Demonstrating the Value of Retaining Forestland in the Chesapeake Bay Watershed

Healthy Watersheds Forest/TMDL Project

Potomac Watershed Roundtable

Presentation

January 8, 2016

Project Partners: Phase I

1914 - 2014 VIRGINIA DEPARTMENT OF FORESTRY 100 YEARS SERVING AND PROTECTING

DEQ VIRGINIA DEPARTMENT OF ENVIRONMENTAL QUALITY

GEORGE WASHINGTON REGIONAL COMMISSION

Virginia WATER RESOURCES Research Center

Be River Friendly
It's Your Backyard
The Rappahannock River Basin Commission

CHESAPEAKE BAY COMMISSION MARYLAND • PENNSYLVANIA • VIRGINIA

The Nature Conservancy
Protecting nature. Preserving life.™

PHASE II: Additional Partners and Collaborators

pennsylvania
DEPARTMENT OF CONSERVATION AND NATURAL RESOURCES

DCR
Virginia Department of Conservation and Recreation

pennsylvania
DEPARTMENT OF ENVIRONMENTAL PROTECTION

VCU
CENTER FOR ENVIRONMENTAL STUDIES

Local Government Advisory Committee
to the Chesapeake Bay Executive Council

Project Goals

PHASE I: Build economic case for crediting forestland retention actions by localities in the TMDL model and through regulatory and policy changes at the federal, state and local levels

PHASE II: Build consensus from the locality level up on a toolbox of policies, practices and incentives necessary to stimulate land use decisions required to achieve CBW healthy watershed goals by retaining high conservation value forestland

Alignment with 2014 CBWA Outcomes & Management Strategy Goals/Activities

- Healthy Watersheds
  - Maintain local watersheds at optimal health across a range of landscape contexts.
  - Vulnerability: Threat of land conversion and the ecological impacts of conversion
- Land Conservation
  - Protected Lands
  - Expanding federal, state and local funding and incentives for conservation
  - Land use methods and metrics development
- Protect and Restore Water Quality
  - Nutrient and sediments reduction
- Activity Categories

  Regulation, Program Management, Information Management, Technical Support, Management Tool Development, TMDL Development, Enforcement, Assessment

Why Keeping and Expanding Forest Cover is Important to the Bay

Riparian forest buffers (RFBs) rank second of all nonpoint source BMPs needed to meet TMDL targets according to data at the Chesapeake Bay Program

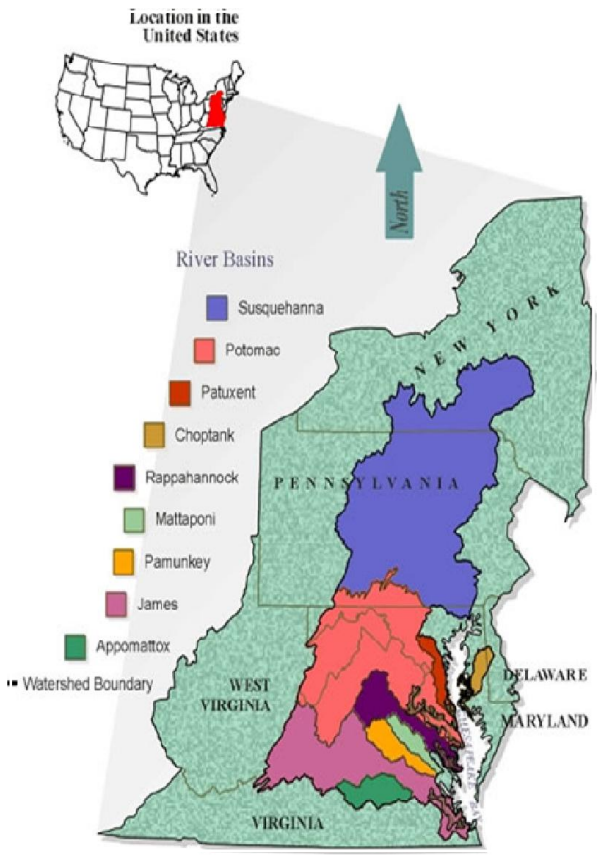
Conversion of forest to other land uses generates persistent increases in stormwater runoff, even without addition of impervious surfaces

Without forests, runoff increases **10 to 30%** or more, carrying more pollutants and increasing risk of flooding

BUT: The Problem

- Forest cover is recognized as one of the best land uses for achieving Chesapeake Bay goals and outcomes.
- BUT – localities in the watershed say unless TMDL credit is given for retaining forestland, there is little local incentive for preserving forestland.
- This project addresses that issue.

Project Approach



- Determine if forest retention actions by localities, private land owners and others will result in a decrease in actual load over the 2025 projected TMDL load allocation land cover
- If the answer is “yes” determine way to credit localities and others for retaining forestland through the Chesapeake Bay TMDL Model

Study Area: Proxy for Chesapeake Bay Watershed

Rappahannock River Basin

- Geography: headwaters to coast
- Land Use: forest, agriculture, urban, rural
- Areas of high density development growth
- Home of Rappahannock River Basin Commission (RRBC)
- 100 percent in Virginia so watershed issues outside of Virginia control are minimal (other than air)

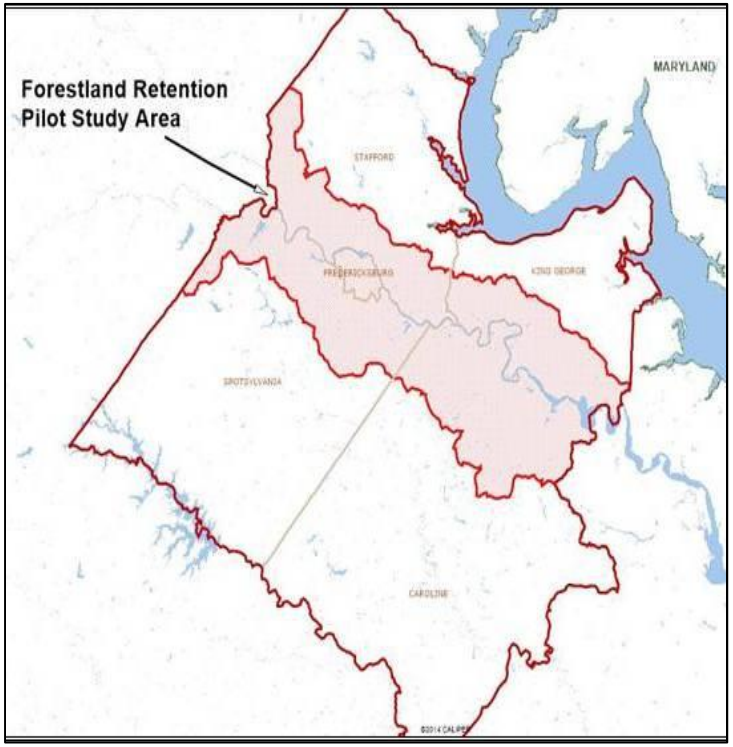
Phase I Project Objectives

- Model alternative growth trend scenarios in pilot region to:
  - Determine load changes from conversion of forests to a mix of pervious and impervious lands.
  - Model resulting load increases
  - Compare to TMDL model projections and assess costs associated with offsetting these increases
- Conduct literature review of forest types and attributes to evaluate spatial variability of water related ecosystem service values
- Share findings with localities and state officials to inform land use planning and decision making
- Provide information to EPA for consideration in 2017 TMDL model revisions

Phase I Methodology

- Project partners coordinated with EPA to use datasets complementary to those used for the EPA CB TMDL model to create synthetic estimates and forecasts of land cover
- Estimates reflected:
  - Current estimates of forest cover by riversegmentshed by locality
  - Assumptions of urban BMP installations with any impervious surface area growth
  - Consideration of the growing inventory of conserved lands

Phase I Pilot Study Area



- GWRC service area within RRB
  - Land Use: forest, agriculture, urban, rural
  - Areas of high density development growth
  - Home of George Washington Regional Commission
  - Much needed data already available
  - 100 percent in Virginia

Phase I Alternative Land Use Modeling Scenarios

1. Current TMDL 2025 predictions for each pilot area locality: “Business as Usual/Decentralized Growth”

2. Comprehensive Plans Implementation Model: “Community Plans”

3. GWRC Green Infrastructure Model: “Greenprint/Forest Retention”

4. Hybrid Model between (2) and (3): “Phased Development Impact on Greenprint/Forest Retention”

In addition, 2010 and 2015 scenarios were run to identify trends.

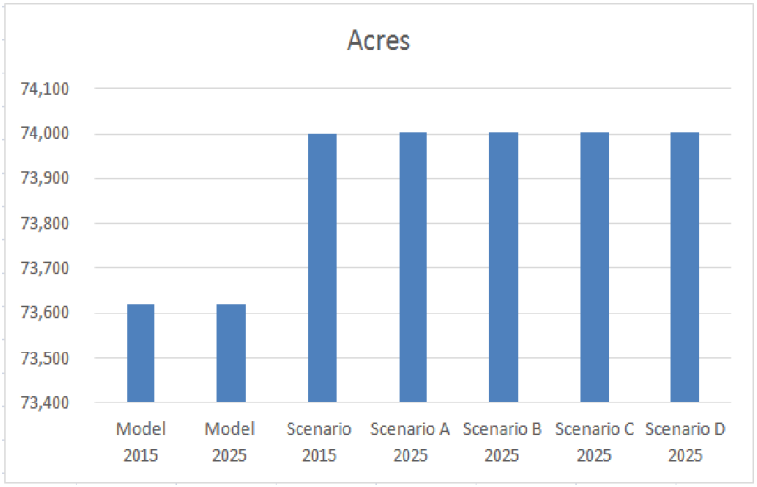
Phase I Healthy Watershed Findings

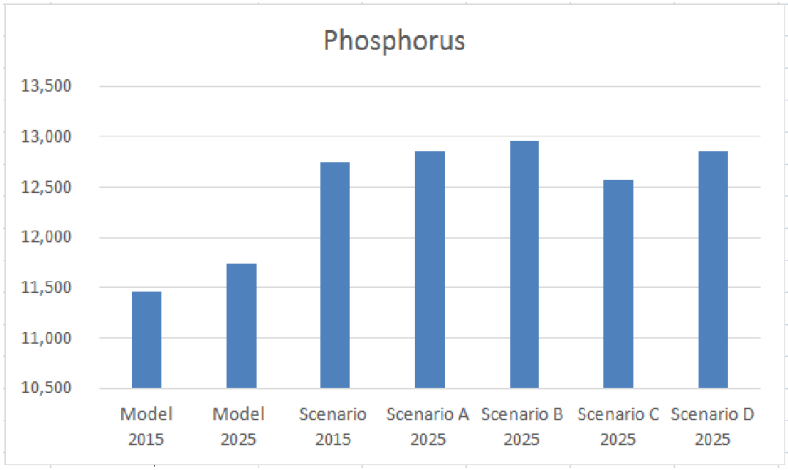
- Produced regional demonstration of how alternative development methods that increase high value forestland retention can help reduce the offset requirements of development.
- Results confirm water quality and healthy watershed value of forestland retention and demonstrate range of potential offsets are possible depending on investment made early in BMPs that retain forestland.
- This could in turn reduce BMP treatment costs needed to comply with Virginia's nutrient neutral stormwater regulations, while maximizing the ecosystem services provided by forests.

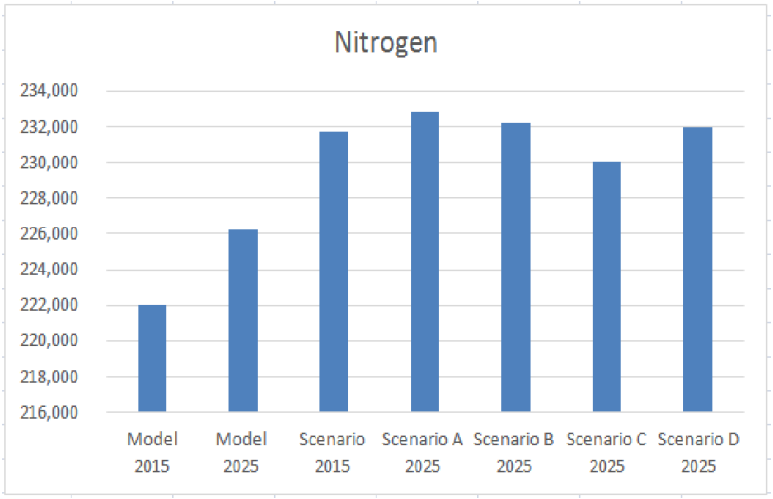
Phase I Economic Findings

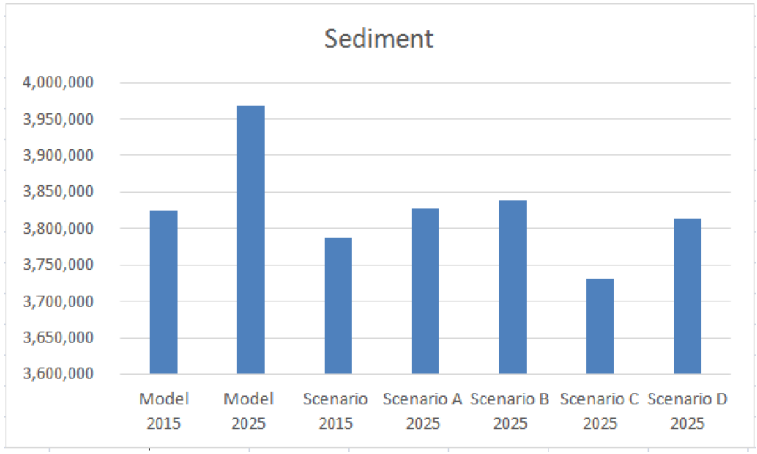
$125 Million in possible future offset savings among the four localities and one city in the Pilot Study Area compared to current EPA TMDL Model 2025 Projections

Caroline County TMDL Results

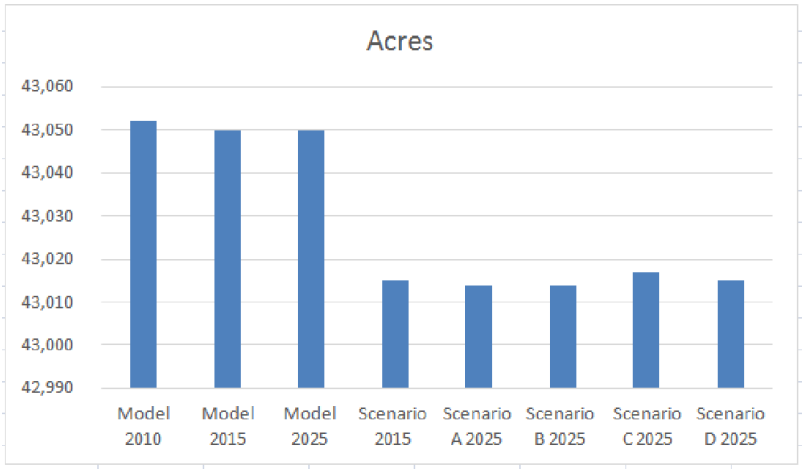


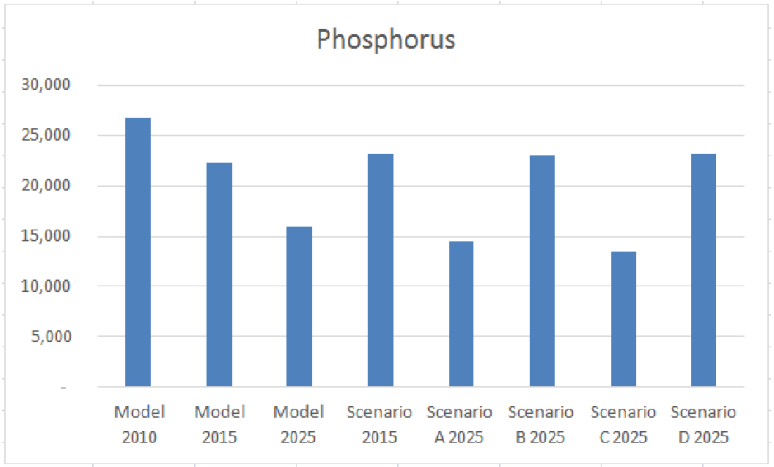


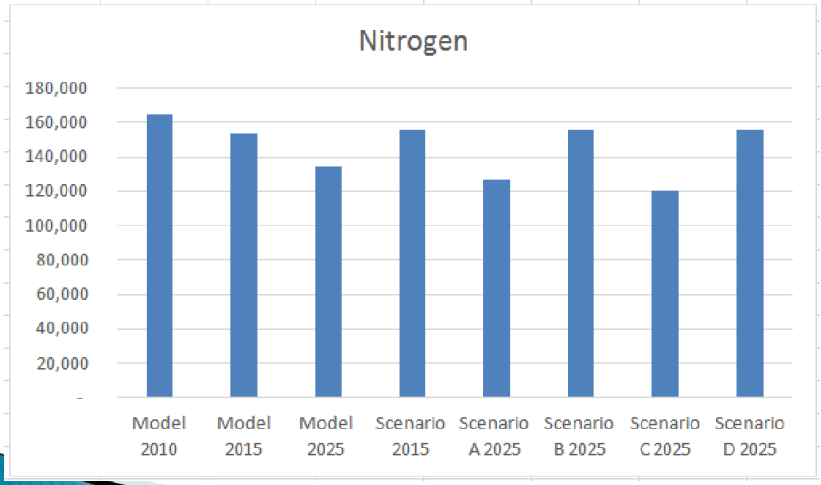


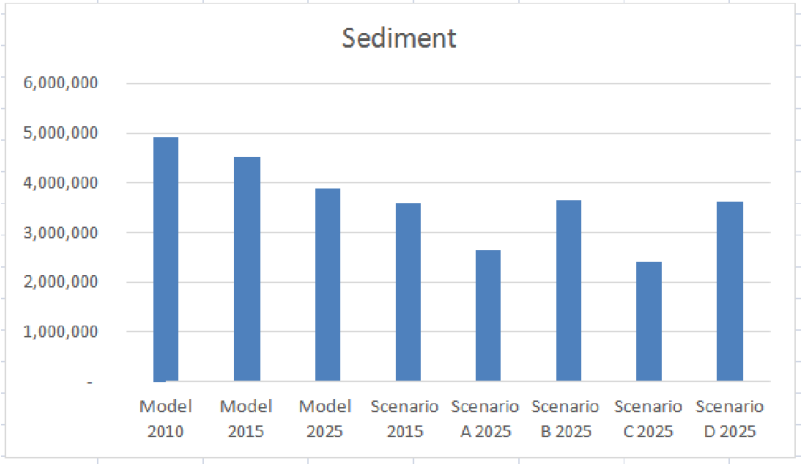


King George County TMDL Results

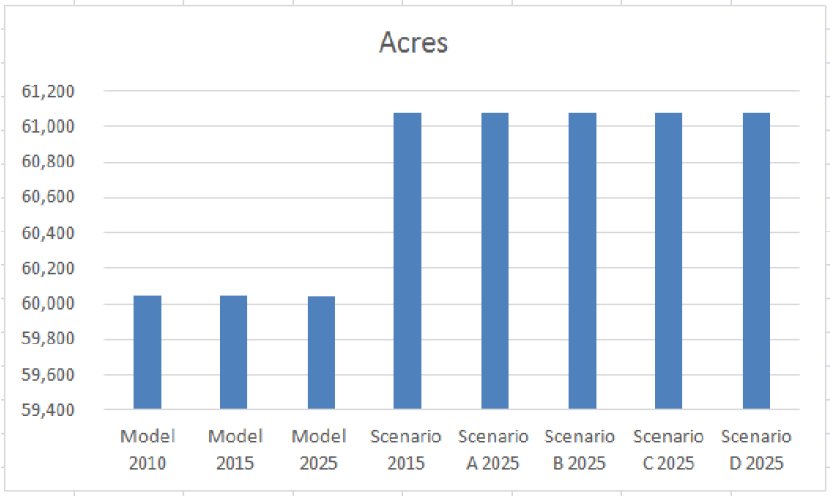


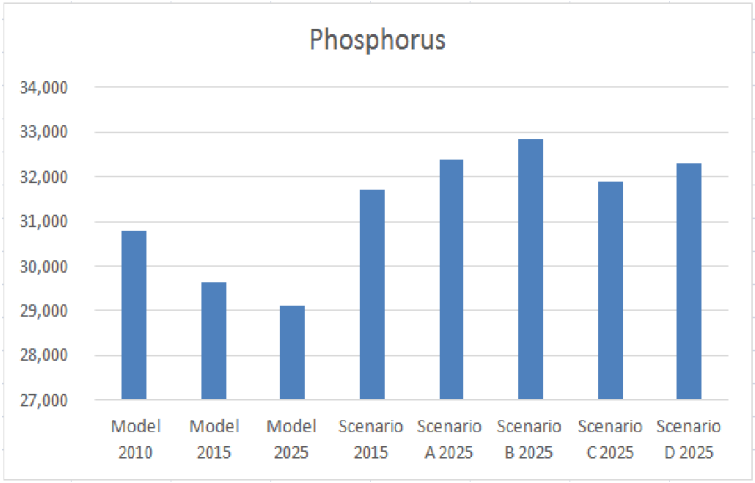


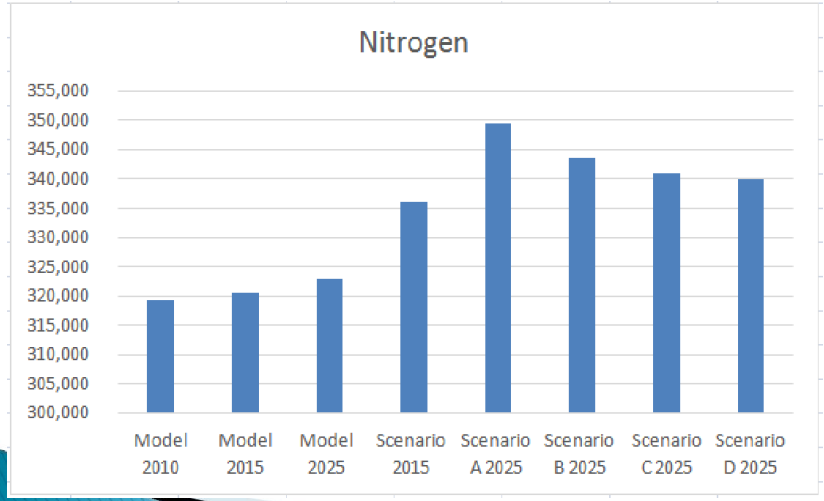


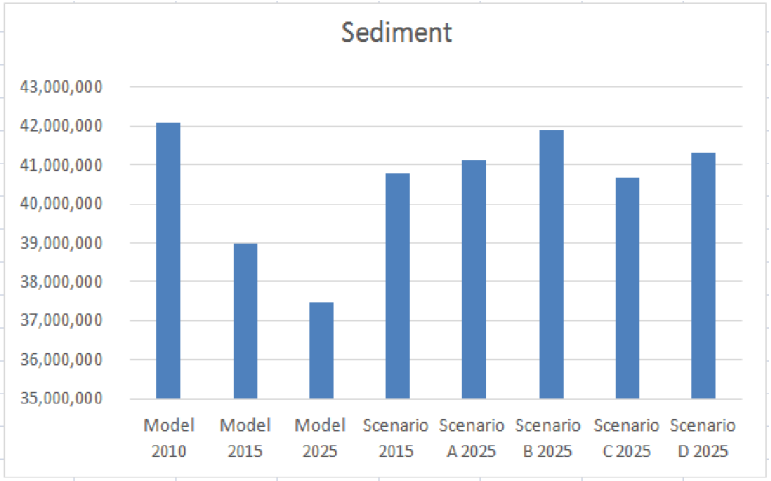


Spotsylvania TMDL Results

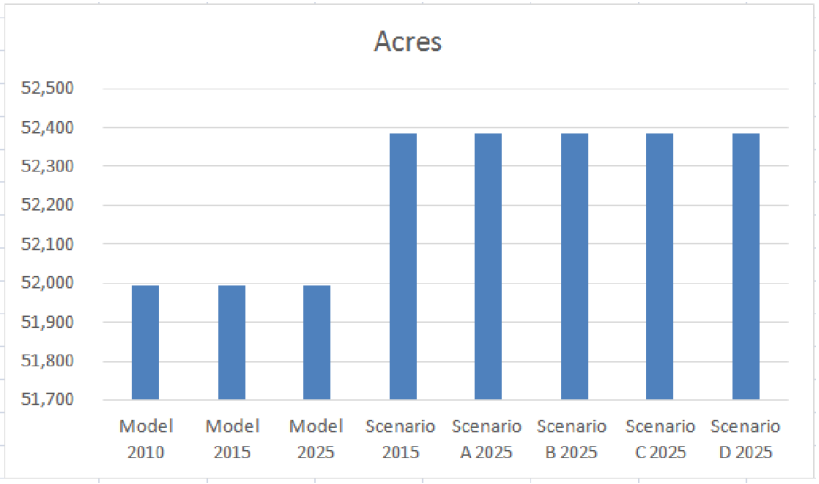


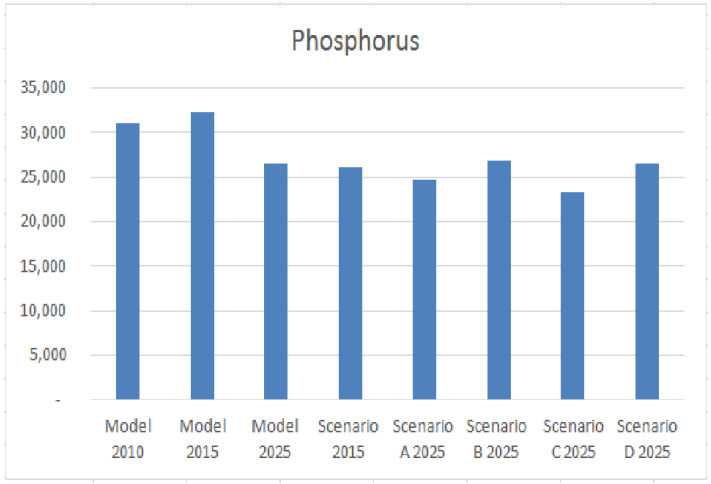


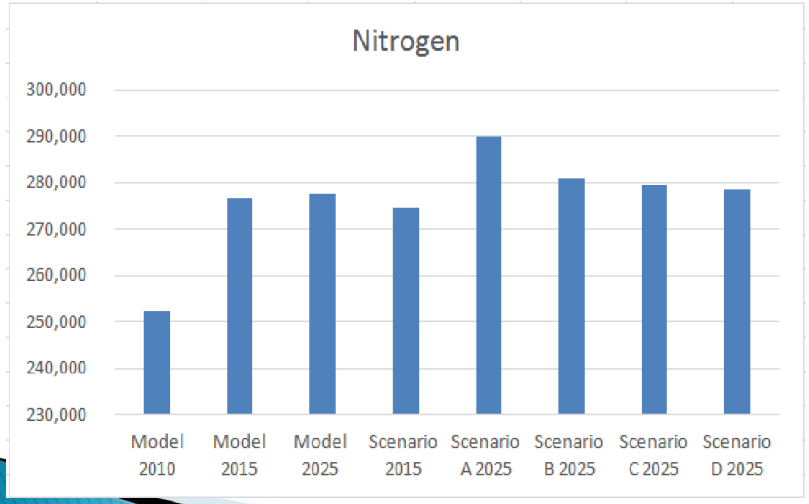


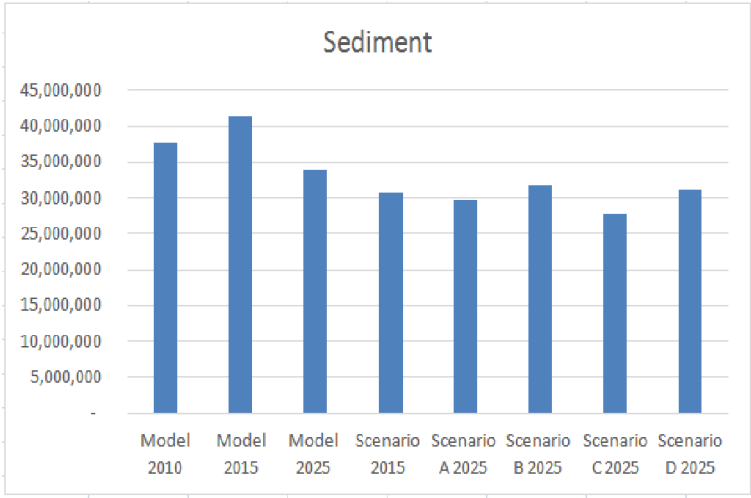


Stafford County TMDL Results

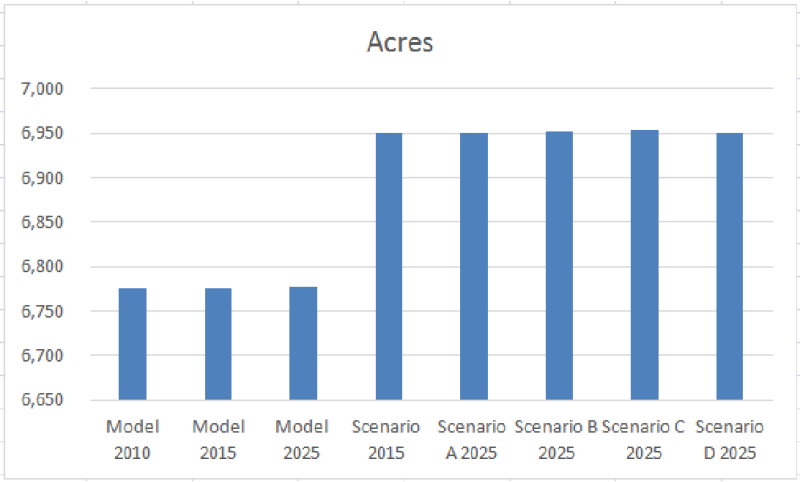


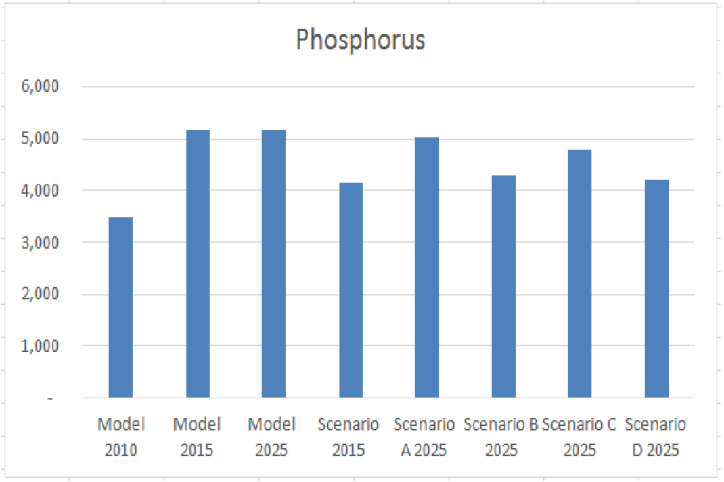


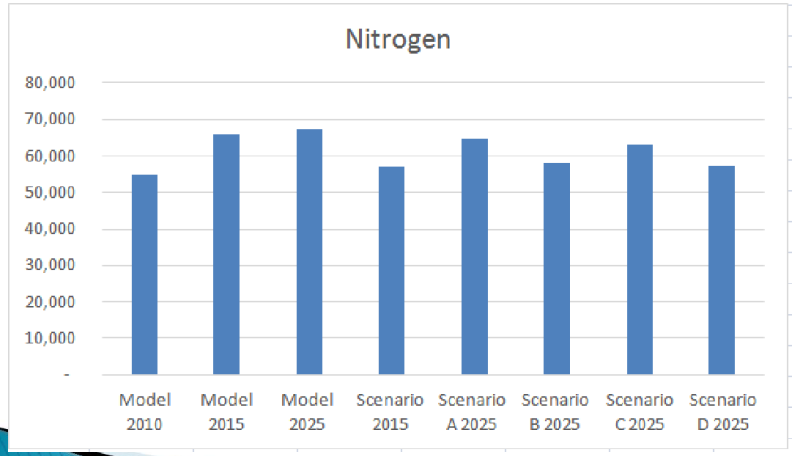


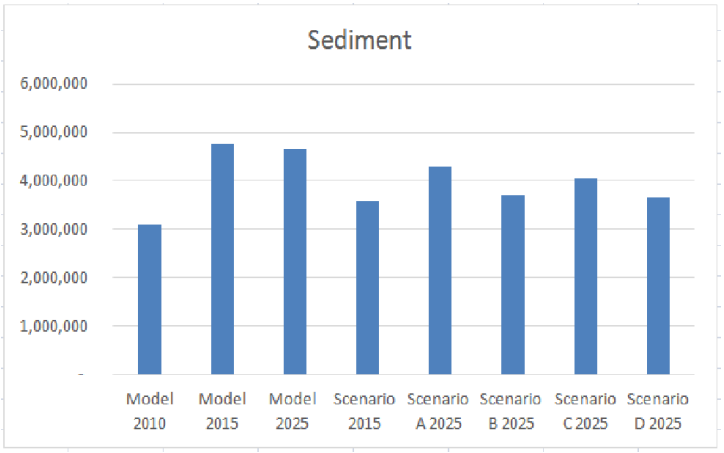


City of Fredericksburg TMDL Results









Phase II Goal: Engagement

- Work extensively through the RRBC, with local government officials within the Basin, as well as Pennsylvania representatives in a similar Basin to develop the tool box of criteria, incentives, etc. that could be used in land use policy and zoning situations to accurately identify and assign appropriate values to high conservation value forest lands.

Phase II Objectives

- Have PA validate VA's modeling approach
- Raise benefit expectations among local governments and citizens regarding value of forestland retention in the design and planning of new development
- Working with localities, build effective standards and guidance
- Meet both development and water quality needs for localities
- Pay attention to aesthetics and quality of life needs, e.g. views, recreation, etc.
- Build consensus on incentives and flexibility

Phase II Plan in Virginia

- Divide Rappahannock River Basin into three separate study areas –
  - Lower, middle and upper basins. Each area provides different political, economic, environmental and social perspectives
  - OBJECTIVE: learn how different dynamics change thinking about what works and doesn't work.
- RRBC will conduct peer-to-peer discussion sessions with geographically targeted focus groups of key elected officials and planning community senior staff
  - Identify obstacles, incorporate best practices and lessons learned elsewhere, develop solutions, and build tool box elements.

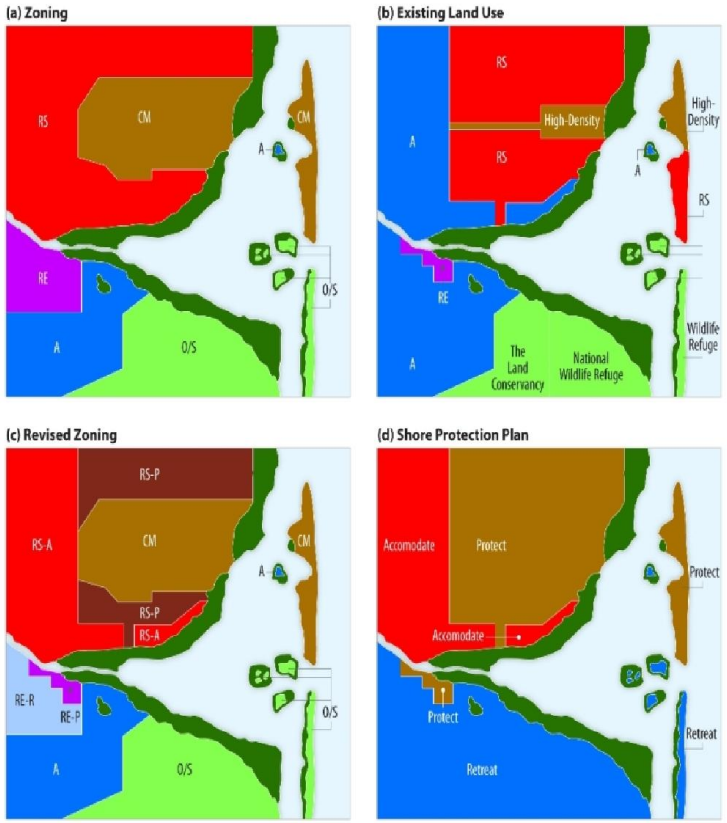
Phase II Plan in Pennsylvania

- Replicate VA Phase I land cover scenario analyses and related economic impact analyses corresponding to the different forestland retention scenarios
- Adapt them for application in the Yellow Breeches Creek demonstration area within Cumberland and York Counties
- Differences between PA's various municipal government environment and VA's Dillon Rule government environment mean forest retention incentives toolbox resulting from these two State governance models is expected to be different

Phase II Tasks

- Work with EPA and CB GITs to frame options for developing Forestland retention BMP in TMDL model
- Carry out discussions/negotiations across basin with localities in both states to build, test and implement elements of tool kit to drive more consideration of forestland retention in land use policies and decisions
- Coordinate with Pennsylvania on lessons learned and tool kit elements
- Make teams available to other CB jurisdictions to provide advice on implementing toolbox elements

Success Outcomes



A: Zoning	B: Land Use	C: Revised Zoning	D: Shore Protection Plan
Commercial/High-Density Mixed Use (CM)			Protect
		RS-P	
Residential Single Family (RS)	RS-A	Accommodate	
Rural Estate (RE)		RE-P	
		RE-R	
Agriculture (A)			Retreat
Open Space and Conservation (O/S)			
Wetlands			

Adding R, A, or P to an abbreviation means "retreat," "accommodate," or "protect," respectively

- Governments empowered with planning tools and incentives to balance growth and forestland retention goals capable of initiating change locally to create quality communities.
- State and local regulations & statutes contain mix of incentives and requirements to promote forestland retention.
- TMDL Credit for Forest Retention

Questions That Need Answers

- What is the most effective way to quantify and offset development impacts that go beyond the borders of one jurisdiction?
- What are the biggest challenges associated with designing TMDL credits resulting from forestland retention actions taken now that may result in reduced offset expenditures in 2025?
- What tools and policies do local governments need to encourage compact development patterns that conserve forestland resources, promote reforestation, and tree planting infill of RPA riparian buffer gaps?

Questions That Need Answers Continued

- What are some good examples of incentives, that could be used in land use policy and zoning situations to accurately identify and assign appropriate values to high conservation value forest lands and inform the development of a forest retention TMDL?

- What works and doesn't work?

For further information:

Greg Evans, Virginia Department of Forestry
gregory.evans@dof.virginia.gov

James Davis-Martin, Virginia Department of Environmental Quality
James.Davis-Martin@deq.virginia.gov

Tim Ware, George Washington Regional Commission
ware@gwregion.org

Eldon James, Rappahannock River Basin Commission
ejames7@earthlink.net

Mark Bryer, The Nature Conservancy
mbryer@tnc.org