

# US EPA Research Perspectives

*U.S.-German Bilateral Workshop  
Cincinnati, April 20, 2012*





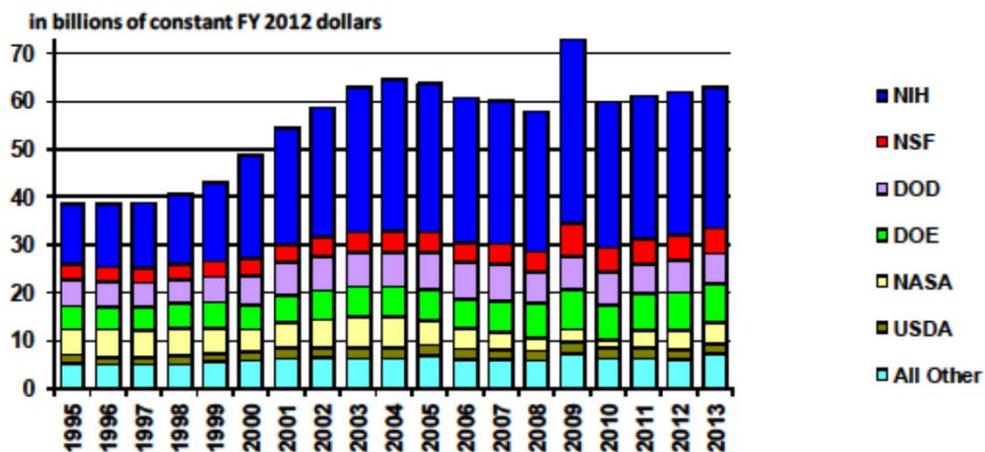
## R & D Funding in the U.S.

- 2008 Preliminary Outlays - Federal
  - ~100 billion dollars
  - Basic and applied are about 2/3
  - Development about 1/3
- 2008 Preliminary Outlays – Private
  - >250 billion dollars
  - Development is about 3/4

Source: AAAS, using data from National Patterns of R&D Resources, National Science Foundation, NSF 08-318

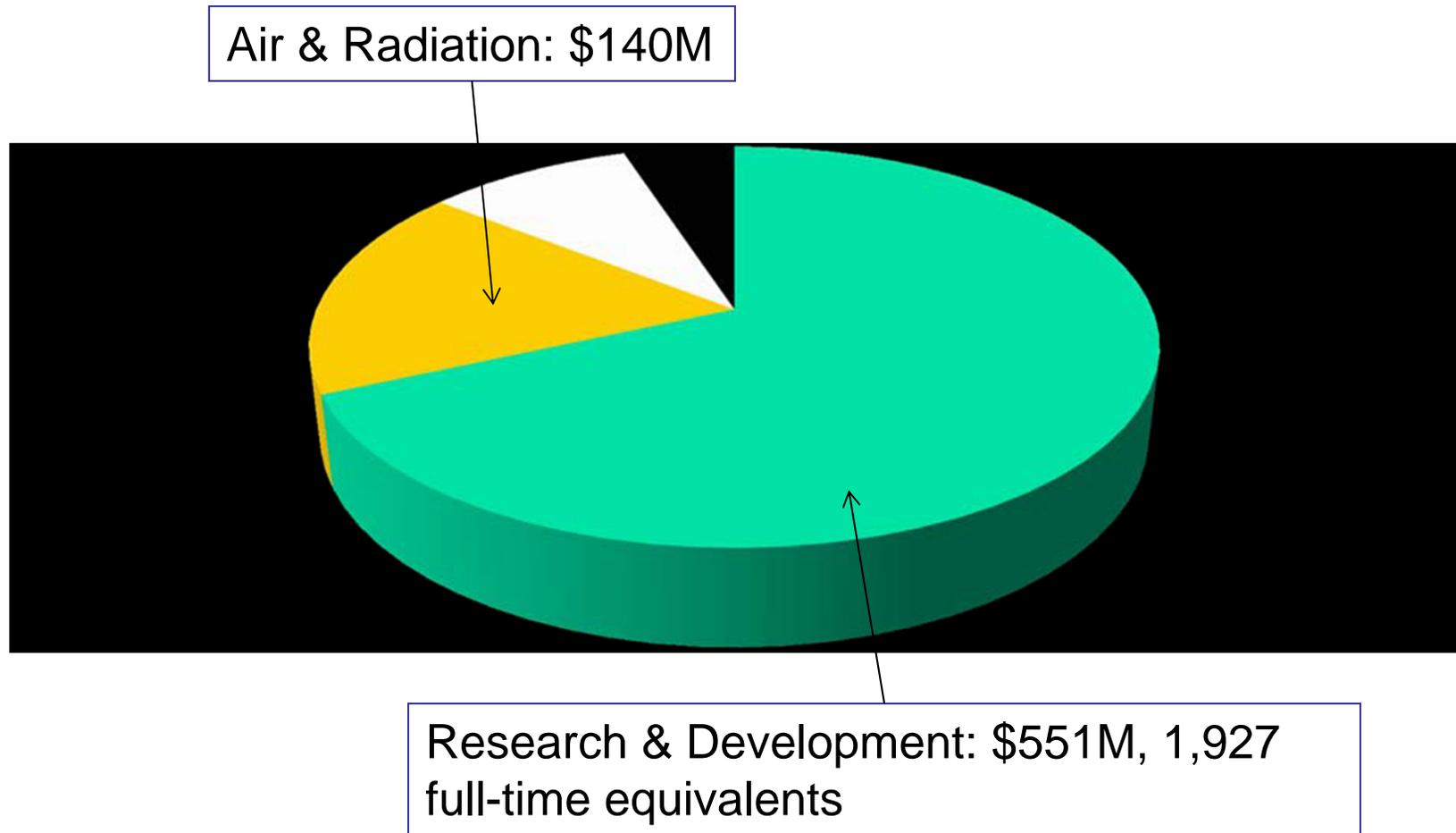
## Government-wide Perspective

**Federal Research by Agency, FY 1995-2013**



FY 2009 figures include Recovery Act appropriations.  
 Research includes basic research and applied research.  
 FEB. '12 OSTP

## US EPA Science & Technology Resources



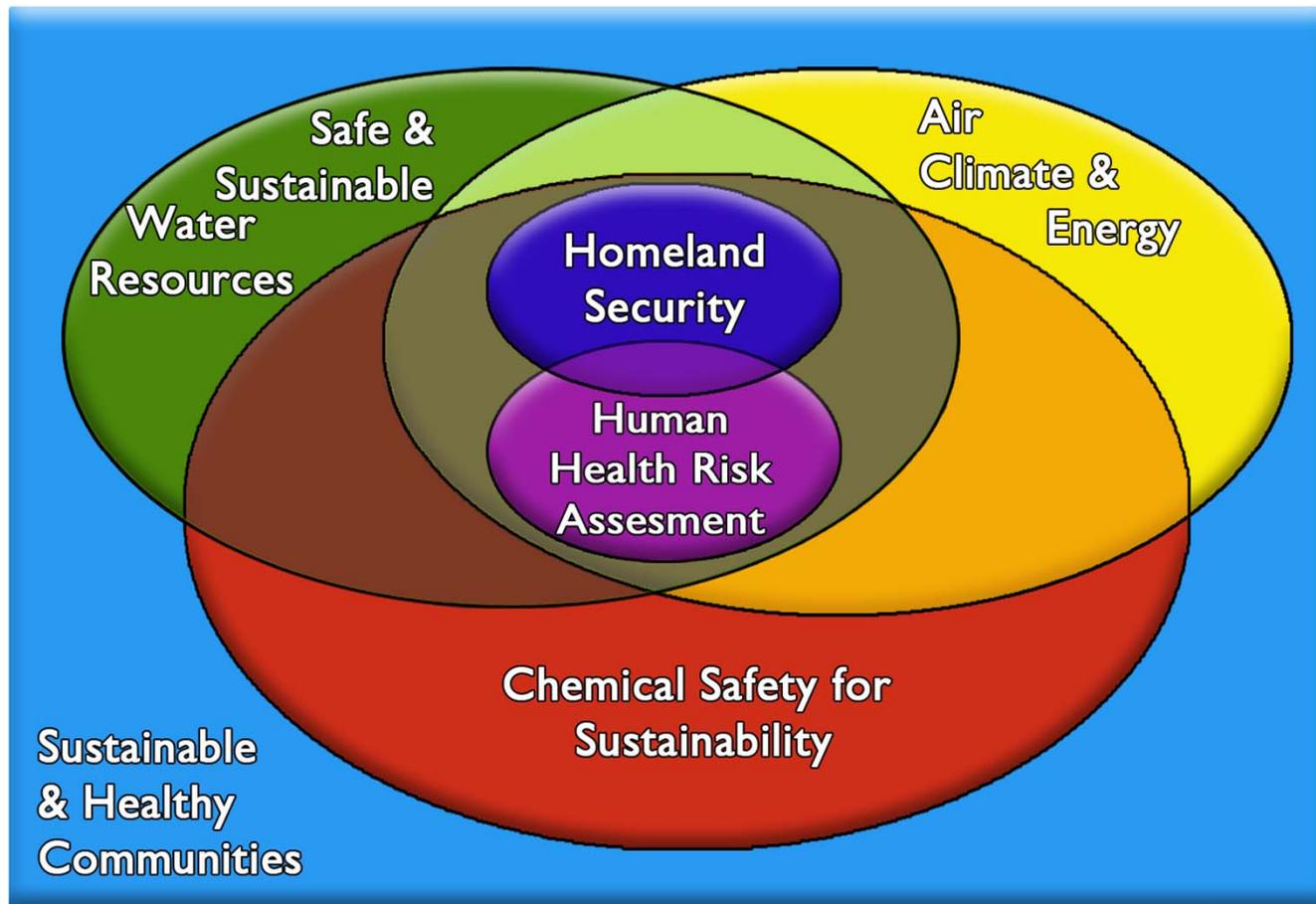
FY 2013 President's Budget



## EPA and ORD Priorities

- Climate change, air quality
- Protecting America's water
- Cleaning up our communities and advancing sustainable development
- Safe chemicals and preventing pollution
- Expanding the conversation on environmentalism; environmental justice and children's health
- Strengthening state, tribal, and international partnerships
- Sustainability as "true north"
  - Research must be solution-oriented, timely, responsive, relevant
- Accomplished via
  - Integrated, transdisciplinary, innovative, and catalytic research

## ORD's New Research Program Structure



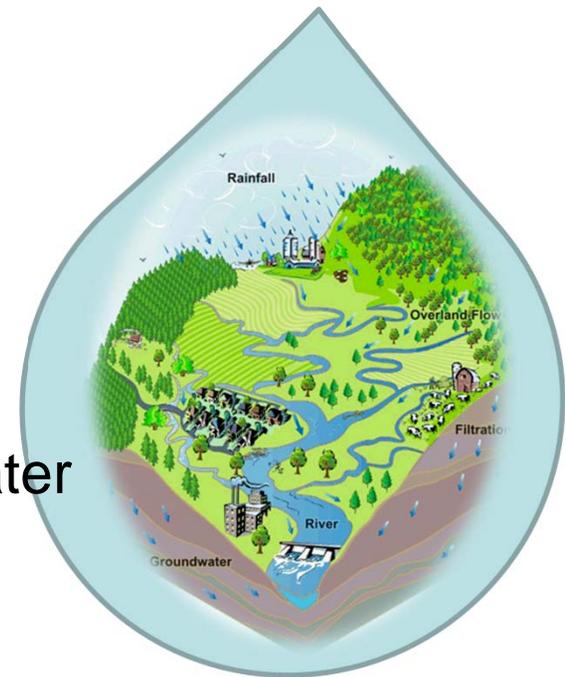
## Air, Climate & Energy – Key Issues/Themes

- Multipollutant nature of air pollution
- Impacts of climate change; sustainable adaptation and mitigation options
- Human health and environmental impacts of current and future energy alternatives
- Multiple scales of impact from global to local
- Social, behavioral, and economic factors that influence the effectiveness of air quality and climate policies
- Assess Impacts
- Prevent and Reduce Emissions
- Respond to Changes in Climate and Air Quality



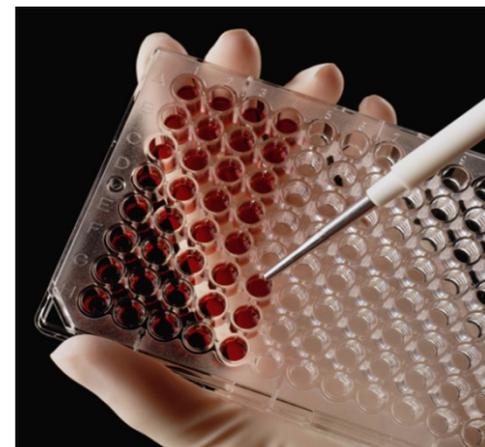
## Safe & Sustainable Water Resources - Themes

- Ensure safe and sustainable water quality and availability to protect human and ecosystem health
  - integrating social, economic and environmental research for protecting and restoring water resources
- Ensure that water of sufficient quality is available to meet human uses and to maintain resilient aquatic ecosystems
  - managing water infrastructure to optimize water conservation, wastewater (and grey water) reuse, groundwater recharge, green infrastructure, and energy conservation and resource recovery



## Chemical Safety for Sustainability – Themes

- Chemical Inherency
- Systems Models
- Biomarkers
- Cumulative Risk
- Life Cycle Considerations
- Extrapolation
- Dashboards
- Evaluation



Focuses on commercial chemicals/byproducts over their life cycle including impacts on ecological species and human health including susceptible life stages and populations



# Sustainable & Healthy Communities

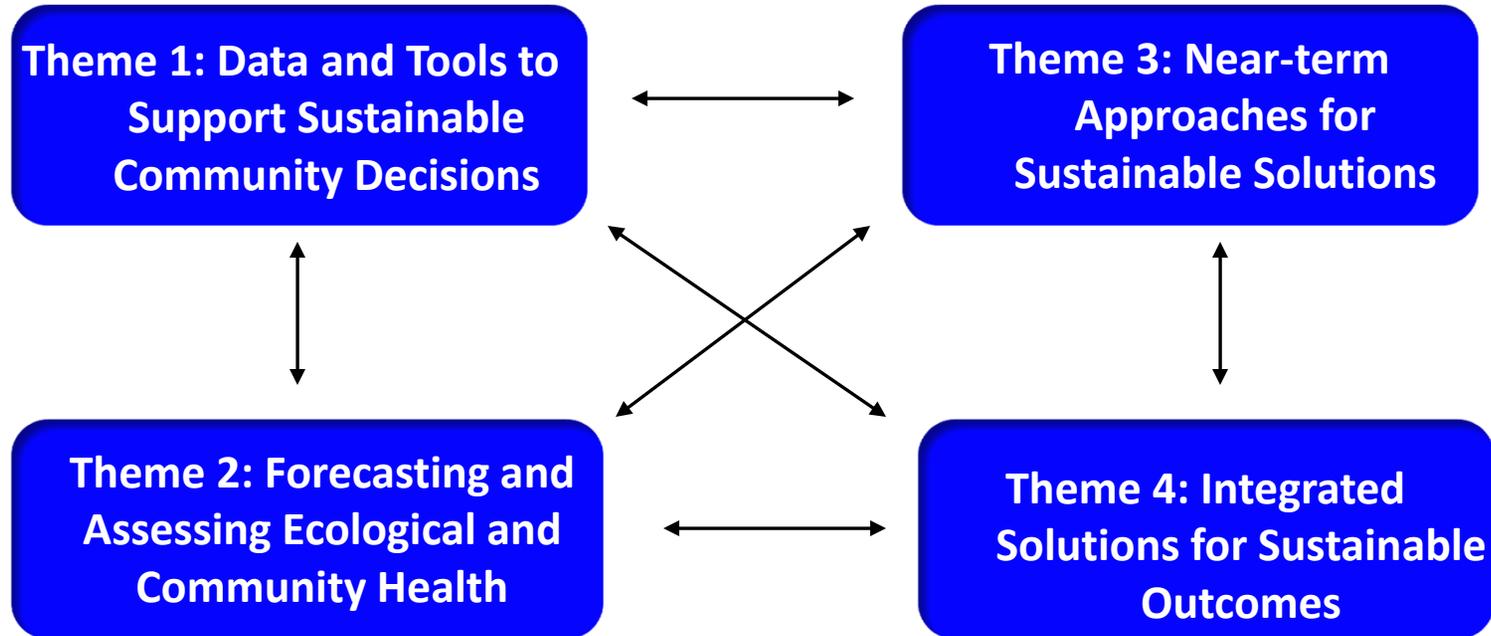
## Vision:

... to inform and empower decision makers in communities, as well as in federal, state and tribal community-driven programs, to effectively and equitably weigh and integrate human health, socio-economic, environmental, and ecological factors into their decisions in a way that fosters community sustainability.

*i.e. actionable science*



## SHC – Four Integrated Themes



## Theme 1 - Data & Tools

- Framing Sustainable Decisions
  - Decision Analysis for a Sustainable Environment, Economy and Society (DASEES)
- Information Science, Innovation and Evolved Stakeholder Engagement
- Community Engagement
- Existing and New Tools
- Indicators and Indices
- National Atlas for Sustainability



Aerial photography of downtown Portland, ME, classified into open space (greens), impervious surfaces (pink), and water (blue)

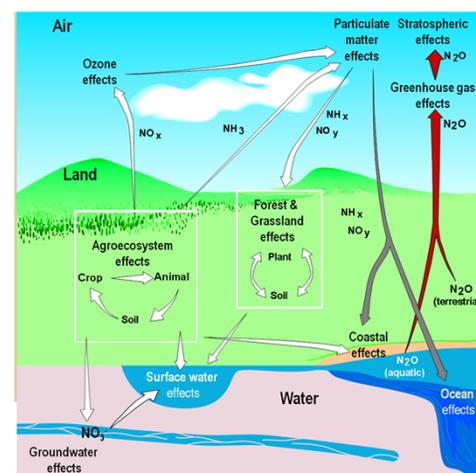
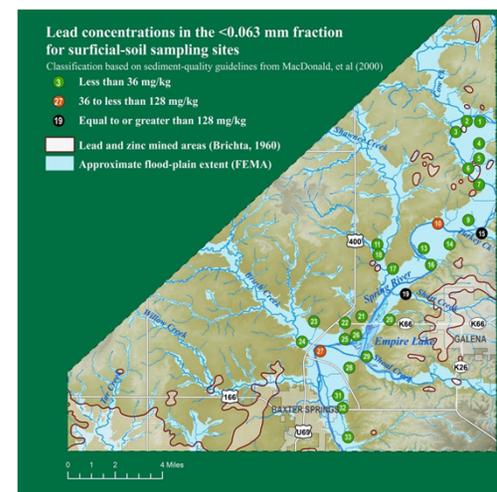
## Theme 2 – Ecological & Community Health

- Eco
  - Standardized Classification and Indicators for ecosystems goods and services (EGS)
  - EGS Production and Benefit Functions
  - Community-Based EGS research
  - Placed-based and thematic EGS research
  - Regional Program for Sustainability
- Human & Community Health
  - Enhancing Community Public Health
  - Enhancing Children’s Health
  - Securing and Sustaining Environmental Justice



## Theme 3 – Near-Term Approaches

- Clean Up Contaminated Sites
  - Remediation toward sustainability
- Materials and Solid Wastes
- Reactive Nitrogen
- Report on the Environment
  - Condition and sustainability indicators tracked over time
- Innovation and Technology
  - SBIR, Technology Innovation Cluster



## Theme 4 – Integrated Solutions

- Assessments of the state of ***practice*** and ***science*** for sustainable practices for 4 sectors
  - Materials & waste management
  - Transportation alternatives
  - Buildings and Infrastructure (including energy and water)
  - Land Use decisions - built and natural environment
- Methods to assess Total Resource Impacts and Outcomes (TRIO) associated with community decisions
  - *prospectively* to inform & *retrospectively* to track progress
- Systems models to identify options for multiple benefits
- Collaborative Proof-of-Concept: Durham, NC

