EPA
MID-ATLANTIC REGION

You have arrived at:

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

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

Welcome!

We will get started soon.

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.

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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?

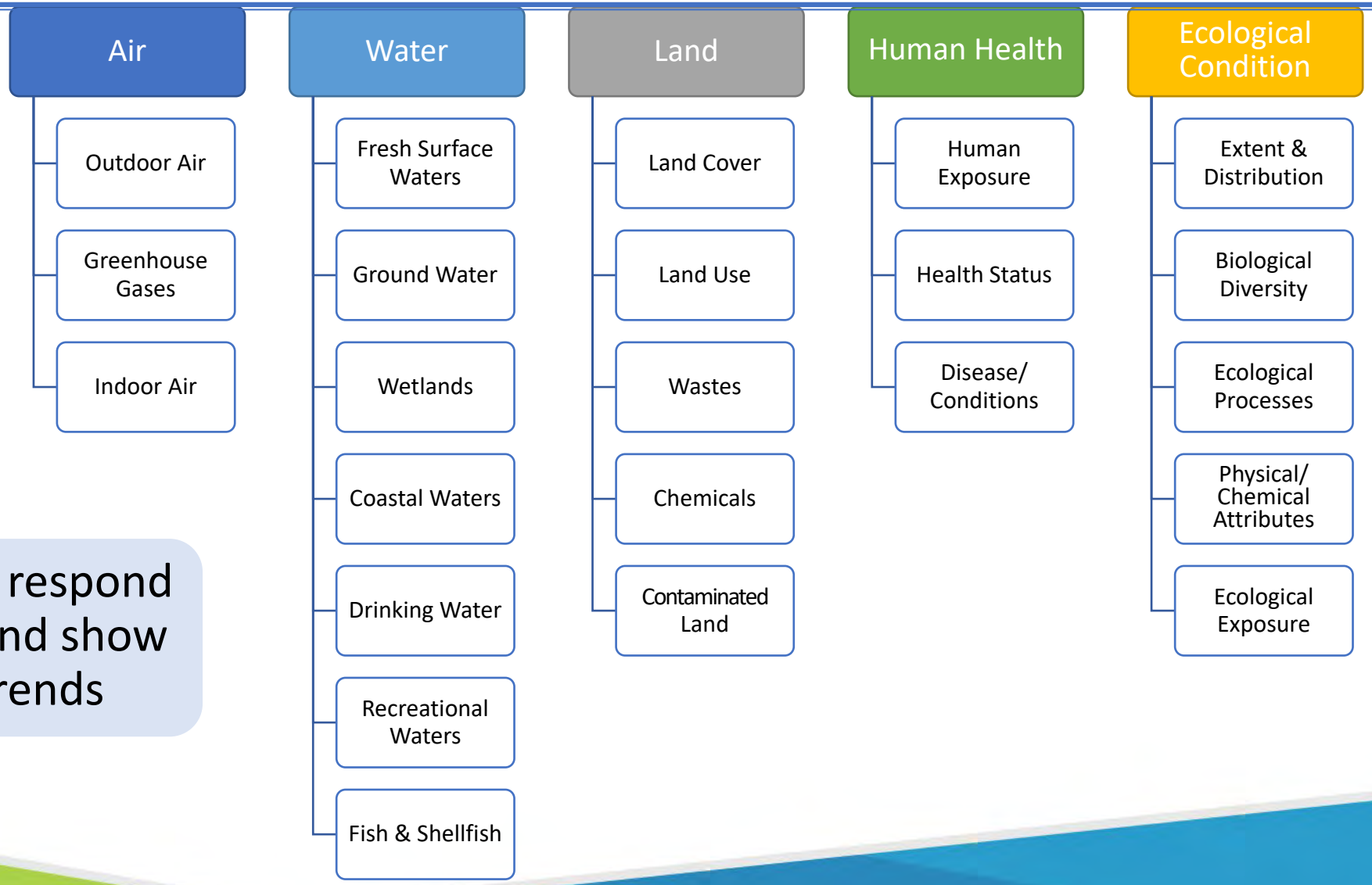
What are the trends in **land cover** and their effects on human health and the environment?

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.

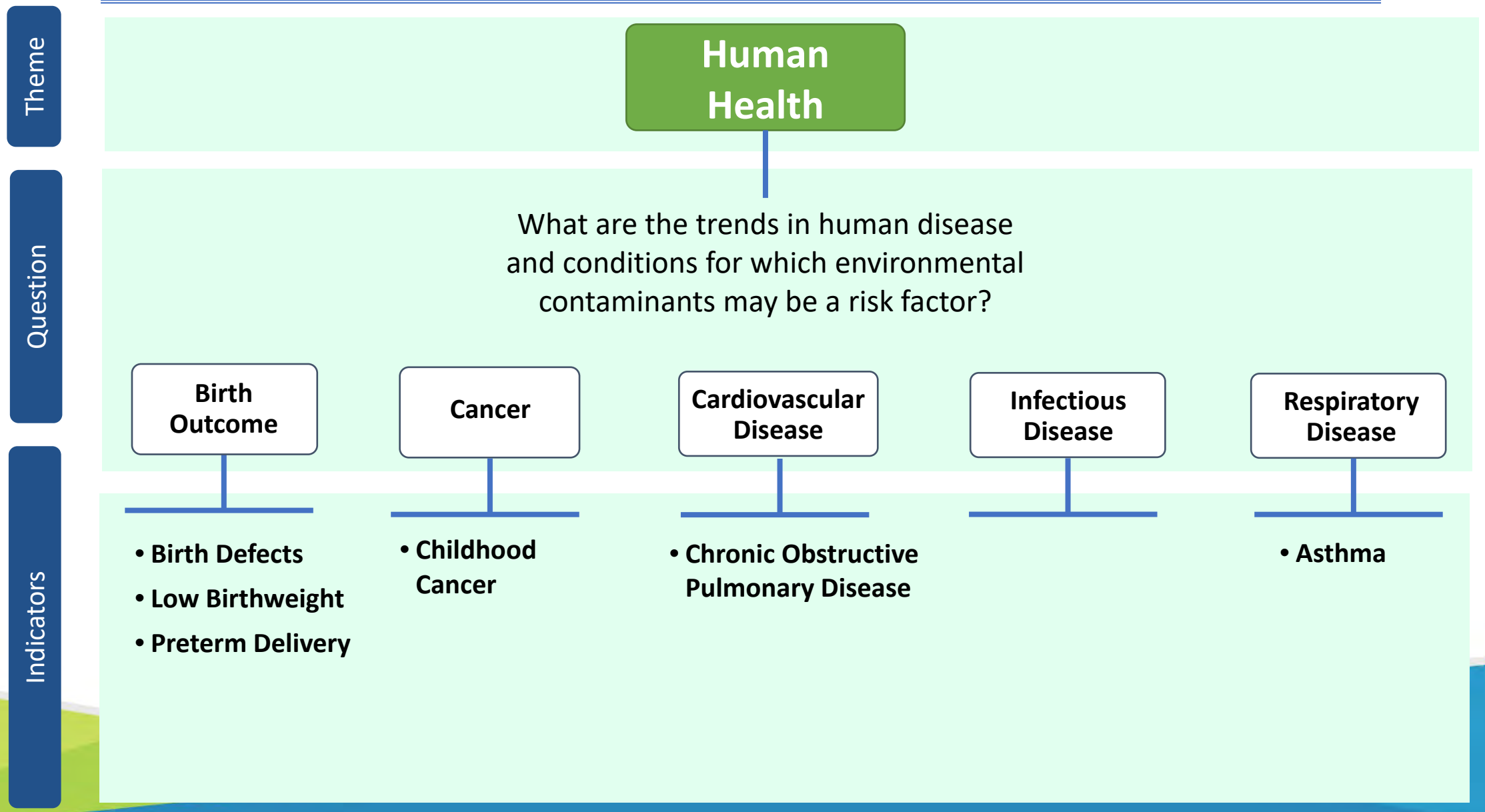
Report Trends	• Status and trends of the environment and human health represented by 80+ indicators
Develop Indicators	• Develop indicators on important issues to EPA
Inform EPA Priorities	• Inform development of Agency activities and priorities
Communicate with Public	• Communicate the state of the nation's environment in an accessible way to the general public

EPA's Report on the Environment (ROE)



80+ indicators respond to questions and show observed trends

EPA's Report on the Environment (ROE)

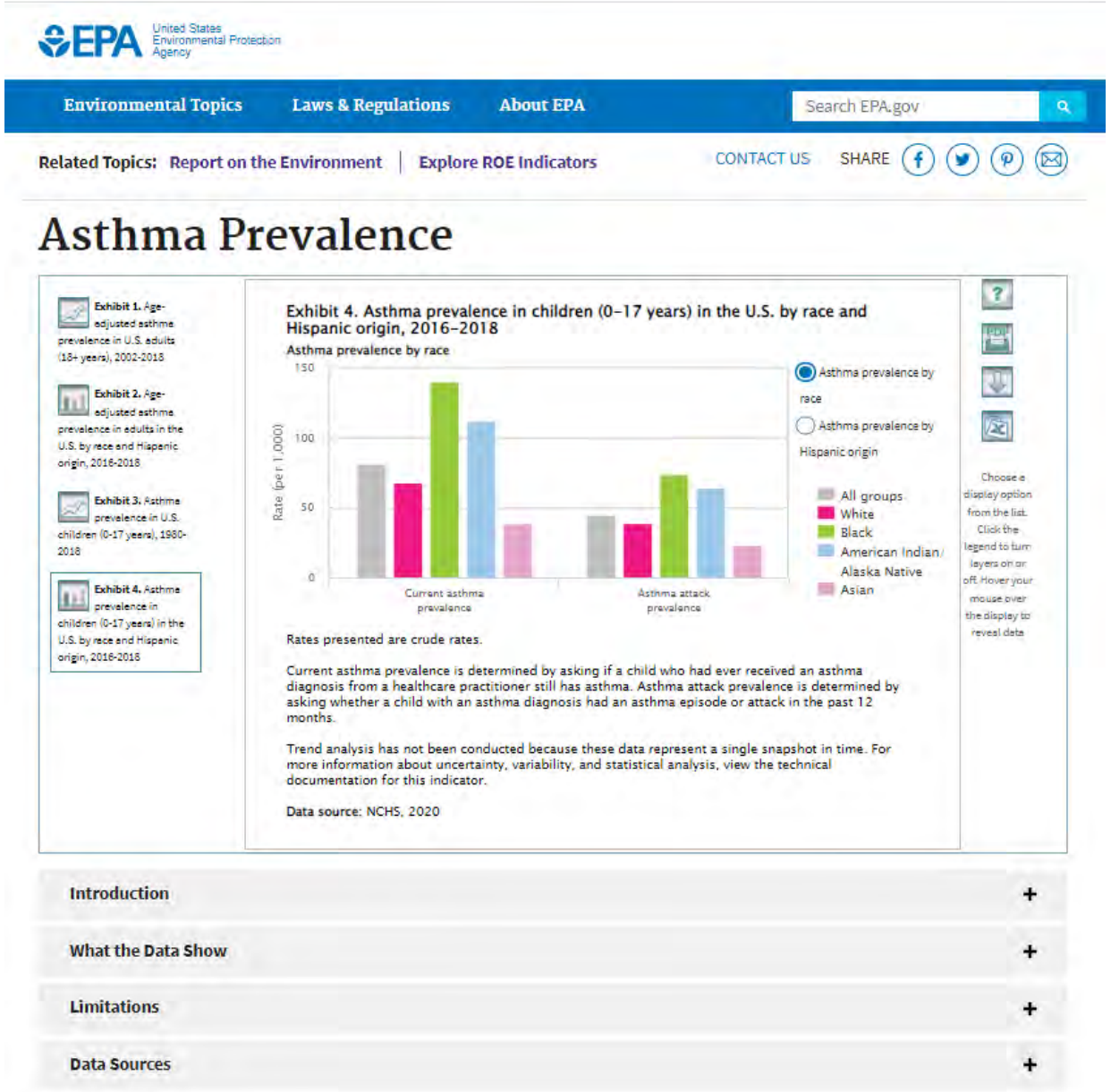


EPA's Report on the Environment (ROE)

Theme

Question

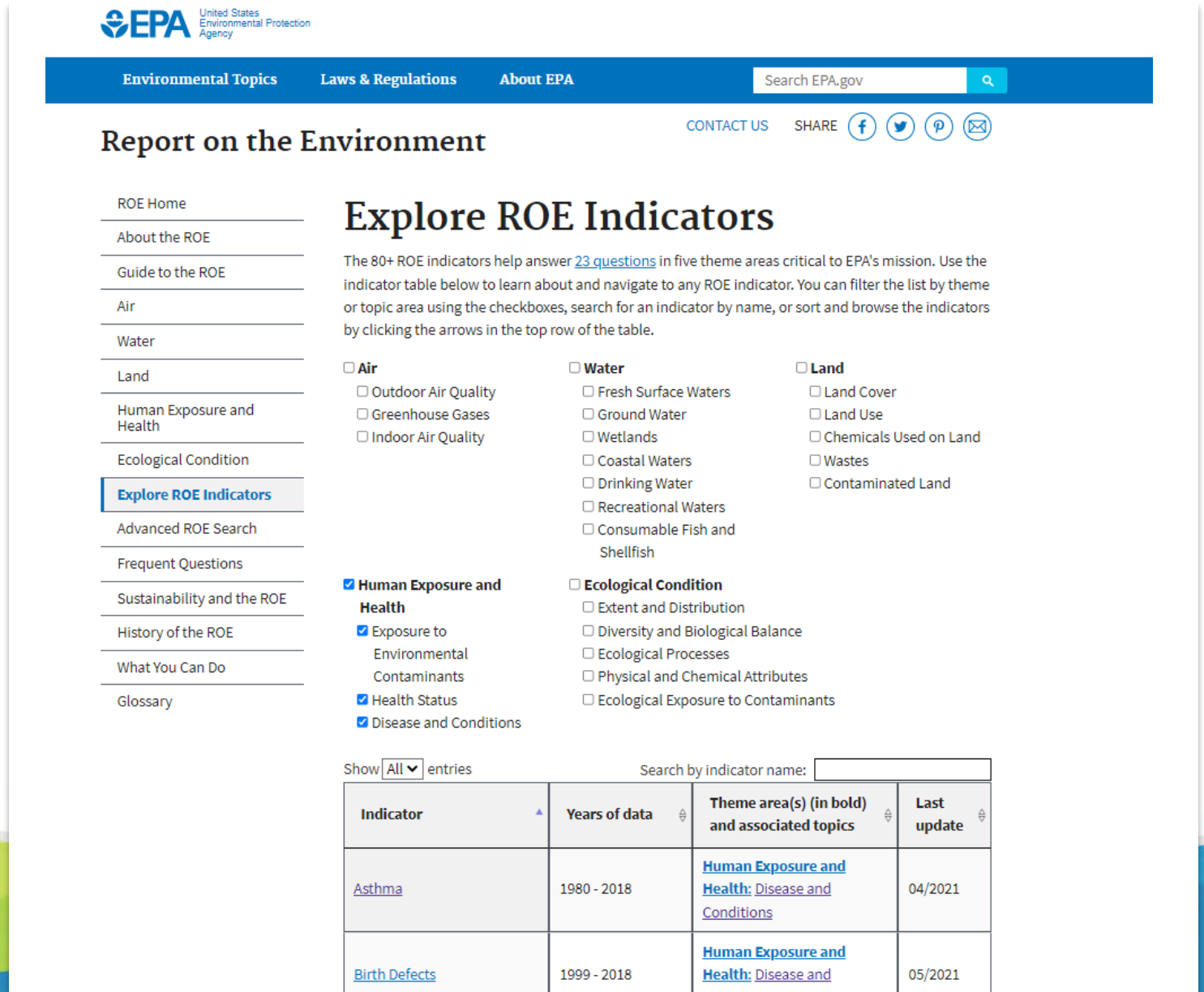
Indicators



Respiratory Disease

- **Asthma**

EPA's Report on the Environment (ROE)



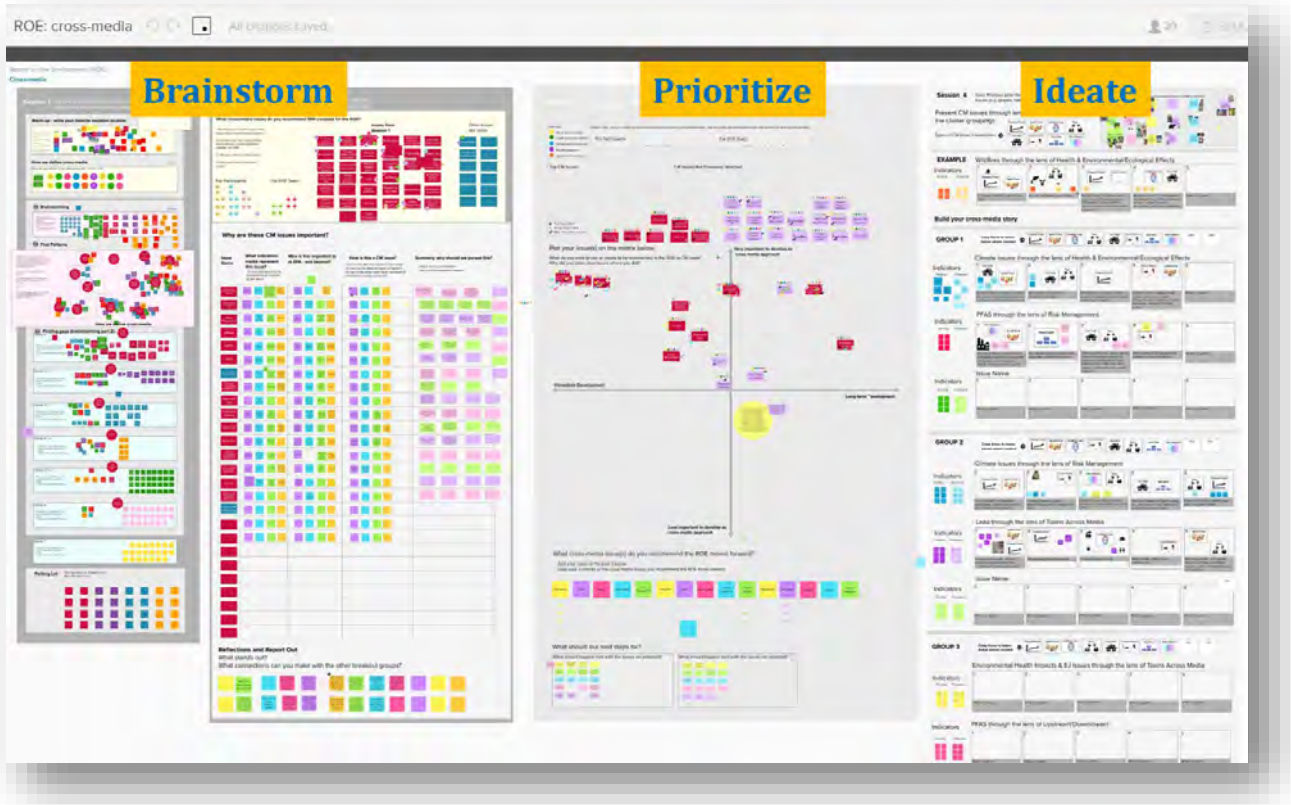
Sortable, filterable, searchable table of the 80+ indicators

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



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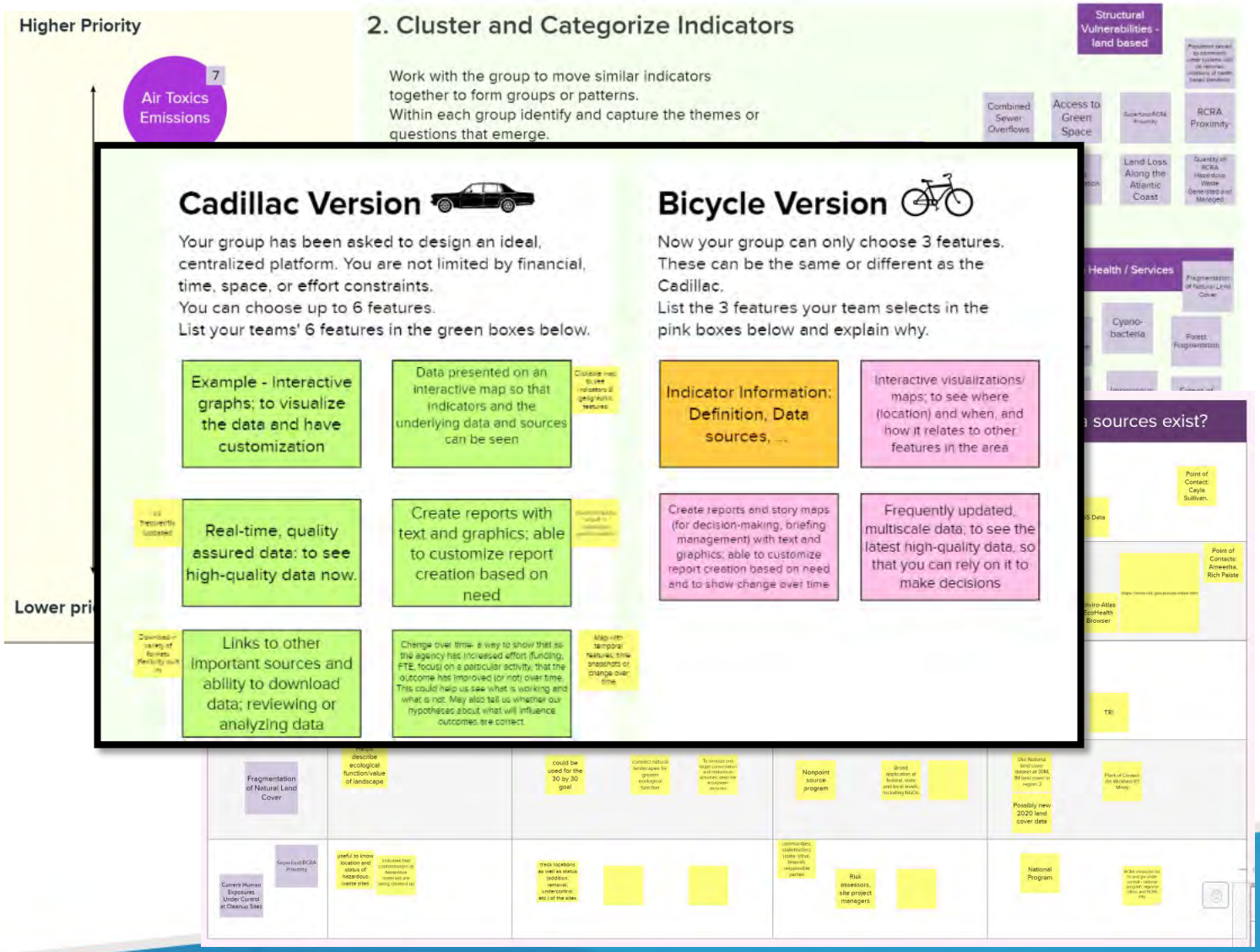
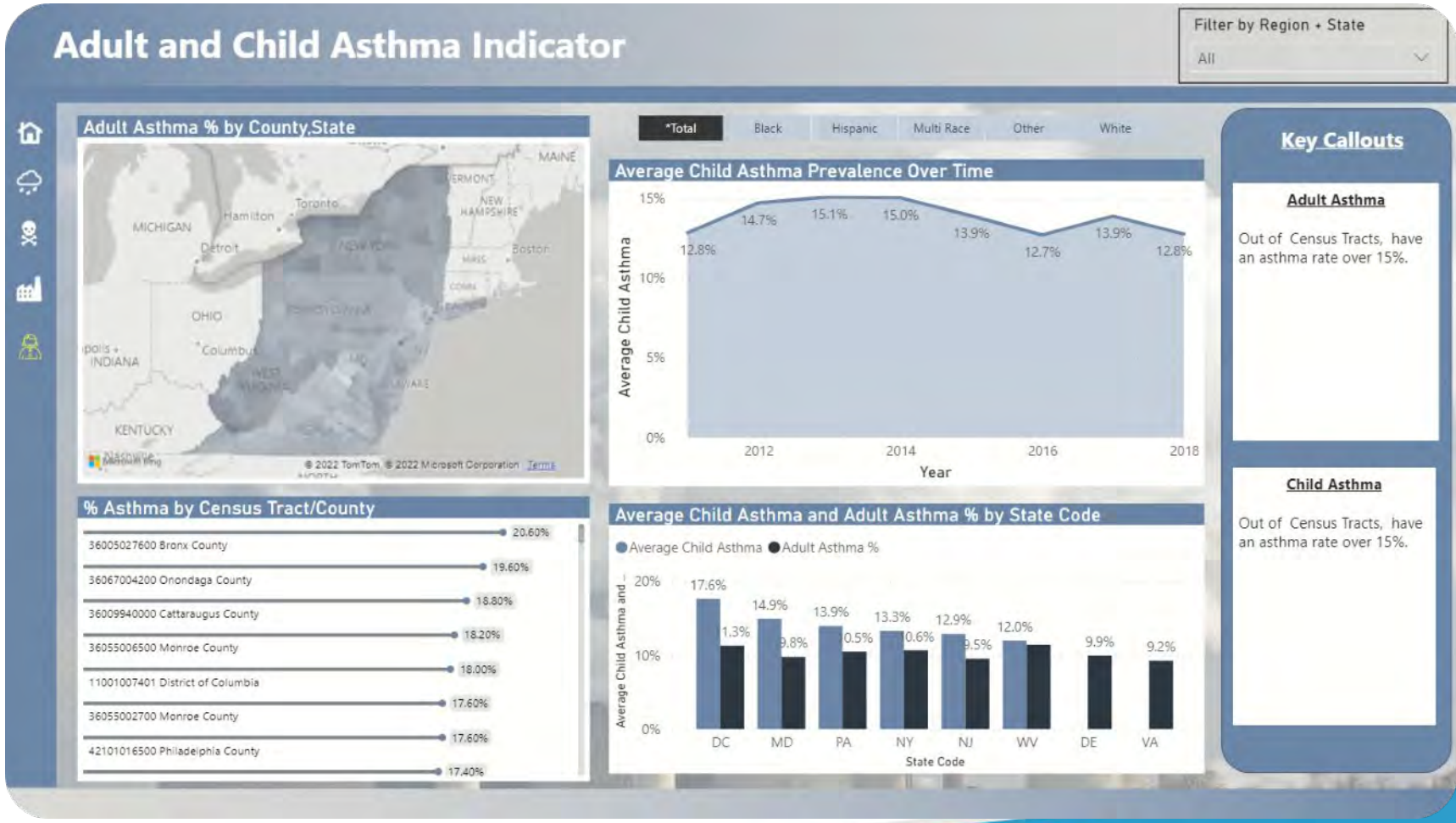


Developing a Mid-Atlantic ROE

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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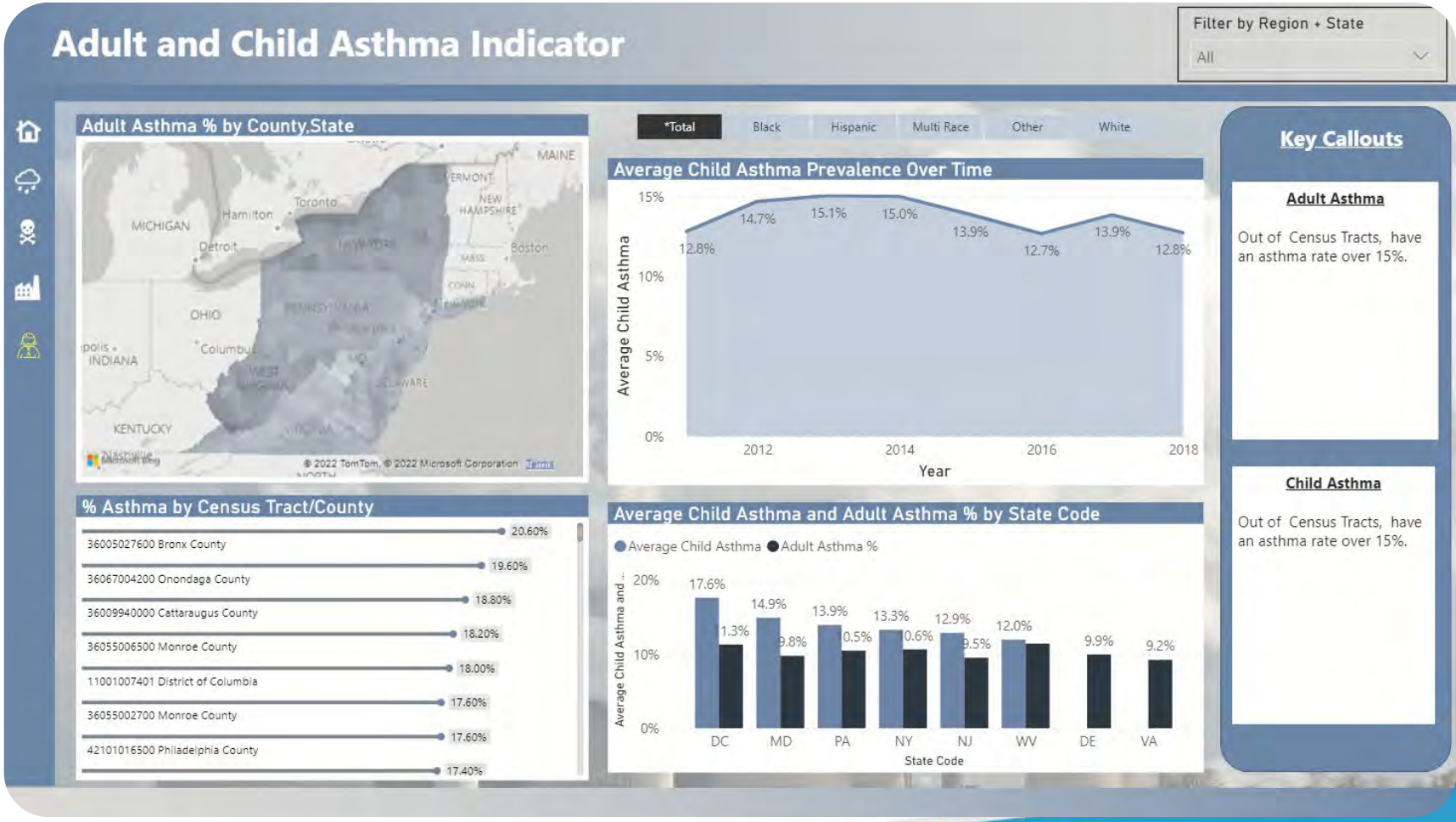

Research → Brainstorm → Prototype

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 EXIT

- 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

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to Inform State, Tribal, & Local Initiatives

USEPA Mid-Atlantic Region

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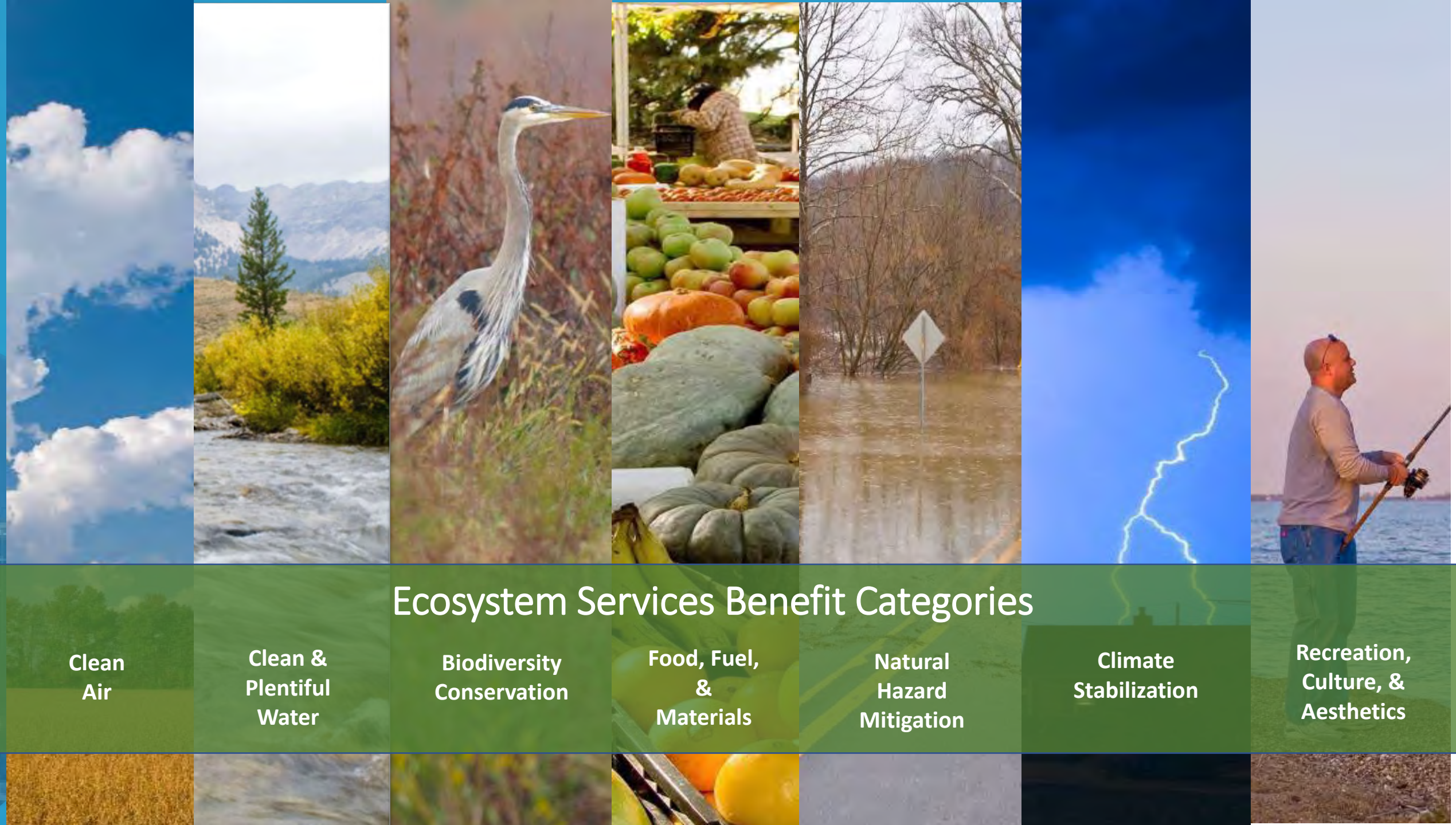
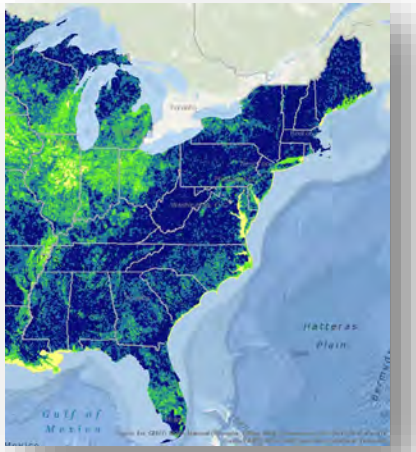
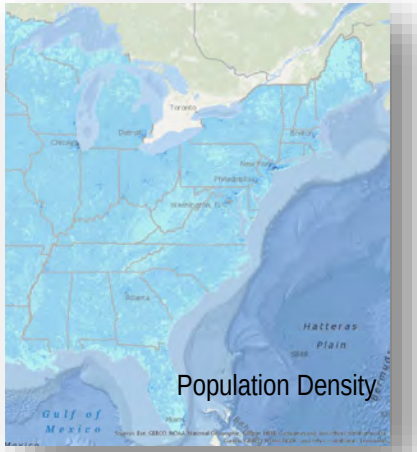


Ecosystem Services Benefit Categories

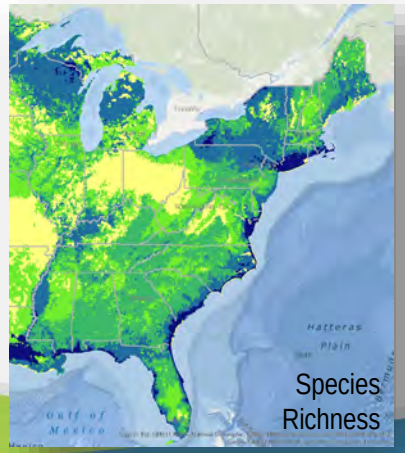
- Clean Air
- Clean & Plentiful Water
- Biodiversity Conservation
- Food, Fuel, & Materials
- Natural Hazard Mitigation
- Climate Stabilization
- Recreation, Culture, & Aesthetics





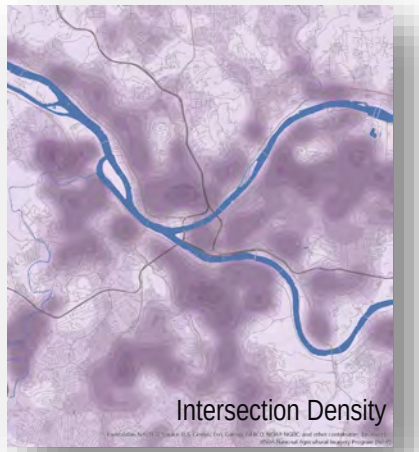
National Data

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



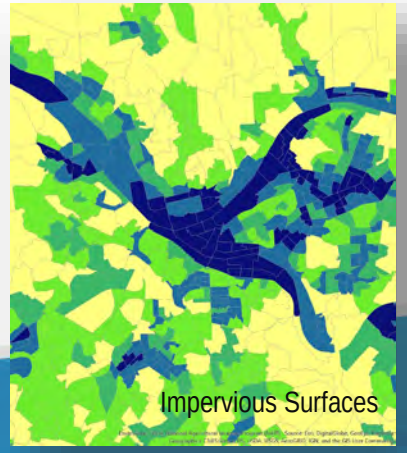
EnviroAtlas

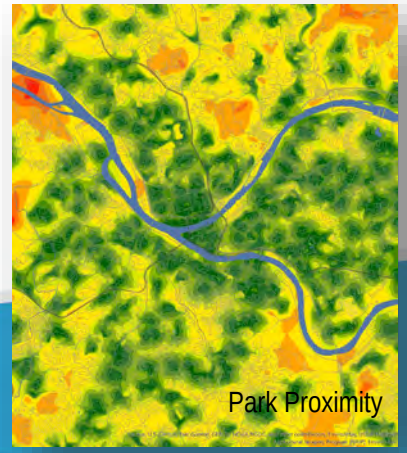
Data Fact Sheets
Peer-reviewed
Standard Metadata
Open access

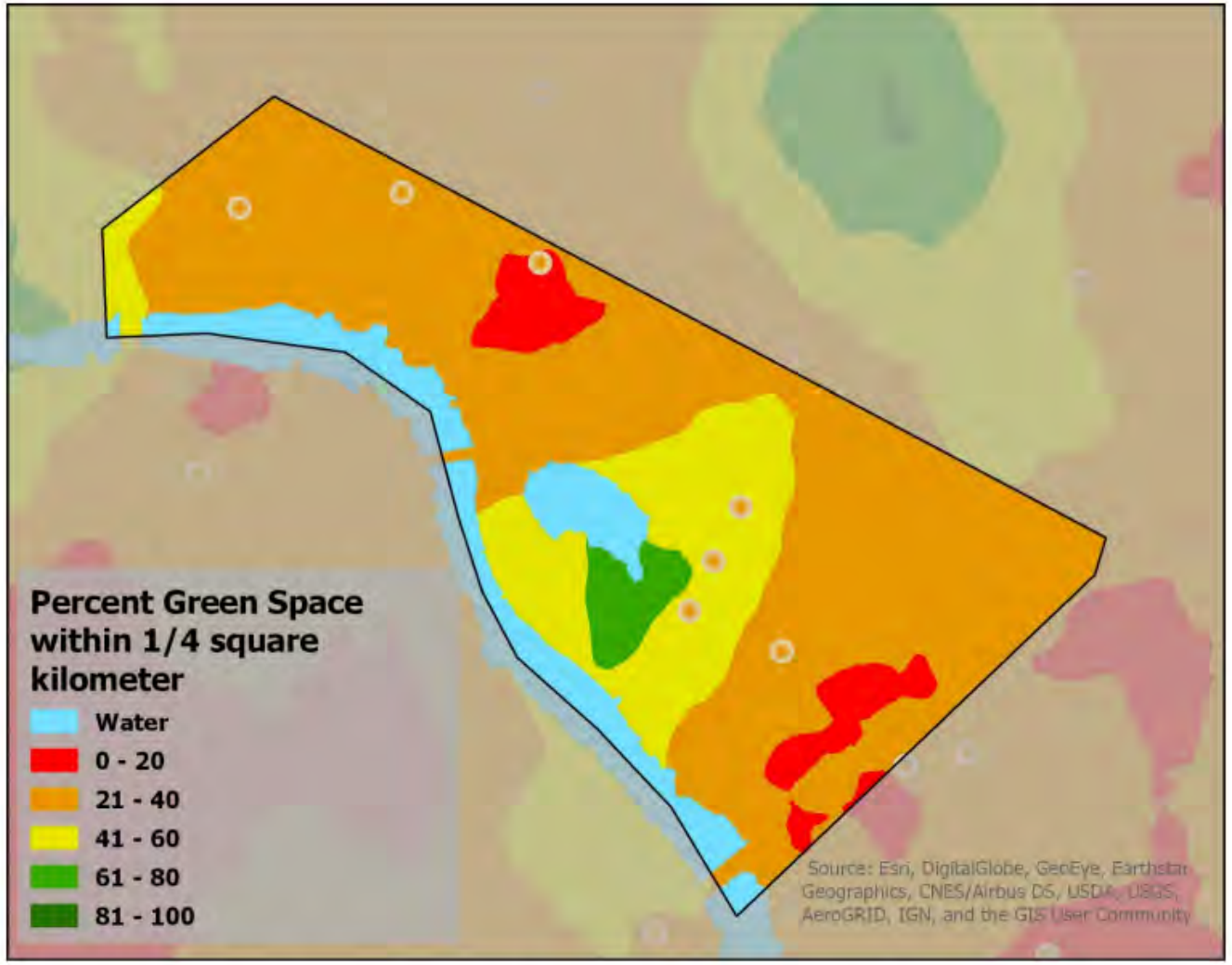


Community Data

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

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USGS
science for a changing world

University of Vermont
Spatial Analysis Lab

Chesapeake Conservancy
EXPLORE. CONSERVE. INNOVATE.

Very-High Resolution Land Use/Land Cover Data

Peter Claggett[1], Labeeb Ahmed[1], Jacob Czawlytko[2], Sean MacFaden[3], Patrick McCabe[2], Sarah McDonald[1], Emily Mills[2], Jarlath O'Neill-Dunne[3], Katie Walker[2]

[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

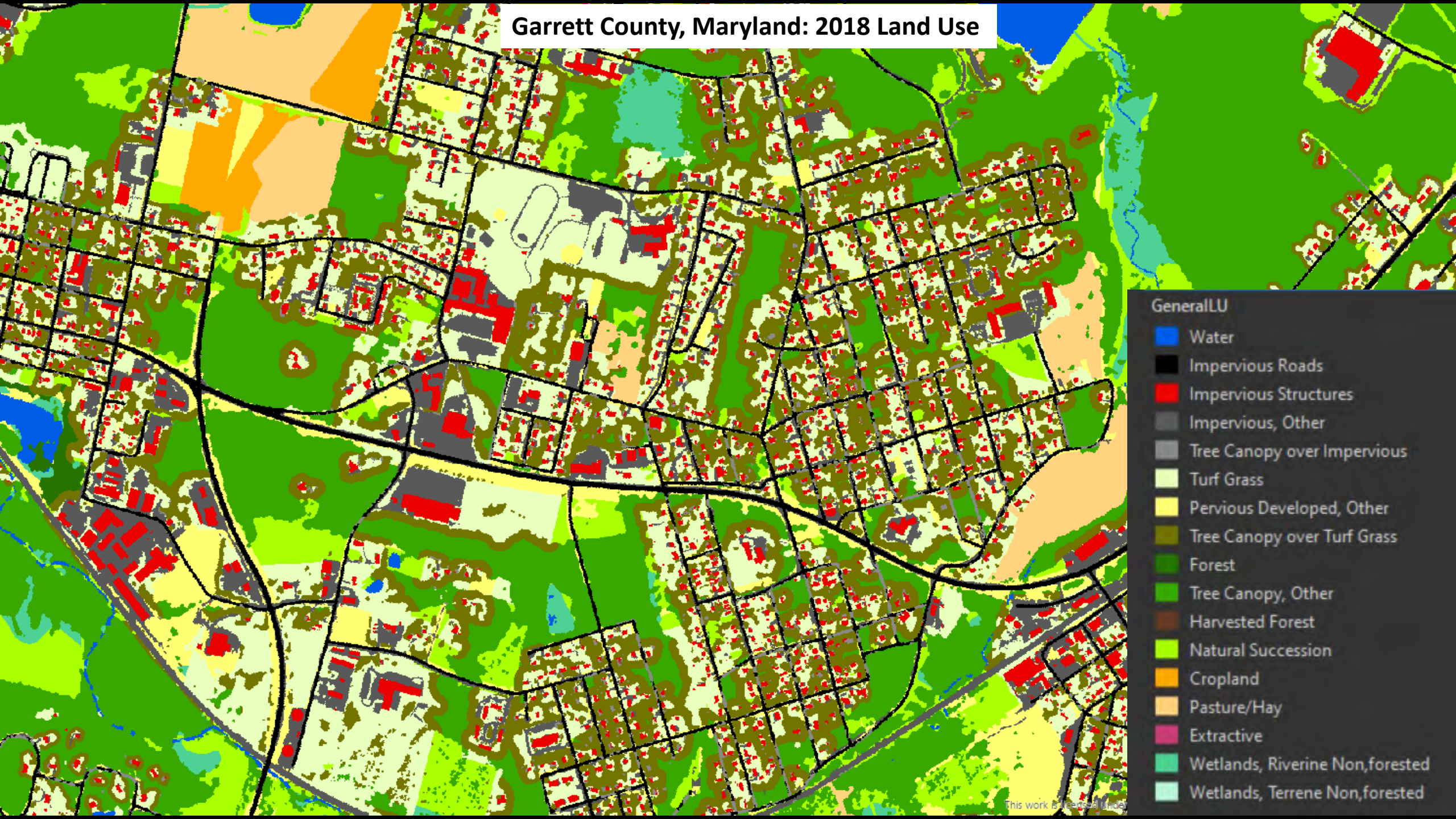
15. **Extractive**
    - 4.3 Extractive (active mines)
      - 4.3.1 Barren

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

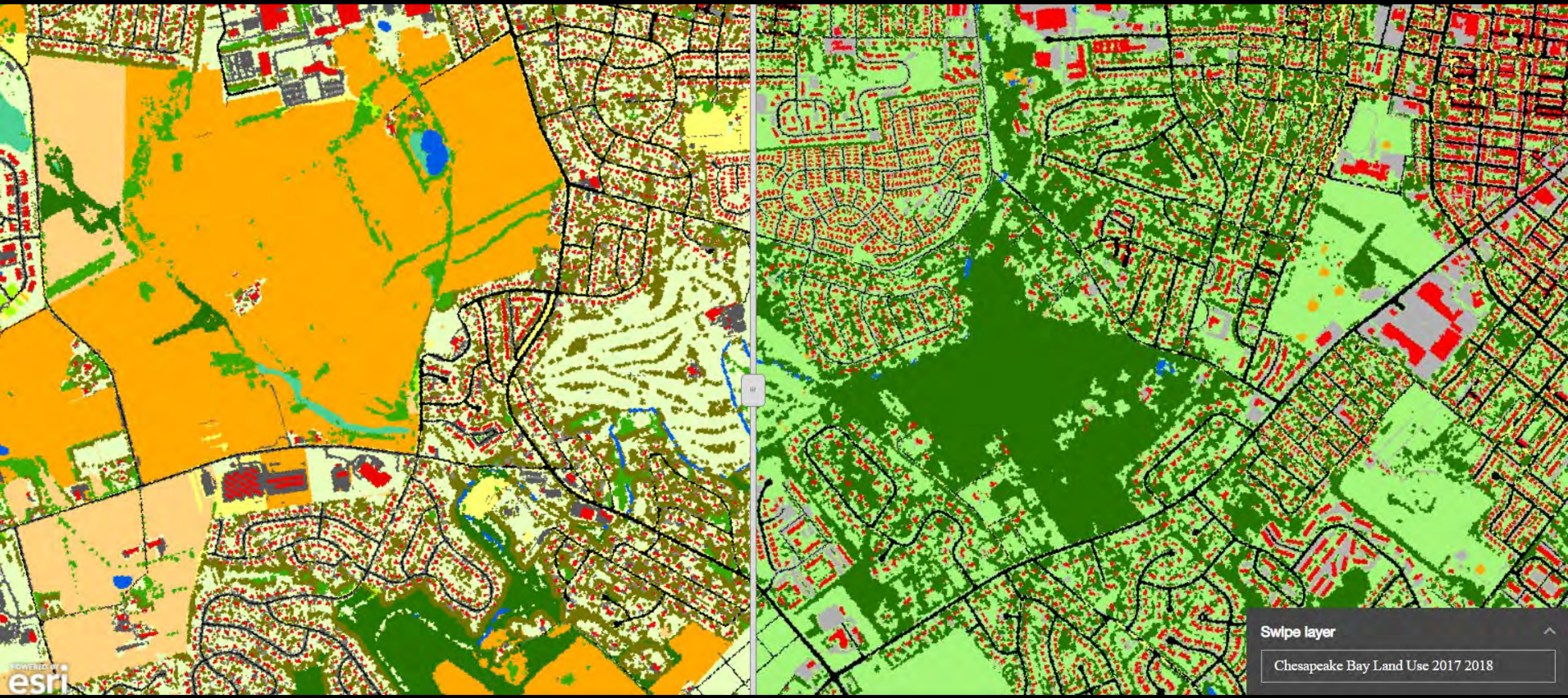
18. **Water**
    - 1.1 Estuarine/ Marine
    - 1.2 Lentic
    - 1.3 Lotic

Garrett County, Maryland: 2018 Land Use



Land Use/Land Cover

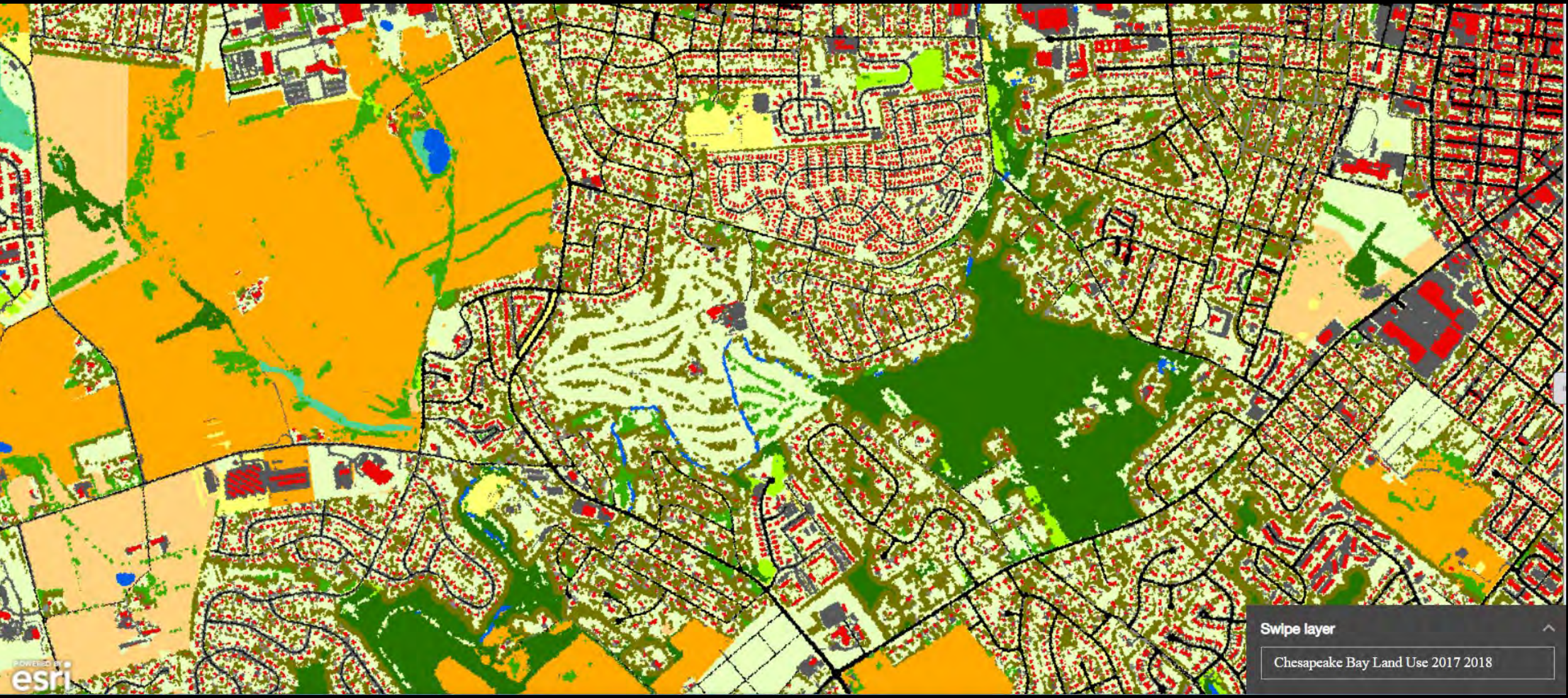
Land Cover



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

Land Use/Land Cover

Land Cover



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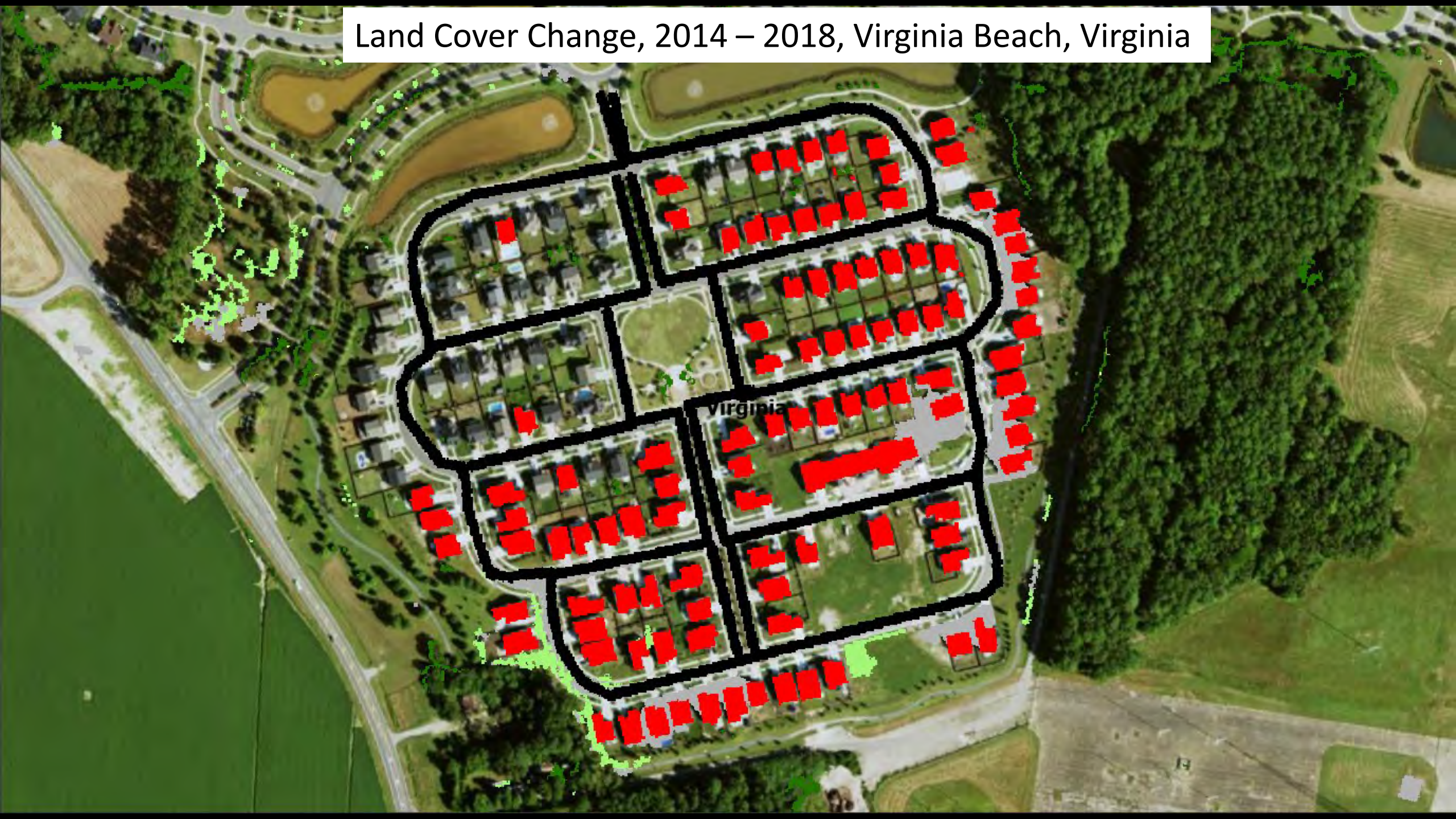
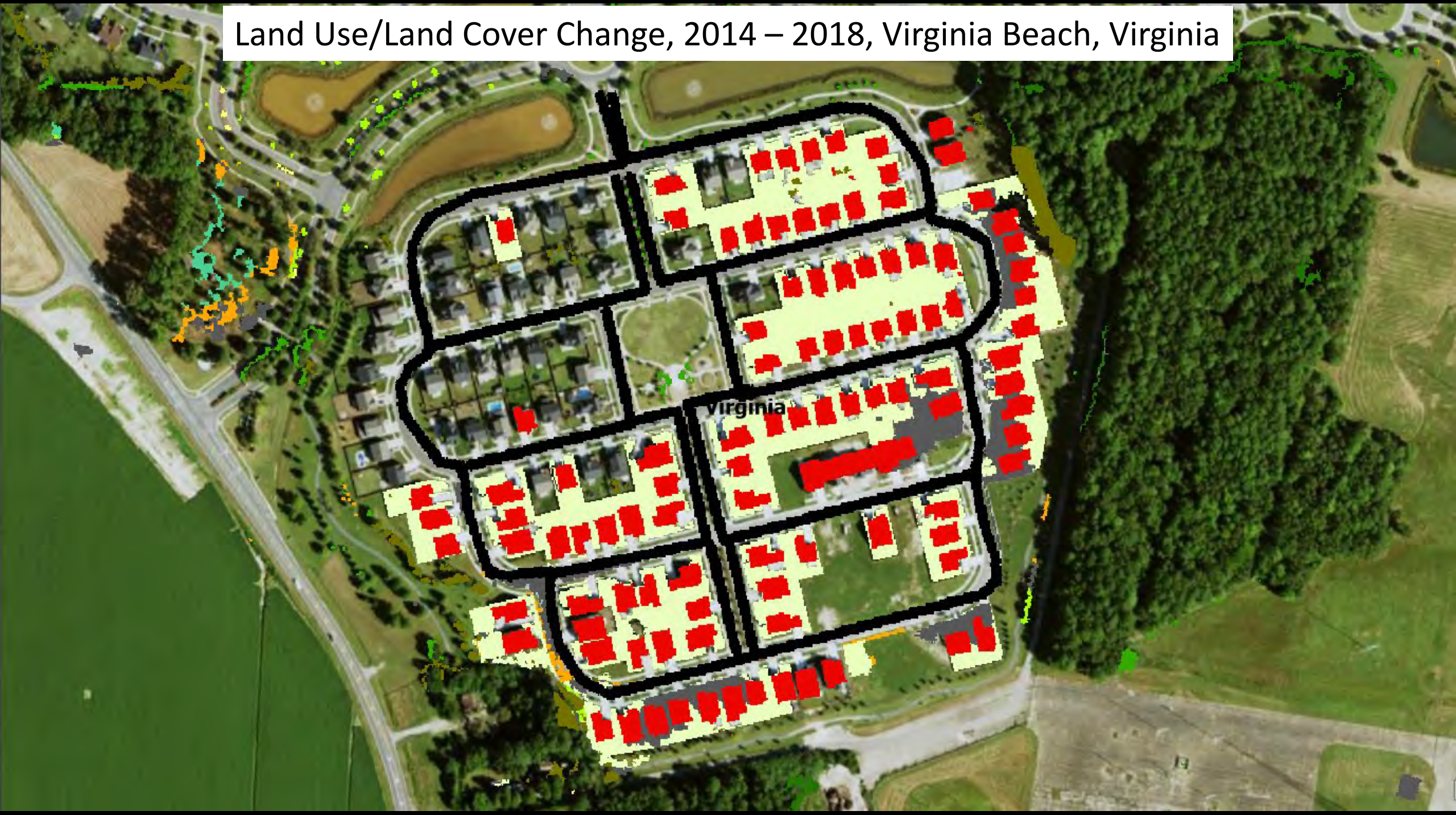
Land Cover Change, 2014 – 2018, Virginia Beach, Virginia



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



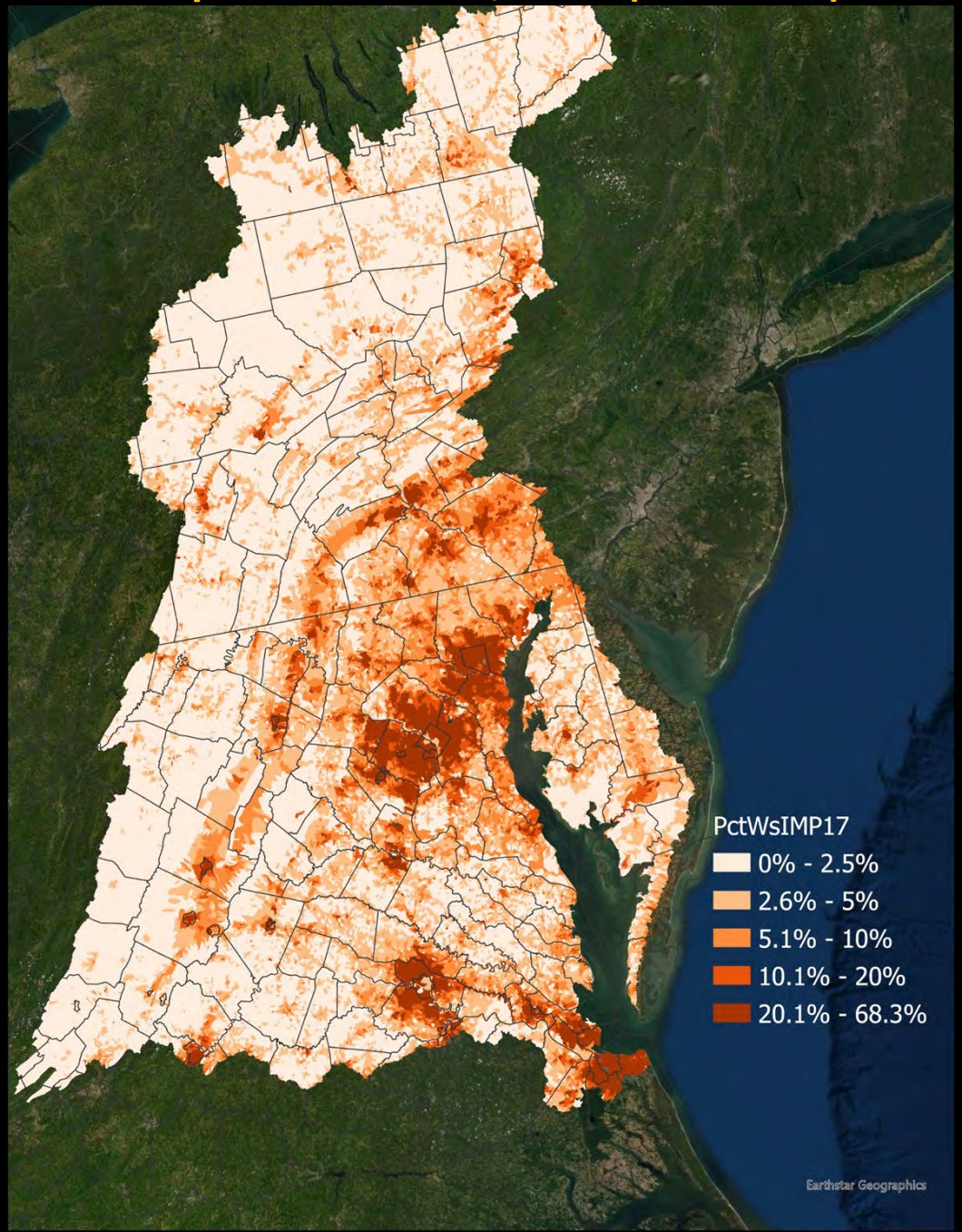
2013/2014 NAIP

2017/2018 NAIP

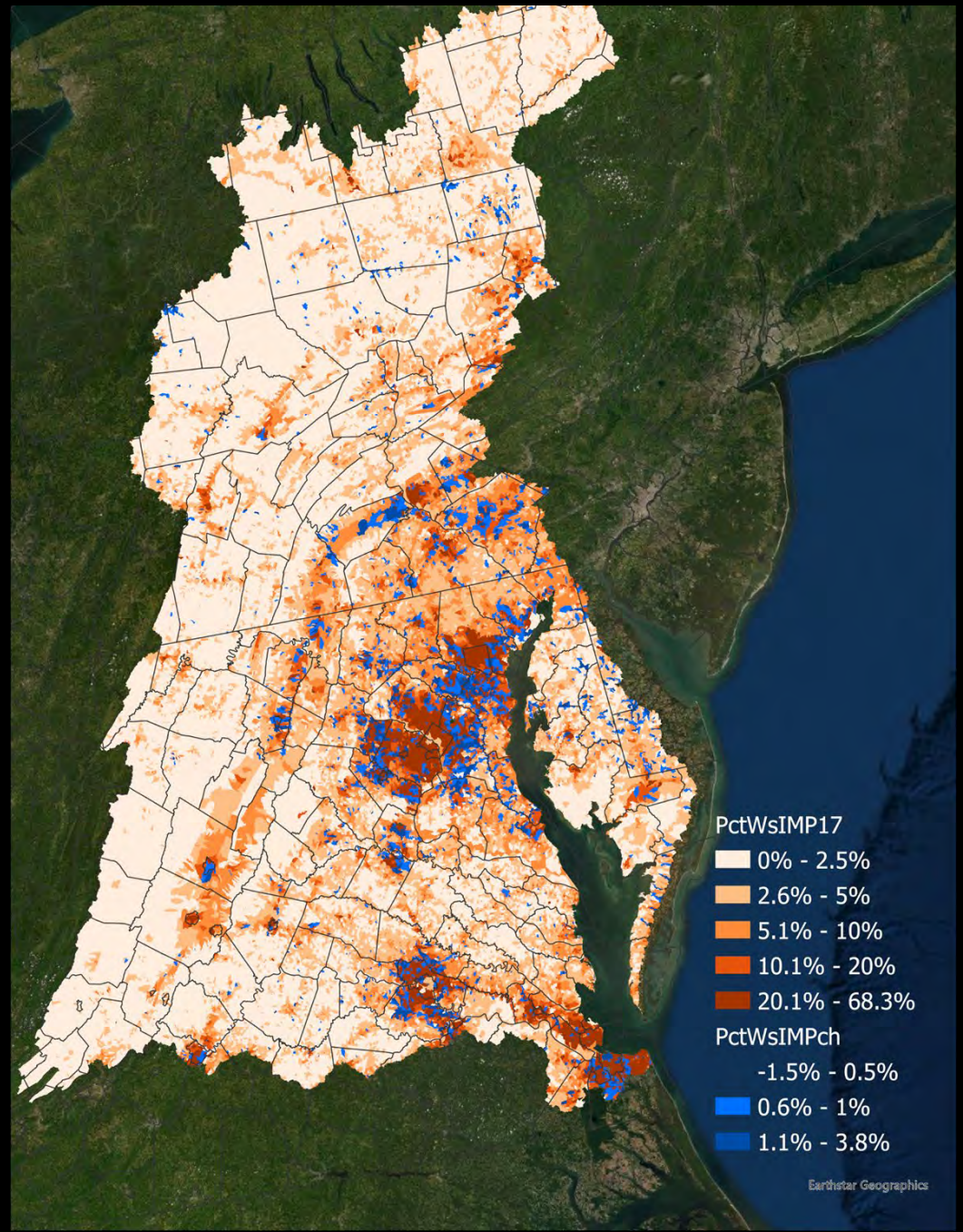
Land Use / Land Cover Change, 2013-2018

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

Impervious Cover, 2017 (accum. %)



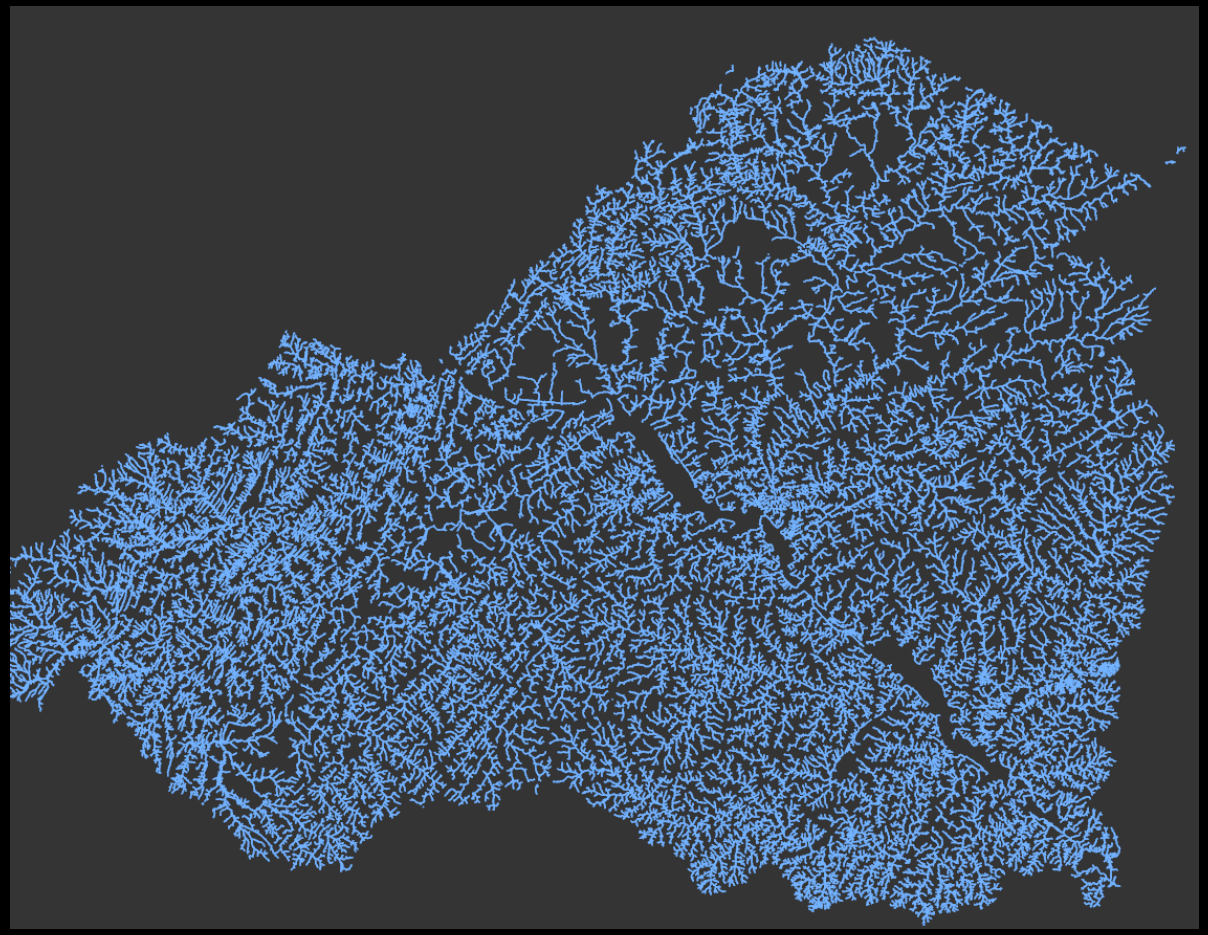
Impervious Cover Change, 2013-17 (accum. %)



Phase 7 Hydrography

Lower Susquehanna Example

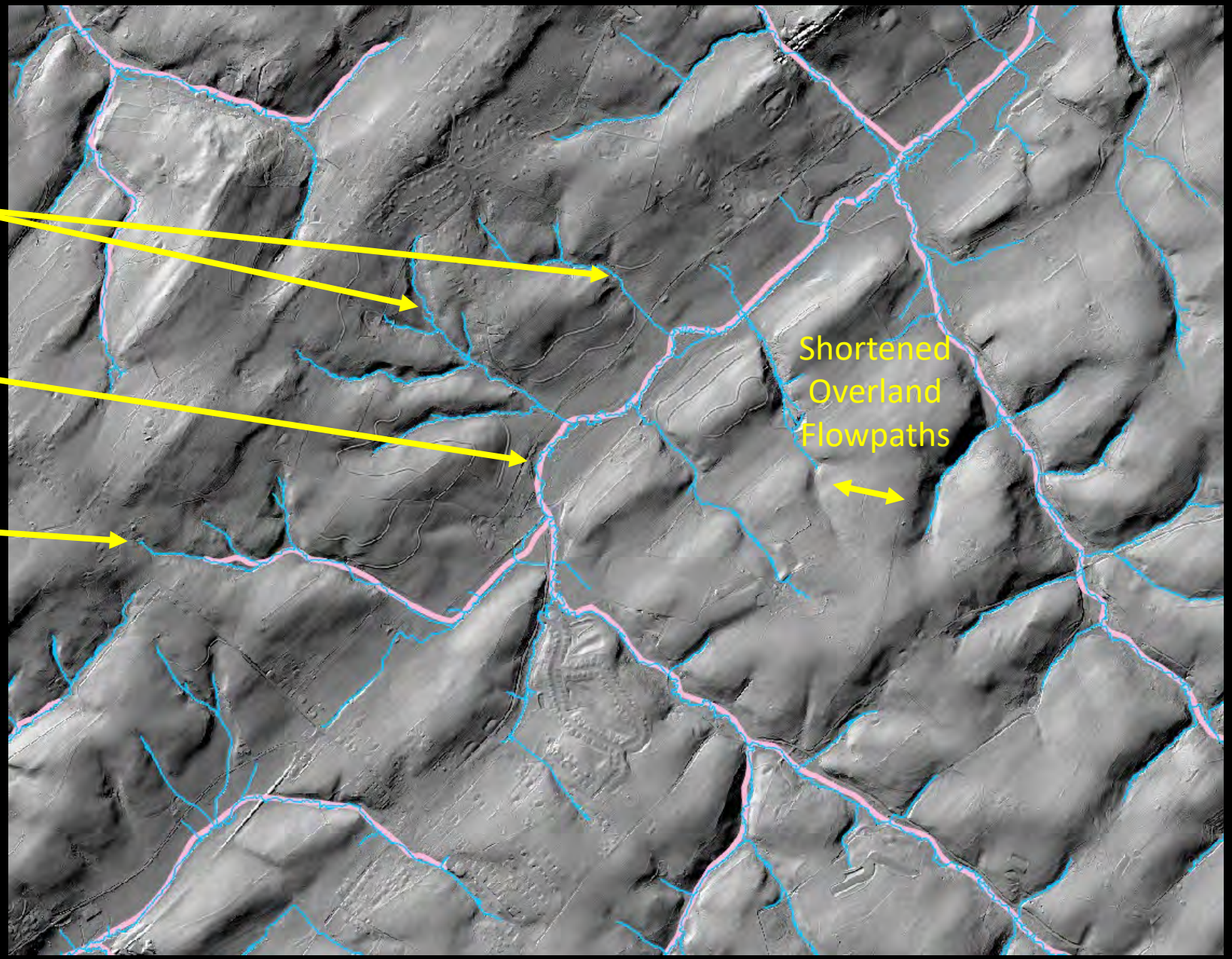
CBP Hyper-Resolution Streams, 1:2000 scale
(Lower Susquehanna Example)



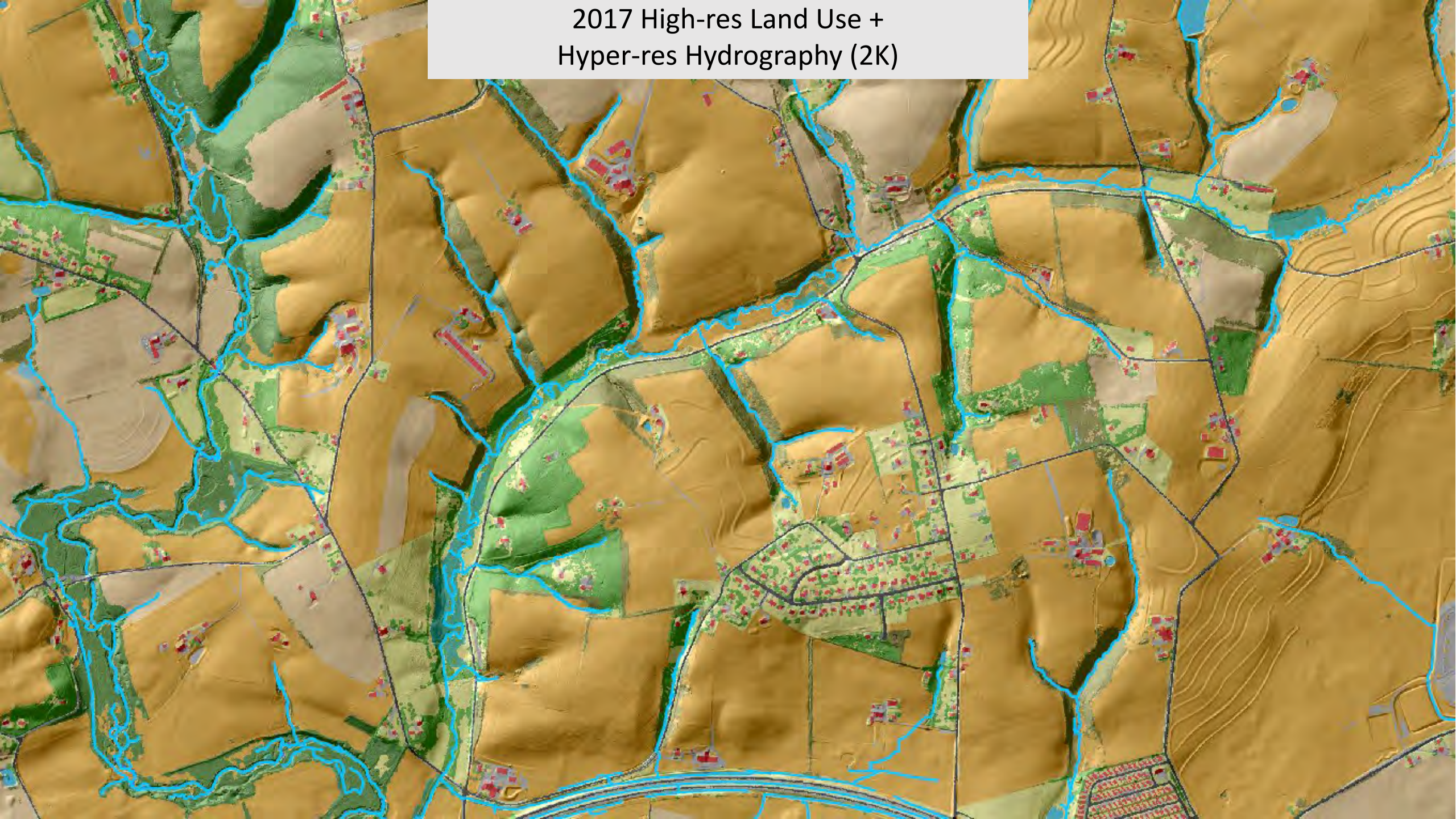
Planned Attributes:

- 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)



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



MID-ATLANTIC REGION

Contact Info:

Peter R. Claggett,
Research Geographer
Lower Mississippi-Gulf Water Science Center
U.S. Geological Survey
1750 Forest Drive
Suite 130
Annapolis, Maryland 21401

Cell: 443-370-5724
Email: pclagget@chesapeakebay.net