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science in ACTION

INNOVATIVE RESEARCH FOR A SUSTAINABLE FUTURE

SUSTAINABLE AND HEALTHY COMMUNITIES RESEARCH

How do we meet today's needs without compromising the ability of future generations to meet their needs? And more specifically, how can we take action to protect our shared environment—air, water, land, and ecosystems—in ways that are economically viable, beneficial to human health and well-being, and socially just in the long-term? EPA's Sustainable and Healthy Communities (SHC) research program is working to provide the knowledge, data, and tools needed to answer those questions. The program is expressly focused on providing guidance and information to EPA Program and Regional Offices and U.S. communities to inform decisions that produce more sustainable outcomes for our environment, society, and economy.

The depletion of resources through the tragedy of the commons is an economic theory by Garrett Hardin[1], and is often cited in connection with sustainable development, aligning economic growth together with environmental protection in ways that result in improved well-being. Commons in this sense has come to mean nature's benefits such as the atmosphere, oceans, rivers, fisheries; i.e., ecosystem goods and services. SHC subscribes to the view of Elinor Ostrom[2] who found the tragedy of the commons not as difficult to solve. She looked at how communities manage common resources, such as fisheries, land, water, and air, and identified a number of factors conducive to successful sustainable management. Successful factors are those that tend to operate as a holistic system, providing appropriate community-based rules and procedures and important feedback mechanisms: built-in incentives for responsible use, consequences for overuse. SHC's research program advances the science of sustainable development and delivers tools and models that empower communities to make informed decisions to avert the tragedy of the commons and improve well-being.

Figure 1. Sustainability is a nested relationship linking economy, well-being, and the environment.

SHC research is based on the recognition of the nested relationship of a resilient economy, existing within a healthy society, dependent on an intact, functional environment—together illustrating the holistic definition of sustainability (see figure 1). SHC's goal is to expand community stakeholders' capabilities to make sustainable decisions despite this complexity, to provide them with flexible sustainability assessment approaches that consider the dynamic nature of the integrated environmental/social/economic system.

[1] *"The Tragedy of the Commons". Science* ***162*** *(3859): 1243–1248.*

[2] *Ostrom, E. (2009). "A General Framework for Analyzing Sustainability of Social-Ecological Systems". Science* ***325*** *(5939): 419–422.*

To advance this work, SHC researchers are developing an integrated suite of tools and information—indicators and indices, maps of land cover and demographics, health data, and information on causal relationships—as well as user-friendly decision support tools and models. Decision makers can use these research products to set goals, guide decisions, and measure progress toward their community objectives. SHC is using this integrated approach to inform decisions that will minimize unintended negative outcomes and maximize positive and multiple benefit outcomes: solutions that will better foster community sustainability in all its aspects.

Examples of Sustainable and Healthy Communities Research Products

- The **EnviroAtlas**, a web-based mapping system, allows interactive analysis of spatial data on environmental conditions, human health statistics, and socio-economic factors for communities across the country. Detailed data for urban areas can be used to identify local issues and evaluate potential solutions. For more information: http://enviroatlas.epa.gov/enviroatlas/atlas.html.
- The interactive **Eco-Health Relationship Browser** illustrates scientific evidence for linkages between human health and ecosystem services. It provides information about several of the nation's major ecosystems, the services they provide, and how those services, or their degradation and loss, might affect people. More information: http://www.epa.gov/research/healthscience/browser/introduction.html.
- EPA's **Report on the Environment** is an informative source of scientific indicators describing trends in the nation's environmental and human health condition. The indicators help to answer important questions about the current status and historical trends in various media. The indicators provide information to help EPA and others make decisions about environmental policy, education, and monitoring priorities. More information: http://cfpub.epa.gov/roe/.
- **Ecosystem Goods and Services.** EPA has created the EcoService Models web-based Library for finding, examining and comparing ecological models that may be useful for estimating ecosystem goods and services.
- **Human Well-Being and Environmental Quality Indexes.** Both incorporate social and economic components as well as environmental factors in deriving indices that are intended for use by communities to evaluate their solutions to achieving sustainable outcomes.
- ***Application of a Structured Decision Making Process for Informing Watershed Management in Guanica Bay, Puerto Rico*** demonstrates the application of a structured decision-making process for an ecosystem and economy stressed by activities in the watershed. Other communities can learn from this case study, about how such decision-making approach supports making defensible choices in complex decision situations. Download the document at: http://go.usa.gov/S9UR.
- **C-FERST** (Community-Focused Environmental Risk Screening Tool) is being developed as a community mapping, information access, and assessment tool designed to help assess risk and assist in decision making with communities. http://www.epa.gov/heasd/c-ferst/

Web Links for SHC Updates: http://www.epa.gov/research/newsflash/index.htm

Contact:
Michael Slimak
National Program Director
slimak.michael@epa.gov
919-541-1406