



EPA

United States
Environmental Protection
Agency

Introduction to the Risk Screening Environmental Indicators Model

**Strengthening the Right to Information for People and
the Environment: Study Tour**

World Resources Institute

October 22, 2012

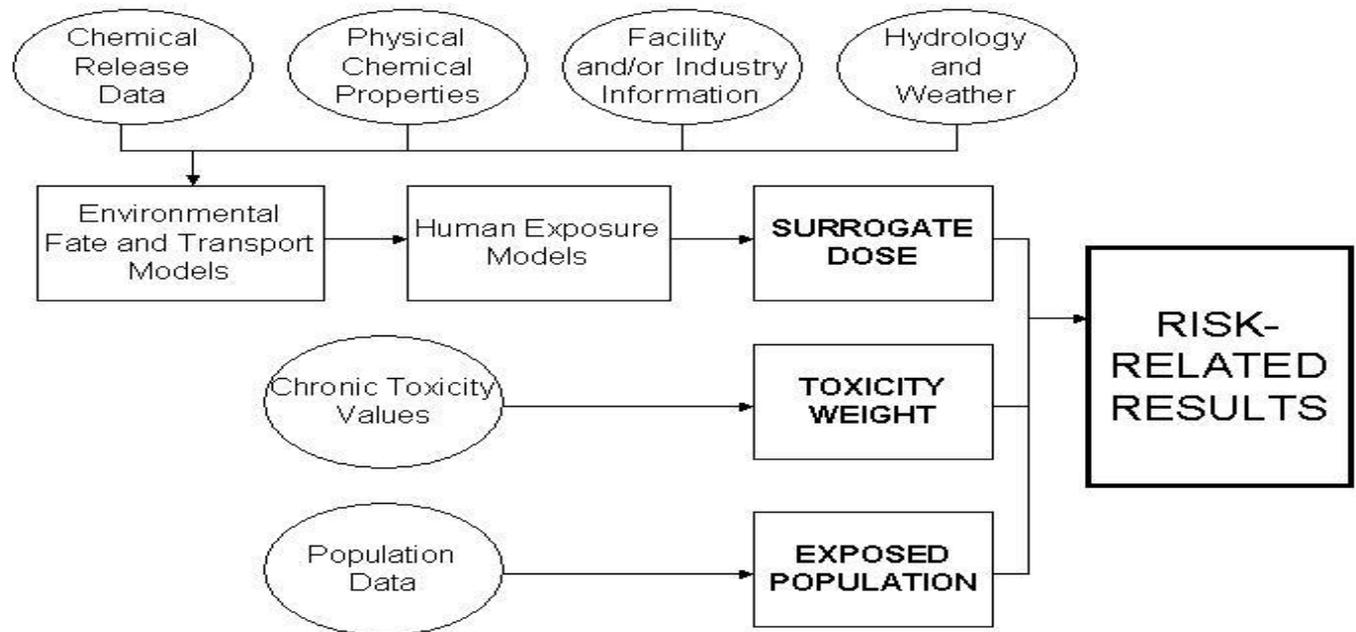
Office of Pollution Prevention and Toxics

- RSEI is a screening-level model that assesses potential chronic human health impacts of industrial releases from pounds-based, hazard-based, and risk-related perspectives.
- RSEI incorporates components of risk assessment:
 - ✓ Amount of chemical released (Toxic Release Inventory data)
 - ✓ Toxicity of the chemical
 - ✓ Fate and transport of the chemical
 - ✓ Route and extent of human exposure
 - ✓ Number of people affected
- RSEI is not a site-specific, formal risk assessment

How Does RSEI Work?

RSEI uses:

- Toxics Release Inventory data
- Existing exposure models and databases
- Reviewed toxicity data



What Kinds of Questions Can RSEI Help Answer?

RSEI

- What are the **trends** in hazard and risk scores associated with toxic chemical releases and other waste management activities at industrial facilities?
- When comparing industries, how can I **rank** which industry sectors are associated with relatively more potential risk?
- What is the relative contribution of specific chemicals to the risk score in a **community** (state, county, city), and how do I **prioritize** these for follow-up activities?
- Are minority and low-income populations disproportionately affected by toxic chemical emissions?
- Is chemical safety improving with respect to industrial emissions of toxic chemicals?
- Who is responsible for the toxic chemicals that affect my neighborhood?
- Do I live in a toxic hotspot? Should I be worried?

RSEI Results in Envirofacts

RSEI

- Home
- Multisystem Search
- Topic Searches
- System Data Searches
- About the Data
- Data Downloads
- Widgets
- Services
- Mobile
- Other Datasets

TRI



List of Facilities Reporting to TRI in Envirofacts

The Toxics Release Inventory (TRI) contains information about more than 650 toxic chemicals that are being used, manufactured, treated, transported, or released into the environment. Manufacturers of these chemicals are required to report the locations and quantities of chemicals stored on-site to state and local governments. The reports are submitted to the EPA and state governments. EPA compiles this data in an on-line, publicly accessible national computerized database. Using this information, citizens, businesses, and governments can work together to protect the quality of their land, air, and water. Note that Envirofacts does not provide any safety or health information about these chemicals and compounds. You may use the [Toxic Release Search](#) for basic facility information and chemical reports, which tabulate air emissions, surface water discharges, releases to land, underground injections, and transfers to off-site locations. The TRI National Analysis website provides a brochure with a quick overview of TRI data for the current reporting year and general trends over the past several years.



TRI Links

- Overview
- Search
 - Search User Guide
- Customized
 - Customized User Guide
- EZ
 - EZ User Guide
- Form R
 - Form R&A Download User Guide
- State Reports
- TRI Explorer
- Data Element Search Tool
- Operator Definition
- Model
- Law
- Contact Us
- TRI Program Home

Report an Error

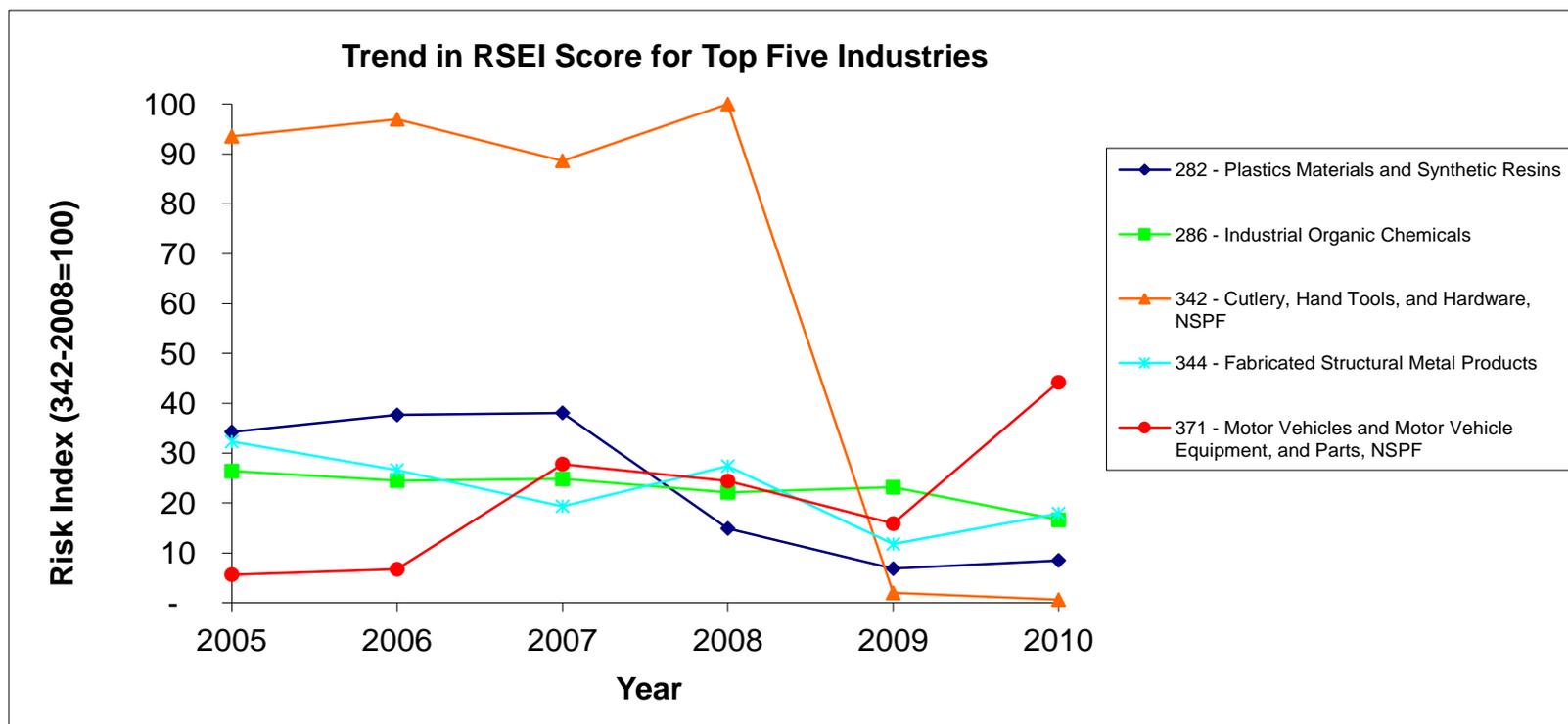
Search Results for:
chicago

*The search results are based upon the facilities that are visible within the map above. To refine your search to a more targeted area of interest, please visit the [TRI Search Form](#). To search Envirofacts via an interactive map, please view your results in [EnviroMapper](#) for Envirofacts

FACILITY NAME	STREET ADDRESS	CITY NAME	COUNTY	STATE	ZIP CODE	SUBMISSIONS	RISK SCREENING
3COM CORP Summary Report	6201 WEST OAKTON	MORTON GROVE	COOK	IL	60053	3	Report
3M CO BEDFORD PARK Summary Report	6850 S. HARLEM AVENUE	BEDFORD PARK	COOK	IL	60501	166	Report
A FINKL & SONS CO Summary Report	2011 N. SOUTHPORT AVE.	CHICAGO	COOK	IL	60614-4079	108	Report
A.G. COMMUNICATIONS SYSTEMS Summary Report	400 NORTH WOLF ROAD	NORTHLAKE	COOK	IL	60164-1659	61	Report
AARHETT ADHESIVES INC Summary Report	2403 N. OAKLEY AVE	CHICAGO	COOK	IL	60647-	11	Report

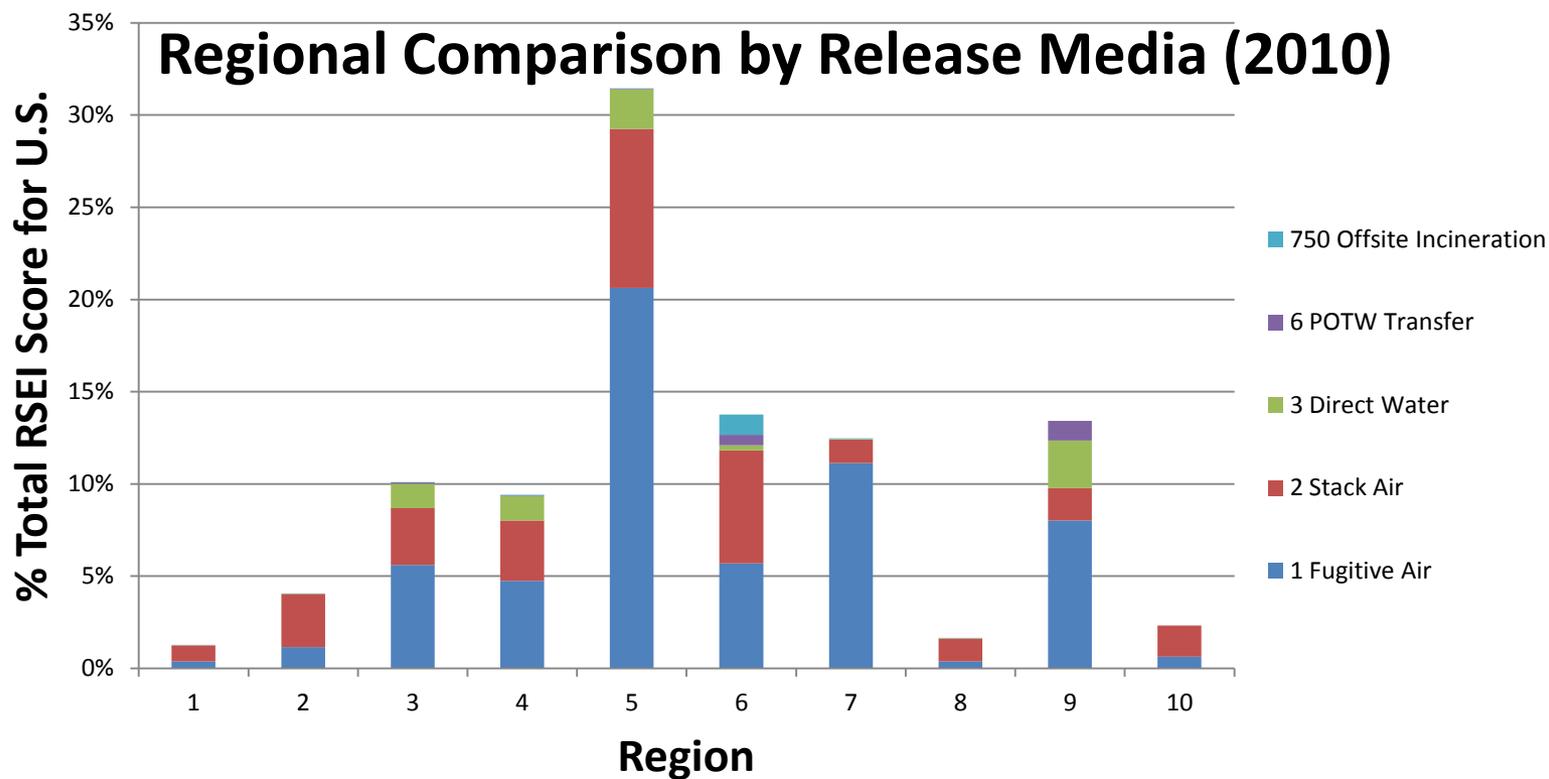
Using RSEI to Analyze Trends

RSEI



Using RSEI to Compare Regional Releases

RSEI

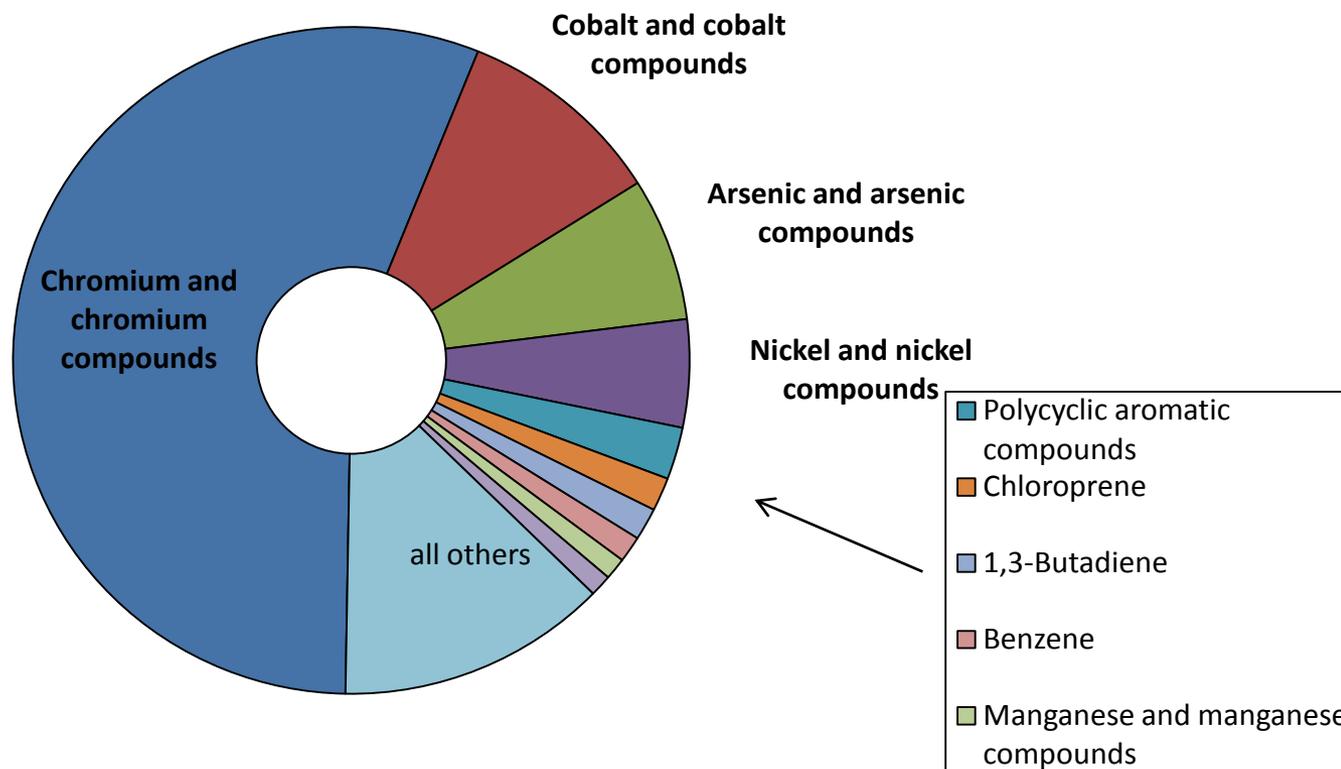


Using RSEI to Compare Regional Releases

RSEI

Top Chemicals in U.S. (2010)

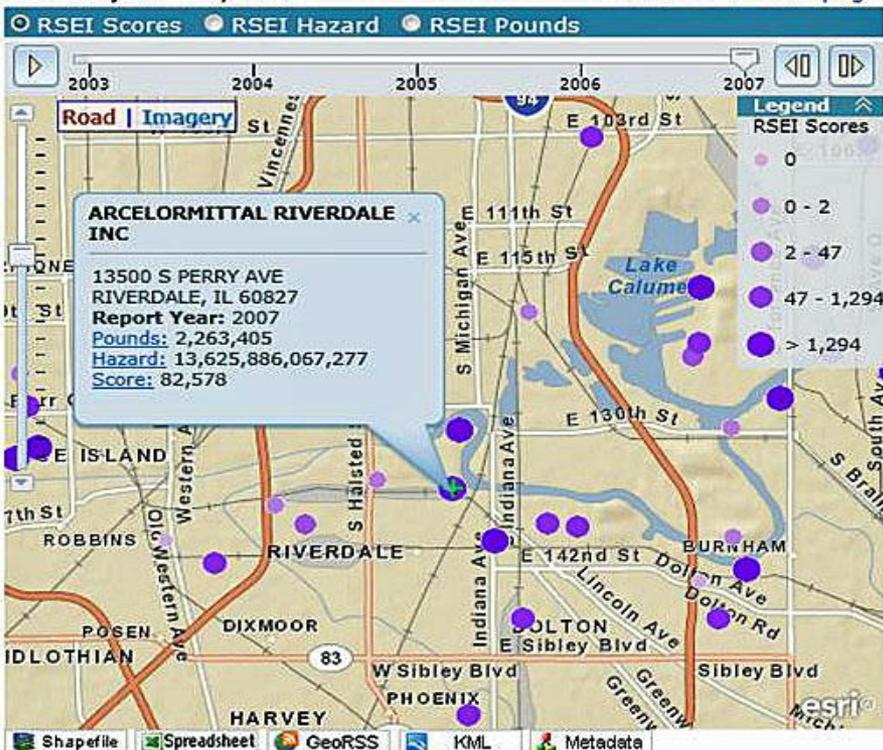
Proportion of Total RSEI Score



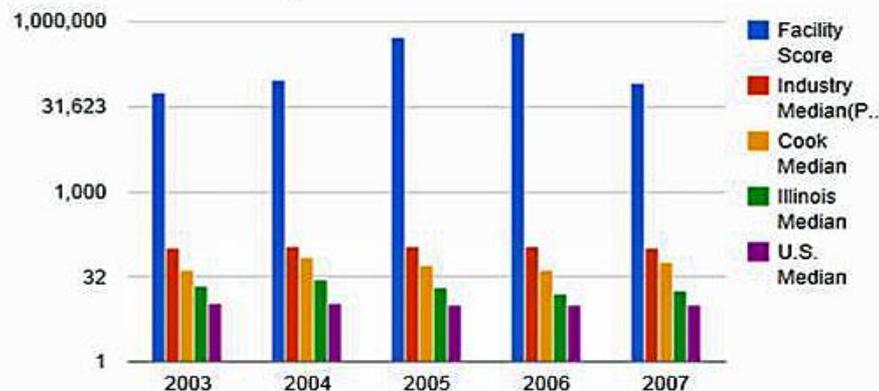
RSEI Results in Envirofacts

RSEI

Facility ID: 60627CMSTL13500
 Name: ARCELORMITTAL RIVERDALE INC
 Address: 13500 S PERRY AVE
 RIVERDALE, IL 60827
 Industry: Primary Metals



RSEI Score Comparison



Year	Facility Score	Industry Median (Primary Metals)	County Median	State Median	U.S. Median
2003	55,077	101	42	22	11
2004	93,266	112	70	28	11
2005	539,640	108	50	21	10
2006	639,174	107	42	16	10
2007	82,578	100	56	18	10

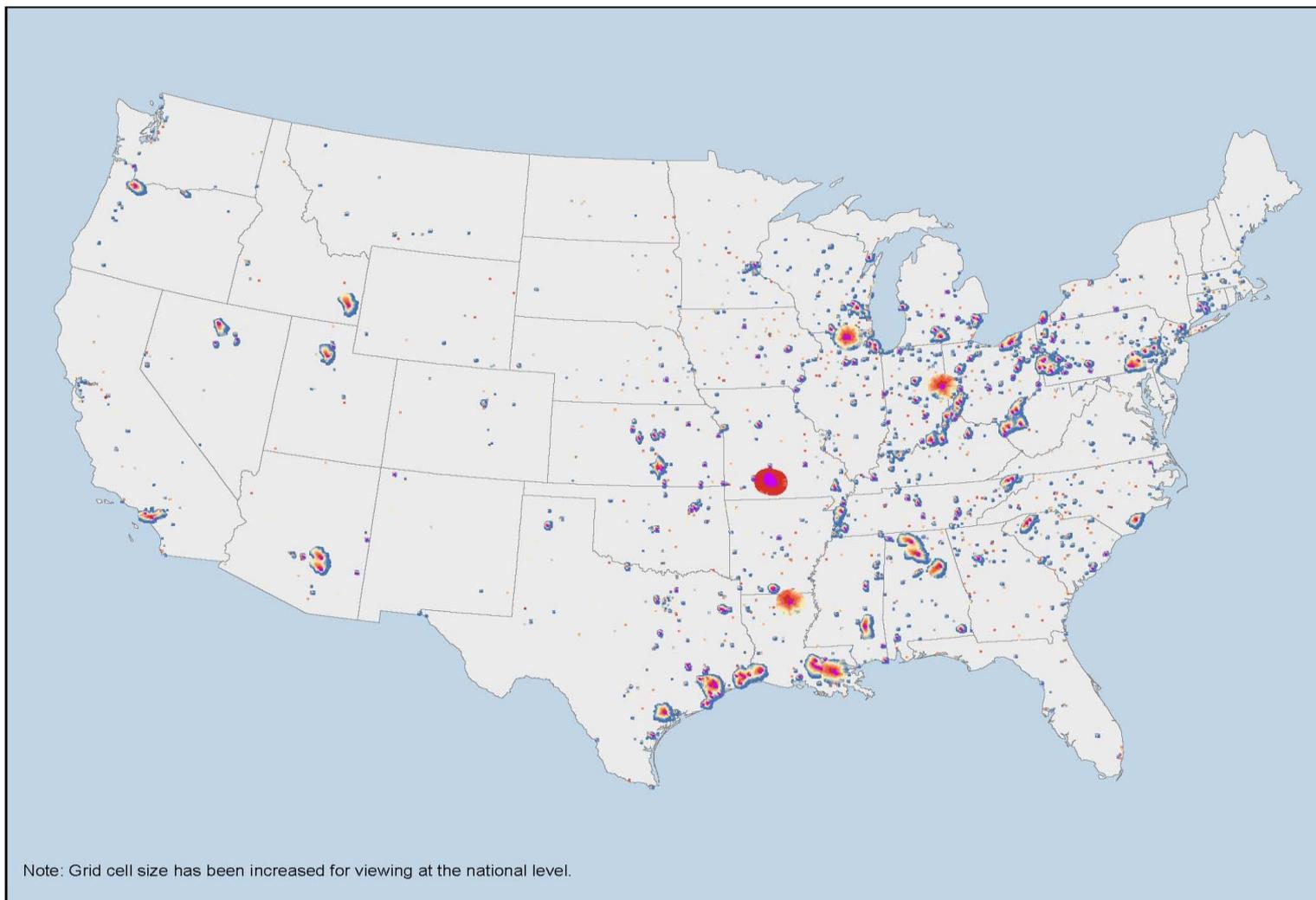


Geographic Microdata (“GM”) RSEI

- Disaggregated RSEI results for air releases in 810 m² grid cell.
- Cell data include: Latitude/longitude, release ID, chemical ID, facility ID, concentration, concentration x toxicity, and RSEI score.
- Cross-walks between grid cells and census block groups are available.
- GM grid can be recreated onto a standard Albers-Equal-Area projection for GIS use.

GM – Hotspot View

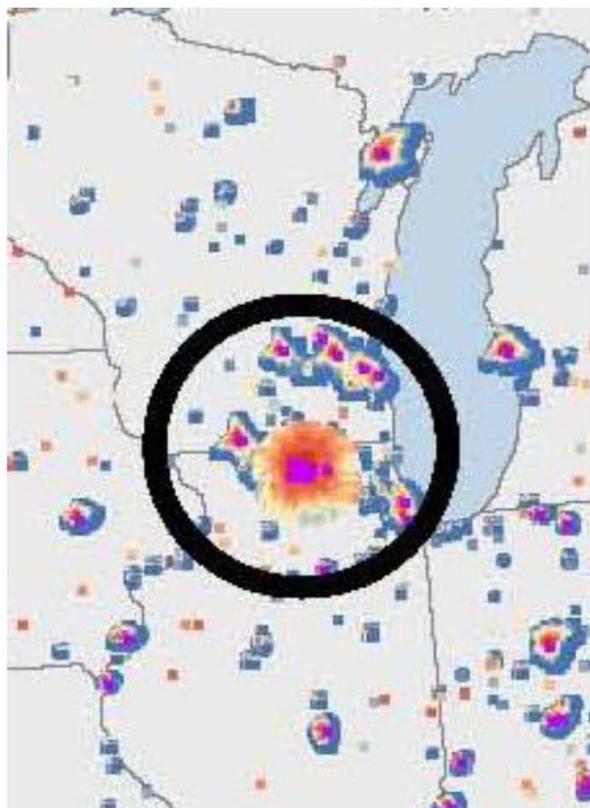
RSEI



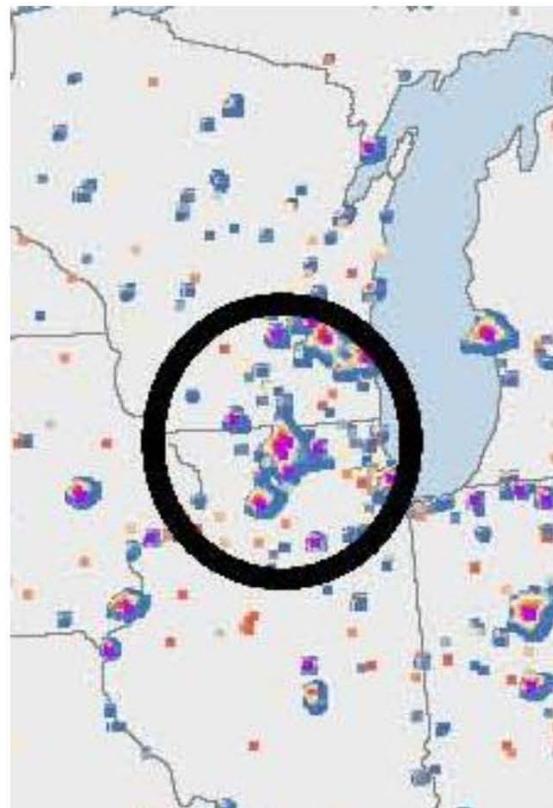
GM-Hotspots Viewed over Time

RSEI

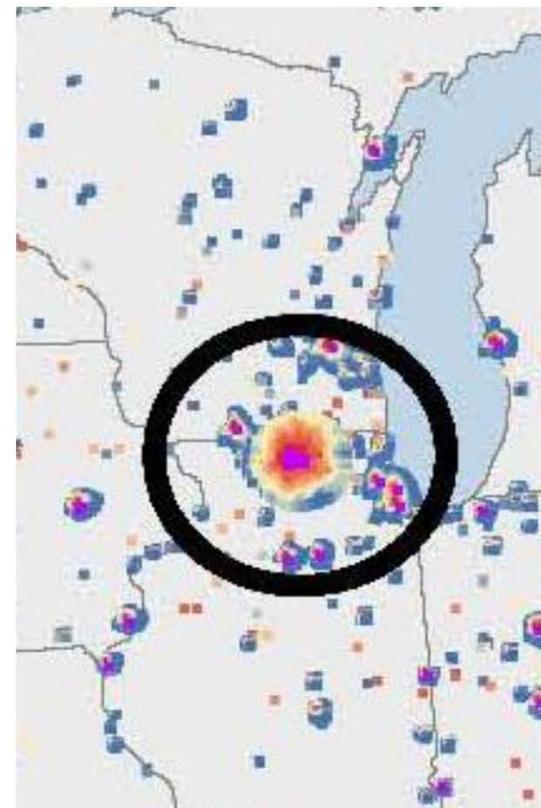
2008



2009



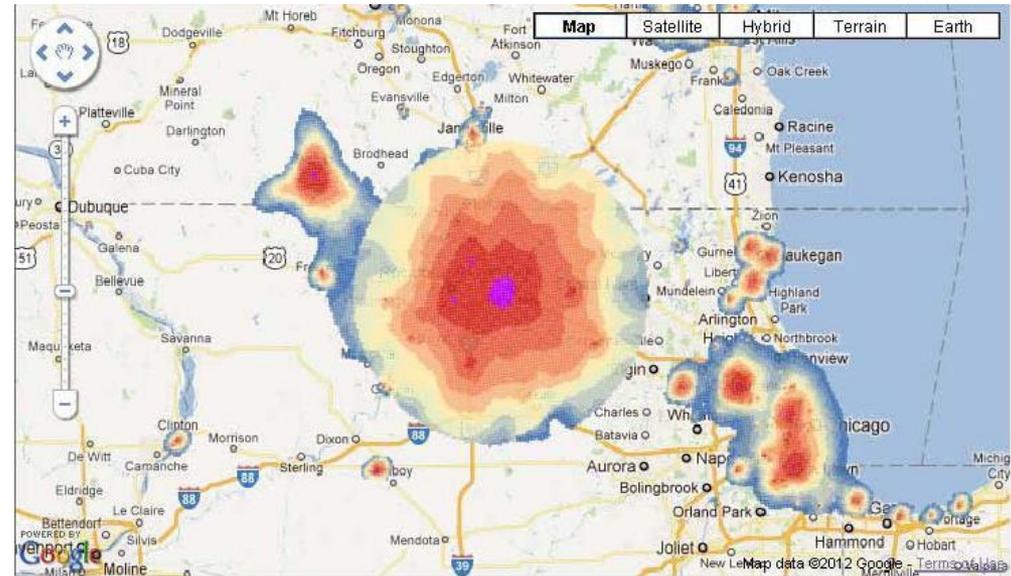
2010



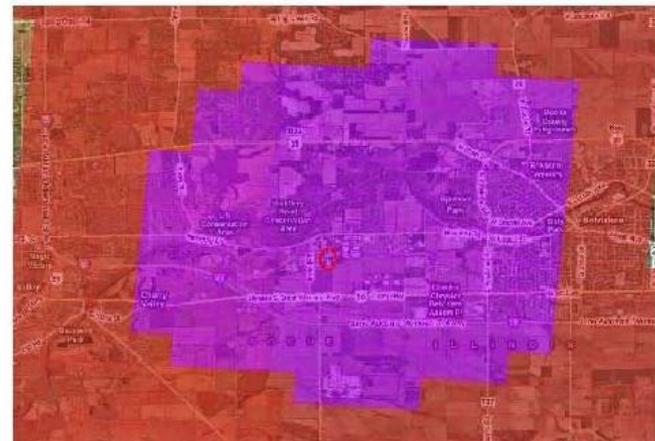
GM - Map Overlays

RSEI

Tox-Weighted
Concentration
overlay on
standard map

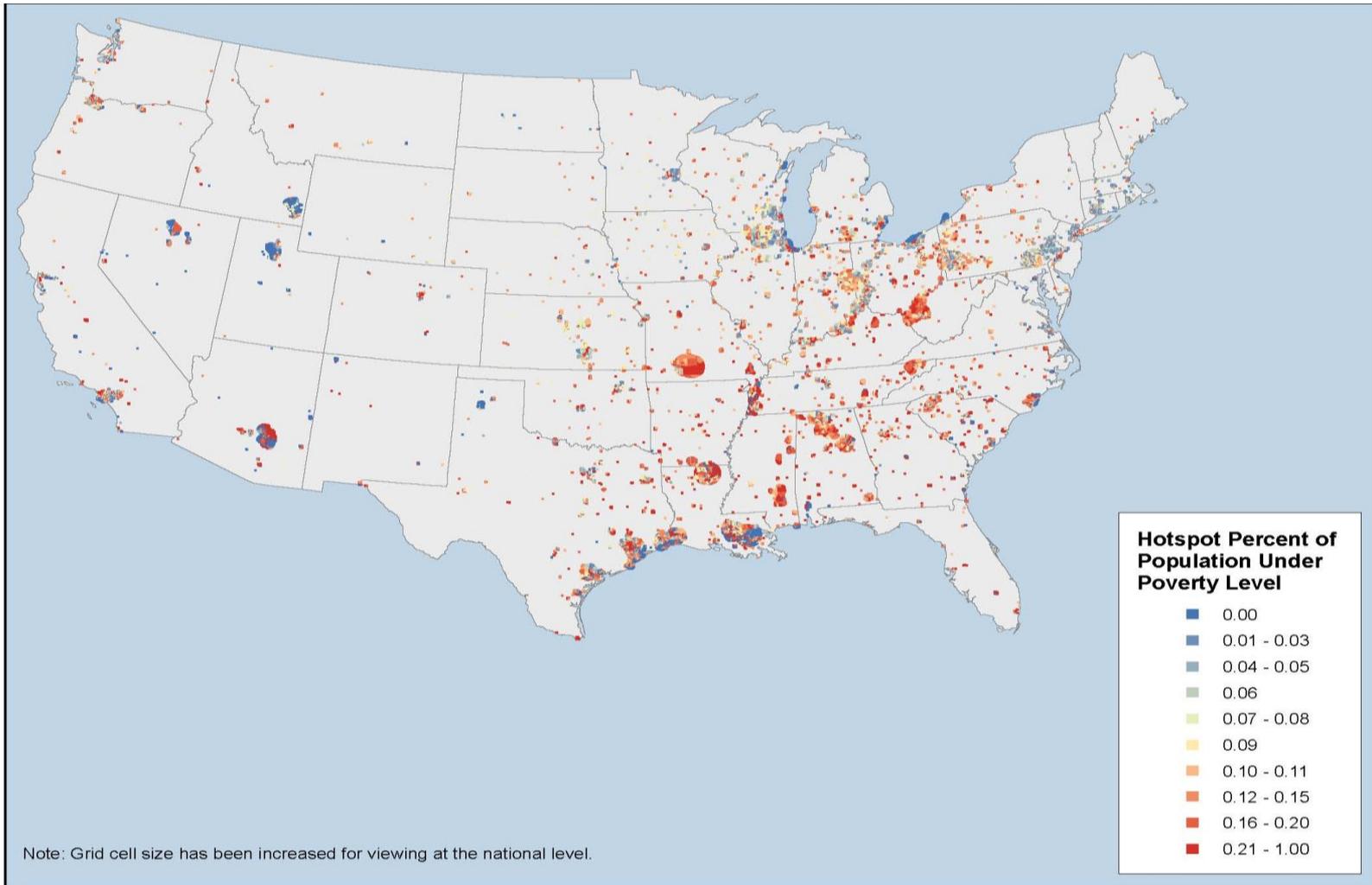


Tox-Weighted
Concentration
close-up overlay
on standard map



GM-Hotspots Combined with Census Data

RSEI



RSEI PROVIDES QUICK PERSPECTIVES ON HAZARD & RISK, BUT IS ONLY THE FIRST STEP!

- RSEI uses facility-reported TRI data which can contain reporting errors. If it's not reported to TRI, it's not modeled in RSEI.
- RSEI toxicity weights are based on chronic human toxicity associated with long-term exposure and do not address acute human toxicity or environmental toxicity.
- Many indirect exposure pathways not considered.
- TRI, and therefore, RSEI, do not cover all sources of TRI-listed chemicals (e.g., small businesses, mobile and agricultural sources).
- RSEI uses simplifying assumptions (e.g., stack height) when specific data are not available.

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www.epa.gov/oppt/rsei