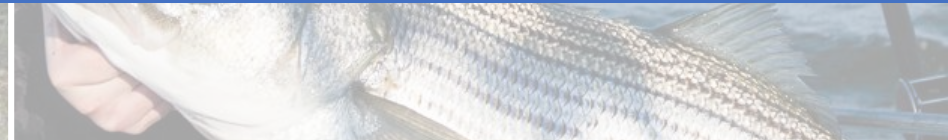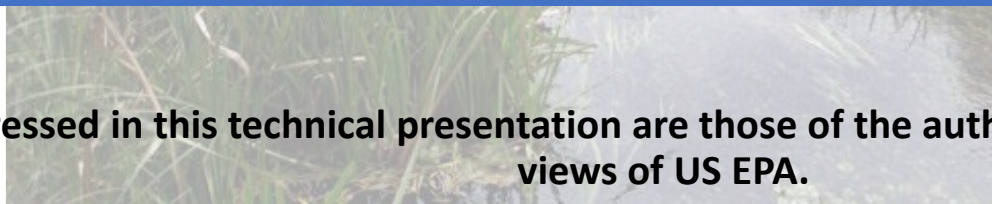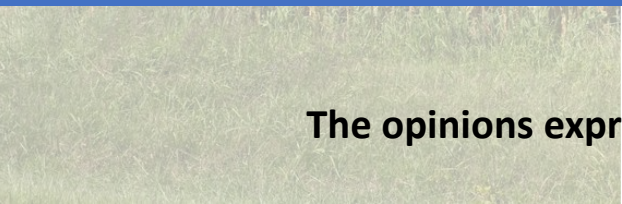# Putting it all together: integrating the monitoring and modeling to inform management

Emily Trentacoste, PhD
EPA Chesapeake Bay Program Office
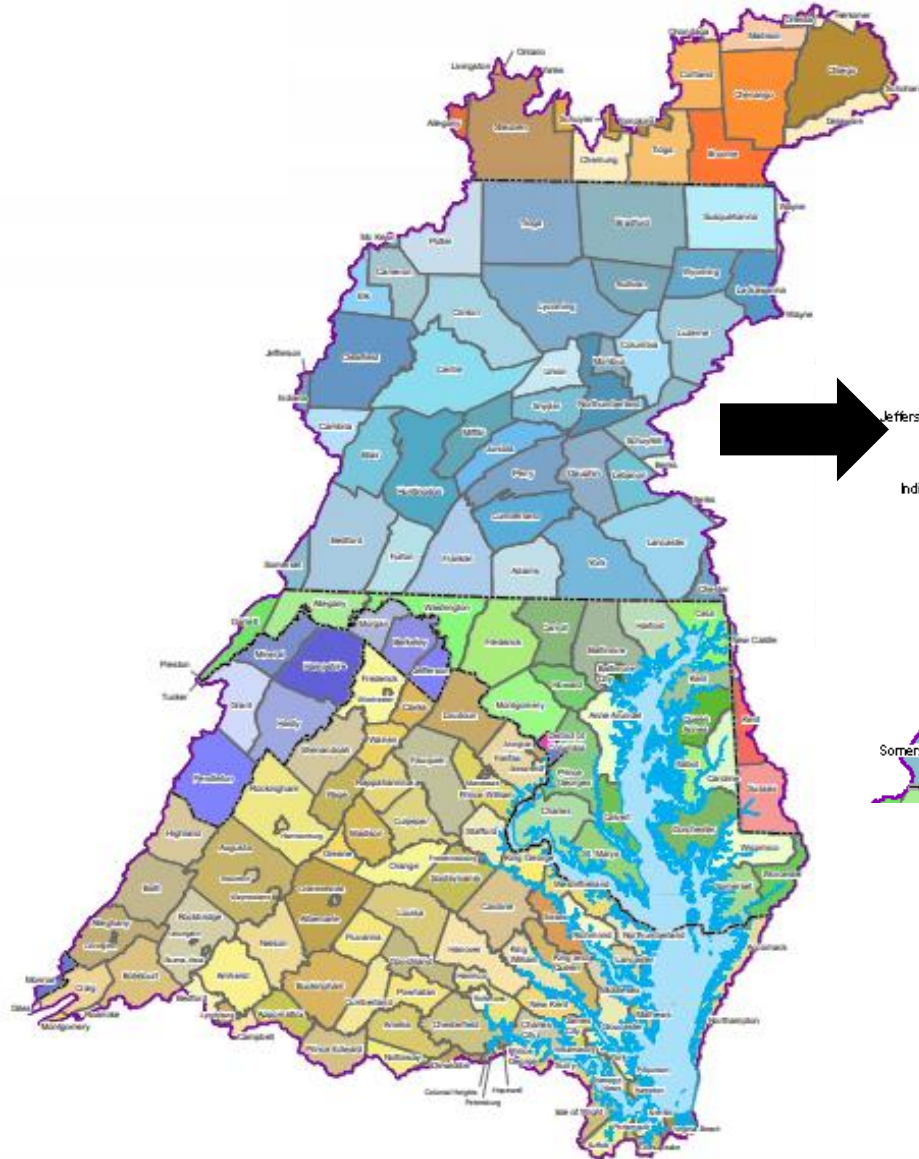Chesapeake Bay Commission
11/8/2018

The opinions expressed in this technical presentation are those of the author and do not necessarily reflect the views of US EPA.
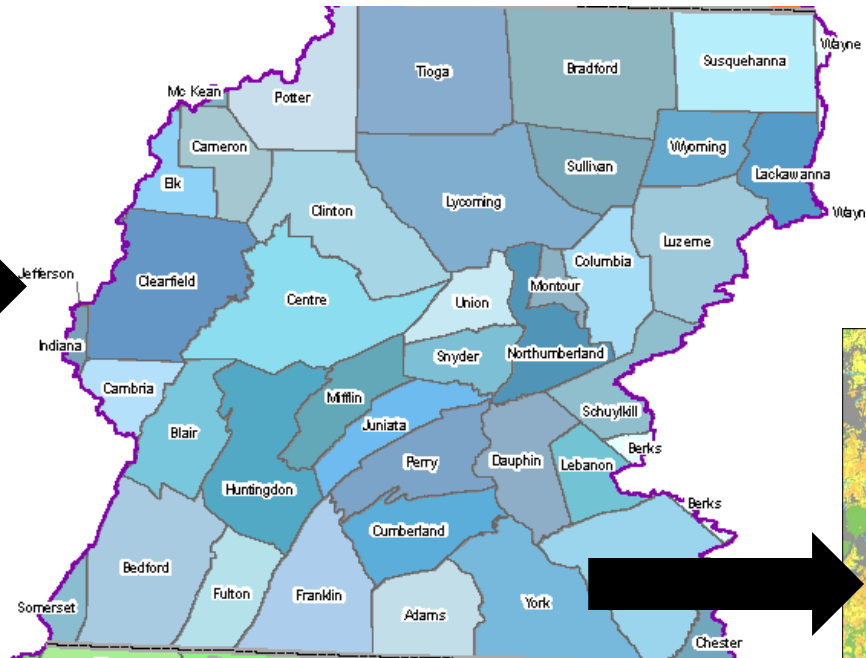
Developing storylines to demonstrate management connections

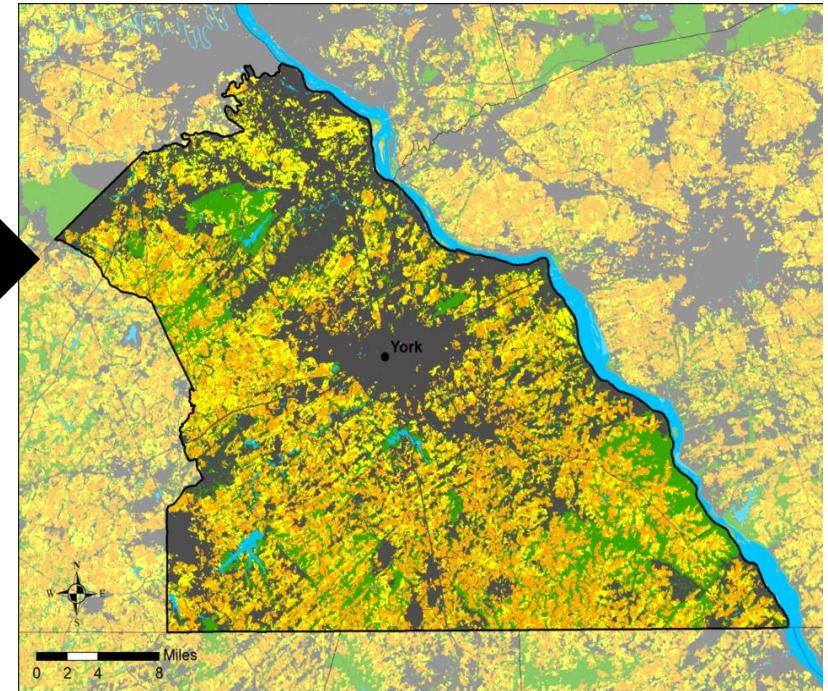**Chesapeake Bay Watershed Counties**

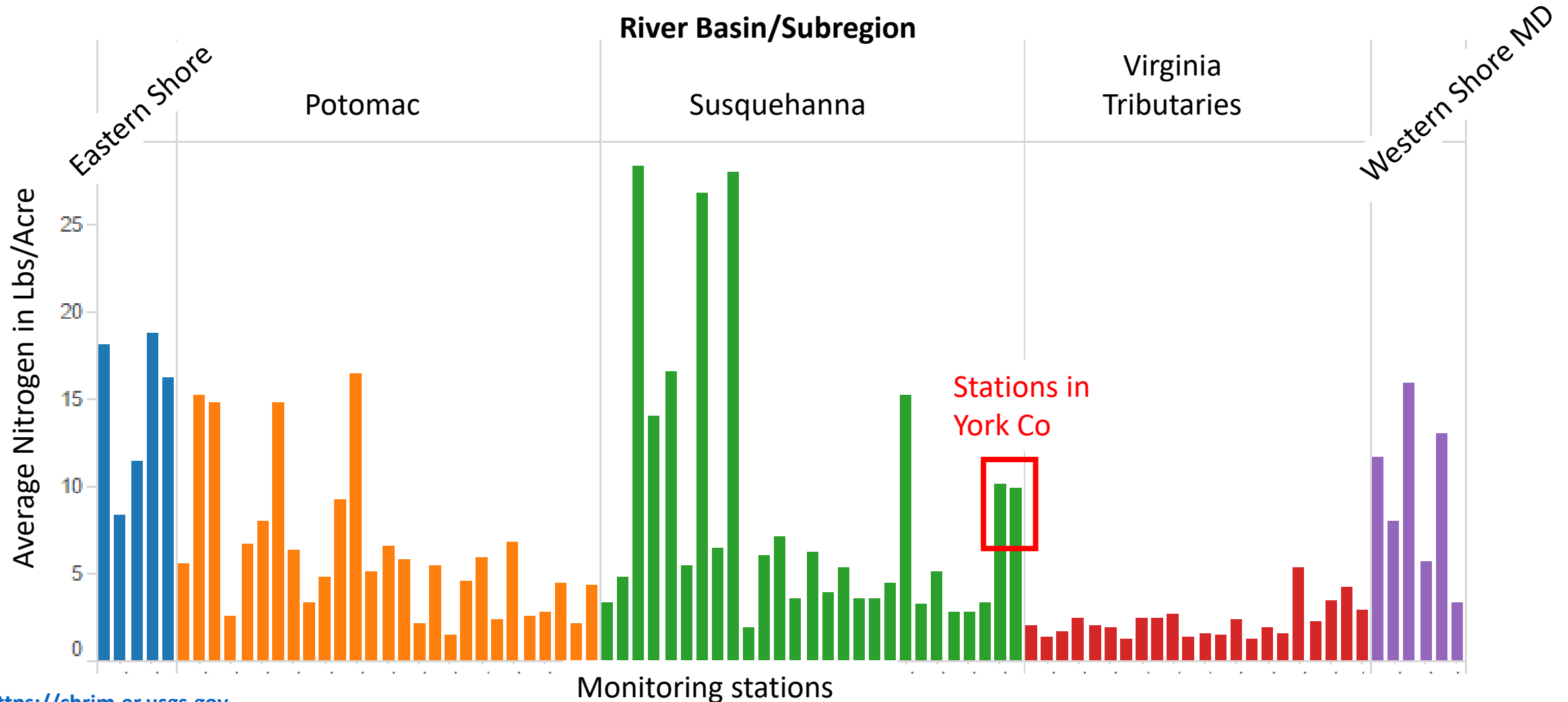**We'll use York County, PA as an example**

Pennsylvania Counties
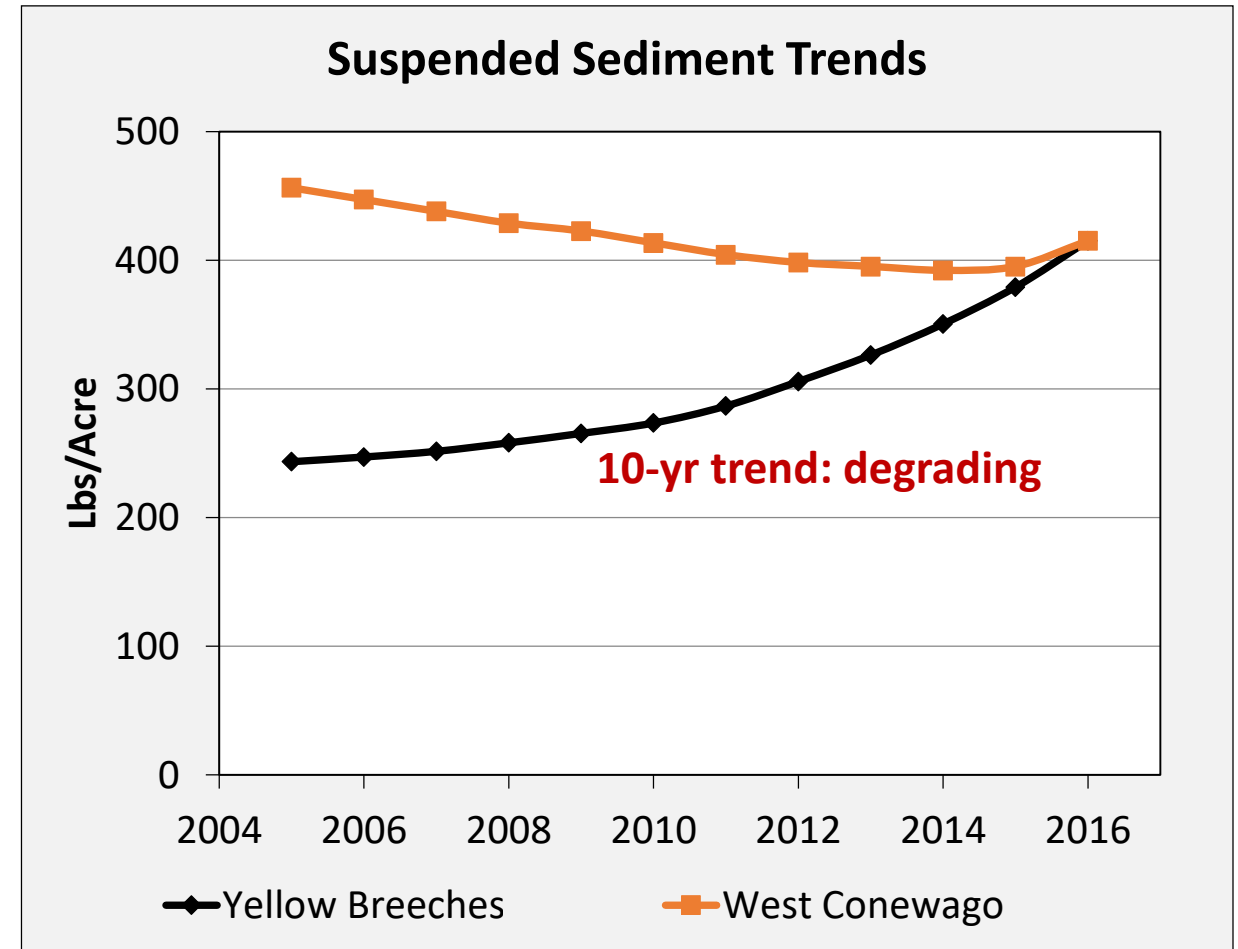
York County, PA
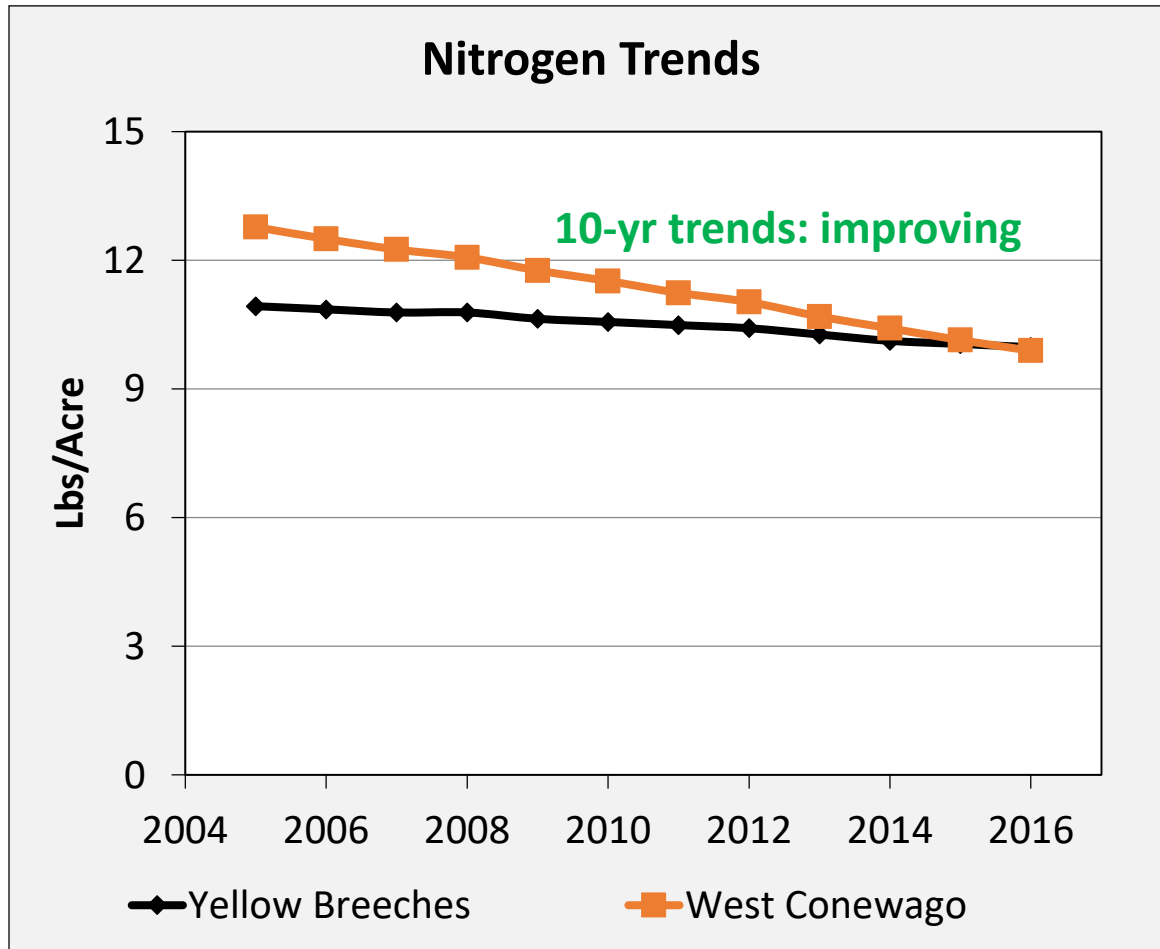
Using the monitoring to inform planning

Amount of nitrogen in streams across all monitoring stations in the Chesapeake Bay watershed

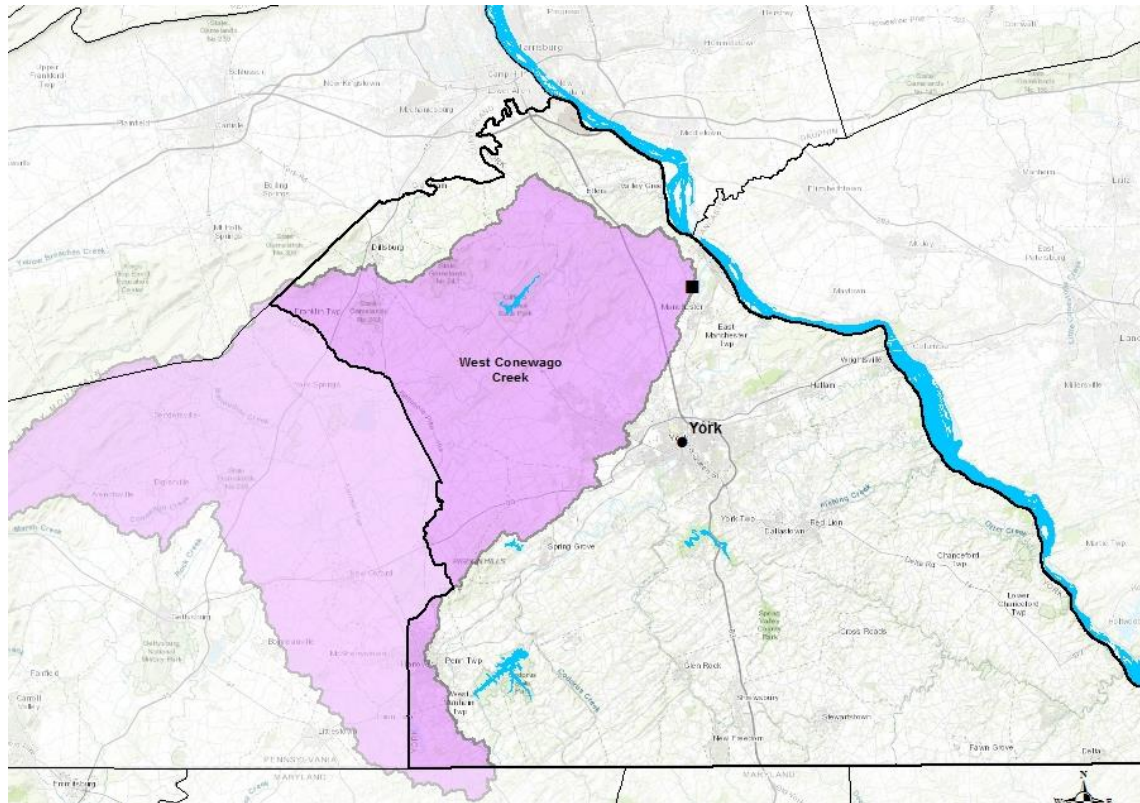# Using the monitoring to inform planning

Monitoring in York Co watersheds reveals that we are making progress in some areas, but require more effort in others
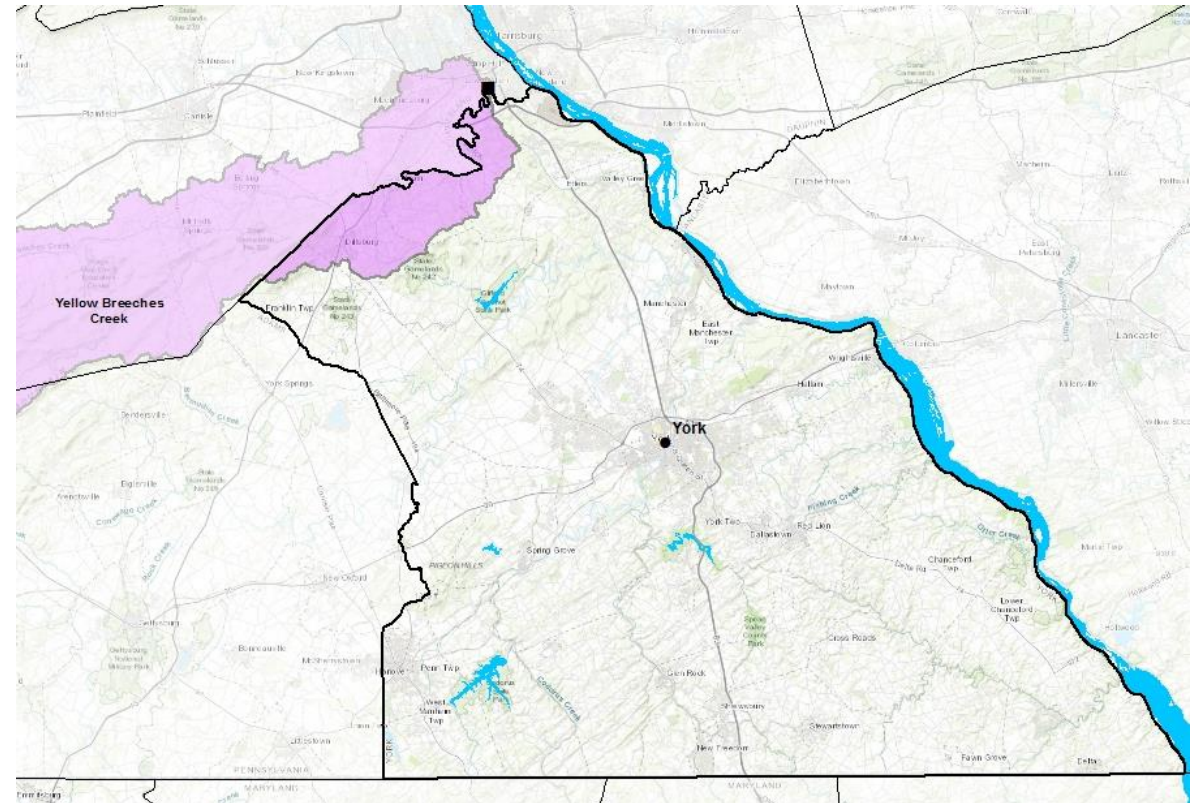
But we can't monitor everywhere

York County's monitoring stations cover less than half the county and overlap other counties
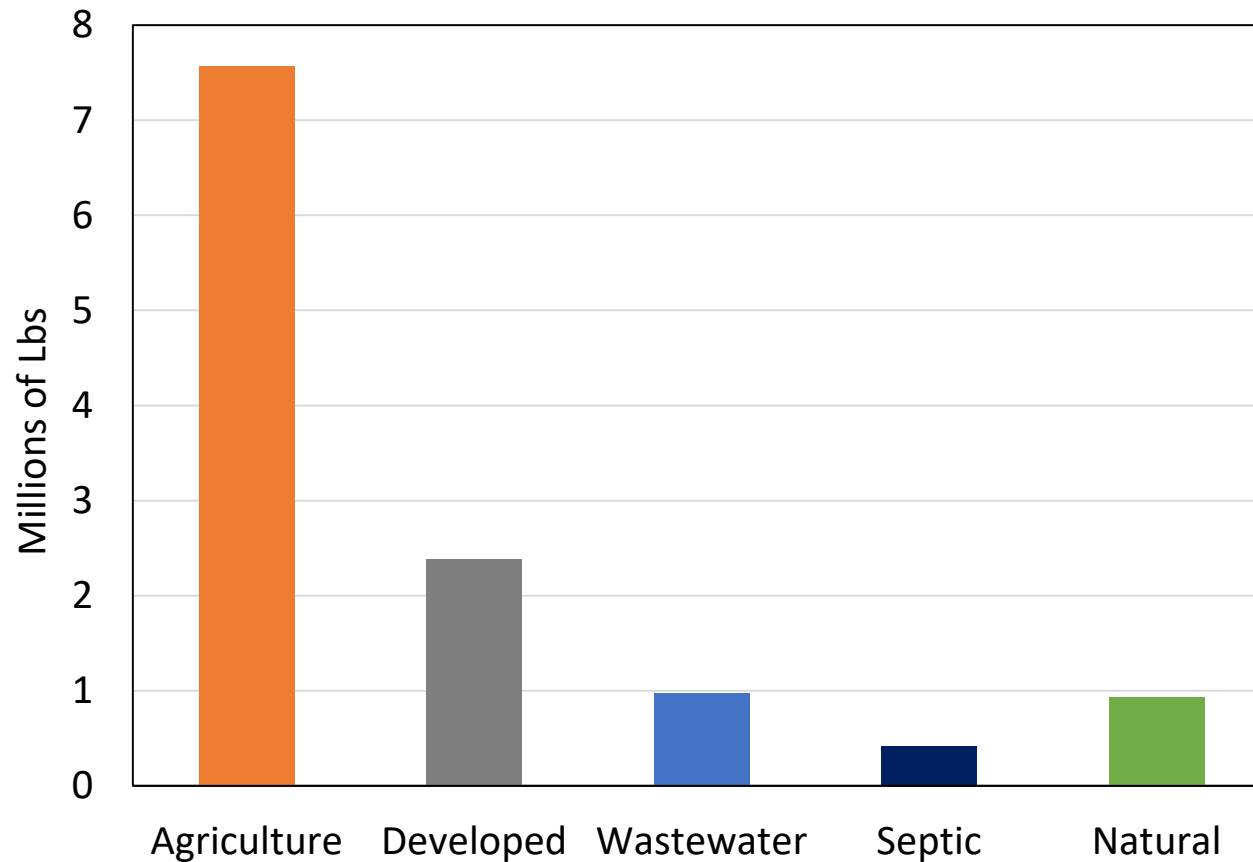
West Conewago Creek
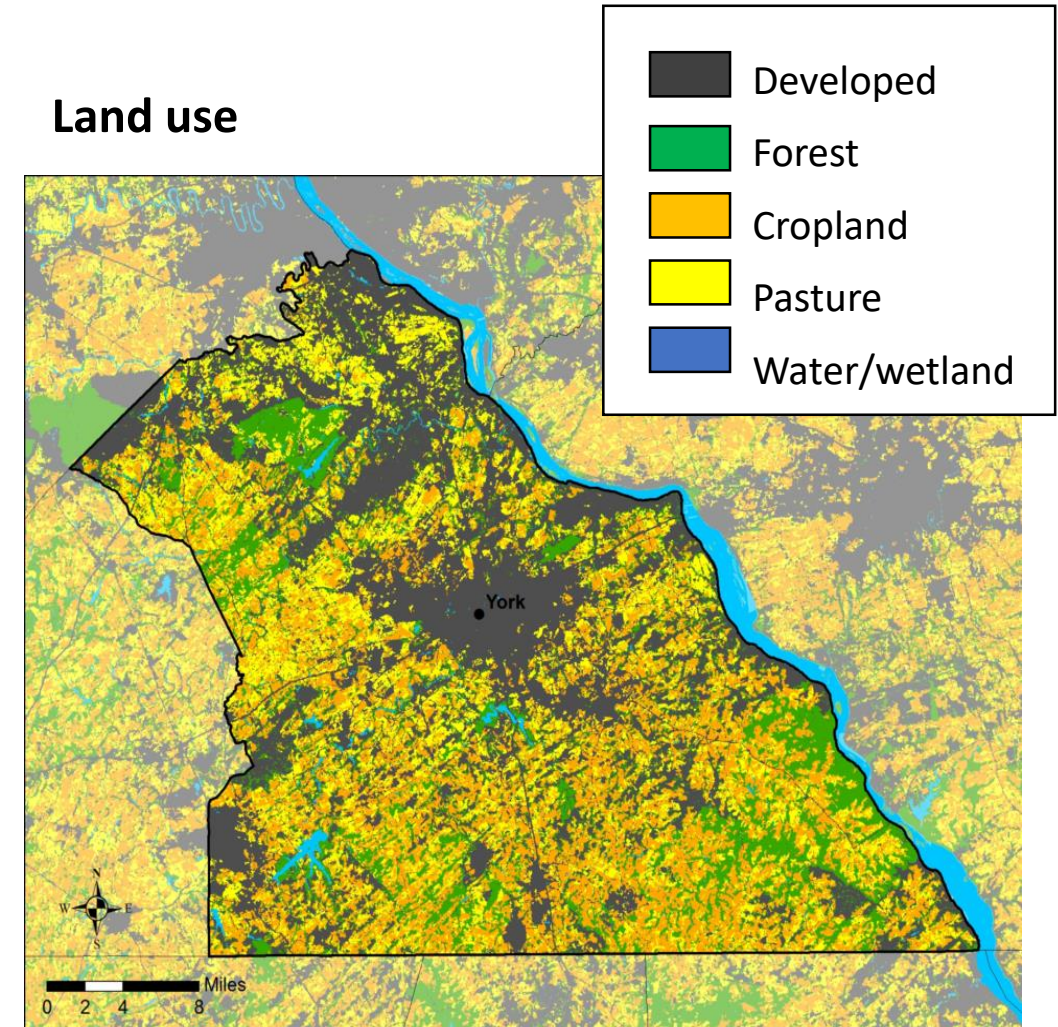
Yellow Breeches Creek

We can use the model to estimate sources

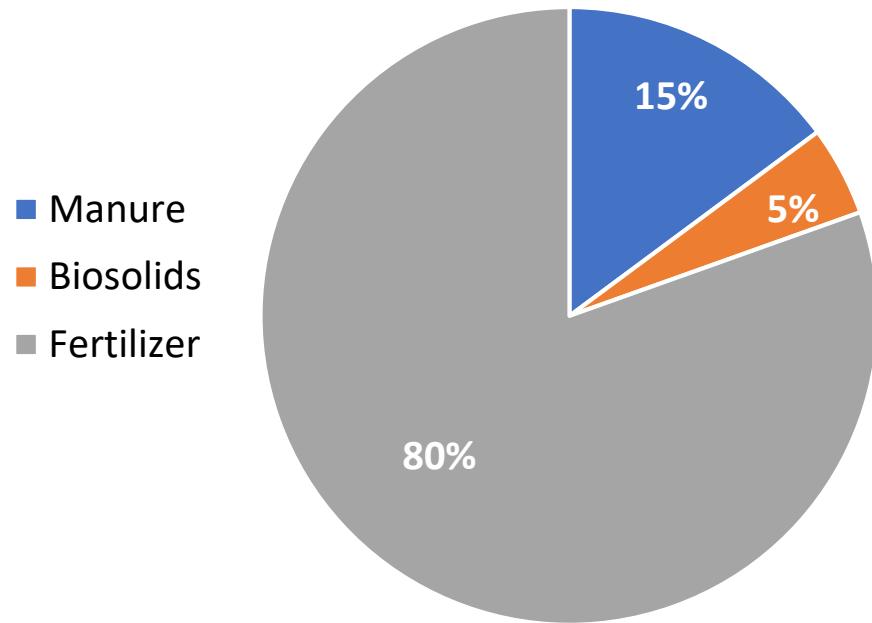York County Nitrogen Delivered to Local Streams (2017 Progress)

Land use

Legend: Developed, Forest, Cropland, Pasture, Water/wetland

Understanding sources helps identify opportunities

Example: Agricultural Nutrient Application

Example: Urban Stormwater Nutrient Sources

Estimated Source of Nitrogen Applied in York County

Estimated Stormwater Nitrogen Sources in York County

- ■ Manure
- ■ Biosolids
- ■ Fertilizer

15%
5%
80%

- ■ MS4 Impervious
- ■ MS4 Pervious
- ■ Non-MS4 Impervious
- ■ Non-MS4 Pervious
- ■ Construction

25%
32%
25%
17%
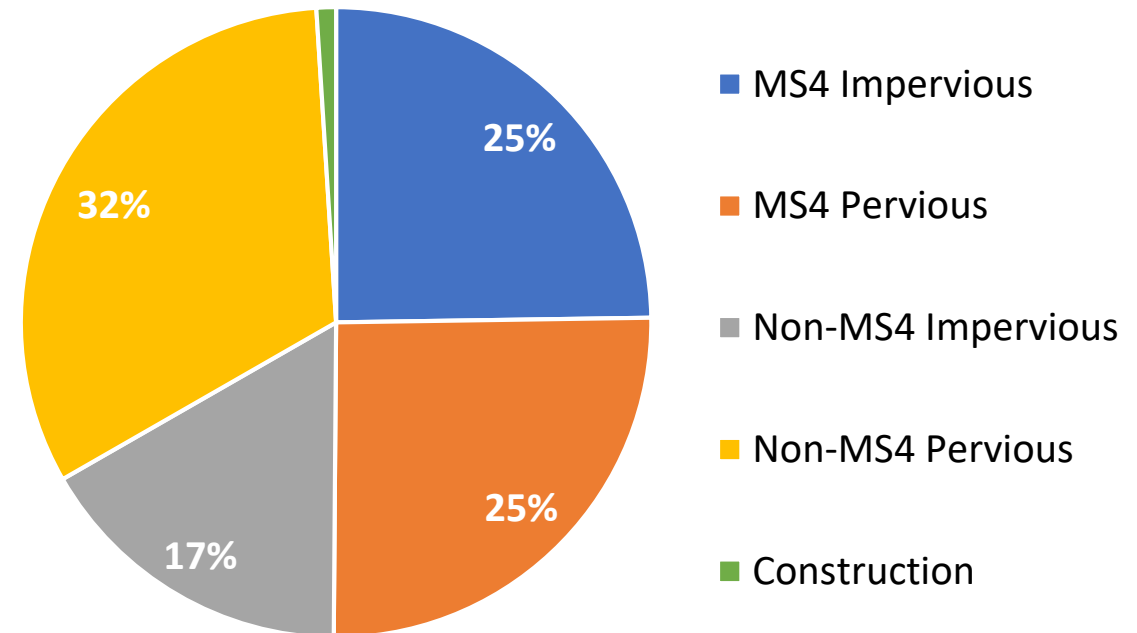
Pervious: grass, lawns, etc.
Impervious: roads, buildings, parking lots, etc.
MS4: Regulated stromwater under MS4 permits

Chesapeake Bay Program Phase 6 Watershed Model.
2017 Progress V9 http://cast.chesapeakebay.net

Identifying opportunities for restoration efforts

Remaining Opportunities in York County for Agricultural Practices

| Practice	Current Reported Implementation	Acres Remaining
Basic Nutrient Management	6%	185,000
Conservation Tillage	55%	67,000
Cover Crop	7%	136,000
Prescribed Grazing	6%	18,000
Barnyard Runoff Control	69%	70
Soil & Water Conservation Plans	10%	180,000
Forest Buffers	NA	13,200

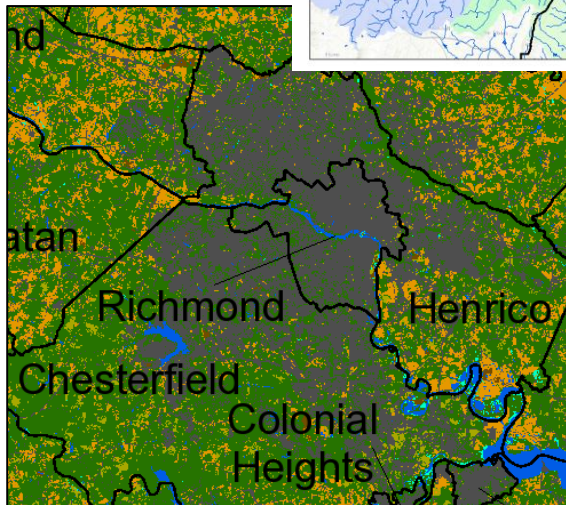# Utilizing storylines to demonstrate management connections

We've developed >20 integrated assessments/storylines at different scales across the entire watershed
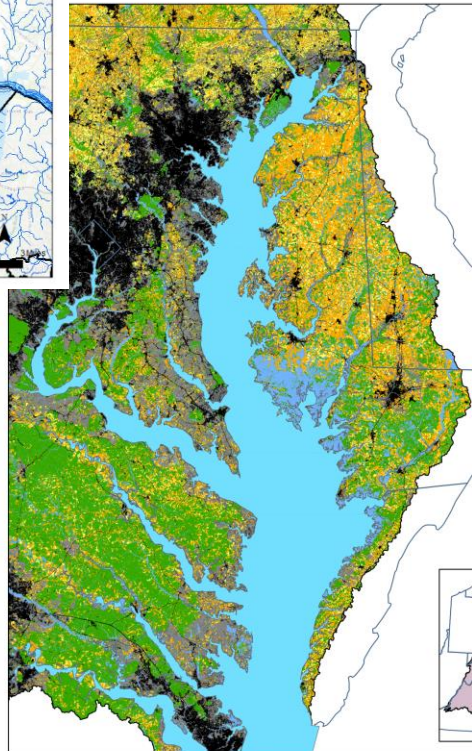
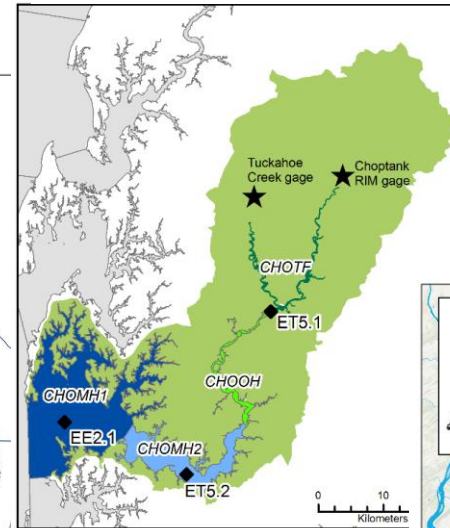**These are just a few examples:**
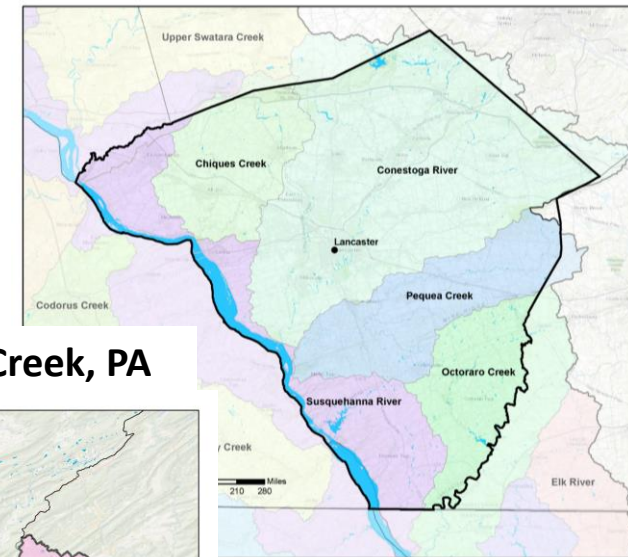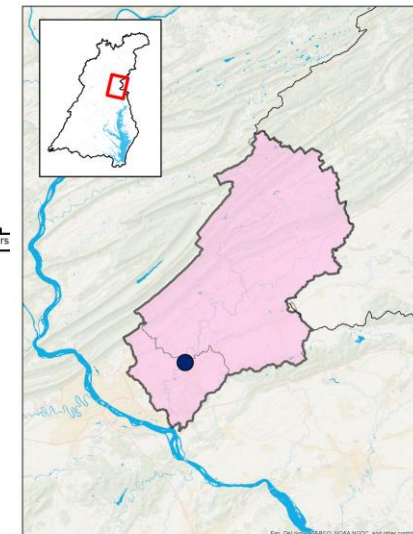

Loudoun County, VA
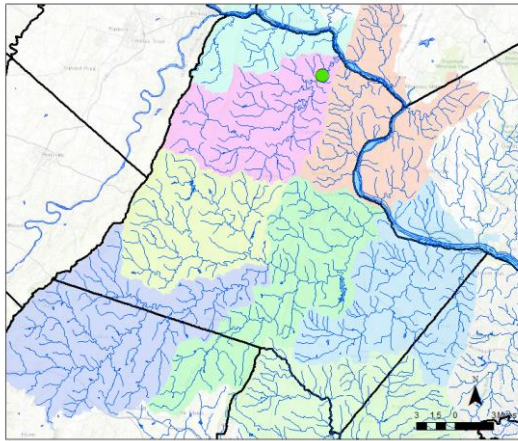
Richmond, VA

Eastern Shore

Choptank River in MD

Swatara Creek, PA

Lancaster County, PA

Incorporating monitoring and modeling into planning

- Pennsylvania – used storyline concept to develop county-specific "toolboxes" and provide information to local areas

- Watershed groups – created storylines that helped identify areas where they can be more active

- WIP Data Dashboard – developed online tools that consolidate information and allow users to develop their own stories

Source: PADEP
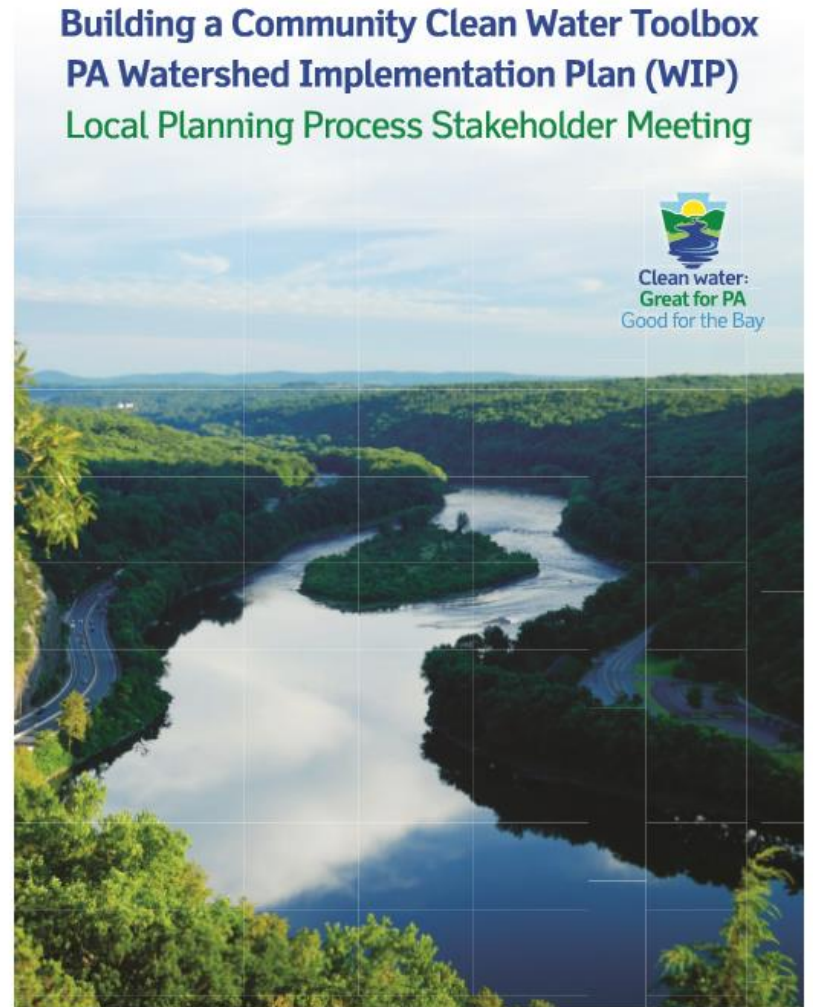
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