

BWRNSM

Water Quality Monitoring Program and Partnerships

Bureau of Watershed Restoration and Nonpoint Source Management (BWRNSM)
08/06/26





Overview

- Background
- BWRNSM Monitoring Program
 - BMP Efficiency Project, Preliminary Data
 - Tier III Mini-Grant Program
 - Collaboration / Partnerships
- Future of BWRNSM Monitoring Program

Status of the Chesapeake...

CESR Report

- May 2023 - Chesapeake Bay Program STAC released the Comprehensive Evaluation of System Response (CESR) Report
- <https://www.chesapeake.org/stac/cesr/>



Key Findings

- Models may be overestimating program effectiveness and nutrient reductions
- Finer-scale monitoring could help identify high nutrient loss areas and be used to evaluate other treatment options

Data Gaps

- Monitoring networks are not typically set up at a scale sufficient to:
- Investigate uncertainties regarding nonpoint source program effectiveness
 - **Assess the efficacy of BMPs at a small watershed scale**

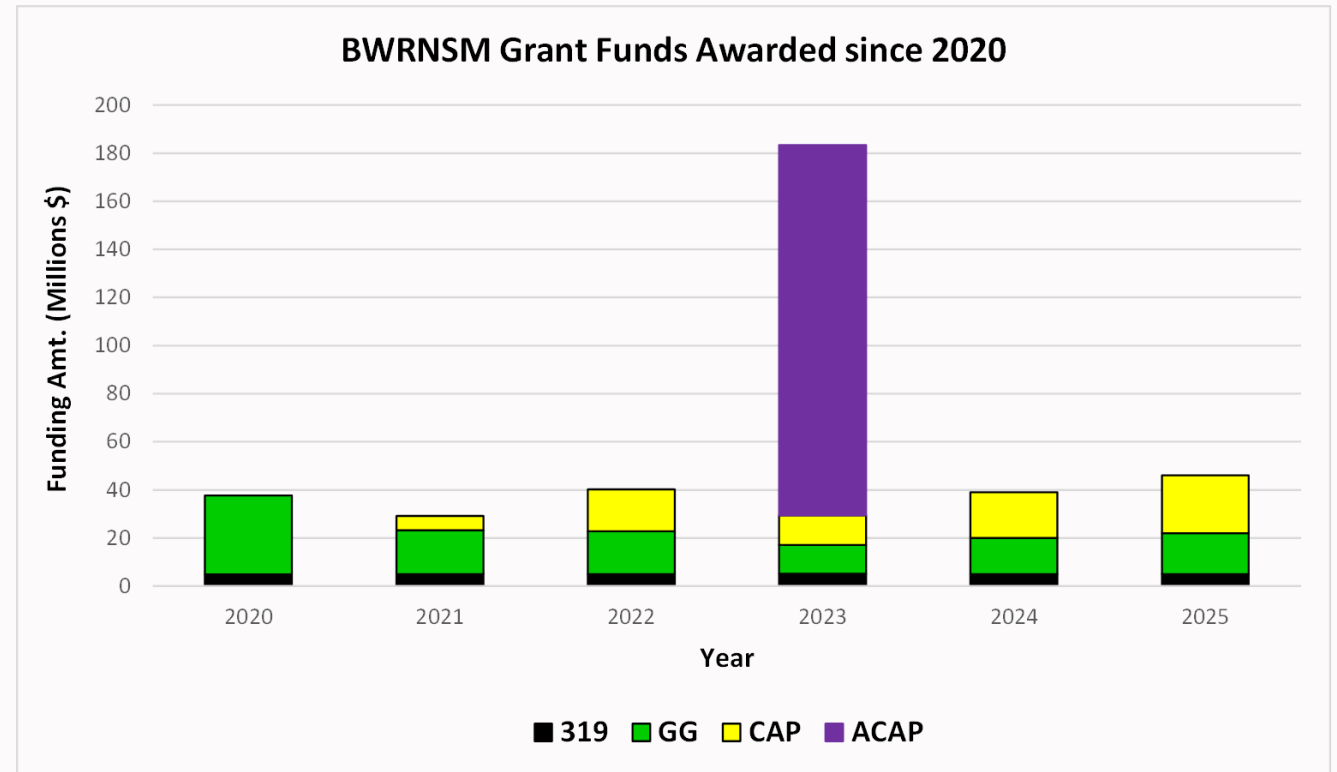
\$\$ for BMPs...

Between 2020 - 2025...

\$380 Million

**Awarded to work towards
preventing/reducing/mitigating NPS nutrient
and sediment pollution via BMP Design and/or
Implementation**

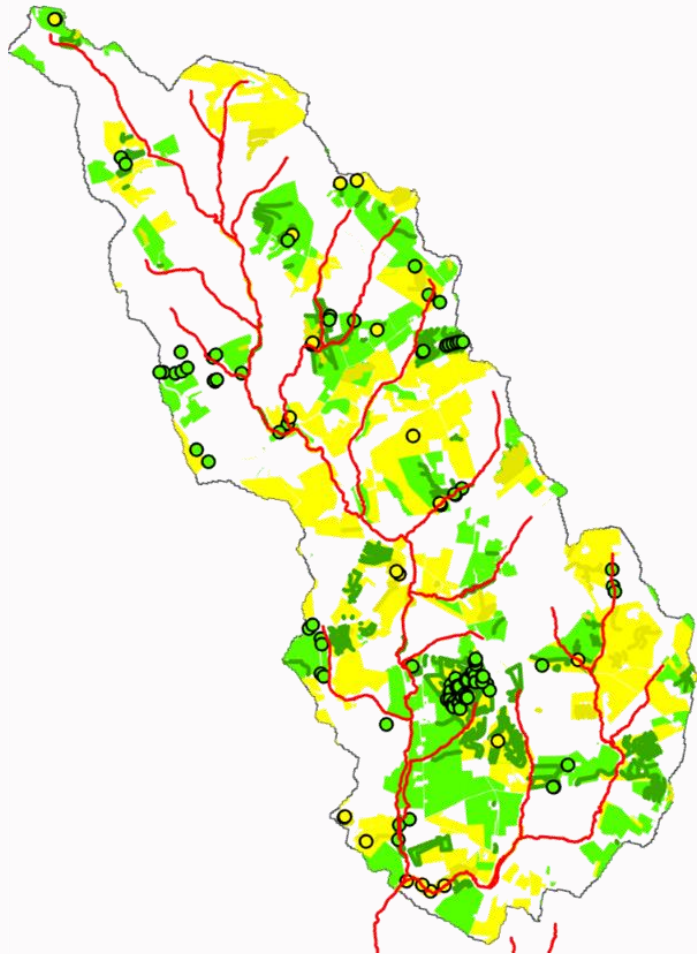
Proof that BMPs are working on an
“implementation-scale” is becoming critical.



Grant funds awarded between 2020 and 2025 through BWRNSM. Colors indicate the funding source (319 [EPA], Growing Greener (GG) [PA DEP], Countywide Action Plan (CAP) [PA DEP], Agriculture Conservation Assistance Program (ACAP) [SCC]).

Practice Keeper

- Geospatial database of BMP practices
- 2012 – Used by some CCDs for BMP entry
- 2016 – System purchased by DEP (program reporting/inspections)
- 2022/23 - CCDs across PA started to enter BMP data
- 2024 - All GG/319 grantees enter project/BMP data



2024 Assessment Status

— Impaired

BMP Implementation Status

— Implemented

— Planned

— Implemented

— Planned

● Implemented

● Planned



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BMP Efficiency Project



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Connecting Models to Data

Pollutants and Load Reductions:

	Pollutant	Estimated Load Reduction	Unit of Measure	Load Reduction Model	Load Reduction Date	TMDL? Yes or No
☐	Acidity					
☐	Metals (Aluminum)					
☐	Metals (Iron)					
☐	Metals (Manganese)					
☐	Nitrogen					
☒	Phosphorus	167.0	LBS/YR	Model My Watershed	06/30/2025	No
☒	Sedimentation-Siltation	223.4	TONS/YR	Model My Watershed	06/30/2025	No

BMP Efficiency Project

The Project / Study Questions

Started a “pilot” project to see if BMP efficacy can be assessed at the small watershed-scale

- As close as possible to the scale of implementation

Study Questions:

- Are BMPs removing the sediment and pollutant loads predicted by the model(s)?
- What affects the efficiency of BMPs?
- How do water quality improvements differ between different “systems” of BMPs?

Study Watersheds

Prioritizing two (2) watersheds for sampling 3x during the growing season

- **Conowingo Creek: 10 sites**
- Codorus Creek: 12 sites (mostly concentrated in the western portion of the watershed)

As time allows, other watersheds will be sampled once annually

- Quittapahilla Creek: 12 sites

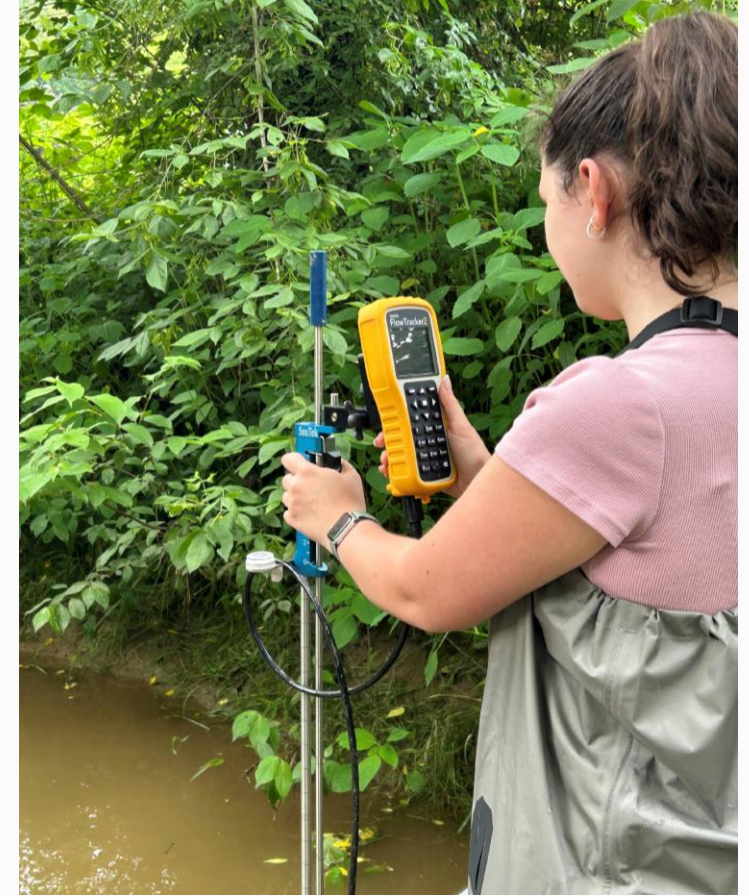
Data Collection

Growing Season

- 3x annually, May-October
- **Water chemistry**
 - Total Nitrogen
 - Total Phosphorus
- **Flow measurements**
- Riparian Vegetation*
- Field meter readings

Non-Growing Season

- Every other year, November-April
- Macroinvertebrates
- Habitat
- Field meter readings
 - Temperature (°C)
 - pH
 - Specific Conductance
 - Dissolved Oxygen





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Monitoring Sites

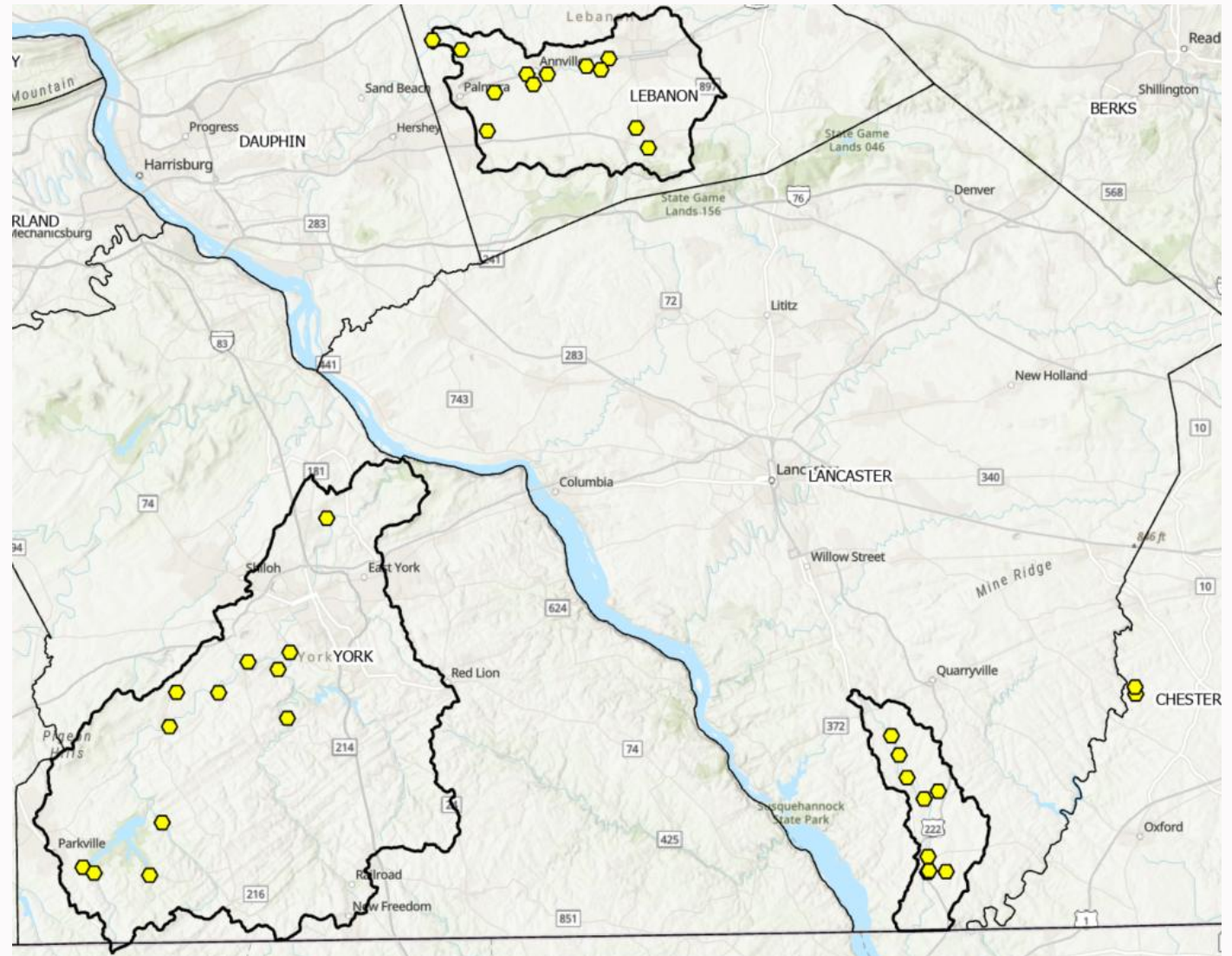
Conowingo Creek (Lancaster Co., PA)

Codorus Creek (York Co., PA)

Quittapahilla Creek (Lebanon Co., PA)

Knight Run - Walton Farm (Chester Co., PA)

Map depicting monitoring site locations (yellow hexagons),
and their associated watersheds (black outlines).





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Preliminary Data Conowingo Creek

Total N Yield

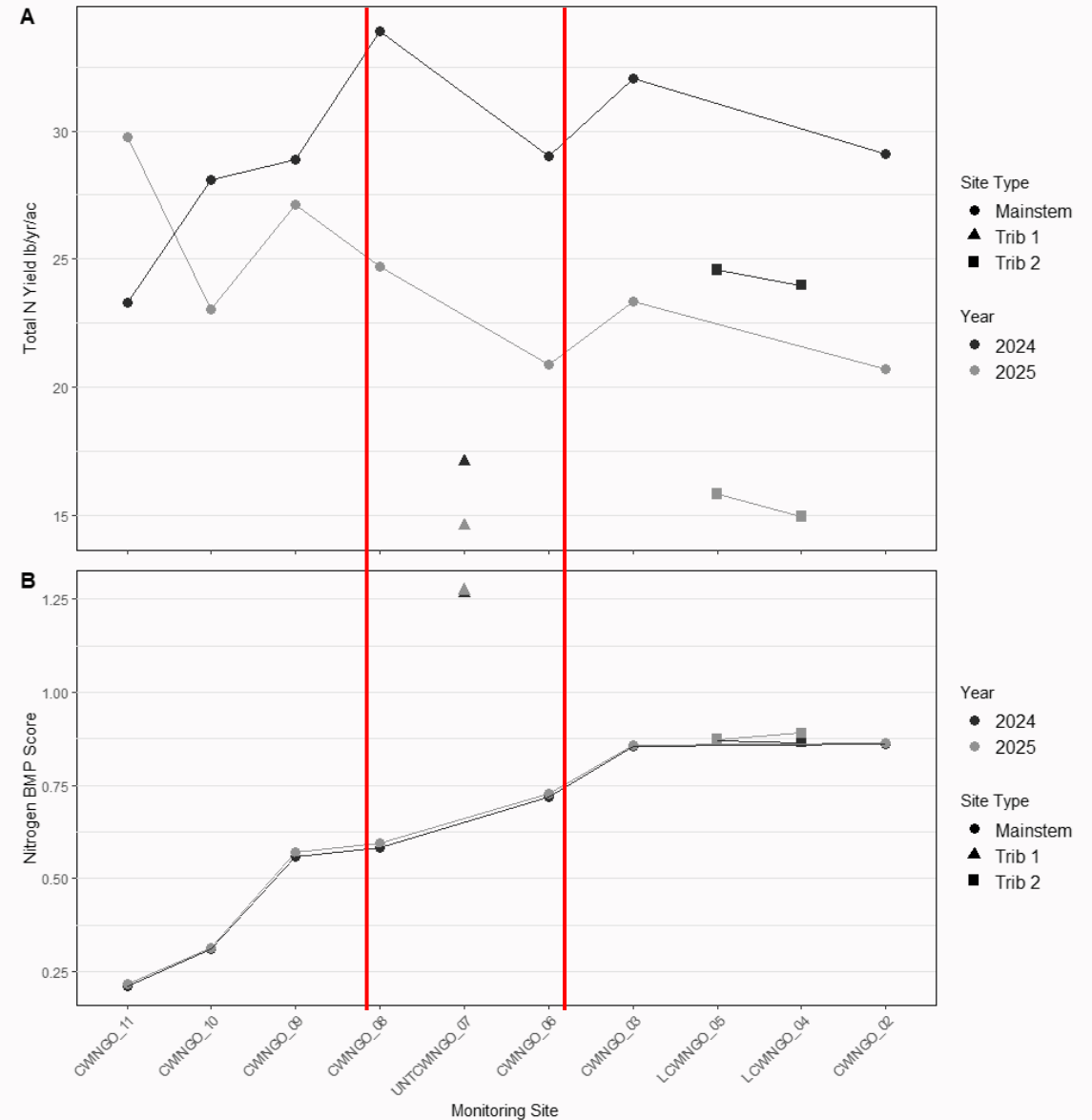
Upstream to Downstream Yield Changes

Looking at:

- Change in avg. yield (2024 n = 3; 2025 n = 2)
- Change in Nitrogen BMP Score
- Point-to-point – upstream to downstream

A. Average (Avg.) Total N yield (upstream to downstream) plotted for each monitoring site.

B. Nitrogen BMP Score for each monitoring site's associated watershed.





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Total N Yield

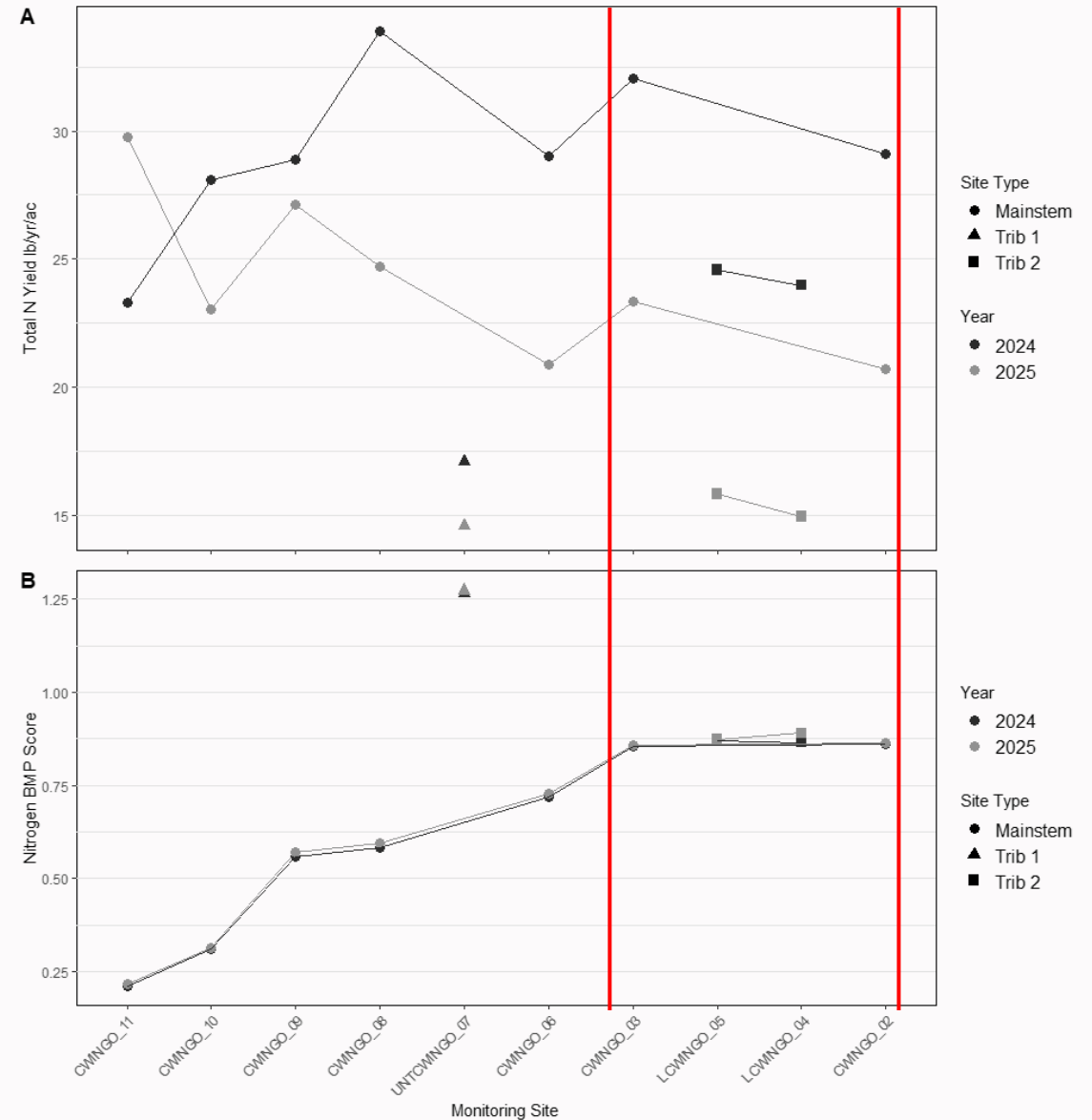
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BWRNSM Monitoring Program

Tier III Monitoring Mini-Grant Program



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Tier III Monitoring Mini-Grant Program

- Section 319 – New project category – Tier III Monitoring
- Tier III Monitoring Grants will be applied for and managed through larger entities (referred to as Sponsors) on behalf of smaller watershed groups.
 - e.g.: Conservation Districts, larger non-profit organizations, colleges/universities, etc.
- Sponsors will coordinate mini-grants for smaller watershed groups doing water quality monitoring.
 - 319 WIP, TMDL / ARP, other impaired watersheds statewide
- Mini-grant recipients will be required to become certified as DEP Tier III qualified collectors – generating Tier III data under this program.
 - Phase 1: Training/Certification of Collectors
 - Phase 2: Monitoring, Data Collection, Laboratory Analyses
- Max overall cap of \$100,000 for each region of the State (West, Central, East) - \$300,000 total.
 - Max cap for each mini-grant award is \$15,000
 - Consumable supplies and laboratory analysis costs
- Data collected can be used to reassess impaired waterways, and aid in development of the Integrated Report.

Early Feedback / Impressions

- 20 Conservation Districts expressed interest in applying to be a mini-grant recipient
- 3 organizations have expressed interest in being regional Sponsors (before “formal” unveiling of the program to a wider audience)
- Overwhelming positivity and expressions of support for this program have been expressed verbally / through email by watershed groups, Conservation Districts, and larger conservation organizations
- EPA is overwhelmingly supportive of this effort as well.



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BWRNSM Monitoring Program Collaboration and Partnerships

Bureau of Clean Water (BCW)

- Stay current and train alongside BCW water quality division staff to maintain consistency within the Department
- Data collected under our program can be utilized across DEP for various projects/water quality assessment efforts
 - Integrated Report
 - Water Quality Index Development
 - Water Quality Assessments
- Maintain open communication and active collaboration with Water Quality Division staff to keep them up to date on our Bureau's efforts and recent developments.



External Partnerships

- Involve Conservation District staff in monitoring activities whenever possible – fostering a collaborative environment and partnership
- Train Conservation District staff and/or volunteers with watershed groups on DEP data collection protocols
- Attend watershed group meetings whenever possible to provide monitoring effort updates and share data/information
- Provide guidance and expertise on water quality monitoring activities
- Provide resources/assistance regarding water quality data



Future of the BWRNSM Monitoring Program

BMP Efficiency Project – Continued Work

- **Continued data collection**
- In-depth BMP analyses
- Compare monitoring data to models

Expand Monitoring Efforts

- Tier III Monitoring Mini-Grant Program
- Build capacity to support BWRNSM monitoring staff in each region of the state

Make Data-Driven Decisions and Discoveries

- Track progress towards watershed restoration goals
- Utilize data collected to delist impaired waters from Section 303(d)
- Contribute information towards the Integrated Water Quality Report
- Build a robust dataset capable of investigating the efficiency of BMPs on the landscape, understanding what factors can affect how efficient they are
- Utilize data collected to optimize how grant funds are invested in BMP implementation



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Questions?





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Get In Touch

Melissa M. Harrison, PWS

**Bureau of Watershed Restoration and
Nonpoint Source Management**

melharriso@pa.gov

The Department of Environmental Protection's mission is to protect Pennsylvania's air, land and water resources and to provide for the health and safety of its residents and visitors, consistent with the rights and duties established under the Environmental Rights Amendment (Article 1, Section 27 of the Pennsylvania Constitution).