



DEQ Groundwater Monitoring

Potomac Watershed Roundtable

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Groundwater Monitoring Team Lead

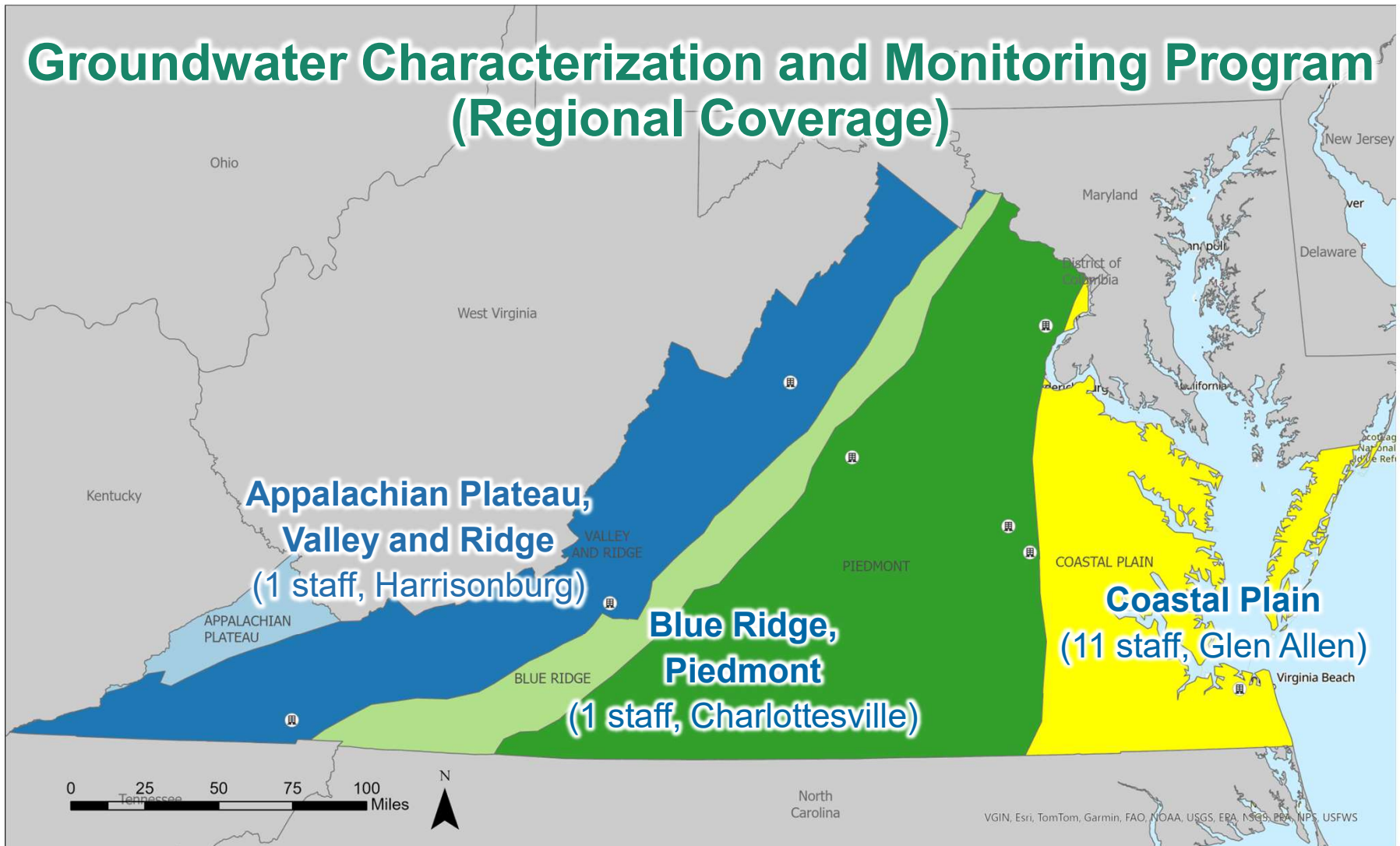
Virginia Department of Environmental Quality

July 11, 2025

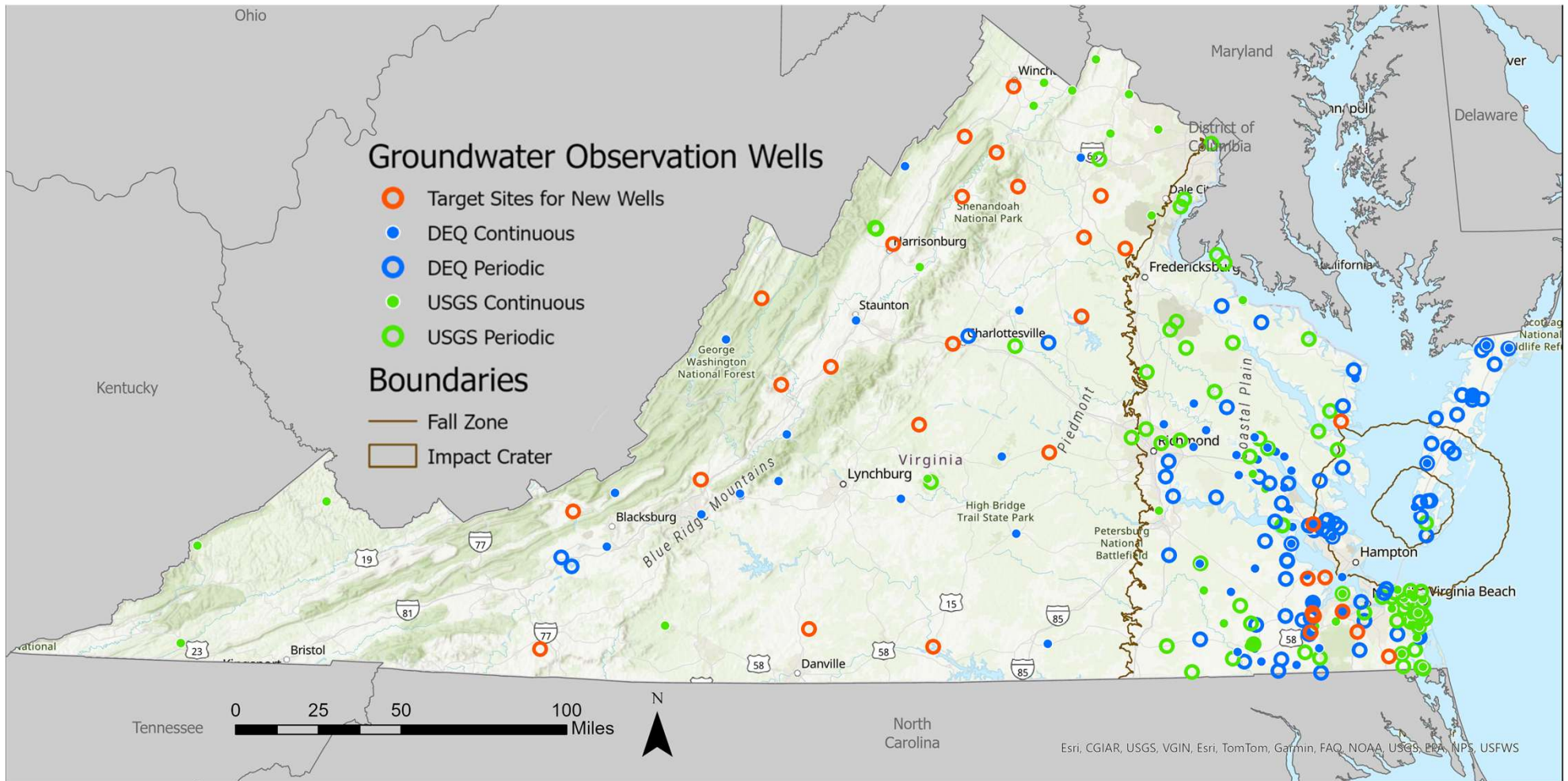
Outline

- Geographic coverage
- Statewide observation well network infrastructure
- Groundwater-level monitoring
 - Drought evaluation
 - Resource management
- Groundwater-quality monitoring
- Data cycle and products
- Ongoing projects in your area

Groundwater Characterization and Monitoring Program (Regional Coverage)



Statewide Groundwater Observation Well Network



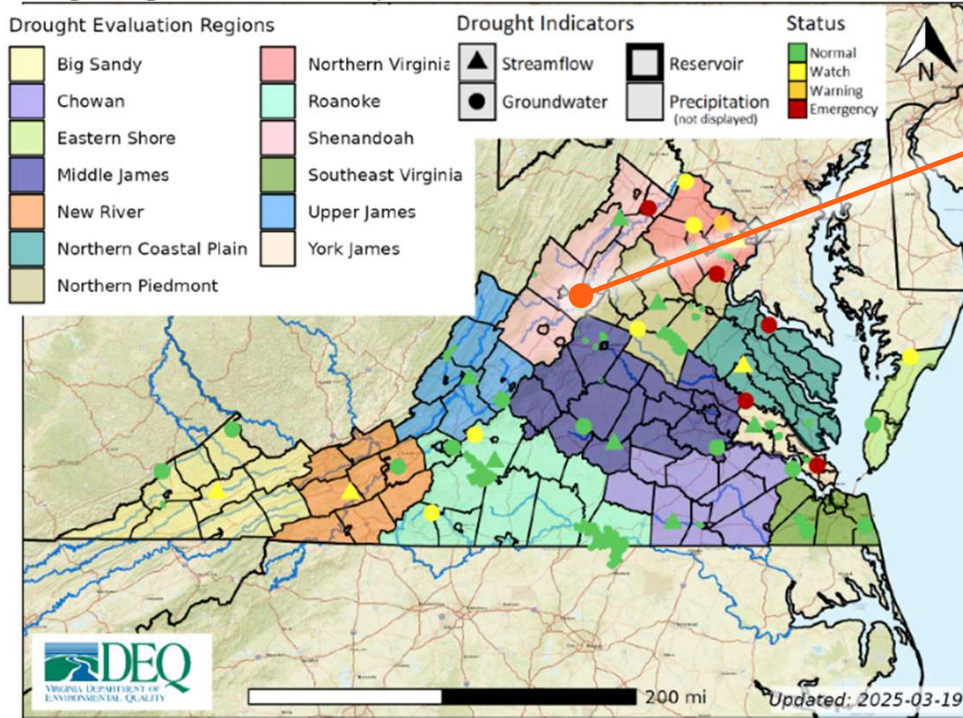
Groundwater-Level Monitoring

- State network operated in partnership with USGS VA-WV Water Science Center
- 358 wells
 - 293 DEQ-operated
 - 65 USGS-operated
 - 148 with continuous monitoring
- Additional USGS wells supported by other partners in Virginia
- Continuous water-level data transmitted to USGS public databases in near-real time



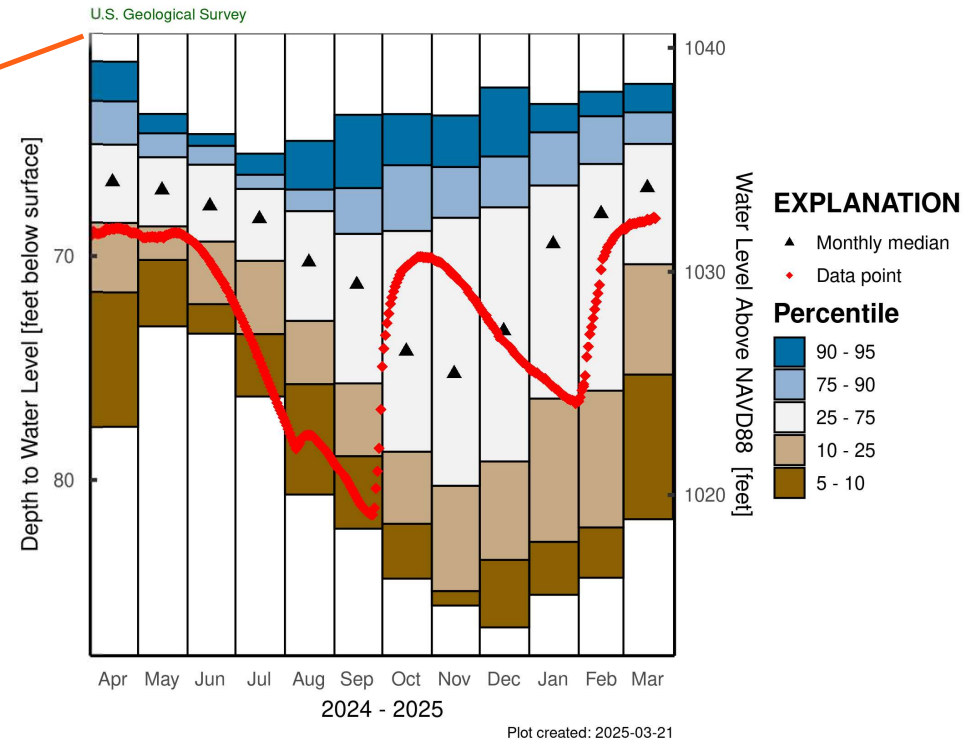
Groundwater-Level Data for Drought Monitoring

Drought Regional Indicator Map:



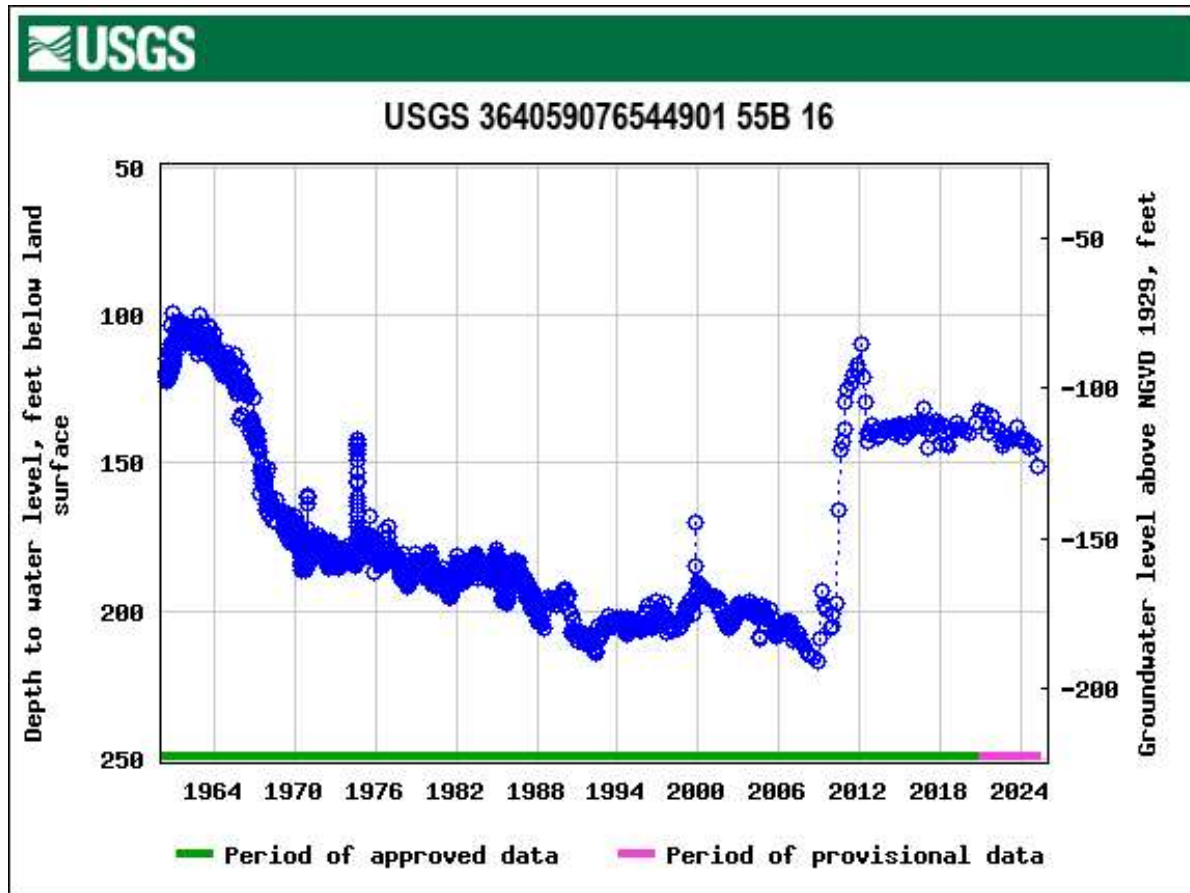
Current drought map available at <https://www.deq.virginia.gov/our-programs/water/water-quantity/drought>

Monthly Statistics Plot
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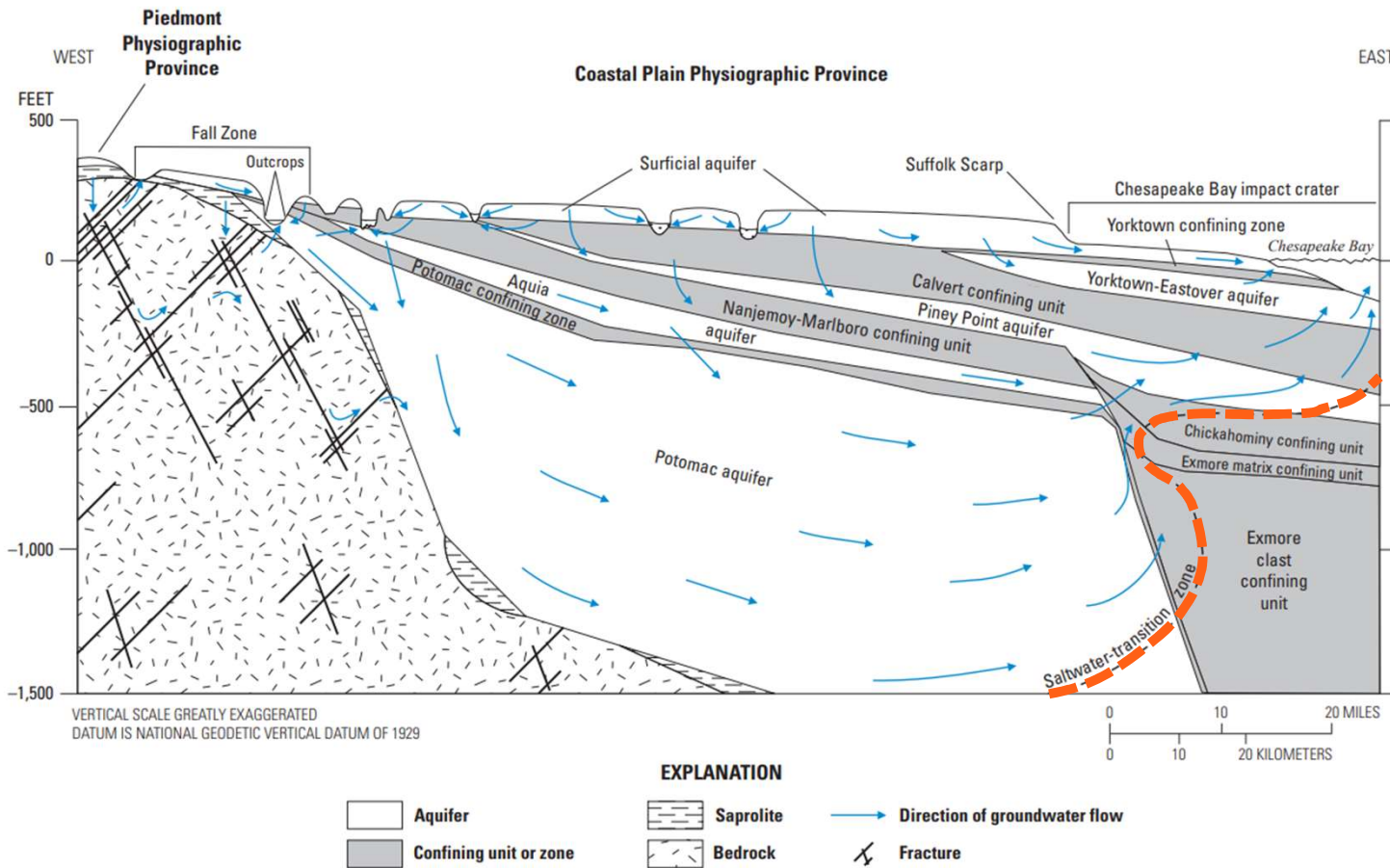


<https://rconnect.usgs.gov/vaww-groundwater/>

Groundwater-Level Data for Resource Management

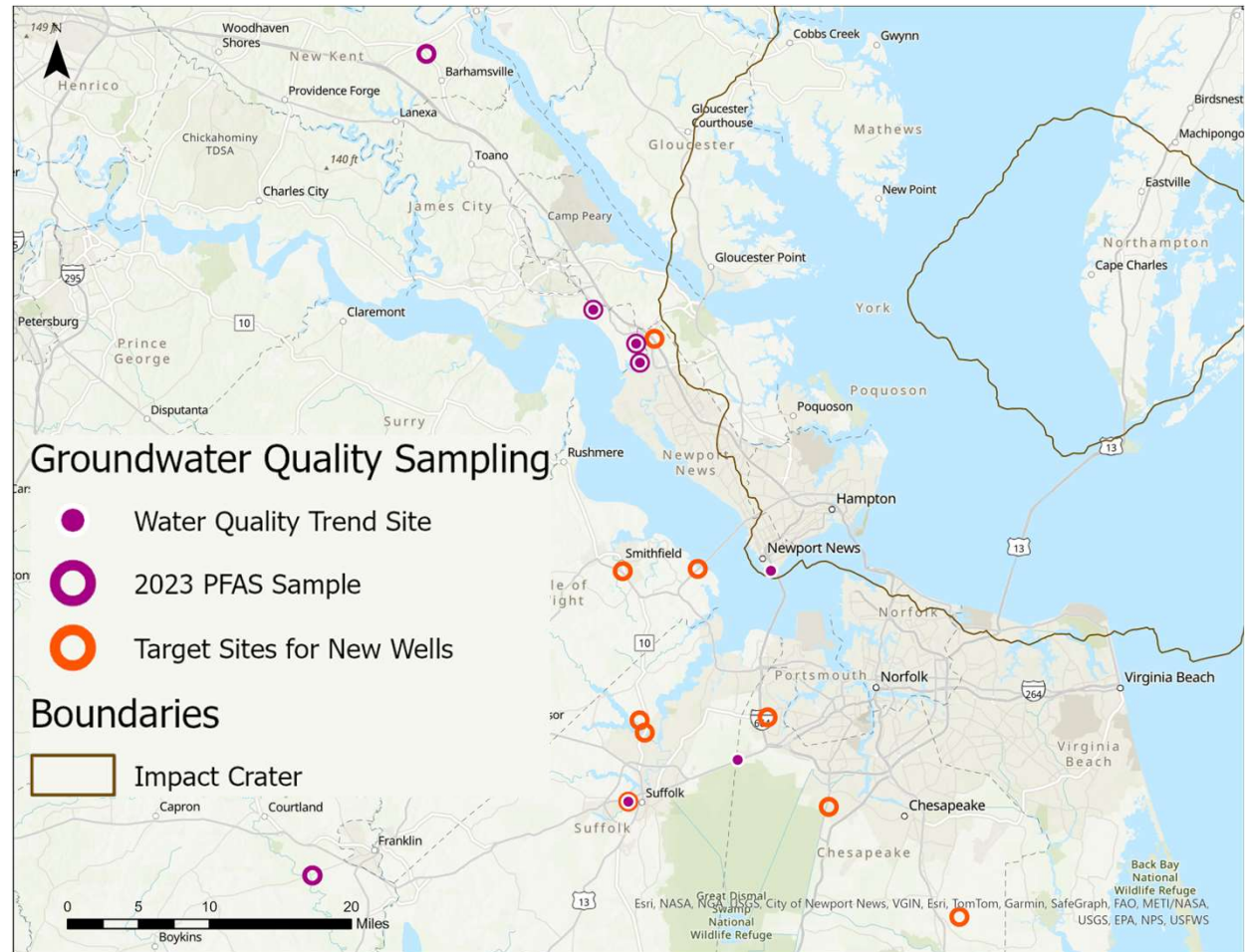


Virginia's Coastal Plain Aquifer System



Ambient Groundwater-Quality Monitoring

- Regular samples from selected trend-monitoring stations
- Additional spot sampling for programmatic needs
- Initial sample from each new State Observation Well
- Add-on PFAS sampling at 11 wells in FY2023
- Withdrawal permittees

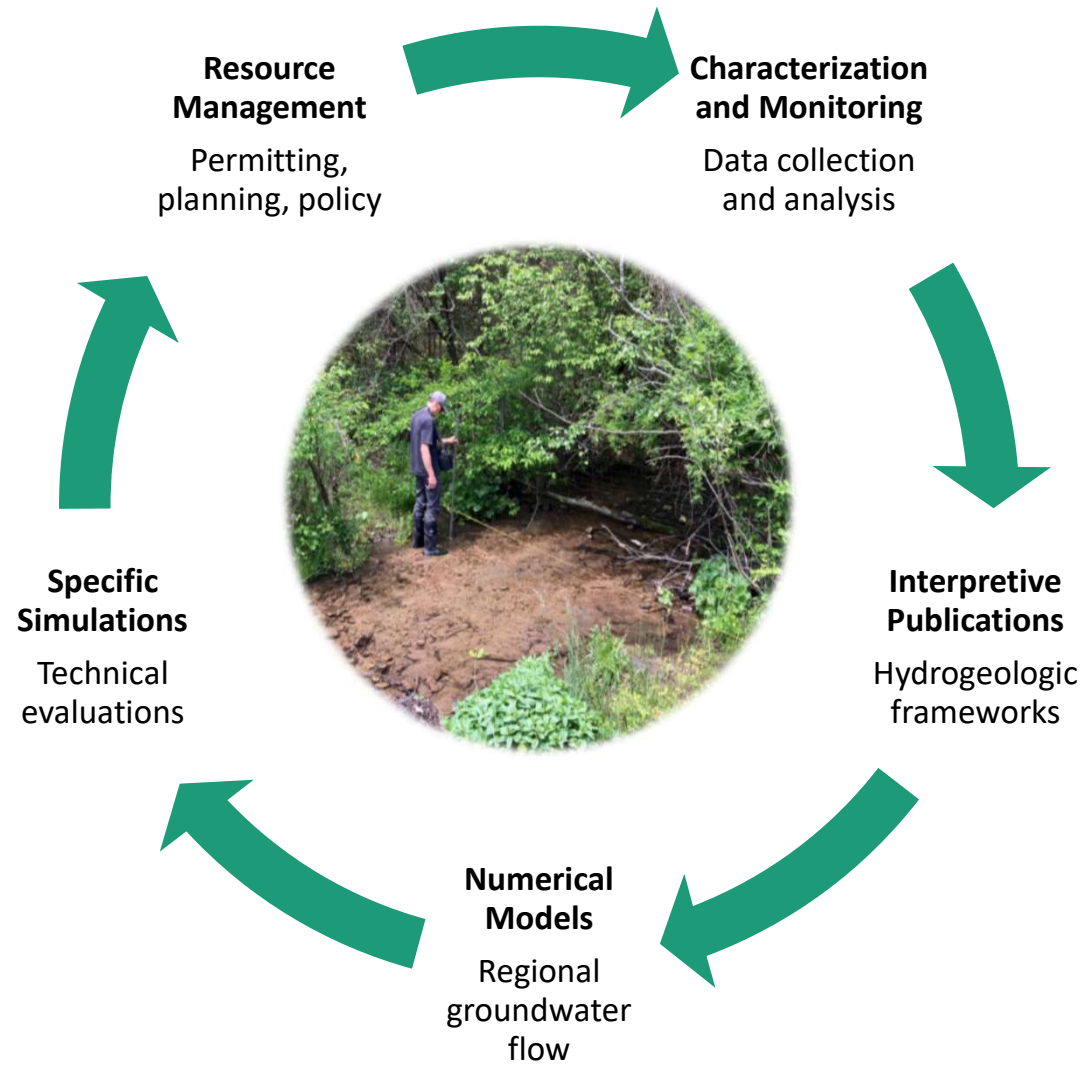


Ambient Groundwater-Quality Monitoring, cont'd

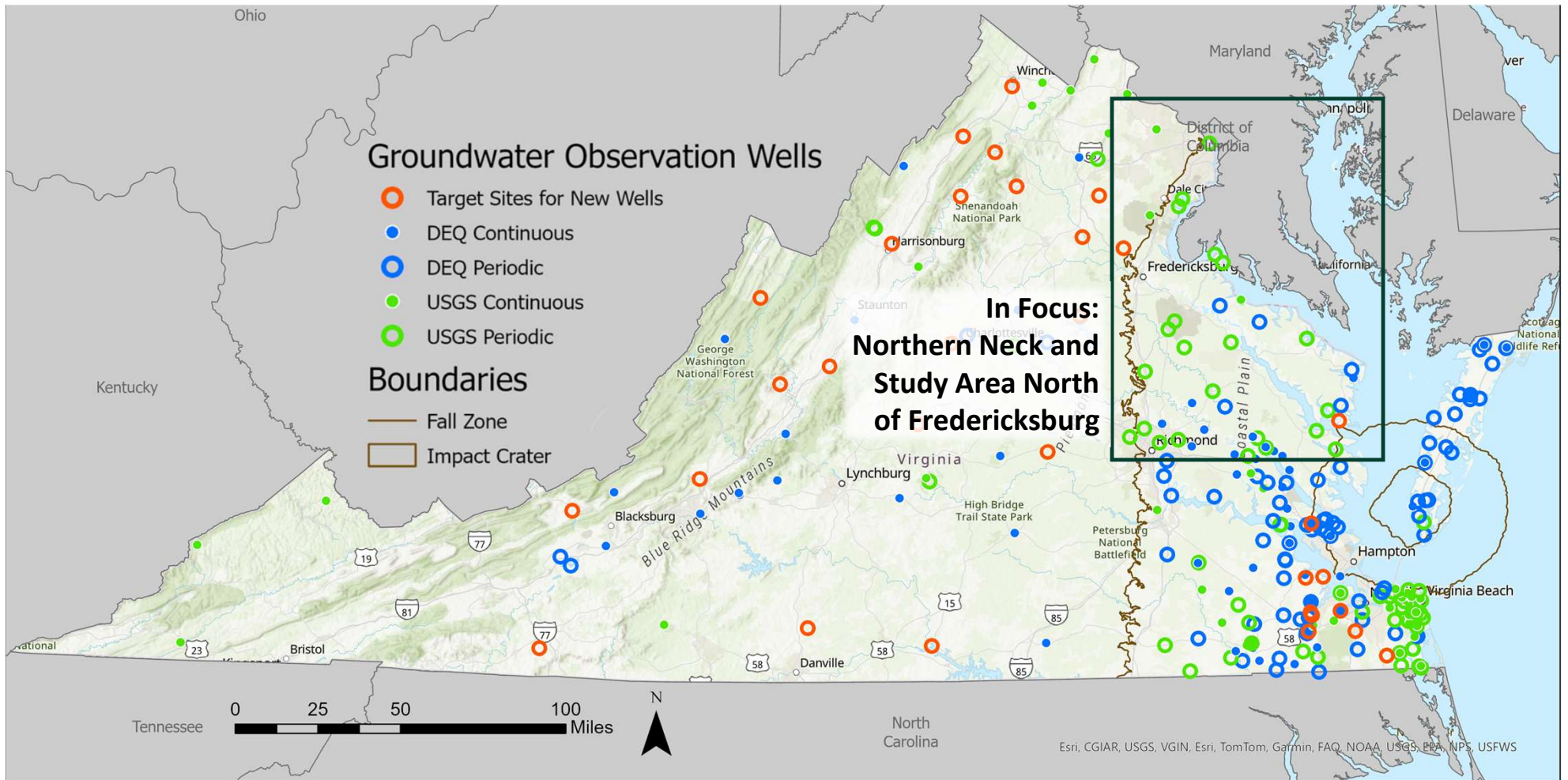
- Led by one team member, supported by EPA Performance Partnership Grant
- Procedures developed from USGS and other guidelines
- Samples collected by submersible pump
- Analyses by state lab (DCLS)
- Results transmitted to Water Quality Portal (<https://www.waterqualitydata.us/>)



DEQ's Groundwater Data Cycle

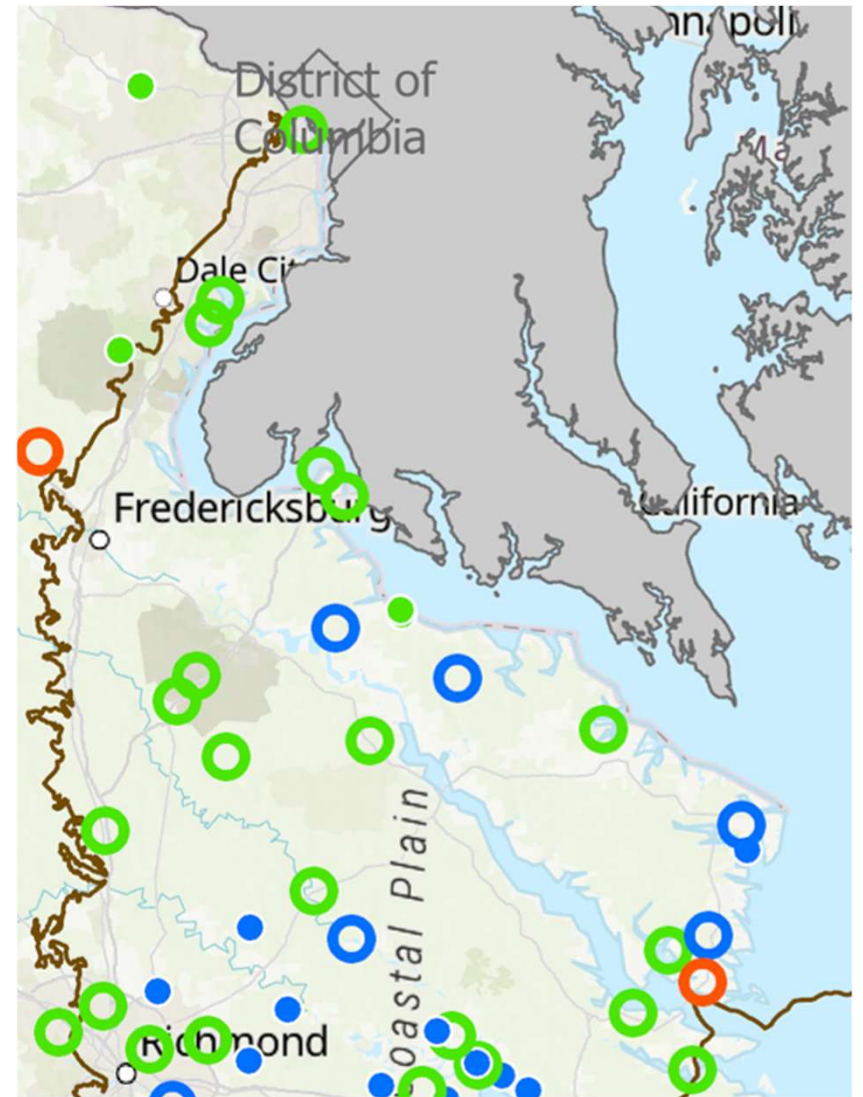


Statewide Groundwater Observation Well Network



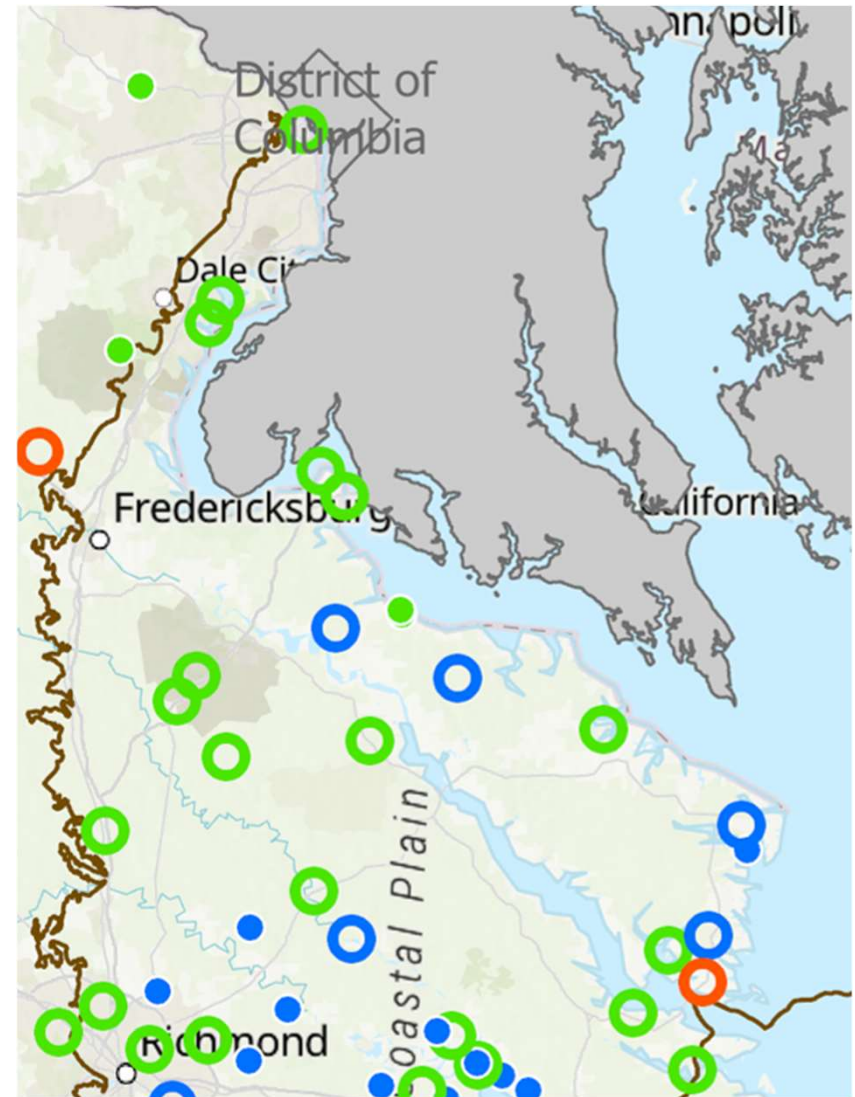
Ongoing Projects: Northern Neck

- 19 active DEQ-USGS observation wells across King George, Westmoreland, Northumberland, and Lancaster Counties
- DEQ exploring possible restoration of real-time monitoring at multi-well Surprise Hill station
- Area included in ongoing DEQ study of groundwater supply east of I-95 requested by Senate Joint Resolution No. 25
- DEQ Groundwater Characterization Team collects hydrogeologic data during well drilling by withdrawal permittees



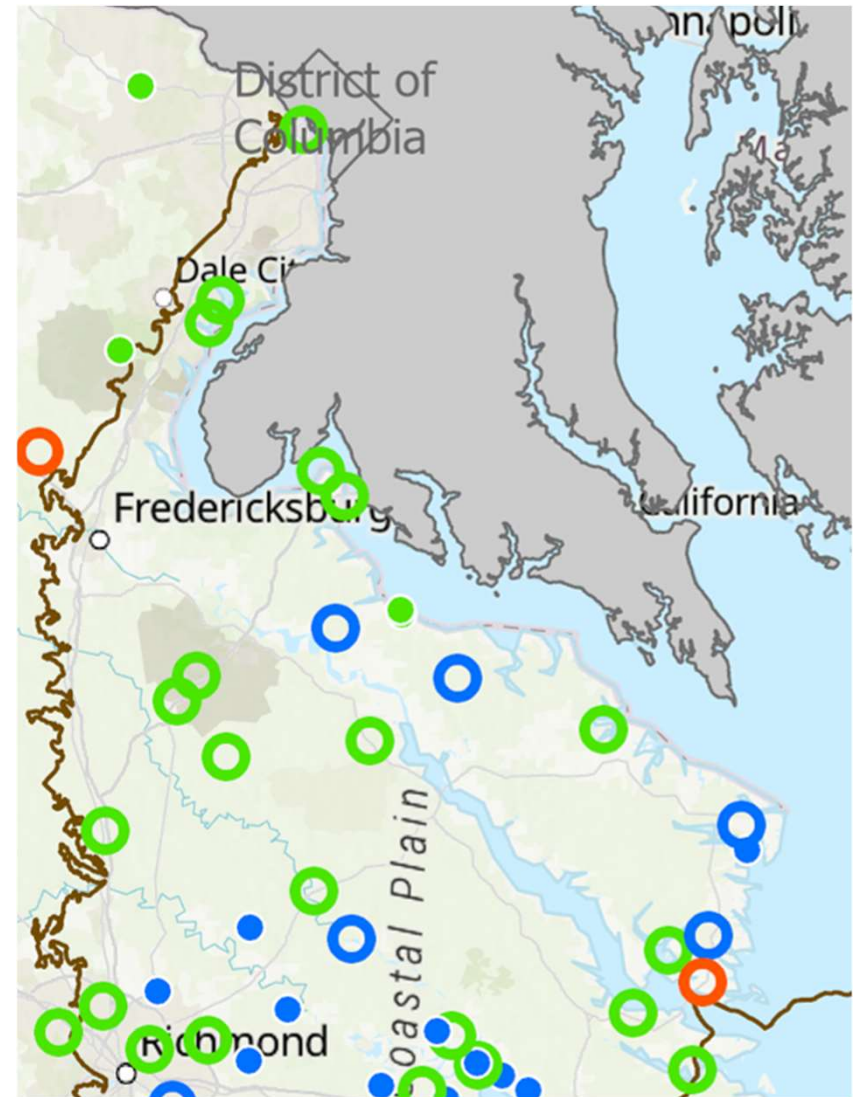
Ongoing Projects: North of Fredericksburg

- USGS currently operates
 - 2 observation wells in Prince William County (in the Groundwater Management Area)
 - 1 in Arlington (outside the GMA)
- Groundwater characterization challenging in complex area between Fall Zone and Potomac River



Ongoing Projects: North of Fredericksburg

- Ongoing DEQ-USGS project:
What can we learn from existing infrastructure?
 - Compile historical data
 - Sample selected wells for age-dating of Potomac aquifer groundwater (3 of possible 5 samples collected)
 - Evaluate existing wells for future GW-level monitoring
 - Conduct passive seismic surveys of bedrock depth
- USGS data release expected in fall 2025





Questions?