USGS Groundwater Resource Assessment
Fauquier County Conservation Roundtable Meeting

July 31, 2017

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Community Development

https://farm4.staticflickr.com/3946/15460625048_a0ee3e69a2_o.jpg

Definitions

1. **Boundary Conditions**

   Things that add or subtract water from an aquifer

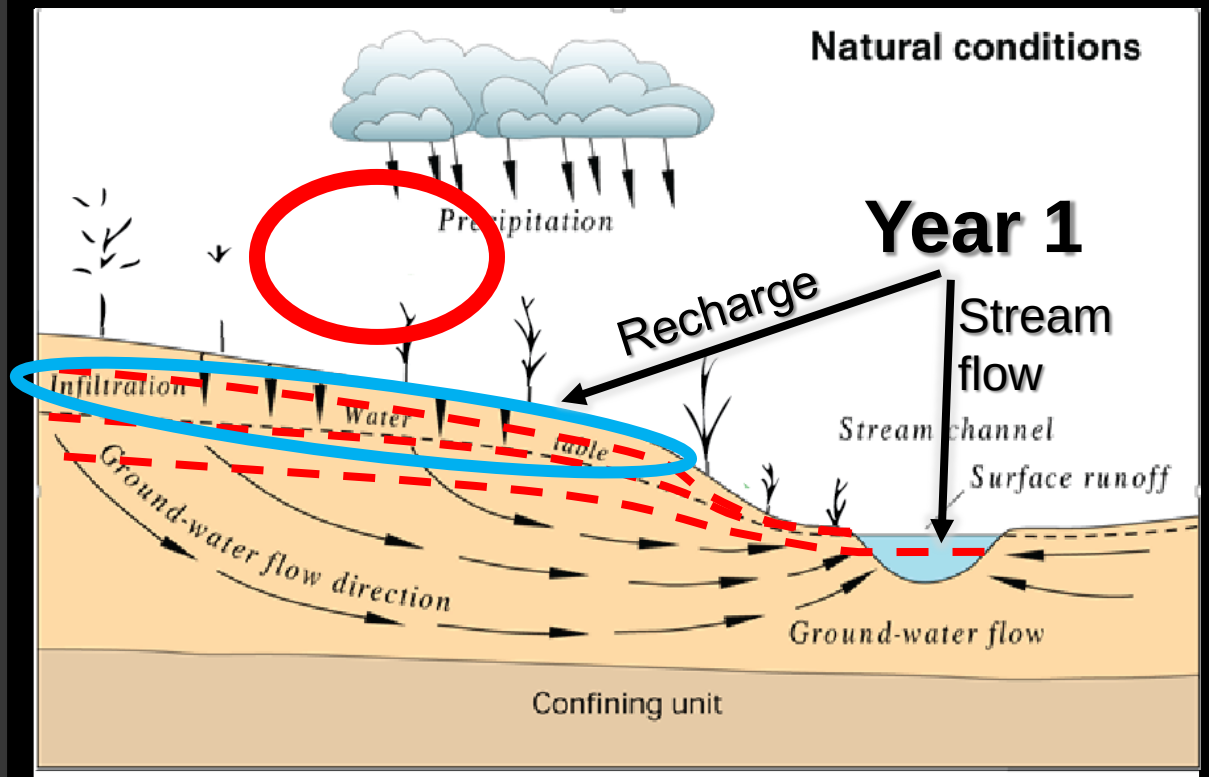
2. **Storage**

   The amount of water in an aquifer

3. **Conceptual Model**

   Idea of “how” the aquifer works

Ground-Water-Flow System (*Natural Conditions*)



Water is recharged to the ground-water system by percolation of water from precipitation and then flows to the stream through the ground-water system.

Spring/Summer

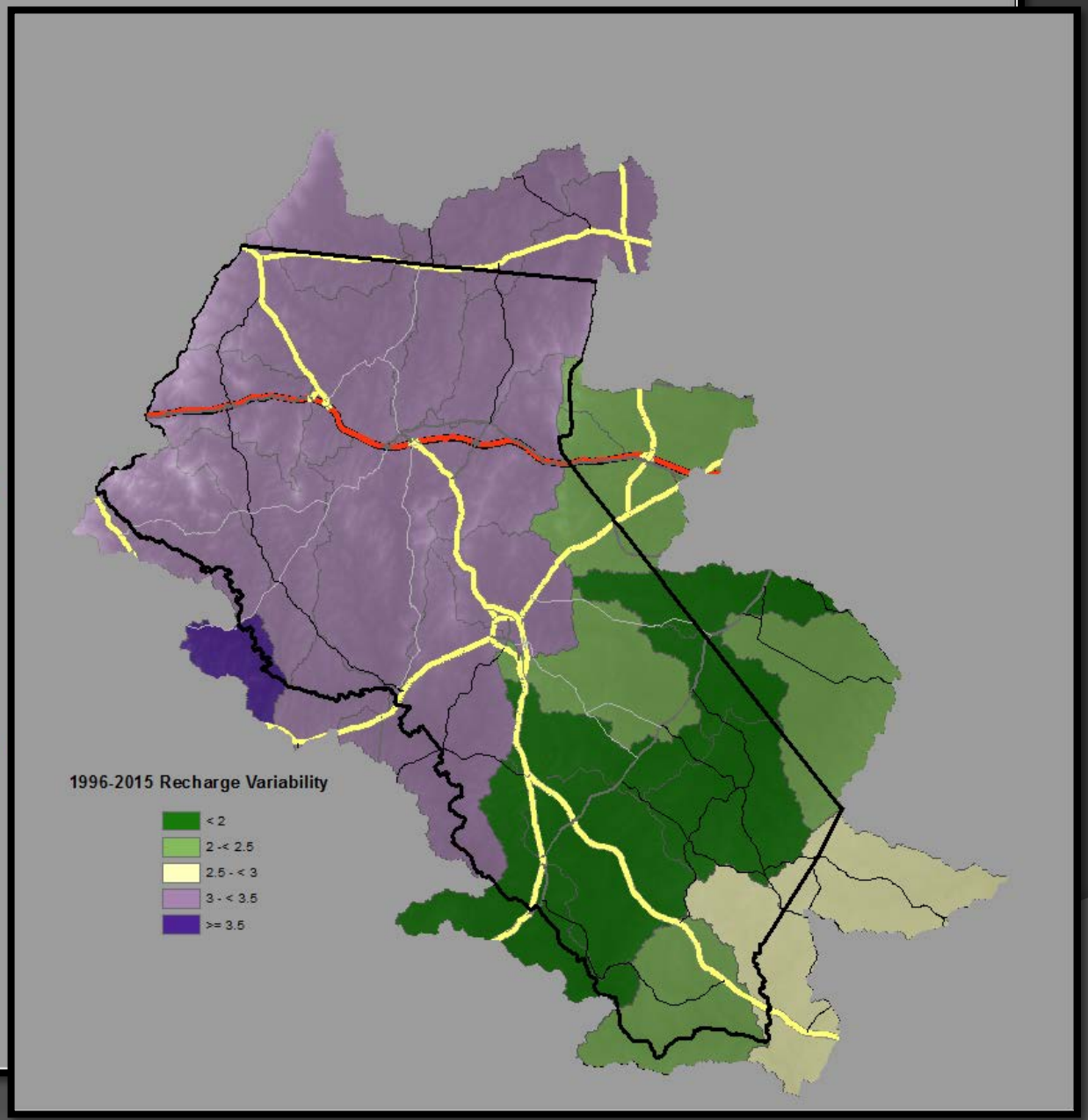
Water level decline

Decrease in storage

Fall/Winter

Water level rise

Increase in storage



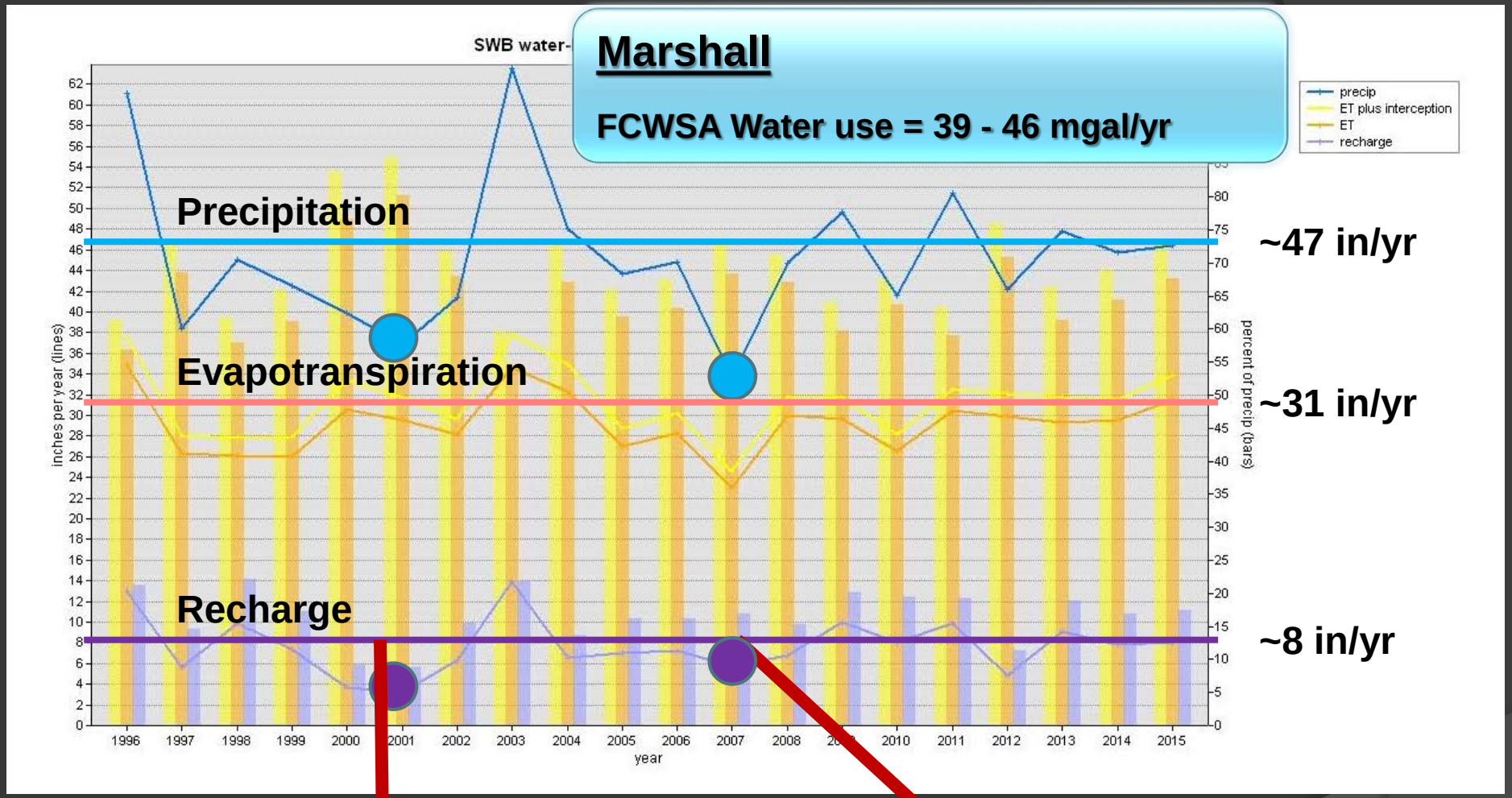
Soil-Water Balance

Annual Precipitation
40-56 in/yr

20-yr average recharge
2-10 in/yr

Drought recharge
<2-6 in/yr

Differences amongst aquifers

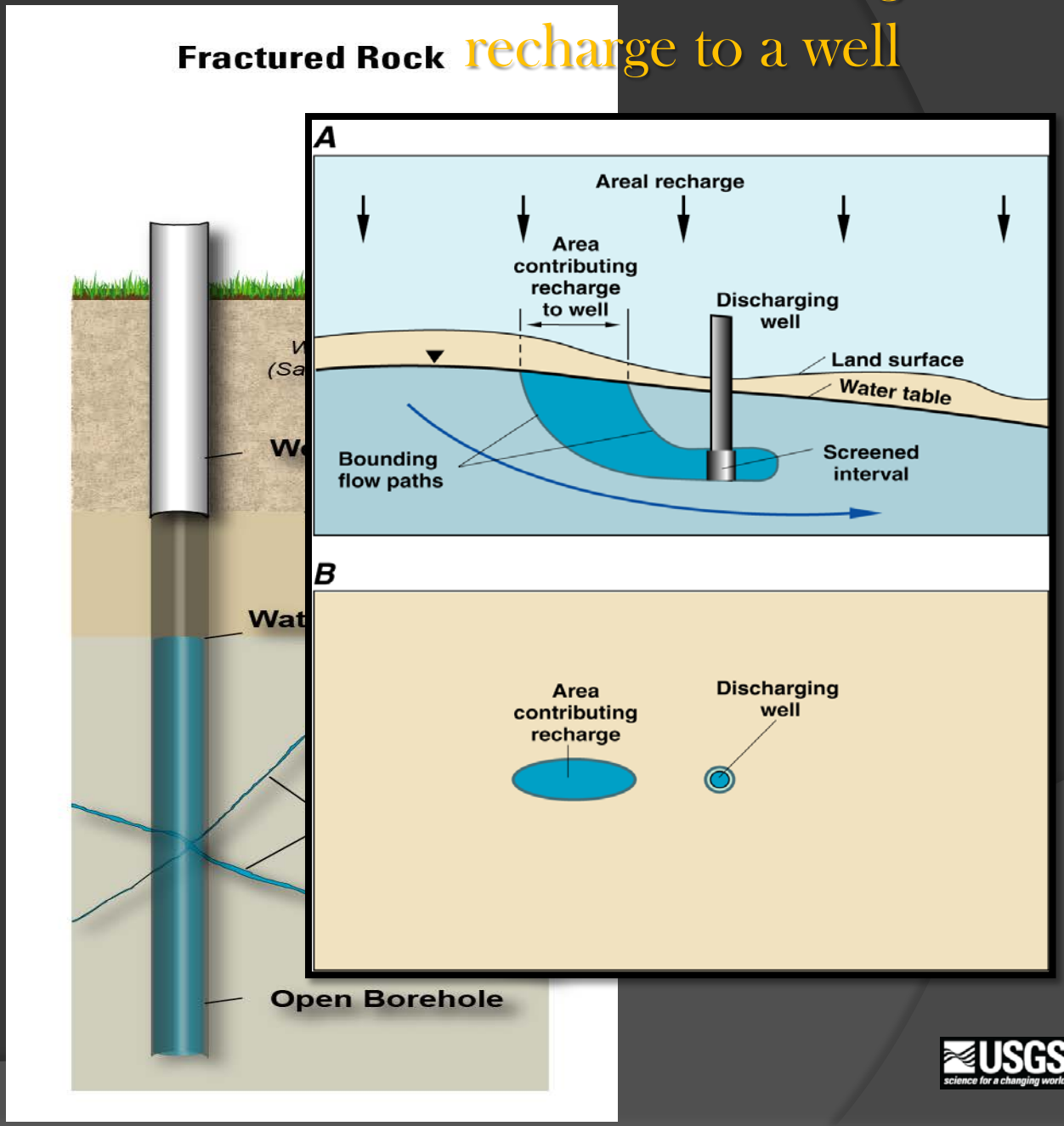


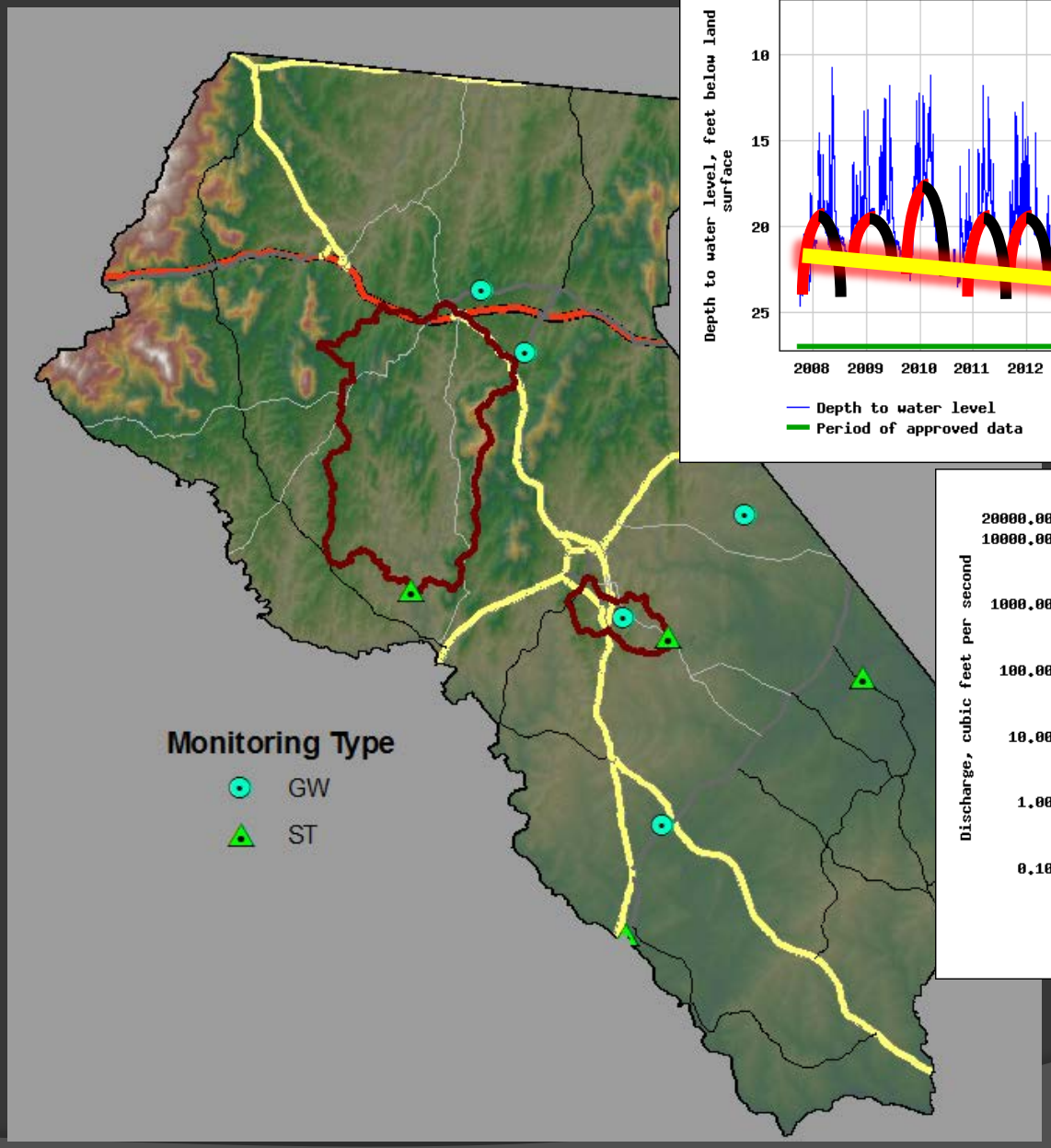
Drought recharge (1 sq mi)
Carter Run – 63 mgal
Goose Creek – 45 mgal

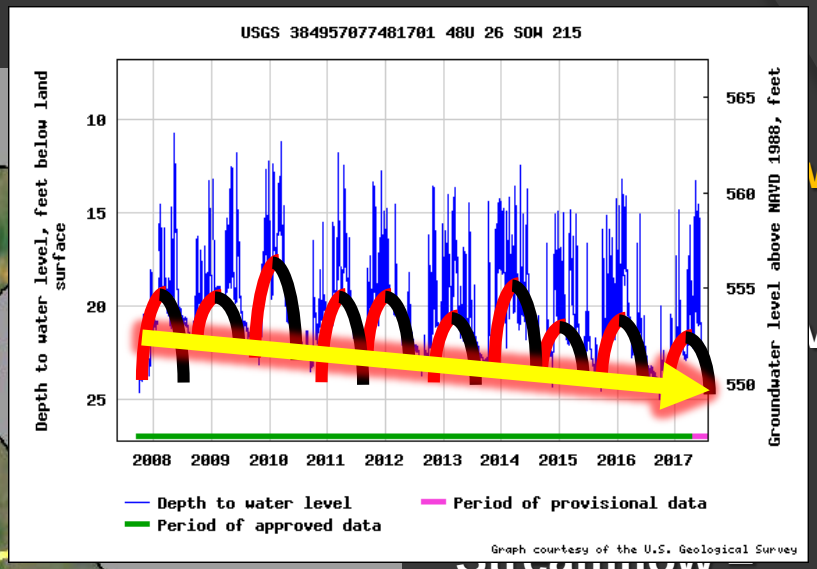
2007 vs 2001
Timing of Recharge is Important

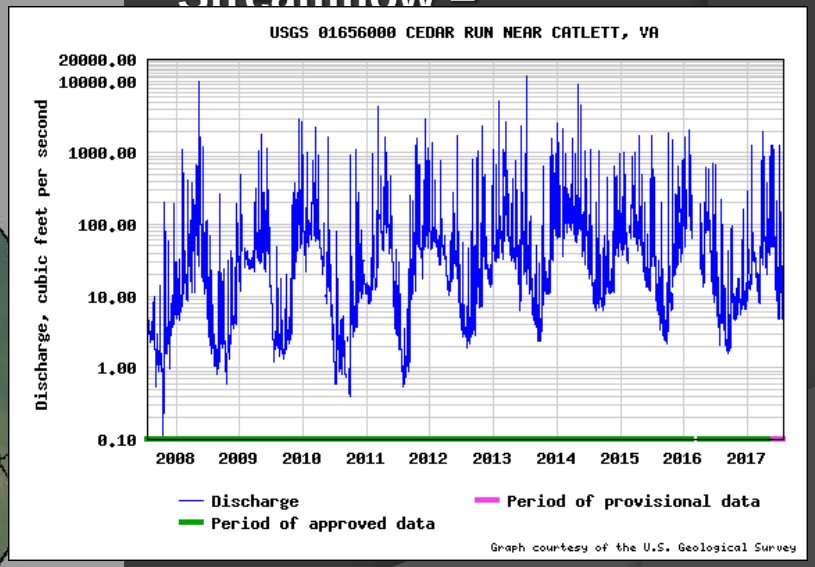
Well Construction

Area contributing recharge to a well









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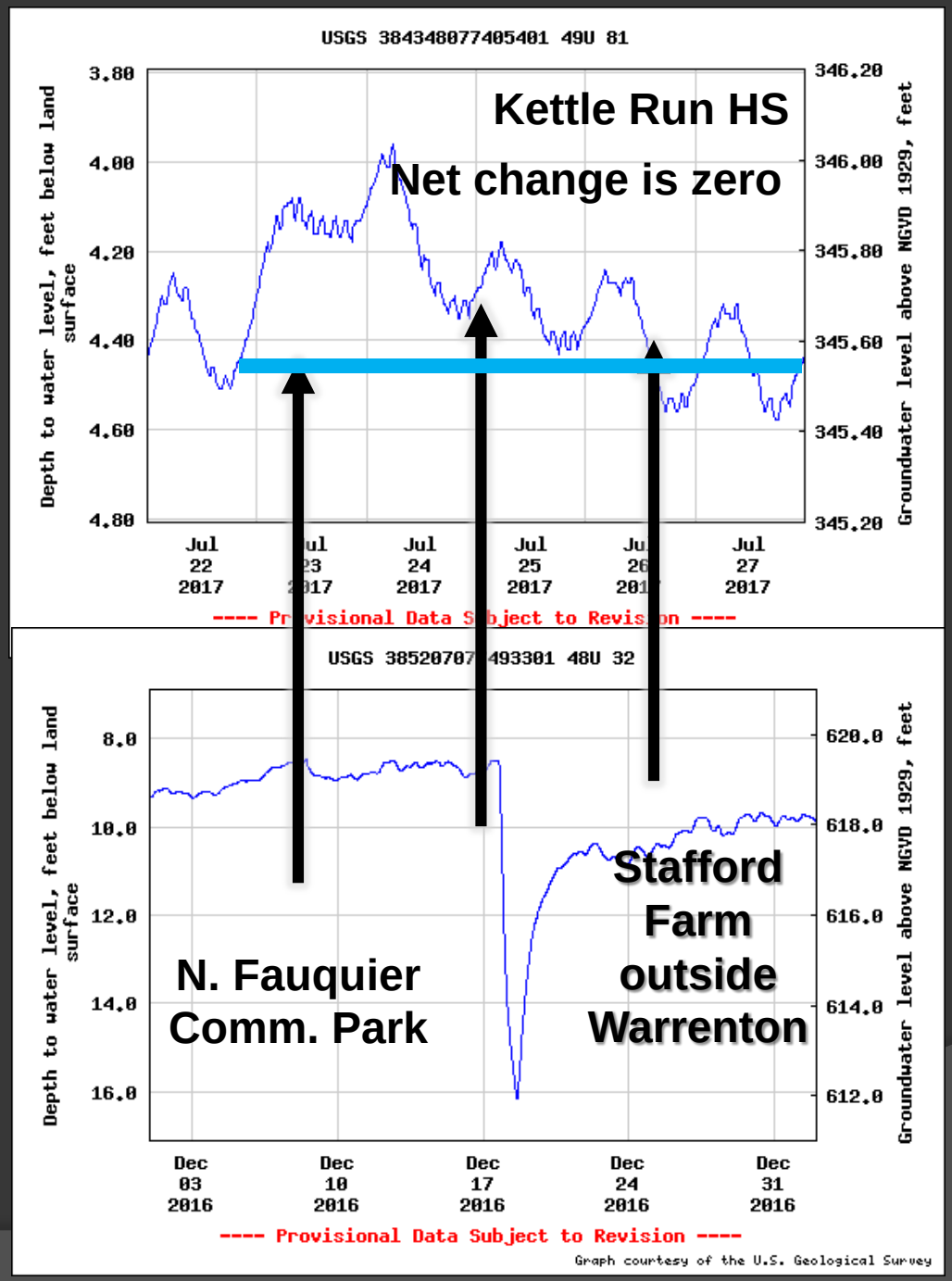
Water in vs Water out
= ΔStorage

Storage

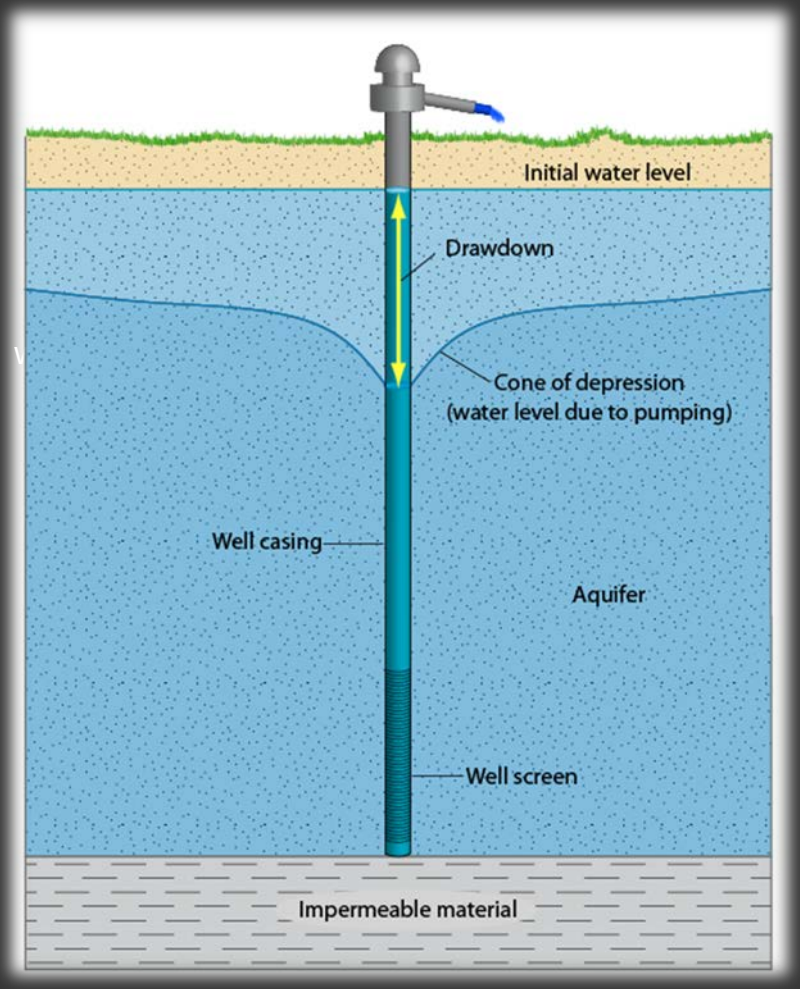
Boundary Condition

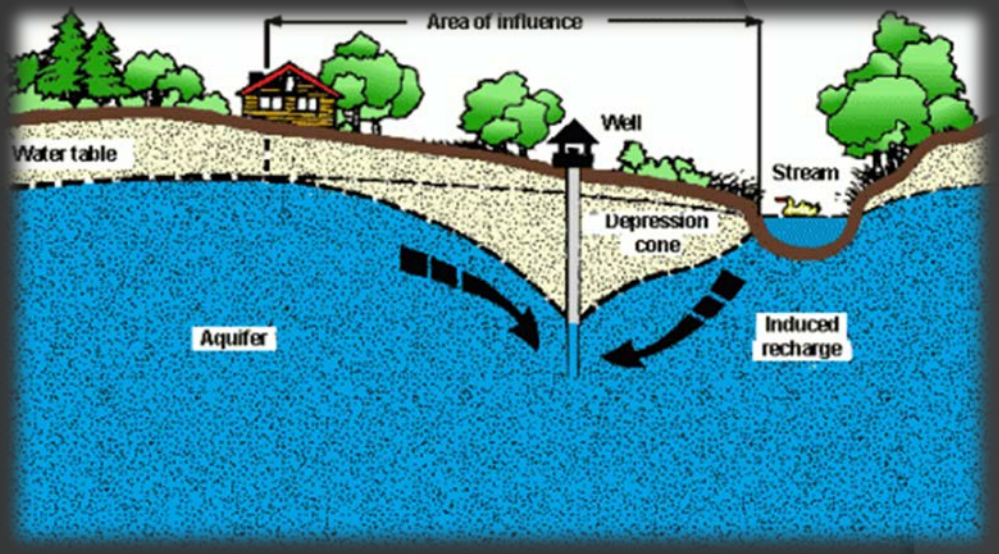
- Recharge
- Streamflow
- ET
- Pumping

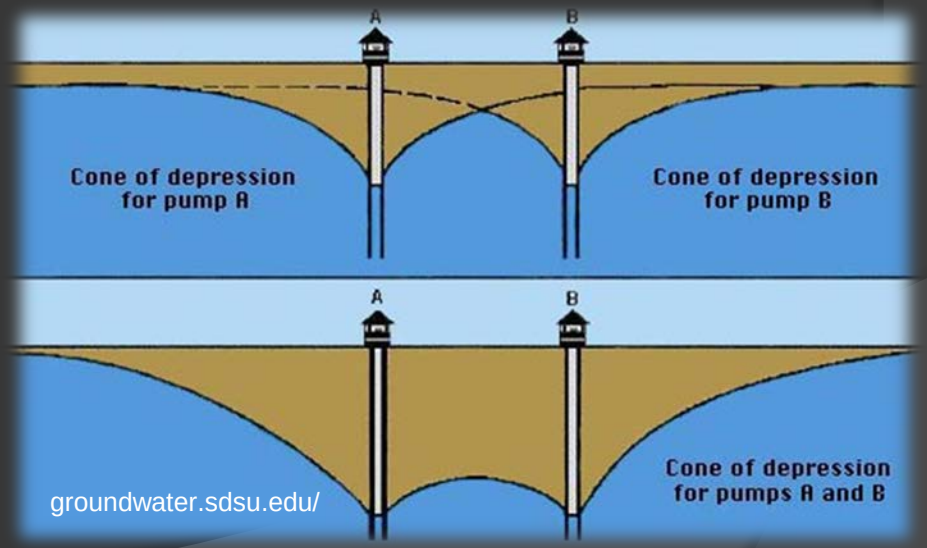
Water Level



Aquifer Pumping

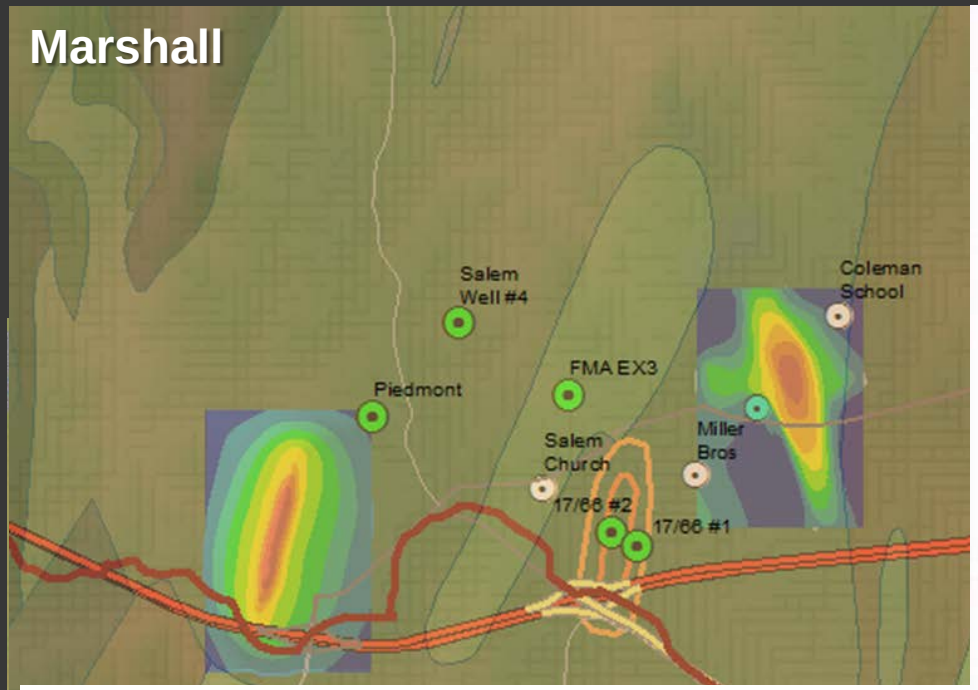






groundwater.sdsu.edu/

USGS science for a changing world



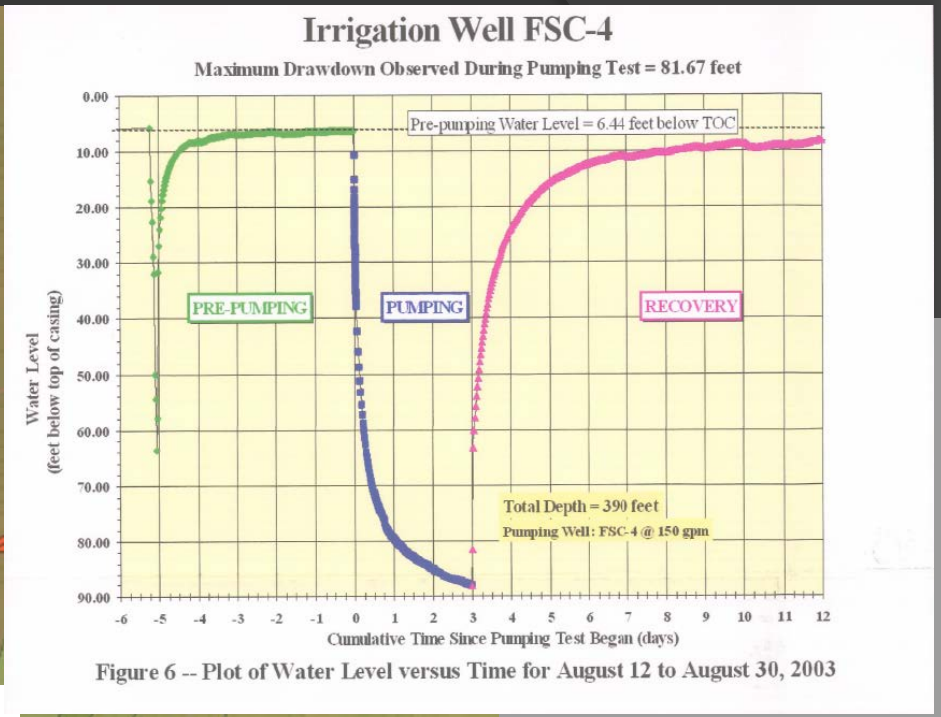
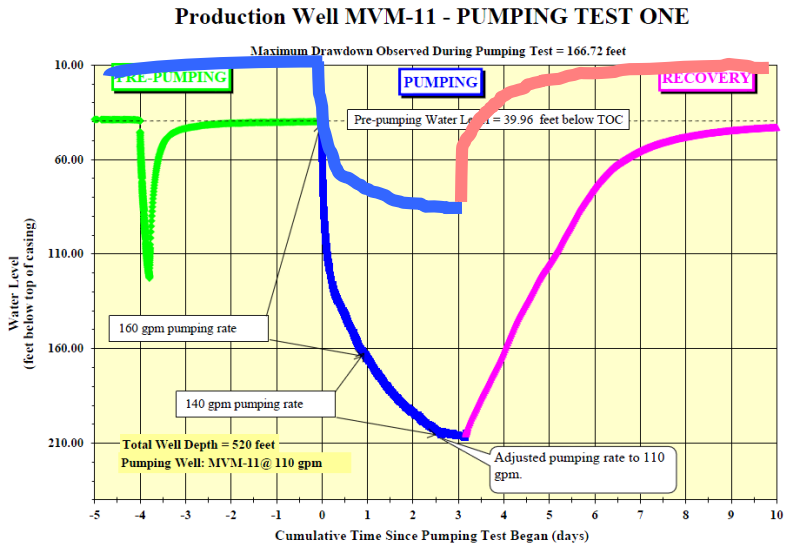
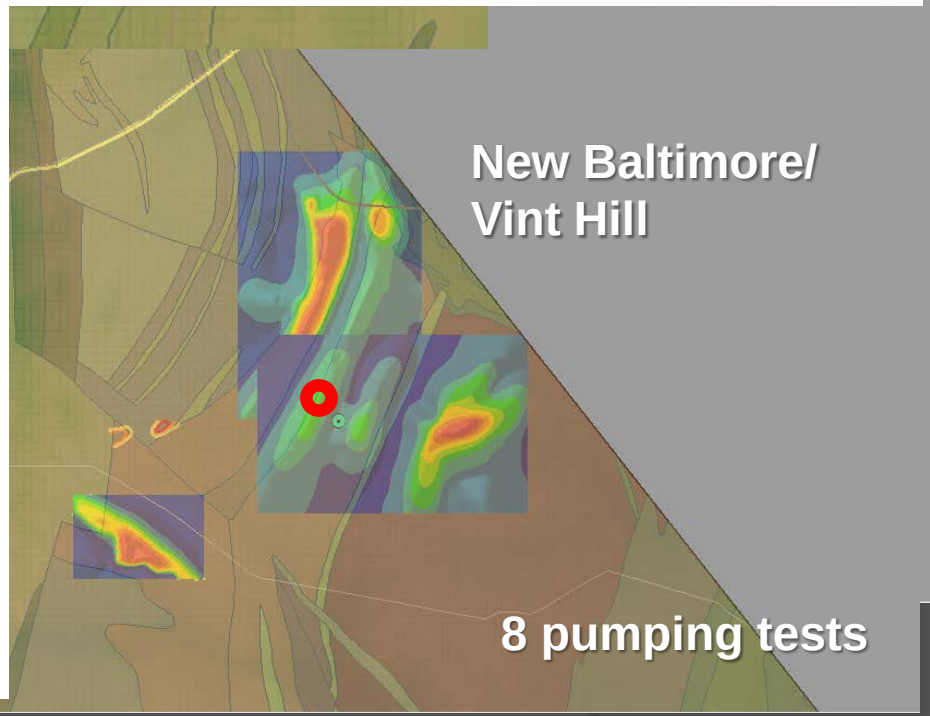


Figure 6 -- Plot of Water Level versus Time for August 12 to August 30, 2003



Plot of Water Level versus Time for June 8 to June 23, 2016
Cunningham Farm Project Site
Fauquier County, Virginia



Steps in a geohydrologic project

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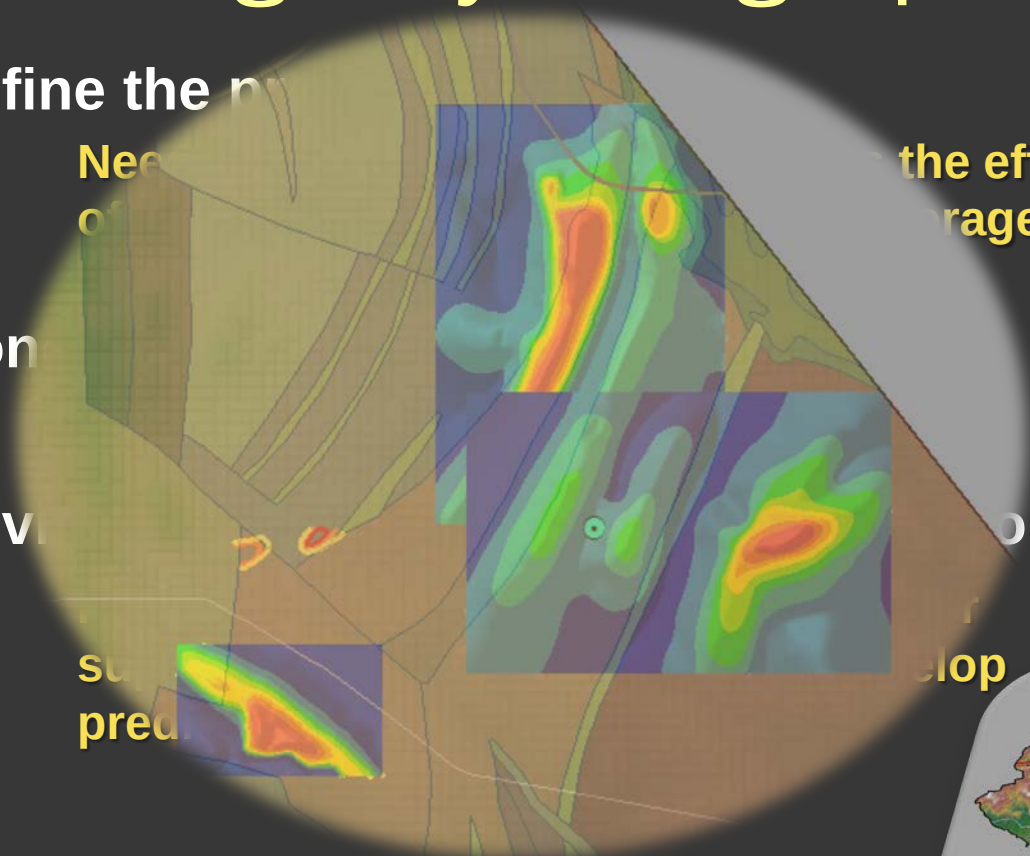
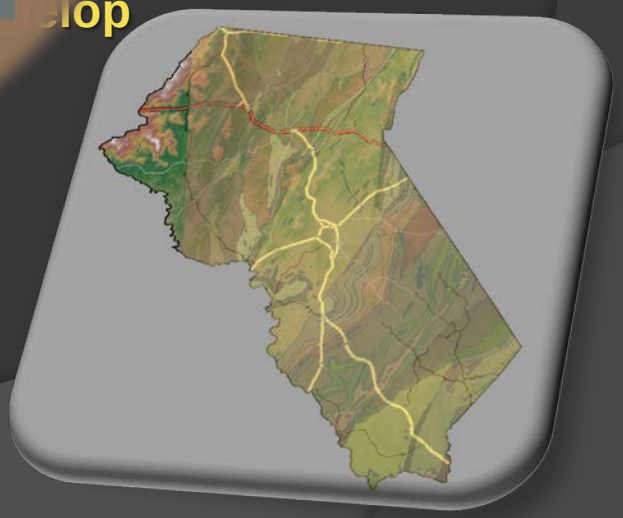


10. Engineered solution to problem
- Groundwater flow model
- A replica of a “real-world” groundwater system



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