BOLD THINKERS DRIVING REAL-WORLD IMPACT

Using Data Visualization to Tell Meaningful Stories about TRI and RSEI Data in Communities

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Presentation Outline

- Background on TRI data

- Examples of telling stories with data visualization

  – Potential risks from climate change
  – Focus on specific communities and the drivers of chemical releases
  – Applications of RSEI census block group data

Disclaimer

- The information in this presentation is provided by Abt Associates and does not reflect the views or policies of the U.S. Environmental Protection Agency

What data do facilities report to TRI?

- **Facility** data, such as name and location, from 21,000 facilities each year

- **Chemical** data, such as how the chemical is used at the facility, for more than 800 chemicals and chemical categories

- **Release** data, such as on-site releases to air, water, and land

- **Transfer** data, such as the locations of off-site facilities receiving waste transfers

- **Other waste management** data, such as on-site recycling, energy recovery, and treatment

- **Pollution prevention** data, such as any barriers to pollution reduction efforts, including green chemistry activities

- TRI can help communities:

  - Identify TRI facilities located in or near communities.
  - Learn about the annual quantities of chemicals released by TRI facilities.
  - Track increases or reductions of toxic chemical releases over time.
  - Compare the toxic chemical releases and pollution prevention efforts of facilities.
  - Prioritize efforts to reduce pollution from facilities.

Adding Context Using RSEI

- EPA's Risk-Screening Environmental Indicators (RSEI) model provides potential risk-related scores for air and water data reported to TRI

- Screening-level tool to help identify and prioritize potential concerns and establish priorities for looking at opportunities

Calculating a RSEI Score
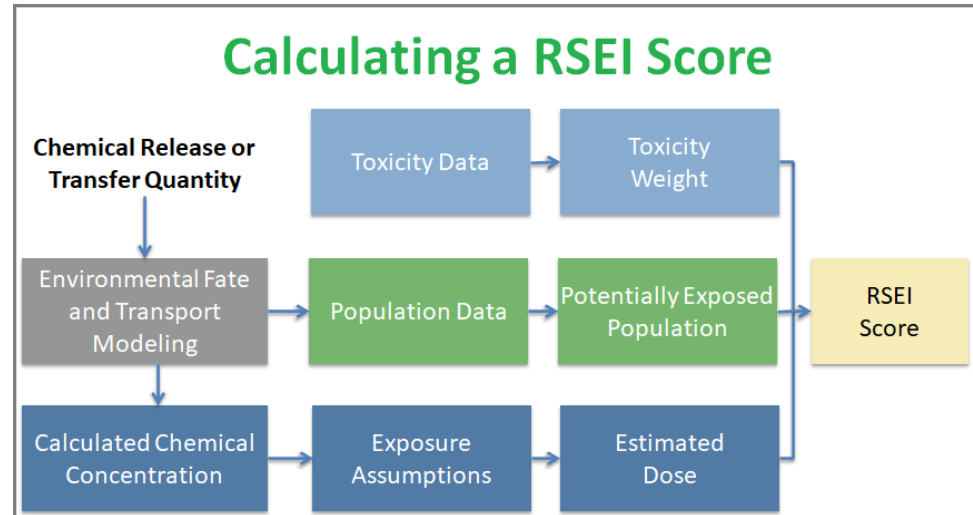
Data Visualization to Tell Stories about TRI

- Advances in technology and online data visualization resources can help to better understand stories, trends, and impacts in TRI and RSEI data

- Maps and charts can help tell a more compelling story than just the data

- Help connect TRI and RSEI data to the larger context about communities
  - Who lives there?
  - What are the drivers of potential risk from toxic chemical releases?
  - What other impacts and burdens affect the community?

Potential Risks from Climate Change

- Impacts of severe weather can impact TRI facilities located in communities

- Example: Hurricane Laura in 2020 caused a fire and release of toxic chemicals at BioLab Inc. facility in Westlake, LA

- TRI facility (70669BLBNCl10WE) which has not been operational since this incident, but had previously reported waste management of chlorine for many years

Photo credit: Travis Spalding, nola.com

Potential Risks from Climate Change

- Data about flooding and wildfire risks can help to better understand potential risks from climate change in communities

- Combined with TRI data, data visualizations and maps can help to pinpoint TRI facilities which could be affected by severe weather incidents driven by climate change

- Shift from reactive to proactive planning

Potential Risks from Climate Change

- EJScreen includes new Climate Change Data layers as well as TRI and RSEI layers

  - Places/EPA Regulated Facilities: TRI facilities
  - Places/Other Environmental Data: RSEI Scores
  - Maps/Climate Change Data
    - Flood Risk
    - Wildfire Risk
    - 100 Year Floodplain
    - Sea Level Rise

- Many caveats (operating conditions, chemicals and processes, Risk Management Program, etc.) - but can serve as a helpful screening exercise for communities

Potential Risks from Climate Change
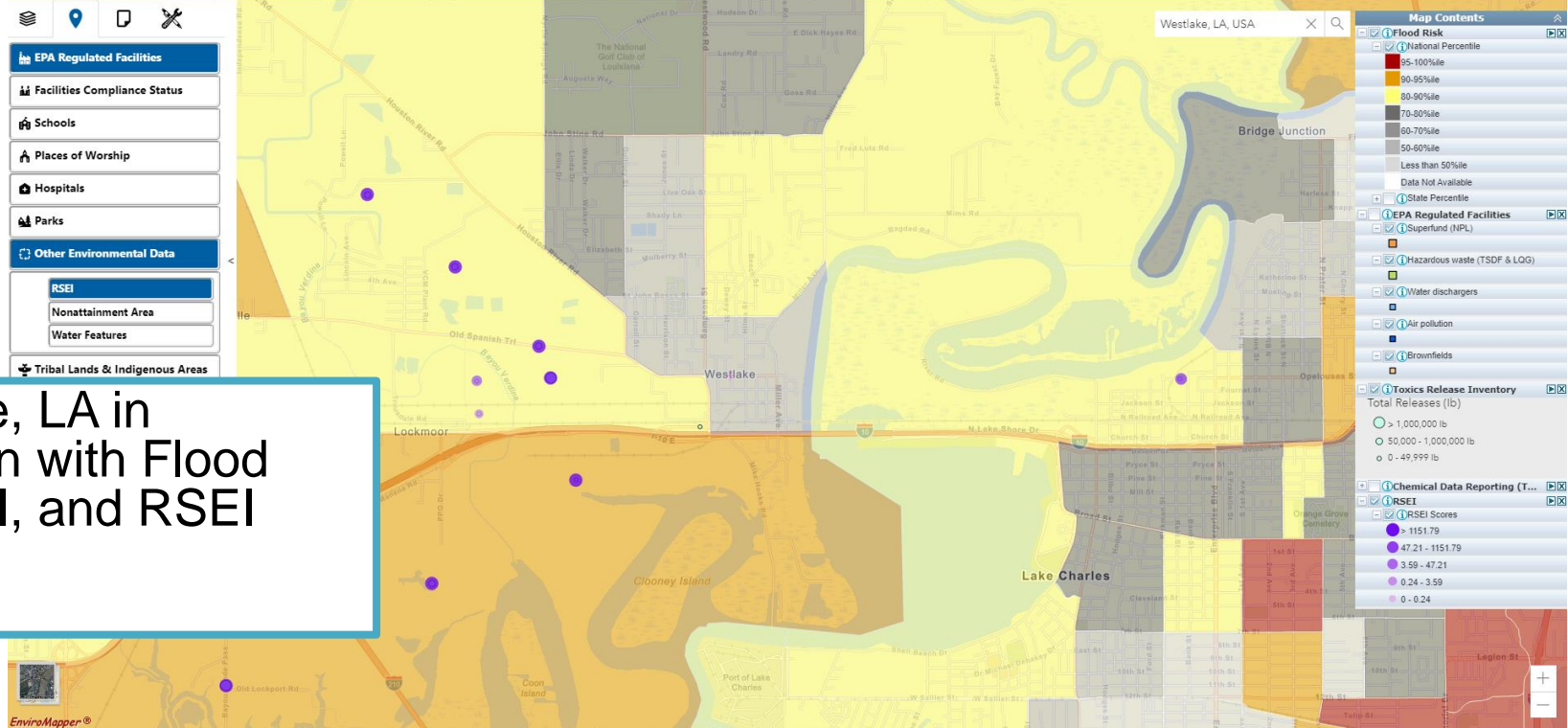
Westlake, LA in EJScreen with Flood Risk, TRI, and RSEI layers

# Potential Risks from Climate Change
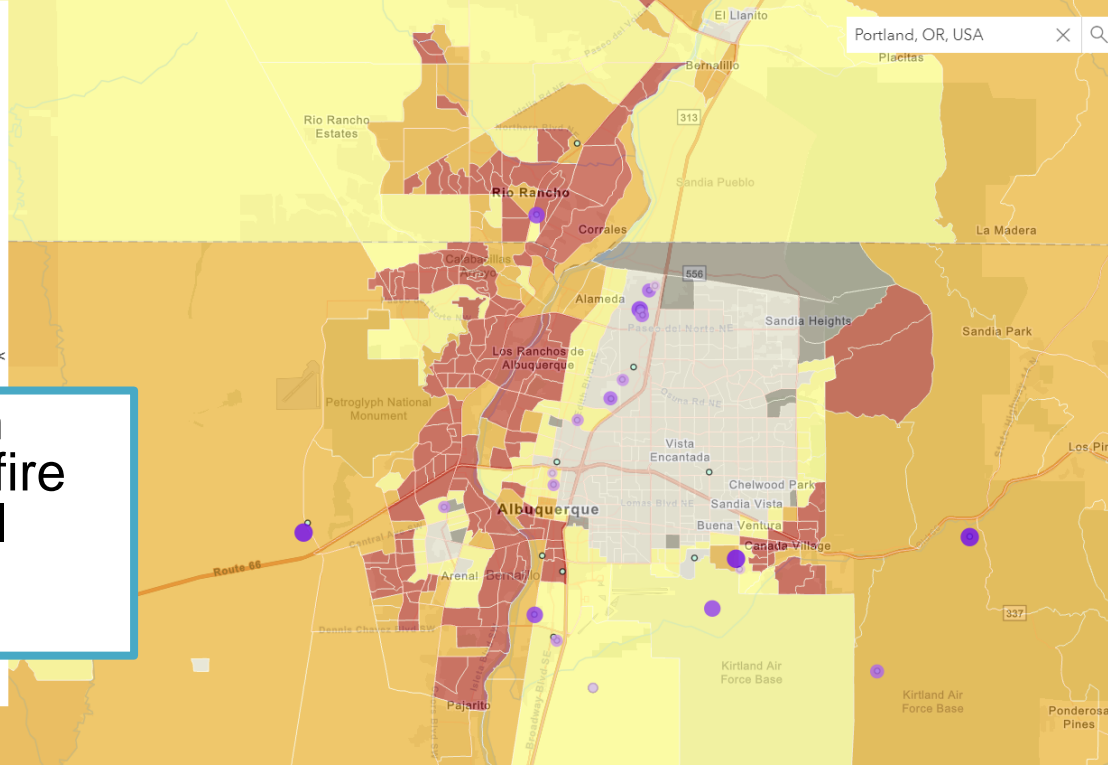
Albuquerque, NM in EJScreen with Wildfire Risk, TRI, and RSEI layers

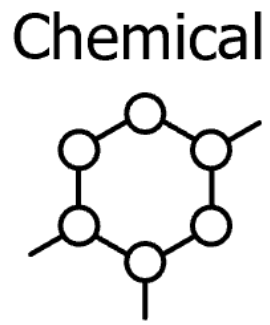# Focusing on Specific Communities

- TRI data can be analyzed across a range of geographic scales.

- Users can identify priority communities in their location of interest through TRI tools.

- Note that *a "priority community" is subjective—this depends on the user's decisions.

- Building in facility-, sector-, and chemical-level information provides greater clarity.

Focusing on Specific Communities

State → County → City → Facility

Sector   Chemical
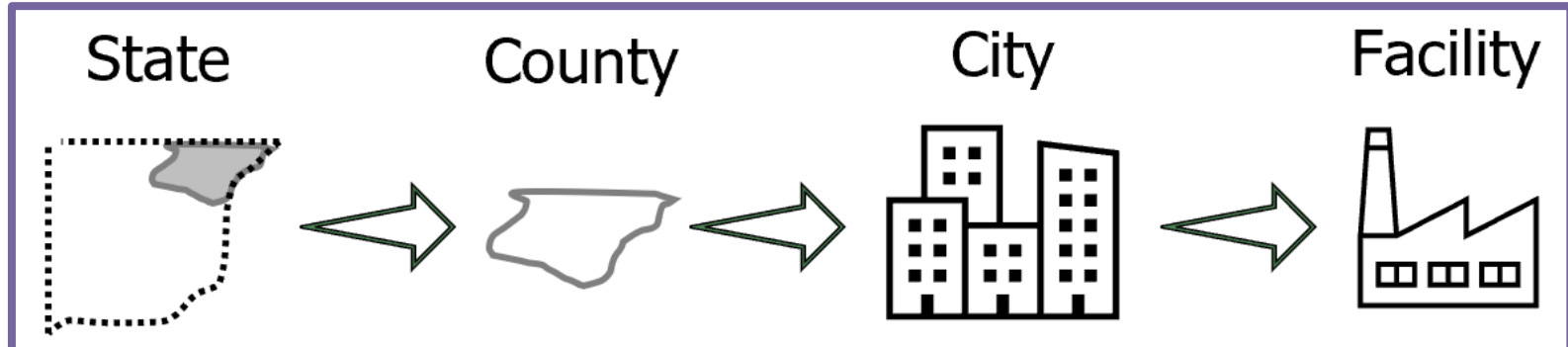
Illustrative example:

High relative **human health risk communities** with **environmental justice concerns** in **California**.

Focusing on Specific Communities

California, 2021

# Facilities	# Chemicals Reported	# Reporting Forms	Releases (lb)	RSEI Score	P2 Activities
1,149	186	3,536	38,143,429	7,108,272	200

Focus

High relative **human health risk communities** with **environmental justice concerns** in **California**.

RSEI Score   *City-level*   *Demographic Index ≥ 80th Percentile*   *Geographic Region*
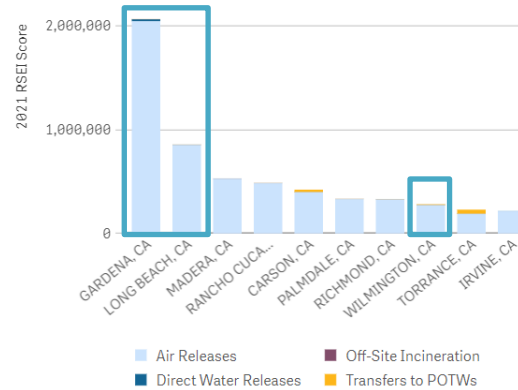
Reorder [California, RSEI Score, by city, with demographic index > 80, media, chemical, facility]
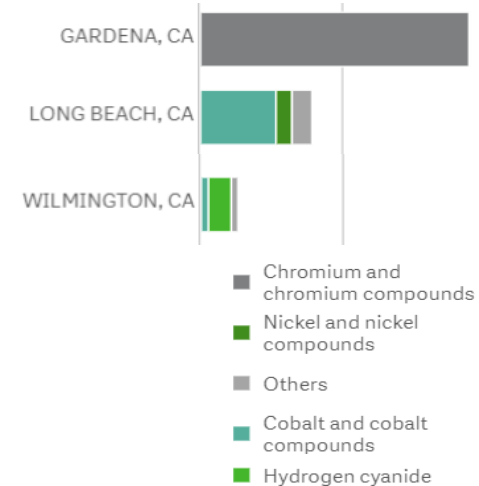
Focusing on Specific Communities

California, RSEI Score, by City, with demographic index > 80

City	2021 RSEI Score	Average Facility Demographic Index (National Percentile)	# Facilities
State Total	**7,108,272**	**71**	**968**
GARDENA, CA	2,056,474	86	11
LONG BEACH, CA	851,544	83	19
MADERA, CA	524,354	79	7
RANCHO CUCAMONGA, CA	485,534	75	8
CARSON, CA	420,350	28	11
PALMDALE, CA	332,548	54	5
RICHMOND, CA	326,449	46	9
WILMINGTON, CA	280,283	80	12
TORRANCE, CA	228,715	57	24
IRVINE, CA	215,704	49	10

Media

Legend:
- Air Releases
- Direct Water Releases
- Off-Site Incineration
- Transfers to POTWs

Chemicals

Legend:
- Chromium and chromium compounds
- Nickel and nickel compounds
- Others
- Cobalt and cobalt compounds
- Hydrogen cyanide

Facility

Facility	Primary NAICS Code	City (County)	Demographic Index National Percentile	2021 RSEI Score	RSEI Score Trend	Top Chemical by RSEI	2021 Releases (lb)	P2 Activities (2012-2021)
COAST PLATING INC - 90248NCMTL417WE	332813 Electroplating, Plating, Polishing,	GARDENA (LOS ANGELES)	83	2,038,135		Chromium and chromium	425,121	4
PHILLIPS 66 LOS ANGELES REFINERY WILMINGTON PLANT - 90748NCLLS1660W	324110 Petroleum Refineries	WILMINGTON (LOS ANGELES)	90	142,501		Hydrogen cyanide	260,404	0

RSEI Block Group Data

- Typical way that RSEI data are aggregated is by the facility reporting the chemical release or waste transfer

- RSEI Geographic Microdata help to understand cumulative impacts from multiple facilities by aggregating data at other geographic levels

- Provide the perspective of where potential impacts associated with releases may occur, which are often but not always near the facility reporting releases/transfers

- Aggregation of toxicity-weighted air concentrations at the block group level can identify locations with potential impacts from multiple facilities
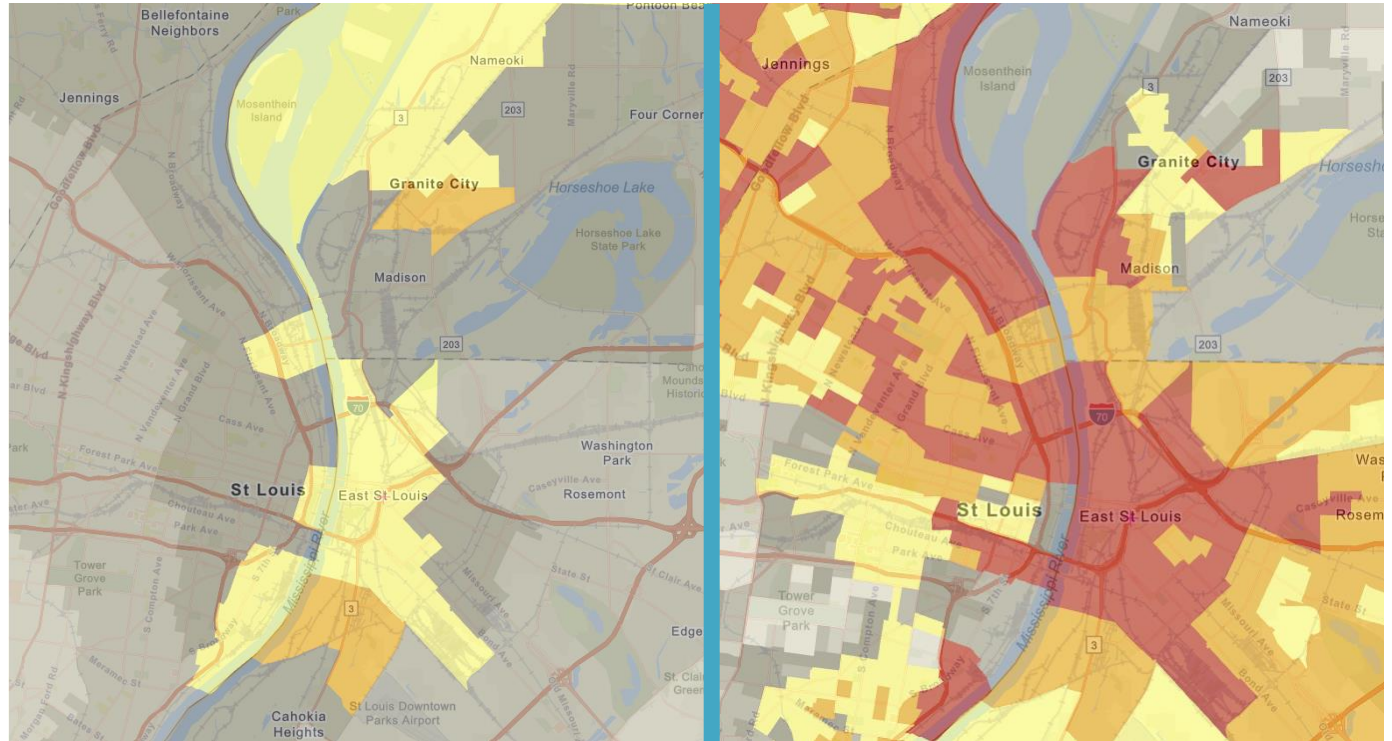
Block Group Data in EJScreen

- New indicator in EJScreen using toxicity-weighted concentrations from RSEI Geographic Microdata added in June 2023

- Highlight census block groups with largest potential impacts from air releases of TRI chemicals

- Aggregation at the block group level helps to identify locations with large potential impacts from multiple sources

RSEI Block Group Data in EJScreen

- Raw data (left) as well as population-weighted EJ index (right) layers are available with comparisons to state and national percentiles
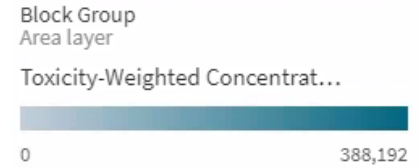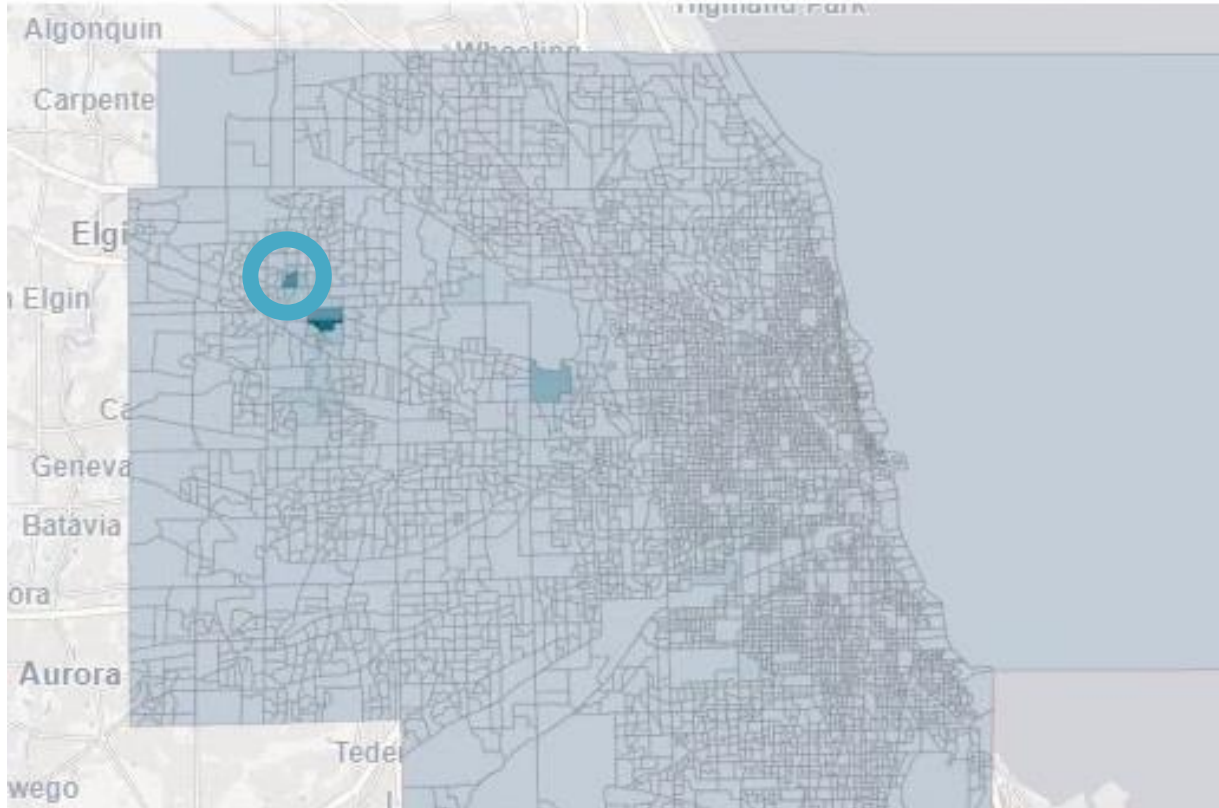
RSEI Block Group Data

- EJScreen layers help highlight block groups with largest potential impacts, but where do those impacts come from?

- Visualizing RSEI Geographic Microdata through an interactive dashboard with block group data can help parse out the source of potential impacts on a given community

Census Block Groups by Tox-Weighted Concentrations in RY2021

Block Group
Area layer
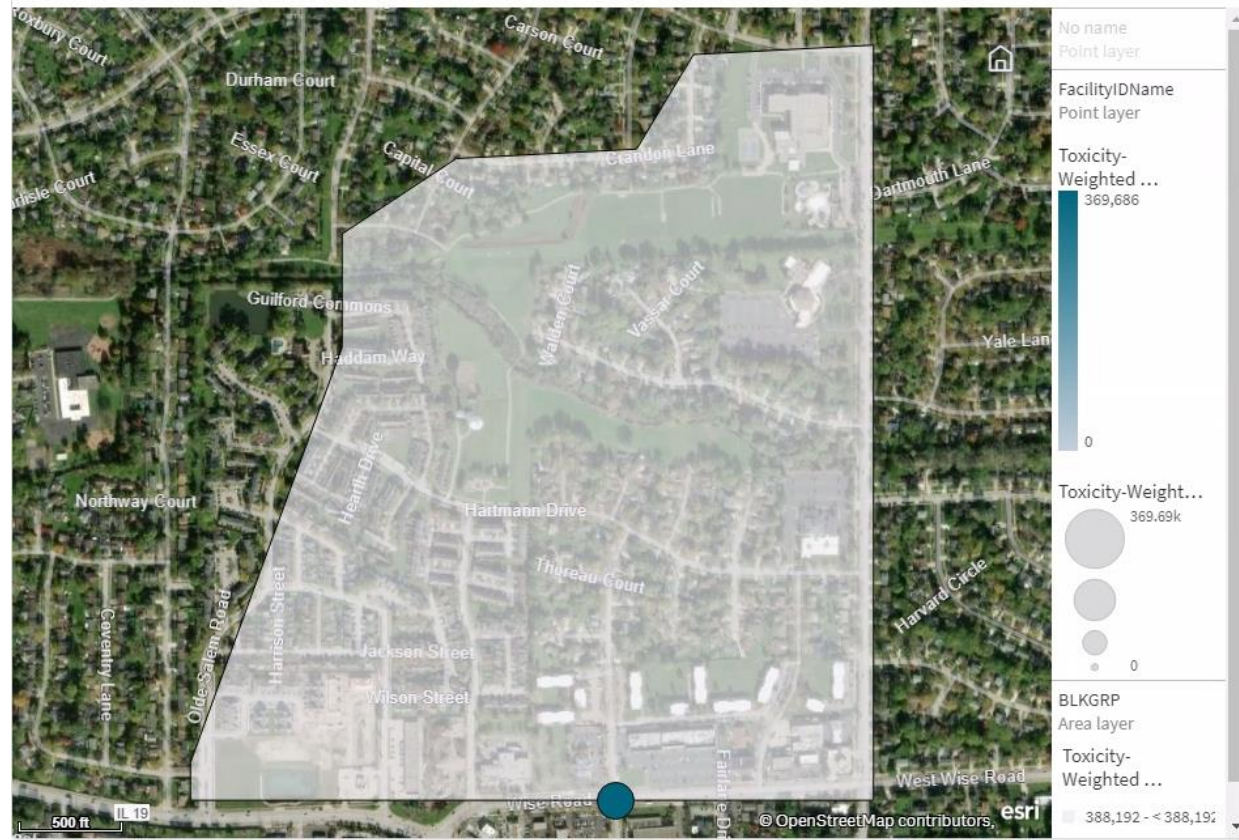
Toxicity-Weighted Concentrat...

0   388,192
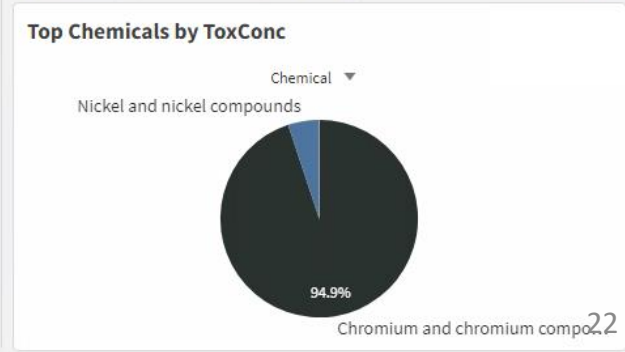
DuPage and Cook Counties, IL

RSEI Block Group Data

Census Block Groups and TRI Facilities by Tox-Weighted Concentrations in RY2021

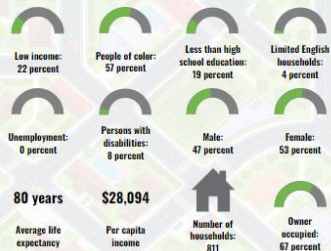| FacilityIDName	Industry Sector	Toxicity-Weighted Concen...
Totals		**388,192**
MERCURY PRODUCTS CORP.-60193MRCRY121SM	332 Fabricated Metals	369,686
ELECTRI-FLEX-6017WLCTRF35CHA	335 Electrical Equipment	11,365
FIC AMERICA-60188FTBND485EL	336 Transportation Equipment	3,372
FIC AMERICA-6010WFCMRC31LNG	336 Transportation Equipment	1,983
PLATING INTERNATIONAL INC-6013WPLTNG11142	325 Chemicals	403
ELECTRI-FLEX CO-60172LCTRF222WC	335 Electrical Equipment	241
AKZONOBEL AEROSPACE COATINGS-60085MDLND17EWA	325 Chemicals	161
W R GRACE & CO-	325 Chemicals	146

Top Chemicals by ToxConc

Chemical ▼

Nickel and nickel compounds

94.9%

Chromium and chromium compo...

RSEI Block Group Data

Block group report in EJScreen to examine other considerations (socioeconomic data, EJ indexes, etc.)

Key Takeaways

- Advances in technology, publicly available data sources, and data visualization tools in recent years help to make TRI and RSEI data more useful when identifying potential concerns in communities

- Goal: expedite the process of identifying potential sources of concern and focus more time and resources on addressing concerns and identifying solutions

Questions?

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Come ask more questions or get a on-hands demo at our booth!

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