pennsylvania
DEPARTMENT OF ENVIRONMENTAL PROTECTION

Chesapeake Bay Program Office

The Phase 3 WIP Story…

Water Resources Advisory Committee

May 9, 2018

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Good for the Bay

Objectives – The Phase 3 WIP Story

- What and Why
  - Planning Targets, Local Goals
  - Progress
  - Why is this Important?
- Where – By County
- Who, When
  - Action items, Measurable outputs and outcomes, timelines
  - Milestones, Progress Reporting, Indicators
  - Other
- How
  - Local Planning Goal Workgroup Toolbox
  - Watershed Agreement Outcomes and Indicators
  - Bay Program and SRBC Resources and Modeling Tools

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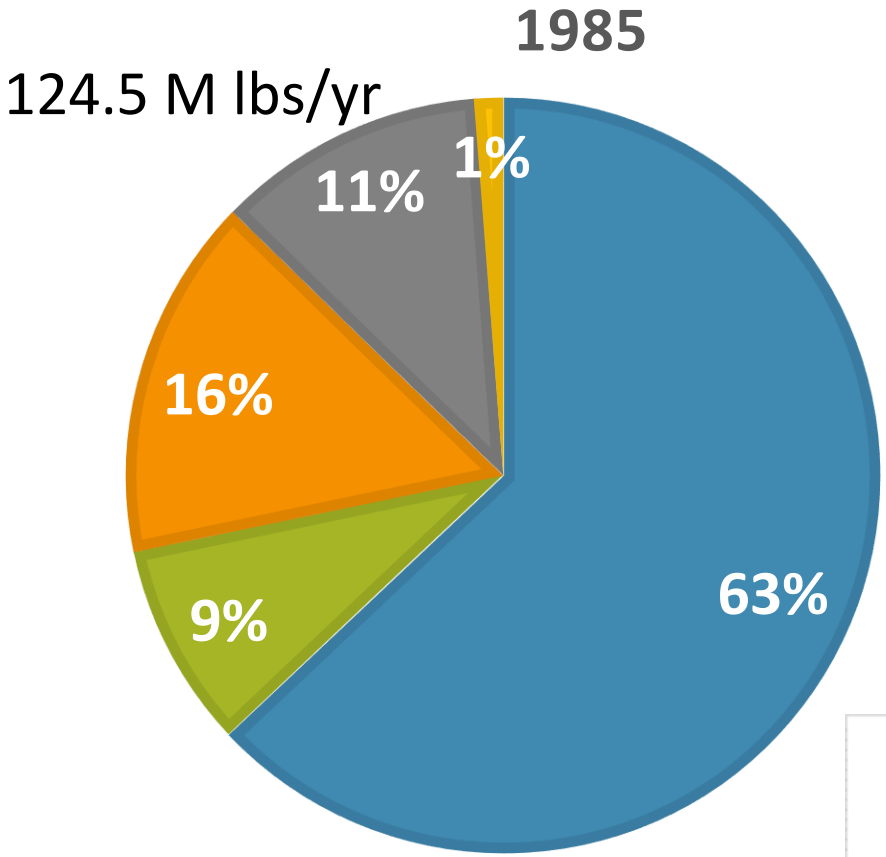
PA Draft Phase 3 WIP Planning Targets + Reference Loads

Nitrogen Load					
	No-Action (M lbs)	E3 (M lbs)	2016 Progress (M lbs)	Phase II WIP (reference) (M lbs)	Draft Phase III WIP Planning Target (M lbs)
PA Eastern Shore	0.81	0.29	0.76	0.43	0.45
PA Potomac	11.04	4.08	9.15	5.39	6.06
PA Susquehanna	127.82	48.05	99.60	63.99	66.65
PA Western Shore	0.04	0.01	0.04	0.02	0.02
PA Total	139.71	52.32	109.55	69.82	73.18

Phosphorus Load					
	No-Action (M lbs)	E3 (M lbs)	2016 Progress (M lbs)	Phase II WIP (reference) (M lbs)	Draft Phase III WIP Planning Target (M lbs)
PA Eastern Shore	0.05	0.02	0.03	0.02	0.03
PA Potomac	0.72	0.19	0.44	0.32	0.35
PA Susquehanna	6.70	1.46	3.47	2.76	2.69
PA Western Shore	0.00	0.00	0.00	0.00	0.00
PA Total	7.47	1.67	3.94	3.10	3.07

PA Nitrogen – Phase 6 Loads and Target



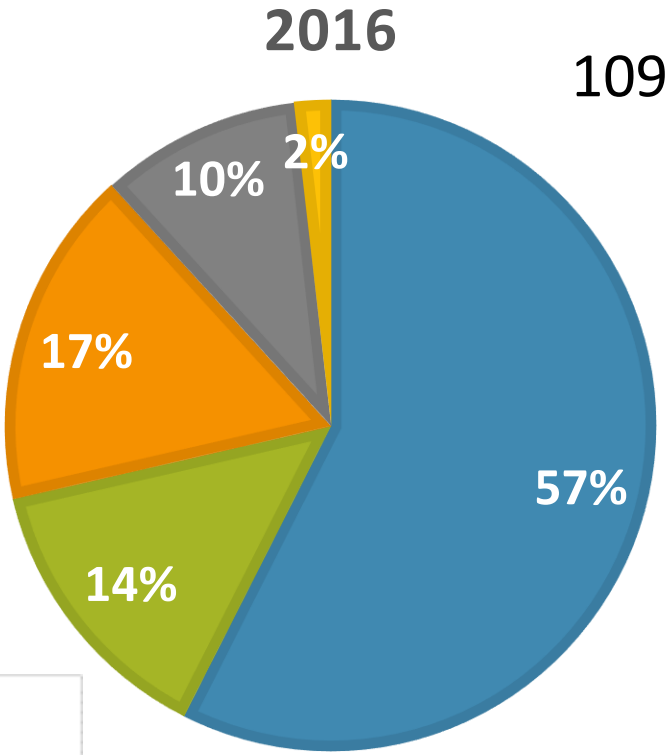
Agriculture

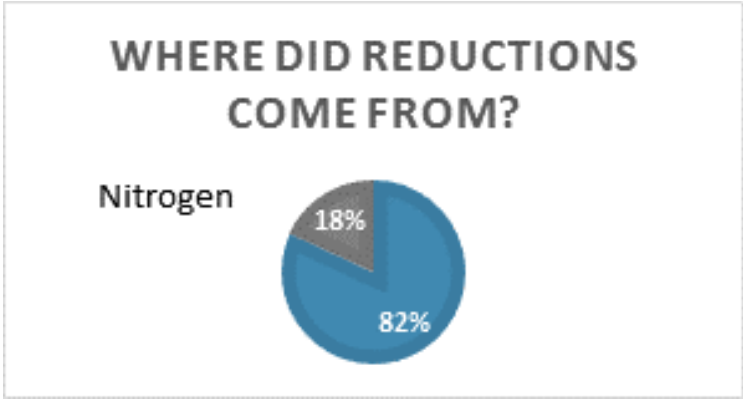
Developed

Natural

Wastewater

Septic





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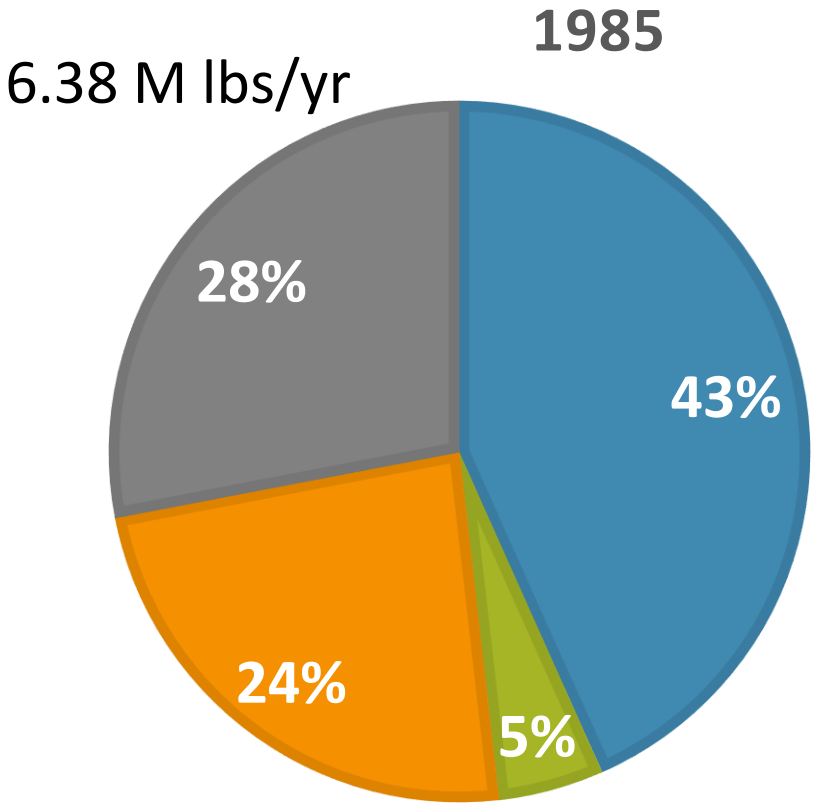
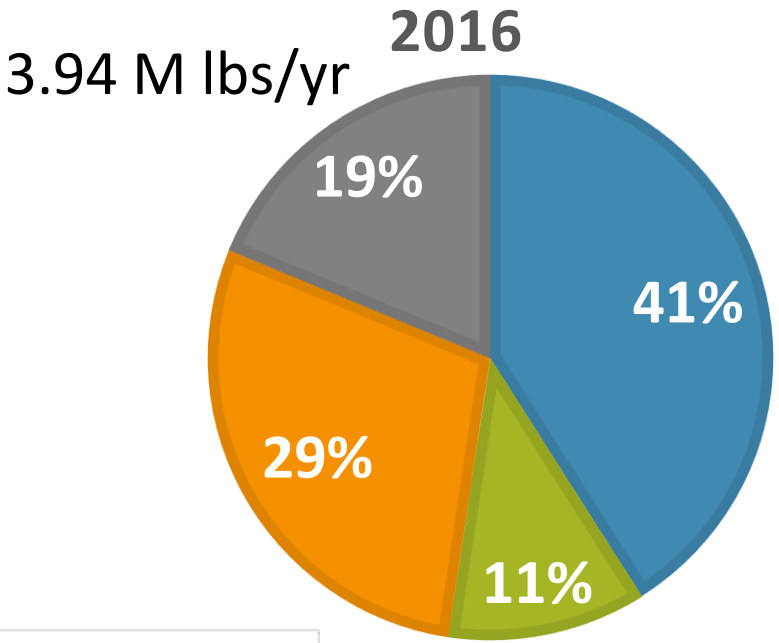
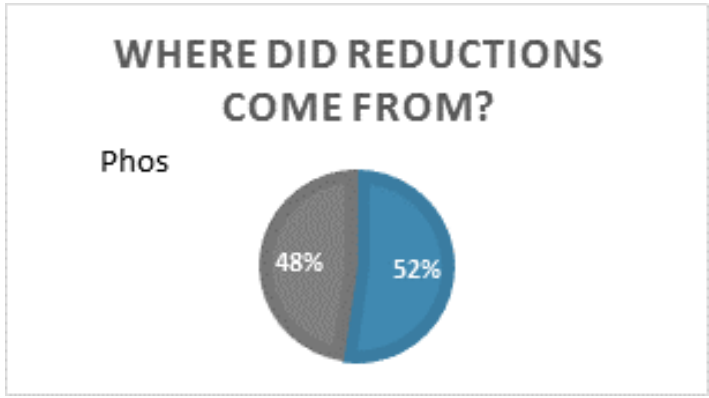
PA Phosphorus – Phase 6 Loads and Target



- Agriculture
- Developed
- Natural
- Wastewater





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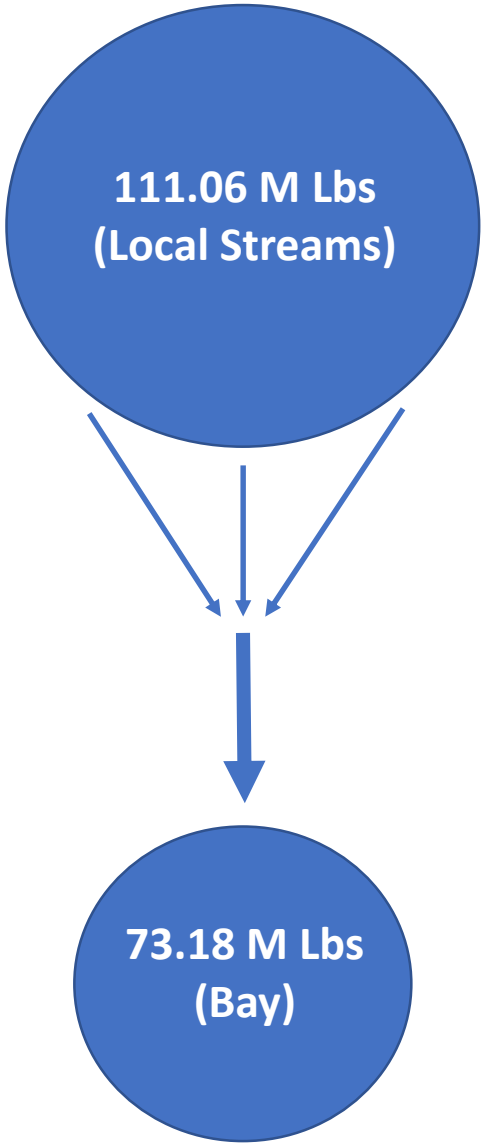
How do we determine “local”?

- Step 1: Convert any Chesapeake Bay “diet” into a local PA stream diet.
  - CBP Model has estimates of nutrient and sediment delivery from the field to local streams through large rivers and to the Bay.
  - Pounds of pollutant delivered to the Bay can be expressed as pounds delivered to local streams using these factors.
  - If 73.18 M lbs of Nitrogen delivered to the Bay is PA’s Chesapeake Bay “diet”, that number is equivalent to 108.06 M lbs of Nitrogen delivered to local streams.

Source:
Matt Johnston, University of Maryland

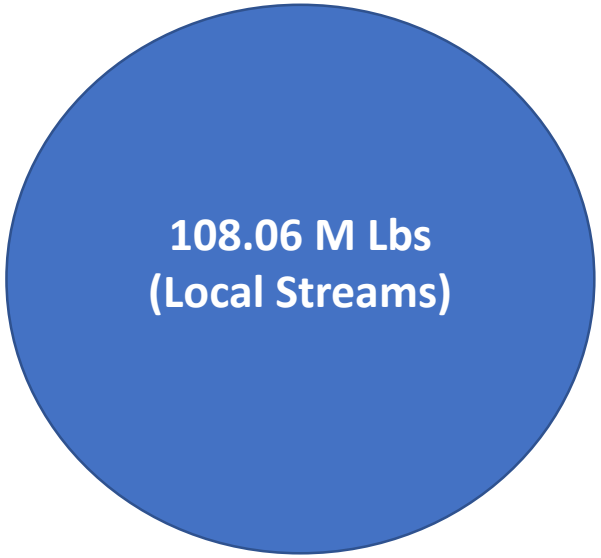


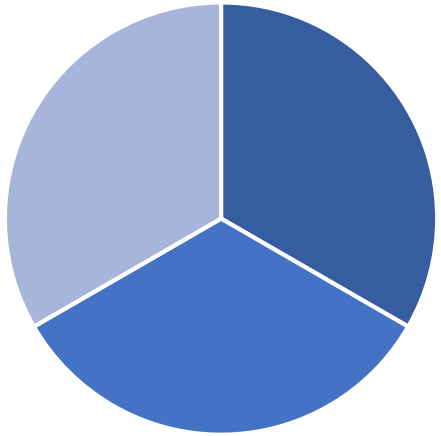
Source:
Matt Johnston, University of Maryland

How do we determine “local”?

- Step 2: Choose a geography to split up the diet.
  - CBP Model can provide pollution by:
    - Small watershed – Swatara Creek (122)
    - County – Berks (43)
    - Sub-basin – Lower Susquehanna River (6)
    - River basin – Susquehanna River (3)

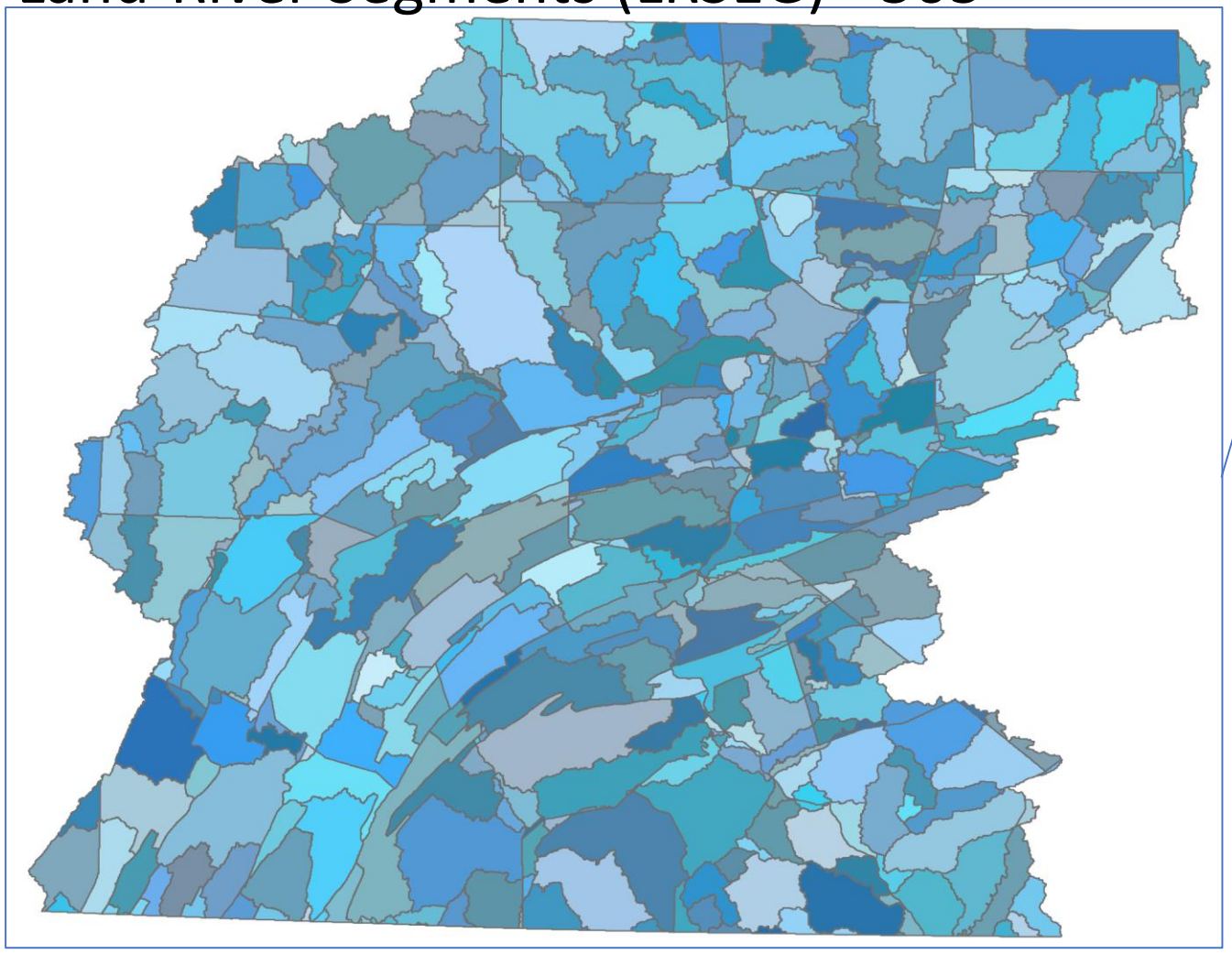
  - **<u>Regardless of geography selected, data can be provided to localities at any level.</u>**

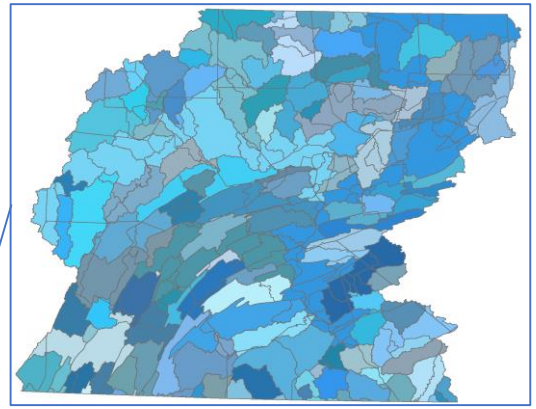




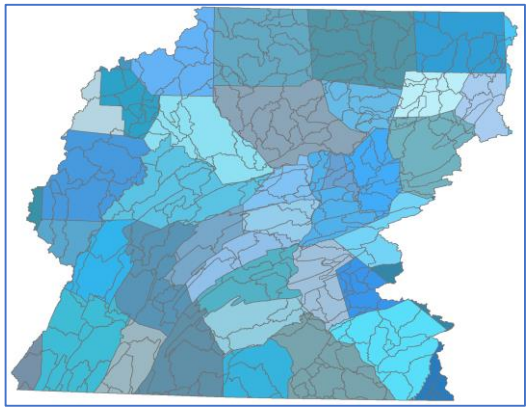
Source:
Matt Johnston, University of Maryland

Land-River Segments (LRSEG) - 505

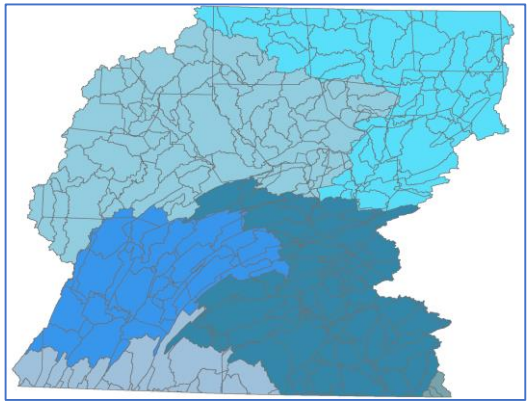




Rivers - 122



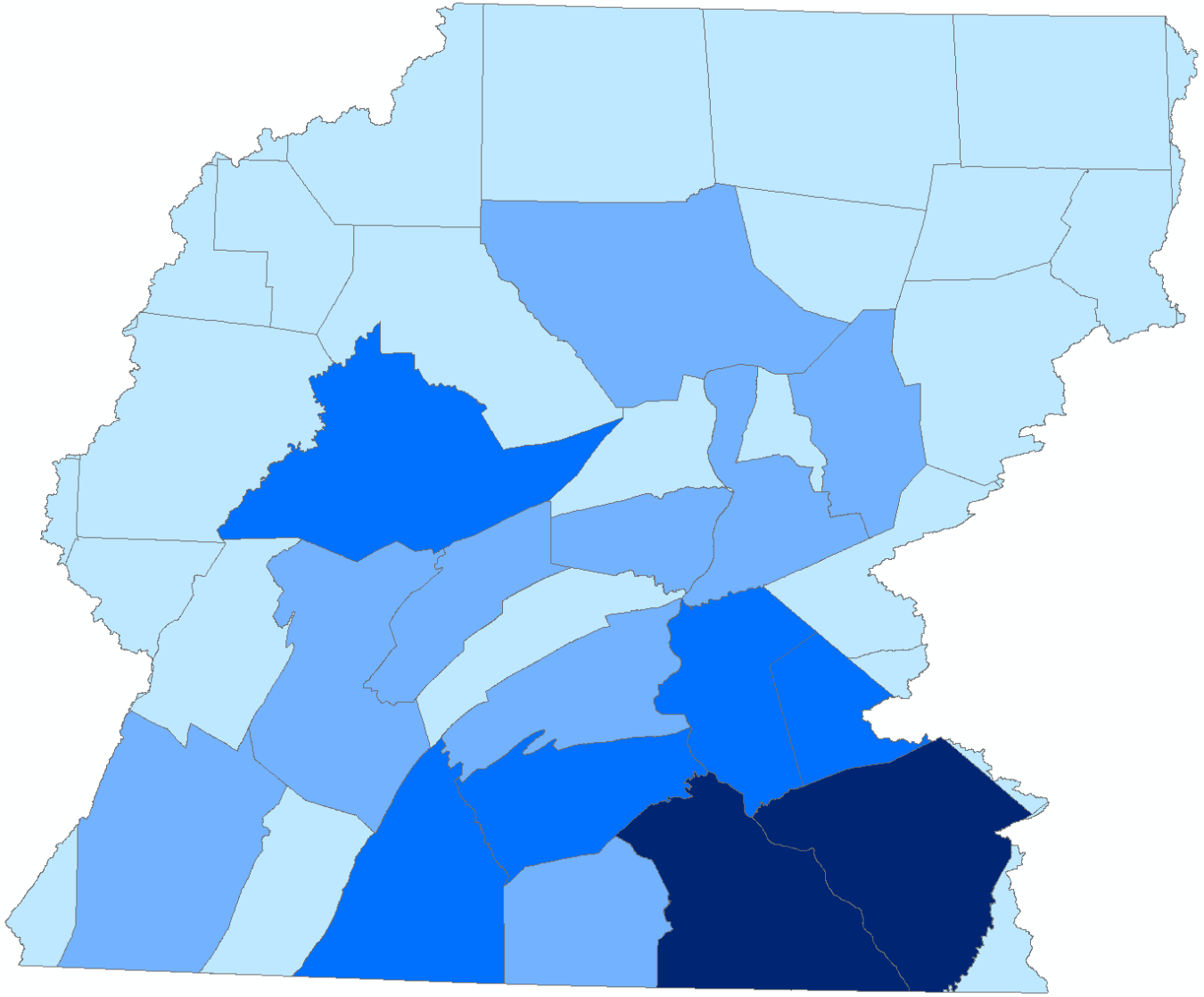
Counties - 42



Sub-Basins - 6

Where Should Efforts be Targeted?

Source:
Matt Johnston, University of Maryland



Tier 1 - First 25% of Reductions

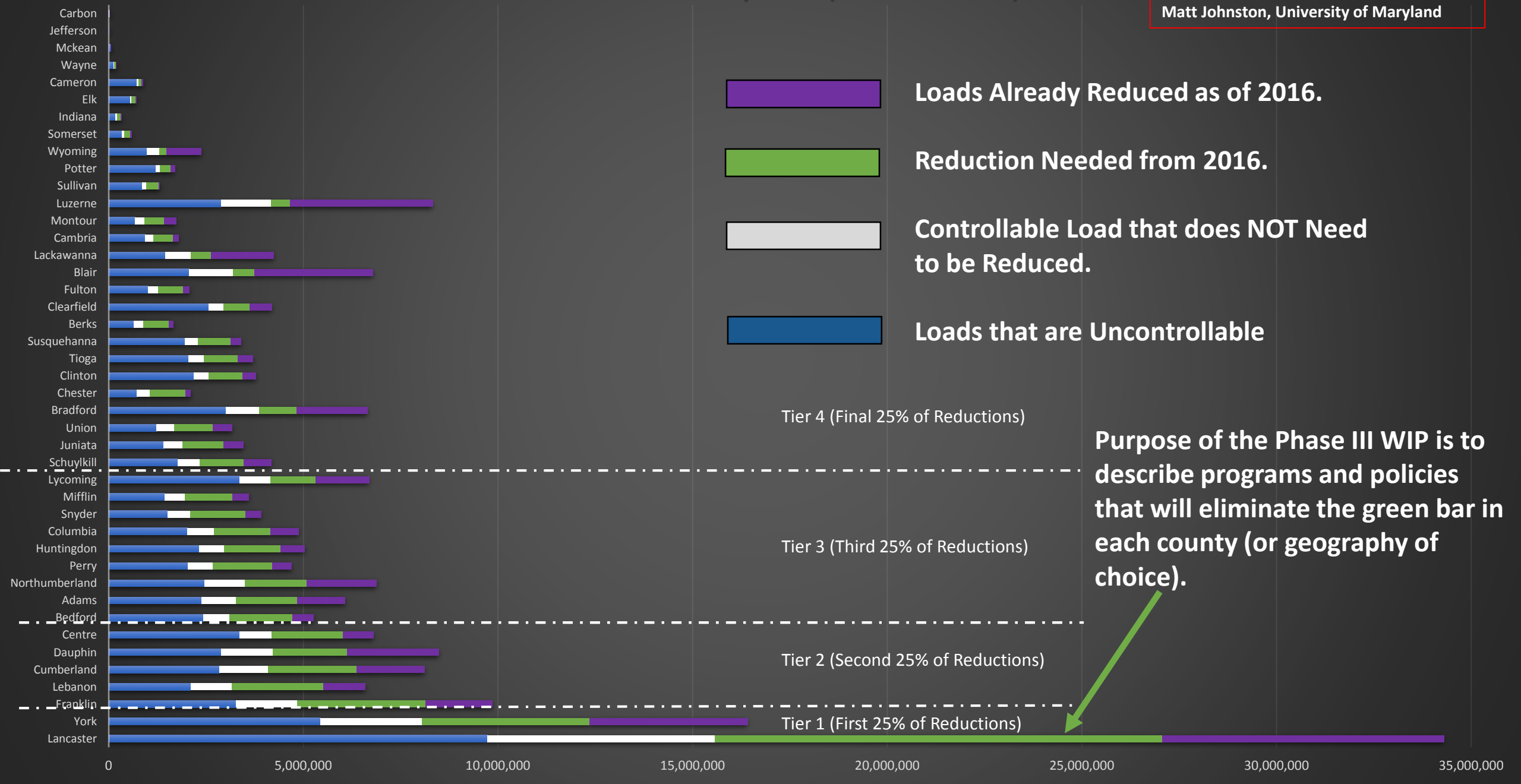
Tier 2 - Second 25% of Reductions

Tier 3 - Third 25% of Reductions

Tier 4 - Last 25% of Reductions

Estimated Reductions in Lbs of Nitrogen Delivered to PA Streams as of 2016, and Additional Reductions Needed by 2025 (Numbers Draft)

Source:
Matt Johnston, University of Maryland

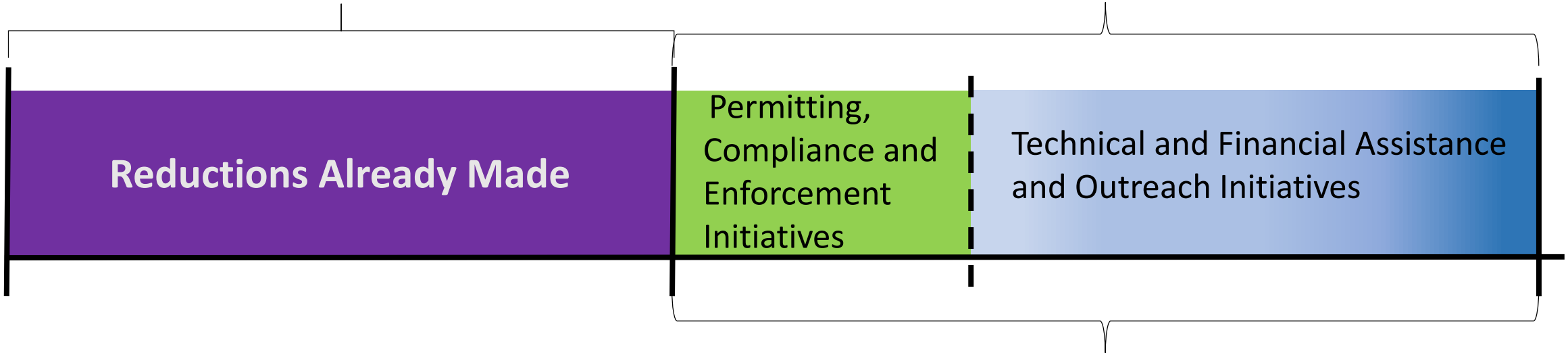


Purpose of the Phase III WIP is to describe programs and policies that will eliminate the green bar in each county (or geography of choice).

Level of Effort – Conceptual Framework

Progress from 1985 through 2016

Potential progress with new and existing state agency programs + Local Initiatives



Customized Partnership by County

Hypothetical journey to a county goal (nitrogen)

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Existing Programs/Enhancements -- PROPOSED

- Agriculture –
  - Compliance –
    - Manure Management
    - Act 38
    - Agriculture Erosion and Sediment Control
  - Technical/Financial Assistance and Outreach
    - Soil Health (PA in the Balance)
    - Expanded Nutrient Management
    - Manure Treatment, Storage and Transportation
    - Riparian Ecosystems
- Stormwater
  - Compliance
    - MS4s and PRPs
    - Refinements in Next Permit Cycle
    - Non-MS4 Communities
  - Technical/Financial Assistance and Outreach
    - “Trees and Pollinators”
    - Stream Restoration
  - Fertilizer Bill
- Wastewater -- Compliance
  - Existing Permit Caps
  - Non-Significant Facilities
  - ENR at Significant Facilities
  - Septics
    - Connections to Treatment Facilities
    - Nutrient Treatment on on-lot Systems
- Forestry (Sector Growth)
  - Riparian/Forest Buffers
  - Protected Lands/Land Conservation
    - Agriculture and Forest
  - Tree Canopy

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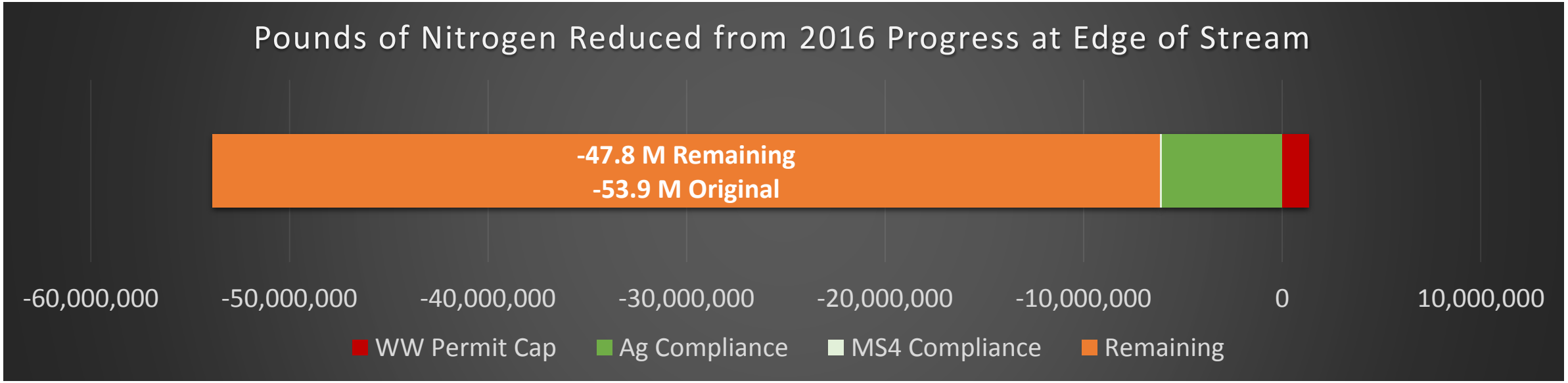
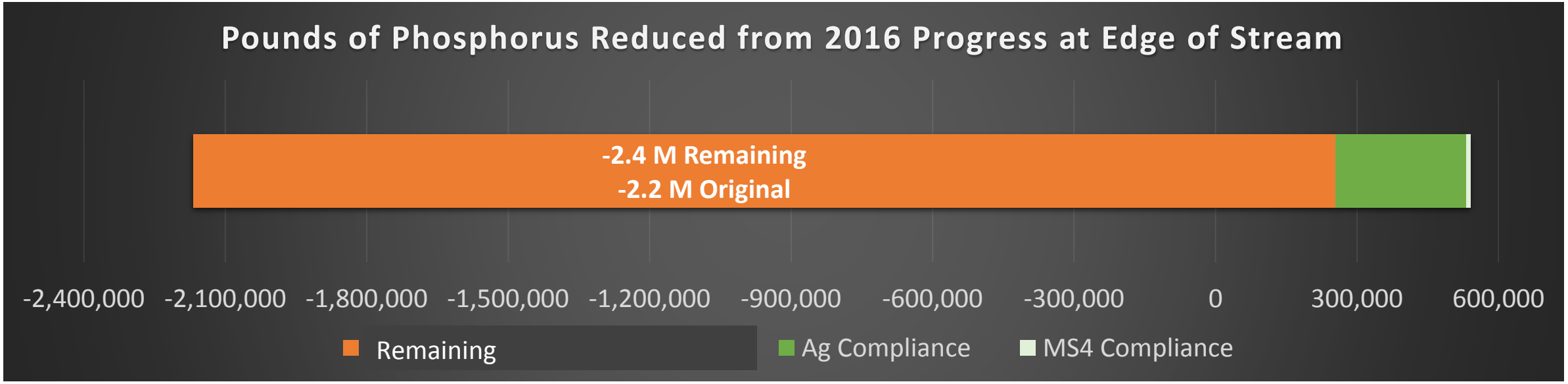
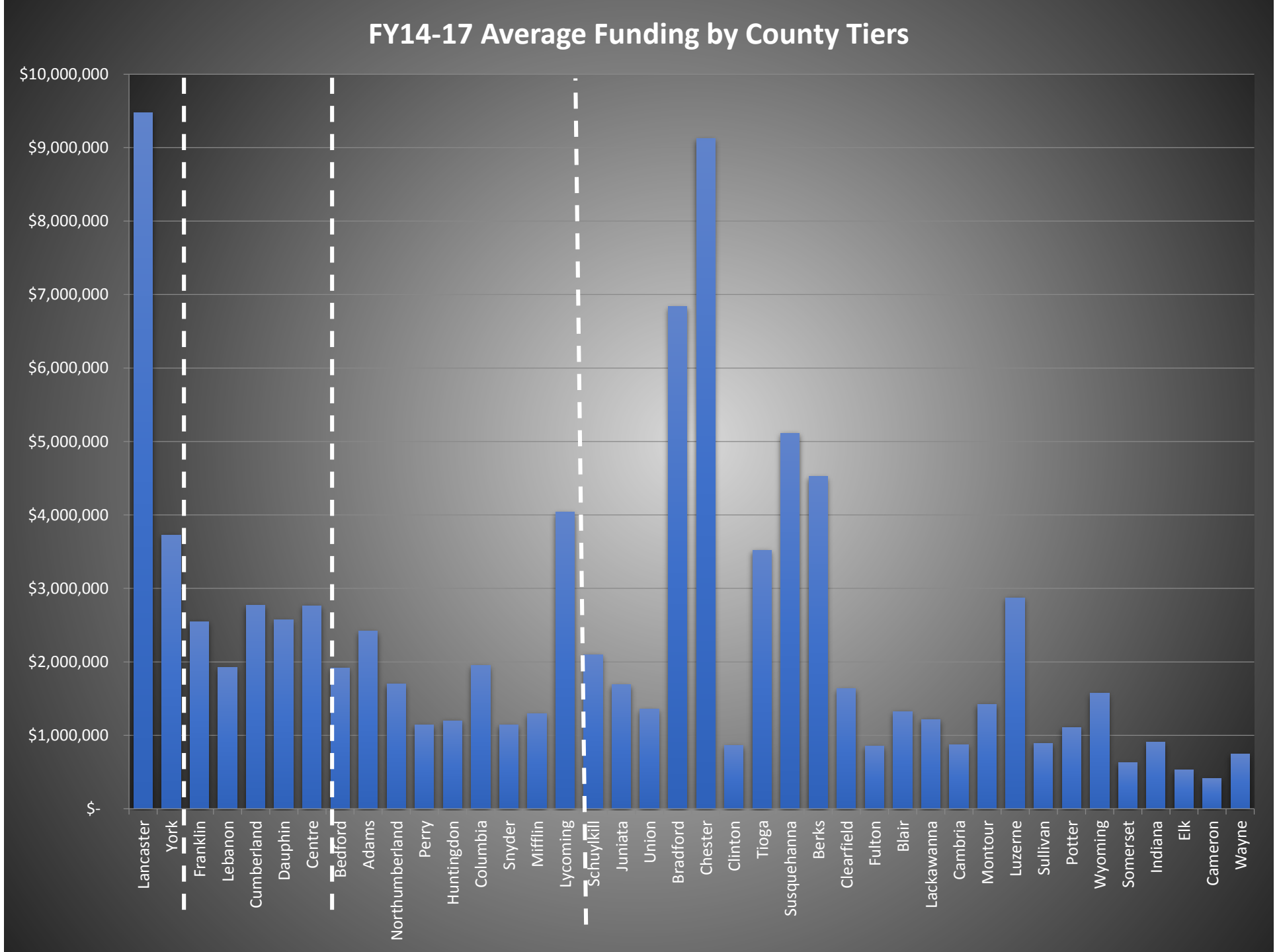

Pounds of Nitrogen Reduced from 2016 Progress at Edge of Stream
-47.8 M Remaining
-53.9 M Original
-60,000,000
-50,000,000
-40,000,000
-30,000,000
-20,000,000
-10,000,000
0
10,000,000
WW Permit Cap
Ag Compliance
MS4 Compliance
Remaining


Pounds of Phosphorus Reduced from 2016 Progress at Edge of Stream
-2.4 M Remaining
-2.2 M Original
-2,400,000
-2,100,000
-1,800,000
-1,500,000
-1,200,000
-900,000
-600,000
-300,000
0
300,000
600,000
Remaining
Ag Compliance
MS4 Compliance


FY14-17 Average Funding by County Tiers
$10,000,000
$9,000,000
$8,000,000
$7,000,000
$6,000,000
$5,000,000
$4,000,000
$3,000,000
$2,000,000
$1,000,000
$-
Lancaster
York
Franklin
Lebanon
Cumberland
Dauphin
Centre
Bedford
Adams
Northumberland
Perry
Huntingdon
Columbia
Snyder
Mifflin
Lycoming
Schuylkill
Juniata
Union
Bradford
Chester
Clinton
Tioga
Susquehanna
Berks
Clearfield
Fulton
Blair
Lackawanna
Cambria
Montour
Luzerne
Sullivan
Potter
Wyoming
Somerset
Indiana
Elk
Cameron
Wayne

Bay Program “Stacking” Efforts

- Brook Trout
- Climate Resiliency
- Fish Habitat
- Forest Buffers
- Healthy Watersheds
- Protected Lands
- Public Access
- Stream Health
- Submerged Aquatic Vegetation
- Toxic Contaminants
- Tree Canopy
- Wetlands

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Templates

Forest Buffers:
Principles for Phase III Watershed Implementation Plans

Planting buffers for human health, economic development, and infrastructure

Restoring riparian forest buffers is tantamount to a healthy watershed. Buffers are a cost-effective, common-sense water quality practice—every dollar spent on this practice reduces the need for more costly urban practices and less effective agricultural practices. Funding is available to restore riparian forest buffers. Through the federal-state Conservation Reserve Program, almost all costs for this practice can be met. Each year, there is more funding than is used in this program.

Buffers are effective at cleaning water—they reduce bacteria, other microorganisms, micro plastic fibers, harmful algal blooms, and an unknown number of emerging contaminants that are easily found in surface waters. Buffers also keep stream temperatures down which can reduce the occurrence of algal blooms and bacteria, making the water in our streams more swimmable and drinkable. Cows also benefit directly-- herd health improved once cows are fenced out of the stream, allowing a buffer to establish.

Buffers help municipalities by treating stormwater and dissipating flood energy and erosion potential of streams, rivers, and tides. Floodplain buffers are particularly important for treating flood water. Buffers improve recreational services such as fishing, boating, swimming, hiking, biking, and wildlife viewing. Quality-of-life is perceived higher around trees. Streams and buffer restoration offer a great opportunity for economic revitalization.

Best Management Practices with Forest Buffers in Mind

Of the many best management practices (BMPs) used to improve quality of Chesapeake Bay waterways, the restoration of forest buffers might be the best. Forest buffers provide critical barriers between polluting landscapes and receiving waterways, reducing the adverse effect of excessive nitrogen, phosphorus, and suspended sediment inputs using relatively little land. In addition to their well-recognized role in improving water quality, riparian forests fulfill important habitat needs for a host of aquatic and terrestrial species. See the table below for forest buffer BMPs with other co-benefits*

Best Management Practice	Forest Buffers	Additional Co-Benefits					
		Habitat Biodiversity	Brook Trout	Stream Health	Fish Habitat	Healthy Watersheds	Tree Canopy
Agricultural Forest Buffer	5	4	4.5	4	4.5	4	4.5
Forest Conservation	3.5	5	4	4	4	5	5
Forest Harvesting Practices	3.5	2	2	4	3	3	2
Narrow Forest Buffer	5	2.5	3.5	2	3.5	2	5
Streamside Forest Buffers	5	4	4.5	3	4.5	3	5
Urban Forest Buffers	5	5	5	4	4	3.5	4.5

*Values were taken from the Quantification of BMP Impact on the Chesapeake Bay Program Management Strategies study by Tetra Tech. Appendix E Final Impact Scores evaluates BMP effects on outcomes on a scale of +5 (very beneficial) to -5 (very harmful). **This table shows BMPs that scored a 3.5 or higher and -3.5 or lower for the Forest Buffer Outcome.**

-5 -4.5 -4 -3.5 -3 -2.5 -2 -1.5 -1 -0.5 0 0.5 1 1.5 2 2.5 3 3.5 4 4.5 5

Guiding Principles for Incorporating Outcome

WIP Development

- Calculate benefit of establishing buffers by using CAST.
- Identify areas where more buffers are needed.
- Staff-up for establishing buffers on agricultural and developed land.
- Insist on buffering all streams on conserved agricultural land.
- Improve internal and external education around the importance of buffers.

WIP Implementation

- Engage over buffer restoration at every opportunity: whenever there is landowner contact- whether for a different restoration practice or conservation easements.
- Educate landowners and increase incentives to them for establishing a buffer.

Tools and Resources

- A Guide for Forestry Practices for Phase III WIPs
  Packet of information on all forestry practices
- Healthy Watersheds Forestry TMDL Forest Retention Study
  (http://www.chesapeakebay.net/channel_files/25322/healthy_waters_forest_retention_-_final_report.pdf)
  This report includes a toolbox of recommendations and incentives for stimulating forestland retention
- Chesapeake Riparian Forest Buffer Network (http://chesapeakeforestbuffers.net/)
  Website with information, resources, and success stories related to riparian forest buffers
- More can be found on the Forestry Workgroup page
  https://www.chesapeakebay.net/who/group/forestry_workgroup

Contacts for More Information on Forest Buffers in your Jurisdiction

Jurisdiction	Website	Lead	Email
Delaware	Delaware Forest Service	Marcia Fox	marcia.fox@state.de.us
D.C.	DOEE – Trees in the District	Luke Cole	luke.cole@dc.gov
Maryland	MD Forest Service Buffer Initiative	Anne Hairston-Strang	astrang@dnr.state.md.us
New York	NYDEC Riparian Buffers	Lauren Townley	lauren.townley@dec.ny.gov
Pennsylvania	PA DCNR Riparian Buffers	Matt Keefer	makeefer@pa.gov
Virginia	VA DOF Riparian Forest Buffers	Greg Evans	gregory.evans@dof.virginia.gov
West Virginia	WV Chesapeake Bay Forestry	Herb Peddicord	herb.f.peddicord@wv.gov
CBP Contact	CBP Forestry Workgroup	Sally Claggett	sclaggett@fs.fed.us

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Climate Resiliency

Source:
EPA Chesapeake Bay Program Office

Goal: Increase the resiliency of the Chesapeake Bay watershed, including its living resources, habitats, public infrastructure and communities, to withstand adverse impacts from changing environmental and climate conditions.

Progress: A formal indicator of progress for climate adaption and climate monitoring and assessment is under development.

Implementing these conservation practices:

- Urban Forest Buffers
- Forest Conservation

Will also benefit these outcomes!

- Climate adaption
- Energy efficiency
- Flood risk mitigation

Source:
EPA Chesapeake Bay Program Office

What should I know about climate resiliency?

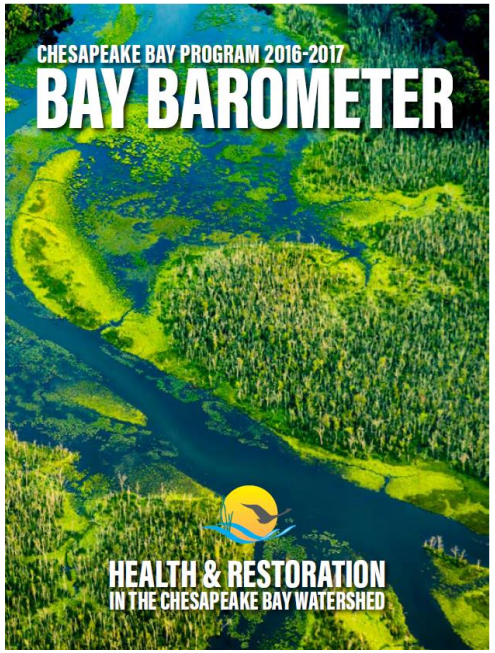
- Addressing climate impacts in conjunction with ongoing restoration efforts will prepare your community for greater variability and can help achieve cost savings and reduce risks.

- Considering future impacts during the planning, siting, design and implementation of conservation practices can help to reduce the vulnerability of a project to fail.

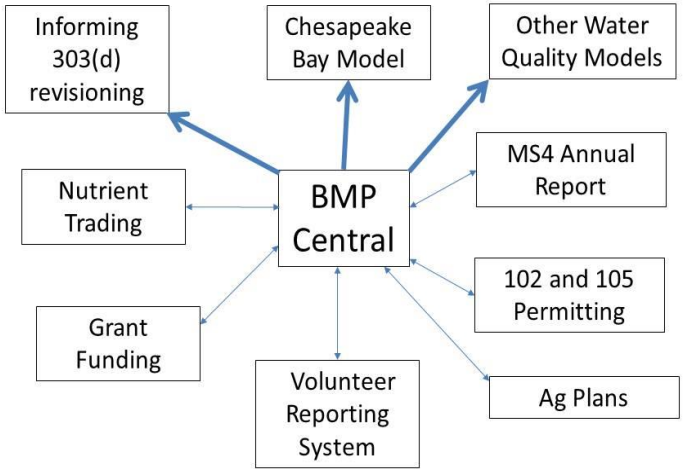
- Assessing climate impacts at the initial stage of watershed implementation planning will increase effectiveness, decrease maintenance costs and contribute toward meeting pollution reduction goals.

Milestones and Progress (Outputs)

- BMP Verification Plan
- Tracking and Reporting
- Indicators of Progress
- “PA Barometer”



BMP DATA MANAGEMENT FRAMEWORK



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Local Engagement -- Proposed

- Developing a toolbox for county stakeholders to use in determining locally how they will meet their goal
  - Informed by sector-based work groups
  - **April 10 –** Local Planning Process Meeting, Holiday Inn, Grantville
- Countywide Planning Goals **– May through October 2018**
  - Pilot Process in 3 to 4 counties
- Continued public engagement and input – Communications Plan and Workgroup
  - Fact Sheets, Program Updates, Website
  - Forums, Regional Meetings – **May through October 2018**
  - Public Review and Comment Period on Draft WIP Plan **– March 2019**
- Final Phase 3 WIP – **June 2019**

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Chesapeake Bay Program Office

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DEP Chesapeake Bay Program Website:

http://www.dep.pa.gov/ChesapeakeBay

Phase 3 WIP Website:

www.dep.pa.gov/chesapeakebay/phase3