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How Are the Toxics Release Inventory Data Used?

-- government, business, academic and citizen uses

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Foreword

The Toxics Release Inventory (TRI) data are used in myriad ways. There are many uses of the TRI data that the authors of the legislation (the Emergency Planning and Community Right-to Know Act) mandating the TRI envisioned and many that they did not foresee. The Pollution Prevention Act of 1990 increased the types of data required to be reported to the TRI, which expanded the potential uses of the TRI. The combination of the types of data collected under TRI and the fact that they are made available to the public under EPCRA 313 makes TRI a powerful tool for many environmental analyses and understanding the many factors that contribute to human health and environmental conditions.

The intent of this report is to provide the reader with an overview of the different ways in which the TRI data are used, and as such does not include a description of all programs, activities, and analyses that use the TRI data. The case studies that are presented in this report were gathered through literature searches and phone interviews. EPA does not support or condone any of the uses of the TRI data presented here; nor does it endorse any of the organizations that are discussed in the case studies. To learn more about TRI data and about EPA's annual Toxics Release Inventory Public Data Release (PDR), consult EPA's TRI website at www.epa.gov/tri.

EPA is interested in learning of new uses of the TRI data. If you know of uses of the TRI data, particularly types of uses not covered in this document, and wish to share them, please send them to:

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Introduction

A chemical accident killed more than 2,000 people and injured hundreds of thousands of others in Bhopal, India, in December 1984. Coupled with similar, though less devastating, chemical accidents in the United States, the Bhopal incident greatly increased the public's awareness of and concern about the dangers of chemicals used and released into communities. Consequently, in 1986, Congress passed the Emergency Planning and Community Right-to-Know Act (EPCRA) as a part of the Superfund reauthorization. EPCRA's mandate is twofold:

- promote contingency planning for chemical emergencies, and
- provide the public with previously unavailable information about toxic and hazardous chemicals in their communities.

Section 313 of EPCRA created the Toxics Release Inventory (TRI), which requires companies within the manufacturing sector and federal facilities to report specified quantities of certain chemicals released from their facilities. In 1990, Congress passed the Pollution Prevention Act (PPA), which requires that facilities report to the TRI the quantities of toxic chemicals that they manage in waste and the types of pollution prevention (source reduction) activities they undertake. In 1998, the public gained access to data from additional industrial sectors. The other industries now required to report under EPCRA and the PPA include metal mining, coal mining, coal and oil burning electrical utilities, hazardous waste treatment and disposal facilities, chemicals distributors, petroleum bulk plants terminals, and solvent recycling operations.

Under Section 313(h) of EPCRA, Congress clearly provides for the wide distribution of the industry information gathered:

"The release forms required under this section are intended to provide information to the federal, state, and local governments and the public, including citizens of communities surrounding covered facilities. The release form shall inform persons about releases of toxic chemicals to the environment; to assist governmental agencies, researchers, and other persons in the conduct of research and data gathering; to aid in the development of appropriate regulations, guidelines, and standards; and for other similar purposes." Through their availability, TRI data have become a useful resource for many different organizations:

- Communities use TRI data to begin dialogues with local facilities and to encourage them to reduce their emissions, develop pollution prevention (P2) plans, and improve safety measures.
- Public interest groups, government, academicians, and others use TRI data to educate the public about toxic chemical emissions and potential risk.
- Industry uses TRI data to identify P2 opportunities, set goals for toxic chemical release reductions, and demonstrate its commitment to and progress in reducing emissions.

- Federal, state, and local governments use TRI data to set priorities and allocate environmental protection resources to the most pressing problems.
- Regulators use TRI data to set permit limits, measure compliance with those limits, and target facilities for enforcement activities.
- Public interest groups use TRI data to demonstrate the need for new environmental regulations or improved implementation and enforcement of existing regulations.
- Investment analysts use TRI data to provide recommendations to clients seeking to make environmentally sound investments.
- Insurance companies use TRI data as one indication of potential environmental liabilities.
- Governments use TRI data to assess or modify taxes and fees based on toxic emissions or overall environmental performance.
- Consultants and others use TRI data to identify business opportunities, such as marketing P2 and control technologies to TRI reporting facilities.¹

This document presents uses of TRI data in the following categories: public, industry, government, international, investment, and academic. Case studies were found primarily by consulting with EPA/TRI program representatives in the state and EPA regional offices, researching numerous literature sources, conducting internet searches and following up leads with phone interviews, mail and email correspondences with TRI data users. This document does not describe all of the many people, programs, and activities that use TRI data, but instead presents examples in each category. Appendix A provides additional examples. More case studies were found of TRI data use by individuals, community groups and environmental organizations than by private industries.

Public Use

Each year, the EPA makes TRI data available to the public on two Internet sites: TRI Explorer <www.epa.gov/triexplorer> and Envirofacts <www.epa.gov/enviro>. The EPA also provides summary national and state data in the annual publications *Toxics Release Inventory: Public Data Release* and *Toxics Release Inventory: Public Data Release: State Fact Sheets*. States also release their own reports. Community organizations, universities, local public interest organizations, national non-governmental organizations (NGOs), and workers and labor unions also conduct analyses and risk assessments based on TRI data. Some of these organizations also make data and analyses available to the public.

The public can use TRI data to:

- *learn about their local environment and potential exposures to toxic chemicals*
- *participate in environmental decision-making*
- *learn more about the environmental behavior of companies in communities to which they might consider moving.*

Citizens and Community Organizations

Citizen activists and community organizations educate their citizens or residents about toxic chemical releases using TRI data, often combining education with a call to action. Some community organizations have used TRI data to initiate discussions with local industries or to call on local and public interest organizations to lobby for their causes. Local public interest organizations improve citizen environmental awareness, encouraging them to become involved in the environmental health of their communities. Members of a local public interest organization can be of technical and legal help to citizens in the field of environmental negotiation. Examples of citizen activists and community interest organizations and the ways in which they use TRI data follow:

- The Eugene Toxics Right-to-Know program, a local grassroots organization in Eugene, Oregon, used TRI as a model to develop the first city right-to-know program. This program gives citizens information about toxic material use and materials accounting information to the kilogram level. Voters adopted the program in 1996 as an amendment to the Eugene City Charter. A citizen initiative placed the amendment on the ballot. Previously, information concerning the use of hazardous substances in the community, and the releases of those substances into the local environment in particular, was not readily accessible to citizens under existing reporting regulations. Unlike other hazardous substance reporting programs, the Eugene charter amendment requires affected businesses to provide materials balance accounting. In other words, inputs and outputs of hazardous substances must be reported and must balance. These reports, required annually, are available in an accessible format at the Eugene Public Library. For more information, or to view the database, go to www.ci.eugene.or.us/firedept/Toxics/toxicsb.htm.²
- South Carolina Environmental Watch is an environmental organization that educates communities about toxic chemicals and their possible health effects. The organization presents TRI data to communities and discusses the potential effects of toxic chemical releases.³
- The Louisiana Environmental Action Network (LEAN) was formed over a decade ago to educate and provide a voice for residents concerned about toxic chemical releases from local facilities. LEAN uses TRI data to help residents become aware of risks associated with toxic chemical releases and to facilitate discussions between communities and industries to evaluate the impact of those releases.⁴ LEAN “encourages community decision-making and legislative challenge in neighborhoods near toxic chemical sites. The organization locates waste disposal sites, dumps and industrial facilities that could potentially affect communities, and compiles TRI, accident release data, and state groundwater data on these types of sites. The resulting data compilations are then used as the spearhead of strategic campaigns directed at making changes at the legislative level.” LEAN publicizes its information in the form of “briefing books,” which it

presents to members of the Louisiana House and Senate environmental committees. These reports “can be the starting points for change. The goal is to build a knowledge base for legislators and communities and to raise awareness of local environmental problems.... In one case, a briefing book was compiled for neighborhoods near a railroad switchyard, where leaking valves on the chemical transport cars stored there overnight were found to have contaminated groundwater. The chemicals included styrene, perchloroethylene, benzene, toluene, hexachlorobenzene, hexachlorobutadiene, and vinyl chloride.”⁵

- California facilities are required to develop and make public P2 plans under the state Hazardous Waste Source Reduction and Management Review. A community organization called “The Mothers of East Los Angeles of Santa Isabel” used TRI data to compare toxic chemical release estimates listed in P2 plans submitted by facilities to their actual estimated releases.⁶
- The Oneida Environmental Resources Board in Wisconsin used TRI data to convince leaders of the Oneida Tribe to organize a conference on cleaner ways to manufacture pulp and paper. The Board used TRI data to show that the pulp and paper industry was the largest industrial source of toxic chemical releases in Wisconsin, despite industry claims that significant release reductions in the past made further improvements unnecessary. The conference improved industry awareness of more environmentally friendly practices and procedures. The Board also used TRI data to alert a local labor union about possible worker health risks. The union included requests for reductions in toxic chemical releases in its contract renewal negotiations.⁷
- California’s Silicon Valley Toxics Coalition has used TRI data for over a decade. The *Silicon Valley Environmental Index (The Index)* <www.svep.org> shows “sustainability trends” in Santa Clara County, California. The *Index* provides information about, but not limited to, hazardous materials and air and water quality. At least five cities in Santa Clara County have referenced or relied on the *Index* as the basis for their "sustainable city" efforts or municipal environmental management system (EMS) initiatives. Private-sector companies, such as IBM and Philips Semiconductor, have also used the *Index* in evaluating their own EMS practices. Several universities have incorporated the *Index* into their environmental science course curricula. In addition, several states (Wisconsin, South Carolina, New Jersey) and countries (Germany and the Netherlands) have developed regional environmental indicators studies modeled after the *Index*.⁸
- Ms. Wilma Subra, a chemical research analyst in Louisiana, has been a vocal citizen leader and an active proponent of the TRI program for 20 years, working to change regulations and policies to improve public health and the environment at the local level.⁹ Ms. Subra has informed residents about the possible effects of toxic chemical releases and has aided their work to improve environmental conditions. The TRI data support

Ms. Subra's efforts to reduce toxic chemical releases from Louisiana's industrial facilities. Ms. Subra gathers and analyzes TRI data, distributes information to the public, participates in legal and regulatory processes against industrial facilities, and is a member of national and international advisory committees.

National Organizations

National organizations employ TRI data in many of the same ways as small community organizations, but on a larger scale. Such organizations analyze TRI data, use it to conduct risk screening and risk assessment, and often help the public interpret the data. National organizations often work with local public interest and community organizations to initiate discussions between citizens and industry. Some national organizations also use TRI data to help them lobby for changes in environmental policy. Examples of TRI data used by national organizations include the following:

- Environmental Defense (ED) launched its Scorecard web site in 1998 <www.scorecard.org/>. The site's "polluter locator" allows users to perform a search by ZIP code on a database containing information on more than 17,000 chemical-releasing facilities. The Scorecard also provides data on the health effects and regulatory status of different chemicals.¹⁰ The site correlates TRI chemical release data with U.S. Census demographic data. ED is currently linking TRI data with toxicological studies to create a Scorecard tool that compares the risks of different toxic chemical releases.¹¹ Logging 500,000 data requests on its first day of operation, the Scorecard web site has drawn significant public interest.
- The Right-to-Know Network (RTKNet) web site <www.rtknet.org>, launched in 1989 by the nonprofit organizations OMB Watch and the Unison Institute, also facilitates public access to TRI data. Users can search the TRI data by ZIP code, city, county, state, year, or chemical. The web site also includes links to additional information about chemicals and right-to-know issues. RTKNet estimates that about a quarter of a million searches are performed on the site annually.¹²
- The former Environmental Information Center conducted a study of the Great Lakes in 1997. Scientists used TRI data to examine endocrine disrupters released in states bordering the Great Lakes. The study ranked the largest emitters of various classes of toxic chemicals by region, and found the Great Lakes region to be the nation's top emitter of reportable endocrine disrupting chemicals.¹³
- In September 2000, Physicians for Social Responsibility, along with the National Environmental Trust and the Learning Disabilities Association of America, released the report, "Polluting Our Future: Chemical Pollution in the U.S. that Affects Child Development and Learning" <www.psr.org/trireport.pdf>. This report used TRI and

other data to present national information about releases of chemicals that present potential developmental and neurological risks. The report ranked states by their releases of these chemicals and included information about counties, industries, and facilities with the highest toxic chemical releases.¹⁴

- Labor unions also have used TRI data to support demands for safer working conditions for employees. Other than citizens who live near facilities, employees of TRI reporting facilities are most at risk from toxic chemical releases because they are most likely to come in regular contact with these chemicals. Beginning in 1990, the International Union, United Automobile, Aerospace & Agricultural Implement Workers of America (UAW) began training employees and managers of UAW companies to access, interpret, and utilize computer databases and programs in “critically assessing industrial emergency response activities at their facilities.” Workers were trained to download and interpret environmental compliance data. TRI data comprised one of the main sources of information for the program. Concerning TRI, the UAW stated, “knowing about maximum amounts on-site can help people prepare for a ‘worst-case scenario.’ It can help an emergency response planning group decide if there are enough response equipment and personnel to deal with an emergency involving the chemical(s) in question.”¹⁵ The UAW continues to provide potential risk information to workers regarding toxic chemical releases to the environment using TRI data. The UAW website provides links to EPA Envirofacts, and to the most recent TRI Data Release (<www.uaw.org/hs/at/index.html>).

Direct Negotiation

Through increasing their understanding of TRI data, members of the public can begin to understand potential risks associated with toxic chemical releases in their communities, and can work with facilities to reduce those risks. The nation’s first “right-to-act” law was enacted in September 1999 by the Passaic, N.J., Board of Chosen Freeholders, the county’s governing body. The law “allows neighbors and/or employees to petition the county health officer for creation of Neighborhood Hazard Prevention Advisory Committees (NHPACs) for specific facilities.”¹⁶ Even without the aid of this law, concerned citizens nationwide can take action in their own communities. Community organizations and citizen activists have used TRI data to negotiate with local facilities. Examples of direct negotiation agreements between citizens and facilities follow:

- In the city of Richmond, California, community members were concerned about toxic chemical releases from several oil refineries and other large industrial facilities. The West County Toxics Coalition, a local environmental organization, joined with Communities for a Better Environment, a statewide environmental organization, to investigate industrial polluters in Richmond. Using the TRI and other databases, they published the report, *Richmond at Risk*, which identified the area’s 20 largest industrial polluters and named the Chevron oil refinery the number one polluter. The report served

to initiate discussions among Chevron, the West County Toxics Coalition, and other community and environmental organizations. As a result of the meetings, the company agreed in 1994 to close down older portions of the plant and install P2 equipment to achieve zero net toxic chemical releases on its reformulated fuel project.¹⁷

- The Calhoun County Resource Watch (CCRW), founded by a Texas environmental activist and shrimper named Ms. Dianne Wilson, used TRI data to build community awareness about pollution of the rich shrimp and oyster breeding grounds of Lavaca Bay on the Gulf of Mexico¹⁸. Calhoun County was ranked first in the nation for toxic chemical disposal to the land, based on the 1987 TRI data. Lavaca Bay was designated as a Superfund site in 1993. CCRW brought suit against the Aluminum Company of America (Alcoa) related to this pollution. In 1995 Alcoa signed an agreement designed to protect the breeding grounds.¹⁹ Two Alcoa firms, a chemical plant and a bauxite refinery, committed to “fund independent review of zero discharge options and to adopt the technologies where technically, economically, and environmentally sound.”²⁰ In return, CCRW agreed to drop its legal challenges and suspend permit interventions against the companies. According to an Alcoa Operations Manager, as of March 2000 the company had made considerable progress toward the goals set in 1995, including compliance with a permit that sets the “allowed total annual maximum mass loading mercury limit” at 30 pounds, development and implementation of a Best Management Practices plan, and installation of an “evaporative spray and dust control system” near the refinery.²¹
- In 1998, Butler County, PA, warned pregnant women and infants against drinking water from Connoquenessing Creek due to high levels of nitrates in the water. In its report, the Pennsylvania Public Interest Research Group (PennPIRG) used TRI data to highlight the significant quantities of nitrate compounds being released into the creek.²² The report identified the major source of the nitrates as the AK Steel Corporation. TRI data showed that the company had discharged approximately 29 million pounds of nitrates into the creek in 1997 and 32 million pounds in 1998. This report and several newspaper articles about these toxic chemical releases prompted the state to commit to reduce the levels of nitrates that AK Steel is permitted to release into the creek.²³ Pennsylvania began developing a new water permit to reduce allowable nitrate releases to a level 90 percent lower than the previous level. In June 2000, EPA issued an emergency order requiring AK Steel to significantly reduce the nitrate compounds it discharges into Connoquenessing Creek. In addition, AK Steel was required to provide and pay for an alternative water source for the affected public on any day that the local water plant could not meet the federal maximum nitrate contaminant standard.
- Working with The Ecology Center, a public interest organization based in Ann Arbor, Michigan, residents of the town of Flat Rock used TRI data to obtain a commitment from Auto Alliance International to enact an aggressive solvent reduction program. TRI data

showed that the company's air releases of toluene had increased from 100,000 pounds in 1991 to 800,000 pounds in 1993, along with an increase in noxious odors in the community. A former Ecology Center staff member, Andrew Cormai, said, "[R]esidents who have put up with the smells since 1987 suddenly have a bone to pick with the company. The company is going to be saving some money by recapturing solvents, and they will be improving community air quality."²⁴

Environmental Justice

The goal of environmental justice is to ensure that all people, regardless of race, national origin, or income, are protected from disproportionate impacts and environmental hazards. "The concept [of environmental justice] addresses evidence [that] in some parts of the nation, poor and minority communities live closer to factories, highways and airports and are exposed to more pollution and noise and generally more environmental risks than the population at large."²⁵ TRI data have proved to be an important tool in environmental justice. Communities that were once uninformed about the toxic chemical releases in their area now have access to that information. Examples of TRI data use in environmental justice activities include:

- Two areas of Louisiana have become focal points for environmental justice efforts: the Mississippi River corridor, popularly known as "Cancer Alley," and the Lake Charles region. Local groups have used TRI data to illustrate the high toxic chemical release rates in these areas compared to those in other regions.²⁶ Several small communities have confronted industrial facilities about their toxic chemical releases and possibly related health effects. One illustrative dispute arose in Mossville, Calcasieu Parish, Louisiana, where some residents suspected that poor health in their community was due to the activities of 17 industrial facilities located within one half-mile of the community. Their concerns prompted numerous public interest organizations to collaborate on the report, *Breathing Poison: The Toxic Costs of Industries in Calcasieu Parish, Louisiana*. The 2000 report used TRI data and information from the Scorecard web site to convey the health risks to which the community might be exposed, and stated the need for "pollution reduction, environmental health services, and a fair and just relocation for consenting residents."²⁷
- The Asian Pacific Environmental Network (APEN) works with Asian and Pacific Islander communities in the San Francisco Bay Area, California. APEN created a series of maps that combined TRI and demographic data, to show that many poor Asian and Pacific Islanders live in "toxic hot spots." The maps increased awareness among community members about both their environment and environmental justice issues. APEN might add more environmental, health, and demographic information, and expand its mapping work to other nearby counties.²⁸
- The Los Angeles chapter of Communities for a Better Environment used TRI data to help

ensure that the communities it serves would not be exposed to higher environmental risks as a result of poverty or ethnicity. In one project, the organization combined 1996 TRI data with GIS mapping data to show that 80 to 100 percent of facilities that release toxic chemicals in Los Angeles County were located in areas where a large majority of the residents were people of color. These findings led to the report, *Holding Our Breath – the Struggle for Environmental Justice in Southeast Los Angeles*.²⁹

Industry Use

Although Congress intended the public to be the primary audience for TRI data, the TRI has also benefitted industries.

Cost Reduction

A primary goal of ISO 14000 (International Organization for Standardization's standards on environmental management) was to bring environmental issues to the attention of the highest levels of corporate management. Leaving decision-making to environmental managers alone might not produce the corporate commitment necessary to achieve the best success.³⁰ TRI data have been used as evidence to convince high-level management of the need for an Environmental Management System (EMS). In turn, the proactive environmental protection afforded by an EMS can reduce corporate costs.

For some industries, the creation of the TRI marked the first time that company managers and operators could look closely at the quantity of chemicals being released from their facilities. Initially, some companies expressed surprise at their own toxic chemical release amounts and set goals to improve their environmental performance. Some companies have reduced their toxic chemical releases and increased their efficiency at the same time, leading to an increased profit. Examples of ways that industry has used TRI data to reduce costs follow:

- At the 1997 EPA Toxics Release Inventory and Right-to-Know Conference, John Pine provided examples of how TRI information has helped companies develop waste reduction strategies. For example, Marathon Oil installed a thermal desorption unit to process oily waste and recovered over 120,000 barrels of oil and the Georgia Gulf Corporation relocated a methanol stripper purge line that resulted in the recovery of 9,300 gallons of

Industry can work with TRI data to:

- *improve internal auditing*
- *stimulate more efficient use of chemicals by identifying material losses*
- *provide a template for environmental reporting under ISO 14000.*

methanol that previously underwent biological waste treatment.³¹

- The Haartz Corporation, located in Acton, Massachusetts, makes coated fabrics used in automobiles. The firm once used 800,000 pounds per year of methyl ethyl ketone (MEK), a solvent that can cause dizziness, nausea, or unconsciousness when inhaled.³² In 1987, when Haartz was preparing its first TRI report, the company installed a new emissions control system to capture and recycle MEK. TRI data enabled Haartz Corp. to track the association between reduced toxic chemical releases and reduced costs. According to the Haartz environmental manager, the company's "emissions have stayed pretty flat" despite its "double-digit sales growth" between 1993 and 1998. In addition, reducing its MEK releases saved Haartz an estimated \$200,000 annually.³³

Public Relations Tools

Demonstrating environmental progress has become a selling point for industries, and many company web sites now include an environmental report. Examples of positive environmental marketing include:

- The Boeing Company posts TRI release data on its web site and uses the information to track the company's environmental progress. The web site noted that overall toxic chemical releases have decreased by more than 82 percent since 1991, and that "Boeing continues to invest and innovate in pollution prevention programs and find new ways to get greater leverage for current emission reduction programs."³⁴
- Monsanto's similar web site provides both current and past TRI information on consolidated chemical releases and transfers from Monsanto facilities. The web site also includes data about carbon dioxide releases, priority on-site toxic chemical releases, compliance penalties, chemical spills, Superfund sites, safety, and compliance.³⁵

Public Disclosure

Companies can use TRI data to "obtain an overview of the release and management of toxic chemicals, to identify P2 and release reduction targets, and to measure progress toward these goals. The publicity that has resulted from the availability of TRI data has prompted many facilities to pledge toxic chemical release reductions, and to work with communities to develop effective strategies for reducing environmental and human health risks."³⁶ For example, the Iowa Association of Business and Industry organized a community-wide pollution prevention initiative in the Des Moines-Polk County area. The organization adopted a goal of a 60 percent reduction of all TRI chemicals by 1992 and a 70 percent reduction by 1995.³⁷

Government Use

Environmental Solutions

Government agencies can take a variety of actions when TRI data reveal an environmental problem in a specific state or region. Some of these actions involve voluntary incentive programs for companies. Although these programs are not binding commitments, they offer good publicity for participating companies. Examples include:

- Governor Frank O'Bannon of Indiana announced the Indiana Governor's Toxics Reduction Challenge in 1998. The challenge pledged to "support the state's goal to reduce toxic chemical releases to the air and water from 1995 levels: 50% by December 31, 2000, in large urban areas for carcinogens and persistent bioaccumulative toxic chemicals; 60% by December 31, 2002 statewide for these chemicals; and, 50% by December 31, 2002, statewide for all toxic chemicals reported in the Toxics Release Inventory." The Challenge also pledged to "energetically help the state reach these goals through efforts emphasizing pollution prevention within your organization and/or in cooperation with other organizations." As of mid-April 2000, 67 companies in Indiana had committed to the Challenge. A list of the companies and an update on their progress is available on the Indiana state web site <www.in.gov/idem/oppta/p2/toxicchallenge/>.³⁸
- The EPA "33/50 Program" targeted 17 priority TRI chemicals for 33 percent and 50 percent reductions from 1988 release levels, to be attained by 1992 and 1995, respectively. More than 1,200 companies nationwide joined the Program, which provided several forms of recognition to participating companies. The Program reached both its interim 33 percent reduction goal and its final 50 percent reduction goal one year early.
- The P2 Program of the Colorado Department of Public Health and the Environment used TRI data, in combination with other data about hazardous waste and toxic chemical releases to air and water, to identify the ten industry organizations responsible for the largest quantities of hazardous waste generation or toxic chemical releases in the state. This research served as the basis for establishing priorities for P2 activities and for distribution of technical assistance grants. The report also aided in targeting large companies for participation in the "Governor's P2 Challenge Program" to reduce toxic chemical releases and hazardous waste generation.³⁹
- Due to the new TRI reporting requirements for dioxin, the Delaware Department of Natural Resources and Environmental Control became aware of dioxin-tainted waste at DuPont's Edge Moor, DE titanium dioxide (TiO₂) plant. Subsequently, DuPont agreed to pay an estimated \$15 million to remediate dioxin-tainted waste at this facility. DuPont discovered that the waste sludge was contaminated with dioxin while the company was

preparing to comply with EPA's requirement that dioxin releases be reported under TRI. In addition, DuPont agreed with the Delaware Department of Natural Resources and Environmental Control to spray a 23-acre stretch along the Delaware River with a starch-like coating to keep the dioxin from being stirred up by the wind or eroding into the river. DuPont used the site to store waste sludge from the Edge Moor plant. The company will also close four sludge lagoons near the plant and plans to cut dioxin formation in half by 2003 and by 90 percent by 2007.

Environmental Targeting

Budgets to fund environmental programs and measures often do not increase in proportion to the need for these activities. Environmental targeting initiatives, such as those listed below, help governments and communities prioritize their needs and ensure that their resources are used most efficiently.

- The P2 Division in Georgia's Department of Natural Resources used TRI data to identify the technical assistance needs of manufacturing sectors generating chemicals that pose the greatest relative risk to public health and the environment. The Division prioritized chemicals, examined manufacturing sectors releasing the highest priority chemicals, and identified particular subsectors for further assessment. The Division also conducted in-depth manufacturing sector assessments to determine which processes produce which wastes, what multi-media waste problems exist, what P2 activities were being undertaken, and what additional opportunities might exist.⁴⁰
- The Florida Waste Reduction Assistance Program provides assistance in source reduction and waste minimization to facilities handling TRI chemicals. The Program relies on TRI and other data to target facilities for the Program.⁴¹
- EPA's Office of Enforcement and Compliance Assurance uses TRI data within its Online Tracking Information System (OTIS) -- a collection of on-line search engines that enables EPA staff, state/local/tribal governments, and federal agencies to access a wide range of data relating to enforcement and compliance. Data on the OTIS site are from OECA's Integrated Data for Enforcement Analysis ([IDEA](#)) system, which extracts and integrates information from TRI as well as the following databases: AFS (Clean Air Act -- AIRS Facility Subsystem), PCS (Clean Water Act -- Permit Compliance System), RCRAInfo (Resource Conservation and Recovery Act Information System), the Federal Enforcement Docket, National Compliance Database (NCDB), and the 1990 U.S. Census. OTIS can be used for many functions, including program planning, enforcement targeting, sector and geographic analyses, data quality review, and pre-inspection review. As of March 2002, all states, all EPA Regional Offices, and another 90 local, state and federal governmental organizations are registered.

Legislation and Regulations

TRI data often provide the impetus for legislative action from federal, state, and local governments. For over a decade, TRI data has been used to influence and change environmental standards, regulations, and legislation, for example:

- In response to legislation passed in 1987 to address toxic chemical releases to the air, the Illinois EPA Bureau of Air used TRI data to determine quantities of stack and fugitive air emissions of reported substances to support continued development of regulatory proposals.⁴²

Risk Assessment

As the connection between toxic chemicals and human health becomes better known, public health officials are looking for ways to assess the levels of risk in their communities. TRI data have been a crucial component in creating tools to address these assessments. Examples follow:

- The New York State Department of Health developed a risk screening protocol using TRI air release data and toxicity potency data to produce relative risk scores and rankings for facilities and chemicals within the state. Results suggested the need for a more careful evaluation of health effects resulting from large releases of noncarcinogenic compounds.⁴³
- Researchers from EPA's Office of Health Research published a study of national and regional differences in county-level TRI chemical releases to air according to the ethnicity or race and household income of the populations. Using the "Population Emissions Index," a population-weighted average release for each county, the study found that all minority groups except Native Americans tend to live in counties where levels of TRI chemical releases to air are higher. The data also suggest that household incomes tend to be higher in counties with higher TRI chemical releases to air.⁴⁴
- The EPA Office of Pollution Prevention and Toxics's Risk-Screening Environmental Indicators Model provides year-to-year indicators of the potential impacts of TRI chemical releases on human health and the environment. The indicators consider TRI release and transfer volumes, chronic toxicity, exposure potential, and the size of receptor populations. Both generic and site-specific exposure characteristics can be incorporated. The model allows the targeting and prioritization of chemicals, industries and geographic areas. Facility scores can also be tracked from year to year to analyze trends.⁴⁵

Quality Assurance and Control

Some states, such as Massachusetts, that require separate reporting of toxic chemical releases for their facilities find TRI data to be a useful measure of quality assurance and control. The Air Pollution Control Program in the Missouri Department of Natural Resources also compares fugitive and stack emissions reported to the TRI with toxic chemical release data reported on the state's Emissions Inventory Questionnaire for quality control.⁴⁶

Other Government Uses

Additional governmental uses of TRI data can be found in agencies not immediately associated with environmental issues. The U.S. Internal Revenue Service used TRI data to identify companies releasing chlorofluorocarbons (CFCs) in order to enforce a tax imposed on releases of CFCs and thus facilitate the phase-out of these chemicals.⁴⁷

International Right-to-Know

The TRI has served as the model for many countries' Chemical Right-To-Know programs and laws. Within the next few years, more than 30 nations are expected to have a TRI-like system, known internationally as Pollutant Release and Transfer Registers (PRTRs). PRTRs allow the public to obtain toxic chemical release data over a large geographic area. Countries can compare their data and share ideas about improving environmental regulations. Examples of how PRTR information is being used include:

- The Commission for Environmental Cooperation (CEC), which was created by a side-agreement to the North American Free Trade Agreement (NAFTA), began its PRTR work by preparing a document that compares U.S. and Canadian PRTR systems. The CEC now develops an annual report, entitled "*Taking Stock*", that correlates data from the TRI and the Canadian National Pollutant Release Inventory to give an overall view of releases and transfers of toxic chemicals within and between countries. The CEC also has created an Internet search engine that allows the public to obtain continental PRTR data.⁴⁸
- In 2000, the Silicon Valley Toxics Coalition attended an international conference in Croatia on public participation and community right-to-know. Participants recognized the fundamental importance of Chemical Right-To-Know and are lobbying the United Nations to promote the program and persuade nations to support the passage of community right-to-know laws modeled after the TRI.⁴⁹

Investment

The public's increased awareness of environmental issues has made environmental performance an important factor in their investment decisions. Many investment companies have responded to this demand by providing socially responsible investment options. Examples of how TRI data have been used in investment decisions include:

- Green Century Funds, an investment organization that specializes in socially responsible mutual funds, offers two funds committed to promoting corporate environmental responsibility. The Green Century Balanced Fund invests in “performance-driven companies that are a part of the solution to environmental problems,” as well as in environmentally benign companies and “best of class” companies that are setting standards for environmental protection in their industries. The Green Century Equity Fund screens out companies with the worst environmental and social records. The funds are monitored for environmental performance using TRI data.⁵⁰
- Vanderbilt University's Owen Graduate School of Management found a correlation between a company's stock value and its P2 efforts, which were assessed using TRI data. A researcher from the University performed two separate studies comparing the progress of a company's P2 activities as reported on TRI forms to a company's stock market performance. The study reported that “companies that underperform expected pollution prevention goals are penalized in the stock market, and the stock of the companies that engage in pollution prevention activity tends to outperform the stock of companies that do not engage in pollution prevention.”⁵¹
- Using TRI data, the Investor Responsibility Research Center (IRRC) developed an Emissions Efficiency Index® that indicates which companies have a competitive edge in environmental performance. The Index is predicated on the idea that greater toxic chemical releases are associated with higher risks of negative publicity, more tort actions, and higher costs for pollution control and waste management. IRRC's constituency uses TRI-based information to identify companies with poor environmental records. Using the index, investors can either screen such companies out of their portfolios or purchase shares and use their ownership as leverage to improve environmental performance.⁵²

Academic Use

A variety of TRI data use applications occur in academia, in areas ranging from doctoral theses to journal publications to use in the classroom itself.

Research

Universities and research institutions are using TRI data as a means for “examining environmental policies and strategies, and clarifying risks associated with toxic chemicals at the state and local level.”⁵³ Students and faculty in the academic community also perform studies based on TRI data. Examples of academic research using TRI data include:

- In February 2000, the journal *Drug and Chemical Toxicology* published an article entitled, “Using GIS to Study the Health Impact of Air Emissions.” This article showed how public health professionals are able to use data (such as the TRI) on toxic chemical releases to air, air dispersion modeling, and GIS to identify and define a potentially exposed population. In addition, such data can be analyzed to estimate the health risk burden of that population and determine correlations between point-based health outcome results and estimated health risk.⁵⁴
- In the *Journal of Environmental Economics and Management* in 1999, researcher Mr. Madhu Khanna published results of research that examined the environmental, economic and investment effects of voluntary and mandatory toxic release reporting programs. One of the research studies focused on the EPA’s “33/50” Program during its first three years, 1991-1993, and its impact on the U.S. chemical industry. The paper concluded that Program participation led to a statistically significant decline in toxic releases over the time period, a statistically significant negative impact on current return on investment, but a positive and statistically significant impact on the expected long run profitability of firms.⁵⁵
- At Louisiana State University, environmental science professor Paul Templet developed a method, using TRI data, to evaluate the comparative effectiveness of pollution control strategies, policies, and programs, by calculating an “emissions to jobs ratio.” This ratio consists of the number of pounds of toxic chemical releases per job in a given industry and location, can be compared to a national or other average. The comparison is then used to assess the relative toxic air releases associated with a certain job. This ratio was used to modify tax exemptions granted to facilities to encourage and reward job creation.⁵⁶
- Professor Mark Stephan used TRI as the background for an academic paper focusing on the role of information disclosure programs in environmental policy. Professor Stephan used TRI as a prime example for the fundamental theories and concepts that underlie the empirical work on the comparison of basic theories arising from the knowledge of economics, psychology, and politics.⁵⁷
- Researchers Klassen and Whybark studied management of the natural environment in manufacturing firms, given increased public awareness and scrutiny as a result of

programs like the TRI. In one of their published studies, they concluded that an emphasis on pollution prevention instead of pollution control, improved delivery performance and firm competitiveness.⁵⁸

Classroom Use

High school and university instructors have incorporated the TRI into curricula involving subjects ranging from introductory chemistry to business.

- The JSI Center for Environmental Health Studies developed a field-based environmental education curriculum for high school students in Chelsea, Massachusetts, a low-income minority community near Boston. The goal was to encourage student participation in environmental assessment and protection. Students learned to inventory sources of contamination in a local creek and worked with community agencies on protecting a valuable environmental resource. TRI data were an integral part of the students' research.⁵⁹

Conclusions

A variety of stakeholders work with TRI data on a regular basis. Some data uses, such as risk screening, were recognized when the TRI was first implemented; other uses have developed as the program has matured and expanded. TRI data have been a key tool in the environmental justice movement and in the drive toward more environmentally responsible investment. The applications of TRI data will likely increase in number as environmental awareness grows and opportunities are identified for integrating TRI data with other types of information.

Appendix A: Expanded Lists of TRI Data Uses and Benefits

User	Description	Reference
PUBLIC USE - Citizens/Community Organizations		
Amalgamated Clothing and Textile Workers Union and community activists in Northfield, MN	Amalgamated called for emissions reductions from a local facility ranked as the nation's 45 th largest emitter of carcinogens to the air. Contract negotiations led to an agreement for a 64% reduction in use of toxic chemicals by 1992 and a 90% reduction in toxic emissions by 1993.	<i>Economic Analysis of the Final Rule to Add Certain Industry Groups to EPCRA Section 313</i> , p. 6-20, April 1997
California Public Interest Research Group (CALPIRG)	CALPIRG uses TRI data to supplement the information that water utilities publish in their Consumer Confidence Reports, and to identify potential water contamination sources. CALPIRG presents these data to policymakers to provide more information to the public on drinking water contamination.	<www.calpirg.org>
Don't Waste Arizona	Don't Waste Arizona produced two videos about the Community Right-to-Know Act for the public and the regulated community. The organization held "house parties" to show the videos and discuss how communities can identify and reduce toxic pollution. Don't Waste Arizona has also distributed videos to citizens, libraries, and compliance assistance centers throughout Arizona, thus increasing public awareness about pollution.	<i>A Citizen's Guide to Reducing Toxics Risks: Putting the TRI to Work!</i> , EPA 909-B98-001, Region 9 Cross Media Division, January, 1998

User	Description	Reference
PUBLIC USE - Citizens/Community Organizations		
Eugene Toxics Right-to-Know program, OR	The Eugene Toxics Right-to-Know program used TRI as a model to develop the first city right-to-know program. This program gives citizens information about toxic material use and materials accounting information to the kilogram level. A citizen initiative placed the amendment on the ballot. Voters adopted the program in 1996 as an amendment to the Eugene City Charter. For more information, or to view the database, go to <www.ci.eugene.or.us/firedept/Toxics/toxicsb.htm>.	<www.ci.eugene.or.us/firedept/toxicsb.html>
JSI Center for Environmental Health Studies	The Center trained librarians on how to access information from computerized electronic databases, including TRI, especially for use as tools to investigate environmental health problems.	JSI Center for Environmental Health Studies: A Division of the JSI Research and Training Institute
Louisiana Environmental Action Network	The Network uses TRI data as part of strategic campaigns for change at a better informed legislative level. The network creates "briefing books" for state House and Senate members and holds tours of focus sites for representatives, media, citizens, etc.	<www.leanweb.org/>
Massachusetts Toxic Usage Reduction Institute (TURI)	TURI uses TRI production data to normalize information on annual toxic chemical releases to eliminate the effects of changes in production.	Tenney, H.M., Mass TURI, e-mail correspondence with Abt Associates on 4/01/99 and 4/15/99

User	Description	Reference
PUBLIC USE - Citizens/Community Organizations		
Mothers of East Los Angeles of Santa Isabel	The organization used TRI data to compare toxic chemical release estimates contained in P2 plans with actual releases to the environment., which led to community evaluation of facility P2 plans.	< http://cnet.ucr.edu/community/intercambios/melasi/ >
National Conference of State Legislators (NCSL)	NCSL conducted a 1996 survey of states, which EPA used to assess how states currently access and use TRI data. Twenty-four states produce annual TRI reports, 37 use TRI data to identify facilities for P2 activities, 22 use TRI data to target facilities for inspection to ensure compliance with permits, 22 use TRI data for emergency planning, seven use TRI data to develop or revise permits, and 5 use TRI data for facility siting and permitting decisions. Other state-produced documents include annual press releases, facts sheets, computer applications, chemical fact sheets, and tables of emissions quantities.	<i>A Citizen's Guide to Reducing Toxics Risks: Putting the TRI to Work!</i> , EPA 909-B98-001, Region 9 Cross Media Division, January, 1998

User	Description	Reference
PUBLIC USE - Citizens/Community Organizations		
Silicon Valley Toxics Coalition	The Coalition uses TRI data on the hazardous materials section of their web site to display toxic chemical releases and other information, increasing public awareness. The Coalition also uses TRI data in its progress reports of the Silicon Valley toxic chemical releases.	<www.svep.org>
	The Coalition used TRI data to develop the first Silicon Valley Environmental Index <www.svep.org>, showing local sustainability trends in Santa Clara County.	
Wilma Subra, grass roots advocate	Ms. Subra uses TRI data to support regulations and policies to improve public health and the environment at the local level.	Personal interview by Katherine Jennrich, intern, Toxics Release Inventory Program Division, OPPT, US EPA, July 21, 2000
Toxics Action Center, Sharon, MA	The Center used TRI to assess the specific media through which toxic chemical releases are made, such as septic systems.	<www.toxicsaction.org>
WashPIRG	WashPIRG used TRI data to relate the number of TRI sites in states to the incidence rates of cancers associated with environmental toxins.	Wise, Alison. "The Toxic State of Washington: Our Health and Environment at Risk," April, 2001

User	Description	Reference
PUBLIC USE - National Organizations		
Citizen's Fund	The Fund summarized 1991 TRI data nationally and by state to attempt to measure the progress of manufacturers in preventing pollution, and included report cards of the top 50 waste generating facilities in the chemical industry. The Fund aggregated 1990 TRI data from different facilities by their parent companies to hold corporations more accountable for the full extent of their toxic pollution.	<i>Economic Analysis of the Final Rule to Add Certain Industry Groups to EPCRA Section 313</i> , p. 6-20, April 1997
Environmental Defense (ED)	ED uses TRI data, along with other resources on its Scorecard web site, to allow the public to find chemical information about their communities by searching by ZIP code.	OMB Watch and the Unison Institute, "The Right Stuff: Using the Toxics Release Inventory." 13 July 1995
	ED is in the process of linking toxic chemical release data with toxicological studies on its Scorecard web site. It released the first version in 1998 and focused on the human health impacts of toxins. The project ranked toxic chemical releases by equivalency factors, taking into account toxicity and exposure potential.	<i>A Citizen's Guide to Reducing Toxics Risks: Putting the TRI to Work!</i> , EPA 909-B98-001, Region 9 Cross Media Division, January, 1998
	ED used TRI data to rank the efficiency of 166 U.S. refineries based on toxic chemical releases and waste per barrel of oil refined per day.	Selcraig, Bruce. "What You Don't Know Can Hurt You," <u>Sierra Magazine</u> . Jan/Feb, 1997

User	Description	Reference
PUBLIC USE - National Organizations		
Envirotrust	Envirotrust uses section 8 TRI data to develop an index that can compare facilities' progress toward better environmental management.	Nathan, T. Envirotrust, phone conversation with Abt Associates, March 3, 1999
Hampshire Research Institute (HRI)	HRI surveyed TRI facilities reporting large reductions in their toxic chemical releases and production-related waste to determine if these changes resulted from P2 activities, "paper" reporting changes, or other factors.	< www.hampshire.org/hri02.htm >
National Environmental Trust for Clear the Air, the National Campaign Against Dirty Power	These organizations analyzed TRI data from power plants, and compared them to those of other industry sectors, and used TRI data to rank the power plants within individual sectors.	Nathan, et al. <i>Toxic Power: What the TRI Tells Us About Power Plant Pollution</i> , August 2000
Physicians for Social Responsibility (PSR)	PSR used TRI and other data in a report that includes national information about releases of developmental and neurological toxins, a ranking of the states, and information about the top releasing counties, industries, and facilities in each of the 50 states.	< www.psr.org/trireport.pdf >
Right-to-Know Network (RTKNet)	RTKNet maintains a web site similar to Environmental Defense's Scorecard (see p.22). Users can also search by specific chemicals.	<i>Economic Analysis of the Final Rule to Add Certain Industry Groups to EPCRA Section 313</i> , p. 6-20, April 1997
Sierra Club	The Sierra Club uses TRI data in citizen outreach documents.	< www.sierraclub.org >

User	Description	Reference
PUBLIC USE - National Organizations		
Public Interest Research Group (U.S. PIRG)	U.S. PIRG examined TRI releases to surface waters and to publicly-owned treatment works (POTWs) in <i>Troubled Waters: Major Sources of Toxic Water Pollution</i> (1993). U.S. PIRG identified the nation's top releasers of toxic chemicals to those water sources. The organization made recommendations for amending the Clean Water Act to provide the public with more information about toxic chemical releases to waterways.	Hopey, Don. <u>Post-Gazette (Pittsburgh)</u> . February 18, 2000 < www.post-gazette.com/healthscience/20000218/pollute2.asp >
Unison Institute/OMB Watch	The organizations collected anecdotal data about how the Right-to-Know Network (RTKNet) used TRI data in <i>The Right Stuff: Using the Toxics Release Inventory</i> (1995).	<i>Economic Analysis of the Final Rule to Add Certain Industry Groups to EPCRA Section 313</i> , p. 6-20, April 1997
	The organizations' publication <i>Where the Wastes Are</i> examines facilities receiving the largest quantities of shipments of TRI chemicals in waste.	<i>Economic Analysis of the Final Rule to Add Certain Industry Groups to EPCRA Section 313</i> , p. 6-20, April 1997
Working Group on Community-Right-to-Know	The Working Group created a list of questions for concerned citizens, reporters, and other interested parties to ask corporations reporting reduced toxic chemical releases, to find out if the decrease is a "phantom reduction" due to a change in reporting procedure (e.g., acetone no longer being required for reporting) rather than a change in production practices.	<i>Economic Analysis of the Final Rule to Add Certain Industry Groups to EPCRA Section 313</i> , p. 6-29, April 1997

User	Description	Reference
PUBLIC USE - National Organizations		
	The Working Group prepared a bibliography listing well over 100 state and local reports and more than 30 national TRI reports compiled by public interest groups.	<i>Economic Analysis of the Final Rule to Add Certain Industry Groups to EPCRA Section 313</i> , p. 6-20, April 1997

User	Description	Reference
PUBLIC USE - Direct Negotiation		
Communities for a Better Environment, CA	In 1994, the organization targeted 16 facilities in California that failed to submit toxic release information of ozone depleting chemicals. In all but one settlement, industries agreed to phase out the chemicals and to donate funds to local community or environmental groups.	Selcraig, Bruce. "What You Don't Know Can Hurt You." <u>Sierra Magazine</u> . Jan/Feb, 1997
Communities for a Better Environment, Richmond, CA	The organization used TRI data to negotiate an agreement with General Chemical, which will fund a \$15,000 study of public health, spend \$100,000 on the surrounding neighborhood, pay for community's experts to do a safety audit of the plant, and then submit to binding arbitration should it disagree on safety recommendations made by those experts.	<i>A Citizen's Guide to Reducing Toxics Risks: Putting the TRI to Work!</i> , EPA 909-B98-001, Region 9 Cross Media Division, January, 1998
Consumer Policy Institute of Brooklyn, NY	The institute used 1988 TRI data to identify Ulano Corporation as the top industrial air toxic polluter in New York City, and launched a media campaign to pressure the state Department of Environmental Conservation (DEC) to take action. The DEC forced Ulano to use a new incinerator that reduced toluene emissions by approximately 95%.	Fung and O'Rourke, "Reinventing Environmental Regulations from the Grassroots Up," <u>Environmental Management</u> . Vol. 25, No. 2

User	Description	Reference
PUBLIC USE - Direct Negotiation		
Don't Waste Arizona	In 1996, the organization filed about 30 lawsuits against facilities for not submitting information on their toxic chemical releases. Facilities signed agreements to adopt P2 measures that resulted in significant reductions in toxic chemical releases.	<i>A Citizen's Guide to Reducing Toxics Risks: Putting the TRI to Work!</i> , EPA 909-B98-001, Region 9 Cross Media Division, January, 1998
Ecology Center, Ann Arbor, MI	The Center used TRI data to get commitments from the president of Auto Alliance International to embark on an aggressive solvent reduction program. The commitments improved air quality (fewer instances of noxious odors).	OMB Watch and the Unison Institute, "The Right Stuff: Using the Toxics Release Inventory." 13 July 1995
MapCruzin	MapCruzin combines GIS technology with TRI data to let Santa Cruz residents and Silicon Valley residents find the exact location of businesses in their areas that report transfers and toxic chemical releases < www.mapcruzin.com/svtc_maps/index.html >.	< www.mapcruzin.com/environmental_justice.htm >
Massachusetts Public Interest Research Group (MASSPIRG)	MASSPIRG used TRI data to target Raytheon, the state's largest emitter of ozone-destroying chemicals such as CFCs and methyl chloroform, in a public accountability campaign in 1990. MASSPIRG obtained a pledge from Raytheon to switch to water-based alternatives to CFCs.	Fung and O'Rourke, "Reinventing Environmental Regulations from the Grassroots Up," <u>Environmental Management</u> , Vol. 25, No. 2

User	Description	Reference
PUBLIC USE - Direct Negotiation		
Minnesota Citizens for a Better Environment	The organization released a report profiling the state's "top 40 toxic polluters" based on emissions of certain priority chemicals. TRI data were combined with other data to provide enough information to support local efforts to negotiate with facilities for emissions reductions. Since publication, activists have worked with 18 of the 40 facilities.	<i>Economic Analysis of the Final Rule to Add Certain Industry Groups to EPCRA Section 313</i> , p. 6-29, April 1997
Pennsylvania Public Interest Research Group (PennPIRG)	PennPIRG used TRI data to identify AK Steel Corporation as the source of nitrate loading of Connoquenessing Creek, a local water source. PennPIRG's report prompted the state to commit to reduce the amount of nitrates AK Steel is permitted to release into the creek.	<www.pennpirg.org>
Community Members of Mansfield, TX	Community Members of Mansfield used TRI data to negotiate permission to have its own experts perform regular environmental and safety audits of a local Rhone-Poulenc chemical plant.	Selcraig, Bruce. "What You Don't Know Can Hurt You." <u>Sierra Magazine</u> . Jan/Feb, 1997

User	Description	Reference
PUBLIC USE - Environmental Justice		
Asian Pacific Environmental Network (APEN)	APEN created a series of maps that combine TRI and demographic data through GIS. The maps show that many poor Asian and Pacific Islander communities live in toxic hot spots and are a powerful visual tool to raise awareness among community members about their environment and environmental justice.	<i>A Citizen's Guide to Reducing Toxics Risks: Putting the TRI to Work!</i> , EPA 909-B98-001, Region 9 Cross Media Division, January, 1998
Environmental Systems Research Institute	The institute used TRI data in a study that compared race, age, and income in areas that were near or far from airborne toxic chemical releases. The study used buffers, based on the toxin released, its quantity, and the atmospheric conditions present at the time of the release, to measure "nearness." Various maps created in the study help communicate results and explain spatial relationships.	"Toxics Releases and Demography in Minneapolis/St. Paul: A GIS Exploration." < www.esri.com/index.html >

User	Description	Reference
PUBLIC USE - Environmental Justice		
North Baton Rouge (LA) Environmental Association, Florence Robinson	The organization used TRI and U.S. Census data to demonstrate environmental racism in Cancer Alley, in testimony before the Civil Rights Association and at hearings on environmental justice for the Department of Environmental Quality.	OMB Watch and the Unison Institute, "The Right Stuff: Using the Toxics Release Inventory." 13 July 1995
Residents of Louisiana's Mississippi River corridor, popularly known as "Cancer Alley" and Lake Charles regions of LA	The residents used TRI data (and ED's Scorecard web site) to show that poor and minority populations suffer from more environmental risks than the public at large. The residents published a report <i>Breathing Poison: The Toxic Costs of Industries in Calcasieu Parish, Louisiana</i> , which indicates the health risks to which the minority community might be exposed.	"Breathing Poison: The Toxic Costs of Industries in Calcasieu Parish, Louisiana." Residents of Calcasieu Parish, Louisiana
Sheppard, E.; Leitner, H; McMaster, RB; Tian, H. <i>Journal of Exposure Analysis and Environmental Epidemiology</i>	The authors used 1995 TRI and 1990 U.S. Census data for the City of Minneapolis, MN, to make a comparative evaluation of two commonly employed proximity measures in GIS-based environmental equity assessment and their influence on the results of the analysis. The authors proposed a methodology for evaluating the significance of these results.	Sheppard, E.; Leitner, H; McMaster, RB; Tian, H. "GIS-based Measures of Environmental Equity: Exploring Their Sensitivity and Significance." <i>Journal of Exposure Analysis and Environmental Epidemiology</i> , 9 Issue 1, p. 18-28

User	Description	Reference
PUBLIC USE - Environmental Justice		
Texas Network for Environmental and Economic Justice	The Network published <i>Toxics in Texas and Their Impact on Communities of Color</i> . The network used TRI and other data to document disproportionate environmental impacts on racial and ethnic minority communities in Texas.	<i>Economic Analysis of the Final Rule to Add Certain Industry Groups to EPCRA Section 313</i> , p. 6-29, April 1997
University of California, Los Angeles	The University found that low-income and Latino neighborhoods in Los Angeles County are more likely than other communities in the region to be near major sources of toxic air pollution.	Kolacovic, Gary. <u>Los Angeles Times</u> . October 18, 2001 <www.greenwire.com>
U.C. Santa Barbara, Center for Geographic Information and Analysis	The Center used 1989 TRI data and U.S. Census data to examine and map significant relationships between race and income populations and their proximity to TRI sites in Los Angeles.	<www.mapcruzin.com/scruztri/docs/se ek55.htm>

User	Description	Reference
INDUSTRY USE - Cost Reduction		
Commonwealth Edison (ComEd), other companies	These companies have applied life-cycle costing methods to achieve significant savings. These steps resulted at least in part due to public awareness of the TRI and the addition of electric utilities to TRI. ComEd has saved over \$25 million since the program's inception in 1993.	McDonnell, Jeff S., "The Toxics Release Inventory: A New Challenge for Electric Utilities," < www.battelle.org>
EPA Region III TRI workshop, 1997	Attendees provided reasons for undertaking waste reduction activities. Their most frequent reason given was cost reduction (98% of respondents).	EPA Region III TRI workshop, 1997
Florida Power and Light (FPL)	FPL created a recycling center to recover and sell a variety of scrap materials, due to public awareness of the TRI and the addition of electric utilities to the TRI. This center generates \$1.8 million in profits annually.	McDonnell, Jeff S., "The Toxics Release Inventory: A New Challenge for Electric Utilities," <www.battelle.org>

User	Description	Reference
INDUSTRY USE - Cost Reduction		
Pine, J. <i>1997 Toxics Release Inventory and Right-to-Know Conference Proceedings</i>	Pine provided examples of how TRI information has helped companies develop waste reduction strategies. For example, Marathon Oil installed a thermal desorption unit to process oily waste and recovered over 120,000 barrels of oil; Georgia Gulf Corporation relocated a methanol stripper purge line that resulted in the recovery of 9,300 gallons of methanol that previously underwent biological waste treatment.	Pine, John. <i>1997 Toxics Release Inventory and Right-to-Know Conference Proceedings</i>
Various Companies, TRI Data Use Conference for 1993	Several corporations presented their experiences of how they reduced emissions and recognized P2 and cost saving opportunities through the EPA 33/50 program.	Various Companies, TRI Data Use Conference for 1993

User	Description	Reference
INDUSTRY USE - Public Relations Tools		
DuPont	DuPont lists TRI data on its web site and uses its progress in emissions reductions as a marketing tool.	<www.dupont.com>
Allegheny Energy and EPRI	As a result of public awareness of the TRI and the addition of electric utilities to the TRI, these two companies are coordinating their efforts to develop an approach for leveraging the utility-owned wetlands by selling conservation banking credits.	McDonnell, Jeff S. "The Toxics Release Inventory: A New Challenge for Electric Utilities." <www.battelle.org>
Boeing	Boeing uses TRI data to track the company's progress. The company continues to invest and innovate in P2 programs and find new ways to obtain greater leverage for current emission reduction programs. Boeing's overall emissions have decreased for more than a decade – more than 82% since 1991.	<www.boeing.com/companyoffices/abotus/environment/eval_results.htm>
Eastman Chemical Company	Each of the company's four U.S. facilities has a Community Advisory Panel (CAP). In addition to other activities, the panel receives updates on TRI data. The CAP then uses the data to recommend process and waste management improvements and ways to present the data to the public.	Forrest, Carol J. "The TRI, P2, and Public Dialogue," <u>Pollution Prevention Review</u> , Winter 1995-96, p. 1

User	Description	Reference
INDUSTRY USE - Public Relations Tools		
Monsanto	Monsanto provides a web site similar to DuPont's (see above), including historical data for sites with over 100,000 pounds of toxic chemical releases.	<www.monsanto.com>
Polaroid	Polaroid used TRI data in its annual report to inform stockholders and the public of efforts they were making to reduce pollution.	OMB Watch and the Unison Institute, "The Right Stuff: Using the Toxics Release Inventory." 13 July 1995

User	Description	References
INDUSTRY USE - Public Disclosure		
Chemical Emergency Preparedness and Prevention Office (CEPPO), U.S. EPA	CEPPO conducted a study to find out how the media affects industries and their emissions reductions. The office found that large polluters singled out by the media due to the public availability of TRI data have decreased their emissions by about twice the percentage as the overall average.	Chemical Emergency Preparedness and Prevention Office (CEPPO), U.S. EPA
Iowa Association of Business and Industry	The association coordinated a community-wide P2 initiative in the Des Moines-Polk County area. The association adopted goals of a 60% reduction of all TRI chemicals by 1992 and a 70% reduction by 1995.	<i>Economic Analysis of the Final Rule to Add Certain Industry Groups to EPCRA Section 313</i> , p. 6-29, April 1997

User	Description	Reference
GOVERNMENT - Environmental Solutions		
Air Pollution Control Program of Missouri, Department of Natural Resources (DNR)	Missouri DNR used TRI data to check quality of their Missouri Emissions Inventory Questionnaire (EIQ) data. Missouri DNR was able to show that 2 facilities incorrectly reported emissions data on the EIQ.	E-mail from Giroir, Louis Eric, Toxicologist, Air Pollution Control Program, Missouri Department of Natural Resources to Katherine Jennrich, intern, Toxics Release Inventory Program Division, OPPT, June 13, 2000
Colorado Department of Public Health and the Environment, P2 Program	The Department used TRI and other data to identify the 10 industry groups responsible for the largest quantities of hazardous waste generation or toxic chemical releases in the state. This work will serve as the basis for establishing priorities for P2 activities and for distribution of technical assistance grants. It will also used to target large companies for participation in a Governor's P2 Challenge Program to reduce toxic emissions and hazardous waste generation.	<i>Economic Analysis of the Final Rule to Add Certain Industry Groups to EPCRA Section 313</i> , p. 6-29, April 1997
Indiana Governor's Office	The Indiana Governor's Toxics Reduction Challenge of 1998 gives publicity to companies meeting certain standards (i.e., reductions in toxic chemical releases).	< www.in.gov/idem/ >

User	Description	Reference
GOVERNMENT - Environmental Solutions		
Louisiana's Environmental Leadership P2 Program	Louisiana used TRI data to track the progress of a statewide emissions prevention and reduction program that seeks a 45% reduction in toxic chemical releases by 1997, using 1992 data as a baseline. The Program sponsors the Governor Awards for Environmental Excellence to promote public recognition of industry achievements (U.S. EPA, 1993b).	<i>Economic Analysis of the Final Rule to Add Certain Industry Groups to EPCRA Section 313</i> , p. 6-29, April 1997
North Carolina P2 Program	North Carolina uses TRI data to integrate multi-media toxic chemical release data into statewide waste reduction activities, such as technical assistance, grants, research, and demonstration projects.	<i>Economic Analysis of the Final Rule to Add Certain Industry Groups to EPCRA Section 313</i> , p. 6-29, April 1997

User	Description	Reference
GOVERNMENT - Environmental Solutions		
States of Kentucky, Ohio, and West Virginia	The states jointly participated in a “Tri-State Initiative” to identify, prevent, and remediate environmental threats. Program coordinators use TRI data in their risk assessment process to focus on sources of greatest concern. The program will use voluntary industry commitments and cooperative efforts among industry, the public, and government to achieve reductions in TRI chemical and criteria air pollutant releases.	<i>Economic Analysis of the Final Rule to Add Certain Industry Groups to EPCRA Section 313</i> , p. 6-29, April 1997
States of Arkansas, Ohio, Oregon, and Washington	The states participated in the EPA Office of Solid Waste’s Measurement Project, using TRI data in projects assessing P2 measurement at the facility level.	“Taking Stock” Commission for Environmental Cooperation (CEC)
U.S. EPA	The EPA 33/50 Program included 1200 companies that reduced emissions of 17 priority TRI chemicals from 1988 levels by 33% and 50% by 1992 and 1995, respectively. The program reached both goals a year early.	U.S. EPA's 33/50 Program, Office of Pollution Prevention and Toxics in the Office of Prevention, Pesticides and Toxic Substances

User	Description	Reference
GOVERNMENT - Environmental Targeting		
Florida Waste Reduction Assistance Program (WRAP)	WRAP uses TRI data to target facilities for the program, which answers facility requests to provide assistance in source reduction and waste minimization in the handling of TRI chemicals.	<i>Economic Analysis of the Final Rule to Add Certain Industry Groups to EPCRA Section 313</i> , p. 6-29, April 1997
Georgia Department of Natural Resources, P2 Division	Georgia used TRI data in the process of identifying the technical assistance needs of manufacturing sectors that generate chemicals posing the greatest relative risk to public health and the environment. The Division first prioritized chemicals, and then examined manufacturing sectors releasing the highest priority chemicals and identified particular subsectors for further assessment.	<i>Economic Analysis of the Final Rule to Add Certain Industry Groups to EPCRA Section 313</i> , p. 6-29, April 1997
Missouri Department of Natural Resources, Air Pollution Control Program (APCP)	APCP uses TRI data to identify air pollution sources that might have to comply with Maximum Achievable Control Technology (MACT) Standards. The Program also used TRI data to identify environmental “hot spots” in Missouri for community-based environmental project targeting.	E-mail from Giroir, Louis Eric, Toxicologist, Air Pollution Control Program, Missouri Department of Natural Resources to Katherine Jennrich, intern, Toxics Release Inventory Program Division, OPPT, June 13, 2000

User	Description	Reference
GOVERNMENT - Environmental Targeting		
New Jersey Department of Environmental Protection and Energy	New Jersey used TRI data in a computerized GIS to prioritize facilities and geographic areas for implementing P2 measures. The Department used minor watersheds to aggregate and map toxic chemical releases to water. The Department then grouped chemicals based on health and environmental effects to study the cumulative impact of many releases in the area.	<i>Economic Analysis of the Final Rule to Add Certain Industry Groups to EPCRA Section 313</i> , p. 6-29, April 1997
New York State Department of Environmental Conservation	New York State used TRI data to identify 400 facilities generating 95% of the state's toxic pollution for priority attention in multi-media inspection, enforcement, ongoing monitoring, and P2 planning.	"States as Innovators: It's Time for a New Look to Our 'Laboratories of Democracy' in the Effort to Improve Our Approach to Environmental Regulation." <u>Alabama Law Review</u> 347, p. 370-71 (1994)

User	Description	Reference
GOVERNMENT - Environmental Targeting		
U.S. EPA, Office of Enforcement and Compliance Assurance (OECA)	OECA uses TRI data as a tool in inspection targeting and enforcement and for cross-checking data from other sources. Enforcement personnel can use TRI data and the Facility and Company Tracking System (FACTS) to identify additional facilities owned by the same corporation or by the same parent company that might be subject to liability.	<i>Economic Analysis of the Final Rule to Add Certain Industry Groups to EPCRA Section 313</i> , p. 6-29, April 1997
U.S. EPA, Office of Enforcement and Compliance Assurance (OECA) (cont.)	OECA uses TRI data in its EPCRA Targeting System (ETS), which provides local access to TRI and FACTS data for all facilities subject to EPCRA section 313 requirements. ETS supports the creation of prioritized inspection targeting lists, generated from a wide array of selection criteria. It also supports daily targeting activities, such as contacting facilities and tracking tips and complaints. Nine out of ten Regional field offices currently use this new system.	as above

User	Description	Reference
GOVERNMENT - Environmental Targeting		
	OECA provides guidance to Regional field offices on the resources available to their inspectors in identifying non-reporters, later reporters, and data quality errors. These resources provide the inspectors with valuable information extrapolated from the TRI, such as facility reporting rates, processes, and toxic chemical releases.	as above
U.S. EPA, Office of Solid Waste and Emergency Response (OSWER)	OSWER uses TRI data when analyzing long-term trends and identifying particular industry practices that warrant attention by the Office. OSWER also uses TRI data when establishing liability under CERCLA and RCRA statutory authorities. TRI data can be used when developing emission inventories for the Superfund site discovery program and during preliminary assessments.	<i>Economic Analysis of the Final Rule to Add Certain Industry Groups to EPCRA Section 313</i> , p. 6-29, April 1997

User	Description	Reference
GOVERNMENT - Environmental Targeting		
U.S. EPA, Office of Water Enforcement and Compliance (OWEC)	OWEC used TRI to identify industrial users with the greatest contribution of toxic pollutants to city sewer systems. The Office identified the industries and provided facility names to the Regions for further evaluation. OWEC also used TRI data to identify industrial users subject to pretreatment standards that are located in cities not required to have pretreatment programs.	<i>Economic Analysis of the Final Rule to Add Certain Industry Groups to EPCRA Section 313</i> , p. 6-29, April 1997
U.S. Occupational Safety and Health Administration (OSHA), local public health departments	OSHA and local public health departments requested identification of facilities in certain areas that release specific chemicals for the purpose of targeting exposure screening for facility employees.	<i>Economic Analysis of the Final Rule to Add Certain Industry Groups to EPCRA Section 313</i> , p. 6-29, April 1997

User	Description	Reference
GOVERNMENT - Legislation and Regulations		
States of California, Delaware, Louisiana, New Jersey, and North Carolina	These and other states have used TRI to support the passage of stricter environmental legislation.	Fung and O'Rourke. "Reinventing Environmental Regulations from the Grassroots Up." <u>Environmental Management</u> , Vol. 25, No. 2
Illinois EPA, Bureau of Air	The Bureau uses TRI data to determine quantities of stack and fugitive air emissions of reported substances. This information supports continuing development of regulatory proposals in response to legislation passed in 1987 to address air toxics.	Dewulf, Cindy. "Utilization of Form R Data," TRI Contact for Ohio EPA
Louisiana State Legislature	TRI data supported the Legislature's actions to require the state DEQ to issue regulations identifying 100 priority pollutants, set emissions standards for those pollutants, and target a 50% emissions reduction from 1987 levels by 1994.	<i>Economic Analysis of the Final Rule to Add Certain Industry Groups to EPCRA Section 313</i> , p. 6-29, April 1997
Minnesota Legislature	The Minnesota Legislature amended the state's EPCRA in 1993 to expand TRI reporting requirements to non-manufacturing industries.	<i>Economic Analysis of the Final Rule to Add Certain Industry Groups to EPCRA Section 313</i> , p. 6-29, April 1997

User	Description	Reference
GOVERNMENT - Legislation and Regulations		
North Carolina Environmental Management Commission	The Commission set limits for 105 pollutants after a public interest group published a report on unregulated air toxics emissions in the state.	<i>Economic Analysis of the Final Rule to Add Certain Industry Groups to EPCRA Section 313</i> , p. 6-29, April 1997
U.S. EPA, Office of Pollution Prevention and Toxics (OPPT), Pollution Prevention Division (PPD)	PPD used TRI data as a screening tool to prioritize proposed regulations and industrial source categories, to promote P2 in rulemaking. The P2 Senior Policy Council has identified a number of regulatory development efforts that should consider inclusion of P2 measures.	<i>Economic Analysis of the Final Rule to Add Certain Industry Groups to EPCRA Section 313</i> , p. 6-29, April 1997
U.S. EPA, Office of Water (OW)	OW used TRI data as one of several sources of information in developing regulations under section 316(b) regarding cooling water. The data were useful in identifying facilities to include in a nationwide list of facilities (i.e., the “sample frame”) within several major industrial groups. OW used the list to select a random sample for survey.	<i>Economic Analysis of the Final Rule to Add Certain Industry Groups to EPCRA Section 313</i> , p. 6-29, April 1997

User	Description	Reference
GOVERNMENT - Risk Assessment		
Kentucky Division of Environmental Services	Kentucky occasionally uses the TRI database when it makes determinations regarding risk assessments.	E-mail from Alex Barber to Katherine Jennrich, intern, Toxics Release Inventory Program Division, dated June 1, 2000
New York State Department of Health	New York State developed a risk screening protocol using TRI air release data and toxicity potency data to produce relative risk scores and rankings for facilities and chemicals within the state. Results suggested the need for more careful evaluation of health effects resulting from large releases of noncarcinogenic compounds.	Hazen, Susan B. "An Overview of Uses of the Toxics Release Inventory Data in the U.S." Environmental Assistance Division, OPPT, US EPA, 1995.
Oregon Department of Environmental Quality (DEQ)	Oregon relied on the TRI database to apply a computer model that evaluates cross-media impacts and ranks the relative risks to human health and the environment associated with pollutant discharges.	<i>Economic Analysis of the Final Rule to Add Certain Industry Groups to EPCRA Section 313</i> , p. 6-29, April 1997
U.S. EPA, Office of Enforcement and Compliance Assistance (OECA) and the Office of Research and Development (ORD)	OECA and ORD used TRI to develop a "Multi-Media Ranking System" to prioritize sites for enforcement actions and to evaluate the effectiveness of environmental laws in reducing risks from sites. The system ranks sites based on their multi-media releases of pollutants, their potential risk to human health and the environment, and the history of legal violations by the facility.	U.S. EPA, Office of Enforcement and Compliance Assistance (OECA) and the Office of Research and Development (ORD)

User	Description	Reference
GOVERNMENT - Risk Assessment		
U.S. EPA, Office of Health Research	The Office published a study of national and regional differences in county-level TRI air emissions according to the ethnicity or race and household income of the populations. Using the “Population Emissions Index,” a population-weighted average emission for each county, the study found that all minority groups except Native Americans tend to live in counties where TRI toxic chemical releases levels are higher.	U.S. EPA, Office of Health Research
U.S. EPA, Office of Information Resources Management	The Office sponsored the development of a Population Estimation and Characterization Tool, which uses GIS technology and demographic data for risk-based and environmental justice applications. The tool allows users to estimate and characterize populations within a given radius of a single or multiple TRI facilities and to identify areas of potential multiple exposure to toxic chemical releases.	U.S. EPA, Office of Information Resources Management

User	Description	Reference
GOVERNMENT - Risk Assessment		
U.S. EPA, Office of Pollution Prevention and Toxics (OPPT), Existing Chemicals Program	OPPT uses TRI data for risk screening, determining testing needs and priorities, and considering and developing P2 activities. TRI data also serve as major inputs to exposure and risk assessments and are used in OPPT's outreach efforts in responses to inquiries from various sources.	<i>Economic Analysis of the Final Rule to Add Certain Industry Groups to EPCRA Section 313</i> , p. 6-29, April 1997
Environmental Assistance Division (EAD)	EAD developed software that contains health and ecotoxicity information on most section 313 chemicals. This software, called PC-TRIFACTS, was made available in January 1991. It enables the TRI data user to better understand the potential health and ecological effects of chemical activities identified in the TRI.	<i>Economic Analysis of the Final Rule to Add Certain Industry Groups to EPCRA Section 313</i> , p. 6-29, April 1997

User	Description	Reference
GOVERNMENT - Quality Assurance and Control		
Missouri Department of Natural Resources (DNR), Air Pollution Control Program	Missouri compared fugitive and stack emissions reported to TRI with emissions data reported on the Missouri Emissions Inventory Questionnaire (EIQ), identifies facilities reporting incorrectly, and corroborates data.	E-mail from Giroir, Louis Eric, Toxicologist, Air Pollution Control Program, Missouri Department of Natural Resources to Katherine Jennrich, intern, Toxics Release Inventory Program Division, OPPT, June 13, 2000

User	Description	Reference
GOVERNMENT - Other Government Uses		
Illinois Department of Public Health	Illinois Department of Public Health requested and received TRI data to use as inputs into its Health and Hazardous Substances Registry.	Dewulf, Cindy. "Utilization of Form R Data," TRI Contact for Ohio U.S. EPA
Illinois EPA, Bureau of Land	Illinois EPA uses TRI data to identify toxic chemicals present at hazardous waste sites for a number of programmatic reasons.	Dewulf, Cindy. "Utilization of Form R Data," TRI Contact for Ohio U.S. EPA
U.S. EPA, Office of Enforcement and Compliance Assurance (OECA)	TRI data are included in the Integrated Data for Enforcement Analysis (IDEA) System, which combines TRI data with permit information from other databases. The public can access IDEA information for several industrial sectors and a subset of federal facilities through the Sector Facility Indexing Project (SFIP) web site <www.epa.gov/oeca/sfi>.	<i>Economic Analysis of the Final Rule to Add Certain Industry Groups to EPCRA Section 313</i> , p. 6-29, April 1997
U.S. Internal Revenue Service (IRS)	The IRS used TRI data to identify companies releasing CFCs in order to enforce a tax imposed on CFC releases.	Hazen, Susan B. "An Overview of Uses of the Toxics Release Inventory Data in the U.S." Environmental Assistance Division, OPPT, US EPA, 1995
West Virginia Division of Environmental Protection, Public Empowerment Program	West Virginia created a web site that includes TRI and other environmental, physical, and demographic data in an easy-to-use and format to increase the public's understanding of their communities through better access to information.	<www.dep.state.wv.us>

User	Description	Reference
INTERNATIONAL RIGHT-TO-KNOW		
Commission for Environmental Cooperation (CEC)	CEC releases <i>Taking Stock</i> , an annual sourcebook that uses TRI data to track the sources of industrial pollutants throughout the U.S. and Canada. Mexico is currently establishing an office to track toxic chemical releases.	< www.cec.org/takingstock/index.cfm?varlan=english >
	CEC correlated TRI data and the Canadian National Pollutant Release Inventory (NPRI) to give an overall view of releases and transfers of toxic chemicals across both countries. The CEC has developed a search engine that allows a user to search the TRI data and its Canadian equivalent.	< www.grconnect.com/querybuilder/index.php3?varlan=english&output=form >

User	Description	Reference
INVESTMENT		
Clean Yield Asset Management, New Hampshire	Clean Yield Asset Management compares companies' TRI release data to their industry averages of pounds of toxic chemicals per sales dollars. The firm uses this comparison to gauge how individual companies measure up against other companies in their industry. TRI data also allow Clean Yield Asset Management to track how a company's toxic chemical release performance improves from year to year.	OMB Watch and the Unison Institute, "The Right Stuff: Using the Toxics Release Inventory." 13 July 1995
Green Century Funds	Green Century Funds offers socially responsible mutual funds and uses TRI data to track portfolio company performance.	<www.greencentury.com>
Investor Responsibility Research Center, Inc.	The Center has an Emissions Efficiency Index® based on TRI data that indicates which companies have a competitive edge in environmental performance.	<i>Economic Analysis of the Final Rule to Add Certain Industry Groups to EPCRA Section 313</i> , p. 6-29, April 1997
	The Center uses TRI data in developing its <i>Corporate Environmental Profile Directory</i> , which presents quantitative, consistently-derived data that allows investors to evaluate and compare corporate environmental performance.	

User	Description	Reference
INVESTMENT		
Fortune magazine	The magazine used TRI data as a central element in compiling a “green index” of America’s largest manufacturers by examining companies’ environmental records and developing a relative ranking system that assigned companies scores from 0-10 in 20 categories.	Rice, Faye, 1993. "Who Scores Best on the Environment," <u>Fortune</u> , Vol. 128, No. 2 (July 26, 1993)
Neuberger and Bergman	Neuberger and Bergman use TRI data to screen socially-responsible portfolios.	Hendricksson, Marla, “Proof Positive: TRI Success Stories,” <u>Public Access Information</u> , Vol. 3, No. 2
Vanderbilt University, Owen Graduate School of Management	Vanderbilt University used TRI data in separate studies showing that companies that engage in P2 activity have better stock values.	< http://mba.vanderbilt.edu/fmrc/pdf/wp9719.pdf >

User	Description	Reference
ACADEMIC - Research		
<i>Drug and Chemical Toxicology</i>	An article shows how utilizing air emission data (such as the TRI), air dispersion modeling, and GIS data enables public health professionals to identify and define the potentially exposed population, estimate the health risk burden of that population, and determine correlations between point-based health outcome results and estimated health risk.	Dent, A.L., D.A. Fowler, B.M. Kaplan, G.M. Zarus, W.D. Henriques. "Using GIS to Study the Health Impact of Air Emissions." <u>Drug and Chemical Toxicology</u> , 23, Issue 1, p. 161-178
Duke University, James Hamilton	Mr. Hamilton found that stock prices of companies that reported high emissions dropped measurably the day the TRI data were first released. Another study showed that pressure from communities and investors influenced firms to cut their toxic chemical releases.	Varon, Elena. "Power to the People." <u>Federal Computer Week</u> . March 30, 1998 <www.fcw.com>
Institute for Environmental Studies, University of North Carolina at Chapel Hill, Frances M. Lynn	The Institute conducted a national study of users of TRI data during 1991. The study provides evidence that the availability of TRI data has contributed to the ability of the right-to-know community to effect changes in behavior in 3 broad areas. Legislation or regulatory action was stimulated by efforts to use TRI data, source reduction activities had taken place, and the data's availability had prompted increased face-to-face meetings between community groups and industry.	Lynn, Frances. "The Toxics Release Inventory: An Evaluation of Use and Impact." Institute for Environmental Studies, UNC at Chapel Hill

User	Description	Reference
ACADEMIC - Research		
<p>Madhu Khanna, Lisa Damon, Wilma Rose H. Quimio, Dora Bojilova - <i>Journal of Environmental Economics and Management</i></p>	<p><i>The Journal of Environmental Economics and Management</i> has published an article by Madhu Khanna and others that examines the potential of voluntary programs as instruments for regulating toxic releases as well as their role vis-à-vis mandatory regulations. Another study in the same journal examines investor reactions to the repeated disclosure of environmental information about firms in the chemical industry and the effectiveness of this information as a decentralized mechanism for deterring their pollution.</p>	<p>Madhu Khanna, Lisa Damon, Wilma Rose, H. Quimio, Dora Bojilova. "EPA's 33/50 Program: Impact on Toxics Releases and Economic Performance of Firms"</p>
<p>Louisiana State University, Paul Templet, Environmental Science Professor</p>	<p>Templet developed a method to evaluate the comparative effectiveness of pollution control strategies, policies, and programs by calculating an "emissions to jobs ratio," which is the number of pounds of emissions per job in a given industry and location. This ratio is compared to a national or other average to assess the job's standing. The ratio was used to modify tax exemptions granted to facilities to encourage and reward job creation.</p>	<p>Templet, Paul H., 1993. "The Emissions to Jobs Ratio," <i>Environmental Science and Technology</i>, Vol. 27, No. 5 (May)</p>

User	Description	Reference
ACADEMIC - Research		
Lynn and Kartez, <i>Environmental Management</i>	Lynn and Kartez conducted a mail survey of active TRI users. The survey showed which data the respondents found most helpful and how they used the data (e.g., check emissions with permit records, identify source reduction opportunities, etc.). The authors wrote that the TRI promotes sound policy development by fostering dialogue among experts and the general public on how to most effectively control toxic emissions into the environment.	“Environmental Democracy in Action: The Toxics Release Inventory.” <u>Environmental Management</u> , Vol 18
New York State School of Industrial and Labor Relations (NYSSILR), Cornell University, John Bunge	Bunge conducted a statistical analysis of TRI data to test the hypothesis: "Is formal employee involvement in source reduction associated with greater reduction in toxic releases?" The study found, for example, that manufacturers using a certain combination of three formal employee participation practices had triple the reduction in toxic chemical releases of manufacturers using none of these practices. The study also discussed competing predictors of source reduction and assessed future research directions.	Center for Advanced Human Resource Studies, New York State School of Industrial and Labor Relations. 1996. < www.cfe.cornell.edu/WEI/employee.html >.
Texas A&M	Texas A&M used TRI and RCRA data in a study of 58 landfills. The study determined that of 143 toxic chemicals found, 60 occurred in municipal waste samples, 31 in industrial waste landfills, and 39 in both.	Toxics Watch, 1995 < www.informinc.org/summaries_chem.php >

User	Description	Reference
ACADEMIC - Classroom Use		
JSI Center for Environmental Health Studies	The Center developed a curriculum for high school students to encourage participation in environmental assessment and protection. The TRI was an integral part of the students' research.	JSI Center for Environmental Health Studies: A Division of the JSI Research and Training Institute
Florida International University, Professor Robert Hognor	Professor Hognor used TRI data in classes in the Department of Business and Society. Students issued a report in 1994 on the impact of toxic chemicals in the Caribbean.	OMB Watch and the Unison Institute, "The Right Stuff: Using the Toxics Release Inventory." 13 July 1995



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