EnviroAtlas

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EPA's EnviroAtlas – GeoSpatial Data and Easy-to-Use Tools to Better Understand Ecosystem Services, Environmental Stressors and Impacts on Human Health.

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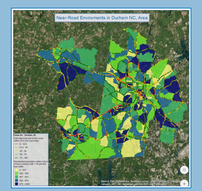
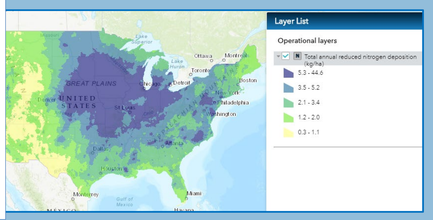
Introduction to *EnviroAtlas*

EnviroAtlas is a web-based tool developed by the EPA and its partners which provides interactive tools and resources for users to explore the benefits people receive from nature, often referred to as **"ecosystem goods and services."**

Using *EnviroAtlas*, users can access, view, and analyze diverse information to better understand the potential impacts of decisions on natural resources and the services they provide. EnviroAtlas provides two primary interactive tools, the ***Interactive Map*** and the ***Eco-Health Relationship Browser***, as well as GIS and analysis tools and informational resources.



Left: Community map of Durham, NC at the Census block-group resolution shows the estimated percent of tree cover and population for the near-road environment. Studies indicate that the capacity of trees to filter air may reduce the health impacts of vehicular pollution. *EnviroAtlas* currently has datasets for 18 U.S. communities available.



Right: A National map of total annual nitrogen deposition (kg/ha) by sub-watershed (12-digit HUC). Total nitrogen deposition includes wet and dry oxidized and reduced nitrogen.

Sources of oxidized nitrogen include burning fossil fuels, lightning, forest fires, and bacterial decay. Nitrogen is emitted primarily from agricultural systems but also from automobiles.

Providing over 500 maps, the *Interactive Map* allows users to investigate various ecosystem elements (i.e. land cover, pollution, and community development) and compare them across localities in the United States. Available maps range from fine-scale community extent (left) to broad-scale national extent (below).

Data

National Data

- Most maps at the national extent provide wall-to-wall data coverage for the contiguous U.S. as well as some data for Alaska, Hawaii, Puerto Rico and the Virgin Islands. There are approximately 300 data layers at this extent.
- Many of these data layers are summarized by 12-digit hydrologic unit codes (12-digit HUCs), or sub-watershed basins, and provide approximately 90,000 similarly sized spatial units. Many of these data layers are derived from data with a resolution of 30 m.
- Ecosystem Markets data layers are available for the nation, showing point and polygon data for ecosystem market initiatives and enabling conditions operating at a variety of scales, from national to local.

Populated Places at High Resolution

- Higher resolution data in EnviroAtlas draws from meter scale urban land cover data, census data, and models. There are approximately 100 data layers per area.
- These fine-scale data are consistent for each available populated place, and they are mostly summarized by census block groups.
- Many of the boundaries for community areas are based on selected block groups within the 2010 US Census Urban Area boundary.
- EnviroAtlas currently includes fine-scale data for more than 1400 cities and towns centered on 30 U.S. urbanized community areas (shown in the map below).

EnviroAtlas Tools: The *Interactive Map* & The *Eco-Health Relationship Browser*

EnviroAtlas Interactive Map

Allows for student exploration of ecosystem services within their communities

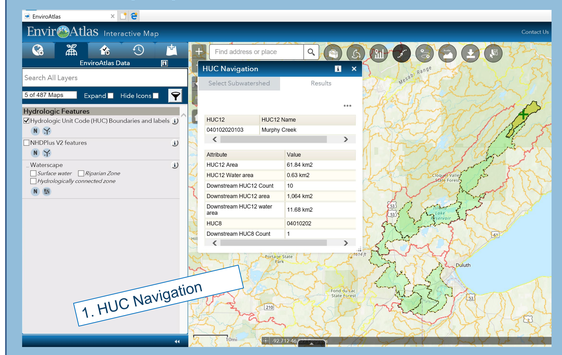
Has the power to visually display ecosystem services and demographic variables

EnviroAtlas Eco-Health Relationship Browser

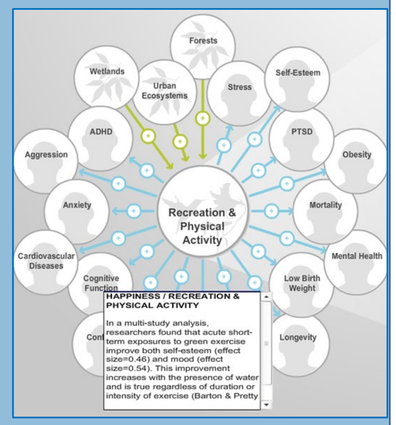
Highly interactive; shows visual connections of the eco-health relationship

Uses existing scientific literature on the linkages between the environment and human health to display connections

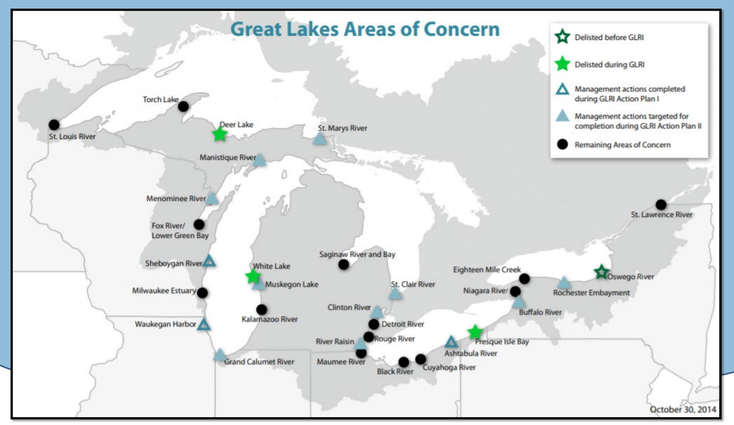
The tools and resources in the *Interactive Map* allow for analysis of relationships between people and the environment.



The **HUC Navigation Tool** navigates up- and down-stream along waterways



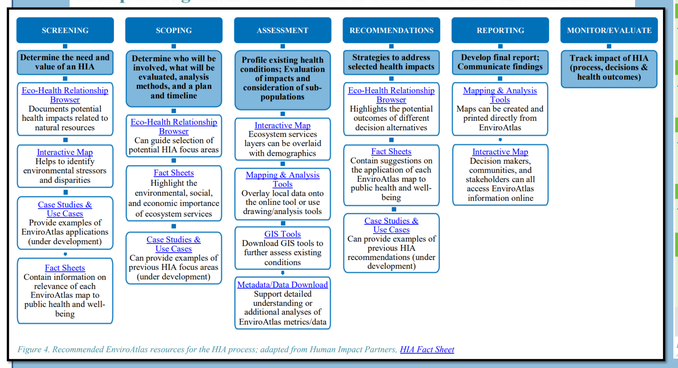
Great Lakes Area of Concern (AOC) communities



Health Impact Assessment (HIA) & Ecosystem Services

- **HIA** is a systematic process that uses an array of data sources and analytic methods considers input from stakeholders to determine the potential effects of a proposed policy, plan, program, or project on the health of a population and the distribution of those effects within the population.
  - provides recommendations on monitoring and managing those effects.
- **Ecosystem Services**, are the benefits that humans receive from nature.
  - These benefits underpin almost every aspect of human well-being, including our food and water, security, health, and economy

Incorporating EnviroAtlas Tools & Resources into the HIA Process



SCREENING	SCOPING	ASSESSMENT	RECOMMENDATIONS	REPORTING	MONITOR/EVALUATE
Determine the need and value of an HIA	Determine who will be involved, what will be evaluated, analysis methods, and a plan and timeline	Profile existing health conditions; Evaluation of impacts and consideration of sub-populations	Strategies to address selected health impacts	Develop final report; Communicate findings	Track impact of HIA (process, decisions & health outcomes)
Eco-Health Relationship Browser: Documents potential health impacts related to natural resources	Eco-Health Relationship Browser: Can guide selection of potential HIA focus areas	Interactive Map: Ecosystem services layers can be overlaid with demographics	Eco-Health Relationship Browser: Highlights the potential outcomes of different decision alternatives	Mapping & Analysis Tools: Maps can be created and printed directly from EnviroAtlas	
Interactive Map: Helps to identify environmental stressors and disparities	Fact Sheets: Highlight the environmental, social, and economic importance of ecosystem services	Mapping & Analysis Tools: Overlay local data onto the online tool or use drawing/analysis tools	Fact Sheets: Contain suggestions on the application of each EnviroAtlas map to public health and well-being	Interactive Map: Decision makers, communities, and stakeholders can all access EnviroAtlas information online	
Case Studies & Use Cases: Provide examples of EnviroAtlas applications (under development)	Case Studies & Use Cases: Can provide examples of previous HIA focus areas (under development)	GIS Tools: Download GIS tools to further assess existing conditions	Case Studies & Use Cases: Can provide examples of previous HIA recommendations (under development)		
Fact Sheets: Contain information on relevance of each EnviroAtlas map to public health and well-being		Metadata/Data Download: Support detailed understanding or additional analyses of EnviroAtlas metrics/data			

Figure 4. Recommended EnviroAtlas resources for the HIA process; adapted from Human Impact Partners. HIA Fact Sheet

Figure 1. Steps of Health Impact Assessment; Health Impact Project

The Eco-Health Browser may aid in HIA by:

- Identifying issues of concern for assessment
- Illustrating the evidence-based connections between health and ecosystem services
- Highlighting the potential outcomes of different decision alternatives
- Providing rapid access to examples of how relationships between ecosystems, ecosystem services, and health have been previously assessed

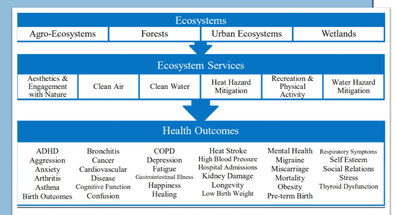
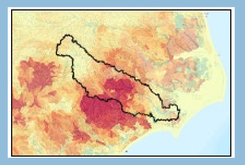


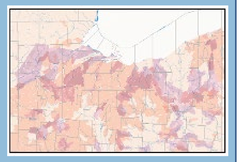
Table 1. Eco-Health Relationship Browser component categories as of 28 July 2014

Featured Examples

Urban Heat Islands and Vulnerable Communities in Portland, OR



Nitrogen Inputs to Watersheds



Agricultural Erosion and Sediment-Impaired Waterways

The EnviroAtlas team has developed Several examples of how EnviroAtlas Data sets can be used together to make decisions

EnviroAtlas is a collaborative project developed by the US Environmental Protection Agency, in cooperation with the US Geological Survey, the US Department of Agriculture's Natural Resources Conservation Service and Forest Service, and Landscape America.

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