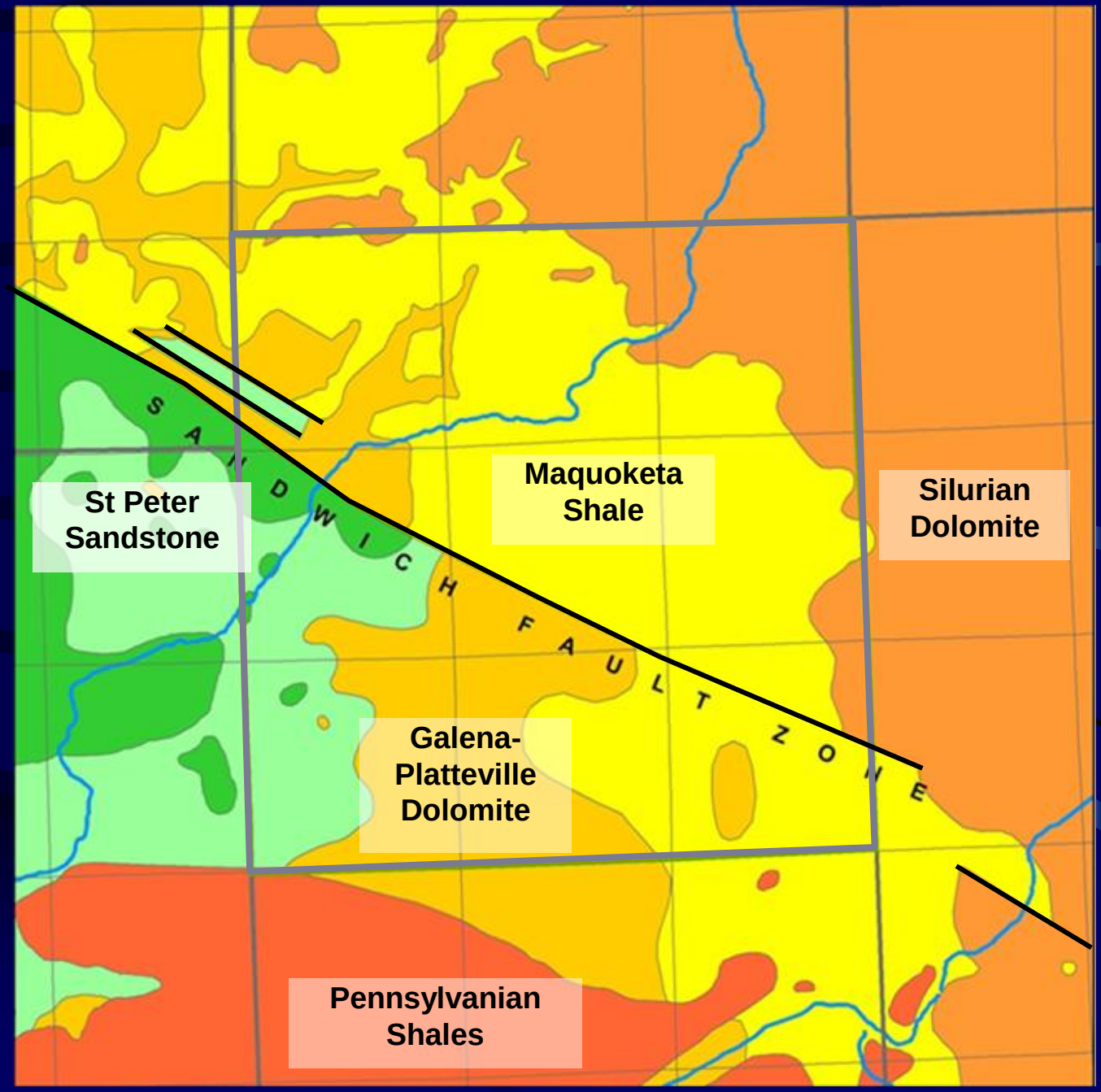
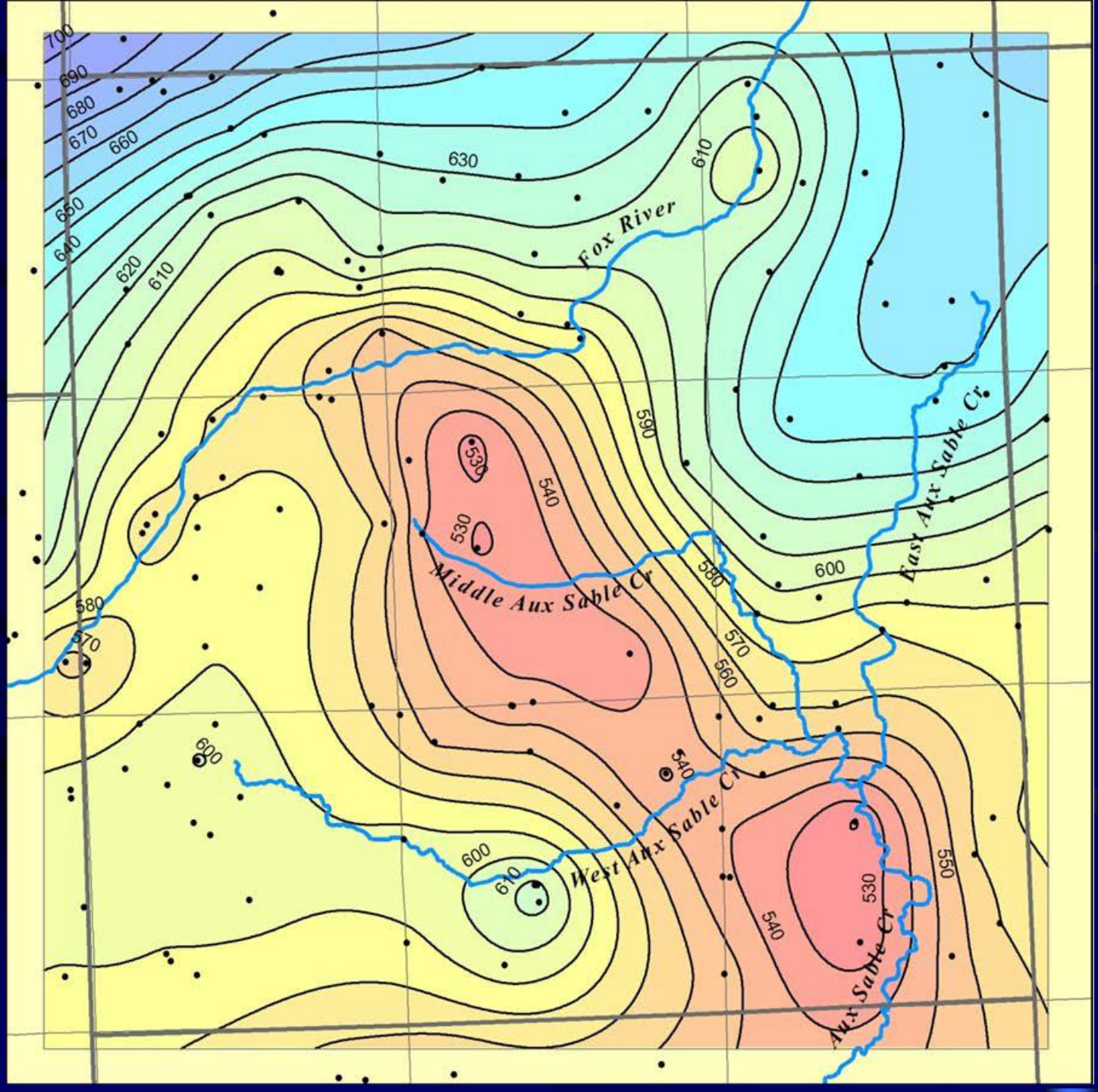
Impact of Future Groundwater Use in Kendall County

I Spy 8 Water Towers

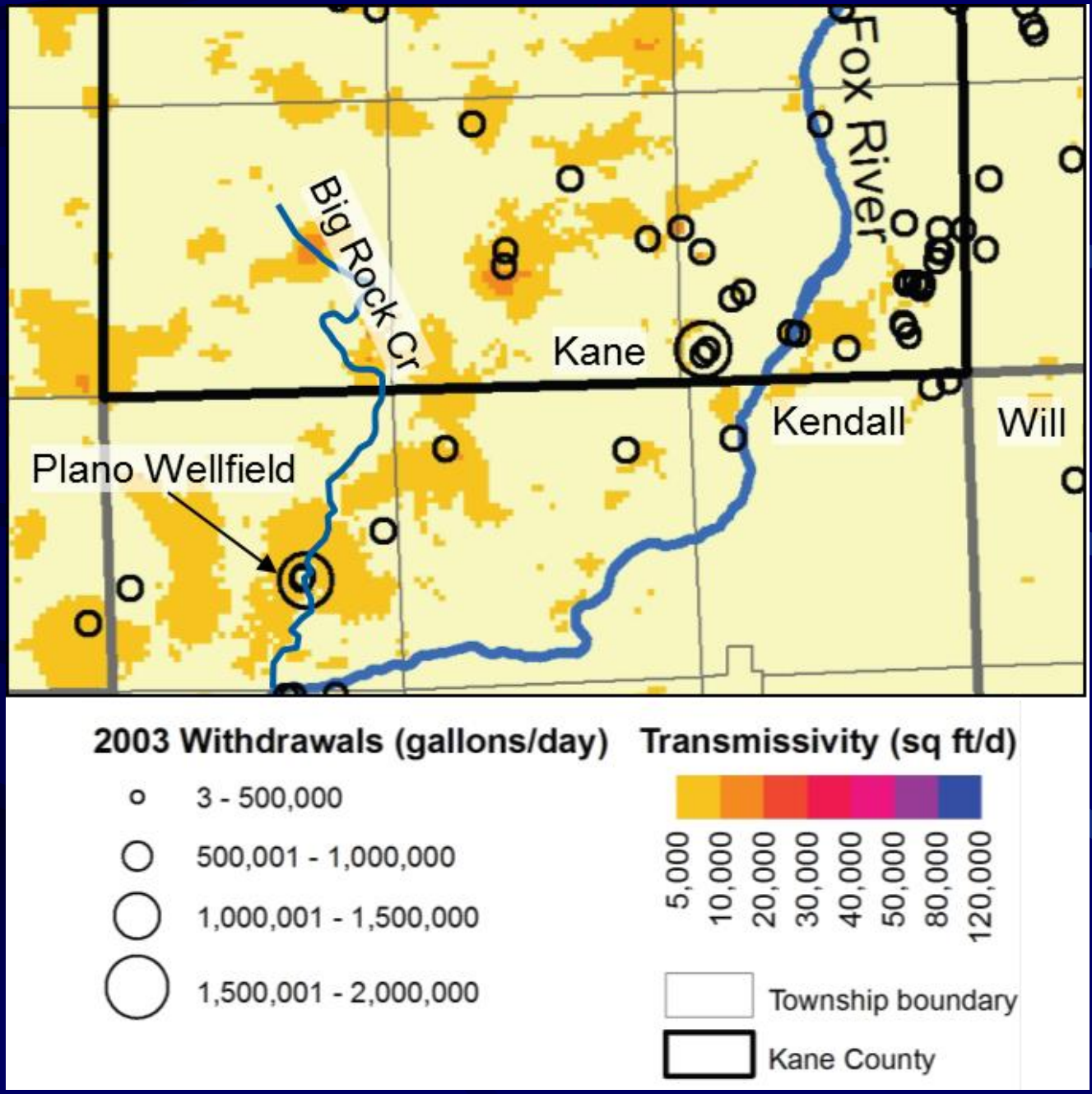
Bedrock Units in Kendall County



Shallow "aquifer" Potentio-metric Surface

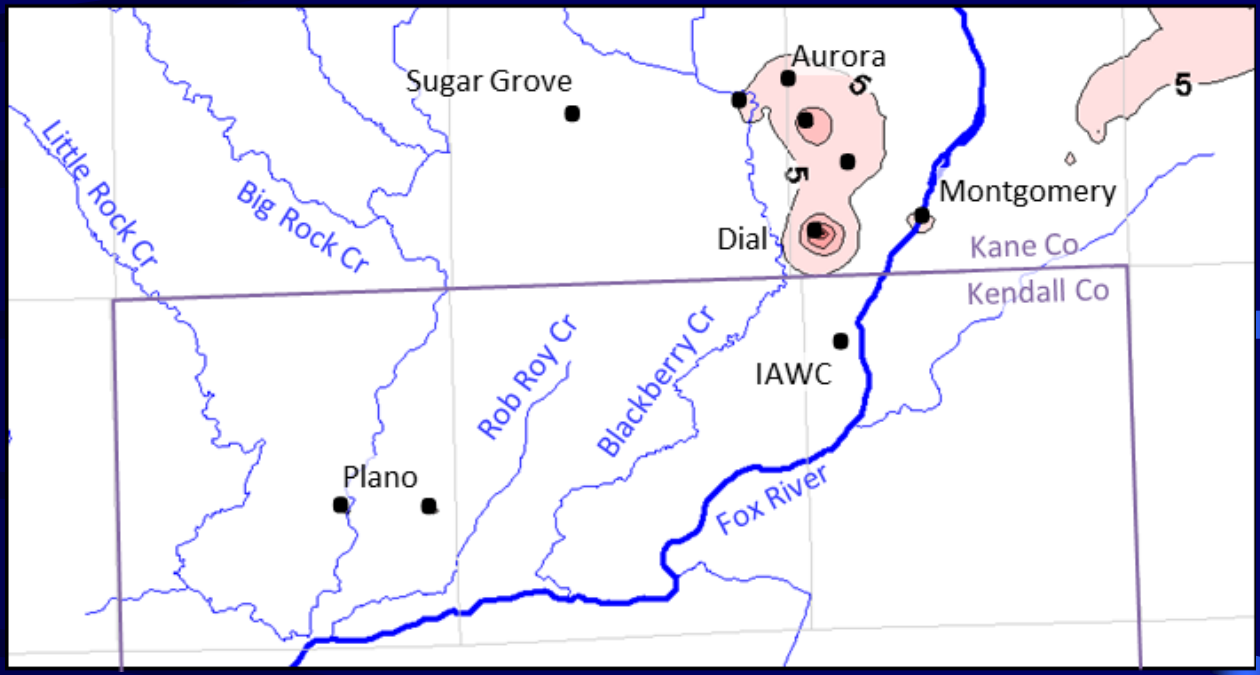


Transmissivity of the shallow deposits and high-capacity wells

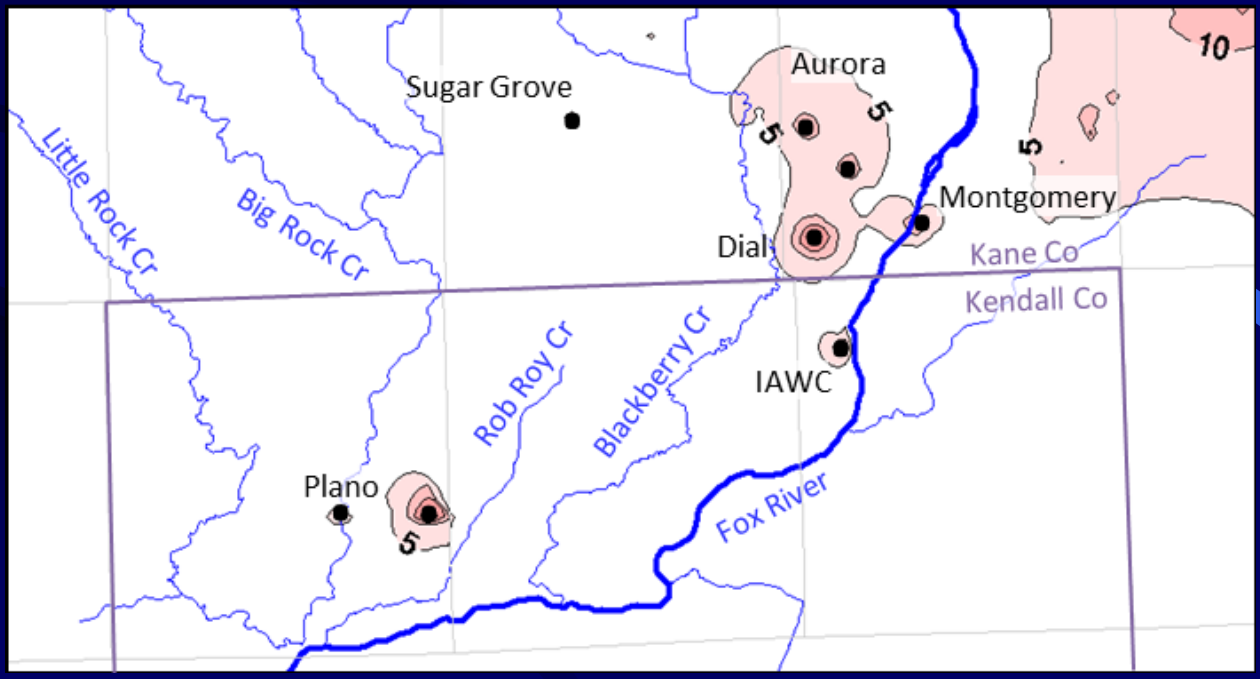


Simulated Drawdown in the Shallow Deposits

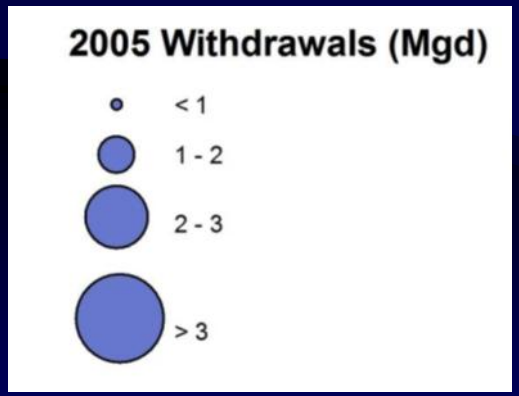
2005

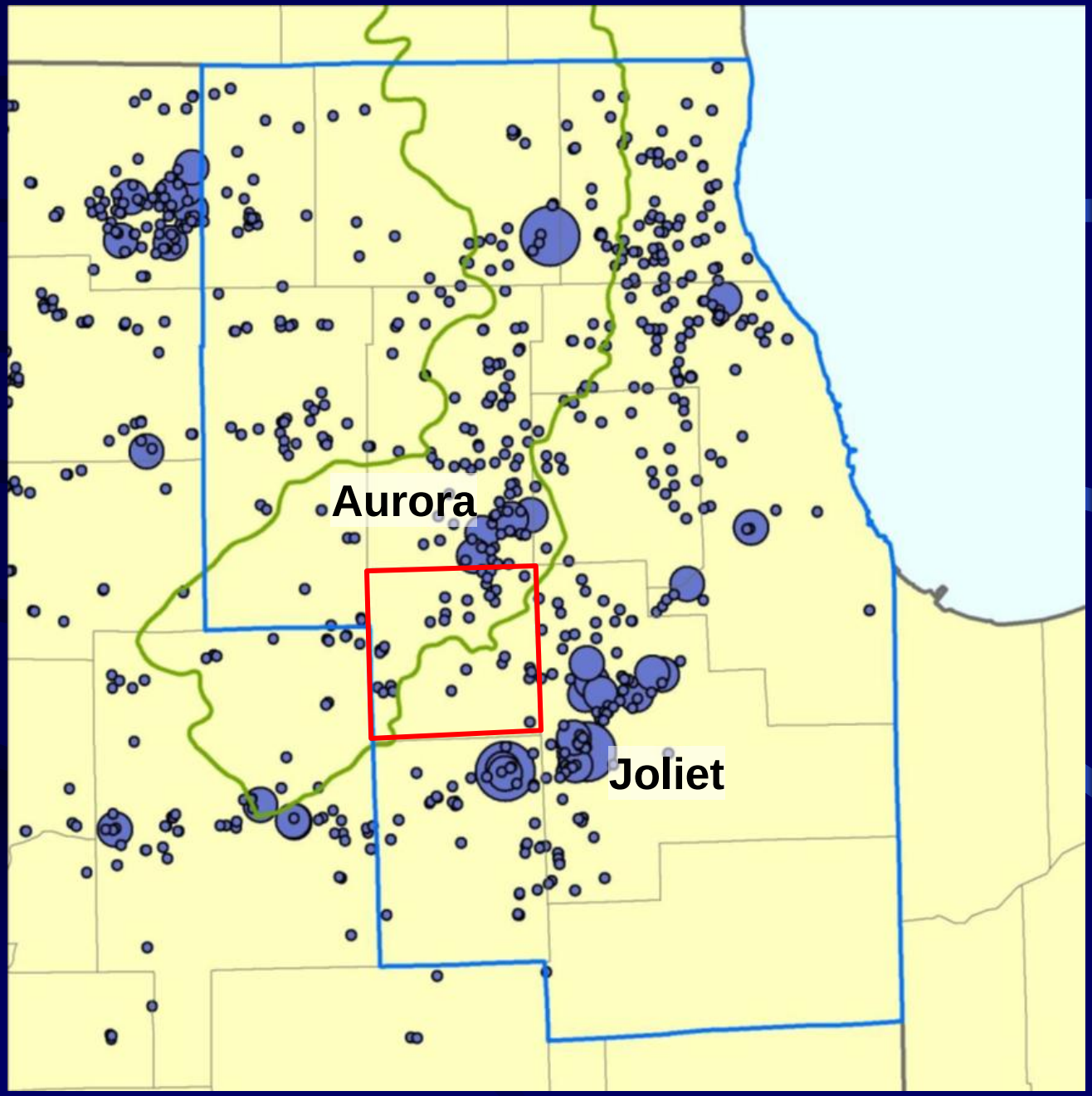


2050

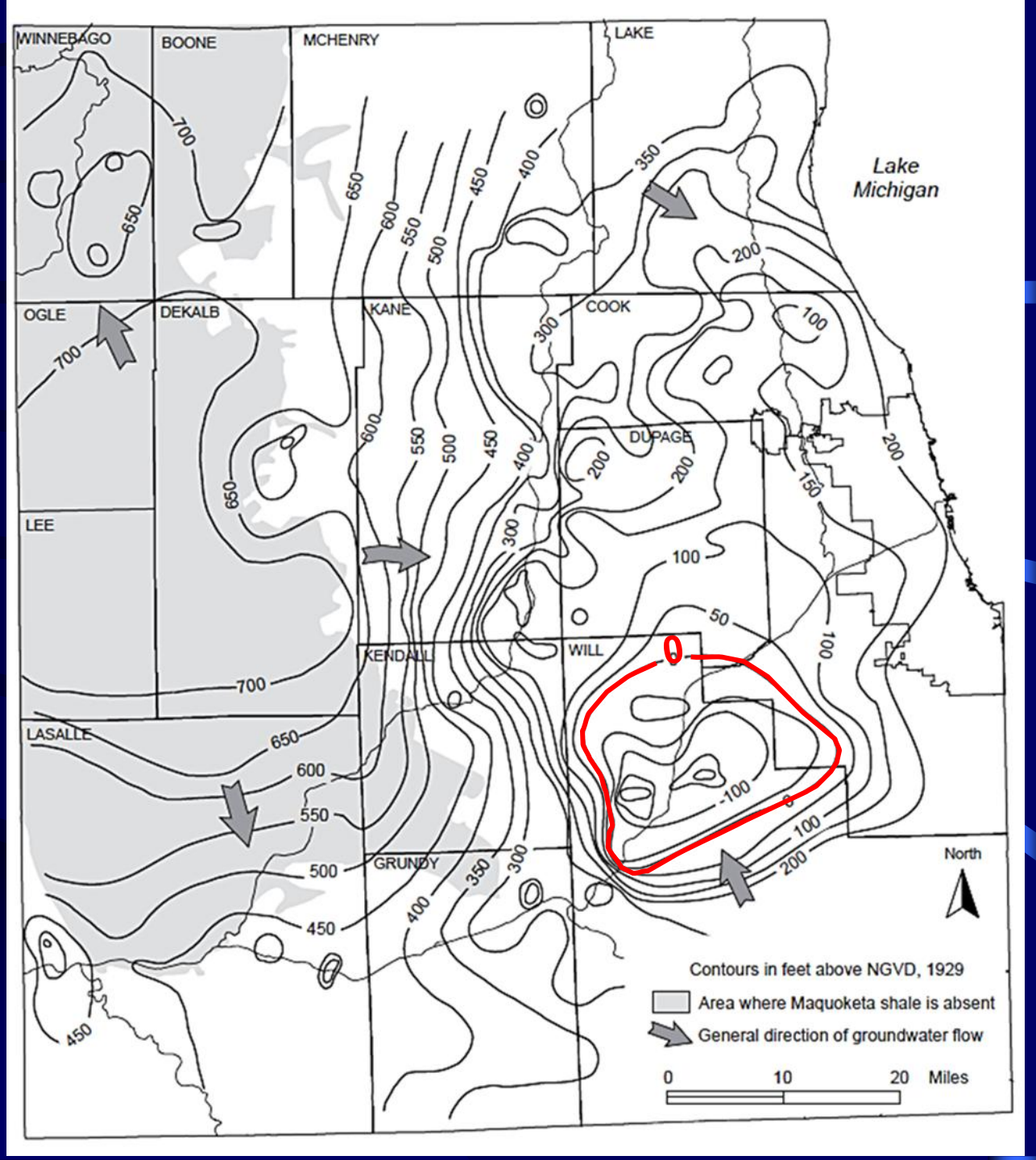


Deep Sandstone Aquifer Pumpage





Deep Sandstone Aquifer Potentiometric Surface in 2000

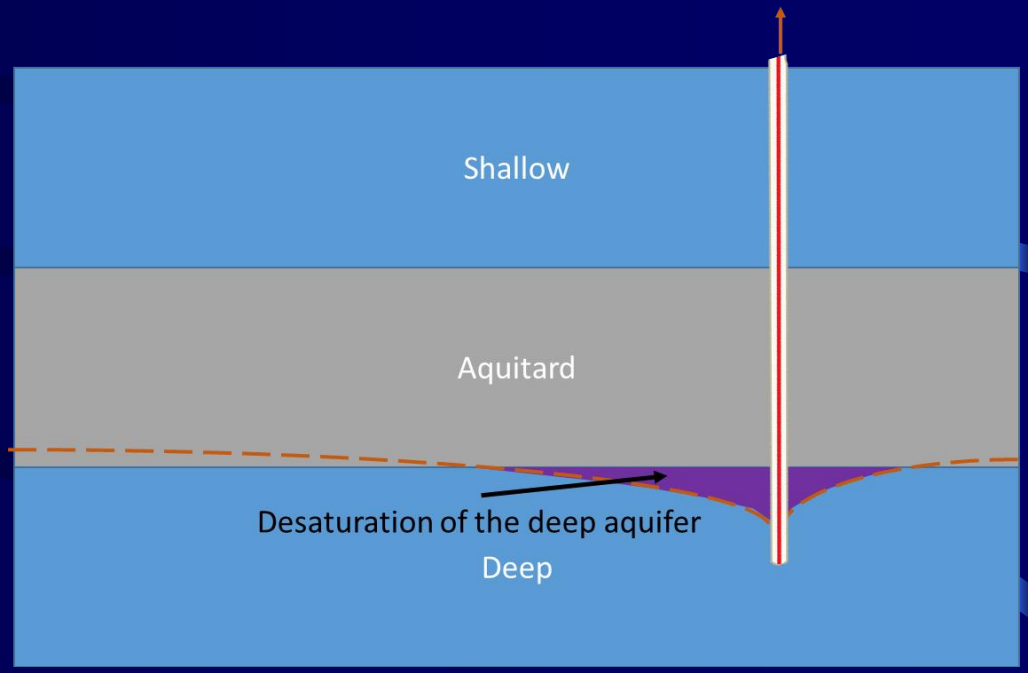


Partial desaturation of the deep aquifer (Ancell)

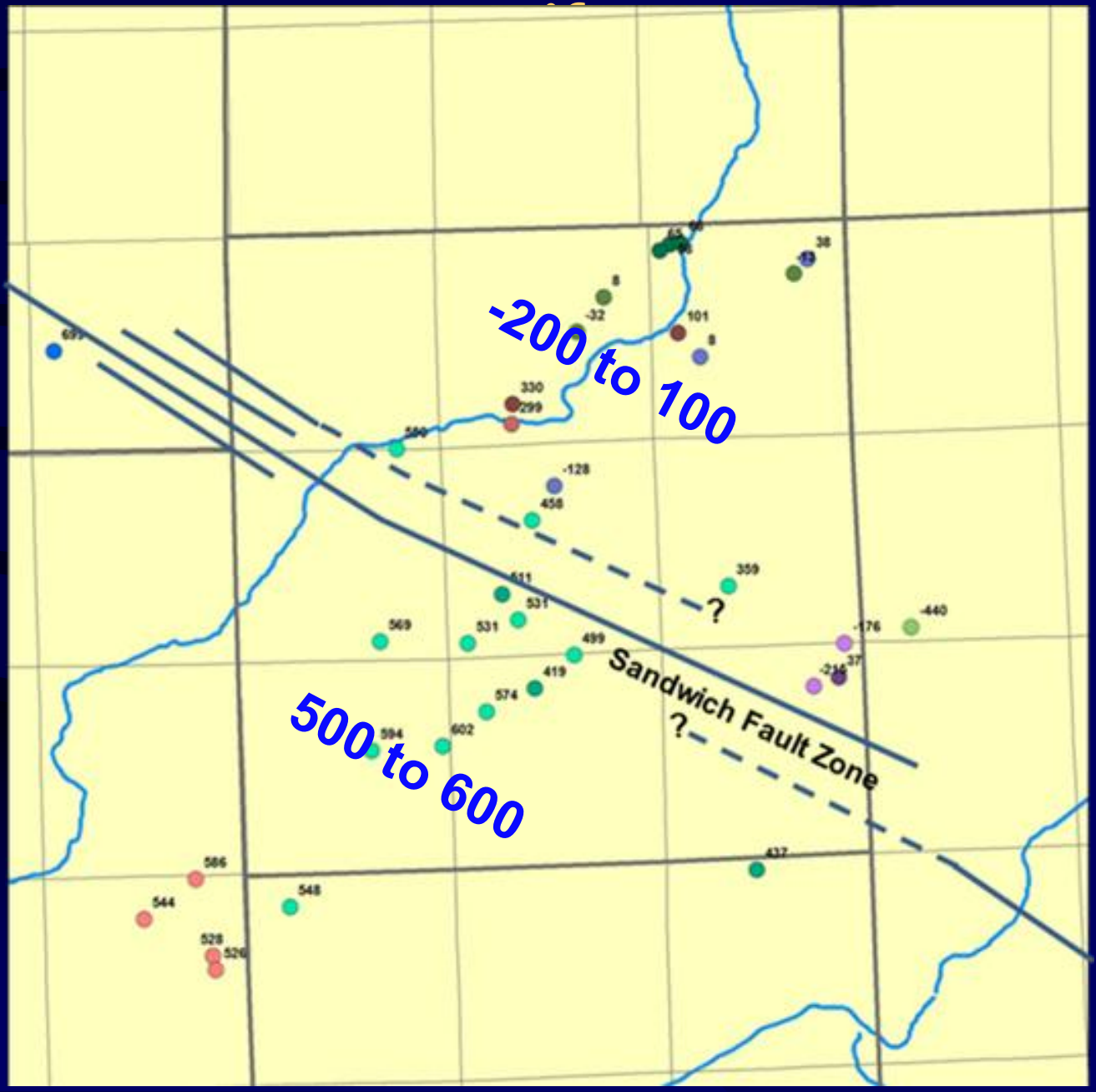
- **Deep groundwater withdrawals result in drawdown of deep heads**

- **Deep drawdown may:**
  - **Induce flow from the shallow aquifer to the deep aquifer**
  - **Induce upward flow of saline water from deep units**
  - **Lead to partial desaturation**

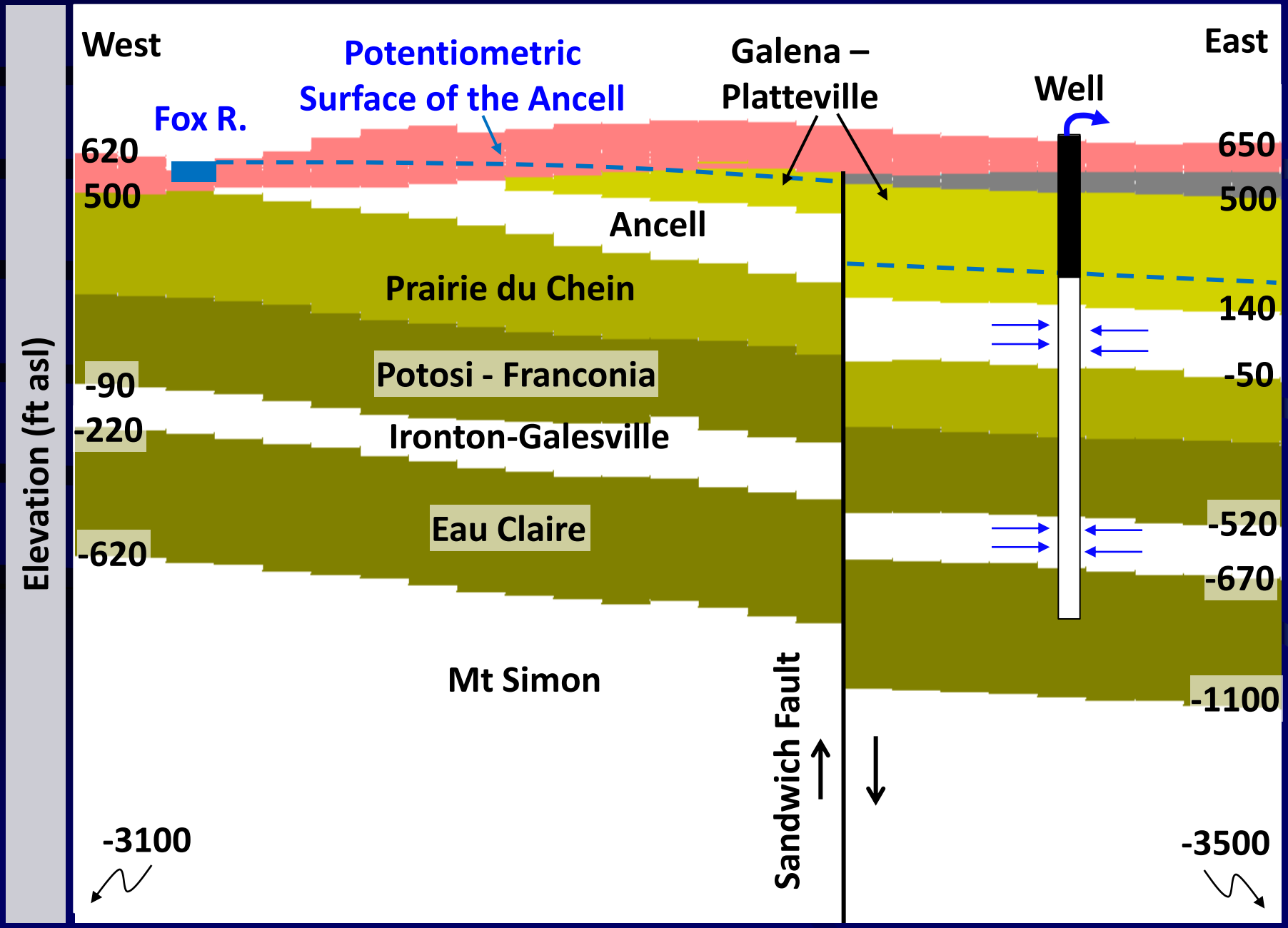
- **Partial desaturation leads to:**
  - **Loss in transmissivity**
  - **Redox changes**



Water Level Elevations in the Deep Sandstone

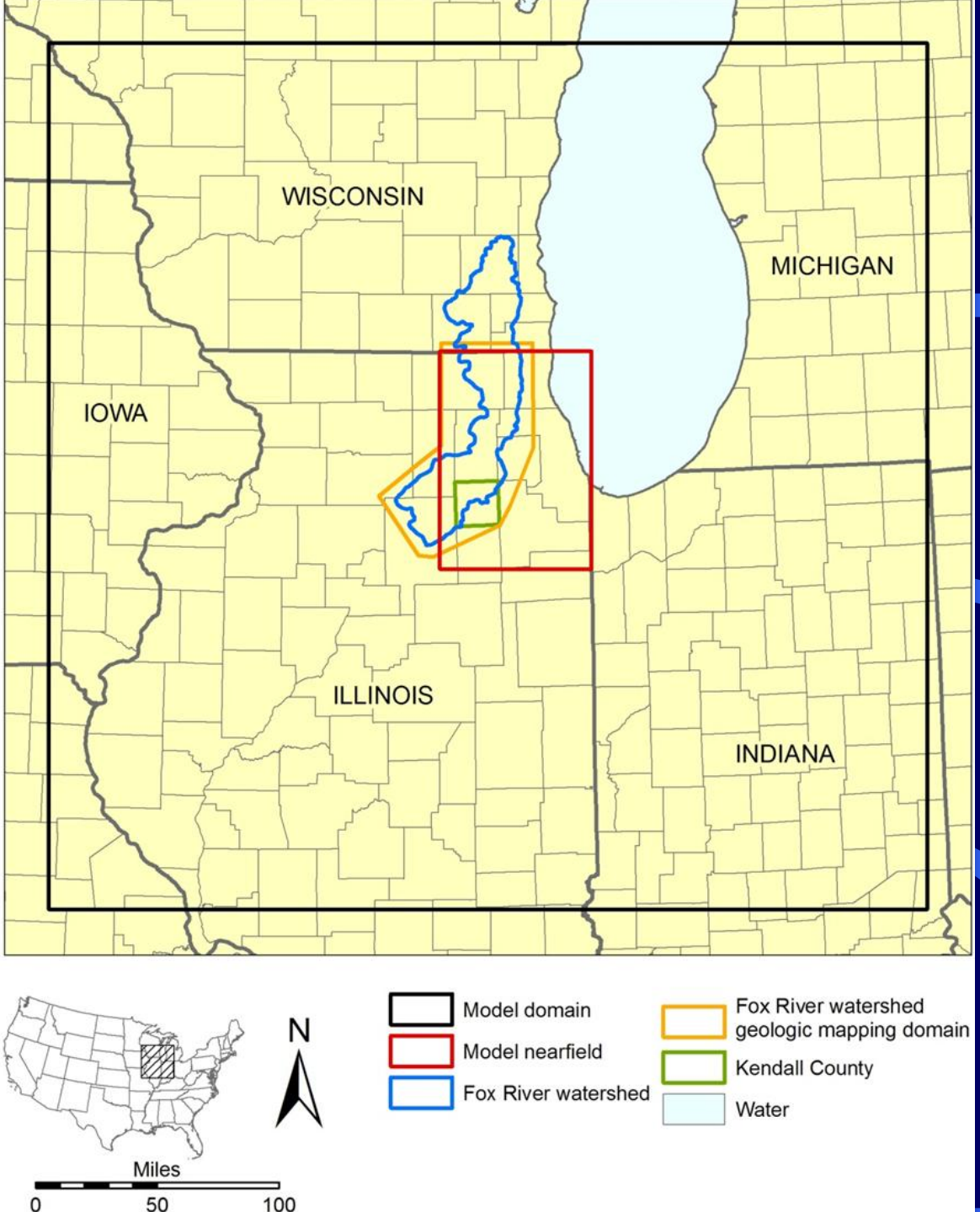


East-West Cross Section Across Fault

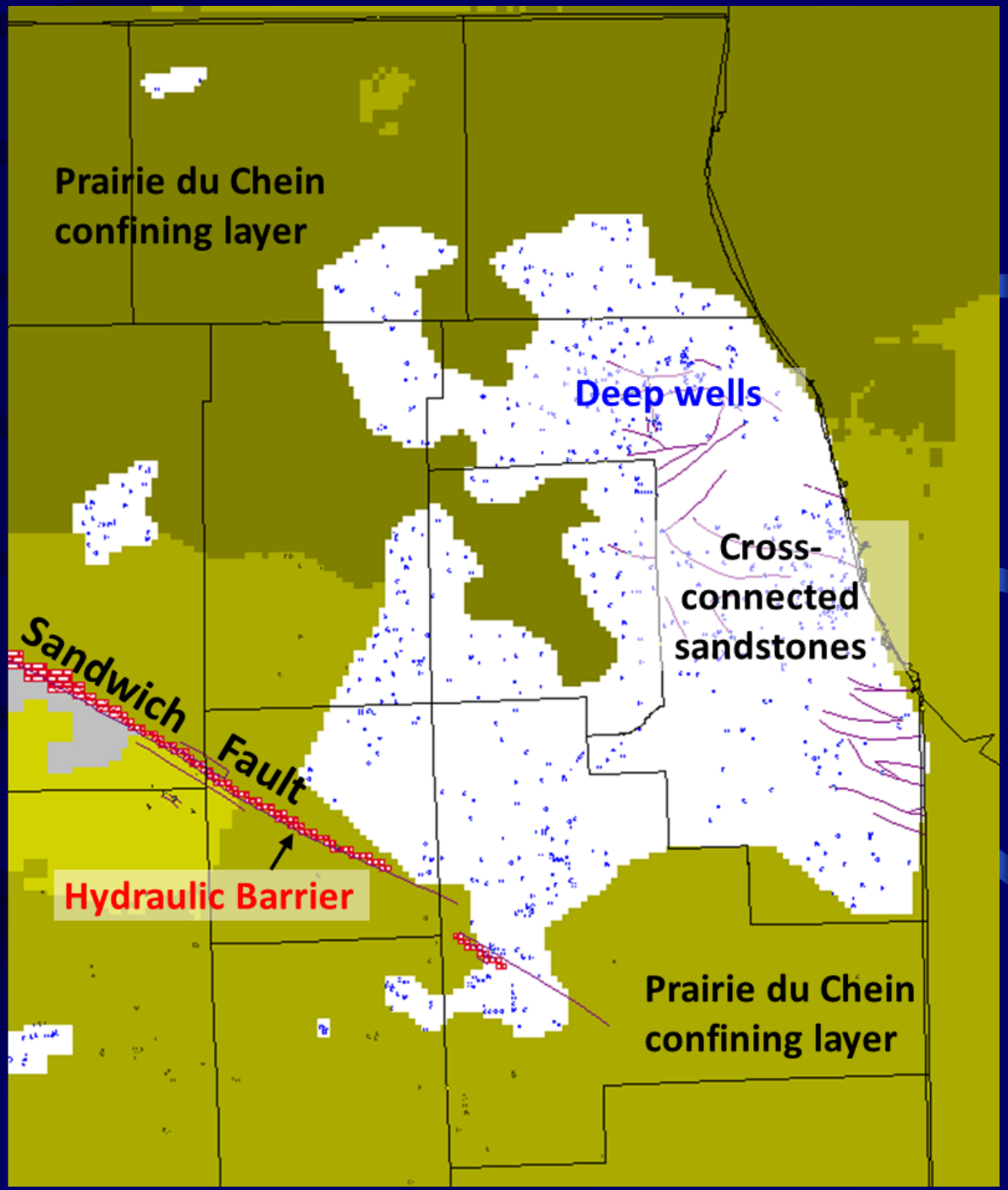


Northeastern Illinois Model

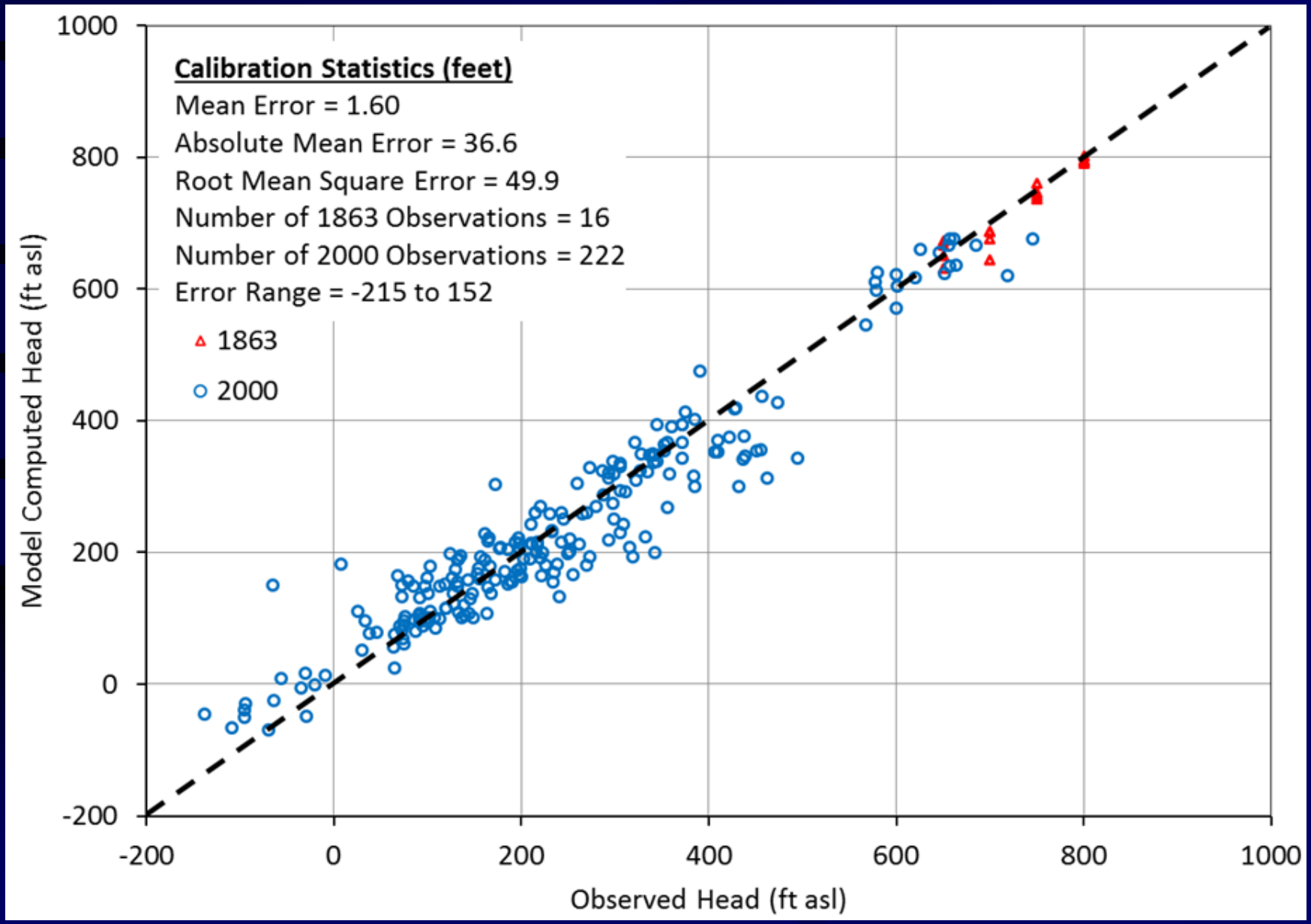
- 2500’ minimum grid
- 21 layers
- Incorporation of the Sandwich Fault
- Incorporation and inter-aquifer connections
- Recalibration of the model with mass measurement data



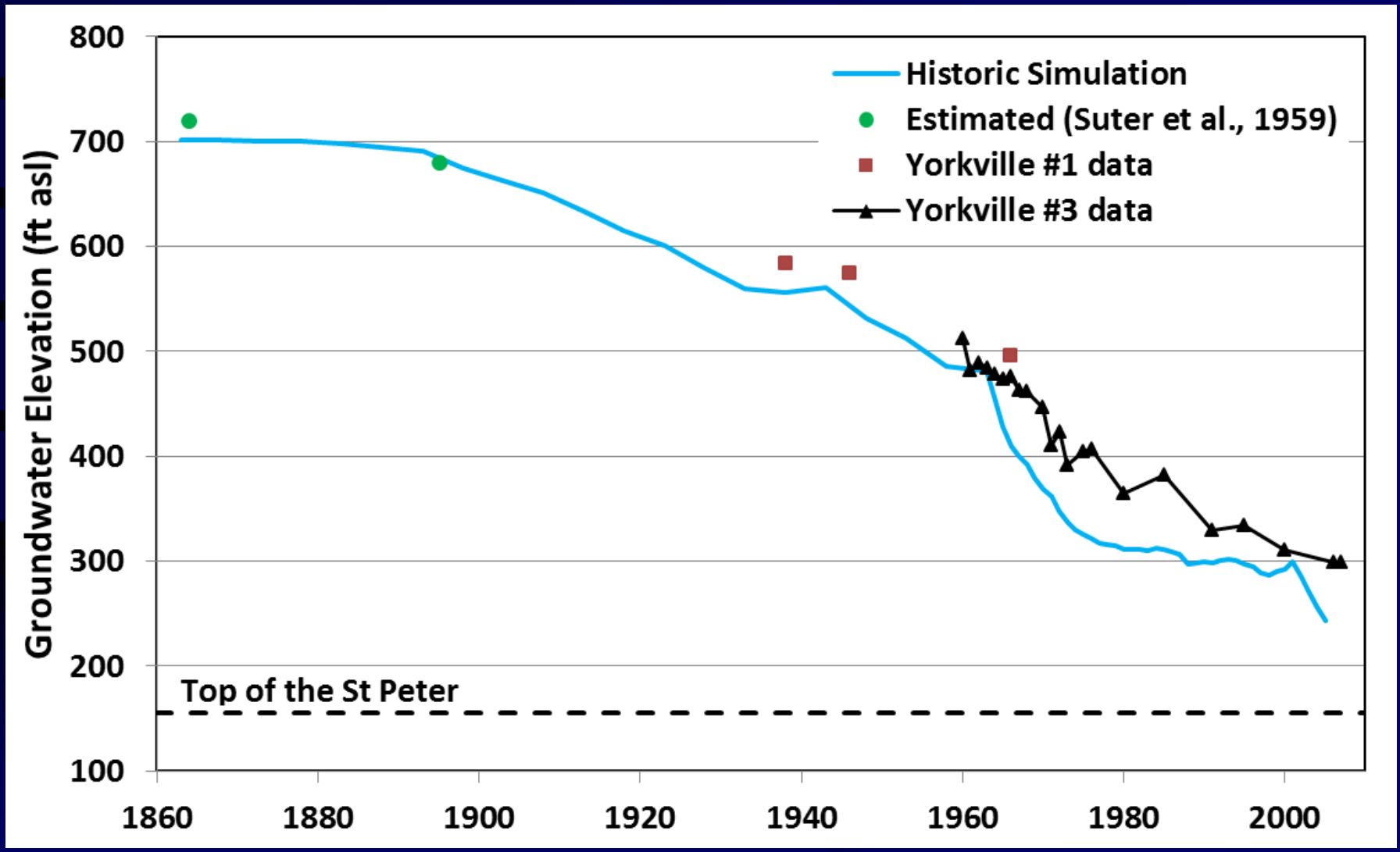
Model Modifications



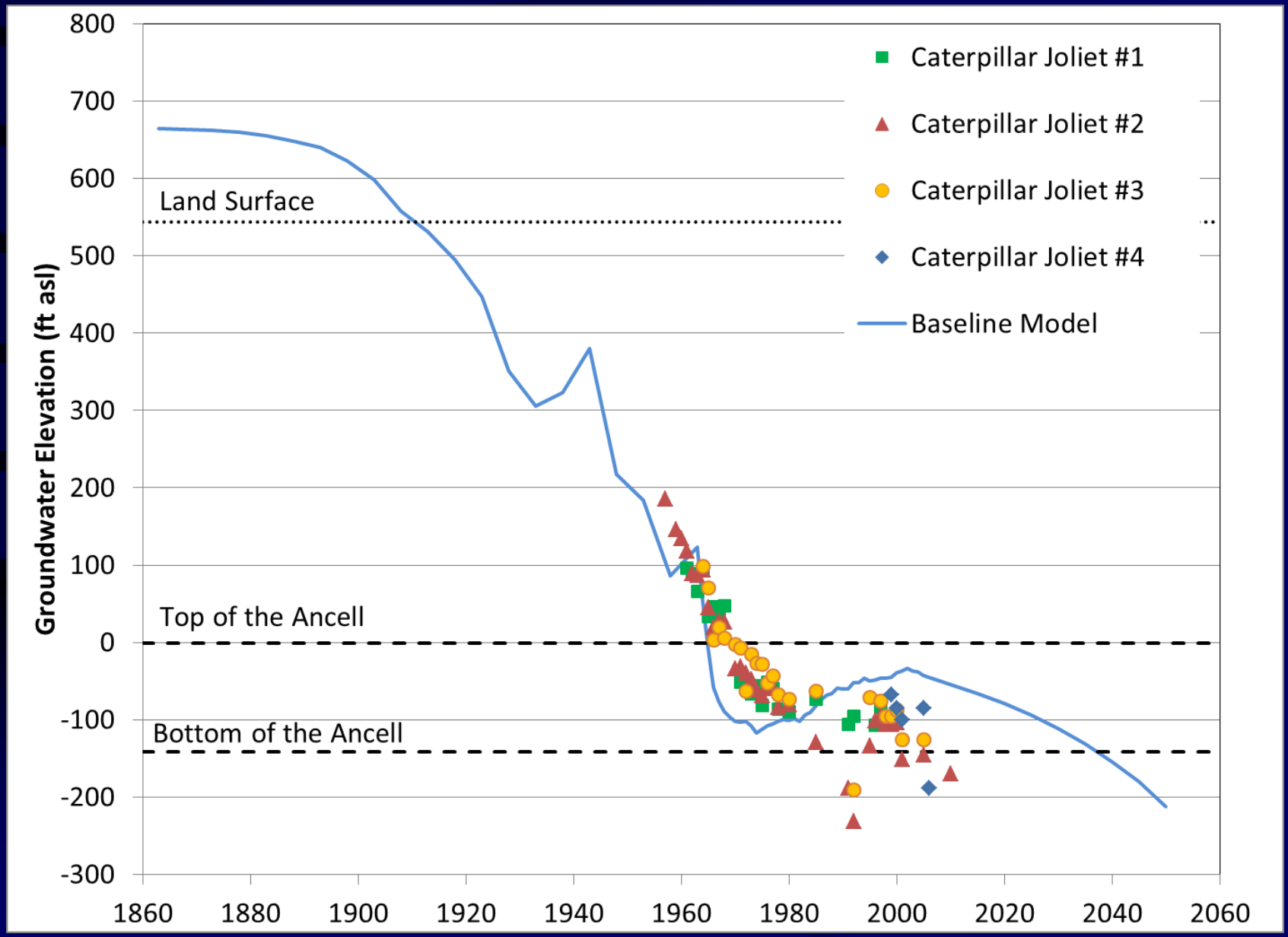
Model Calibration



Transient Model Calibration - Yorkville



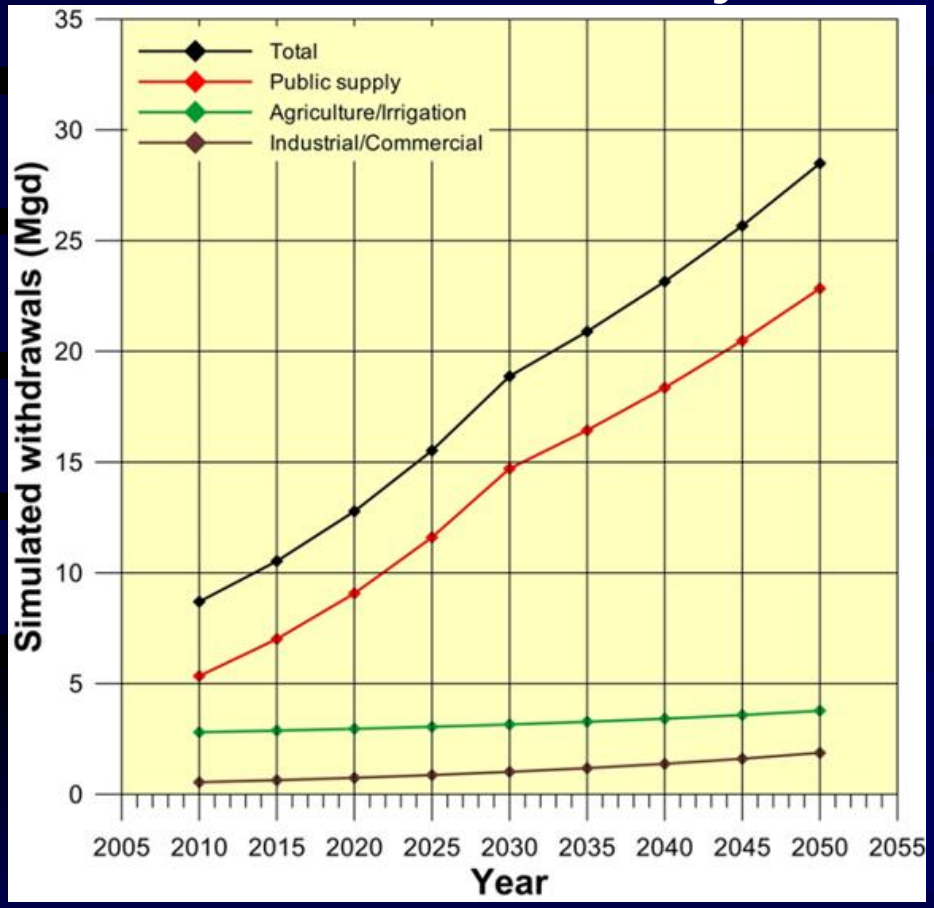
Caterpillar Joliet Data



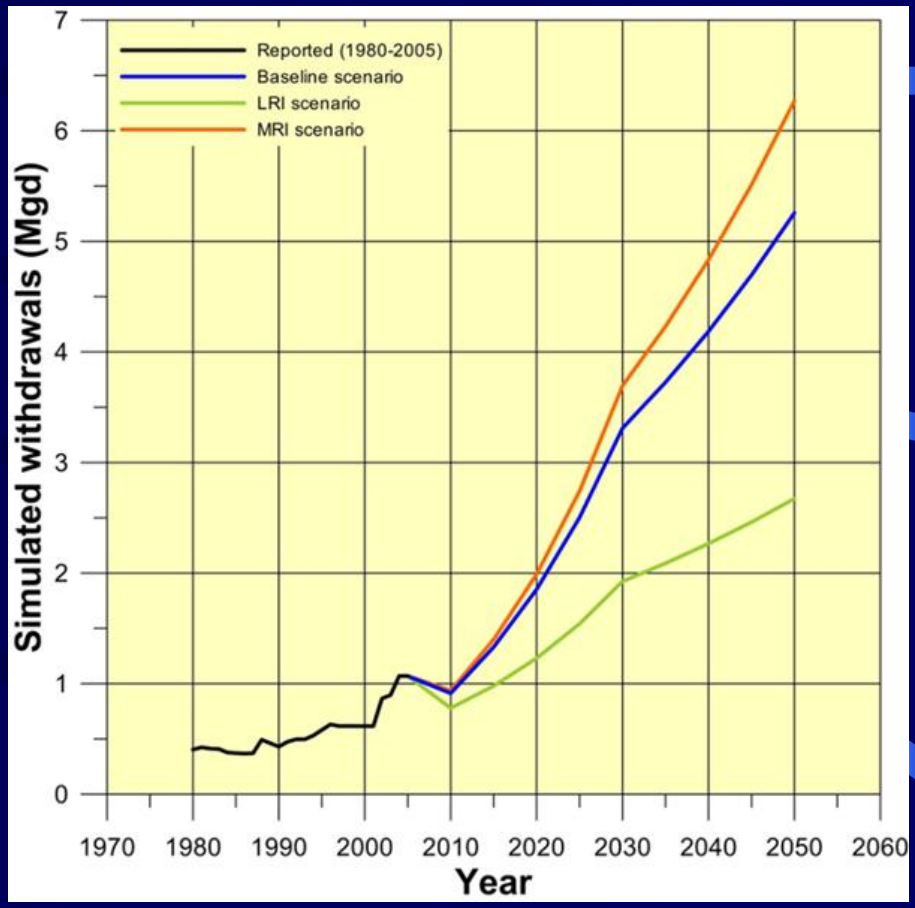
What Does this Mean for Future Growth?

Projected Future Pumpage

Kendall County

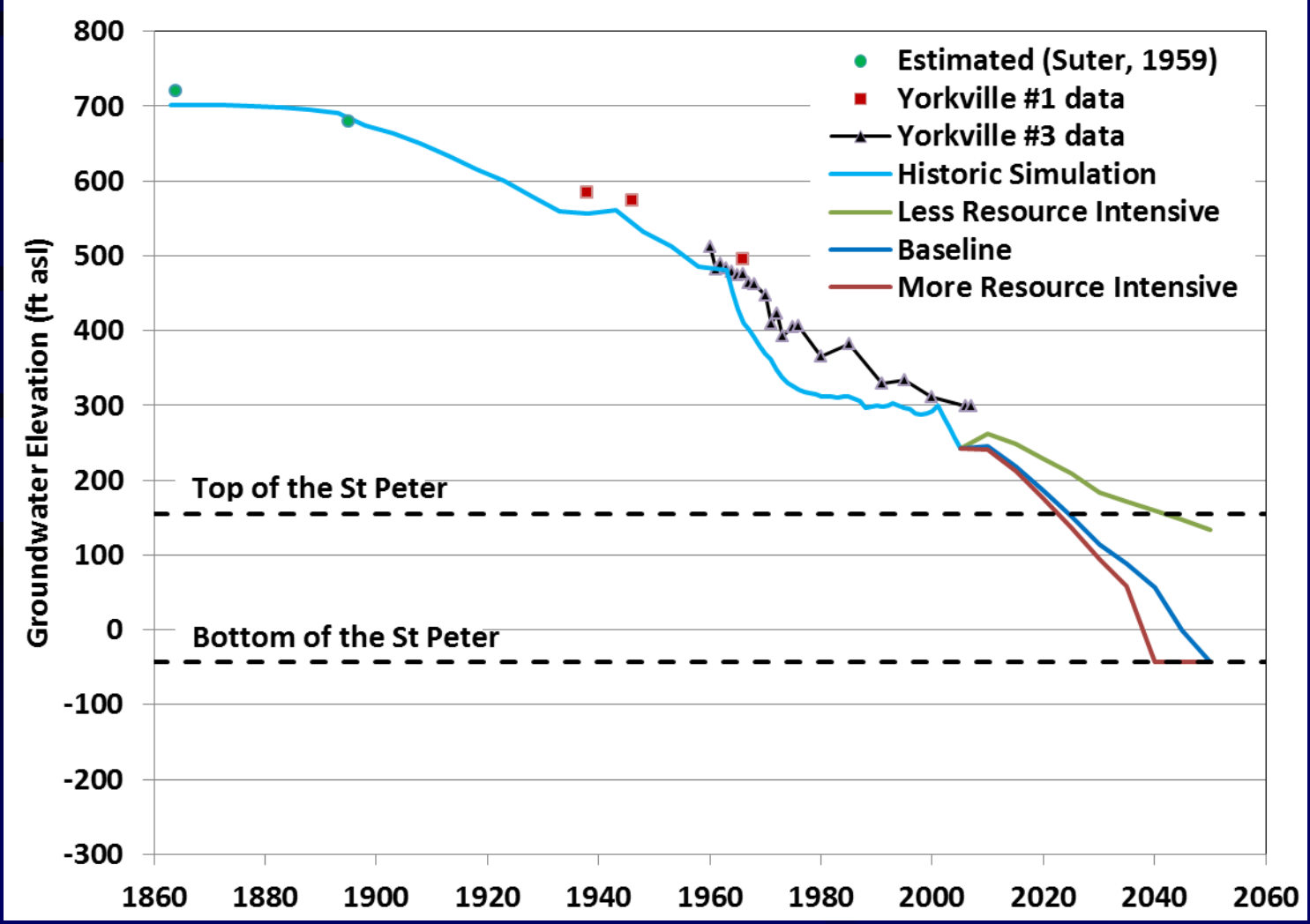


Yorkville

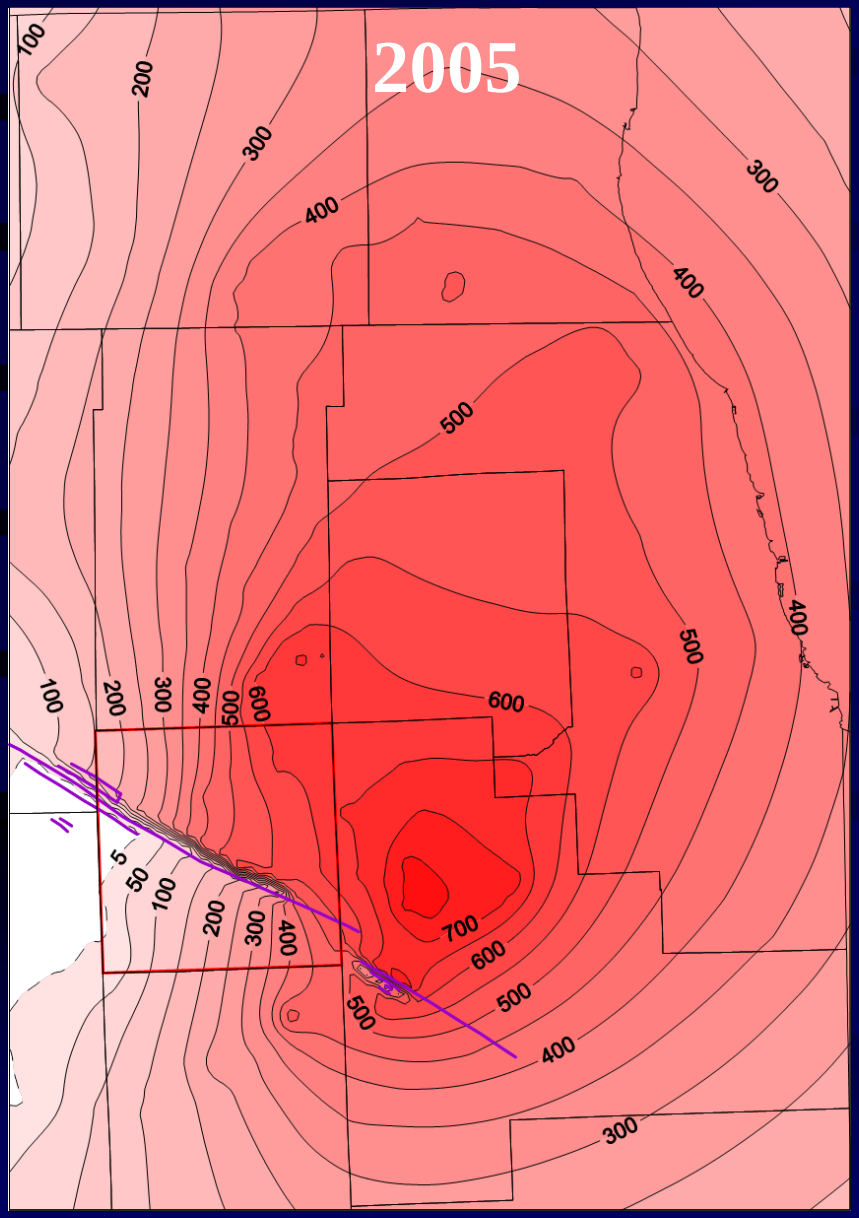


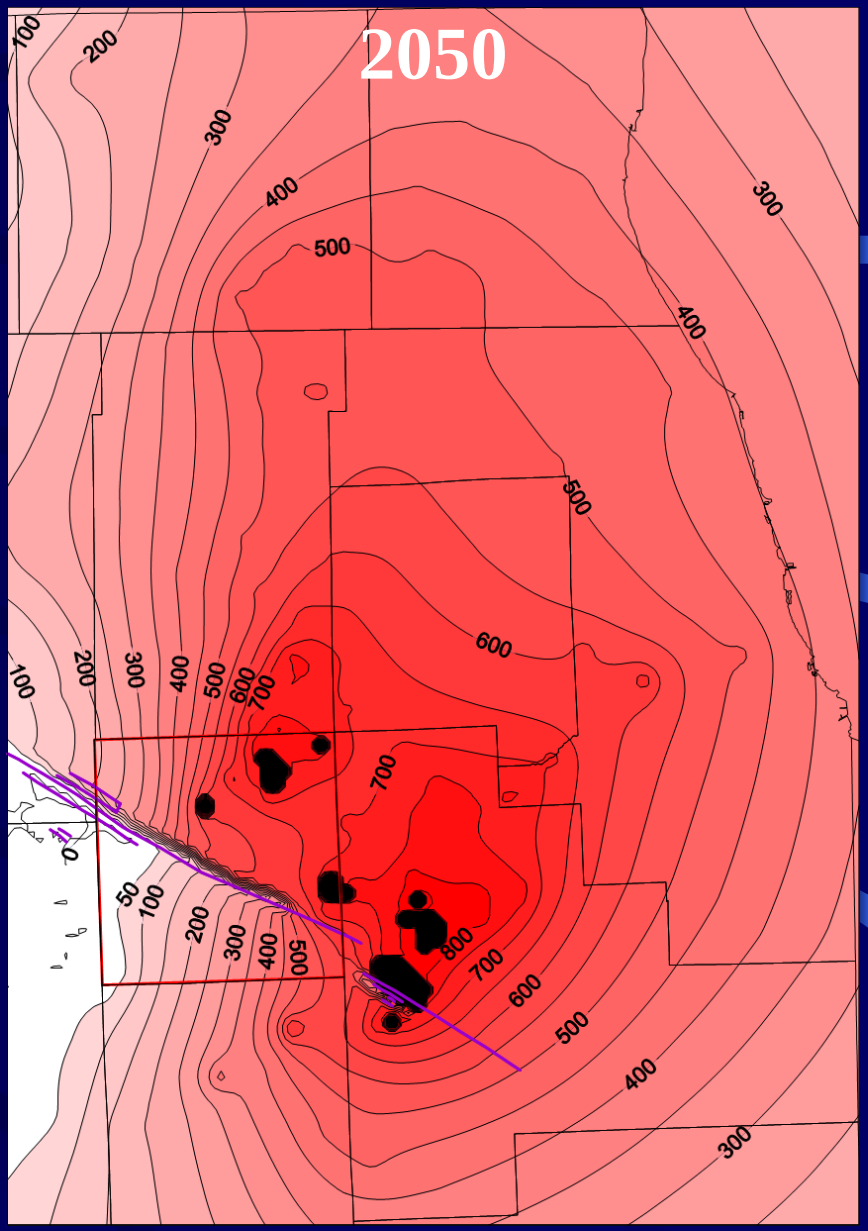
Yorkville

Transient Calibration and Projected Water Levels to 2050



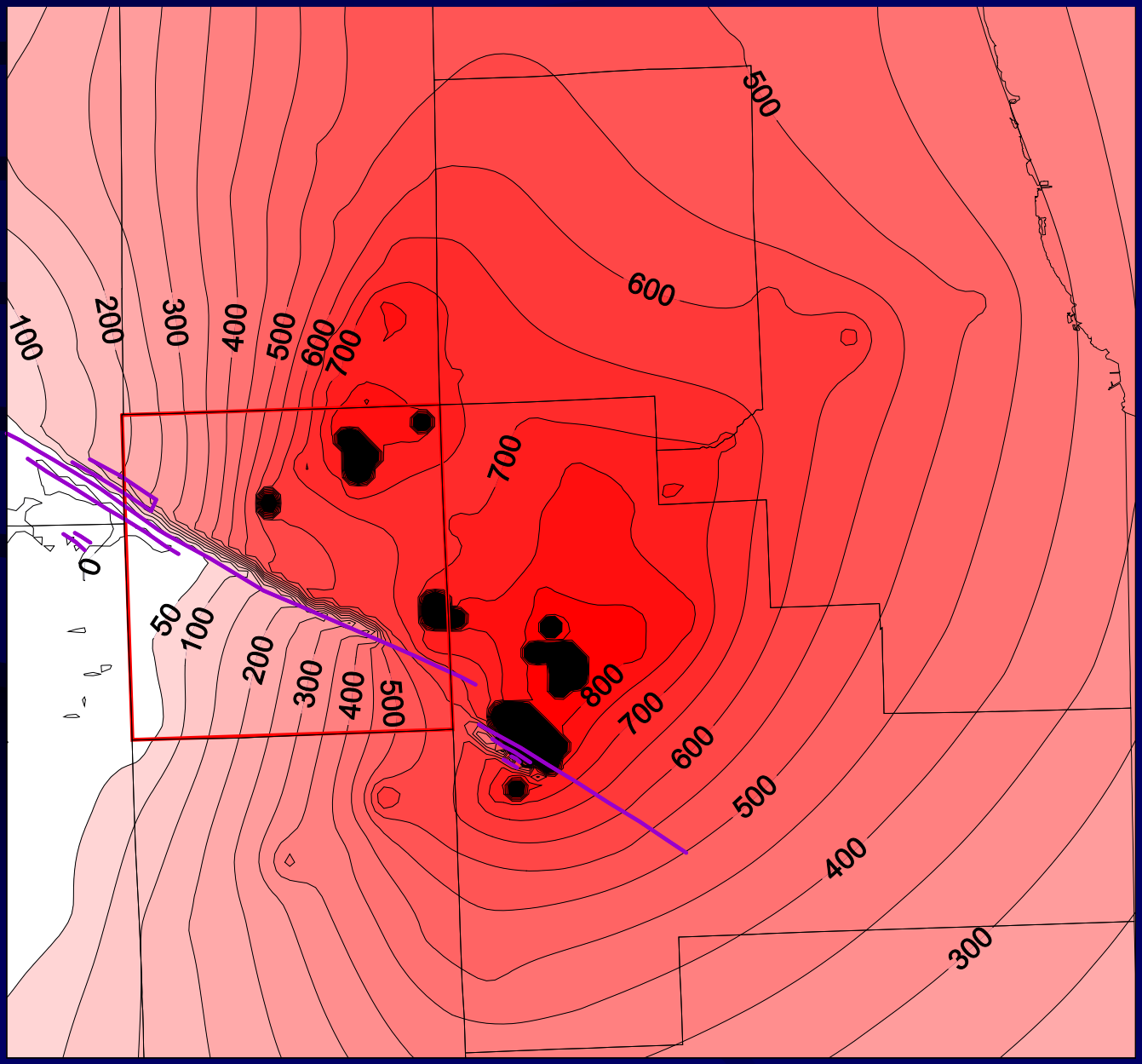
Model Predicted Drawdown - Baseline





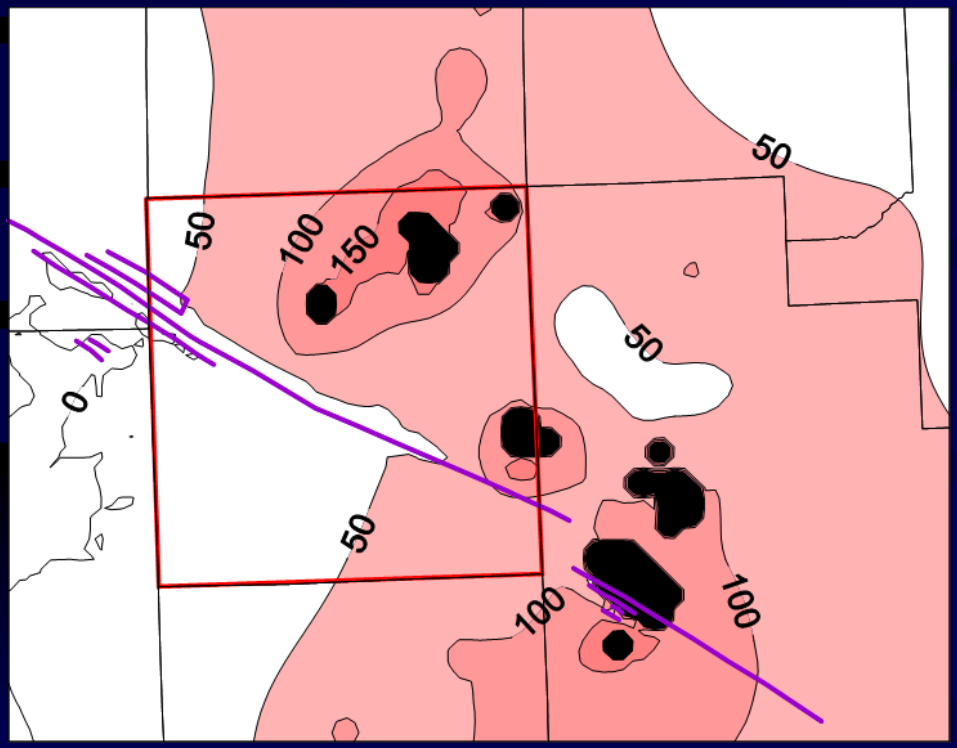
Black areas represent complete dewatering of the Ancell (St Peter)

Model Predicted Drawdown – 2050 Baseline

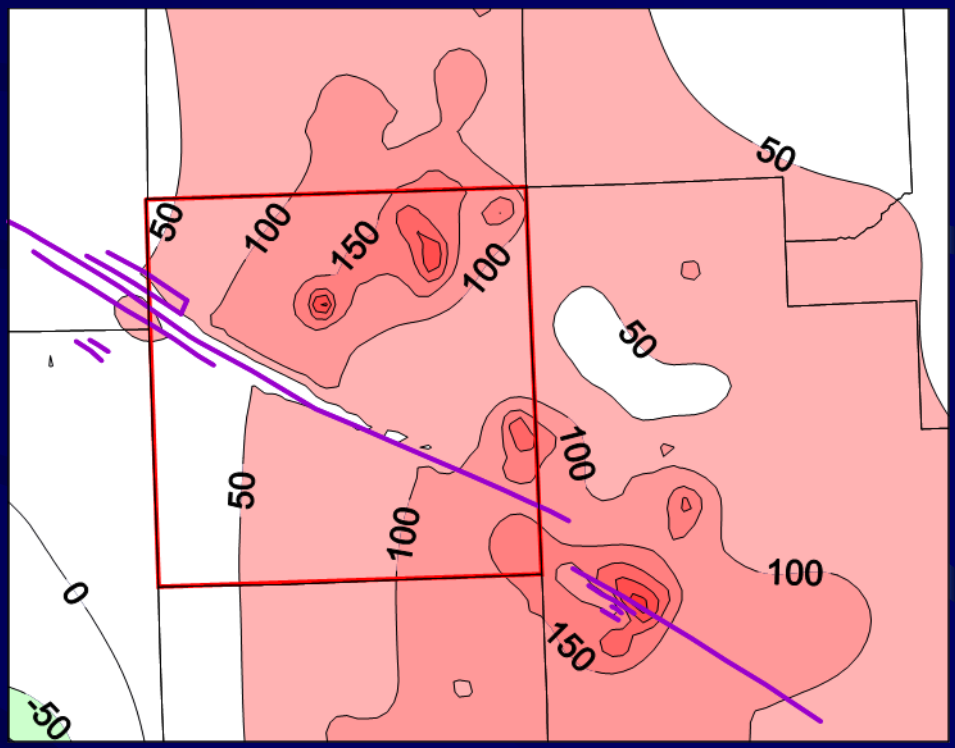


Additional Drawdown: 2005 to 2050
Baseline Scenario

Ancell (St Peter)

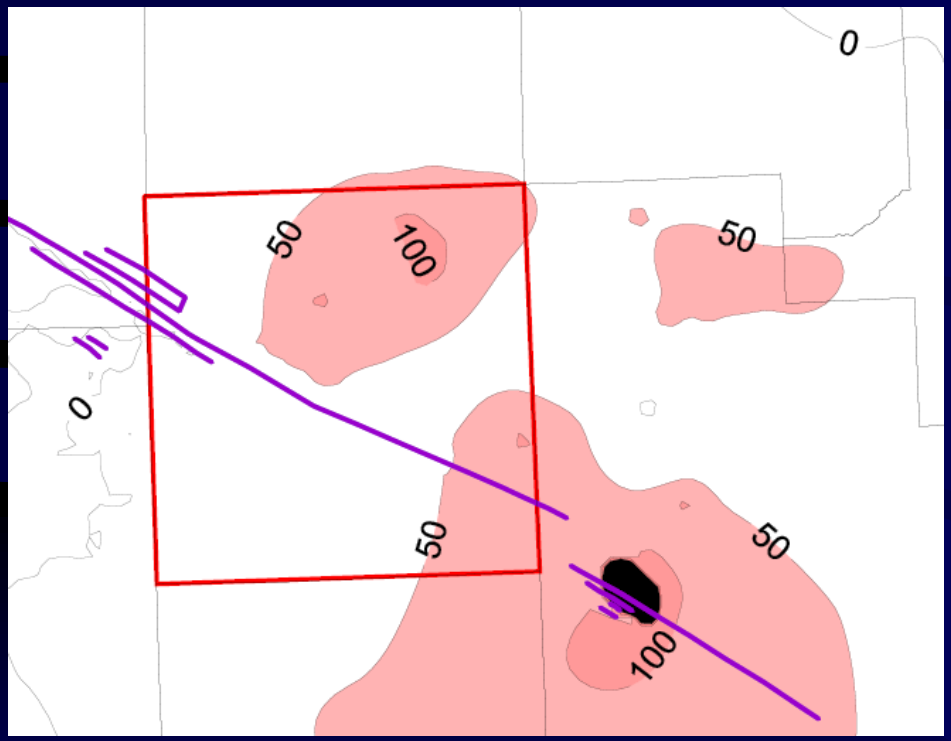


Ironton Galesville

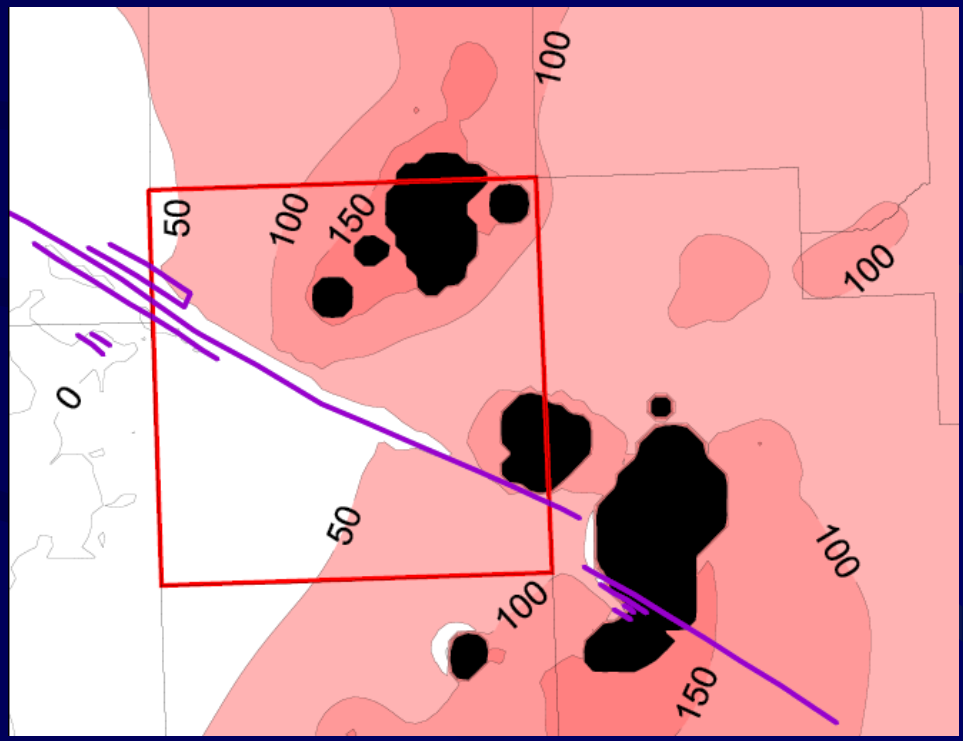


Additional Drawdown: 2005 to 2050
Ancell (St Peter)

Least Resource Intensive

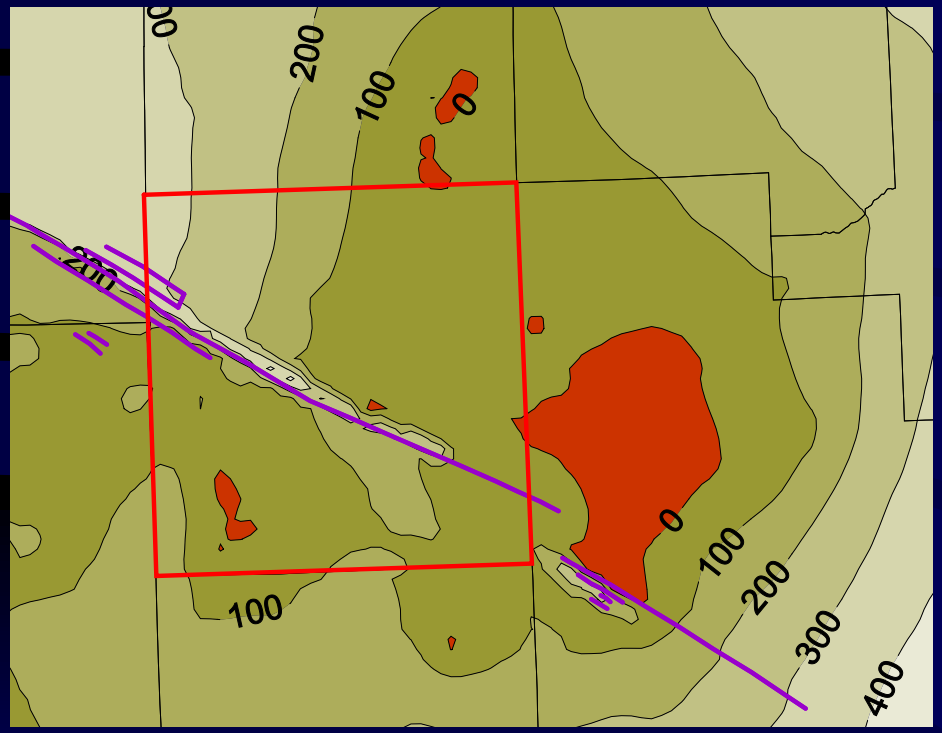


More Resource Intensive

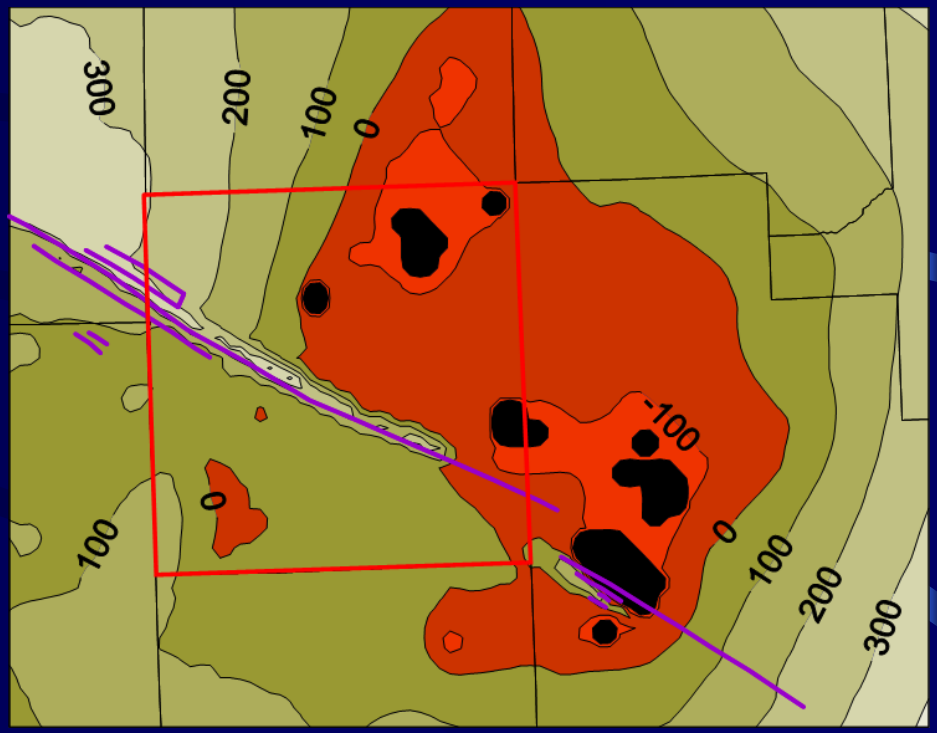


Model Predicted Head above the Top of the Ancell (St Peter) Aquifer

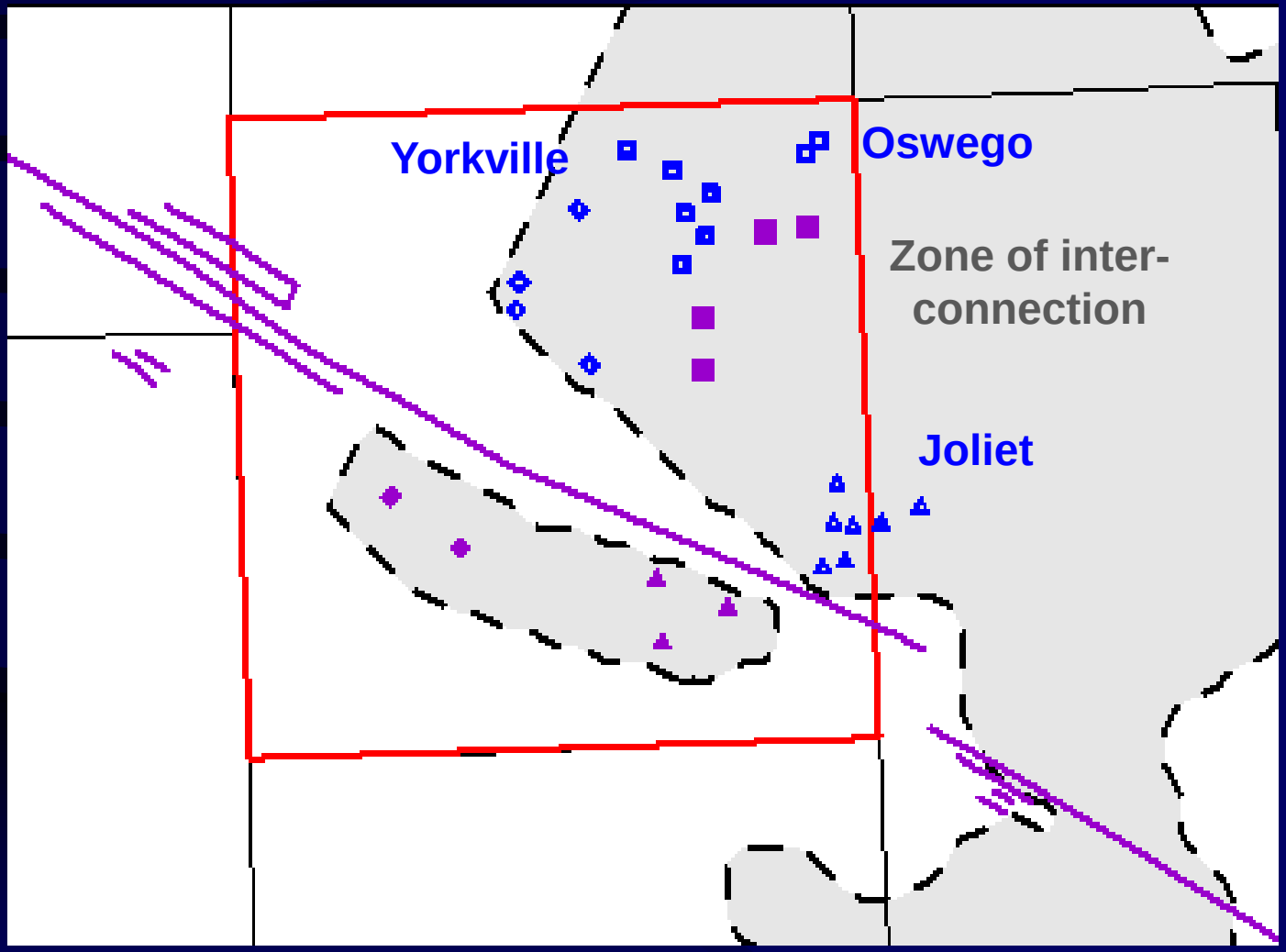
2005



2050

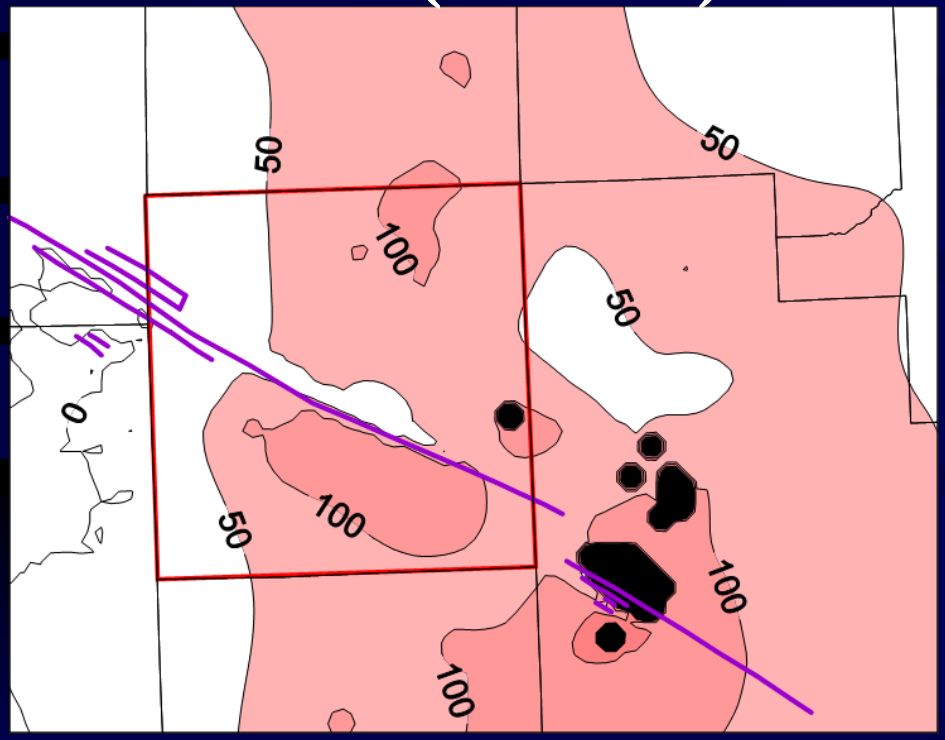


Modified Baseline Scenario

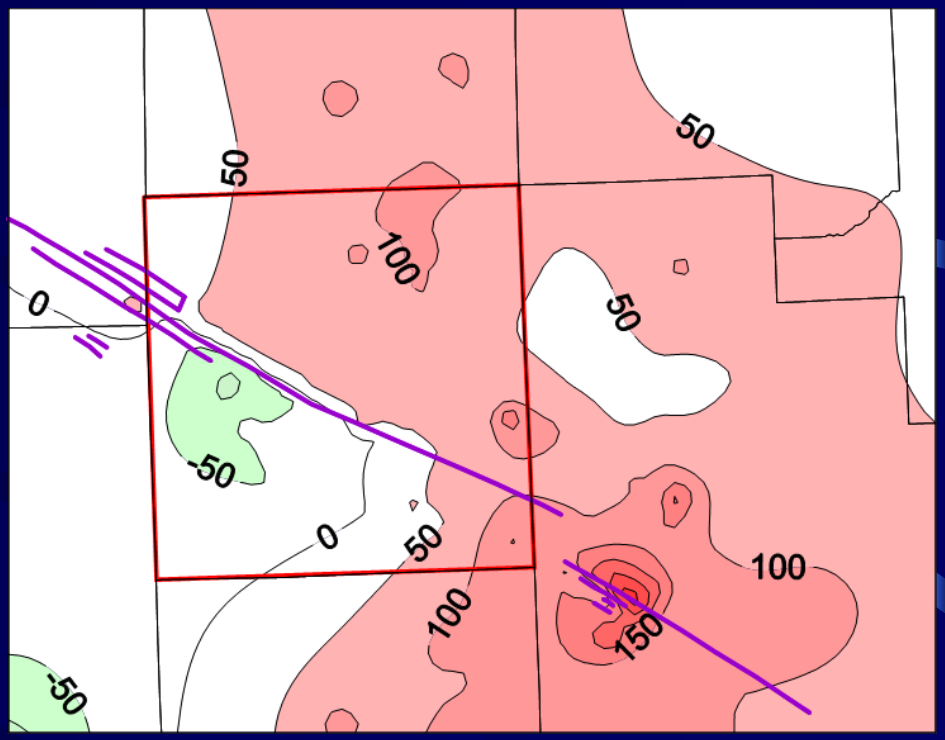


Additional Drawdown: 2005 to 2050
Modified Baseline Scenario

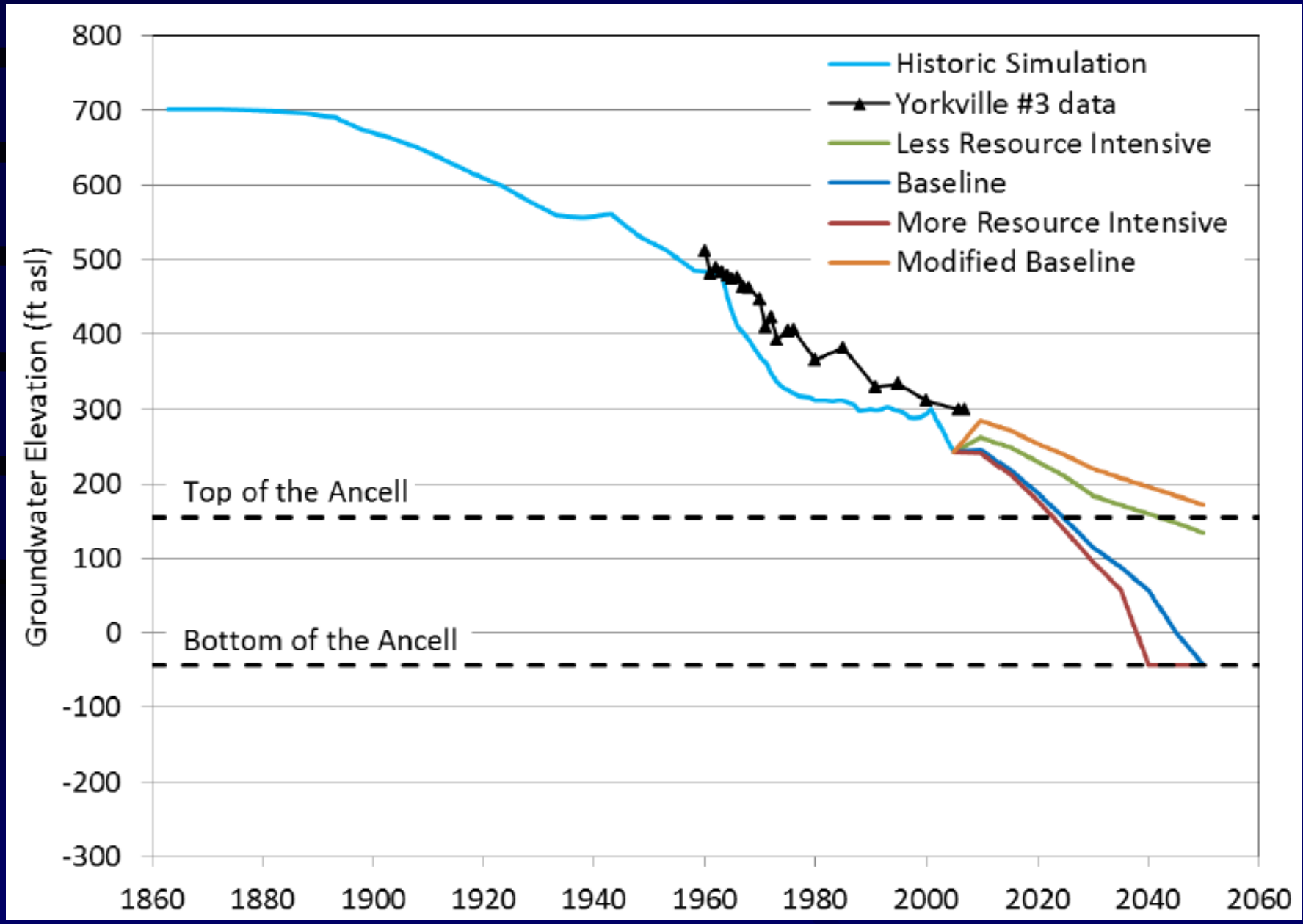
Ancell (St Peter)



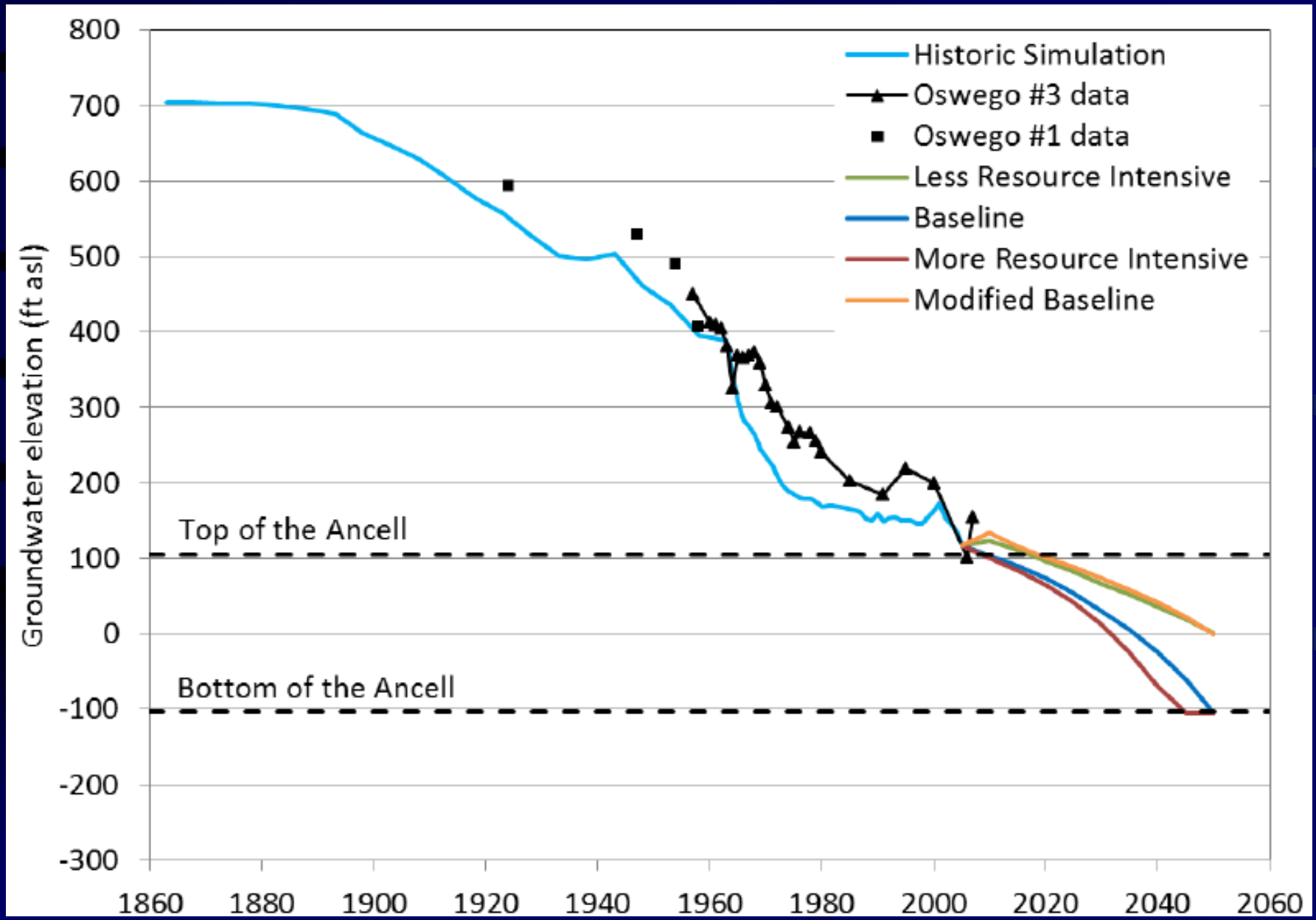
Ironton Galesville



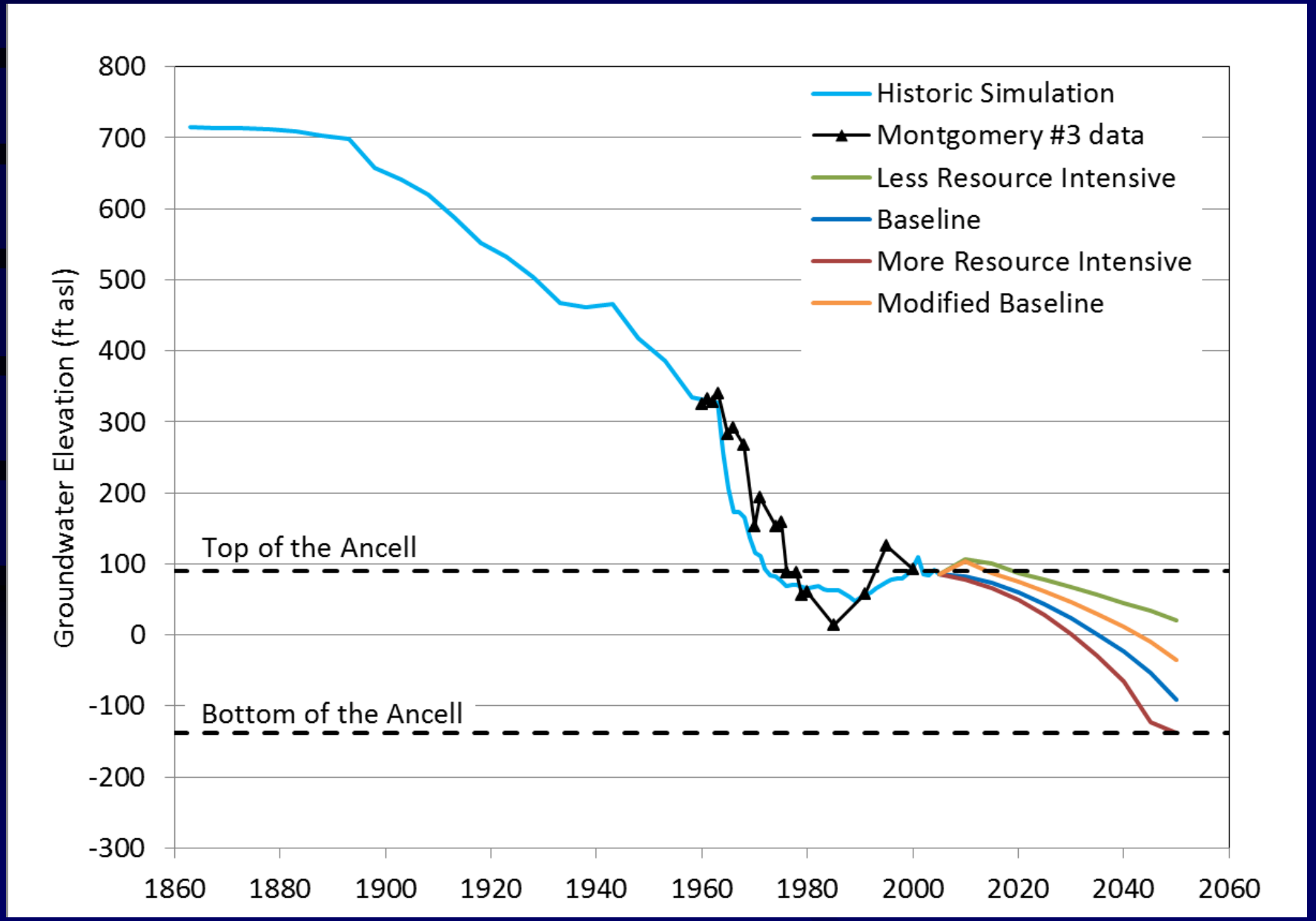
Modeled and Measured Data at Yorkville



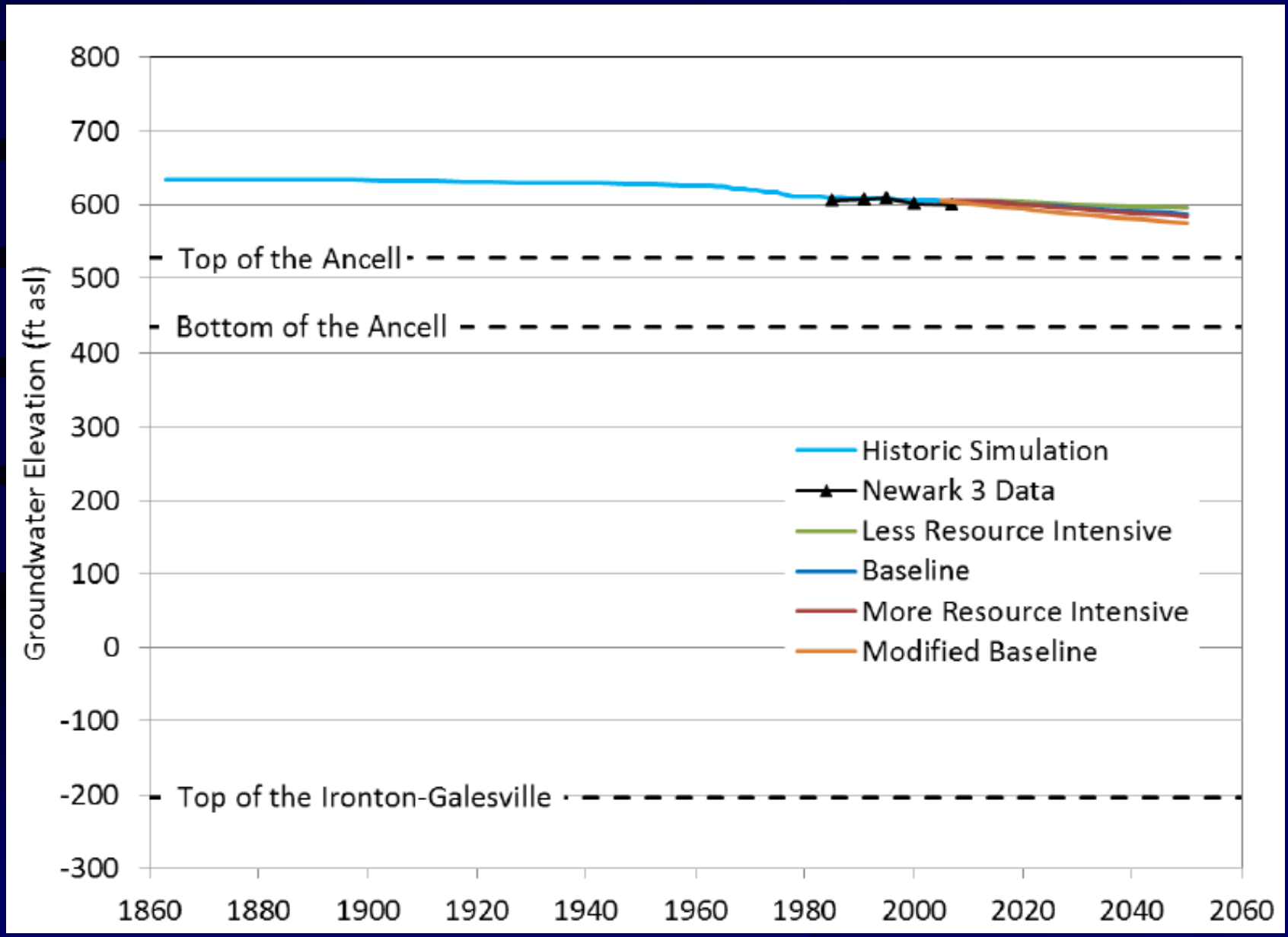
Modeled and Measured Data at Oswego



Modeled and Measured Data at Montgomery



Modeled and Measured Data at Newark



Surface Water Alternatives

- Lake Michigan
- Fox River
- Des Plaines River
- Kankakee River

Thank You

Oswego 12/19/2013