

Uses of the TRI Risk Screening Indicators (RSEI) Model

Wednesday, 1:00-2:10 p.m.

Grand Ballroom

Using the RSEI Model

Lynn Blake-Hedges, Presenter

EPA's Risk-Screening Environmental Indicators (RSEI) is a geographically-based model, using data from the Toxics Release Inventory (TRI) to explore data on releases of toxic substances from industrial facilities. By analyzing TRI information on the amount of chemical released together with risk factors, such as the chemical's fate and transport through the environment, each chemical's relative toxicity, and the number of people potentially exposed, RSEI calculates a numeric score, which allows a user to compare releases relative to each other on the basis of relative risk. The RSEI project was initiated in 1991, reviewed by EPA's Science Advisory Board in 1997 and first publically released in 1999. The first version included data from 1988, the first year of TRI reporting, through 1999 and only included risk-related results for air releases. RSEI now includes results for air and water releases and incorporates 27 years of TRI release data, three U.S. Censuses, toxicity and physical properties for more than 400 chemicals, and geographical information for more than 50,000 facilities and thousands of streams and other waterbodies.

This information is used to model the route of each chemical release through the environment and exposures to produce screening-level results on the potential for chronic human health risks. Some of the uses of RSEI results include ranking regions, states, counties, industries, chemicals, facilities, or release pathways for follow-up activities and trend analyses. RSEI is a screening-level model, and uses worst-case assumptions about toxicity and potential exposure where data are lacking, and simplifying assumptions to reduce the complexity of the calculations. A more refined assessment is required before any conclusions about health impacts can be drawn. This presentation will introduce the basics of the RSEI model, ways to access the data, highlight some uses of the data, and present plans for using and improving RSEI.

Applications of RSEI Data for Assessment of Corporate Environmental Performance

James Boyce, Presenter

Measures of corporate environmental justice performance can be a valuable tool in efforts to promote corporate social responsibility. Using data from the Risk-Screening Environmental Indicators (RSEI) we measure the extent to which toxic air emissions from industrial facilities disproportionately impact racial and ethnic minorities and low-income households. Applying this measure to 100 major corporate air polluters in the United States, we find wide variation in the extent of disproportional exposures. In 54 cases, minorities bear excess burden; and in 15 of these cases, the minority share exceeds half of estimated total human health impacts from the firm's industrial air pollution.

Using RSEI to Link Super Polluters with EJ Communities

Mary Collins, Presenter

Several key studies have found that a small group of super-polluters, polluting at levels far exceeding expectation, generate the majority of overall human exposure to industrial toxics. To our knowledge, our research is the first to systematically described the scope and extent of extreme variations in industrially-based exposure estimates. Using EPA's Risk Screening Environmental Indicators Geographic Microdata, we examine all permitted industrial facilities across the United States, showing that, in deed, a class of super-polluters can be identified. Although many hypotheses exist, we test the idea that super-polluters are located in places that escape scrutiny, namely, environmental justice communities. Our analysis links inequities in harm produced to inequities in exposure. We find that super polluters disproportionately expose communities of color and low income populations to chemical releases. We hope our study moves beyond a traditional environmental justice research frame, bringing new computational methods and perspectives aimed at the empirical study of societal power dynamics. Our findings suggest the possibility that substantial environmental gains may be made through selective environmental enforcement, rather than sweeping initiatives.

Geographical Clusters of RSEI Hazard Scores in the USA

Raid Amin, Presenter

We focused on the carcinogenic components in a cluster analysis that was sequentially done in stages. As a first step, we used data at the county level for the USA's 48 contiguous states in a cluster analysis with the software SaTScan. The Normal model was used, after transforming the raw hazard scores into normal quantiles in order to reduce the impact of any existing outliers. Then, in the following stage, we analyzed the county based hot spots with data at the census tract level. The multi-resolution cluster analysis then considers data at the block group units, followed by data at the block level. This research project is based on EPA's micro data set for the Risk-Screening Environmental Indicators (RSEI).