



ORD Research Implementation in the Center for Public Health and Environmental Assessment

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Office of Research and Development Center for Public Health and Environmental Assessment

SEPA

EPA Research

ORD provides the scientific foundation for EPA to execute its mandate to protect human health and the environment.

Research to Inform Agency Priorities

Conduct innovative and anticipatory research to solve longer-term environmental challenges and provide the scientific basis for future environmental protection. This research is applied to the range of EPA program and regional office needs.

Targeted Research to Meet Statutory Requirements and Specific Environmental Challenges Provide research support to EPA program and regional offices, as well as states, tribes, and local communities, to help them respond to current environmental challenges.

Scientific and Technical Support

Offer unique expertise and translational capacity to assist EPA programs and regions, local, state, and tribal governments, and other Federal agencies as they respond to both emergency and longer-term environmental issues.

Aligning CPHEA's Mission

EPA Vision

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To promote a clean, healthy and well-protected environment supporting a sustainable society and economy.

ORD Vision

We are the world's leader in environmental science, technology and research, developing breakthrough solutions that enable EPA, federal agencies, states, tribes, and communities to protect human health and the environment, now and in the future.



CPHEA Vision

We are world science leaders delivering innovative and integrative research providing the foundation for evidence-based decisions and actions to protect our environment, public health, and well-being.

CPHEA Mission

To provide the science needed to understand the complex interrelationship between people and nature in support of assessments and policy to protect human health and ecological integrity.





CPHEA-Led Products in SSWR WTI

Water Treatment & Infrastructure	Research Area	Product Title	Example CPHEA Research
	Drinking Water	Exposure and human health effects from pathogens found in distribution systems	Health benefits from installation of community level water filtration in rural Puerto Rico
		Predictive computational tools to group chemicals, determine joint toxicity and components driving risk and improve estimation	Predicting the effect of mixtures
		Innovative approaches for evaluating exposure to and toxicity from chemical mixtures	Evaluation of a proportional response addition approach to mixtures risk assessment and predictive toxicology using data on four trihalomethanes (disinfection byproducts that are regulated as a group)



CPHEA-Led Products in SSWR WTI

(1)	Research Area	Product	Example CPHEA Research
Water I reatment & Infrastructur	Wastewater and Water Reuse	Effects-based methods for assessing chemical contaminants in wastewater/reclaimed water	 Validation of use of water extract bioassays to detect NIS inhibition, the first step for thyroid hormone synthesis Biological Activity in Effluent from US Food Processing Plants In vitro effects-based method and water quality screening model for use in pre- and post-distribution treated waters Similarities and Differences in Public and Private Tapwater Exposures and Predicted Effects at Cape Cod, USA
	Stormwater	Recommendations for planning and managing stormwater	 Stormwater Best Management Practices to manage freshwater salinization syndrome Incorporation of fine-scale green and gray infrastructure in a landscape-scale ecohydrology model (VELMA) for urban stormwater runoff assessments



CPHEA Capabilities for Water Treatment and Infrastructure

- Pacific Ecological Systems Division (Corvallis/Newport, OR)
 - VELMA modeling platform used to develop predictive models of pollution fate and transport and assess best management practices effectiveness
 - Integrated Stable Isotope Research Facility lab used to characterize groundwater hydrology
 - Biochar lab development of tailor-made biochars for heavy metal attenuation
 - Green houses mesocosm-level simulations of pollutant movement through wetland and soil ecosystems
 - Marine mesocosms simulations of pollutant movement through estuarine ecosystems
 - Geophysics expertise and a range of geophysical equipment for land and waterborne geophysical measurements



CPHEA Capabilities for Water Treatment and Infrastructure

- Human and Environmental Effects Assessment Division (Washington, DC)
 - Scientific synthesis and assessment (e.g., Enhanced Aquifer Recharge report)
- Public Health & Integrated Toxicology Division (RTP, NC)
 - Modern mathematical and statistical methodologies for improved estimation/predictions of contaminants
 - Interdisciplinary assessment of water quality effects on human health and aquatic life (bioassays, chemistry, and microbial analysis)



CPHEA Capabilities for Water Treatment and Infrastructure

- Public Health & Environmental Systems Division (Cincinnati, OH)
 - Animal Research Facilities to support research with live infectious microorganisms to characterize exposure risks associated with pathogens
 - These facilities are equipped with a Madison Chamber to enable researchers to safely conduct aerosol exposure studies in rodent models and are being used to better understand immune responses that may result from inhaled Legionella.
 - Molecular and Antibody Labs to assess the occurrence of pathogens in human stool and detect waterborne infections using an innovative salivary immunoassay
 - These methods are currently being applied to samples from residents of rural communities receiving inadequately treated drinking water in Puerto Rico





Thank You!



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