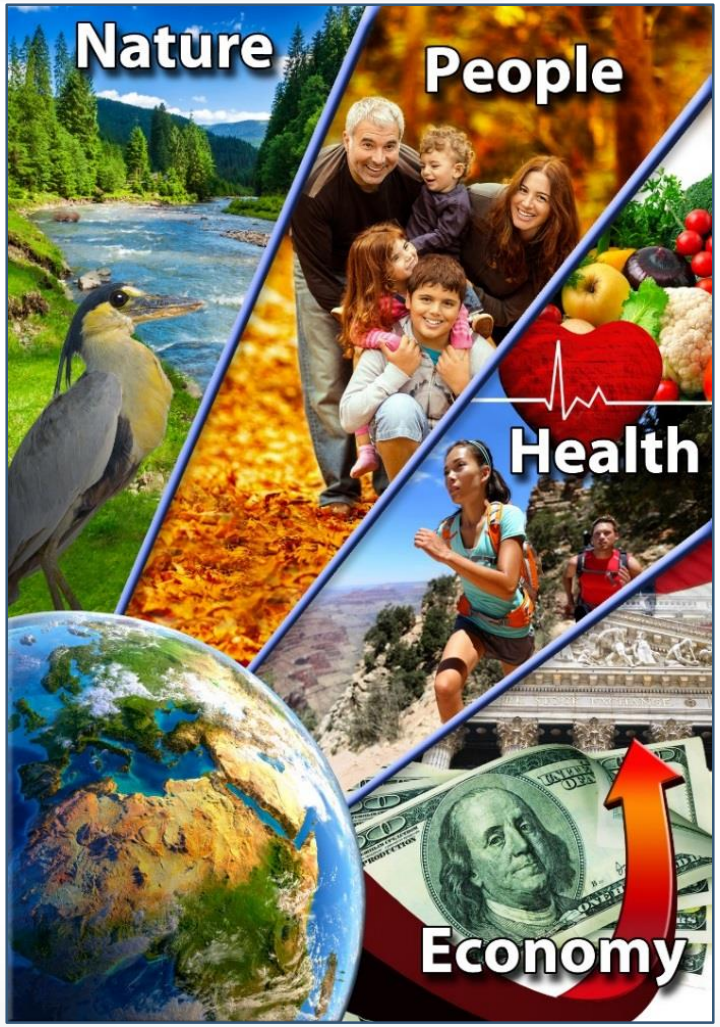


Sustainable and Healthy Communities (SHC) Research Program

U.S. EPA's Office of Research and Development

Presentation to the BOSC
July 16, 2015

Michael Slimak
National Program Director (NPD)

Andrew Geller
Deputy NPD

SHC’s Vision & Priorities

EPA Strategic Priorities

Working to Make a Visible Difference in Communities

Cleaning Up Communities and Advancing Sustainable Development

Working Toward a Sustainable Future

SHC Program Vision

To understand the associations and causal relationships between public health, well-being, and ecosystem services. SHC is developing the underlying research and tools to offer solutions to community-based decision makers within and outside the Agency

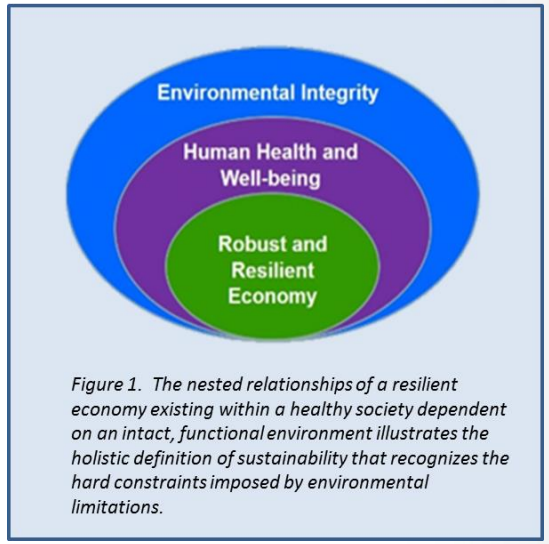
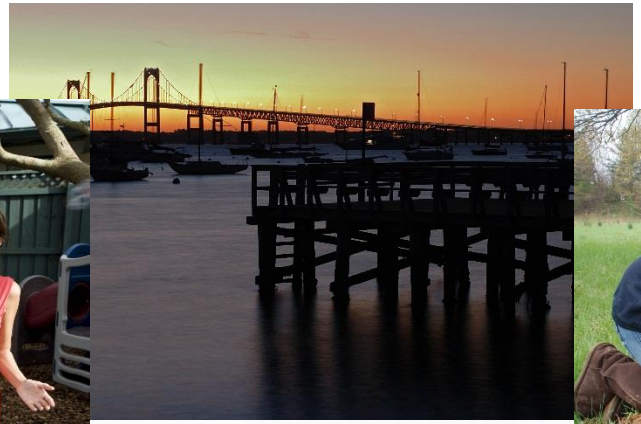


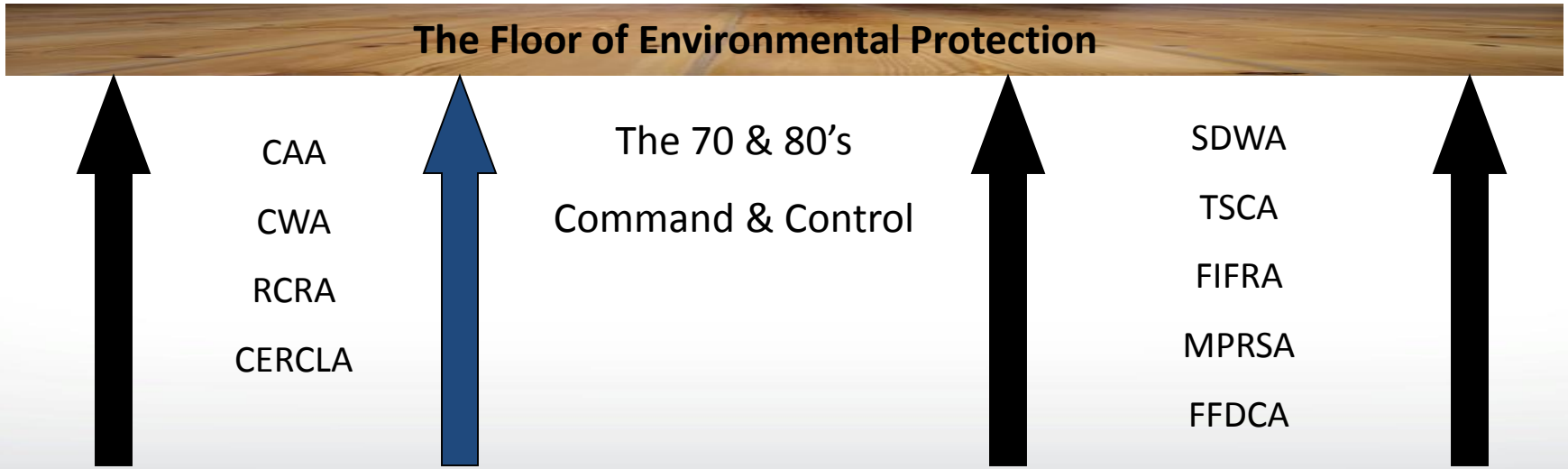
Figure 1. The nested relationships of a resilient economy existing within a healthy society dependent on an intact, functional environment illustrates the holistic definition of sustainability that recognizes the hard constraints imposed by environmental limitations.



The Ceiling of Environmental Protection

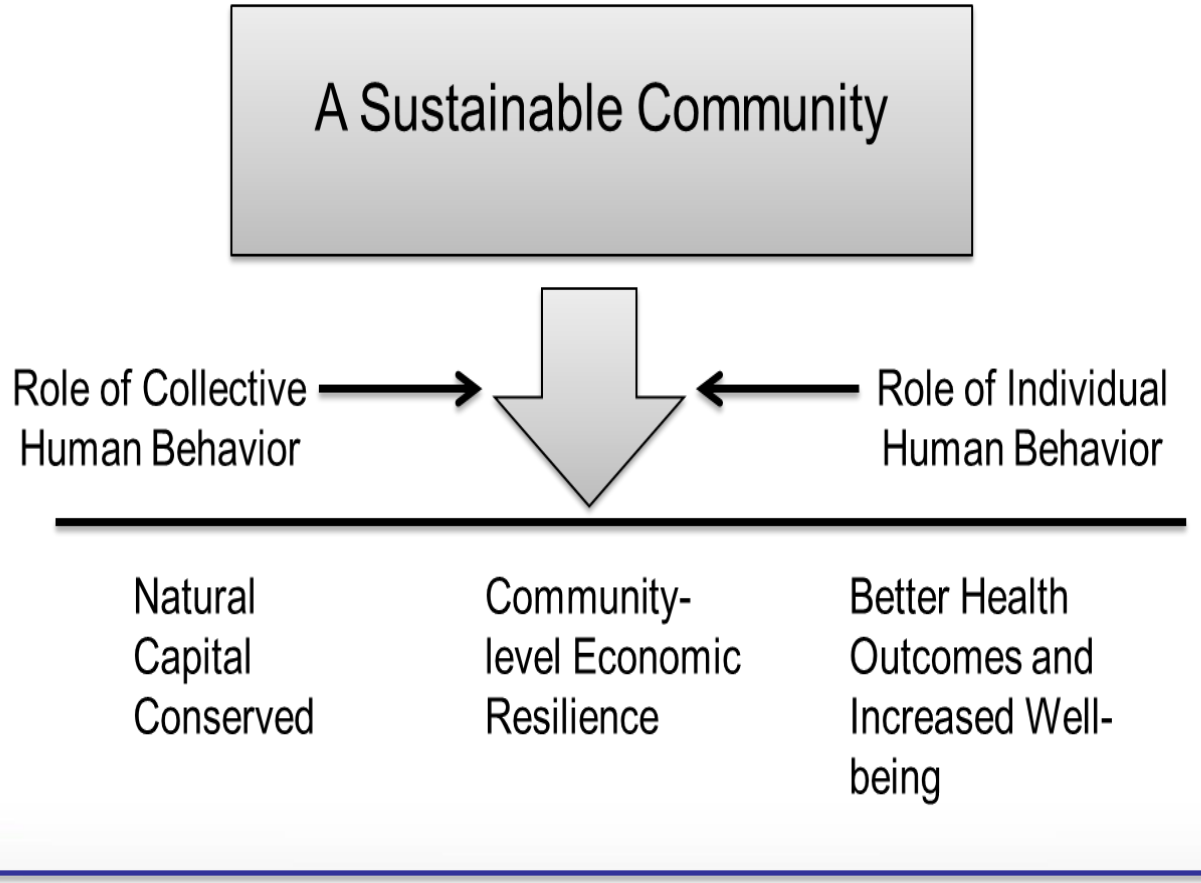
- Traditional approaches have set a “high floor”
- Systems approach necessary for sustainable environmental, economic and social outcomes

SHC research will develop science-based tools, data, and information to support sustainable regulatory and non-regulatory approaches



Sustainable and Healthy Communities Research Program

Hypothesis: Community-based decisions using a sustainability paradigm (i.e., a systems approach) will result in positive environmental, social & economic outcomes



SHC's Perspective on Sustainability

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, meshing economic growth and environmental protection resulting 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, air, and identified a number of factors conducive to successful sustainable management. All of these factors tend to operate as a holistic system with appropriate community-based rules and procedures in place with built-in incentives for responsible use and consequences for overuse.

SHC's research program is intended to understand the science of sustainable development and to develop tools that allow communities to avert the tragedy of the commons by using these tools to make informed decisions leading to improved well-being.

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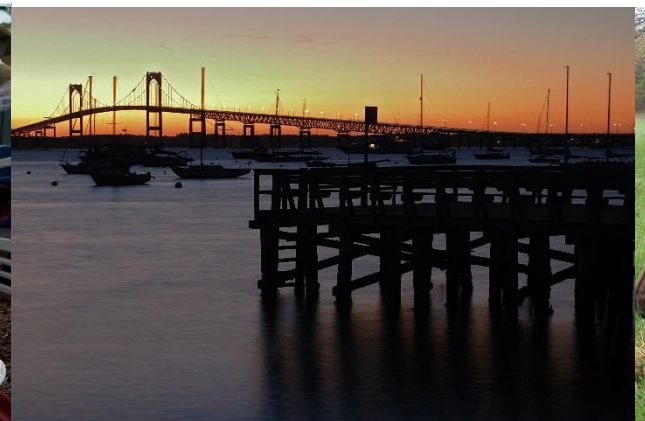
[1] *The Tragedy of the Commons". Science* ***162*** *(3859): 1243–1248.*

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

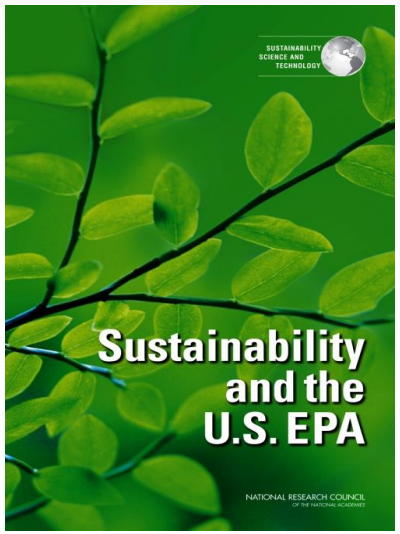
SHC Priorities

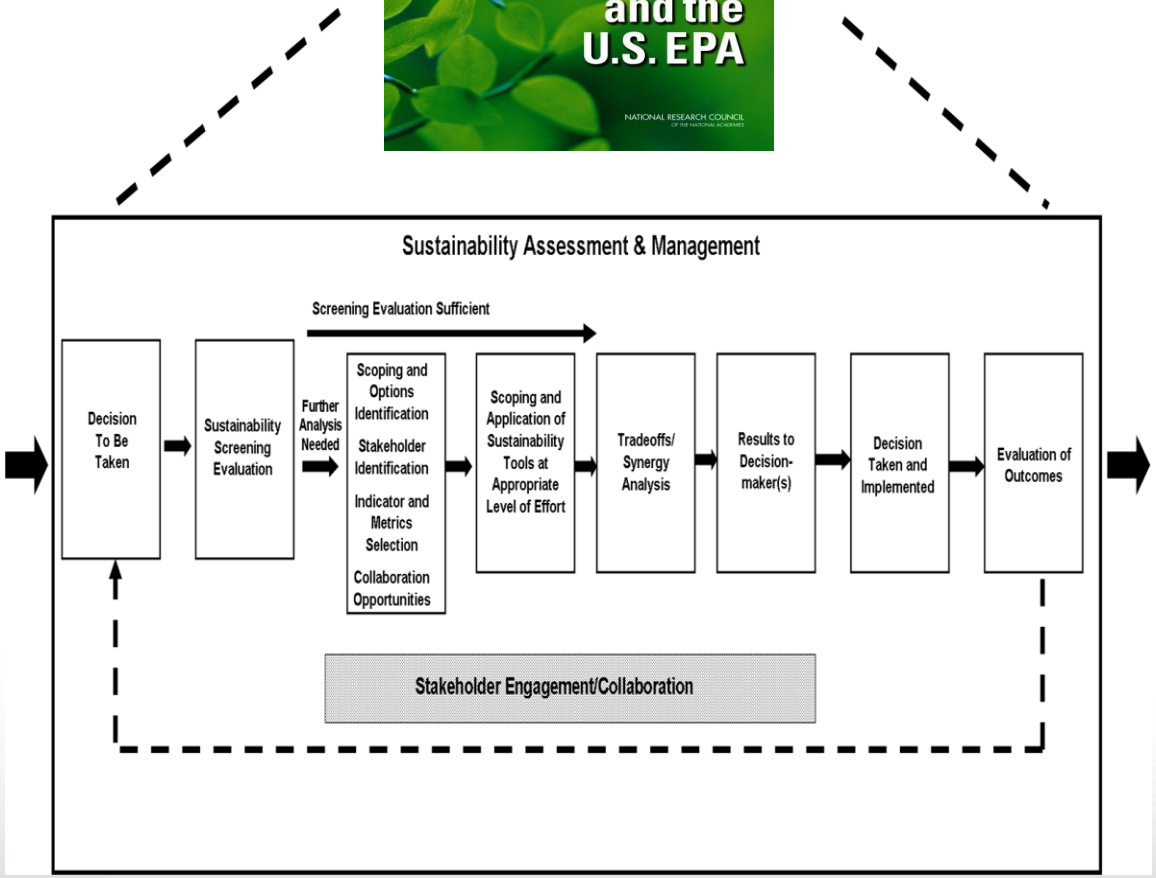
- ✓ Research to help the Agency build sustainability into its day-to-day operations
- ✓ Develop the data, models and tools to expand community stakeholders' capabilities to consider the impacts of decision alternatives
- ✓ Research and technical support for cleaning up communities, ground water, and oil spills, restoring habitats and communities, and advancing sustainable development
- ✓ Development of a Sustainability Assessment and Management Toolbox





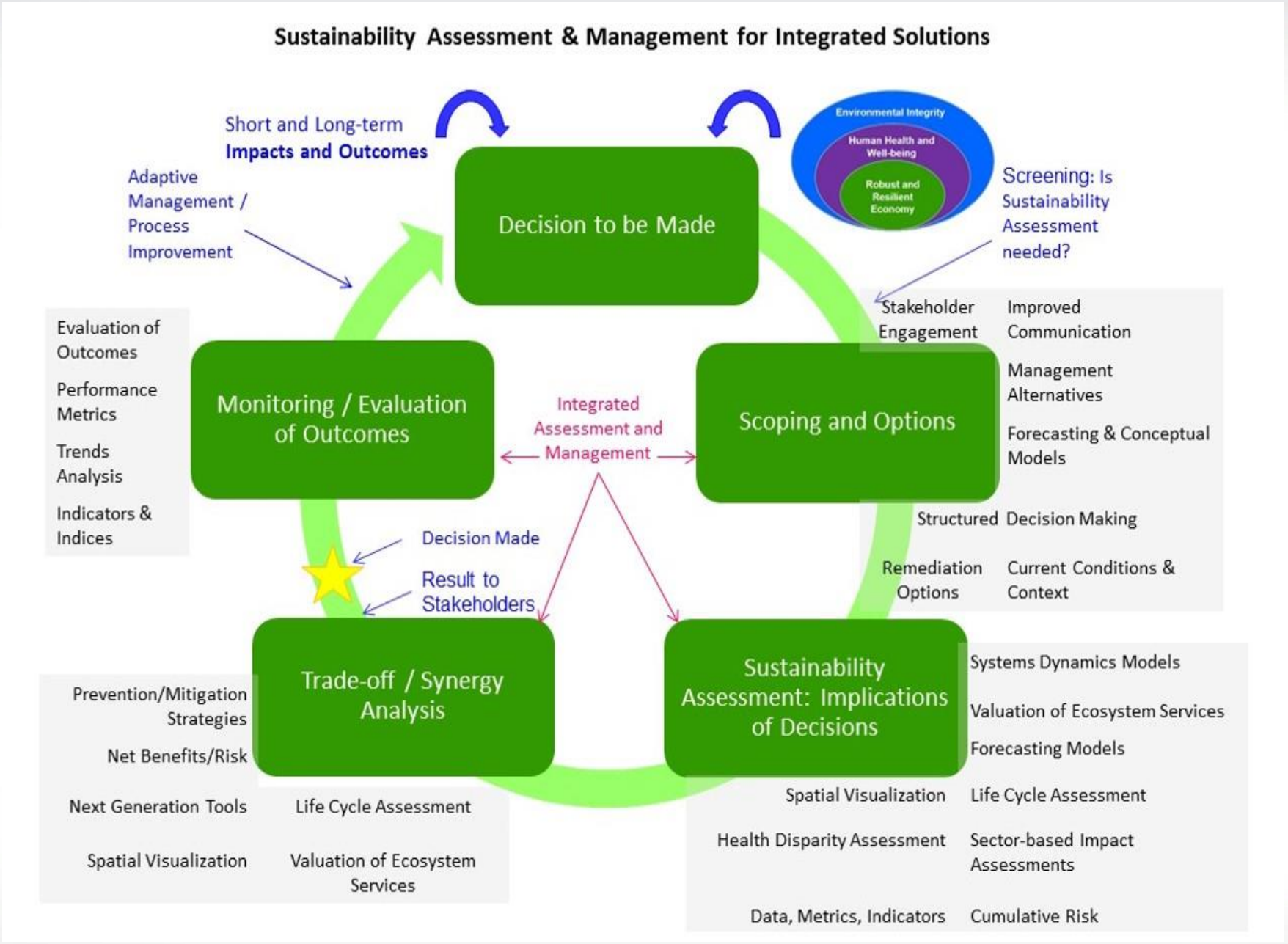

Integrated Solutions = A Sustainability Assessment Toolbox





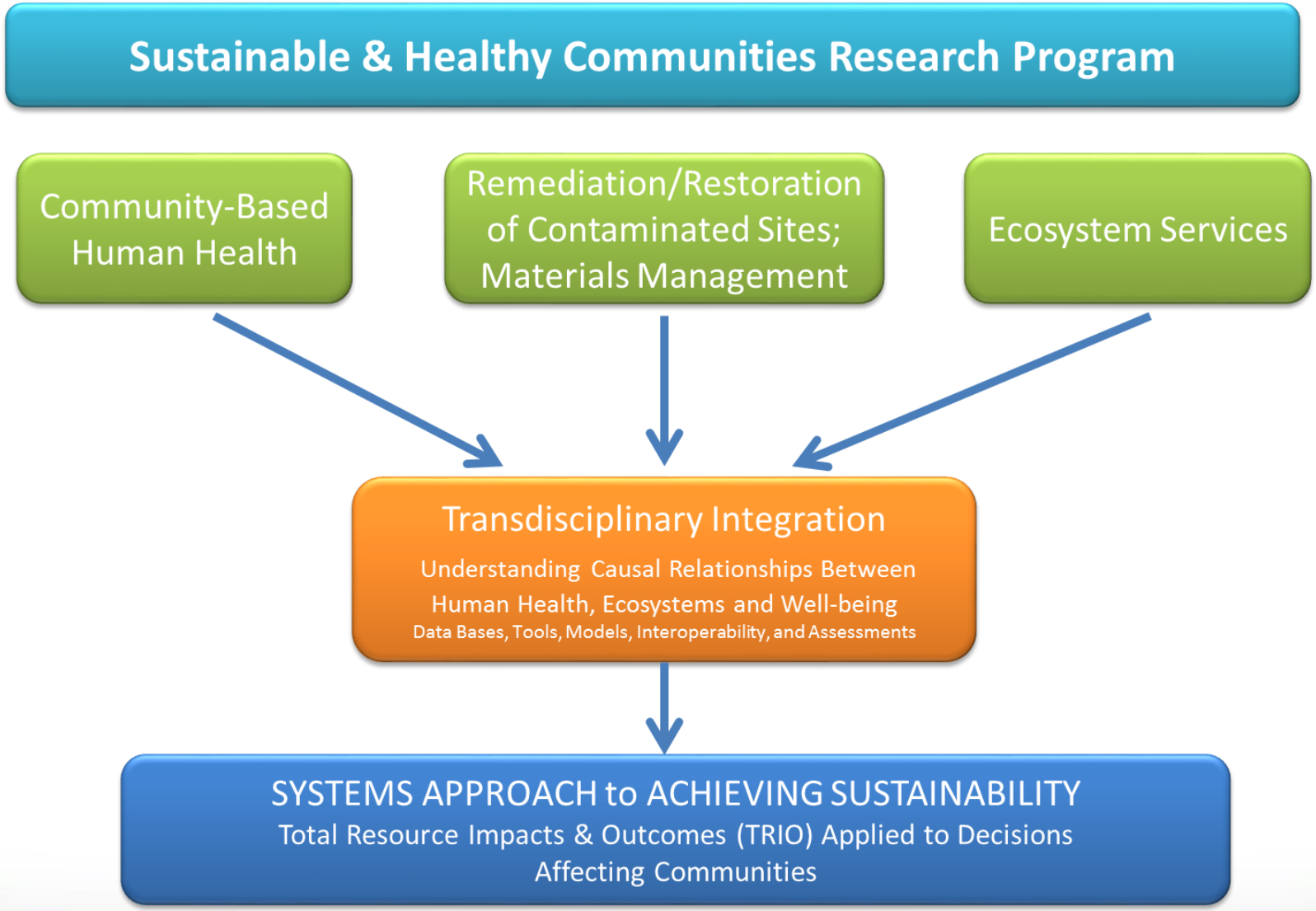
The National Academy of Sciences Recommends:

- Sustainability Assessment and Management toolbox
- Analyze consequences of alternative decision options on the full range of social, environmental, and economic indicators
- Show distributional impacts to vulnerable or disadvantaged groups and ecosystems


Sustainability Assessment & Management for Integrated Solutions
Short and Long-term
Impacts and Outcomes
Adaptive Management / Process Improvement
Decision to be Made
Environmental Integrity
Human Health and Well-being
Robust and Resilient Economy
Screening: Is Sustainability Assessment needed?
Stakeholder Engagement
Improved Communication
Management Alternatives
Forecasting & Conceptual Models
Structured Decision Making
Current Conditions & Context
Scoping and Options
Integrated Assessment and Management
Monitoring / Evaluation of Outcomes
Evaluation of Outcomes
Performance Metrics
Trends Analysis
Indicators & Indices
Decision Made
Result to Stakeholders
Trade-off / Synergy Analysis
Prevention/Mitigation Strategies
Net Benefits/Risk
Next Generation Tools
Life Cycle Assessment
Spatial Visualization
Valuation of Ecosystem Services
Sustainability Assessment: Implications of Decisions
Systems Dynamics Models
Valuation of Ecosystem Services
Forecasting Models
Spatial Visualization
Life Cycle Assessment
Health Disparity Assessment
Sector-based Impact Assessments
Data, Metrics, Indicators
Cumulative Risk

SHC Structure

Program Design: SHC Builds on ORD's Historic Strengths



SHC's Research Topics and Project Areas

Decision Support and Innovation

1.61 Decision Science and Support Tools

1.62 EnviroAtlas: A Geospatial Analysis Tool

1.63 Environmental Workforce and Innovation

Community Well-Being

2.61 Community-based Ecosystem Goods & Services

2.62 Community Public Health & Well-Being

2.63 Assessing Health Disparities in Vulnerable Groups

2.64 Indicators, Indices, & the Report on the Environment

Sustainable Approaches for Contaminated Sites and Materials Management

3.61 Contaminated Sites

3.62 Environmental Releases of Oils and Fuels

3.63 Sustainable Materials Management

Integrated Solutions for Sustainable Communities

4.61 Integrated Solutions for Sustainable Communities

Topic 1: Decision Support & Innovation

Develop tools and approaches to assist community stakeholders in making environmental decisions.

Project 1.61	**Decision Science & Support Tools** (a) Decision-focused Design and Use of Tools; (b) Software Re-Configuration; (c) Tool Development, Support & Delivery
Project 1.62	**EnviroAtlas: A Geospatial Analysis Tool** (a) Improved Functionality & Case Studies; (b) New Tools & Data Layers; (c) Outreach & Communication
Project 1.63	**Environmental Workforce and Innovation** (a) STAR & GRO Fellowships; (b) People, Prosperity, & the Planet (P3) and Small Business Innovation (SBIR)

Topic 2: Community Well-Being (Public Health and Ecosystems Goods and Services)

Provide research and metrics to predict interactions between natural and built environment to promote individual and community well-being and maintain or restore high environmental quality.

Project 2.61	**Community-Based Ecosystem Goods & Services** (a) Classification, Metrics & Production; (b) Benefits; (c) Climate/Stressors; (d) Coordinated Case Studies; (e) Integration, Synthesis & Communication
Project 2.62	**Community Public Health & Well-being** (a) Engagement, Assessment Tools & Decision-Support; (b) Enviro Drivers of Community Health & Well-being; (c) Improving Community Health, Well-being, and Exposure Assessments
Project 2.63	**Assessing Health Disparities in Vulnerable Groups** (a) Children's Environmental Health; (b) Tribal Communities; (c) Disproportionately Impacted Communities
Project 2.64	**Indicators, Indices & the Report on the Environment** (a) State of the Practice for Sustainability Indicators; (b) Development of Indicators of Ecological & Community Resilience; (c) Interpreting Environmental Conditions; (d) Report on the Environment (ROE)

Topic 3: Sustainable Approaches for Contaminated Sites and Materials Management

Provide science and technical support to assess and manage contaminated sites. Develop science that supports materials reduction, reuse, recycling, and disposal to minimize environmental impacts.

Project 3.61	**Contaminated Sites** (a) Technical Support; (b) Site Characterization, Remediation, & Management; (c) Impacts of Contaminated Ground Water
Project 3.62	**Environmental Releases of Oils and Fuels** (a) Oil Spills; (b) LUST
Project 3.63	**Sustainable Materials Management** (a) Life Cycle Management; (b) Re-use of Organics & Other Materials; (c) Regulatory Support

Topic 4: Integrated Solutions for Sustainable Communities

Integrated sustainability assessments: Develop tools and research to assist communities in holistically evaluating their decisions so they can optimize economic, societal, ecological, and human health outcomes (while minimizing adverse impacts and costs).

Project 4.61

Integrated Solutions for Sustainable Communities

(a) Sustainability Tool Box; (b) Sustainability Assessment & Management for Communities; (c) Case Studies

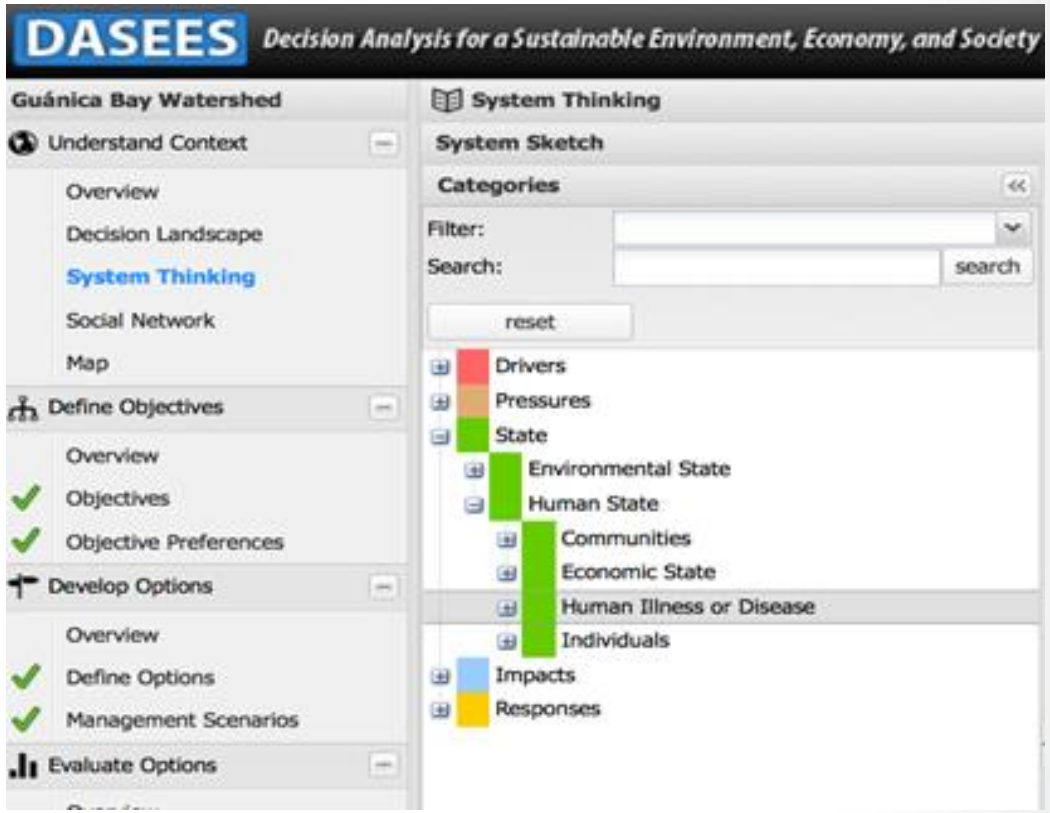
Representative Products

Structured Decision-Making

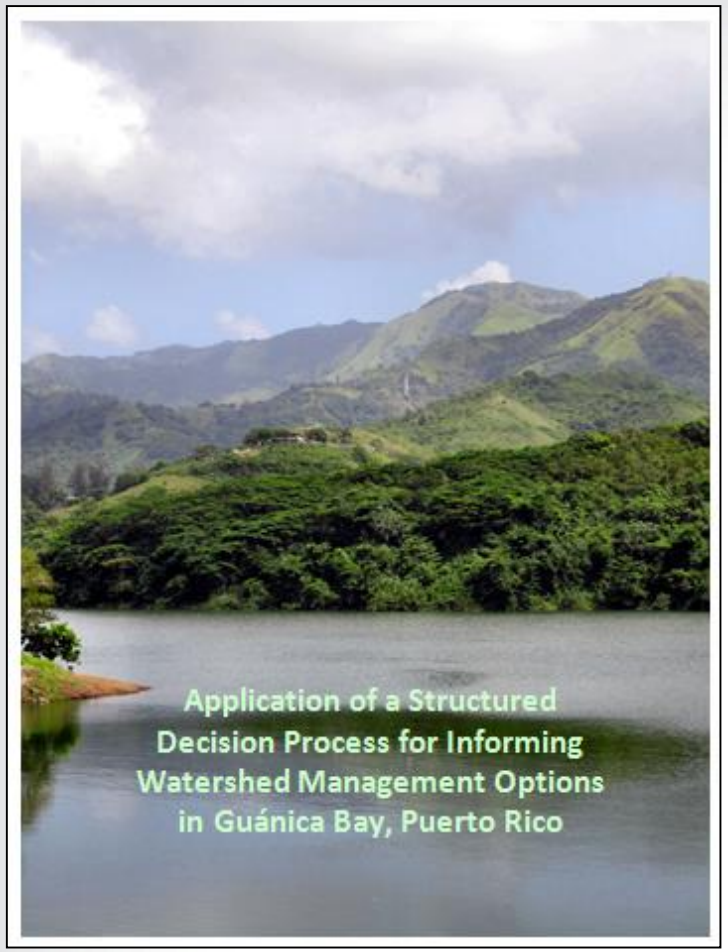
A process to elicit and organize key ***stakeholder values*** and relevant ***scientific knowledge*** for making decisions

DASEES (**D**ecision **A**nalysis for a **S**ustainable **E**nvironment, **E**conomy, and **S**ociety)

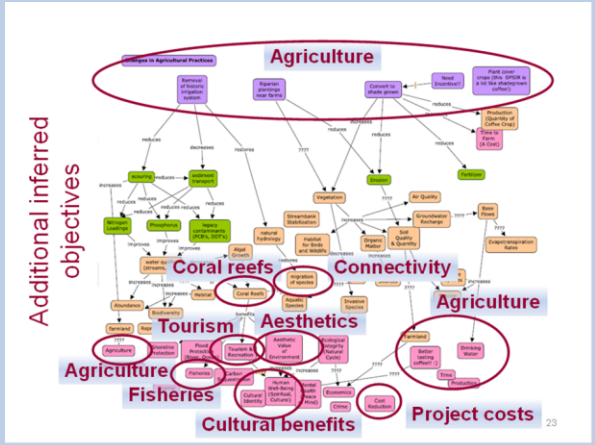
- a web-based tool supporting community decision-making
- Facilitates the application of Structured Decision Making (SDM) through organizing and processing information used for identifying common goals, and creating, evaluating, and implementing alternatives for complex environmental management and policy problems



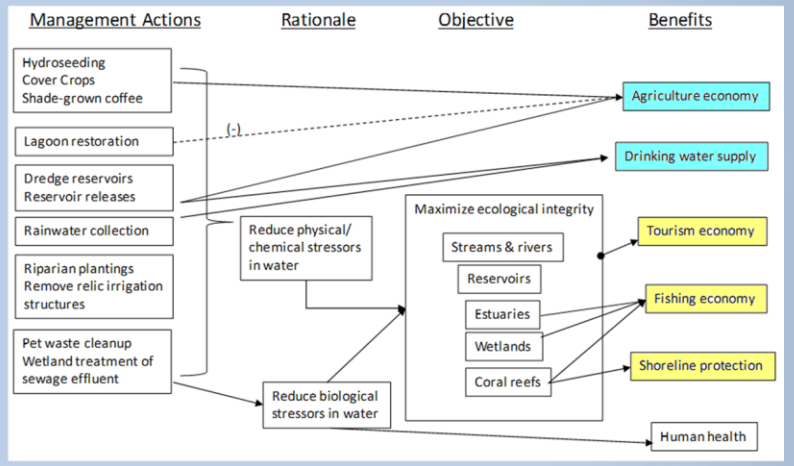
Project 1.61



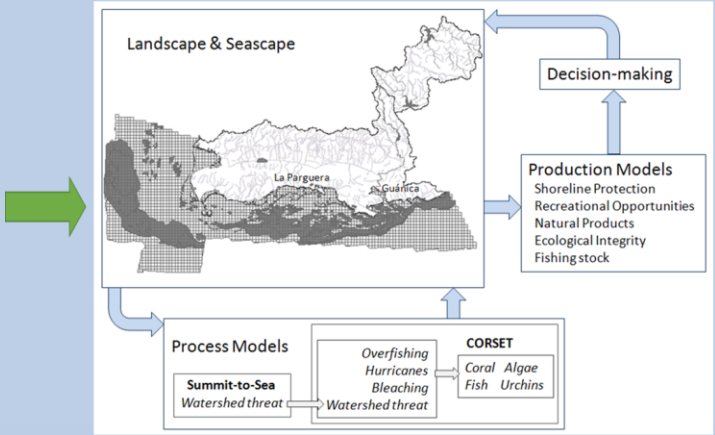
Guánica Bay, Puerto Rico Watershed Management



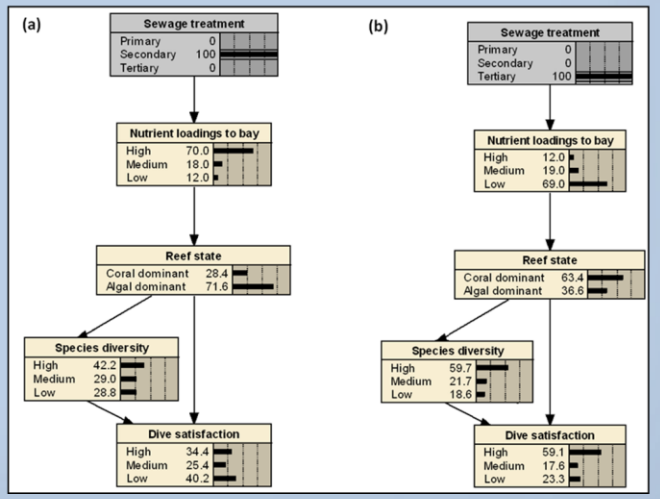
Decision Context – Conceptual Mapping



Objectives, Measures, Management Action



Scenario Modeling



Alternative Evaluation and Trade-offs

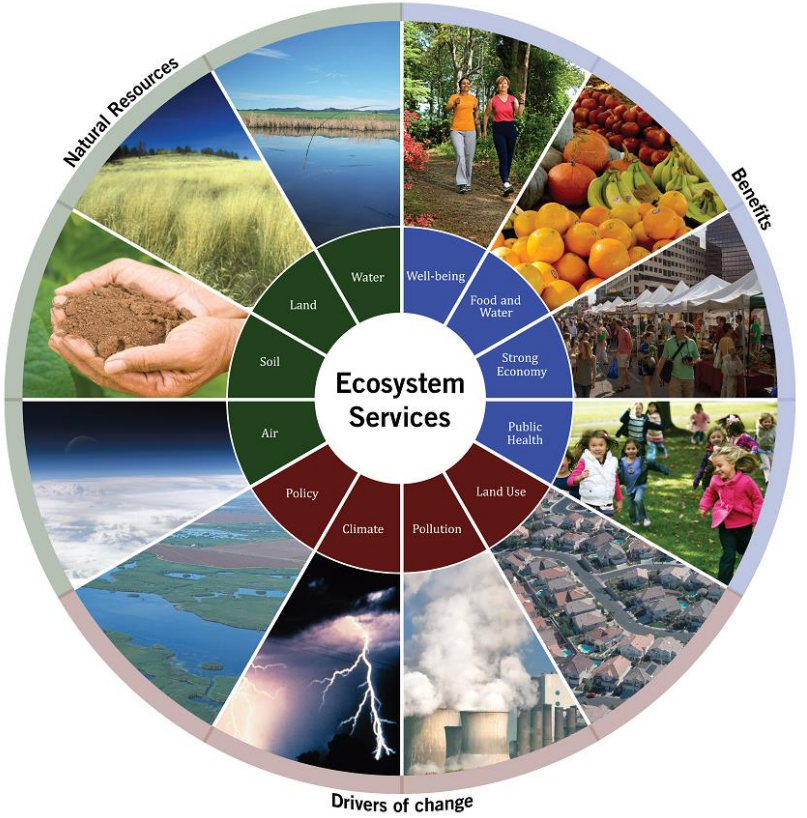
Project 1.61

EnviroAtlas

An online decision support tool giving users the ability to view, analyze, and download geospatial data and other resources; designed to inform decision-making, education, and additional research

EnviroAtlas includes:

- Geospatial indicators
- Supplemental data (e.g., boundaries, land cover, soils, hydrography, impaired water bodies, wetlands, demographics, roads)
- Analytic and interpretive tools



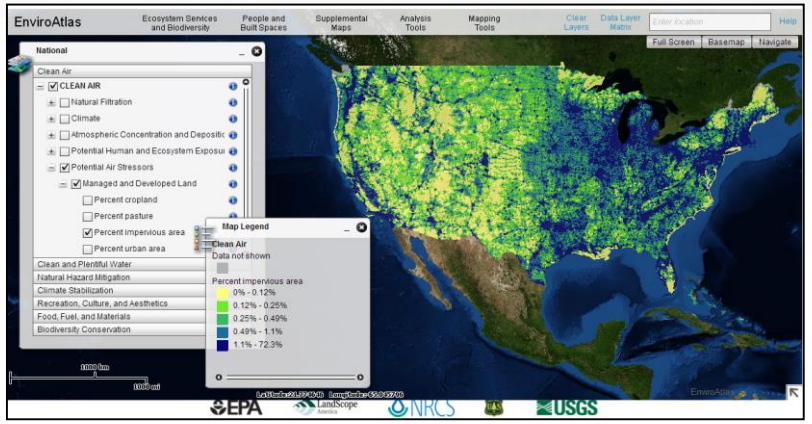
Developed through cooperative effort amongst multiple Federal agencies and other organizations

Project 1.62

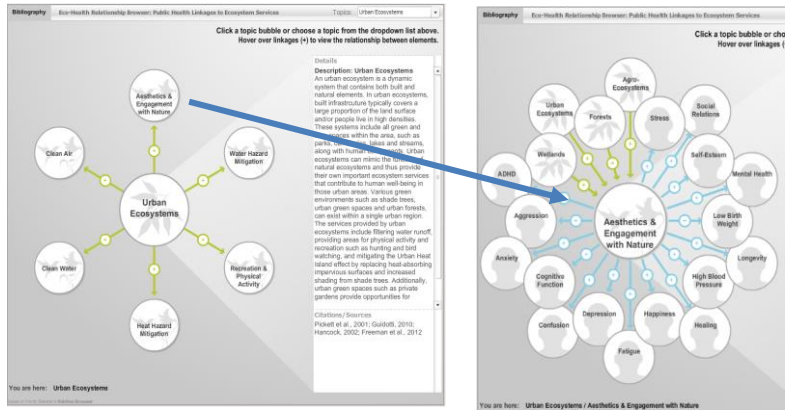
Version 1 Released May 2014

EnviroAtlas is a collection of tools and resources

http://enviroatlas.epa.gov



Interactive Mapping Application



Eco-Health Relationship Browser

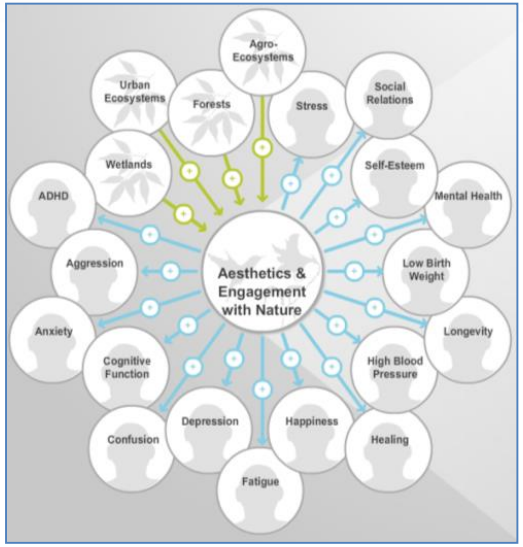
Project 1.62

The Eco-Health Relationship Browser

http://enviroatlas.epa.gov/enviroatlas/Tools/EcoHealth_RelationshipBrowser/introduction.html

4 ecosystems:

- Forests
- Urban Ecosystems
- Wetlands
- Agro-Ecosystems



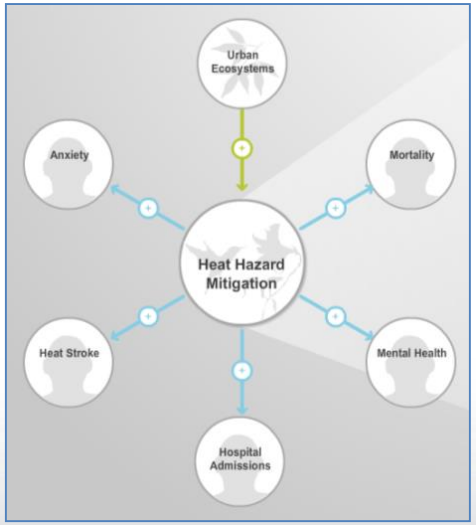
6 Ecosystem Services:

Health promotional services

- Aesthetics & Engagement with Nature
- Recreation & Physical Activity

Buffering services

- Clean Air
- Clean Water
- Heat Hazard Mitigation
- Water Hazard Mitigation



30+ health outcomes:

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

… many more

Incl. extensive bibliography (n ~ 300)

Project 1.62

Environmental Innovation and Sustainable Education

Grooming the Next Generation of Environmental Scientists and Engineers

- Science to Achieve Results (STAR) Graduate Fellowships (1786 since 1995)
- Greater Research Opportunity - GRO (362 since 1997)

People, Prosperity, Planet (P3)
Student Sustainability Competition

Small Business Innovation Research (SBIR)

Project 1.63

Final Ecosystem Goods and Services

"components of nature, directly enjoyed, consumed, or used to yield human well-being" *(Boyd & Banzhaf 2007)*

Environmental Class + Beneficiary → FEGS

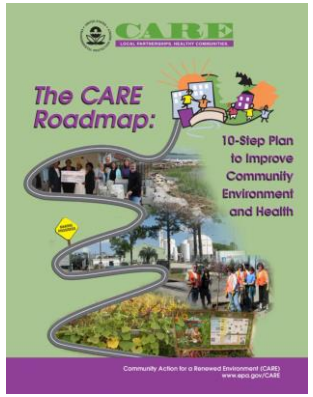
Estuaries and Near Shore Marine

Recreational Food Pickers and Gatherers

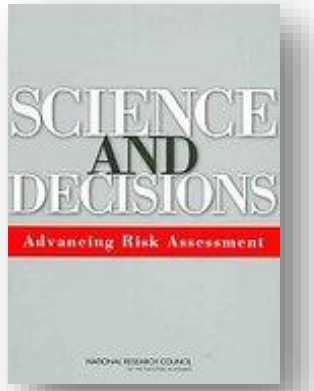
Flora and fauna, such as mussels, seaweed, crabs, etc.

Decision Support Tools for Communities

C-FERST is a web-based "tool-kit" to help communities learn more about environmental health issues, gather information, and develop options



PACE EH
NACCHO's CEHA Program
Community-based Environmental Health Assessment



- Includes step-by-step guidance to inform community-based assessments
- Addresses challenges and needs identified by NRC, NEJAC, others
- Provides a venue for communicating science; EPA recommendations and options to address issues

Health Impact Assessment

Proposed Decision → **Determinants of Health** → **Health Outcomes**

- National community of practice
- SHC
  - Strengthen the overall rigor of HIA practice
  - Advance the use of HIA at higher decision-making levels

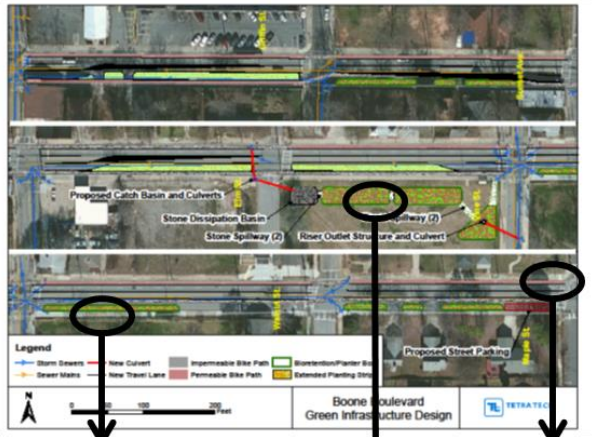
HIA Core Values: Democracy • Equity • Sustainability • Ethical Use of Evidence • Comprehensive Approach to Health

Issues Facing the Community:

- Pervasive flooding
- Impaired water quality
- Poverty
- Derelict properties
- Aging infrastructure

Potential Solution:

Boone Boulevard Green Street Project



Project 2.62

Social Determinants of Environmental Health: Complementary animal and population-based approaches

Complementary animal and human approaches show how:

- Prenatal and early life environments impact children's growth, development, health, and future well-being as adults;
- Community stressors impact both individual and community resilience and well-being.

Factor Interactions & Lifecourse Impacts

Healthy Food

Clean home & school

Exercise

Air Quality
Chemicals

Poverty
Stress

Associations *Biological Plausibility*

Causation

Animal Studies:

Reliable methods were developed and used to measure key health outcomes in rodent models, These experimental approaches will now be used to evaluate causation and attribution of risk for multiple stressors

Population-based studies:

Exposure to air pollution from wildfires was shown to have a greater impact on health in lower SES communities based on the frequency of emergency room visits for asthma and cardiovascular incidents.

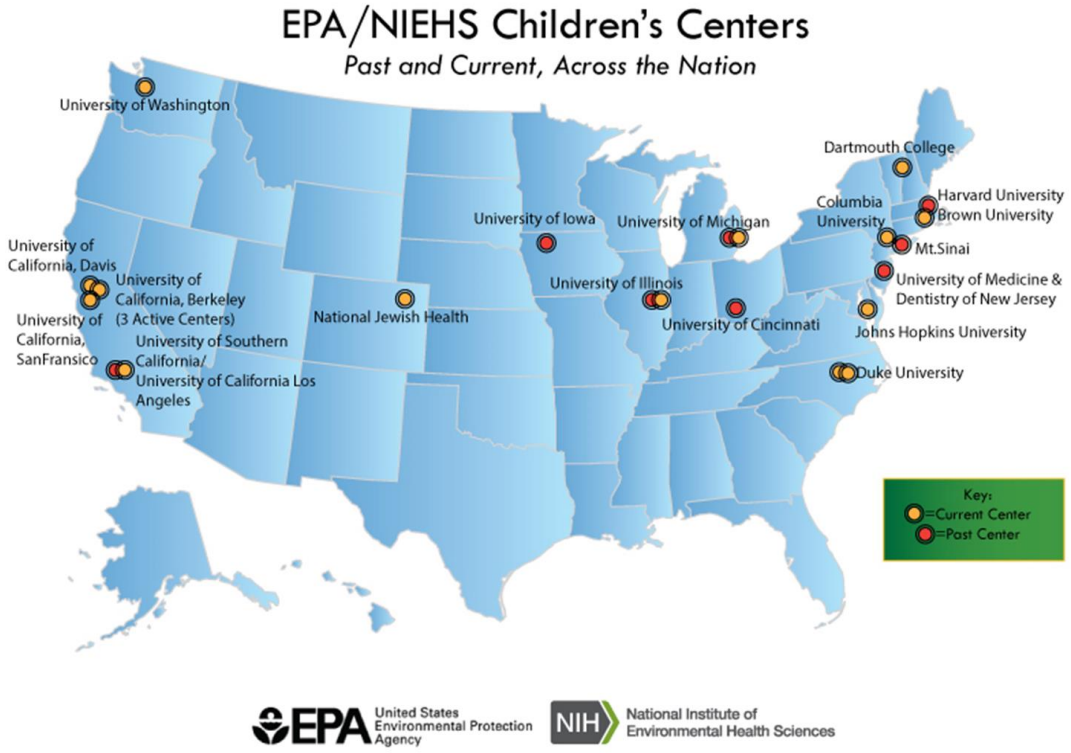
Project 2.62

Science to Achieve Results (STAR) Grants

RFA Titles	Periods of Performance
Healthy Schools: Environmental Factors, Children's Health & Performance, & Sustainable Building Practices	FY 2015-2019
Science for Sustainable and Healthy Tribes	FY 2015-2019
Issues in Tribal Environmental Research and Health Promotion: Novel Approaches for Assessing and Managing Cumulative Risks and Impacts of Global Climate Change	FY 2008 -2012
Lifestyle and Cultural Practices of Tribal Populations and Risks from Toxic Substances in the Environment	FY 2003- 2006
Understanding the Role of Nonchemical Stressors & Developing Analytic Methods for Cumulative Risk Assessments	FY 2011-2014
Exploring Linkages Between Health Outcomes and Environmental Hazards, Exposures, and Interventions for Public Health Tracking and Risk Management	FY 2010 -2013
Development of Environmental Health Outcomes Indicators (2006 & 2007)	FY 2007-2010; FY 2008 -2011

Project 2.62

Centers for Children's Environmental Health



- Asthma and allergy
- Adverse impacts linked to exposure to flame retardants
- Environment and Autism
- Health and safety of whole family – agricultural workers and vulnerable groups

Intended End Users

Research Community

- e.g., Dartmouth College Children's Center

Decision Makers

- Federal, State and local (e.g., FDA arsenic and rice studies)

General Public

ConsumerReports

npr

Los Angeles Times

Proximity to freeways increases autism risk, study finds

More research is needed, but the report suggests air pollution could be a factor.

December 16, 2010 | By Shari Roan, Los Angeles Times

Children born to mothers who live close to freeways have twice the risk of autism, researchers reported Thursday. The study, its authors say, adds to evidence suggesting that certain environmental exposures could play a role in causing the disorder in some children.

"This study isn't saying exposure to air pollution or exposure to traffic causes autism," said Heather Volk, lead author of the paper and a researcher at the Saban Research Institute of Children's Hospital Los Angeles. "But it could be one of the factors that are contributing to its increase."

Project 2.63

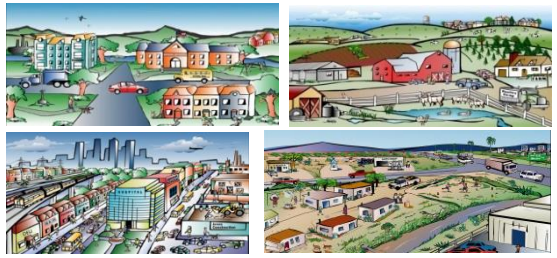
Recipients of EPA-NIMHD Centers of Excellence on Environment and Health Disparities Research

Institutions
Weill Cornell Medical College, Cornell University
University of Illinois at Chicago
University of Kansas Medical Center
University of Michigan - Ann Arbor, Drexel University, Jackson State University
Georgia State University
University of South Carolina at Columbia, University of Maryland
Meharry Medical College, Charles Drew University of Medicine & Science, National Space Science and Technology Center, Tulane University of Louisiana, University of Maryland - Baltimore, University of Tennessee - Knoxville
Columbia University Medical Center
University of New Mexico Health Sciences Center
The University of Texas at El Paso, The University of Texas Health Science Center Houston

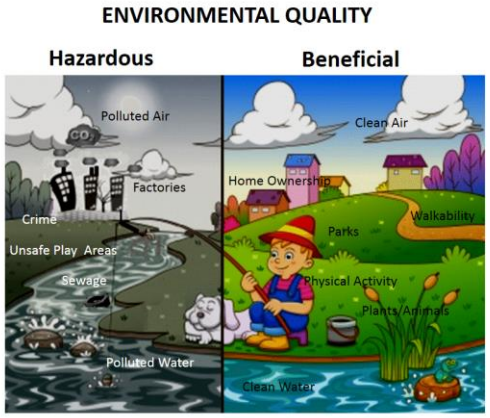
Project 2.63

Environmental Quality Index

Multiple Environments



Multiple Environmental Benefits and Hazards



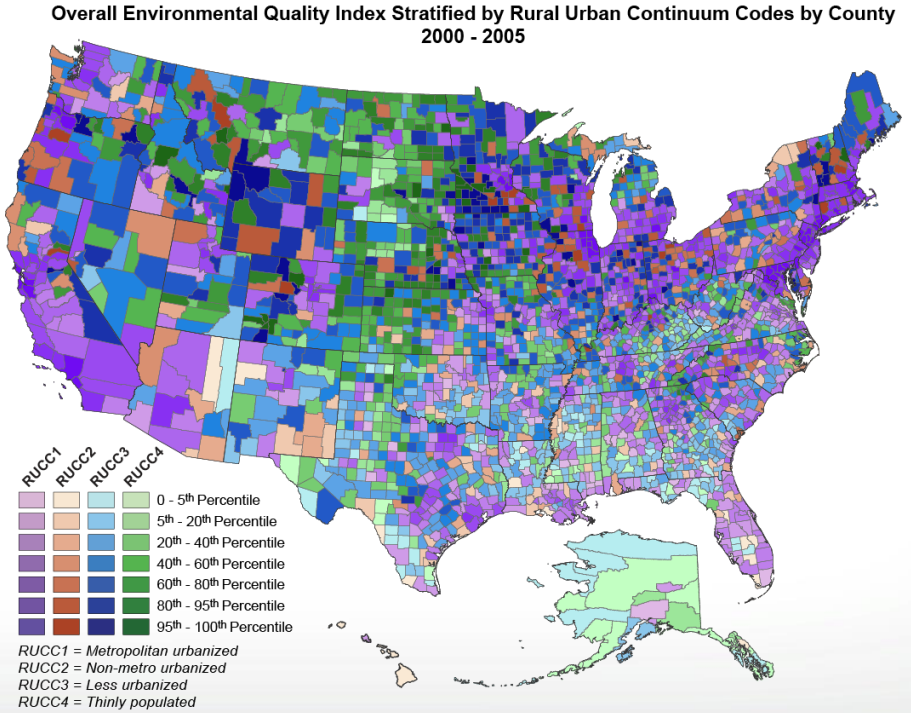
Public Access To EQI

http://epa.maps.arcgis.com/home/item.html?id=90ab3f8d668c4a4e88144d586ea34141

https://edg.epa.gov/data/Public/ORD/NHEERL/EQI

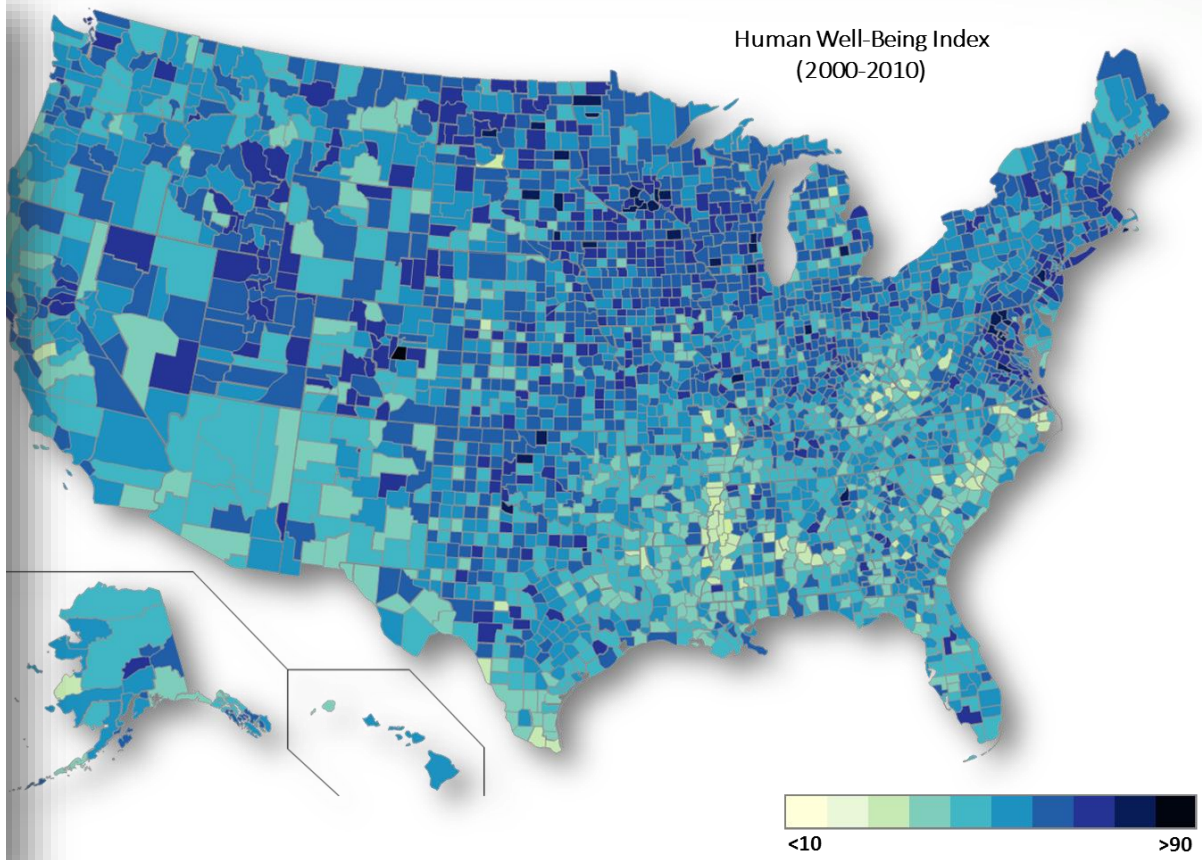
Goals:

- To construct an environmental quality index (EQI) for all counties in the U.S. taking into account:
  - multiple domains that influence exposure and health
    - five domains: air, water, land, built environment, and socio-demographic
  - incorporates data representing the chemical, natural and built environment
- Developed to explore associations with adverse health effects



Human Well-Being Index (HWBI)

Domain	Indicator	Metric Count
Connection to Nature	Biophilia	2
Cultural Fulfillment	Activity Participation	2
Education	Basic Educational Knowledge and Skills of Youth	3
	Participation and Attainment	4
	Social, Emotional and Developmental Aspects	4
Health	Healthcare	2
	Personal Well-being	3
	Physical and Mental Health Conditions	9
	Life Expectancy and Mortality	7
	Lifestyle and Behavior	4
Leisure Time	Activity Participation	2
	Time Spent [Amount of Time]	1
	Working Age Adults	3
Living Standards	Basic Necessities	2
	Income	3
	Wealth	2
	Work	2
Safety and Security	Actual Safety	4
	Perceived Safety	1
	Risk	1
Social Cohesion	Attitude Towards Others and the Community	5
	Democratic Engagement	6
	Family Bonding	3
	Social Engagement	3
	Social support	2

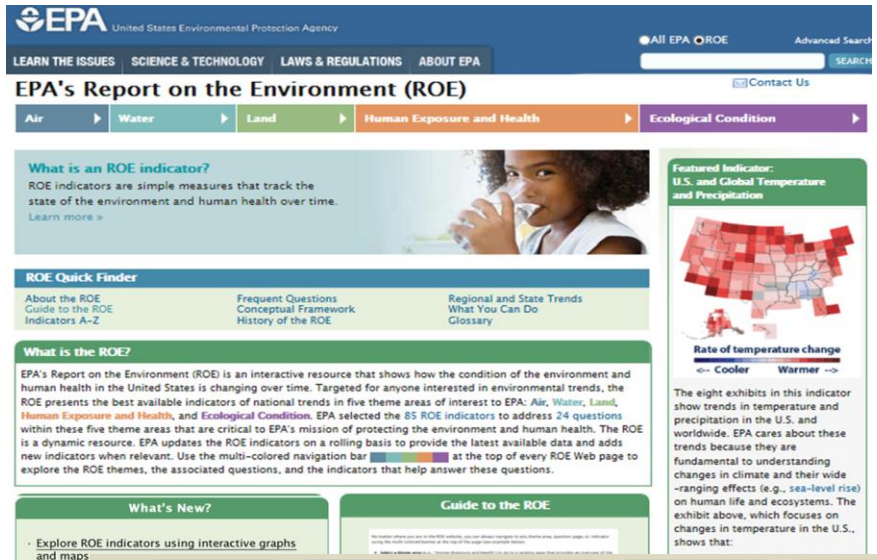


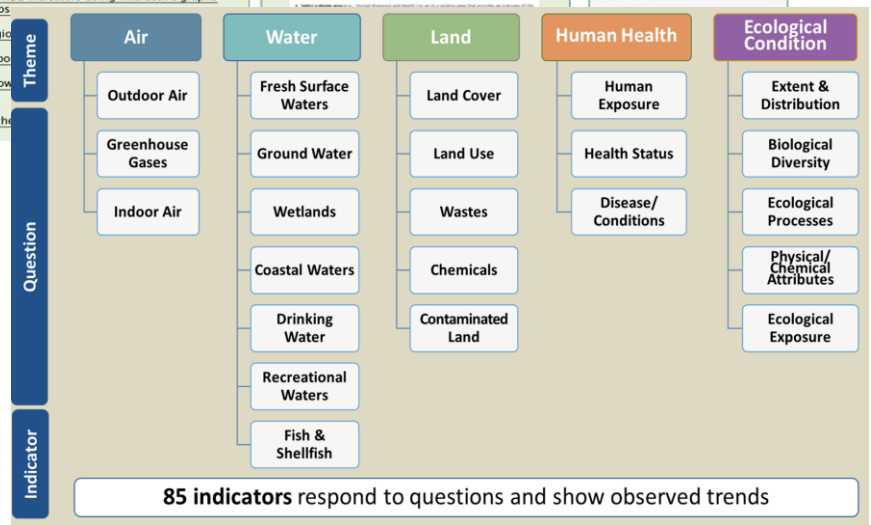
- A holistic approach to characterize the current state of well-being
- Relevant to any community at any spatial scale and over time
- Highlights the link between the flow of ecological, economic and social services, and human well-being
- Intended to inform and empower communities to equitably weigh and integrate human health, socio-economic and environmental factors to foster sustainability in their built and natural environments

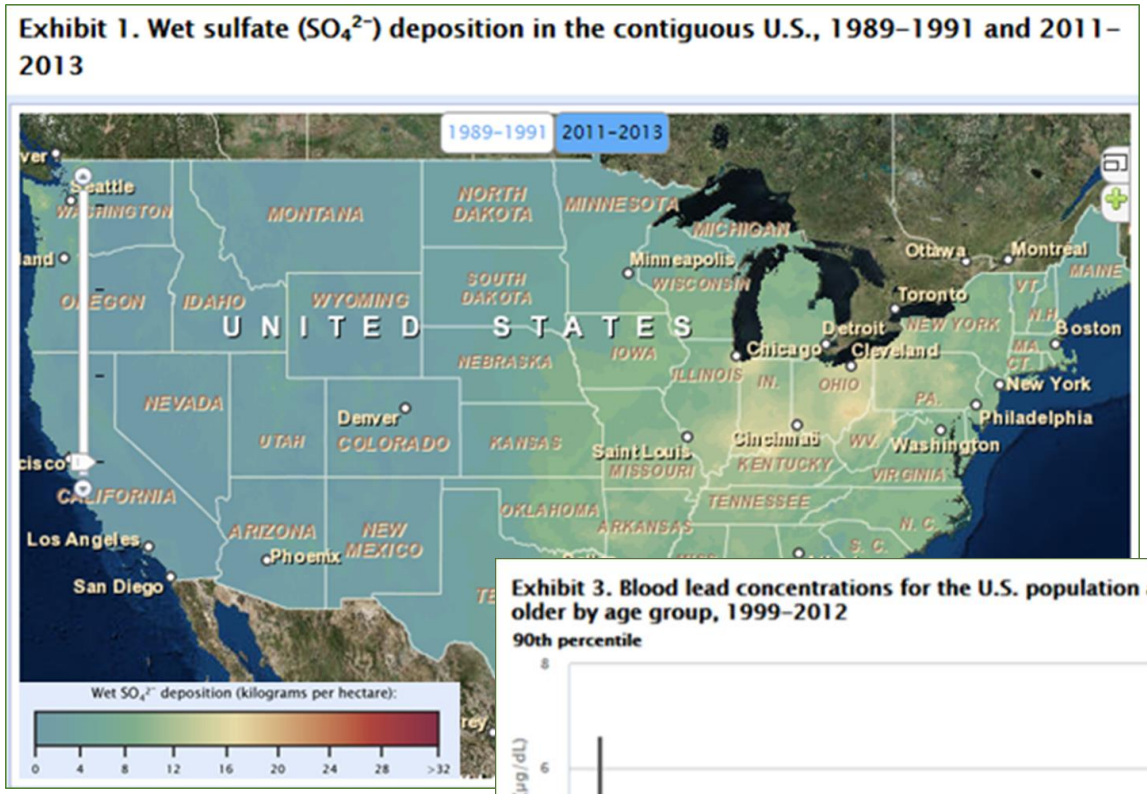
Project 2.64

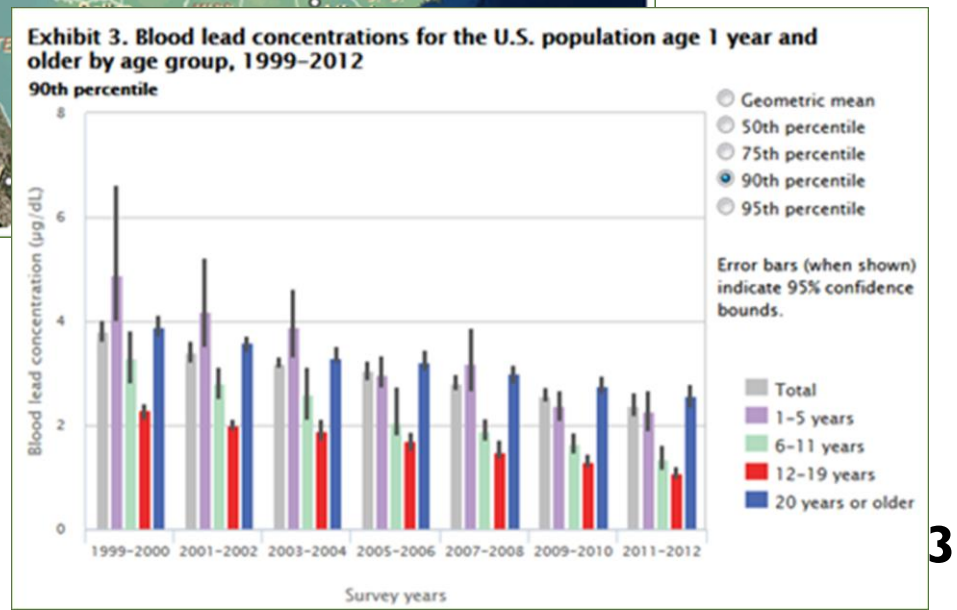
Report on the Environment (ROE)

ROE is now an online, interactive website



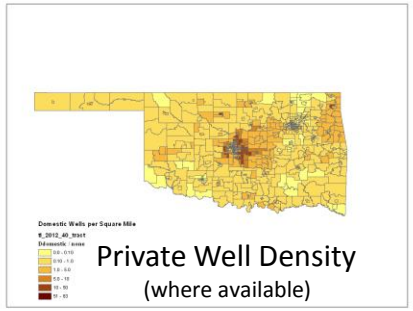


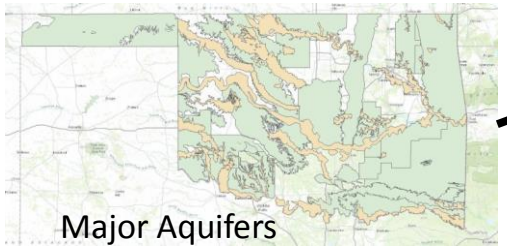


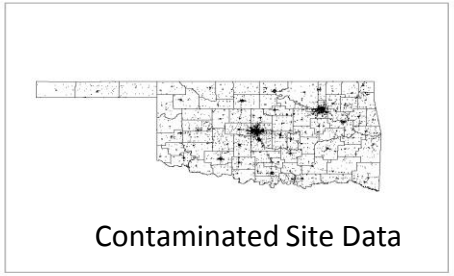


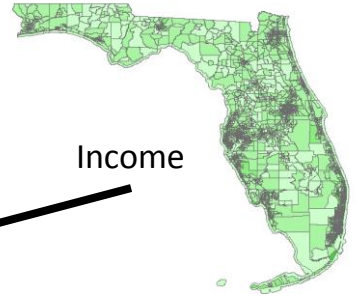
Project 2.64

Temporal/Spatial Impacts of Ground Water Decisions on Public Health



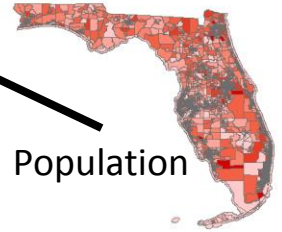






Human Health Assessments informed by ground water considerations

C-FERST/T-FERST
Community-/Tribal-Focused Exposure and Risk Screening Tool



$$R\frac{\partial c}{\partial t} = -q\,\nabla \cdot c + \nabla \cdot D\nabla c + f(c;\lambda,\ldots)$$

Transport Considerations and Models

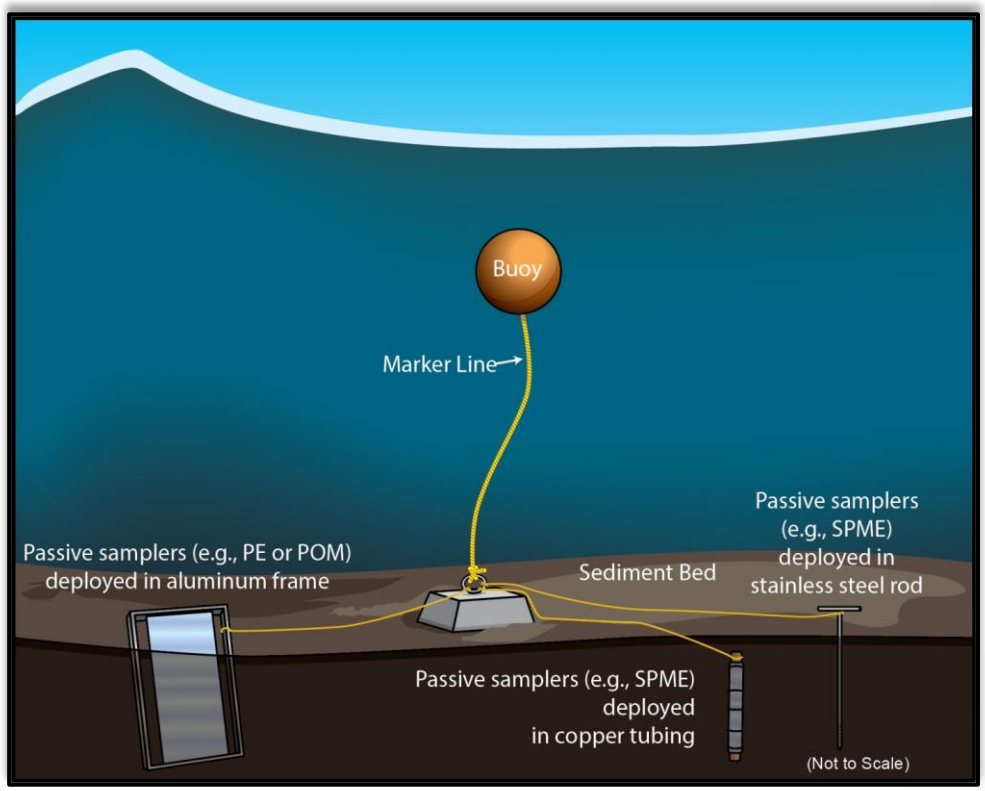
Project 3.61

Passive Sampling for Contaminants in Waters & Sediments

Passive sampling is a tool for sampling the bioavailable concentrations of contaminants of concern in waters and sediments

Passive sampling is a scientifically-robust, cost-effective and logistically-simpler tool compared to conventional sampling methods

This research provides guidance to Superfund Remedial Project Managers (RPMs), States and Tribes for using passive sampling to make scientifically informed decisions at their sites



Project 3.61

Bioreactor Landfills

- Bioreactor landfill operation accelerate the short-term landfill gas (LFG) generation rate, which increases opportunities for economically viable and beneficial utilization of methane in renewable energy options

- Bioreactor research and development has contributed to a notable reduction in methane emissions

Project 3.63

Beneficial Use of Industrial Materials in Roadways and Structural Fill Emplacements

Reference: U.S. EPA, Report on Potential Risks Associated with the Use of Chat from the Tri-State Mining Area in Transportation Projects. RTI project 0208860.003.020

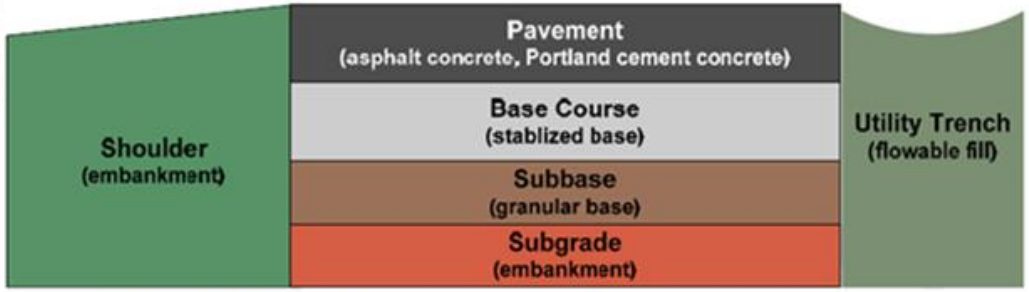
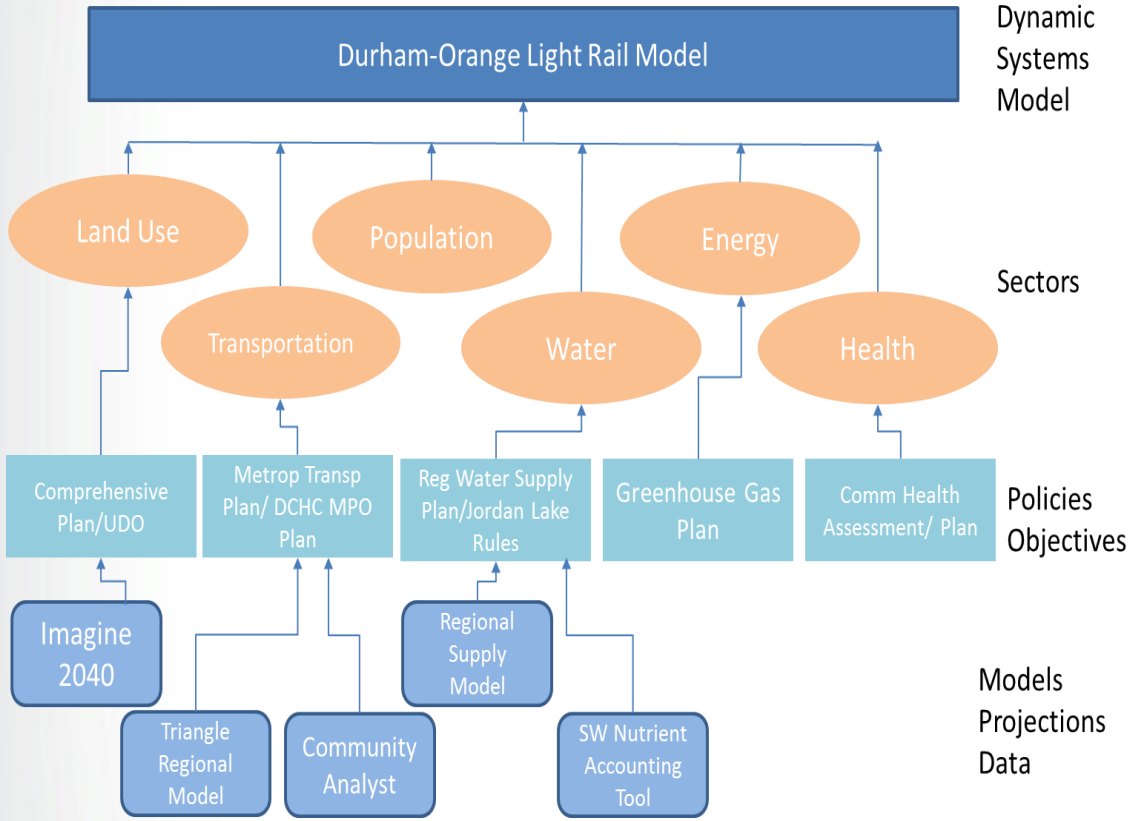


Figure 3-1. Cross section of typical road illustrating engineered layers.

RIMM Problem: Hazardous Material Reuse in Roadway Construction

Project 3.63

Systems Approach to Assessing the Durham Light Rail Project



The dynamic systems model (DSM) is a tool that integrates actions and policies from multiple sectors with knowledge about their interactions and feedbacks to achieve greater net benefits. Consistent with the goals of Federal Partnership for Sustainable Communities, the Durham Light Rail seeks to increase mobility, decrease VMT and air emissions, while providing affordable housing, increasing public health and safety, enhancing economic development, improving water quality and resources, reaching vulnerable and underserved populations, and creating an overall improved sense of "place."

Project 4.61

The Green Infrastructure Wizard [GIWiz]

- GIWiz is an EPA Internet Web Application that quickly and simply connects users with EPA's tools and resources related to Green Infrastructure.

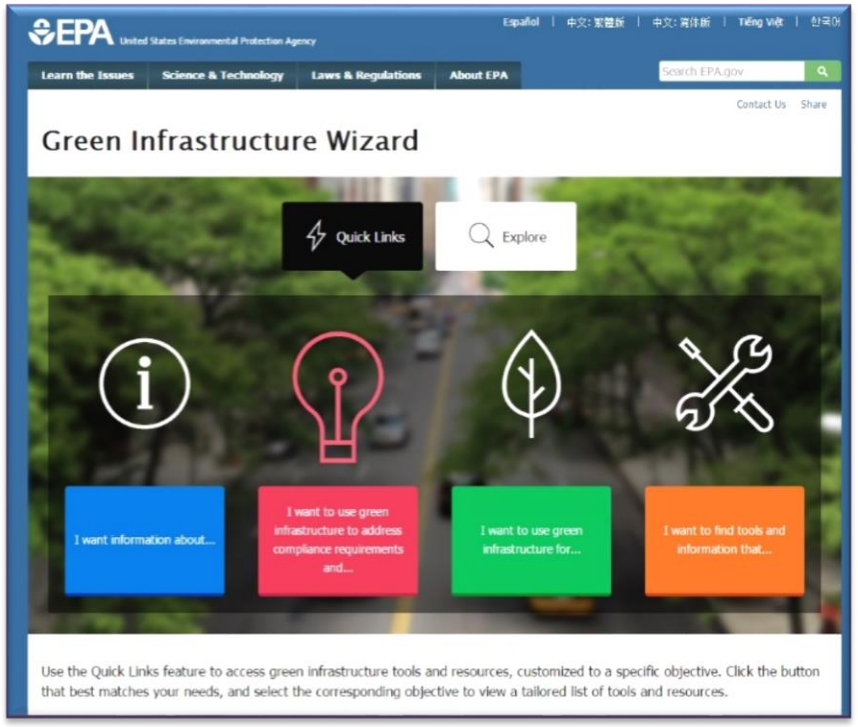
- It is a collaborative, cross-agency, priority project led by OP, ORD, and OW, with help from EPA regions and program offices.

- The Web Application accesses a database of Green Infrastructure tools and resources (TARs) that are available currently on EPA's various internet sites.

- GIWiz has two primary functions to access Green Infrastructure information: 'Quick Links,' and 'Explore.'

  - The Quick Links function allows users to very quickly access information with two clicks. They first click one of four areas: 'Learn,' 'Research,' 'Design,' or 'Assess,' then click a subarea, and receive a dynamic table of tools and resources.

  - The Explore function allows users to pick and choose areas of interest from a set of Green Infrastructure categories that narrows the dynamic results table to their specific needs.



Project 4.61

Cross-Cutting Research

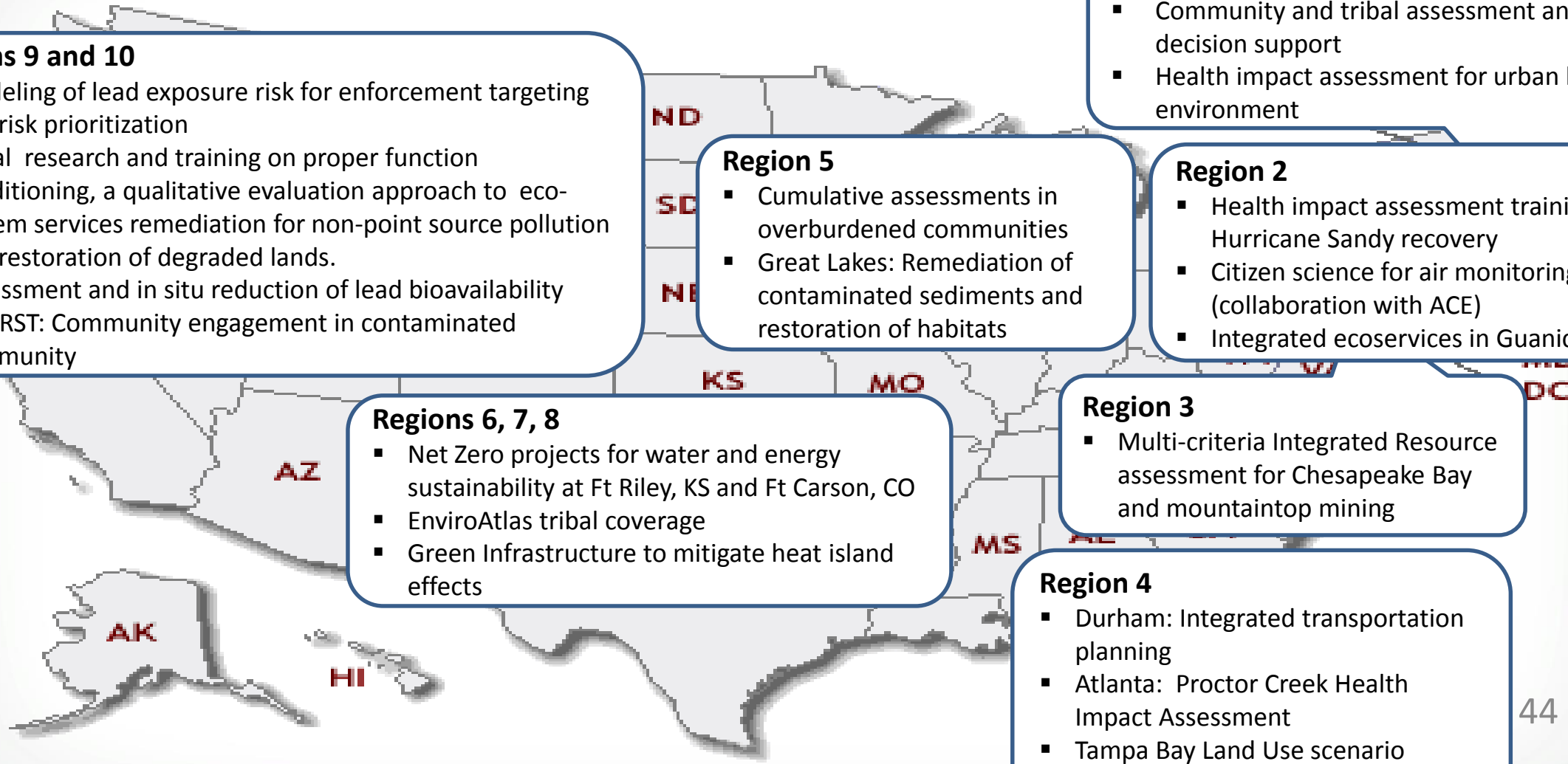
SHC collaborates with all of ORD's research programs on cross-cutting issues, for example

- Children's Environmental Health – Co-funding with NIEHS of Childrens' Environmental Health Research Centers
- Nitrogen and Co-pollutants – 9 SHC research products in FY14 addressing nutrient pollution
- Climate Change – Developing sustainable community responses to climate change
- Environmental Justice – Community-based pilot studies using tools such as EnviroAtlas and approaches to cumulative assessment

ORD Roadmap	SHC Topic Area			
	Decision Support and Innovation	Community Well-Being: Public Health and Ecosystem Goods & Services	Contaminated Sites and Material Managment	Integrated Solutions for Sustainable Outcomes
Climate Change	✓	✓ ✓	✓	✓
Environmental Justice	✓	✓ ✓	✓	✓
Children's Health		✓ ✓		
Nitrogen & Co-Pollutants	✓	✓		✓ ✓

Relationships

Examples of SHC's Regional Interactions



Region 1

- Community and tribal assessment and decision support
- Health impact assessment for urban built environment

Region 2

- Health impact assessment training to aid Hurricane Sandy recovery
- Citizen science for air monitoring (collaboration with ACE)
- Integrated ecoservices in Guanica Bay, PR

Region 3

- Multi-criteria Integrated Resource assessment for Chesapeake Bay and mountaintop mining

Region 4

- Durham: Integrated transportation planning
- Atlanta: Proctor Creek Health Impact Assessment
- Tampa Bay Land Use scenario analysis

Region 5

- Cumulative assessments in overburdened communities
- Great Lakes: Remediation of contaminated sediments and restoration of habitats

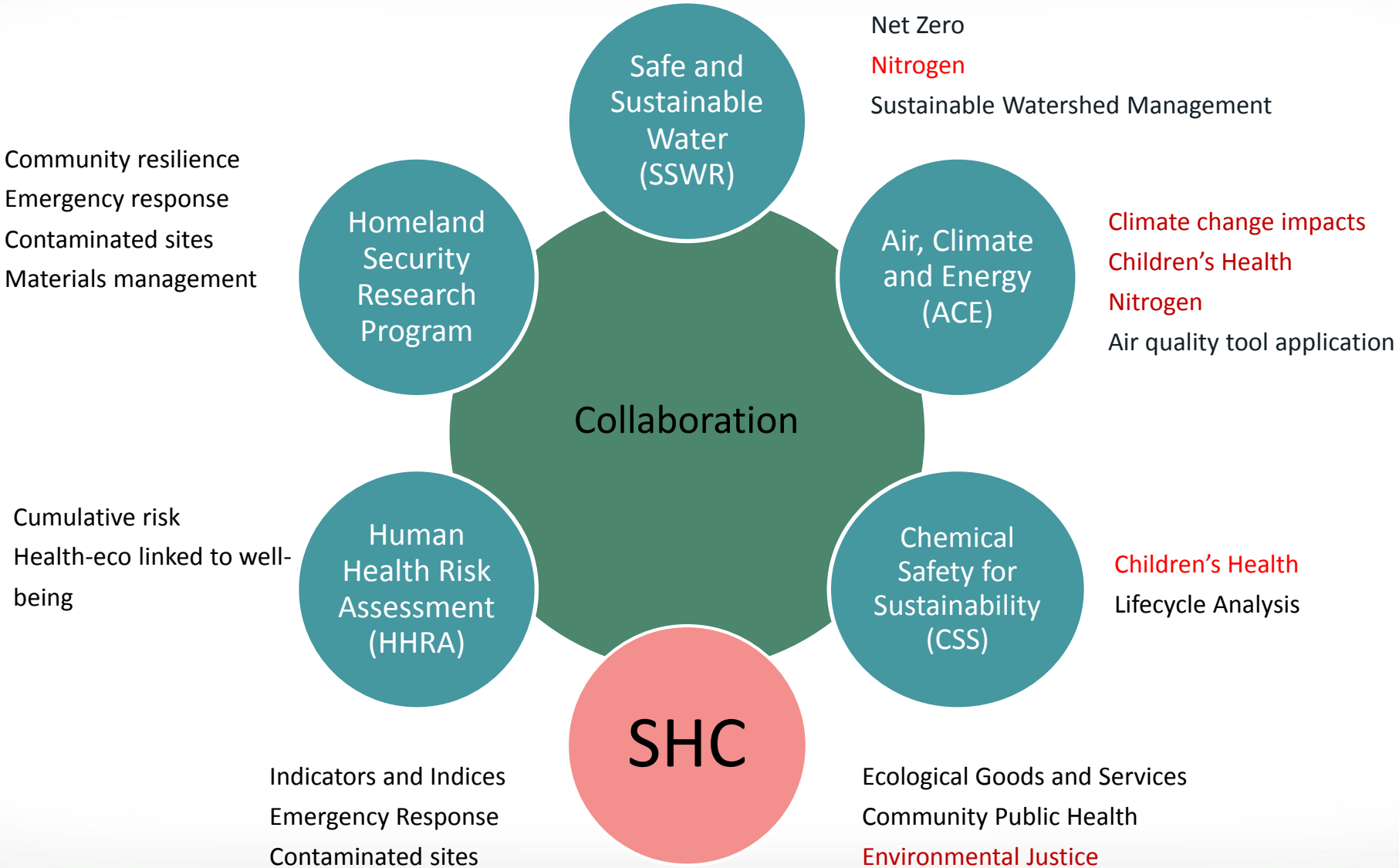
Regions 6, 7, 8

- Net Zero projects for water and energy sustainability at Ft Riley, KS and Ft Carson, CO
- EnviroAtlas tribal coverage
- Green Infrastructure to mitigate heat island effects

Regions 9 and 10

- Modeling of lead exposure risk for enforcement targeting and risk prioritization
- Tribal research and training on proper function conditioning, a qualitative evaluation approach to eco-system services remediation for non-point source pollution and restoration of degraded lands.
- Assessment and in situ reduction of lead bioavailability
- C-FERST: Community engagement in contaminated community

SHC Interactions



Opportunities for Communication

Webinars

- SHC Monthly Seminar Series
- Scientific presentations at monthly partner meetings
- Scientific presentations at monthly SHC team meetings

Engagement in Research Planning

- Program and Regional Office input in:
  - Strategic Research Action Plan
  - Project Charters

Newsletter

- Bi-monthly Science Matters e-newsletter highlights ORD research

Annual Communique

- Highlight research and direction (in person and via webinar)
- 260 attendees, including 140 from program offices and regions
  - OSWER: OBLR, OEM, ORCR, OSRTI, OUST, IOAA, other
  - All 10 Regions, OAR, OP (OCHP, OSC), OW

Workgroups and Meetings (examples)

- OSWER: Community engagement, OUST, Contaminated ground water
- Regional Science Liaisons
- OAR: OAQPS, ORIA
- OSC
- Community Facilitation Team
- Quarterly meetings with OSWER AA
- Monthly Call for All Partners, includes “science moment”
- Monthly Call with SHC Implementation Team

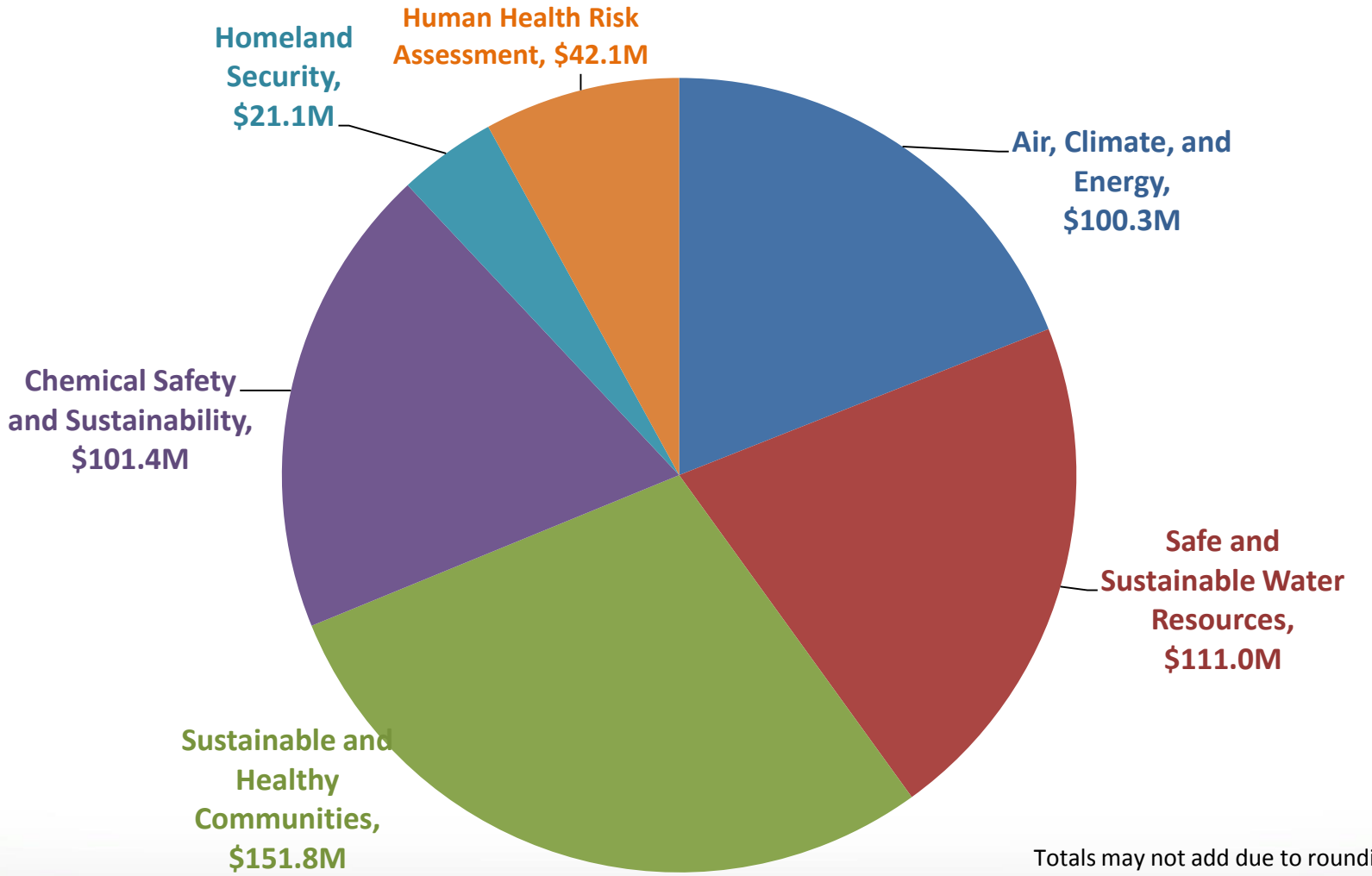
Budget

FY15 Operation Plan

Appropriation	FY 2015 Planning ($k)	FY 2015 Op Plan ($k)[1]
Science & Technology	$43,918	$149,975
Fellowships	$9,346	
STAR Grants	$10,528	
SBIR	$4,474	
People, Prosperty, Planet (P3)	$1,607	
Inland Oil Spill Programs	$517	$664
Leaking Underground Storage Tanks	$62	$320
Hazardous Substance Superfund	$1,094	$14,032
Total Budget Authority / Obligations	***$45,591***	***$164,991***
Total Workyears	***332.4***	***503.5***

[1] Op Plan levels include personnel costs and benefits (PC&B)

ORD's FY 2016 Budget by Research Program Projects



Totals may not add due to rounding

ORD FY 2016 President's Budget

General Charge Questions

- *Question 1*. Given the research objectives articulated in the StRAP, are the topics and project areas planned and organized appropriately to make good progress on these objectives in the 2016-2019 time frame?

- *Question 2.* How effective are the approaches for involving the EPA partners in the problem formulation stage of research planning?

- *Question 3*. How well does the program respond to the needs of EPA partners (program office and regional).

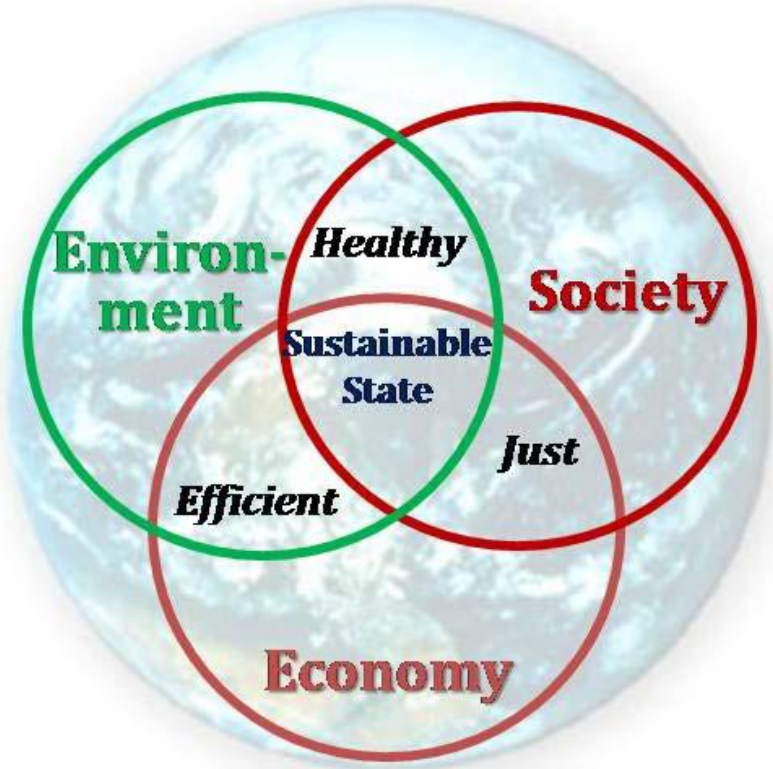
SHC-Specific Charge Questions

- *Question 1.* SHC has committed to integrating ecological and human health to better address issues of human and community well-being. Does the research program contain the elements necessary to integrate these two critical elements of EPA's mission?

- *Question 2.* SHC's portfolio includes both hypothesis-driven research and the development of decision-support tools to aid Agency, state, and community stakeholders. Is the balance of research and tool development appropriate for this program?

- *Question 3*. SHC has a mission to address the short-term needs of EPA's Office of Solid Waste & Emergency Response for research on contaminated sites, oil and fuel spills, and sustainable materials management. How can SHC best leverage these short-term research goals with longer term community sustainability and environmental justice goals?

THANK YOU


Environ-
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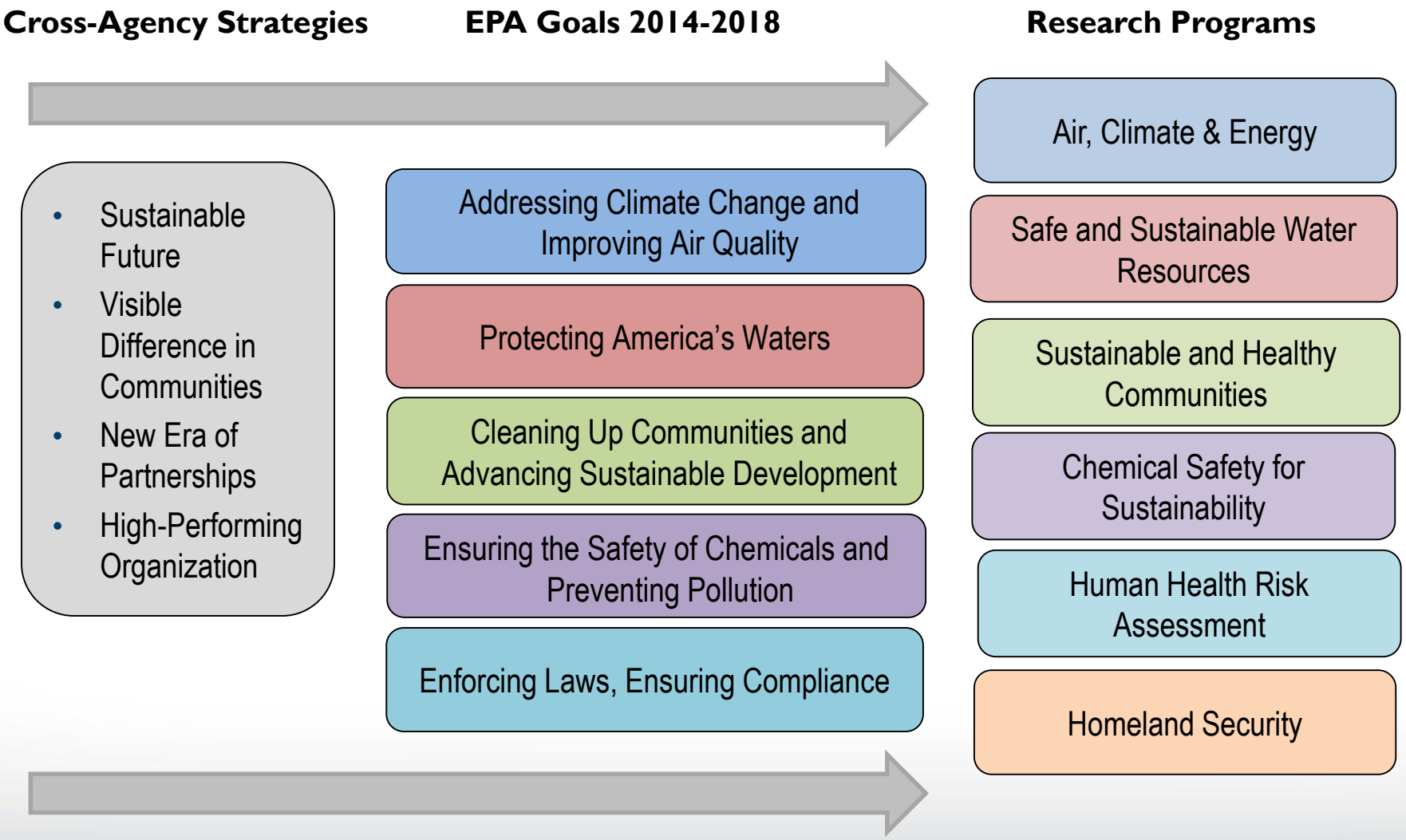
Healthy
Society
Sustainable
State
Just
Efficient
Economy

Background Slides

ORD “101”

Aligning Research with EPA Strategic Goals



Strategic Research Action Plans

- **What is a Strategic Research Action Plan (StRAP)?**
  - Describes our research program for internal and external audiences
  - Serves as our guide for resource planning activities
  - First generation covered 2012-2016
  - Currently completing 2nd generation to over FY16-19 (final release October 1, 2015)
  - Developed in consultation with advisors (Science Advisory Board and Board of Scientific Counselors), EPA partner offices, other stakeholders

Air, Climate & Energy

Sustainable & Healthy Communities

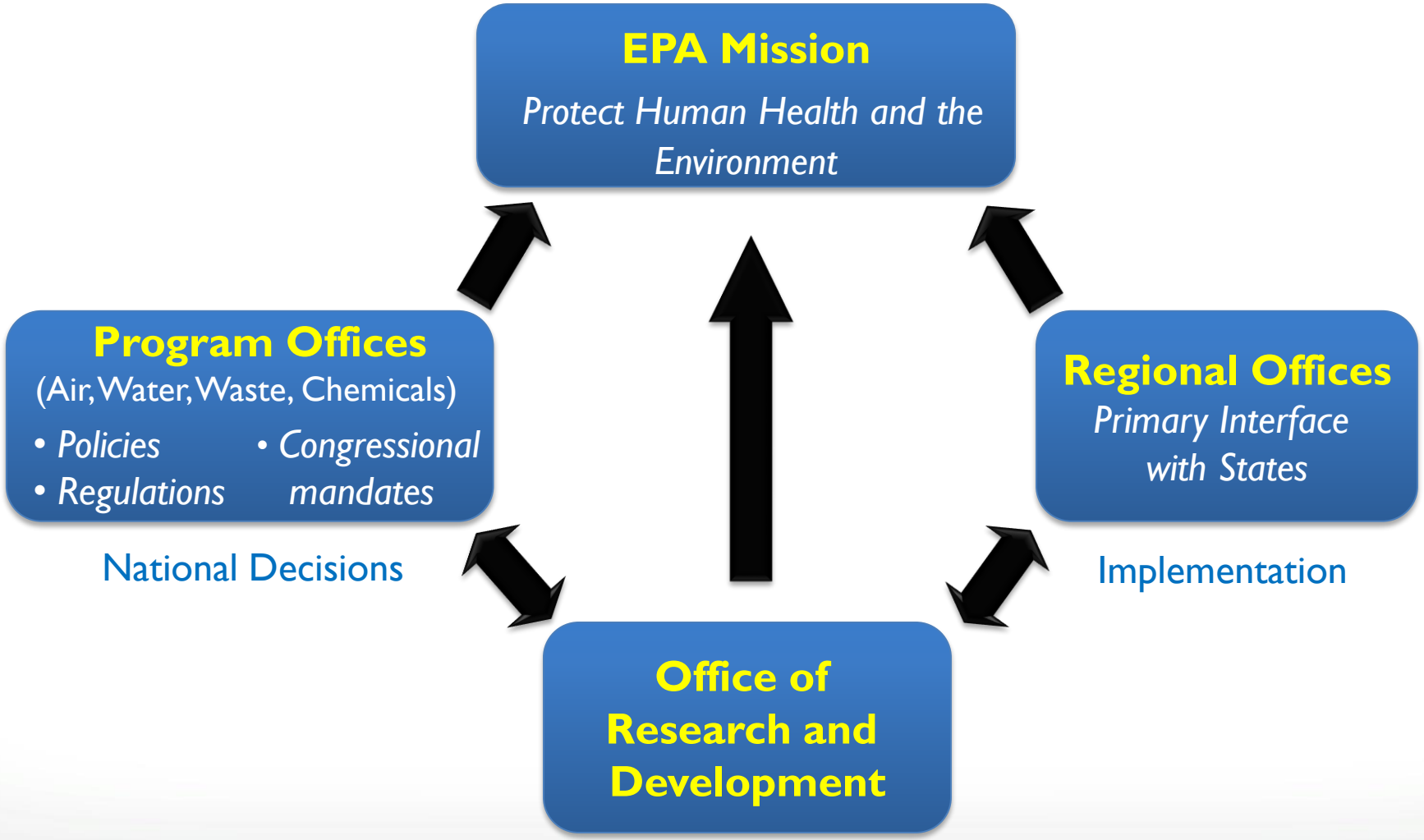
Safe & Sustainable Water Resources

Chemical Safety for Sustainability

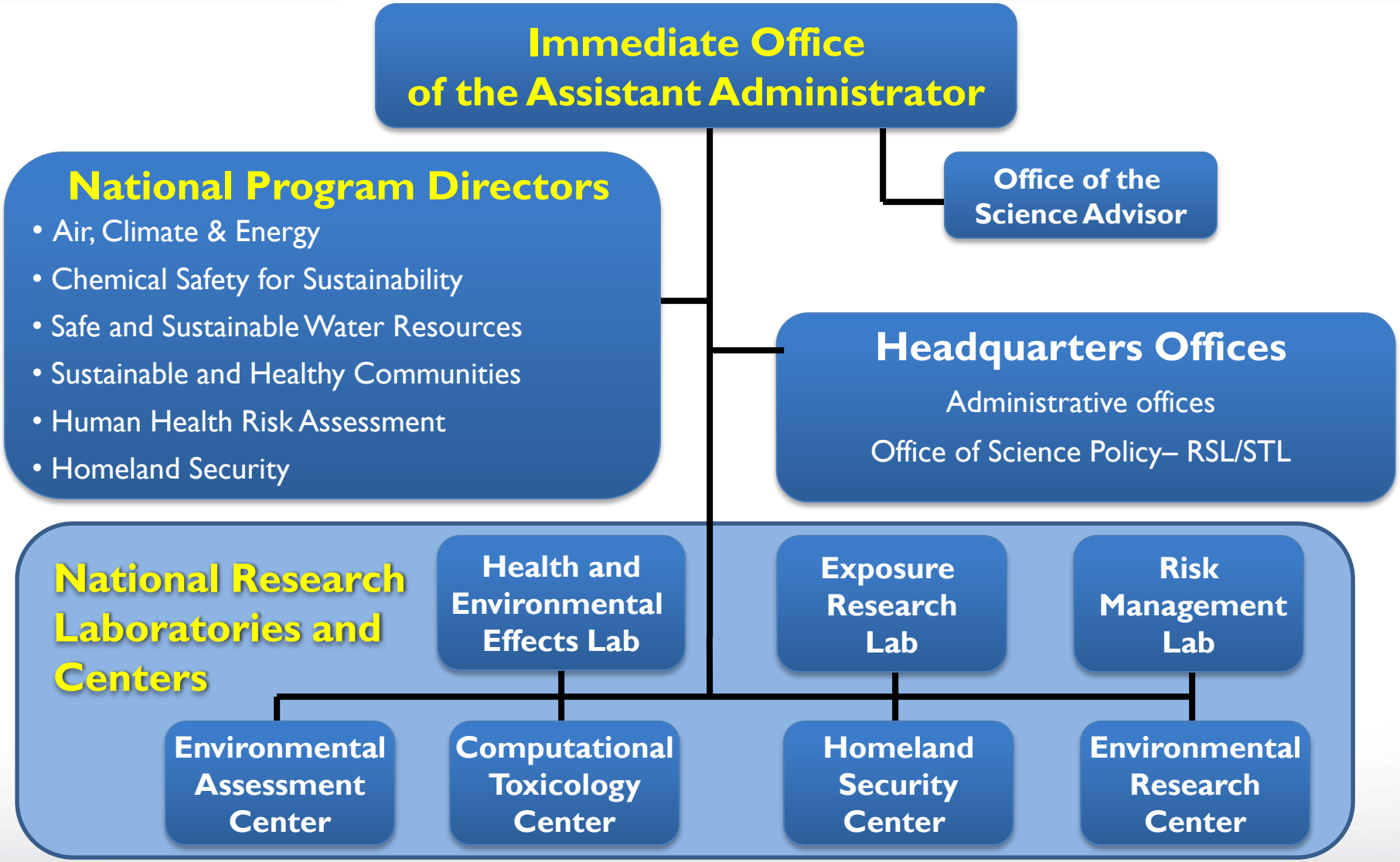
Human Health Risk Assessment

Homeland Security

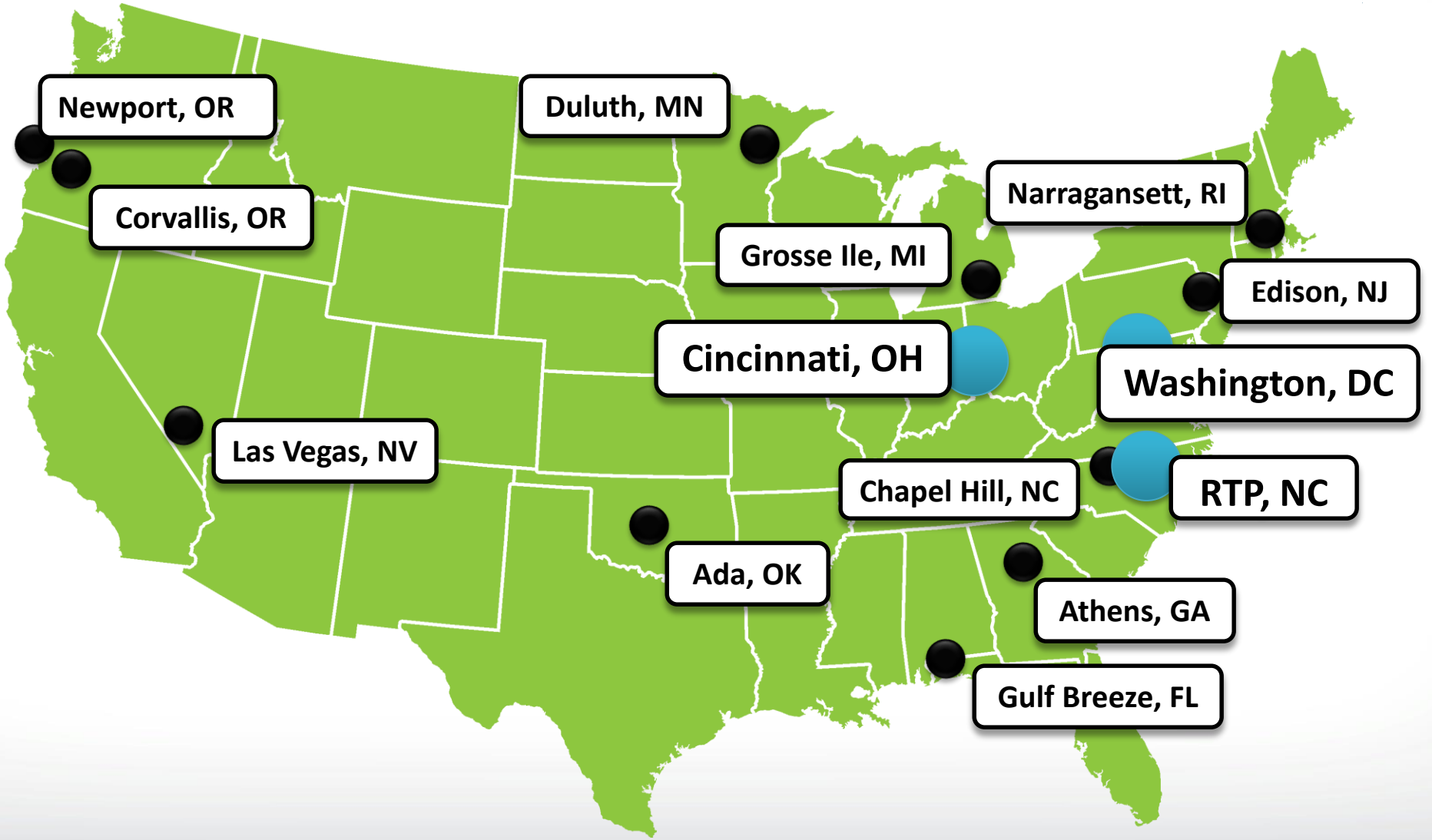
Science to Support EPA's Mission



ORD Organizational Chart

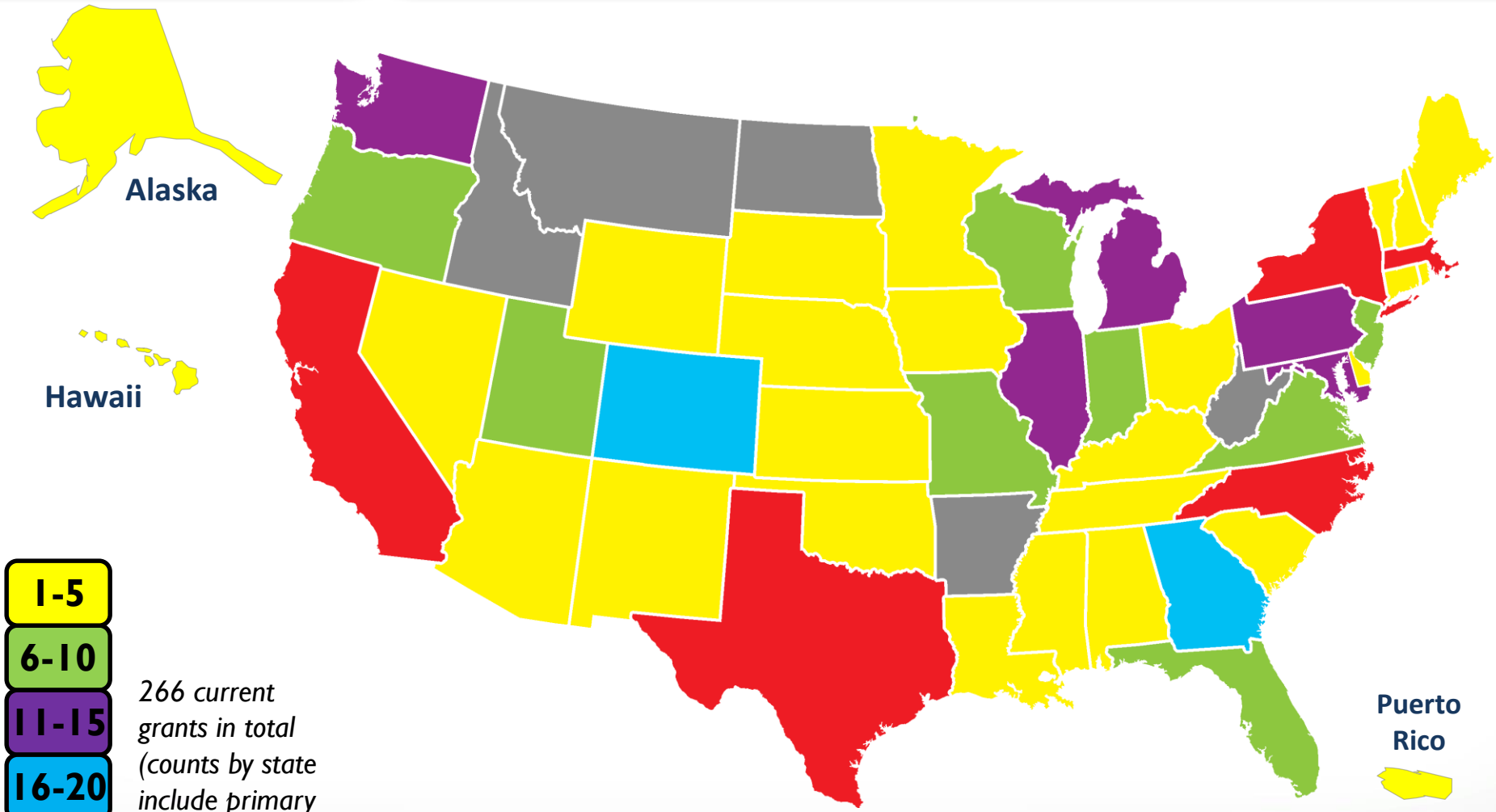


ORD Research Facilities



EPA Research Grants to Universities

STAR Research Grants by State



266 current grants in total (counts by state include primary and secondary Institutions)

$52 million extramural research grants + $9 million fellowships
(FY 2014 Enacted Budget)