

Open Science, Collaboration and Capacity Building 2009: A Sample of the Work of BU SRP Research Translation and Community Outreach Cores

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Assessing Vapor Intrusion Exposure & Risk

In collaboration with Brown University SRP and the Massachusetts Department of Environment Protection (MA DEP), BU SRP is working on a field study to improve vapor intrusion risk assessments and to refine the Brown SRP vapor intrusion model using exposure assessment data. The site for our collaborative study is a neighborhood near Boston, MA where an industrial facility, used for decades as a dry-cleaning supply storage and transfer station, contaminated the soil and groundwater with PCE and TCE. To date, a number of vapor intrusion mitigation systems have been installed at residences. Additional testing will determine whether additional homes will also require mitigation (and associated long-term monitoring). This project will combine field data (BU SRP) with modeling capabilities (Brown SRP) in a setting that will allow for the direct translation of our research to action, and potentially inform future agency procedures (MA DEP).



L to R: Madeleine Scammell, Eric Seaberg, Yijun Yao, John Miao (MA DEP), Michael McClean, Kelly Fennell, Wendy Heiger-Bernays, Irene Dake (MA DEP) on recent site visit

Modeling PCE Exposure for Municipal Water Companies

Tetrachloroethylene (PCE) leached into drinking water supplies of Cape Cod from vinyl lining in nearly 400 miles of water distribution pipes installed between 1968 and 1990. Characteristics of the water distribution networks resulted in an irregular contamination pattern and a wide range of exposure levels. BU SRP researchers on Projects 1 and 2 used the EPANET simulation model to estimate and rank residents' PCE exposure through drinking water. Maps of estimated exposure levels, in files compatible with Google Earth and other GIS applications, have been shared with municipal water companies in the affected areas.



Sharing Laboratory Reagents

Five of the BU SRP research projects have published a list of over 60 laboratory reagents and tools. Available on the BU SRP website, the reagents include rodent liver and fibroblast cell lines, expression construct libraries, and DNA and antibody probes for a variety of fish species (e.g., dogfish, killifish, zebrafish, goldfish). These tools are available via email request and can be distributed without permission.



The **Research Translation Core** works to create partnerships with government agencies; identify and transfer technology developed in the BU SRP to appropriate stakeholders, including researchers at other institutions; and to communicate research methods and findings to broad audiences. The BU SRP holds the view that publicly supported scientific knowledge and tools should be freely available and accessible. The Research Translation Core works closely with the Community Outreach Core toward the goal of open science.

Understanding Statistics: Empowering Community Environmental Organizers and Concerned Residents

With the purpose of making data and statistics more meaningful for individuals and community groups confronting risk assessments, health studies and laboratory reports, the BU SRP Community Outreach Core is collaborating with Toxics Action Center and adult education experts at TERC on a project titled, Statistics for Action. Trainings and written materials developed by the group will improve participants' understanding of measurement units used for environmental samples and measures of risk, and increase their proficiency at developing statistics for their own research.



The **Community Outreach Core** seeks to establish collaborative projects with communities, health care providers, and researchers in order to address environmental health problems related to community exposures to hazardous waste. Our current collaborators are Alternatives for Community & Environment (ACE), The Center for Health, Environment and Justice (CHEJ), Greater Boston Physicians for Social Responsibility (GBPSR), and Toxics Action Center (TAC).



Participatory Research to Map Local Hazards

Building on the in-house mapping strengths used by BU SRP PIs, Community Outreach Core collaborators are working with newer collaborators in the City of Chelsea, MA to develop community-based, user-generated content maps in response to residents' concerns regarding contaminated sites and land uses. The Core has hosted six trainings in 2009 for community collaborators on the use of environmental monitoring equipment and data visualization techniques. Data collection is ongoing in Chelsea, where residents are conducting simultaneous PM_{2.5} and PM₁₀ monitoring. Google Earth is being used to display measured levels of environmental hazards as well as geocoded photographs to document sources of hazards and land use issues.

Health & Environment Assistance Resources (HEAR) Database

With the purpose of increasing and diversifying the expertise available to BU SRP community collaborators, three of the four worked together to build the HEAR database. This online database is comprised of researchers and assistance providers who have agreed to respond to requests for legal, scientific, medical, and technical expertise from community groups. There are presently close to 300 experts enrolled. The database computer code will be published under an open-source license to enable other organizations or programs to develop their own expert networks.

www.hear-db.org

Outreach Publication in Social Science & Medicine

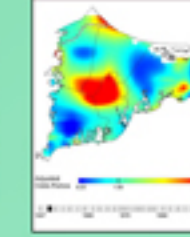
BU SRP Community Outreach Core and Research Translation Core PI, Madeleine Kangsen Scammell, coauthored a paper published in *Social Science & Medicine* in January 2009. The paper, "Tangible evidence, trust and power: Public perceptions of community environmental health studies" is the product of a collaboration with members of the Brown University SRP Community Outreach Core. The paper presents findings from three focus groups conducted in communities north of Boston that have been the subject of two different environmental health studies. The authors explore what shapes the participants' interpretation of the health study's findings and the role of trust in interpretation.



Thanks to Raphael Adamek, Ann Backus, Richard Clapp, Lisa Gallagher, Wendy Heiger-Bernays, Greg Howard, Jessica Nelson, Verónica Vieira, our collaborating partners, and all BU SRP PIs, staff, and students.

Sharing Analytic Methods for Spatial Data

Innovative methods developed by BU SRP Project 2 offer a new approach to investigating disease clusters. The methods use generalized additive models that smooth point-based data while adjusting for known risk factors and produce a continuous surface of disease risk that can be visualized with GIS. The computer code for the methods and synthetic data sets to test the methods are available on the BU SRP website under Research Resources.



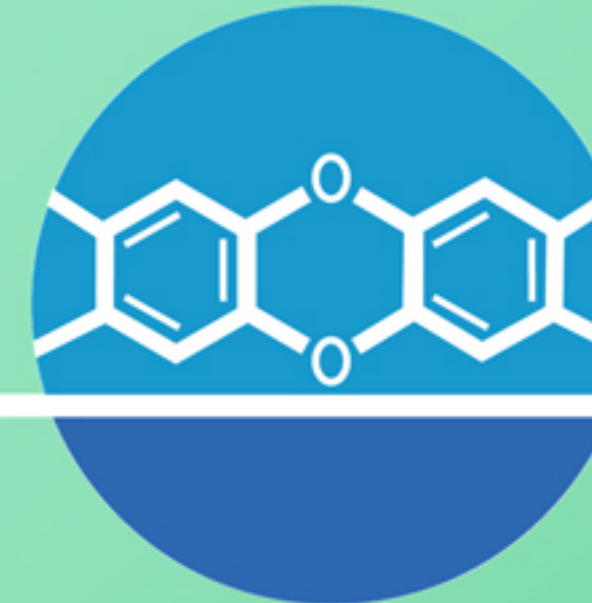
Toxics Use Reduction Agency Advisory Board Appointment

Verónica Vieira (Project 2) has joined the Scientific Advisory Board of the Toxics Use Reduction Institute (TURI). TURI is a state agency responsible for continuing education training sessions for Massachusetts companies, communities, and agencies on toxics use reduction, resource conservation planning, and environmental management systems. The Board's primary role is to consider petitions and make recommendations regarding which toxic chemicals must be reported to state agencies when used, generated as byproducts, or shipped in designated quantities by Massachusetts companies.



Hazardous Materials Policy Training for Local Health Officers

The BU SRP Research Translation Core presented a session at the Massachusetts Health Officers Association Annual Educational Conference in October 2009. The session focused on the regulatory and oversight mandates of local health agents and Boards of Health with regards to hazardous wastes, hazardous materials, and permitted facilities that potentially pose a health threat. In addition to these requirements and obligations, health officers were given guidance on approaches to addressing hazards and working with state agencies.



Environmental Health Nursing Education Collaborative

The Environmental Health Nursing Education Collaborative is jointly organized by the BU SRP COC and the Harvard-NIEHS Center for Environmental Health. Our goal is to increase environmental health education and training of nurses and nursing students. This is accomplished primarily by working with nursing faculty to integrate environmental health into their curricula. The Collaborative website includes a variety of resources, including case studies, developed for environmental health nursing education. In 2009, the Collaborative has benefited greatly from the participation of UNC Chapel Hill's Superfund Program.

Ongoing Community Outreach

In 2009, BU SRP investigators and staff engaged in numerous activities related to our goal of addressing environmental health problems related to community exposures to hazardous waste:

Cataloging Hazards: In response to a request by the Town of Framingham Board of Health, BU SRP investigators and students are cataloging former and current environmental health hazards, including state and federally designated hazardous waste sites and census tract demographics.

Engaging Science Journalism Students: Mark Hahn (Project 5 PI) presented to a group of Columbia University Science Journalism master's students about his Superfund project, providing them with guidance on reaching out to communities affected by environmental hazards.

Testing Toys: Community Outreach Core staff brought an X-ray fluorescence analyzer to a local school in an environmental justice community and tested children's toys and consumer products brought in by residents concerned about lead and other metals.

Youth Education: John Stegeman (Project 6 PI) and Mark Hahn (Project 5 PI) corresponded with eighth grade students from Takoma Park, MD for several months as they worked on a project about the effects of toxic chemicals on algae growth. The students later visited the Woods Hole Oceanographic Institution, touring the facilities and going on an ocean sampling cruise.



Mark Hahn and John Stegeman hold eighth grade students from Takoma Park, MD at the Woods Hole Oceanographic Institution

Participation in US EPA Reviews

Ann Aschengrau (Project 1 PI) and Tom Webster (Project 2 PI) are serving as reviewers on two separate US EPA reviews. Dr. Aschengrau is a reviewer on the "IRIS Toxicological Review of Tetrachloroethylene" and Dr. Webster is reviewing "An Exposure Assessment of Polybrominated Diphenyl Ethers." Both contaminants feature in their research.



Communicating Biomonitoring

The 2006 Boston Consensus Conference on Human Biomonitoring brought together a cross-section of Boston area residents to engage with experts on human biomonitoring for environmental chemicals and produce a consensus statement on their views. Since then, we have worked to share these results with key stakeholders in the area of Biomonitoring.



In April 2009, *Environmental Health Perspectives* published a commentary written by BU SRP staff and researchers titled, "A new spin on research translation: The Boston Consensus Conference on Human Biomonitoring." A video documenting the background and highlights of the conference is available on DVD and can be viewed at www.biomonitoring06.org. RTC staff have also presented at a variety of conferences around the country, including the Association of Public Health Laboratories, the US EPA, and most recently at the International Council of Chemical Associations' Connecting Innovations in Biological Exposure and Risk Sciences: Better Information for Better Decisions workshop in Charleston, SC.

Web Communications Workshop

The Community Outreach Core hosted an online workshop to train participants in the use of Web 2.0 tools such as wikis and RSS aggregators. The workshop focused on how the tools could be used to enhance collaboration, publicize research findings, and conduct online advocacy campaigns. The workshop was attended by leaders and staff of eight chapters of COC Collaborator, Physicians for Social Responsibility.



Mapping Toxic Sites and Sources of Environmental Contamination

In response to a request by Massachusetts Toxics Action Center, COC staff produced a map of Massachusetts NPL sites and other community-identified sources of environmental contamination. The Core used GIS software to plot publicly available data. Hard copies of the map with additional information about each type of site are distributed by Toxics Action Center.

