



EPA Tools and Resources Webinar

EnviroAtlas: Updates, uses, and coming soon

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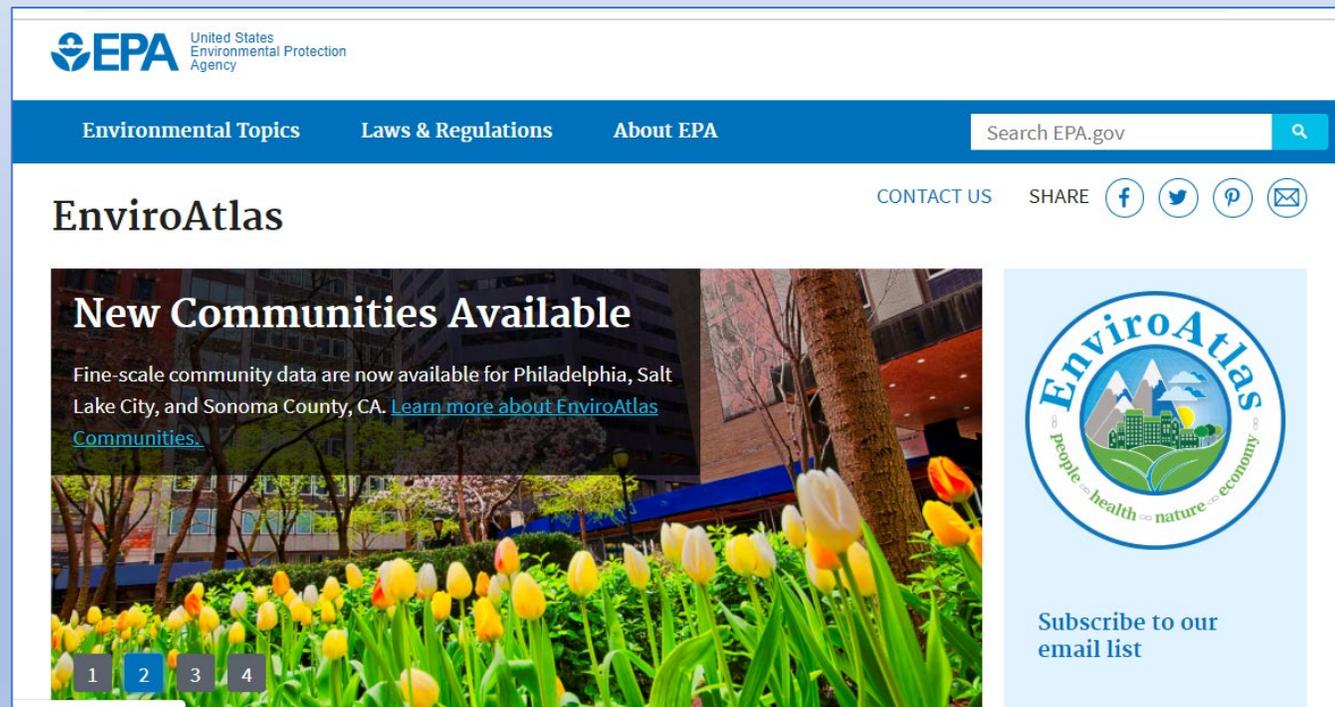
January 15, 2020



EnviroAtlas is a public website with interactive tools that states, tribes and the public are using to help inform policy and planning decisions.

- Increases ability for technology transfer through interactive tools
- Broadly applicable across scales, topic areas, uses
- Provides streamlined access to wealth of data
- Offers consistent format and documentation via metadata and fact sheets

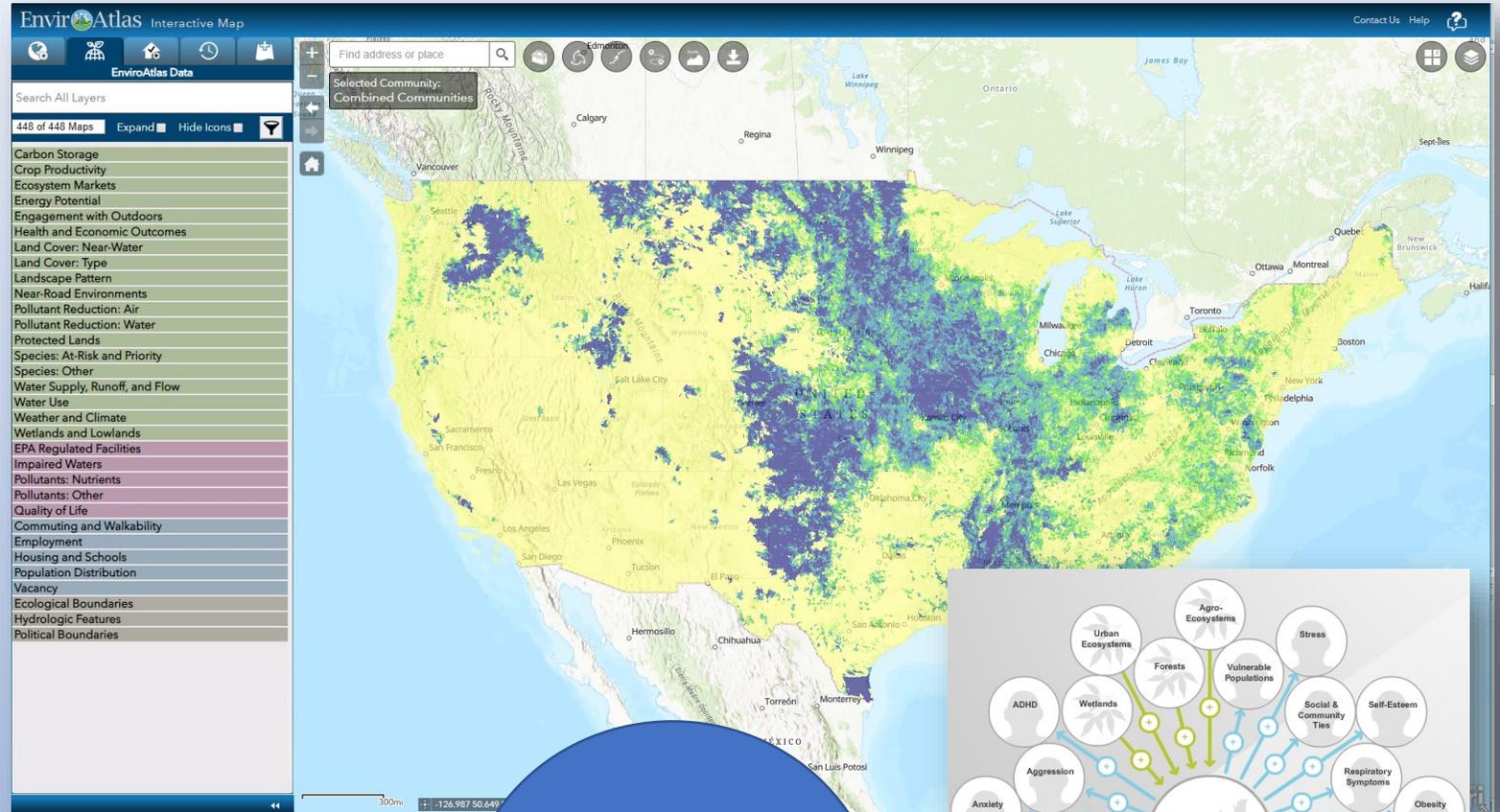
www.epa.gov/enviroatlas



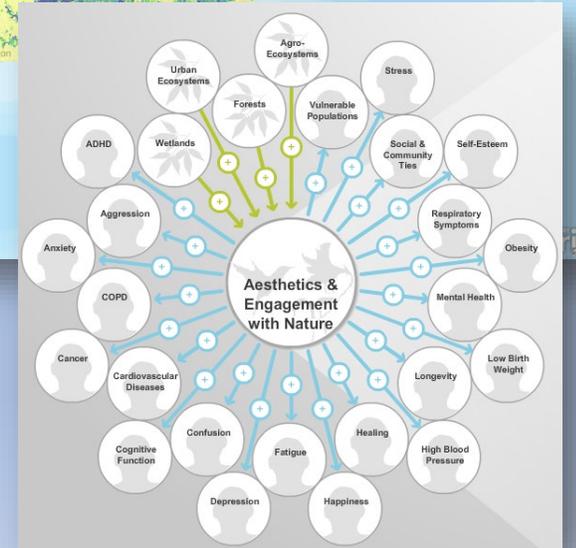
The screenshot shows the homepage of the EnviroAtlas website. At the top left is the EPA logo with the text "United States Environmental Protection Agency". A navigation bar contains "Environmental Topics", "Laws & Regulations", and "About EPA", along with a search box labeled "Search EPA.gov". The main heading "EnviroAtlas" is on the left, with "CONTACT US" and social media icons (Facebook, Twitter, Pinterest, Email) on the right. The central banner features a photograph of tulips and a building, with the text "New Communities Available" and a link to "Learn more about EnviroAtlas Communities". On the right side, there is a circular logo for EnviroAtlas with the tagline "people - health - nature - economy" and a "Subscribe to our email list" button.

EnviroAtlas Includes:

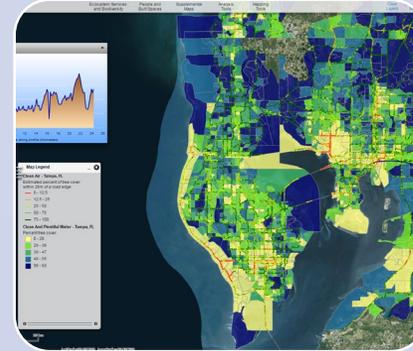
- Interactive Mapping Application
- Eco-Health Relationship Browser
- 400+ Geospatial Datasets
- Analytic and Interpretive Tools
- GIS Toolboxes
- Video Tutorials (new)
- Educational Lesson Plans (new)
- Guide for use in Health Impact Assessment



EnviroAtlas
Flagship tools



EnviroAtlas Educational Curriculum



K- 6

*Exploring
Your
Watershed*

*Also available
in Spanish*

4 - 6

*Introduction
to Ecosystem
Services*

*Suite of 6
mini lessons*

4 -12+

*Connecting
Ecosystems
and Human
Health*

9 - 12+

*Building a
Greenway
Case Study*

- Four lesson modules, with hands-on and outdoor portions
- Align with Next Generation Science Standards and individual State Science Standards
- Adaptations available for each lesson

5 Ecosystems:

- Forests
- Urban ecosystems
- Wetlands
- Agro-ecosystems
- Drylands

6 Ecosystem Services:

Health promotional services

- Aesthetics & Engagement with Nature
- Recreation & Physical Activity

Buffering services

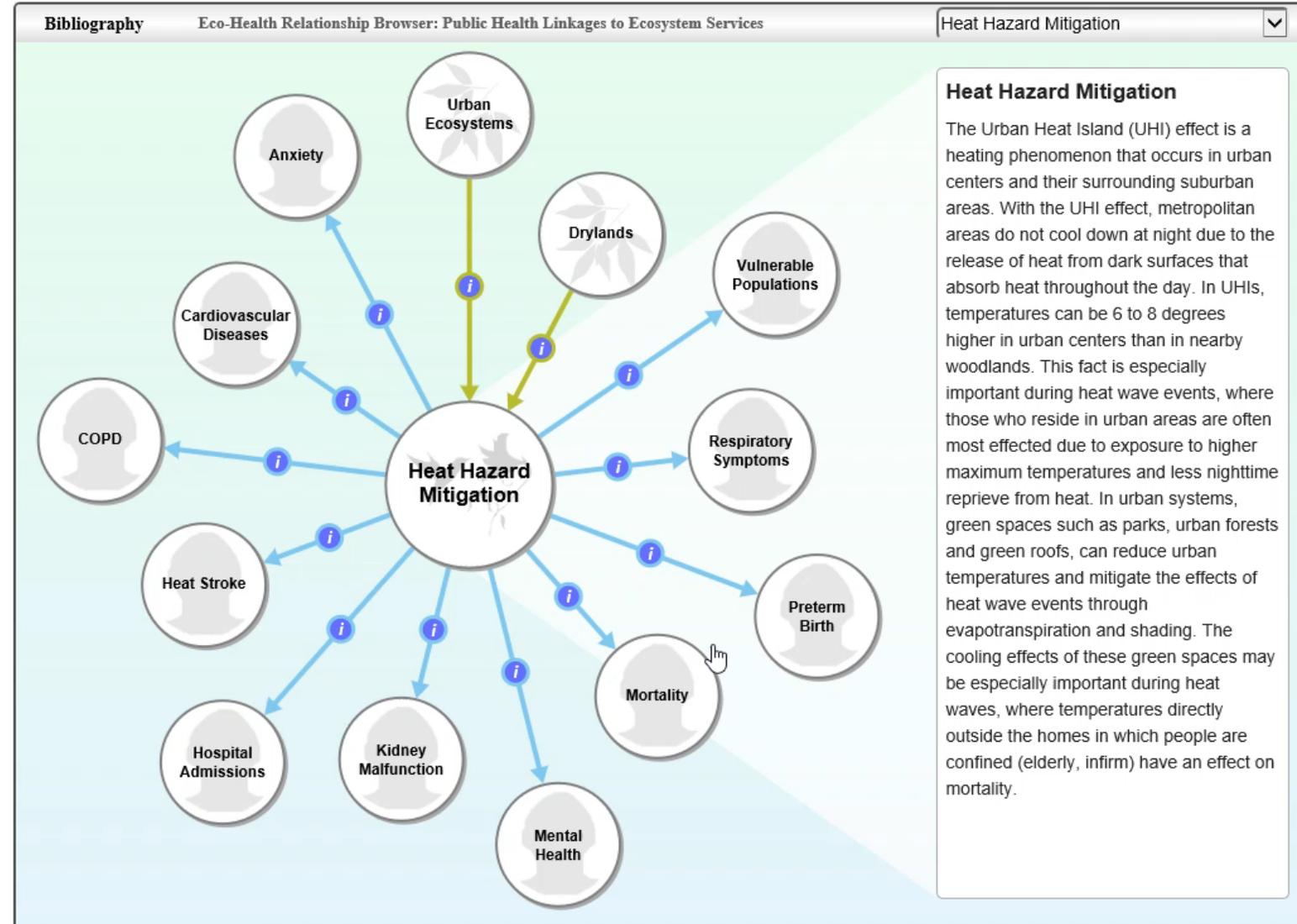
- Air Quality
- Water Quality
- Heat Hazard Mitigation
- Water Hazard Mitigation

30+ Health Outcomes:

- Asthma
- ADHD
- Cancers
- Cardiovascular diseases
- Heat stroke
- Healing
- Low birth weight
- Obesity
- Social relations
- Stress
- + More**

Eco-Health Relationship Browser

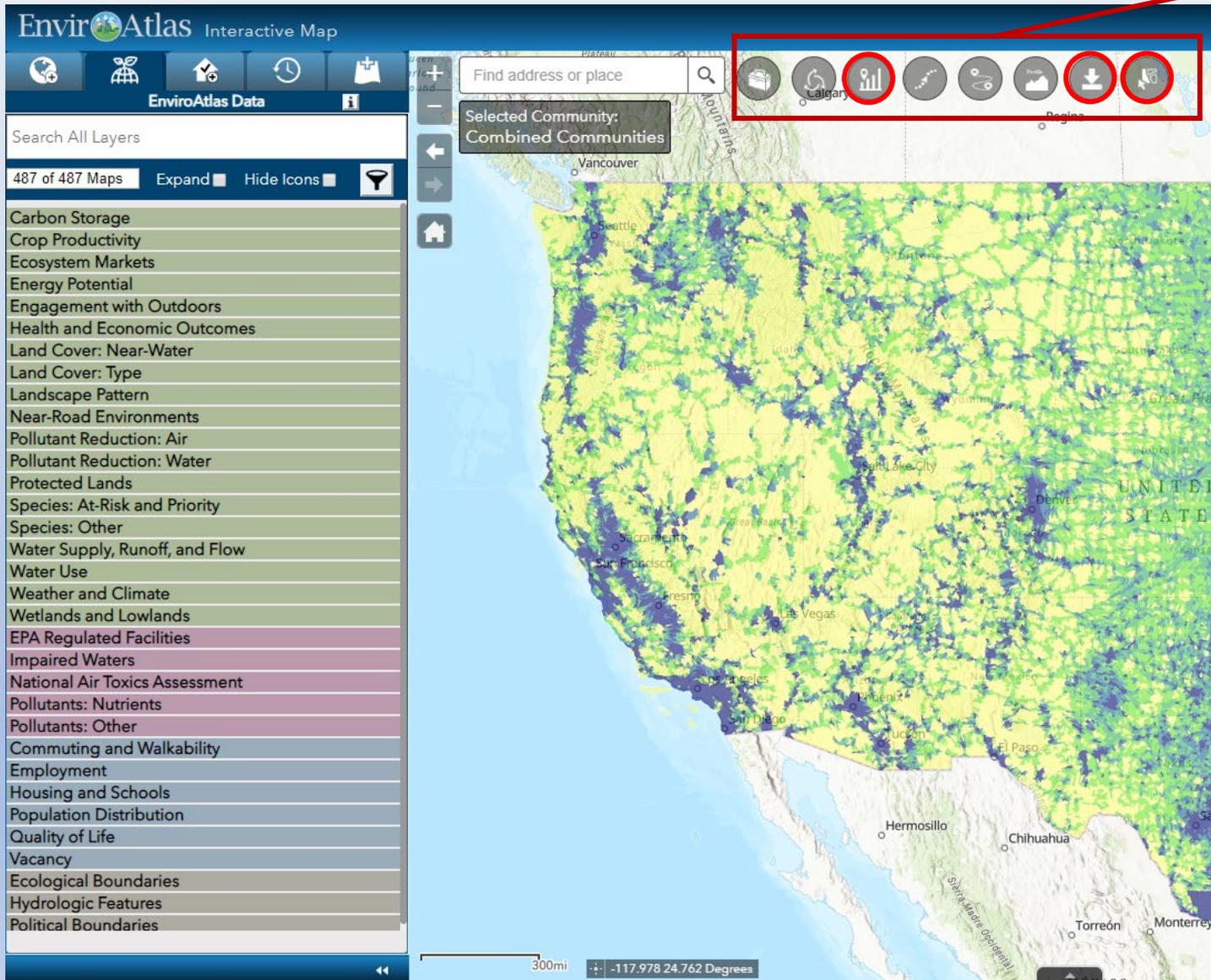
Click on the topic bubbles to explore. Click on the linkages (*i*) to view the relationship between elements.



Evidence-based associations
700+ scientific articles

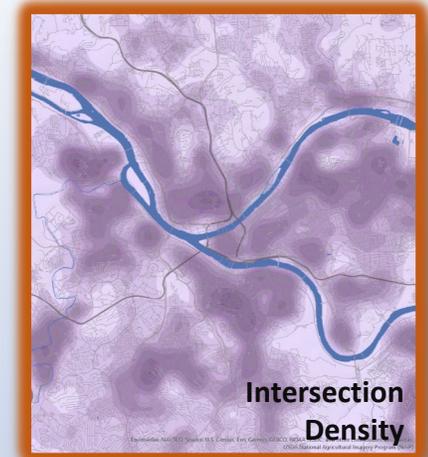
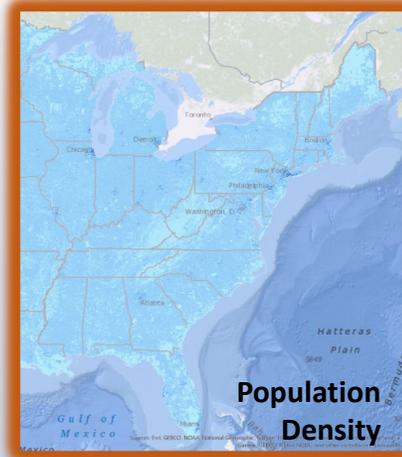
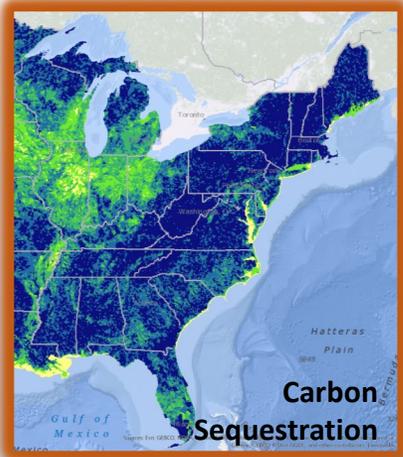
EnviroAtlas Interactive Map

Data Topics



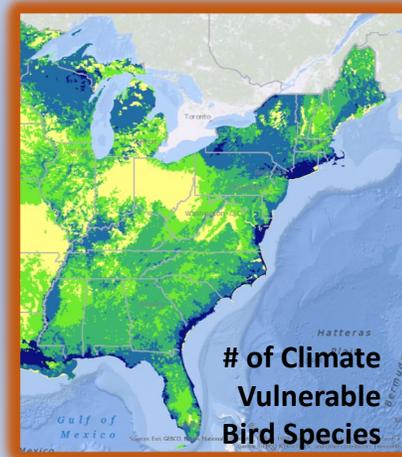
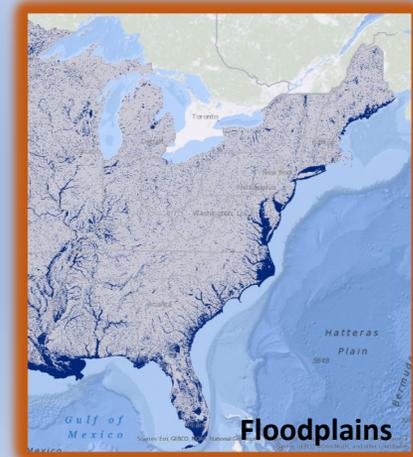
Built-in analysis tools

- Access EnviroAtlas Data:
 - Via our Interactive Map
 - Use web services
 - Download data
- Users can add their own data to our map for a session
- Users can search for data from the internet and add to map
- Save your session and return to it



National Data

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

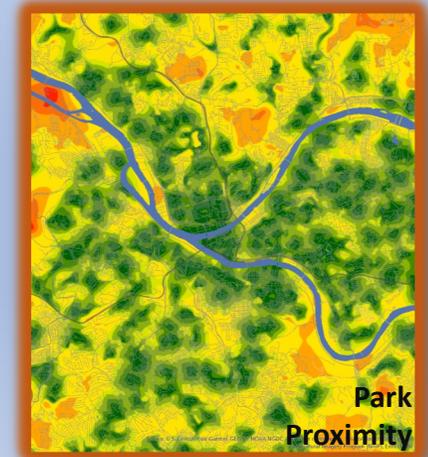
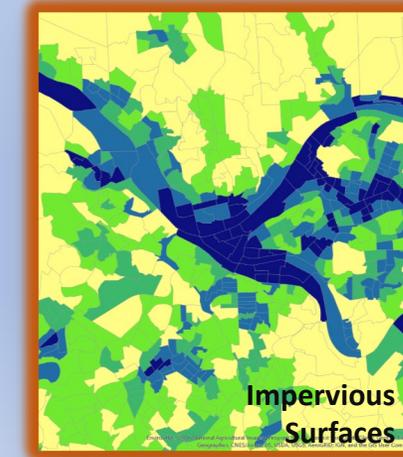


EnviroAtlas

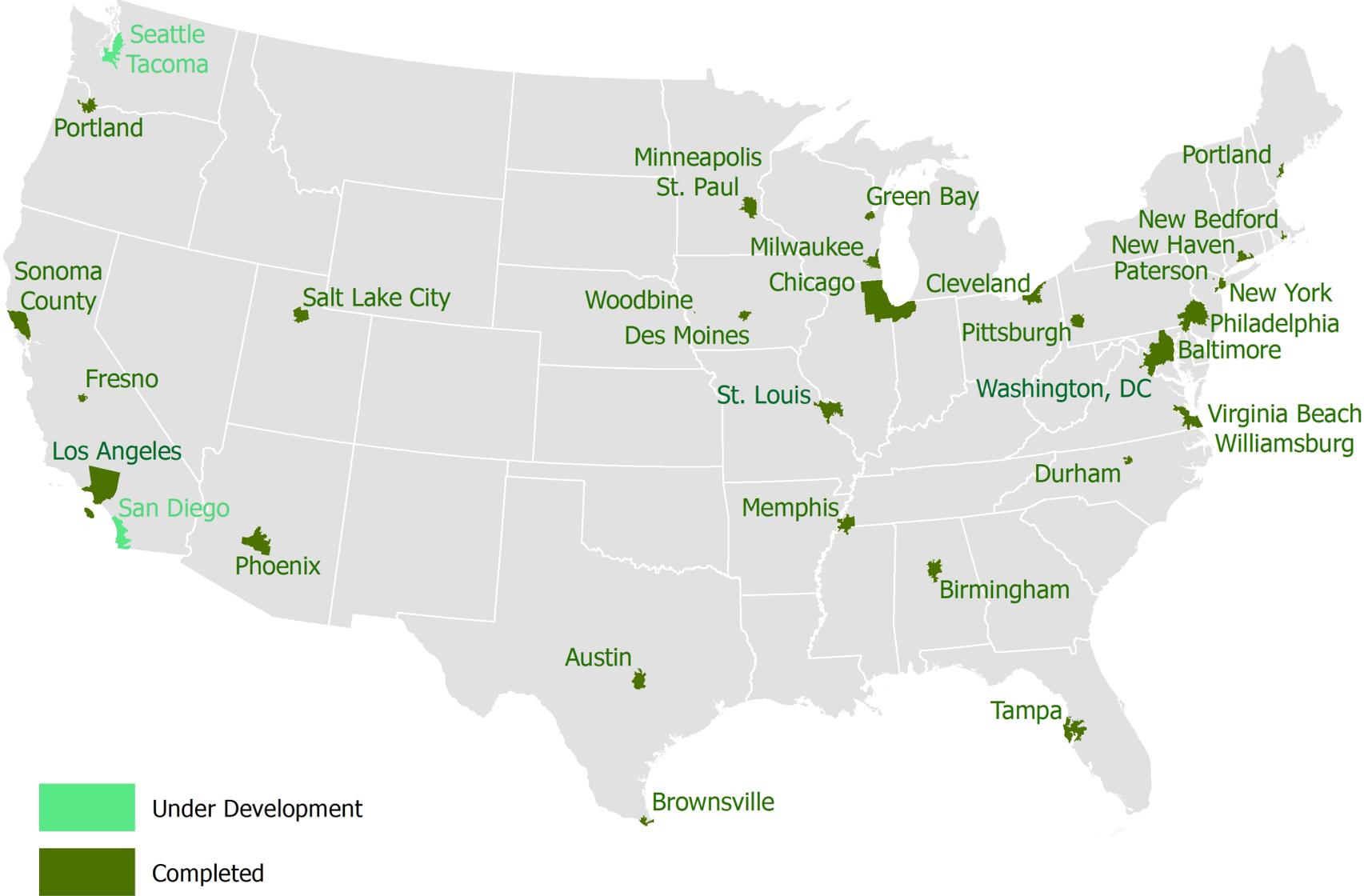
Data Fact Sheets
 Peer-reviewed
 Standard Metadata
 Open access

Community Data

1-meter land cover
 100+ unique data layers
 30 metropolitan areas
 1450 cities & towns (65+ million people)



EnviroAtlas Communities

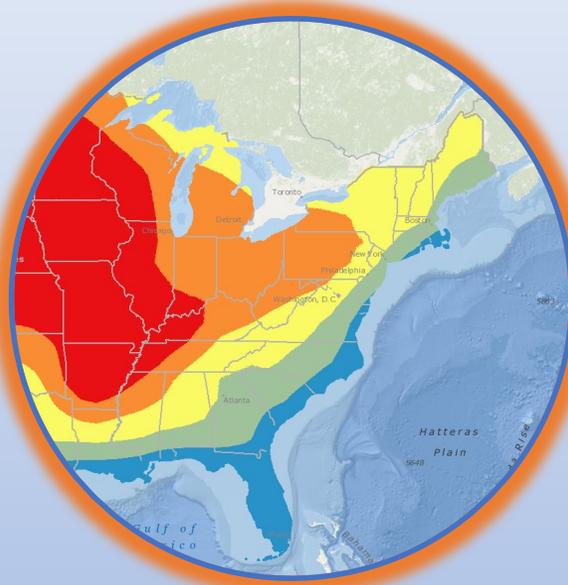


EnviroAtlas Built-in Tools

Watershed Navigator

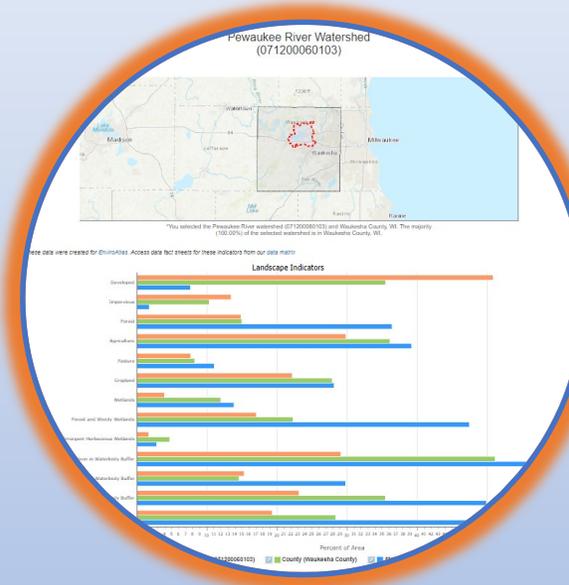


Change Analysis & Time series Viewer



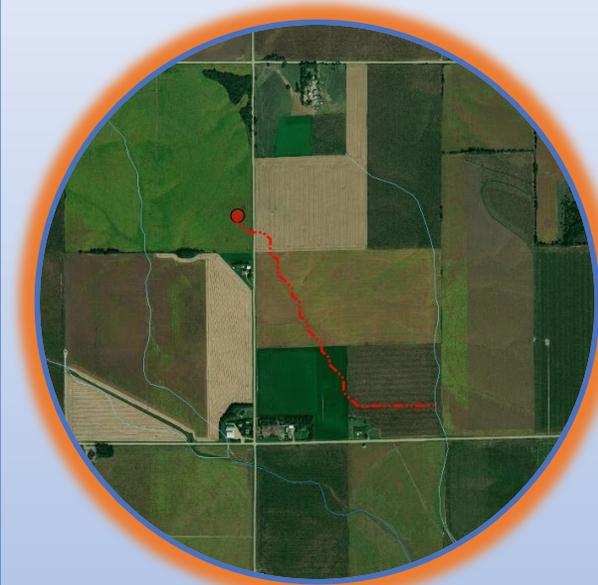
- Calculate precipitation, temperature, Potential Evapotranspiration (PET) difference between two time periods
- Animated view of 150 years of modeled climate data

Compare My Area (New)



- Compare watershed or census tract to surrounding county or state values
- View demographics, national air toxics, or landscape characteristics

Follow a Rain Drop

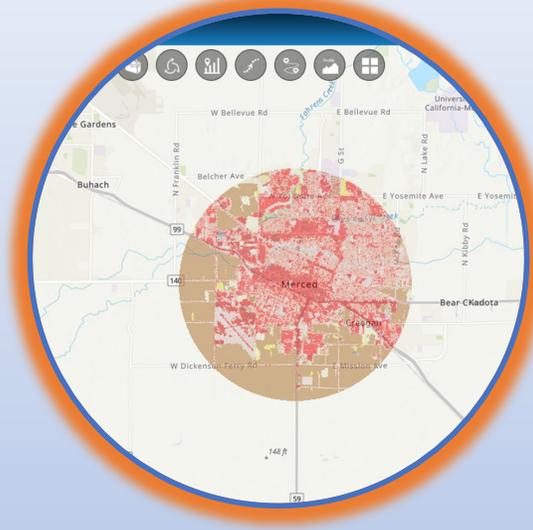


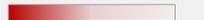
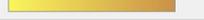
- Find flowpath to nearest water feature

EnviroAtlas Tools – Coming Soon

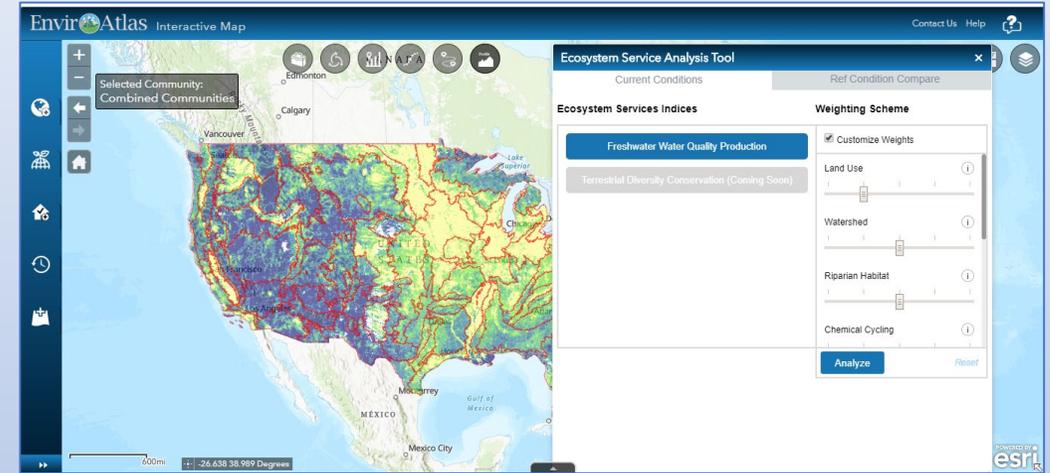
Gridded Analysis Tool

- User can select watershed, county, congressional district
 - or create a varying-size circular buffer around a selected point
 - or draw a custom area
- Can then calculate land cover proportions for area selected
- Will be expanded to include other calculations in addition to land cover



Gridded Map Tool	
Select Area and Layer	Results
Draw Type	Buffer Distance
User Point	3.5 m
Attribute	Value
Area of Selection:	38 m2
Percent NLCD Developed	64.59 %  View Full Legend
Percent NLCD Greenspace	2.79 %  View Full Legend
Percent NLCD Agriculture	32.38 %  View Full Legend
Percent NLCD Water	0.24 %  View Full Legend

Screen and Prioritize Index Tool

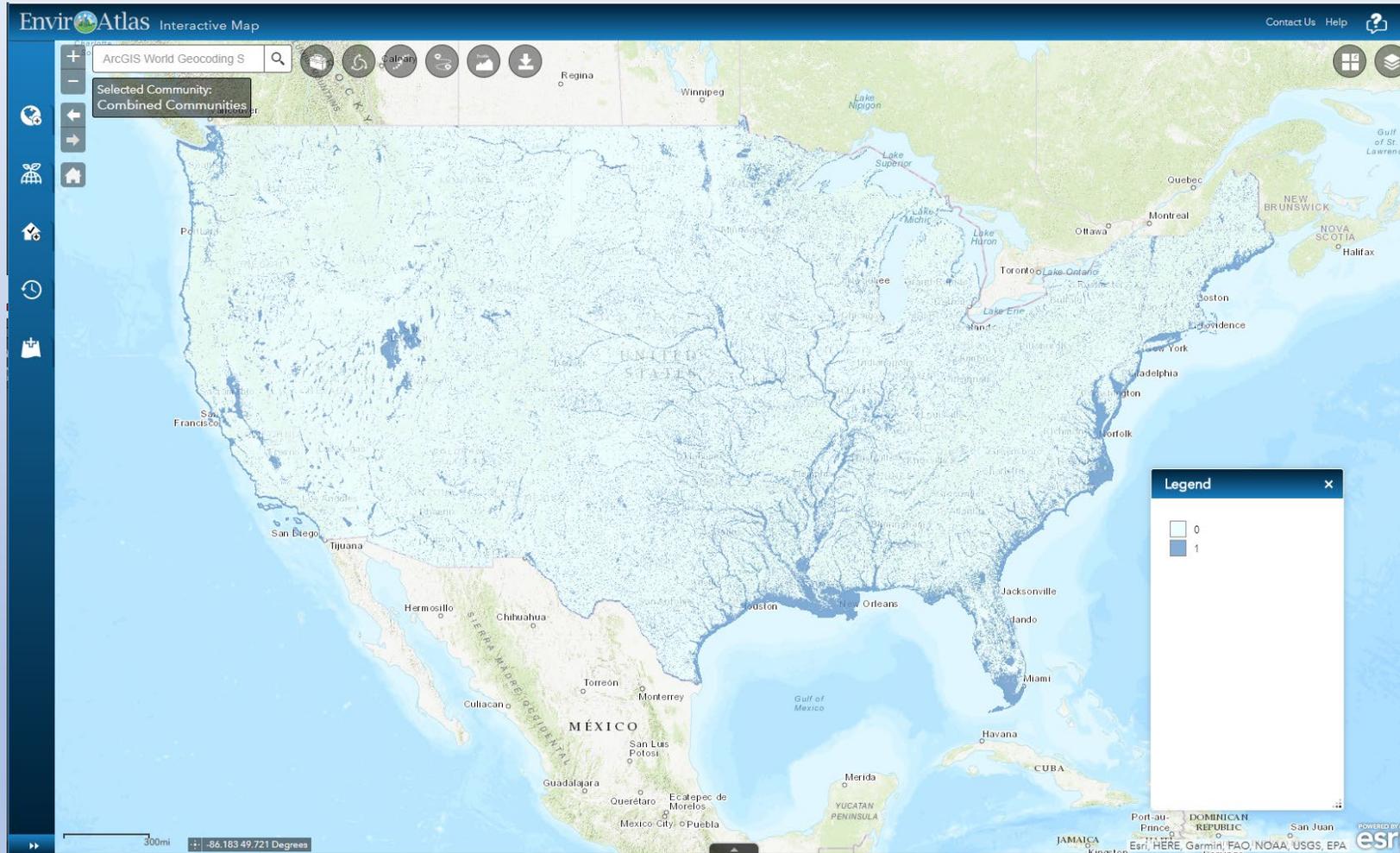


- User can combine metrics to create screening or prioritization score for targeted questions
- First example will be related to provision of clean water
- User will be able to adjust importance of each element



How are states,
communities,
others using
EnviroAtlas?

Where are floodplains?



EPA region	Count of NPL Superfund Sites in Floodplain	EPA Region	Count of Brownfields Sites in floodplains
01	26	01	406
02	34	02	160
03	23	03	456
04	37	04	586
05	42	05	913
06	30	06	255
07	14	07	367
08	11	08	198
09	9	09	539
10	12	10	149
Total	238	Total	4029

Is there risk for inundation?

Sean A. Woznicki, Jeremy Baynes, Stephanie Panlasigui, Megan Mehaffey, Anne Neale. 2019. Development of a spatially complete floodplain map of the conterminous United States using random forest. *Science of The Total Environment*. Vol 647, Pages 942-953

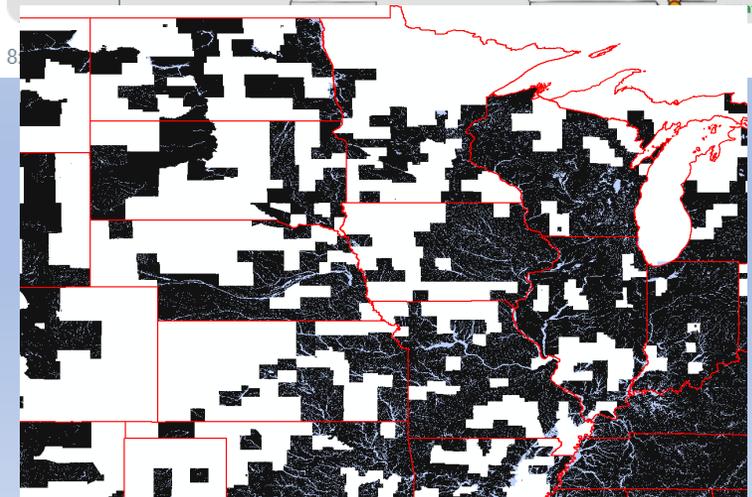
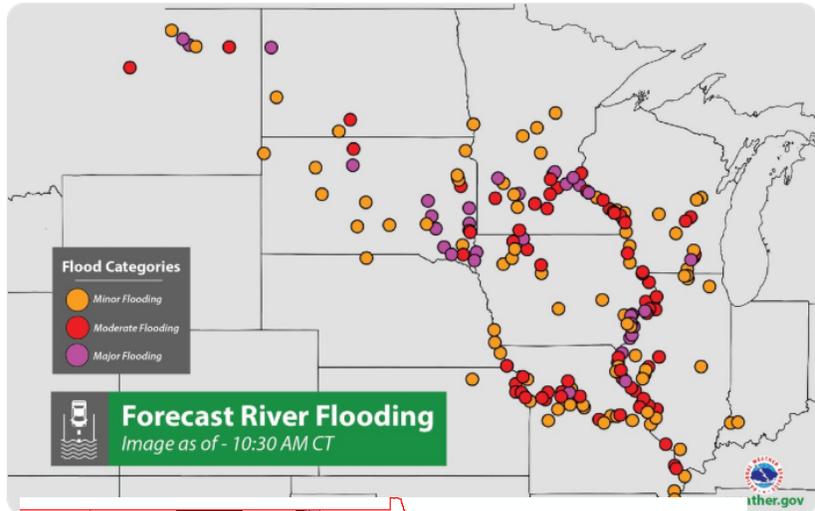


NWS
@NWS

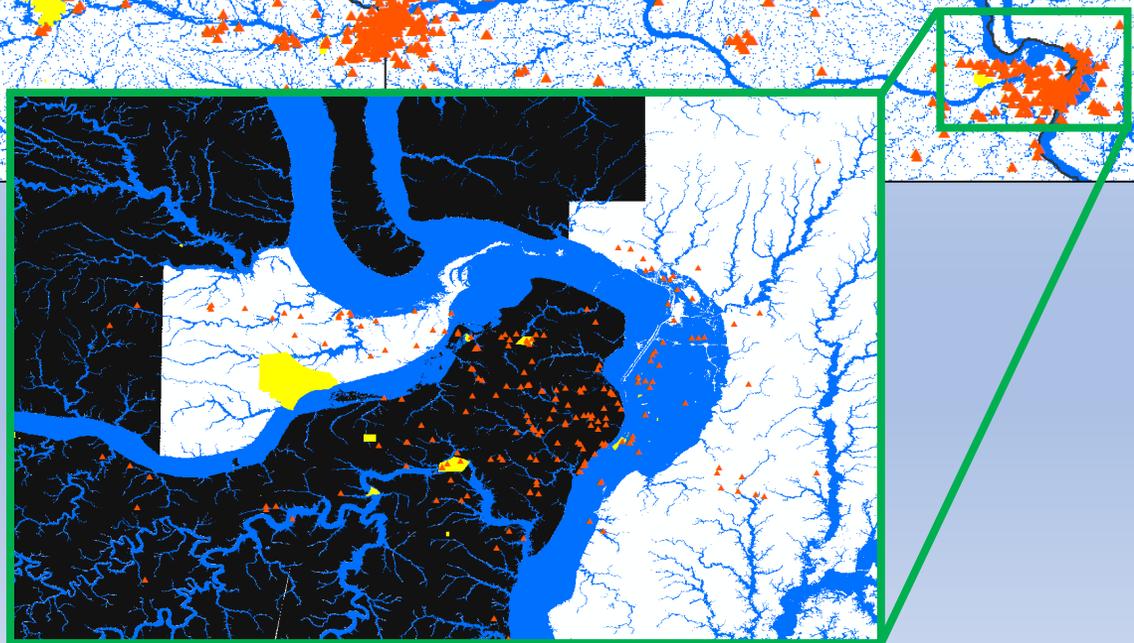
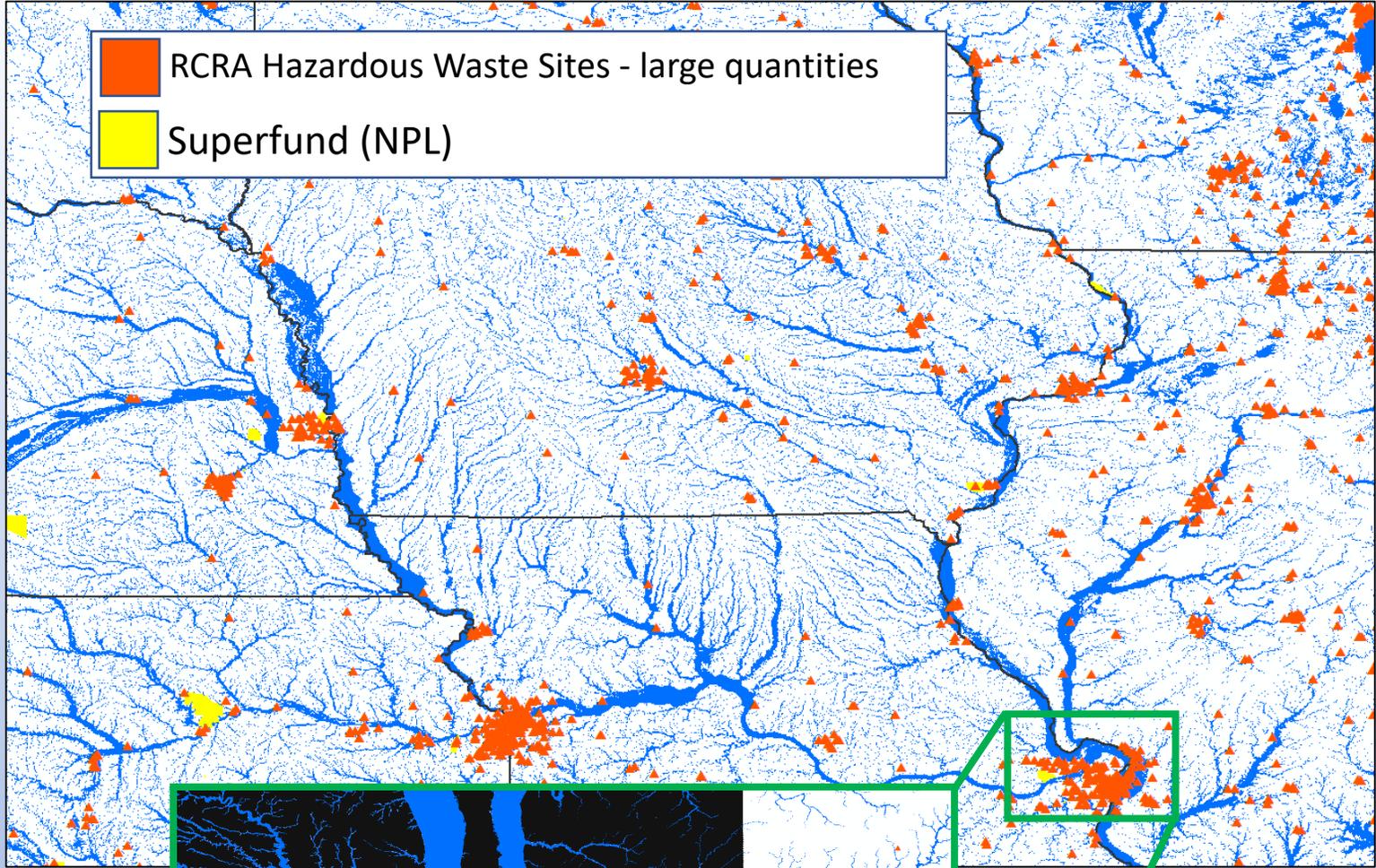
Follow



Major river flooding will continue across parts of the Mississippi and Missouri River Basins. The combination of snow melt and additional rainfall will lead to rising rivers in some locations this week. For the latest river flood forecasts visit: water.weather.gov/ahps/



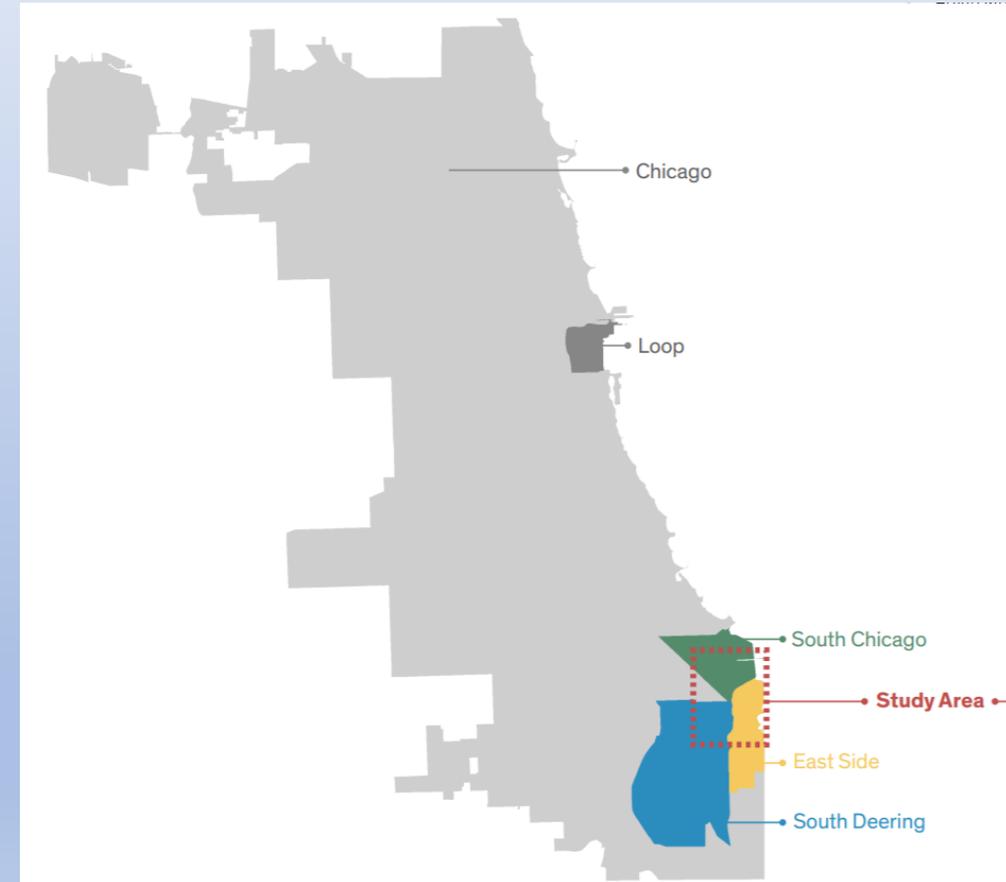
■ FEMA Coverage
□ No FEMA Coverage



Calumet River Communities Planning Framework

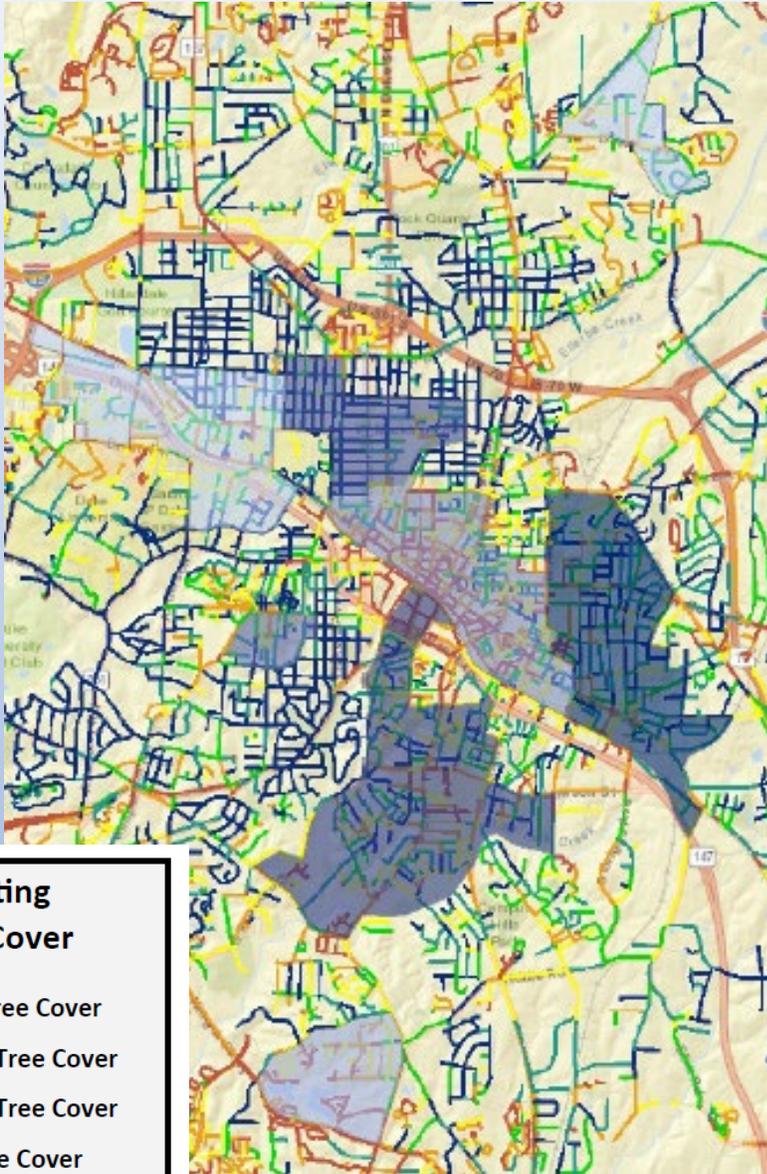
South Chicago, East Side, South Deering | A Guide for Equitable Development

- Provides a framework for future planning efforts in Southeast Chicago and serves as a resources guide...“to better coordinate efforts and share resources to improve the quality of life for all residents”
- Uses EnviroAtlas-hosted regulated facilities data on hazardous waste sites, Superfund sites and Brownfields
- Topics covered: social equity, economic development, populations, commute modes, access to green amenities *



* EnviroAtlas provides data that can help communities conduct similar analyses and consider each of these topics

Maximizing the Benefits of Tree Planting in Durham, NC



- At the City of Durham's request, EPA researchers conducted an analysis of Durham neighborhoods to identify areas in which to prioritize tree planting
- Priority neighborhoods were selected and ranked according to the estimated benefits potentially generated by the planting of new trees along street rights-of-ways
- Potential benefits were estimated according to three socioeconomic goals:
 - Improving walkability along sidewalks and neighborhood streets
 - Reducing air pollution from car traffic
 - Targeting benefits to disadvantaged or vulnerable populations

The City of Durham has implemented a 7-year plan to plant 10,000 trees in priority neighborhoods.

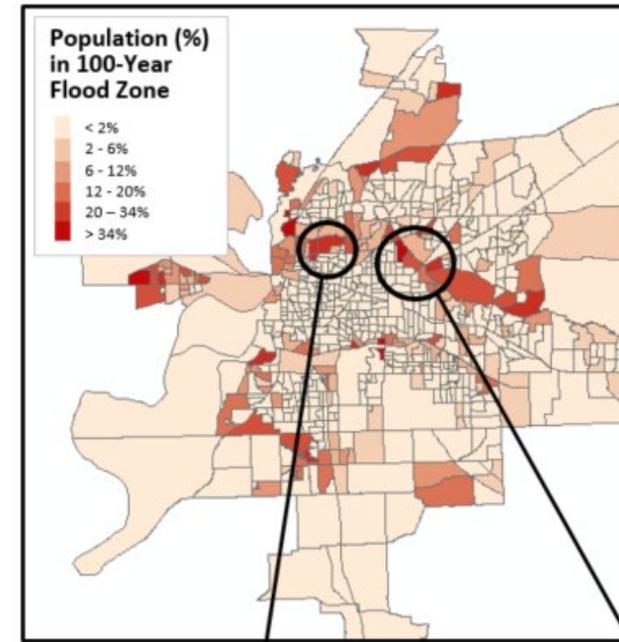
Inland Port Community Resilience Roadmap

Memphis, TN EPA Region 4

- Roadmap providing “actionable information and steps for local governments and port and community stakeholders to increase their resilience to the variability of river water levels.”
- EnviroAtlas highlighted as a tool with a wealth of data to help communities consider potential risks to ecosystems and human health
- For example:
 - Understanding where populations may be in the 100 year flood zone
 - Identifying particularly vulnerable populations in high risk areas
 - Pulling in community data such as Place of Worship to identify potential gathering spaces
 - Identifying lands that could be restored to back to wetlands in order to help mitigate flooding extent and duration

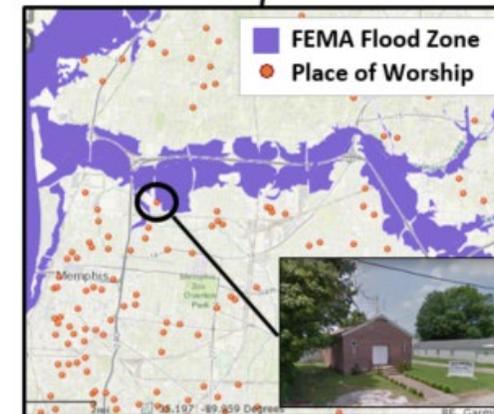
Appendix B: EnviroAtlas

Assessing flood risk and mitigating its impact

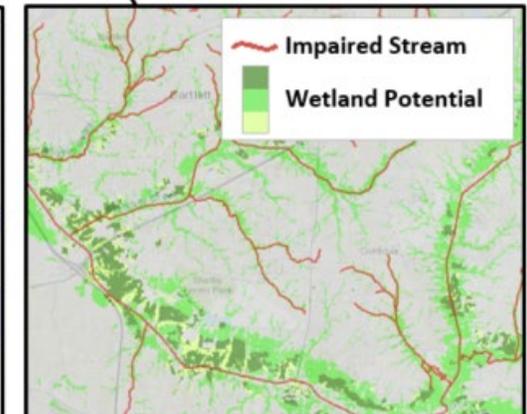


High water events in major rivers cause flooding at ports and in port communities by causing back-ups in tributary streams and rivers. It is essential for port communities to assess regions susceptible to flooding so that preventative measures may be enacted both to mitigate potential damage and to identify the likely location of populations especially vulnerable to extreme flood events for assistance or evacuation.

EnviroAtlas has recently developed maps that help identify populations and infrastructure likely to experience flood damage during 100 and 500-year floods. These maps allow users to target, for example, neighborhoods with dense populations living in the 100-year flood zone (left panel).



Available local data can be used in the EnviroAtlas interactive map to help identify potential gathering spaces of flood victims to help target relief efforts.

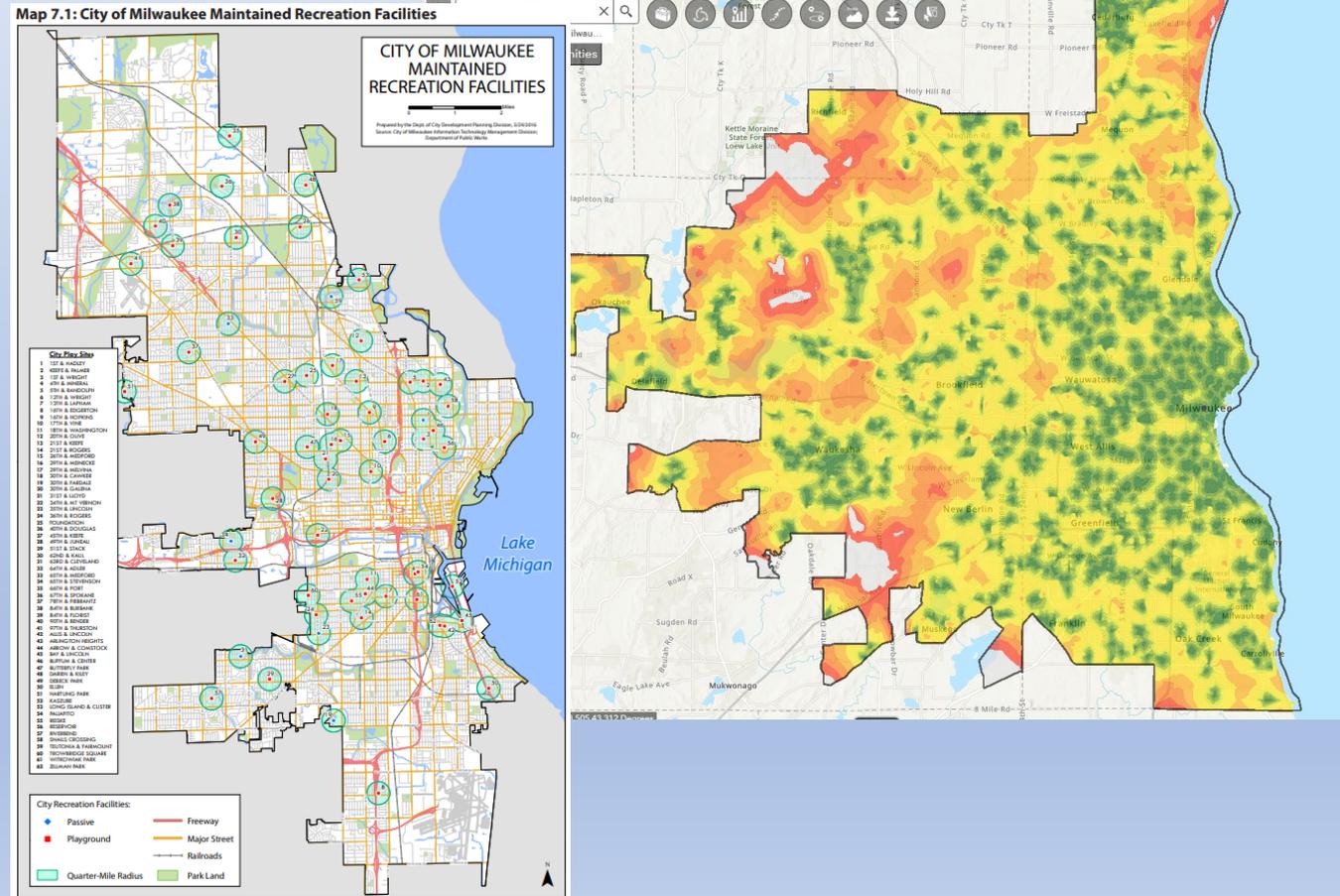


Restoring lands back to wetlands helps mitigate flooding extent and duration, while also benefiting the water quality of local impaired streams.

State of Wisconsin Urban Forestry & Milwaukee Outdoor Recreation Plan

- Wisconsin State Urban Forester used EnviroAtlas data for multiple projects:
 - Explored greenness and health for Wisconsin's Forest Action Plan
 - Analyzed average per-mile canopy cover in Milwaukee metro
 - Used *Tree cover connectivity* data for pinpointing areas of greatest conservation need
- In 2016, the City of Milwaukee, WI released a plan for assessing and improving access to outdoor recreation, to be completed by 2021.
- The plan cited EnviroAtlas as a tool that can be used for identifying, establishing and measuring quality of life benchmarks in areas adjacent to improved recreation areas.

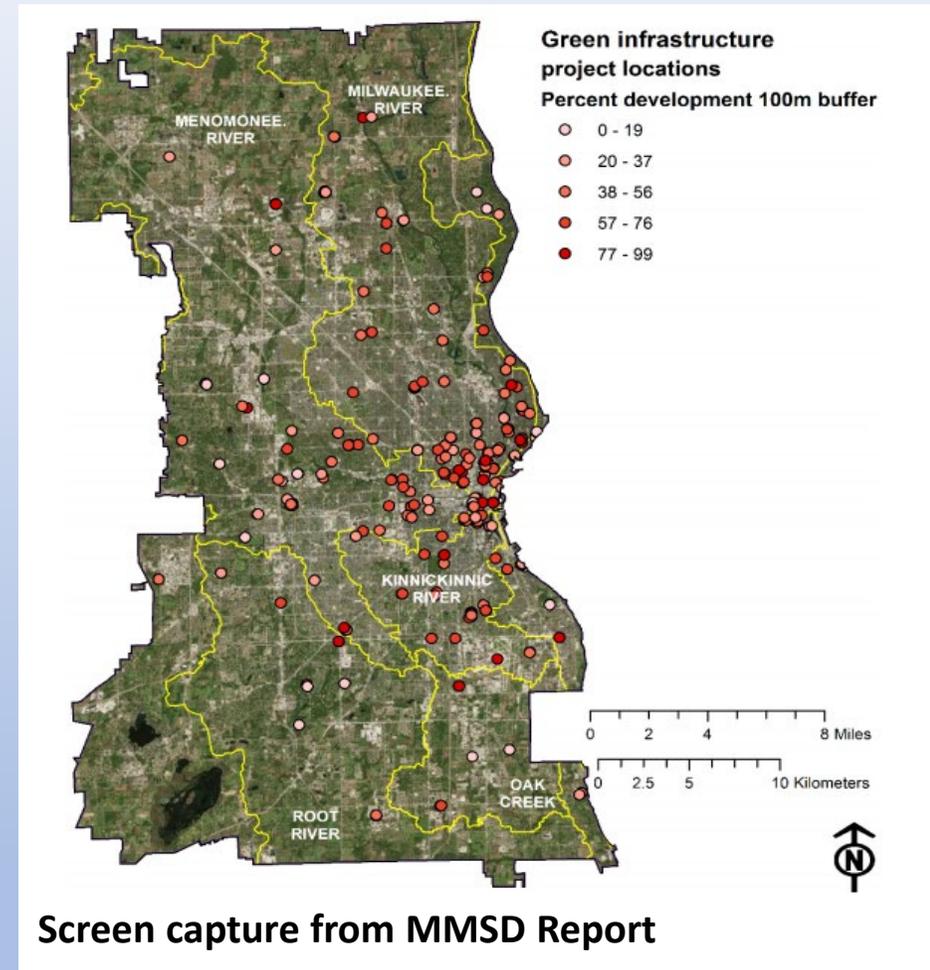
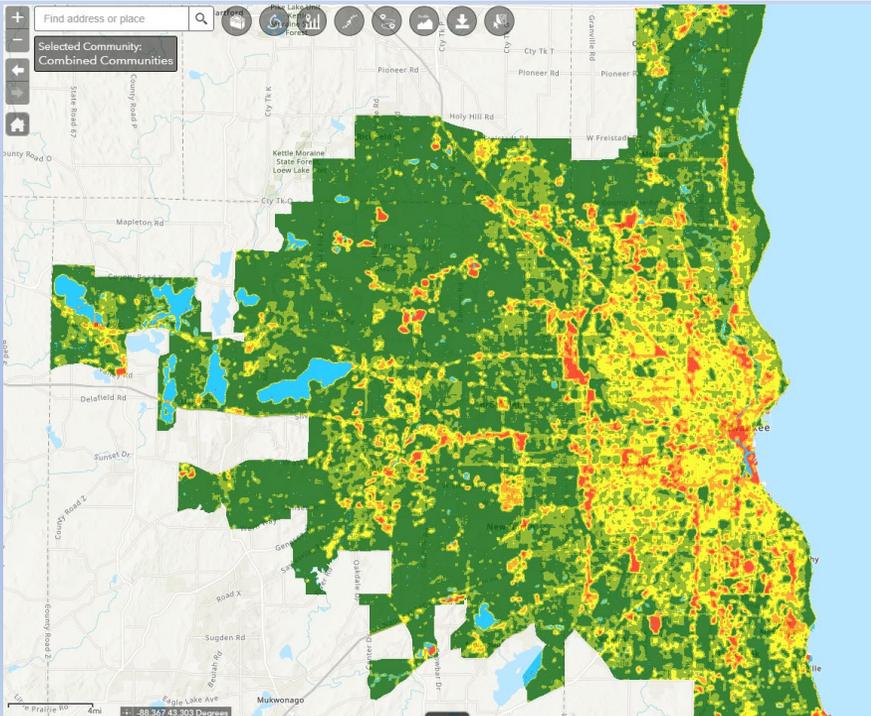
EnviroAtlas Estimated Walking Distances to Park Entrance for Milwaukee



Milwaukee Green Infrastructure Project for Enhancing Biodiversity

The Milwaukee Metropolitan Sewerage District (MMSD) used EnviroAtlas as part of a plan for enhancing urban biodiversity in certain districts.

**From Interactive Map:
Milwaukee, WI Percent Green Space within ¼ km square km**



Existing Green infrastructure projects were studied using EnviroAtlas land cover data to test for project trends.

Watershed-Based Stormwater Mitigation Toolbox

The National Cooperative Highway Research (NCHR) program is developing a Watershed-Based Stormwater Mitigation Toolbox (WBSMT) geared toward state departments of transportation managing stormwater impacts; their tool will incorporate EnviroAtlas tools and data.

“The USEPA’s EnviroAtlas was identified as the most appropriate single source of data for use in the WBSMT, augmented by information from NOAA’s National Centers for Environmental Information and the USDA National Resources Conservation Service Web Soil Survey”
– 2017 NCHR project report

Table 4. EnviroAtlas evaluation criteria: availability and applicability.

ENVIROATLAS DATA LAYER	Criteria 1: Availability	Criteria 2: Applicability					
		Describes water quantity	Describes water quality	Watershed characterization	Evaluates ecosystem services	Helps identify and evaluate watershed priorities	Spatially links project to mitigation need / opportunity
Acres of crops that have no nearby pollinator habitat	SW	N	N	Y	Y	Y	N
Atmospheric nitrogen deposition data by 12-digit HUC (2006 and 2002)	SW	N	Y	Y	Y	Y	Y
Average annual precipitation 1981-2010 by HUC-12	SW	Y	N	Y	N	Y	N
Biodiversity conservation metrics	SW	N	N	N	Y	Y	Y
Biological nitrogen fixation in natural/semi-natural ecosystems by 12-digit HUC	SW	N	Y	Y	Y	Y	Y
Ecosystem rarity metrics by 12-digit HUC	SW	N	N	Y	Y	Y	Y
HUC-12 polygons	SW	N	N	Y	N	Y	Y
Land cover	NW	N	N	Y	Y	Y	Y
Land cover on wet areas	SW	N	N	Y	Y	Y	Y
Morphological Spatial Pattern Analysis connectivity	SW	N	N	Y	Y	Y	Y
NatureServe analysis of imperiled or Federally listed species by HUC-12	R/NW	N	N	Y	Y	Y	Y
Percent impervious	NW	N	N	Y	Y	Y	Y
Percent urban land cover by 12-digit HUC	SW	N	N	Y	Y	Y	Y
Percent stream buffer zone as natural land cover	SW	N	N	Y	Y	Y	Y
Potentially restorable wetlands	S	N	N	Y	Y	Y	Y
Protected lands	SW	N	N	Y	Y	Y	Y
Rare ecosystems	R/NW	N	N	Y	Y	Y	Y
Synthetic N fertilizer application to agricultural lands by 12-digit HUC	SW	N	Y	Y	Y	Y	Y
303(d) impairments by 12-digit HUC	SW	N	Y	Y	Y	Y	Y

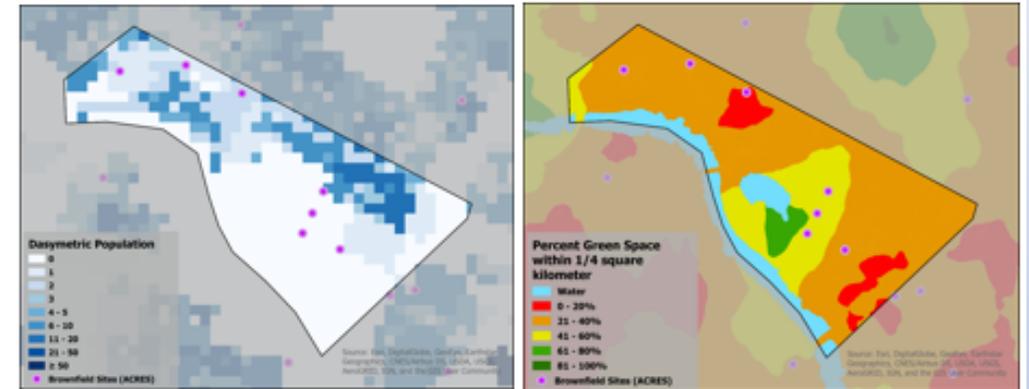
Note: S– Site, SW – Subwatershed, W – Watershed, R – Region, ST – State, NW – Nationwide, Y – Yes, N – No

EnviroAtlas and Brownfields

- EnviroAtlas team is exploring applying EnviroAtlas data, tools and resources to Brownfields processes, from grant application to redevelopment
- Stakeholder driven process to identify needs

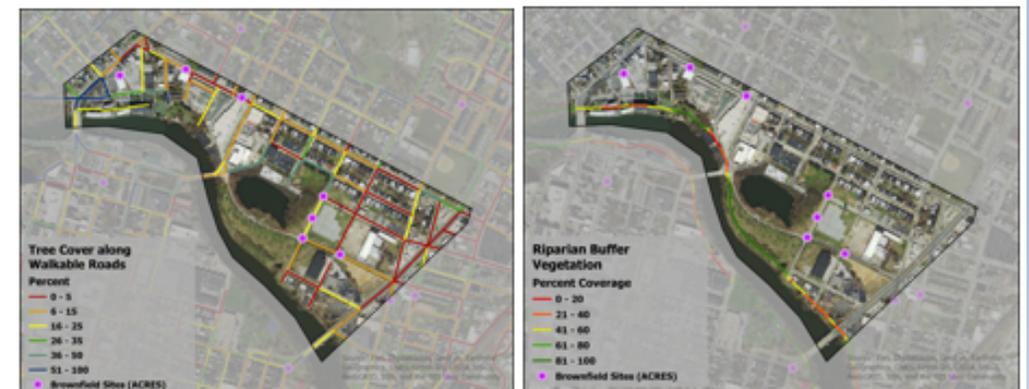
Problem Accounting

- **Where is the population more likely to reside?** The top left map shows population that has been downscaled from Census blocks to exclude areas that are likely uninhabited.
- **Where are there potential hotspots?** The top right map shows areas that have low green space (in red) and thus may exhibit the urban heat island effect.



Opportunities

- Tree cover along walkable roads (below left) illustrates one way to revitalize reclaimed Brownfields sites to improve livability and well-being.
- Riparian buffers (below right) could be increased to enhance filtration capability for improving waterways.

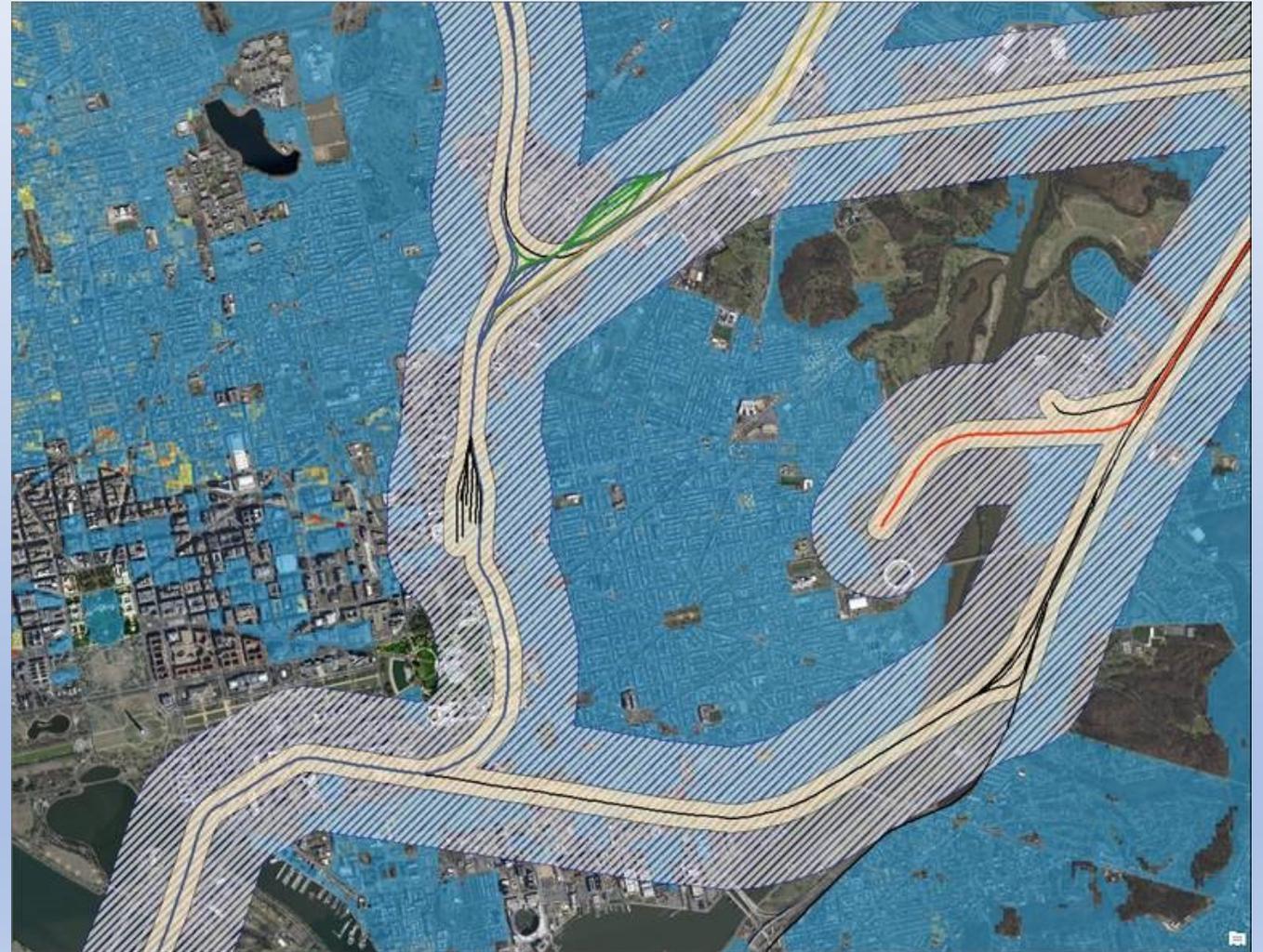


Population Living Close to Railways, Railyards, Ports, Busy Roadways & Airports

- Multiple Buffer Sizes
- Using our estimate of population / 30 m²
- Created polygons from railyard tracks



Norfolk, Virginia Rail Yard



Washington, DC

State/Local Government Staff Example Responses to Data Download Question

In general terms, how do you intend to use the data?

- **East-West Gateway Council of Governments, St. Louis, MO** – “Long-term goal to support land use decisions. Near-term we are collecting and assembling a data repository of biodiversity, natural resource, etc. data. One of our goal deliverables is a regional comprehensive biodiversity plan.”
- **Southwest Michigan Planning Commission** – “We are a regional planning commission. I make maps in support of projects regarding environmental, transportation and health topics. Consequently, the data will be used in reports for watershed management, transportation and health impact assessments.”
- **Nevada DOT** – “Assessing potential impacts from highway runoff to water quality and sensitive habitats.”
- **Oregon DEQ** – “To enhance water quality.”
- **Washington State Voluntary Stewardship Program for Thurston County** – “We are working on identifying the baseline agricultural economy in Thurston County to inform what our needs are, and what areas of the industry need support, can expand, etc.”
- **Cleveland, OH** – “For conservation planning and evaluation of carbon credit program participation.”
- **New Mexico** – “Evaluating wetlands services for the state of New Mexico” **Mid-Region Council of Governments** – “Long range transportation planning for environmental resiliency.”
- **California Waterboards** – “Prioritize watersheds moving forward with our next Agricultural Order”

Demonstration

Contacts

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