

# *GMA 12*

## ▣ Preliminary Results and Discussion of Yegua-Jackson and QC/Sparta/C-W Modeling Results

by

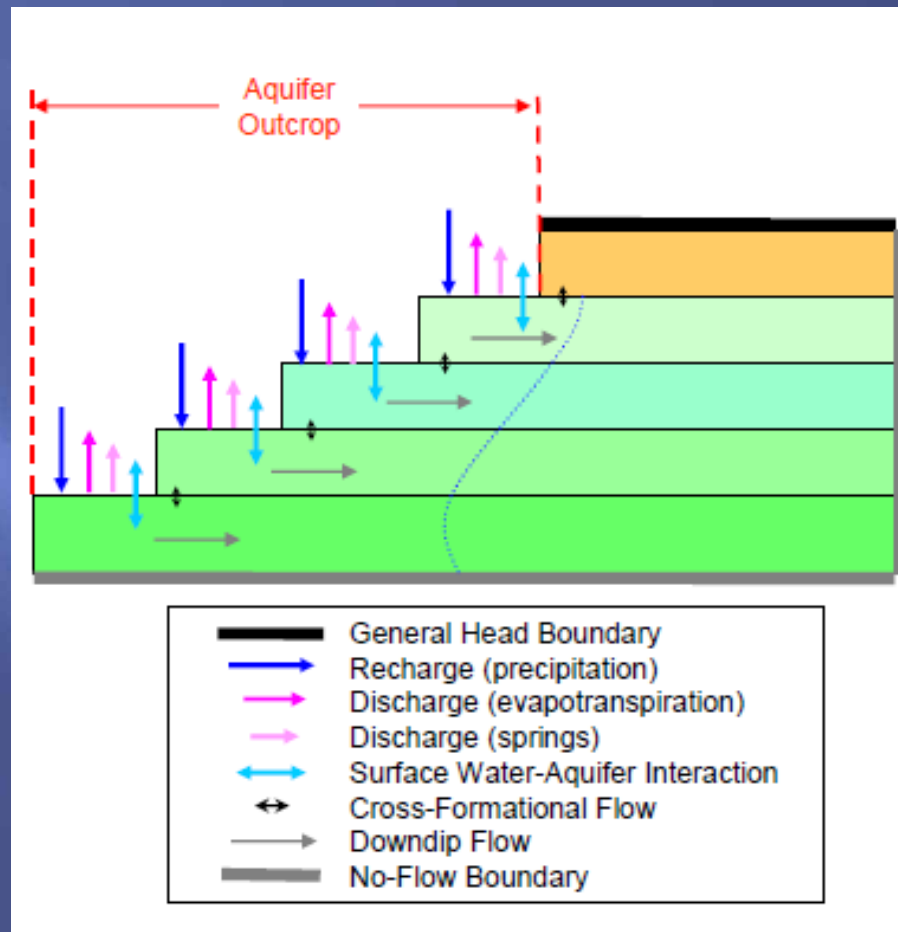
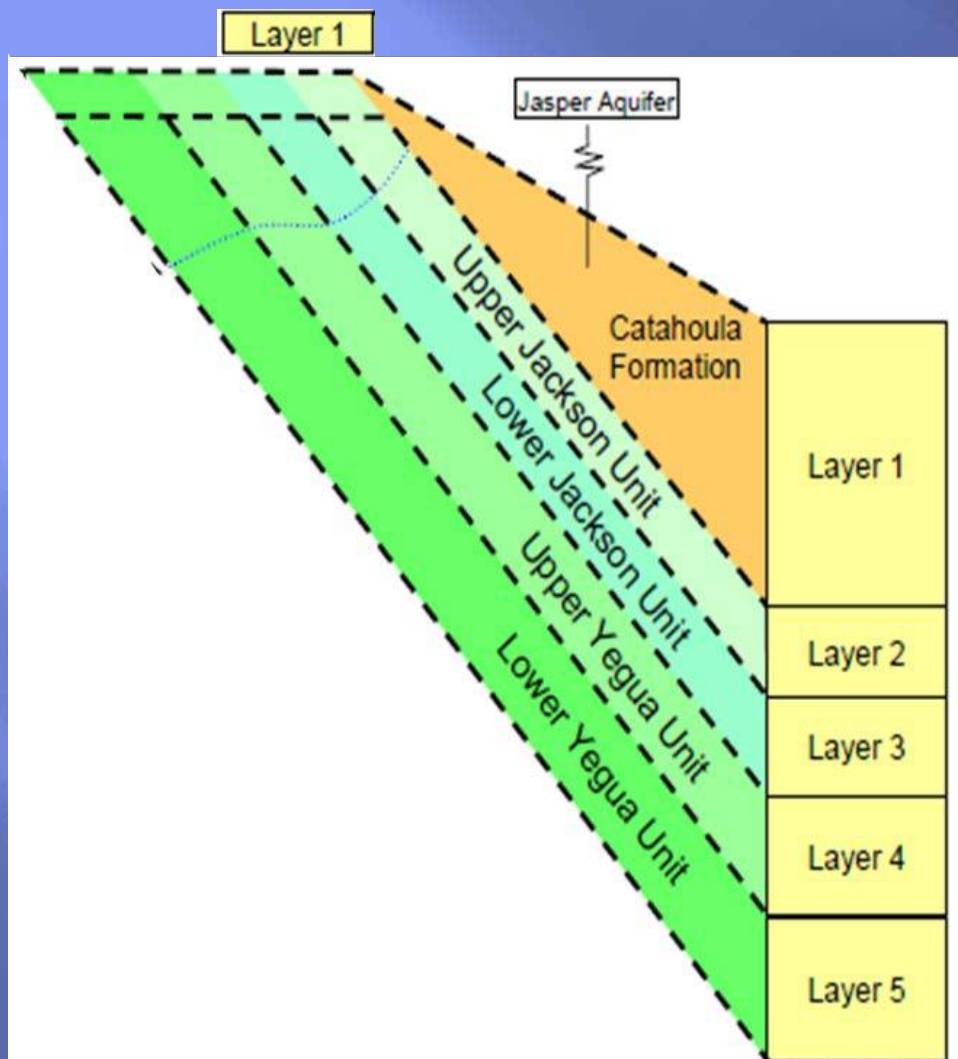
*GMA 12 Consultant Team*

*January 29, 2020*

# Outline

- ▣ Revised Yegua-Jackson Simulations (#11)
- ▣ Sensitivity analysis on PS-7 and PS-9 Simulations (#12, #13)

# Yegua-Jackson GAM



# Yegua-Jackson DFC Run (YJ-PS1)

**TABLE 10**      **MODELED AVAILABLE GROUNDWATER FOR THE YEGUA-JACKSON AQUIFER IN GROUNDWATER MANAGEMENT AREA 12**  
**SUMMARIZED BY GROUNDWATER CONSERVATION DISTRICT (GCD) AND COUNTY FOR EACH DECADE BETWEEN 2010 AND**  
**2069. VALUES ARE IN ACRE-FEET PER YEAR.**

| Groundwater Conservation District           | County                     | Aquifer              | 2010          | 2020          | 2030          | 2040          | 2050          | 2060          | 2069          |
|---------------------------------------------|----------------------------|----------------------|---------------|---------------|---------------|---------------|---------------|---------------|---------------|
| Brazos Valley GCD                           | Brazos                     | Jackson              | 4,411         | 4,404         | 4,402         | 4,402         | 4,402         | 4,402         | 4,402         |
| Brazos Valley GCD                           | Brazos                     | Yegua                | 2,452         | 2,452         | 2,452         | 2,452         | 2,452         | 2,452         | 2,452         |
| <b>Brazos Valley GCD Total<sup>1</sup></b>  |                            | <b>Yegua-Jackson</b> | <b>6,863</b>  | <b>6,856</b>  | <b>6,854</b>  | <b>6,854</b>  | <b>6,854</b>  | <b>6,854</b>  | <b>6,854</b>  |
| <b>Fayette County GCD<sup>1</sup></b>       | <b>Fayette<sup>3</sup></b> | <b>Yegua-Jackson</b> | <b>9,262</b>  | <b>9,262</b>  | <b>9,262</b>  | <b>9,262</b>  | <b>9,262</b>  | <b>9,261</b>  | <b>9,261</b>  |
| Lost Pines GCD <sup>2</sup>                 | Bastrop                    | Yegua-Jackson        | NR            | NR            | NR            | NR            | NR            | NR            | NR            |
| Lost Pines GCD <sup>2</sup>                 | Lee                        | Yegua-Jackson        | NR            | NR            | NR            | NR            | NR            | NR            | NR            |
| <b>Lost Pines GCD Total<sup>1,2</sup></b>   |                            | <b>Yegua-Jackson</b> | <b>NR</b>     | <b>NR</b>     | <b>NR</b>     | <b>NR</b>     | <b>NR</b>     | <b>NR</b>     | <b>NR</b>     |
| Mid-East Texas GCD                          | Leon                       | Yegua-Jackson        | 0             | 0             | 0             | 0             | 0             | 0             | 0             |
| Mid-East Texas GCD                          | Madison                    | Yegua-Jackson        | 809           | 809           | 809           | 809           | 809           | 809           | 809           |
| <b>Mid-East Texas GCD Total<sup>1</sup></b> |                            | <b>Yegua-Jackson</b> | <b>809</b>    | <b>809</b>    | <b>809</b>    | <b>809</b>    | <b>809</b>    | <b>809</b>    | <b>809</b>    |
| <b>Post Oak Savannah GCD<sup>1</sup></b>    | <b>Burleson</b>            | <b>Yegua-Jackson</b> | <b>14,544</b> | <b>14,544</b> | <b>12,576</b> | <b>12,564</b> | <b>12,478</b> | <b>12,326</b> | <b>10,200</b> |
| <b>GMA 12 Total<sup>1</sup></b>             |                            | <b>Yegua-Jackson</b> | <b>31,478</b> | <b>31,471</b> | <b>29,501</b> | <b>29,489</b> | <b>29,403</b> | <b>29,250</b> | <b>27,124</b> |

1. Individual estimates are rounded and may not always sum up to the total value displayed.

2. NR: Groundwater Management Area 12 declared the Yegua-Jackson Aquifer not relevant in these areas .

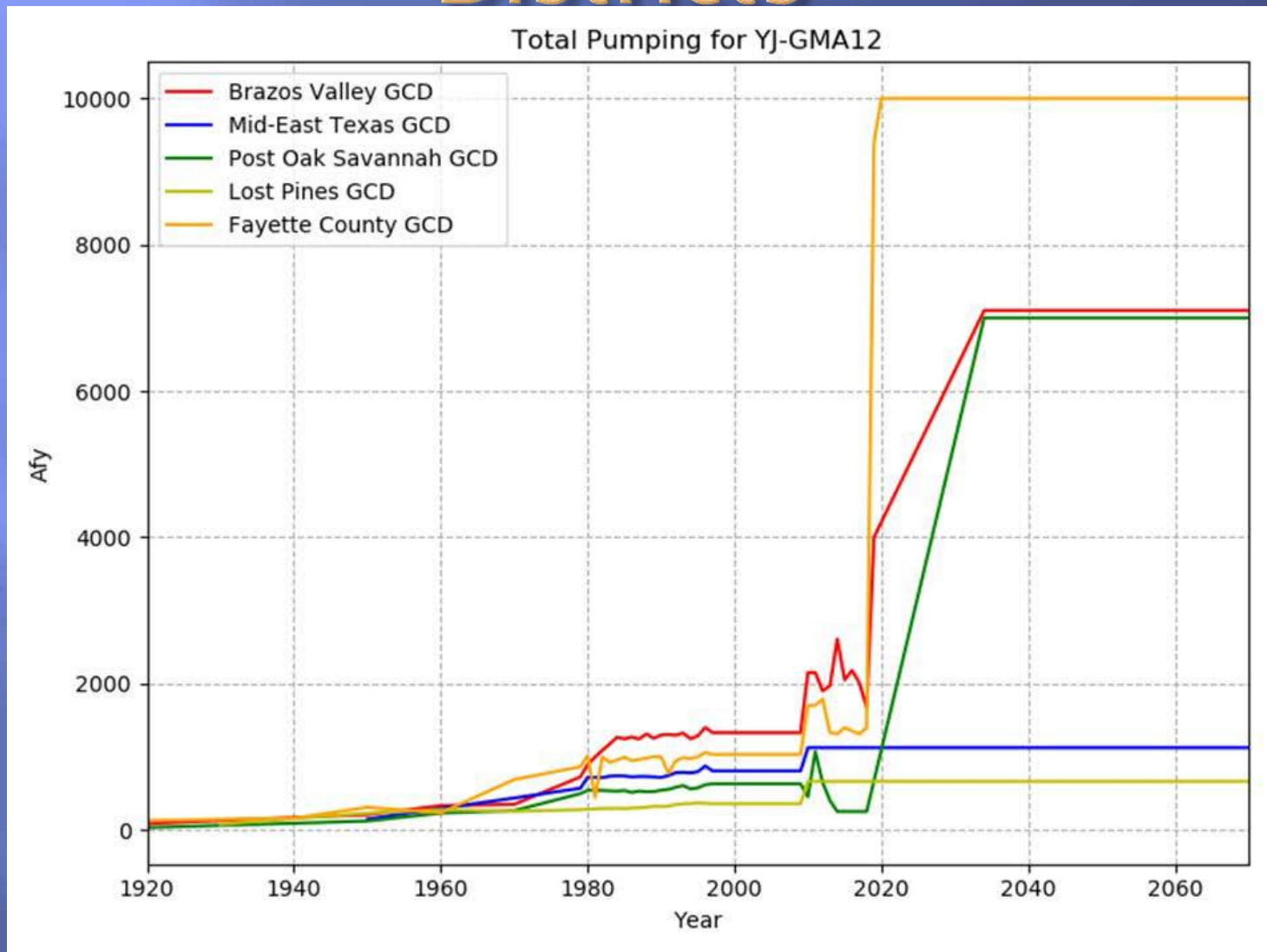
3. Modeled available groundwater values for Fayette County include all of the county (GMA 12 and GMA 15 portions)

# Yegua-Jackson Run (YJ-PS2)

- ▣ YJ-PS1 historical pumping from 2010 to 2018 is too high
- ▣ GMS 12 Districts revised pumping rates to reflect
  - historical pumping from 2010 to 2018
  - revised estimates for future pumping

| GCD    | Total 2070 YJ<br>Pumping AFY |
|--------|------------------------------|
| FCGCD  | 10,000                       |
| BVGCD  | 7,100                        |
| POSGCD | 7,000                        |
| METGCD | 1,121                        |
| LPGCD  | 661                          |

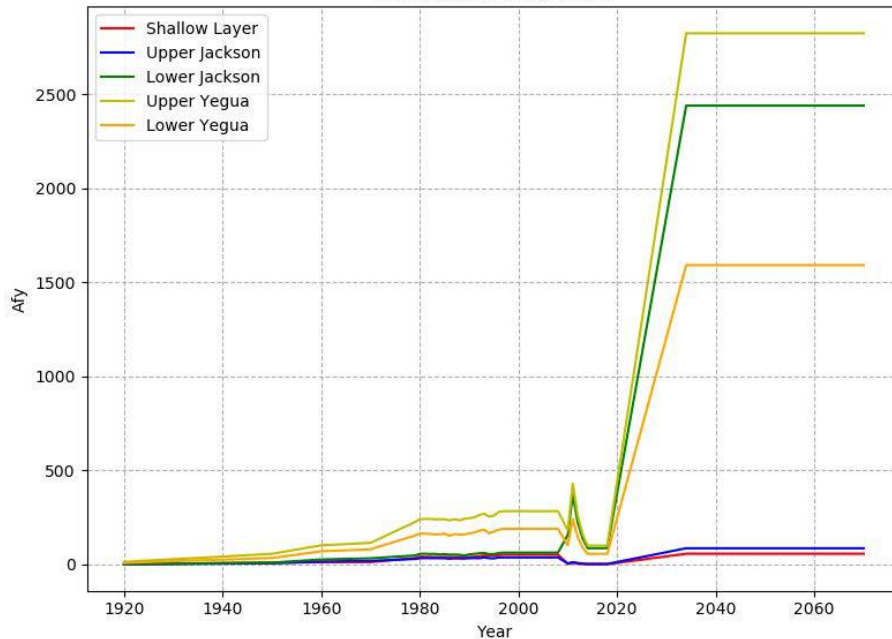
# Yegua-Jackson Run (YJ-PS2), All Districts



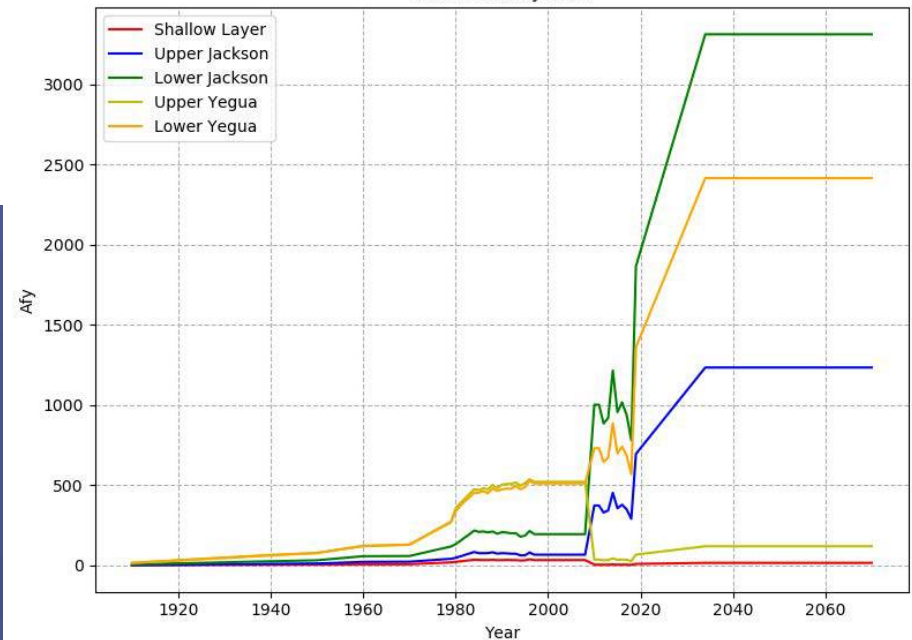


# YJ-PS2 for POSGCD & BVGCD

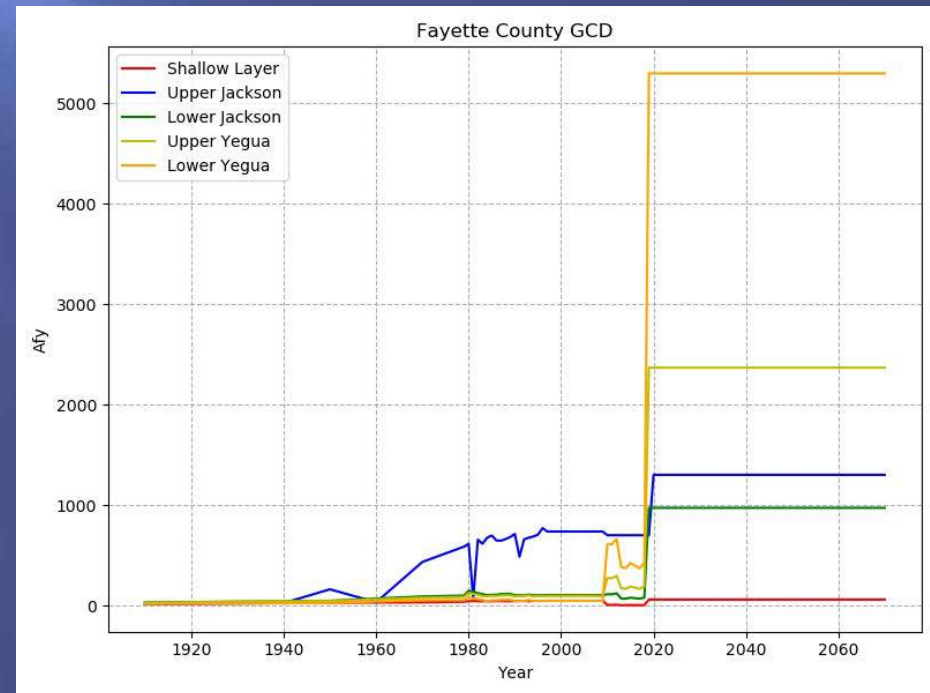
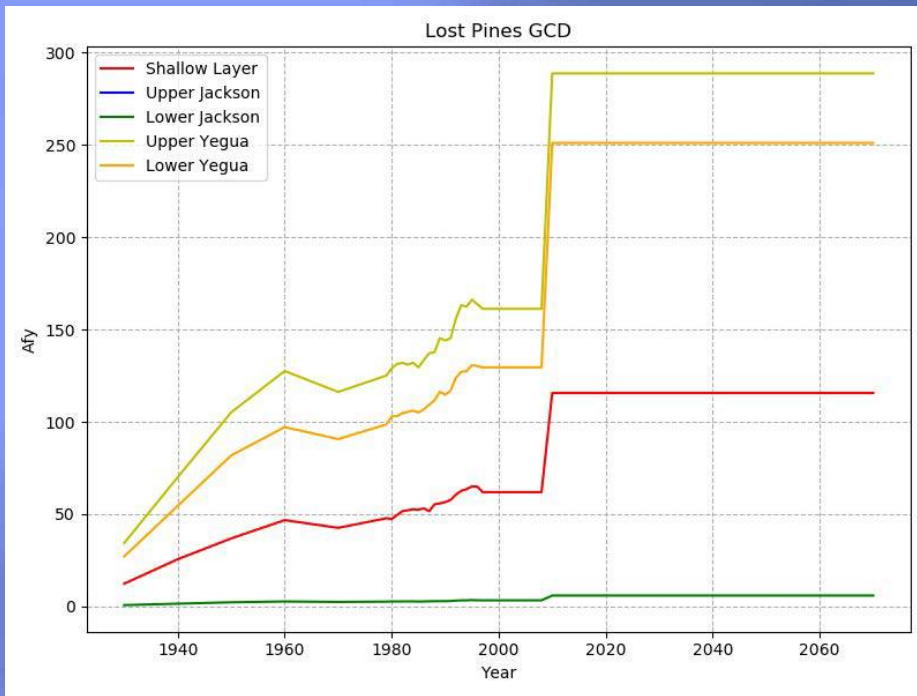
Post Oak Savannah GCD



Brazos Valley GCD

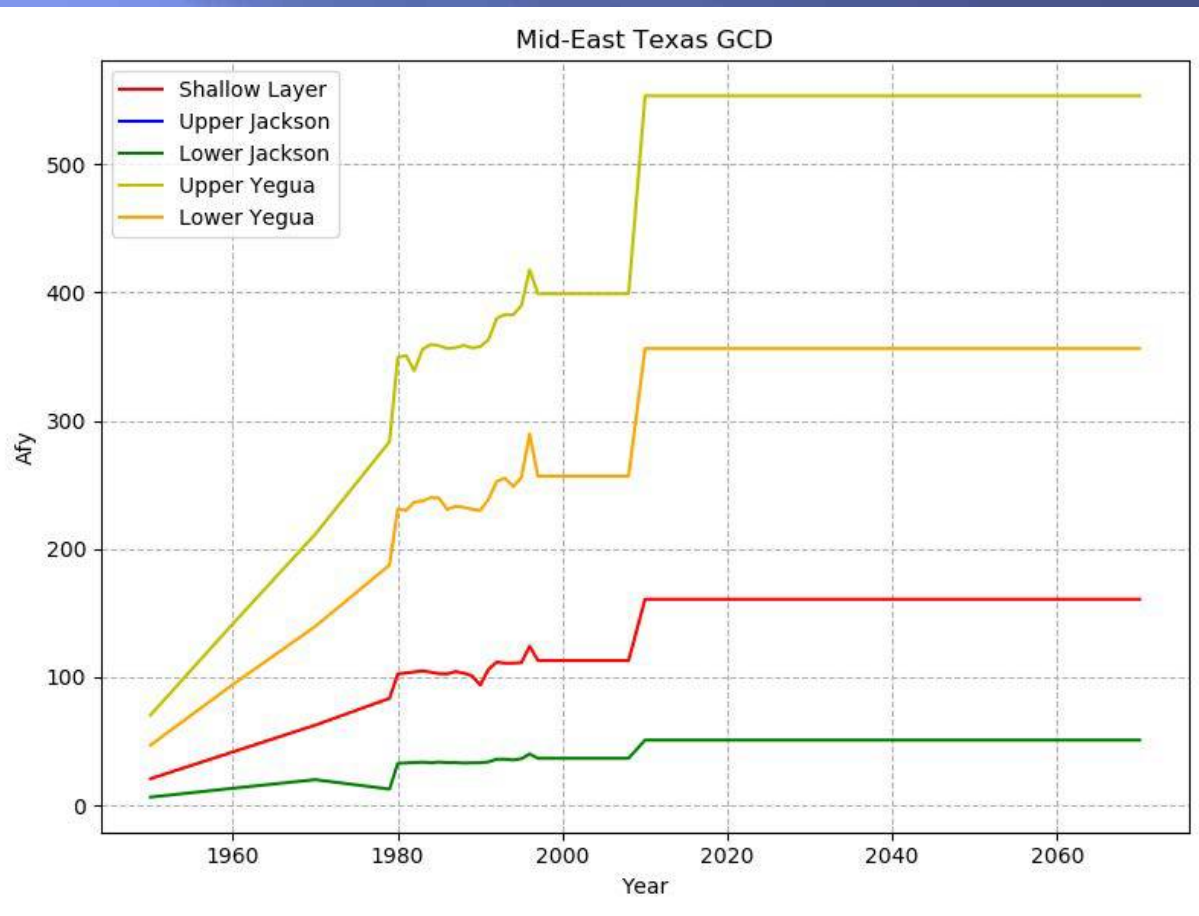


# YJ-PS2 for LPGCD & FCGCD





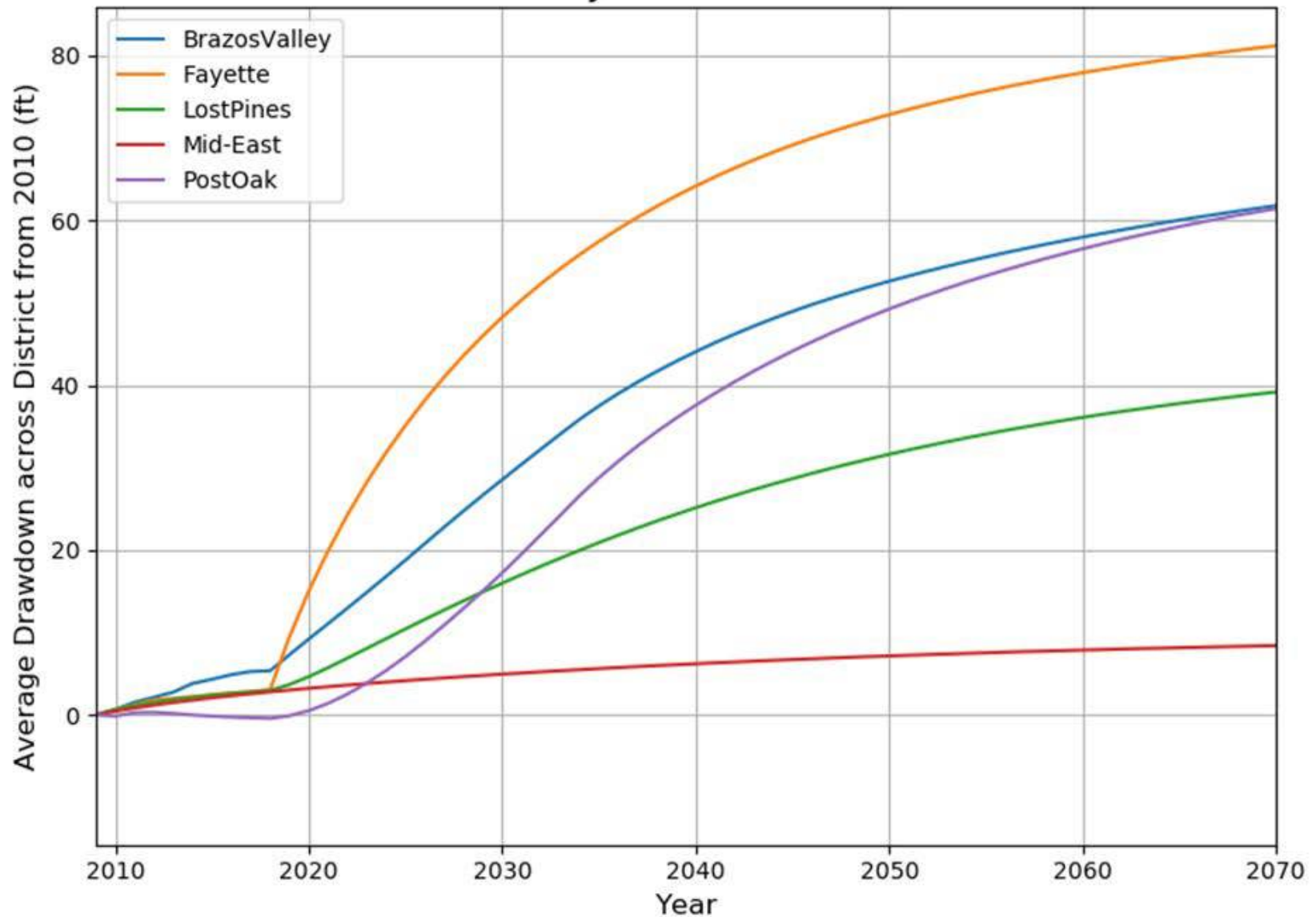
# YJ-PS2 for METGCD



# Average Drawdowns

| GCD           | Existing DFC, ft |         |               | Drawdown 2010-2070, ft |     |
|---------------|------------------|---------|---------------|------------------------|-----|
|               | Yegua            | Jackson | Yegua-Jackson | PS1                    | PS2 |
| Brazos Valley | 70               | 114     | -             | 73                     | 61  |
| Fayette       | -                | -       | 77            | 77                     | 81  |
| Lost Pines    | -                | -       | -             | 42                     | 39  |
| Mid-East      | -                | -       | 7             | 7                      | 8   |
| PostOak       | -                | -       | 100           | 100                    | 61  |

# Average Drawdown for YJ-PS2



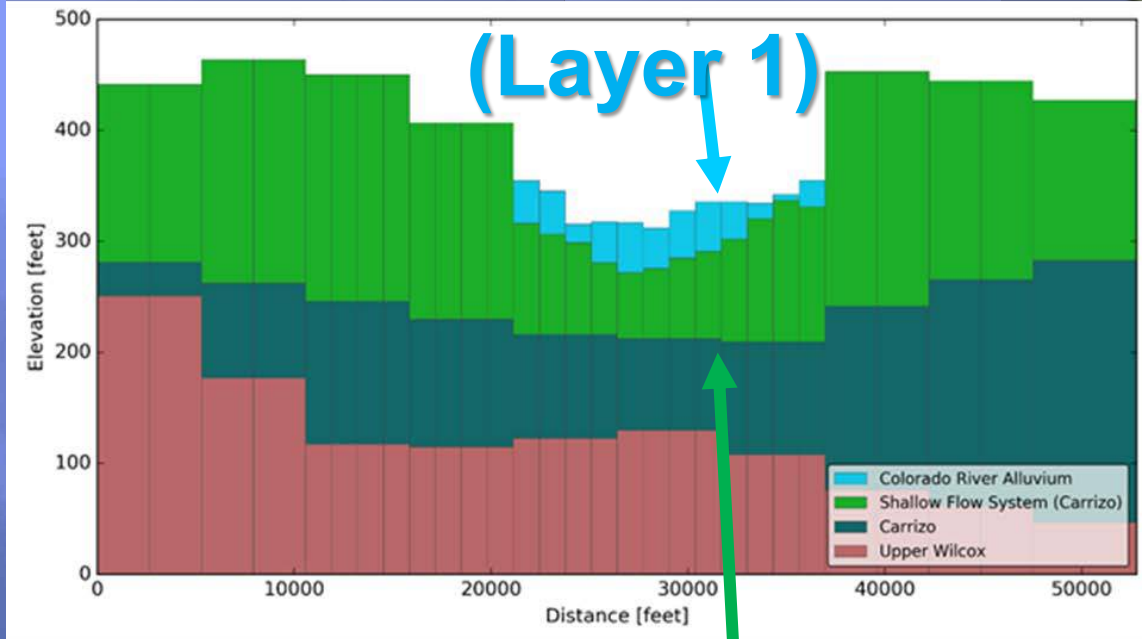
# Yegua-Jackson DFC Runs

- ▣ Additional checks will be performed on YJ-PS2 by GMA 12 Consultants
- ▣ No additional Runs are Planned
- ▣ District GMs will determine if Additional Runs are Needed

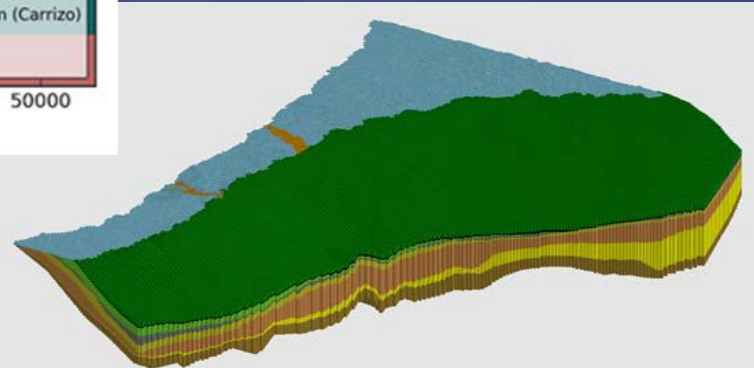
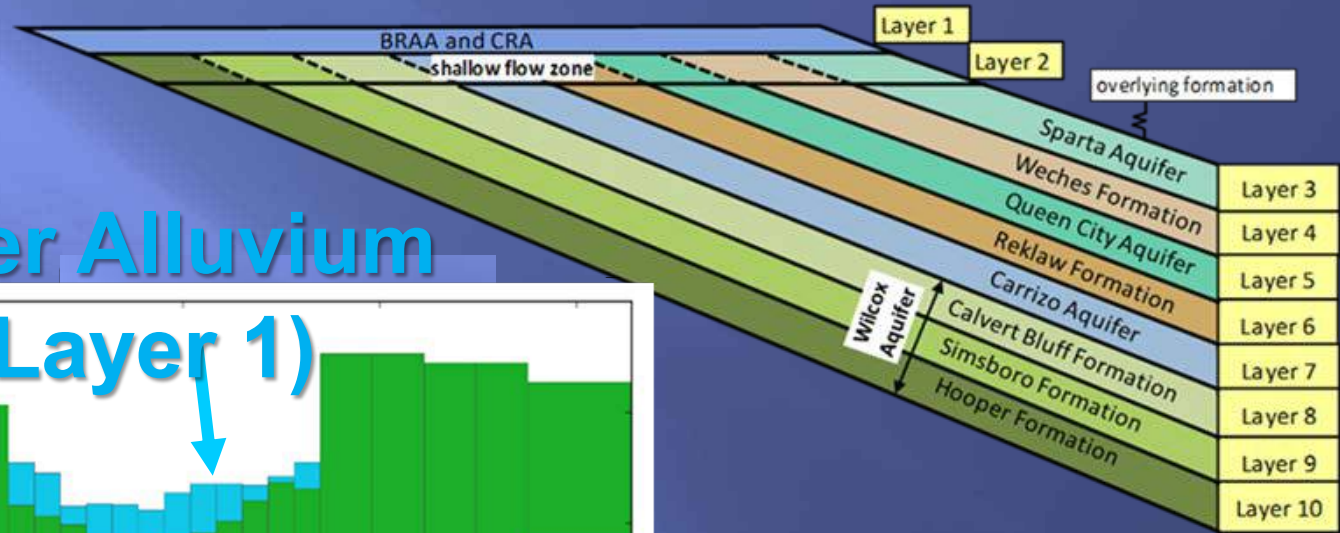
# SP/QC/CW GAM

## River Alluvium

(Layer 1)



Shallow Flow Zone  
(Layer 2)



# SP/QC/CW GAM

- ▣ Replace pumping in Brazos River Alluvium in SP/QC/CW GAM with amounts in BRAA GAM Run

| GCD    | Well Pumping from Brazos River Alluvium (afy) |                      |
|--------|-----------------------------------------------|----------------------|
|        | BRAA Model                                    | Carrizo-Wilcox Model |
| POSGCD | 70,000                                        | 30,500               |
| BVGCD  | 140,000                                       | 61,000               |



# Sensitivity of Average Drawdown To Change in BRAA Pumping

| Aquifer       | POSGCD       |                          |           | BVGCD        |                          |           |
|---------------|--------------|--------------------------|-----------|--------------|--------------------------|-----------|
|               | Existing DFC | Drawdown 2010-2070, feet |           | Existing DFC | Drawdown 2010-2070, feet |           |
|               |              | S7                       | S7 + BRAA |              | S7                       | S7 + BRAA |
| Sparta        | 28           | 23                       | 17        | 12           | 47                       | 46        |
| Queen City    | 30           | 21                       | 18        | 12           | 41                       | 39        |
| Carrizo       | 67           | 176                      | 176       | 61           | 76                       | 76        |
| Calvert Bluff | 149          | 182                      | 182       | 125          | 95                       | 96        |
| Simsboro      | 318          | 352                      | 352       | 295          | 211                      | 212       |
| Hooper        | 205          | 220                      | 220       | 207          | 151                      | 151       |

| Aquifer       | POSGCD       |                          |           | BVGCD        |                          |           |
|---------------|--------------|--------------------------|-----------|--------------|--------------------------|-----------|
|               | Existing DFC | Drawdown 2010-2070, feet |           | Existing DFC | Drawdown 2010-2070, feet |           |
|               |              | S9                       | S9 + BRAA |              | S9                       | S9 + BRAA |
| Sparta        | 28           | 6                        | 6         | 12           | 21                       | 21        |
| Queen City    | 30           | 9                        | 9         | 12           | 21                       | 20        |
| Carrizo       | 67           | 132                      | 132       | 61           | 57                       | 57        |
| Calvert Bluff | 149          | 165                      | 166       | 125          | 88                       | 88        |
| Simsboro      | 318          | 347                      | 347       | 295          | 207                      | 208       |
| Hooper        | 205          | 217                      | 217       | 207          | 147                      | 148       |

*QUESTIONS?*