



Water Quality in Rockbridge County

An Update on Stream Health

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How healthy is my stream?

Assessing Virginia's waterways

- Biological monitoring program
 - Spring and Fall monitoring
 - Assess habitat and biological community
 - VA Stream Condition Index
- Ambient monitoring program
 - Monthly or bi-monthly monitoring
 - 2-year window in 6-year cycle
 - Trend stations to assess long term trends



Photo: Jan Hamrsky, www.lifeinfreshwater.net

Designated Uses of Our Waterways

- Recreational use
- Aquatic life use
- Public drinking water supply (applied within 5 miles of intake)
- Wildlife use
- Shellfishing use
- Fish consumption use



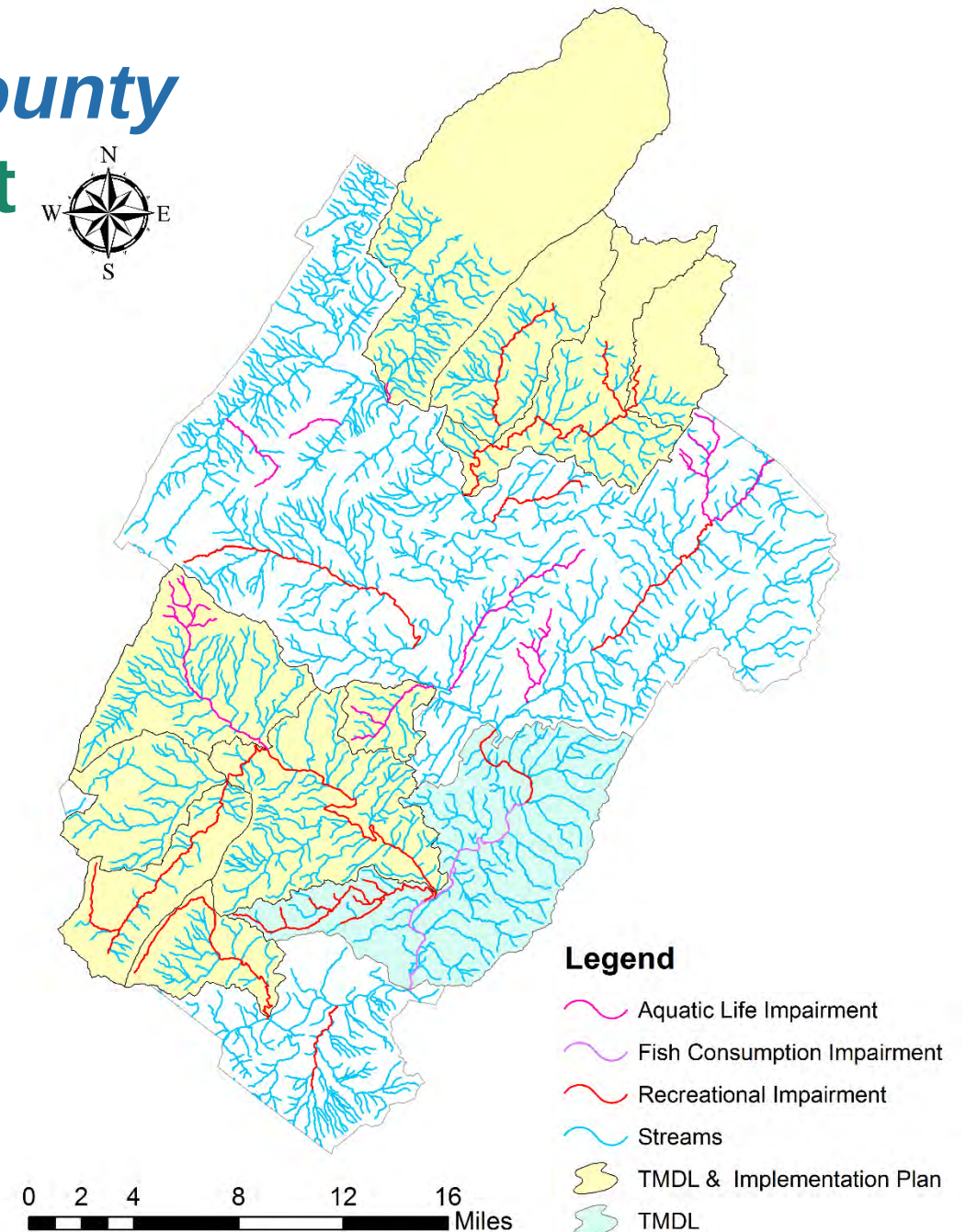
Photo: Jan Hamrsky, www.lifeinfreshwater.net

Water Quality in *Rockbridge County*

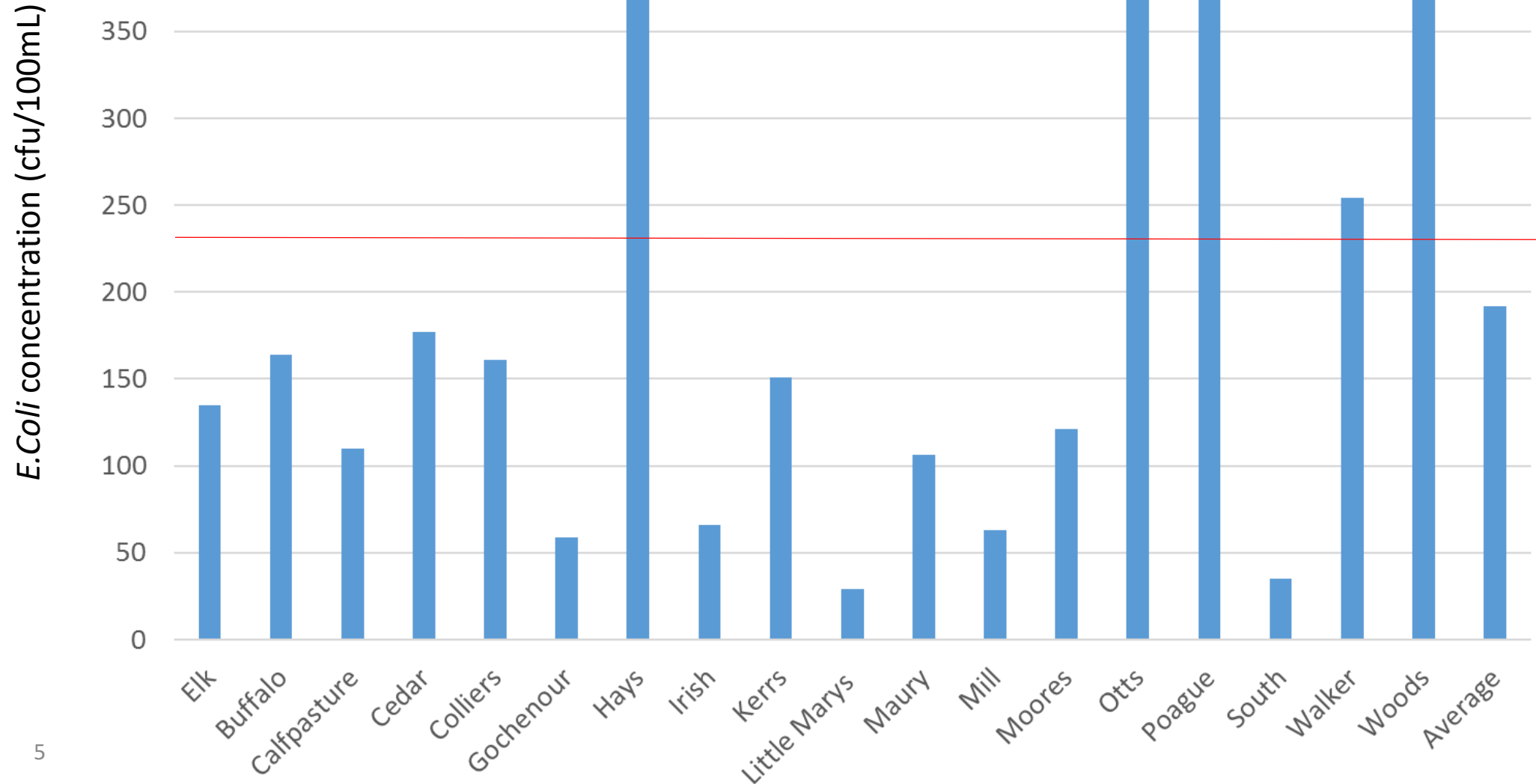
2018 Water Quality Assessment



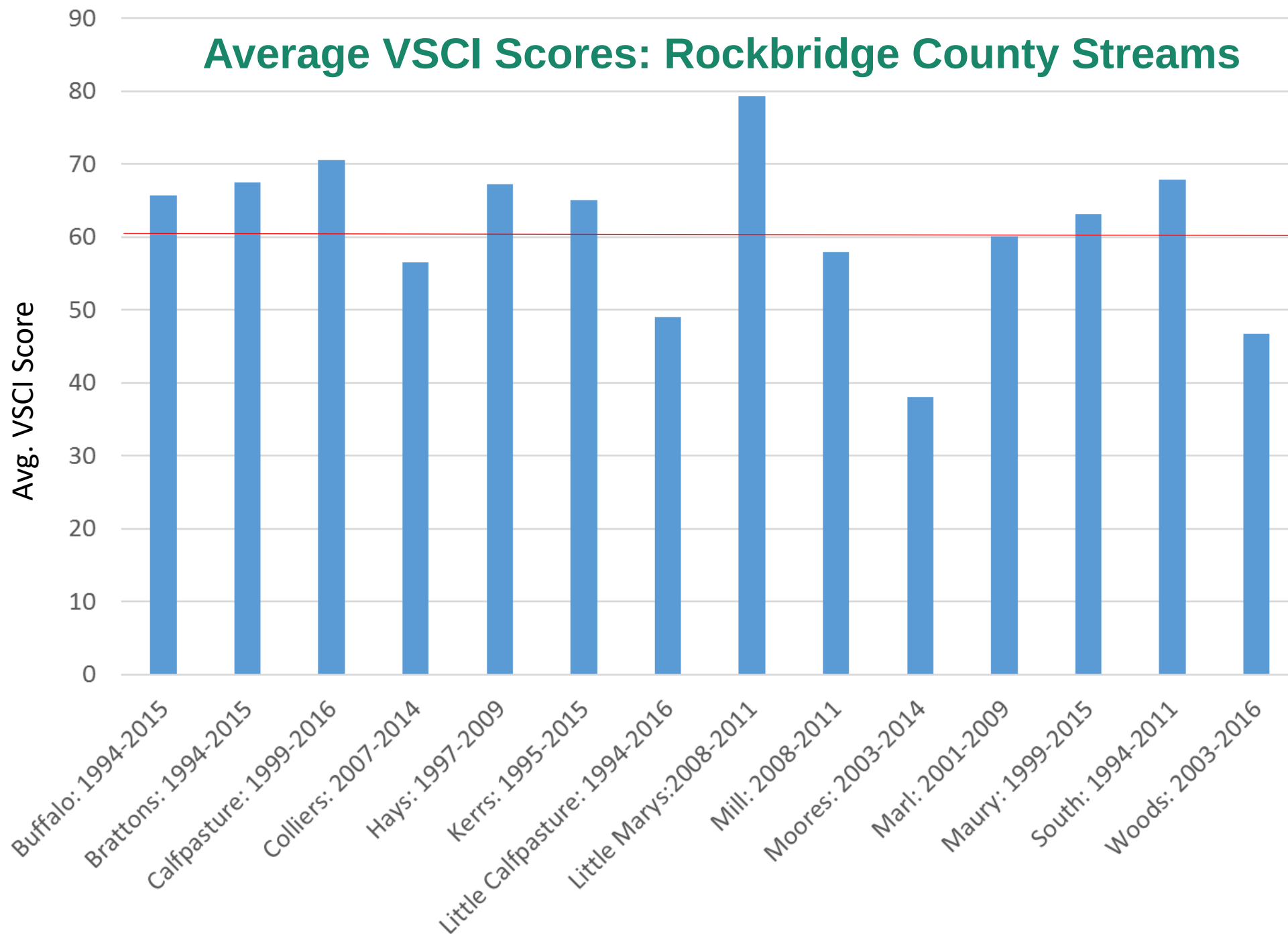
- 1,820 miles of stream
- 61 miles of aquatic life impairments
 - Temperature
 - pH
 - Benthic
- 17 miles of fish consumption impairments
- 158 miles of bacteria impairments



Average *E.coli* Concentrations: Rockbridge County Streams (2011-2019)



Average VSCI Scores: Rockbridge County Streams



How do we address impairments?

- Total Maximum Daily Loads (TMDL)
 - Identify pollutant sources
 - Develop watershed model
 - Estimate pollutant reductions needed
- TMDL Implementation Plans
 - Identify corrective actions needed to achieve reductions
 - Cost estimates and timeline
 - Education and outreach
- Implementation Projects
 - Supported through state and federal grant programs
 - Partnerships with local SWCDs

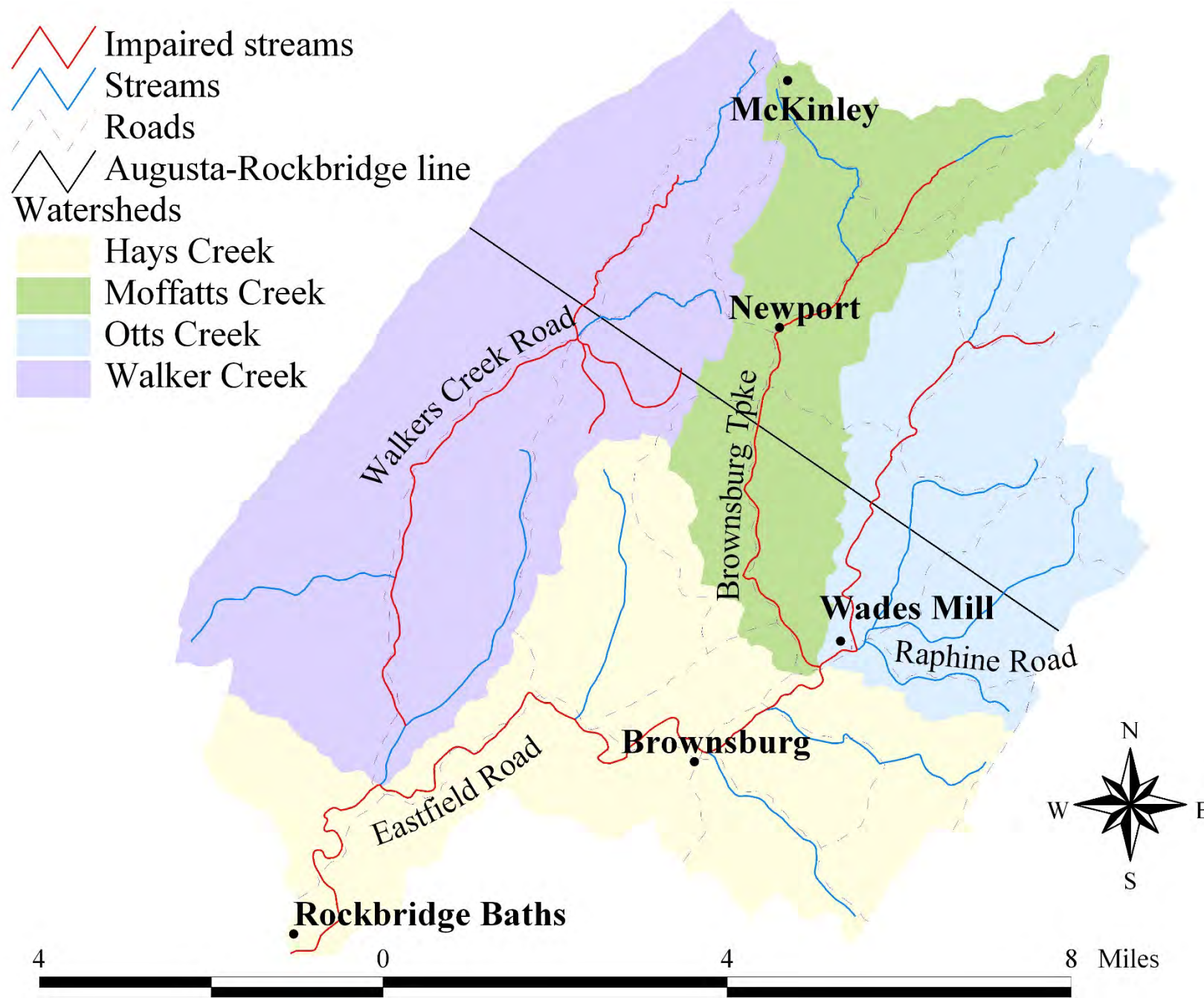


Total Maximum Daily Loads:

Rockbridge County, Virginia

Watershed	Impairment	TMDL Dev. Year	TMDL IP Dev. Year	Implementation Project Year
Hays, Walker, Moffatts & Otts Creeks	Bacteria	2008	2010	2012
Little Calfpasture River	Benthic (sediment)	2010	2018	N/A
Maury River, Buffalo, Cedar and Colliers Creeks	Bacteria, Benthic (Colliers, sediment)	2014	2015	2017
Woods Creek	Bacteria, Benthic	2018	2019	N/A

The Hays Creek Watershed



Hays Creek Bacteria TMDL:

Bacteria Source Reductions

Watershed	Livestock direct deposition	Cropland	Pasture	Straight pipes and failing septic systems	Estimated violation rate of <i>E.coli</i> standard
Otts Creek	55%	0%	0%	100%	10%
Walker Creek	40%	0%	0%	100%	9%
Hays Creek	80%	80%	80%	100%	10%

Hays Creek Water Quality Improvement Project

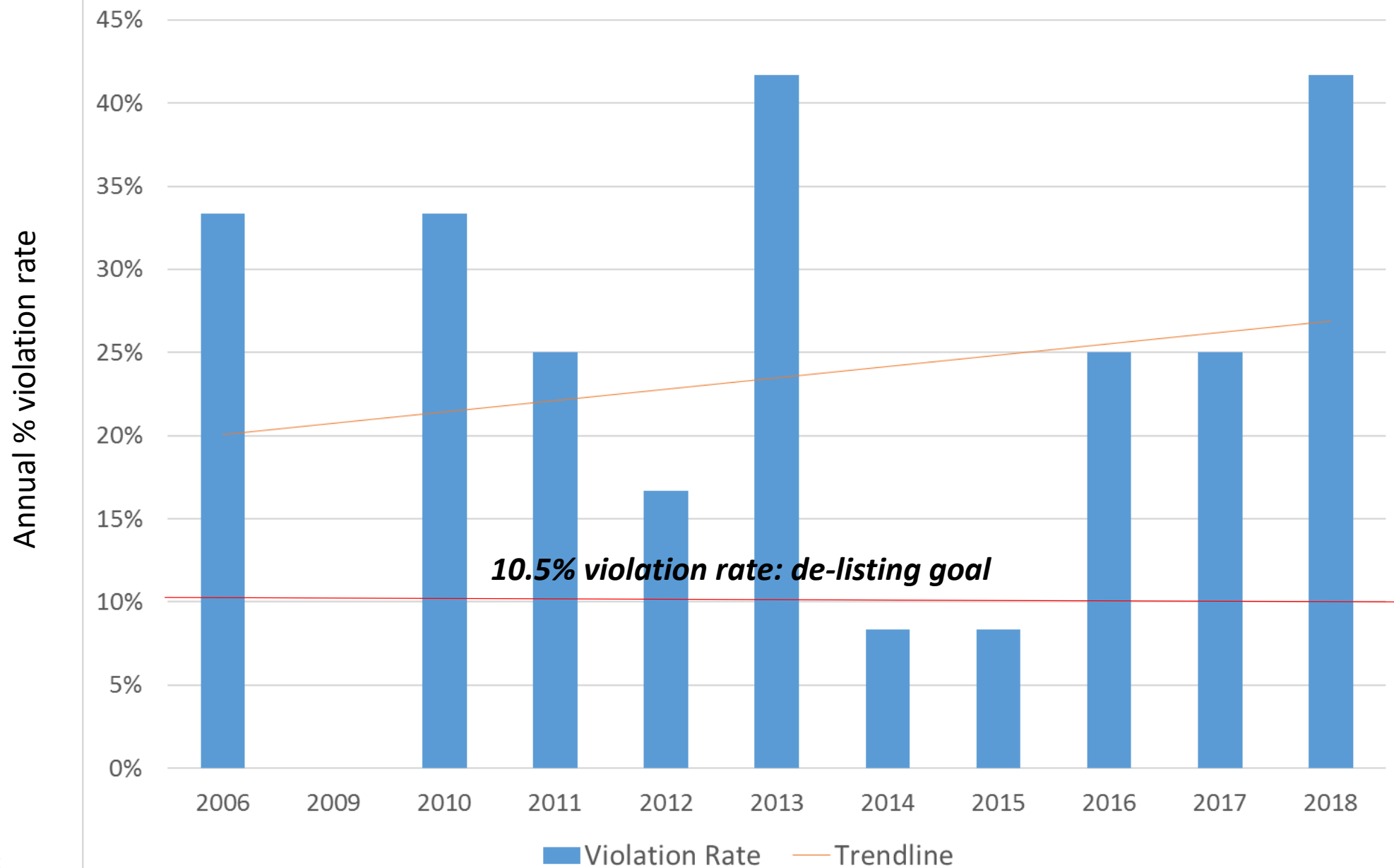
- Implementation led by Natural Bridge SWCD with numerous partners
- 5 year implementation project
- Challenges with residential septic program
- Moderate success with livestock exclusion

Table 1: Hays, Moffatts, Otts and Walkers Creeks BMP Summary: July 2012—June 2017

Control Measure	Units	Goal	Installed	%
Agricultural				
Stream Exclusion Fencing	F	353,062	31,544	9
Stream Exclusion Fencing	S	115	19	17
Riparian Buffer	A	275	24	9
Improved Pasture Management	A	23,356	0	0
Aforestation of Highly Erodible Pasture	A	1,000	0	0
Sod Waterways	A	49	0	0
Continuous No-Till	A	502	0	0
Vegetative Buffer on Cropland	A	73	0	0
Long Term Vegetative Cover on	A	N/A	159	N/A
Manure Storage	S	11	1	9
Residential Septic				
Septic Tank Pump-out	S	66	12	18
Septic System Repair	S	90	0	0
Septic System Installation	S	28	1	4
Alternative Waste Treatment System	S	57	1	2

A = Acres, F = Linear Feet, S = System; Note: BMP counts only include 319-funded and state VACS.

Hays Creek at Route 602: Annual *E.coli* Standard Violation Rate

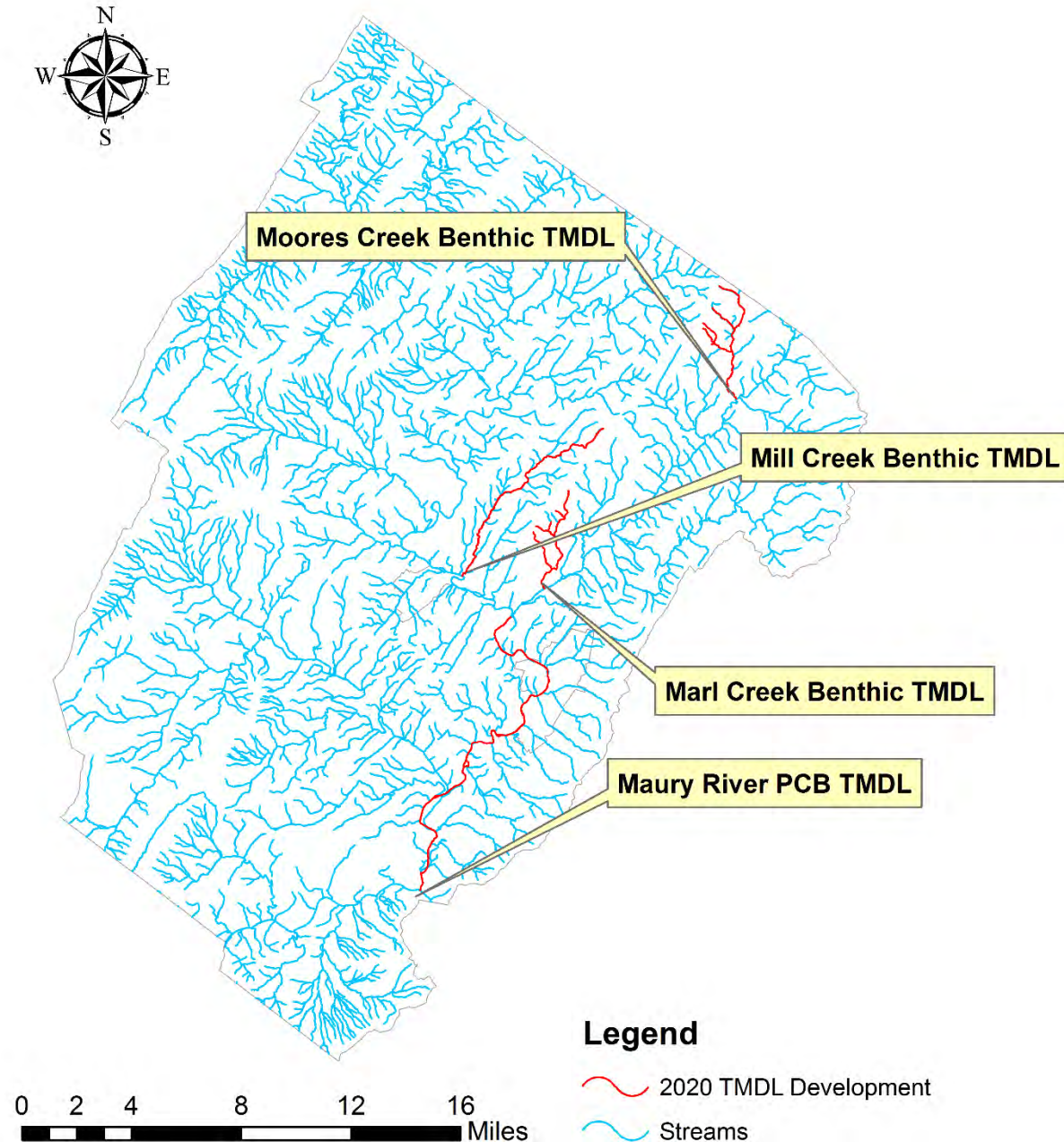


Implementation Cost Estimates

TMDL Watersheds	Agricultural BMP Costs (\$)	Residential/ Urban BMP Costs (\$)	Lake Mgmt. BMP Costs (\$)	Technical Assistance Costs (\$)	Project Timeline (Years)
Hays, Walker, Otts & Moffatts Creeks	\$6.1M	\$1.5M	N/A	\$1M	10
Little Calfpasture River	\$230,000	N/A	\$1.6M	\$600,000	10
Buffalo, Cedar, & Colliers Creeks	\$5.4M	\$3.4M	N/A	\$500,000	10
Woods Creek	\$634,000	\$80,800	N/A	\$300,000	5

Future Plans for TMDL Development

- Benthic TMDL development
 - Mill Creek
 - Moores Creek
 - Marl Creek
- PCB TMDL development
 - Maury River



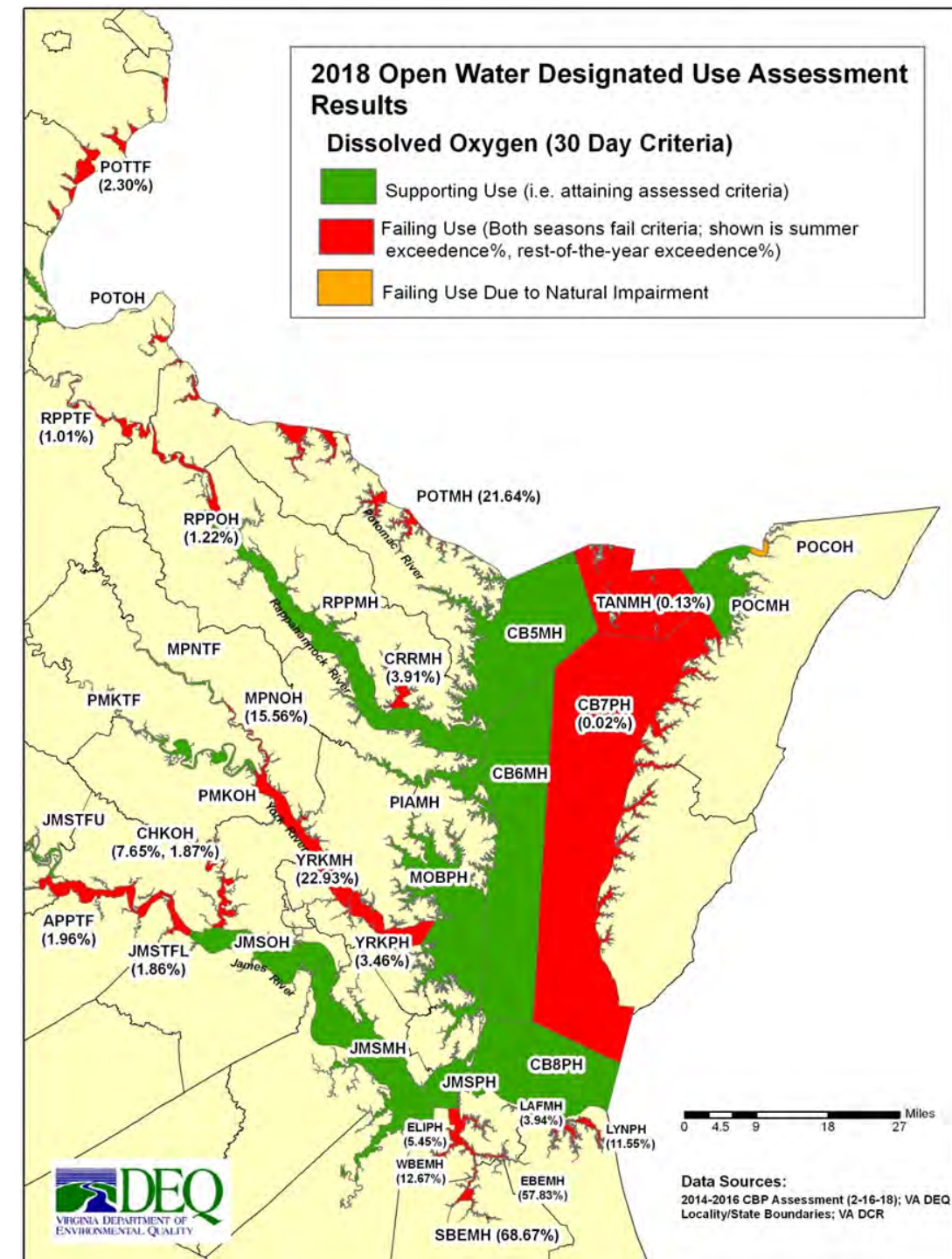


How healthy is your Chesapeake Bay?



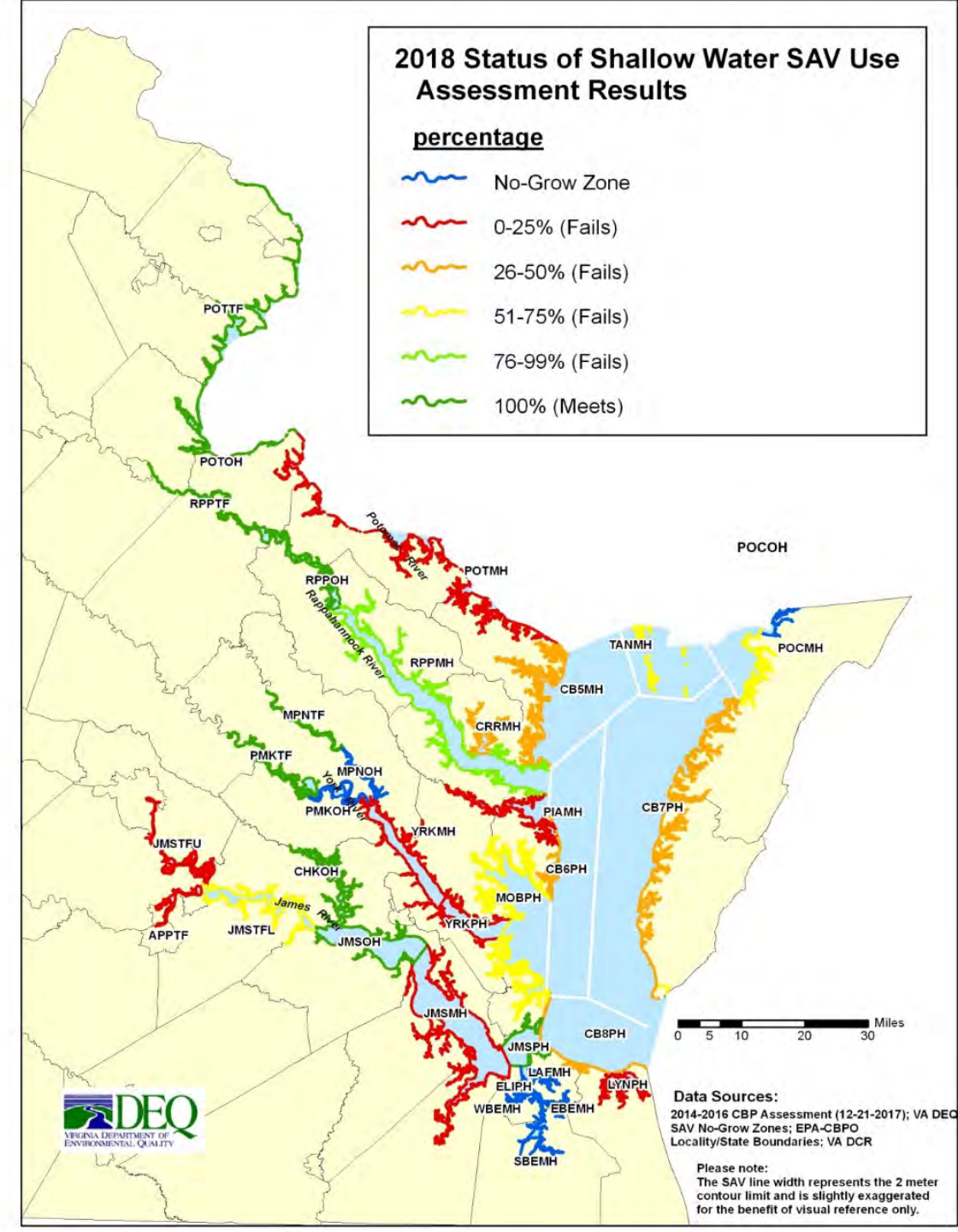
Virginia's 2018 Water Quality Assessment Integrated Report Highlights

- Improvements seen in the several Bay segments, James and Rappahannock
- Hypoxia continues to be an issue in portions of the Bay



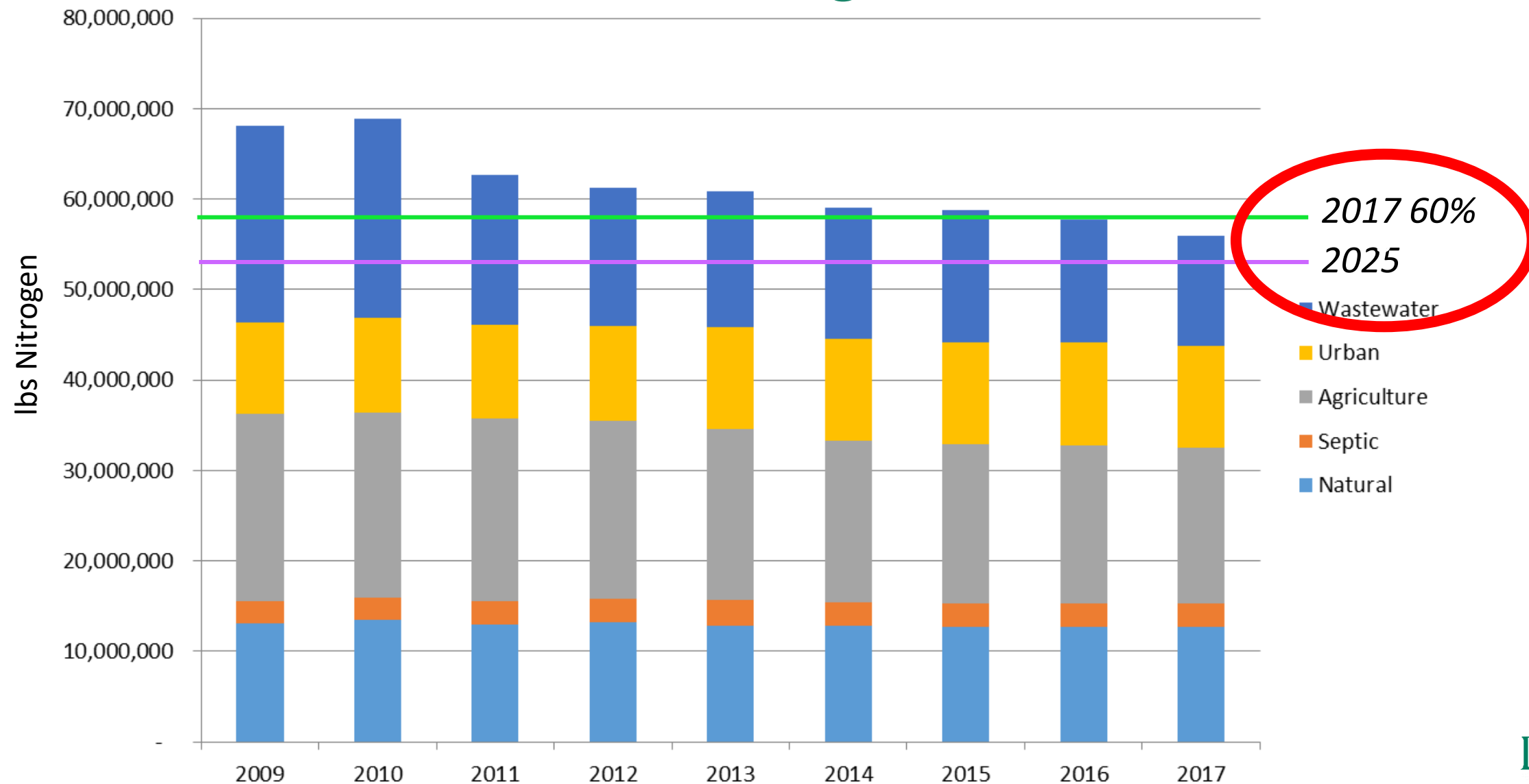
Chesapeake Bay and Tidal Tributaries - Highlights

- 55% of SAV restoration goal met (target is 77,463 acres)
- Full attainment of SAV use found in parts of each major tidal tributary, except Eastern Shore





Virginia Achieves Midpoint Clean Water Goals for Nitrogen





Governor Ralph S. Northam

April 4, 2018, Environment Virginia, VMI

“Our DEQ experts tell us that at our current Bay restoration pace, we will fall millions of pounds short of our goals to reduce nitrogen and phosphorus. So my Administration is committed to preparing a new cleanup plan that incorporates input from local decision makers, prioritizes nature-based solutions, and tackles the impact of climate change on our clean water goals.”



Virginia's Phase III Watershed Implementation Plan

Goals

- Restore the Chesapeake Bay.
- Achieve state basin planning targets for the Potomac, Rappahannock, York, and James Rivers and the Eastern Shore.
- Achieve our goals no later than December 31, 2025.
- Tackle additional pollution expected from growth.
- Tackle the impacts of climate change.
- Continue to engage partners, including local governments, planning district/regional commissions, and soil and water conservation districts.
- Develop a plan that is practical and cost effective.
- Maximize the potential for co-benefits.
- Meet the Environmental Protection Agency's expectations.



WIP III Development Process

- Extensive public engagement
 - Stakeholder Advisory Group
 - Contracts with 14 of 15 PDCs for facilitation of meetings
 - Partnerships with SWCDs in agricultural planning sessions
 - Partnerships with localities and VDH on urban/residential planning
- 60-day public comment period ended June 7, 2019
- Submitted to EPA in August 2019

Questions?

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