



Great Valley Water Resources Science Forum Virginia Water Science Center Programs



Habitat Suitability Criteria for Fishes of the South Fork of the Shenandoah River

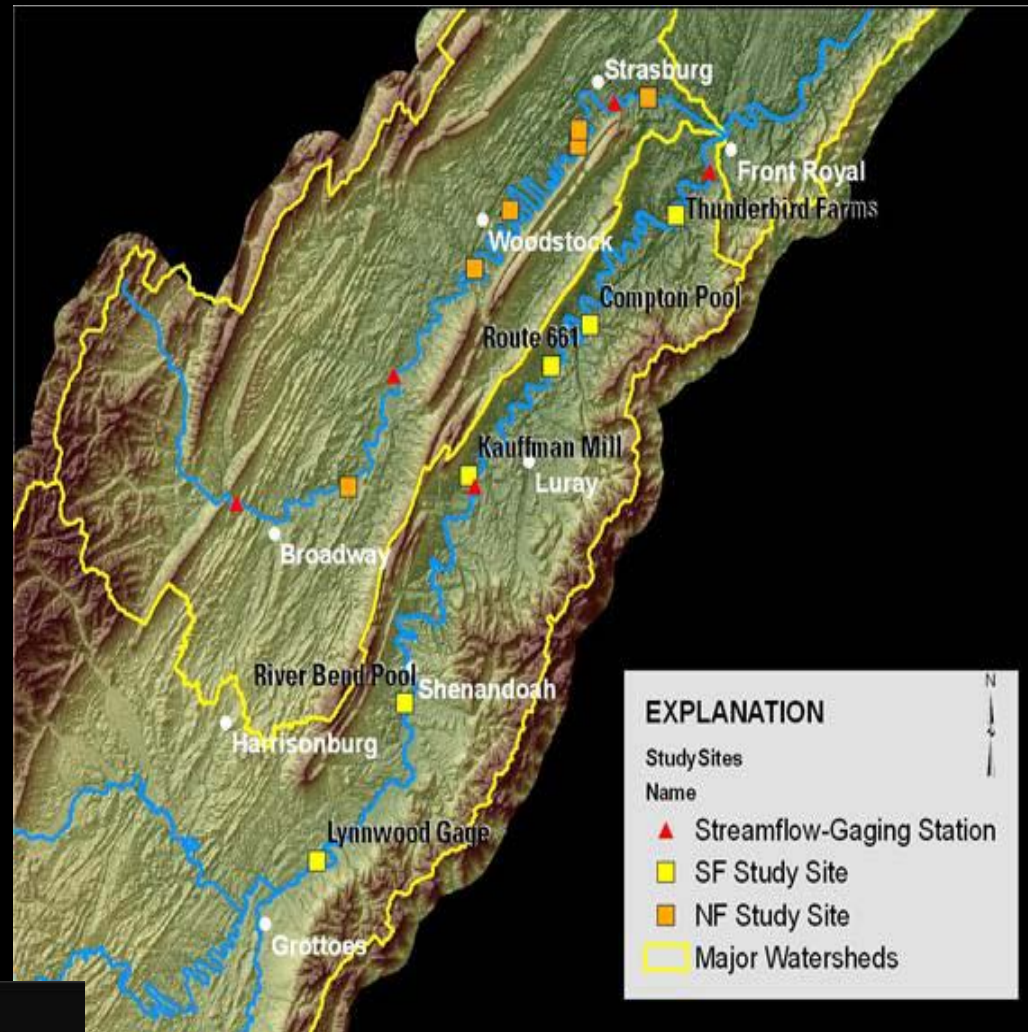
Data Collection Sites

Randomly selected transects
from USGS sites:

Kaufman's Mill, Thunderbird
Farms, Lynnwood, River Bend
Pool, Compton, Rte. 661

~ from Grottoes to Front Royal

R. Clay Ramey



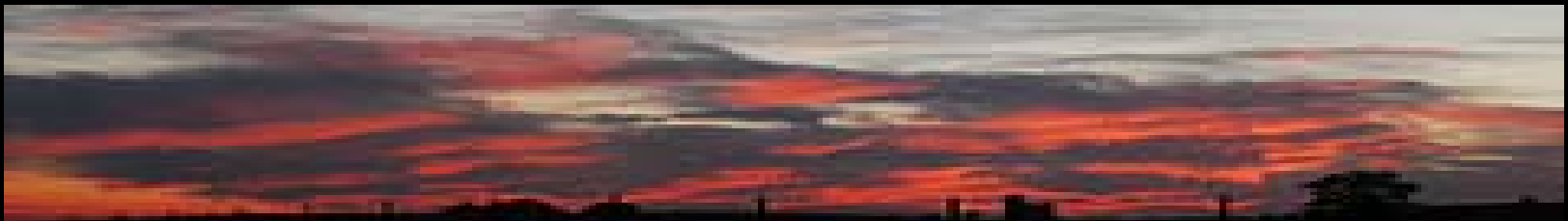
Findings

Shallow/fast habitats are most affected by low flow:

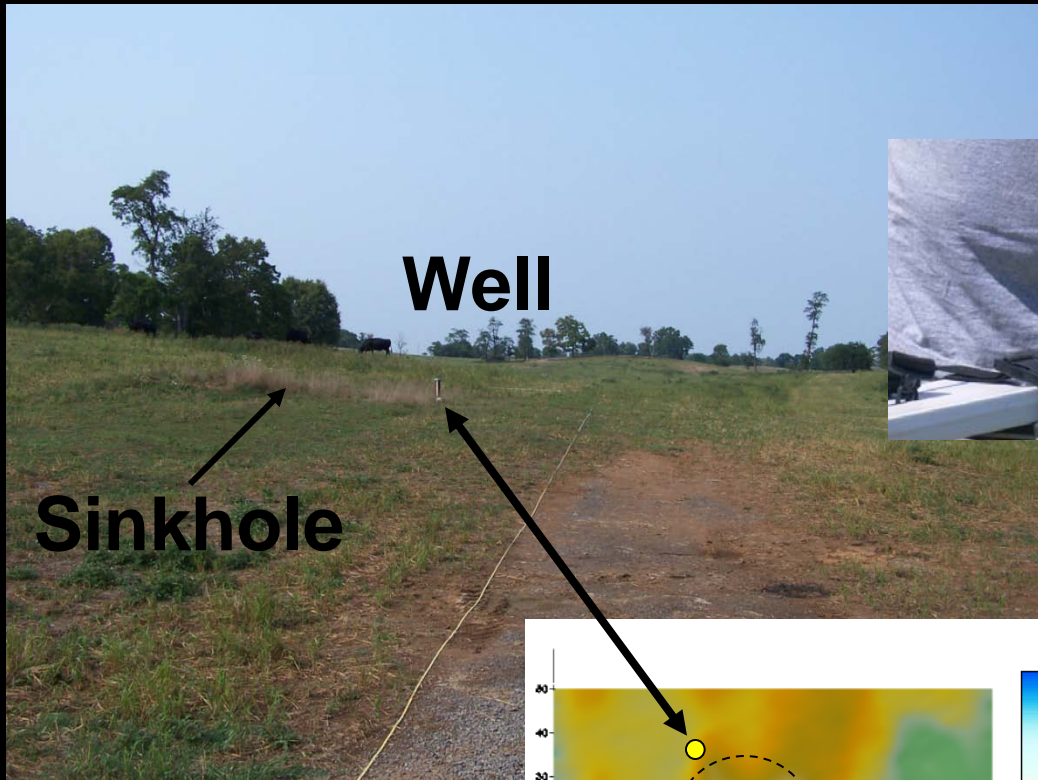
*madtoms, chubs, minnows, arguably sub-adult
smallmouth*

Deep/slow habitats are more resistant:

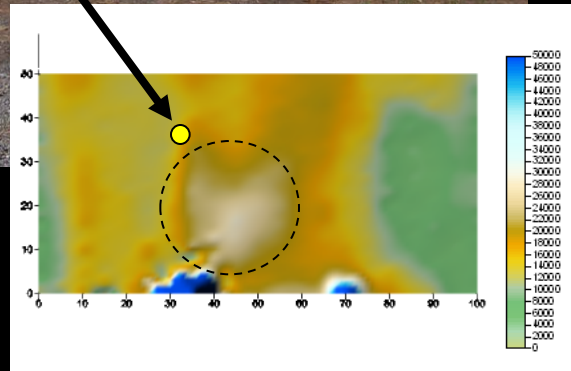
smallmouth, sunfish, catfish



Frequency-Domain EM (FDEM) Conductivity Over Karst



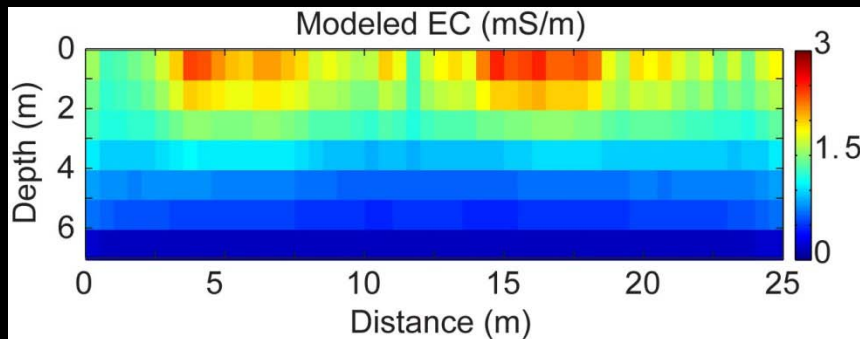
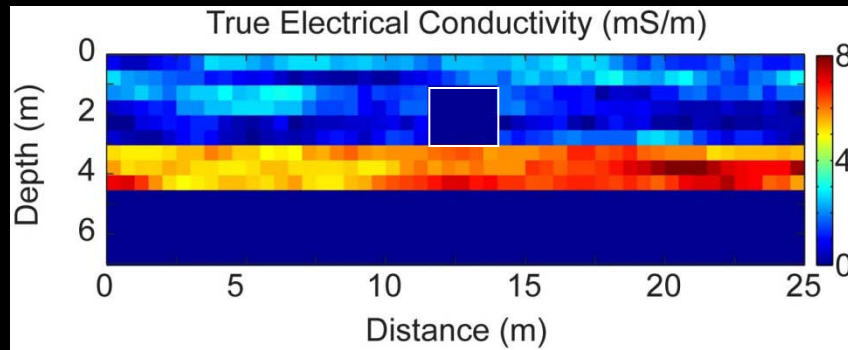
Clarke County, VA



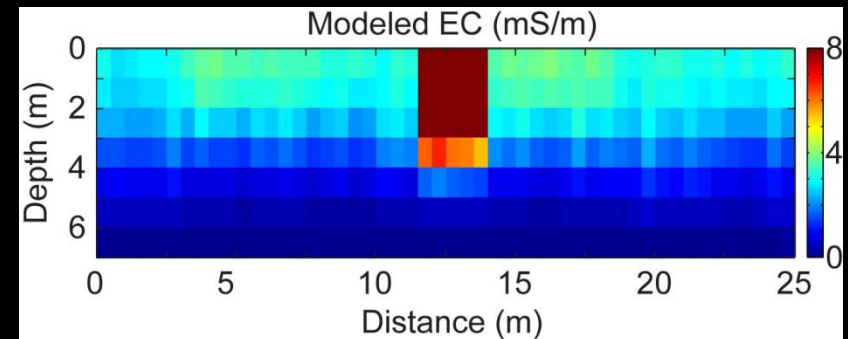
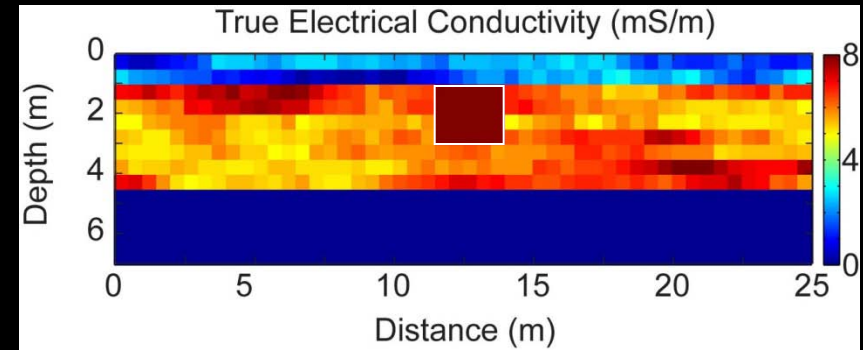
Office of Groundwater
Branch of Geophysics

FDEM Software Development (Synthetic Modeling & Field Data Inversion)

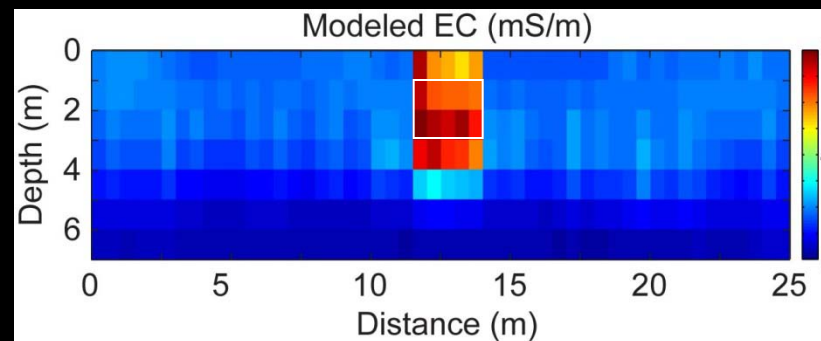
Air-Filled Void



Water-Filled Void

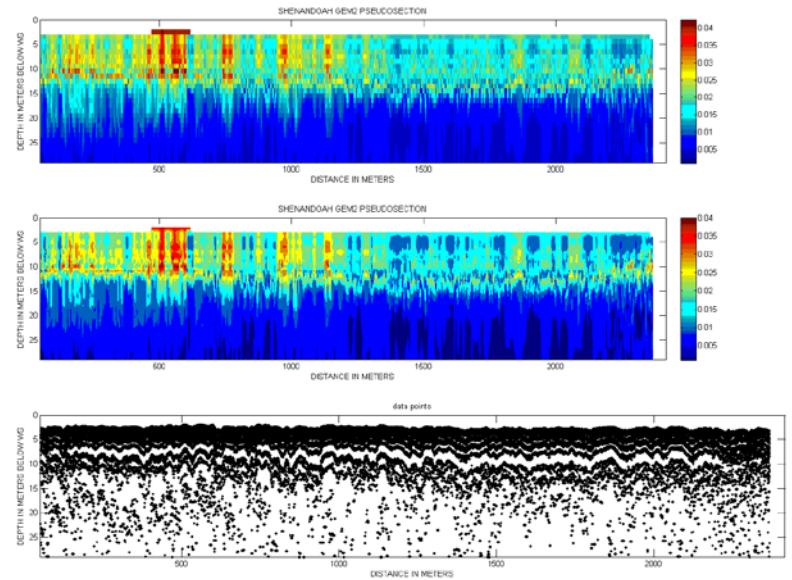


Water– Air Filled Void Difference



Exploit Seasonal
Changes

FDEM GW/SW Relation



South Fork Shenandoah River
Front Royal, Va.



Micro-Gravity

Shenandoah Valley of Virginia



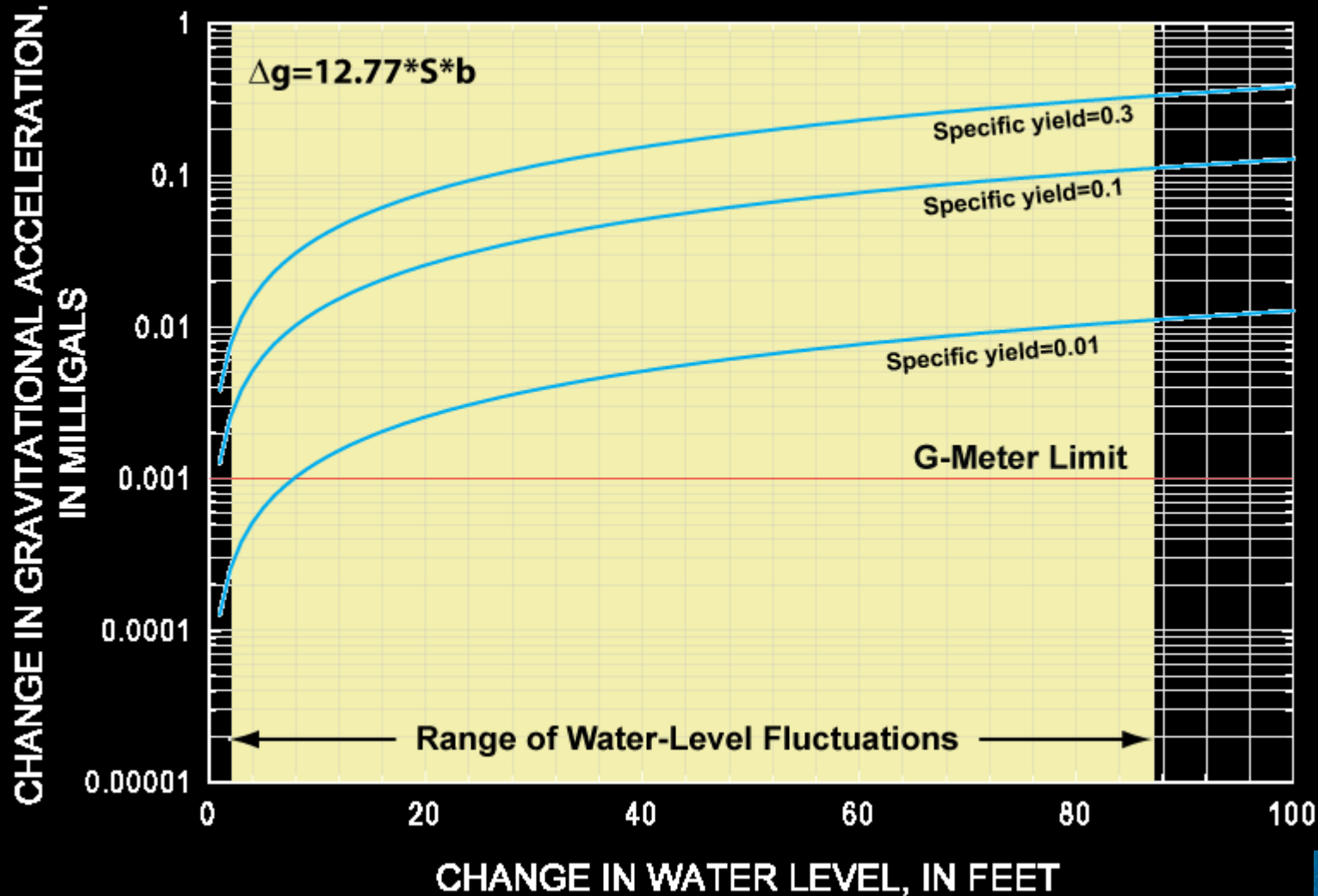
Absolute Gravity Station



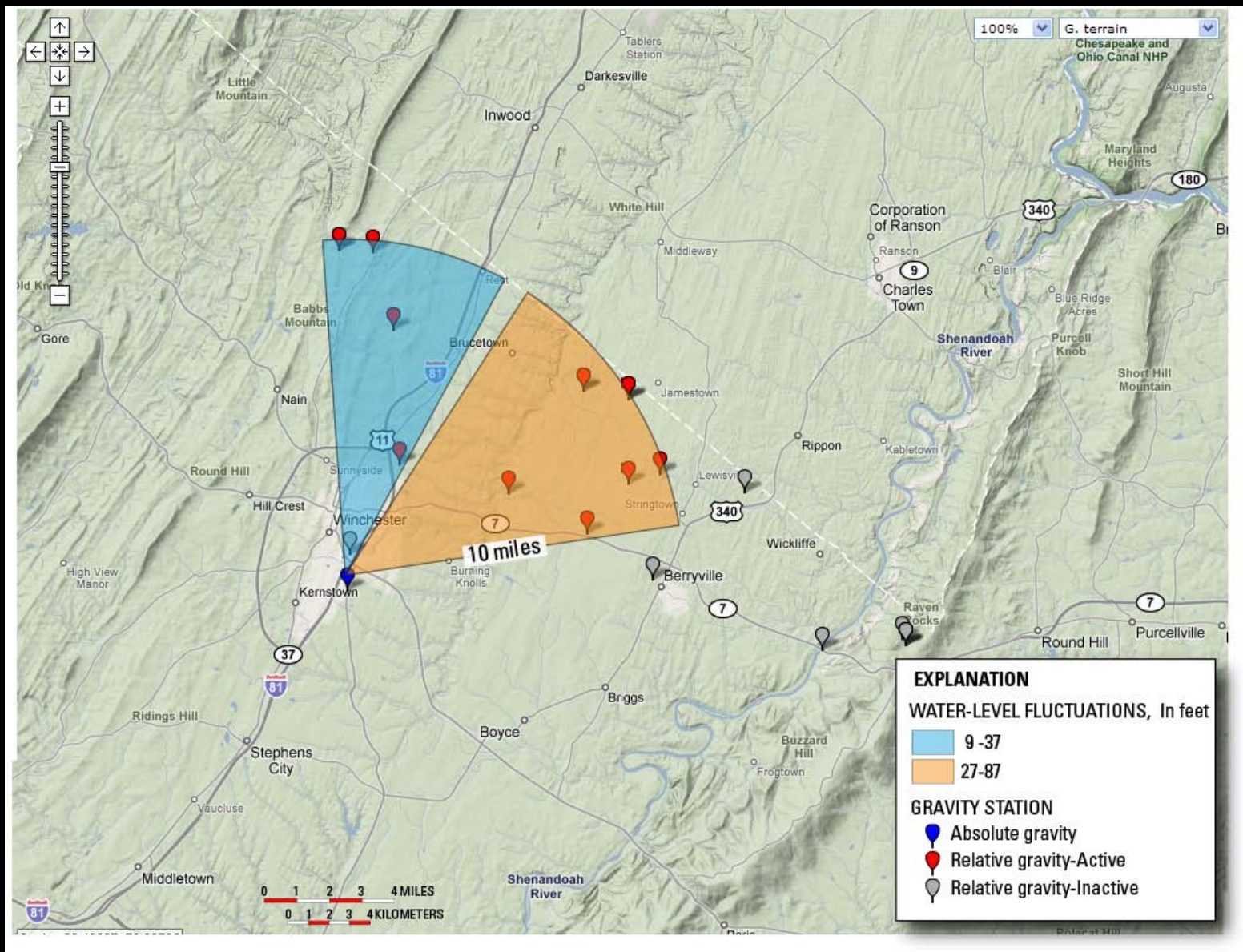
Relative Gravity Station

Temporal Micro-Gravity Changes

Water-level change vs. gravity change
Pool and Eychaner (1995)

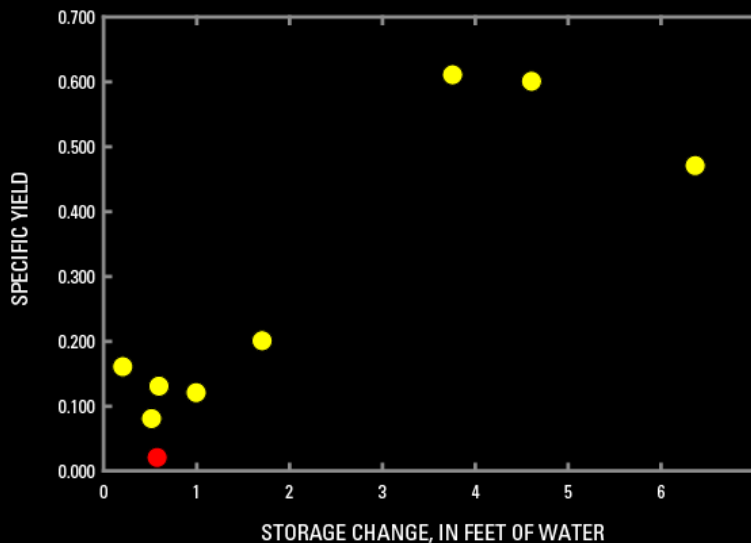
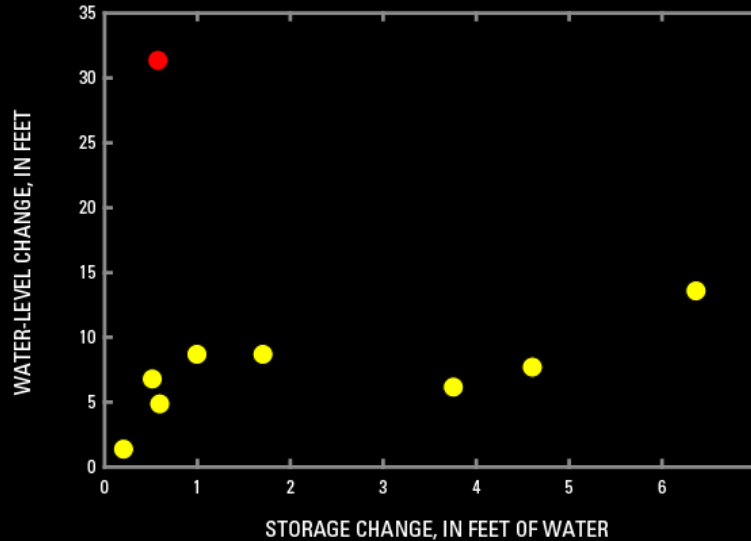


Shenandoah Valley Revised Micro-Gravity Network

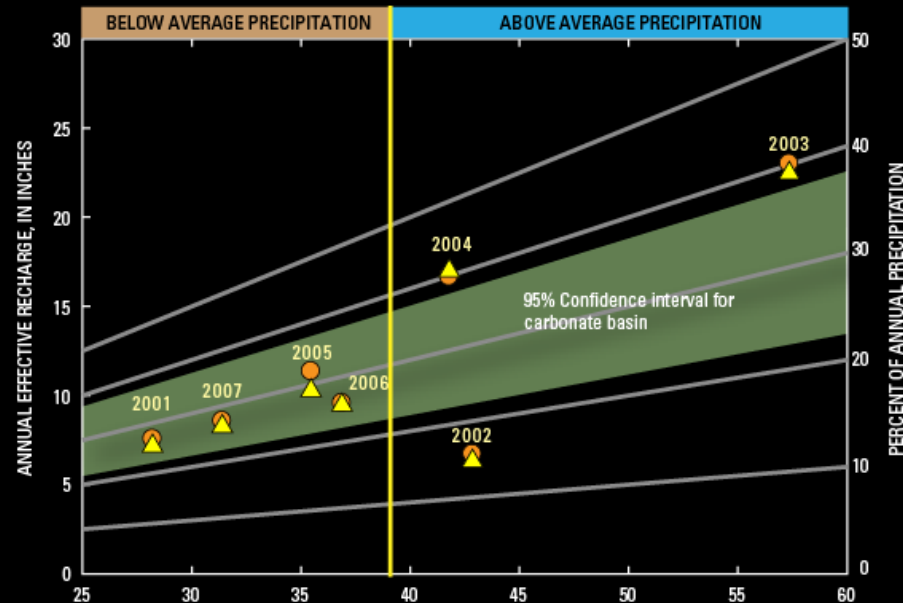


Temporal Micro-Gravity Changes, Water Levels, and Storage

Pool and Eychaner (1995)

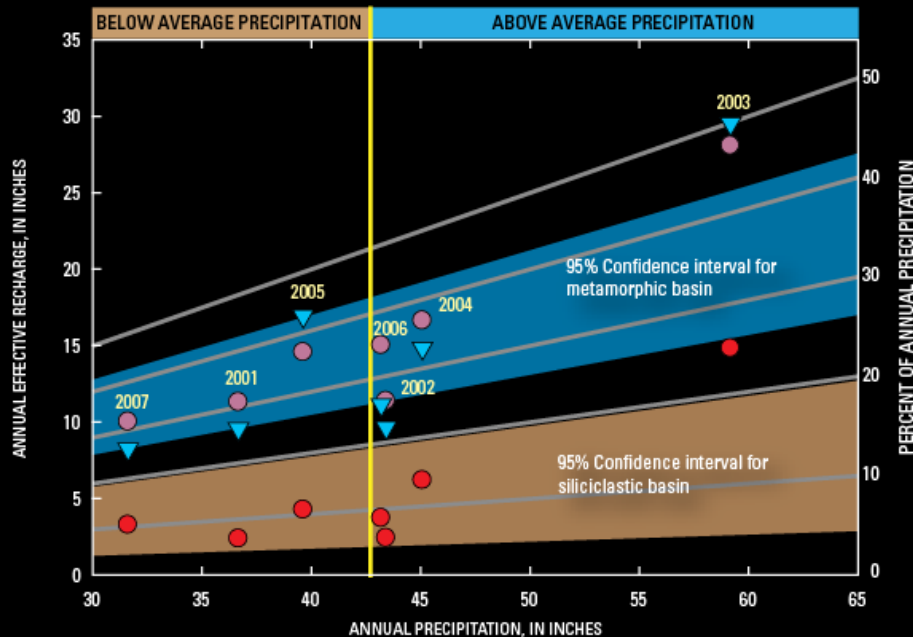


Effective Recharge and Annual Precipitation



Clarke County Carbonate Basins

01616100 Dry Marsh Run at Route 645 near Berryville, Va.
01636316 Spout Run at Route 621 near Millwood, Va.



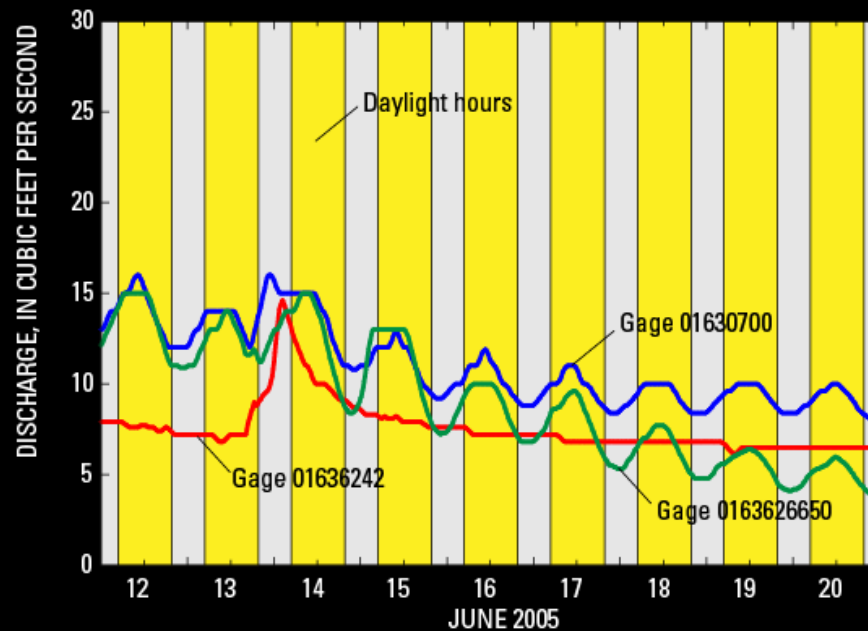
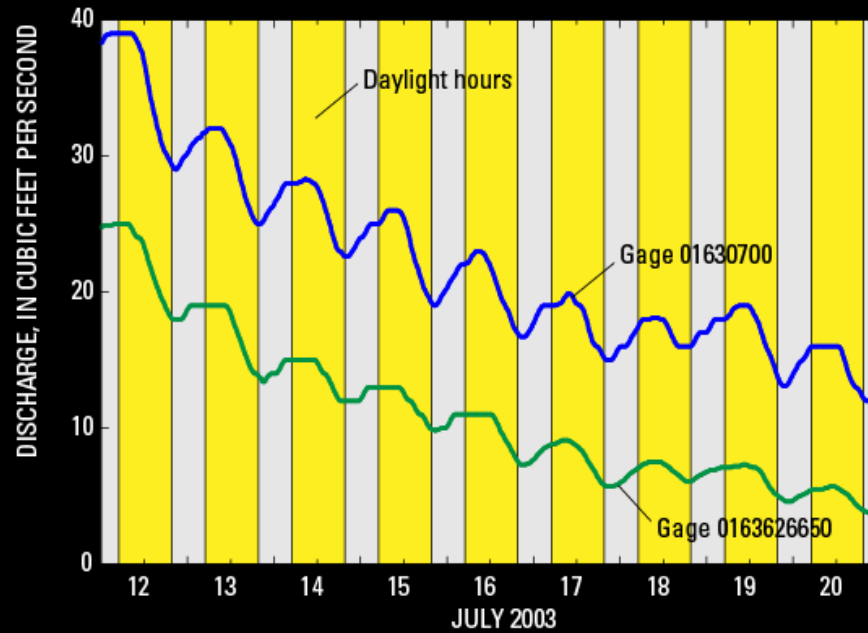
Warren County Metamorphic Basins

01630700 Gooney Run at Route 622 near Glen Echo, Va.
0163626650 Manassas Run at Route 645 near Front Royal, Va.

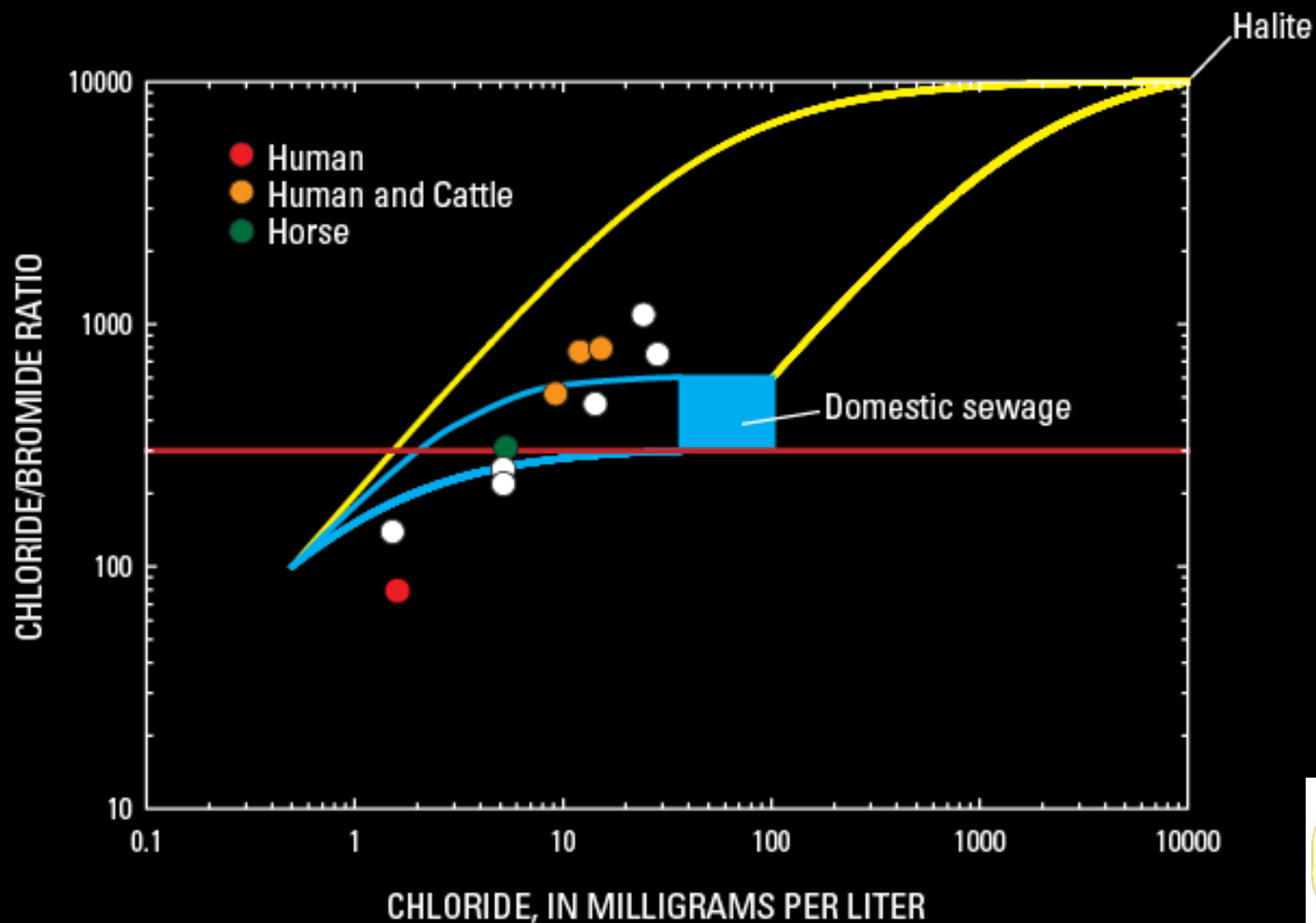
Warren County Siliciclastic Basin

01636242 Crooked Run below Route 340 at Riverton, Va.

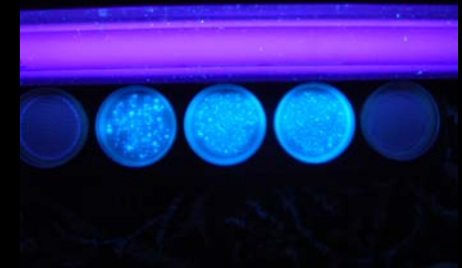
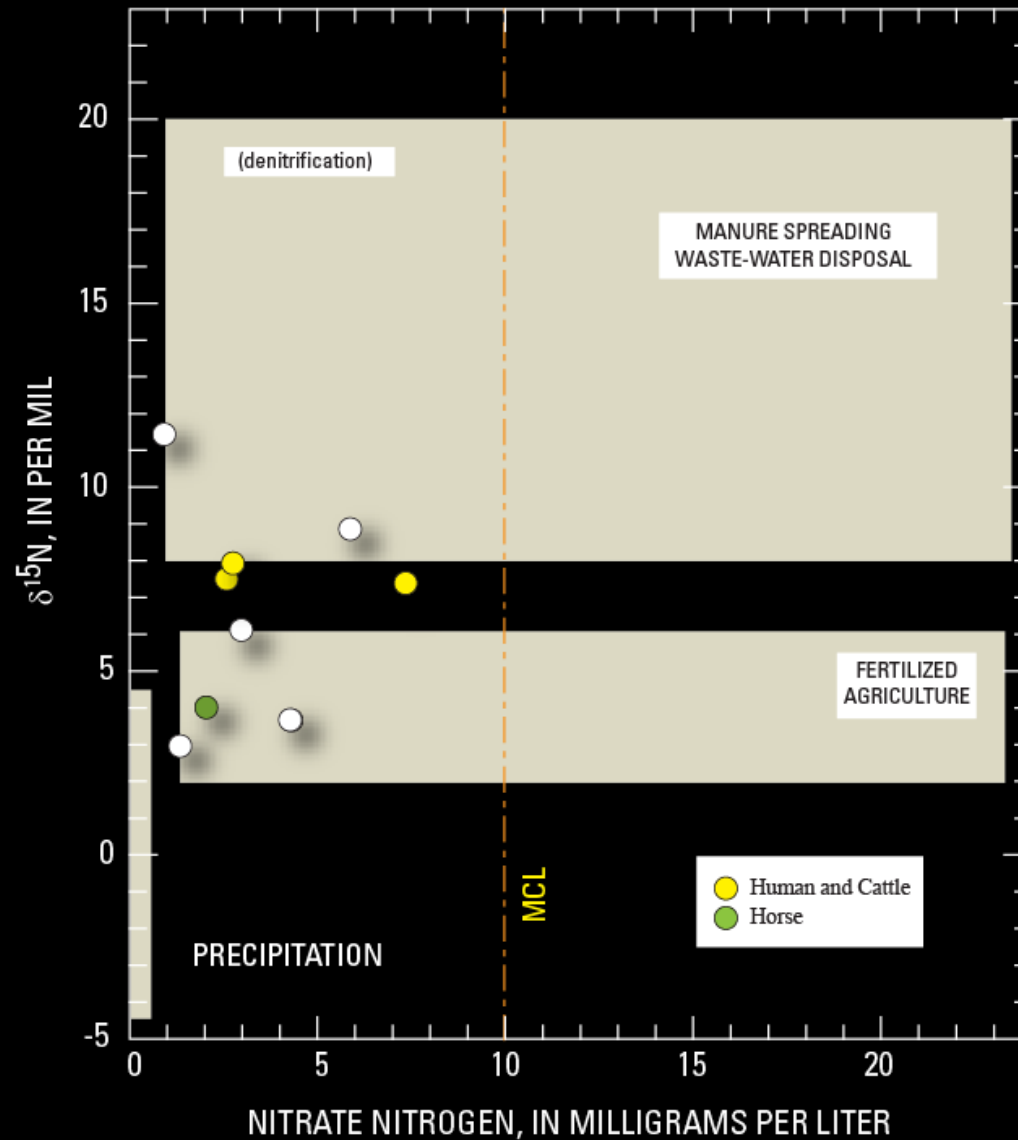
Riparian Evapotranspiration



Source of Nitrogen and Bacteria in Clarke County



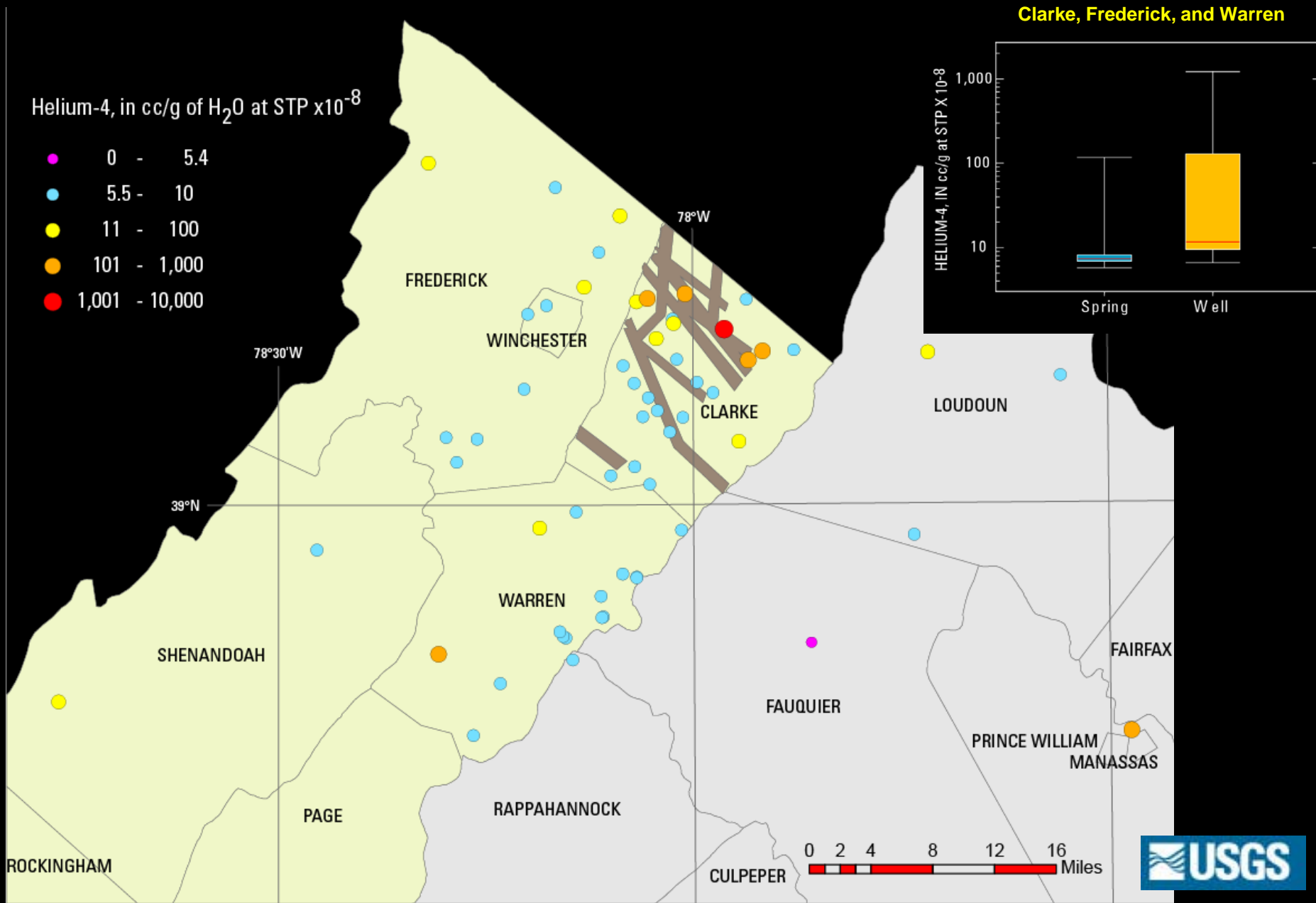
Source of Nitrogen and Bacteria in Clarke County



Shaded areas (modified from Böhlke, 2003) indicate typical ranges of $\delta^{15}\text{N}$ values for nitrate in different source environments.



Old Waters?



Long-term Water Monitoring Network Shenandoah Valley of Virginia FY2009

SITE TYPE

Well

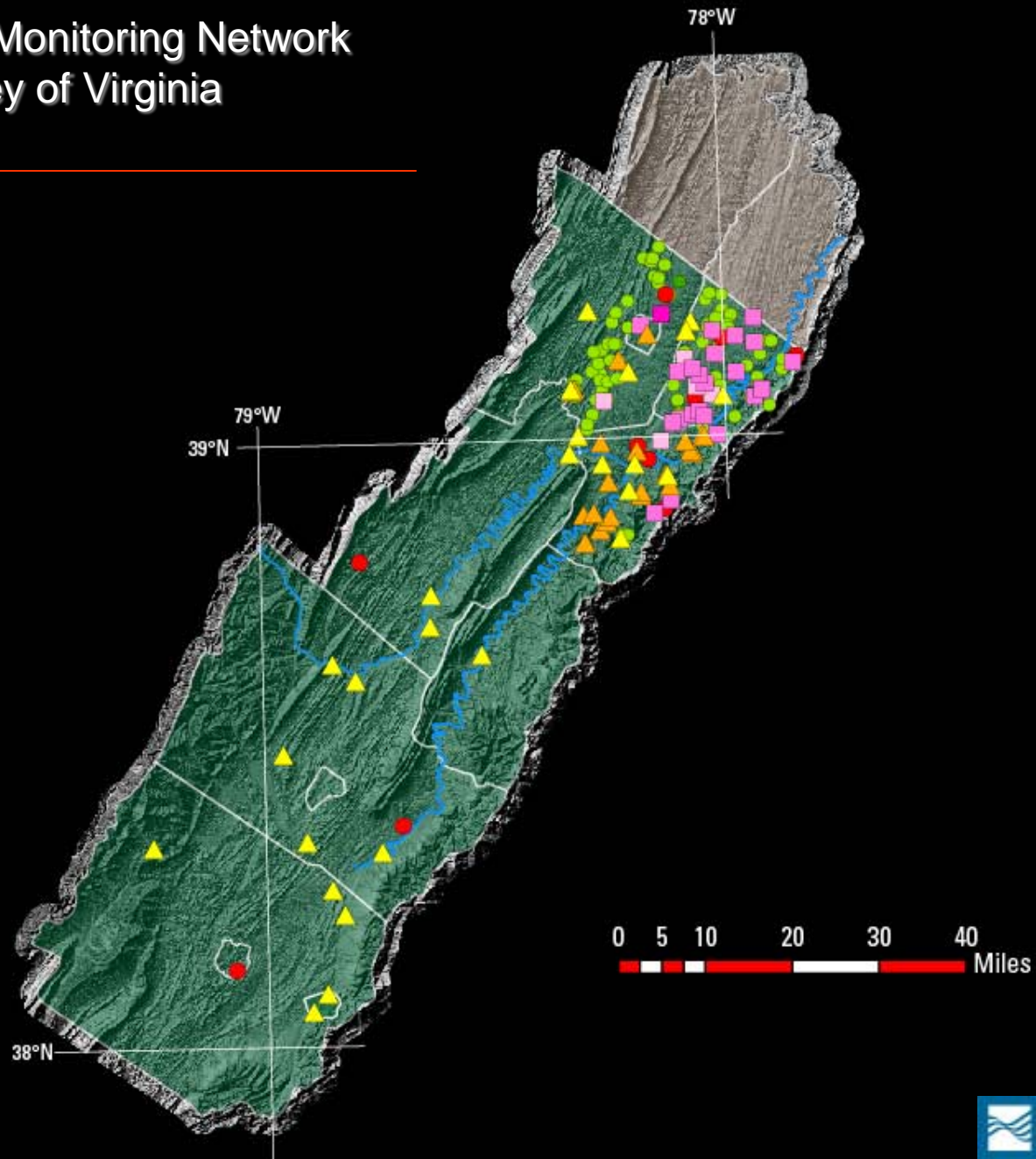
- Continuous
- Intermittent
- Real time

Spring

- Continuous
- Intermittent
- Real time

Streamflow gage

- Partial record
- Real time



Long-term Water Monitoring Network Shenandoah Valley of Virginia FY2010

SITE TYPE

Well

- Continuous
- Intermittent
- Real time

Spring

- Continuous
- Intermittent
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Streamflow gage

- Partial record
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