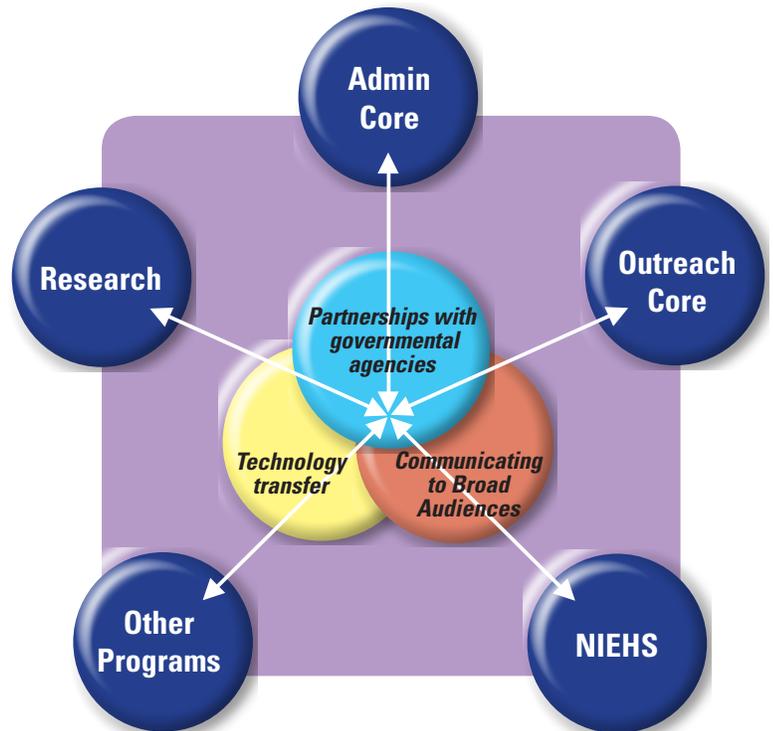


Committed to mobilizing research discoveries, with the goal of making a difference in peoples' lives and improving the Nation's ability to cleanup Superfund sites, the SBRP has incorporated a required element, the Research Translation Core (RTC), into each Multi-project Grant. The requirement, which was initiated in 2005, stipulates that grantees must formulate and implement a plan to work with the public, policy-makers, industry and other stakeholders to ensure the timely use of the grantee's research findings. To a great extent, the activities undertaken should build on the research and technologies developed by the parent grant; however, accessing and using internal resources and expertise frequently becomes key to the success of these activities.



As seen in the diagram, a critical aspect of the RTC is establishing and maintaining two-way communication channels with other members of its Multi-project Grants, as well as with other SBRP grantees and the SBRP staff. As depicted in the center of this diagram, each RTC is required to conduct three specific activities:

- partnering with governmental agencies
- conducting technology transfer
- communicating to broad audiences

Under these broad guidelines, each grantee is allowed the flexibility to pursue activities most appropriate to the research emanating from the parent grant. Consequently, the RTCs at the fourteen currently funded Multi-project Grant programs, each have unique projects tailored to the theme of its grant. However, many RTC utilize similar tools, such as hosting conferences, constructing web sites, etc.

The following text provides examples of unique RTC projects conducted to enhance the use of the science being conducted by its program.

Boston University

With the goal of making its resources available to the wider community, the Boston University RTC has put mechanisms in place to make fully annotated computer code, user manuals and software freely available under a public license. It also makes reagents and animal models, with appropriate documentation, similarly accessible.

To meet another need the Boston University RTC has created a broad range of technical and educational materials, including workbooks for use by community groups. These materials are available on a public website for convenient access, and are distributed in hardcopy through the Community Outreach Core and its partners in the community.

The Boston University RTC Core is using Web 2.0 communication strategies to disseminate information from the static hydraulic model of local water distribution systems on Cape Cod. This was developed as part of an exposure model for the solvent PCE in the BU research project "Neurotoxic Effects of PCE Exposure During Gestation and Childhood". The tool will allow the RTC to provide the community with information on the location of vinyl-lined piping which leached the solvent PCE several decades ago. By creating a Google Map KML version of the water pipe distribution system, the RTC hopes to improve the community's understanding of the contamination in a user-friendly way.

Brown University

The Brown University RTC has a very rigorous partnership with the Rhode Island Department of Environmental Management (RIDEM). One outcome of this partnership has been the creation of a series of training workshops. These workshops have been quite successful as they were developed collaboratively and target the needs of the state and local officials dealing with environmental problems.

- Vapor Intrusion Mitigation Workshop
- Toxicology/Remediation Workshop and Site Tour
- Manufactured Gas Plant Site Characterization and Remediation
- Hazardous Waste Training for Occasional Site Workers
- Sediment Characterization and Remediation
- Continuing Legal Education (CLE) Course

The Brown RTC works particularly closely with the Community Outreach Core. One area where the RTC supports the Community Outreach Core is that on an ongoing basis the RTC organizes the information obtained by its researchers and the larger scientific community and makes it generally available.

Columbia University

A central theme of the Columbia University's RTC is evaluating elevated levels of arsenic (As) and manganese (Mn) in ground water with the goal of minimizing human exposure. To accomplish this, it collaborates with governmental agencies in four states (NJ, NY, NH, ME). For this activity, it is integrating existing geophysical, geochemical, hydrological, and socio-demographic data for the Newark basin and adjacent areas of northern NJ and southern NY to assess sources (natural and anthropogenic) and human exposure to elevated groundwater As and Mn. As part of the project they are making presentations to schools and communities on the effect of arsenic exposure on cognitive and motor functioning in children.

In addition, the Columbia RTC provides the framework for sustained communication among research projects, cores and governmental agencies and interested parties through monthly seminars, a website and focus meetings.

Dartmouth College

The Dartmouth College RTC has conducted a series of activities that is informed by an understanding of the social, political and economic contexts that affect the relevance of the science conducted by the Dartmouth SBRP. One significant undertaking is that it is working with a journal editor on the publication of a series of scientific papers on the bioavailability of mercury - - this publication is an outcome of a workshop funded by the SBRP and hosted by Dartmouth College.

In another area the Dartmouth RTC, is collaborating with the New Hampshire Department of Environmental Services on a Women's Fish Consumption and Mercury Awareness outreach project. They developed a survey to explore the knowledge and attitudes of health care providers and their patients about eating fish. The survey was distributed to 80 New Hampshire practices in order to guide development of a new brochure. A post-survey will be administered to the same group after the brochure has been distributed. The information was also used by the NH DES to develop a grocery-store fish advisory poster.

Duke University

The Duke University RTC has established an interdisciplinary partnership focused on lead exposure issues related to changes in Durham NC's water disinfection process. The partnership involved stakeholders from community groups, local government, the local health department, and the RTC. This group organized to form the Durham Environmental Lead Collaborative (DELCO) and convened in March 2007 to address high water lead levels in Durham. The goal of the DELCO is to protect Durham County residents from lead poisoning hazards from all sources. Scientific contributions to this effort were provided by the RTC, which has expertise in the analysis of changes in blood lead levels associated with the use of chloramines in water treatment systems.

Michigan State University

The Michigan State University RTC has developed an interactive web site, Molecular Biology Tools Repository (MTBR), for bioremediation workers, researchers and policy decision makers. This tool is based on software developed as part of the Michigan State University program. The intent of this tool is to enhance the quality and efficiency of risk assessments. The Functional Gene Pipeline/Repository component of the MBTR is now used by researchers from both the US and Europe. On average, it receives over 5000 visits from over 700 unique IP addresses each month.

This RTC has also been active in organizing grantee seminars for state/federal agencies. It recently organized and hosted "The NAS and WHO on Dioxin and Dioxin-Like Compounds: International Policy Implications and Potential Impact," with 105 participants representing governmental agents (22), foundations/consulting firms (27), and academia (56).

University of Arizona

The University of Arizona RTC is committed to ensuring that stakeholders have effective and timely use of research products. In order to accomplish this, as Arizona is a border state, it is committed to consistently producing all research translation materials in English and Spanish.

It has also established a well received and recognized web-based seminar series for EPA Region 9 Remedial Project Managers. To date, it has have hosted seminars on “Catalytic Destruction of PCE and TCE in Soil Vapor – Laboratory and Field Studies,” “Phytostabilization of Mine Tailings in Arid and Semi-Arid Environments,” and “Characterizing Mass Transfer and Mass Flux for DNAPL Source Zones.”

The University of Arizona RTC also coordinates technology transfer activities such as field studies to test phytostabilization strategies at Boston Mill site within the San Pedro National Conservation Area; Klondyke Tailings State Superfund Site; and Phelps-Dodge Tailings Site, Green Valley, Arizona. The Core is supporting additional field studies to test innovative characterization and remediation methods for chlorinated-solvent contaminated sites at the TIAA federal Superfund site and the Park-Euclid state Superfund site in Tucson.

University of California, Berkeley

The RTC leaders at the University of California, Berkeley have used their expertise to contribute to several state and federal activities. They conduct independent but coordinated activities with regard to the health and engineering sciences. From the health science perspective they have advocated for the appropriate use of biomonitoring to improve public health. They have conducted a workshop to discuss the implementation of California legislation passed in fall of 2006, with regard to biomonitoring, and are planning a workshop on how biomonitoring can contribute to improving environmental health in communities. One of the core leaders presented a new analysis of approaches being used to select chemicals for biomonitoring at the American Public Health Association annual meeting. The side bar presents an additional example of the University of California, Berkeley RTC environmental science activities.

University of California, Berkeley RTC leader James Hunt’s progress in the identification of environmental transport processes that constrain environmental remediation was highlighted in an SBRP Research Brief. The Brief provided broad coverage of the research and generated an invitation to speak at additional professional society meetings and at a symposium for earth scientists working on site assessment and remediation for the State of California. This forum allowed Dr. Hunt to summarize the research findings and discuss their application to the remediation of groundwater contaminated by perchlorate and chromate spills. As a consequence of these outreach efforts to the regulatory community, Dr. Hunt presented an expanded seminar at the EPA Region 9 Headquarters for staff and consultants. Subsequently, Dr. Hunt initiated discussion with the owner of sites contaminated by chromate. In addition, Dr. Hunt is engaged in further discussion with EPA Region 9 staff to identify additional sites where long-term monitoring data are available for the analysis of remediation efficiency and the analysis of dominant transport processes that occur at the field scale.

University of California, Davis

The University of California, Davis RTC has several unique activities underway. For one, this RTC coordinated efforts of several research projects to follow-up on recent reports of the entry of triclocarbon (TCC), an anti-microbial compound found in soaps, into the environment via wastewater treatment solids stream. One of the program's research projects determined potentially adverse endocrine effects of TCC and provided evidence of a new mechanism of endocrine disruption. In coordination with the RTC, the project investigator has submitted a patent disclosure regarding the development of a new androgen receptor assay.

Another activity includes the establishment of a new start-up company, SYNTHIA-LLC, to develop nanoparticle-based technologies to test for environmental pollution or contamination of food products, and for medical diagnostics. It is composed of SBRP researchers and was formed as a result of the RTC efforts. Four SBIR and STTR proposals have been submitted in conjunction with SYNTHIA-LLC.

The Davis RTC also hosts an annual "Environmental Health Entrepreneurship Academy" where SBRP-funded students and post-docs (from all 14 Programs) are provided the opportunity to develop skills for designing, validating and communicating the commercial potential of their research results and products, as well as learning about initiating business ventures. The course culminates with the students making presentations of business plans to a panel of entrepreneurs.

University of California, San Diego

The broad long-term objective of the University of California, San Diego, is to apply toxicogenomic knowledge and biomolecular technologies to real-life problems concerning hazardous substances and environmental health. Along these lines, biomarkers developed by SBRP scientists are being evaluated, in partnership with the San Diego Baykeeper, Tribal labs and government agencies responsible for water quality monitoring, as potentially effective new tools for detecting Superfund toxicants in contaminated watersheds. This RTC's approach leverages strong working partnerships and information/visualization technologies already developed by the San Diego Supercomputer Center. It has established a web-based research and learning network for sustainable development using on-line geographic information systems (GIS), decision support systems (DSS), multimedia interactive stories, and 3D visualization.

A specific outcome of these activities includes the completion of a formal Material Transfer Agreement (MTA) enabling sharing of cell line technology with the 29 Palms Tribal EPA Laboratory. This arrangement is building capacity within Tribal institutions to screen for Superfund toxicants identified by the U.S. EPA National Tribal Science Council as Tribal priorities (e.g., dioxins).

University of Iowa

The University of Iowa RTC works closely with state legislators to educate them on environmental issues. Recently it hosted the "Environmental Health Issues in the Midwest: A Workshop for State Legislators," which was an initiative that brought together Midwest state legislators for a workshop to learn about and discuss how research can be used to inform policy. Ten legislators and four staff members from Iowa, Illinois, Wisconsin, Minnesota, Nebraska, and Missouri attended. Several University of Iowa SBRP investigators and other

University staff, faculty, students and members of the public interacted with legislators and legislative staff through four formal scientific panels and three interactive sessions.

Additional RTC activities include meetings with school officials in East Chicago, Indiana and Columbus Junction, Iowa. These several meetings resulted in investigators making presentations on PCB to chemistry classes in Columbus Junction High School. Meetings with school officials are also part of community outreach as well as research translation.

The RTC also provided support for filing of an invention disclosure with the University of Iowa Research Foundation for a device developed in one of their studies. The Foundation is currently evaluating patentability and market potential of this device.

University of Kentucky

The University of Kentucky RTC recognizes that effective research translation begins with good communication skills. This group has targeted its programs graduate students and postdoctoral scholars for communication training/research endeavor to improve their research translation skills. Pre-testing will provide necessary data for a needs assessment that will inform curriculum development. Pre- and post-test assessments of subject attitudes regarding their own communicative competencies, along with peer and reviewer evaluations of subject presentations, will identify best practices for tailoring messages about complex research processes to meet the varied needs of specific audiences.

The RTC also partners with the Commonwealth of Kentucky's Environmental Quality Commission. Together they sponsored a public forum on health and the environment. The audience included state policy makers and the general public. Regional EPA and ATSDR personnel were invited and the forum encouraged communication among public officials, stakeholders, and concerned citizens regarding the Commonwealth's environmental health challenges and available resources. An audience survey provided valuable feedback regarding attendees' knowledge of Superfund issues and the meeting's perceived efficacy. Survey results will inform planning and implementation of future Research Translation events. Government partnerships also were encouraged through the development of a Research Translation brochure for congressional contacts and state officials.

University of North Carolina, Chapel Hill

The University of North Carolina at Chapel Hill RTC has developed a variety of mechanisms to translate its program's research to meet the needs of their target audiences, i.e., government agencies, local communities and technology developers. Working with the EPA, a local county park, and the Neuse River Foundation, the RTC team stimulated community involvement at a PCB contaminated site in Morrisville, NC. The multi-faceted approach began with an assessment of community knowledge about local contamination and clean-up. It created materials to improve the availability of information regarding the Superfund clean-up process and potential health risks from PCB contamination. It also identified needs related to communicating with decision-makers. In response to local requests and the needs assessment, a web page to inform the community about the proposed remedial alternatives at the site was developed. This knowledge empowered the community to provide feedback during a public comment period. The EPA remediation project manager thanked the UNC-Chapel Hill RTC staff for their efforts, noting the production of clear information in a short time-frame.

On another front, the RTC leaders also plan and participate in a regular seminar program with the North Carolina Department of Environment and Natural Resources (NC DENR) Superfund Program. UNC- CH researchers, post-docs and senior graduate present their findings to DENR staff.

University of Washington

The University of Washington RTC staff assists investigators in moving research findings into application through formal mechanisms, including patents on technologies and products, as well as leveraging open-source approaches to advance research findings:

- One investigator working with a clinical laboratory, assisted in adapting an SBRP-developed urinary porphyrin profile procedure for assessing mercury exposure and toxicity in humans into a standard clinical assay. This assay is now commercially available and being utilized.
- Another investigator is working with a small business to develop methods for removal of indoor air pollutants using transgenic plants.

The RTC has also established partnerships with EPA Region 10, and the Washington State Departments of Health and Ecology. The RTC and these agency partners are collaborating on issues related to the Lower Duwamish Waterway Superfund Site, Rayonier Mill Hazardous Waste Site, Whatcom Waterways Site, and Lake Roosevelt Site. The Washington RTC has been attending public meetings, assisting agency staff in developing site-related educational materials, and serving as a resource once materials are disseminated to community groups.