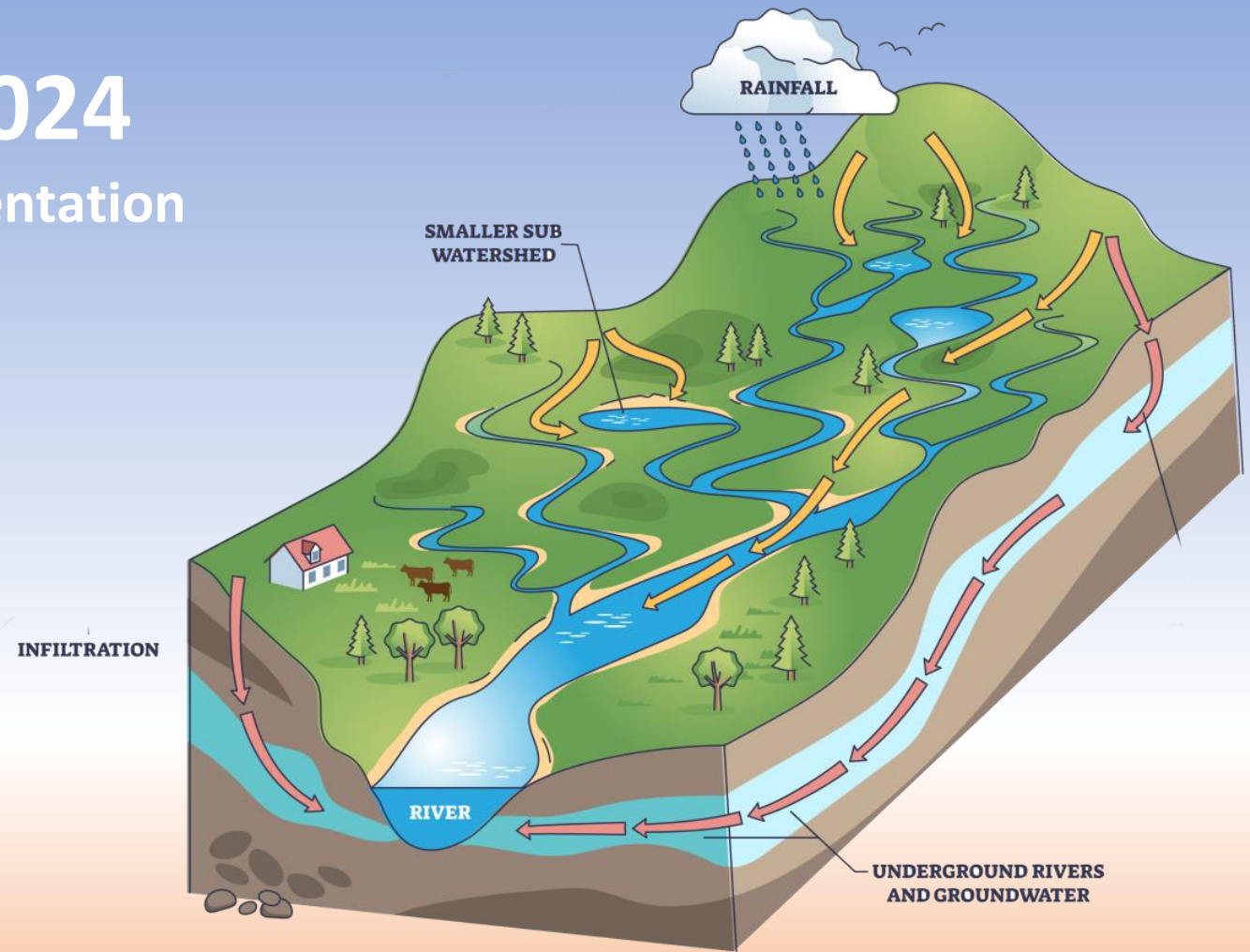


# Healthy Watersheds 2024

Biennial Strategy Review System Presentation  
June 13, 2024



**Jeff Lerner**, HWGIT Co-chair, U.S. Environmental Protection Agency  
**Peter Claggett**, HWGIT Coordinator, U.S. Geological Survey

# Healthy Watersheds 2024

## Presentation Outline

- HWGIT Goals and Strategies
- Accomplishments
- Status
- Challenges
- Alignment with other outcomes, goal teams, and workgroups
- Future Directions
- Management Board Support

# Healthy Watersheds Outcome Strategy

**Land Conservation  
(NGO's, States, Feds)**

**Protect**

**Land Use and Green  
Infrastructure Planning  
(Local Governments)**

**Prevent**

**NPDES, Stormwater,  
and 319 programs  
(State and Local  
Gov'ts)**

**Permit & Finance**

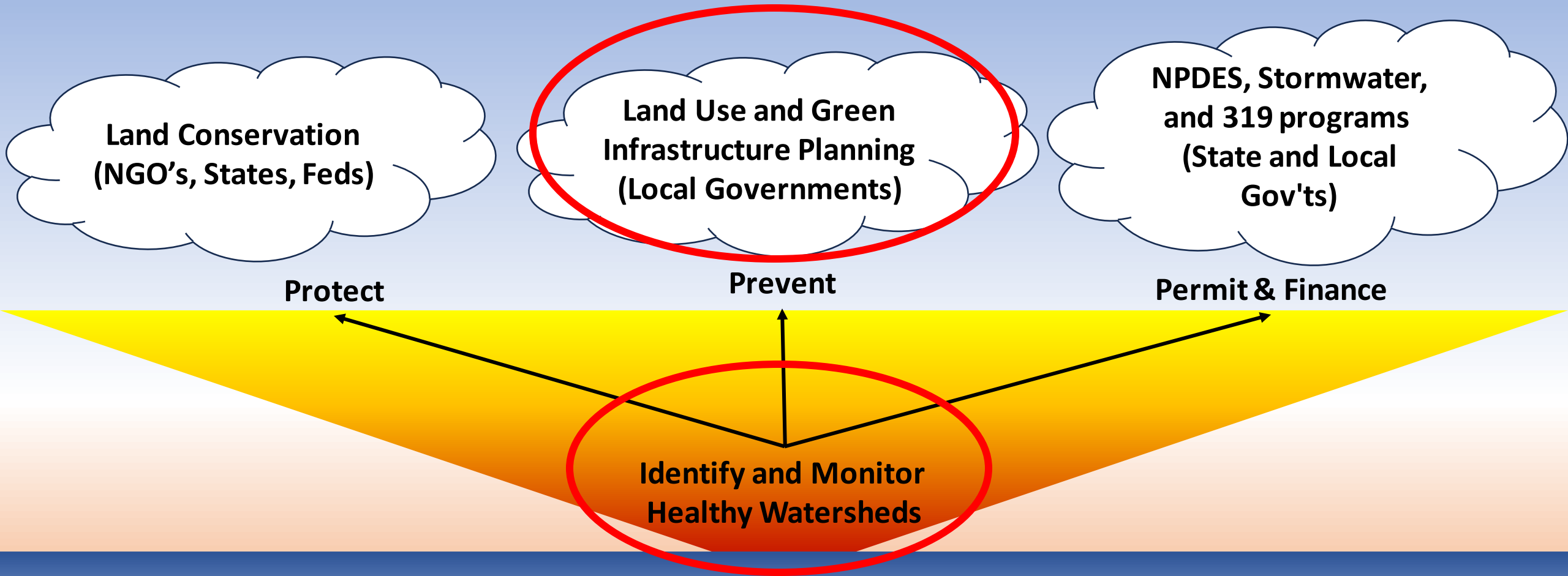
**Identify and Monitor  
Healthy Watersheds**

## Role of Healthy Watersheds GIT

**Outreach & Communication**

**Science & Data, Planning Support**

**Capacity Building**



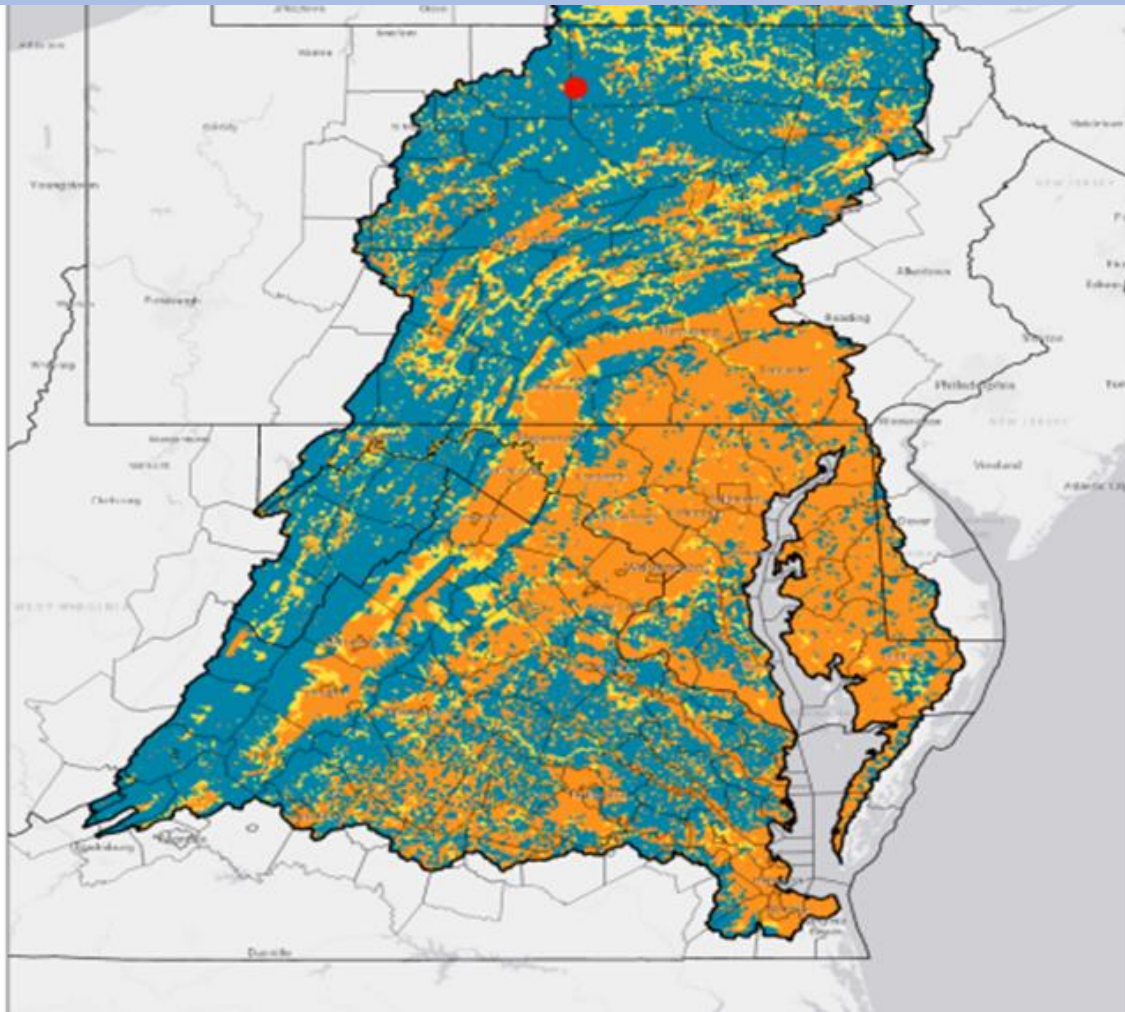
# **Direct Accomplishments: 2022-2024**

- 1. Maryland Healthy Watersheds Assessment**
- 2. Chesapeake Healthy Watersheds Assessment 2.0**
- 3. Healthy Watersheds Indicator, draft (impervious and protected lands in state-identified healthy watersheds)**

# Chesapeake Healthy Watersheds Assessment (CHWA) 2.0

## CHWA

- Stream Health
- Landscape Integrity



### Watershed Health Metrics

#### Landscape Condition

% Tree Cover in Riparian 2017/18 Catchment	99.96%
% Tree Cover in Riparian 2017/18 Watershed	99.96%
Housing Unit Density 2020 Catchment (units/km <sup>2</sup> )	0
Housing Unit Density 2020 Watershed (units/km <sup>2</sup> )	0
Population Density 2020 Catchment (people/km <sup>2</sup> )	<0.01
Population Density 2020 Watershed (people/km <sup>2</sup> )	0
% Extractive 2017/18 Catchment	0.00%
% Extractive 2017/18 Watershed	0.00%
% Forested Extent Loss to Development 2001-2013 Catchment	0.00%
% Forested Extent Loss to Development 2001-2013 Watershed	0.10%
% Impervious Cover 2017/18 Catchment	0.10%
% Impervious Cover 2017/18 Watershed	0.10%
% Natural Land in Riparian 2017/18 Catchment	100.00%
% Natural Land in Riparian 2017/18 Watershed	100.00%
% Protected Lands Catchment	100.00%
% Protected Lands Watershed	100.00%
% Agriculture 2017/18 Catchment	0.00%
% Agriculture 2017/18 Watershed	0.00%

#### Habitat

Nature's Network Connectivity Catchment	99.00%
Fish Habitat Condition Index (Catchment)	5
Fish Habitat Condition Index Cumulative (Watershed)	4
% Tree Cover with Unmanaged Understory 2017/18 Catchment	92.90%
% Tree Cover with Unmanaged Understory 2017/18 Watershed	92.90%

#### Hydrology

% Tree Canopy with Managed Understory 2017/18 Catchment	0.00%
% Tree Canopy with Managed Understory 2017/18 Watershed	0.00%
% Non-forested Wetlands 2017/18 Catchment	0.00%
% Non-forested Wetlands 2017/18 Watershed	0.00%
Road Stream Crossing Density Catchment (crossings/km <sup>2</sup> )	0
Road Stream Crossing Density Watershed (crossings/km <sup>2</sup> )	0
Flow Alteration	0

#### Geomorphology

Streambed Fine Sediment and Sand Cover Catchment	3.10
Streambed Particle Size D50 Catchment	35
Streambank Sediment Flux Catchment (kg and m <sup>3</sup> per ft)	<0.01
Streambank Lateral Erosion Catchment	<0.01
Streambank Fine Sediment Flux Catchment (kg/footed m <sup>3</sup> per ft)	<0.01
Streambank Erosional Change Catchment	<0.01
Road Density Riparian Catchment (miles/km <sup>2</sup> )	<0.01
Road Density Watershed (miles/km <sup>2</sup> )	<0.01
Road Density Riparian Watershed (miles/km <sup>2</sup> )	<0.01

#### Water Quality

% Impaired Stream Catchment	0.00%
Incremental suspended sediment load from streambank erosion (lb/acre/yr)	29.98
Incremental total nitrogen load from manure applications (kg/yr)	0
Incremental total nitrogen load from fertilizer applications (kg/yr)	0.54
Incremental total nitrogen load from septic system effluent (kg/yr)	8.81
Incremental total nitrogen load from wastewater treatment facility point sources (kg/yr)	0
Incremental total phosphorus load from manure applications (kg/yr)	0

### Watershed Vulnerability Metrics

#### Land Use Change

Housing Unit Density Change Catchment	0
Housing Unit Density Change Watershed	0
% Non-forested Wetland Conversion to Development 2013-18 Catchment	0.00%
% Non-forested Wetland Conversion to Development 2013-18 Watershed	0.00%
% Forest Harvesting 2013-18 Catchment	0.00%
% Forest Harvesting 2013-18 Watershed	0.00%
% Change in Impervious Cover 2013-18 Catchment	0.00%
% Change in Impervious Cover 2013-18 Watershed	0.03%
% Change in Forested Extent 2013-18 Catchment	0.03%
% Change in Forested Extent 2013-18 Watershed	0.03%
% Impervious Projected to 2055 Catchment	0.00%

#### Wildfire

% Wildland Urban Interface Catchment	0.00%
% Wildland Urban Interface Watershed	0.00%

#### Climate Change

Probability of Brook Trout (current)	100
Probability of Brook Trout (2-degree Celsius increase)	100
Probability of Brook Trout (4-degree Celsius increase)	99
Probability of Brook Trout (6-degree Celsius increase)	97
Climate Stress Catchment	95
% Resilient Lands Catchment	91.00%

#### Water Use

Domestic Water Use	2.42
Industrial Water Use	1.69
Agriculture Water Use	0.05

<https://gis.chesapeakebay.net/chwa/>

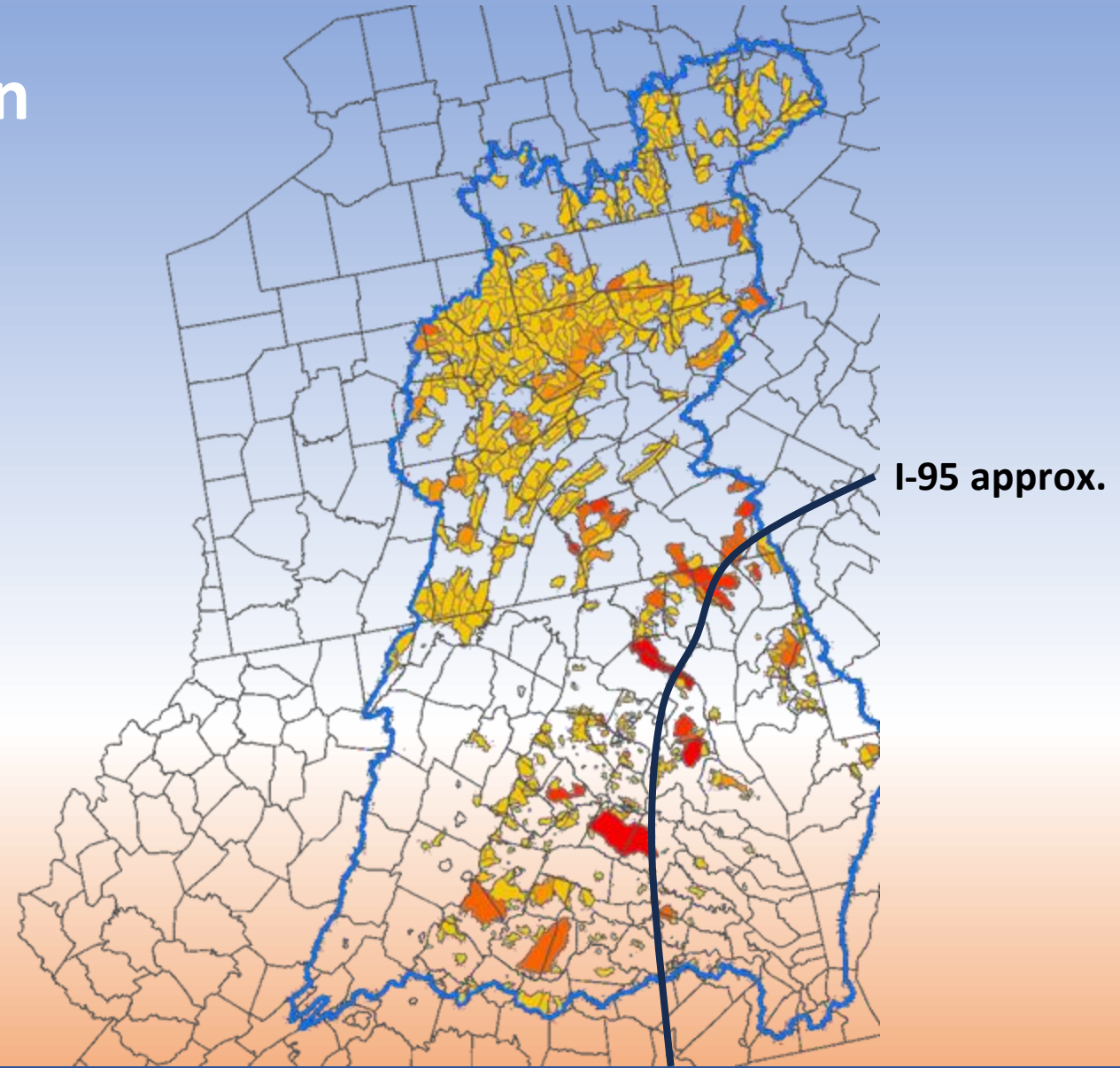
# Indirect Accomplishments: 2022-2024

1. Land Use Methods and Metrics Indicators: Impervious Cover Change, Riparian Forest Change (LUWG)
2. High-resolution Land Use/Land Cover Data for years: 2013/14, 2017/18, 2021/22 due September 2024 (LUWG)
3. Hyper-resolution Hydrography Data due September 2024 (LUWG)
4. Initiation of “Community Response to Land Use Change” GIT-funded project (LUWG)
5. County Tree Canopy Fact Sheets (FWG/USGS/CIC)
6. State of Chesapeake Forests 2.0 (FWG/USGS/CIC)
7. Riparian Forest Indicators (FWG/USGS/CIC)
8. Local government workshops (LLWG)
9. Mid-Atlantic Planning Collaboration Webinar (LUWG)
  - ~ 150 planners attended, AICP credit,



# Land Use/Land Cover Change in Healthy Watersheds 2013/14 – 2017/18

- Healthy watersheds along the I-95 corridor tend to have higher amounts of development.



# Land Use Change & Land Protection in State-Identified Healthy Watersheds

- Over 20,000 acres of new development occurred within State-Identified Healthy Watersheds (SIHWs).
- Most development occurred on forest and open space lands, compared to agriculture.
- The rate of development (by area) was only slightly less in healthy watersheds compared to the rest of the Chesapeake region.
- A greater percentage of lands within healthy watersheds are protected compared to all other lands.
- But- we are not confident knowing when protection took place.



# Status

**Maintaining stream health???**

**Protecting and preventing stream health degradation???**

**Building local capacity to protect healthy watersheds???**

**Why status is uncertain? Lack of monitoring and reporting.**

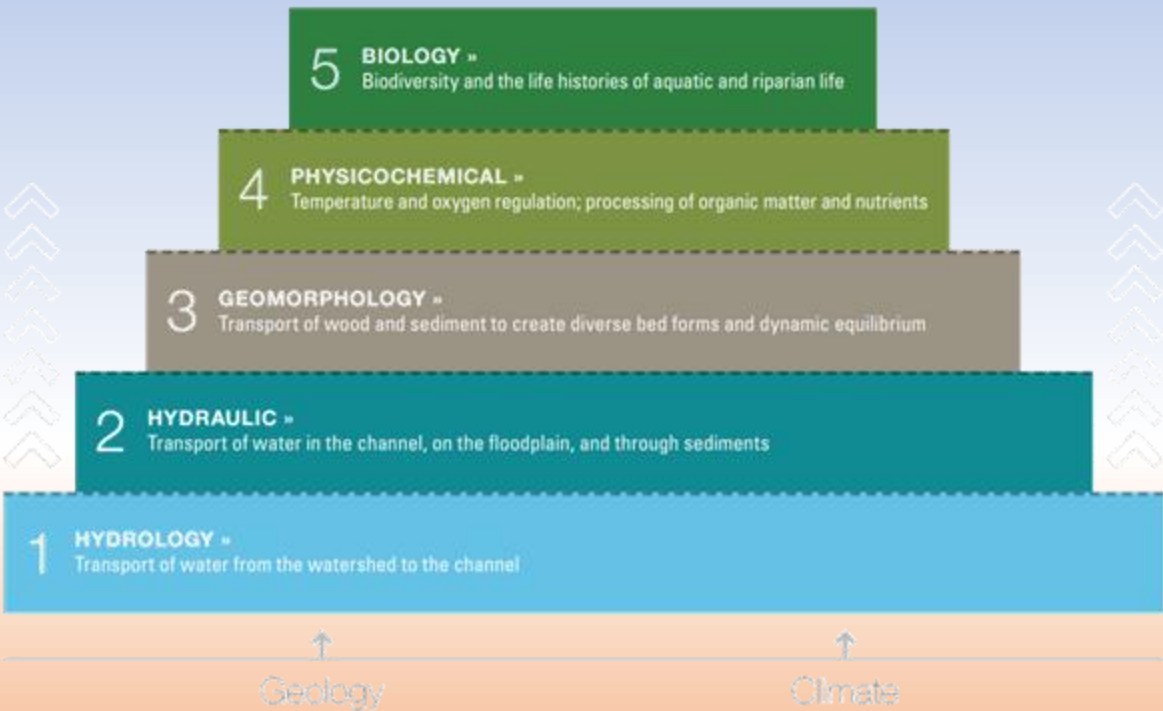
- Stream health (e.g., Fish IBI, Benthic IBI, Conductivity, Temperature, Nutrients, Metals)
- New development permits
- Land protection
- Land use planning policies
- Local awareness of healthy streams and landscapes

# Challenges

1. Regulatory programs are insufficient to maintain watershed health given their limited scope and expected changes in land use and climate.
2. States define watershed health differently and have different levels of regulatory engagement that inhibit a consistent and comparable approach for characterizing and monitoring watershed health.
3. No accountability for the healthy watersheds outcome because stream health and land protection efforts in state-identified healthy watersheds are not monitored.
4. The work needed to monitor and maintain watershed health overlaps with other workgroups, goal teams, and outcomes.

# Science informing stream and watershed health

## Stream Functional Pyramid

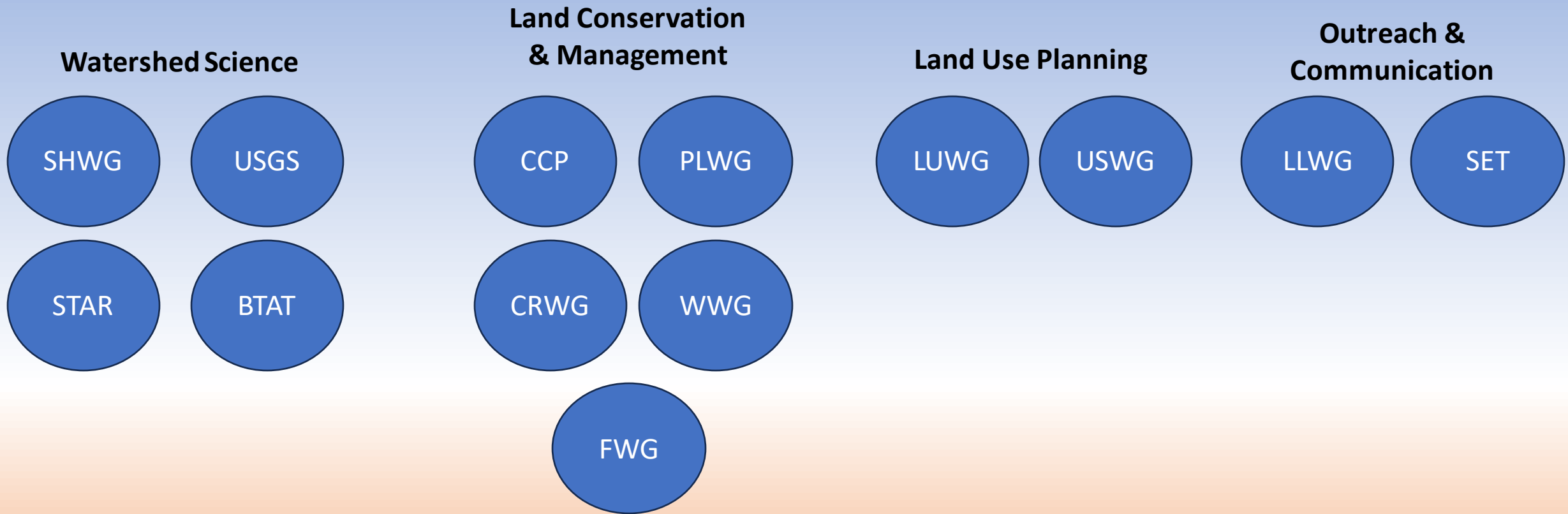


StreamMechanics

## Watershed-Stream Functional Pyramid



# Alignment: Maintaining Watershed Health Takes a Village



BTAT: Brook Trout Action Team  
CCP: Chesapeake Conservation Partnership  
CRWG: Climate Resiliency Workgroup  
FWG: Forestry Workgroup  
LLWG: Local Leadership Workgroup  
LUWG: Land Use Workgroup

PLWG: Protected Lands Workgroup  
SET: Strategic Engagement Team  
SHWG: Stream Health Workgroup  
STAR: Scientific, Technical, and Reporting team  
USGS: U.S. Geological Survey  
USWG: Urban Stormwater Workgroup  
WWG: Wetlands Workgroup

# Future Directions (Beyond 2025)

## 1. Data, Tools and Monitoring:

- Provide consistent and integrated watershed-wide characterization and monitoring of stream and watershed health and land conservation efforts.
- Provide science, data, and tools to enable targeting and prioritization of land conservation and stream restoration actions at multiple scales.

## 2. Planning:

- Provide science, data, models, and tools to enable green infrastructure planning (e.g., forests, farms, and open space) to protect watershed health at multiple scales.

## 3. Local Engagement and Capacity:

- Create and support a network of networks enabling two-way communication with local and NGO implementers to share needs, information, and data and to improve the functionality and utility of tools.

## 4. Watershed Actions:

- Integrate land conservation, management, and stewardship more explicitly into the goals of the Bay Program
- Expand public access to waters and natural lands through the creation, stewardship and improvement of more parks and trail networks.

## 5. Measure Watershed Outcomes:

- Quantify ecosystem services and integrate them into restoration and conservation decision processes.

# **Management Board Ask #1**

## **Improve the alignment of outcomes**

**The intent of the Stream Health Outcome is to improve the ecological integrity of streams. The intent of the Healthy Watersheds Outcome is to sustain those improvements and maintain the condition of currently healthy streams.**

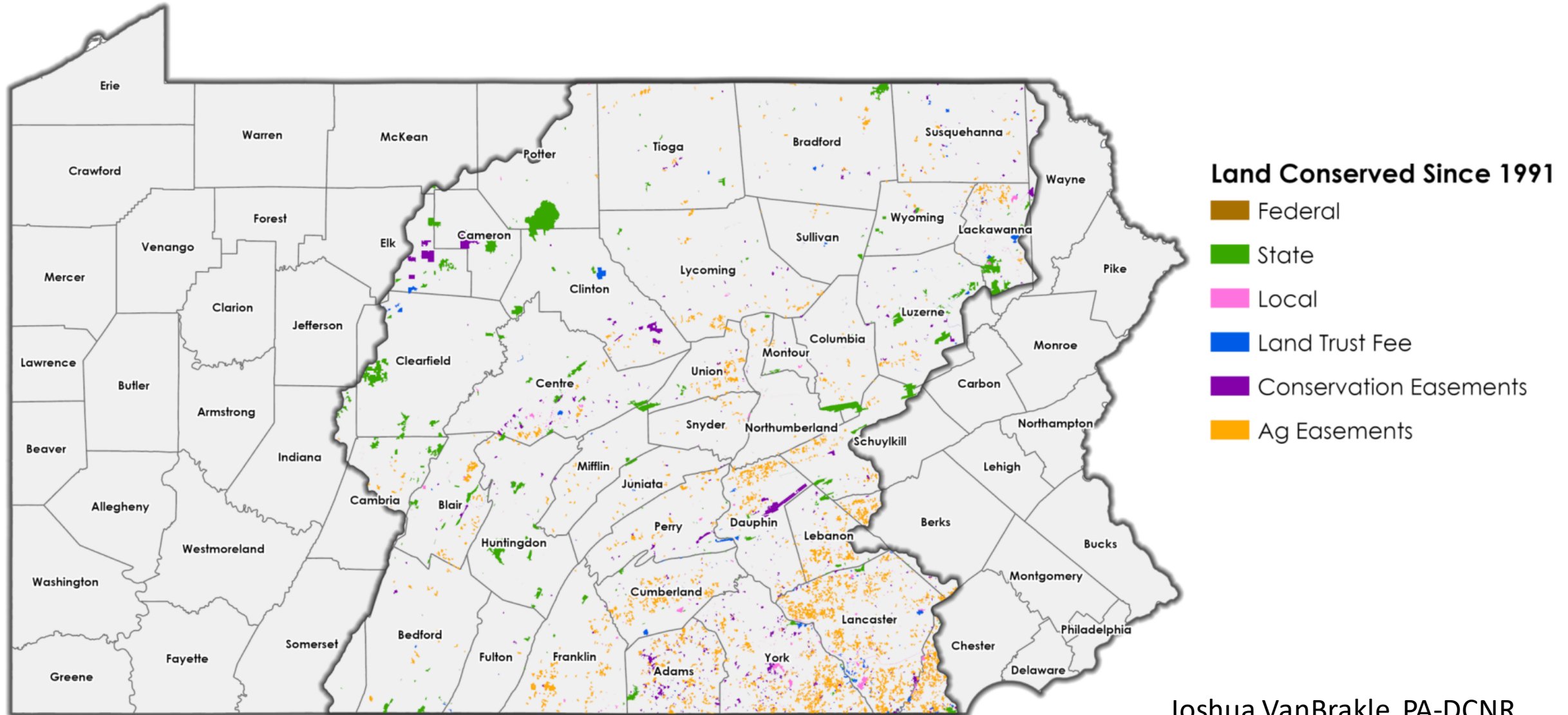
- Revise the scope of the healthy watersheds outcome to include all healthy streams and their watersheds in the Bay basin (not just State-Identified Healthy Watersheds).**
- Align stream and watershed health outcomes, data, science, policies, and management.**
- Align CBP support activities for local land use planning and land conservation efforts.**



## Management Board Ask #2: Support the tracking of protected lands

- For the 2022 protected lands data, **only 62% of the records (by area- 7.14 million acres) have valid "date-of-establishment" field values.** For the remaining 38% of the records (2.97 million acres), we don't know when they were protected!
- For the 62% valid records, 764,000 acres were protected after 2010. The outstanding records represent 4x this area. Therefore, our progress towards land protection goals is uncertain.
- Most protected lands lacking a valid date field are owned by Federal or State agencies. These lands are mostly in Maryland, Virginia, West Virginia, and New York.

# Bay Land Conserved Since 1991



Joshua VanBrakle, PA-DCNR

## **Management Board Ask #3:**

### **Support the new CBP Land Use Strategy**

- **The importance of planning and conservation to maintain healthy streams and watersheds and to sustain restoration progress in the face of population growth and associated changes in land use (and climate) has been a primary concern of the CBP Partners since its inception.**
- **Over the past 40 years, the CBP has struggled to define a value-added role in planning and conservation because both are activities largely governed by local governments or NGO's.**
- **The proposed new Land Use Strategy, endorsed by the Land Use Workgroup and presented to the WQGIT and HWGIT, provides guidance on how the CBP can be more supportive and effective in promoting more sound land use decisions.**