

A vibrant field of bluebonnets in full bloom, stretching towards a bright blue sky with scattered white clouds. The flowers are a mix of deep blue and white, with some yellow centers visible.

Updated Exempt and Non-Exempt Production

DFC Committee Meeting
10/1/2019



Some Background

Desired Future Conditions (DFC)

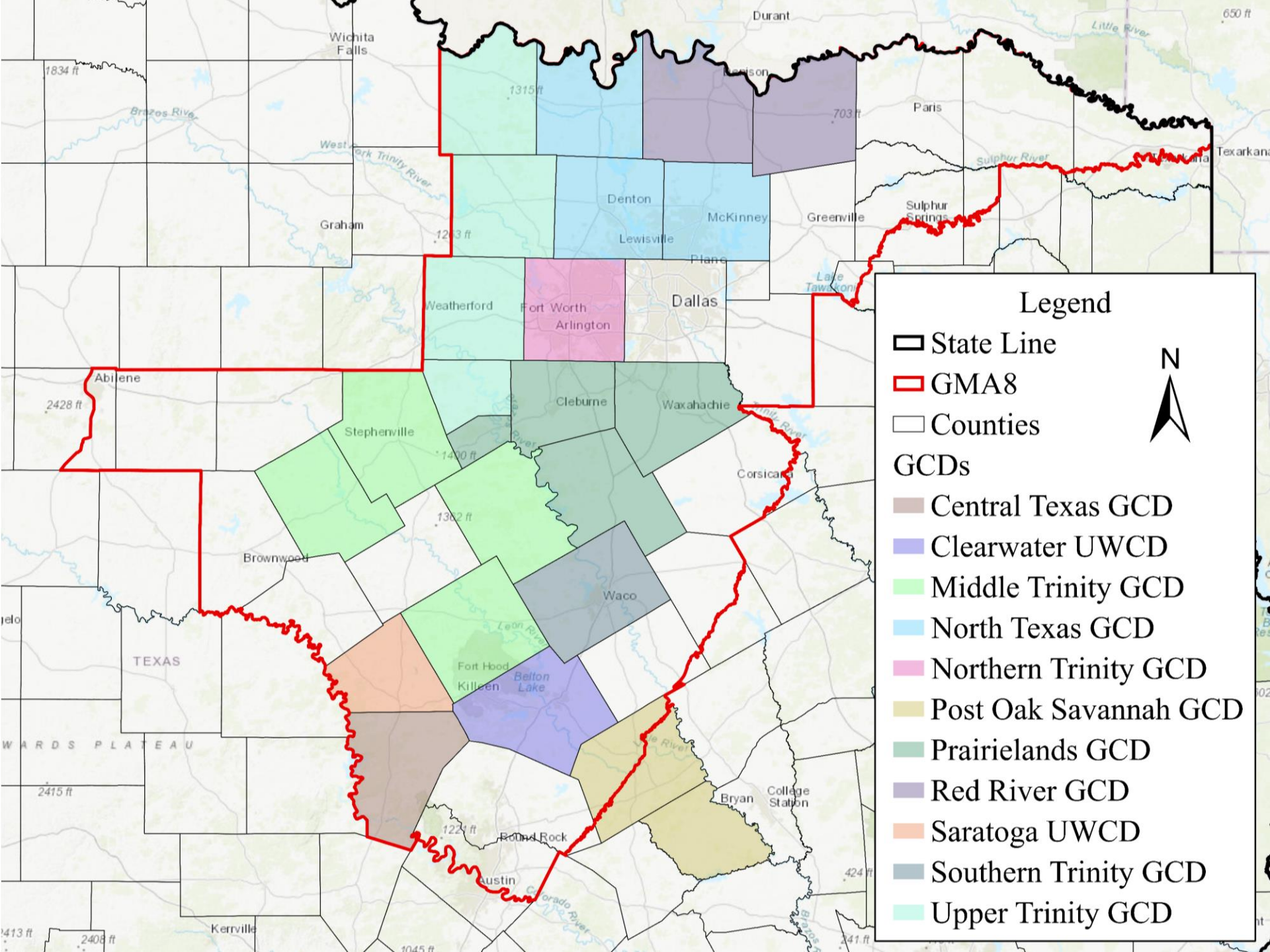
- Defined as “the desired, quantified condition of groundwater resources (such as water levels, spring flows, or volumes) within a management area at one or more specified future times as defined by participating groundwater conservation districts within a groundwater management area (GMA) as part of the joint planning process”
- Adopted every 5 years
- 2/3rds majority vote by the GMA is required to adopt the DFC

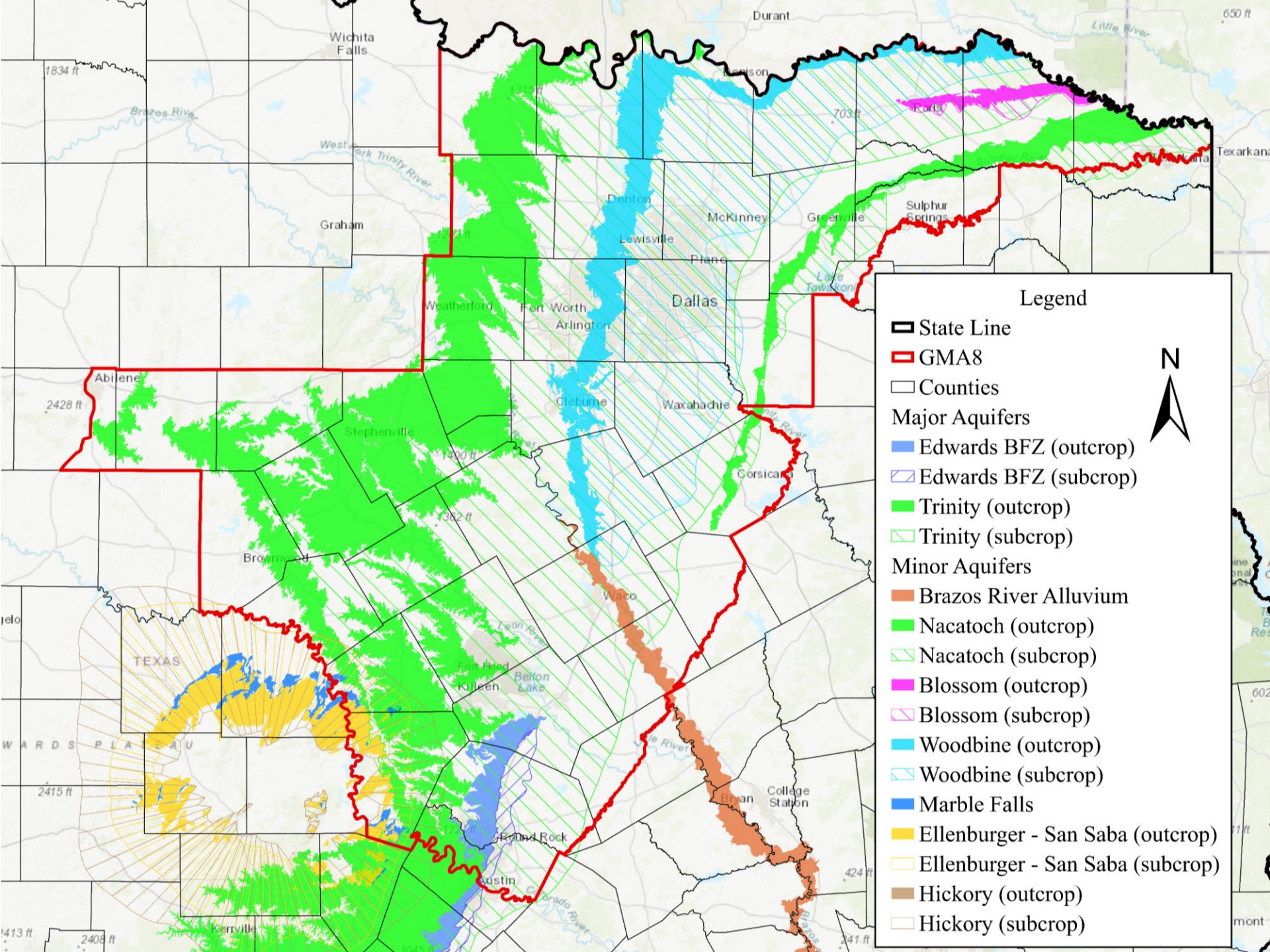
Groundwater Availability Model (GAM)

- A model used to estimate future trends in the amount of water available in an aquifer and is based on hydrogeologic principles, actual aquifer measurements, and stakeholder guidance.
- The GAM for the northern portion of the Trinity and Woodbine Aquifers was updated in 2015

Modeled Available Groundwater (MAG)

- The MAG is the estimated pumping rate that will achieve the DFC
- Texas Water Development Board uses the GAM to determine these pumping rates





Legend

- State Line
- GMA8
- Counties
- Major Aquifers**
- Edwards BFZ (outcrop)
- Edwards BFZ (subcrop)
- Trinity (outcrop)
- Trinity (subcrop)
- Minor Aquifers**
- Brazos River Alluvium
- Nacatoch (outcrop)
- Nacatoch (subcrop)
- Blossom (outcrop)
- Blossom (subcrop)
- Woodbine (outcrop)
- Woodbine (subcrop)
- Marble Falls
- Ellenburger - San Saba (outcrop)
- Ellenburger - San Saba (subcrop)
- Hickory (outcrop)
- Hickory (subcrop)



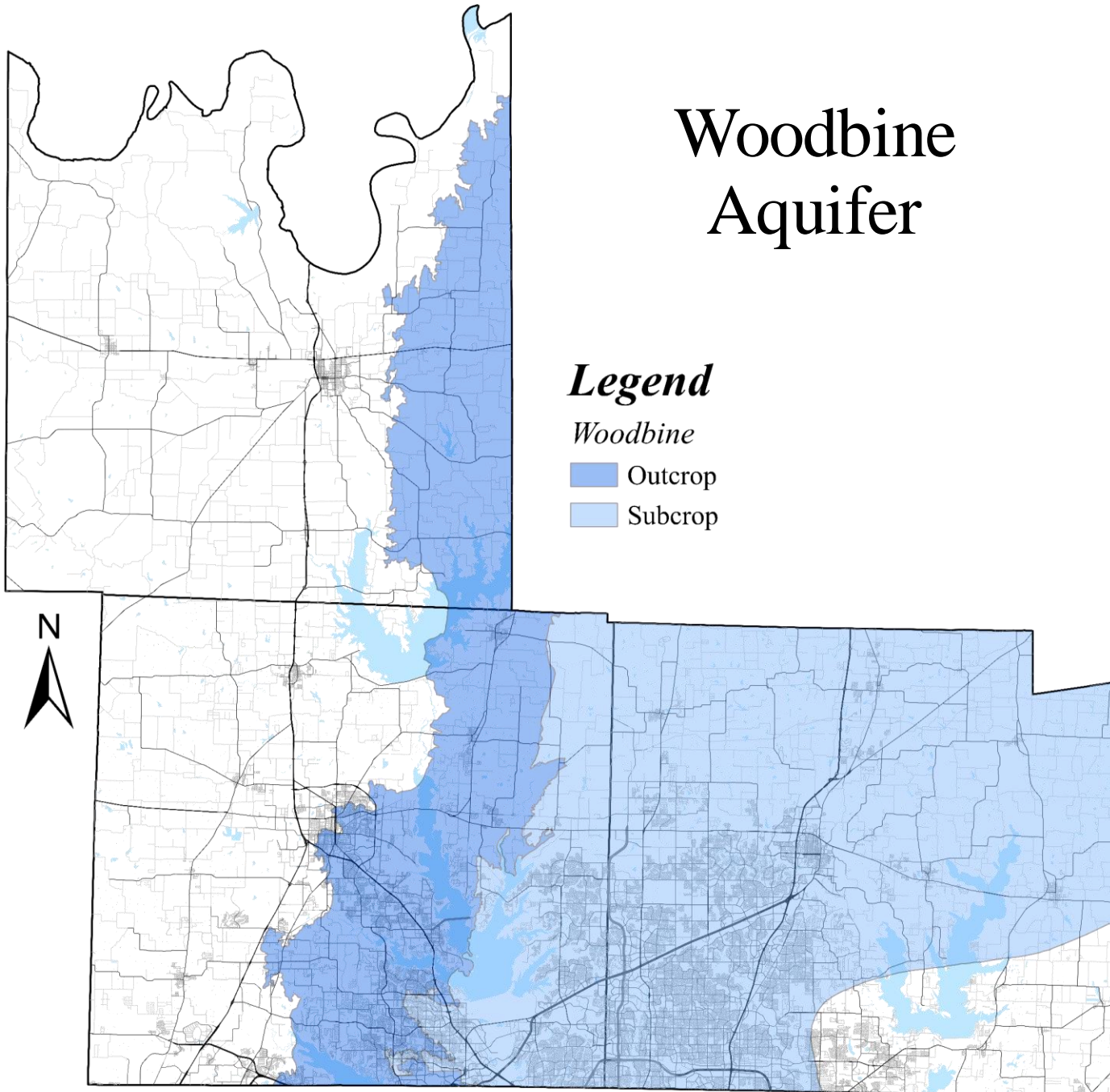
Woodbine Aquifer

Legend

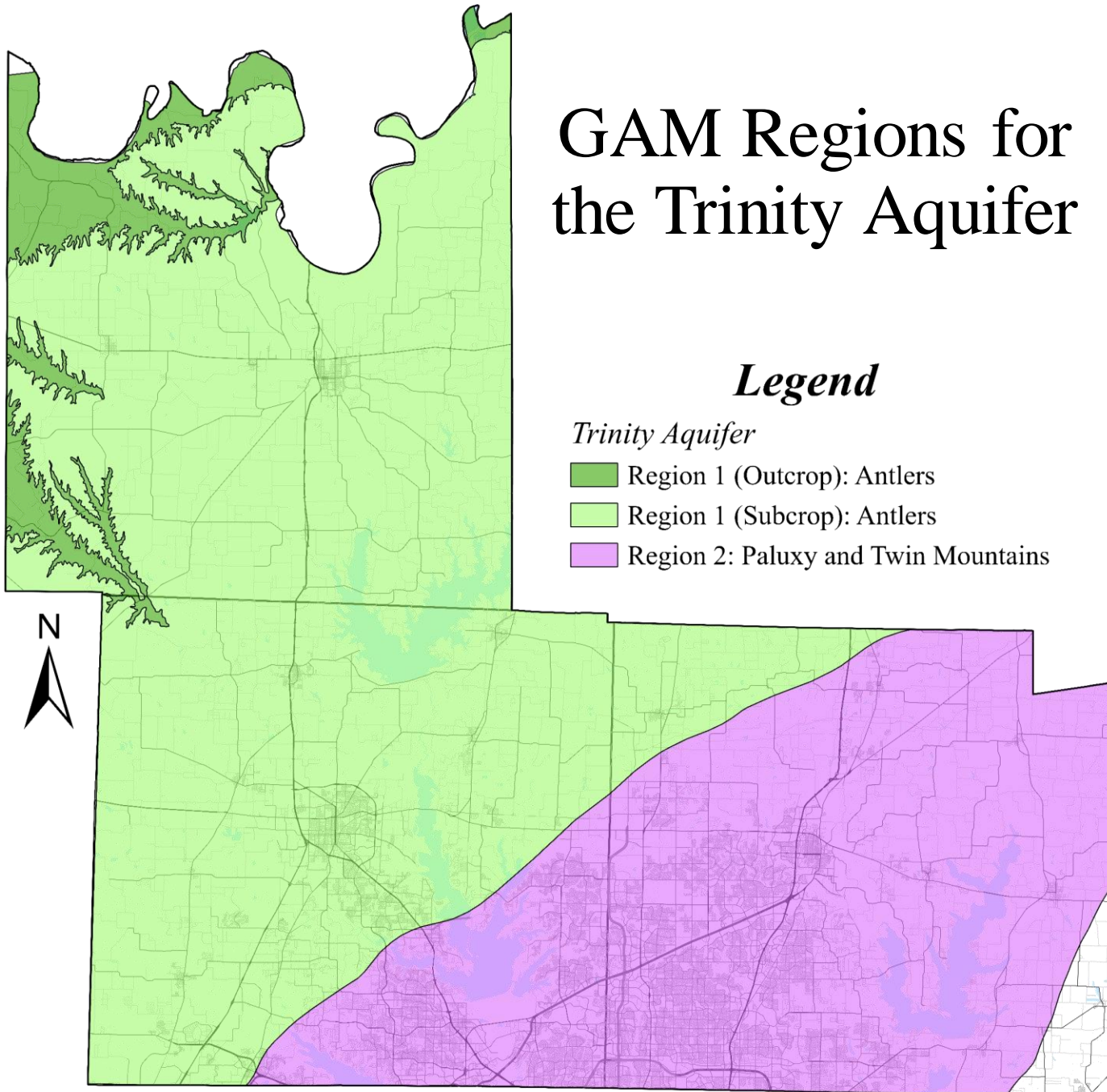
Woodbine

■ Outcrop

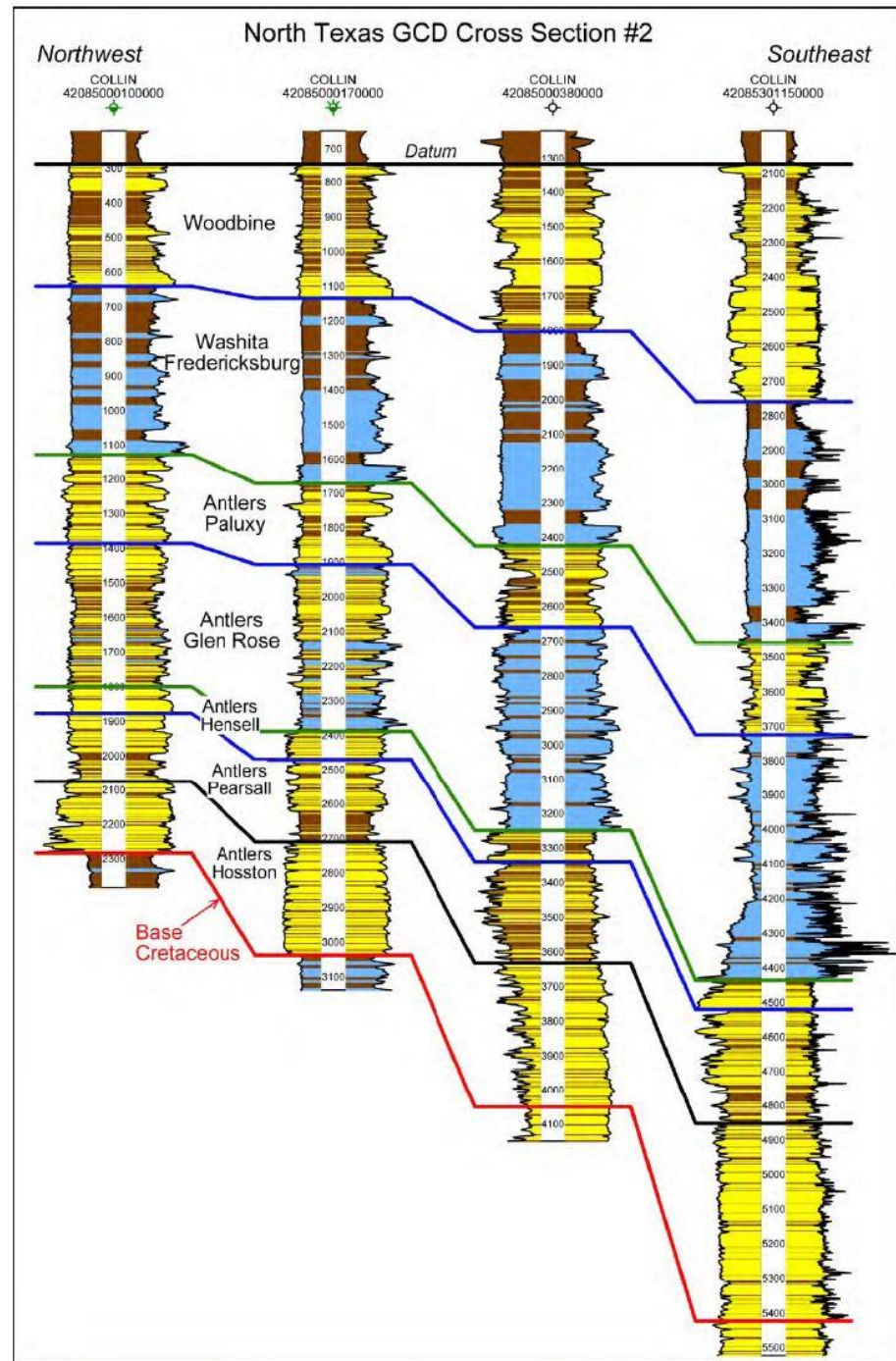
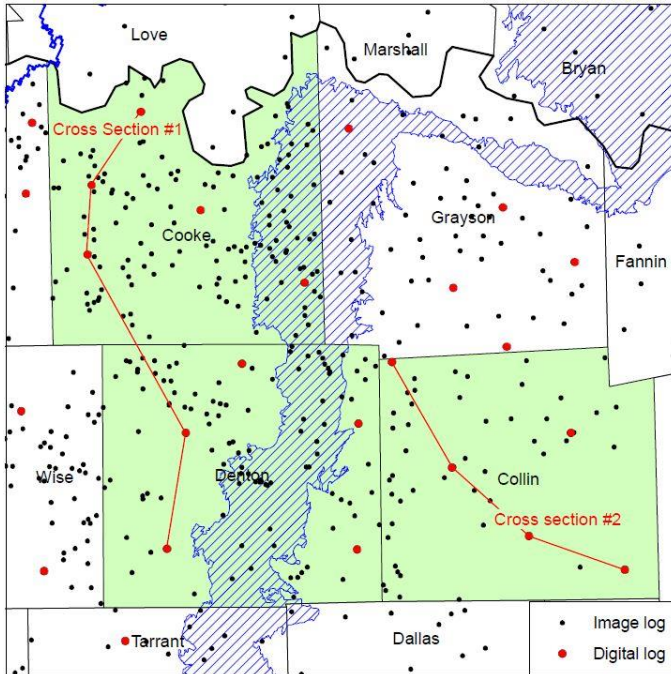
■ Subcrop



GAM Regions for the Trinity Aquifer

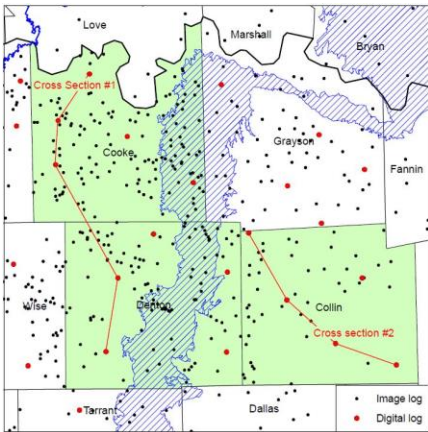


Cross Section of the Aquifer



yellow = greater than 50 percent sandstone, blue = greater than 50 percent limestone, brown = greater than 50 percent shale

Cross Section of the Aquifer

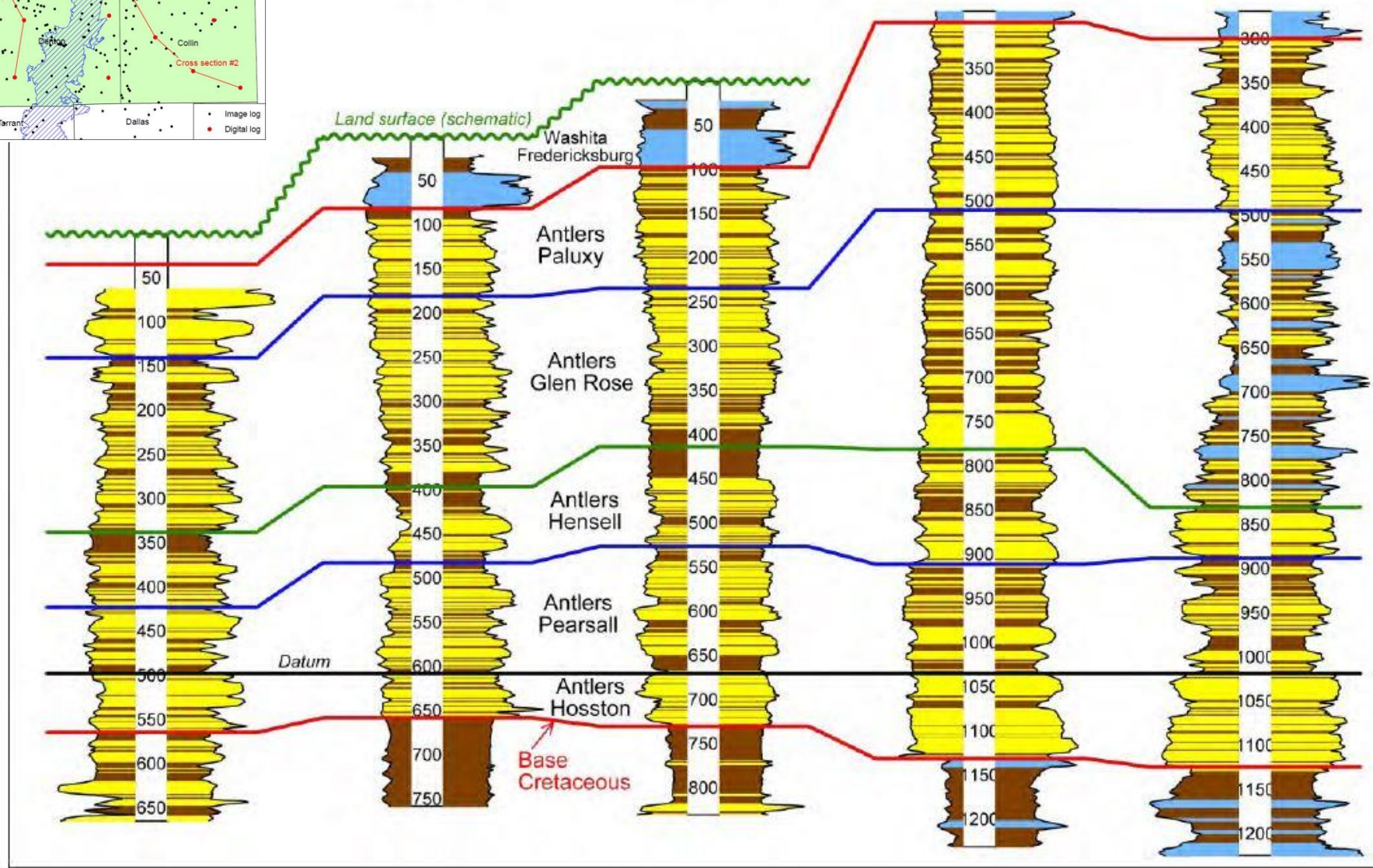


COOKE
42097338200000

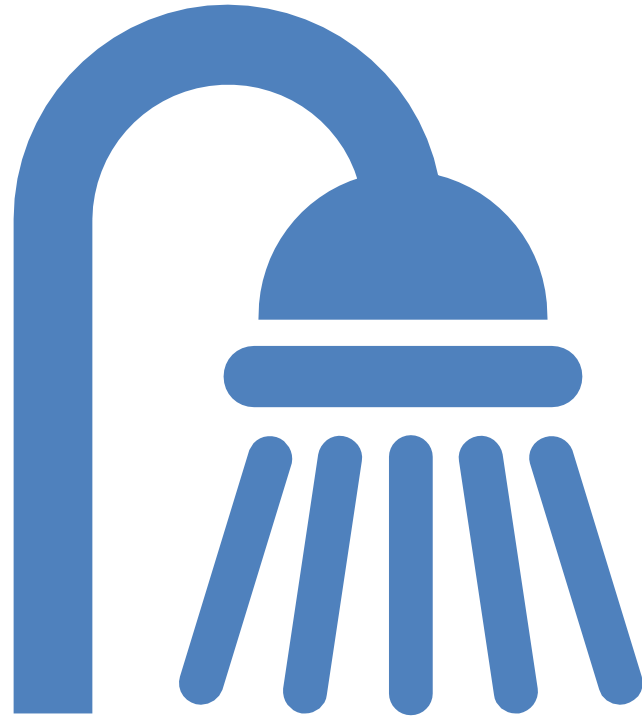
COOKE
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DENTON
42121004060000

DENTON
42121306800000



yellow = greater than 50 percent sandstone, blue = greater than 50 percent limestone, brown = greater than 50 percent shale



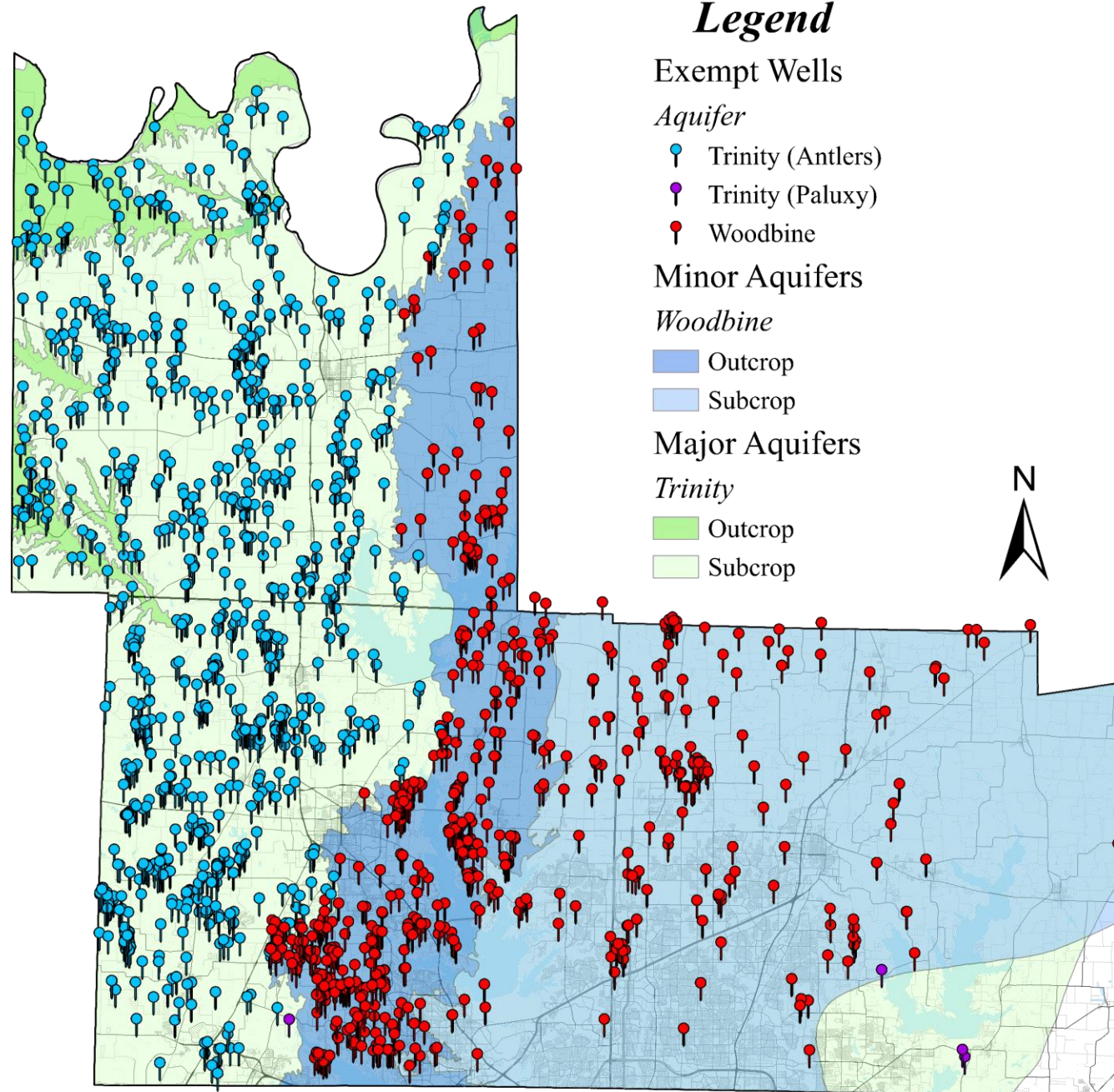
Exempt Use

Estimating Exempt Use

What aquifer the Exempt Use is being produced from?

How to estimate the Exempt Use?

Aquifer Identification for Exempt Wells



Estimated Production from Exempt Wells

Use	Active Wells	Sum Of Capacity (GPM)	Estimated Production (Ac-ft)	3x Estimated Production (Ac-ft)	Methodology
Agriculture	30	530.0	71	214	Average time pumping per day of 2 hours
Commercial	36	632.7	6	18	Assumed average consumption is 150 gallons per day
Domestic Use	1154	18,345.8	194	582	Assumed average consumption is 150 gallons per day
Industrial/Manufacturing	2	36.7	5	15	Average time pumping per day of 2 hours
Irrigation	145	2,643.5	355	1,066	Average time pumping per day of 2 hours
Livestock	117	3,795.0	510	1,530	Average time pumping per day of 2 hours
Oil/Gas	6	390.0	52	157	Average time pumping per day of 2 hours
Other	33	513.6	69	207	Average time pumping per day of 2 hours
Pond/Surface Impoundments	61	1,253.5	168	505	Average time pumping per day of 2 hours
Public Water System	11	192.5	78	233	Average time pumping per day of 6 hours
Total	1,595	28,333	1,509	<u>4,528</u>	

Note: The estimated production includes a three times multiplier of the calculated production. The three times multiplier is based on the assumption that only a third of the exempt wells are registered with the District.



Non-Exempt Use

Updated Non-Exempt Production

Determine the aquifer for the
611 Non-Exempt Wells



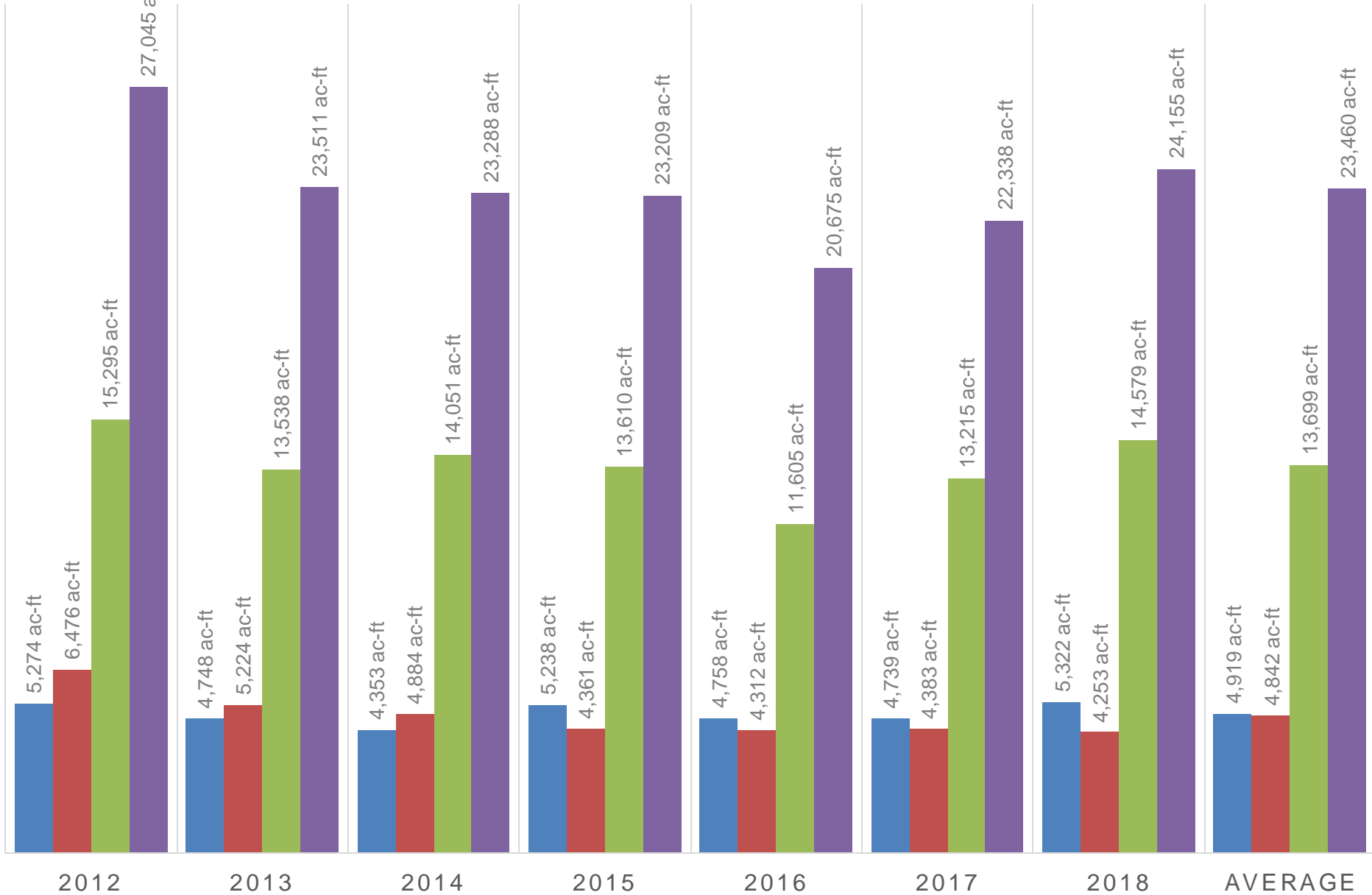
Estimate the production for
each well



Performed QA/QC

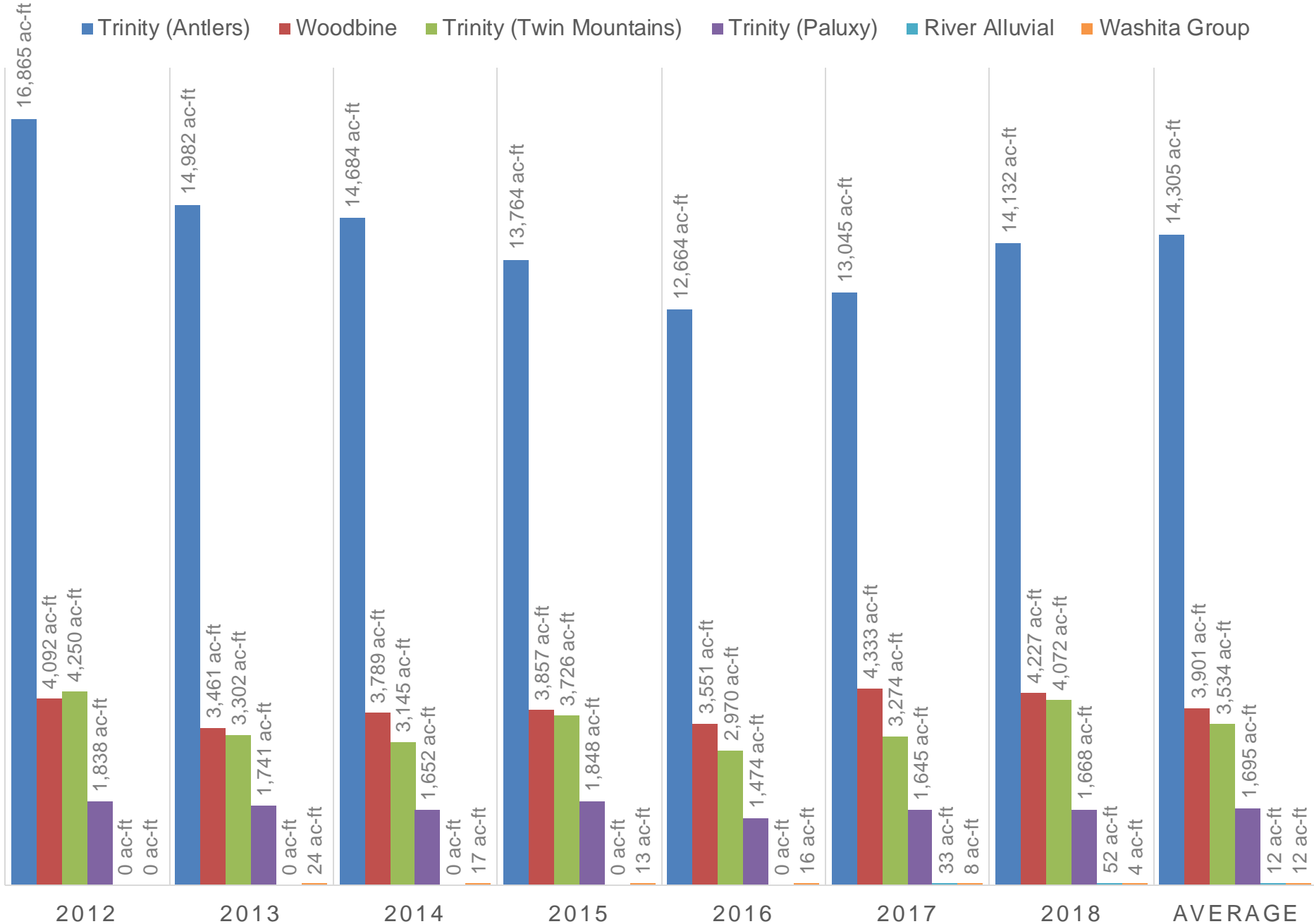
Non-Exempt Production by County

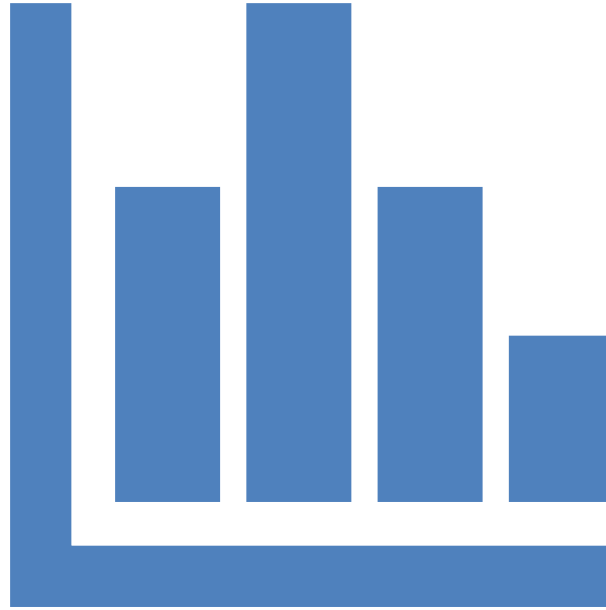
■ Collin ■ Cooke ■ Denton ■ Total



Non-Exempt Production By Aquifer

■ Trinity (Antlers)
 ■ Woodbine
 ■ Trinity (Twin Mountains)
 ■ Trinity (Paluxy)
 ■ River Alluvial
 ■ Washita Group





Comparing Updated Estimated Production

Current Modeled Available Groundwater

County	Aquifer	2020	2030	2040	2050	2060	2070
Collin	Trinity (Antlers)	1,966	1,961	1,966	1,961	1,966	1,961
	Trinity (Glen Rose)	83	83	83	83	83	83
	Trinity (Paluxy)	1,551	1,547	1,551	1,547	1,551	1,547
	Trinity (Twin Mountains)	2,207	2,201	2,207	2,201	2,207	2,201
	Woodbine	4,263	4,251	4,263	4,251	4,263	4,251
	Total	10,070	10,043	10,070	10,043	10,070	10,043
Cooke	Trinity (Antlers)	10,544	10,514	10,544	10,514	10,544	10,514
	Woodbine	802	800	802	800	802	800
	Total	11,346	11,314	11,346	11,314	11,346	11,314
Denton	Trinity (Antlers)	16,591	16,545	16,591	16,545	16,591	16,545
	Trinity (Glen Rose)	339	338	339	338	339	338
	Trinity (Paluxy)	4,832	4,819	4,832	4,819	4,832	4,819
	Trinity (Twin Mountains)	8,389	8,366	8,389	8,366	8,389	8,366
	Woodbine	3,616	3,607	3,616	3,607	3,616	3,607
	Total	33,767	33,675	33,767	33,675	33,767	33,675
District	Trinity (Antlers)	29,101	29,020	29,101	29,020	29,101	29,020
	Trinity (Glen Rose)	422	421	422	421	422	421
	Trinity (Paluxy)	6,383	6,366	6,383	6,366	6,383	6,366
	Trinity (Twin Mountains)	10,596	10,567	10,596	10,567	10,596	10,567
	Woodbine	8,681	8,658	8,681	8,658	8,681	8,658
	Total	55,183	55,032	55,183	55,032	55,183	55,032

Estimated Exempt Use Compared to 2016 Estimates

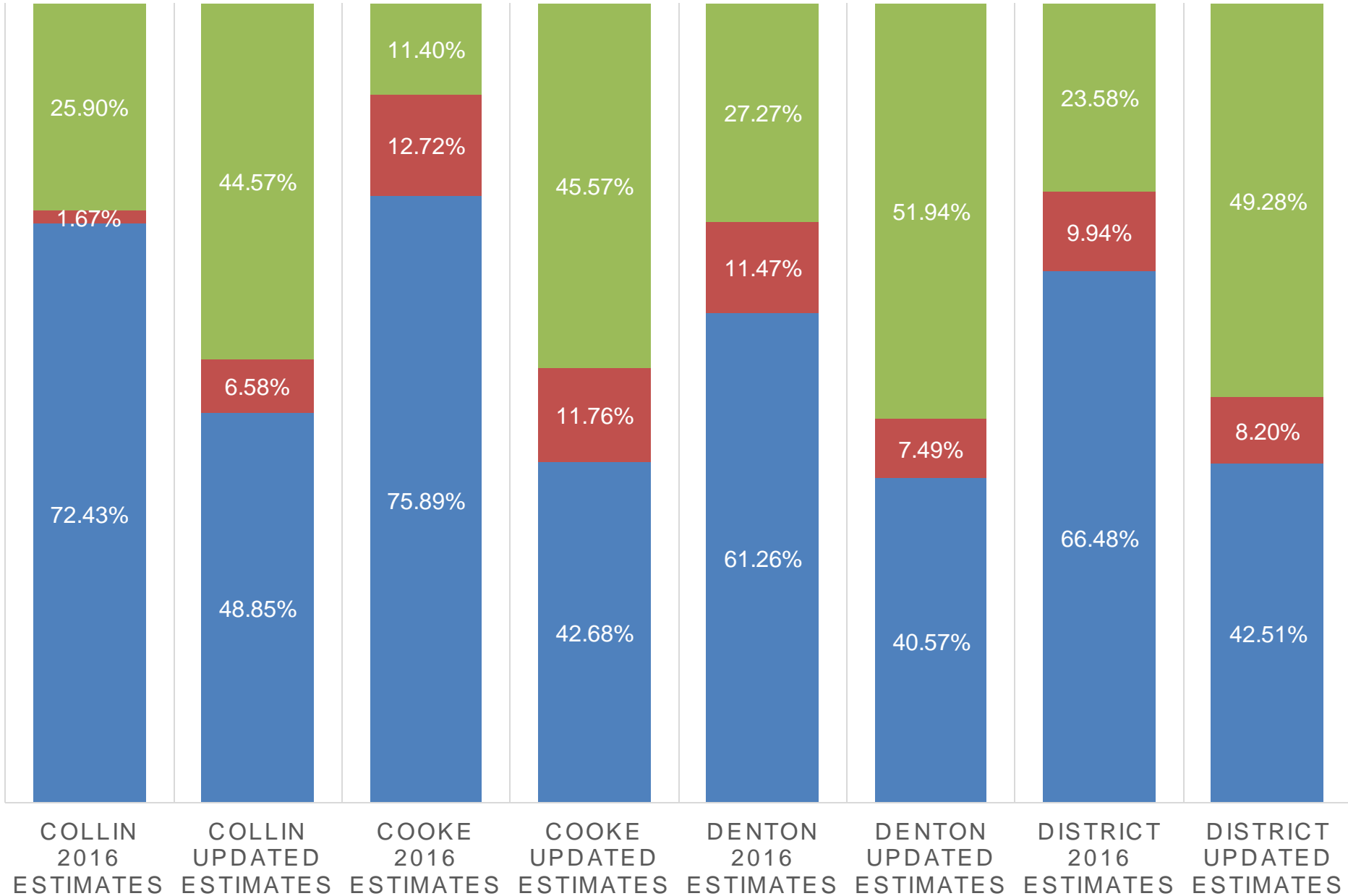
County	Aquifer	2016 Estimated Exempt Use (ac-ft)	New Exempt Use (ac-ft)	Percent Different
Collin	Trinity (Antlers)	18	0	-100.00%
	Trinity (Paluxy)	38	7	-81.62%
	Trinity (Twin Mountains)	7	0	-100.00%
	Woodbine	105	656	525.17%
	Total	168	663	294.93%
Cooke	Trinity (Antlers)	664	1,210	82.26%
	Woodbine	779	124	-84.13%
	Total	1,443	1,334	-7.57%
Denton	Trinity (Antlers)	1,557	924	-40.68%
	Trinity (Paluxy)	400	8	-98.06%
	Trinity (Twin Mountains)	357	0	-100.00%
	Woodbine	1,658	1,599	-3.58%
	Total	3,972	2,530	-36.30%
District	Trinity (Antlers)	2,239	2,134	-4.70%
	Trinity (Paluxy)	439	15	-96.62%
	Trinity (Twin Mountains)	363	0	-100.00%
	Woodbine	2,542	2,379	-6.43%
	Total	5,583	4,527	-18.91%

Estimated Non-Exempt Use Compared to 2016 Estimates

County	Aquifer	2016 Estimated Non-Exempt Use (ac-ft)	New Non-Exempt Use (ac-ft)	Percent Different
Collin	Trinity (Antlers)	746	646	-13.47%
	Trinity (Paluxy)	734	656	-10.62%
	Trinity (Twin Mountains)	1,946	1,296	-33.40%
	Woodbine	3,868	2,321	-39.99%
	Total	7,294	4,919	-32.56%
Cooke	Trinity (Antlers)	8,501	4,830	-43.18%
	Woodbine	110	0	-99.89%
	Total	8,611	4,830	-43.91%
Denton	Trinity (Antlers)	10,765	8,830	-17.98%
	Trinity (Paluxy)	1,496	1,039	-30.53%
	Trinity (Twin Mountains)	6,582	2,238	-66.00%
	Woodbine	1,843	1,580	-14.27%
	Total	20,686	13,687	-33.83%
District	Trinity (Antlers)	20,012	14,305	-28.52%
	Trinity (Paluxy)	2,230	1,695	-23.98%
	Trinity (Twin Mountains)	8,528	3,534	-58.56%
	Woodbine	5,821	3,901	-32.98%
	Total	36,591	23,436	-35.95%

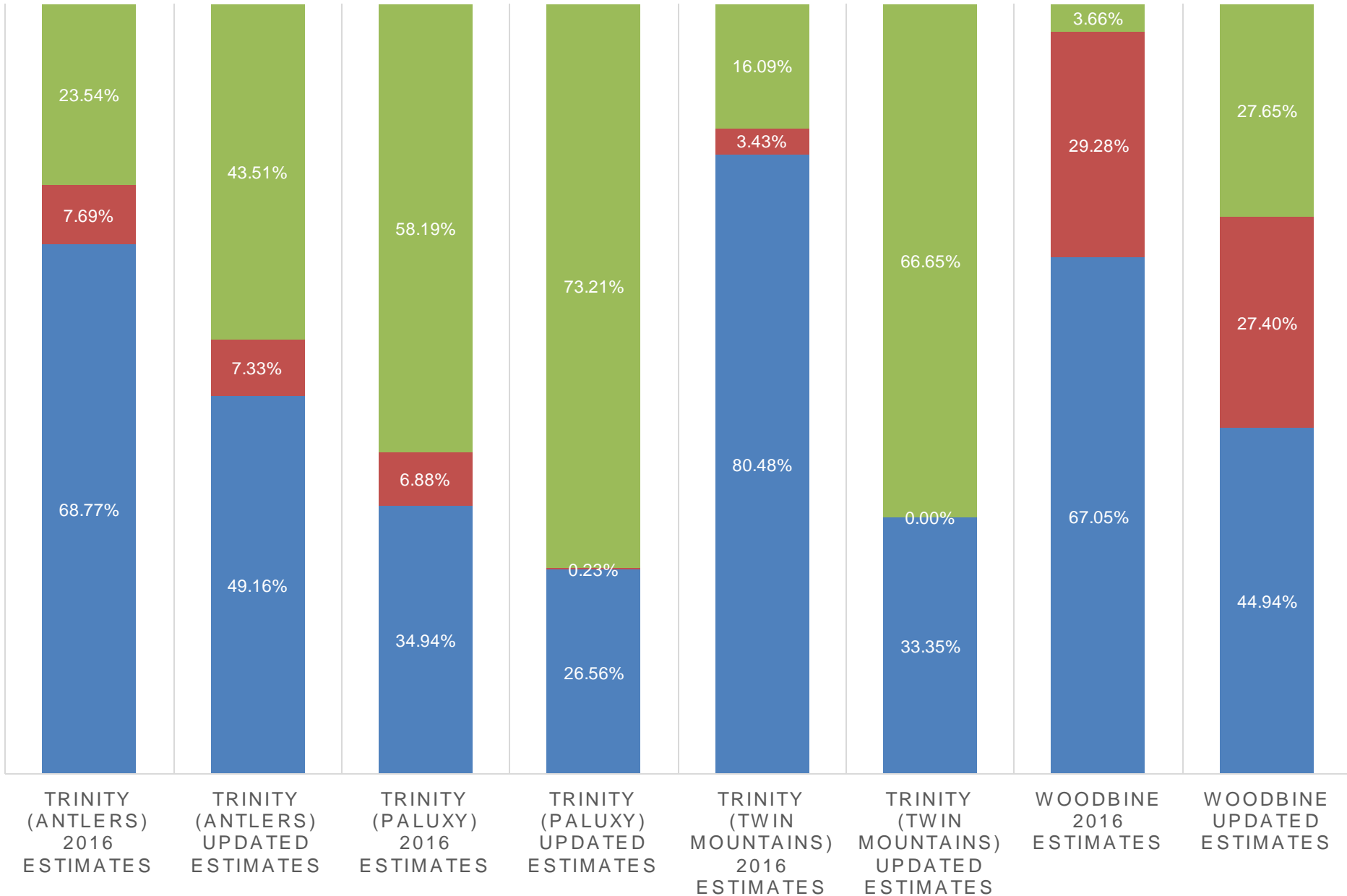
Production Compared to 2020 MAG by County

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



Production Compared to 2020 MAG by Aquifer

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



DFC Committee and Staff Recommendation

No change to the MAG

Estimated Production vs. Average MAG

County	Aquifer	New Total Production (ac-ft)	Average MAG (ac-ft)	Percent Increase
Collin	Trinity (Antlers)	646	1,964	204.18%
	Trinity (Paluxy)	663	1,549	133.60%
	Trinity (Twin Mountains)	1,296	2,204	70.05%
	Woodbine	2,978	4,257	42.96%
	Total	5,582	10,057	80.15%
Cooke	Trinity (Antlers)	6,040	10,529	74.31%
	Woodbine	124	801	547.43%
	Total	6,164	11,330	83.81%
Denton	Trinity (Antlers)	9,753	16,568	69.87%
	Trinity (Paluxy)	1,047	4,826	360.90%
	Trinity (Twin Mountains)	2,238	8,378	274.30%
	Woodbine	3,179	3,612	13.62%
	Total	16,217	33,721	107.93%
District	Trinity (Antlers)	16,439	29,061	76.78%
	Trinity (Paluxy)	1,710	6,375	272.76%
	Trinity (Twin Mountains)	3,534	10,582	199.40%
	Woodbine	6,280	8,670	38.05%
	Total	27,963	55,108	97.07%



Questions
