Optimizing the Built and Natural Environments in a Community for Children's Health and Well-Being

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Abstract

An emerging concept in the field of children's environmental health is the need for a systems approach to characterize and optimize the built and natural environments where children live, learn, and play. A holistic, systems model should enable decision makers in community sectors, such as land use planning, buildings and infrastructure, and transportation, to adequately consider children's lifestage-specific needs in community design and remediation efforts. Research to understand the linkages between cumulative environmental exposures (chemical and non-chemical) that occur in community settings and childhood health outcomes is central to this systems approach and informs decisions that prevent or diminish potentially harmful exposures and associated health risks. Equally important is research about how characteristics of the built and natural environments, such as natural lighting in schools and affordable access to green space and nature, can interact to actively promote children's health and well-being. This poster highlights research underway in EPA's Office of Research and Development's *Sustainable and Healthy Communities Research Program* to provide State and local governments and community planners with the knowledge and tools they need to support decisions and health impact assessments specific to children's environments. Examples include an eco-health browser used to document the benefits of natural environments for children's health; community assessment tools to help identify problems; geospatial tools that integrate ecosystem goods and services with demographics and features of the built environment at national to local scales; and an Environmental Quality Index that incorporates public health data pertinent to birth outcomes and childhood diseases at the county scale.

Objective of the Poster

Illustrate selected community assessment and decision support tools under development in ORD and their applications related to optimizing healthy environments for children.

Background and Rationale

- Complex features of natural and built environments influence children's health, development, and well-being .
- Holistic approach is needed to integrate all of the environmental factors and interactions that impact growth and development of children at EPA defined lifestages and across the life course.
- Federal, State and local governments and community planners make a wide variety of decisions that ultimately determine the quality of child specific environments and children's access to them.
- Decision-makers need information and tools to make sound decisions about these environments (e.g., homes, schools, parks, and natural areas) and accessibility (e.g., to healthy foods, medical care ,and recreation).
- Ideal community planning and decision support tools are adaptable across geospatial scales, and can be used in weighing the costs and benefits of decisions.

Next Steps

- Refine the framework for integrating major environmental factors associated with the built and natural environments that impact children's health and well-being.
- Adapt/use decision support tools to consider children's environments, lifestage activities and susceptibility, and impacts on their health and well-being.

Integrated Conceptual Framework

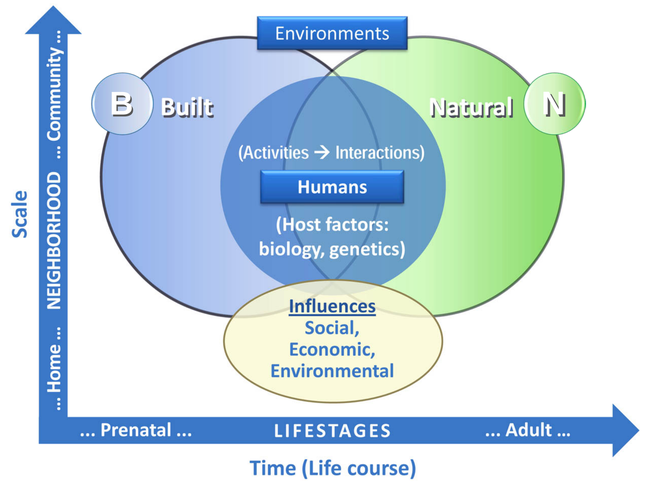

Diagram showing how the built and natural environments interact with host factors and social and economic influences. This holistic framework builds in scale and time (life course) as necessary considerations for optimizing child-specific environments.

Environmental Quality Index

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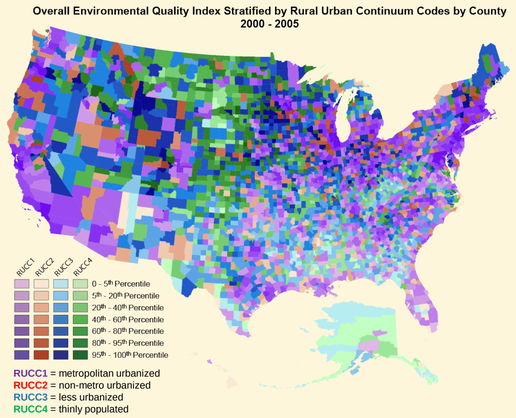

Constructed an *Environmental Quality Index* (EQI) for all counties in the U.S. which incorporates five domains that influence exposure and health:

- Air, water, land, built, and sociodemographic environments
- Data represent the chemical, natural and built environment
- Includes data for birth outcomes and infant mortality
- Used to explore associations with adverse health effects

Map indicates EQI stratified based on Rural Urban Continuum Codes (RUCC) Public release in 2014 will make data and maps publically available on the web.

Website: http://www.epa.gov/nheerl/eqi/
Contact: lobdell.danelle@epa.gov

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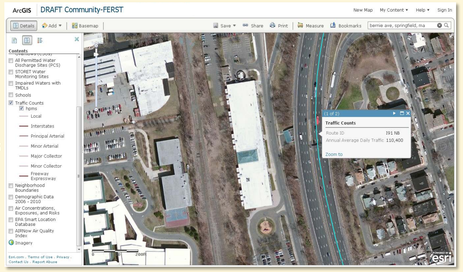
C-FERST

Community-Focused Exposure and Risk Screening Tool provides resources and data used to identify and prioritize community environmental issues, evaluate cumulative human exposures and risks, and inform sustainable solutions.



Website: http://www.epa.gov/heasd/c-ferst
Contact: zartarian.valerie@epa.gov

Example: C-FERST used in a Health Impact Assessment (HIA) related to school renovation decisions in Springfield, MA. Issues included a need to reduce asthma and enhance environmental equity in the community.

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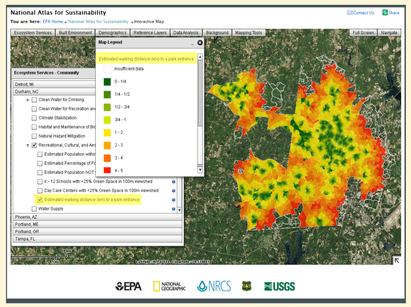
EnviroAtlas, a geospatial tool



Example: Data layer on walking distance to parks for Durham and Chapel Hill, NC. Other data layers can provide demographics, and features of the built environment pertinent to children's health such as:

- *Schools*
- *Grocery stores*
- *Medical facilities*
- *Transportation options*

Website: http://www.epa.gov/research/enviroatlas/
Contact: neale.anne@epa.gov

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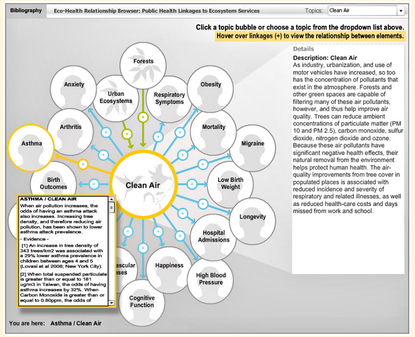
Eco-Health Browser



The *Eco-Health Relationship Browser* illustrates the linkages between human health and ecosystem services, i.e., benefits supplied by nature. This interactive tool provides information about several of our nation's major ecosystems, the services they provide, and how those services, or their degradation and loss, may affect people.
Example: asthma

Website: http://www.epa.gov/research/healthscience/browser
Contact: jackson.laura@epa.gov