Discussion of Current DFCs and Potential Alternatives

Presented by:

James Ben, P.G.

Groundwater Management Area No. 12

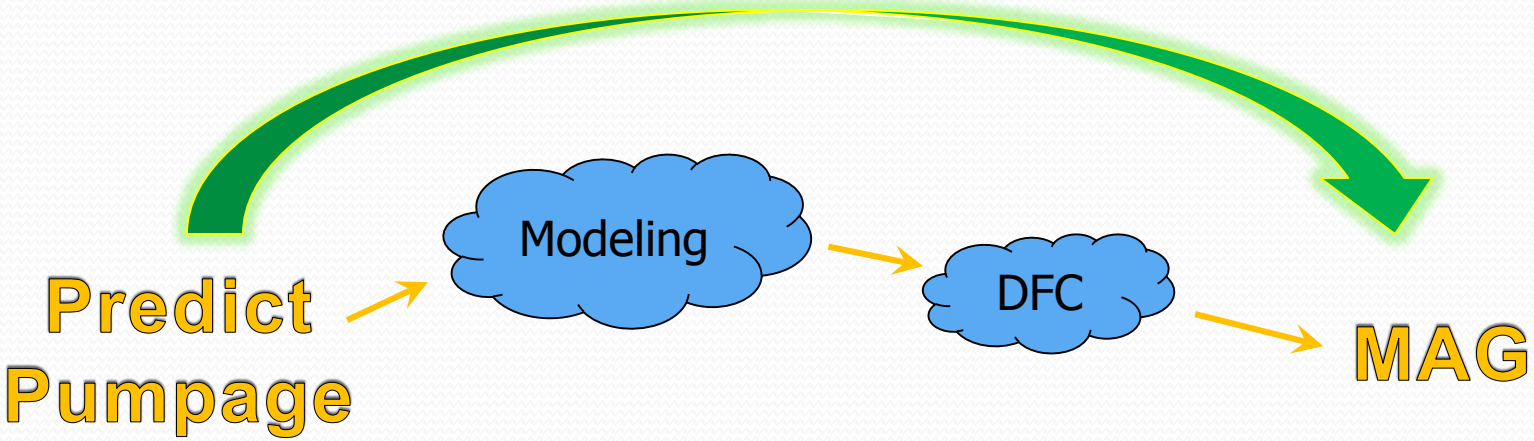
June 27, 2013

Presentation Outline

1. Current DFCs/MAGs and some of their shortcomings
2. What is “drawdown” – why it is important to distinguish between the different types
3. What makes a good DFC?
4. Alternative DFCs and their advantages

Current DFC/MAG Process

1. Predict pumpage locations and amounts
2. Model the predicted pumpage
3. Accept model results as DFCs
4. Predicted pumpage becomes MAG



Drawbacks of Current DFCs

- DFCs are based on simulated response model pumpage inputs instead of aquifer conditions
  - Model inputs are educated guesses for the next ½ century:
    - Pumpage/project locations, rates, and schedules
    - Cannot be correct
  - Difficult to justify model results as a regulatory limit?

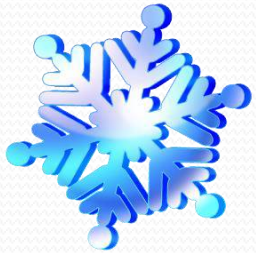
Drawbacks of Current MAGs

- The MAGs do not correspond to physical/actual groundwater availability
  - MAGs must be treated as physical/actual groundwater availability in regional and state water plans
  - Create stakeholder confusion
    - the distinction between the current MAGs and physical groundwater availability not widely recognized

Drawbacks of Current DFCs

3. Current DFCs are based on non-specific “drawdown”
   - There are two very different types of drawdown
     1. Water table
     2. Artesian pressure
   - They are not interchangeable (apples and oranges)

1 Inch Precipitation



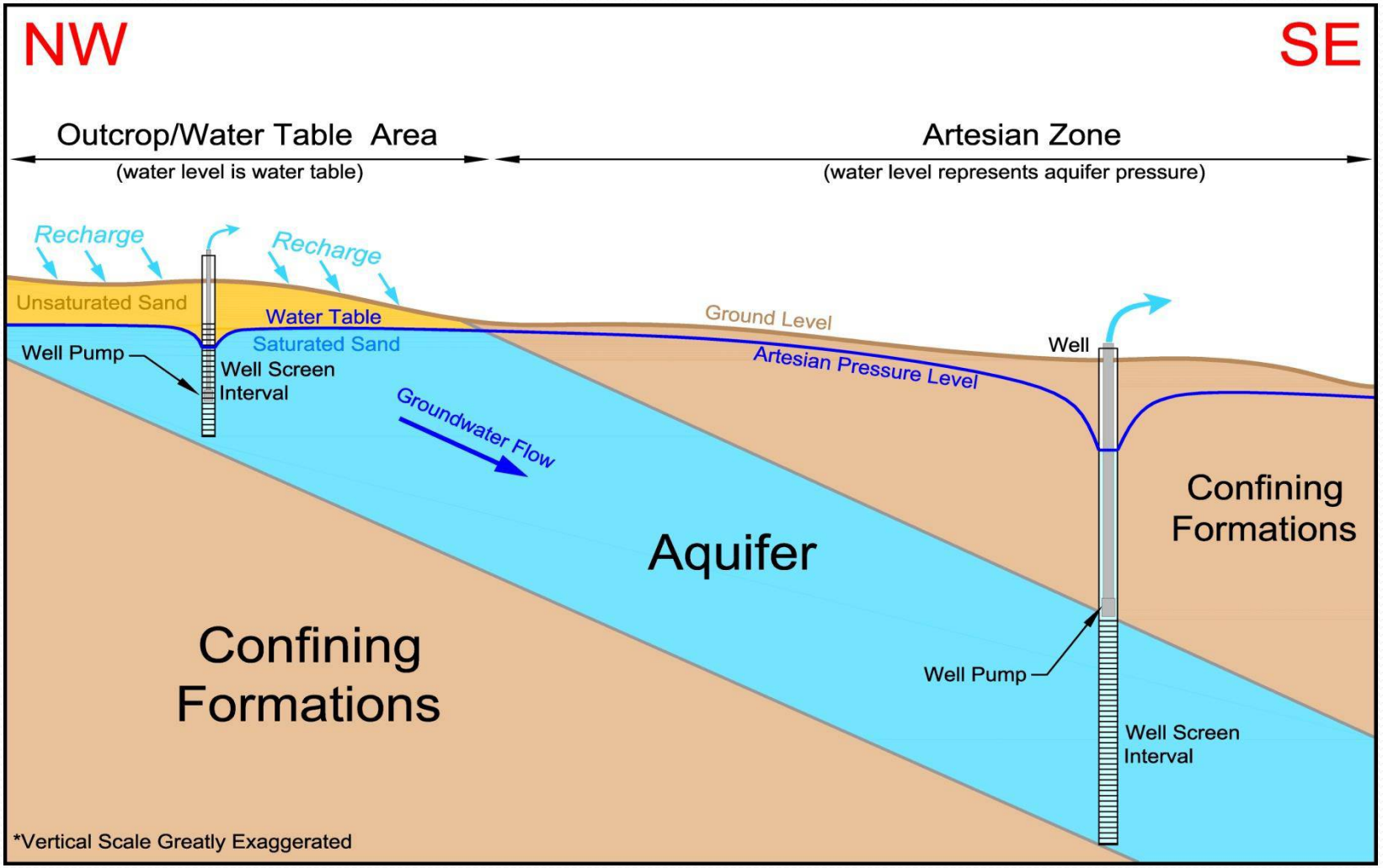
10 Inches Precipitation

Drawdown as a DFC

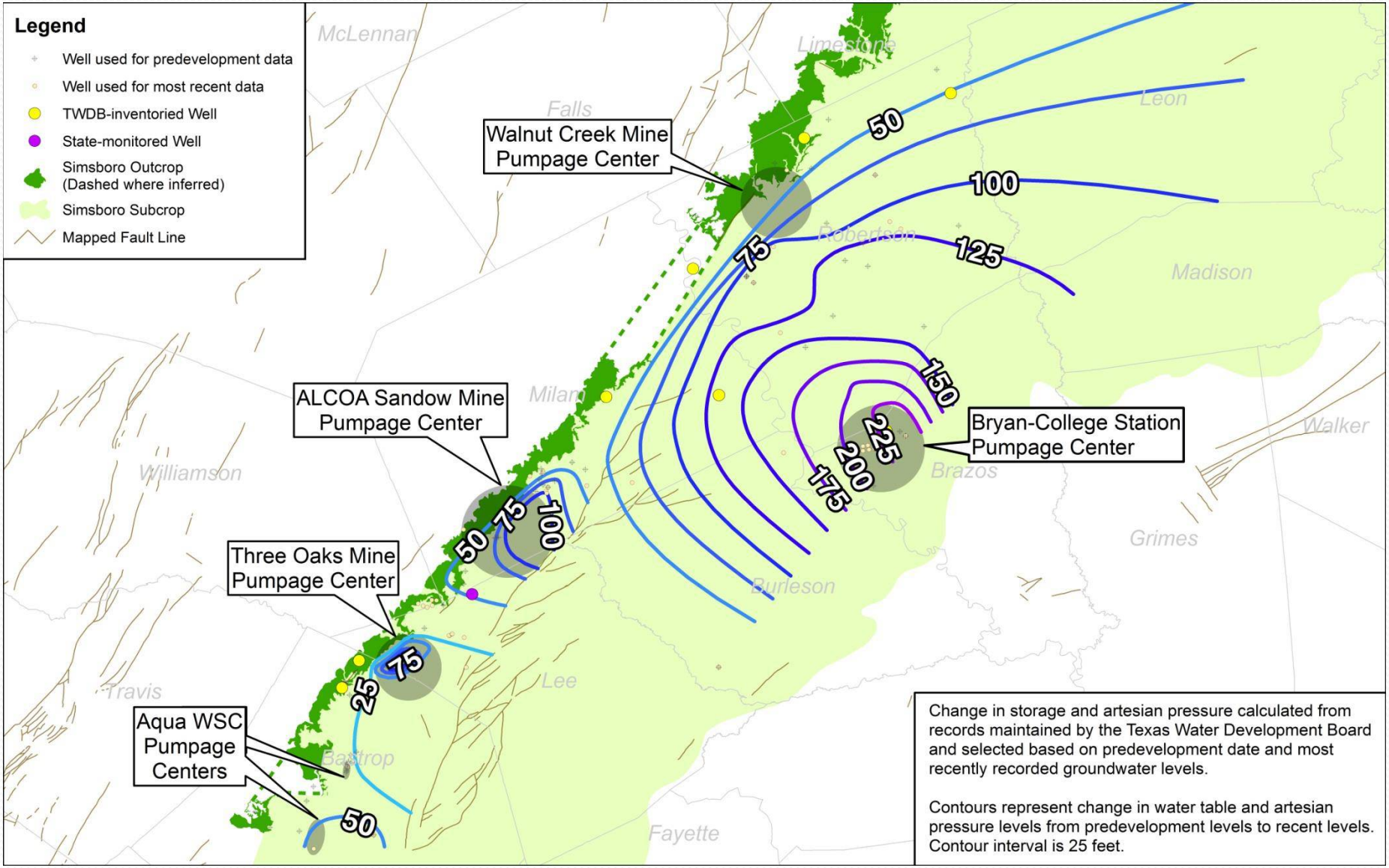
- Drawdown must be “translated” into meaningful information:
  - Will the drawdown result in aquifer depletion or unwanted environmental impacts?
  - The acceptability of drawdown always depends on other factors (saturated thickness, hydraulic boundaries, aquifer structure, etc.)

100 Feet Drawdown = ***Good, Bad, Ugly?***

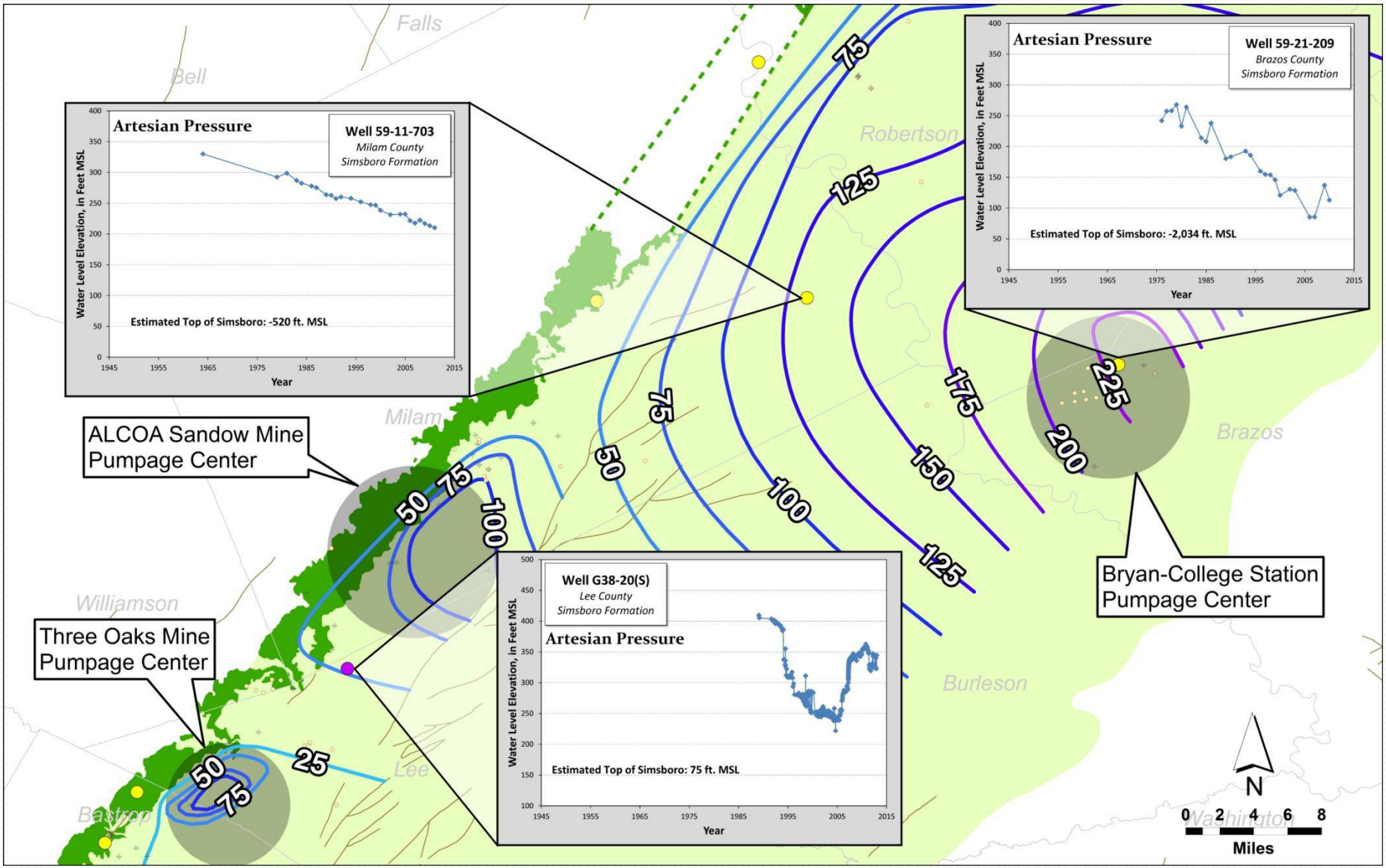
What is Drawdown?



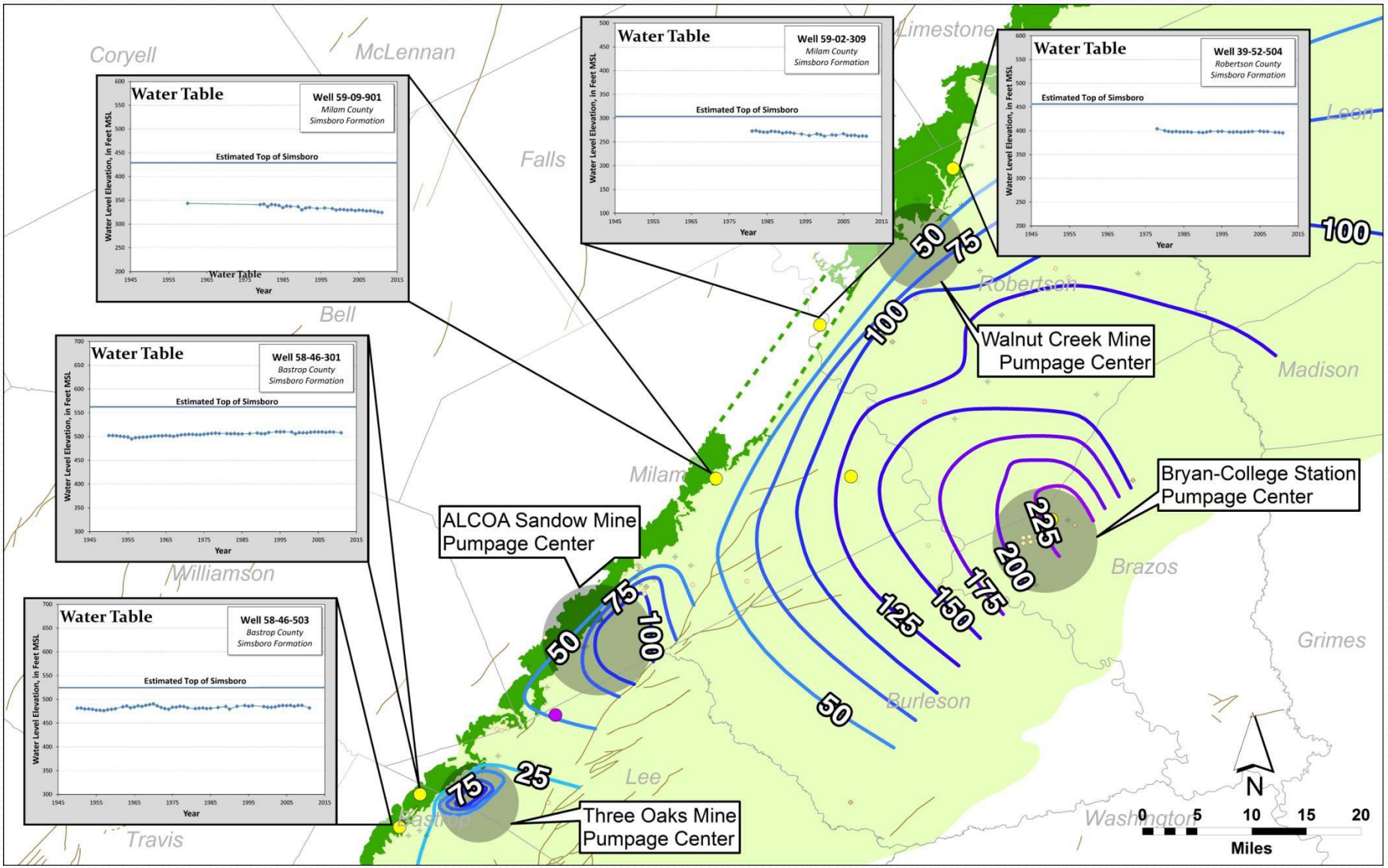
Simsboro Historical Drawdown



Artesian Pressure Drawdown



Water Table Drawdown



What Makes a Good DFC?

- Should succinctly and directly address core issues:
  - ***Resource Depletion*** – Will there be enough groundwater for future needs?
  - ***Environmental Impacts*** – Will pumping harm the aquifer system or ecosystems that depend on groundwater?
  - ***Economic Concerns**** – What are the costs vs. benefits of groundwater use?

Alternative DFCs

1. **Aquifer Storage DFC –**

   Specify the acceptable amount of water in aquifer storage through time.

"At least 95% of the groundwater currently stored in the aquifer should remain in storage in 50 years."

---

2. **"Spotlight" DFC –**

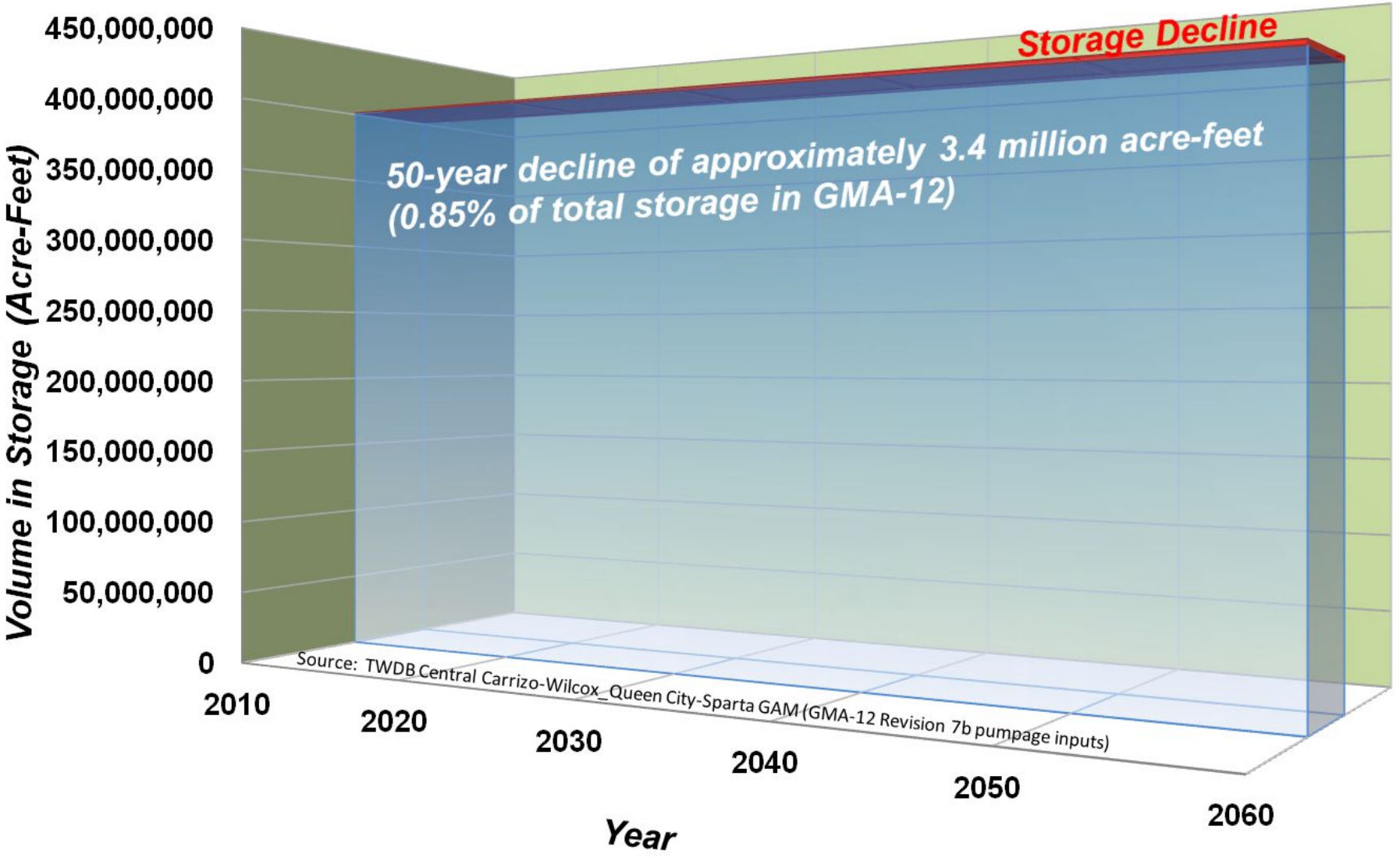
   Select conditions for specific areas or features that are uniquely affected by groundwater flows or effects.

"The flow from Clearwater Spring shall be maintained at rate of at least ten cubic feet per second over the next 50 years."

Alternative DFCs

- **Aquifer Storage DFCs** –
  - Currently used in GMA 1, GMA 2, GMA 6, GMA 7
  - Verified through water table monitoring
  - Slow, predictable response
- **"Spotlight" DFCs** –
  - Directly address environmental concerns (EAA)
  - Straightforward monitoring
  - Careful cost/benefit analysis needed to justify
  - More difficult to implement fairly

Simsboro & Carrizo Storage



DFC Comparison

Current Model-Based DFCs

- Do not directly address aquifer depletion or environmental concerns
- Based only on modeling incorporating educated guesses of future pumpage
- Tied to unique simulation: inflexible planning and permitting

Alternative DFCs

- Directly address aquifer depletion or environmental concerns
- Based on assessment of resource availability and environmental protection
- Tied to overall groundwater availability: flexible planning and permitting

DFC Comparison, Cont.

Current Model-Based DFCs

- Non-specific “drawdown” difficult to monitor/calculate
- Limits difficult to justify

Alternative DFCs

- Monitoring is relatively straightforward
- Limits much easier to justify

In Conclusion

- DFCs and MAGs play an extremely influential role in Texas' response to current and future demands
  - Sets pumping cap for regional and State water plans
  - Determines which projects (strategies) Texas will approve and fund
  - Can act as permitting cap *on GCD level*

Conclusions, Cont.

- The current methods of selecting/adopting DFCs have fundamental drawbacks associated with them.
- There are many advantages to storage-based and “spotlight” DFCs and they are already in use in other GMAs.

Discussion

More detailed article available:

James.Bene@RWHarden.com
512-345-2379