Science (and Policy) Needs for the Land Use Outcomes

Chesapeake Bay Program
Science. Restoration. Partnership.

STAC June 13th

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How many CBP Outcomes mention land use change or land conversion as an important metric or factor influencing progress?

20 of 31 Outcomes

taken from survey results and/or identified from individual LAPs, management strategies, or science needs lists

| Themes (5 of 5)	Goals (8 of 10)	Outcomes (20 of 31)
Abundant Life	Sustainable Fisheries	Blue Crab Abundance
		Blue Crab Management
		Oysters
		Forage Fish
		Fish Habitat
	Vital Habitats	**Wetlands**
		Black Duck
		Stream Health
		Brook Trout
		Fish Passage
		Submerged Aquatic Vegetation
		Forest Buffers
		Tree Canopy
Clean Water	Water Quality	**2017 Watershed Implementation Plan (WIP)**
		2025 Watershed Implementation Plan (WIP)
		WQ Standards Attainment & Monitoring
	Toxic Contaminants	Toxic Contaminants Research
		Toxic Contaminants Policy & Prevention
	Healthy Watersheds	**Healthy Watersheds**
Conserved Lands	Land Conservation	**Protected Lands**
		Land Use Methods and Metrics Development
		Land Use Options Evaluation
Engaged Communities	Stewardship	Citizen Stewardship
		Local Leadership
		Diversity
	Public Access	**Public Access Site Development**
	Environmental Literacy	Student
		Sustainable Schools
		Environmental Literacy Planning
Climate Change	Climate Resiliency	**Climate Monitoring & Assessment**
		Climate Adaptation

New and Emerging Science Needs - High Priority

Need: Develop attributes for the hyper resolution hydrography data on streamflow permanence/periodicity

- **What needs to be done to address it?** Develop a **predictive model of stream flow permanence/periodicity**.

- **What is the urgency/reason for the need?** High priority as it enables the identification of perennial streams which inform forest buffer and riparian data needs across multiple outcomes as well as CWA regulatory requirements. It will also help with assessing climate change impacts on ecological flow metrics.

- **Who are the currently engaged resources?** Included in the long-term land use monitoring plan but currently unfunded.

- **Are there potential resources and do you need support engaging them?** Dedicated CBP funding from federal agencies.
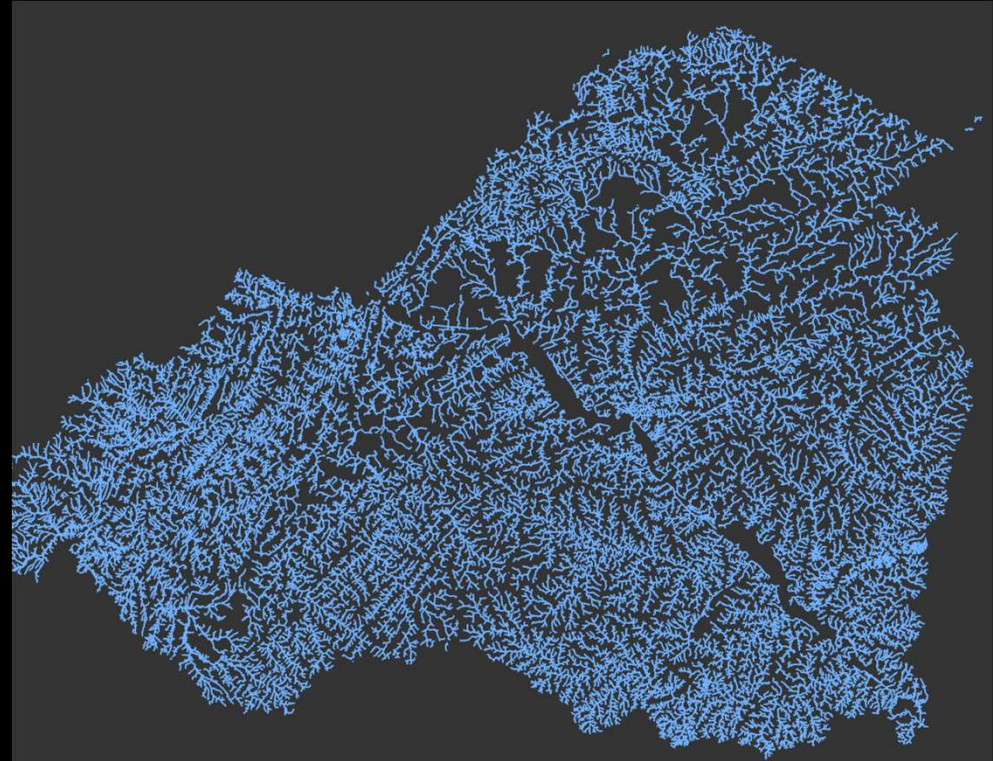
New Hyper-res Streams (1:2000 scale)
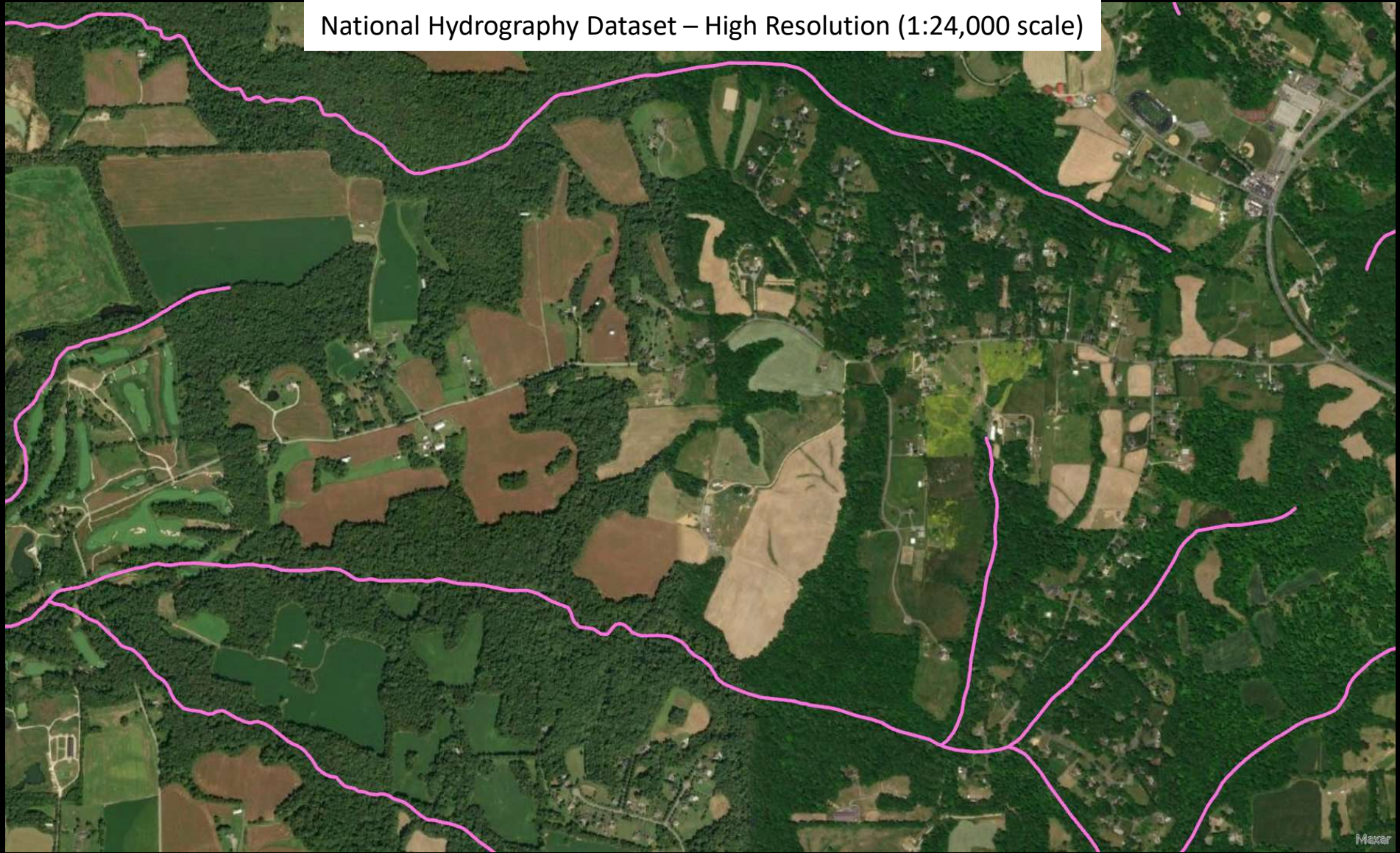## Lower Susquehanna Example

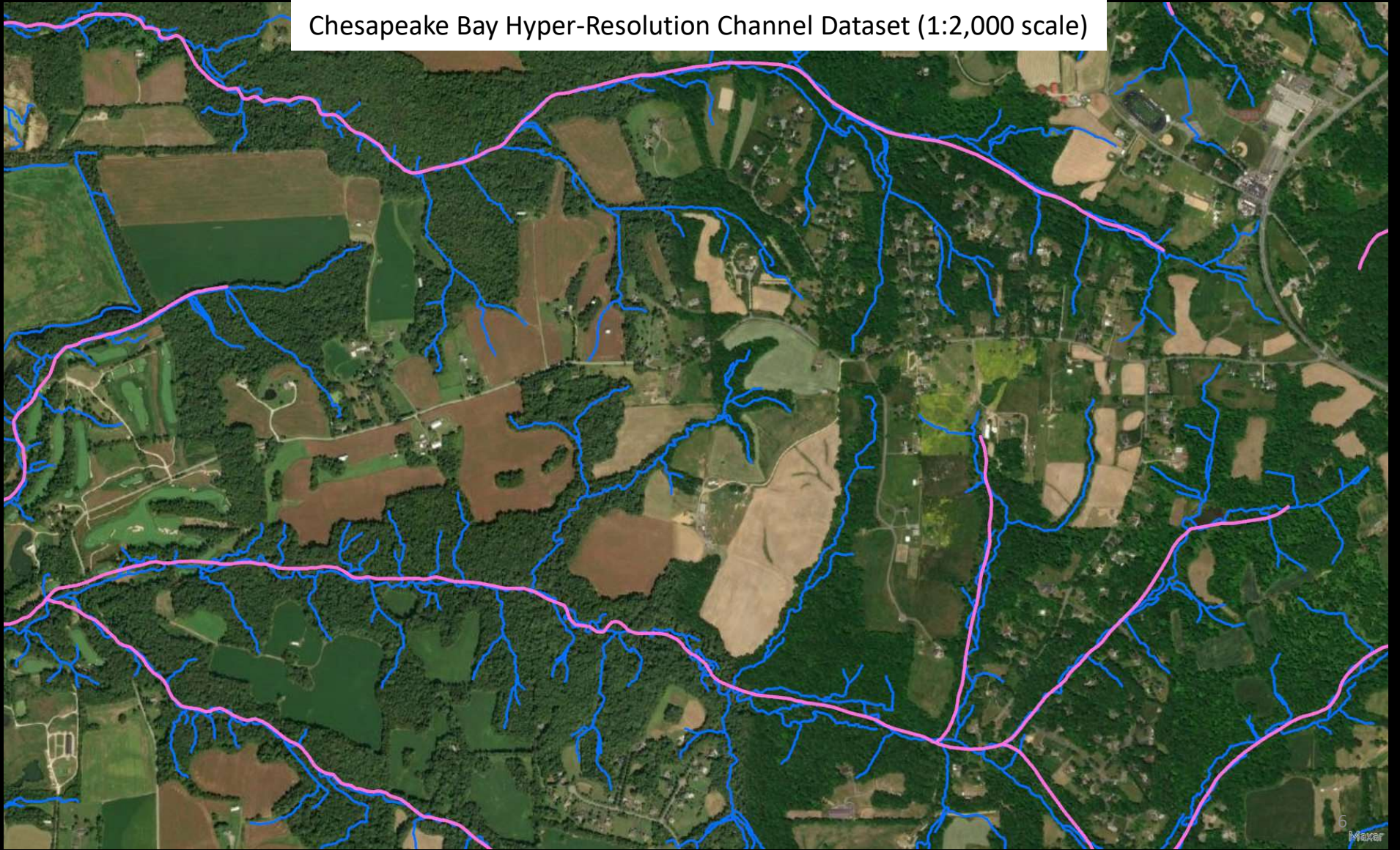National Hydrography Dataset, 1:24,000
6,923.6 km
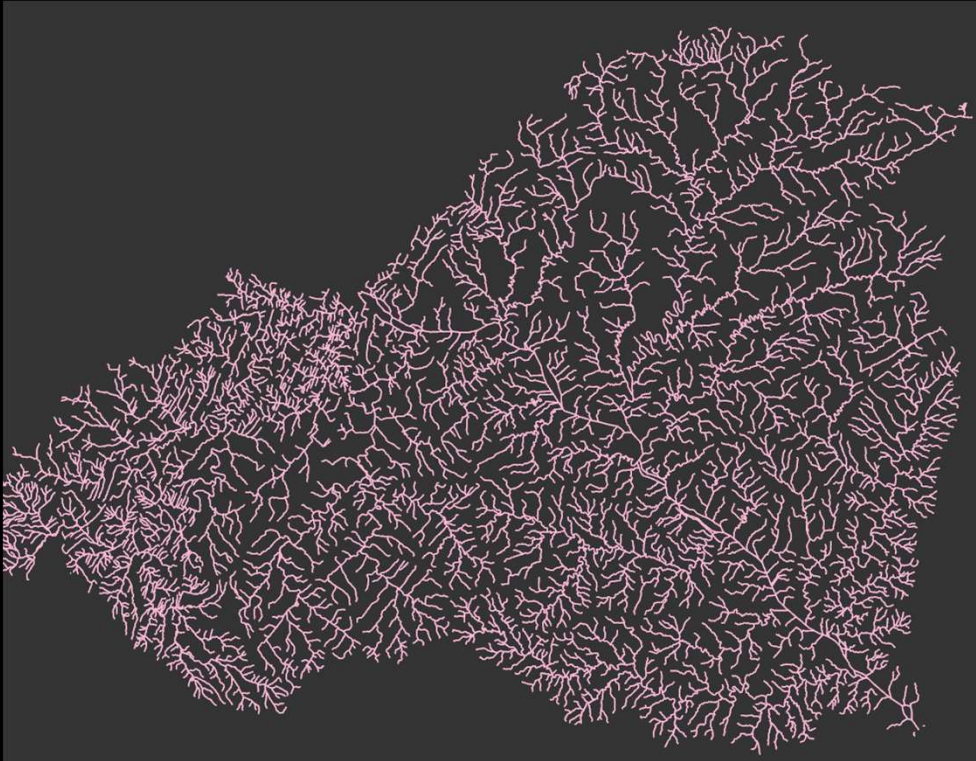
CBP Hyper-Resolution Streams, 1:2000
16,784.6 km

National Hydrography Dataset – High Resolution (1:24,000 scale)

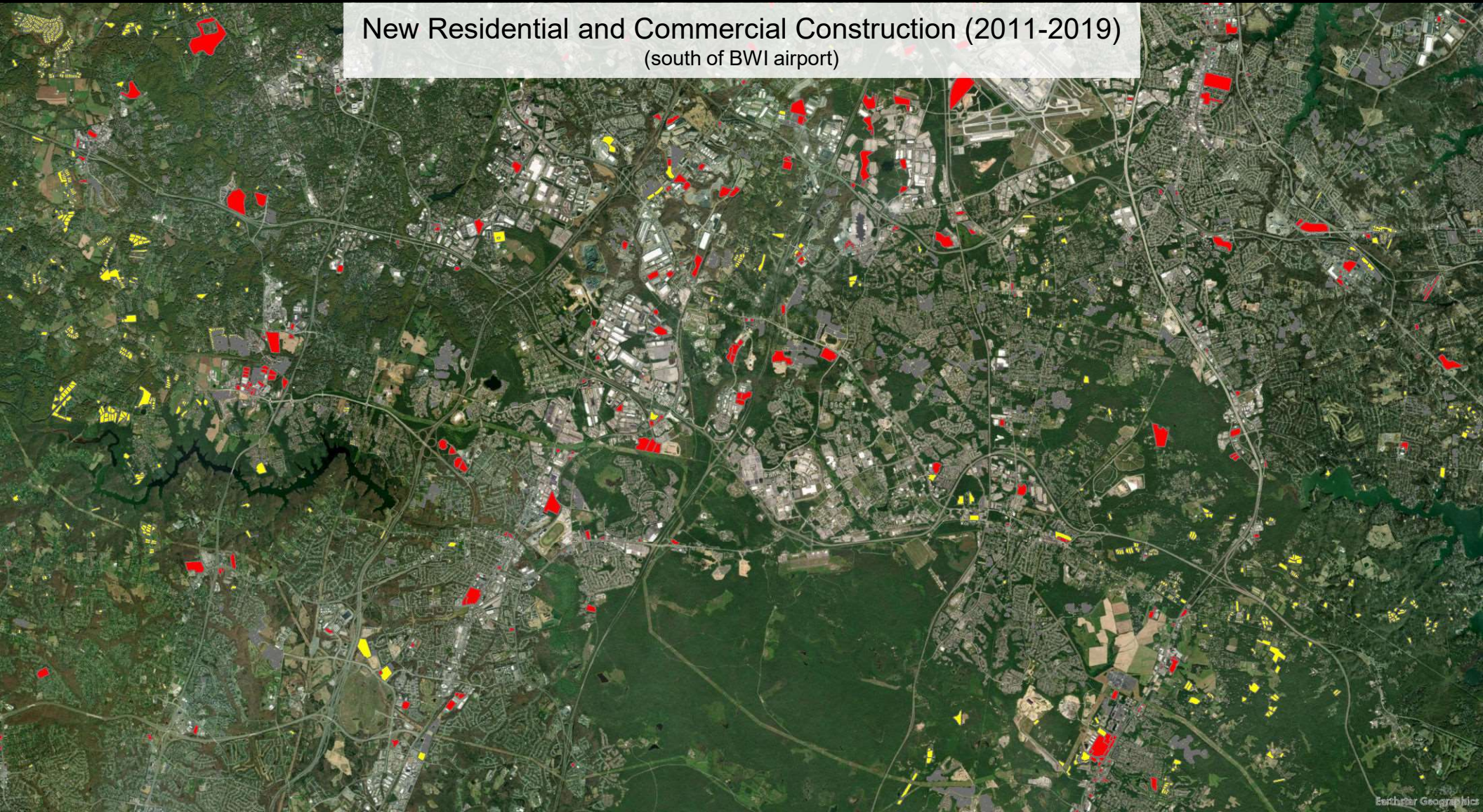Chesapeake Bay Hyper-Resolution Channel Dataset (1:2,000 scale)

Status of the resource

- Full resources
- Partial resources
- **No resources**

New and Emerging Science Needs - High Priority

Need: Collate and curate local **spatial data on building permits** to assess and map near-term development potential.

- **What needs to be done to address it?** Explore the availability and accessibility of local building permit data and compare it to the construction data already provided by states to CAST and with the building permit data already reported to the Census Bureau.

- **What is the urgency/reason for the need?** While using models to forecast future development is necessary for assessing the combined effects of land use and climate change, development over the next 5-10 years has typically already been approved and permitted. Mapping approved building permits will provide highly accurate information on potential future land change in time for the possible intervention to mitigate impacts.

- **Who are the currently engaged resources?** LUWG, HWGIT

- **Are there potential resources and do you need support engaging them?** Local government planning agencies and regional/state planning agencies. Potential GIT funding or connection and coordination with existing efforts.

New Residential and Commercial Construction (2011-2019)
(south of BWI airport)

Status of the resource

- Full resources
- **Partial resources**
- No resources

New and Emerging Science Needs - High Priority

Need: Translate, format, package, and **communicate LULC information** and policy guidance to organizations and individuals trusted by local decisionmakers to inform a variety of policies and programs including land use and comprehensive plans, hazard mitigation and climate resiliency plans, as well as greenway, recreational and forestry management.

- **What needs to be done to address it?** Further develop tools (e.g., County Tree Canopy Fact Sheets) based on stakeholder feedback to communicate information on LULC characteristics, trends, and consequences to localities. **Identify translators within key organizations** to share LULC information with local trusted sources (e.g., planning staff) and leaders. The "translator" positions are needed in each major jurisdiction or sub-basin with representation on the Land Use Workgroup;
- **What is the urgency/reason for the need?** High priority because communication tools and translators are critical to the success of the CBP's efforts to inform local land conservation and land use planning activities.
- **Who are the currently engaged resources?** LUWG, HWGIT, Local Leadership Workgroup, FWG, Strategic Engagement Team
- **Are there potential resources and do you need support engaging them?** Assistance identifying existing networks or individuals who are already serving in "translator" roles. Dedicated annual CBP funding for jurisdictions may be needed to support these positions.

Impervious Surfaces and Change
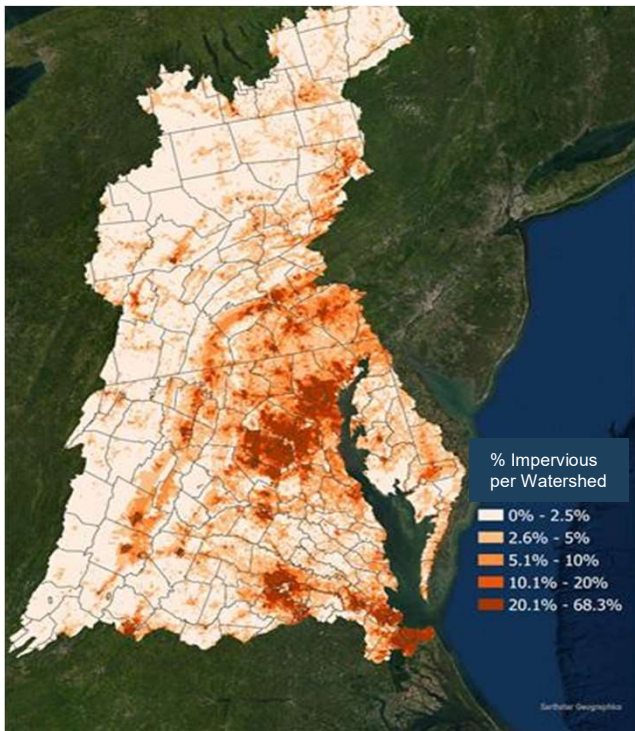
Impervious Cover, 2017/18
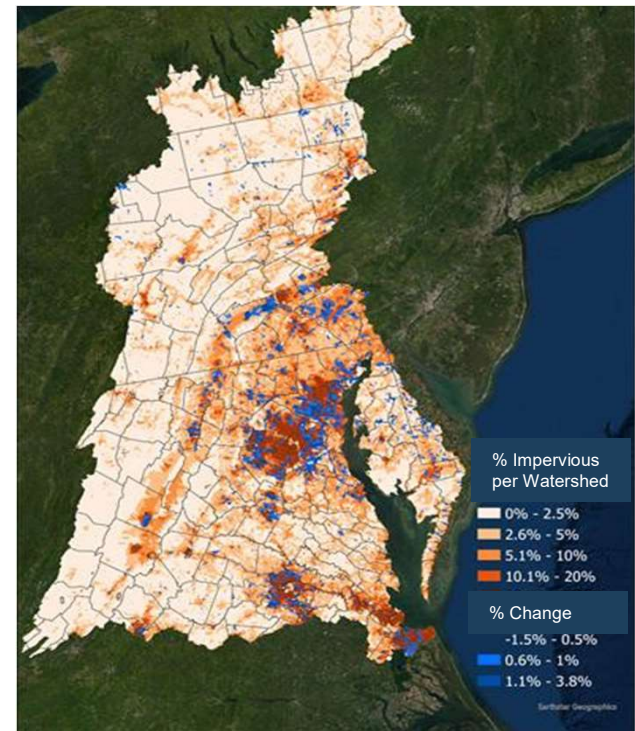
Impervious Cover Change, 2013/14 - 2017/18
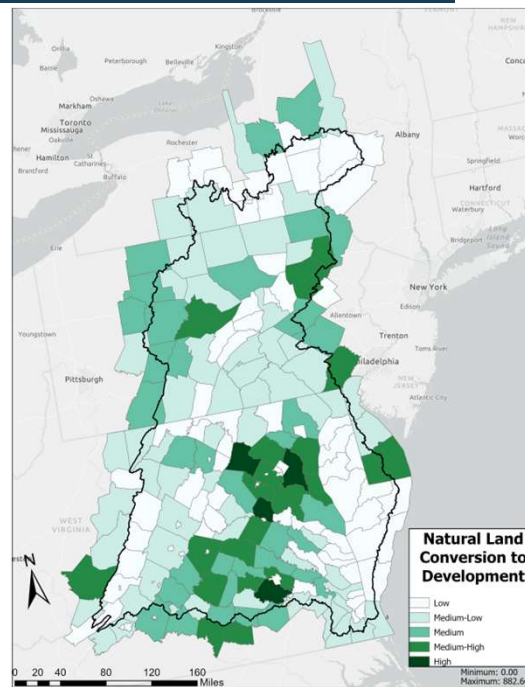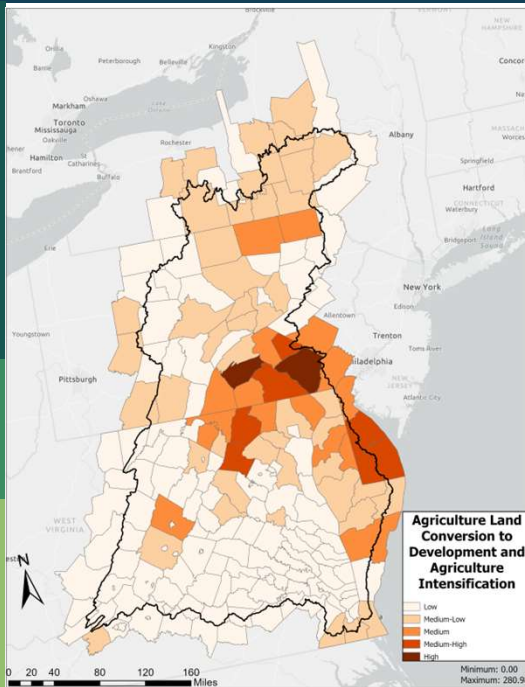
Slide 10

JP0   Need to clarify if it's on track or off track (use icons on last slide)

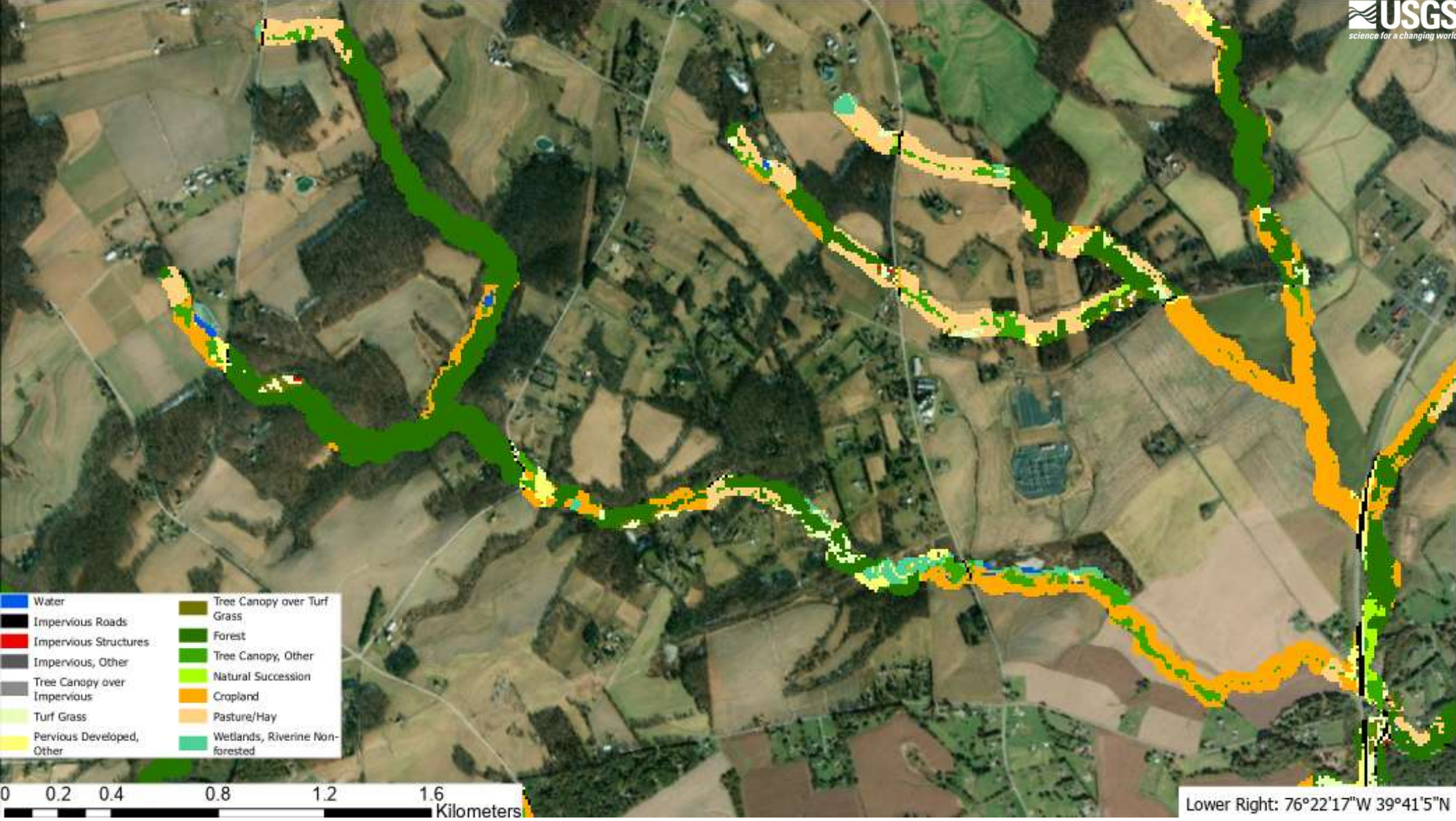Jackie Pickford, 2023-02-14T20:41:15.914

Patterns and Rates of Land Conversion

Ratio of Natural Lands (Forest and Wetlands) to Productive Lands (Cropland and Pasture) Converted to Development from 2013/14 to 2017/18

DRAFT

State	Ratio
DE	0.67 : 1
DC	n/a
MD	2.63 : 1
NY	1.5 : 1
PA	1.8 : 1
VA	5.28 : 1
WV	3.43 : 1

Example interpretation: for every acre of productive land converted to development in Virginia, 5.3 acres of natural land were converted.

Water

Impervious Roads

Impervious Structures

Impervious, Other

Tree Canopy over Impervious

Turf Grass

Pervious Developed, Other

Tree Canopy over Turf Grass

Forest

Tree Canopy, Other

Natural Succession

Cropland

Pasture/Hay

Wetlands, Riverine Non-forested

0   0.2   0.4   0.8   1.2   1.6
Kilometers

Lower Right: 76°22'17"W 39°41'5"N

Technical Study on Changes in Forest Cover and Tree Canopy in Maryland

November 2022

Harry R. Hughes CENTER FOR AGRO-ECOLOGY

COLLEGE OF AGRICULTURE & NATURAL RESOURCES

Chesapeake Conservancy

University of Vermont Spatial Analysis Lab

SENATE BILL 526

M1

3lr1713
CF HB 723

By: Senators Elfreth, Guzzone, Gile, Hester, Kramer, Lam, Hettleman, M. Washington, West, and Zucker

Introduced and read first time: February 3, 2023
Assigned to: Education, Energy, and the Environment

Committee Report: Favorable with amendments
Senate action: Adopted
Read second time: March 19, 2023

The most significant changes in the legislation include:

- Setting a statewide goal to increase the acreage of forested land and tree canopy.

- Increasing replanting requirements for developers who clear forest by requiring them to replant each acre of forest cleared in most cases. Previously, developers were only required to replace a fraction, if any, of the forested land cleared for new construction.

- Providing local governments flexible options to stop net forest loss. These alternatives are coupled with regular reviews by the state's Department of Natural Resources to ensure the local plans align with state forest protection goals.

https://www.cbf.org/news-media/newsroom/2023/maryland/historic-forest-preservation-legislation-approved-by-maryland-general-assembly.html

New and Emerging Science Needs - High Priority

Need: Quantify impact of land conversion on communities. Develop a better understanding of the needs of underserved and other communities and of their **perception of land use characteristics, trends, and policy/planning tools**.

- **What needs to be done to address it?** Engage with underserved communities and identify strategies to effectively address trends in land use and loss of natural resources and open space that are responsive to community needs and goals.

- **What is the urgency/reason for the need?** The loss of trees, forests, and wetlands and increases in impervious cover threaten the health of watersheds and threaten public health in communities. High priority need to better meet the CBP's DEIJ and climate resiliency goals and Presidential mandates.

- **Who are the currently engaged resources?** Chesapeake Healthy Watersheds Assessment, Land Change Model/Watershed model, CBP Communications Team and HWGIT through a 2023 GIT funding project.

- **Are there potential resources and do you need support engaging them?** Local Leadership WG, 2023 GIT funding project (Community Response to Land Use Change). Diversity Workgroup and Stewardship GIT. Support for working with underserved communities is needed.
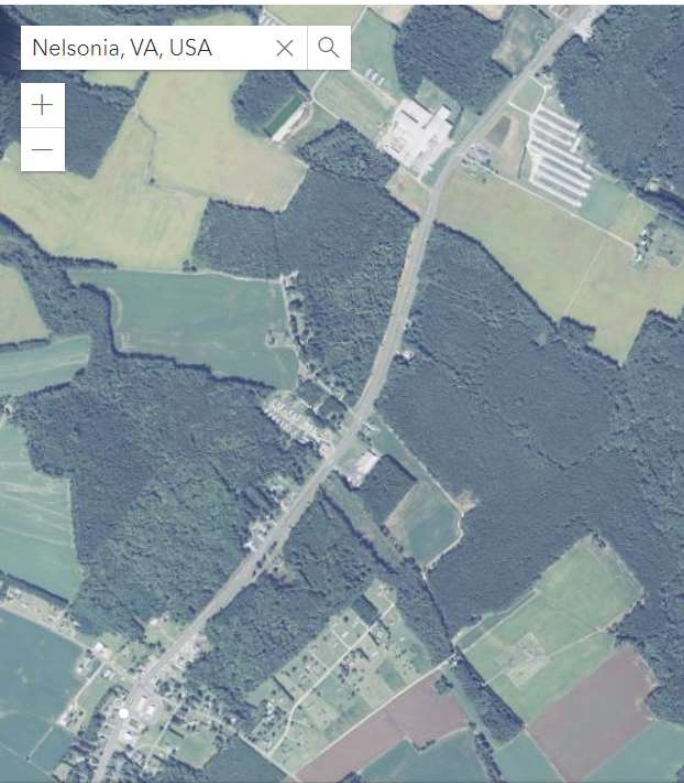
Land Use Change in Communities

2013/2014 NAIP

2017/2018 NAIP
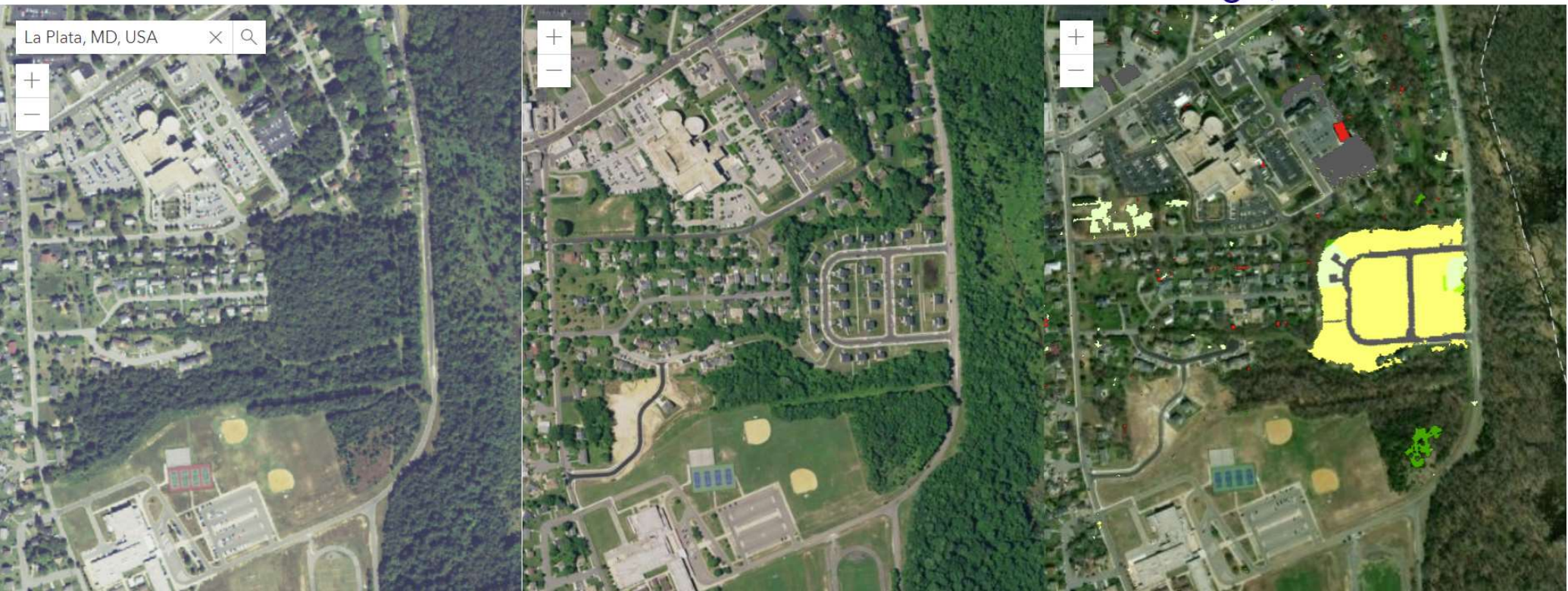
Land Use / Land Cover Change, 2013-2018

La Plata, MD, USA

https://lulc-1718.cicapps.org/

2013/2014 NAIP   2017/2018 NAIP   Land Use / Land Cover Change, 2013-2018

https://lulc-1718.cicapps.org/

# New and Emerging Science Needs - High Priority

Need: Develop **stronger incentives for land conservation and land use management** policies as part of the overall Chesapeake Bay watershed restoration effort.

- **What needs to be done to address it?** Example: WQGIT and PSC decisions that grant 100% credit to land conservation as avoided conversion.

- **What is the urgency/reason for the need?** Additional incentives are needed to achieve CBP and CCP land conservation goals (e.g., 30x30).

- **Who are the currently engaged resources?** States, CCP, WQGIT, LUWG

- **Are there potential resources and do you need support engaging them?** Research into ways and rationales other organizations have valued land conservation and land use planning to incentivize behavior.

Crediting Land Conservation and Planning towards Water Quality Improvement

PA 2025 Baseline Condition

PA 2025 Land Policy BMP (draft)
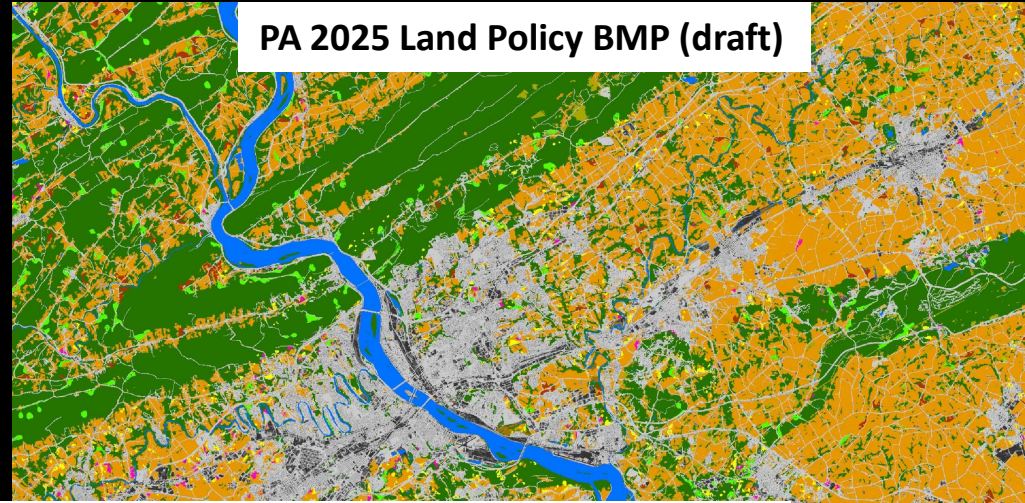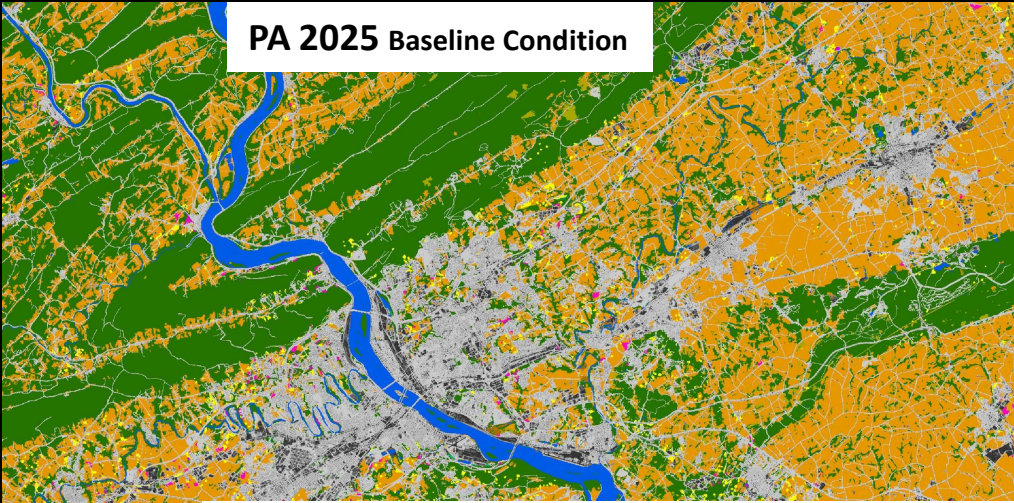
Difference in land use translated into a change in pollutant loads =
Water quality credit afforded to land conservation and land use planning

LandPolicyBMP	TN (lbs/yr)	TP (lbs/yr)	TSS (lbs/yr)
PA Custom (draft)	(158,146)	(943)	(1,080,715)

Commercial
Residential
Mixed use

Commercial
Residential
Mixed use
Forest Conservation
Farm Conservation

Questions?

Point of Contact information for new/emerging science needs.*
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* Multiple Points of Contacts allowed for each science need.