

Presentation Abstracts for the 2014 National Training Conference on the Toxics Release Inventory and Environmental Conditions in Communities

(In the order listed on the conference agenda)

Toxics Release Inventory Program Overview and Vision for the Future

Steve Knizner, Dipti Singh, Ingrid Rosencrantz, Tim Antisdell, Guy Tomassoni & Rosemarie Kelley, U.S. EPA

There is no abstract for this presentation.

Your Environment = Your Health: Meaningful Involvement, Meaningful Information

Marianne Seifert, Tacoma-Pierce County Health Department & Diane Fowler, Washington State Department of Ecology

What environmental health issues do people care about in Pierce County, Washington? What do they want to know? What do they want tracked? What can they do about the issues? The Tacoma-Pierce County Health Department Environmental Health Division brought together government agencies, non-governmental organizations, businesses and community members to tell us.

In 2006 we formed air, water, food, land use, waste and zoonotic diseases work groups to guide the Pierce County Environmental Health Indicators Project. Since then more than 200 agency, business and community members have helped:

- Review and improve an Environmental Health Indicators Model to show connections between ecosystem and human health, awareness and actions.
- Review international, national, state and local indicators and brainstorm their own list of indicators they'd select from.
- Review and identify their own criteria for selecting indicators.
- Select a final set of indicators.
- Identify available data and other information for each part of the indicators model.
- Review draft Pierce County Environmental Health Trends reports.
- Shorten the report from 21 indicators to 12 indicators.
- Share indicators at public forums, conferences, community meetings, staff meetings and Living Well in Pierce County: Happiness, Economy and Environment.
- Share the report with other high school and university students, community members, elected officials, organizations, agencies and others.

One of the indicators in all versions of the report is "Hazardous Waste: Toxic Releases" using US EPA Toxics Release Inventory data. The indicator, report and additional information about the project are at www.tpchd.org/ehindicators.

Developing and sharing the indicators have helped us provide essential public health services:

- Monitor environmental and health status to identify and solve community environmental health problems.
- Inform, educate and empower people about environmental health issues.

Duwamish Valley Cumulative Health Impact Analysis, Seattle, Washington

Linn Gould, Just Health Action

South Seattle's Duwamish Valley (DV), which flanks the Lower Duwamish Waterway Superfund Site, is home to 80% of Seattle's industrial lands, and the city's poorest and most ethnically diverse neighborhoods. It has long been referred to as an Environmental Justice (EJ) community but limited evidence has been available to date to validate or quantify this designation.

The Duwamish River Cleanup Coalition Technical Advisory Group and Just Health Action received an EPA EJ Research grant to conduct a Cumulative Health Impacts Analysis to quantify the DV's cumulative impact status relative to other Seattle areas.

A total of 15 indicators in 5 different categories: 1. Socioeconomic factors; 2. Sensitive populations; 3. Environmental exposures; 4. Environmental effects; and 5. Public health effects were input into a formula to calculate cumulative health impact scores for ten Seattle ZIP codes in accordance with California EPA's cumulative impacts ranking methodology. Three EPA indicators were input into the cumulative impacts formula including data from the Toxic Release Inventory (TRI) and Community-Focused Exposure and Risk Screening Tool (C-FERST). The DV ZIP code had the highest (worst) ranking for multiple indicators including air pollution, number of TRI sites, percent tree canopy, square feet per resident of park area, heart disease death rate, and childhood asthma hospitalization rates. The DV received the highest cumulative impacts score demonstrating a disproportionate burden relative to the rest of Seattle.

The analysis was also conducted to assist decision-makers in prioritizing activities and taking action in communities with the largest cumulative impacts. This presentation discusses the cumulative health impacts method, the use of EPA indicators, results, and limitations of the study. We also describe how the conclusions of the study have been received and responded to by the community, policy- and decision-makers.

Is Meaningful Community Involvement Radical? A Case Study of the Duwamish River

Alberto J. Rodriguez, Duwamish River Cleanup Coalition/Technical Advisory Group

We are engaging communities in decision making processes more and more these days. These efforts are the center of attention on national news (especially when underserved communities are involved). We are talking, sometimes even boasting and congratulating ourselves, about how we are finally doing "what's supposed to be done" and "how it's supposed to be done"... but are we being intentional at engaging the communities that have more at stake in the issues we are working on? Are we delivering the information they need in a manner that serves them? Are our community involvement and communication strategies, public processes, outreach workplans, etc. effective or do we need to change, re-think and completely recreate the way we do things? Most importantly, do the decisions we make reflect the communities' needs, wants, values, and are these respectful of their cultures?

During this presentation, we will take a close look at the community involvement and communication strategy used in Seattle, WA during the public comment period for the Duwamish River Superfund site that resulted in community awareness, action, and stewardship. We will discuss lessons learned, success stories, and more. We will also briefly learn about the history and complex issues for this site and its affected communities, as well as other stakeholders' interests, and how EPA and the community conducted one of the most robust and holistic community involvement and communication plans in the nation.

Development of ChemView: EPA's Online Database on Chemical Information under the Toxic Substances Control Act

Maria Doa, U.S. EPA

To improve chemical safety and provide for streamlined access to information on chemicals regulated under the Toxic Substances Control Act (TSCA), EPA has built and is populating a new database called ChemView (www.epa.gov/chemview). ChemView is part of EPA's commitment to strengthen its chemicals management programs by improving access to and the usefulness of chemical information. This new on-line system significantly enhances access to chemical information regulated under TSCA for public utilization.

The initial phase focused on providing easy access to thousands of documents including: data submitted to EPA (e.g., test rule data submissions), EPA assessments (e.g., hazard characterizations and alternative assessments), EPA regulatory actions (e.g., Significant New Use Rules), and manufacturing, processing, use and release data maintained by EPA (e.g., Chemical Data Reporting). The process entailed identifying, organizing, and extracting human health, ecotoxicological, environmental fate and product chemistry data to populate ChemView so users could access both summary and in-depth information. Pre-defined templates were developed to capture key details from source documents, including information on chemistry, ecotoxicology, and human health endpoints. Summary results provide links to original studies or documents which contain more detailed information.

ChemView also links to other Agency databases with key information on TSCA chemicals including EPA's Integrated Risk Information System, and Toxics Release Inventory systems. The objectives completed and challenges encountered during development will be highlighted. Future enhancements, including incorporation of additional data sources, will also be presented.

EPA's Startup Crowdsourcing Tool for Community Activism

Kim Balassiano, U.S. EPA

EPA's Office of Water Urban Waters Program has developed an online mapping tool that enables community groups operating in the area of Urban Waters to connect. This simple, yet powerful tool, allows organizations to upload information about their events so that other local groups working in the same geographic area can learn about them and potentially partner up to achieve even higher outcomes sought under the Clean Water Act. The tool was piloted for the South Platte watershed in Colorado but is now open to groups around the country. Come see a demonstration and help us spread the good word amongst organizations you know.

Tribal Analysis Using Envirofacts and other TRI Tools

Beth Jackson, Steve Witkin & Bill Muldrow, U.S. EPA

With the finalization of the TRI Reporting in Indian country rule in April 2012, EPA increased its outreach to tribal communities on the TRI Program, opportunities available for tribal governments under the new rule, and new reporting requirements for facilities in Indian country. In addition to opportunities made available to tribes by the rulemaking, for several years both tribes and EPA staff have expressed an increasing interest in having the ability to search EPA's environmental data, by tribe, in addition to the ability to search by city, state, and zip code. EPA undertook an effort to address this growing need through some of our existing tools. This presentation will:

- Discuss why EPA embarked on the project to enhance these tools;

- Provide step-by-step demonstrations of TRI and Envirofacts and their ability to perform various tribally relevant searches, including how to select tribal filter, how to generate reports; and
- Show practical examples of how these tools can be used to search multiple EPA databases, by tribe and within a specified distance of a tribe.

Using TRI Data to Identify Patterns of Pollution in Metro Atlanta

MaKara Rumley, GreenLaw

The metro Atlanta region has not fared well in recent comparisons to other areas in the United States in regard to pollution and its effect on the quality of life of its residents. Metro Atlanta received national attention in 2009 when it was named by Forbes Magazine as the “most toxic city” in the United States. The pollution that exists in metro Atlanta does not touch all residents in the same way. In 1995, the City of Atlanta reported that more routine releases of toxics occur in neighborhoods that are poorer, and to a lesser extent, have larger percentages of African Americans. These findings are important because toxic releases and other pollution can result in serious health ramifications.

Impacts on fetal and childhood health provide the most clearly defined link between pollution exposure and health effects. Children of mothers who lived near a facility designated by the federal government as a Toxic Release Inventory (TRI) site while pregnant may be more likely to later develop brain cancer, especially if the site released carcinogens. Considering these potential health effects, we should understand which populations are living closest to and potentially being most impacted by pollution in metro Atlanta.

Through an oral presentation I would like to present how TRI data in conjunction with the location of other pollution points were used to identify which communities are most impacted and exposed to pollution in the metro Atlanta area.

Building a Compendium of Federal Data Sources to Support Research and Programs Intended to Eliminate Disparities

Rosalyn Correa-de-Araujo, National Institutes of Health

A variety of datasets relevant to disparities research are available from the Federal government, some of which are not always easily accessible. In an effort to develop a resource that facilitates the identification and use of data relevant to research and programs aiming to reduce or end disparities, a compendium of federal data sources is being developed by the U.S. Department of Health (HHS) Federal Interagency Health Equity Team (FIHET) Data Workgroup. This compendium aims to provide easy access to researchers and other interested individuals to publically available data through a single, updated source of information. Numerous Federal agencies including the Environmental Protection Agency (EPA), Department of Transportation (DOT), Department of Labor (DOL), Department of Education (DOE) and the Veterans’ Administration (VA) are collaborating in this effort.

This presentation will discuss the status of the project and provide a demonstration of the content and organization of the compendium. Examples of potential research gap areas will be highlighted with emphasis on how datasets included in the compendium can support research efforts. Examples of potential gap areas related to paucity or unavailability of data will also be presented with the purpose of increasing awareness for the need for data collection and the relevance of Section 4302 of the Affordable Care Act under which standards for race, ethnicity, primary language, sex, and disability status were established.

Comparison Between the Chemical Data Reporting Rule and the Toxics Release Inventory

Katherine Sleasman & Nick Nairn-Birch, U.S. EPA

Under the Chemical Data Reporting rule (CDR), EPA collects manufacturing, processing, and use information about certain chemicals listed on the TSCA Inventory and makes that information available for use by the EPA and the public. Manufacturers of chemicals listed on the TSCA Inventory and were produced in volumes of 25,000 pounds or more at a single site during calendar year 2011 were required to report. For CDR, the reporting frequency is usually every four years, although the submission period prior to 2012 was in 2006. The purpose of CDR is to collect quality screening-level, exposure-related information on chemical substances.

By combining CDR and TRI data users can gain a more complete picture of chemical manufacturing and processing and the associated chemical waste generated. For example, the CDR data show how much of a chemical was domestically manufactured and imported – information that is not reported to the TRI program. Conversely, TRI shows how much of a chemical was released to the environment or otherwise managed as waste – information that is not reported to the CDR program. The presentation will compare the 2012 reporting of CDR (reflecting 2011 activities), and the 2011 TRI reporting. During this reporting period, more than 700 toxic chemicals were reported to both programs. This presentation will profile one chemical to demonstrate: (1) How to match CDR and TRI data; and (2) How the public can use these data to assemble both industry and facility-level information on domestic manufacturing, processing, use, and waste management of a given toxic chemical.

Long-Term Trends in TRI Reporting

Steven Greenwald, U.S. EPA

Long term trends in TRI reporting have been analyzed at the national, regional and state level (for EPA Region 7). Particular attention has been paid to evaluating total on- and off-site TRI disposal and air emissions. The effectiveness of the TRI program can be seen by the steady decrease in the use and disposal of TRI chemicals over the last decade. In all ten EPA regions large gains have been made in limiting the quantity of TRI chemicals released into the air. Evaluation of the long-term trends in TRI reporting provides a useful tool for determining the responsiveness of various industry sectors to EPA's initiatives to lower TRI chemical usage. For example, this technique has been used to look at the performance of coal-fired power plants in Region 7.

2012 TRI National Analysis

Kara Koehn, U.S. EPA

The Toxics Release Inventory (TRI) data reflect information about volumes of toxic chemicals released to the environment, volumes of toxic chemicals managed in waste and pollution prevention opportunities at TRI facilities nationwide. The most recent TRI data is from the 2012 calendar year. The TRI National Analysis is an annual report displaying EPA's latest analysis and interpretation of TRI data.

The data for 2012 shows that total disposal or other releases of toxic chemicals from TRI facilities decreased 12% (483 million lbs) from 2011-2012. Mainly due to decreases in land disposal from metal mines (accounts for 423 million lbs of the decrease). Metal mines in Alaska and Nevada had the biggest decreases. Other industries also saw decreases including electric utilities and primary metals. Some industries saw increases including chemical manufacturing, hazardous waste management and paper.

Releases to air from TRI facilities decreased, continuing a long-term trend driven mainly by decreases in acid gas releases from electric utilities. Long-term decreases are in part due to installation of control technologies at coal

fired power plants and a shift to other fuel sources.

This presentation will cover the points noted above as well as discussing the new features of the National Analysis such as:

- Reporting on hydrogen sulfide, mostly reported to TRI as releases to air;
- Opportunities for facilities to report “green chemistry” source reduction activities;
- An analysis combining OCSP’s Chemical Data Reporting (CDR) data with TRI data to give a more complete picture of chemicals’ lifecycles; and
- High-level TRI data analysis for all 300+ Metropolitan Statistical Areas (MSAs) across the country, compared to last year’s 13 of the most populous MSAs.

Examining the Links between Air Toxics Risk and Academic Performance Using the TRI

Paul Mohai, University of Michigan, Byoung-Suk Kweon, University of Maryland & Sangyun Lee, Korea Environment Institute

Background and Objective: This study seeks to understand the distribution of air pollution from industrial sources around public schools in the U.S., whether racial and socioeconomic disparities in such distribution exist, and whether these burdens are linked with student performance and health.

Methods: We expand on an earlier study examining air pollution burdens around public schools in Michigan to other states in the Great Lakes Region, including Illinois, Indiana, Minnesota, Ohio, and Wisconsin. Geographic information systems (GIS) were used to link school, census, and air pollution estimates from the 2006 TRI. Statistical analyses were used to examine racial and socioeconomic disparities in the distribution of pollution burdens around public schools in these five states and whether such burdens are related to student performance and health.

Results: Racial and socioeconomic disparities at the school- and neighborhood-levels exist in the distribution of air toxics generated from industrial sources. Furthermore, air toxic burdens within 1.0 km, 2.0 km, and 3.0 km of the schools are associated with low attendance rates and poor academic performance.

Conclusion: This study demonstrates the usefulness of the TRI database for evaluating air pollution burdens from industrial sources around public schools. That our initial findings in Michigan are generalizable to the Great Lakes Region indicate environmental justice policy needs to give greater attention to environmental quality around public schools. Policies should focus on avoiding locating schools in areas of poor quality. Pollution around existing schools near industrial facilities should be monitored and ameliorated where found to be at unacceptable levels.

Beyond TRI: Lessons learned from additions to TURA

Heather Tenney, Toxics Use Reduction Institute

This presentation will share the results of twenty-one years of Massachusetts TURA data, coupled with the Massachusetts TRI data. Lessons learned from the introduction of Higher Hazard Substances –with associated lower reporting thresholds- will be highlighted. In addition, the lessons learned from the recent addition of n propyl bromide to the TURA Toxic Substances List will be shared. In particular, the types of industries, uses, and releases in these previously non-regulated populations will be shared. Participants will be encouraged to consider opportunities for TRI that could be developed with the information gained from these changes to TURA.

The presentation will touch upon many of the potential topics described in your “Call for Abstracts”:

- Providing information related to toxic pollutants through effective partnerships, tools, and outreach;
- Measuring and assessing corporate environmental performance;
- Promoting the adoption and recognition of P2 practices;
- Assessing health impacts using TRI to shape policy; and
- Improving the quality of TRI information.

Meeting TRI Data User’s Needs

Susan Day & Andrew Stoeckle, Abt Associates

The U.S. Environmental Protection Agency currently focuses its attention on curating TRI data so that it is of the highest possible quality and is released as soon as possible. The TRI Program serves a wide range of “customers,” building tools and providing support to enhance analysis and support users’ ability to use and interpret TRI data. Information technology and the manner in which individuals access and use government data, however, are changing. This review examines to what extent EPA’s information products and services will meet the needs of customers’ current and future uses.

In this presentation, we identify near-term changes in EPA’s information resources, changes in the information technology available to TRI users, and changes in current and potential TRI customers. For example, more individuals will access the web from mobile devices; environmental awareness will likely increase as the effects of climate change become apparent; there will be greater integration of facility-based environmental information records; and EPA will increase the analytical capability of TRI-centered tools. To identify future trends in social concerns and behaviors as well as technological trends, reviews of current literature and EPA’s planning documents were undertaken. To identify user needs, user feedback in the form of emails, questions, and comments submitted to the TRI Program through a variety of feedback mechanisms (e.g., TRI Explorer, TRI.NET, RTKnet, OEI Community Engagement Pilots, Envirofacts, data.gov, EPA’s National Dialogue, RCRA-EPCRA-CERCLA Hotline, etc.) were reviewed.

This information was synthesized to describe both the future state of services to be provided by EPA and the demand for new and/or improved services for TRI data users. This analysis has identified areas where current information products and services are sufficient and where there may be gaps in meeting the needs of TRI data users.

Using Toxic Release Inventory to Evaluate the Risk of Elevated Blood lead Levels in Children Aged 1-5 in the U.S.

Evelyn O. Talbott & LuAnn L. Brink, University of Pittsburgh

Objective: Assess how environmental contributions of lead exposure, as assessed by reported emissions in the Toxic Release Inventory, affect U.S. childhood blood lead measurements (CBL). Methods: The population of interest was children 1 to 5 years of age who had blood lead measurements collected between 1999 and 2006 as part of the National Health and Nutrition Examination Survey. Cumulative exposure was calculated by determining the distance from each child’s residence to each lead emitting facility and summing the pounds of lead released divided by distance squared. Survey weighted linear regression was performed using natural log blood lead as the outcome variable with cumulative exposure, home age, race, age, poverty, region, US born, reference adult education, and gender as predictor variables.

Results: Overall, it was found that for every 10,000 lbs/mi² of cumulative exposure, blood lead levels increase by 0.86% (p = 0.0017). For children who had a poverty income ratio (PIR) of 200% plus for every 10,000 lbs/mi² blood lead levels increased by 1.3% (p = 0.0012). This was not the case in children with lower PIR levels after adjusting for age, gender, race, age of the child's home, reference adult's education, poverty income ratio, survey cycle, US born, and region. This appears to be counter intuitive to the published literature linking poverty, pre50 housing and lead exposure.

Conclusions: The primary factors associated with blood lead levels in US children remains pre-1950 housing, poverty and race. However, industrial activities located close to a child's home also influence their blood lead levels. Additional monitoring in and around active TRI sites might be a first step in elucidating the contribution of ambient lead levels to CBL.

This is the first analysis of NHANES data to employ survey weighted design and link each child to a measure of environmental lead exposure.

Exploring children's environmental health impacts using PRTR data

Osnat Wine & Alvaro Osornio-Vargas, University of Alberta

Over the past five years we have been working with NPRI data exploring geographic co-location of emitting facilities with childhood conditions such as: cancer, congenital heart anomalies and adverse birth outcomes. As part of our work, we recently performed a review on the use of Pollution Release and Transfer Registries (PRTR) in the academic literature (1993 and 2011), identifying only 40 papers studying health impacts. Of these, 25 papers investigated relationships with cancer and 32 identified positive associations with different health outcomes. Several papers identified challenges, some imputable to the PRTR data, that may contribute to the low number of papers identified. Our review suggests that PRTR data are useful for health-related studies and have significant potential for research that can influence public policy, environmental management practices and ultimately human/child health.

Although PRTR data have limitations, they are still a unique and useful information source that has not been fully exploited. Developing strategies to overcome limitations could improve data quality and increase its utility in future environmental health research and policy. To improve current PRTR limitations towards citizens well being, we consider exchange of experiences between data providers and data users as a step forward.

In light of the number of studies we identified related to health outcomes and the usefulness of the data we feel reassured to continue in the research we do.

In our research we aim to generate hypotheses regarding possible links between industrial emissions and health outcomes. Our interdisciplinary team is exploring multiple variables, including NPRI data and health outcomes databases, as well as wind, socioeconomic status, chemical combinations and urban monitored data. Data mining, land use regression and GIS proximity analysis will help us characterize exposures and colocation of negative birth outcomes cases, for example. We will provide examples of this process during the conference.

Canadian Experiences in Pollutant Reporting - the National Pollutant Release Inventory

Jody Rosenberger, Environment Canada

The National Pollutant Release Inventory (NPRI) is the Canadian equivalent to the TRI. The NPRI, the TRI and the corresponding Mexican RETC program form the North American Pollutant Release and Transfer Register (PRTR).

Environment Canada will present on the NPRI, including our experiences with pollutant reporting, highlights of 2012 data reported to the NPRI, changes to the NPRI over time and current activities and priorities. Some examples of key differences between NPRI and the TRI, which are relevant in the context of a North American picture of pollution, will also be provided.

Exploring North American Industrial Pollution Data through Taking Stock Online

Orlando Cabrera-Rivera & Danielle Vallee, Commission for Environmental Cooperation

Pollutant Release and Transfer Registers (PRTR) provide information on the amounts of pollutants released from facilities to the environment on-site (air, water, land, and injected underground), as well as transferred off-site for recycling, treatment or disposal. PRTR data can serve as an effective tool in tracking and assessing the generation, release, and fate of industrial toxic contaminants over time, and their potential impact on human health and the environment.

The Commission for Environmental Cooperation's (CEC) Taking Stock Online (www.cec.org/takingstock), compiles and disseminates the latest data from North America's three pollutant release and transfer registers (PRTRs). It features an integrated, multi-year database covering over 30,000 industrial facilities and 500 substances from about 100 major industrial sectors that report to the PRTRs of Canada, Mexico and the United States. The site features tools to assist in PRTR data analysis, such as customized searches, Toxicity Equivalency Potentials (TEP) information for selected pollutants, a graphics generator, file exports for data analysis and mapping, and a tool to explore data on pollutants transferred across national borders. These tools also allow users to explore, analyze, and compare information on pollution from industrial facilities across North America.

Additionally, the Taking Stock Online tool integrates social media outlets such as Facebook and Twitter in an effort to make online queries and analyses easy to share amongst users. An overview of Taking Stock Online and examples of analyses of PRTR data with respect to geospatial information data will be presented.

On the Development of a Framework to Improve the Environmental Health of Vulnerable Communities in North America

Stephen DeVito, U.S. EPA

Pollution in the environment can significantly affect human health. Some individuals, or even groups of people, are more vulnerable to health risks from exposure to environmental contamination than others. Many variables directly or indirectly influence such vulnerability. Differential vulnerability to chemical exposures is characterized by the degree of exposure, an individual's susceptibility to the harmful effects caused by the chemical, and the capacity to cope with and mitigate chemical risks. Many environmental health risks are preventable or can be mitigated. Public access to a wide range of information, such as data on pollutant emissions and ambient air quality conditions, is instrumental to reduce the risk of exposure for individuals and vulnerable communities.

In the fall of 2010, the North American Commission for Environmental Cooperation (CEC) announced that it would fund projects to improve the environmental health of the vulnerable communities in North America. EPA's Office of Information Analysis and Access (OIAA) submitted a proposal under this priority, and the project was approved. The EPA/OIAA project seeks to develop a framework for building capacity among individuals throughout North America (with a particular focus on vulnerable populations) to make more informed decisions about how to protect their health from environmental contaminants and global hazards. This framework document, which is nearly finalized, identifies and describes the factors that need to be considered in the characterization of an individual's or community's vulnerability to the health consequences posed by

environmental pollution throughout North America. This presentation will provide a general overview on the development of this framework, the factors discussed therein, and the intended application of the framework document.

TRI Curriculum Project for Universities and High Schools

John Katers & Jake Eggert, University of Wisconsin - Green Bay

Drawing from curriculum that has been successfully utilized for almost fifteen years in the Pollution Control course at the University of Wisconsin – Green Bay (UWGB), a comprehensive instructor’s manual was developed for the implementation of a TRI based class project. Graduate students in the Environmental Science and Policy Program at UWGB developed the manual in the fall 2013. In the spring of 2014, several sessions will be completed by UWGB students at area high schools and the manual will also be utilized for the first time in the Pollution Control course during the fall of 2014. The instructor’s manual provides detailed information on how to implement the curriculum, as well as how it may be utilized in other university or high school environmental programs. Guidelines are also provided on the assessment of the paper and presentation, which are required from the students for the successful completion of the project.

It should be noted that the student presentations essentially serve as “virtual tours” of the facilities selected for the project, which complements the actual industry tours that are also completed as part of the Pollution Control course. For the high school students, after an introductory session the students will be tasked with conducting research, either individually or as a class, on the TRI data and industries in their communities. During a follow-up session, students will present their findings and evaluate how effective current and proposed measures are for dealing with the pollutants that were identified. The intent of this curriculum is to allow students the opportunity to research the environmental performance and impact of a company within their own community. Therefore, the project takes a significant real world problem, pollution, and connects the students with this problem within their own community.

Keeping Track, Promoting Health Classroom Modules: Developing Plain Language Materials for Environmental Health Classroom Instruction

Ify Mordi, Association of State and Territorial Health Officials

Education lays the foundation for practice throughout a career. What we first learn becomes our default; the tools we discover become our “go-to” resources. CDC developed the Keeping Track, Promoting Health Classroom Modules. These modules are designed for college-level instruction on environmental public health using CDC’s National Environmental Public Health Tracking Network (Tracking Network). The modules are intended to educate future public health and environmental health professionals on the basics of environmental public health, and application of those principles within the Tracking Network, through real-life, case-based scenarios.

If new curriculum lessons are going to be used, they must be simple for instructors to implement and explain to students with minimal preparation. The relationship between health and the environment is a very difficult concept to explain. Add to that the complex structure of the Tracking Network and the complicated terminology involved in surveillance, and you have a web of terms and concepts that even an advanced degree professional might find difficult to grasp.

The materials were pilot tested by 11 professors and 46 students in classrooms at universities. Just over half (55%) of instructors say they are “very likely” to use this coursework in their regular teaching program, and 36%

said that they are somewhat likely. A majority of the students found the modules to be engaging and reported they sparked discussion in class.

The Keeping Track, Promoting Health Classroom Learning Modules will expand use of Tracking Network data and increase understanding of the need to collect information about the impact of the environment on health. By engaging academic communities, the Tracking Branch has the opportunity to involve the next generation of leaders as well as their professors in becoming active users of environmental public health data, thereby furthering awareness of environmental exposures and the impact on individual and community health.

The Many Paths Forward for the TRI Program

Sean Moulton, Center for Effective Government, Rick Hind, Greenpeace & Adam Kron, Environmental Integrity Project

EPA's Toxics Release Inventory (TRI) database enables the public to learn about the environmental risks in workplaces and communities by providing information about hundreds of toxic chemicals released into the environment. The easy access to pollution information has empowered citizens to push for improvements, and facilities have acted to reduce releases.

Until about 2001, regular enhancements and expansions to the program were a common occurrence. Despite the overall success of the program, a 60% reduction in total releases of toxic chemicals since 1988, TRI has stagnated and is long overdue from some significant improvements and upgrades.

While some improvements have been made in the past three years (e.g., adding more chemicals, announced plans to add more industry sectors, releasing its raw data earlier, redesigned its website, and finalized an electronic reporting rule), more needs to be done to keep the program vital and maximize the usefulness of the reporting. The program must be more systematic in its improvements, and consider several paths to further expand and reinvigorate the program for it to regain its rightful position as a leader in community right-to-know.

The Center for Effective Government will host a panel discussion that explores several paths forward for the TRI program. The panel, which includes experts from public interest organizations, will focus on expanding information provided under TRI and improving management of the program. Panelists will address: What industry sectors and chemicals should be added? What should the process be for adding them? What additional information should be collected? What can the TRI program learn from other regulatory programs? How can the program better track reporting facilities? How can TRI be further used to prevent pollution? The panel includes 3 speakers and a moderator.

Additional Comments: The Center for Effective Government (CEG), formerly OMB Watch, is a nonprofit organization located in Washington, DC. The organization's mission is to increase transparency and public participation in the government. Since 1989, CEG has maintained www.rtknet.org, a website through which the public may access TRI data free of charge, as well as information from several other EPA databases. CEG has championed citizens' right to know about releases of toxic chemicals for almost three decades, allowing us to work with numerous citizens, businesses, academics, and advocacy organizations who use and depend on TRI data.

EPA's TRI Community Engagement Initiative – What's New and What to Expect Next

Shelley Fudge, Amanda Patterson & Carol Ann Gross-Davis, U.S. EPA

In 2012 – 2013 EPA conducted four TRI Community Pilot Projects to test new approaches for raising awareness about TRI at the community level. This presentation will provide participants with the results of the pilots, including lessons learned and responses from the pilot communities to each of the four special trail-blazing projects that were produced, such as an EPA community-scale mapping project displaying the proximity of TRI and other EPA regulated facilities with sites where youth and senior citizens congregate, and a creative comic-book style fotovovela to introduce U.S. Spanish speakers to TRI. The presentation may be in the form of a panel discussion and it may include a representative from one of the community pilots. The presentation will also include information about how EPA plans to follow up on the pilots to further enhance the Agency's community engagement efforts.

In addition, we propose to do poster session that about EPA's TRI Community Engagement Initiative. The poster session will feature information about the initiative's pilot projects and other efforts to raises awareness at the community level about the benefits to communities of using TRI. The poster will feature EPA's online TRI tool for smart phones and for a community-based audience, MyRTK, as well as the TRI P2 Search Tool, and information about several other community-oriented TRI products.

Using the TRI Pollution Prevention Tool to Compare Facilities and Identify Sustainable Practices

Daniel Teitelbaum, U.S. EPA

Since 2012, the TRI Program has taken various steps to improve the quality, accessibility and usefulness of its pollution prevention (P2) information. This session will demonstrate how you can use TRI tools to identify reported P2 achievements and will highlight some of the P2 stories from companies that have led the way in implementing and reporting P2. Session will also include a panel of representative from these companies who will discuss their toxic chemical reduction initiatives and provide perspectives on TRI and P2. Companies are being selected based on the quality and quantity of their optional pollution prevention submissions and the extent to which their toxic chemical waste management quantities have trended downward in recent years.

How Does Pollution Prevention Affect U.S. Toxic Releases?

Matthew Ranson, Abt Associates

This talk would present findings of a quantitative analysis on the impacts of specific pollution prevention approaches on the long-term declining trend in releases reported to TRI. Initial results suggest that most categories of source reduction projects cause sharp, statistically significant reductions in TRI releases in the year after a project is implemented.

Erasing the Refinery: Industry and Air Pollution as Hidden Urban Stressors Abstract

Carol Ann Gross-Davies, U.S. EPA & Drexel University

Social stressors can contribute to the effects of exposure to environmental hazards. With respect to air pollution, social stressors have been shown to interact with the effects of chemical exposures in changing health outcomes. While studies are emerging that demonstrate exposure to air pollution and its sources is a form of psychosocial stress, few if any have investigated the nature of this stress.

This study uses qualitative data collected from eight focus groups of residents in multiple urban neighborhoods of Philadelphia, U.S.A., about their perceptions of air pollution, a nearby oil refinery, and effects on individual and community health. Participants were not as concerned about air pollution when compared to issues of social and physical disorder, such as crime and pervasive trash. However, further discussions revealed that the refinery and its emissions are really the “elephant in the room”, and that desensitization to this issue may be a coping mechanism to preserve health and to protect against feelings of vulnerability. At the same time, the idea of improving air pollution raised feelings of distrust and fear of displacement. Our findings indicate that air pollution poses more than the risk of disease via inhalation pathways, but may also strongly contribute to physical and psychosocial conditions that act as community-level social stressors. Cumulative risk assessments, community-level health studies and interventions should account for these stressors, and concomitantly address unequal distribution of resources, employment and educational opportunities.

Beyond the Neighborhood: Understanding the Unequal Distribution of Environmental Hazards across U.S. Neighborhoods

Juyoung Lee, Brown University

This research project aims to understand how large-scale social processes shape the distribution of environmental hazards across U.S. neighborhoods. Previous quantitative studies on environmental inequality have documented the disproportionate proximity or exposure of disadvantaged social groups to environmental hazards by examining the association between neighborhood characteristics and environmental outcomes. However, we cannot fully understand neighborhood-level variation in environmental hazards without taking into account social processes that operate on broader geographic scales. These social processes include, but are not limited to, the activities of corporations, governments, and environmental movement organizations, all of which vary from one place to another.

The present study focuses on the manner in which the operations of state governments, in conjunction with neighborhood characteristics, shaped the environmental performance of polluting industrial establishments during the first decade of the twenty-first century. In particular, I will address the following issues: (1) how the racial and socioeconomic attributes of neighborhoods influenced the environmental performance of polluting facilities; (2) how state governments' efforts in environmentalism, such as governmental expenditure on environmental issues and pro-environmental legislation, affected facilities' environmental record; (3) how state-level economic conditions mediated the impacts of state government efforts on local environmental outcomes; and (4) how the integration of minorities into local political institutions conditioned the relationship between neighborhood racial composition and polluting facilities' environmental performance. To answer these research questions, I estimate a series of hierarchical generalized linear models with a multilevel dataset of approximately 2,000 facilities nested within the contiguous forty-eight United States. The necessary information is obtained from the TRI program, the 2000 U.S. Census, and several other sources. This study intends to offer a multilevel explanation of local environmental outcomes that considers both neighborhood characteristics and larger social processes beyond the neighborhood.

Advancements and Methodologies for Toxic Emission Accounting from Storage Tanks

Sarah Sajedi, ERA Environmental Management Solutions

The accuracy of a business' Toxic Release Inventory report is only as reliable as the methodologies used to calculate the emissions released through material processing. Tanks are one of the most common types of emission sources within the United States, yet they also present some of the most difficult and complex emissions calculations. As such, they represent a potential weakness and enormous opportunity for increasing the accuracy and usefulness of TRI reporting, particularly for the Oil and Gas industry and other petrochemical

manufacturers. The goals of the oral presentation will be to improve the quality of TRI information, increase the accuracy and ease of TRI reporting, explore advancements in information technology, and promote environmental education and stewardship.

Air emission expert Sarah Sajedi, will give a presentation on overcoming the challenges of reporting for and monitoring the hazardous air emissions from storage tanks, including a discussion on the most accurate and feasible methods of correctly reporting tank emissions for TRI reports. The presentation will outline the science and calculations used for a number of tanks and tank-related processes: hot and heated tanks, fixed-roof tanks, mobile tanks, loading/unloading, and control equipment (flares, VRU, VCU, etc.). In addition, the presentation will cover current best practices for EH&S managers to stay on top of their tank emissions, how to develop a continuous stream of information which can be used for TRI reporting, and how an EH&S department can accurately report on tank farms and batteries even a great distance away. The presentation will also educate attendees about the most recent regulatory changes affecting tank emission reporting, including emissions accounting for Alternate Operating Scenarios and Maintenance, Startup and Shutdown (MSS) events – both of which are difficult to account for but must be included in site-wide TRI reports.

TRI-MEweb: Tackling the Electronic Reporting Challenge

Juan Parra, U.S. EPA

This presentation will focus on newest features of the TRI-MEweb reporting tool. I could also answer questions from the public. It will also talk about what is coming in RY 2014.

Environmental Pollutants and Low-Income Children's Development Across Urban, Suburban, and Rural Communities

Portia Miller & Elizabeth Votruba-Drzal, University of Pittsburgh

Low-income children face, on average, increased levels of environmental pollution, such as air pollution and toxins like lead and solvents, when compared to their more advantaged counterparts.

Exposure to such pollutants has been linked to diminished cognitive ability, behavioral difficulties, and health problems. In fact, exposure to pollution has been hypothesized as a pathway through which poverty threatens child development. Recent evidence shows that economic disadvantage may be particularly harmful for the development of children living in large urban cities when compared to children residing in suburbs and rural areas.

Variation in pollution across the urban-rural continuum may explain these findings. This study will examine differences in pollution in the neighborhoods of low-income children living in communities spanning the urban-rural continuum. Furthermore, it will test whether differences in pollution across the urban-rural continuum explain urbanicity-related variation in disadvantaged children's development. Data come from the Early Childhood Longitudinal Study, Kindergarten Cohort—a nationally representative, longitudinal study of approximately 22,000 children entering kindergarten in 1998. Children were followed through eighth grade to assess their development. The sample contains a large subsample of low-income children living across the urban-rural continuum. Several measures of child functioning were collected, including measures of achievement, behavior, and health.

Using participants' census tract or zip codes, measures of pollution will be created using Toxic Release Inventory (TRI) and National Air Toxics Assessment (NATA) data. We will begin by examining mean differences in pollution in large urban, small urban, suburban, small town, and rural communities that low-income children reside in. Next, multivariate analyses will explore whether environmental pollution explains disparities in disadvantaged

children's academic, behavioral, and health outcomes across the urban-rural continuum. In answering both questions, we will explore whether different geographic aggregations of TRI and NATA data or subsets of chemicals more strongly relate to mean differences across urbanicity or children's outcomes.

The Health Equity Index: Correlating TRI data with health outcomes in Connecticut

Michael Knapp, Green River

The Health Equity Index (HEI) is a web application comparing community, social and environmental conditions with health outcomes. Its purpose is to promote well-being for residents experiencing disproportionate burdens of disease and disability. To incorporate environmental indicators, Connecticut TRI data were mapped to geographic areas using a probability function, and correlated with 62 health outcomes. Four TRI indicators measuring proximate facilities, air, water and waste stream were incorporated into the HEI, and scored on a decile scale.

TRI scores were aggregated to the 2,616 census block groups in Connecticut. Each block group's TRI scores reflected the cumulative burdens originating in the proximate point sources. Burden scores were calculated as the sum of $[a * e^{(-1 * (\xi^2) / (2 * s^2))}]$ for all ξ from $i=1$ to n , where: ξ is the distance between a block centroid and a TRI point source within a maximum radius; a is a TRI indicator value of the point source; s is the environmental burden spread constant; and n is the number of proximate point sources. Spearman correlation coefficients above 0.5 were observed for proximity to TRI facilities and some health outcomes.

The correlated outcomes included an infectious disease and a health care access indicator. The correlation changed markedly when the data set containing 169 Connecticut towns was stratified into groupings of urban, suburban, and rural towns. In the largest cities, the correlation between TRI scores and infectious disease was zero, whereas the correlation was much higher for rural and suburban subsets. Stratifying by race/ethnicity, we observed higher correlations between TRI scores and health outcomes among whites than among racial minorities. The observation that location of facilities reporting to TRI correlates with both demographic and health characteristics is intriguing, with potential implications for environmental justice, and should be explored further.

Assessment of the Distribution of TRI Facilities in Metropolitan Charleston: Environmental Injustice, Goods Movement & Policy

Sacoby Wilson, University of Maryland

Objectives: We assessed spatial disparities in the distribution of Toxic Release Inventory (TRI) facilities in Charleston, South Carolina, as part of a community-driven research program to assess the cumulative burden and impact of industrial facilities and unhealthy land use in the Charleston region. We aimed to ascertain whether the racial and SES composition of census tracts with a TRI facility differs from the composition of those that do not have a TRI facility.

Methods: We used spatial methods and regression to assess burden disparities in the study area at the block and census-tract levels by race/ethnicity and socioeconomic status (SES). We employed 3 GIS methods to ascertain the demographic profile of populations burdened by TRI facilities in the Charleston MSA: (1) mean distance analysis, (2) spatial coincidence, and (3) proximity analysis.

Results: Results revealed an inverse relationship between distance to TRI facilities and race/ethnicity and SES at the block and census-tract levels. Results of regression analyses showed a positive association between presence of TRI facilities and high percentage non-White and a negative association between number of TRI facilities and high SES.

Conclusions: There are burden disparities in the distribution of TRI facilities in Charleston at the block and census-tract level by race/ethnicity and SES. In future analyses we will explore the intersection of communities being overburdened by environmental hazards and also underserved by health infrastructure using the 2010 US Census Health Professional Shortage Area (HPSA) designation. We will also explore the policy implications of this work as it relates to goods movement and the expansion of the Port of Charleston.

Communication and Enforcement of Scientific Outcomes among Vulnerable Communities: An Environmental Justice's Perspective in North Charleston Neck Communities, South Carolina

Olalekan Ogunsakin, Tulane University

Environmental injustice and health disparities are still evident among vulnerable communities across the country, especially in the port cities like Charleston, South Carolina. These communities are mostly populated by low income populations and populations of color with diverse exposure burdens and adverse health outcomes. Among North Charleston Neck communities, several studies have been done to assess the level of exposure of residents to ubiquitous environmental hazards and toxicants. In addition, many projects have been conducted and are ongoing to evaluate the spatial disparities in the distribution of Toxic Release Inventory (TRI) facilities in these vulnerable communities. However, there are gaps between exposure assessments and communication-cum-enforcement of the scientific outcomes among all the stakeholders. There is the need to extend the community-based participation beyond scientific research phase to the phase of policy communication and enforcement as a virile means of effectively mitigating exposure and burden of environmental hazards.

The primary objective of this project involved the assessment of progress that has been attained in Charleston Neck communities with respect to exposure assessment and mitigation compliance by the stakeholders. Of particular interest is the exposure assessment of particulate matter (PM 2.5 and 10) among vulnerable communities in North Charleston in the wake of ongoing port expansion. The port expansion project was embarked upon to position Charleston ports for larger ships and businesses from the expanded Panama Canal. The Environment Impact Statement (EIS) conducted in 2005 predicted the average concentration of PM_{2.5} as 47.0 ug/m³ after port expansion as against the present concentration range of 11.0 - 13.5 ug/m³ from the air quality measurements. Our secondary objective centered on developing comprehensive criteria as an all-encompassing model to bridge the gaps between science, communication and enforcement among vulnerable populations, an effective tool that can be utilized by other port communities across the country.

Toxic Release! An Eco-Educational Role Playing Game

Curt Gervich, Jake Eudene, Christopher Evans, & Jim Fonzone, SUNY Plattsburgh

This session will provide participants the opportunity to play Toxic Release! An Eco-educational Simulation. Toxic Release! was created by students at SUNY Plattsburgh as part of the Toxics Release Inventory (TRI) University Challenge, with support from Caitlin Briere and Nora Lopez. The compounding elements of toxic releases make teaching and learning about them difficult. For example, toxic releases have multifarious source/sink dynamics, high-stakes risk profiles, complex timelines and passionate stakeholders with conflicting concerns and objectives. Furthermore, the environmental and health-related impacts of hazardous releases are difficult to pin down, and challenging for scientists to communicate to constituents.

As a result, the management of toxic releases and associated processes of risk reduction and policy development are difficult to explore in conventional classroom settings. Toxic Release! overcomes many of the barriers to effective teaching and learning about toxic releases through a participatory, computer-based environmental management and policy development simulation. In other words, a game. The purpose of this game is to use TRI data to make the invisible dynamics associated with toxic releases more tangible. The game

allows participants to assume the roles of industry professionals, community members concerned with environmental and human health, and government regulators.

Stakeholders then use computer models founded upon data from the TRI, role play and environmental problem-solving frameworks to manage a toxic release scenario. The simulation pushes participants to think creatively while collaborating to explore the science, risk, management and policy development processes related to toxic releases. The scenarios included in the game mirror real-world cases, as documented by the TRI program and National Public Radio's Poisoned Places series.

Our conference session will give participants the opportunity to play Toxic Release! The session will be lively, fun, informative and unique, and will showcase an innovative product from the TRI University Challenge.

Assessing Green Chemistry Success

David Constable, American Chemical Society Green Chemistry Institute

For nearly two decades, product and process changes through the application of green chemistry and engineering principles have led to measurable advances in environmental protection and pollution prevention. Every year more companies across the world are employing innovative technologies and operating practices that reduce toxics emissions and toxics in products. Detailed metrics are critical in order to demonstrate progress in the chemical industry and the reduction of toxics releases. This talk will examine selected green chemistry breakthroughs by industrial leaders that embody the types of progress the EPA tracks. The bulk of the presentation will discuss tools and metrics companies are using to assess their sustainable and green chemistry and engineering efforts.

Role of the TRI and Green Chemistry in DuPont's Sustainability Journey

Robert J. Giraud & Robert A. Reich, DuPont Company

DuPont is committed to sustainable growth. For us, that means creating shareholder and societal value while reducing our environmental footprint. As part of our holistic approach to sustainability, we strive to achieve environmental footprint goals set to reduce our operational impacts, including decreasing emissions of air carcinogens, water consumption, energy usage, and greenhouse gas emissions. In the U.S., DuPont has reduced total TRI environmental releases by over 50 percent since the first TRI report in 1987. This is a substantial reduction considering the TRI program has expanded significantly to include 650 chemicals and chemical categories during that time. The significant company-wide decrease in TRI emissions through the years can be attributed to numerous individual projects at several manufacturing sites and facilities that contributed to the overall reduction, including process modifications employing the principles of Green Chemistry. This presentation will highlight TRI emission reductions achieved through applying the tools of Green Chemistry and describe DuPont's efforts to plan and track environmental footprint reductions on our continued sustainability journey.

TRI as a Tool to Measure Green Chemistry Progress: A Pharmaceutical Case Study

Cheryl Keenan, Abt Associates

Pharmaceutical firms have reported that implementation of green chemistry practices in their manufacturing processes have significantly reduced the quantities of toxic chemicals they use, release to the environment, or otherwise manage as waste. Using the United States Environmental Protection Agency's (EPA's) Toxics Release Inventory (TRI) database and literature publications, we conducted research to assess this claim. Our analyses show that over the 2002 through 2011 timeframe the quantities of toxic chemicals reported annually by

pharmaceutical manufacturing facilities to EPA's TRI Program as released to the environment or otherwise managed as waste have declined steadily and by more than 60%. Our analysis tests and rules out factors other than green chemistry as driving this trend such as outsourcing, the economic recession, regulations, shifts to other waste management practices, or TRI reporting characteristics by the larger pharmaceutical firms. Our research indicates that the downward trend in waste resulted primarily from implementation of green chemistry practices. Moreover, we believe the TRI is uniquely well-suited for assessing the progress made by different industry sectors or specific facilities therein in implementing green chemistry practices: a use of the TRI that previously has not been reported.

Community-Based Research on TRI Exposure Risks using Online Environmental Geographic Information Systems (GIS)

David A. Padgett, Tennessee State University

The primary objective of this workshop is to introduce community stakeholders to geographic information systems (GIS) mapping-supported environmental websites, many of which include Toxic Release Inventory (TRI) data. The ten online portals to be demonstrated include US Environmental Protection Agency websites such as - the Environmental Justice Viewer, the TRI Explorer, and the EnviroMapper. The National Institute of Health (NIH) TOXMAP website, the Environmental Defense Fund's Scorecard site and several others will also be examined. Workshop participants will be introduced to tutorials designed to assist them in effectively accessing geospatial TRI and other community exposure risk data from each site. The tutorials are designed to make online research, and community-based mapping, as user-friendly as possible, especially for individuals who may have limited computer experience.

The GIS mapping tools hosted by many of the sites offer excellent opportunities for stakeholders to visualize the scope of environmental issues impacting their lives; however, new users may need support in using the tools effectively. The presenter will provide guidance to enable even novice researchers to assess toxic exposure risks in their communities. Participants will be asked to complete a brief survey instrument asking them to share their familiarity with online environmental GIS mapping sites. At present, there is little knowledge of what percentage of site users are "grassroots" stakeholders, and/or are from vulnerable populations. Anecdotal evidence to date suggests that the majority of users are government agencies and academic researchers.

A second objective of this workshop is to increase awareness of the numerous online environmental exposure mapping sites among community-based stakeholders outside of academia and government organizations. Previous workshops led by the presenter show that with a small amount of assistance, individuals with limited computer literacy are able to navigate the sites and produce exposure risk maps, most notably pre-teen and elderly stakeholders.

Environmental Justice Mapping at EPA

Kim Balassiano, U.S. EPA

The EPA takes environmental justice into account when making regulatory, resource and other decisions. Come see a demonstration of EPA's latest mapping tool required for use when screening for areas of potential environmental justice.

Facility Registry Service Data Quality Initiatives

David Smith, U.S. EPA

The Facility Registry Service (FRS) team will present on TRI facility data quality, with some updates regarding locational data, and will also introduce some data quality initiatives in FRS such as secondary steward capabilities which will additionally empower program offices like TRI toward data quality analysis, as well as discussing REST web services for front-end integration and validation.

Understanding Toxic Chemical Releases to Surface Waters in the Mid-Atlantic Region

Wayne Davis & Carey Johnston, U.S. EPA

The two major sources of information on US facility discharges of toxic chemicals to surface waters are the Discharge Monitoring Reports (DMR) required under the National Pollutant Discharge Elimination System in the Clean Water Act and the Toxics Release Inventory (TRI) required under the Emergency Planning and Right to Know Act (EPRCA). A pilot study was conducted in the Mid-Atlantic Region of the US to evaluate the precision, accuracy, representativeness, completeness, and potential use of information submitted to the DMR and TRI data systems using an online analytical tool.

This study identified submission errors, differences in reporting of the same chemicals by the same facilities to the DMR and TRI Programs, potential omission of reporting under the DMR or TRI program, and potential industry sectors reporting large quantities of toxic chemicals in the DMRs that are not currently required to report under TRI. In most cases, toxic pollutant discharges calculated using the DMR data are higher than those in TRI which may indicate an under-reporting in TRI, but may also be due to data quality issues or different reporting requirements.

TRI Data Quality Initiatives

Velu Senthil & Nora Lopez, U.S. EPA

The presenter will describe various current data quality efforts and their immediate impact on TRI data; and also the presenter will discuss future direction of TRI data quality.