf production. Mr. Tymrak had questions regarding the water quality of	Water Levels Water Quality	Sent email to Dir's Neal and Schorp. Followed up on PIR, providing WSE data, map, and #, volume of irrigation permits.	
Atasocsa	Carrizo	11/20/2024	Complaint regarding illegal drilling, hydrologic trespass during drilling activities	Waste	Staff conducted site visit, determined waste was occurring, coordinated with Drilling crew to resolve. Issued NOV	Second site visit was conducted, Resolution of waste was conducted

2a. Objective- Controlling and Preventing Waste of Groundwater:

Each year the District will conduct an on-site investigation of all reports of waste of groundwater within two working days of the time of the receipt of report to the District.

- (1) Waste Complaint
  - Frio County
  - November 2024
  - Notice of Violation Issued & Resolved
- (1) General Concern of Water Levels
  - Atascosa County
  - July 2024
- (4) Water Quality
  - (2) Wilson County, (1) Karnes, (1) Atascosa
  - March 2024

3. Addressing Conjunctive Surface Water Management Issues:

3a. Objective- Encourage the use of surface water supplies where available to meet the needs of specific user groups within the District.

- **Performance Standard-** The District will participate in the Region L Regional Water Planning process by attending at least two Region L meetings annually and will encourage the development of surface supplies where appropriate. This activity and involvement will be discussed in the Annual Report presented to the District Board of Directors.

- District representative participated in the following Region L Work-sessions and meetings.
  - Planning Group Meetings
    - February 14, 2024
    - May 2, 2024
    - August 1, 2024
    - November 7, 2024
  - Groundwater Availabilities Workgroup
    - April 15, 2024
  - Staff Workgroup
    - April 18, 2024
    - October 22, 2024
- District representatives included:
  - Darrell Brownlow- GMA 13
  - Weldon Riggs – Agricultural WUG
  - Aarin Teague- Groundwater Districts
  - Ed Griffin - Citizen

3. Objective: Addressing Conjunctive Surface Water Management Issues:

Objective- Encourage the use of surface water supplies where available to meet the needs of specific user groups within the District.

District Representation

- Darrell Brownlow- GMA 13
- Weldon Riggs – Agricultural WUG
- Aarin Teague- Groundwater Districts
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- Region L Participation
  - Planning Group Meetings
    - February 14, 2024
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    - April 15, 2024
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    - April 18, 2024
    - October 22, 2024

4. <u>Addressing Natural Resource Issues that Impact the Use and Availability of groundwater and which are Impacted by the Use of Groundwater</u>

4a. Objective – Each year the District will sample at least eight water wells in the District, two per county, for chemical analysis of water quality for chemical constituents of concern.

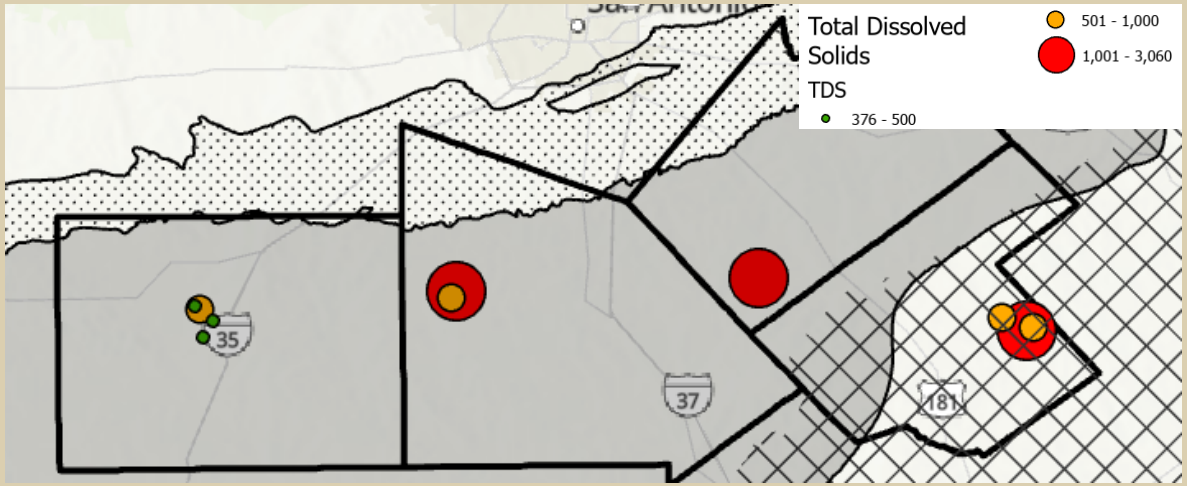
- **Performance Standard –** A table giving the results of the chemical analyses of the water quality samples taken by the District each year will be included in the Annual Report of District Activities made to the Board of Directors each year.

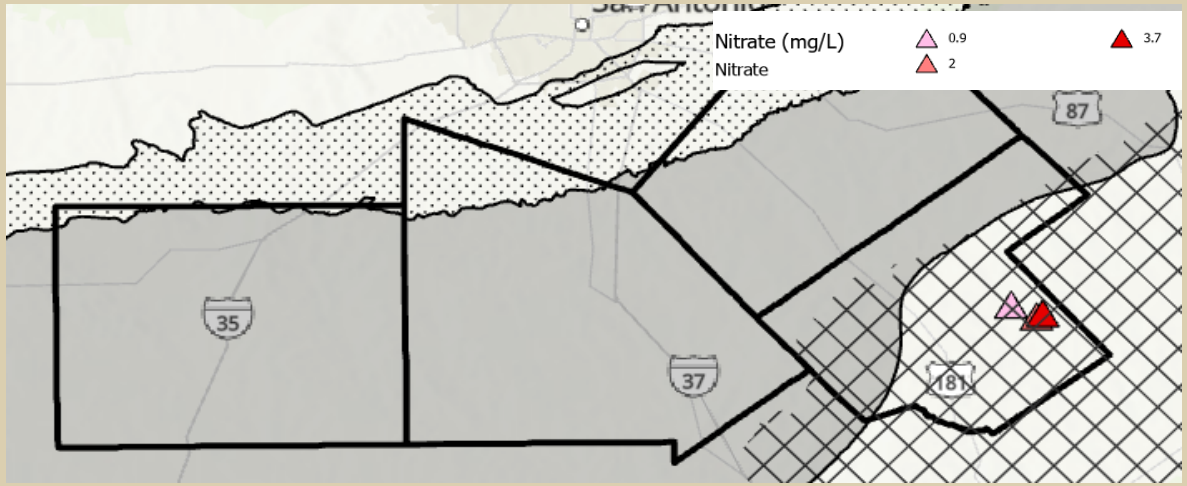
Performance Standard – A discussion of whether any instances of groundwater contamination or issues of concern were noted in the water quality sample analyses will be included in the Annual Report of District Activities made to the Board of Directors each year.

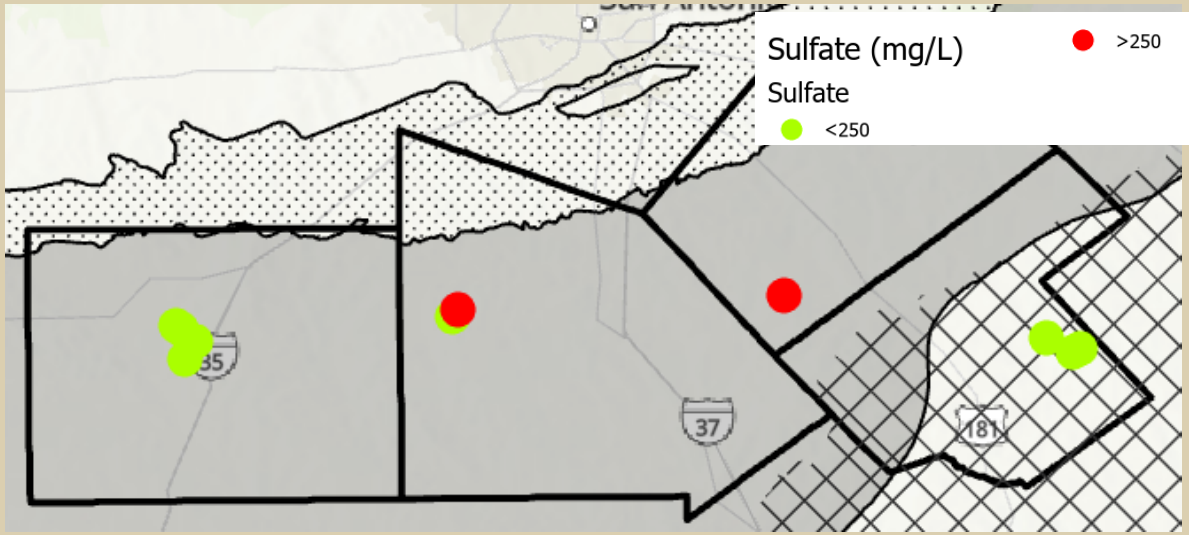
Table4.a.1.Water quality results

Well ID	County	Latt	Long	pH	Chloride (mg/L)	Conductivity (umhos/cm)	Nitrate (mg/L)	Nitrite (mg/L)	Sulfate (mg/L)	TDS	Flouride (mg/L)	Alkalinity (mg/L)	Arsenic (mg/L)	Copper (mg/L	Calcium Hardness (mg/L)	Calcium (mg/L)	Lead (mg/L)	Aluminum (mg/L)	Iron (mg/L)	Sodium (mg/L)	Manganese (mg/L)	Zinc (mg/L)
Carrizo																						
EUWCD-08572	Frio	28.87722	-99.1558	7.8	27	651	<0.5	<0.5	69	376	<0.5	248	<0.0005	0.006	239.7	96	<0.0005	<0.010	0.27	25	0.011	0.042
EUWCD-01826	Frio	28.93238	-99.1704	7.1	30	688	<0.5	<0.5	72	396	<0.5	246	<0.0005	<0.005	244.7	98	<0.0005	<0.010	0.15	25	0.011	<0.010
EUWCD-01391	Frio	28.90558	-99.137	7.6	29	663	<0.5	<0.5	71	392	0.5	248	<0.0005	<0.005	239.7	96	<0.0005	<0.010	0.18	26	<0.010	<0.010
Gulf Coast																						
EUWCD-09769	Karnes	28.88823	-97.7031	7.5	378	1656	2	<0.5	42	1140	0.59	222	0.0013	<0.005	324.6	130	<0.0005	<0.010	<0.010	120	<0.010	0.012
EUWCD-08086	Karnes	28.89434	-97.6925	7.6	284	1392	3.7	<0.5	30	936	0.56	232	0.0011	<0.005	324.6	130	<0.0005	<0.010	<0.010	100	<0.010	0.011
EUWCD-03462	Karnes	28.91028	-97.7475	7.3	269	1394	0.9	<0.5	53	950	<0.5	258	0.0028	<0.005	374.6	150	<0.0005	<0.010	<0.010	79	<0.010	0.014
Queen City																						
EUWCD-09812	Atascosa	28.95831	-98.7083	8	486	3505	<0.5	<0.5	460	1928	0.69	206	<0.0005	0.005	349.6	140	0.0008	<0.010	0.019	430	<0.010	0.014
EUWCD-01950	Atascosa	28.94605	-98.7184	7.6	210	1358	<0.5	<0.5	122	788	0.4	222	<0.0005	<0.005	222.2	89	<0.0005	<0.010	0.5	130	<0.010	<0.010
EUWCD-09810	Frio	28.92499	-99.1617	7.5	84	1019	<0.5	<0.5	105	568	0.5	302	<0.0005	0.005	112.4	45	<0.0005	0.2	0.18	140	0.052	0.026
Jackson																						
EUWCD-09006	Wilson	28.98204	-98.1762	7.5	421	4925	<1	<1	1213	3060	<1	302	<0.0005	<0.005	724.1	290	<0.0005	<0.010	0.59	560	0.064	0.026

4. Objective: Addressing Natural Resource Issues that Impact the Use and Availability of groundwater and which are Impacted by the Use of Groundwater :



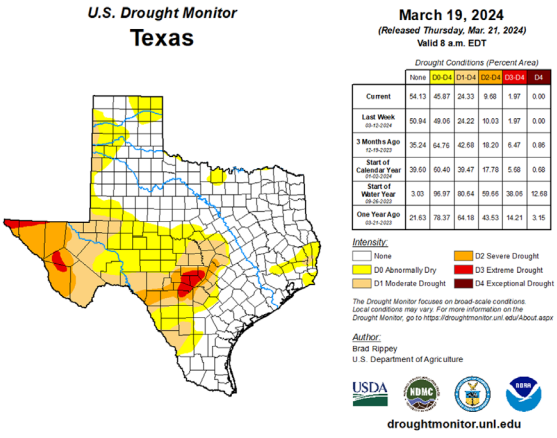


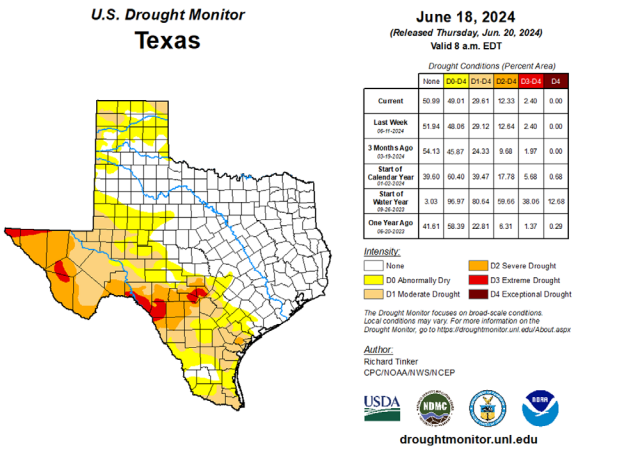


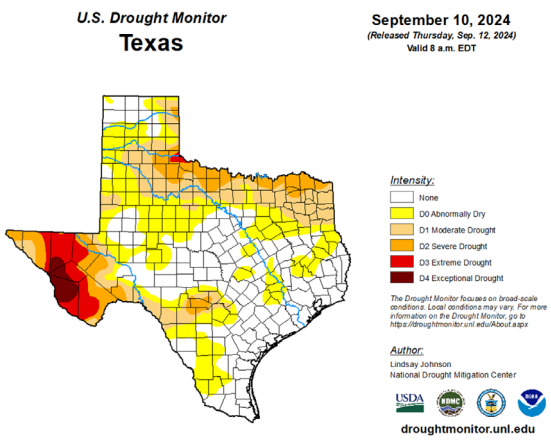
5. Addressing Drought Conditions:

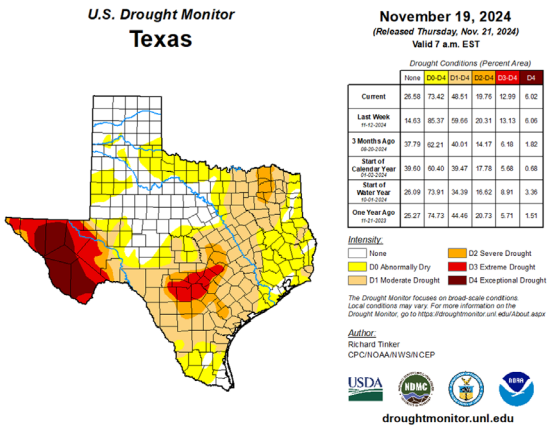
5a. Objective – At least each quarter, the District will download at least one updated U.S. Drought Monitor map posted on The National Drought Mitigation Center at the University of Nebraska Lincoln website (https://droughtmonitor.unl.edu/CurrentMap/StateDroughtMonitor.aspx?TX) and check for periodic updates to drought conditions as posted on the Texas Water Development Board website.

- **Performance Standard** – at least quarterly, the District will assess the status of drought in the District and prepare a quarterly briefing to the Board of Directors. The downloaded U.S. Drought Monitoring maps and drought report will be included with copies of the quarterly briefing in the Annual Report of District Activities made to the Board of Directors each year.
- **Performance Standard** –the District will put the following link to the TWDB drought page as a resource https://www.waterdatafortexas.org/drought



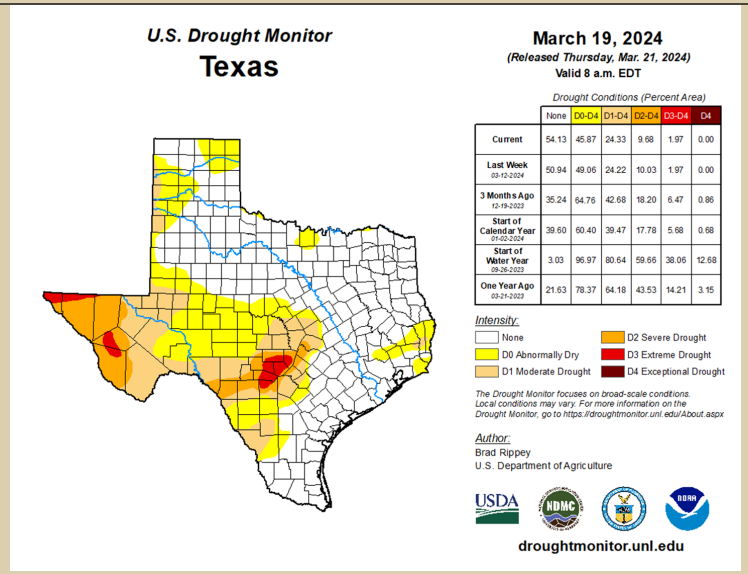


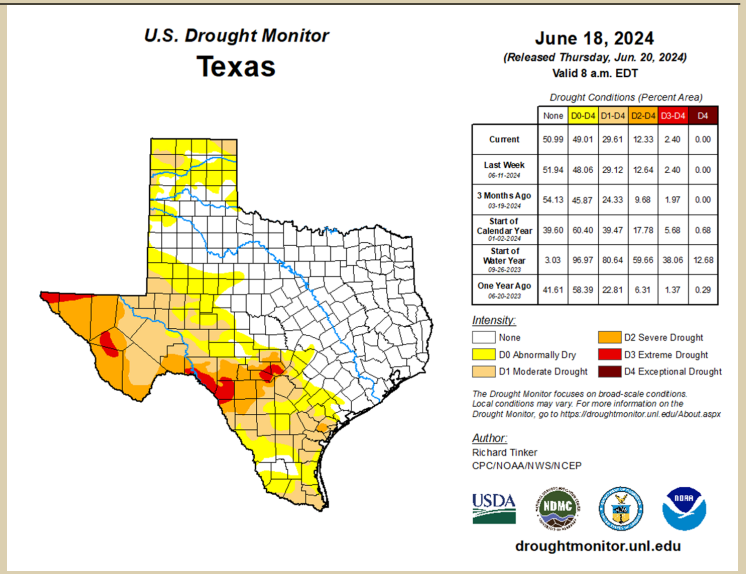


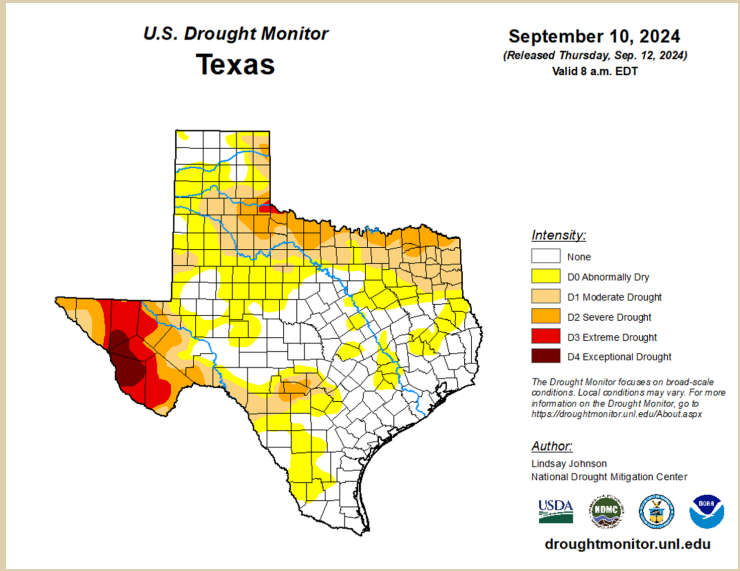


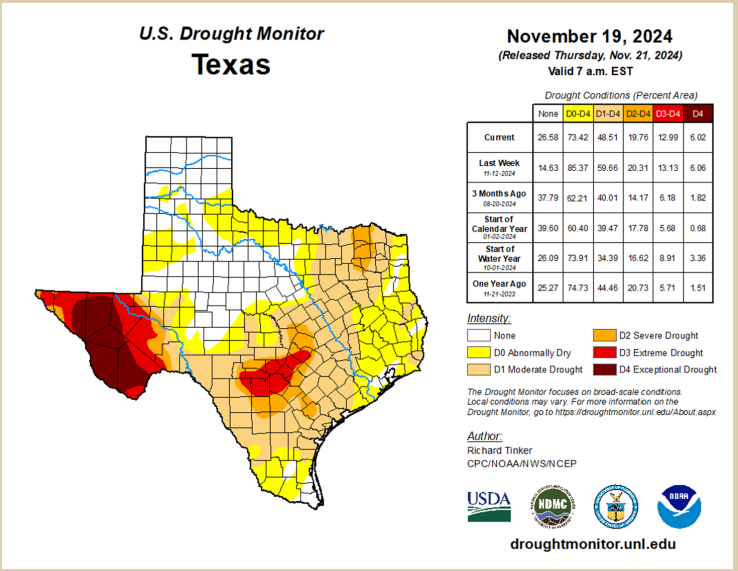
Objective 5: Addressing Drought Conditions:

Objective – At least each quarter, the District will download at least one updated U.S. Drought Monitor map posted on The National Drought Mitigation Center at the University of Nebraska Lincoln website









6. <u>Addressing Water Conservation:</u>

6a. Objective - Each year the District will provide several conservation website links on Districts websites and provide conservation fliers in the District office foyer.

- **Performance Standard** – Each year the District will brief the Board of Directors with the conservation links provided on the website and provide them with fliers that are in the office foyer.

EUWCD

Evergreen Underground Water Conservation District

How Do I Find My Well?

1

Why It's Important to Locate Your Well

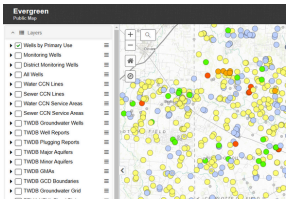
- Protect your investment and establish your water rights.
- Verify your well's location and spacing requirements.
- Monitor and maintain well health and safety.
- Ensure compliance with groundwater management regulations.
- Ensure your well is documented accurately for future needs.

2

Tools and Resources

- **Public Map Tool**: Access EUWCD's online map to locate wells. Scan the QR code or visit https://euwcd.halff.com/Map/Public
- **Groundwater Data**: Explore well details, including depth, aquifer, and registration information.

3



How to Use the Public Map

- Visit the map, scan QR code above or type URL above
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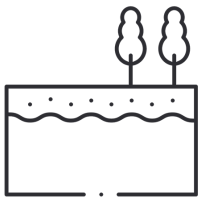
4



Key Terms to Know

- **Well ID:** A unique identifier assigned to each well by the Evergreen UWCD
- **Aquifer:** The underground layer where groundwater is being pumped from
- **Permitted/Exempt Well:** Wells classified based on water use and volume. Most domestic use wells are exempt.

5

Contact Us for Assistance

- Need help? Reach out to Evergreen UWCD:
- Phone 830-569-4186
- Email: info@EvergreenUWCD.org
- Office Address: 110 Wyoming Blvd, Pleasanton, TX 78064

Edition #1

Summer 2024

NEWSLETTER

KNOW THE WATER BELOW

Evergreen Underground Water Conservation District

TOP NEWS OF THE MONTH

PLAN AHEAD FOR PRODUCTION REPORTING

Public water supply and industrial users are required to submit monthly production reports. All other permitted users are required to report annually.

All permitted wells should monitor ground water production with the use of an approved water flow meter.

Production reports can be submitted online at https://www.evergreenuwcd.org.

Reporting groundwater production is a key responsibility of well owners. The EUWCD collects this data in order to understand how much groundwater is pumped from each aquifer in the District. Evergreen personnel analyze this data to improve scientific understanding of the aquifers and build models to simulate future conditions and availability of groundwater.

Evergreen uses these tools to better monitor and manage our groundwater resources. Even more, we provide data to the regional water planning process, which guides water conservation and use planning. Data characterizing water use within the district is an integral part of planning for future use of water within our region.

Now is a great time to check your meter to ensure it is functioning properly. If you need assistance with selecting or purchasing a water flow meter, please contact the EUWCD office.

Greetings from the President

BLAINE SCHORP

In the 30 years that I have served the people of Frio County on the Evergreen Underground Water Conservation District, the demand for groundwater in our communities has increased significantly. Safe and sustainable groundwater supplies are key to meeting the drinking water, industrial, agricultural, domestic, and livestock needs of the District. The Board of Evergreen has been tasked by the State Legislature with the responsibility to manage the resource for its continued and sustainable use.

The District believes water is a valuable resource that can be managed in a reasonable manner through conservation, education, and equitable regulation. The Board of Directors goal is to ensure a sustainable supply of water from our local groundwater resources, while recognizing the need to balance the protection of rights of private landowners with the responsibility of managing the area's groundwater resources for future generations.

At the same time the District participates in Regional and State planning processes, coordinating with other groundwater management districts, conducting aquifer studies, developing groundwater models to assess future scenarios, and developing guidelines for desired future conditions.

The Board is in the process of developing a strategic plan to invest in education, science, and efficient management systems. These investments are designed to make the permitting process easier to navigate, while providing essential data and analysis about the quantity and quality of groundwater.

"...for the purpose of conserving, preserving, protecting, and enhancing the recharge of the underground water in the district."

Information regarding permitting of wells, resources for well owners, and water conservation can be found on the District website at http://www.evergreenuwcd.org.

WHY OLD WELLS MATTER

PROTECTING GROUNDWATER

BY EUWCD STAFF

>>> OFTEN HIDDEN IN PLAIN SITE

Have you ever encountered a random hole in the ground or a pipe sticking out of the ground? It could be an abandoned well. Abandoned wells are wells that are not currently in active use or are deteriorated with the casing or pump column in poor condition. Often, there is little known about the location or condition of these wells, presenting both safety and legal risk issues to the landowner. While easily overlooked, these wells are potential conduits for groundwater contamination and can be a threat to health and safety.

IMPACT

If you encounter an abandoned or non-functional well, please contact the EUWCD in order to ensure the well is appropriately documented. This allows for the district to monitor hazards to water quality.

>>> CAPPING AND PLUGGING WELLS

Both Texas law and the rules of the EUWCD requires that landowners plug or cap abandoned wells. The EUWCD tracks abandoned wells in order to ensure accurate information for addressing risk to the water quality of groundwater. Landowners are highly encouraged to seek professional assistance from a licensed water well driller. More information and resources about abandoned wells can be found at https://www.tceq.texas.gov/goto/rg-347.


Photo by Evelynn Caraway

YOUTH LEADERSHIP IN GROUNDWATER

A WORD FROM THE DIRECTORS

By Weldon Riggs

>>> SCHOLARSHIP PROGRAM

The EUWCD recently conducted it's annual scholarship program for area high school seniors. This year, students were challenged to create photo essays that told the story of the role of groundwater in their community. Using this visual medium, students were able to illustrate the value and necessity of conserving groundwater resources.

>>> LEADERSHIP

Students rose to the challenge. Their original photos and narrative captured a local viewpoint of water that conveys how their families and communities are dependent on groundwater resources. The unique and often poignant views expressed by the students reflect the critical role of groundwater to maintaining agricultural, ecological, and economic stability of their family, friends, communities, and land around them.

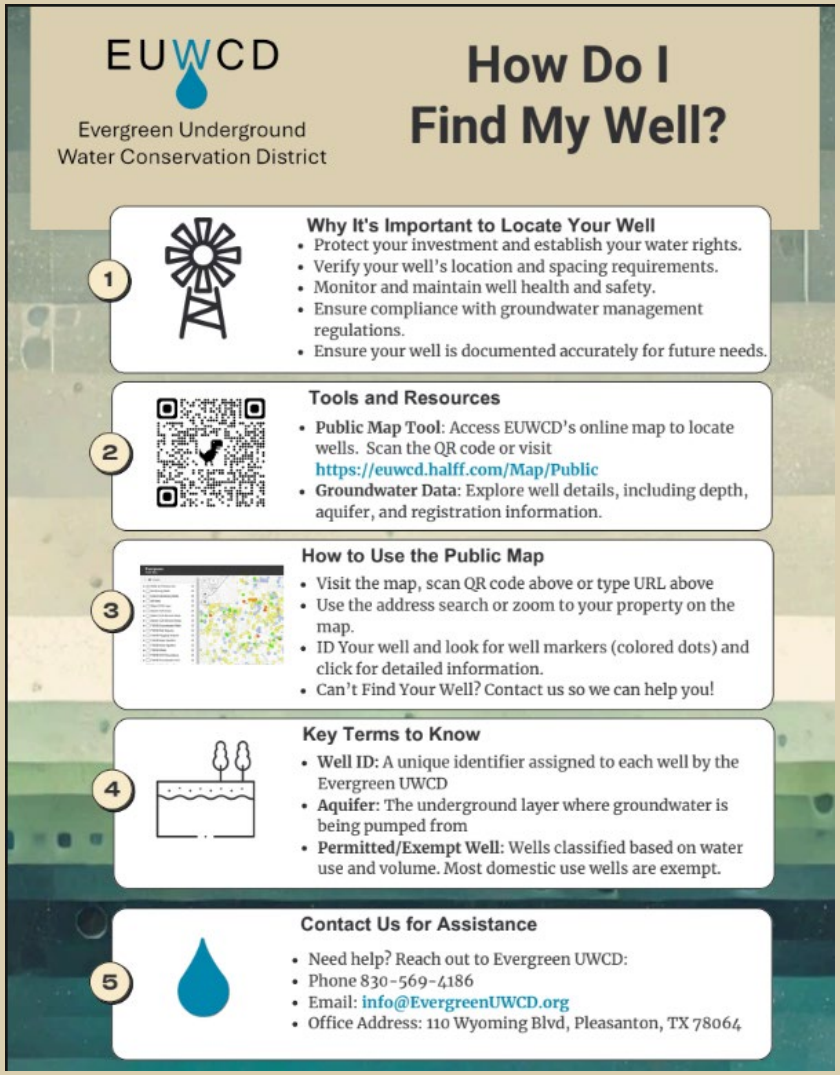
CONGRATULATIONS

Evelynn Caraway was recognized by the EUWCD Board of Directors on May 31, 2024.

>>> RECOGNITION

Evelynn Caraway, a recent graduate from Pleasanton High School, submitted the winning photo essay. The EUWCD Board of Directors recognized her at the May 31, 2024 board meeting, presenting her with a $1,000 scholarship. She will be attending Texas A&M University to study Agricultural Engineering.

Objective 6 - Each year the District will provide several conservation website links on Districts websites and provide conservation fliers in the District office foyer.



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Evergreen Underground Water Conservation District

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Edition #1 Summer 2024

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Evergreen Underground Water Conservation District

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Evergreen uses these tools to better monitor and manage our groundwater resources. Even more, we provide data to the regional water planning process, which guides water conservation and use planning. Data characterizing water use within the district is an integral part of planning for future use of water within our region.

Now is a great time to check your meter to ensure it is functioning properly. If you need assistance with selecting or purchasing a water flow meter, please contact the EUWCD office.

7. Addressing Desired Future Conditions

7a. Objective - The District monitors groundwater levels and evaluates whether the average change in groundwater levels is in conformance with the DFCs. The District will estimate the total annual groundwater production based on water use reports and other relevant information and compare these production estimates to the MAGs.

- **Performance Standard** – Each year the District will summarize the monitoring activities in the annual report including average change in groundwater levels and estimated annual groundwater production.

Table 7.a. Desired future conditions for the District

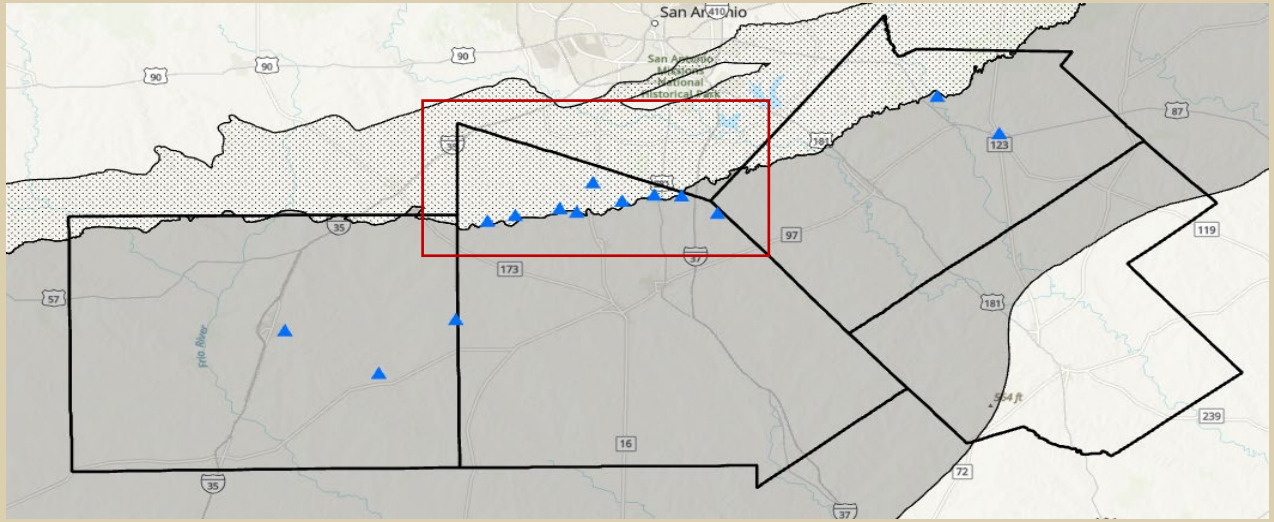
Aquifer	Desired Future Condition	Date DFC Adopted
Carrizo-Wilcox, Queen City, and Sparta (outcrop)	75 percent of saturated thickness in the outcrop at the end of 2012 remains at the end of 2080.	11/19/2021
Carrizo-Wilcox, Queen City, and Sparta	Average drawdown of 48 feet (+/- 5 feet) for all of GMA 13 calculated from the end of 2012 conditions through the year 2080	11/19/2021
Yegua-Jackson	For Karnes County, the average drawdown from the end of 2010 through 2080 is 1 foot (+/- 1 foot).	11/19/2021
Gulf Coast	22 feet of drawdown of the Gulf Coast Aquifer System.	April 8, 2021

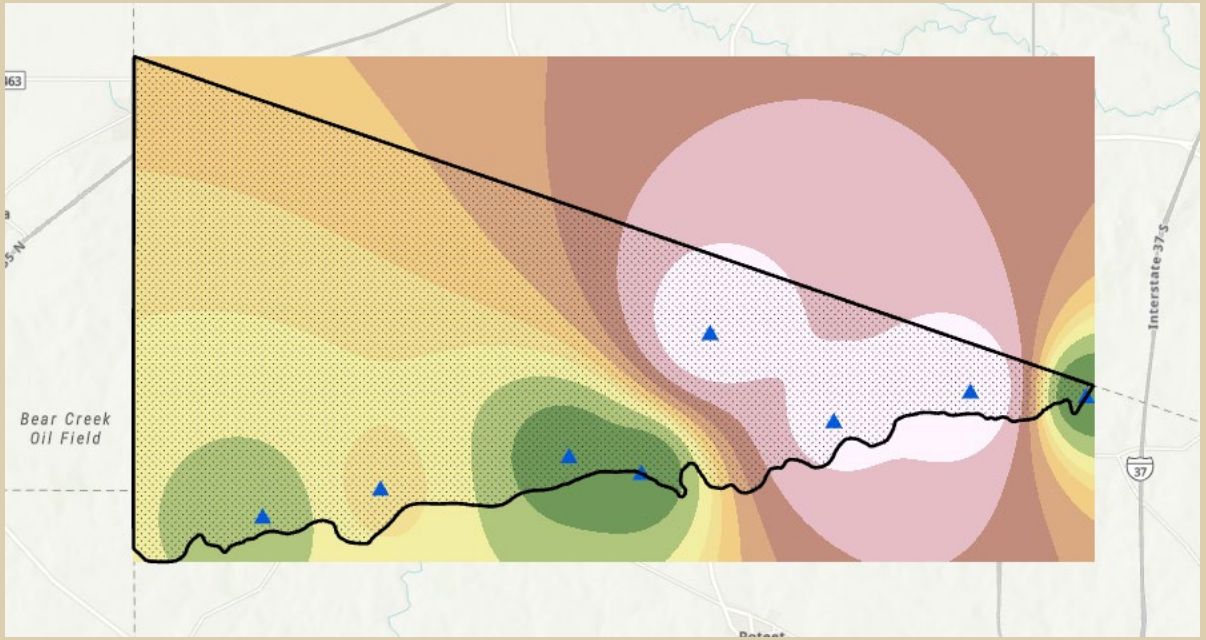
Object 7a: Addressing Desired Future Conditions

- **7a. Objective** - The District monitors groundwater levels and evaluates whether the average change in groundwater levels is in conformance with the DFCs. The District will estimate the total annual groundwater production based on water use reports and other relevant information and compare these production estimates to the MAGs.

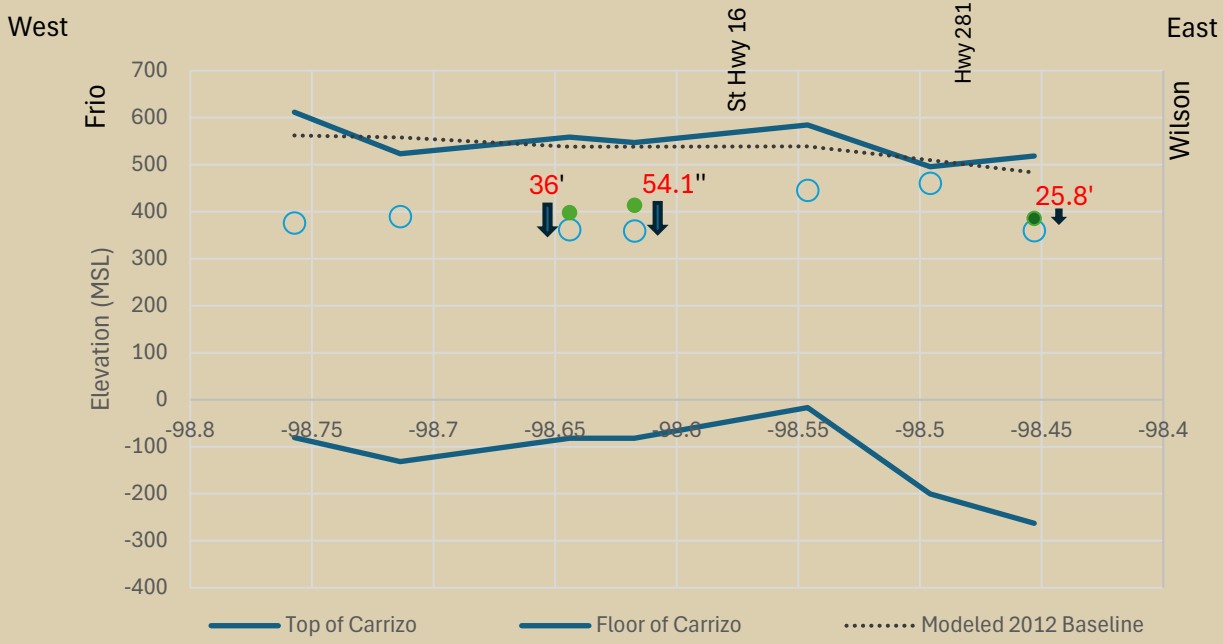
Aquifer	Desired Future Condition	Date DFC Adopted
Carrizo-Wilcox, Queen City, and Sparta (outcrop)	75 percent of saturated thickness in the outcrop at the end of 2012 remains at the end of 2080.	11/19/2021
Carrizo-Wilcox, Queen City, and Sparta	Average drawdown of 48 feet (+/- 5 feet) for all of GMA 13 calculated from the end of 2012 conditions through the year 2080	11/19/2021
Yegua-Jackson	For Karnes County, the average drawdown from the end of 2010 through 2080 is 1 foot (+/- 1 foot).	11/19/2021
Gulf Coast	22 feet of drawdown of the Gulf Coast Aquifer System.	April 8, 2021

Carrizo

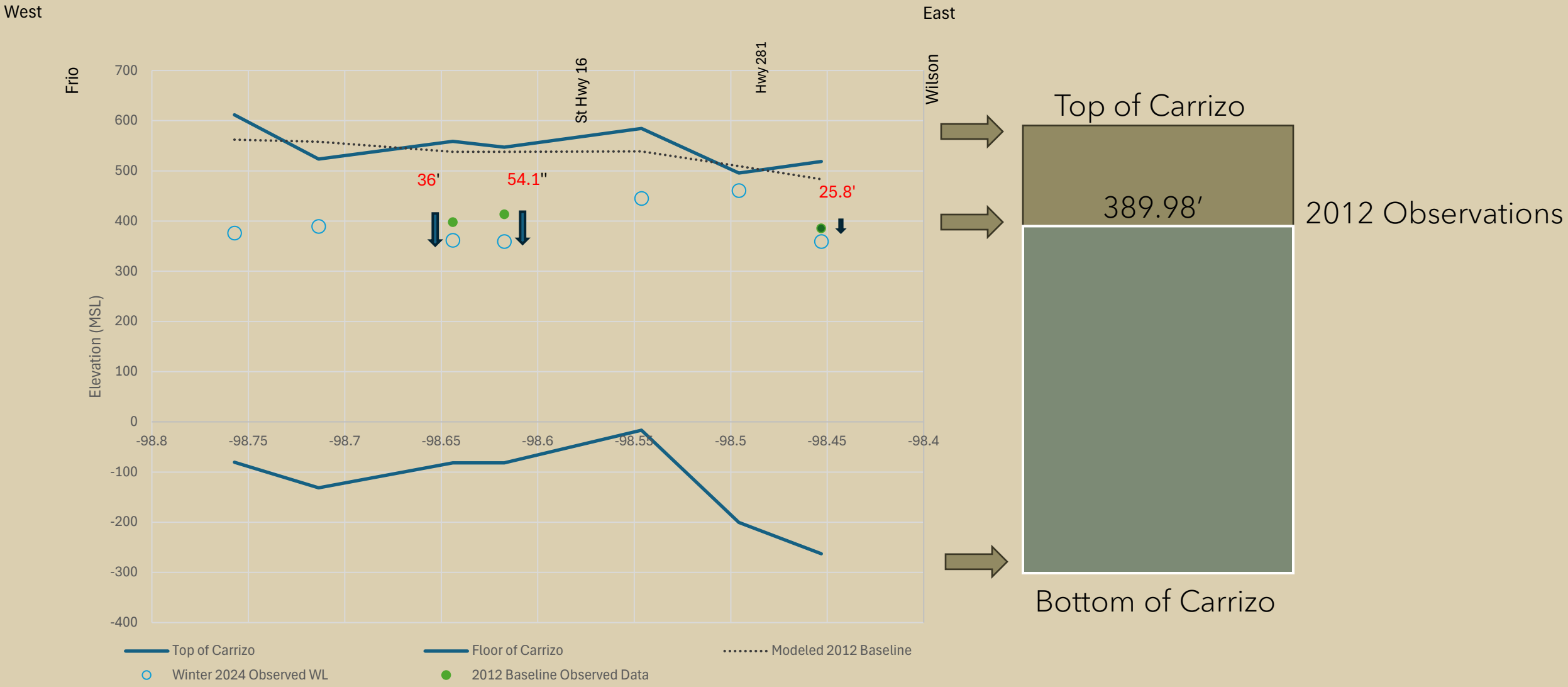




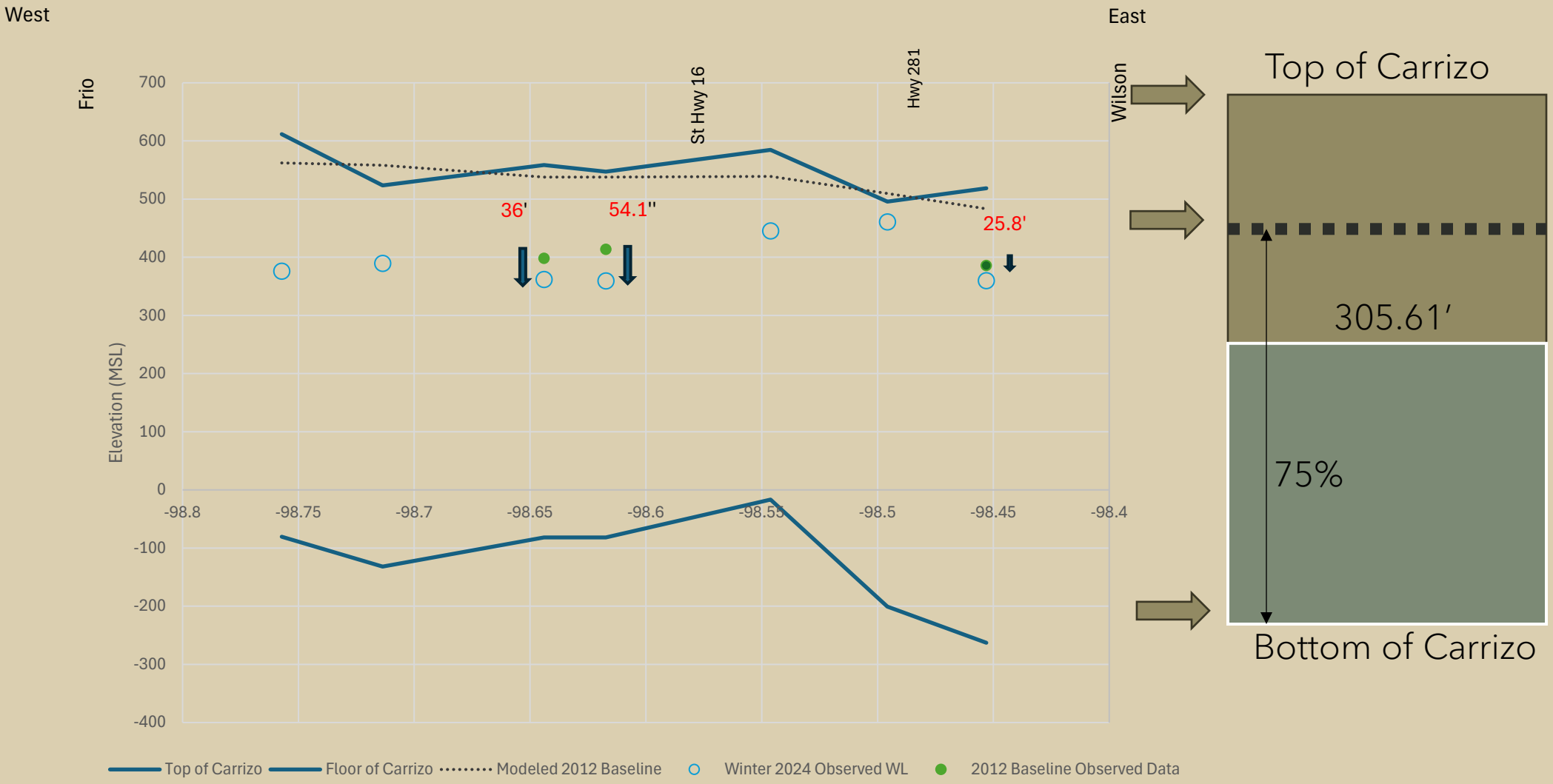
Level	Data Source	WSE (MSL)
Average 2012 Baseline WSE	State Driller's Reports & District Data	389.98′
Average 75% Saturated Thickness WSE	District Lithology Data; State Driller's Reports, District Monitoring Data	305.61′
Average Monitored WSE	District Data	368.88′
Average WSE DFC Threshold Level 1	District Lithology Data; State Driller's Reports, District Monitoring Data	360.5′

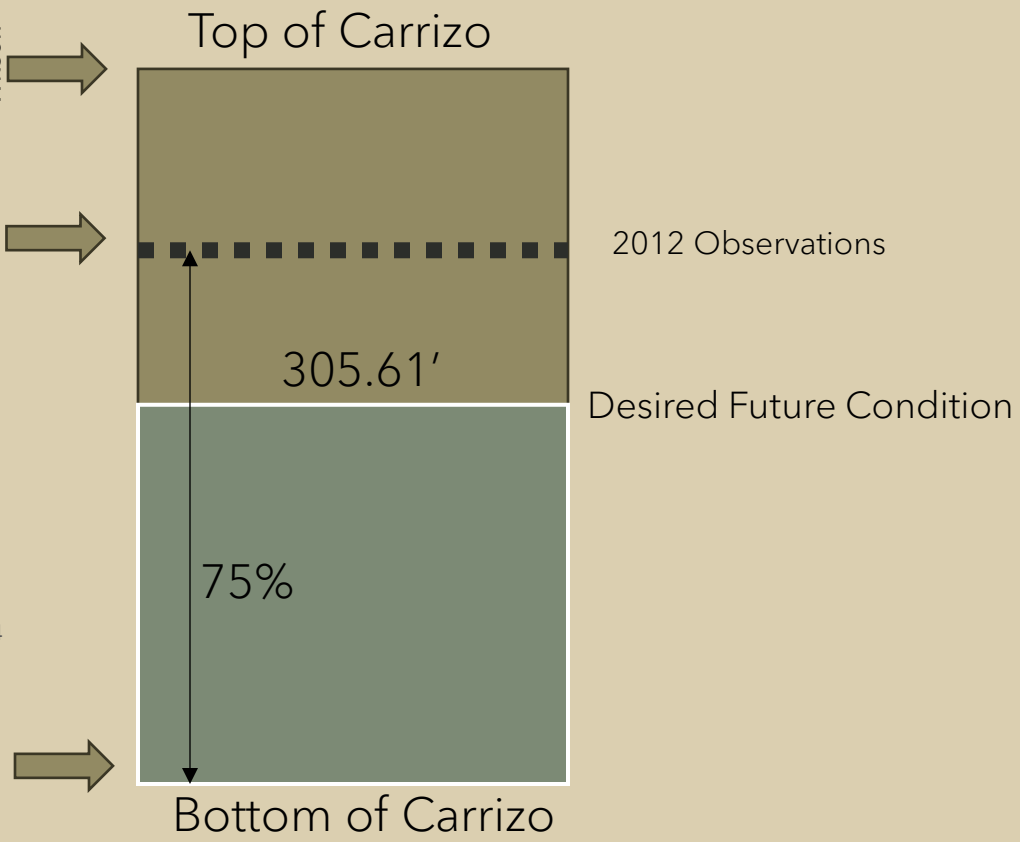


Carrizo

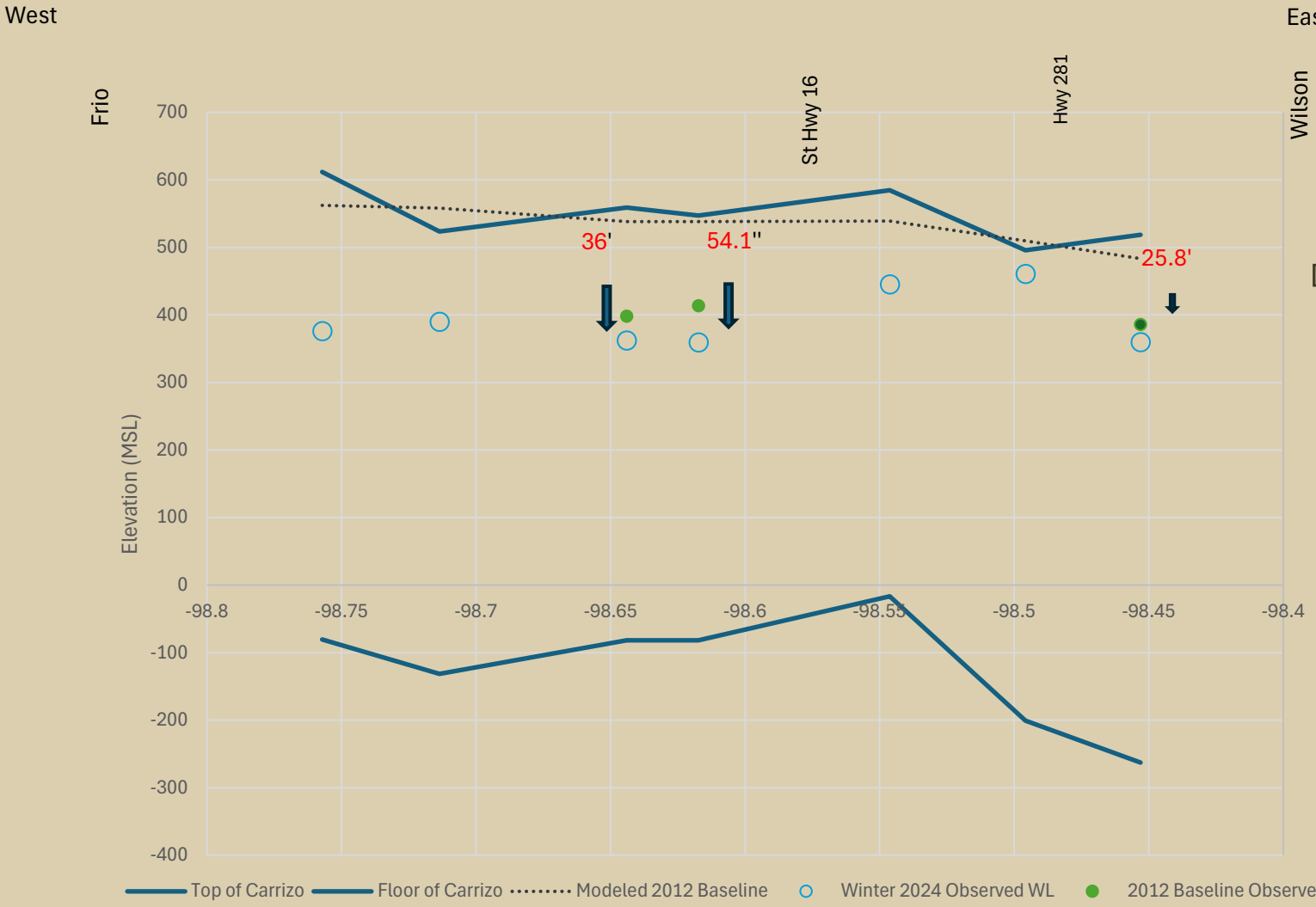

West
East
Frio
St Hwy 16
Hwy 281
Wilson
Elevation (MSL)
700
600
500
400
300
200
100
0
-100
-200
-300
-400
-98.8
-98.75
-98.7
-98.65
-98.6
-98.55
-98.5
-98.45
-98.4
36'
54.1"
25.8'
Top of Carrizo
Floor of Carrizo
Modeled 2012 Baseline
Winter 2024 Observed WL
2012 Baseline Observed Data
Top of Carrizo
389.98'
2012 Observations
Bottom of Carrizo

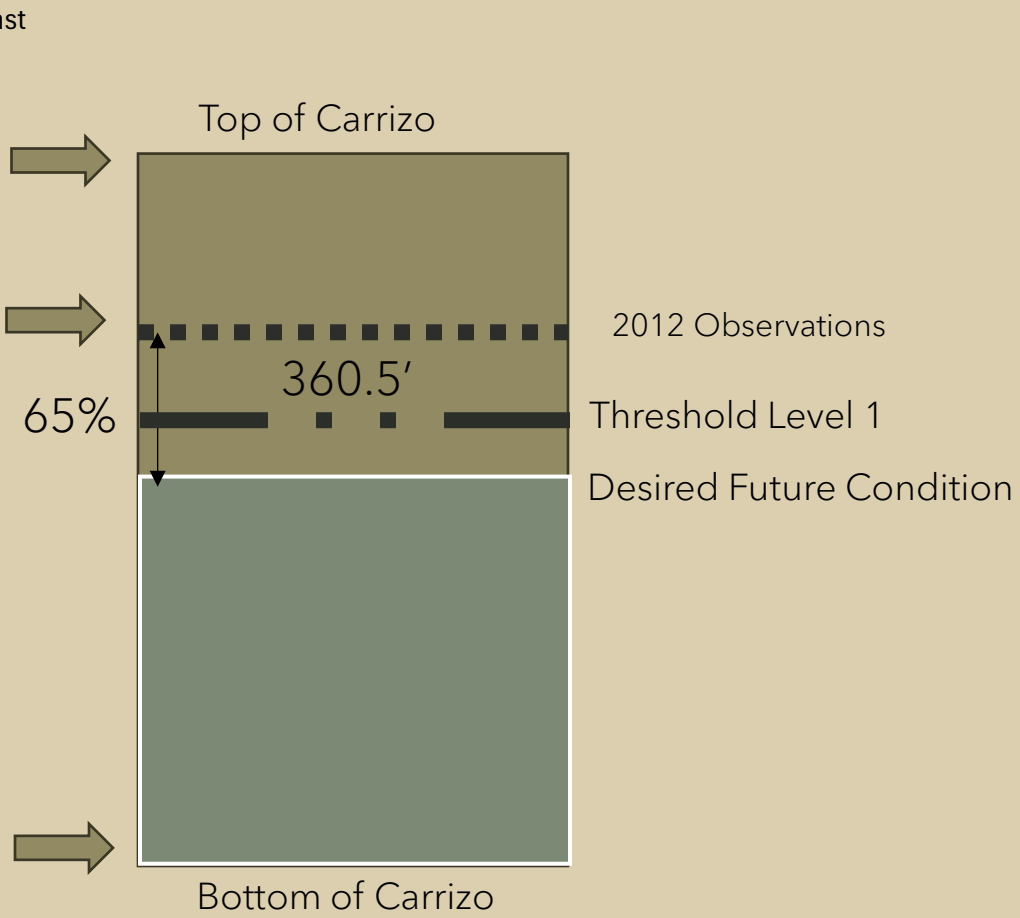
Carrizo


West
East
Frio
St Hwy 16
Hwy 281
Wilson
Elevation (MSL)
700
600
500
400
300
200
100
0
-100
-200
-300
-400
-98.8
-98.75
-98.7
-98.65
-98.6
-98.55
-98.5
-98.45
-98.4
36'
54.1''
25.8'
Top of Carrizo
Floor of Carrizo
Modeled 2012 Baseline
Winter 2024 Observed WL
2012 Baseline Observed Data

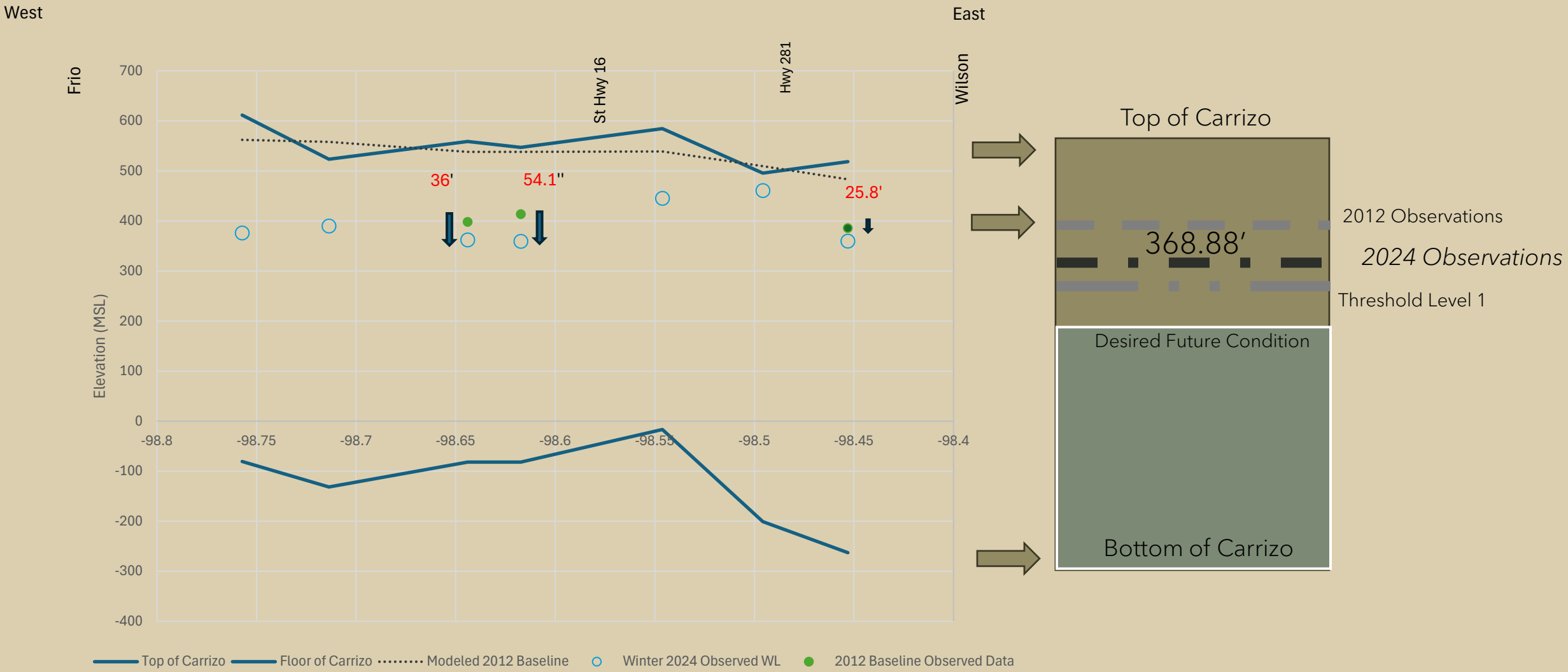

Top of Carrizo
2012 Observations
305.61'
Desired Future Condition
75%
Bottom of Carrizo

Carrizo

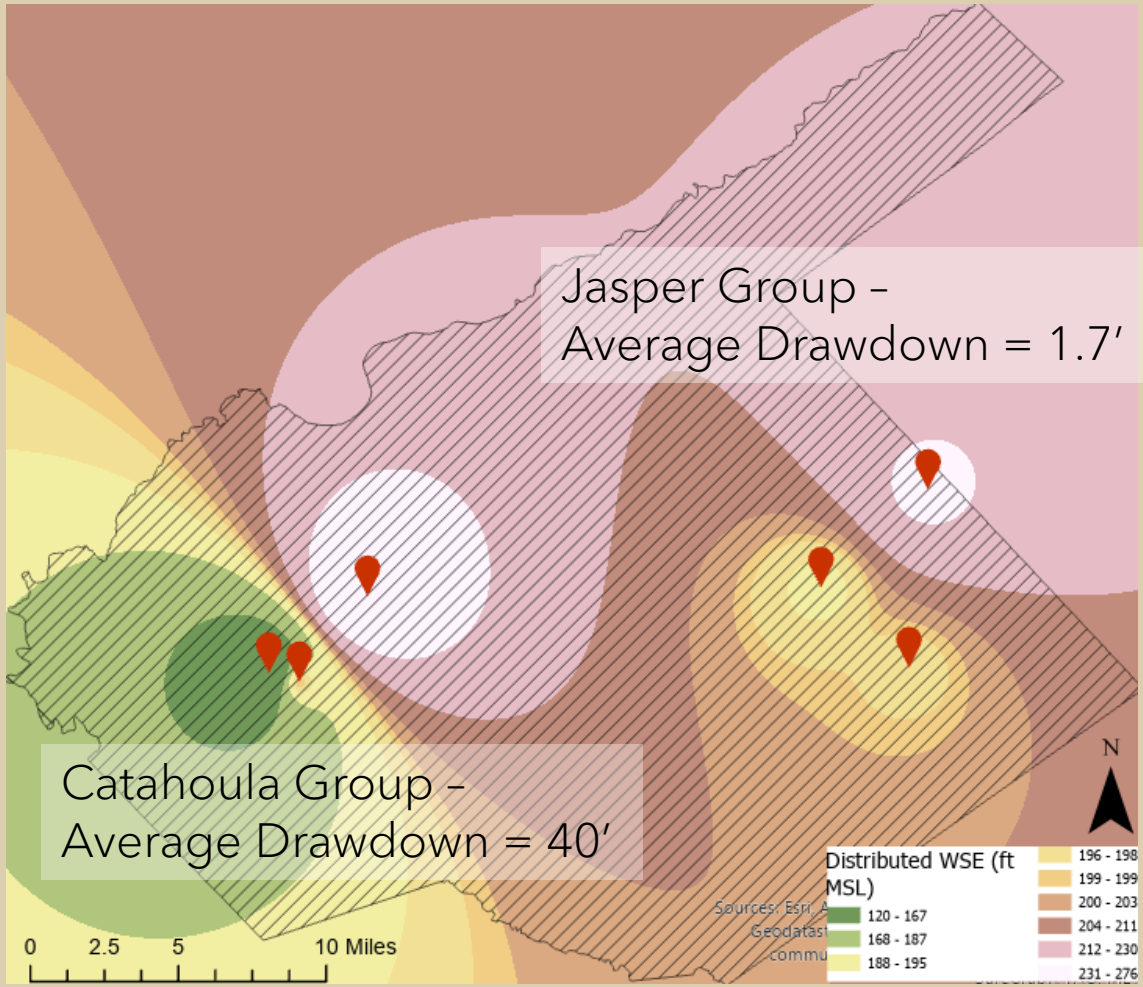

West
East
Frio
St Hwy 16
Hwy 281
Wilson
Elevation (MSL)
700
600
500
400
300
200
100
0
-100
-200
-300
-400
-98.8
-98.75
-98.7
-98.65
-98.6
-98.55
-98.5
-98.45
-98.4
36'
54.1"
25.8'
Top of Carrizo
Floor of Carrizo
Modeled 2012 Baseline
Winter 2024 Observed WL
2012 Baseline Observed Data


Top of Carrizo
2012 Observations
360.5'
65%
Threshold Level 1
Desired Future Condition
Bottom of Carrizo

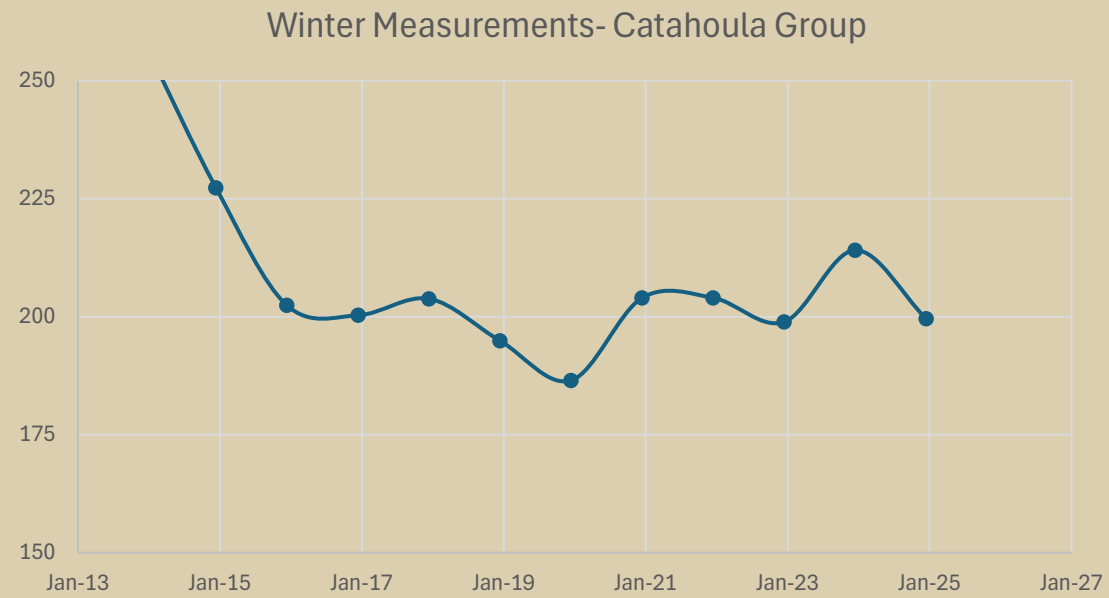
Carrizo

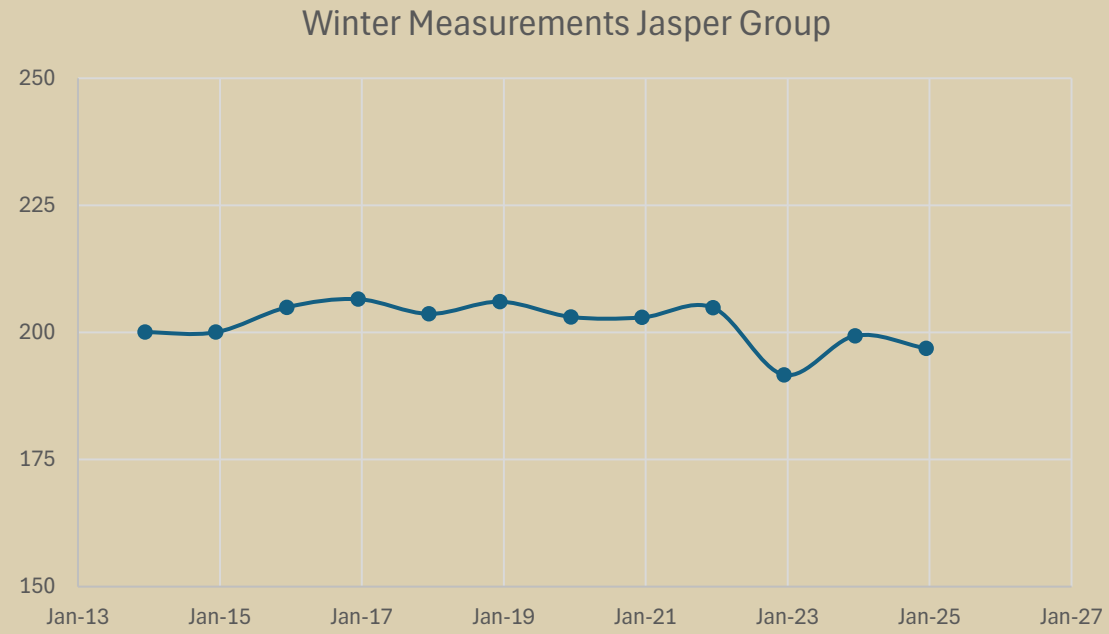

West
East
Frio
St Hwy 16
Hwy 281
Wilson
Elevation (MSL)
700
600
500
400
300
200
100
0
-100
-200
-300
-400
-98.8
-98.75
-98.7
-98.65
-98.6
-98.55
-98.5
-98.45
-98.4
36'
54.1''
25.8'
Top of Carrizo
Floor of Carrizo
Modeled 2012 Baseline
Winter 2024 Observed WL
2012 Baseline Observed Data
Top of Carrizo
368.88'
2012 Observations
2024 Observations
Threshold Level 1
Desired Future Condition
Bottom of Carrizo

Gulf Coast

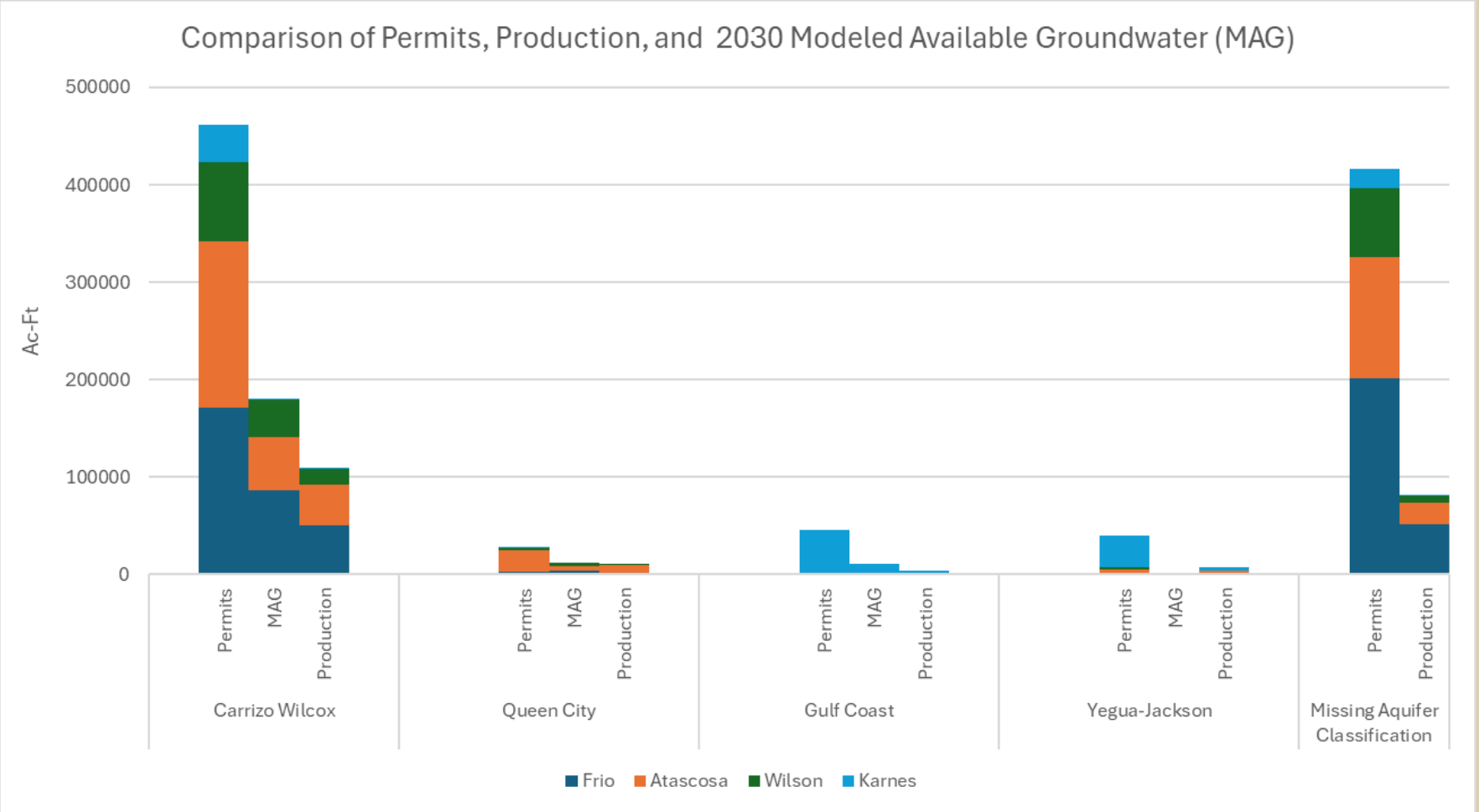


Average Drawdown across Karnes County = 19.8′
***Limited Baseline Data





Comparison of Production to MAG



Total Permitted (ac-ft/yr)	1,000,839
2030 MAG (ac-ft/yr)	204,661
2024 Reported Production (ac-ft)	211,724

8. **Addressing Precipitation Enhancement**

8a. **Objective** – The District participates in a cloudseeding program and plans on continuing this effort. Rainfall enhancement is conducted using cloud seeding techniques where aircraft release microscopic particles of silver iodide and calcium chloride into thunderstorms to increase rainfall efficiency. Any positive results from the cloudseeding program are estimated to be gauged over years of the collection and evaluation of precipitation data.

- **Performance Standard** – Each year the District will brief the Board of Directors with a report of its cloudseeding program and the collection and evaluation of precipitation data.

Objective 8: **Addressing Precipitation Enhancement**

- May – September
- 66 Operations
- 122 Clouds Seeded

- Average Increase of 0.72 in of rain representing a 6.1% increase in precipitation
- Total increase in 412,400 ac-ft

STWMA Meteorologist Report

January 22, 2025
EGWCD Special Board Meeting
Bria DeCarlo, Project Meteorologist

Evaluation 2024

- 38 days evaluated/122 clouds
- 98 small-seeded clouds, 4 large-seeded clouds, 20 type B clouds

Table 1: Generalities

First operational day: **May 13th, 2024**
Last operational day: **September 25th, 2024**

Number of operational days: 38
(Two in May, five in June, sixteen in July, eight in August, and seven in September)

According to the daily reports, operational days were qualified as:

Seventeen with excellent performance
Ten with very good performance
Eight with good performance

Three with technical problems (no TITAN data available)

Number of seeded clouds: 122
(98 small-seeded clouds, 4 large-seeded clouds, 20 type B clouds)

Flares used: 598 BIP-AgI flares and 22 hygroscopic flares

Opportunities missed: two (with a lifetime longer than 1 hour), ~ 2 % of resources.

Storm # 331 on July 12th over Karnes and Wilson Counties (15:16 – 18:00 Z)

Storm # 2690 on July 25th over Wilson County (17:16 – 18:30 Z)

Evaluation 2024

Small Clouds

Evaluations were done using TITAN and NEXRAD data.

Table 2 shows the results from the classic TITAN evaluation for the 98 small-seeded clouds that obtained proper control clouds.

Table 2: Seeded Sample versus Control Sample (98 couples, averages)

Variable	Seeded Sample	Control Sample	Simple Ratio	Increases (%)
Lifetime	65 min	45 min	1.44	44 (**30**)
Area	61.8 km^2	43.5 km^2	1.42	42 (**39**)
Volume	176.7 km^3	122.1 km^3	1.45	45 (**40**)
Top Height	7.9 km	7.7 km	1.03	3 (**1**)
Max dBz	52.4	50.8	1.03	3 (**1**)
Top Height of max dBz	3.5 km	3.7 km	0.95	-5 (**-3**)
Volume Above 6 km	25.4 km^3	18.7 km^3	1.36	36 (**49**)
Prec.Flux	517.6 m^3/s	317.0 m^3/s	1.63	63 (**54**)
Prec.Mass	2466.8 kton	1109.6 kton	2.22	122 (**118**)
CloudMass	170.0 kton	107.9 kton	1.58	58 (**50**)
η	14.5	10.3	1.41	41 (**46**)

The seeded sub-sample was 46 % more efficient than the control sub-sample. Results are evaluated as **excellent** for this subsample.

An increase of 118 % in precipitation mass for a control value of 1109.6 kilotons in 98 cases means:

Δ1= 98 x 1.18 x 1109.6 kilotons ≈ 128,314 kilotons ≈ <u>104,063 ac-f</u> (layer: 21.2 mm ≈ 0.83 in)

SMALL CLOUDS

Evaluation 2024

Large Clouds

The sub-sample of 4 large-seeded clouds received a synergetic analysis. On average, the seeding operations on these large clouds affected 75 % of their whole volume with perfect timing (100 % of the material went to the clouds in their first half-lifetime); **41 AgI-BIP flares and 1 hygroscopic flare** were used in this sub-sample for an average effective silver iodide dose of about **50 ice nuclei per liter**.

Also, on average, large clouds were 35 minutes old when the operations took place; the operation lasted about 13 minutes, and the large-seeded clouds lived 205 minutes.

Table 3 shows the corresponding results:

Table 3: Large Seeded Sample versus Virtual Control Sample (4 couples, averages)

Variable	Seeded Sample	Control Sample	Simple Ratio	Increases (%)
Lifetime	205 min	175 min	1.17	17
Area	398 km^2	314 km^2	1.27	27
Volume	1376 km^3	1081 km^3	1.27	27
Volume Above 6 km	256 km^3	193 km^3	1.33	33
Prec.Flux	3492 m^3/s	2572 m^3/s	1.36	36
Prec.Mass	70 803 kton	42 060 kton	1.68	68

An increase of 68 % in precipitation mass for a control value of 42,060 ktons in 4 cases may mean:

Δ2= 4 x 0.68 x 42,060 kilotons ≈ 114,403 kilotons ≈ 92,781 ac-f (Layer: 71.9 mm ≈ 2.83 in)

LARGE CLOUDS

Evaluation 2024

Type B Clouds

The sub-sample of 20 type B seeded clouds also received a synergetic analysis. On average, the seeding operations on these type B clouds affected 9 % of their whole volume with very good timing (82 % of the material went to the clouds in their first half-lifetime); **152 AgI-BIP and 6 hygroscopic flares** were used in this sub-sample for an average effective silver iodide dose of about **30 ice nuclei per liter.**

Also, on average, type B clouds were 180 minutes old when the operations took place; the operation lasted about 16 minutes, and the type B seeded clouds lived 300 minutes.

Table 4 shows the results:

Table 4: Type B Seeded Sample versus Virtual Control Sample (20 couples, averages)

Variable	Seeded Sample	Control Sample	Simple Ratio	Increases (%)
Lifetime	300 min	290 min	1.03	3
Area	1398 km^2	1362 km^2	1.03	3
Volume	5161 km^3	5028 km^3	1.03	3
Volume Above 6 km	1593 km^3	1546 km^3	1.03	3
Prec.Flux	13497 m^3/s	13071 m^3/s	1.03	3
Prec.Mass	279 396 kton	265 785 kton	1.05	5

An increase of 5% in precipitation mass for a control value of 265,785 ktons in 20 cases may mean:

Δ3= 20 x 0.05 x 265,785 kilotons ≈ 265,785 kilotons ≈ <u>215,552 ac-f</u>
(Layer: 9.5 mm≈ <u>0.40 in</u>)

TYPE B CLOUDS

Evaluation Results

The total increase:Δ1+Δ2+Δ3

= 412,396 ac-f

1,062 ac-f per small

23,195 ac-f per large

10,778 ac-f per type B

Micro-regionalization

Increases in precipitation mass were analyzed county by county in an attempt to better describe the performance and corresponding results. **Table 5** below offers the details for operations (season: May to October):

County Seeding	Initial Seeding	Extended Seeding	Acre-feet (increase)	Inches (increase)	Rain Gage (season value*)	% (increase)
Uvalde	**17**	**20**	**48 300**	**0.56**	**11.97 in**	**4.7**
Bandera	**6**	**7**	**52 200**	**1.42**	**18.88 in**	**7.5**
Medina	**15**	**18**	**59 000**	**0.79**	**9.16 in**	**8.7**
Bexar	**5**	**7**	**15 900**	**0.20**	**12.22 in**	**1.6**
Frio	**11**	**14**	**31 200**	**0.56**	**9.56 in**	**5.9**
Atascosa	**22**	**25**	**37 100**	**0.57**	**11.14 in**	**5.1**
McMullen	**15**	**17**	**29 700**	**0.51**	**12.91 in**	**3.9**
Wilson	**9**	**11**	**42 400**	**0.43**	**7.09 in**	**6.1**
Karnes	**13**	**16**	**31 200**	**1.05**	**10.41 in**	**10.1**
Bee	**9**	**10**	**52 800**	**1.11**	**16.22 in**	**6.9**
Subtotal	**122**	**145**	**399 800**			
Outside		7	12 600 (~ 3 % of total)			
Total	**122**	**152**	**412 400**			
Average				**0.72**	**11.95 in**	**6.1 %**

(**Initial seeding** means the counties where the operations began, whereas **extended seeding** means the counties favored by seeding after the initial operations took place).

*** Seasonal precipitation values: May-September 2024**

Evaluation Results

- Results are evaluated as excellent; the operations, with an average timing of **89 %**, an average dose of **about 45 ice-nuclei per liter,** and **two missed opportunities** (about 2 % of resources) an excellent relative increase of 98 % was obtained.
- The micro-regionalization analysis showed increases per county; different zones received downwind benefits; the average increase in precipitation, referred to as rain gauge seasonal value (May-September), was about **6 %**
- Radar estimations of precipitation should be considered as measurements of trend.
- Seeding operations improved the dynamics of seeded clouds.
- In 2024, the total increase in the region, estimated at 0.4 million acre-feet over the target area, should be considered a visible help to freshwater natural resources.
- Dual seeding was modestly used during the 2024 campaign: 22 hygroscopic flares were utilized due to the relatively high temperatures of the cloud bases.

Addendum: a brief comparison of the last six STWMA cloud seeding campaigns.

Year	seeded storms	operational days	increase (million ac-f)	%	season precipitation (inches)
2019	124	40	0.77	11.5	12.31 (May-October)
2020	152	42	2.35	15.5	16.33 (April-September)
2021	55	29	0.48	3.8	23.34 (April-September)
2022	98	32	0.34	7.5	8.53 (April-August)
2023	30	15	0.17	2.0	14.62 (April-September)
2024	122	38	0.40	6.1	11.95 (May – September)

Notice the relatively high number of seeded storms, and operational days.

2024 Season Update

- 66 operations conducted.
- 12 of those days ended up RECON missions.
- We have had 45 operational days
- Flight Hours-114 hours
- May- 4 days/ 6 operations
- June- 7 days/ 10 operations
- July- 17 days/ 28 operations
- August- 8 days/11 operations
- September- 9 days/11 operations

Total Flares Used

- 623 glaciogenic/3,427g AgI
- 26 hygroscopic flares 13,000g NaCl

1c. Objective – Each year the District will request production reports from the operators of 600 agricultural **irrigation wells in the District.**

➢ **Performance Standard –** A table showing production volumes reported to the District from the agricultural irrigation well operators in the District will be included in the Annual Report of District Activities made to the Board of Directors each year.

	Irrigation	Livestock	Industrial	Public Supply	**Total**
Frio	203,585	58	2,492	4,188	210,323
Atascosa	104,290	5,018	10,650	9,372	129,330
Wilson	35,239	956	2,103	12,778	51,075
Karnes	4,699	276	4,705	3,386	13,066
Total	347,813	6,308	19,950	29,724	403,795

		Frio	**Atascosa**	**Wilson**	**Karnes**	**Total**
Total Permitted Amount		335,842	210,842	91,966	17,250	655,899
# Permits		469	367	185	48	1,069
2024 Production		99,354	50,269	12,712	918	163,253
	Carrizo	46,559	31,253	7,524	278	85,614
	Queen City	230	2,372	32	0	2,634
	Gulf Coast	0	0	745	351	1,097
	Yegua-Jackson	0	125	133	279	537
	Other	52,566	16,519	4,278	10	73,372
Total Number of Reports Submitted		321	256	134	34	745
Number of Owners Reported		114	152	87	25	378