

# RED RIVER

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## GROUNDWATER CONSERVATION DISTRICT

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Updated Exempt and Non-Exempt  
Production

September Board of Directors Meeting

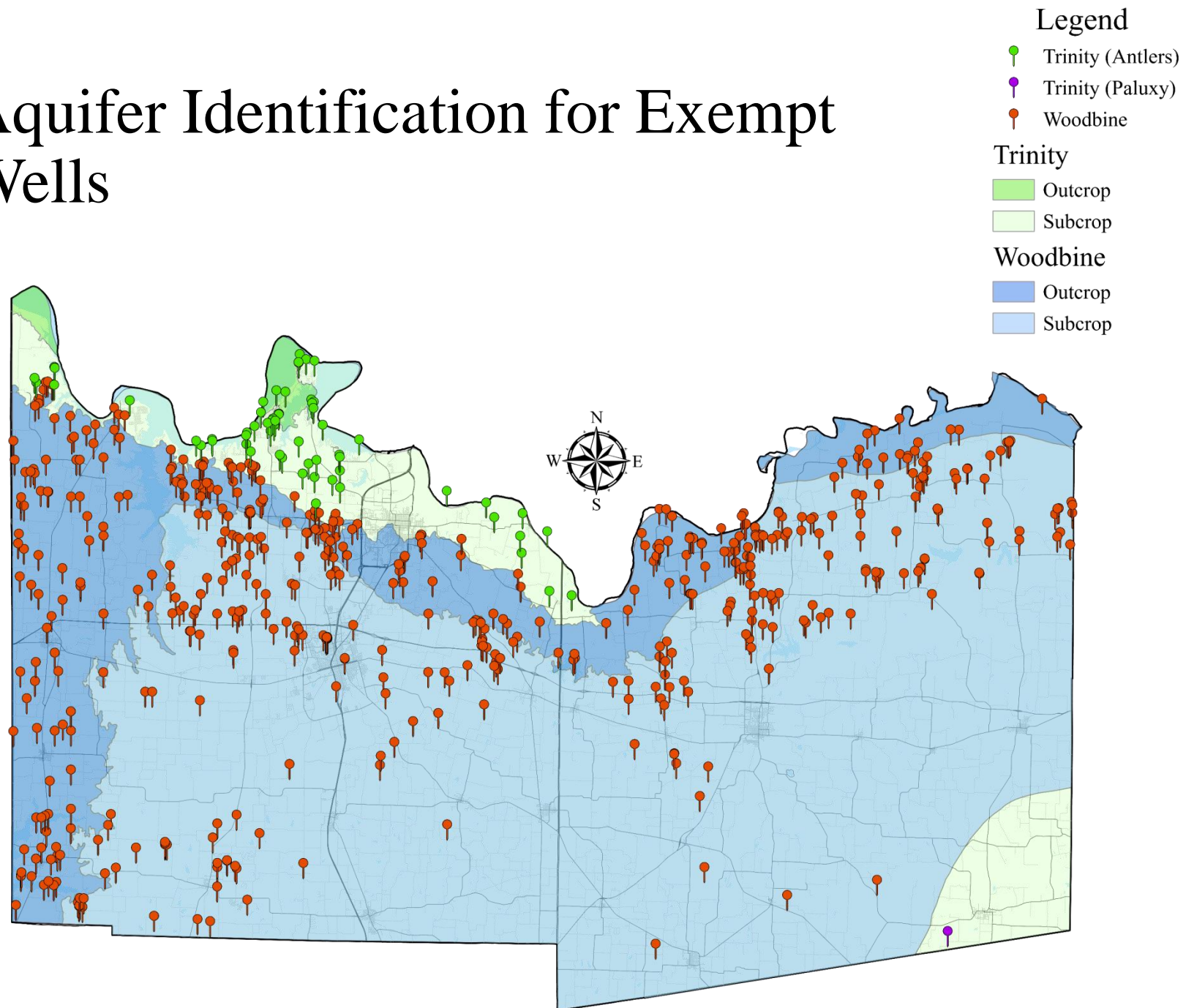
9/19/2019

# 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

<b>Use</b>	<b>Active Wells</b>	<b>Sum Of Capacity (GPM)</b>	<b>Estimated Production (Ac-ft)</b>	<b>3x Estimated Production (Ac-ft)</b>	<b>Methodology</b>
Agriculture	19	311.5	126	377	Average time pumping per day of 6 hours
Commercial	16	1,238.4	3	8	Assumed average consumption is 150 gallons per day
Domestic	414	5,959.9	70	209	Assumed average consumption is 150 gallons per day
Golf Course Irrigation	2	34.7	5	14	Average time pumping per day of 2 hours
Irrigation	5	98.0	13	40	Average time pumping per day of 2 hours
Livestock	38	678.7	274	821	Average time pumping per day of 6 hours
Oil/Gas	3	80.0	11	32	Average time pumping per day of 2 hours
Pond/Surface Impoundments	17	664.4	268	804	Average time pumping per day of 6 hours
<b>Total</b>	<b>514</b>	<b>9,066</b>	<b>768</b>	<b><u>2,305</u></b>	

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.

# Updated Non-Exempt Production

Determine the aquifer for the  
289 Non-Exempt Wells



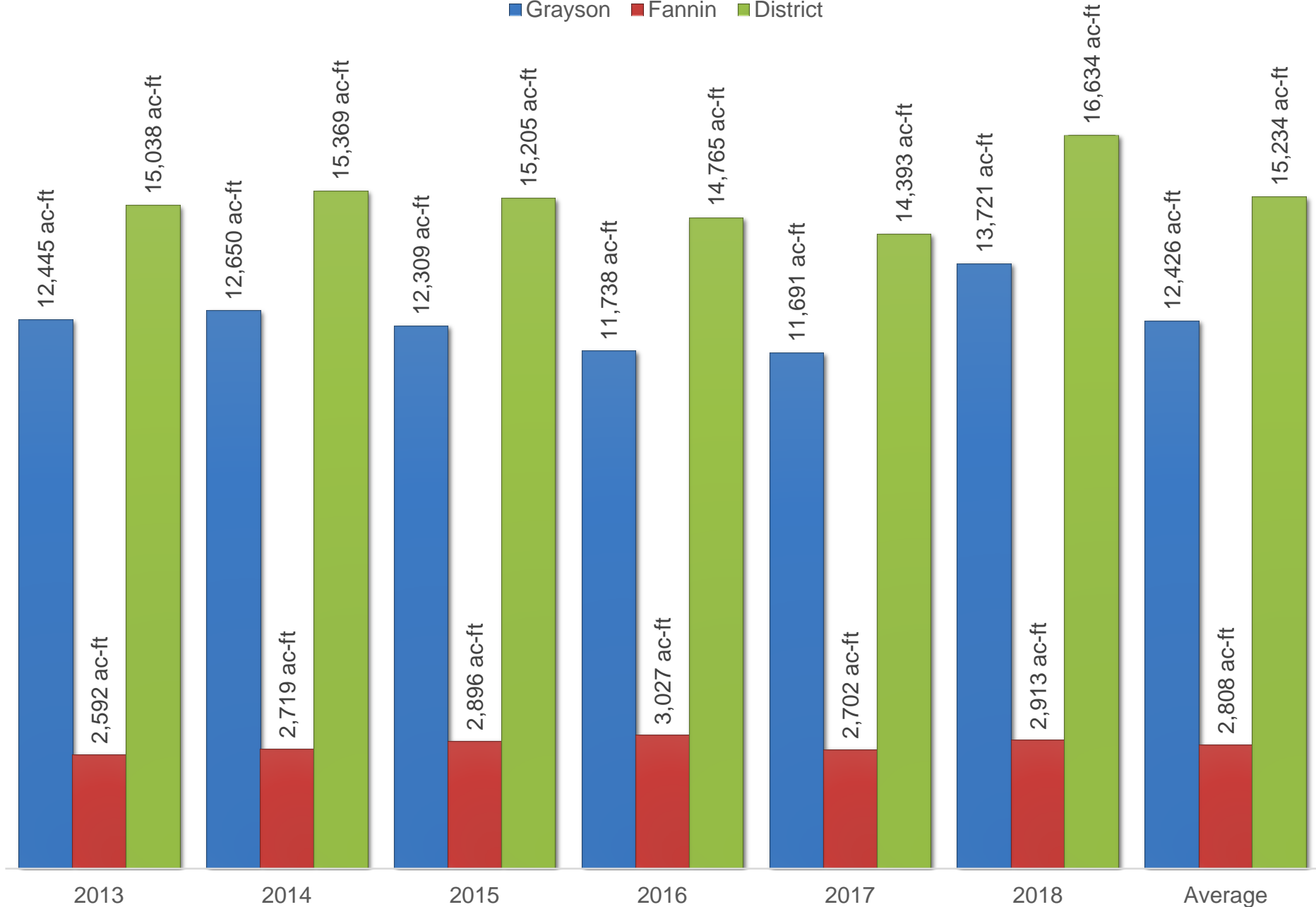
Estimate the production for  
each well



Performed QA/QC

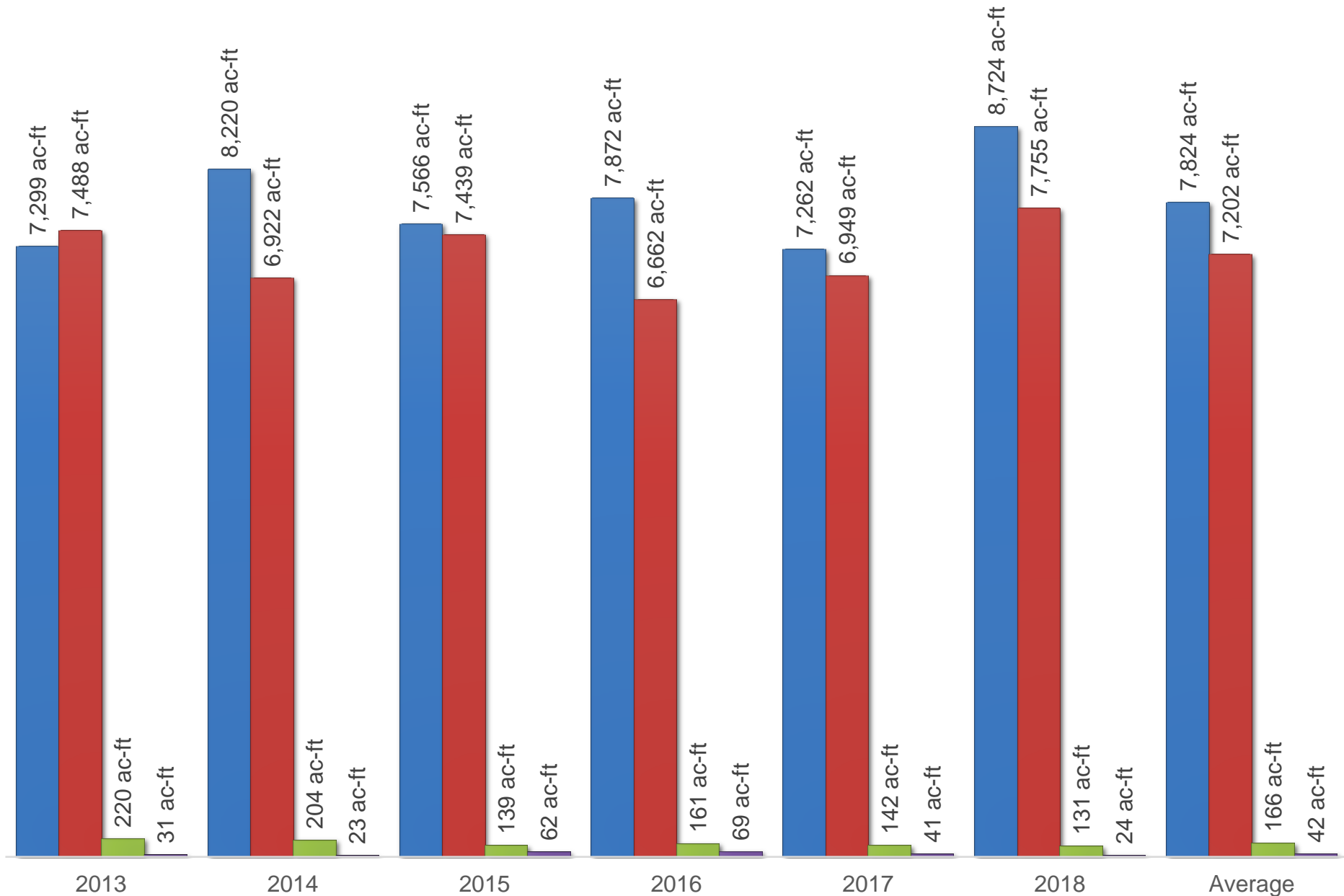
# Non-Exempt Production By County

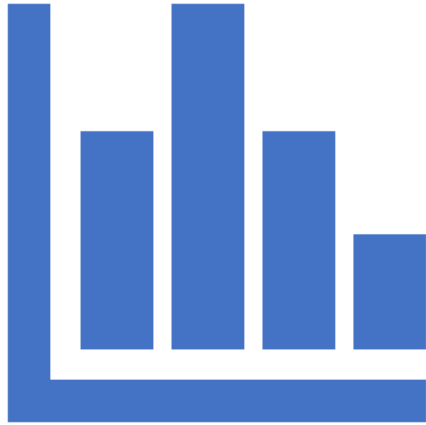
■ Grayson ■ Fannin ■ District



# Non-Exempt Production By Aquifer

■ Woodbine ■ Trinity (Antlers) ■ Washita Group ■ River Alluvial





# Comparing Updated Estimated Production



# Current Model Availability Groundwater

<b>County</b>	<b>Aquifer</b>	<b>2020</b>	<b>2030</b>	<b>2040</b>	<b>2050</b>	<b>2060</b>	<b>2070</b>
	Trinity (Antlers)	2,092	2,087	2,092	2,087	2,092	2,087
Fannin	Woodbine	4,933	4,921	4,933	4,921	4,933	4,921
	Total	7,025	7,008	7,025	7,008	7,025	7,008
	Trinity (Antlers)	10,737	10,708	10,737	10,708	10,737	10,708
Grayson	Woodbine	7,541	7,521	7,541	7,521	7,541	7,521
	Total	18,278	18,229	18,278	18,229	18,278	18,229
	Trinity (Antlers)	12,829	12,795	12,829	12,795	12,829	12,795
District	Woodbine	12,474	12,442	12,474	12,442	12,474	12,442
	Total	25,303	25,237	25,303	25,237	25,303	25,237

# Estimated Exempt Use Compared to 2016 Estimates

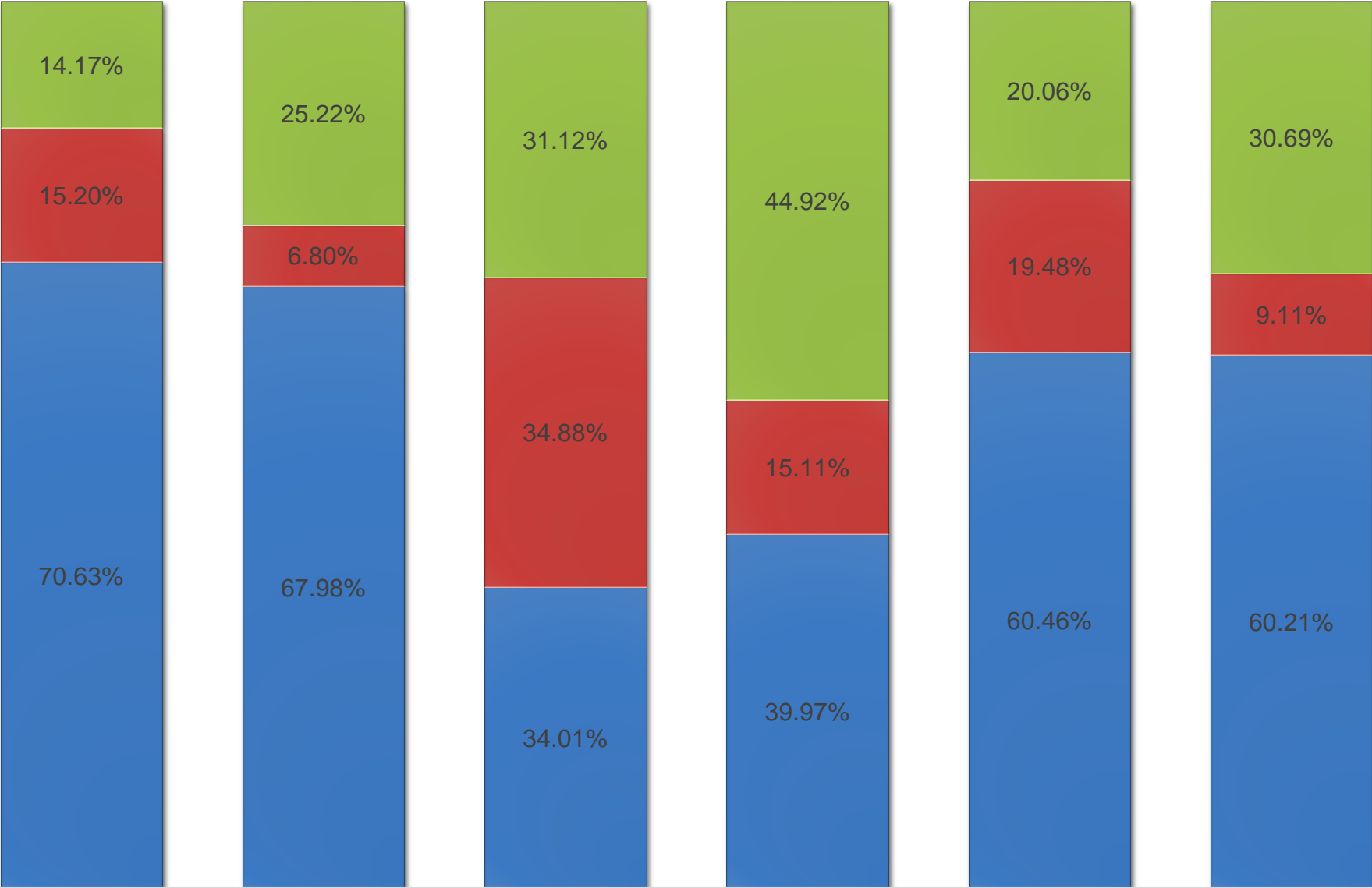
<b>County</b>	<b>Aquifer</b>	<b>2016 Estimated Exempt Use (ac-ft)</b>	<b>New Exempt Use (ac-ft)</b>	<b>Percent Different</b>
	Trinity (Antlers)	84	1	-99.81%
Fannin	Woodbine	2,066	1,061	-48.66%
	Total	2,150	1,062	-50.60%
	Trinity (Antlers)	1,245	143	-88.52%
Grayson	Woodbine	1,534	1,100	-28.29%
	Total	2,779	1,243	-55.27%
	Trinity (Antlers)	1,329	143	-89.21%
District	Woodbine	3,600	2,161	-39.98%
	Total	4,929	2,305	-53.24%

# Estimated Non-Exempt Use Compared to 2016 Estimates

<b>County</b>	<b>Aquifer</b>	<b>2016 Estimated Non-Exempt Use (ac-ft)</b>	<b>New Non-Exempt Use (ac-ft)</b>	<b>Percent Different</b>
Fannin	Trinity (Antlers)	96	261	172.00%
	Woodbine	2,293	2,529	10.27%
	Total	2,389	2,790	16.77%
Grayson	Trinity (Antlers)	7,442	6,941	-6.73%
	Woodbine	5,467	5,295	-3.14%
	Total	12,909	12,237	-5.21%
District	Trinity (Antlers)	7,538	7,202	-4.45%
	Woodbine	7,760	7,824	0.82%
	Total	15,298	15,026	-1.78%

# Production Compared to 2020 MAG by County

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



Grayson  
2016 Estimates

Grayson  
Average Production

Fannin  
2016 Estimates

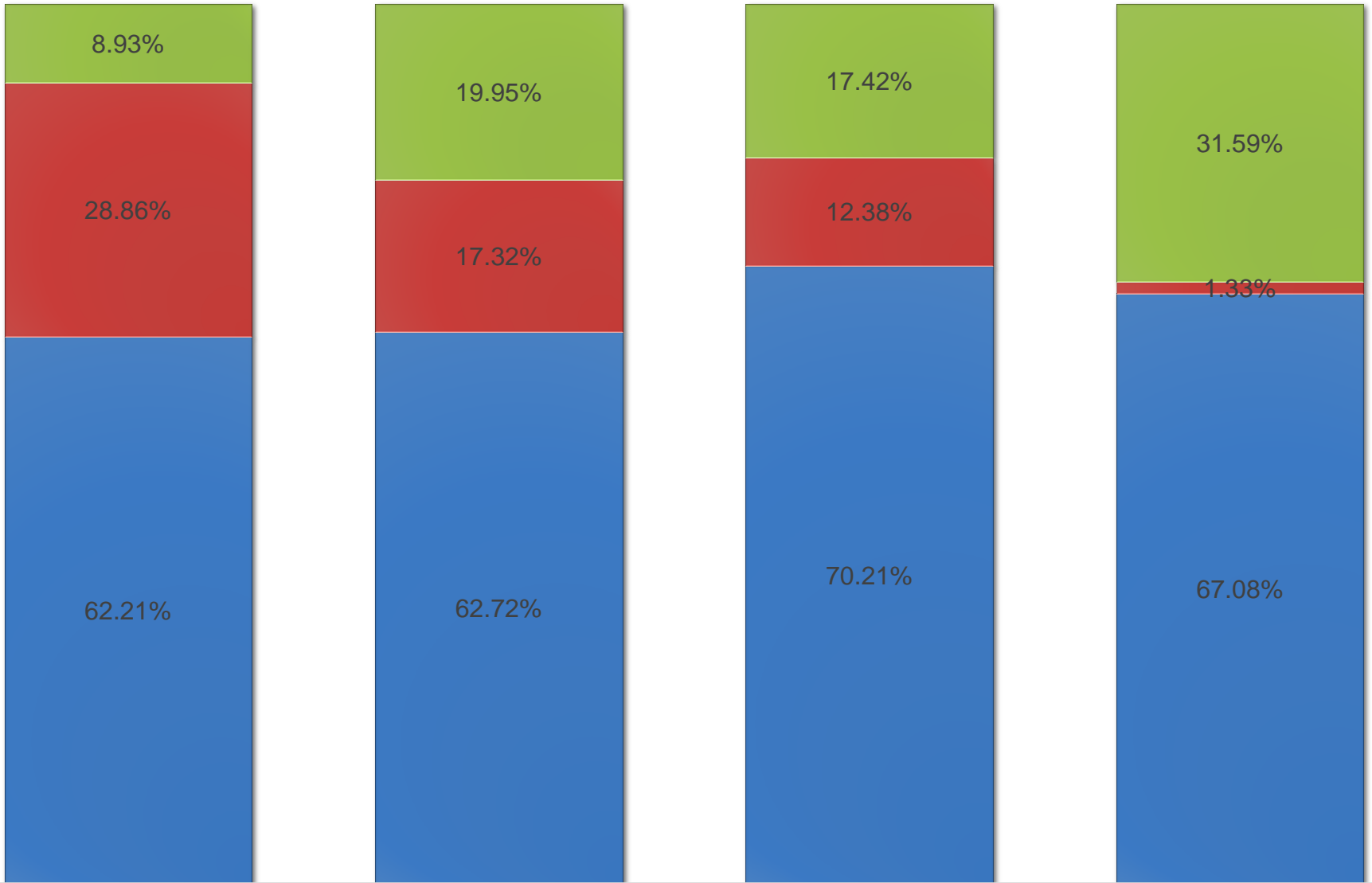
Fannin  
Average Production

District  
2016 Estimates

District  
Average Production

# Production Compared to 2020 MAG by Aquifer

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



Woodbine  
2016 Estimates

Woodbine  
Average Production

Trinity (Antlers)  
2016 Estimates

Trinity (Antlers)  
Average Production

# DFC Committee and Staff Recommendation

No change to the MAG

# Estimated Production vs. Average MAG

<b>County</b>	<b>Aquifer</b>	<b>New Total Production (ac-ft)</b>	<b>Average MAG (ac-ft)</b>	<b>Percent Increase</b>
Fannin	Trinity (Antlers)	262	2,090	697.15%
	Woodbine	3,590	4,927	37.26%
	Total	3,852	7,017	82.17%
Grayson	Trinity (Antlers)	7,084	10,723	51.36%
	Woodbine	6,395	7,531	17.76%
	Total	13,480	18,254	35.42%
District	Trinity (Antlers)	7,346	12,812	74.40%
	Woodbine	9,985	12,458	24.77%
	Total	17,331	25,270	45.81%

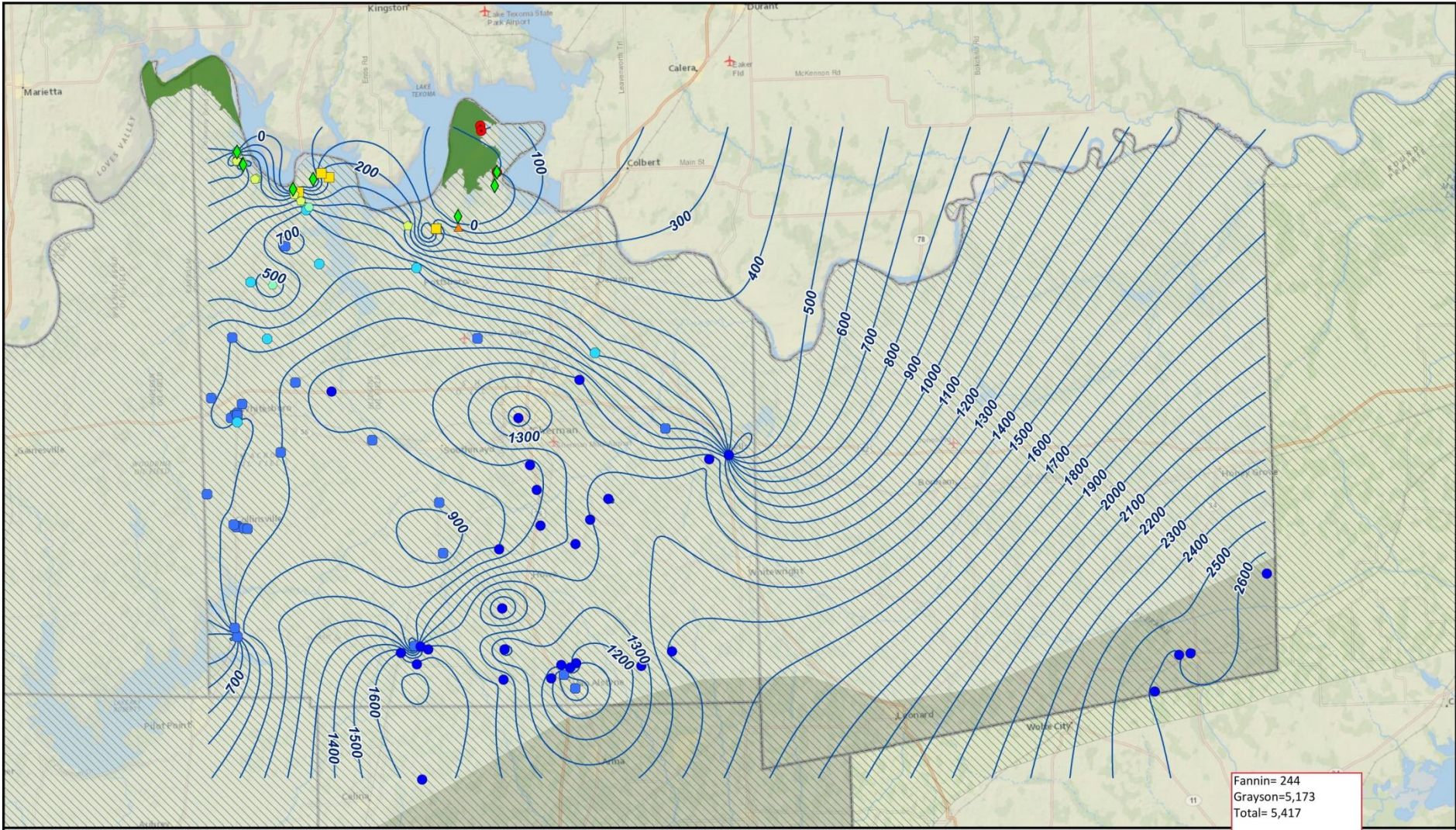


Questions





# Extra Slides



Fannin=244  
 Grayson=5,173  
 Total=5,417

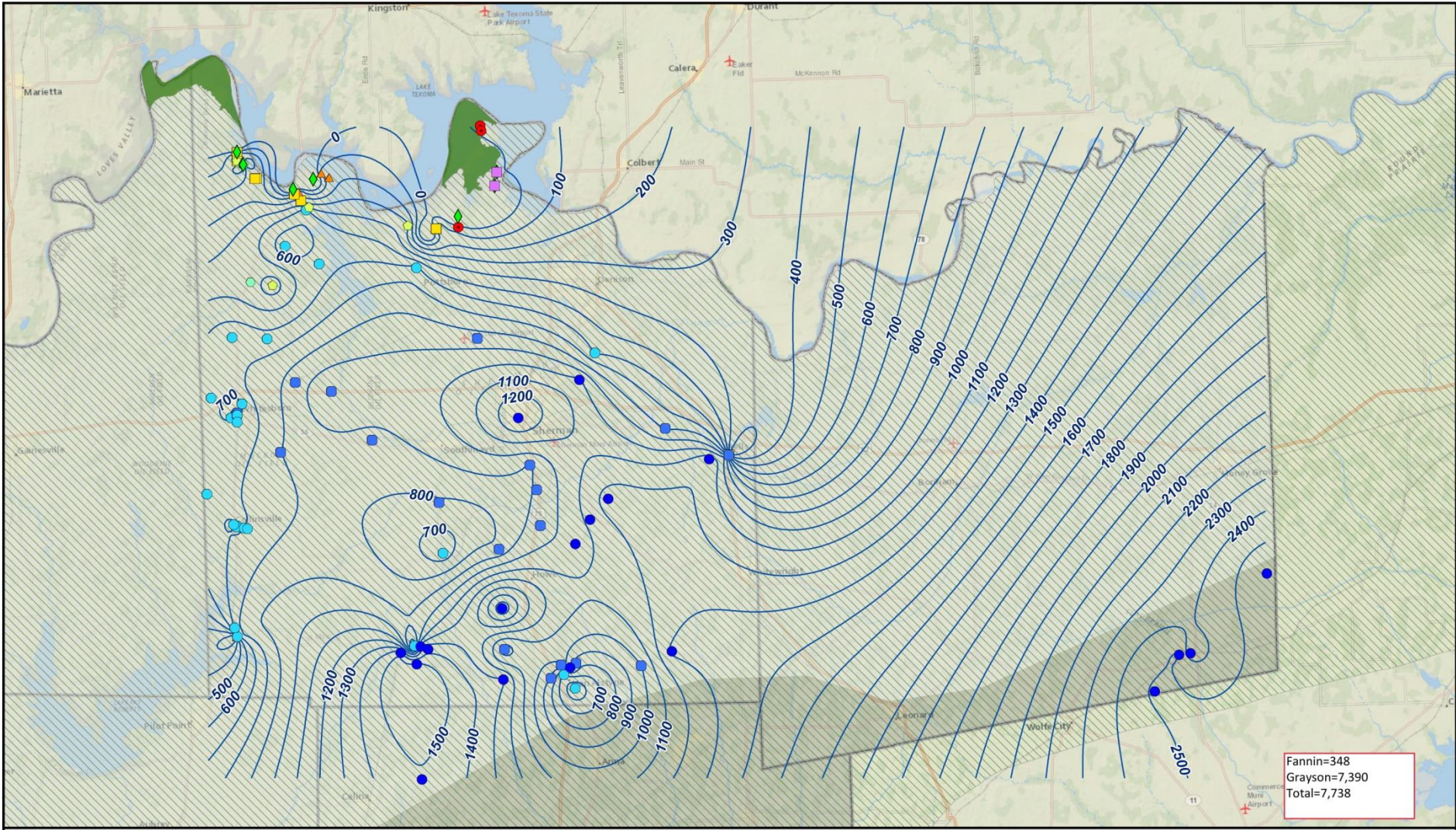


- Available Drawdown (ft)
- Dry Well
- ◆ Below Pinch Point
- Strat Region 1
- Strat Region 2
- Available Drawdown (ft)**
- 1 - 100
- ▲ 101 - 200
- 201 - 300
- 301 - 400
- 401 - 500
- 501 - 750
- 751 - 1,000
- 1000 >



**2070 Available Drawdown Map**  
**Trinity - Antlers**  
 Fannin and Grayson Counties  
 NTWGAM Run 6.1 (0.7 x 2010 Pumping)

Explanation  
 Available drawdown calculated as the difference between water level and the lowest estimated pump setting.  
 For multi-aquifer wells, the Run 5 water level for each aquifer was averaged to obtain a single water level value.

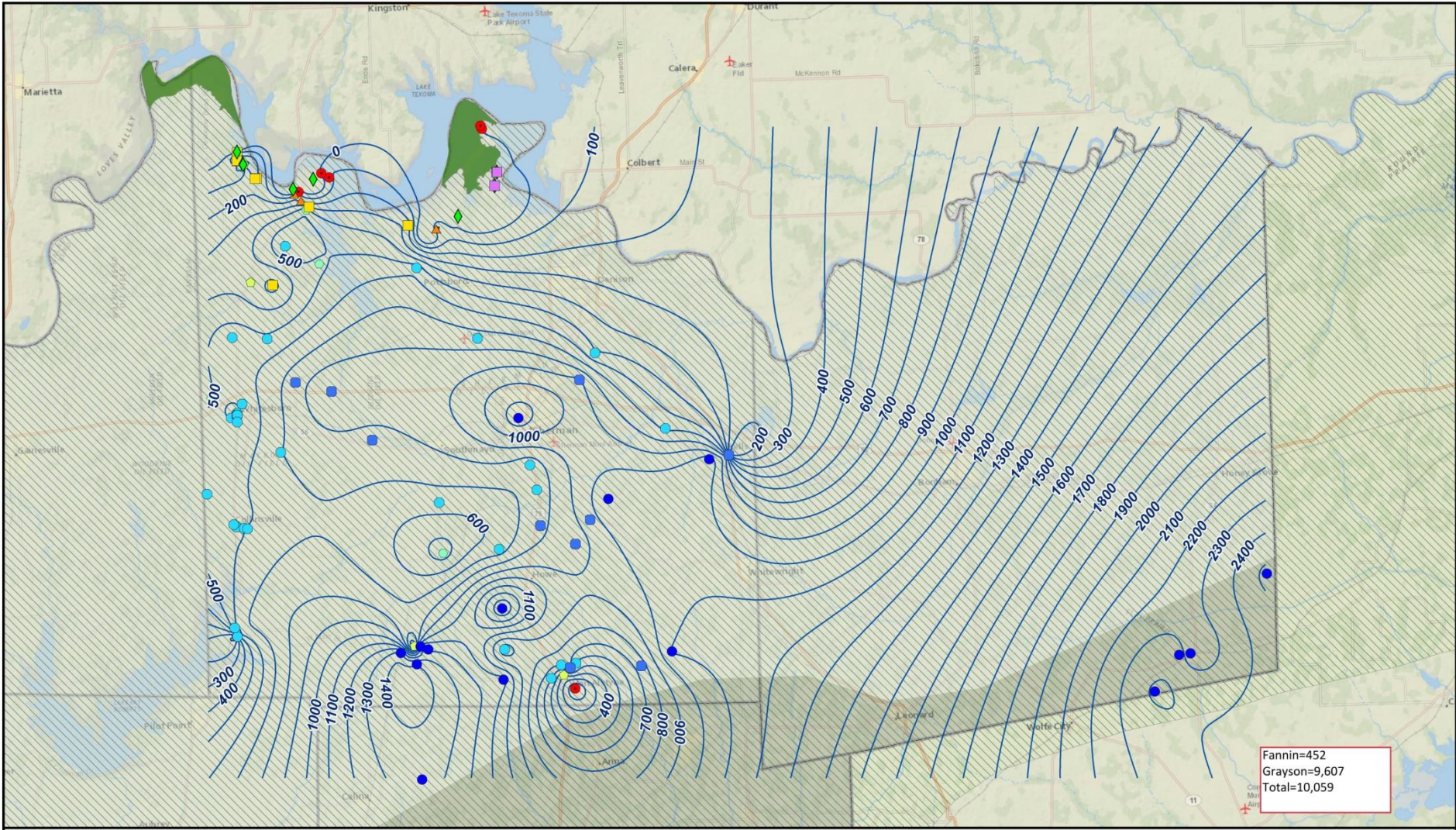


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**2070 Available Drawdown Map**  
**Trinity - Antlers**  
 Fannin and Grayson Counties  
 NTWGAM Run 5 (1.0 x 2010 Pumping)

Explanation  
 Available drawdown calculated as the difference between water level and the lowest estimated pump setting.  
 For multi-aquifer wells, the Run 5 water level for each aquifer was averaged to obtain a single water level value.



Fannin=452  
 Grayson=9,607  
 Total=10,059

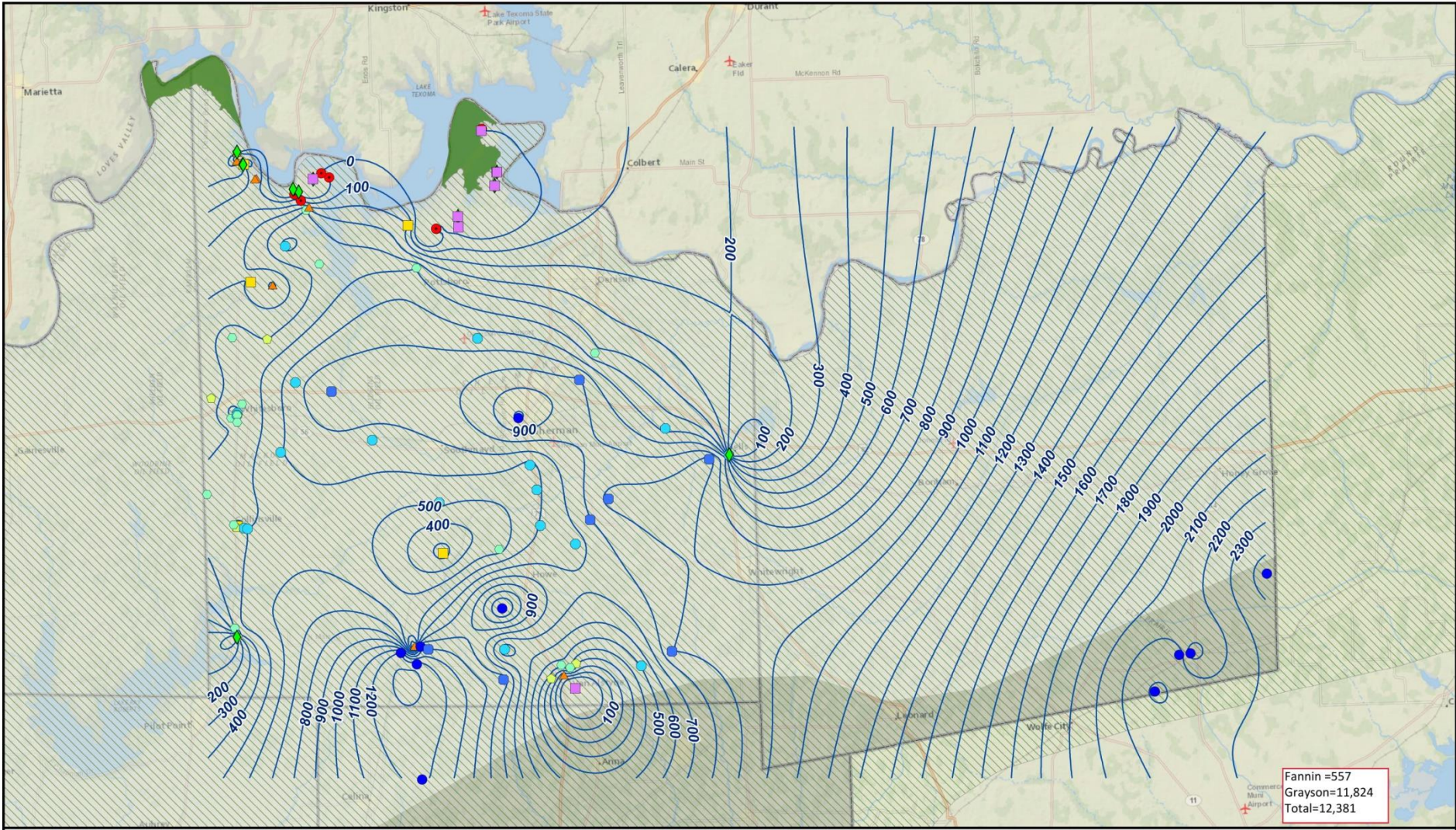


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- 1000 >



**2070 Available Drawdown Map**  
**Trinity - Antlers**  
 Fannin and Grayson Counties  
 NTWGAM Run 6.2 (1.3 x 2010 Pumping)

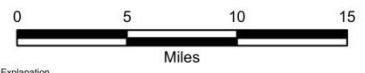
Explanation  
 Available drawdown calculated as the difference between water level and the lowest estimated pump setting.  
 For multi-aquifer wells, the Run 5 water level for each aquifer was averaged to obtain a single water level value.



Fannin = 557  
 Grayson = 11,824  
 Total = 12,381



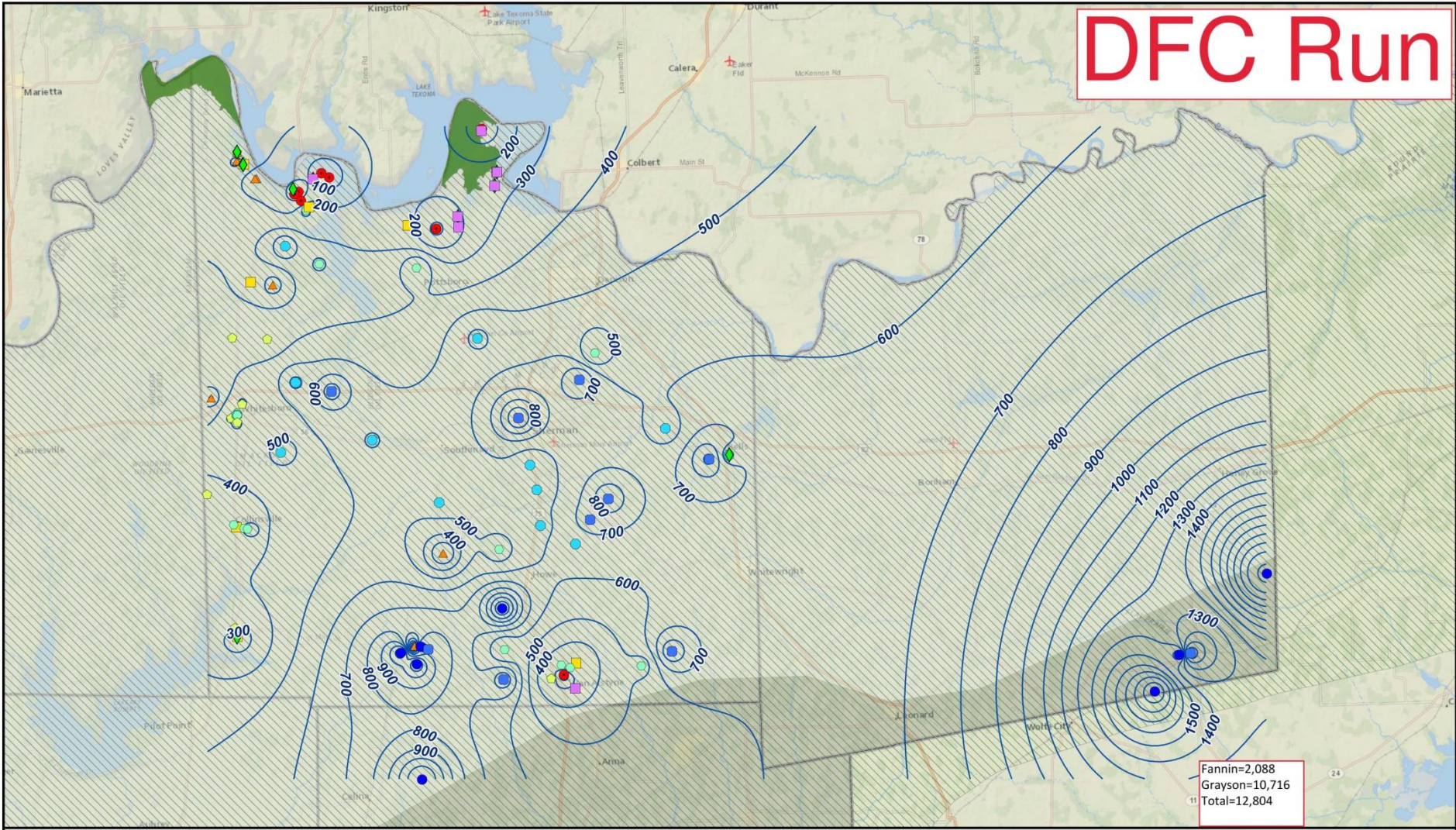
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- 1000 >



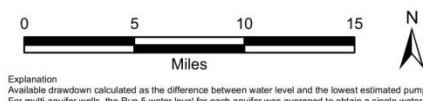
**2070 Available Drawdown Map**  
**Trinity - Antlers**  
 Fannin and Grayson Counties  
 NTWGAM Run 6.3 (1.6 x 2010 Pumping)

Explanation  
 Available drawdown calculated as the difference between water level and the lowest estimated pump setting.  
 For multi-aquifer wells, the Run 5 water level for each aquifer was averaged to obtain a single water level value.

# DFC Run

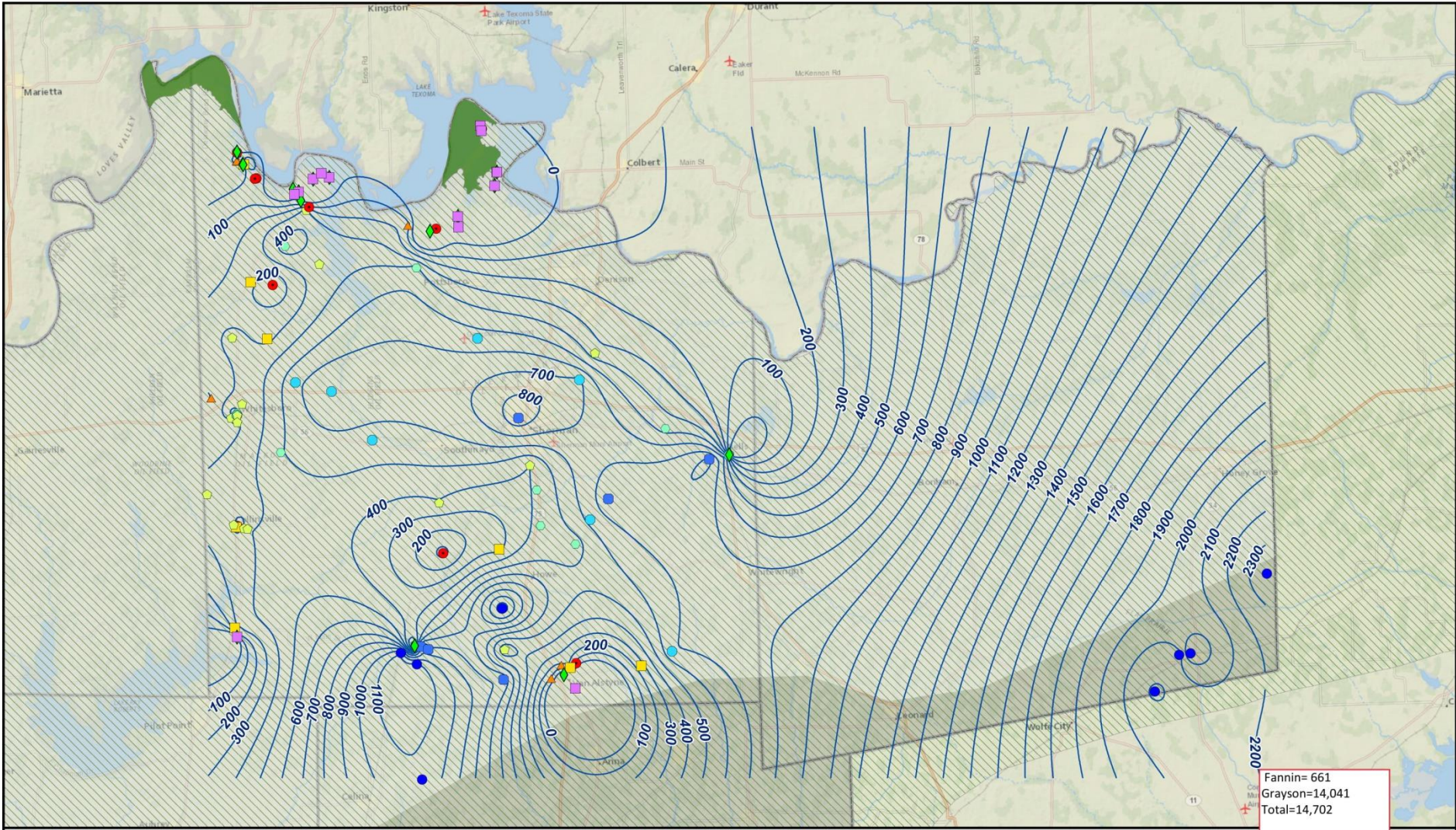


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- 1000 >



**2070 Available Drawdown Map**  
**Trinity - Antlers**  
 Fannin and Grayson Counties  
 NTWGAM Run 10

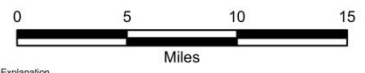
Explanation  
 Available drawdown calculated as the difference between water level and the lowest estimated pump setting.  
 For multi-aquifer wells, the Run 5 water level for each aquifer was averaged to obtain a single water level value.



Fannin= 661  
 Grayson=14,041  
 Total=14,702

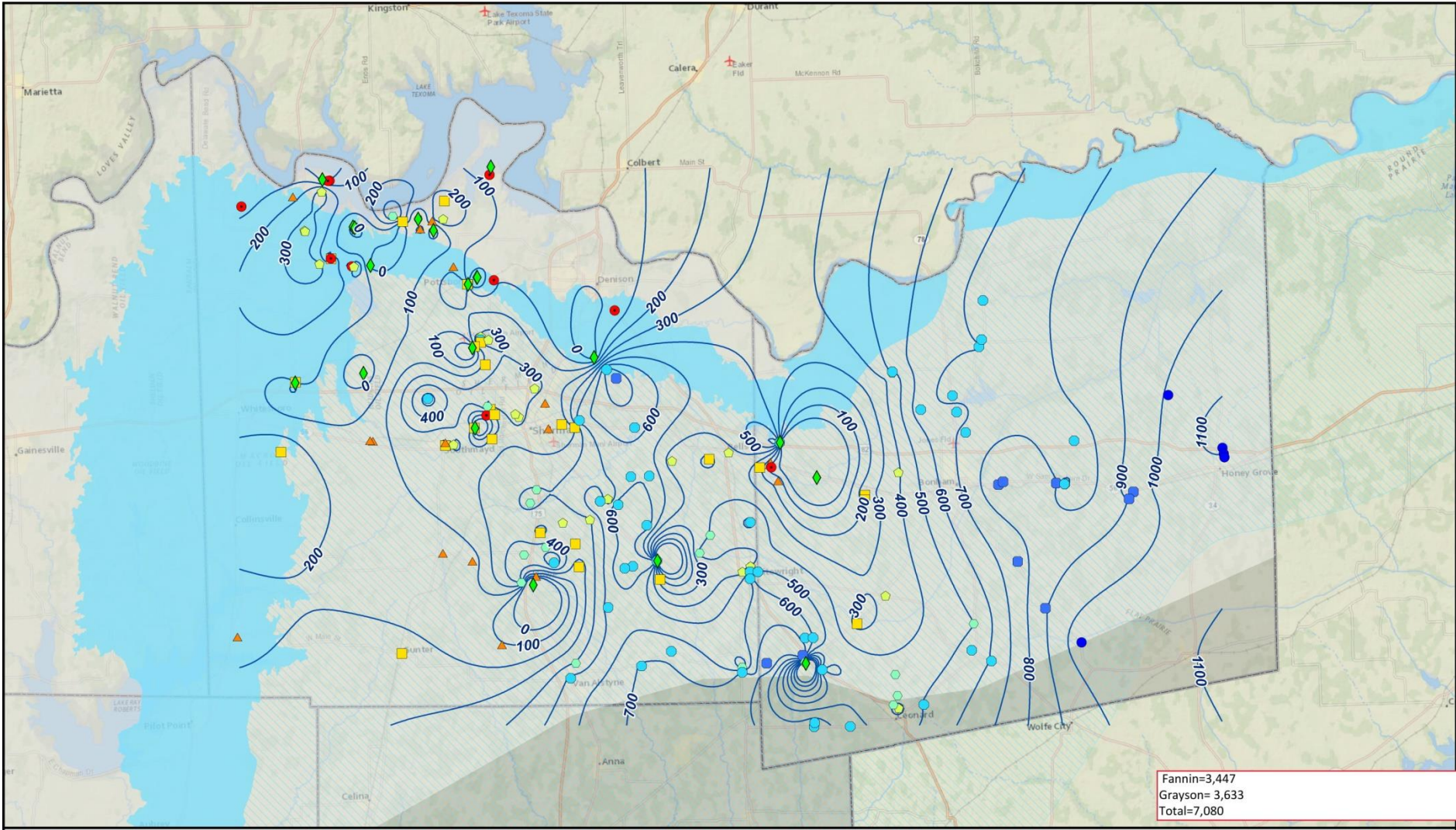


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**2070 Available Drawdown Map**  
**Trinity - Antlers**  
 Fannin and Grayson Counties  
 NTWGAM Run 6.4 (1.9 x 2010 Pumping)

Explanation  
 Available drawdown calculated as the difference between water level and the lowest estimated pump setting.  
 For multi-aquifer wells, the Run 5 water level for each aquifer was averaged to obtain a single water level value.



Fannin=3,447  
 Grayson= 3,633  
 Total=7,080

<ul style="list-style-type: none"> <li><span style="color: blue;">—</span> Available Drawdown (ft)</li> <li><span style="color: purple;">■</span> Dry Well</li> <li><span style="color: green;">◆</span> Below Pinch Point</li> </ul>	<ul style="list-style-type: none"> <li><span style="background-color: #e0e0e0; border: 1px solid black; width: 20px; height: 10px; display: inline-block;"></span> Strat Region 1</li> <li><span style="background-color: #a0a0a0; border: 1px solid black; width: 20px; height: 10px; display: inline-block;"></span> Strat Region 2</li> </ul>	<p><b>Available Drawdown (ft)</b></p> <ul style="list-style-type: none"> <li><span style="color: red;">●</span> 1 - 100</li> <li><span style="color: orange;">▲</span> 101 - 200</li> </ul>	<ul style="list-style-type: none"> <li><span style="background-color: yellow; border: 1px solid black; width: 10px; height: 10px; display: inline-block;"></span> 201 - 300</li> <li><span style="background-color: #90ee90; border: 1px solid black; width: 10px; height: 10px; display: inline-block;"></span> 301 - 400</li> <li><span style="background-color: #90ee90; border: 1px solid black; width: 10px; height: 10px; display: inline-block;"></span> 401 - 500</li> </ul>	<ul style="list-style-type: none"> <li><span style="background-color: #add8e6; border: 1px solid black; width: 10px; height: 10px; display: inline-block;"></span> 501 - 750</li> <li><span style="background-color: #4169e1; border: 1px solid black; width: 10px; height: 10px; display: inline-block;"></span> 751 - 1,000</li> <li><span style="background-color: #0000cd; border: 1px solid black; width: 10px; height: 10px; display: inline-block;"></span> 1000 &gt;</li> </ul>
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0      5      10      15

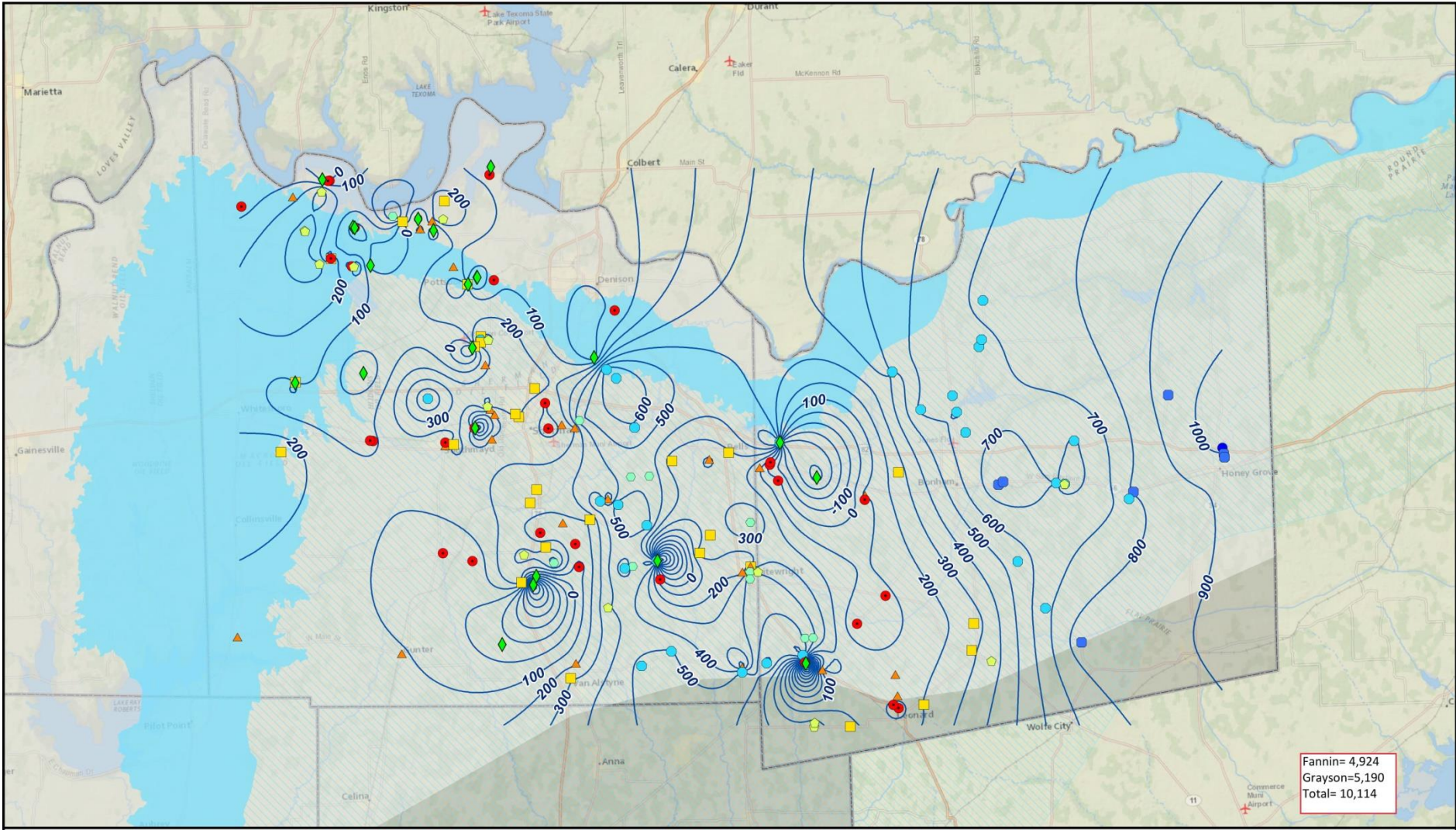
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**2070 Available Drawdown Map**  
**Woodbine**  
 Fannin and Grayson Counties  
 NTWGAM Run 6.1 (0.7 x 2010 Pumping)

Explanation  
 Available drawdown calculated as the difference between water level and the lowest estimated pump setting.  
 For multi-aquifer wells, the Run 5 water level for each aquifer was averaged to obtain a single water level value.





Fannin= 4,924  
 Grayson=5,190  
 Total= 10,114



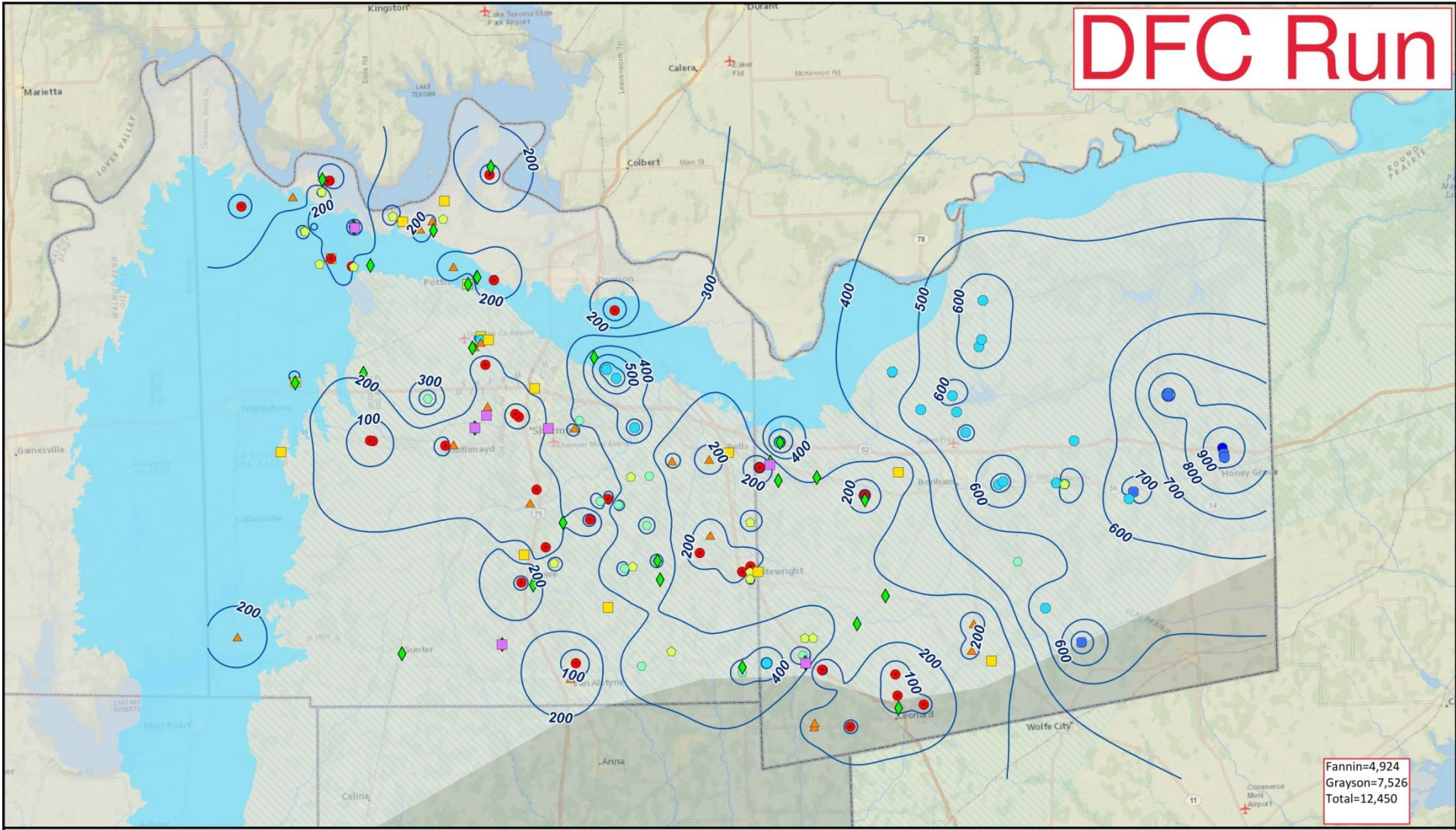
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**2070 Available Drawdown Map**  
**Woodbine**  
 Fannin and Grayson Counties  
 NTWGAM Run 5 (1.0 x 2010 Pumping)

Explanation  
 Available drawdown calculated as the difference between water level and the lowest estimated pump setting.  
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# DFC Run



Fannin=4,924  
 Grayson=7,526  
 Total=12,450

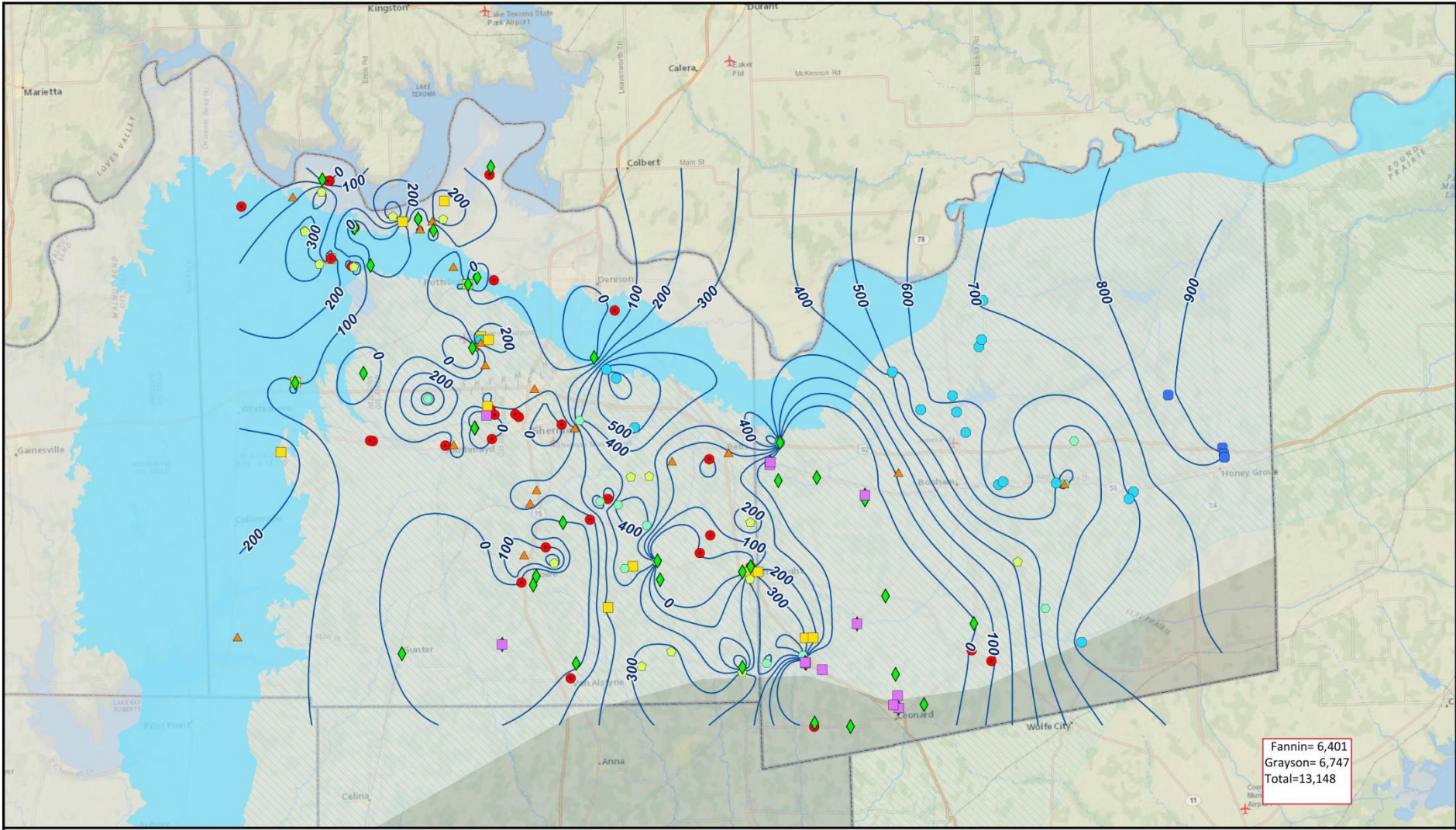


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**2070 Available Drawdown Map**  
**Woodbine**  
 Fannin and Grayson Counties  
 NTWGAM Run 10

Explanation  
 Available drawdown calculated as the difference between water level and the lowest estimated pump setting.  
 For multi-aquifer wells, the Run 5 water level for each aquifer was averaged to obtain a single water level value.



Fannin= 6,401  
 Grayson= 6,747  
 Total=13,148

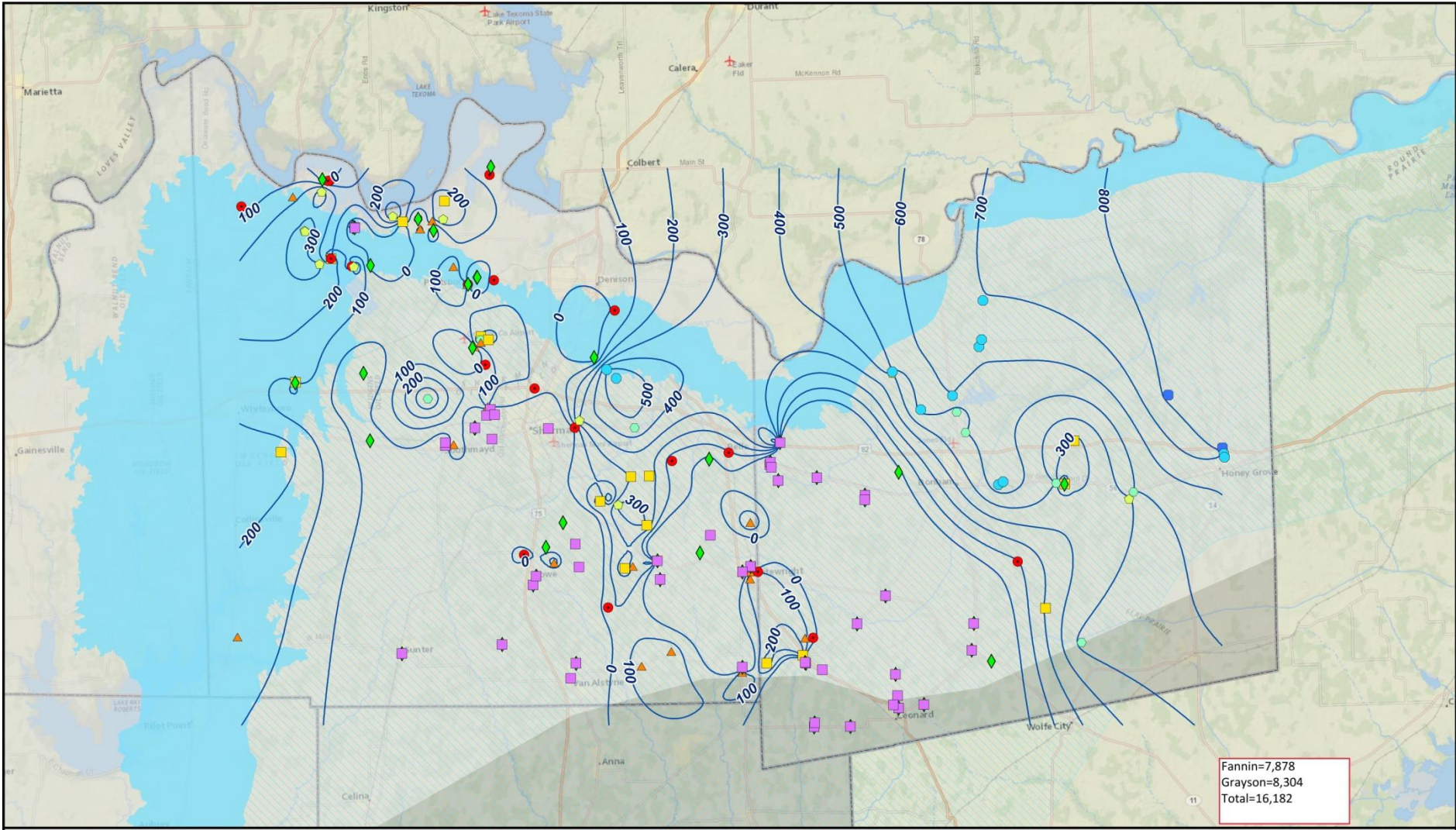


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**2070 Available Drawdown Map**  
**Woodbine**  
 Fannin and Grayson Counties  
 NTWGAM Run 6.2 (1.3 x 2010 Pumping)

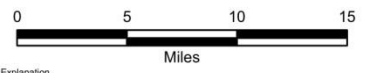
Explanation  
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Fannin=7,878  
 Grayson=8,304  
 Total=16,182

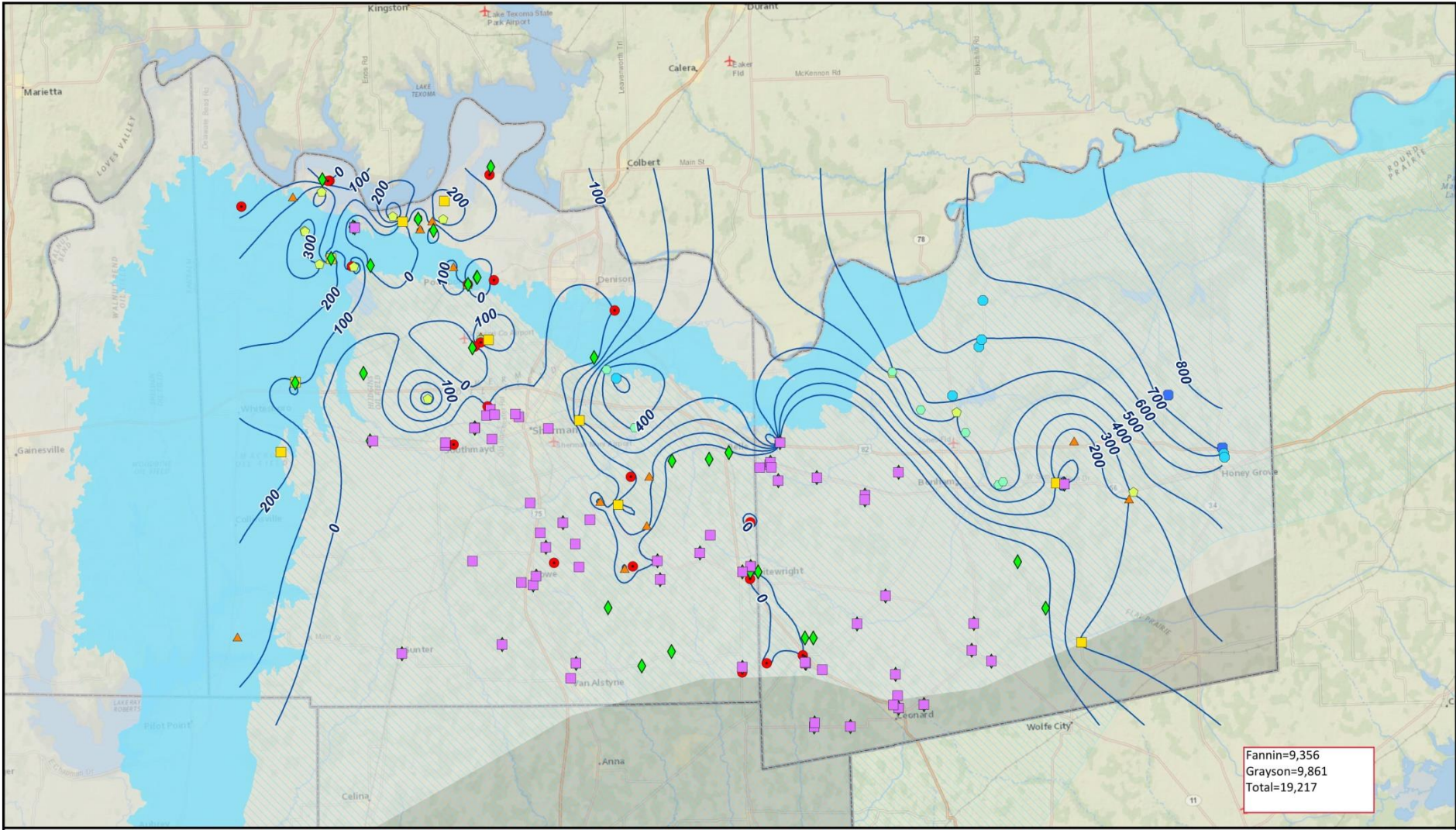


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**2070 Available Drawdown Map**  
**Woodbine**  
 Fannin and Grayson Counties  
 NTWGAM Run 6.3 (1.6 x 2010 Pumping)

Explanation  
 Available drawdown calculated as the difference between water level and the lowest estimated pump setting.  
 For multi-aquifer wells, the Run 5 water level for each aquifer was averaged to obtain a single water level value.



Fannin=9,356  
 Grayson=9,861  
 Total=19,217



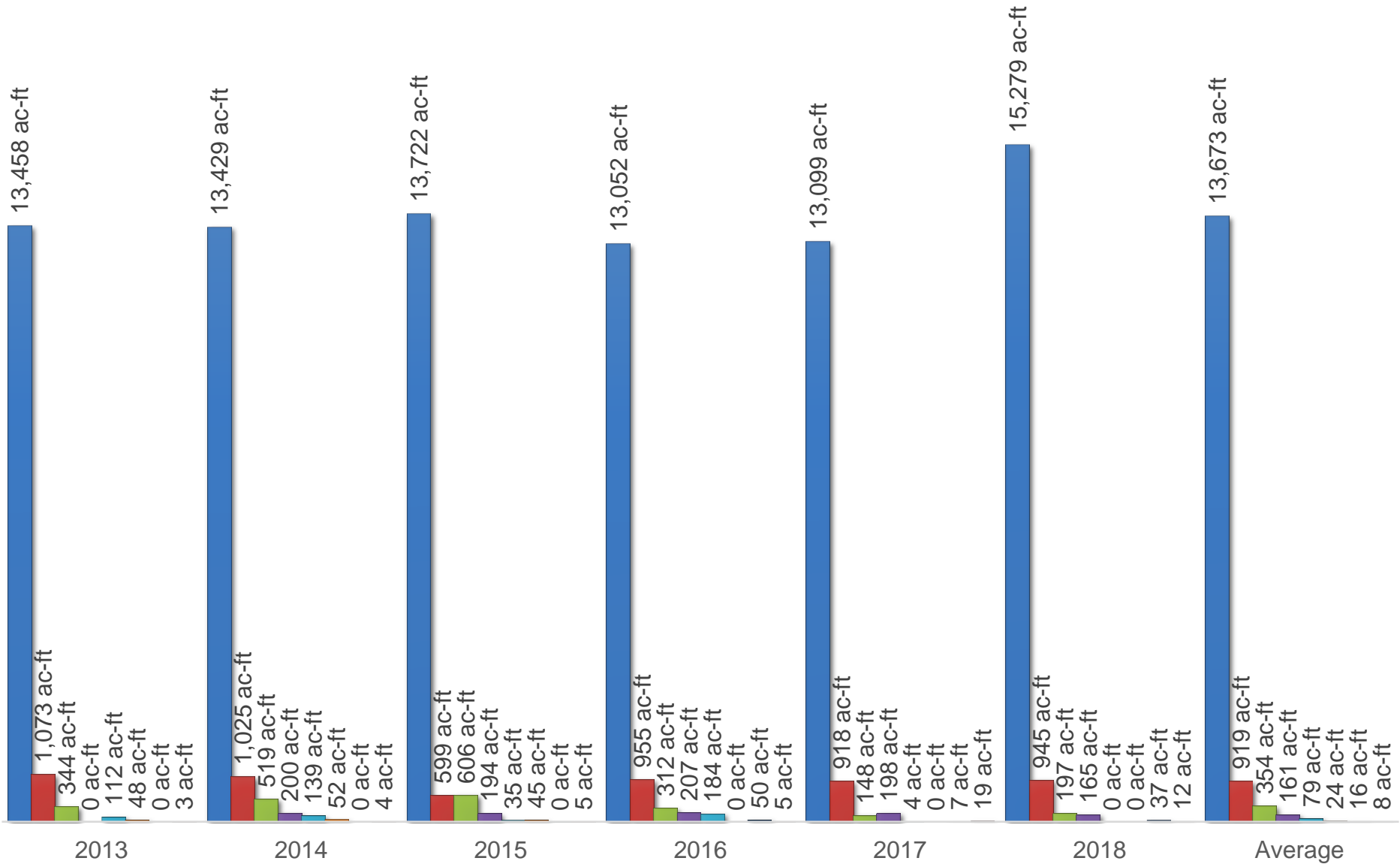
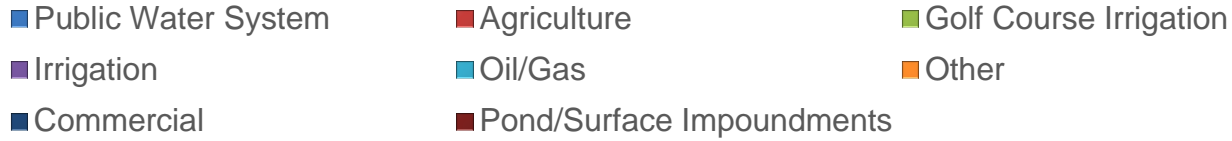
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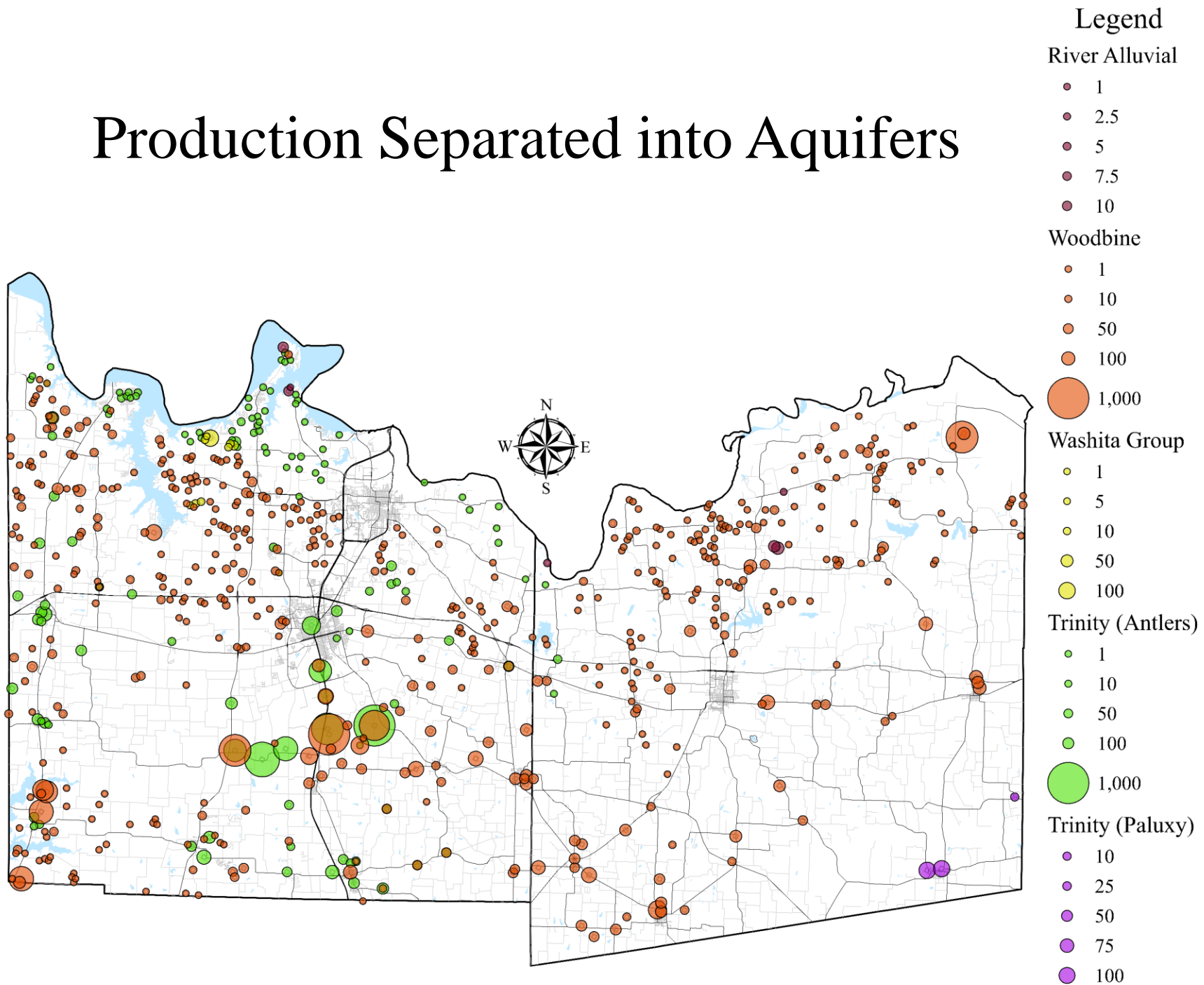
**2070 Available Drawdown Map**  
**Woodbine**  
 Fannin and Grayson Counties  
 NTWGAM Run 6.4 (1.9 x 2010 Pumping)

Explanation  
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# Non-Exempt Production By Use

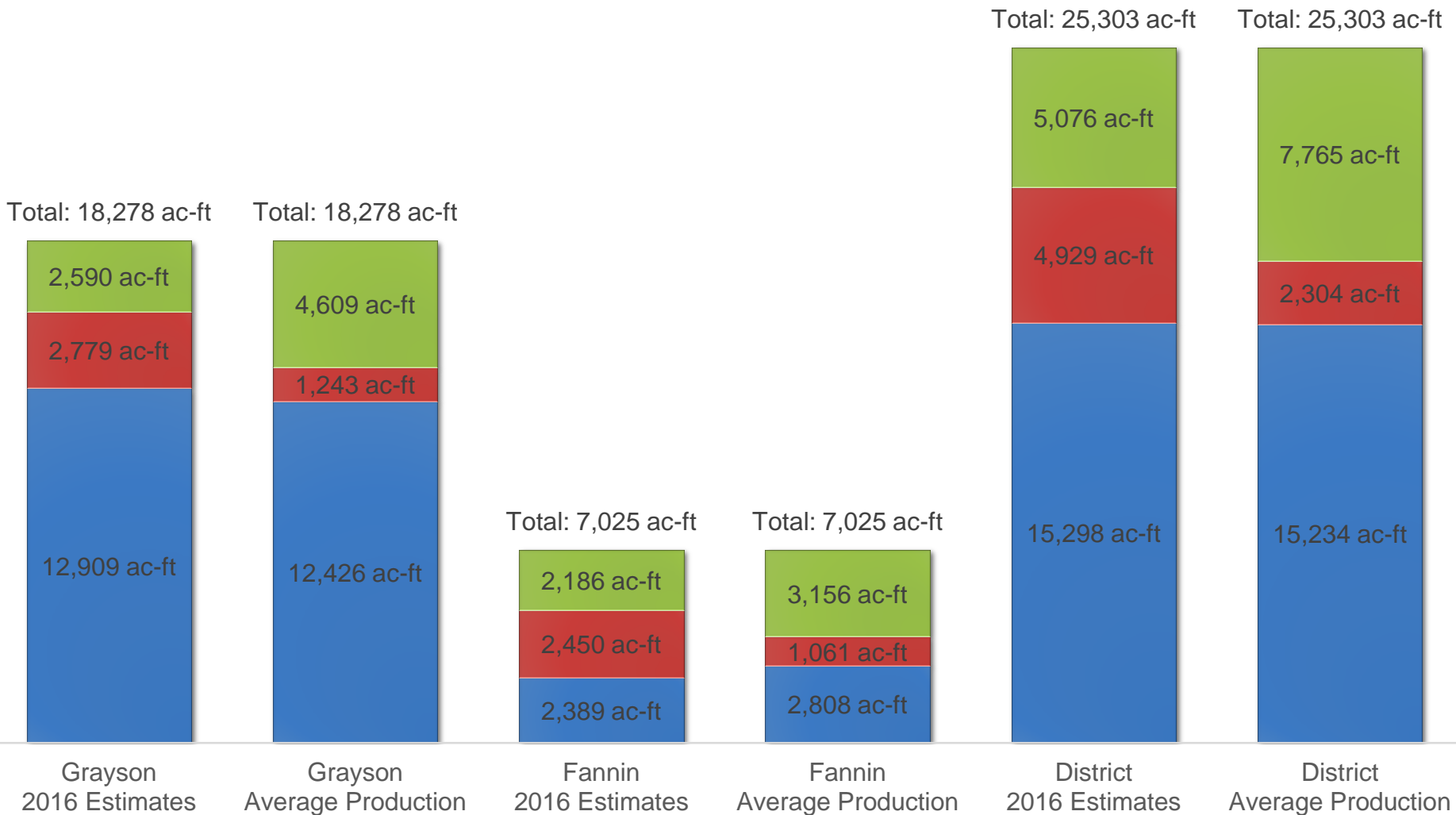


# Production Separated into Aquifers



# 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

