EPA
United States
Environmental Protection
Agency

US EPA Office of Research and Development Call on Waste Research Planning with ECOS

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Sustainable & Healthy Communities (SHC) Research Program

Drivers for EPA's Office of Research and Development (ORD) SHC research program:

EPA's 2018-2022 Strategic Plan (February 2018)

https://www.epa.gov/planandbudget/strategicplan

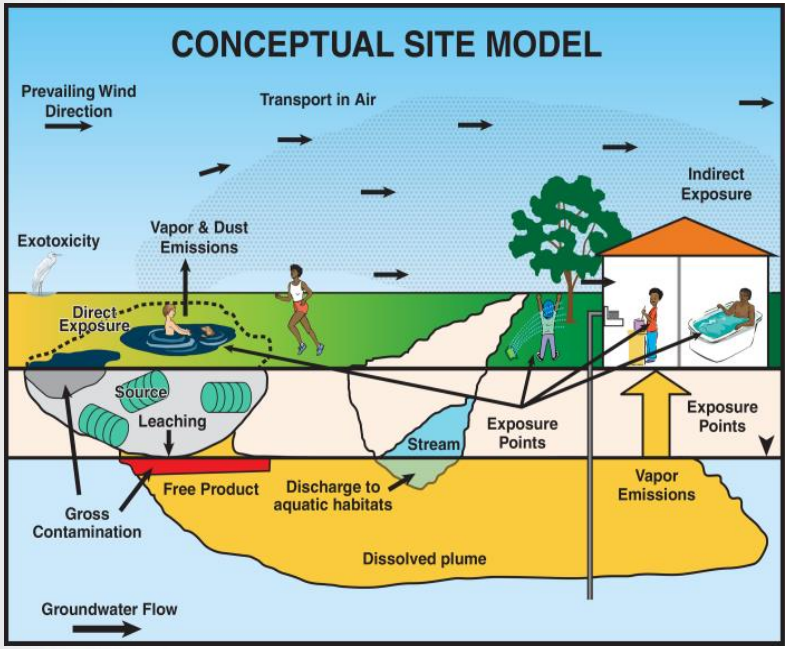
Superfund Task Force Recommendations (July 25, 2017)

https://www.epa.gov/superfund/superfund-task-force-recommendations

Vision: ORD will integrate public health, environmental engineering, and ecosystems research to provide and translate:

(1) Remediation solutions for contaminated sites
(2) Operational tools for waste sites and for materials management
(3) Revitalizing communities impacted by contamination and natural disasters by linking ecosystem services (nature's benefits) to human health and well-being

Contaminated Sites



- Technical Support
  - 5 Centers
    - Groundwater, Engineering, Site Characterization, Human Health & Ecological Risk
    - Requests are made through EPA's regional offices
- Remediation Solutions
    - Groundwater
    - Vapor Intrusion
    - Sediments
    - Mining Sites
- Leaking Underground Storage Tanks
- Inland Oil Spills
- Priority Chemicals
  - Lead (Pb) contamination, bioavailability, soil/dust ingestion
  - Per- and polyfluoroalkyl substances (PFAS)/ Perfluorooctanoic acid (PFOA) – toxicity, treatment & remediation

Materials Management

Materials Management

- Methods/tools for Waste & Materials Management using Life Cycle Approach (LCA)
- Municipal Solid Waste Landfills
  - Liquids management, and Bioreactors
  - Post closure care
  - Uncontrolled heating events
- Built Environment
  - Construction and demolition debris
  - Buildings as materials banks
- Food Waste
- Electronic Waste
- Materials Management Wizard

https://cfpub.epa.gov/mwiz/

Community Revitalization

- R2R2R*: Linking ecosystem services and well-being
  - Superfund/Hazardous waste sites
  - Brownfield sites
  - Great Lakes Areas of Concern
  - Communities impacted by natural disasters
- Resiliency Indicators

* Remediation to Restoration to Revitalization

Office of Land and Emergency Management Research Priorities

Office of Resource Conservation and Recovery:

- Subtitle C & Subtitle D Post-Closure Care: Is the 30 year post-closure care requirement sufficient?
- Update Leaching Environmental Assessment Framework (LEAF) for organics (including application to municipal landfills)
- Updated Hydrologic Evaluation of Landfill Performance (HELP) model: modern software; new meteorological data; new containment systems
- Life-Cycle Analysis (LCA) for state-scale decision support on materials management prioritization

Office of Superfund Remediation and Technical Innovation:

- Lead – model support (e.g. validation, bioavailability)
- PFAS – toxicity values, combustion criteria, other remediation
- Mining – Administrator focus, mine waste water treatment, metals recovery
- Superfund Task Force Recommendations: site characterization and monitoring tools
- Direct technical support to Remedial Project Managers (RPMs) and On-Scene Coordinators (OSCs)

***Office of Brownfields and Land Revitalization*:**

- Health Impact Assessment applied to land revitalization planning and implementation
- Support from ORD for use of science-based tools

ECOS Waste & Remediation Research Needs
(March 2017 Calls)

Broad concern for emerging contaminants (PFOA/PFAS; Pb)

EPA has a major effort underway to better understand these contaminants

Vapor intrusion

This is a major research area for the SHC program; source identification & mitigation (PVI Screen tool); sampling and remediation of vapor intrusion

Remediation of chlorinated solvents in shallow aquifers; delineating solvent plumes

Groundwater remediation esp. shallow aquifers is a long-standing research area in SHC

Beneficial use of solid wastes

A major research area in SHC; development of methods and tools; construction & demo debris; life cycle approach; materials management wizard

Solid waste landfills & post-closure care

A major R&D area in SHC; post-closure issues in subtitle C&D landfills; liquids management; landfill fires (subsurface pyrolysis)

Remediation of mining sites

Anticipated focus area beginning in FY19

Homeland Security Waste Challenges

- Waste management significant factor in overall cost and timeline of remediation
- All on-site activities have the potential to generate waste
- Waste must be managed safely and effectively
- Some factors influencing waste management decisions:
  - Extent of the incident
  - Types of materials contaminated
  - Contaminant properties
  - Site decontamination decisions
  - Availability of waste management options
  - Waste sampling/analytical requirements

Homeland Security Research Activities

- Understand fate and transport of contaminants
  - Hazard mitigation
  - Waste handling, staging, packaging and transport
  - Waste treatment and disposal
- Development of on-site waste treatment methods
- Waste sampling methods and strategies
- Assessment of off-site waste treatment and disposal options

Testing of biological contaminant inactivation on waste in a commercial autoclave

Human Health Risk Assessment (HHRA) Research Areas

(1) Science Assessments & Translation

- Science Assessment Development
- Science Assessment Translation

(2) Advancing the Practice of Risk Assessment

- Emerging and Innovative Assessment Opportunities
- Essential Assessment Infrastructure and Support Tools

Vision: To advance the science and practice of risk assessment

Key Outputs: A portfolio of fit for purpose assessment products that meet the needs and priorities of customers, including the states, tribes, and EPA program and regional offices

- Focus on priority pollutants (PFAS, lead), criteria pollutants (to support NAAQS), drinking water contaminants, cleanup of contaminated and hazardous waste sites
- Integration of new approach methods and emerging data into assessments of data poor chemicals

A Portfolio Approach

- Moving away from a ‘one-size-fits-all’ approach to risk assessment towards a spectrum of assessment products to meet specific decision contexts
- Facilitating the incorporation of new data and science into risk assessment and decision-making
- Enabling assessments to be better tailored to meet needs of decision makers
- Increasing the number of chemicals that can be evaluated for their effects on human health by utilizing constrained resources in the most efficient manner
- Anchoring in systematic review
- Integrating key components of existing portfolio – Integrated Risk Information Systems (IRIS), Integrated Science Assessments (ISAs), and Provisional Peer-Reviewed Toxicity Values (PPRTVs) – to inform future assessments

Discussion Questions

1. Are there any clarifying questions about our capabilities and/or the kind of research and work we do in the Waste area?

2. Do the areas on which we are focusing align well with your states' science and technical needs?

3. Are there areas you would suggest emphasizing or de-emphasizing? Is there anything missing?

4. Do you have any other feedback for us as we formulate our Strategic Research Action Plans to be implementing over the next 4-5 years?

5. Are the EPA Technical Support Centers a resource that you have or would consider using?

Contacts

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Materials Management Wizard

Example of a materials management tool available for use by states and communities. Click on the link below to check it out.

https://cfpub.epa.gov/mwiz/

The Materials Management Wizard (MWiz) offers you access to a repository of EPA-sourced materials management tools and resources designed to support and promote sustainable materials management and community planning decisions. The tools and resources available through MWiz will help you analyze problems, understand management options, calculate design parameters, analyze costs and benefits, evaluate tradeoffs, engage stakeholders, and/or develop education and outreach campaigns. MWiz is made possible through a cross-Agency collaboration involving US EPA ORD, Office of Policy, Office of Land and Emergency Management, and regional office staff.