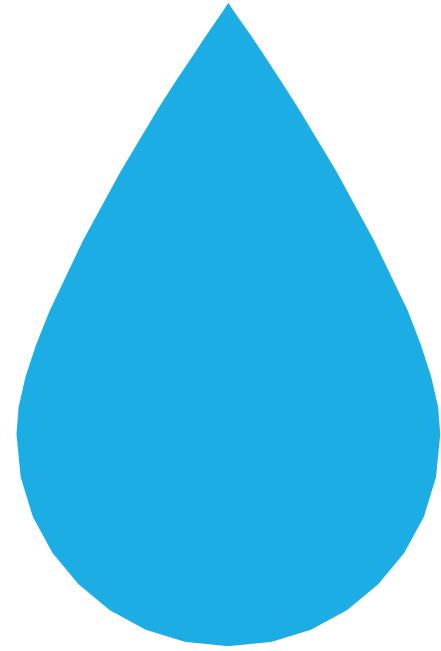


2019 Annual Report

AUGUST 11, 2020
BOARD OF DIRECTORS
MEETING

Goal 1:
Providing the
Most Efficient
Use of Water



Exempt and Non-Exempt Wells Registered with the District

<i>Use</i>	<i>2019 Exempt</i>	<i>2019 Non-Exempt</i>	<i>2019 Total</i>	<i>Exempt</i>	<i>Non-Exempt</i>	<i>Total</i>
<i>Agriculture</i>	2	-	2	35	22	57
<i>Commercial/Small Business</i>	2	1	3	40	11	51
<i>Domestic</i>	142	-	142	1,265	-	1,265
<i>Golf Course Irrigation</i>	-	-	-	1	37	38
<i>Industrial/Manufacturing</i>	-	-	-	4	24	28
<i>Irrigation</i>	4	8	12	157	116	273
<i>Livestock</i>	8	-	8	129	1	130
<i>Not Specified</i>	6	-	6	63	8	71
<i>Oil/Gas</i>	-	-	-	7	68	75
<i>Other</i>	4	1	5	44	10	54
<i>Pond(s)/Surface Impoundment(s)</i>	6	2	8	71	87	158
<i>Public Water System</i>	-	11	11	28	313	341
<i>Total</i>	174	23	197	1,844	697	2,541

Well Inspections During 2019

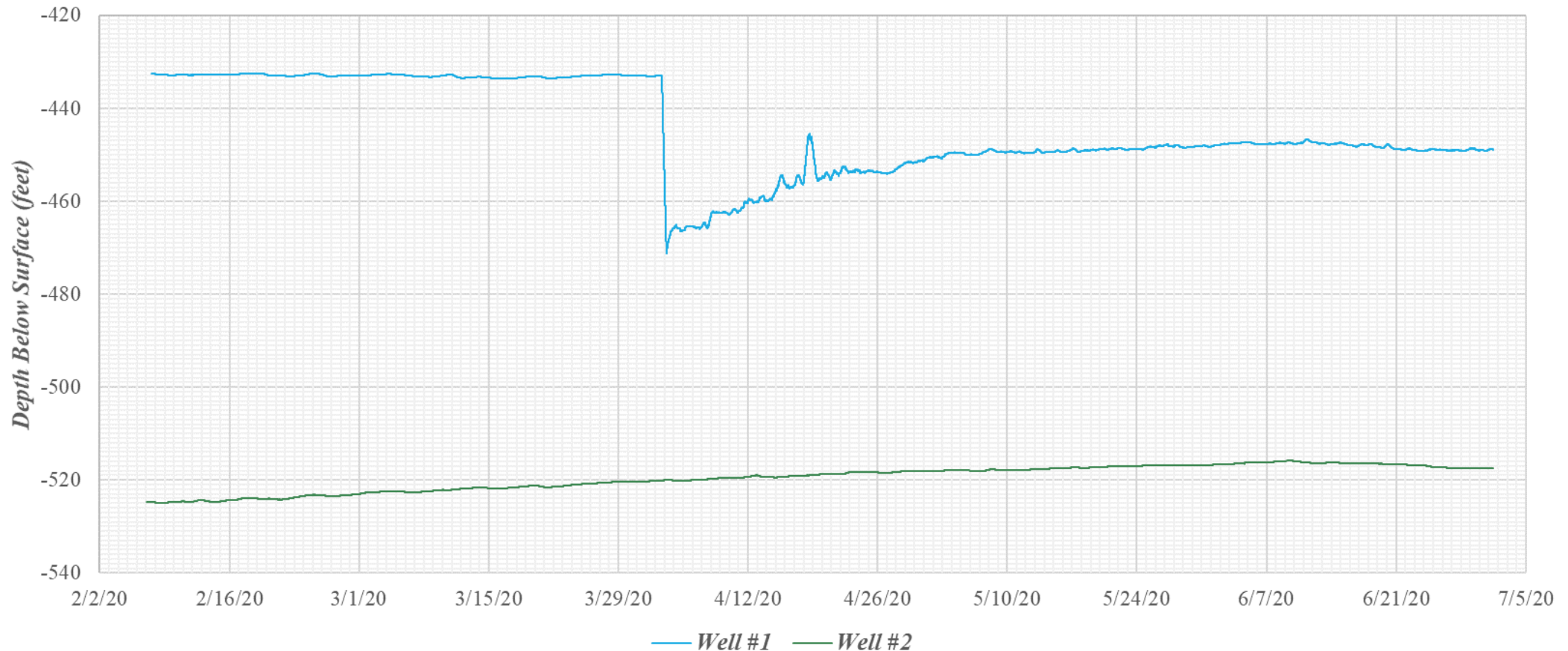
<i>Month</i>	<i>Collin County</i>	<i>Cooke County</i>	<i>Denton County</i>	<i>Total</i>
<i>January</i>	2	2	40	44
<i>February</i>	5	11	29	45
<i>March</i>	5	4	27	36
<i>April</i>	1	10	22	33
<i>May</i>	4	2	31	37
<i>June</i>	1	3	25	29
<i>July</i>	1	1	23	25
<i>August</i>	4	8	12	24
<i>September</i>	6	2	12	20
<i>October</i>	3	5	16	24
<i>November</i>	1	5	7	13
<i>December</i>	5	7	12	24
<i>Total</i>	38	60	256	354

Wells Measured for the District's Monitoring Program

<i>Year</i>	<i>Wells Measured</i>
2013	22
2014	31
2015	31
2016	31
2017	24
2018	4
2019	51

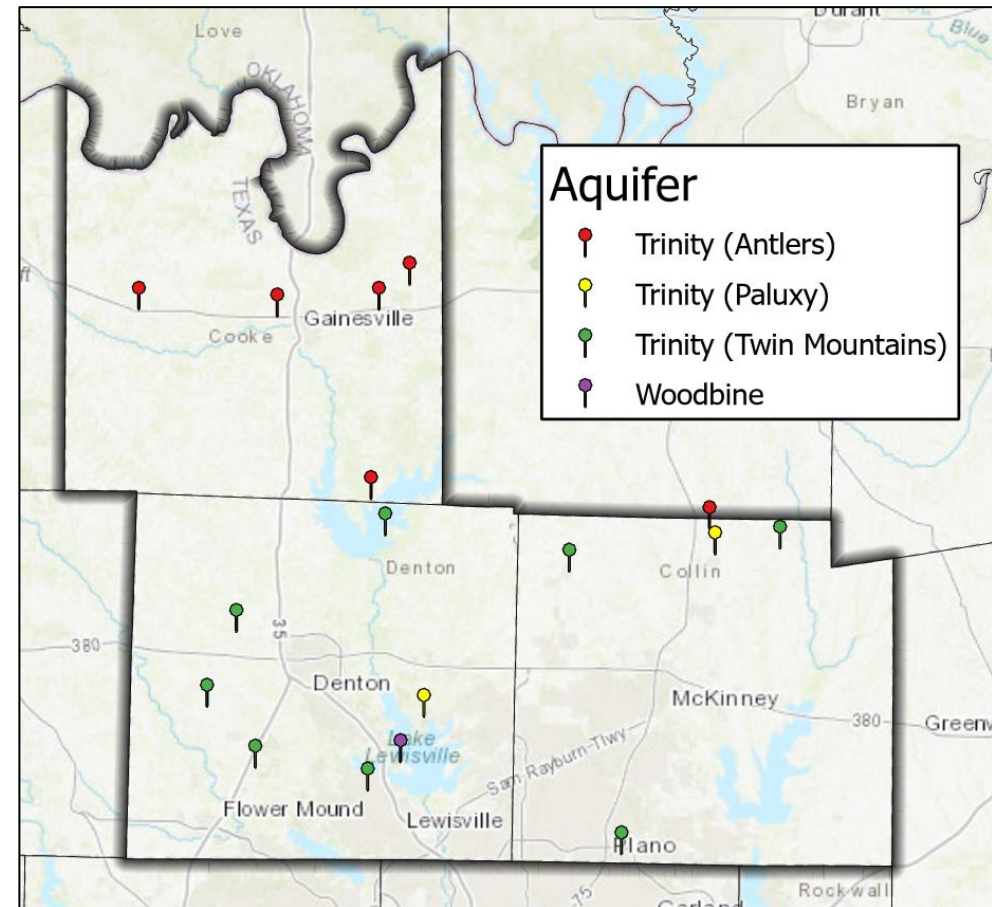
- Throughout 2018 and 2019, the District sent out letters to selected public water systems asking the public water system to participate in the District's monitoring program. Through this process, the District added 33 new wells to the District's monitoring program.
- The District Staff moved the timeframe for measuring wells from November to February in 2019/2020 as they felt that was the closest time of year to static conditions. The wells measured for 2019 were actually measured in February of 2020.

District's Continuous Monitoring Wells



Wells Tested for Water Quality by the TWDB

<i>County</i>	<i>Trinity Aquifer</i>	<i>Woodbine Aquifer</i>	<i>Total</i>
<i>Collin</i>	5	0	5
<i>Cooke</i>	5	0	5
<i>Denton</i>	6	1	7
<i>Total</i>	16	1	17



Water Quality Data from TWDB

<i>Parameter Description</i>	<i>Trinity Average Value</i>	<i>Trinity Highest Value</i>	<i>Woodbine Value</i>	<i>Unit</i>
<i>Temperature</i>	28.64	46.70	20.90	C
<i>Specific Conductance</i>	1,058.75	1,752.00	1,068.00	MICR
<i>pH</i>	8.62	9.16	6.89	SU
<i>Alkalinity, Total</i>	355.06	508.00	364.00	mg/L
<i>Alkalinity, Phenolphthalein</i>	15.36	32.60	-	mg/L
<i>Alkalinity, Bicarbonate</i>	324.50	484.00	364.00	mg/L
<i>Alkalinity, Carbonate</i>	30.70	65.10	-	mg/L
<i>Bicarbonate Ion</i>	395.82	590.65	444.21	mg/L
<i>Carbonate Ion</i>	18.43	39.12	-	mg/L
<i>Nitrite Plus Nitrate</i>	0.02	0.02	0.02	mg/L
<i>Phosphorus</i>	0.09	0.69	0.09	mg/L
<i>Hardness, Total</i>	9.95	46.09	94.27	mg/L
<i>Calcium</i>	2.54	9.97	19.60	mg/L
<i>Magnesium</i>	0.85	4.85	10.80	mg/L
<i>Sodium</i>	242.44	470.00	265.00	mg/L
<i>Sodium Adsorption Ration</i>	43.02	71.26	11.93	
<i>Potassium</i>	1.11	2.90	1.98	mg/L
<i>Chloride</i>	72.79	285.00	29.60	mg/L
<i>Sulfate</i>	83.68	390.00	267.00	mg/L
<i>Fluoride</i>	0.73	2.10	2.00	mg/L
<i>Silica</i>	11.92	18.50	8.44	mg/L

Water Quality Data from TWDB

<i>Parameter Description</i>	<i>Trinity Average Value</i>	<i>Trinity Highest Value</i>	<i>Woodbine Value</i>	<i>Unit</i>
<i>Arsenic</i>	1.03	1.46	1.00	ug/L
<i>Barium</i>	26.40	113.00	9.80	ug/L
<i>Boron</i>	491.13	1,350.00	1,710.00	ug/L
<i>Chromium</i>	2.00	2.95	3.83	ug/L
<i>Iron</i>	65.92	287.00	1,100.00	ug/L
<i>Manganese</i>	4.20	9.31	3,100.00	ug/L
<i>Molybdenum</i>	1.13	2.33	1.00	ug/L
<i>Strontium</i>	211.91	1,060.00	737.00	ug/L
<i>Zinc</i>	5.27	9.28	17.00	ug/L
<i>Aluminum</i>	6.57	13.60	21.50	ug/L
<i>Lithium</i>	29.80	126.00	44.90	ug/L
<i>Selenium</i>	5.00	5.00	5.00	ug/L
<i>Total Dissolved Solids</i>	629.29	1,266.48	823.57	mg/L
<i>Nitrate Nitrogen</i>	0.02	0.02	0.02	mg/L
<i>Residual Sodium Carbonate</i>	6.91	10.09	5.41	
<i>Bromide</i>	0.39	1.59	0.11	mg/L
<i>Mercury</i>	0.20	0.20	0.20	ug/L

Percentage of Registered Non-Exempt Wells Meeting Reporting Requirements

<i>Year</i>	<i>Percentage Meeting Reporting Requirements</i>
2012	85%
2013	89%
2014	95%
2015	96%
2016	92%
2017	82%
2018	93%
2019	93%

Percentage of Registered Non-Exempt Wells Inspected Annually

<i>Year</i>	<i>Percentage of Well Inspected</i>
2012	74%
2013	6%
2014	21%
2015	24%
2016	13%
2017	37%
2018	51%
2019	16%

Non-Exempt Production by County (All Production is in Acre-Feet)

<i>Year</i>	<i>Collin County</i>	<i>Cooke County</i>	<i>Denton County</i>	<i>Total</i>
<i>2012</i>	5,274	6,476	15,295	27,045
<i>2013</i>	4,748	5,224	13,538	23,511
<i>2014</i>	4,353	4,884	14,051	23,288
<i>2015</i>	5,238	4,361	13,610	23,209
<i>2016</i>	4,758	4,312	11,605	20,675
<i>2017</i>	4,739	4,383	13,215	22,338
<i>2018</i>	5,322	4,253	14,579	24,155
<i>2019</i>	5,723	4,046	13,631	23,399
<i>Average</i>	5,019	4,743	13,691	23,452

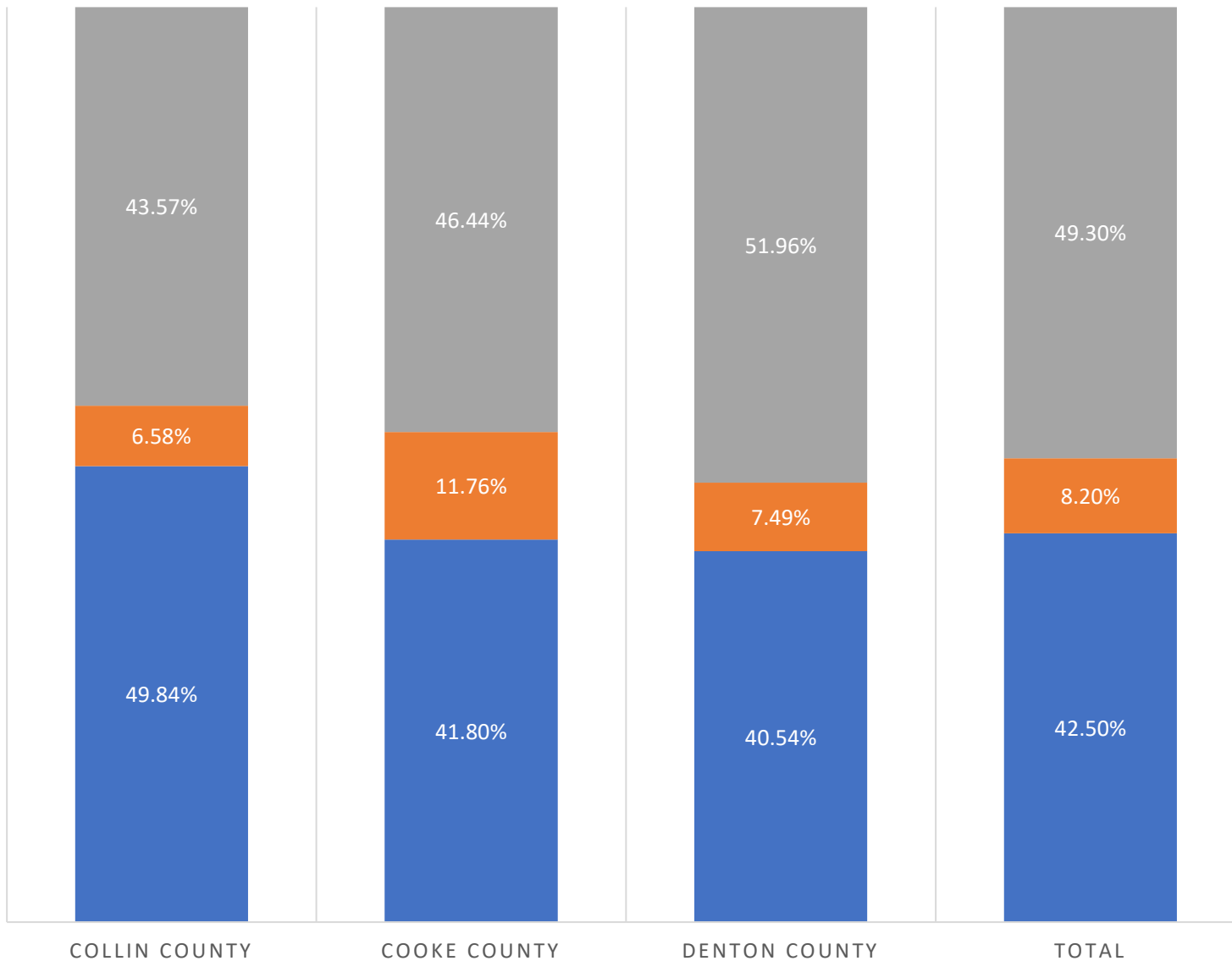
Non-Exempt Production by Aquifer (All Production is in Acre-Feet)

<i>Year</i>	<i>River Alluvial</i>	<i>Trinity (Antlers)</i>	<i>Trinity (Paluxy)</i>	<i>Trinity (Twin Mountains)</i>	<i>Washita Group</i>	<i>Woodbine</i>
2012	0	16,865	1,838	4,250	0	4,092
2013	0	14,982	1,741	3,302	24	3,461
2014	0	14,684	1,652	3,145	17	3,789
2015	0	13,764	1,848	3,726	13	3,857
2016	0	12,664	1,474	2,970	16	3,551
2017	33	13,045	1,645	3,274	8	4,333
2018	52	14,132	1,668	4,072	4	4,227
2019	60	12,936	1,997	3,639	0	4,768
<i>Average</i>	<i>12</i>	<i>14,305</i>	<i>1,695</i>	<i>3,534</i>	<i>12</i>	<i>3,901</i>

Non-Exempt Production by Use (All Production is in Acre-Feet)

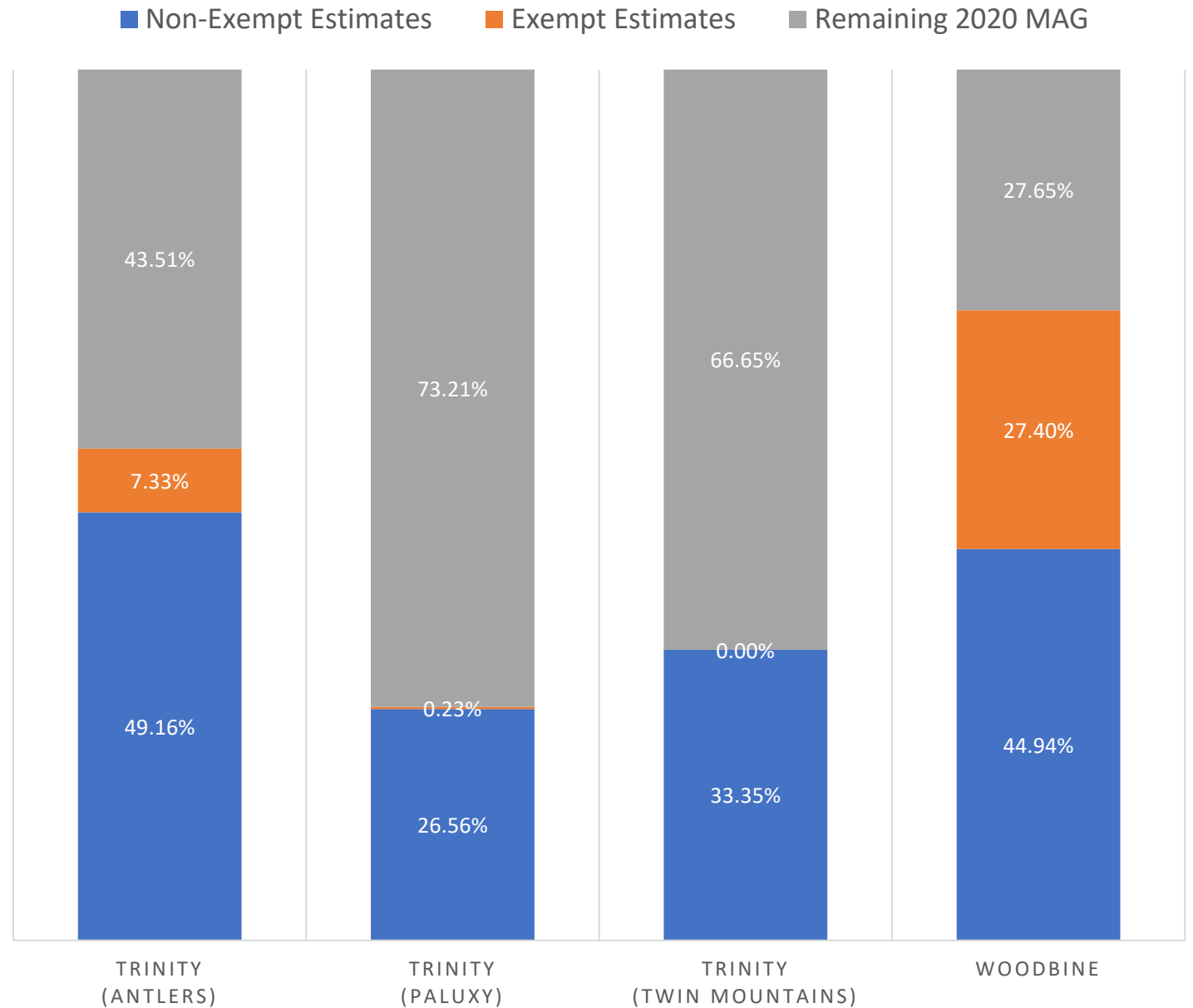
<i>Use</i>	<i>2012</i>	<i>2013</i>	<i>2014</i>	<i>2015</i>	<i>2016</i>	<i>2017</i>	<i>2018</i>	<i>2019</i>	<i>Average</i>
<i>Public Water System</i>	17,401	15,640	15,552	16,217	16,110	16,401	17,239	16,328	16,361
<i>Golf Course Irrigation</i>	3,081	2,819	2,468	2,325	1,661	1,794	2,184	2,241	2,322
<i>Oil/Gas</i>	2,780	1,885	1,552	1,096	212	434	1,097	268	1,165
<i>Agriculture</i>	1,447	1,226	1,619	1,311	948	1,331	1,012	1,279	1,272
<i>Irrigation</i>	686	611	1,099	1,272	1,014	1,175	1,437	1,838	1,142
<i>Pond/Surface Impoundment</i>	821	732	566	522	459	779	721	1,067	708
<i>Industrial/Manufacturing</i>	116	135	192	219	184	228	251	229	194
<i>Livestock</i>	582	456	140	40	0	4	2	2	153
<i>Commercial</i>	122	2	92	198	37	89	111	92	93
<i>Other</i>	9	4	8	9	49	101	100	57	42

■ Non-Exempt Estimates ■ Exempt Estimates ■ Remaining 2020 MAG



Average
Production
Compared
to 2020
MAG by
County

Average Production Compared to 2020 MAG by Aquifer





Goal 2:
Controlling and
Preventing Waste
of Groundwater

Total Fees Paid and Groundwater Usage Based on the Fees Paid

<i>Year</i>	<i>Total Fees Paid</i>	<i>Total Groundwater Used (gallons)</i>
<i>2015</i>	\$739,685	7,396,850,000
<i>2016</i>	\$625,978	6,259,780,000
<i>2017</i>	\$625,969	6,259,690,000
<i>2018</i>	\$792,081	7,290,180,000
<i>2019</i>	\$713,307	7,133,070,000
<i>Average</i>	\$699,404	6,867,914,000

Violations and Investigations of Potential Waste of Groundwater

- 4 Owners/Drillers accounting for 8 violations
- No reports of potential waste

Goal 3: Controlling and Preventing Subsidence



Due to the geology of the Northern Trinity/Woodbine Aquifers in the District, problems resulting from water level declines causing subsidence are not technically feasible and as such, a goal addressing subsidence is not applicable. The District's Hydrogeologist presented subsidence information to the Board of Directors in 2019.



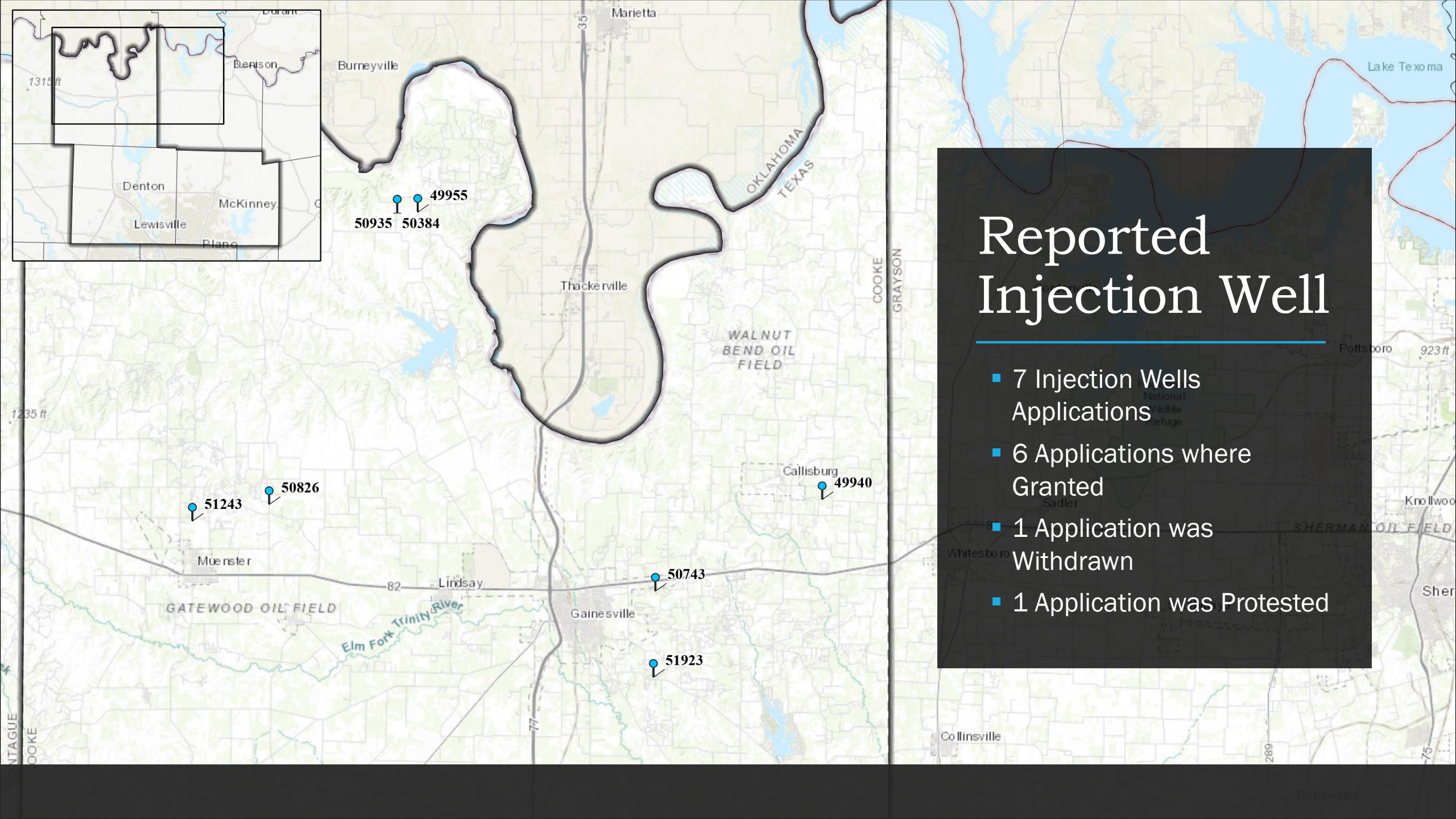
Goal 4: Addressing Conjunctive Surface Water Management Issues

Region C and GMA 8

- Region C Water Planning Group held 3 meetings in 2019, on February 25, June 24, and December 16. General Manager Drew Satterwhite attended all three meetings.
- Groundwater Management Area 8 (GMA 8) held 3 meetings in 2019, on May 6, July 26, and November 22. General Manager Drew Satterwhite and District Staff attended all three meetings. GMA 8 representative Ronny Young was unable to attend the November 22, 2019 meeting, but attended all others in 2019.

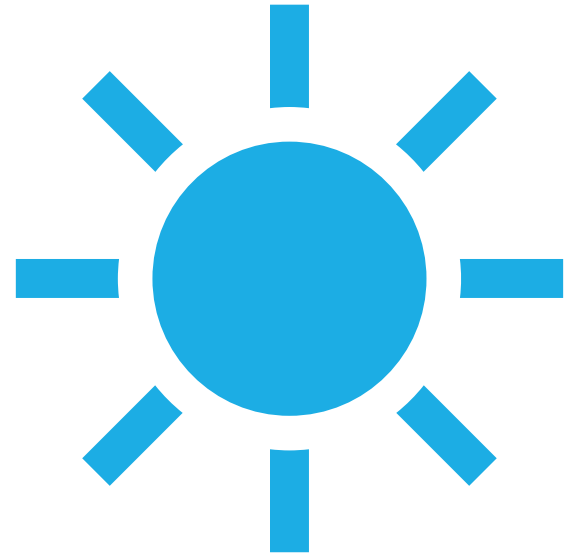
Goal 5: Addressing Natural Resource Issues





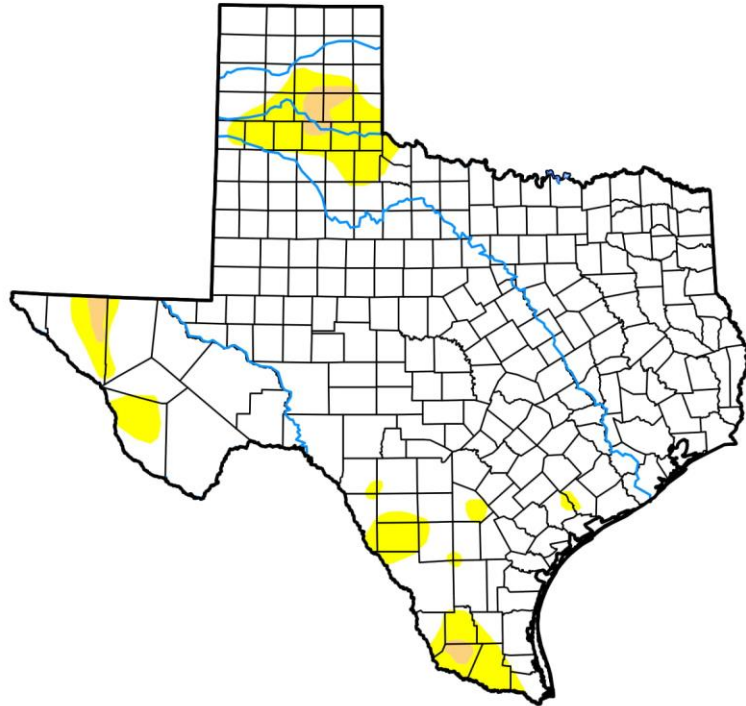
Reported Injection Well

- 7 Injection Wells Applications
- 6 Applications where Granted
- 1 Application was Withdrawn
- 1 Application was Protested



Goal 6: Addressing Drought Conditions

**U.S. Drought Monitor
Texas**



January 29, 2019
(Released Thursday, Jan. 31, 2019)
Valid 7 a.m. EST

Drought Conditions (Percent Area)

	None	D0-D4	D1-D4	D2-D4	D3-D4	D4
Current	90.22	9.78	1.15	0.00	0.00	0.00
Last Week <i>01-22-2019</i>	90.39	9.61	2.45	0.00	0.00	0.00
3 Months Ago <i>10-30-2018</i>	96.15	3.85	1.84	0.43	0.00	0.00
Start of Calendar Year <i>01-01-2019</i>	92.99	7.01	1.32	0.00	0.00	0.00
Start of Water Year <i>09-25-2018</i>	57.46	42.54	20.19	7.03	0.96	0.00
One Year Ago <i>01-30-2018</i>	13.27	86.73	56.47	21.98	7.30	0.00

Intensity:

- D0 Abnormally Dry
- D1 Moderate Drought
- D2 Severe Drought
- D3 Extreme Drought
- D4 Exceptional Drought

The Drought Monitor focuses on broad-scale conditions. Local conditions may vary. See accompanying text summary for forecast statements.

Author:

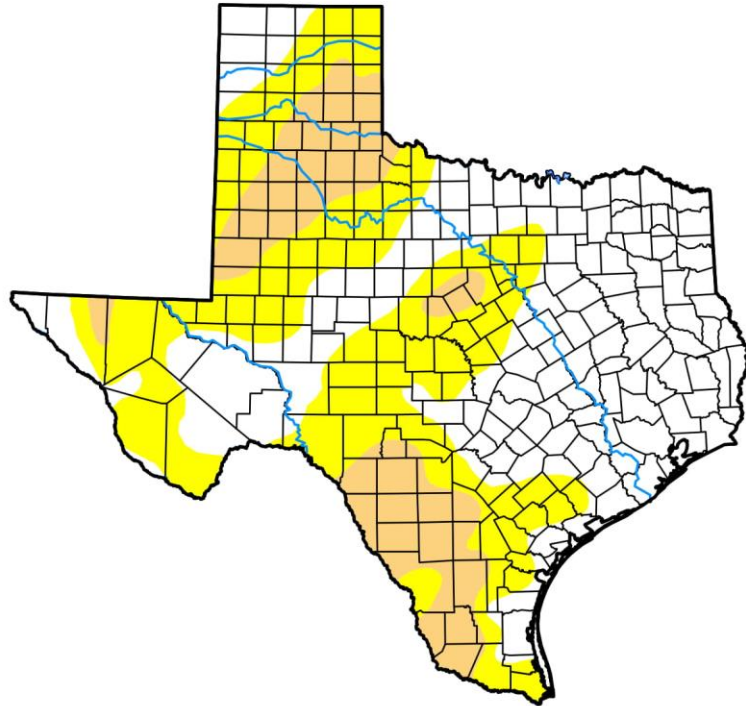
Brian Fuchs
National Drought Mitigation Center



<http://droughtmonitor.unl.edu/>

2019 Palmer Drought Index Maps

**U.S. Drought Monitor
Texas**



February 26, 2019
(Released Thursday, Feb. 28, 2019)
Valid 7 a.m. EST

Drought Conditions (Percent Area)

	None	D0-D4	D1-D4	D2-D4	D3-D4	D4
Current	48.21	51.79	16.33	0.00	0.00	0.00
Last Week <i>02-19-2019</i>	59.54	40.46	6.63	0.00	0.00	0.00
3 Months Ago <i>11-27-2018</i>	97.73	2.27	0.80	0.00	0.00	0.00
Start of Calendar Year <i>01-01-2019</i>	92.99	7.01	1.32	0.00	0.00	0.00
Start of Water Year <i>09-25-2018</i>	57.46	42.54	20.19	7.03	0.96	0.00
One Year Ago <i>02-27-2018</i>	22.75	77.25	55.19	22.04	11.47	0.00

Intensity:

- D0 Abnormally Dry
- D1 Moderate Drought
- D2 Severe Drought
- D3 Extreme Drought
- D4 Exceptional Drought

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Author:

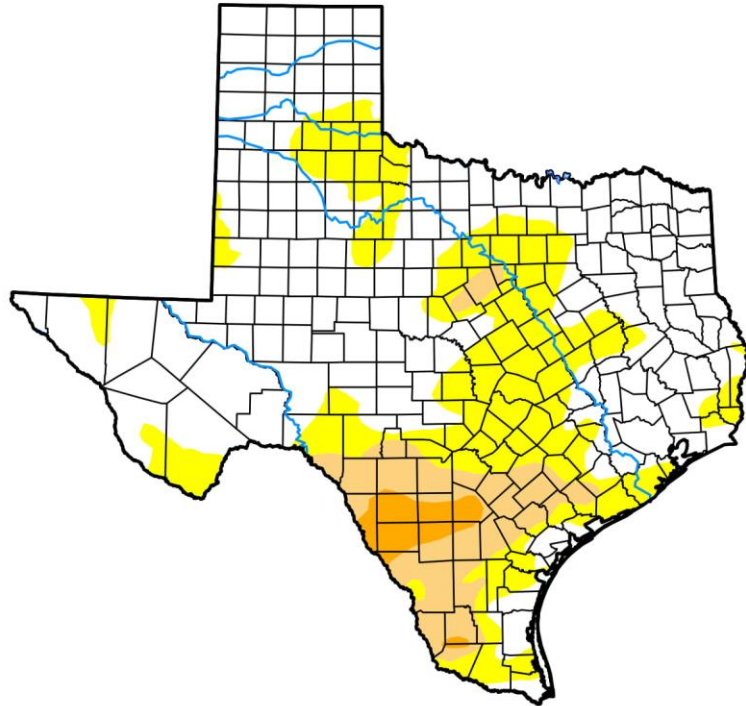
Brad Rippey
U.S. Department of Agriculture



<http://droughtmonitor.unl.edu/>

2019 Palmer Drought Index Maps

**U.S. Drought Monitor
Texas**



March 26, 2019
(Released Thursday, Mar. 28, 2019)
Valid 8 a.m. EDT

Drought Conditions (Percent Area)

	None	D0-D4	D1-D4	D2-D4	D3-D4	D4
Current	61.92	38.08	11.44	2.38	0.00	0.00
Last Week <i>03-19-2019</i>	69.05	30.95	9.67	0.90	0.00	0.00
3 Months Ago <i>12-25-2018</i>	90.02	9.98	0.80	0.00	0.00	0.00
Start of Calendar Year <i>01-01-2019</i>	92.99	7.01	1.32	0.00	0.00	0.00
Start of Water Year <i>09-25-2018</i>	57.46	42.54	20.19	7.03	0.96	0.00
One Year Ago <i>03-27-2018</i>	26.19	73.81	64.23	28.30	15.08	1.21

Intensity:

- D0 Abnormally Dry
- D1 Moderate Drought
- D2 Severe Drought
- D3 Extreme Drought
- D4 Exceptional Drought

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Author:

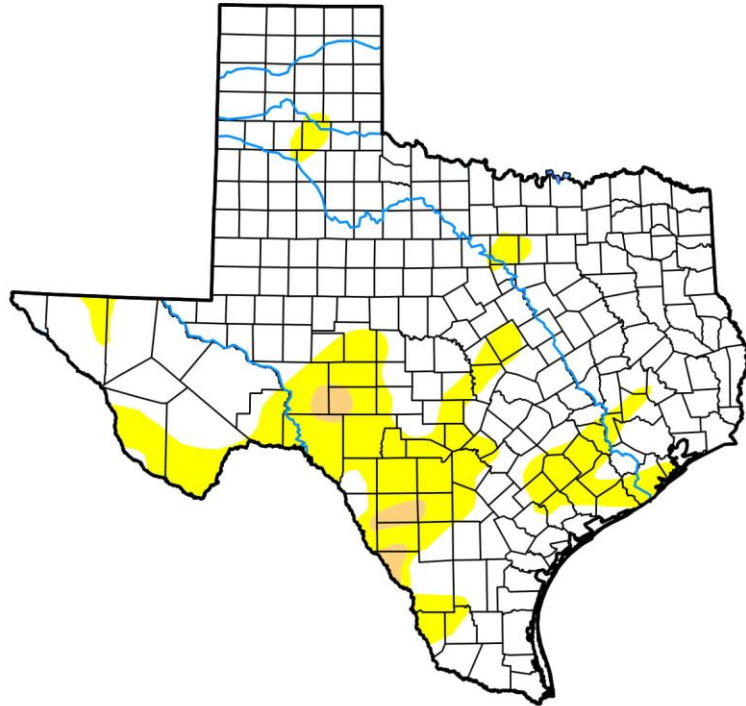
Eric Luebehusen
U.S. Department of Agriculture



<http://droughtmonitor.unl.edu/>

2019 Palmer Drought Index Maps

**U.S. Drought Monitor
Texas**



April 23, 2019
(Released Thursday, Apr. 25, 2019)
Valid 8 a.m. EDT

Drought Conditions (Percent Area)

	None	D0-D4	D1-D4	D2-D4	D3-D4	D4
Current	79.75	20.25	1.29	0.00	0.00	0.00
Last Week <i>04-16-2019</i>	74.85	25.15	5.22	0.00	0.00	0.00
3 Months Ago <i>01-22-2019</i>	90.39	9.61	2.45	0.00	0.00	0.00
Start of Calendar Year <i>01-01-2019</i>	92.99	7.01	1.32	0.00	0.00	0.00
Start of Water Year <i>09-25-2018</i>	57.46	42.54	20.19	7.03	0.96	0.00
One Year Ago <i>04-24-2018</i>	33.36	66.64	53.23	26.26	14.54	3.88

Intensity:

- D0 Abnormally Dry
- D1 Moderate Drought
- D2 Severe Drought
- D3 Extreme Drought
- D4 Exceptional Drought

The Drought Monitor focuses on broad-scale conditions. Local conditions may vary. See accompanying text summary for forecast statements.

Author:

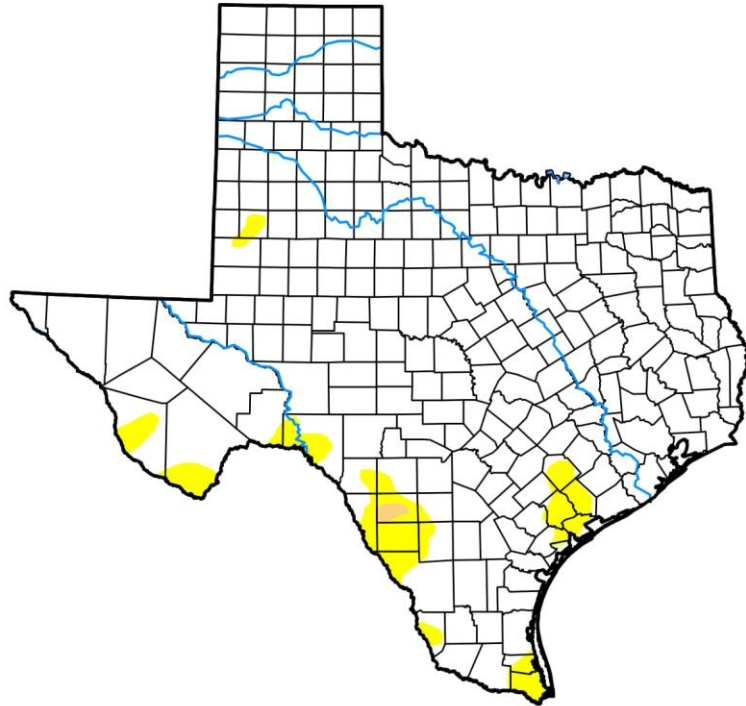
David Miskus
NOAA/NWS/NCEP/CPC



<http://droughtmonitor.unl.edu/>

2019 Palmer Drought Index Maps

**U.S. Drought Monitor
Texas**



May 28, 2019
(Released Thursday, May. 30, 2019)
Valid 8 a.m. EDT

Drought Conditions (Percent Area)

	None	D0-D4	D1-D4	D2-D4	D3-D4	D4
Current	94.24	5.76	0.20	0.00	0.00	0.00
Last Week <i>05-21-2019</i>	97.90	2.10	0.00	0.00	0.00	0.00
3 Months Ago <i>02-26-2019</i>	48.21	51.79	16.33	0.00	0.00	0.00
Start of Calendar Year <i>01-01-2019</i>	92.99	7.01	1.32	0.00	0.00	0.00
Start of Water Year <i>09-25-2018</i>	57.46	42.54	20.19	7.03	0.96	0.00
One Year Ago <i>05-29-2018</i>	31.26	68.74	40.06	21.93	7.82	1.17

Intensity:

- D0 Abnormally Dry
- D1 Moderate Drought
- D2 Severe Drought
- D3 Extreme Drought
- D4 Exceptional Drought

The Drought Monitor focuses on broad-scale conditions. Local conditions may vary. See accompanying text summary for forecast statements.

Author:

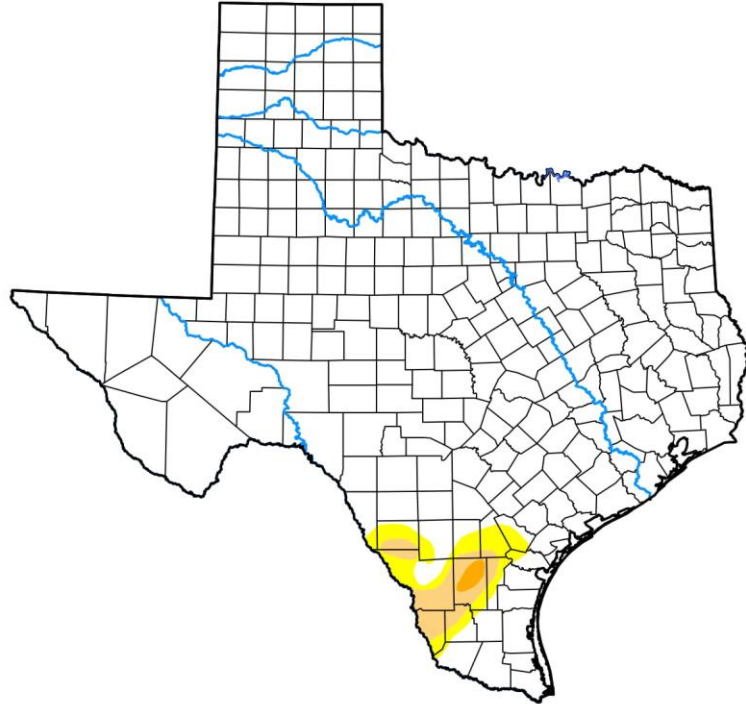
Richard Heim
NCEI/NOAA



<http://droughtmonitor.unl.edu/>

2019 Palmer Drought Index Maps

**U.S. Drought Monitor
Texas**



June 25, 2019
(Released Thursday, Jun. 27, 2019)
Valid 8 a.m. EDT

Drought Conditions (Percent Area)

	None	D0-D4	D1-D4	D2-D4	D3-D4	D4
Current	95.84	4.16	1.93	0.23	0.00	0.00
Last Week <i>06-18-2019</i>	94.17	5.83	1.59	0.00	0.00	0.00
3 Months Ago <i>03-26-2019</i>	61.92	38.08	11.44	2.38	0.00	0.00
Start of Calendar Year <i>01-01-2019</i>	92.99	7.01	1.32	0.00	0.00	0.00
Start of Water Year <i>09-25-2018</i>	57.46	42.54	20.19	7.03	0.96	0.00
One Year Ago <i>06-26-2018</i>	27.33	72.67	47.80	17.91	5.07	0.00

Intensity:



The Drought Monitor focuses on broad-scale conditions. Local conditions may vary. See accompanying text summary for forecast statements.

Author:

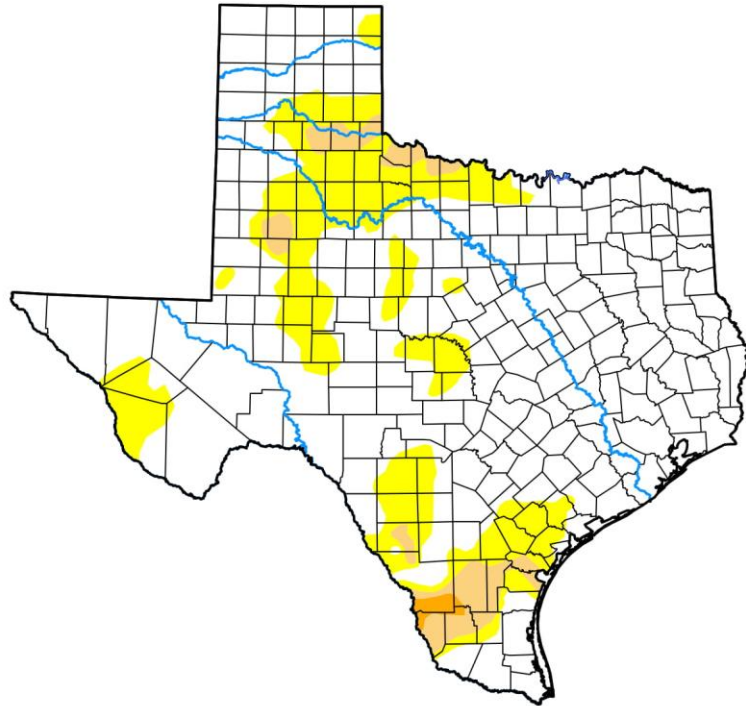
Brad Pugh
CPC/NOAA



droughtmonitor.unl.edu

2019 Palmer Drought Index Maps

**U.S. Drought Monitor
Texas**



July 30, 2019
(Released Thursday, Aug. 1, 2019)
Valid 8 a.m. EDT

Drought Conditions (Percent Area)

	None	D0-D4	D1-D4	D2-D4	D3-D4	D4
Current	76.49	23.51	4.31	0.42	0.00	0.00
Last Week <i>07-23-2019</i>	89.88	10.12	1.99	0.66	0.00	0.00
3 Months Ago <i>04-30-2019</i>	87.27	12.73	1.46	0.00	0.00	0.00
Start of Calendar Year <i>01-01-2019</i>	92.99	7.01	1.32	0.00	0.00	0.00
Start of Water Year <i>09-25-2018</i>	57.46	42.54	20.19	7.03	0.96	0.00
One Year Ago <i>07-31-2018</i>	21.82	78.18	59.26	35.93	8.48	0.00

Intensity:

- None
- D0 Abnormally Dry
- D1 Moderate Drought
- D2 Severe Drought
- D3 Extreme Drought
- D4 Exceptional Drought

The Drought Monitor focuses on broad-scale conditions. Local conditions may vary. See accompanying text summary for forecast statements.

Author:

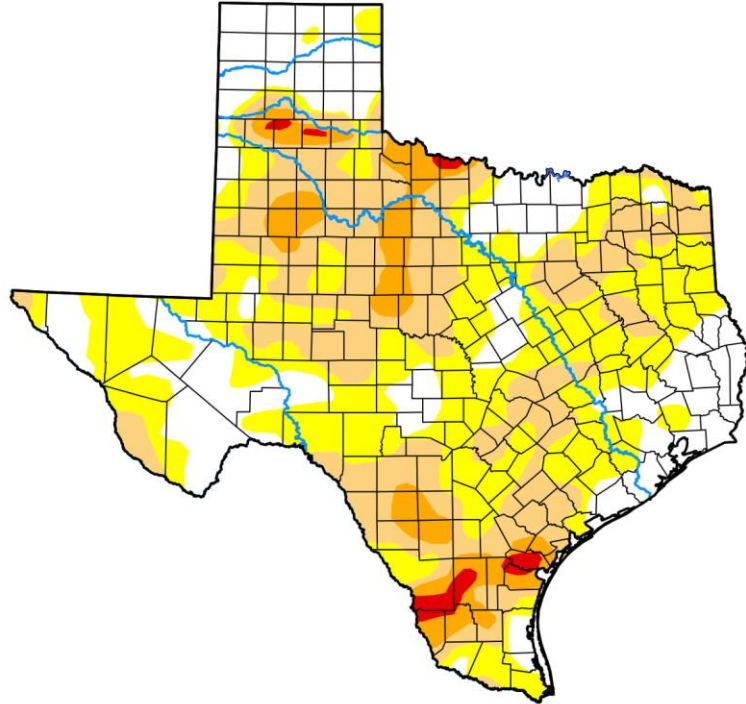
Curtis Riganti
National Drought Mitigation Center



droughtmonitor.unl.edu

2019 Palmer Drought Index Maps

**U.S. Drought Monitor
Texas**



August 27, 2019
(Released Thursday, Aug. 29, 2019)
Valid 8 a.m. EDT

Drought Conditions (Percent Area)

	None	D0-D4	D1-D4	D2-D4	D3-D4	D4
Current	25.90	74.10	37.58	8.75	1.21	0.00
Last Week <i>08-20-2019</i>	27.48	72.52	32.00	6.75	0.56	0.00
3 Months Ago <i>05-28-2019</i>	94.24	5.76	0.20	0.00	0.00	0.00
Start of Calendar Year <i>01-01-2019</i>	92.99	7.01	1.32	0.00	0.00	0.00
Start of Water Year <i>09-25-2018</i>	57.46	42.54	20.19	7.03	0.96	0.00
One Year Ago <i>08-29-2018</i>	18.56	81.44	62.34	30.69	6.78	0.30

Intensity:

- None
- D0 Abnormally Dry
- D1 Moderate Drought
- D2 Severe Drought
- D3 Extreme Drought
- D4 Exceptional Drought

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Author:

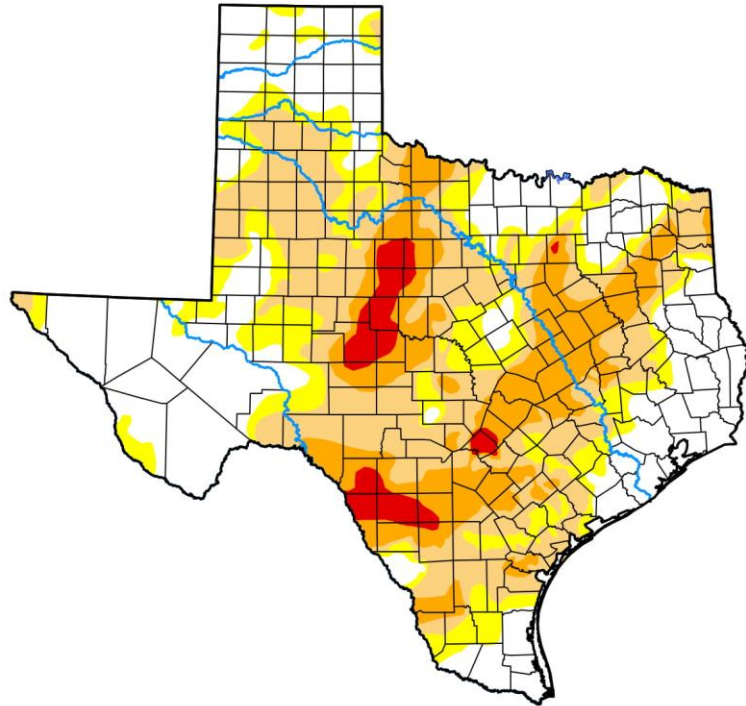
Jessica Blunden
NCEI/NOAA



droughtmonitor.unl.edu

2019 Palmer Drought Index Maps

**U.S. Drought Monitor
Texas**



September 24, 2019
(Released Thursday, Sep. 26, 2019)
Valid 8 a.m. EDT

Drought Conditions (Percent Area)

	None	D0-D4	D1-D4	D2-D4	D3-D4	D4
Current	34.78	65.22	48.33	19.69	3.50	0.00
Last Week <i>09-17-2019</i>	27.74	72.26	51.75	21.20	3.07	0.00
3 Months Ago <i>06-25-2019</i>	95.84	4.16	1.93	0.23	0.00	0.00
Start of Calendar Year <i>01-01-2019</i>	92.99	7.01	1.32	0.00	0.00	0.00
Start of Water Year <i>09-25-2018</i>	57.46	42.54	20.19	7.03	0.96	0.00
One Year Ago <i>09-25-2018</i>	57.46	42.54	20.19	7.03	0.96	0.00

Intensity:



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Author:

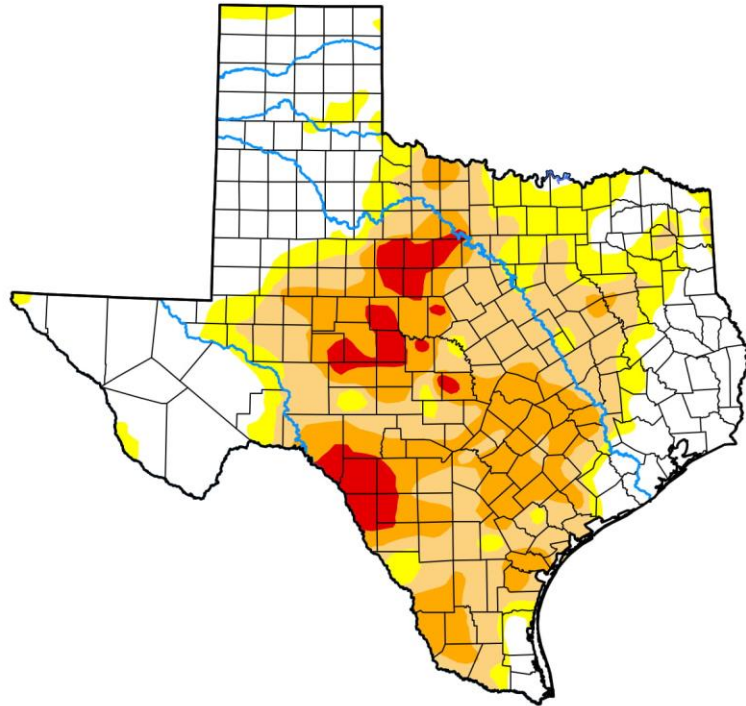
Eric Luebehusen
U.S. Department of Agriculture



droughtmonitor.unl.edu

2019 Palmer Drought Index Maps

U.S. Drought Monitor
Texas



October 29, 2019
(Released Thursday, Oct. 31, 2019)
Valid 8 a.m. EDT

Drought Conditions (Percent Area)

	None	D0-D4	D1-D4	D2-D4	D3-D4	D4
Current	38.98	61.02	46.55	22.40	4.65	0.00
Last Week <small>10-22-2019</small>	39.30	60.70	48.74	25.85	6.68	0.00
3 Months Ago <small>07-30-2019</small>	76.49	23.51	4.31	0.42	0.00	0.00
Start of Calendar Year <small>01-01-2019</small>	92.99	7.01	1.32	0.00	0.00	0.00
Start of Water Year <small>10-01-2019</small>	31.74	68.26	46.05	22.33	6.32	0.00
One Year Ago <small>10-30-2018</small>	96.15	3.85	1.84	0.43	0.00	0.00

Intensity:



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Author:

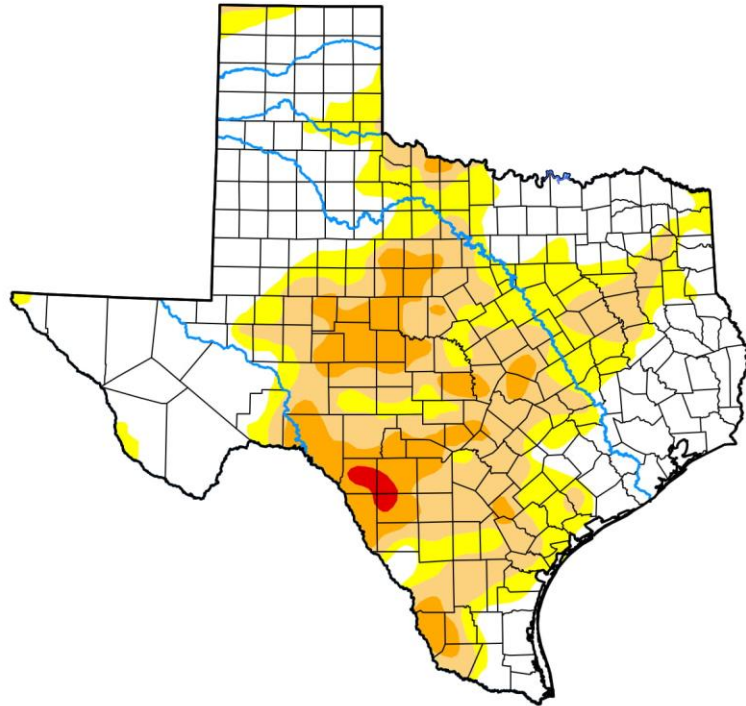
David Simeral
Western Regional Climate Center



droughtmonitor.unl.edu

2019 Palmer Drought Index Maps

**U.S. Drought Monitor
Texas**



November 19, 2019
(Released Thursday, Nov. 21, 2019)
Valid 7 a.m. EST

Drought Conditions (Percent Area)

	None	D0-D4	D1-D4	D2-D4	D3-D4	D4
Current	47.81	52.19	31.96	10.46	0.53	0.00
Last Week <i>11-12-2019</i>	46.76	53.24	31.97	11.04	0.56	0.00
3 Months Ago <i>08-20-2019</i>	27.48	72.52	32.00	6.75	0.56	0.00
Start of Calendar Year <i>01-01-2019</i>	92.99	7.01	1.32	0.00	0.00	0.00
Start of Water Year <i>10-01-2019</i>	31.74	68.26	46.05	22.33	6.32	0.00
One Year Ago <i>11-20-2018</i>	97.73	2.27	0.80	0.00	0.00	0.00

Intensity:



The Drought Monitor focuses on broad-scale conditions. Local conditions may vary. For more information on the Drought Monitor, go to <https://droughtmonitor.unl.edu/About.aspx>

Author:

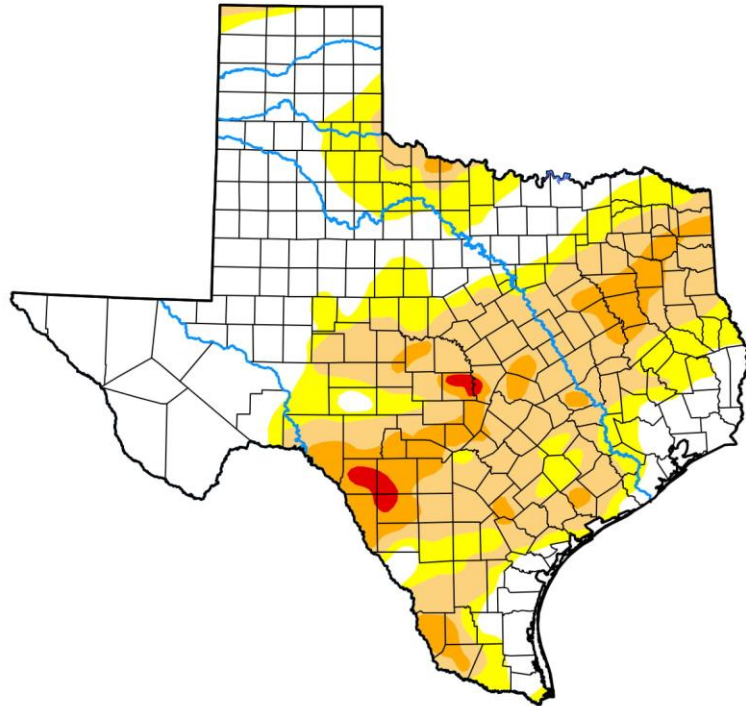
Brad Rippey
U.S. Department of Agriculture



droughtmonitor.unl.edu

2019 Palmer Drought Index Maps

**U.S. Drought Monitor
Texas**



December 31, 2019
(Released Thursday, Jan. 2, 2020)
Valid 7 a.m. EST

Drought Conditions (Percent Area)

	None	D0-D4	D1-D4	D2-D4	D3-D4	D4
Current	44.69	55.31	36.12	9.19	0.74	0.00
Last Week <small>12-24-2019</small>	44.13	55.87	38.62	9.46	0.67	0.00
3 Months Ago <small>10-01-2019</small>	31.74	68.26	46.05	22.33	6.32	0.00
Start of Calendar Year <small>01-01-2019</small>	92.99	7.01	1.32	0.00	0.00	0.00
Start of Water Year <small>10-01-2019</small>	31.74	68.26	46.05	22.33	6.32	0.00
One Year Ago <small>01-01-2019</small>	92.99	7.01	1.32	0.00	0.00	0.00

Intensity:



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Author:
Brad Pugh
CPC/NOAA

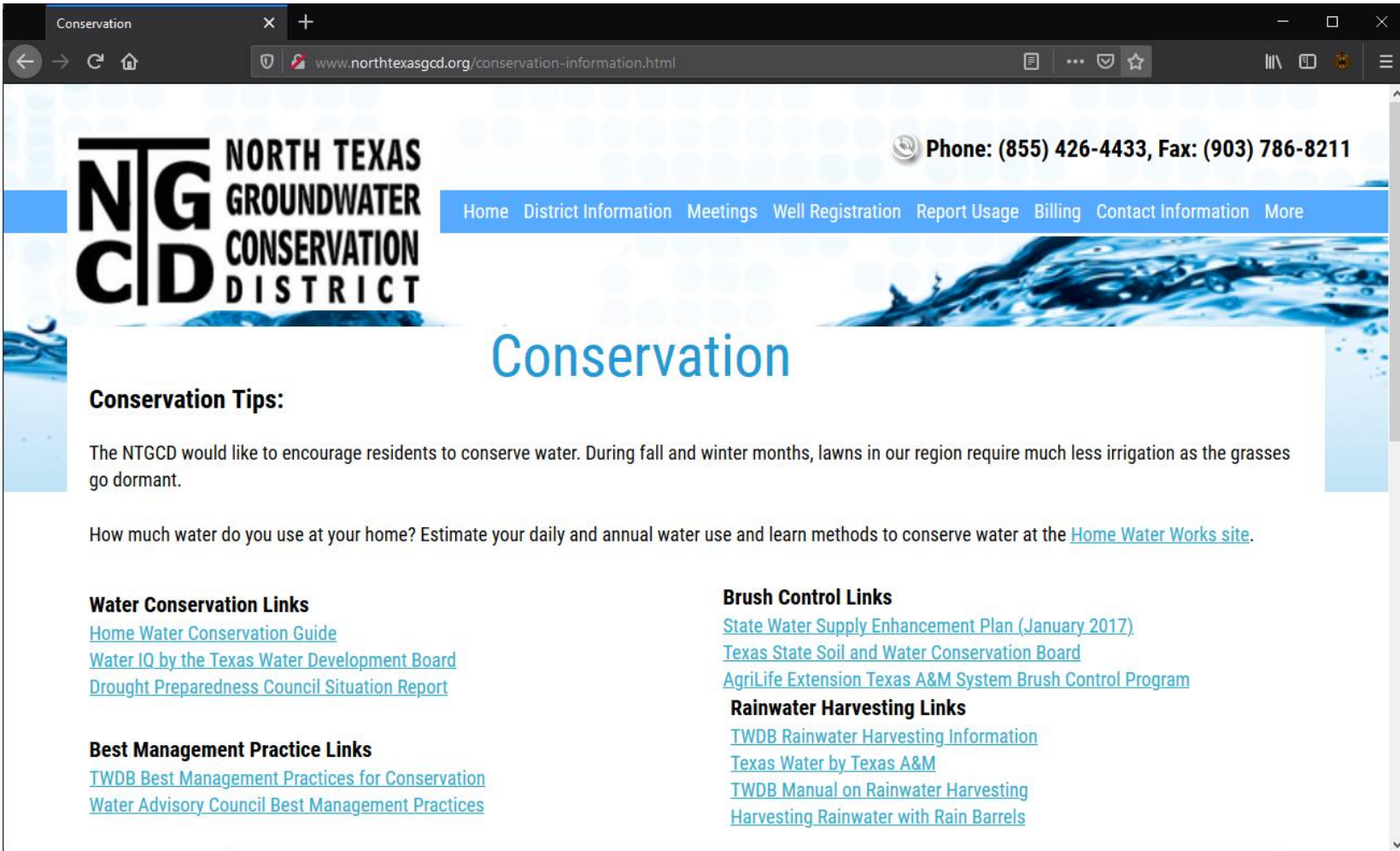


droughtmonitor.unl.edu

2019 Palmer Drought Index Maps

Goal 7: Addressing
Conservation, Recharge
Enhancement,
Rainwater Harvesting,
Precipitation
Enhancement, and
Brush Control





Conservation Links of the District Website

Publish Water Conservation Articles

Water Conservation Tips

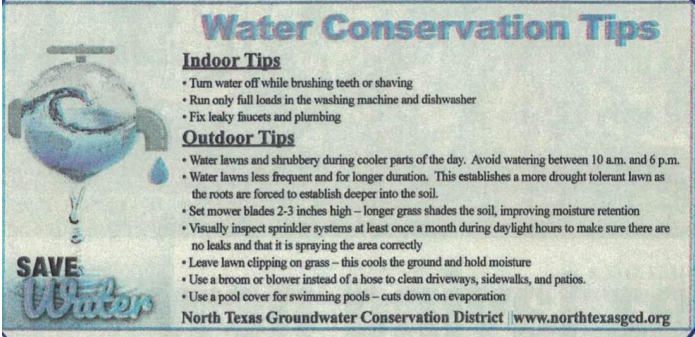
Indoor Tips

- Turn water off while brushing teeth or shaving
- Run only full loads in the washing machine and dishwasher
 - Fix leaky faucets and plumbing

Outdoor Tips

- Water lawns and shrubbery during cooler parts of the day. Avoid watering between 10 a.m. and 6 p.m.
- Water lawns less frequent and for longer duration. This establishes a more drought tolerant lawn as the roots are forced to establish deeper into the soil.
- Set mower blades 2-3 inches high – longer grass shades the soil, improving moisture retention
- Visually inspect sprinkler systems at least once a month during daylight hours to make sure there are no leaks and that it is spraying the area correctly
- Leave lawn clipping on grass – this cools the ground and hold moisture
- Use a broom or blower instead of a hose to clean driveways, sidewalks, and patios.
- Use a pool cover for swimming pools – cuts down on evaporation

North Texas Groundwater Conservation District
www.northtexasgcd.org



Water Conservation Tips

Indoor Tips

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Outdoor Tips

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North Texas Groundwater Conservation District | www.northtexasgcd.org

Water Conservation Tips

Indoor Tips

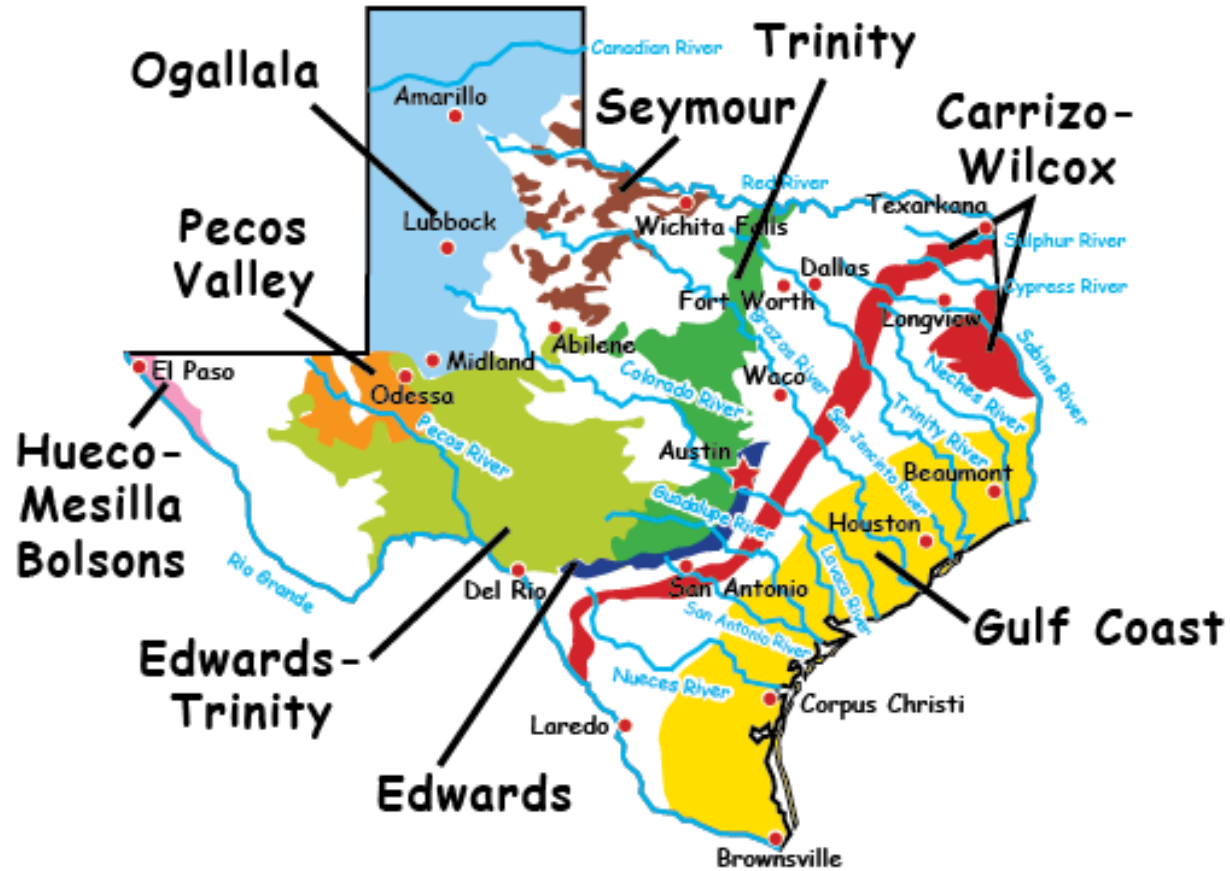
- Turn water off while brushing teeth or shaving.
- Run only full loads in the washing machine and dishwasher.
- Fix leaky faucets and plumbing.

Outdoor Tips

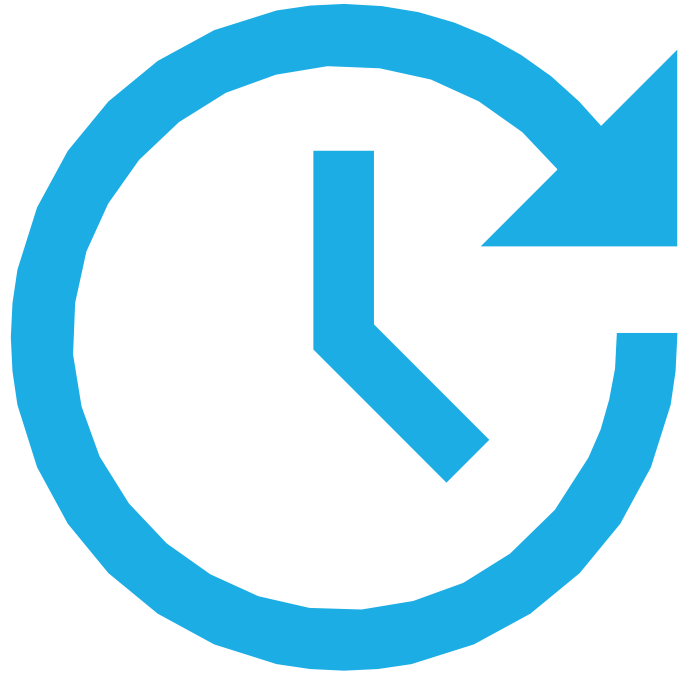
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North Texas Groundwater Conservation District
www.northtexasgcd.org

MAJOR RIVERS



Major Rivers Curriculum



Goal 8: Achieving Desired Future Conditions of Groundwater Resources

NTGCD DFC Tool

Select County or entire GCD

GCD

DFC Summary for Slope Analysis

Aquifer	County	Adopted DFC (ft of Avg. Drawdown)	DFC Period (Years)	Annual DFC (ft/yr of Avg. Drawdown)	Current Trend (ft/yr of Avg. Drawdown)	Current Status (+ indicates value above DFC/ - indicates value below DFC)
Woodbine	GCD	278	60	-4.63	-0.72	3.91
Paluxy	GCD	671	60	-11.18	-6.38	4.8
Glen Rose	GCD	341	60	-5.68		
Antlers	GCD	290	60	-4.83	-2.78	2.05
Twin Mountains	GCD	569	60	-9.48	-7.11	

DFC Summary for Spatial Analysis

Aquifer	County	Adopted DFC (ft of Avg. Drawdown)	DFC Period (Years)	Annual DFC (ft/yr of Avg. Drawdown)	Current Trend (ft/yr of Avg. Drawdown)	Current Status (+ indicates value above DFC/ - indicates value below DFC)
Woodbine	GCD	278	60	-4.63	13.11	17.74
Paluxy	GCD	671	60	-11.18	9.98	21.16
Glen Rose	GCD	341	60	-5.68		
Antlers	GCD	290	60	-4.83	-11.52	-6.69
Twin Mountains	GCD	569	60	-9.48		

DFC Evaluation Tool

DFC Summary Based on Slope Analysis

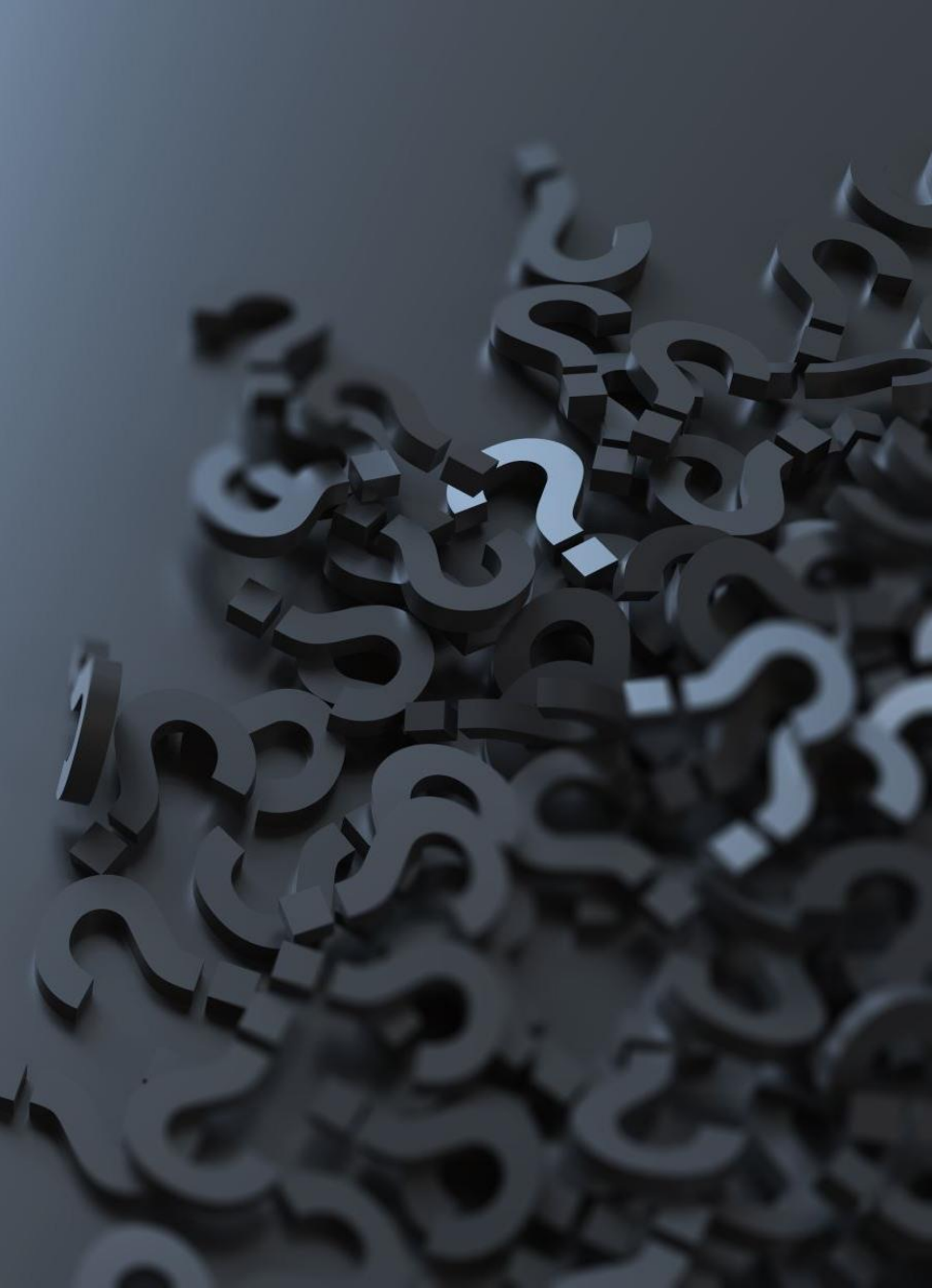
<i>Aquifer</i>	<i>County</i>	<i>Adopted DFC</i> <i>(ft. of Avg. Drawdown)</i>	<i>Annual DFC</i> <i>(ft./yr. of Avg. Drawdown)</i>	<i>Current Trend</i> <i>(ft./yr. of Avg. Drawdown)</i>	<i>Current Status</i> <i>(ft./yr.)</i>
<i>Trinity (Antlers)</i>	Collin	570	-9.5	-	-
	Cooke	176	-2.93	-2.78	0.15
	Denton	395	-6.58	-2.75	3.83
	District	290	-4.83	-2.78	2.05
<i>Trinity (Paluxy)</i>	Collin	705	-11.75	-1.28	10.47
	Denton	552	-9.2	-7.4	1.80
	District	671	-11.18	-6.38	4.80
<i>Trinity (Twin Mountains)</i>	Collin	526	-8.77	-14.25	(5.48)
	Denton	716	-11.93	-5.08	6.85
	District	569	-9.48	-7.11	2.37
<i>Woodbine</i>	Collin	459	-7.65	-1.39	6.26
	Cooke	2	-0.03	0.12	0.15
	Denton	22	-0.37	-0.43	(0.06)
	District	278	-4.63	-0.72	3.91

DFC Summary Based on Spatial Analysis

<i>Aquifer</i>	<i>County</i>	<i>Adopted DFC</i> <i>(ft. of Avg. Drawdown)</i>	<i>Annual DFC</i> <i>(ft./yr. of Avg. Drawdown)</i>	<i>Current Trend</i> <i>(ft./yr. of Avg. Drawdown)</i>	<i>Current Status</i> <i>(ft./yr.)</i>
<i>Trinity (Antlers)</i>	Collin	570	-9.5	-26.55	(17.05)
	Cooke	176	-2.93	-10.04	(7.11)
	Denton	395	-6.58	-14.14	(7.56)
	District	290	-4.83	-11.52	(6.69)
<i>Trinity (Paluxy)</i>	Collin	705	-11.75	11.32	23.07
	Denton	552	-9.2	5.31	14.51
	District	671	-11.18	9.98	21.16
<i>Trinity (Twin Mountains)</i>	Collin	526	-8.77	-	-
	Denton	716	-11.93	-	-
	District	569	-9.48	-	-
<i>Woodbine</i>	Collin	459	-7.65	8.83	16.48
	Cooke	2	-0.03	11.61	11.64
	Denton	22	-0.37	22.94	23.31
	District	278	-4.63	13.11	17.74

Slope and Spatial Analysis Comparison

<i>Aquifer</i>	<i>County</i>	<i>Slope Analysis Current Status</i>	<i>Spatial Analysis Current Status</i>
<i>Trinity (Antlers)</i>	Collin	-	(17.05)
	Cooke	0.15	(7.11)
	Denton	3.83	(7.56)
	District	2.05	(6.69)
<i>Trinity (Paluxy)</i>	Collin	10.47	23.07
	Denton	1.80	14.51
	District	4.80	21.16
<i>Trinity (Twin Mountains)</i>	Collin	(5.48)	-
	Denton	6.85	-
	District	2.37	-
<i>Woodbine</i>	Collin	6.26	16.48
	Cooke	0.15	11.64
	Denton	(0.06)	23.31
	District	3.91	17.74



Any Questions?

PAUL M. SIGLE, GROUNDWATER
TECHNICAL LEAD