Comments Regarding Predictive Simulations 1 through 4 and Preliminary Evaluation of Potential DFCs for the Simsboro Aquifer

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Milano Civic Center

Milam, TX

Steven Young Phd, PE, PG

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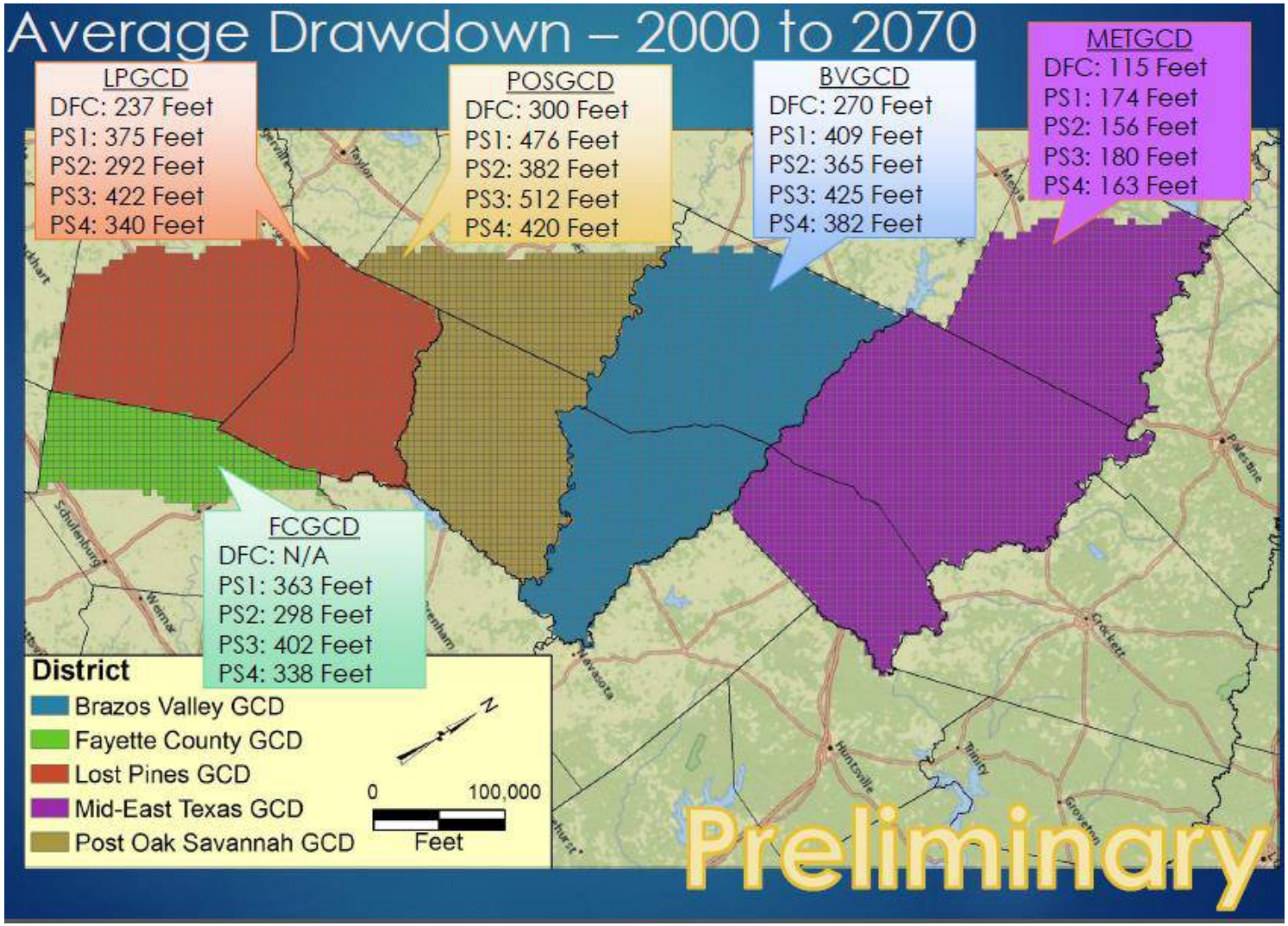
Outline

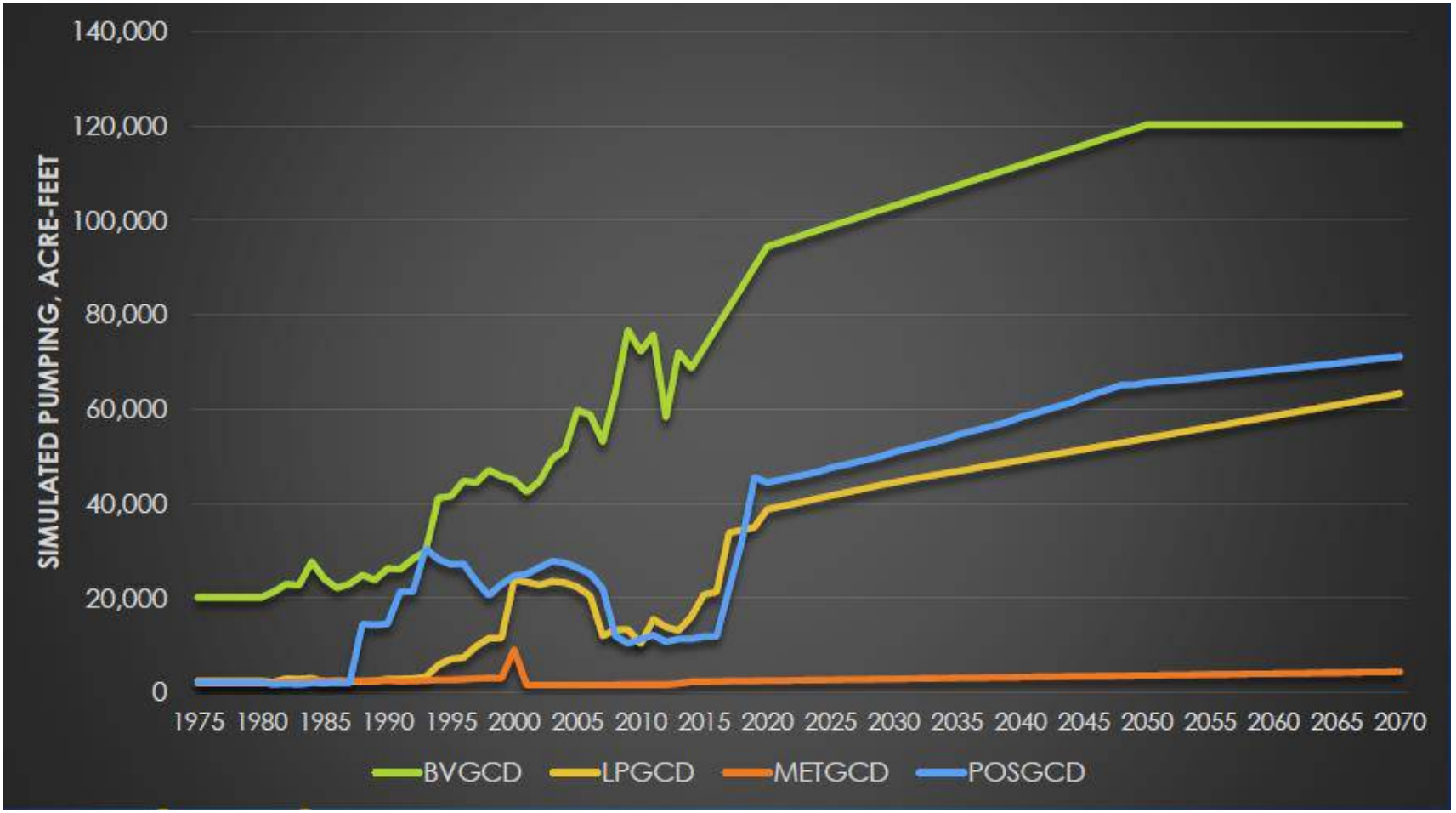
- Predictive Simulation PS4
  - Pumping Assumptions
  - Simulated Simsboro Water Levels
- Simsboro Measured Water Levels
  - POSGCD Monitoring Network
  - Measured versus Model Water Levels
  - Preliminary Evaluation of PS4 Predictive Accuracy
- Possible Approach for Simsboro DFC
  - Aquifer-wide DFC
  - DFCs in Unconfined Area

Simsboro (2000 – 2070)



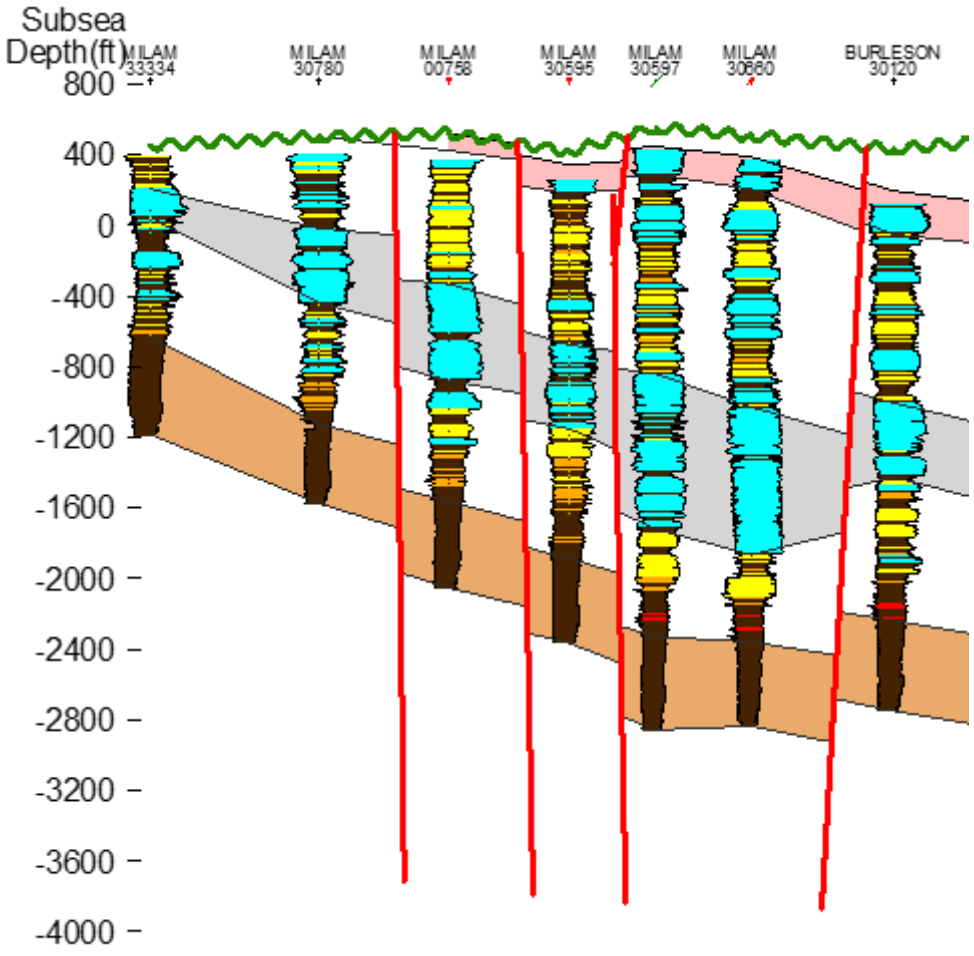
Predictive Scenario 4 (PS 4)

Simsboro Pumping

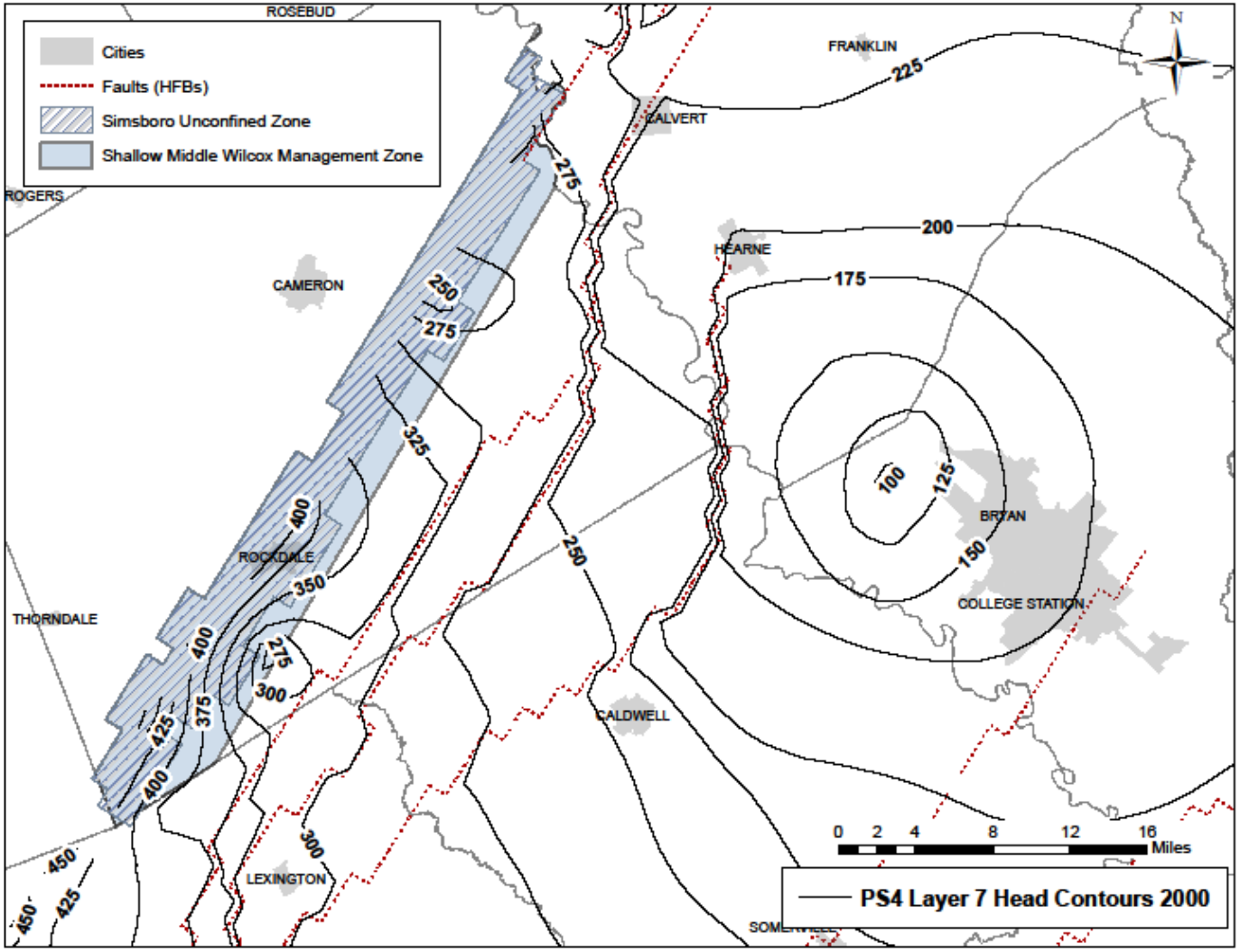


Critical Assumption in PS4

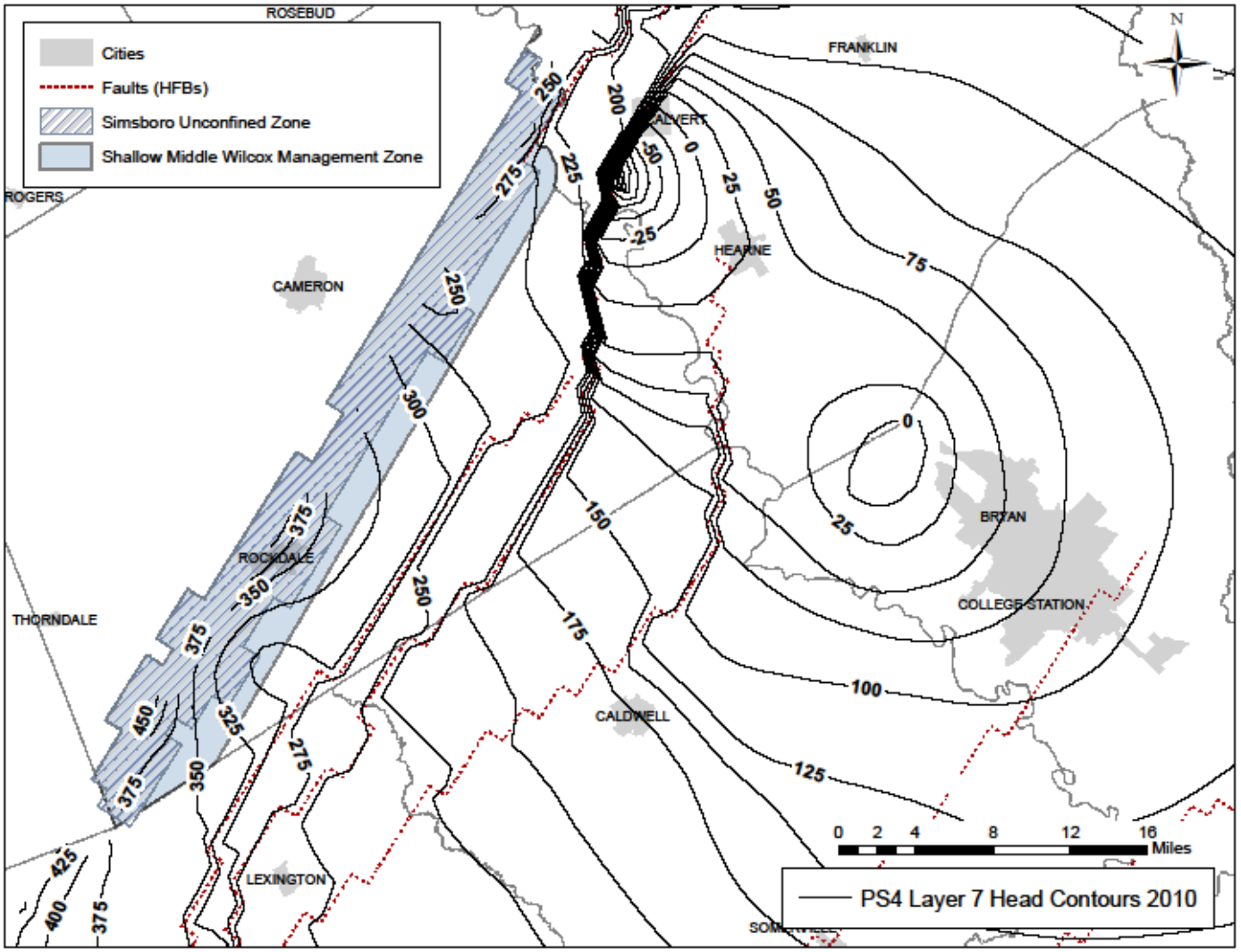
- Majority of faults in Milam & Burleson County are sealing faults
- Sealing faults are assigned a hydraulic conductivity of 0.0001 ft/day (about 1/10,000 the value of sand)



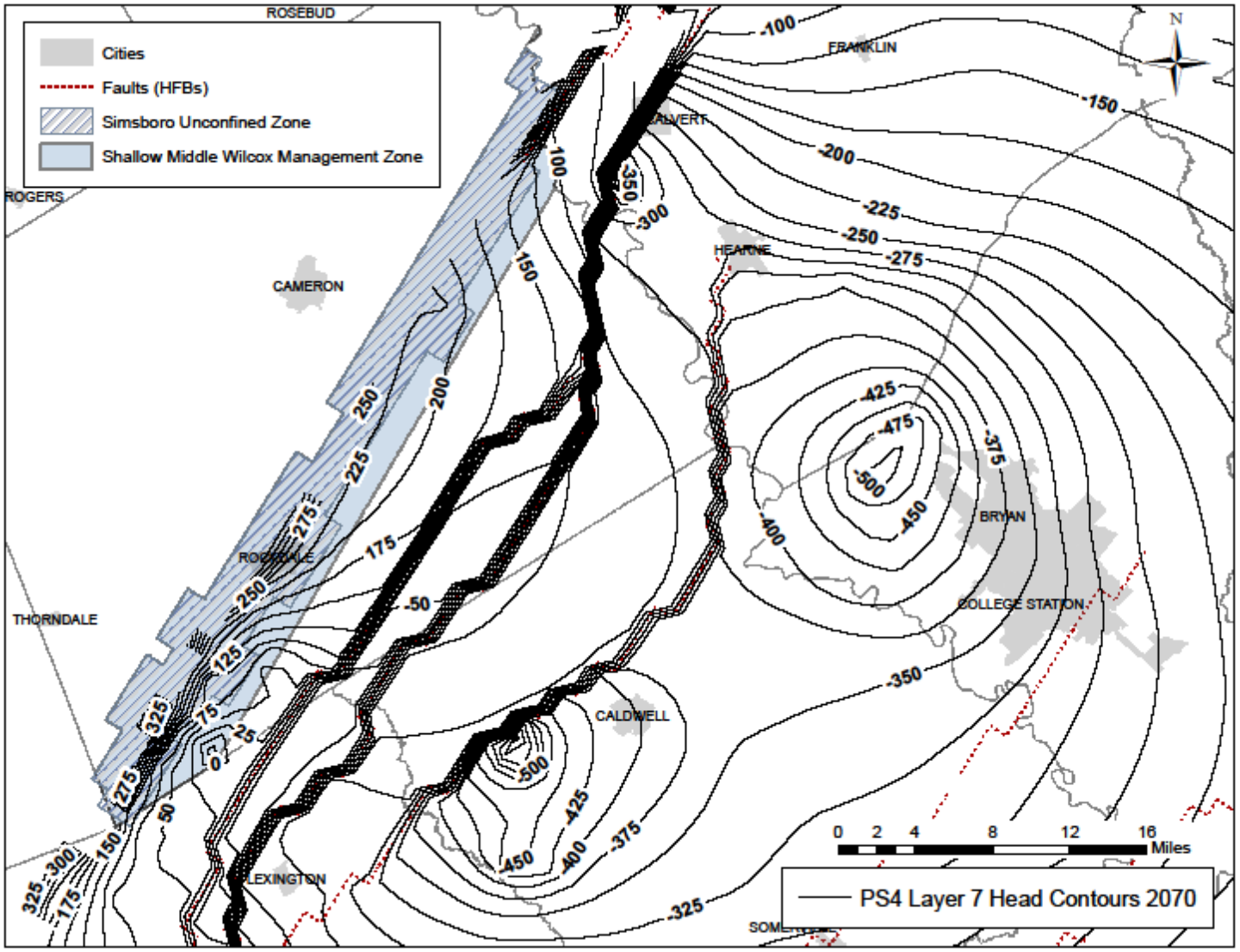
2000 Simsboro Water Level Contours (PS4)



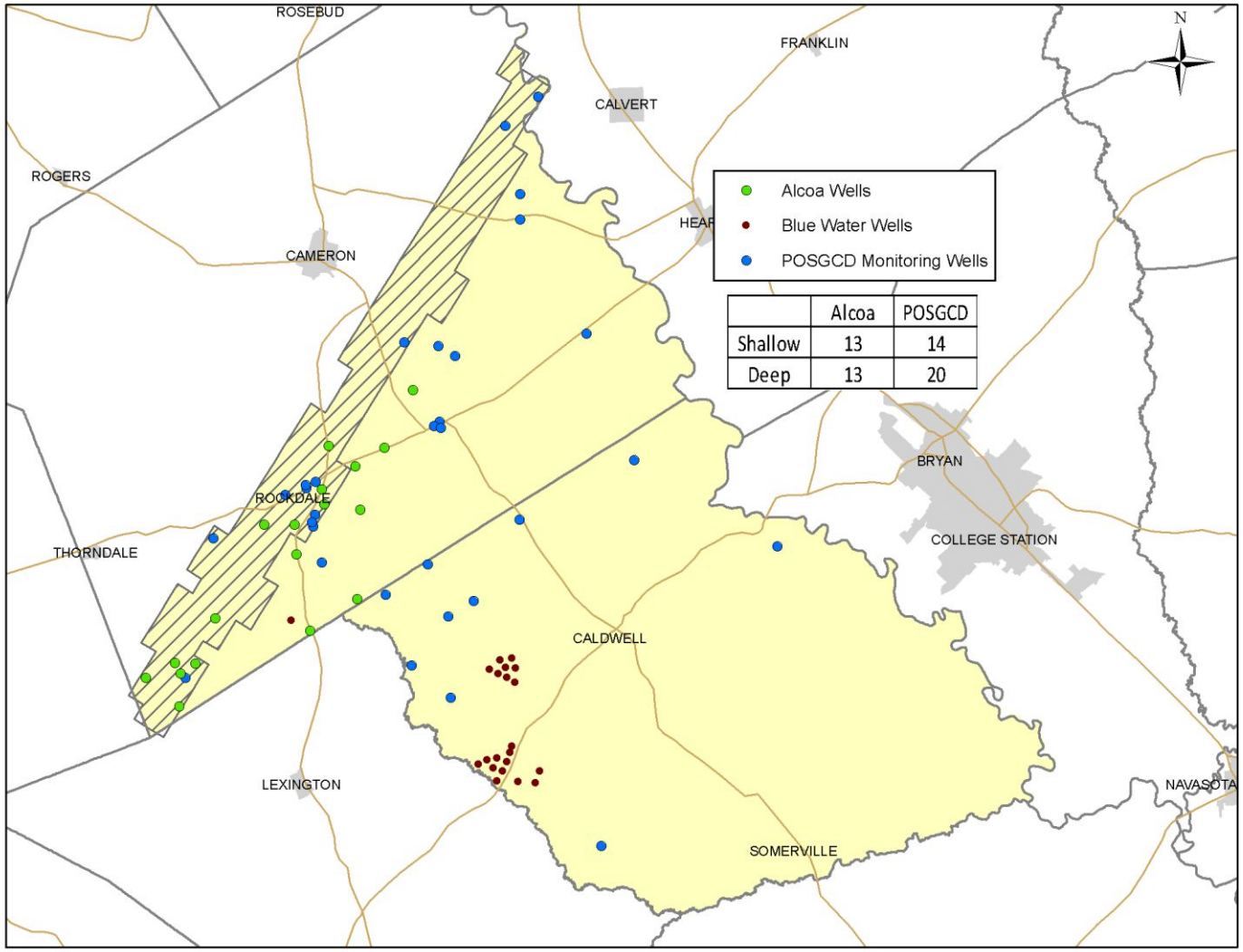
2010 Simsboro Water Level Contours (PS4)



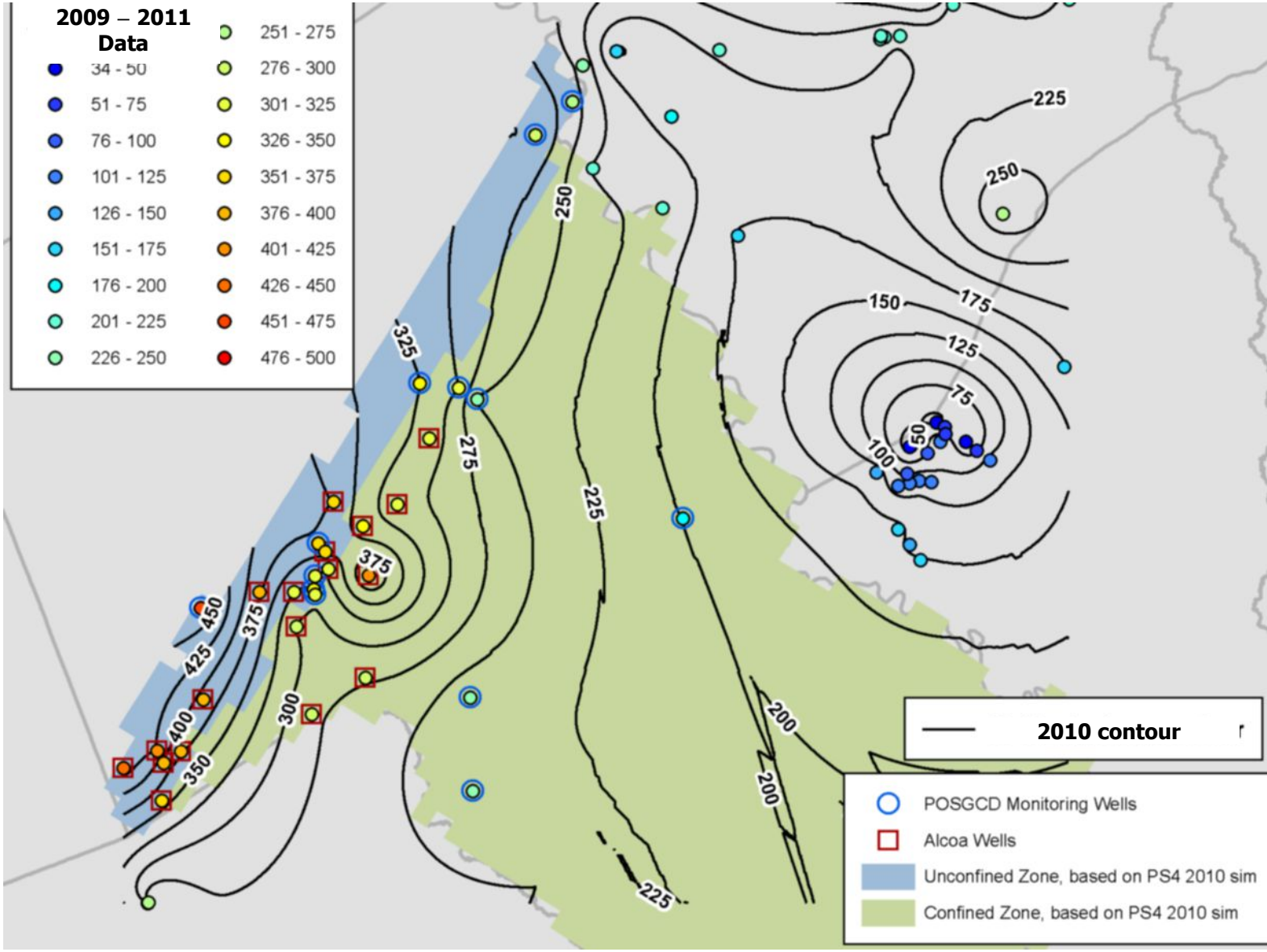
2070 Simsboro Water Level Contours (PS4)



POSGCD Simsboro Monitoring Locations



2010 Water Level Contours Based on Measured Water Levels



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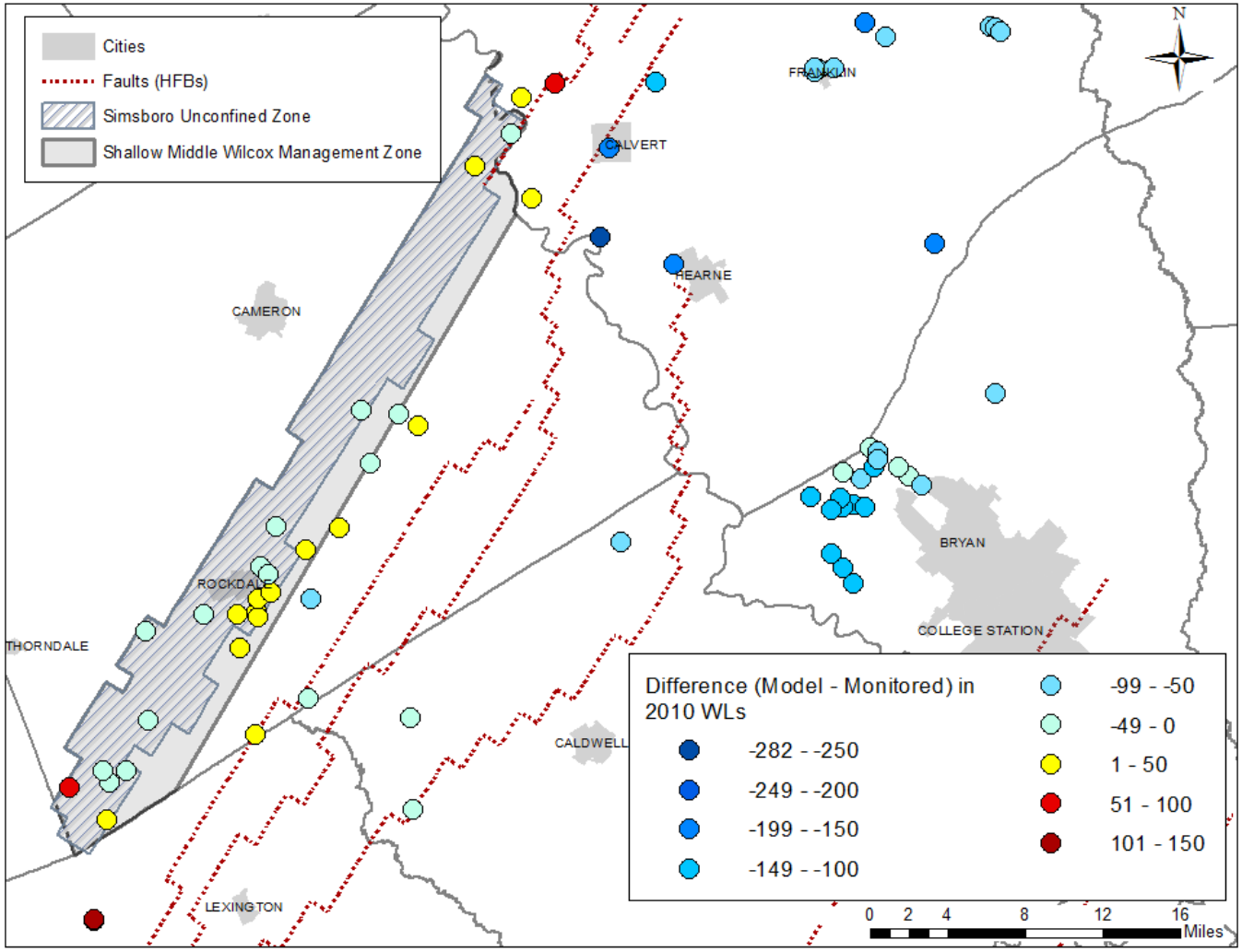
Comparison of Model to Measured Water Level Data for 2010

Blue or Negative means GAM is over predicting drawdown



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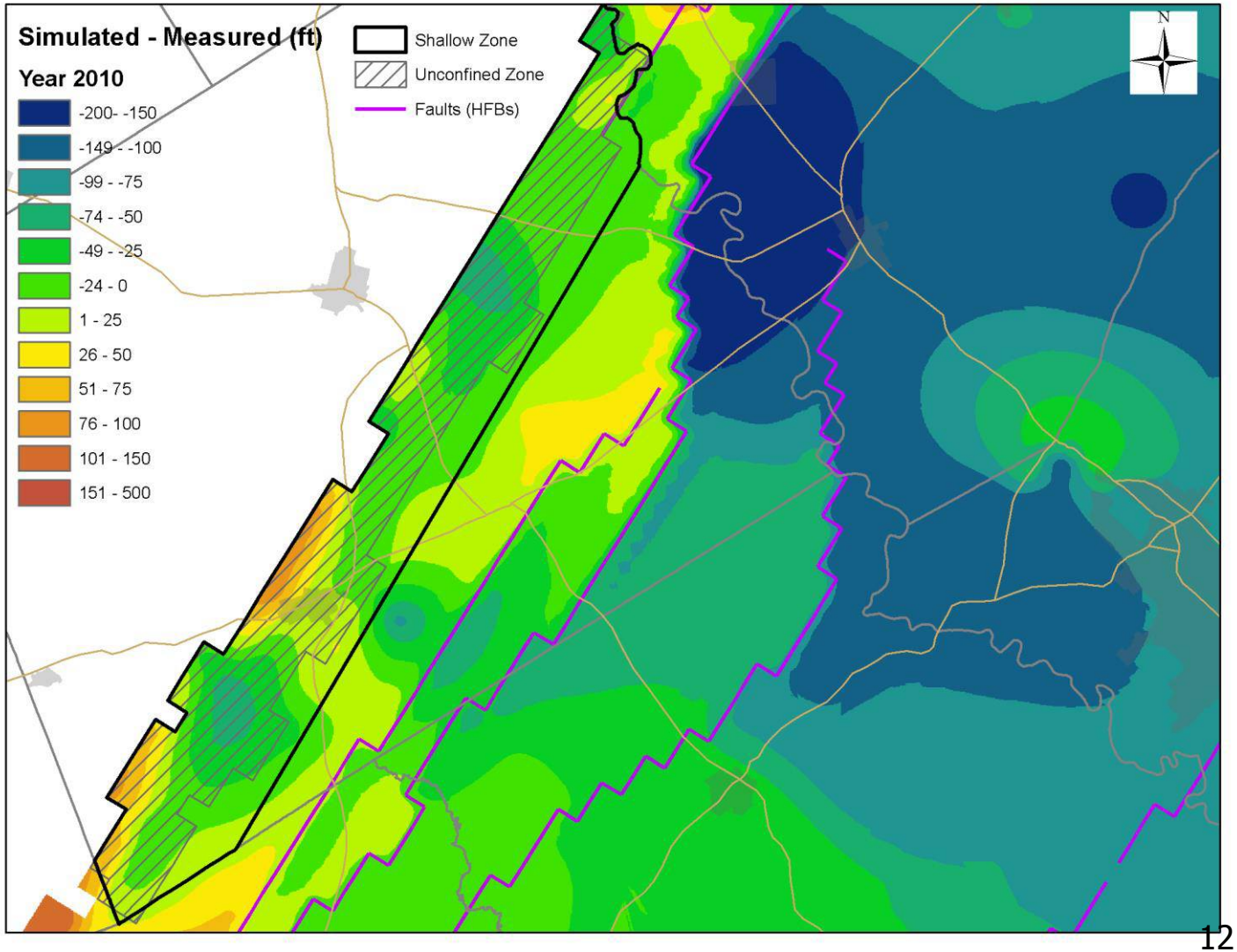
2010 Simsboro Water Column (water level – bottom aquifer)

Blue or Negative means GAM is over predicting drawdown



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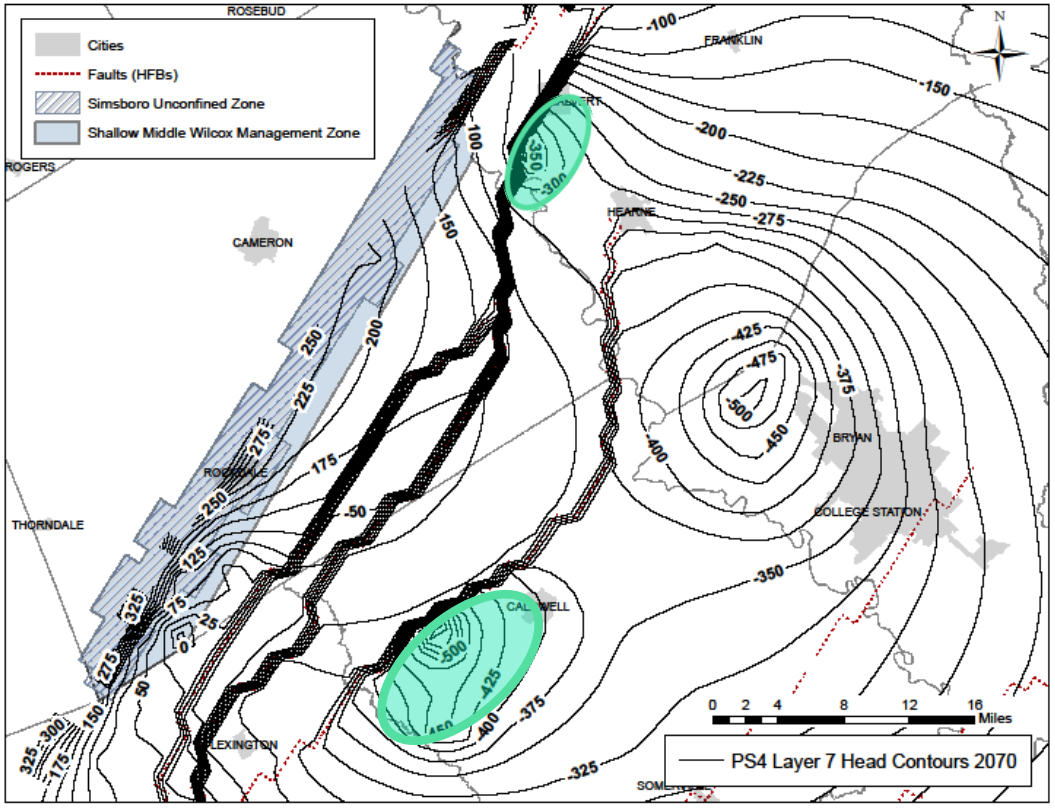
Preliminary Evaluation of PS4 Predictive Uncertainty

- PS4 runs likely will over predict drawdowns and especially near the faults

- PS4 runs likely will over predict drawdowns in shared regions by more than 200 feet in 2070



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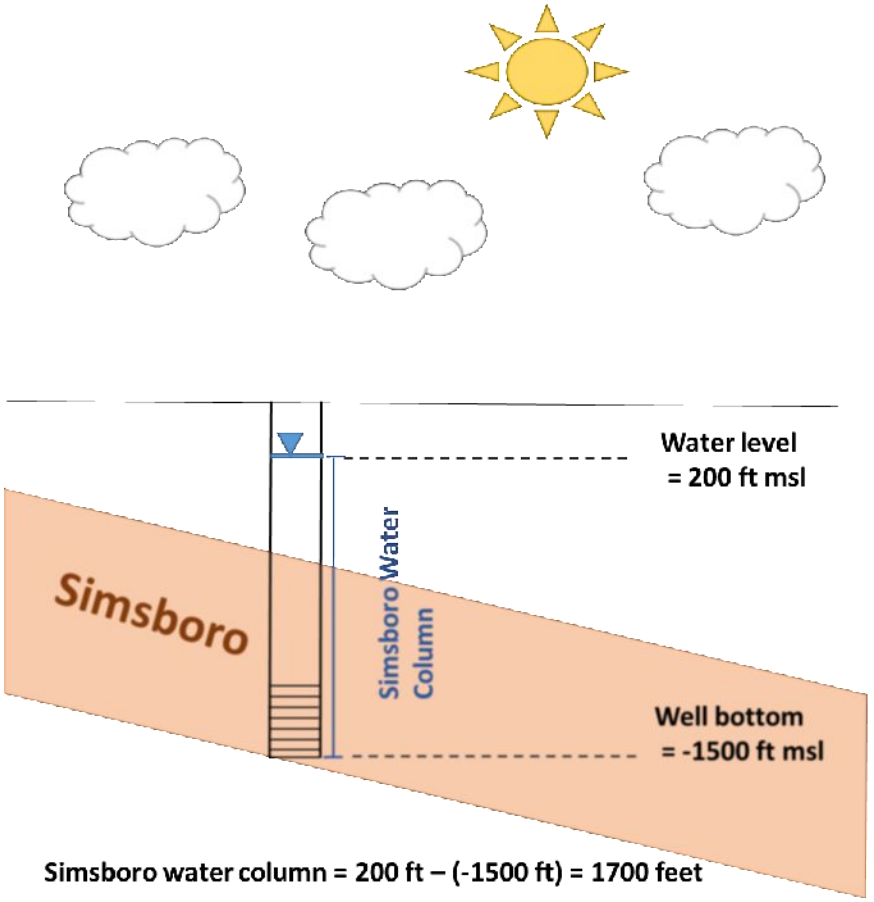
Possible Approach for Simsboro DFC: Metric would be Water Column Height

- Height that water will rise in a well that is drilled to the base of the Simsboro
- Change in water column height can be expressed as average drawdown or percent decline in water column height



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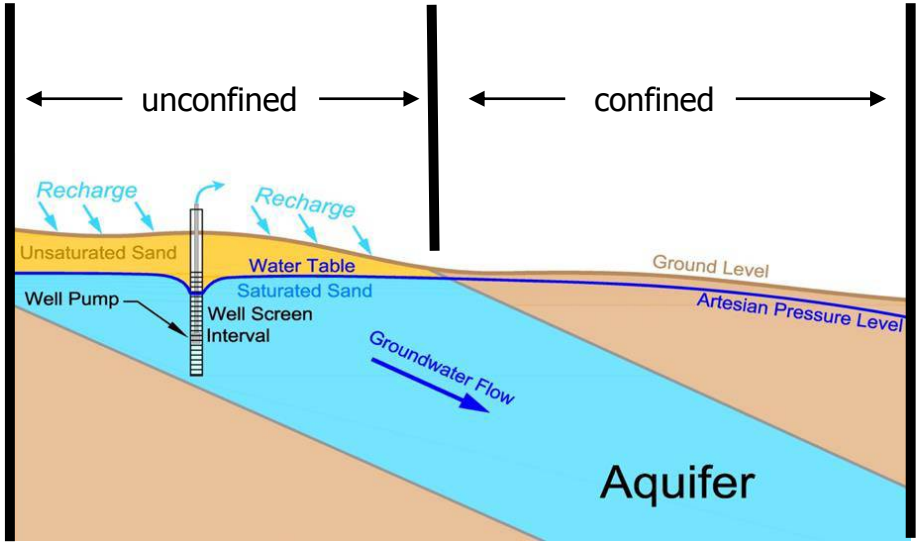
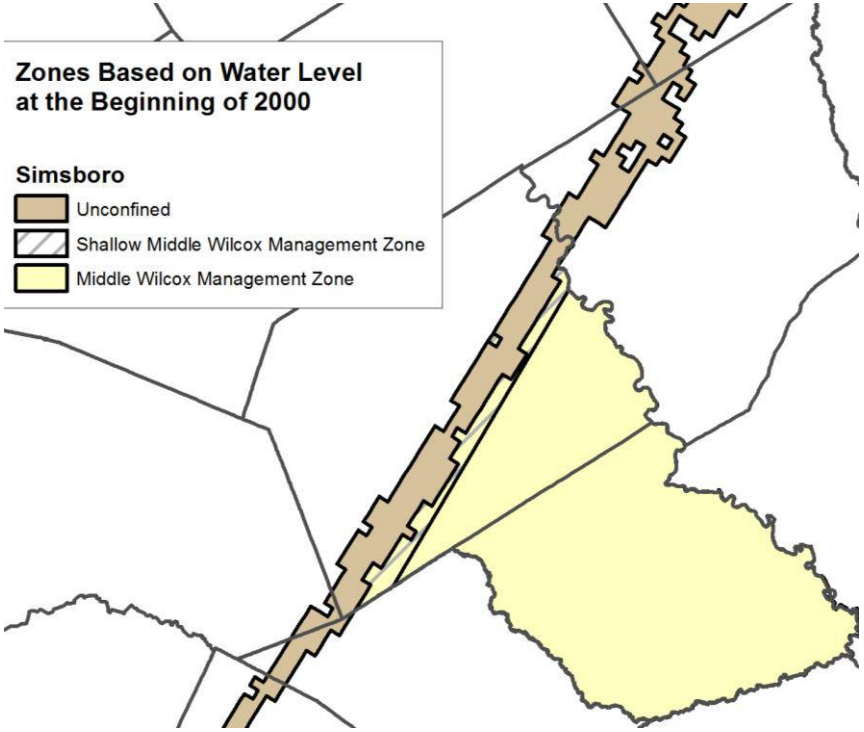
Possible Approach for Simsboro DFC: Management Zones

- Unconfined
- Confined
- Entire Aquifer (unconfined and confined)





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Possible Approach for Simsboro DFC: DFC values

- GAM Simulation for Aquifer-wide (or confined) DFC
  - GAM run similar to PS4 that considers permits issued by districts
  - Recognizes sources of uncertainty in the model predictions
  - Aquifer-wide DFC would likely be between 370 and 450 ft average drawdown

- Monitoring Data for Unconfined Area
  - Average Simsboro water column height in unconfined zone is 187 feet based on 2010 monitoring data. Discussion of up to 40 feet drawdown (about 20% decline in Simsboro water height)
  - PS4 model show drop of 177 ft in 2010 to 99 feet in 2070, which is an average drawdown of 78 feet (percent drop of 44% in Simsboro water height).

Next Steps

- Improve POSGCD pumping estimates in a revised PS4 run
- Review evidence related to potential impacts of faults on groundwater flow
- Estimate predictive uncertainty in GAM simulations
- Evaluate monitoring data for other aquifers besides Simsboro
- Work with district members to integrate monitoring data
- Continue to promote sometype of shallow DFC by other districts in GMA 12
- Work with TWDB consultant regarding possible improvements to GMA 12 GAM