Examples of SBRP-funded Activities at Hazardous Waste Sites

http://www.niehs.nih.gov/sbrp/

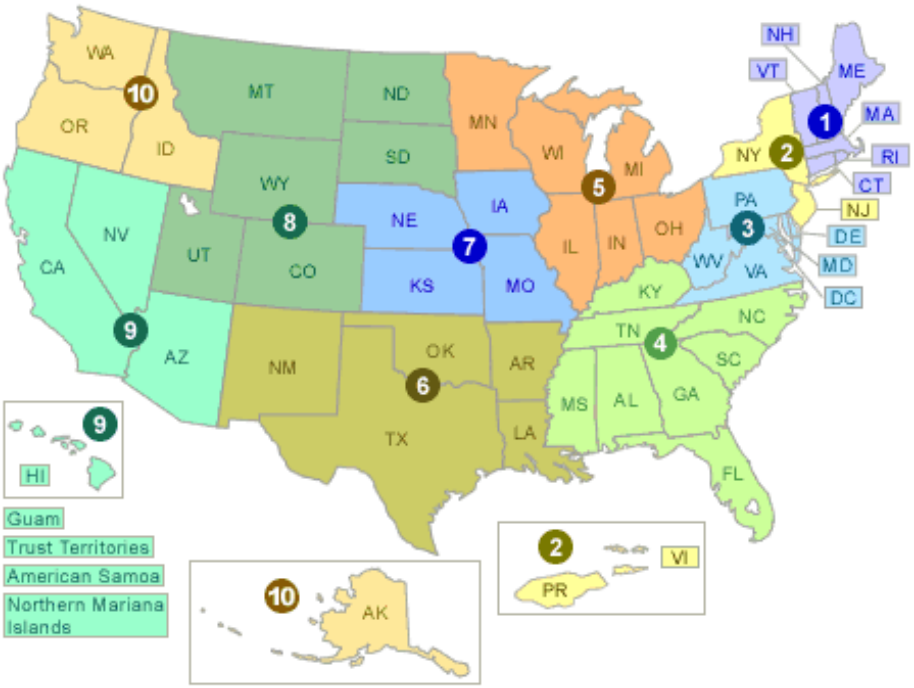
Since its inception, the SBRP has funded research and outreach projects involving activities at hazardous waste sites. Grantees conducting biomedical, non-biomedical, and outreach projects have interacted with state/federal site managers and community organizations to establish relationships that provided grantees with: access to environmental data and samples; opportunities to support the work of site managers; and opportunities to provide education and outreach support to communities impacted by hazardous waste sites.

The distribution of these sites across the country is depicted in the following figure. Information on all 223 sites is presented in the booklet at the end of this appendix.

Number of Hazardous Waste Sites with SBRP-funded Activities by EPA Region

EPA Region	Number of Sites*
1	40
2	6
3	12
4	22
5	33
6	15
7	5
8	7
9	57
10	26
Total	**223**

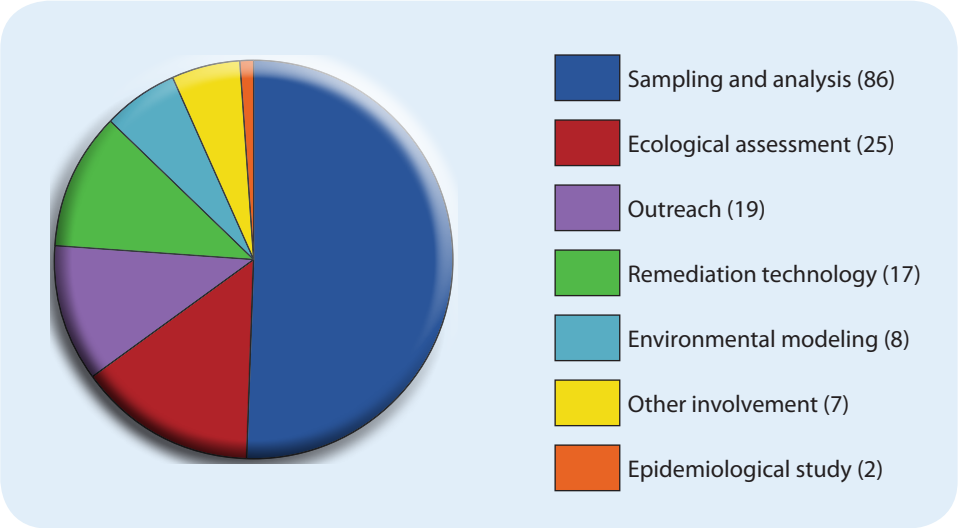
**2008 data*



As shown below, SBRP grantees have conducted a wide range of activities, which have provided data for approximately 50 peer-reviewed publications and 35 student theses/dissertations.

Types of SBRP-funded Activities at Hazardous Waste Sites

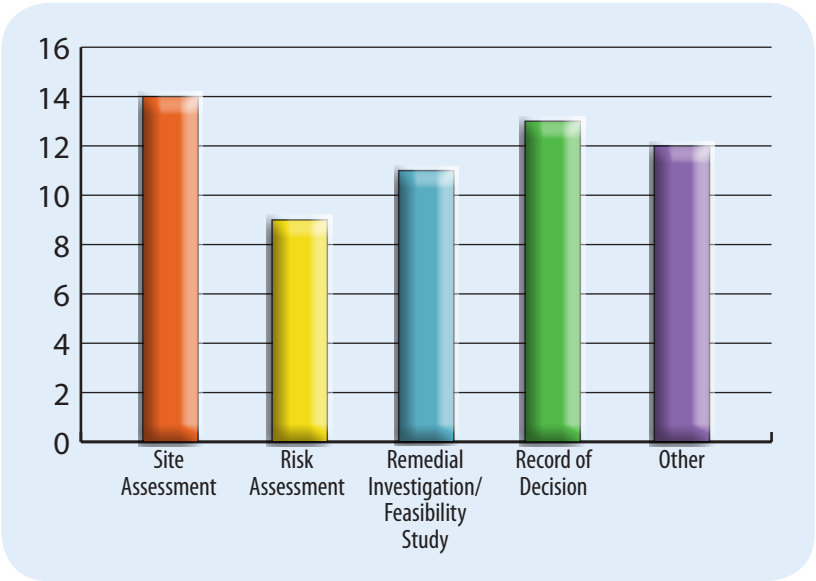
(Data from 2005 survey of 98 sites)



These activities have been beneficial to SBRP grantees, EPA managers, and individuals living near the sites. The figure below illustrates how state/federal site managers have used data generated by SBRP grantees to support site characterization, risk assessment, and clean-up activities.

Use of SBRP-funded Research by Site Managers

(Data from 2005 survey)



The five examples below convey specific SBRP grantee interactions with state and/or EPA site officials at hazardous waste sites:

Jasper and Hart Creosoting Companies Superfund Sites (Texas)

Dr. Kirby (KC) Donnelly, Texas A&M University SBRP, worked collaboratively with EPA Region 6 Remedial Project Manager (RPM) Robert Sullivan and Risk Assessor Ghassan Khoury to provide technical support to communities and city/state health departments impacted by these two wood preserving sites, which are contaminated with semi-volatile chemicals, PAHs, PCP and dioxin/furans. Dr. Donnelly involved his students in the design and implementation of an educational outreach program (workshop) which they presented in several cities throughout Texas. He led student field trips and meetings with state regulators and EPA Region 6. Ghassan Khoury coordinated these activities for Region 6. At the Jasper and Hart wood preserving sites, Dr. Donnelly conducted sediment and biota sampling for site contaminants. His data were used in the Net Environmental Benefit Analysis (NEBA) that was utilized in the ecological risk assessment. In March, 2007, Dr. Khoury sent Dr. Donnelly a letter thanking him for helping the Superfund technical team by providing ecological analysis that reduced uncertainty in the decision making process for the two sites.

Lower Duwamish Waterway Superfund Site (Washington)

Dr. Kirby Donnelly worked with Washington state officials and EPA staff in Region 10 (Bruce Duncan [Eco Risk Assessor], Allison Hiltner [RPM], and John Barich [ORD Liaison]) to collect and analyze samples from the Lower Duwamish Waterway Superfund site. The goal of this on-going work was to develop biomarkers of exposure and dysfunction in fish and fry captured in the waterway. These biomarkers could serve to replace costly and time consuming conventional bioassay processes which are commonly used to determine impacts of contamination on aquatic life. The results of this work have been applied by EPA in decision-making processes at the site. This project served as the groundwork for the SBRP Bioassay Network. Dr. Donnelly brought together researchers from five SBRP universities and two partnering universities to create and validate a suite of bioassays to support ecological risk assessment.

Anaconda Smelter Superfund Site (Montana)

Dr. Mike Hooper, University of Washington SBRP, conducted extensive wildlife biomonitoring studies (small mammals and birds) to characterize the extent of contamination at the large site. The EPA Region 8 staff (Dale Hoff [ecological risk assessor] and Charles Coleman [RPM]) used Dr. Hooper's data along with other remedial design investigations to help refine the contaminated soil areas of concern and to develop remedial design criteria. Dr. Hooper's work also changed the basic characterization of terrestrial risk at the site. It provided a scientific basis for EPA to validate exposure models in the screening level eco risk assessment, compare metal

accumulation among pilot projects completed on various remedial alternatives, and establish a clean-up goal for sensitive wildlife species.

Central Arizona Water Conservation District Site (Arizona)

Dr. Raina Meier, University of Arizona SBRP, and two graduate students provided technical support to Richard Rupert, a Region 3 Superfund On-scene Coordinator, in an effort to identify an economical, yet effective method of remediating the site where approximately 4,000 gallons of petroleum products had leaked into the vadose zone. Dr. Meier's team investigated a variety of potential biodegrading bacteria and the methods upon which the operating parameters could be modified to improve biodegradation of the incoming hydrocarbon-rich air stream. They determined the parameters required for the use of naturally occurring bacteria to degrade the contaminants. Dr. Maier provided the technical knowledge needed to modify the environment to encourage growth of the appropriate populations of naturally occurring bacteria and maximum system efficiencies. Use of this bioremediation system eliminated the need for an on-site combustor and saves thousands of dollars per year in operating costs.

Site: New York State Municipal Solid Waste (MSW) Landfill Arsenic Study (New York)

Dr. Steven Chilrud, Columbia University SBRP, supported the efforts of New York State Department of Environmental Conservation solid waste manager Steve Parisio to determine why the leachate from closed MSW landfills was creating a reducing groundwater environment which mobilizes natural arsenic and creates health and environmental problems in nearby groundwater wells. The Columbia University researchers postulated that organic material was working with the iron compounds in the landfill leachate and was creating the reducing environment, which was mobilizing natural arsenic in the soils. Prior to this study, the landfill owners denied that the arsenic contamination was caused by their leachate. Dozens of landfills were sampled and work has continued to determine which oxidizing components of the leachate were most likely to cause the mobilization of arsenic so that corrective measure could be initiated. As a result of this work, several landfills had new caps installed and some private wells were relocated.