

You have arrived at:

Using Geospatial Data & Applications to Inform State, Tribal, & Local Initiatives

Welcome!

We will get started
soon.



EPA MID-ATLANTIC REGION 2022 SUMMIT
Working Together to Build a Better, More Equitable Region

2 PM

Friendly Reminders Before We Get Started

Please **mute yourself** and **turn off your webcam** during presentations.

If you encounter technical difficulties during the meeting, you can:

- ✓ Put a request for help in the chat
- ✓ Call in to the meeting at +1 551 285 1373;
Meeting ID: 161 872 4960
- ✓ Email Lauren Harris Harris.Lauren@epa.gov

This session is being recorded and will be made available after the summit.

Developing a Mid-Atlantic Report on the Environment

Kelsey Hensley

Data Analytics Specialist

USEPA Mid-Atlantic Region

In order to track and measure success
we need...

reliable indicators of
human health,
environmental condition and
social well-being

...that reflect the long-term mission and
goals of our agency or organization

What We Have: metrics tracking actions

Numbers and Counts

Number of poor air
quality days

Number of
brownfield sites

Miles of nutrient
impaired waters



What We Need: environmental outcomes

Connections to:

human health
biotic health
ecosystems health
community health

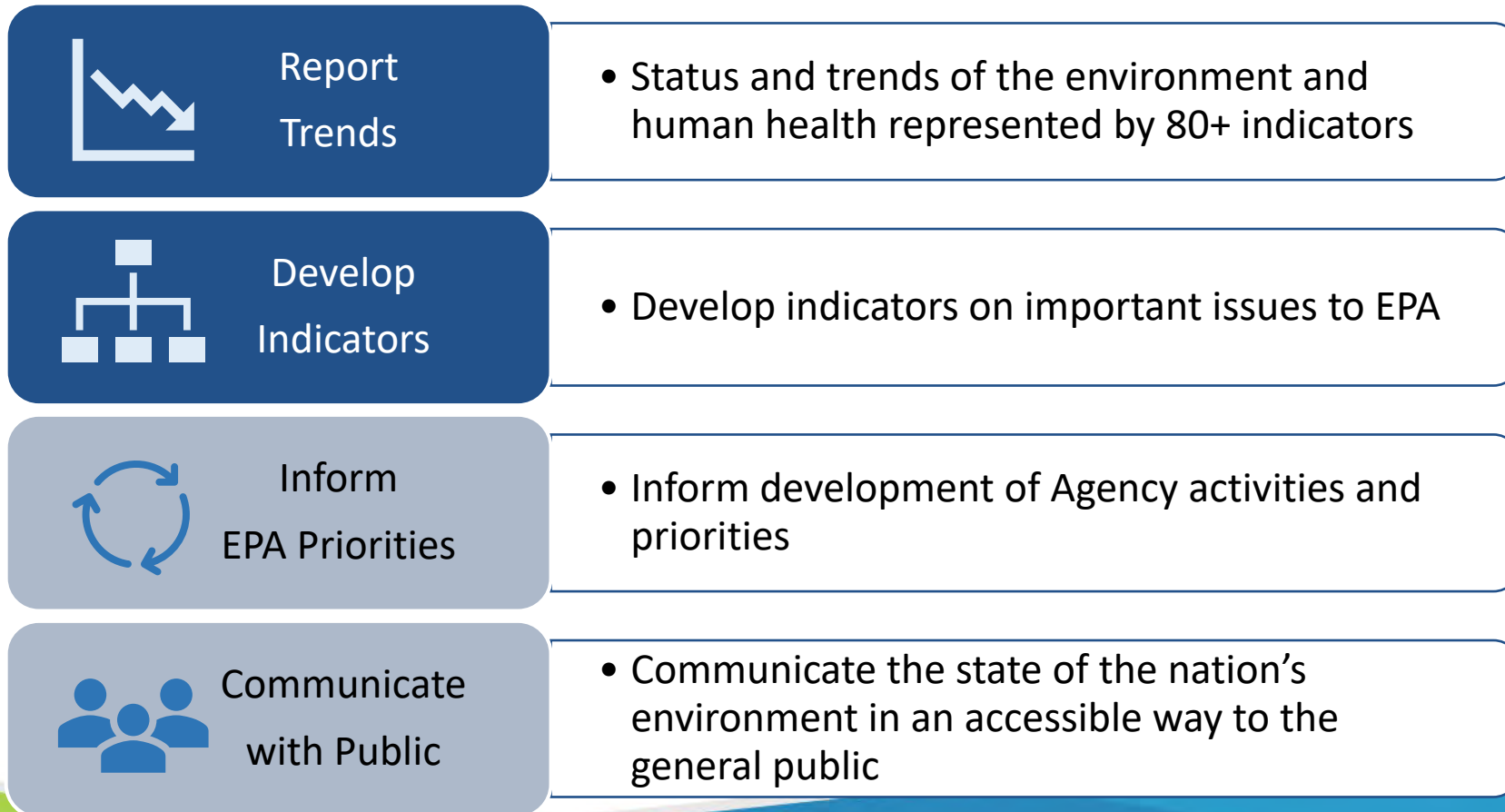
What are the trends in **water quality** and their effects on human health and the environment?

What are the trends in **land cover** and their effects on human health and the environment?

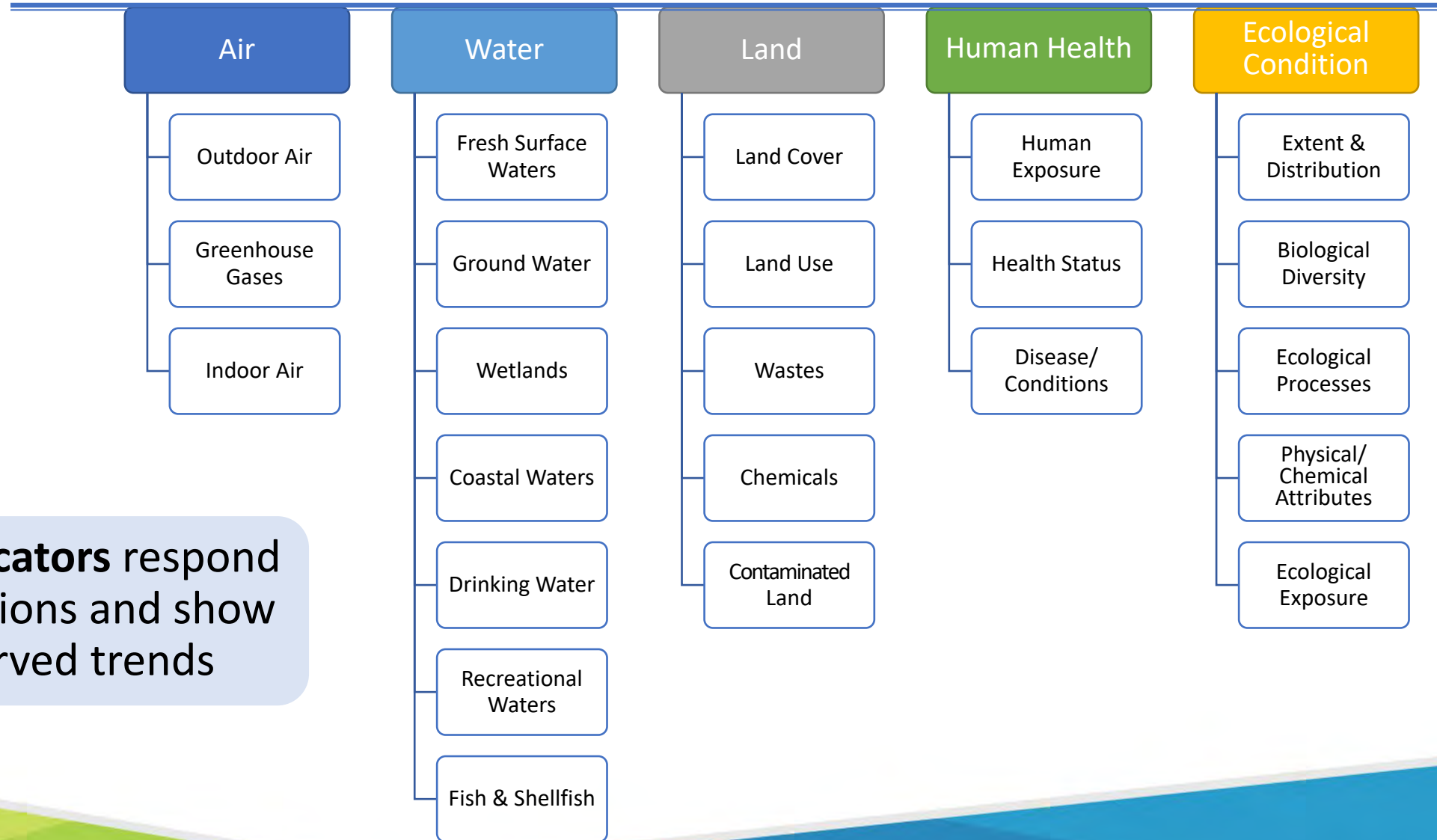


EPA's Report on the Environment (ROE)

The ROE Program provides environmental policy decision makers and others with scientifically defensible, up-to-date, objective, and relevant indicators and indicator-based products that are of *national importance* for protecting human health and the environment.



EPA's Report on the Environment (ROE)



80+ indicators respond to questions and show observed trends

EPA's Report on the Environment (ROE)

Theme

Human Health

Question

What are the trends in human disease and conditions for which environmental contaminants may be a risk factor?

Birth Outcome

- Birth Defects
- Low Birthweight
- Preterm Delivery

Cancer

- Childhood Cancer

Cardiovascular Disease

- Chronic Obstructive Pulmonary Disease

Infectious Disease

Respiratory Disease

- Asthma

Indicators

EPA's Report on the Environment (ROE)

Theme

Question


Indicators

 United States Environmental Protection Agency

Environmental Topics Laws & Regulations About EPA Search EPA.gov

Related Topics: [Report on the Environment](#) | [Explore ROE Indicators](#) CONTACT US SHARE    

Asthma Prevalence

 **Exhibit 1.** Age-adjusted asthma prevalence in U.S. adults (18+ years), 2002-2018

 **Exhibit 2.** Age-adjusted asthma prevalence in adults in the U.S. by race and Hispanic origin, 2016-2018

 **Exhibit 3.** Asthma prevalence in U.S. children (0-17 years), 1980-2018

 **Exhibit 4.** Asthma prevalence in children (0-17 years) in the U.S. by race and Hispanic origin, 2016-2018

Exhibit 4. Asthma prevalence in children (0-17 years) in the U.S. by race and Hispanic origin, 2016-2018

Asthma prevalence by race



Prevalence Type	All groups	White	Black	American Indian/ Alaska Native	Asian
Current asthma prevalence	~80	~65	~140	~110	~40
Asthma attack prevalence	~45	~40	~75	~65	~25

Legend: Asthma prevalence by race, Asthma prevalence by Hispanic origin

Color key: All groups (grey), White (pink), Black (green), American Indian/ Alaska Native (blue), Asian (light pink)

Choose a display option from the list. Click the legend to turn layers on or off. Hover your mouse over the display to reveal data.

Rates presented are crude rates.

Current asthma prevalence is determined by asking if a child who had ever received an asthma diagnosis from a healthcare practitioner still has asthma. Asthma attack prevalence is determined by asking whether a child with an asthma diagnosis had an asthma episode or attack in the past 12 months.

Trend analysis has not been conducted because these data represent a single snapshot in time. For more information about uncertainty, variability, and statistical analysis, view the technical documentation for this indicator.

Data source: NCHS, 2020

- Introduction +
- What the Data Show +
- Limitations +
- Data Sources +

Respiratory Disease

• Asthma

EPA's Report on the Environment (ROE)



Environmental Topics

Laws & Regulations

About EPA

Search EPA.gov



Report on the Environment

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ROE Home

About the ROE

Guide to the ROE

Air

Water

Land

Human Exposure and Health

Ecological Condition

Explore ROE Indicators

Advanced ROE Search

Frequent Questions

Sustainability and the ROE

History of the ROE

What You Can Do

Glossary

Explore ROE Indicators

The 80+ ROE indicators help answer [23 questions](#) in five theme areas critical to EPA's mission. Use the indicator table below to learn about and navigate to any ROE indicator. You can filter the list by theme or topic area using the checkboxes, search for an indicator by name, or sort and browse the indicators by clicking the arrows in the top row of the table.

Air

- Outdoor Air Quality
- Greenhouse Gases
- Indoor Air Quality

Water

- Fresh Surface Waters
- Ground Water
- Wetlands
- Coastal Waters
- Drinking Water
- Recreational Waters
- Consumable Fish and Shellfish

Land

- Land Cover
- Land Use
- Chemicals Used on Land
- Wastes
- Contaminated Land

Human Exposure and Health

- Exposure to Environmental Contaminants
- Health Status
- Disease and Conditions

Ecological Condition

- Extent and Distribution
- Diversity and Biological Balance
- Ecological Processes
- Physical and Chemical Attributes
- Ecological Exposure to Contaminants

Show entries

Search by indicator name:

Indicator	Years of data	Theme area(s) (in bold) and associated topics	Last update
Asthma	1980 - 2018	Human Exposure and Health: Disease and Conditions	04/2021
Birth Defects	1999 - 2018	Human Exposure and Health: Disease and	05/2021

Sortable,
filterable,
searchable
table of the 80+
indicators

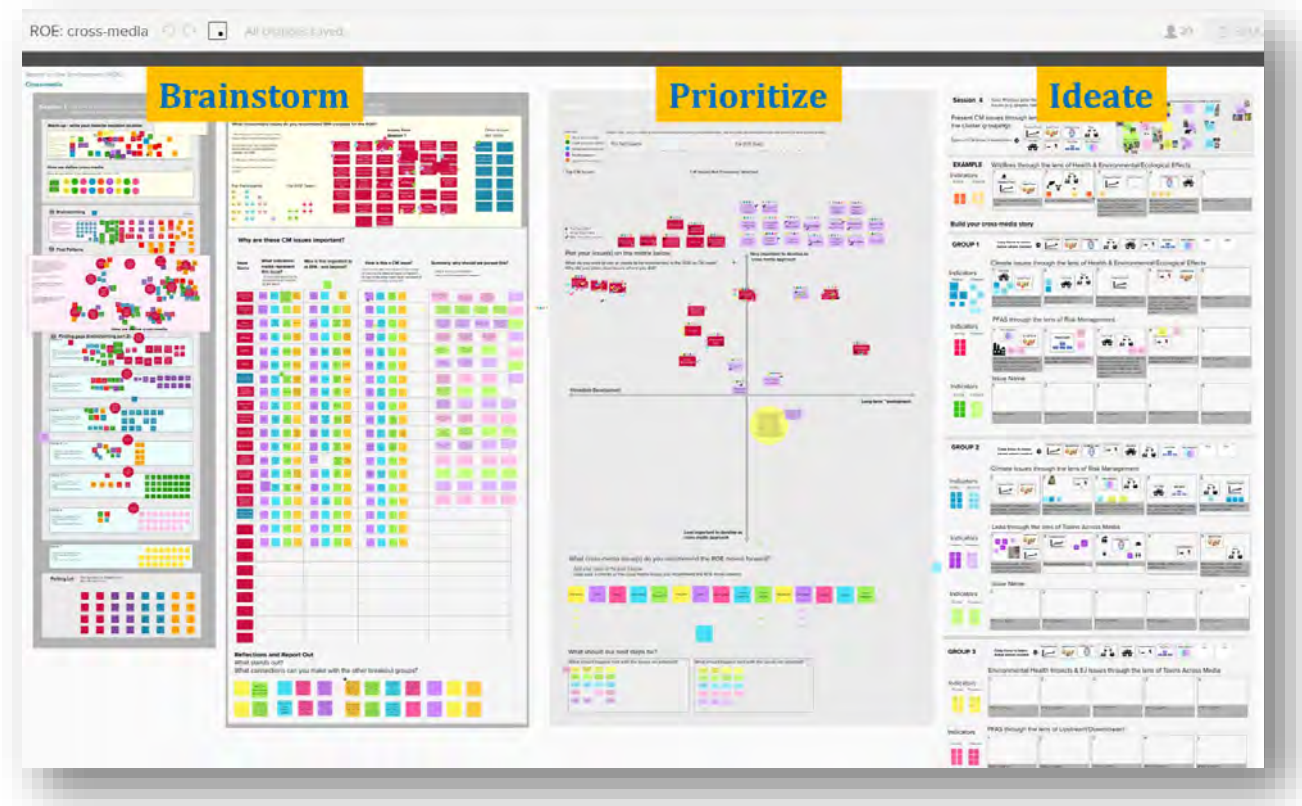


www.epa.gov/report-environment

Developing a Mid-Atlantic ROE

Research & Brainstorm

- Engage stakeholders to determine regional priorities & potential indicators
- Research indicators
- Gather data
- Refine indicators



Research

Brainstorm

Prototype

Developing a Mid-Atlantic ROE

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Higher Priority

2. Cluster and Categorize Indicators

Work with the group to move similar indicators together to form groups or patterns. Within each group identify and capture the themes or questions that emerge.

Cadillac Version

Your group has been asked to design an ideal, centralized platform. You are not limited by financial, time, space, or effort constraints. You can choose up to 6 features. List your teams' 6 features in the green boxes below.

Bicycle Version

Now your group can only choose 3 features. These can be the same or different as the Cadillac. List the 3 features your team selects in the pink boxes below and explain why.

Example - Interactive graphs: to visualize the data and have customization

Data presented on an interactive map so that indicators and the underlying data and sources can be seen

Indicator Information: Definition, Data sources, ...

Interactive visualizations/ maps; to see where (location) and when, and how it relates to other features in the area

Real-time, quality assured data: to see high-quality data now.

Create reports with text and graphics; able to customize report creation based on need

Create reports and story maps (for decision-making, briefing management) with text and graphics; able to customize report creation based on need and to show change over time

Frequently updated, multiscale data, so that you can rely on it to make decisions

Links to other important sources and ability to download data; reviewing or analyzing data

Change over time: a way to show that as the agency has increased effort (funding, FTE, focus) on a particular activity, that the outcome has improved (or not) over time. This could help us see what is working and what is not. May also tell us whether our hypotheses about what will influence outcomes are correct.

Fragmentation of Natural Land Cover

General Hazard Exposure Under Control at Chesapeake Bay

Severn-RCA Priority

Nonpoint source program

Risk assessors, site project managers

National Program

Structural Vulnerabilities - land based

Access to Green Space

Combined Sewer Overflows

Land Loss Along the Atlantic Coast

Health / Services

sources exist?

Point of Contact Cape Sullivan

Point of Contact Annapolis, Rich Paste

Point of Contact for Volatility

TR

Developing a Mid-Atlantic ROE

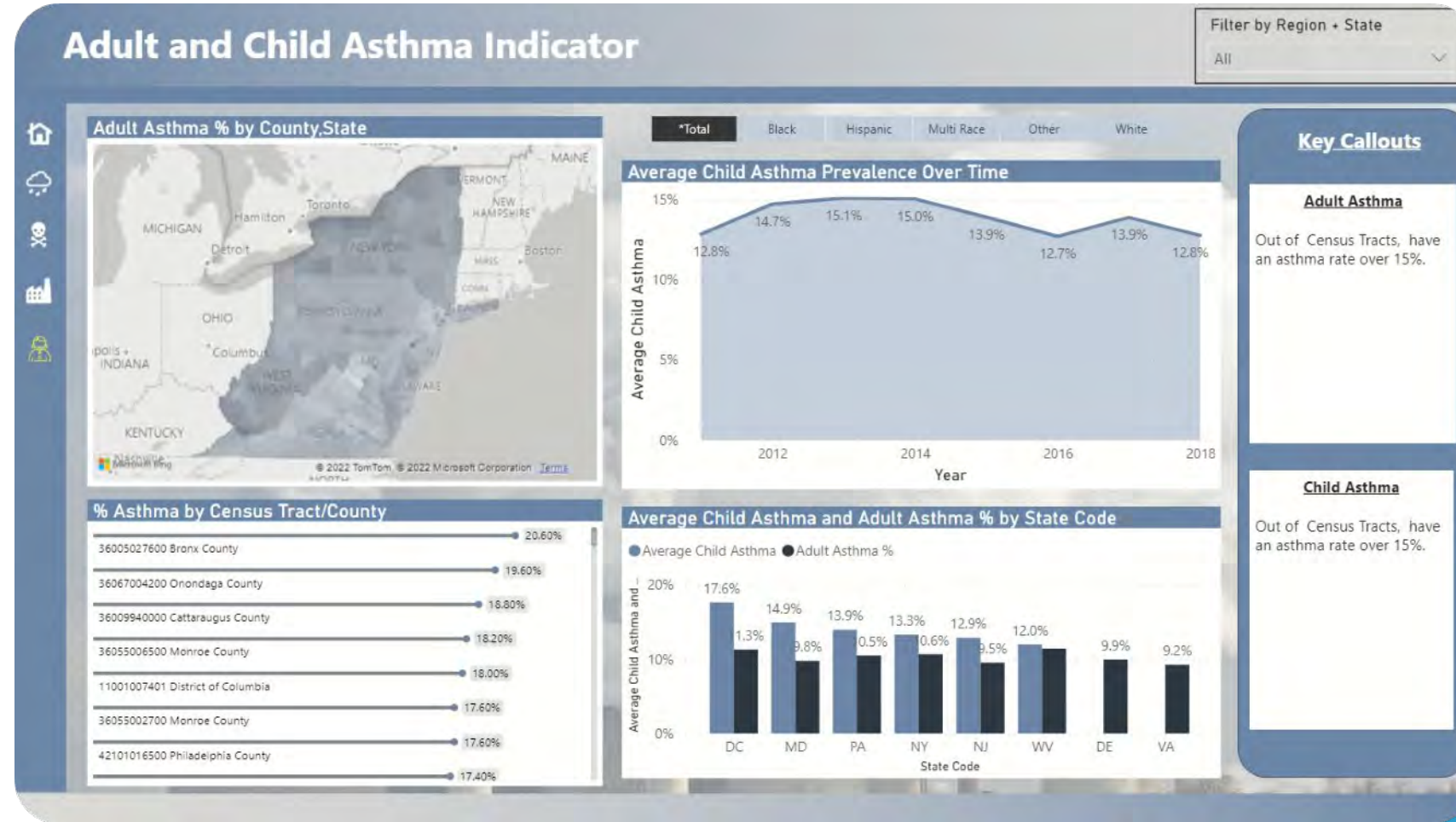
Prototype

- Research data visualization applications
- Develop interactive dashboard/storyboard prototype
- Communicate results to regional programs and stakeholders

Research

Brainstorm

Prototype



Developing a Mid-Atlantic ROE

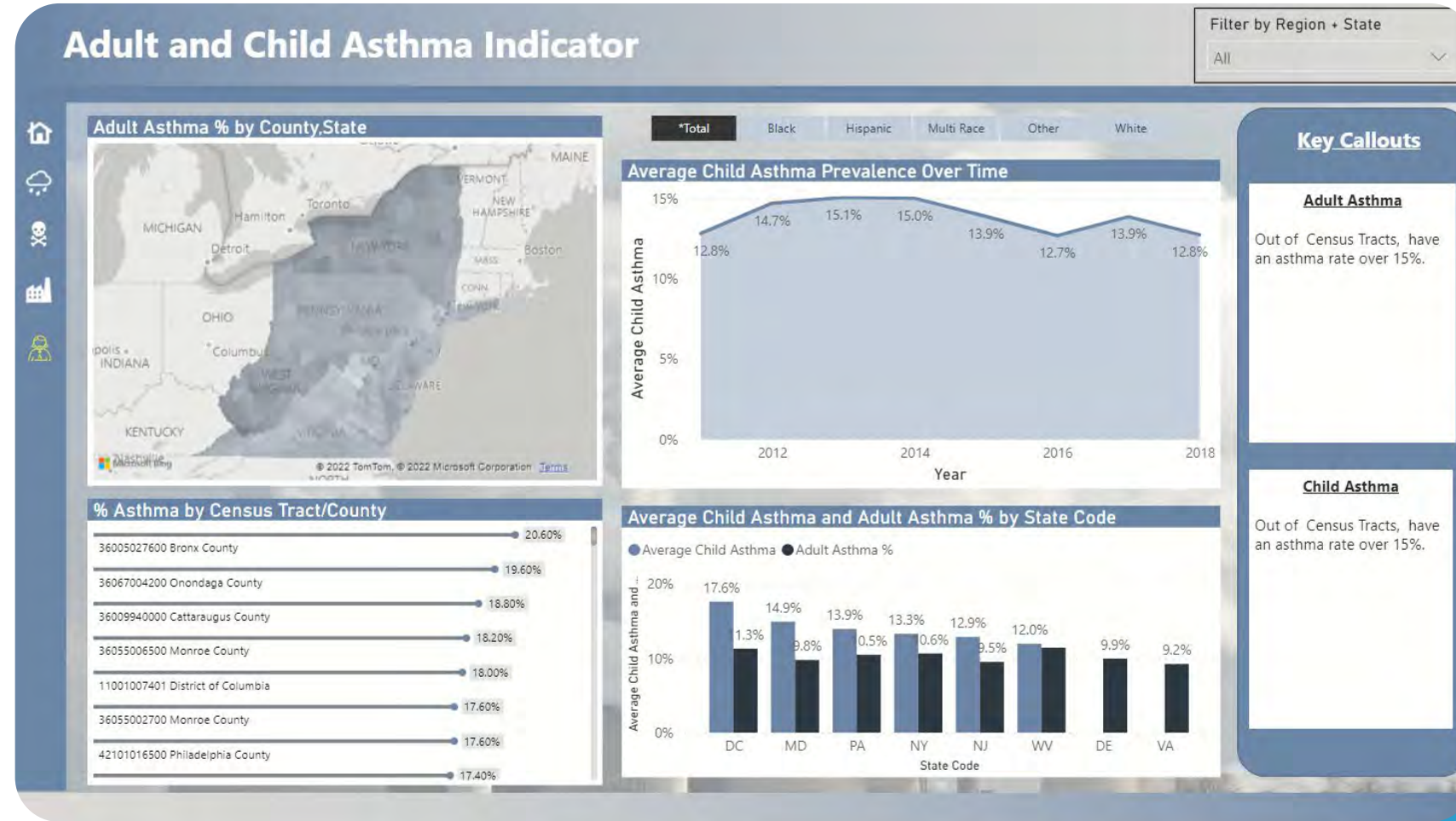
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Brainstorm

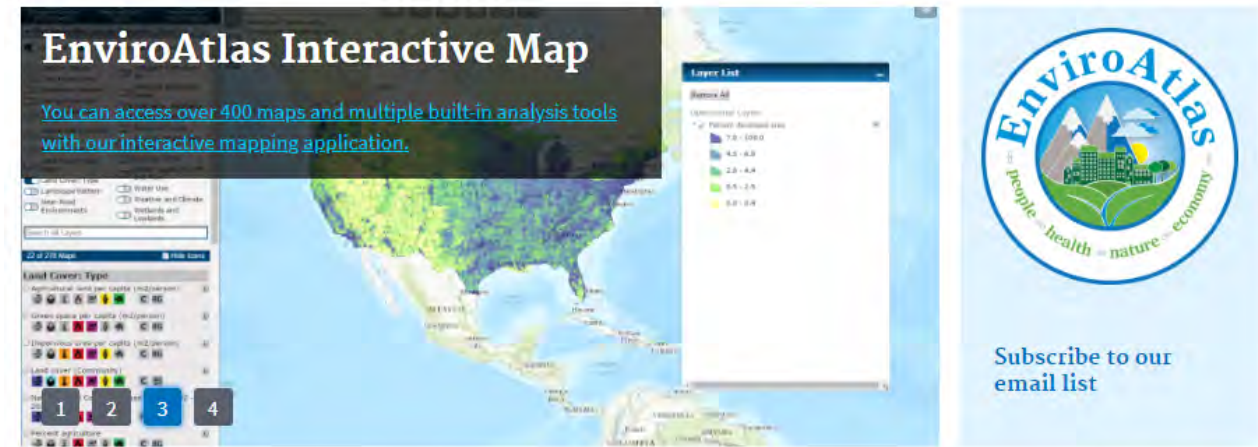
Prototype



EnviroAtlas

is an interactive, web-based tool that anyone can use to help inform decisions that impact the places where people live, learn, work and play.

- **Web-based**
- **Easy to use**
- **No technical skills required**



Human health and well-being are closely tied to the environment, which provides benefits such as clean water, clean air, and protection from natural hazards. Chemical and non-chemical stressors can impact the environment's ability to provide these benefits, also known as ecosystem goods and services. EnviroAtlas provides geospatial data, easy-to-use tools, and other resources related to ecosystem services, their stressors, and human health.



- [Project Fact Sheet](#)
- [Community Component Fact Sheet](#)
- [Current Status of EnviroAtlas](#)
- [EnviroAtlas Introduction Video](#)
- [EnviroAtlas Interactive Map](#) - Discover and use hundreds of maps
- [Eco-Health Relationship Browser](#) - See the many linkages between ecosystem services and human health
- [Learn about EnviroAtlas Data](#)- Spatial extents, organization, and approach
- [Data Matrix](#) - Search and sort 300+ maps
- [Data Download](#)



www.epa.gov/enviroatlas

Using Geospatial Data & Applications

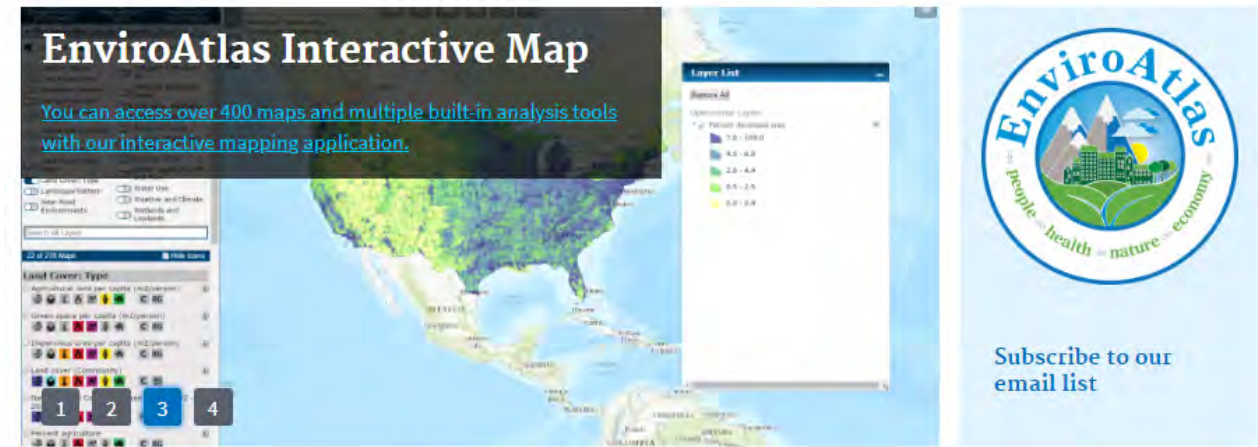
to Inform State, Tribal, &
Local Initiatives

USEPA Mid-Atlantic Region

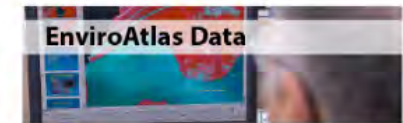
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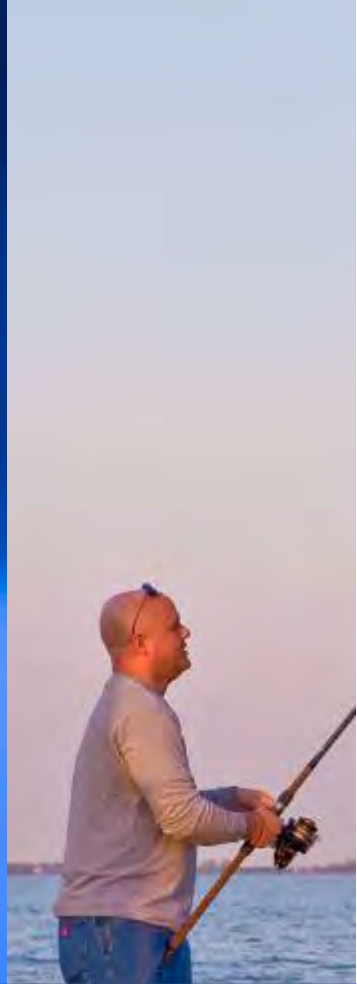
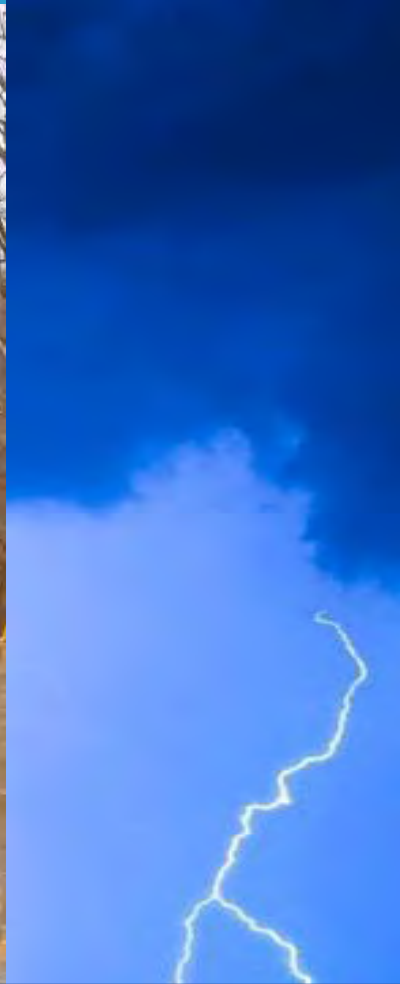


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Ecosystem Services Benefit Categories

Clean
Air

Clean &
Plentiful
Water

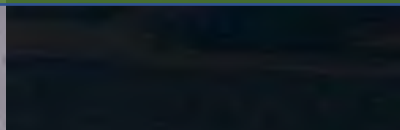
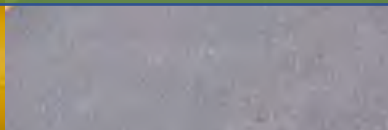
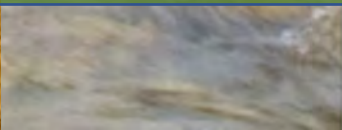
Biodiversity
Conservation

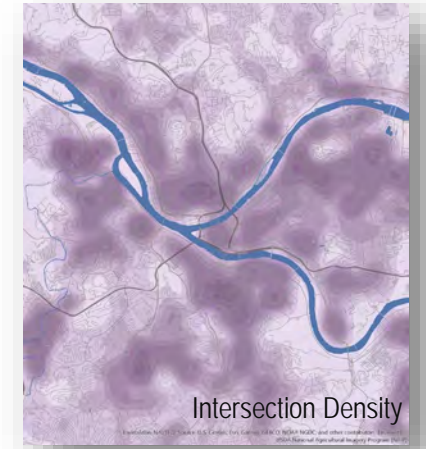
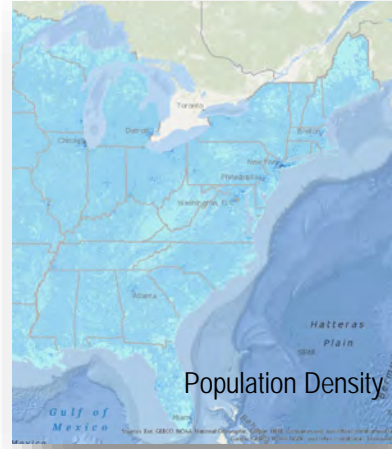
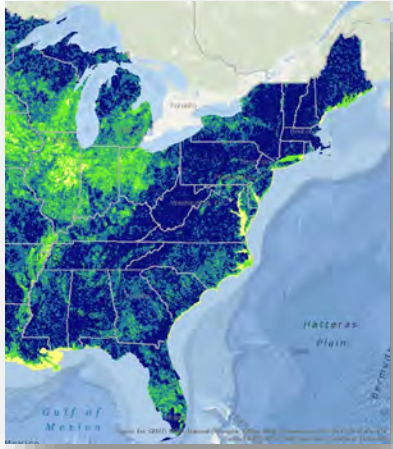
Food, Fuel,
&
Materials

Natural
Hazard
Mitigation

Climate
Stabilization

Recreation,
Culture, &
Aesthetics





National Data

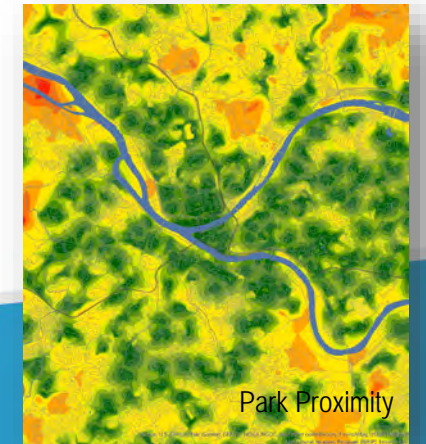
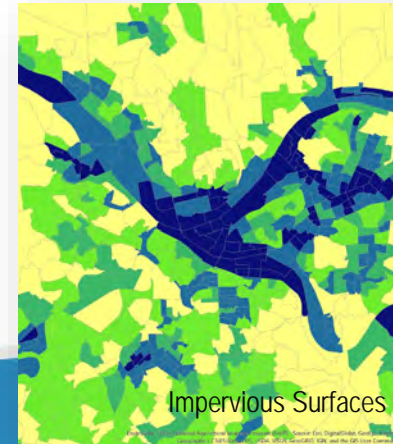
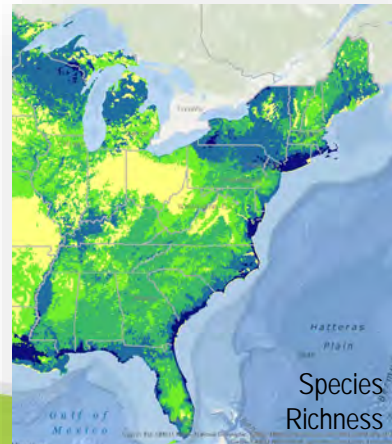
30-meter land cover
 300+ unique data layers
 Consistent data for the conterminous U.S.

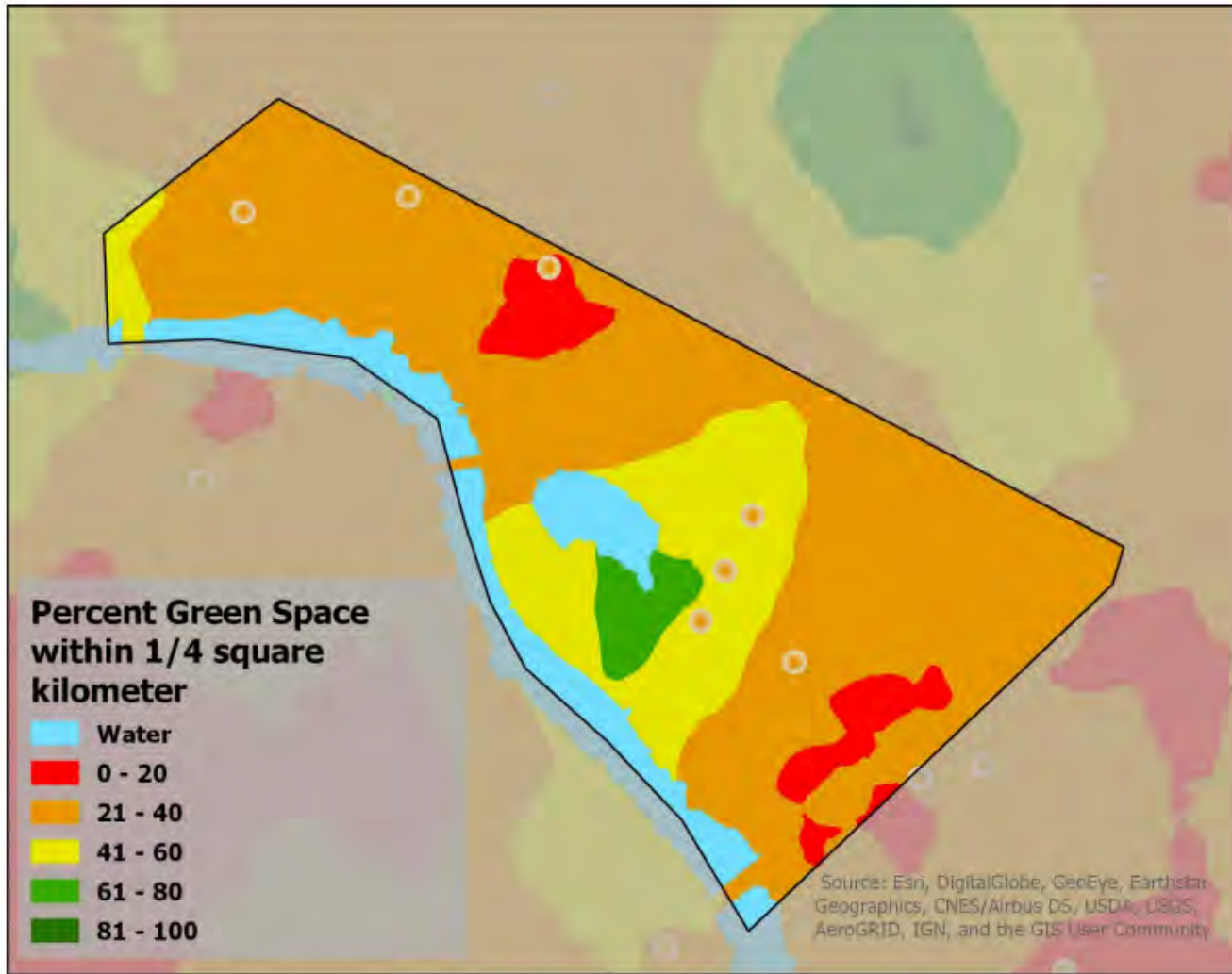
EnviroAtlas

Data Fact Sheets
 Peer-reviewed
 Standard Metadata
 Open access

Community Data

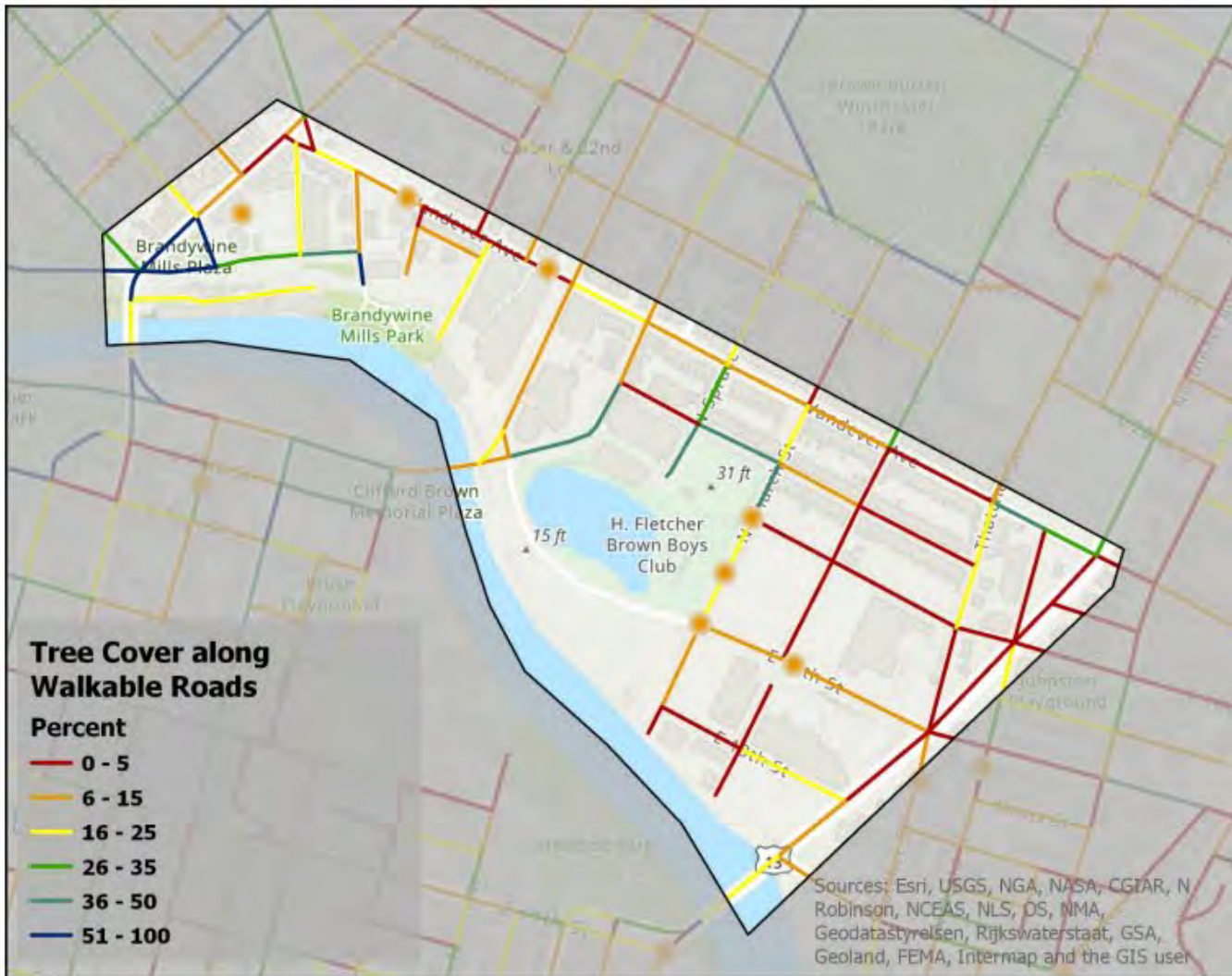
1-meter land cover
 27 metropolitan areas
 1200 cities & towns
 48.9 million people





- Meter Scale Urban Land Cover (MULC)
- Problem Accounting
 - Dasymetric population
 - Vulnerable populations
 - Infrastructure (Schools, Parks, Daycares)
 - FEMA floodplains
 - **Urban heat islands**
- Opportunities
 - Tree cover along walkable roads
 - Riparian buffers

This map shows the Percent Green Space within ¼ Square Kilometer, identifying areas in red that may be potential hotspots for the urban heat island effect.



- Meter Scale Urban Land Cover (MULC)
- Problem Accounting
 - Dasymetric population
 - Vulnerable populations
 - Infrastructure (Schools, Parks, Daycares)
 - FEMA floodplains
 - Urban heat islands
- Opportunities
 - **Tree cover along walkable roads**
 - Riparian buffers

The tree cover along walkable roads layer illustrates one way to revitalize a reclaimed brownfield site to improve livability and well-being.

Developing High-Resolution Metrics of Ecosystem Services for all Communities in the Mid-Atlantic

Project objective:

Produce a full suite of Community-level metrics (based on the EnviroAtlas) that describe the connections between ecosystem services and the natural resources that provide them covering the entire Mid-Atlantic Region. This would include EnviroAtlas metrics describing the built environment, demographics, and forces of environmental change such as pollution and land conversion.

Result:

- 1) 1-meter landcover map for the entire EPA Region 3 area
- 2) Suite of EnviroAtlas ecosystem services and associated demographic and built environment metrics for the Mid-Atlantic States

How will this product help the State, Community, or Tribe with local decision making?

The proposed suite of ecosystem services metrics will expand extensively the existing coverage of community-level EnviroAtlas data in the Mid-Atlantic. This will allow EPA Region 3 programs and partners to use this information to assess environmental conditions and make better informed decisions associated with remediation, restoration and revitalization activities. All EPA Region 3 communities, including small and rural communities, will have access to 1-meter land cover data and a host of fine-scale ecosystem service metrics.

Our objective is to work with stakeholders from communities to learn from them what metrics are of most interest and value, and to ensure and demonstrate how the data produced can be used in community decision-making.

[EnviroAtlas Fact Sheet](#)

[Baltimore, MD](#)







Very-High Resolution Land Use/Land Cover Data



**Peter Claggett¹, Labeeb Ahmed¹, Jacob Czawlytko², Sean MacFaden³,
Patrick McCabe², Sarah McDonald¹, Emily Mills², Jarlath O'Neill-Dunne³,
Katie Walker²**

¹ Lower Mississippi-Gulf Water Science Center, U.S. Geological Survey

² Chesapeake Conservancy's Conservation Innovation Center

³ University of Vermont's Spatial Analysis Laboratory

CBP Complete Land Use/Cover Classification (62 classes)

1. Water (11)

1.1 Estuarine/ Marine

1.2 Lentic (fresh)

1.2.1 Lakes and reservoirs

1.2.2 Riverine ponds

1.2.3 Terrene ponds

1.3 Lotic

1.3.1 Channels

1.3.1.1 Open Channel

1.3.1.2 Tree Canopy over Channel

1.3.1.3 Culverted

1.3.2 Ditches

1.3.2.1 Open Ditch

1.3.2.2 Tree Canopy over Ditch

1.3.2.3 Culverted

2. Development (12)

2.1 Impervious

2.1.1 Roads

2.1.2 Structures

2.1.3 Other Impervious

2.1.4 Tree Canopy (TC) over Impervious

2.1.4.1 TC over Roads

2.1.4.2 TC over Structures

2.1.4.3 TC over Other Impervious

2.2 Pervious

2.2.1 Turf Grass

2.2.2 Transitional- barren

2.2.3 Suspended Succession

2.2.3.1 Barren

2.2.3.2 Herbaceous

2.2.3.3 Scrub-shrub

2.2.4 Tree Canopy over Turf Grass

3. Natural (forest-related) (7)

3.1 Forest (≥ 1 acre, 240-ft width)

3.2 Other Tree Canopy

3.3 Harvested Forest (≤ 3 years)

3.3.1 Barren

3.3.2 Herbaceous

3.4 Natural Succession (> 3 years)

3.4.1 Barren

3.4.2 Herbaceous

3.4.3 Scrub-shrub

4. Production (17)

4.1 Agriculture

4.1.1 Cropland

4.1.1.1 Barren

4.1.1.2 Herbaceous

4.1.2 Pasture/Hay

4.1.2.1 Barren

4.1.2.2 Herbaceous

4.1.2.3 Scrub-shrub

4.1.3 Orchard/vineyard

4.1.3.1 Barren

4.1.3.2 Herbaceous

4.1.3.3 Scrub-shrub

4.1.4 Animal Operations

4.1.4.1 Impervious

4.1.4.2 Barren

4.1.4.3 Herbaceous

4.2 Solar fields

4.2.1 Impervious

4.2.2 Pervious

4.2.2.1 Barren

4.2.2.2 Herbaceous

4.2.2.3 Scrub-shrub

4.3 Extractive (active mines)

4.3.1 Barren

4.3.2 Impervious

5. Wetlands and Water Margins (16)

5.1 Tidal

5.1.1 Barren

5.1.2 Herbaceous

5.1.3 Scrub-shrub

5.1.4 Other Tree Canopy

5.1.5 Forest

5.2 Riverine (Non-tidal)

5.2.1 Barren

5.2.2 Herbaceous

5.2.3 Scrub-shrub

5.2.4 Other Tree Canopy

5.2.5 Forest

5.3 Terrene/Isolated (Non-tidal)

5.3.1 Barren

5.3.2 Herbaceous

5.3.3 Scrub-shrub

5.3.4 Other Tree Canopy

5.3.5 Forest

5.4 Bare shore

Note: White, yellow, and blue classes are mapped for 2017/18. Grey classes will be added to all years with the production of the 2021/22 LULC.

1. Impervious, Roads

2.1 Impervious

2.1.1 Roads

2. Impervious, Structures

2.1 Impervious

2.1.2 Structures

3. Impervious, Other

2.1 Impervious

2.1.3 Other Impervious

4.2 Solar fields

4.2.1 Impervious

4.3 Extractive (active mines)

4.3.2 Impervious

4. Tree Canopy Over Impervious

2.1 Impervious

2.1.4 Tree Canopy over Impervious

5. Turf Grass

2.2 Pervious, Developed

2.2.1 Turf Grass

6. Tree Canopy over Turf Grass

2.2 Pervious, Developed

2.2.4 Tree Canopy over Turf Grass

7. Pervious Developed, Other

2.2 Pervious, Developed

2.2.2 Transitional- barren

2.2.3 Suspended Succession

4.2 Solar fields

4.2.2 Pervious

8. Forest (all)

3.1 Forest (non-wetland)

5.1 Tidal

5.1.5 Forest (>= 1 acre, 240-ft width)

5.2 Riverine (Non-tidal)

5.2.5 Forest (>= 1 acre, 240-ft width)

5.3 Terrene/Isolated (Non-tidal)

5.3.5 Forest (>= 1 acre, 240-ft width)

9. Tree Canopy, Other

3.2 Other Tree Canopy

5.1 Tidal

5.1.4 Other Tree Canopy

5.2 Riverine (Non-tidal)

5.2.4 Other Tree Canopy

5.3 Terrene/Isolated (Non-tidal)

5.3.4 Other Tree Canopy

10. Harvested Forest

3.3 Harvested Forest (<= 3 years)

11. Natural Succession

3.4 Natural Succession (> 3 years)

5.4 Bare shore, Water Margins

12. Wetlands, Tidal non-forested

5.1 Tidal Wetlands

5.1.1 Barren

5.1.2 Herbaceous

5.1.3 Scrub-shrub

13. Wetlands, Riverine Non-forested

5.2 Riverine Wetlands (Non-tidal)

5.1.1 Barren

5.1.2 Herbaceous

5.1.3 Scrub-shrub

14. Wetlands, Terrene Non-forested

5.3 Terrene/Isolated Wetlands (Non-tidal)

5.1.1 Barren

5.1.2 Herbaceous

5.1.3 Scrub-shrub

15. Extractive

4.3 Extractive (active mines)

4.3.1 Barren

16. Cropland

4.1 Agriculture

4.1.1 Cropland

4.1.3 Orchard/vineyard

17. Pasture/Hay

4.1 Agriculture

4.1.2 Pasture/Hay

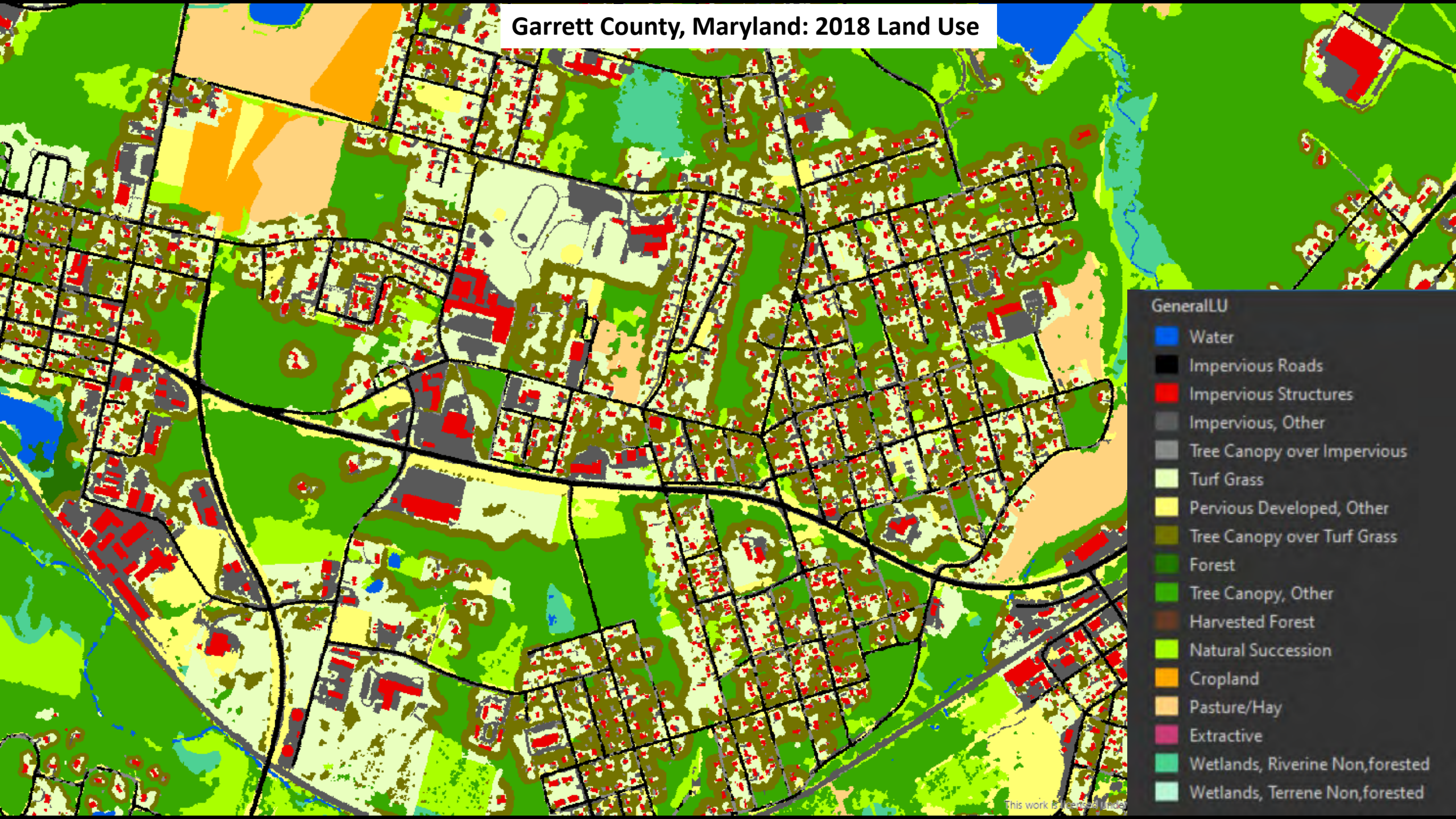
18. Water

1.1 Estuarine/ Marine

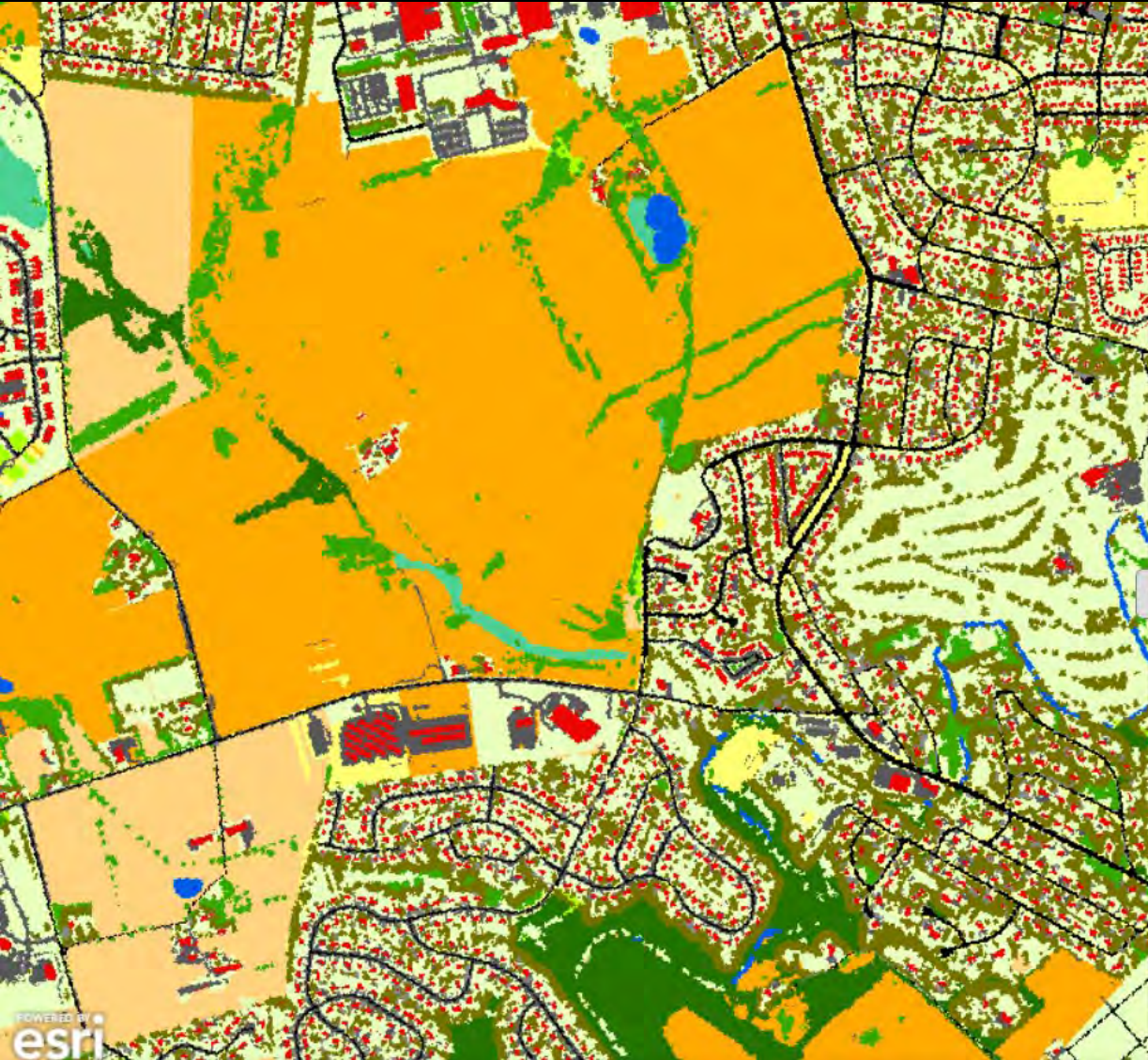
1.2 Lentic

1.3 Lotic

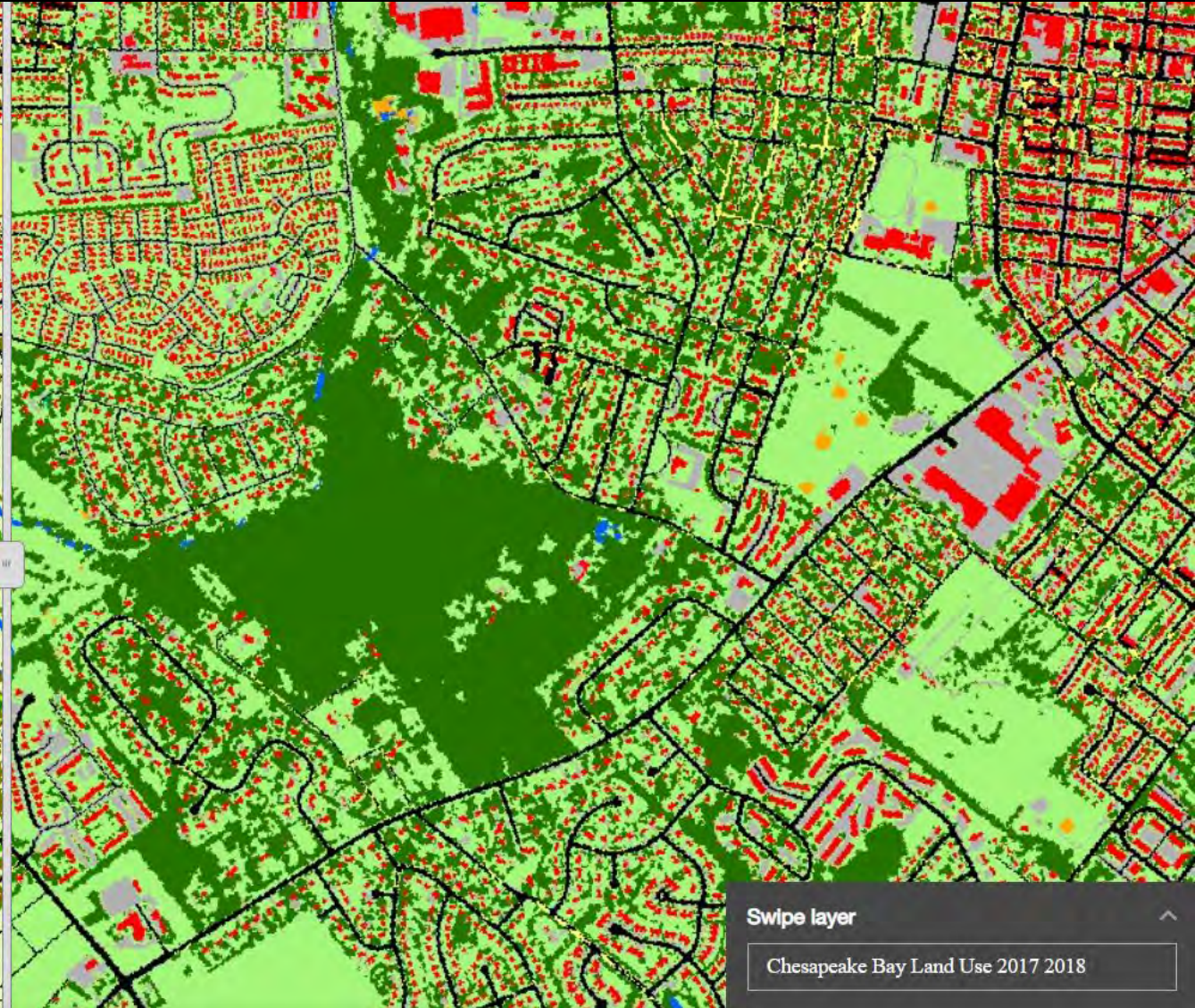
Garrett County, Maryland: 2018 Land Use



Land Use/Land Cover



Land Cover



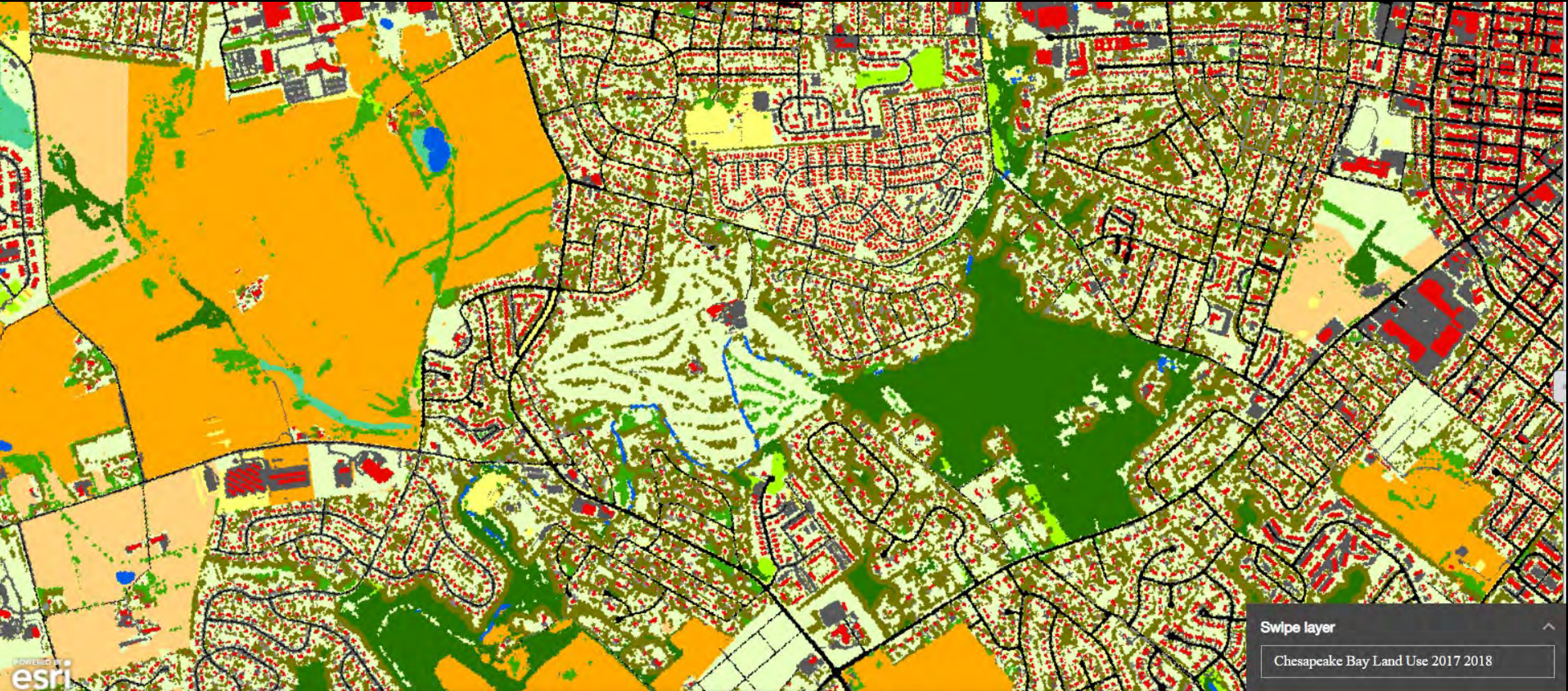
Swipe layer

Chesapeake Bay Land Use 2017 2018

<https://www.chesapeakeconservancy.org/conservation-innovation-center/high-resolution-data/lulc-data-project-2022/>

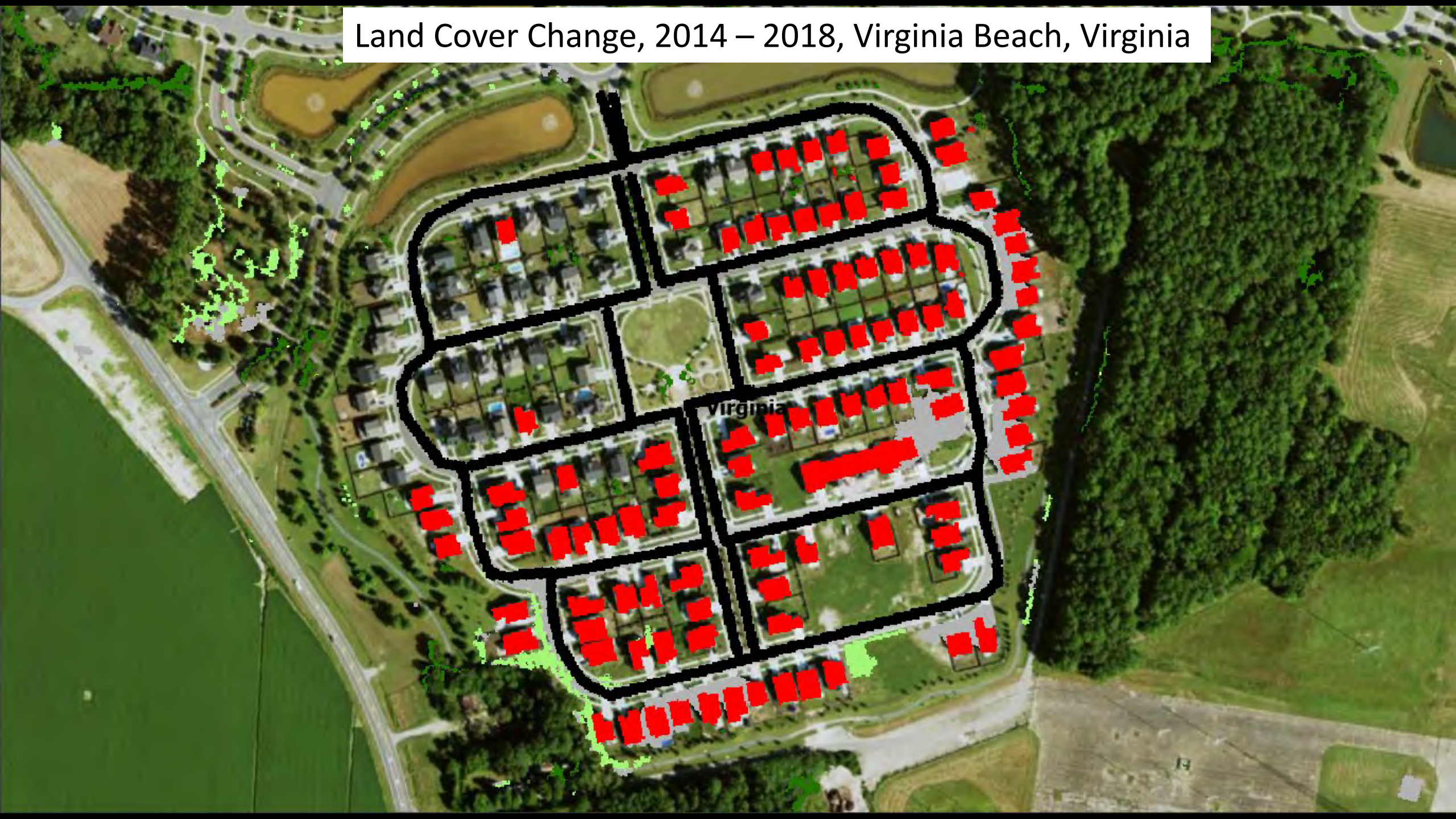
Land Use/Land Cover

Land Cover

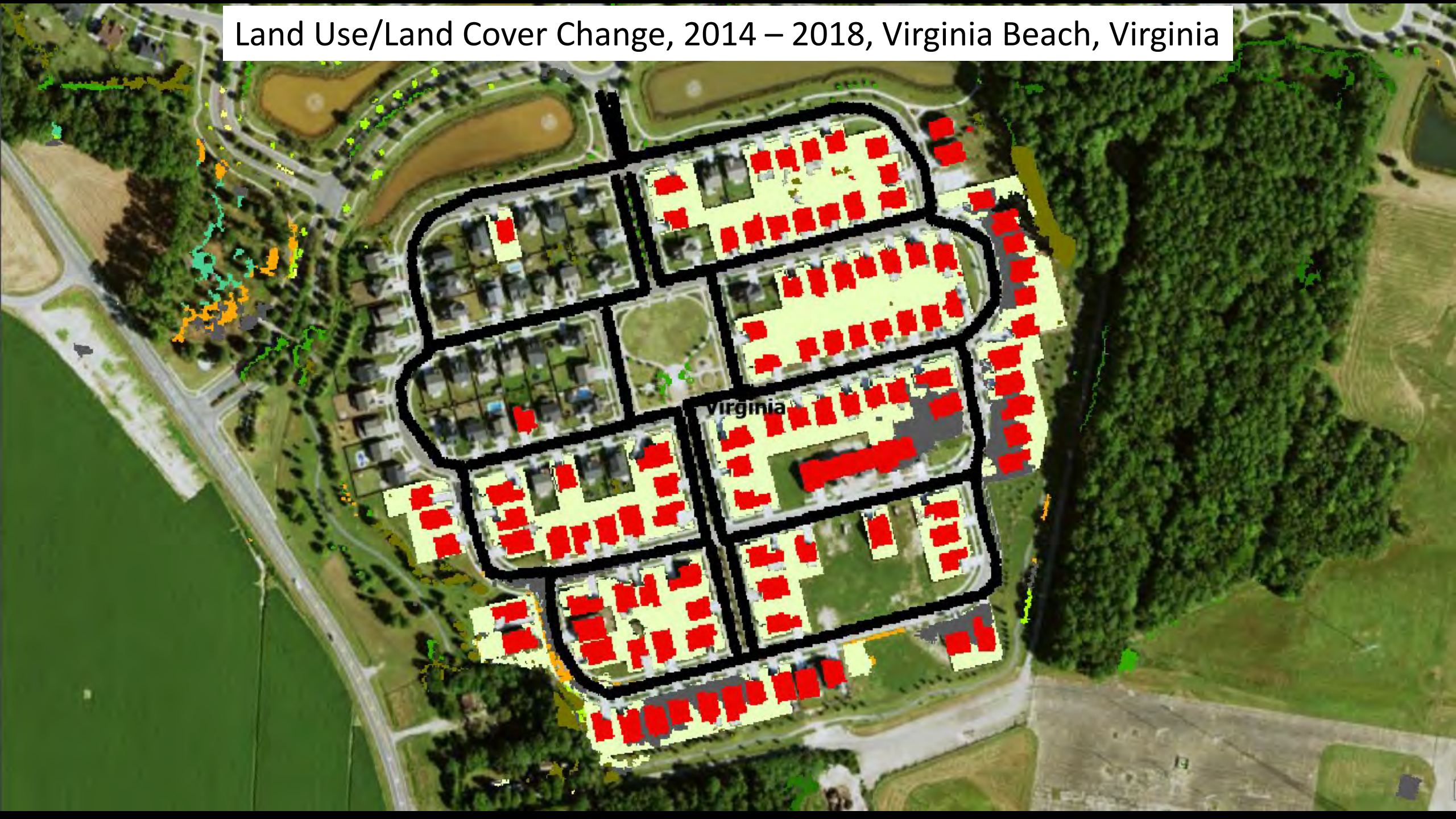


<https://www.chesapeakeconservancy.org/conservation-innovation-center/high-resolution-data/lulc-data-project-2022/>

Land Cover Change, 2014 – 2018, Virginia Beach, Virginia



Land Use/Land Cover Change, 2014 – 2018, Virginia Beach, Virginia



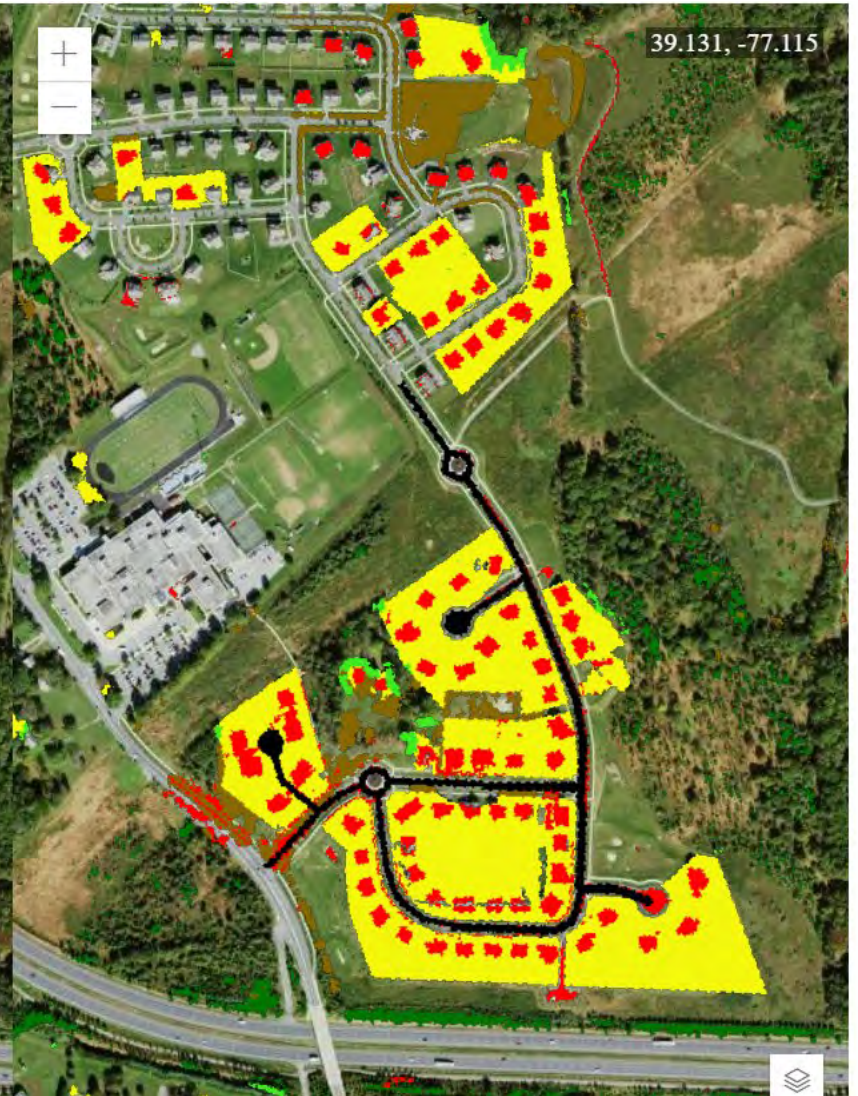
2013/2014 NAIP



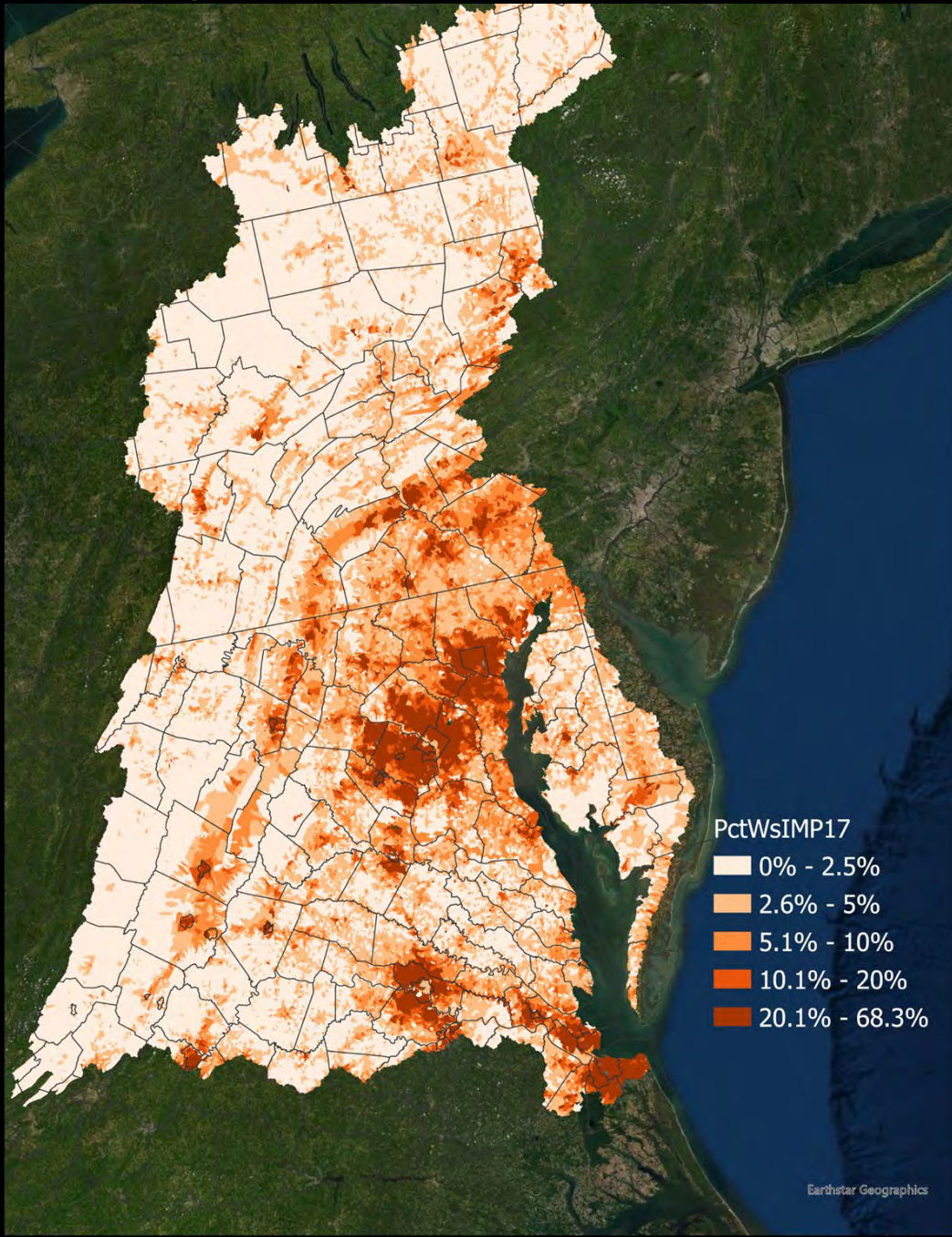
2017/2018 NAIP



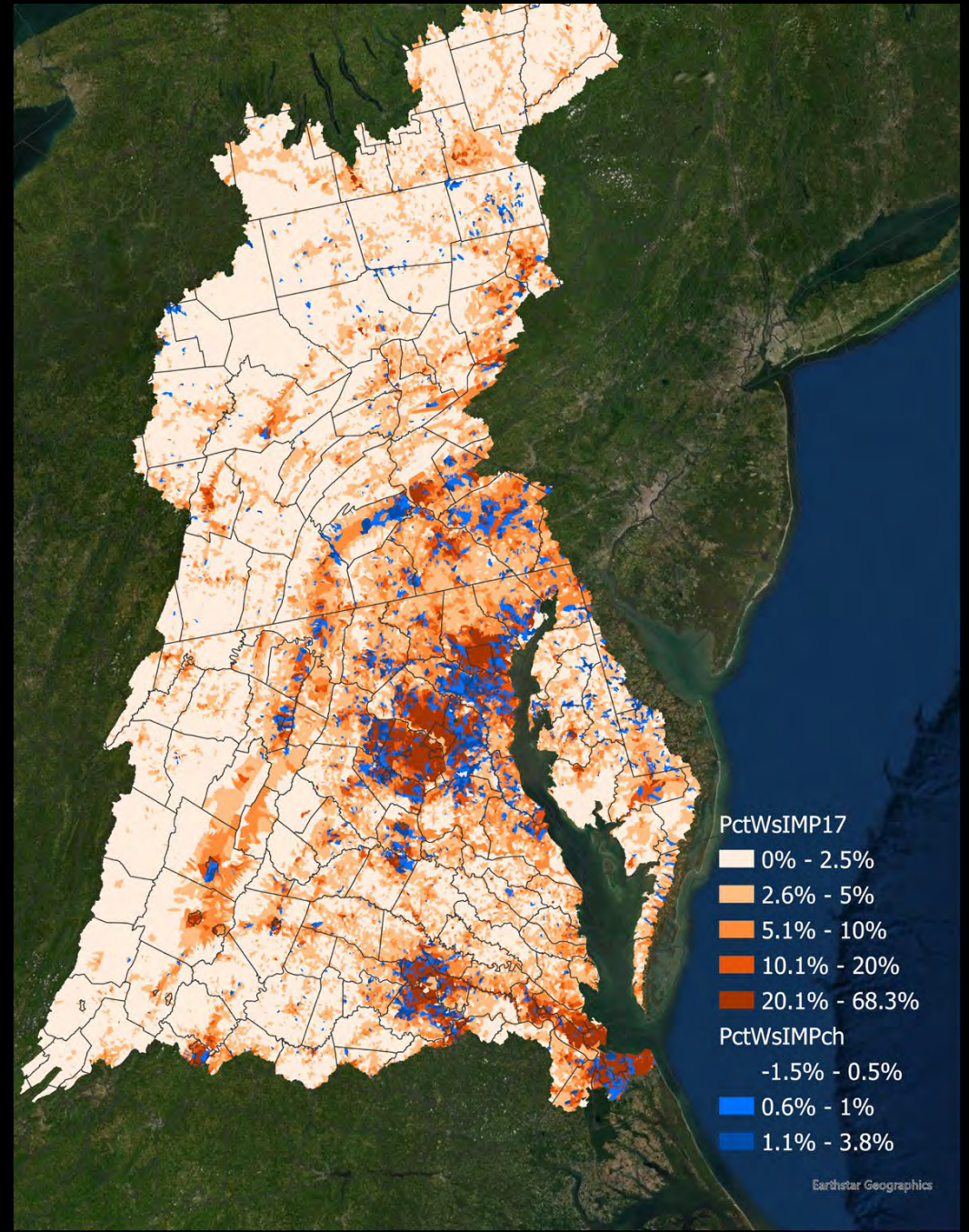
Land Use / Land Cover Change, 2013-2018



Impervious Cover, 2017 (accum. %)



Impervious Cover Change, 2013-17 (accum. %)

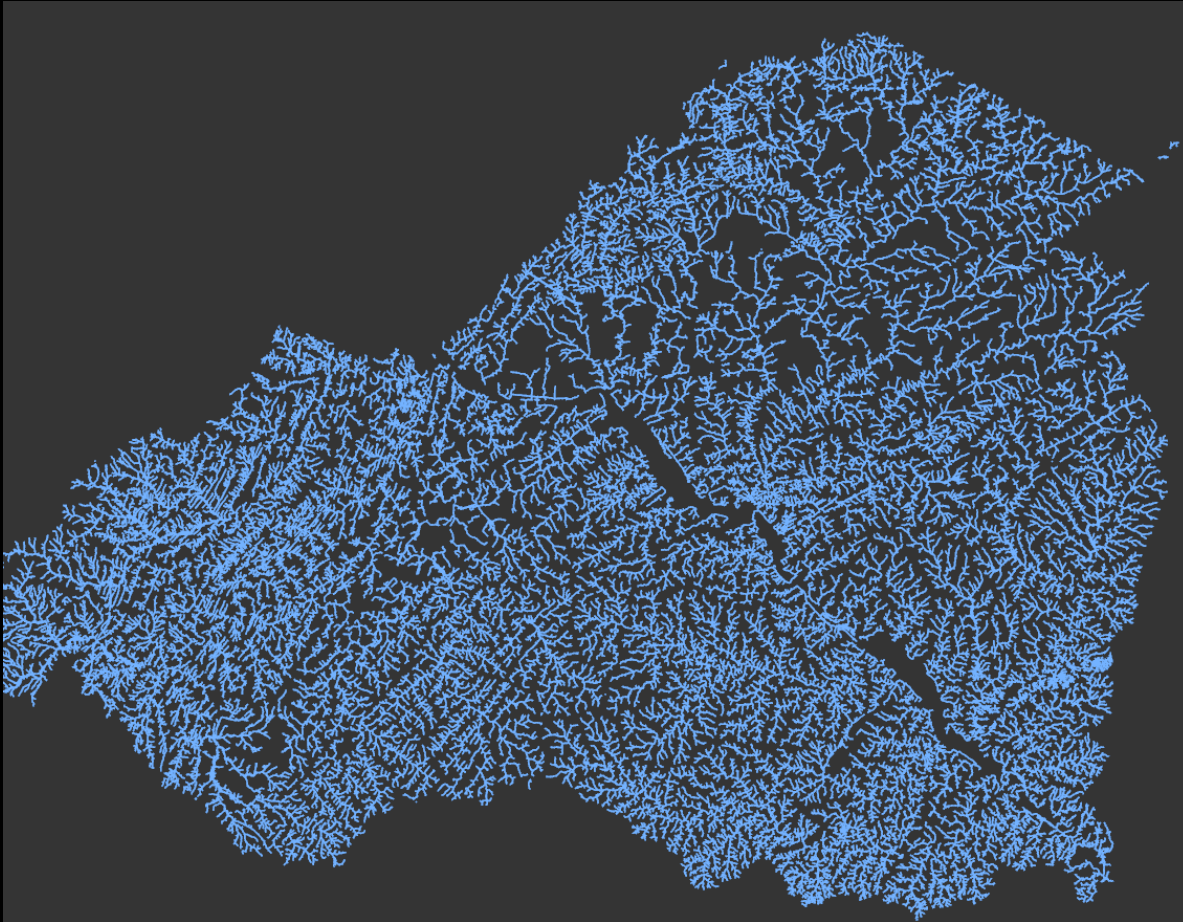


Phase 7 Hydrography

Lower Susquehanna Example

CBP Hyper-Resolution Streams, 1:2000 scale

(Lower Susquehanna Example)



Planned Attributes:

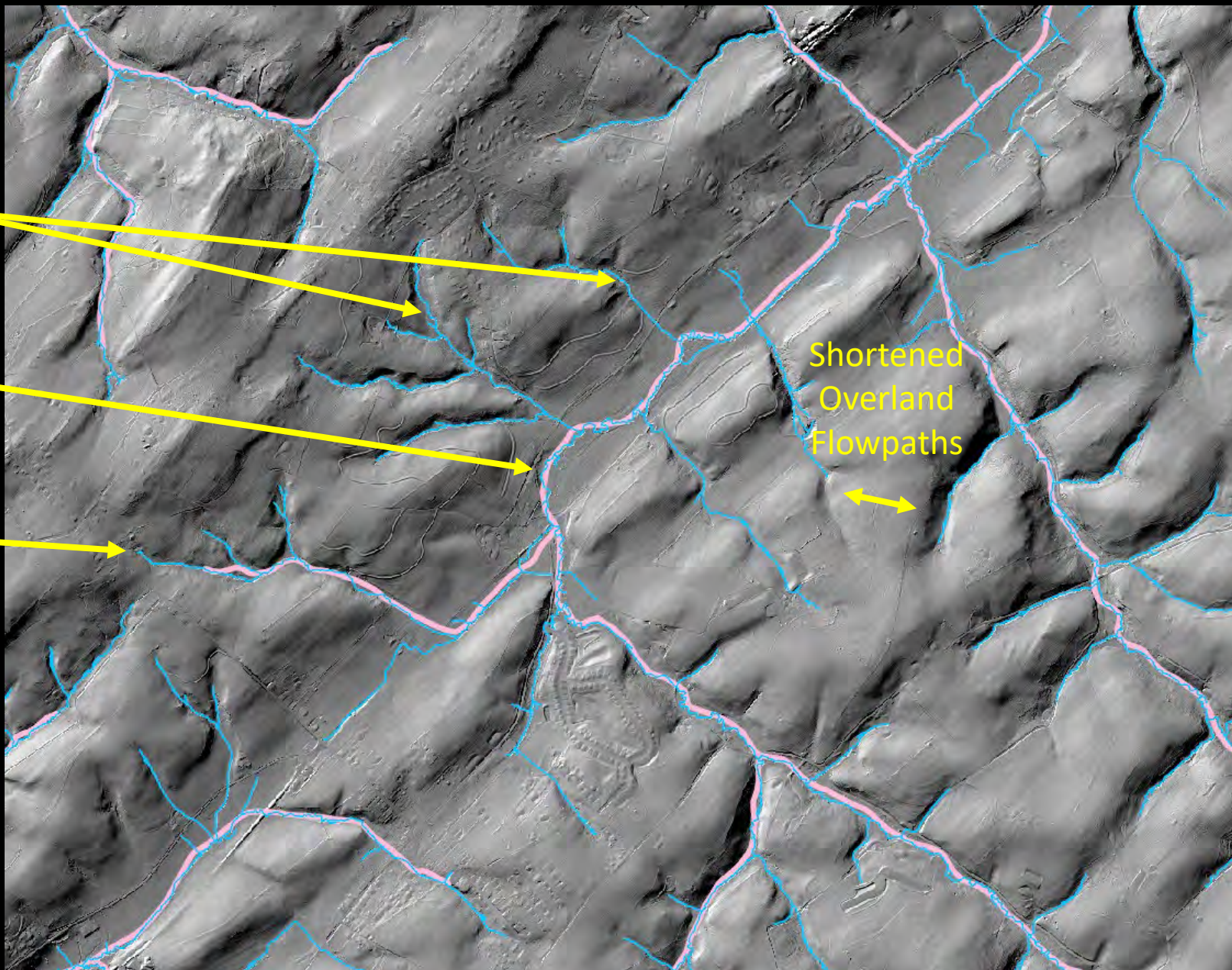
- Channel type (gully, ditch, stream, etc.)
- Bank height
- Channel width
- Floodplain width
- Entrenchment ratio
- Flow permanence probability
- Stream order
- Drainage area

2x difference in stream density (2K vs 24K hydrography)

Added
Tributaries

Increased
Complexity

Extended
headwaters

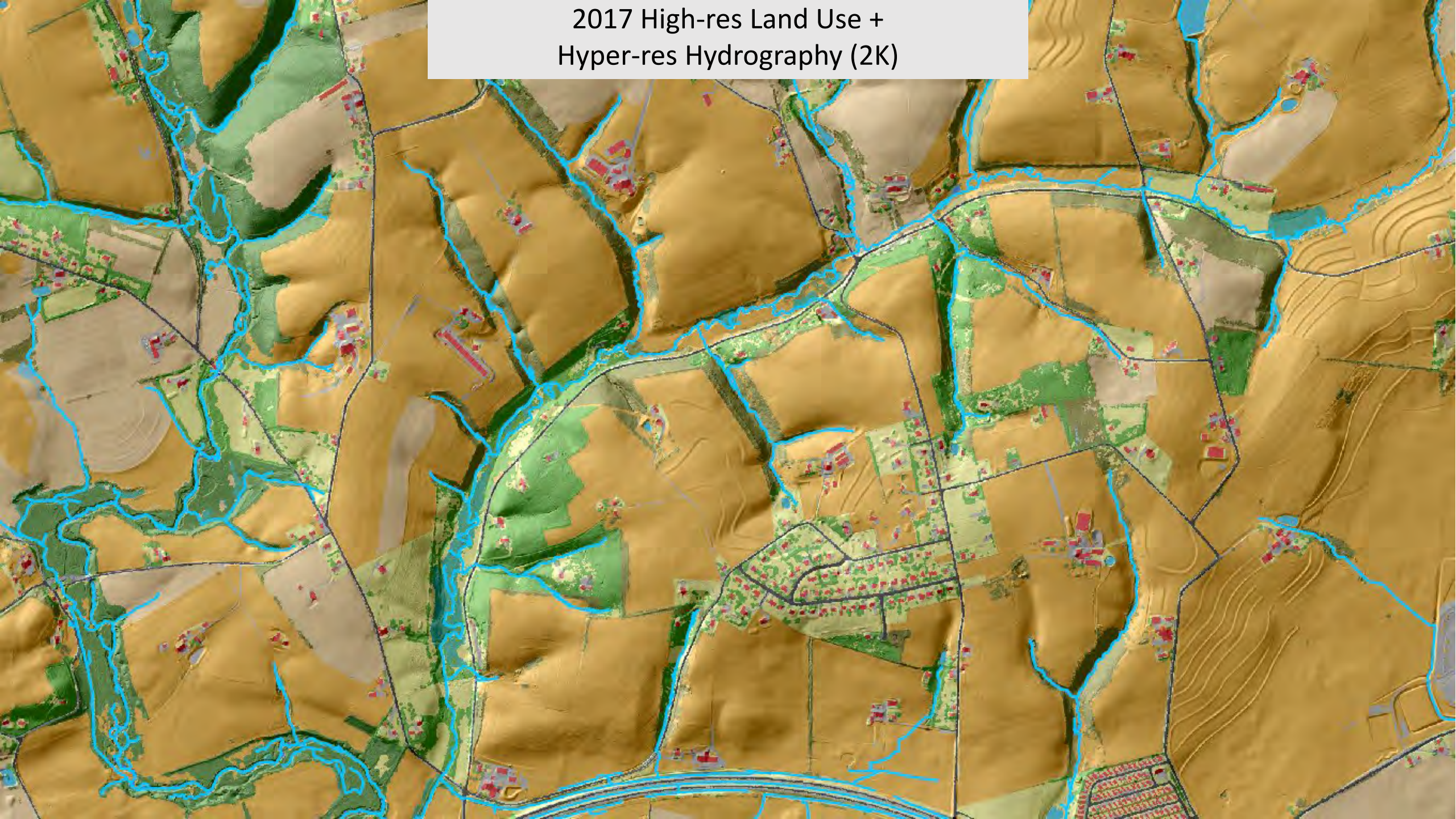


Shortened
Overland
Flowpaths

— NHD24K

— HyperRes

2017 High-res Land Use +
Hyper-res Hydrography (2K)



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