COLLABORATIVE SCIENCE FOR ESTUARIES

WEBINAR SERIES

Cory Riley

Great Bay NERR

Dolores Leonard

Roca Communications

James Houle

University of New Hampshire

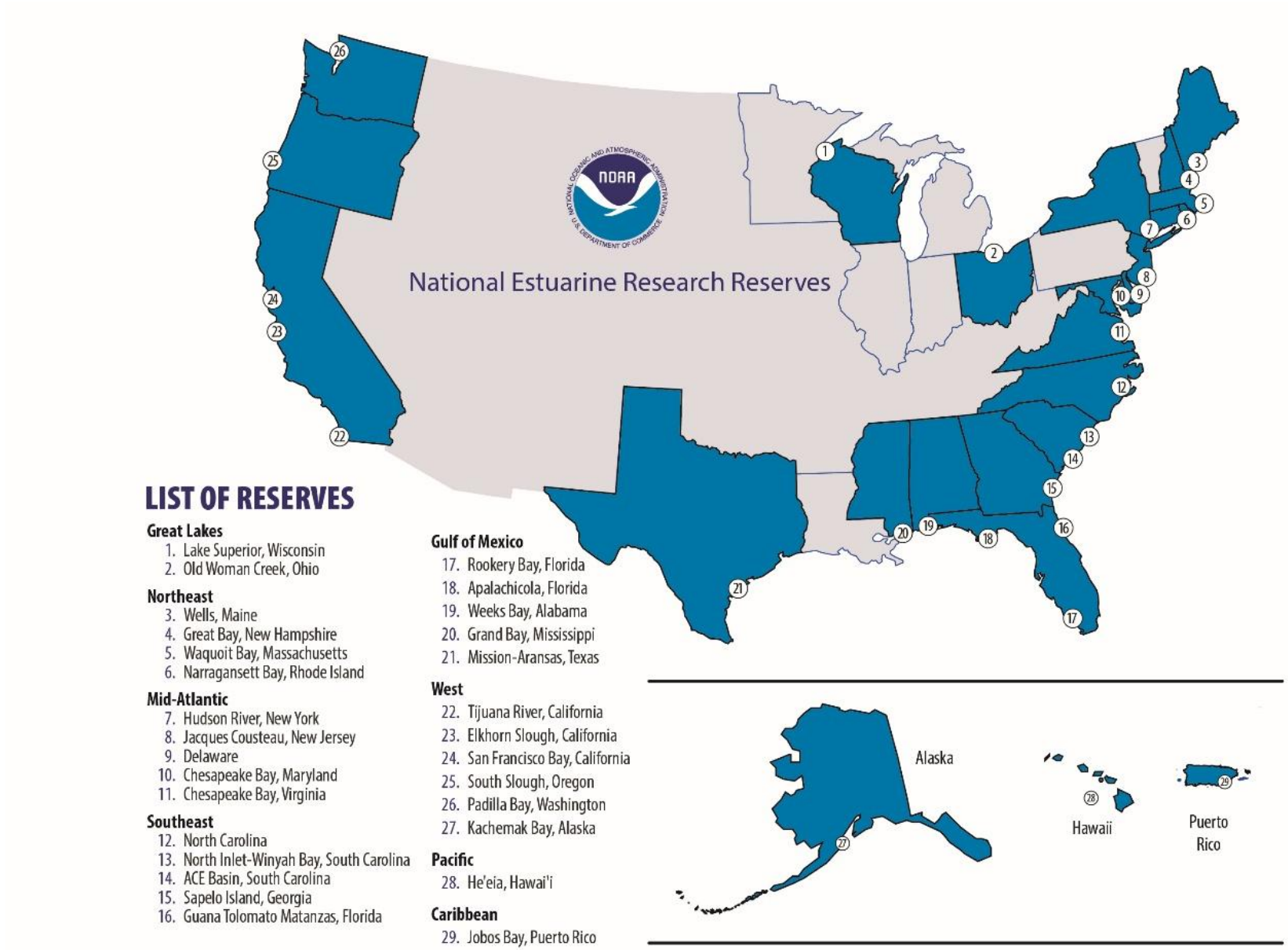
Credit for Going Green: Using an Expert Panel Process to Quantify the Benefits of Buffers

National Estuarine Research Reserve System Science Collaborative

Date: Wednesday, June 17, 2020

Time: 3-4 PM ET

National Estuarine Research Reserve System



LIST OF RESERVES

Great Lakes
1. Lake Superior, Wisconsin
2. Old Woman Creek, Ohio

Northeast
3. Wells, Maine
4. Great Bay, New Hampshire
5. Waquoit Bay, Massachusetts
6. Narragansett Bay, Rhode Island

Mid-Atlantic
7. Hudson River, New York
8. Jacques Cousteau, New Jersey
9. Delaware
10. Chesapeake Bay, Maryland
11. Chesapeake Bay, Virginia

Southeast
12. North Carolina
13. North Inlet-Winyah Bay, South Carolina
14. ACE Basin, South Carolina
15. Sapelo Island, Georgia
16. Guana Tolomato Matanzas, Florida

Gulf of Mexico
17. Rookery Bay, Florida
18. Apalachicola, Florida
19. Weeks Bay, Alabama
20. Grand Bay, Mississippi
21. Mission-Aransas, Texas

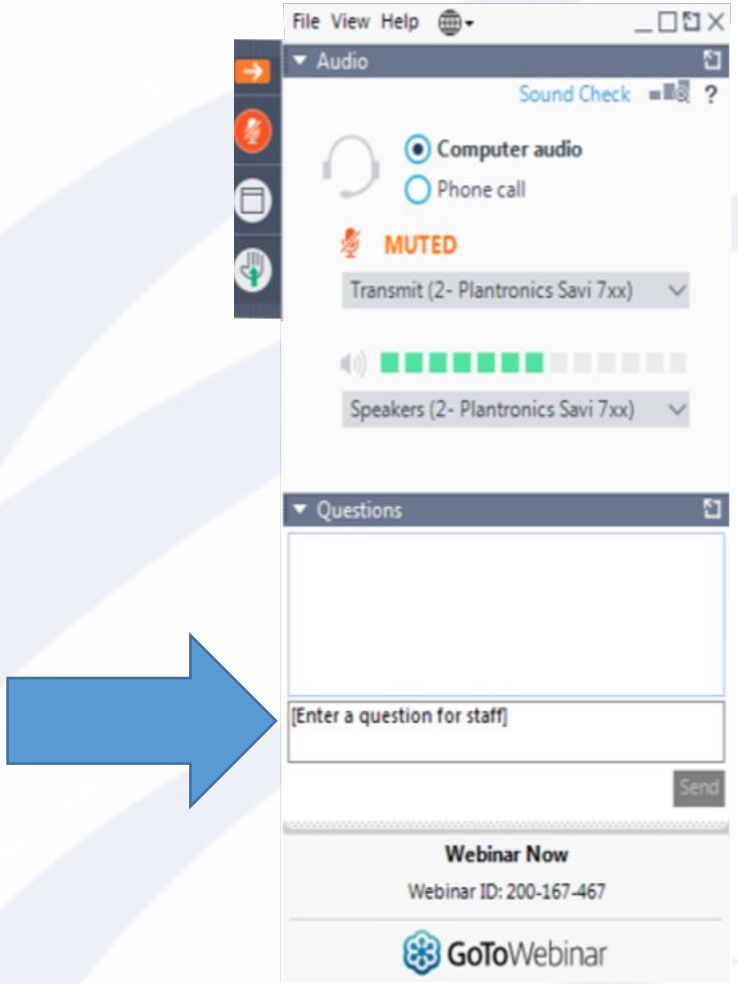
West
22. Tijuana River, California
23. Elkhorn Slough, California
24. San Francisco Bay, California
25. South Slough, Oregon
26. Padilla Bay, Washington
27. Kachemak Bay, Alaska

Pacific
28. He'eia, Hawai'i

Caribbean
29. Jobos Bay, Puerto Rico

Have a question?

Use the “Questions” function to pose questions throughout the webinar.



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- Waquoit Bay National Estuarine Research Reserve

Advisors

- New Hampshire Department of Environmental Services
- United States Environmental Protection Agency Region 1

Poll Questions:

What most interests you about this topic? (choose one)

How relevant are pollutant reduction regulatory credits for your work?

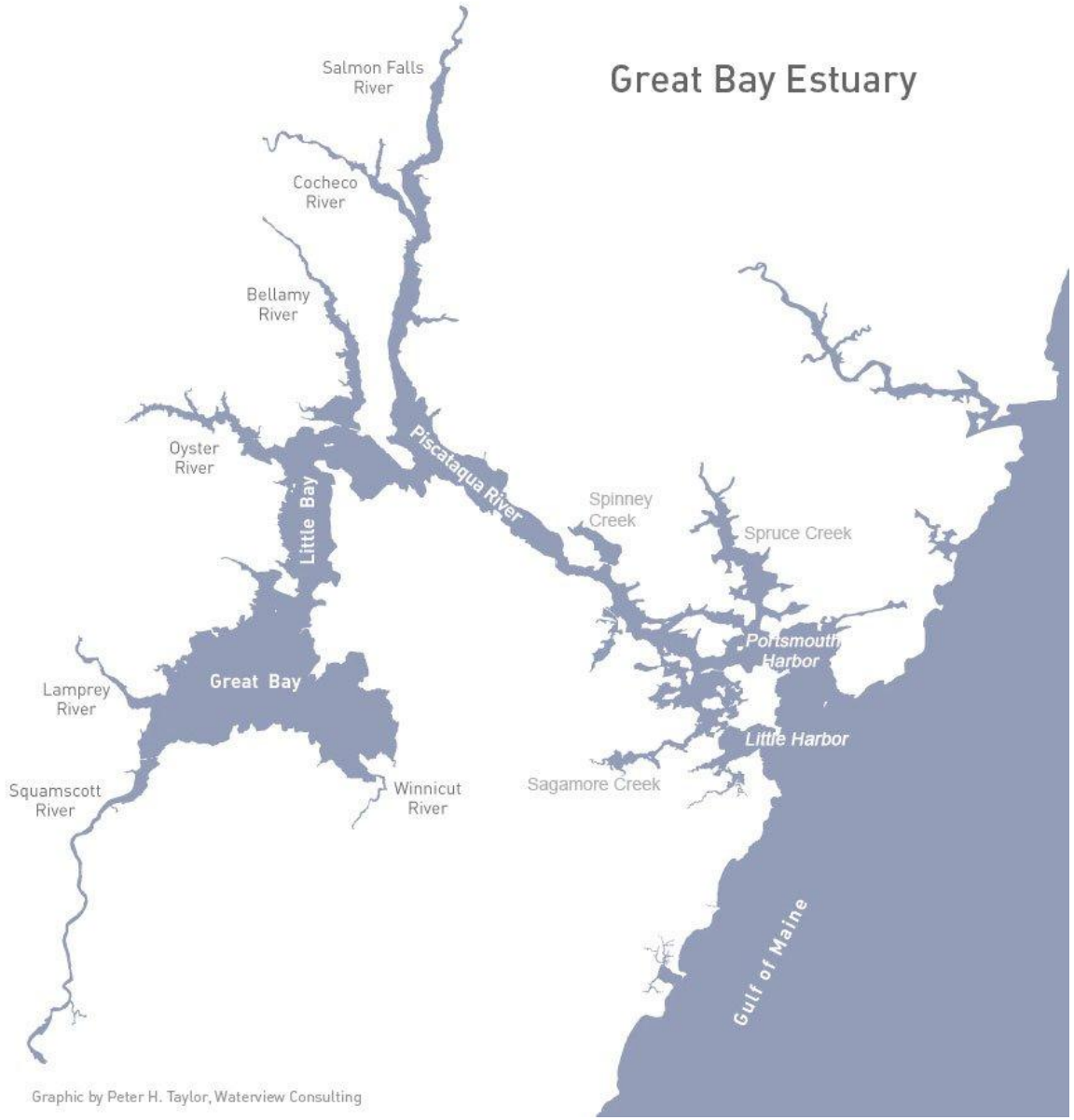
Our Context

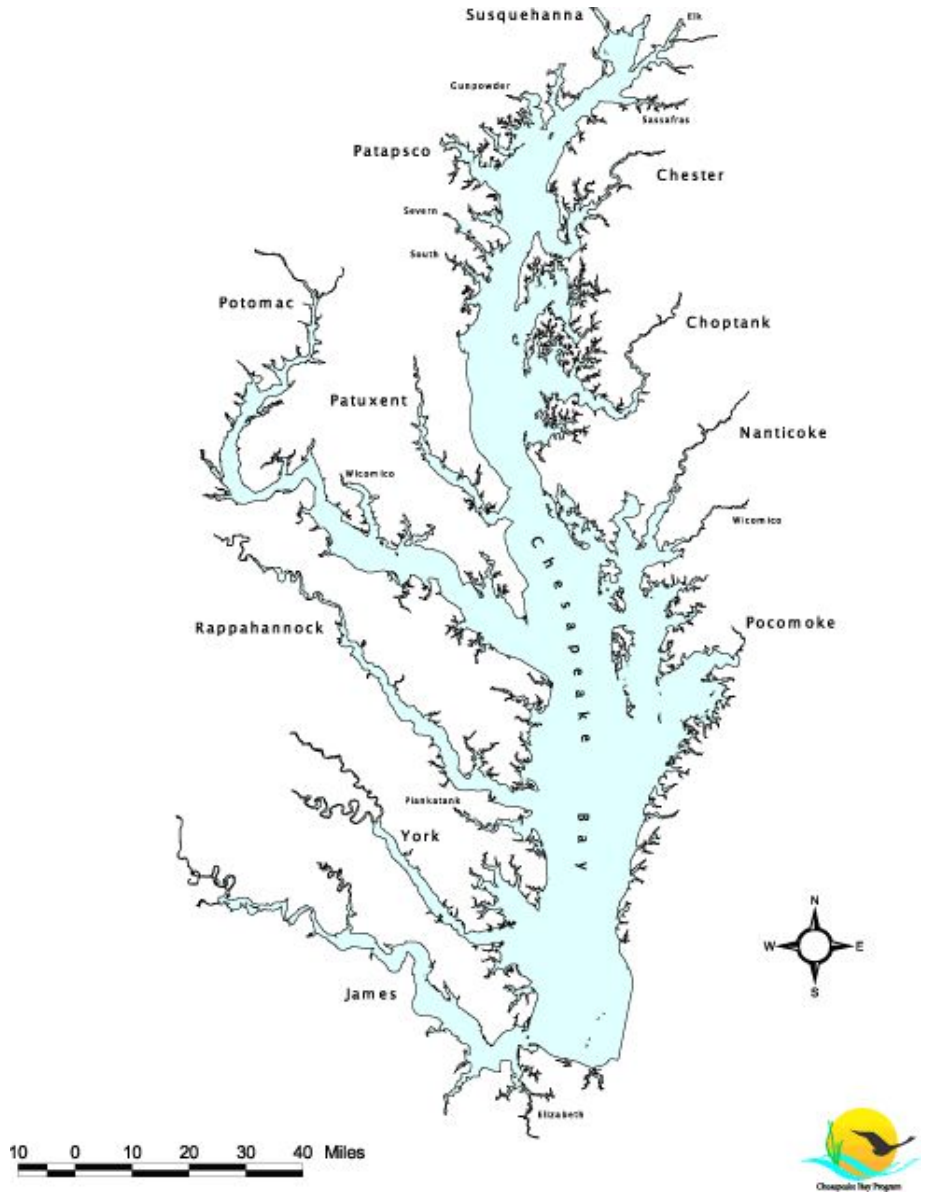
Our Goal

Help New Hampshire communities use buffers to help meet pollution reduction targets for stormwater permits

Our Process

Weight of evidence approach that engaged experts in recommending pollutant load reduction performance curves for restored or constructed buffers in projects involving land use change


Great Bay Estuary
Salmon Falls River
Cocheco River
Bellamy River
Oyster River
Little Bay
Piscataqua River
Spinney Creek
Spruce Creek
Portsmouth Harbor
Little Harbor
Great Bay
Lamprey River
Squamscott River
Winnicut River
Sagamore Creek
Gulf of Maine
Graphic by Peter H. Taylor, Waterview Consulting


Susquehanna
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Get the guide!

F FRAME YOUR QUESTION
A ASSEMBLE HE TEAM
S SUSTAIN MOMENTUM
T TAKE IT ON THE ROAD

Expert Panel Process for
DECISION MAKING

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A ASSEMBLE THE TEAM
S SUSTAIN MOMENTUM
T TAKE IT ON THE ROAD

FAST
Expert Panel Process for Decision Making

The needs of natural resource managers and policy makers often outstrip existing science and data. FAST is a process to help National Estuarine Research Reserves and other groups working at the interface of science and management to collaborate with experts to develop timely, science-based solutions to coastal environmental problems.

What is FAST?

- Way to synthesize expert opinion on a subject or question around which there is uncertainty due to insufficient or unattainable science or data
- Iterative, weight-of-evidence approach to reaching general agreement, though not necessarily unanimity, around science-based recommendations for resource management
- Adaptable process that can be approached with different levels of rigor depending on the situation at hand

When to go FAST

- When science-based solutions are needed, but available data and science is vague or insufficient
- When a question could be addressed with intensive, site-specific, original research, but you lack the time and other resources
- When there are differences in expert opinion around the most appropriate solutions
- When you have access to professionals with the right expertise and enough time to help
- When you have sufficient resources (time, funding, and expertise) to make it all work

About FAST

FAST was modeled after *Protocol for the Development, Review, and Approval of Loading and Effectiveness Estimates for Nutrient and Sediment Controls in the Chesapeake Bay Watershed Model*, a process based on independent peer reviews at the National Academy of Sciences. It was refined as part of the Credit for Going Green, a project that developed consensus-based recommendations to help New Hampshire stakeholders use restored or constructed buffers to meet pollution reduction targets in development, restoration, and other projects involving land use change.

Frame Your Question

- Build on what you know
- Check in with Stakeholders
- Case studies & mentors
- Secure the resources you need

Assemble the team

- Form the Core
- Convene Your Advisors
- Recruit the Panel

Table 1: Going Green Expert Panel Members	
Panelist	**Position & Affiliation**
Dr. James Houle (Chair)	Program Director, University of New Hampshire Stormwater Center
Dr. Thomas Ballestero	Director, University of New Hampshire Stormwater Center Associate Professor, Civil Engineering
Dr. Michael Dietz	Director, Connecticut Nonpoint Education for Municipal Officials (NEMO) Associate Extension Educator, University of Connecticut
Mr. Mark Voorhees	Environmental Engineer, U.S. Environmental Protection Agency, Region 1
Mr. Ted Diers	Administrator, NHDES, Watershed Management Bureau
Ms. Karen Dudley	Resource Soil Scientist, Natural Resources Conservation Service
Dr. Nigel Pickering	Research Associate Professor, State of Washington Water Research Center and the Washington Stormwater Center. (Formerly of Horsely Whitten)
Mr. Pete Steckler	GIS & Conservation Project Manager, NH Certified Wetland Scientists, The Nature Conservancy, NH
Mr. John Magee	Certified Fisheries Professional & Fish Habitat Biologist, New Hampshire Fish and Game Department
The panel retained a consultant who had run an expert panel process to develop credits for non structural BMPs in the Chesapeake Bay Region: Thomas Scheuler, Executive Director of the Chesapeake Stormwater Network	

Sustain Momentum

- Get Organized
- Compile the Science
- Keep Moving forward

CENTER FOR LEADERSHIP & ORGANIZATIONAL CHANGE
PARTNERING FOR RESULTS

Consensus Continuum

Stop	Hold	Stand Aside	Agreement with Reservations	Endorsement
"I do not agree and feel the need to stand in the way of this decision"	"I believe more work is needed before we make a decision"	"I trust the group and will not block this decision but need to register my disagreement"	"I can live with it"	"I like it"

Sustain Momentum

- Get Organized
- Compile the Science
- Keep Moving forward

Take It On the Road

- Develop recommendations
- Advisory committee check in
- Wrap it up and roll it out

Credit For Going Green Outreach Toolkit

Panelists & Advisory Committee Members: *Thank you* for participating in this project. We deeply appreciate your willingness to share your time, expertise, and thoughtfulness. We developed this simple toolkit to support you in sharing project results within your organization and throughout your professional networks. Our goal is to honor your investment in this collaboration by making every effort to ensure the final results are as accessible as possible. We hope that you will consider using these resources to...

- Include a short write up about the project for your newsletters and/or distribution lists
- Post a short write up on your website and/or blog
- Post about the project or one of its results to social media
- Include the project or results in an upcoming training or meeting

Each file is set to view only, but you are free to download and edit all of them to suit your purposes. If you have questions, please contact a member of the Going Green Team: James Houle, Cory Riley, or Dolores Leonard.

Credit for Going Green Outreach Toolkit		
Tool	**Purpose**	**Download it**
Final Technical Memorandum	Presents performance curves, use cases, considerations for applications, and supporting decisions made by the panel. Intended for more technical audiences, e.g., consultants and municipal staff.	Here
Final Panel Report	Comprehensive overview of the panel's process, decisions, and products, along with information about the local contexts that led to the project.	Here
Non technical summary	Two-page overview for anyone, but particularly for less technical audiences, e.g., conservation commissions and planning boards.	Here
FAST Overview	Two-page overview of the expert panel process for anyone interested in how the panel reached its decisions	Here
FAST Guide	Twelve-page guide to the expert process for those interested in applying this approach to another management question	Here
Project descriptions	For use in blogs, web sites, and newsletters	Here
Sample blog	A sample blog post you can copy or cut and paste from to meet your needs	Here
Sample social media posts	For use on Facebook & Twitter	Here
Buffer photos	For use online	Here
Powerpoint deck	Slides with messages, graphics, and notes to support sharing the results and panel process	Here

About the Panel Recommendations

Key Terms

Removal Efficiency (RE): Buffer capacity to remove total nitrogen (TN), total suspended solids (TSS), & total phosphorus (TP)

Performance: Buffer's ability to remove TN, TSS, and/or TP.

Credit: Estimated pollutant load reduction given for the use of buffers in regulatory permits issued for redevelopment projects under the NPDES Stormwater Permit Program and other efforts to manage stormwater

Penalty: Reduction in credit (from the total possible) that a buffer can receive. It reflects the impact of different conditions on the buffer's ability to remove TN, TSS, and/or TP.

Key Decisions

What Gets Credit

Restored or constructed buffers in development, redevelopment, restoration & other projects involving land use change.

Optimal Buffer Condition for Credit

Forested buffer with a width of 100 feet can achieve maximum removal efficiency values. Deviations from this condition result in penalties that reflect lower performance expectations.

Minimally Acceptable Buffer Width for Credit

20 feet—Narrower buffers, while valuable, will not receive credit.

Key Decisions

Grassed Buffers

Receive a 20% reduction (penalty) in performance based on the Chesapeake values for nitrogen for grassed buffers (Lowrance 1998, Mayer et al. 2005).

HSGs and Sediment and Phosphorus Removal

As hydrologic soil groups (HSGs) assist in pollutant reduction through infiltration, HSG A soils receive the maximum credit for total suspended solids and phosphorus removals.

HSGs and Nitrogen Removal

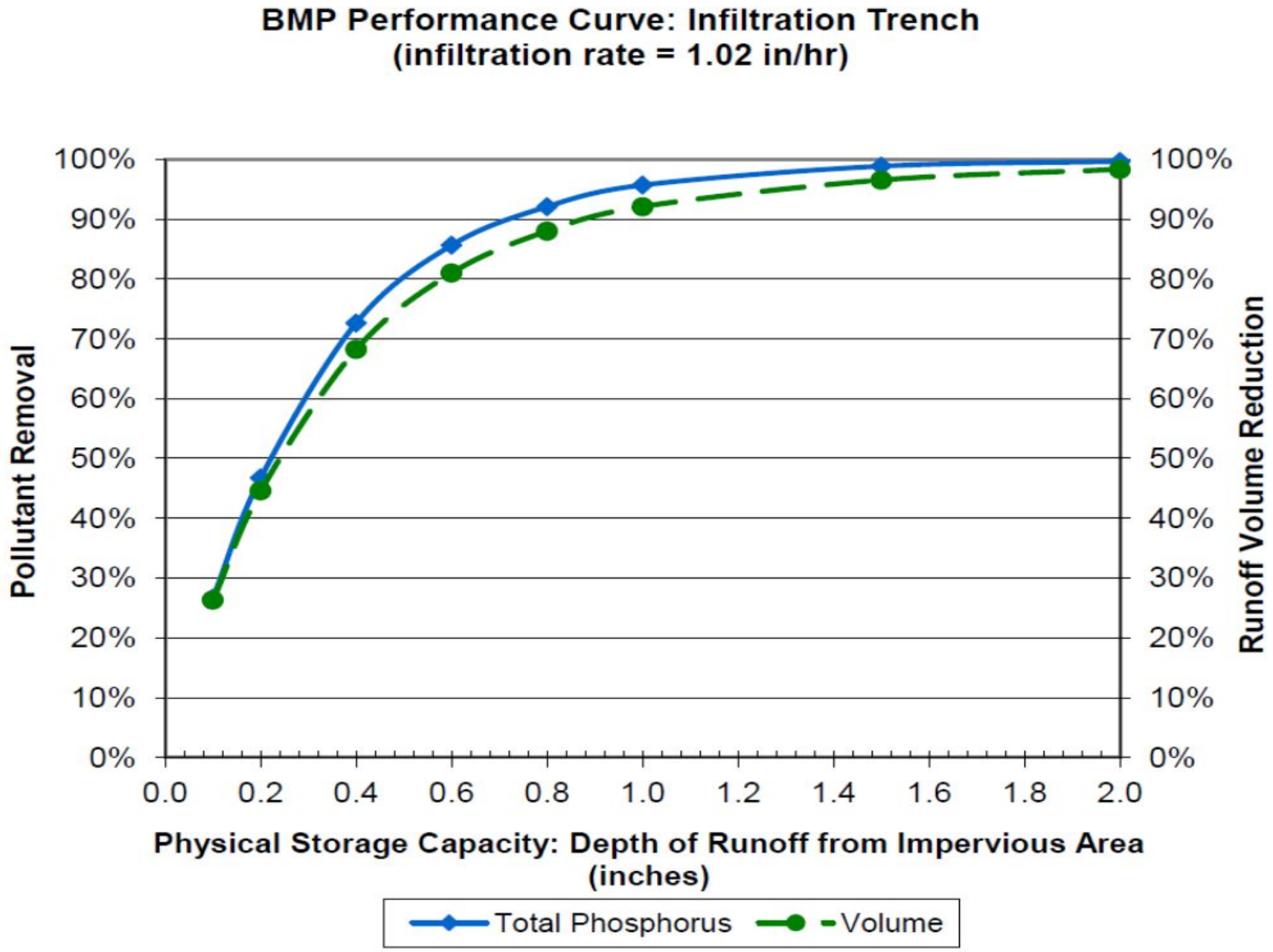
As total nitrogen performance is enhanced by depth to ground water, removal efficiencies for nitrogen are *inversely* proportional to those for TSS and TP, i.e,, HSGs that are best for TN removal (HSG D) are the opposite of those that are optimal for TSS and TP removal (HSG A).

Chesapeake Bay Pollutant Removal Efficiencies for Buffers By Geology (source)

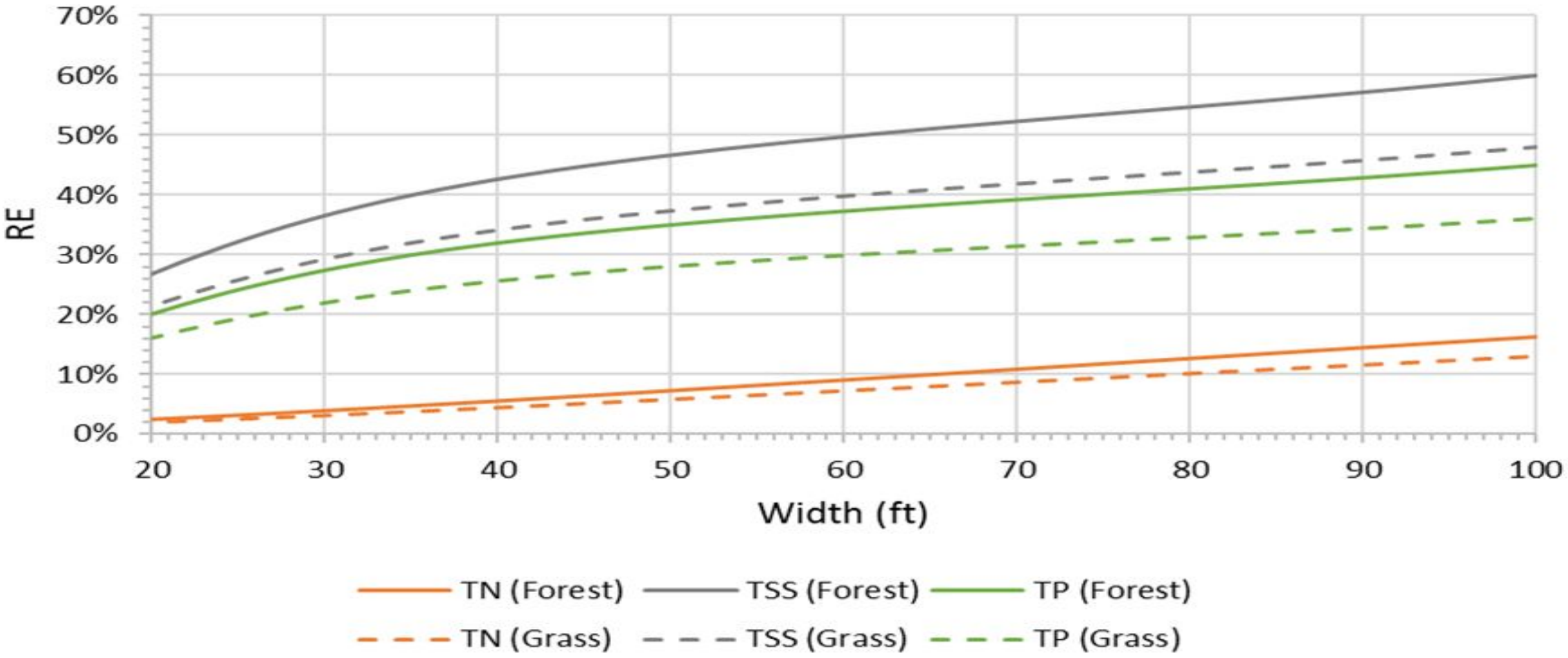
	Forest on one side of the stream (same as 2008)			Grass on one or both sides of the stream (same as 2008)		
	TN	TP	TSS	TN	TP	TSS
Inner Coastal Plain	65	42	56	46	42	56
Outer Coastal Plain (well drained)	31	45	60	21	45	60
Outer Coastal Plain (poorly drained)	56	39	52	39	39	52
Tidally Influenced	19	45	60	13	45	60
Piedmont (schist/gneiss)	46	36	48	32	36	48
Piedmont (sandstone)	56	42	56	39	42	56
Valley and Ridge (karst)	34	30	40	24	30	40
Valley and Ridge (sandstone/shale)	46	39	52	32	39	52
Appalachian Plateau	54	42	56	38	42	56

Performance Curves

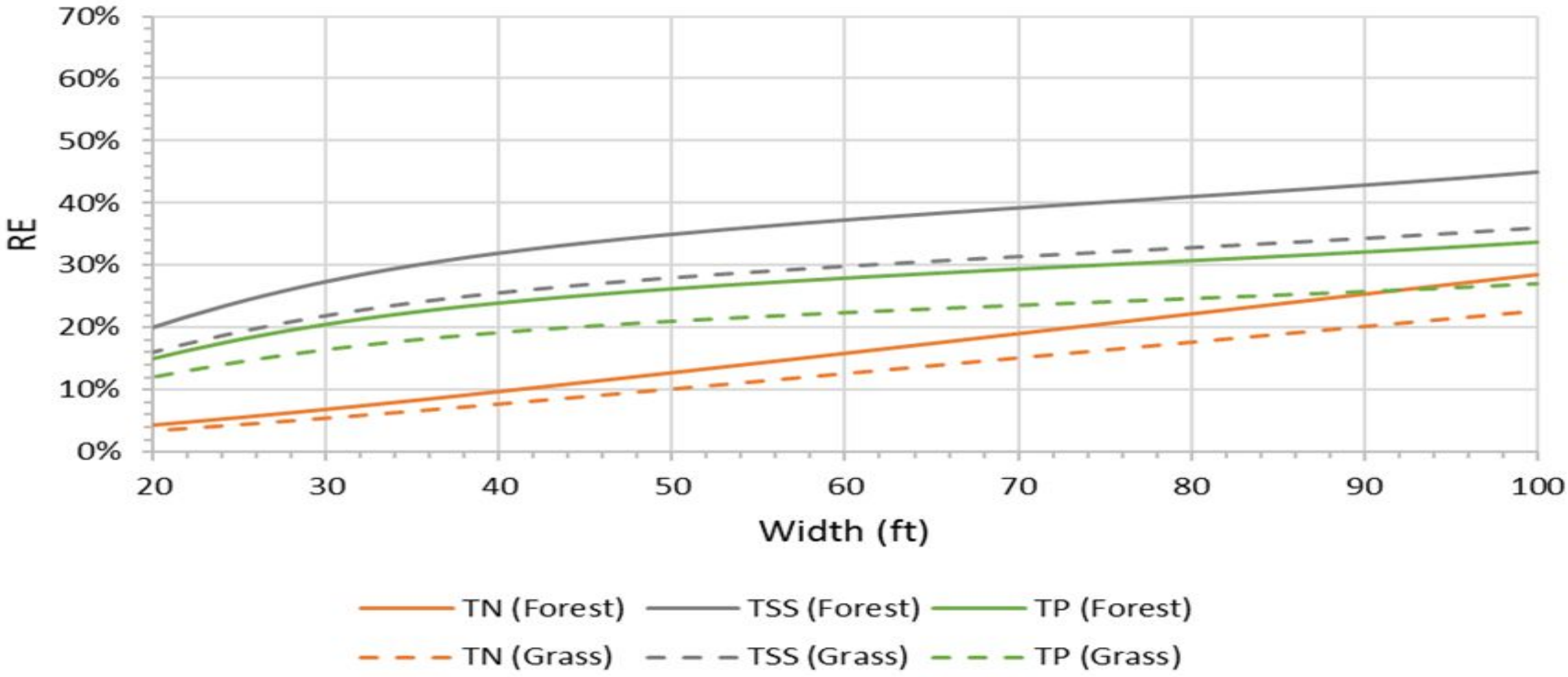
Design Guidance



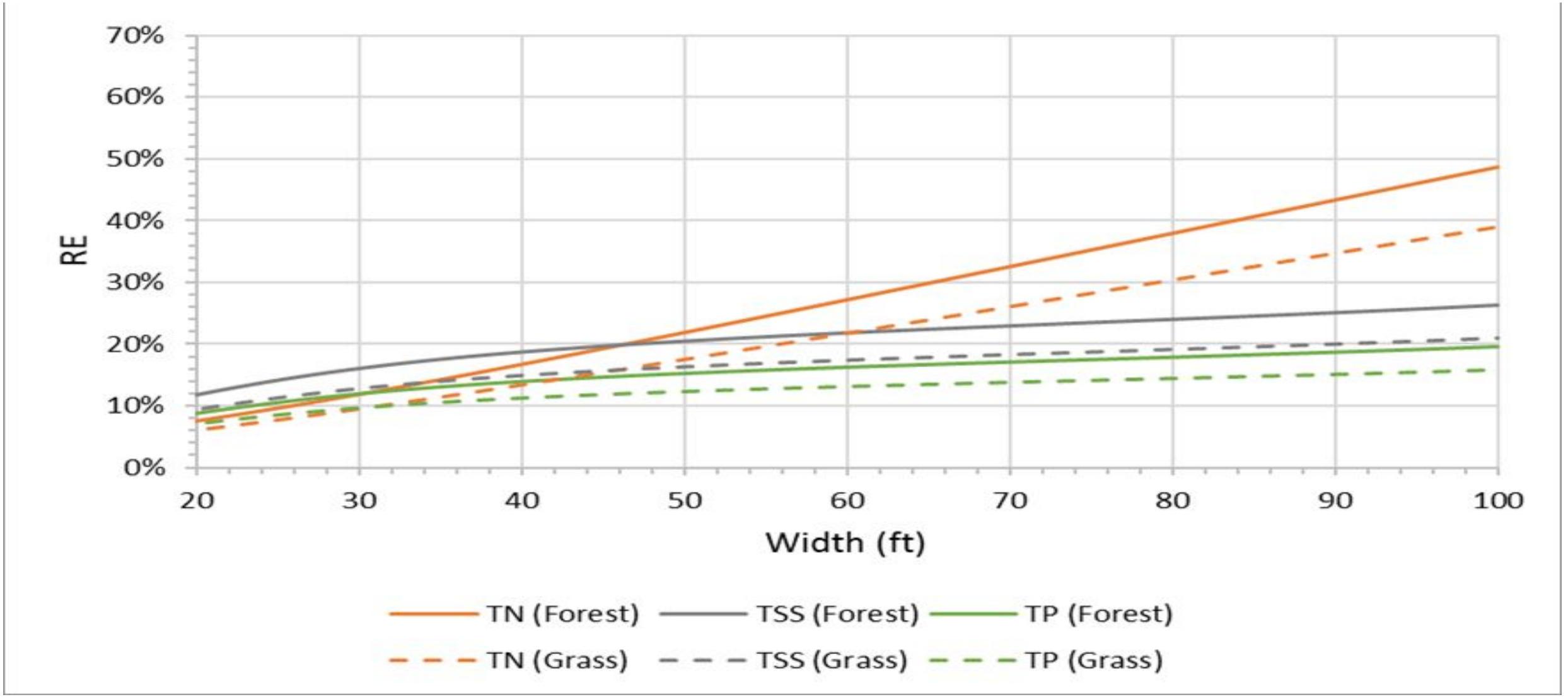
Removal Curves: Hydrologic Soil Group A



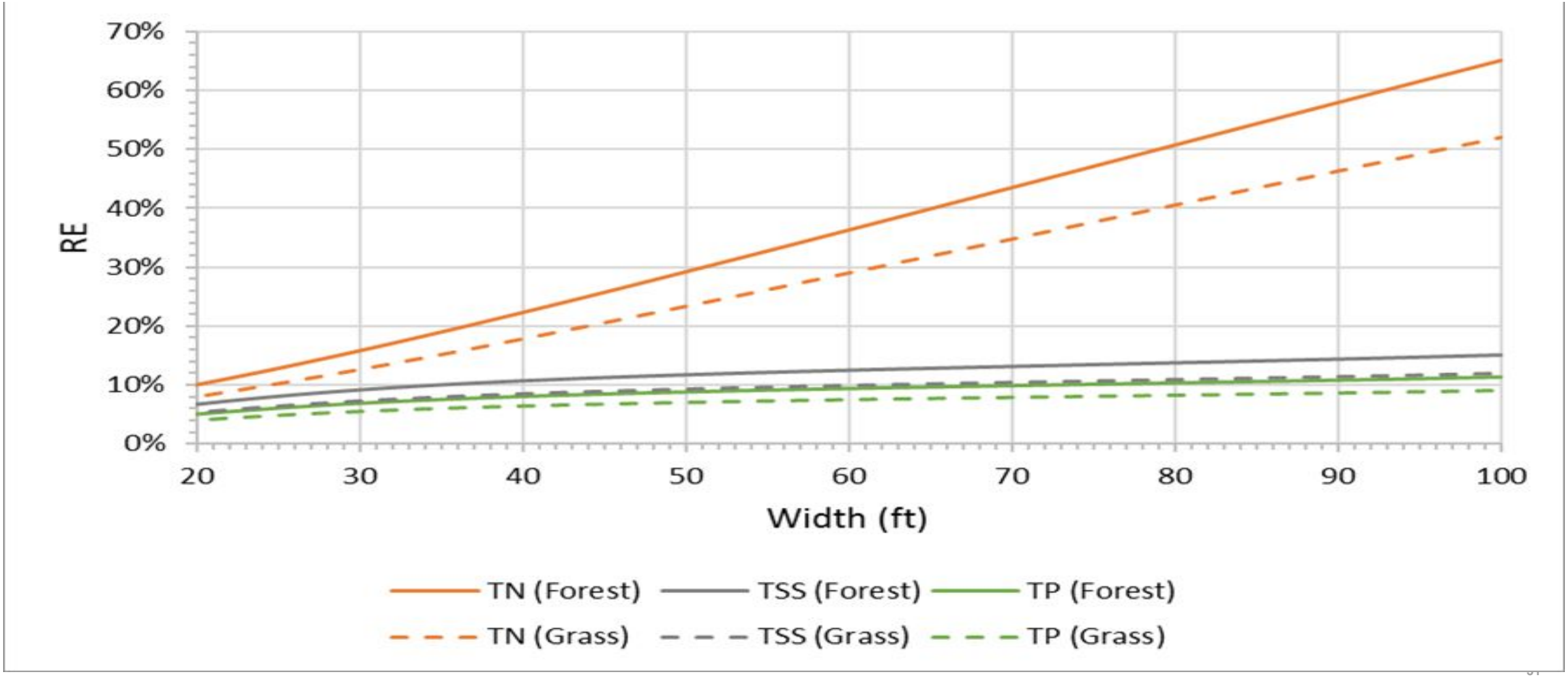
Removal Curves: Hydrologic Soil Group B



Removal Curves: Hydrologic Soil Group C



Removal Curves: Hydrologic Soil Group D



Land Use Categories & Pollutant Load Export Rates

Loading Ration by land use			PLER lb/ac/yr		
Buffer Curves	DCIA %	Max Contributing Area (ft)	TSS	TN	TP
Low Residential	<36	400	108	3.8	0.55
Residential	36-60	300	186	6.2	1.07
Commercial/Trans	>60	100	234	9.3	1.16

Performance Multiplier Based on Slopes up to 15%

Health and Longevity: consensus reached on 10-year lifespan of credit			
Slope	0-5%	5-10%	10-15%
Buffer Multiplier	1	0.75	0.5

When to Use the Curves

- Development, redevelopment, & restoration
- Ordinances related to buffers
- Watershed management planning
- Nitrogen management budget

What the Curves Can't Address

- Buffers Wider Than 100 Feet (Although these have great value!)
- Buffers Narrower Than 20 Feet
- Slopes Steeper Than 15%


What is Next?

Questions?

For more about this project

UNH Stormwater Center Online: www.unh.edu/unhsc

Credit for Going Green: www.unh.edu/unhsc/news/credit-going-green

Q&A

Use the “Questions” function in the GoToWebinar console

Cory Riley
Manager
Great Bay NERR, NH

Dolores Leonard
Principal and Co-Founder
Roca Communications

James Houle
Program Director
University of New Hampshire Stormwater Center

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Q&A

Q: Would you expect infiltration trenches to perform better?

- **A:** In this case, a lot of these pollutant removal curves are dominated by hydrology. So anything that corrects the hydrology or infiltrates the water gets better performance from this approach.

Q: Is there a mechanism for revisiting the removal curves if new information becomes available for wider buffers?

- **A:** We think so; at least, that's how it's supposed to work. We're in a place where the science rapidly outpaces the regulatory environment in terms of how to credit and evaluate the performance of these types of things.

Q: How are credits generated? The term suggests reductions that can be sold or traded once the target is met. What are the targets that need to be met before credit is issued?

- **A**: Because we have nutrient issues in our area, the economy is largely dictated by load-reduction targets for specific nutrients. There's different ways to do it, but I don't think we've successfully been able to quantify the value of the environmental services that buffers provide; this is a huge area for future research.

Q: It takes a long time for buffers to recover. How is that worked into the crediting? Are reduction credits phased in over time?

- **A**: We said that buffers would have to be reevaluated every 10 years, which is consistent with other restoration approaches.

Q: Were panel members compensated?

- **A**: We offered a small stipend to every panelist, and we recommend everyone do that. Not everyone could accept it, but it is a good standard practice.

Webinar Announcements

Upcoming Schedule

- **Innovative Approaches to Integrating Research and K-12 Education to Advance Estuary Stewardship**
  3.00 - 4.30 PM Eastern Time, July 28, 2020
  Moderator:
  Sarah Nuss, Chesapeake Bay NERR, VA

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Thank you for joining us

Please complete the short survey at the end of the webinar, and be on the lookout for the webinar brief!

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