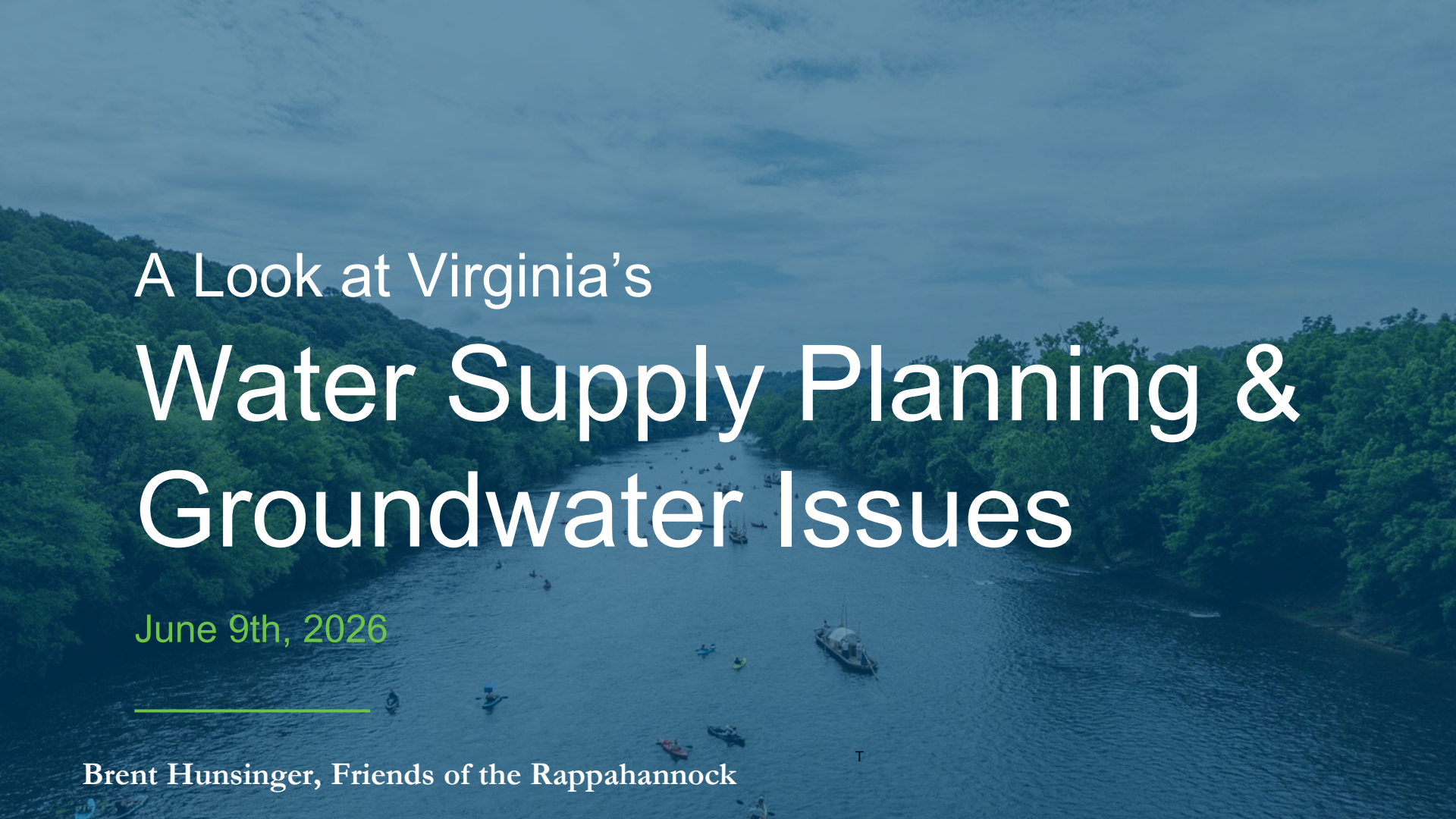
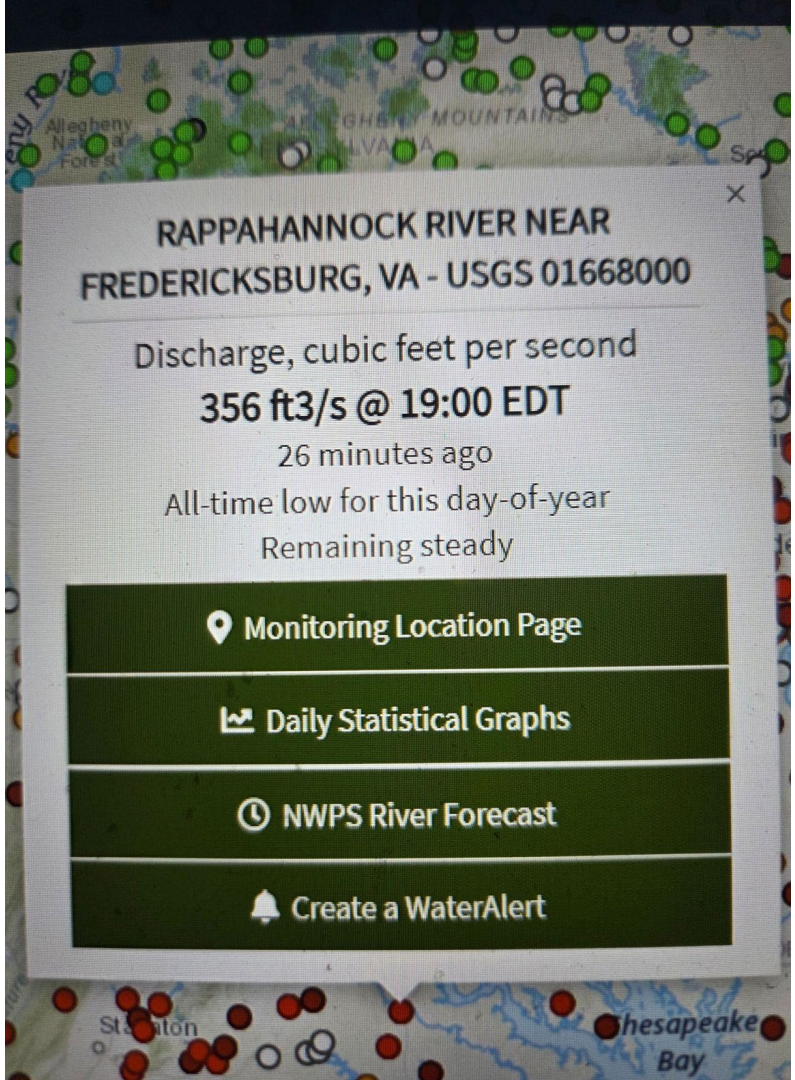


A Look at Virginia's

Water Supply Planning & Groundwater Issues

June 9th, 2026

Brent Hunsinger, Friends of the Rappahannock


RAPPAHANNOCK RIVER NEAR
FREDERICKSBURG, VA - USGS 01668000
Discharge, cubic feet per second
356 ft3/s @ 19:00 EDT
26 minutes ago
All-time low for this day-of-year
Remaining steady
Monitoring Location Page
Daily Statistical Graphs
NWPS River Forecast
Create a WaterAlert
Allegheny
MOUNTAINS
Chesapeake
Bay

Why are we concerned?

Changes in precipitation patterns stemming from climate change are resulting in highly variable surface water flows for extended periods of time.

Groundwater resources are under stress throughout Virginia. In some regions this is resulting in movement from groundwater wells to surface water sources for municipal water use.

80% of all water withdrawals in Virginia unpermitted leading to uncertainty regarding water availability under low flow scenarios

Many data center projects are utilizing water resources to cool servers via reclaimed water systems. Their need for this water peaks at times of highest temperatures. This could be an issue where reclaimed systems are clustered.

Regional Water Supply Planning In Virginia

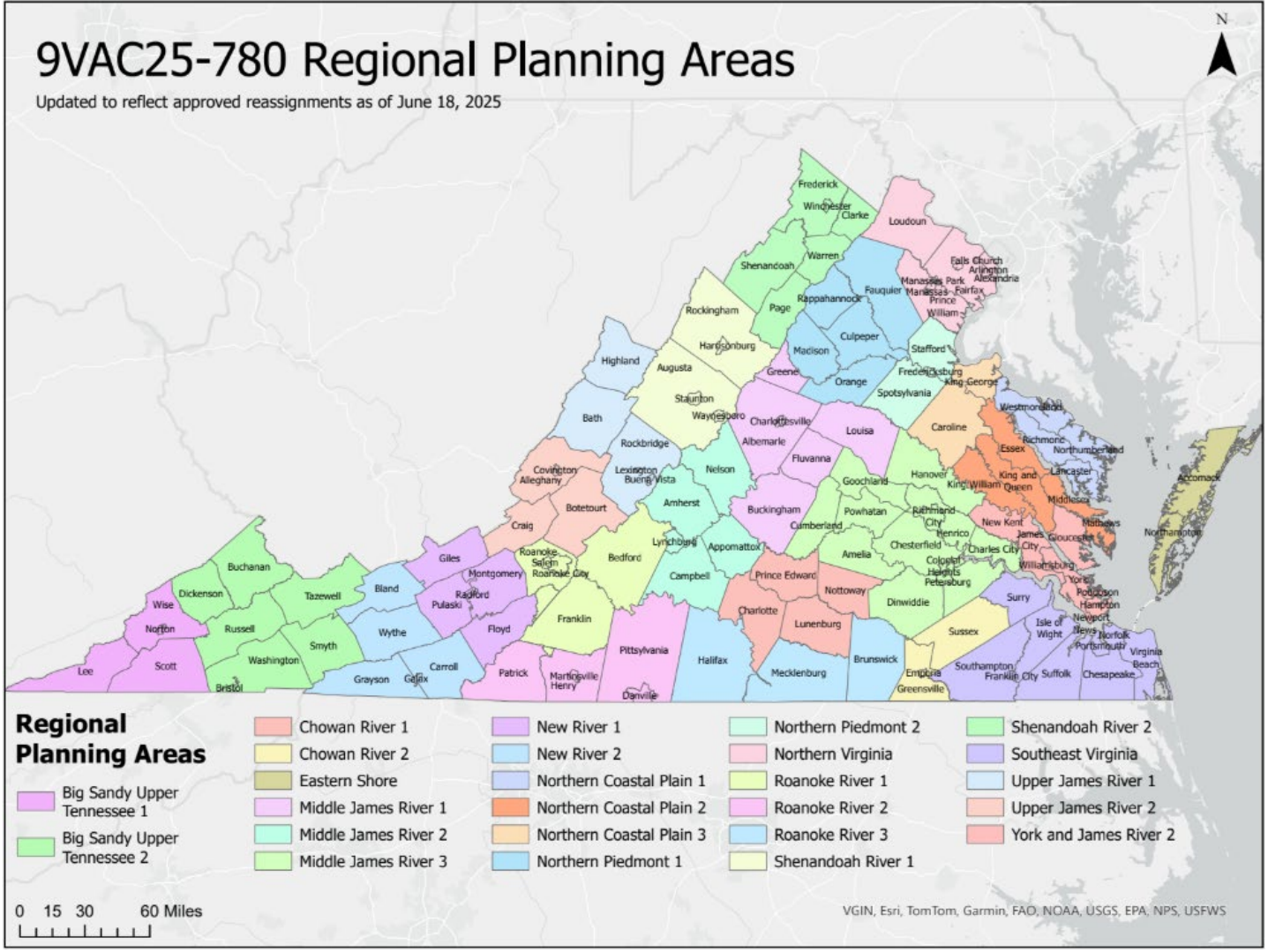
The Water Supply Planning program was created after the 2001-2002 drought.

2024 regulation stemming from 2020 legislation resulted in 25 Regional Planning Areas (RPAs).. Localities in each RPA develop a single jointly produced regional water supply plan to DEQ by October 9, 2029.

Plans include information on water sources, water use, and water resources, as well as water demand projections, water management actions, drought response and contingency plans, and the identification of water supply risks and proposal of regional strategies to address such risks.

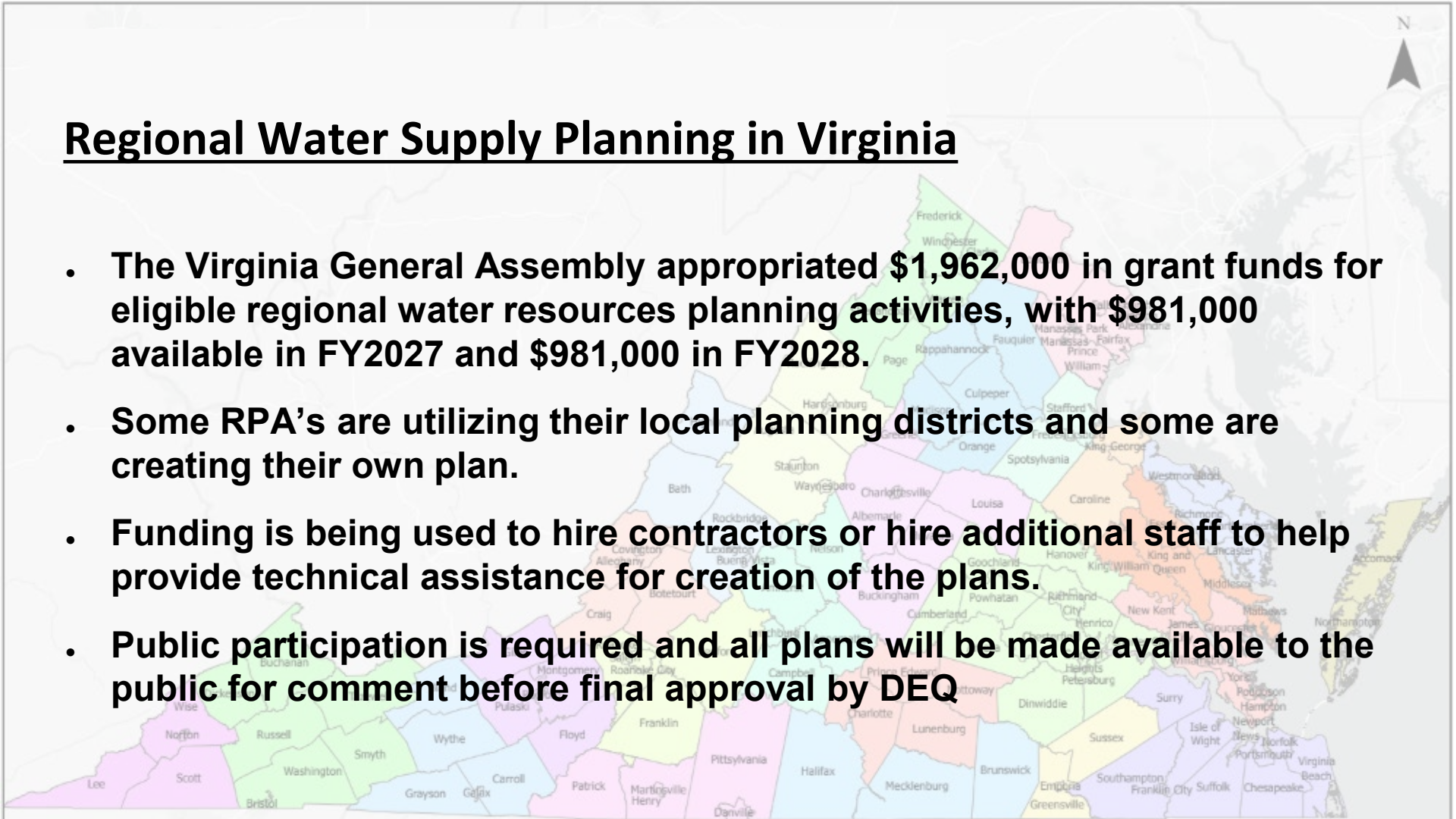
9VAC25-780 Regional Planning Areas

Updated to reflect approved reassignments as of June 18, 2025



Regional Water Supply Planning in Virginia

- **The Virginia General Assembly appropriated $1,962,000 in grant funds for eligible regional water resources planning activities, with $981,000 available in FY2027 and $981,000 in FY2028.**
- **Some RPA's are utilizing their local planning districts and some are creating their own plan.**
- **Funding is being used to hire contractors or hire additional staff to help provide technical assistance for creation of the plans.**
- **Public participation is required and all plans will be made available to the public for comment before final approval by DEQ**



VIMS Cumulative Impacts Study of Surface Water Intakes on Icthyoplankton and Water Quality

The 3-year study is being led by Jian Shen and Lyle Varnell - began July, 2025

Focus is on the cumulative impacts of surface water intakes on fish eggs and larval mortality and salinity intrusion in the Rappahannock, York, and James Rivers. Concentration on tidal fresh stretches of these rivers.

Collecting information on permitted and unpermitted water withdrawals in Virginia's tributaries.

Using three dimensional particle tracking model to measure hydrodynamics and simulate fish eggs/larval transport.

Report and recommendations due in late 2028

Loudoun County Groundwater Study

“red zones” where data indicate the water table has declined by 10 to 40 feet during the past 25 years.

Loudoun County Preservation and Conservation Coalition

$200k to study groundwater in western Loudoun and Fauquier Counties

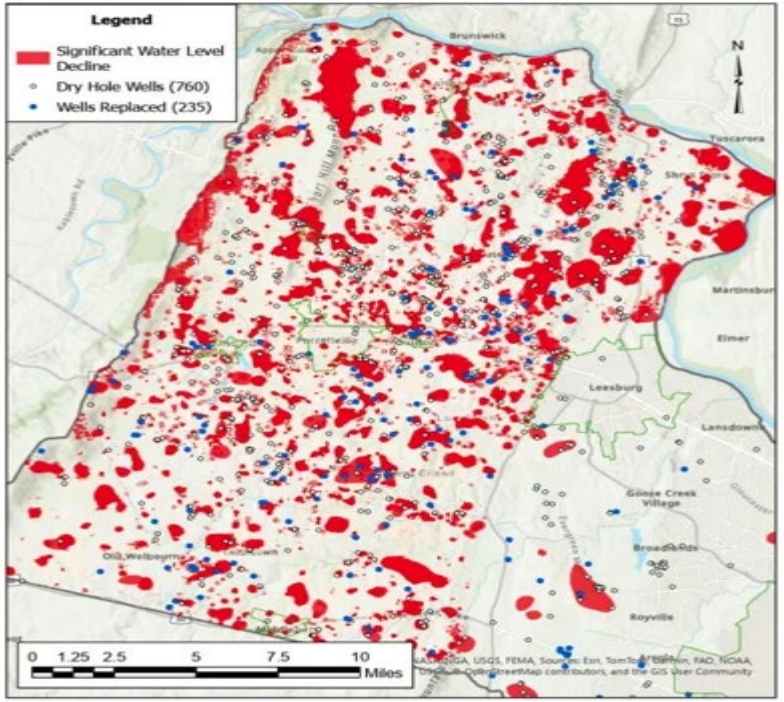
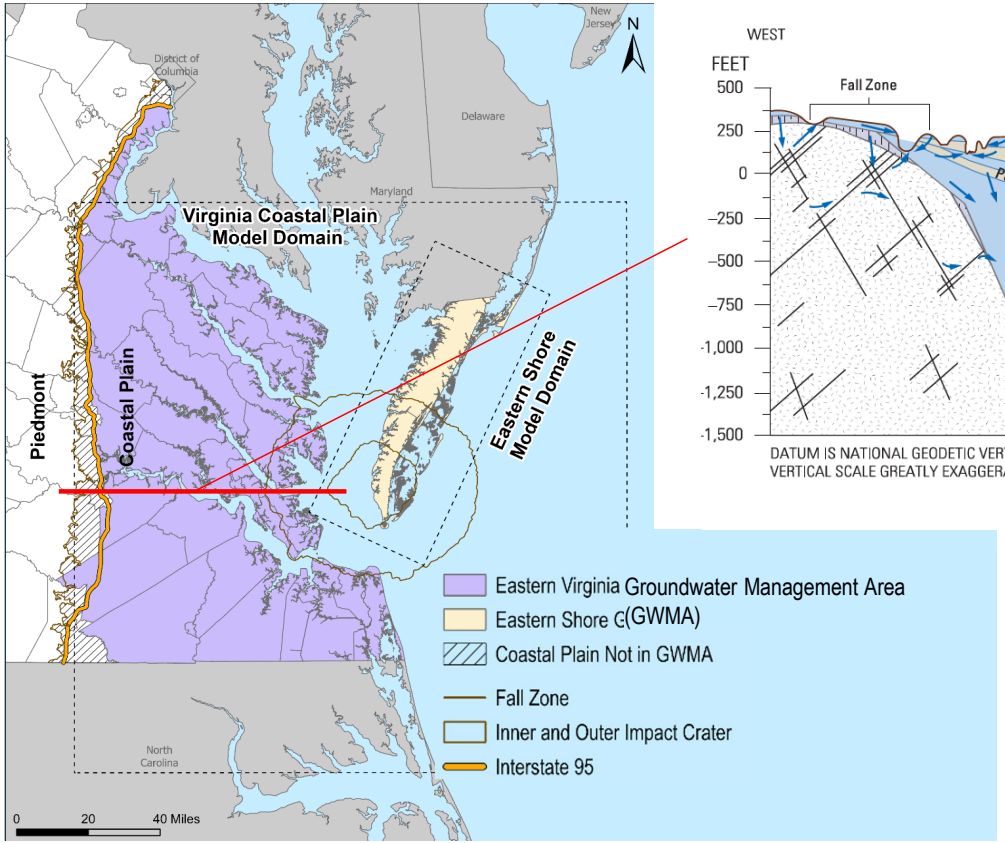
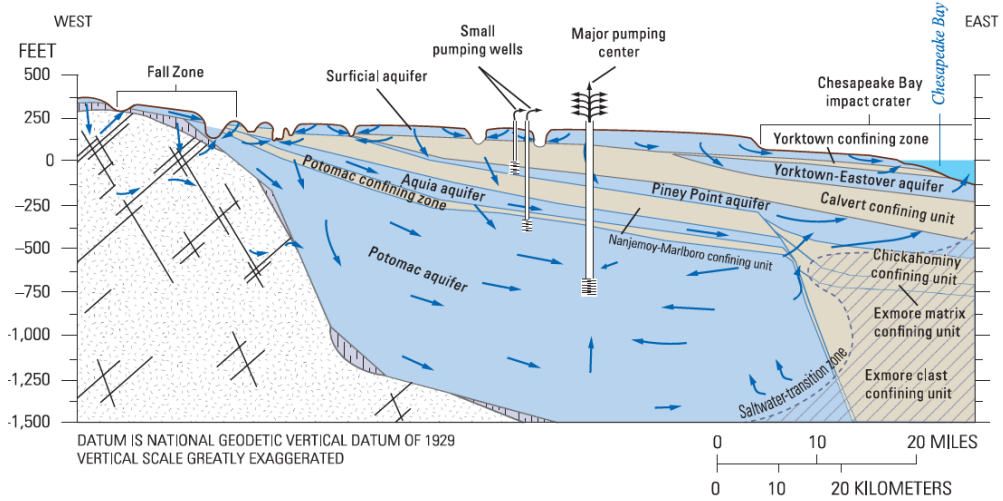


Figure 37 Areas of Significant Water Level Decline, Wells Drilled Dry, and Wells Replaced Based on Analysis of Pre-2000 and Post-2000 Data.

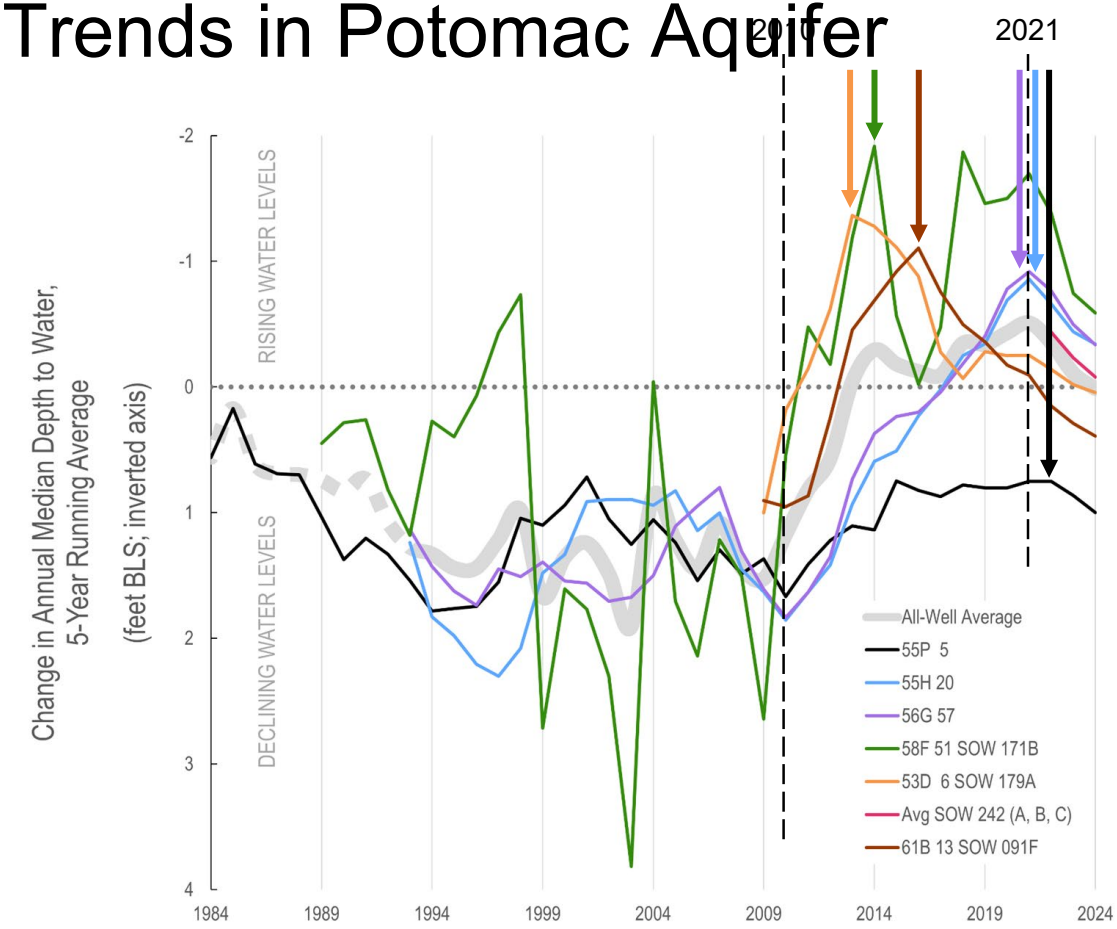
Virginia Coastal Plain (VCP) Aquifer System





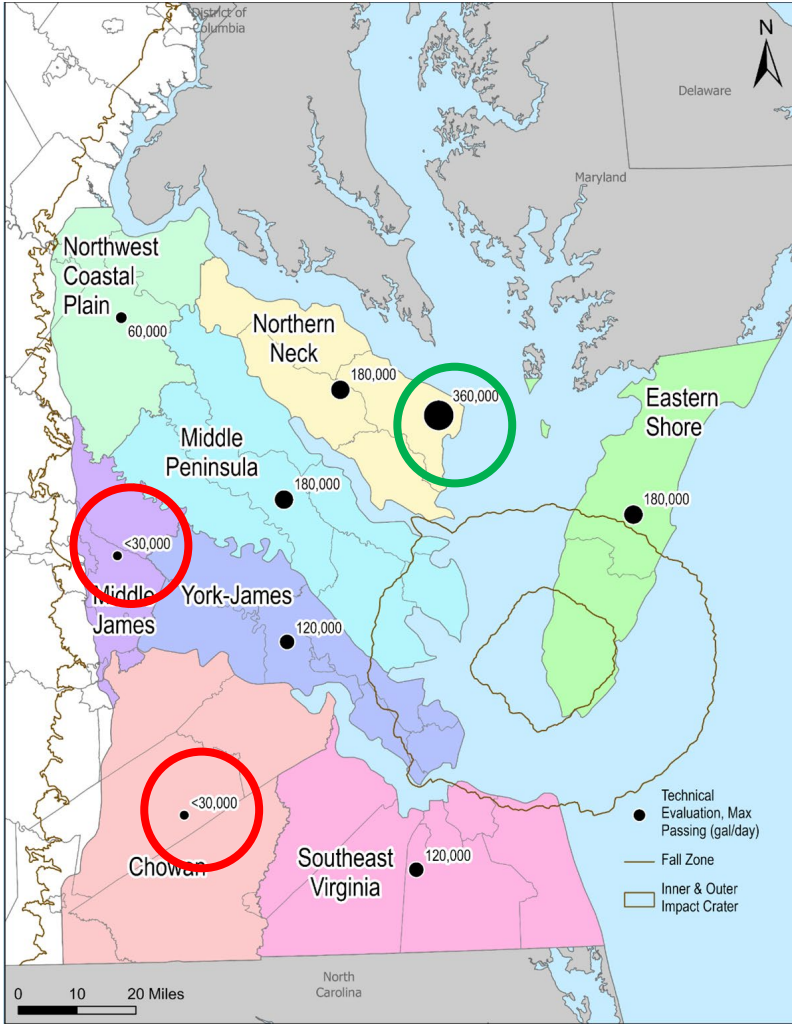
Observed GW-Level Trends in Potomac Aquifer

- Trend wells (colored lines) with overall average (thick gray line)
- After 2010, GW levels across the Potomac aquifer broadly rose and stabilized for about a decade
- By around 2021, rising trends stalled and began to reverse
- Levels throughout Potomac aquifer projected to resume declining in the next 5 to 10 years



Limited Capacity for New GW Withdrawals

- Simulated a single additional withdrawal of 3 Mgal/day at each of 9 locations
- None passed criteria for permitting
- Maximum-passing amount varied regionally
  - o 360,000 gal/day in Northumberland County
  - o <30,000 gal/day in western regions
- Only the best-case estimate would support a large withdrawal



Summary of Key Technical Findings

- Major industrial withdrawals have caused inland GW levels to decline below sea level, inducing inward and downward flows
- Sharp decrease in a major industrial withdrawal (2010), plus special management efforts (2014–2017), reduced GW deficit to near zero in the overall Potomac aquifer (with regional variation)
- GW levels in the Potomac aquifer rose and broadly stabilized until about 2021, when rising trends stalled and began to reverse
- VCP aquifer system currently has limited capacity for significant new withdrawals (varying by region from near zero to ~360,000 gal/day)
- Chloride concentrations in the aquifer system are increasing locally in parts of Eastern Virginia and parts of the Eastern Shore

SJ25 Key Problems Revealed

Lack of Groundwater Supply for Future Withdrawals in the VCP

Reconciling the Prioritization for Human Consumption with Other Provisions of the Groundwater Management Act of 1992

Accounting for Lawful Unpermitted Withdrawals

Accounting for Unlawful Unpermitted Withdrawals

Understanding Uncharacterized Areas in the VCP

Accounting for SWIFT

Groundwater Trading

Source of Groundwater Program Funding

SJ25 Key Recommendations for Legislation and Funding

It is the Virginia Conservation Network and members hope that all stakeholders can work together in the coming months to create a legislative agenda that will help to begin address the key problems the SJ25 groundwater study revealed.

Credits

This presentation contains slides from a presentation given by Brian Campbell from Virginia Department of Environmental Quality at the 2026 Environment Virginia conference.

Photos on Slides 1 and 2 are courtesy of James River Association and Friends of the Rappahannock.