

Translation of Basic and Advanced Research on the Fate and Transport of Toxins, Carcinogens and Endocrine Disrupting Chemicals (EDC) in Water and Other Media to Aid Policy-Makers, Decision-Makers and Key Stakeholders

It is essential to translate basic academic and scientific literature on toxic, carcinogenic and endocrine-disrupting contaminants to aid policy makers and other decision-makers in Southwestern Pennsylvania, nationally and internationally to find solutions to environmental/ecological health issues and related economic, social and political problems. Translation of basic science is also necessary to guide applied research and outreach programs in all areas of environmental health. The CHEC is particularly poised, through its extensive work on Southwestern Pennsylvania's water resources, to translate basic science in the related areas of water quality and other water management problems (water quantity, stormwater runoff, flooding, climate change, and land development).

a. What is Translation of Basic and Advanced Research-Why do it?

Research in the fields of hazard assessment, toxicology, exposure assessment, the movement of chemicals through different media into surface and groundwater and their uptake by susceptible human populations and ecological receptors is flourishing. Each month there are hundreds of important peer-reviewed manuscripts dealing with some aspect of the problem of contaminants in water that are published. Unfortunately, most of these papers appear in journals that are obscure to all but scholars in specific fields of inquiry. **The mechanisms used to connect researchers between independent fields of inquiry as well as basic and advanced research to issue and policy oriented organizations and decision-makers are called translation.** Translation of findings of all scientific efforts to a wide audience of researchers, organizations and decision-makers is now required on many projects funded by the National Institute for Environmental Health Sciences (NIEHS).

Translation is issue and policy specific. Before translation can be effectively carried out the intended outcomes of translation must be clearly stated. Translation consists of **continually scanning the literature for timely and notable manuscripts that directly correlate with the policy outcomes under study.** It means that those papers will be condensed, combined and transformed into language understood by a lay audience that needs the information to determine policy concerning the best uses of human and capital and ecological resources to combat environmental problems. Translated science is disseminated to organizations, decision-makers and individuals via websites, newsletters and factsheets, conferences, speaking engagements, the translators participation in non-governmental organizations, quasi-governmental and governmental committee's and boards, small group talks and one on one conversation.

Translation also includes fostering connections between research groups and fields and decision makers. This can be achieved by holding retreats, informal meetings, and/or conferences regarding the inter- and multi-disciplinary character of water quality science.

In these conferences decision-makers and organizations that require scientific input are invited to hear the latest advances in science related to their policy responsibilities.

b. Why is Translation of the Fate and Transport of Contaminants Important for Southwestern Pennsylvania Decision-Makers?

Southwestern Pennsylvania is facing a water quality crisis. Solving water quality and quantity issues are important to the continued rebirth and economic revitalization of Southwestern Pennsylvania. Water quality and quantity problems cannot be solved by one borough, township or large city because both surface waterways and underground water cross state, county, township and city boundaries. One township or industry's wastes affects another community's drinking water downstream or down gradient for surface water and groundwater, respectively. A regional watershed approach is necessary to address the many threats to our water quality. Treating water as a regional asset will allow us many opportunities to solve surface and groundwater contamination problems.

The decision-makers and the organizations that help support the policy-making process require up to date, understandable scientific information on the public health significance of contaminants in water and the routes of entry of toxic or carcinogenic pollutants into both surface and groundwater. For instance, old industrial and municipal contaminants are contained in stream and river sediments. Stream and river sediments act as a sink for contaminant retention and they are dispersed during high water and other hydrological events. Old contaminants also continue to enter our surface and groundwater water from contaminated soils. Additionally, our watersheds are threatened by new sources of toxic and potentially carcinogenic and endocrine-disrupting substances. These contaminants are emitted from point sources such as industrial and wastewater treatment plants and non-point sources such as runoff of organic substances from parking lots, application of agricultural and residential pesticides and the natural processes of leeching of metals such as arsenic from rock broken by glacial actions. Without translation of academic knowledge of the specific concentration of pollutants in water, their flow through the different environmental media and the risk that they present to the health of both our population (and particularly susceptible sub-populations such as developing fetuses and young children) and ecological receptors- we cannot prioritize efforts to solve our water quality problems.