

EJScreen Update:

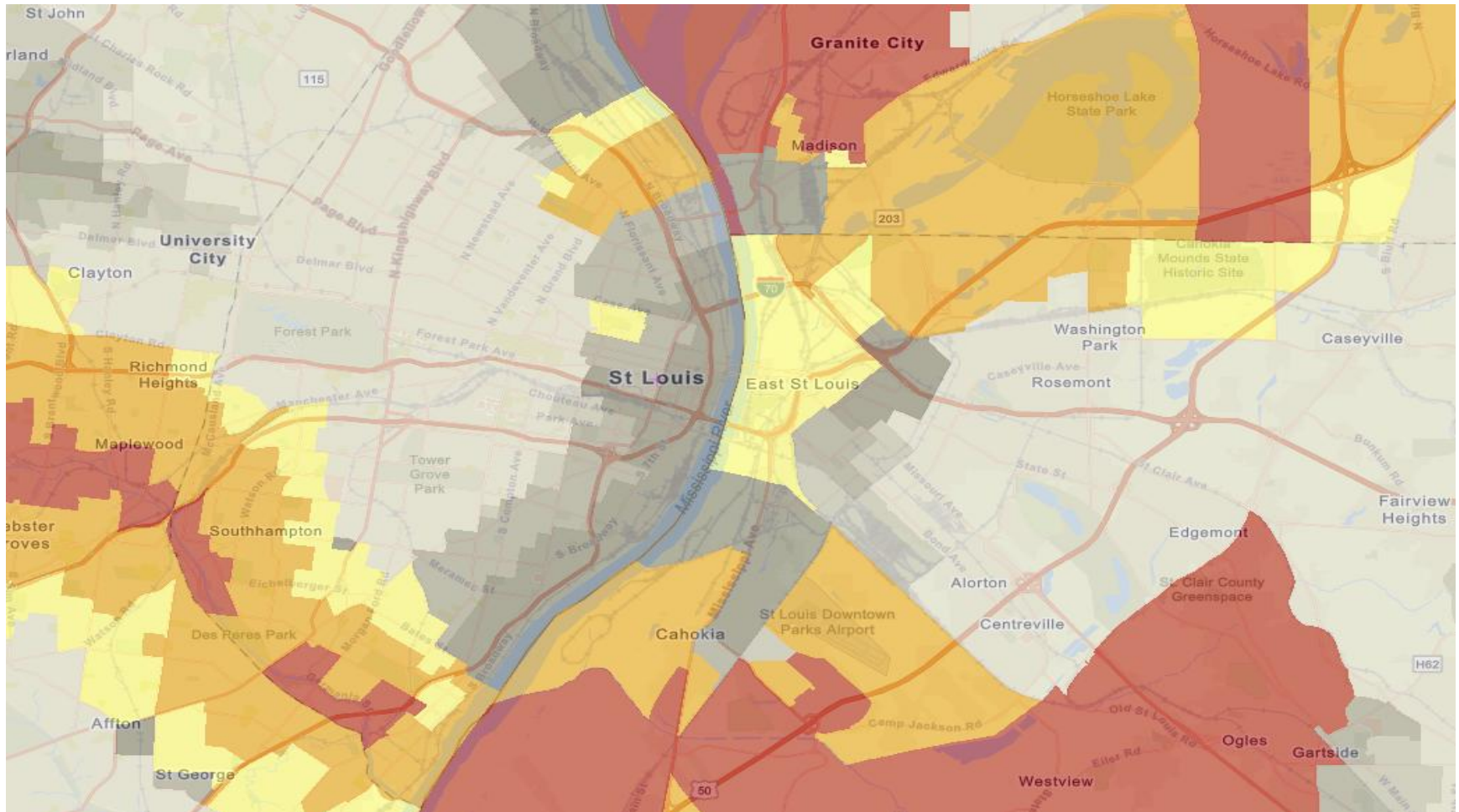
Tips and Pitfalls When Using EJScreen

“Understanding Environmental Justice: Guidance for Regulated Facilities”, December 6, 2022, REGFORM

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What is EJScreen?


- “EJScreen is the EPA’s environmental justice mapping and screening that provides EPA with a nationally consistent dataset and approach for combining environmental and demographic socioeconomic indicators.”



A Brief History of EPA EJScreen

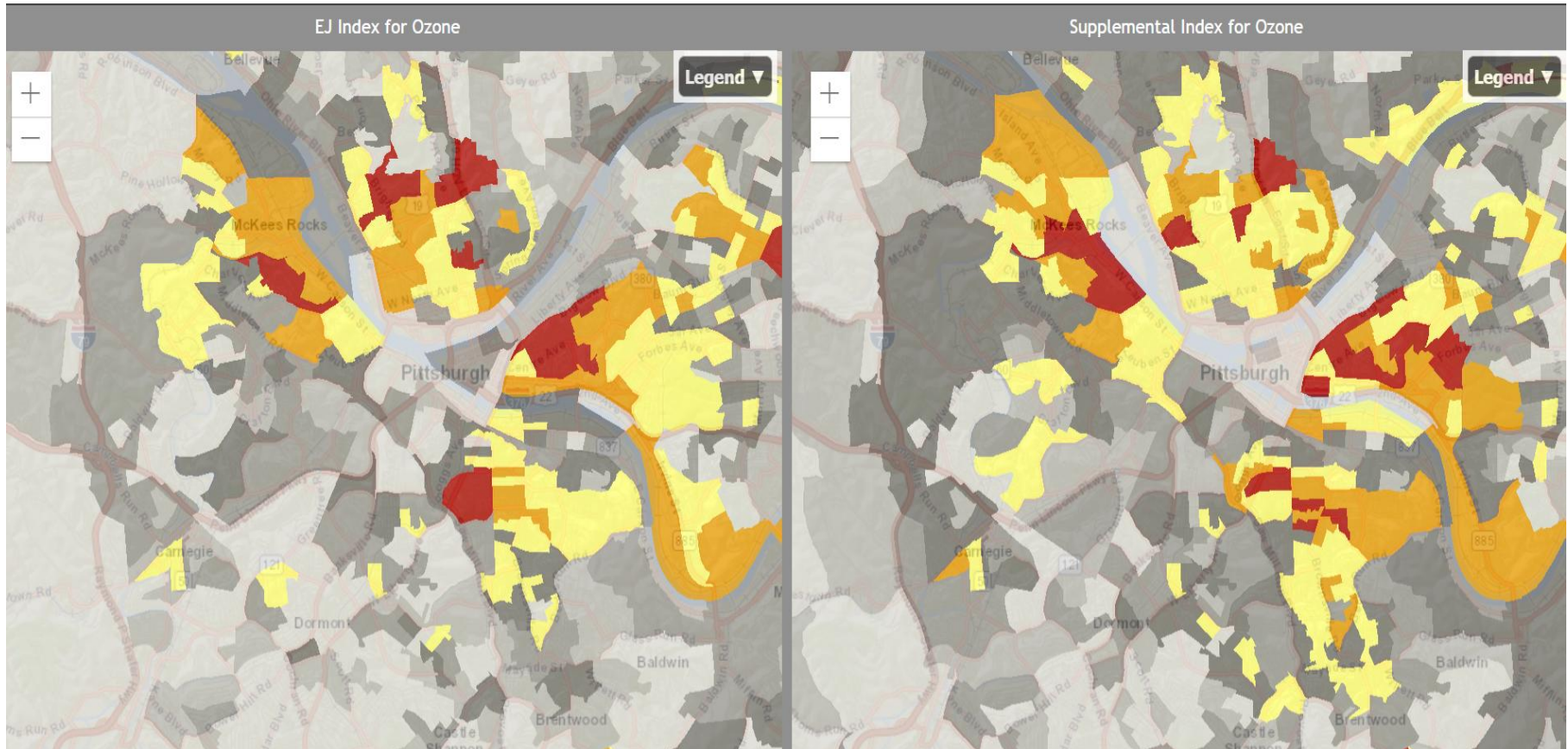
- Development began in late 2010.
- EPA began using an early version in 2012. EJScreen was peer reviewed in early 2014, and released to the public in 2015. EJScreen 1.0 was in play until....
- **EJScreen 2.0: Released February 18, 2022**
 - Included updated health inequity data, new environmental and demographic indicators, and new data showing communities with gaps in food availability, medical services, and broadband internet.
- **EJScreen 2.1: Major Changes, Released October 11, 2022**
 - Added new data and updated the vintage of the existing environmental and demographic data;
 - Created Supplemental Indexes
 - Supplemental indexes use the same EJScreen methodology but incorporate a five-factor supplemental demographic index (as opposed to the two factor demographic index which averages low income and people of color populations).
 - Changed the methodology of the calculations and computing the percentiles;
 - Added threshold maps. Allows a user to set a threshold limit and select the number of EJ indexes above that threshold. The map will then show the census tracts on the map that meet or exceed the data points.
 - Added U.S. territories and colonias to the tool.

EJScreen 2.1 – Supplemental Indexes

- Expanding to a five factor socioeconomic analysis instead of two.
 - The low-income population
 - The people of color populations
- 
- % Low Income
 - % Unemployed
 - % Limited English Speaking
 - % Less than High School Education
 - Low Life Expectancy
- Offer a different way to look at the information.
 - The Supplemental Indexes are not replacing the original EJ Indexes. **EJ indexes will continue to be used to conduct EJ analysis.**
 - Can be used by Agencies to aid in decision-making regarding allocation of resources.
 - EPA is still evaluating how they will use the Supplemental Indexes.

EJ Index vs Supplemental EJ Index

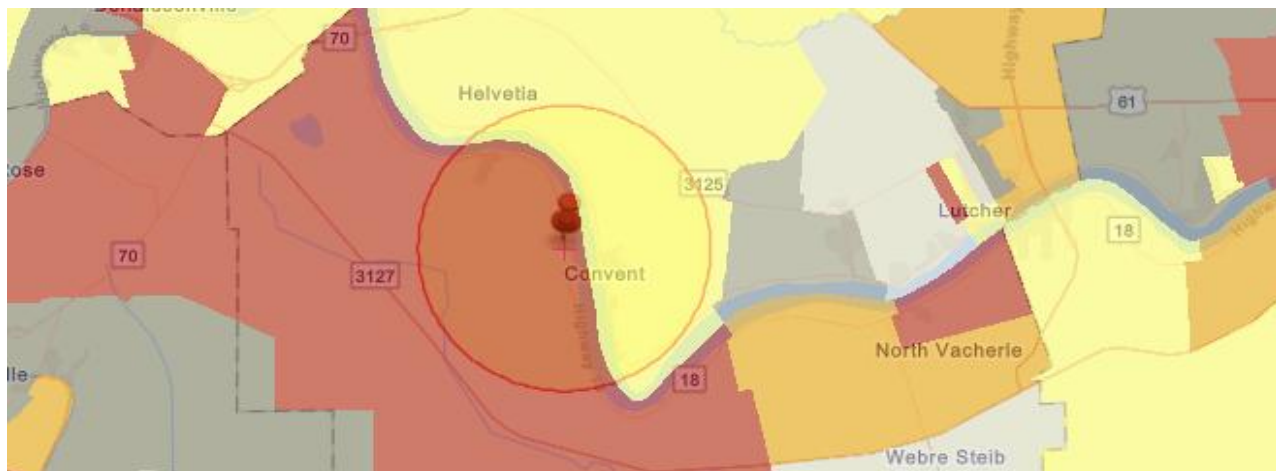
Pittsburgh, PA - Ozone



Red: 95-100 percentile; Orange: 90-95 percentile; Yellow 80-90 percentile
Dark Grey: 70-80 percentile; Medium Grey: 60-70 percentile

Choosing a Radius for an EJScreen

- EPA has not taken an official position on a standard radius to use for EJ evaluations.
- However, within multiple Orders and submitted comments the EPA has stated that they used a five-kilometer radius from the facility when conducting EJ analysis.
- Example of recent EPA analysis: “EPA conducted an Environmental Justice (EJ) analysis using EPA’s EJSCREEN. Of the approximately 8,265 residents within a five-kilometer radius of the facility, of which approximately 85 percent are people of color and 51 percent are low income. In addition, the EPA reviewed the EJSCREEN Environmental Justice Indices, which combine certain demographic indicators with twelve environmental indicators. Five of the twelve EJ indices in this five-kilometer area exceed the 80th percentile in the State of Texas, with four of the twelve EJ indices exceeding the 90th percentile.”



Simplified Representation of EJ Index Methodology



EJScreen 2.1 – Calculating Percentiles

The old calculation was:

EJ Index = Environmental Indicator Score X [(Supplemental Demographic Index for Block Group) - (Demographic Index for U.S.)] X Population Count for Block Group

The new calculation is:

EJ & Supplemental Index = Environmental Indicator Percentile for Block Group X Demographic Index for Block Group

- There are three changes when comparing EJScreen 2.1 and EJScreen 2.0 calculations:
 - Replaced the environmental indicator score with the environmental indicator percentile.
 - Removed the subtraction of the demographic index for the US from the calculation.
 - Removed weighting by block group population from the equation.
- There are two methodology changes for computing percentiles. These include:
 - Percentiles are now unweighted. The version 2.0 used population weights.
 - Percentile ties now use a floor method, instead of ceiling method. This produces lowest value for ties instead of highest value for ties.

What is the 80th percentile filter?

- EJScreen Index percentiles quantify the percent of the respective region's population (state, EPA region, or US) that is exposed to higher values of that specific indicator.
 - For example, a Pollution and Source value for PM2.5 of 80% in the USA means only 20% of the US population is exposed to higher values of PM2.5.
- When first creating EJScreen, the EPA identified the 80th percentile filter as that initial starting point for interpreting screening results.
 - The 80th percentile filter in EJSCREEN is not intended to designate an area as an "EJ community."
 - In recent EPA EJ analysis, they have identified the number of indexes above both the 80th and 90th percentiles for the facilities.
 - An area with any of the 12 EJ indexes at or above the 80th percentile nationally *could* be considered as a potential candidate for further consideration, analysis, or outreach.
 - Examples of further review may include considering other factors and other sources of information such as health-based information, local knowledge, proximity and exposure to environmental hazards, susceptible populations, unique exposure pathways, and other federal, regional, state, and local data.

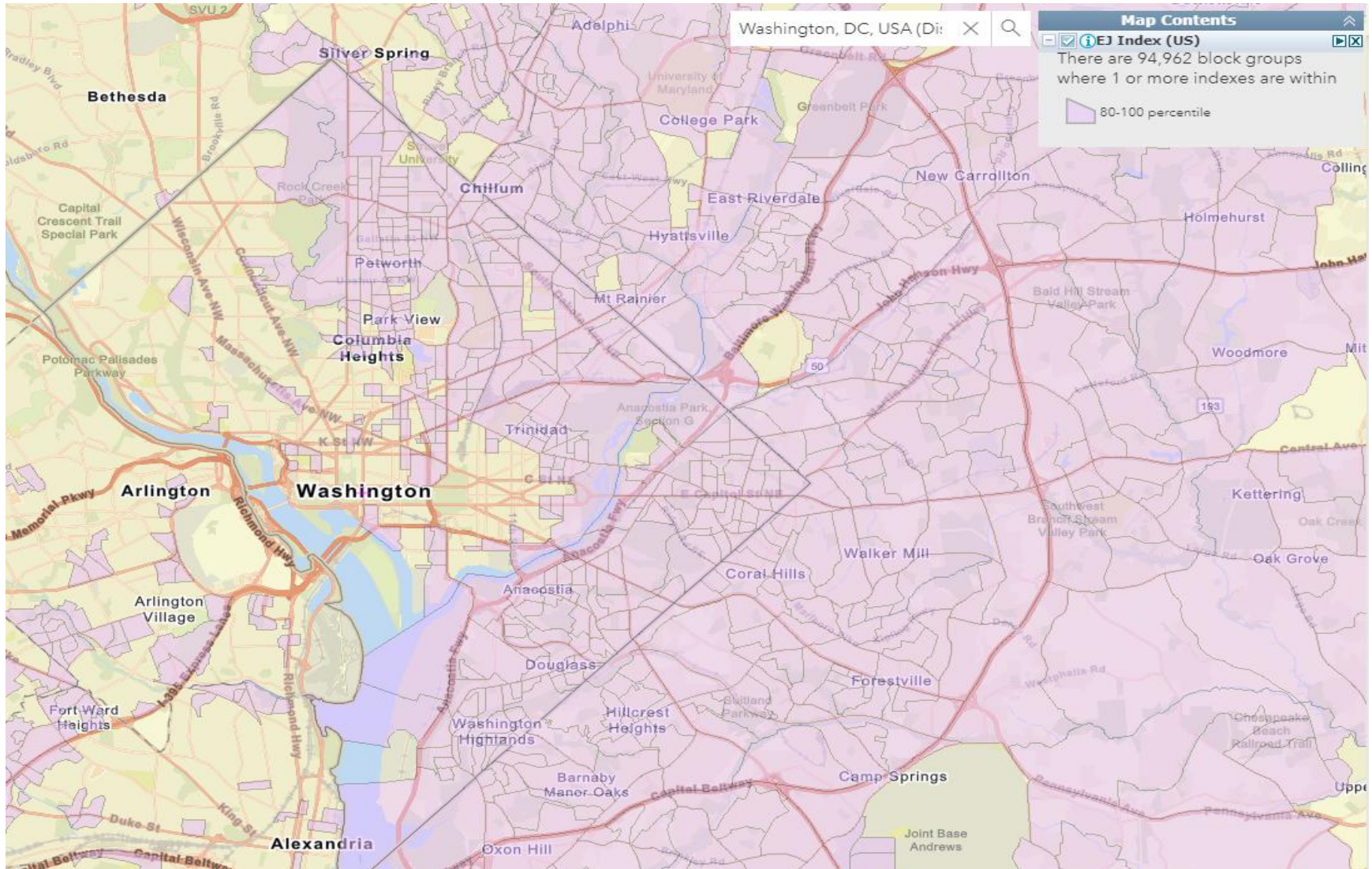
What About Cumulative Impacts?

- EJScreen currently does not evaluate cumulative impacts.
 - The CDC's Agency for Toxic Substances and Disease Registry's Environmental Justice Index is the first, National tool to evaluate cumulative impacts of environmental burden through human health and human equity.
- The EPA is currently working on a tool to evaluate cumulative impacts as part of the FY 22-26 Strategic Plan.
 - Several states, such as California, Washington and New Jersey, have implemented cumulative impacts screen as part of their EJ policy
- Together with the new Supplemental Indexes, the addition of the **threshold maps** are the EPA's initial steps towards evaluating cumulative impacts.
 - Threshold maps allow for user defined thresholds to customize how the results are displayed.
 - Able to evaluate across all 12 indicators rather than individually.



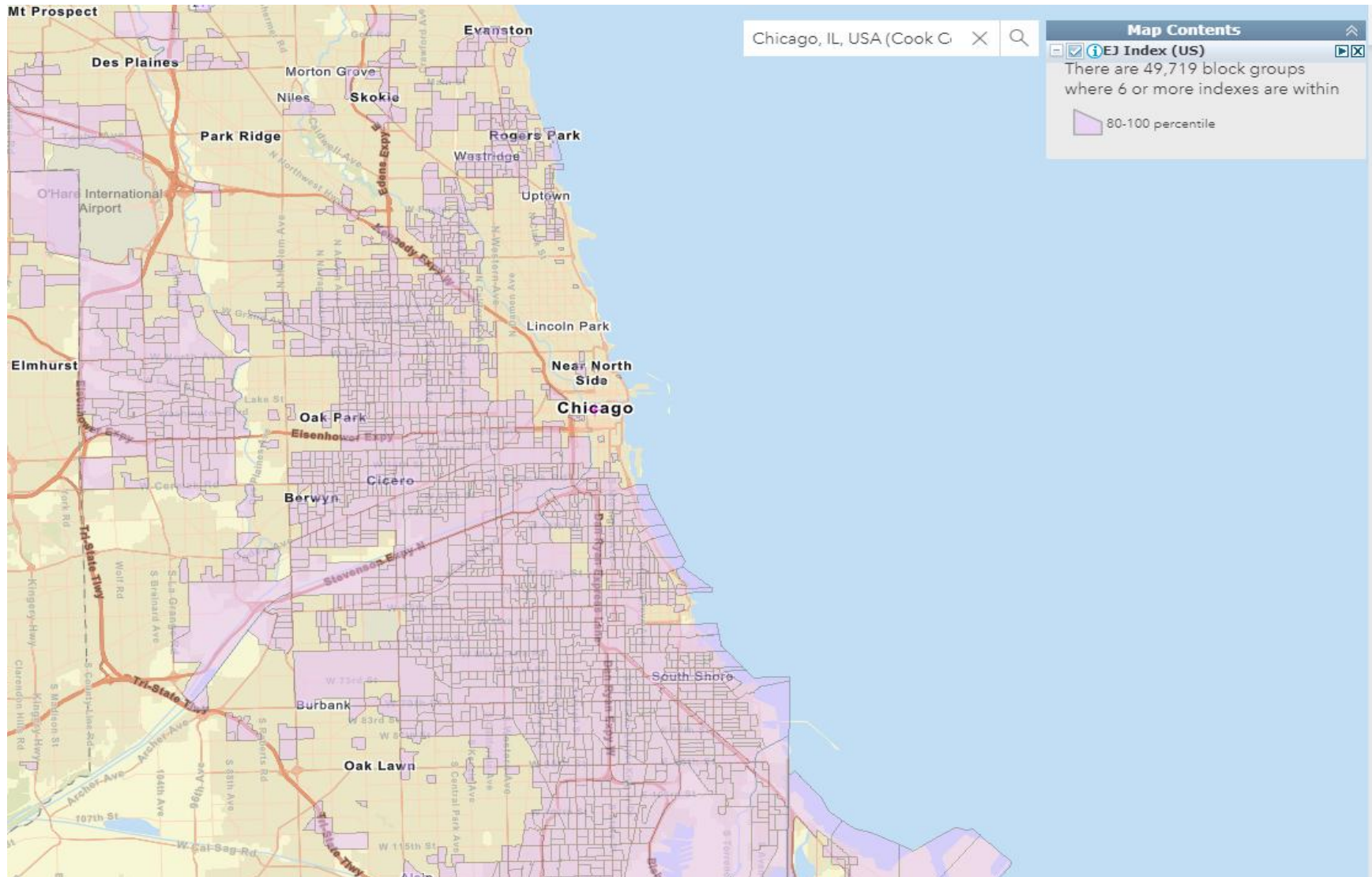
Threshold Map – Washington, D.C.

- Pink: Areas where 1 or more indexes are within 80-100 percentile

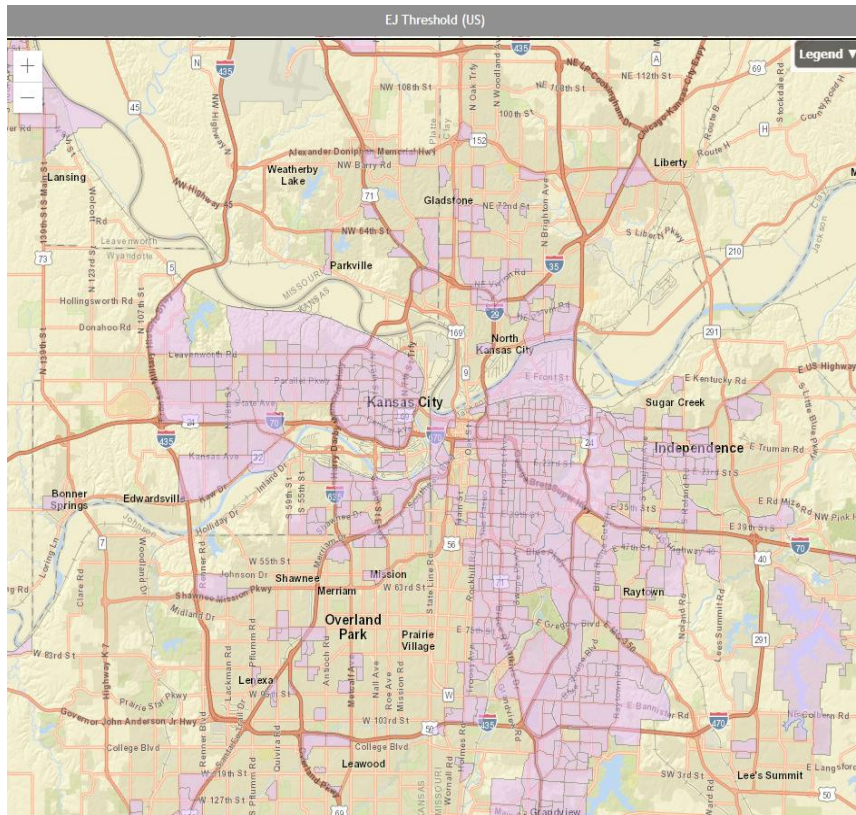


Threshold Map – Chicago, IL

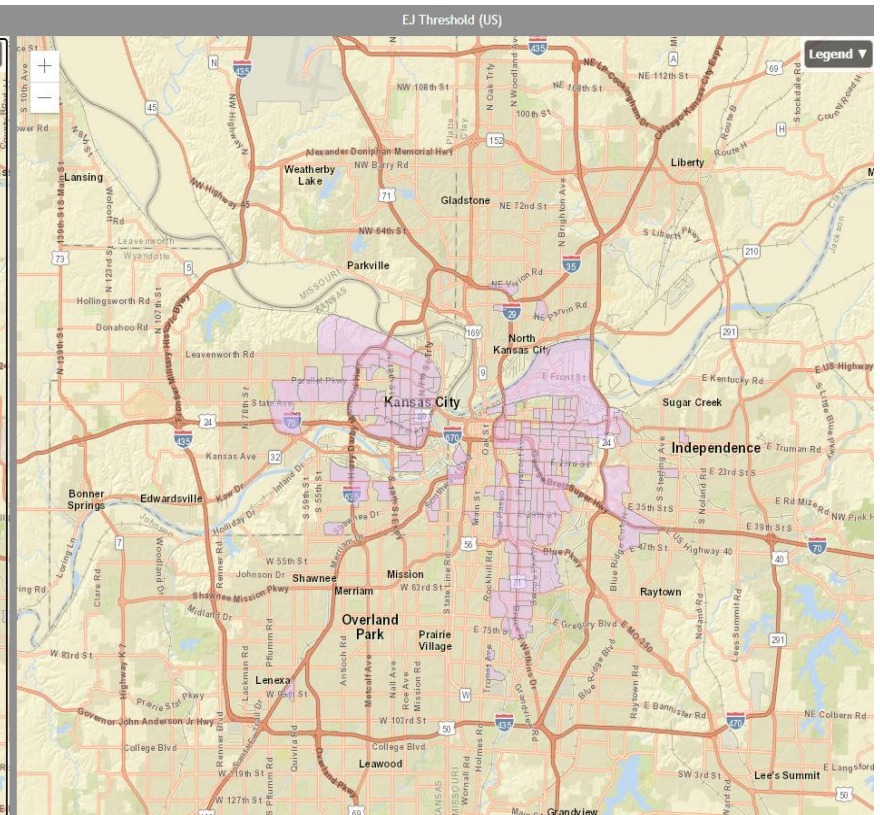
- Pink: Areas where 6 or more indexes are within 80-100 percentile



Threshold Map Comparison – Kansas City, MO



Areas where 1 or more indexes are within 80-100 percentile

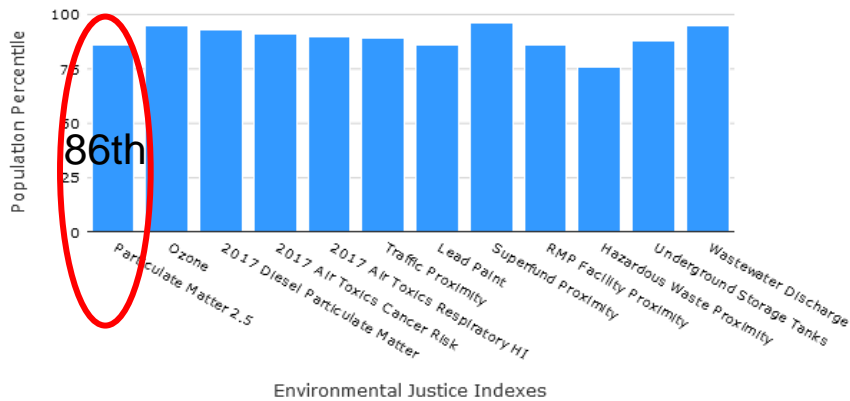


Areas where 6 or more indexes are within 80-100 percentile

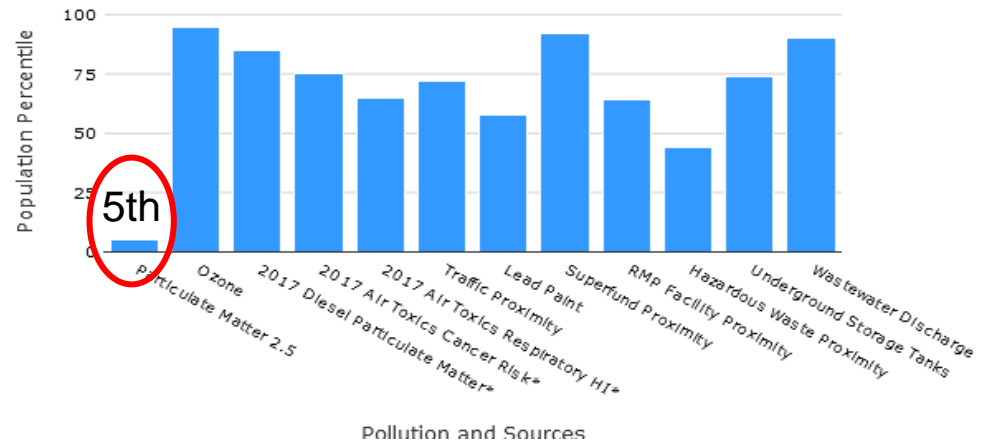
Adding Demographic Layers Impact Outputs

Albuquerque, NM (3-mile buffer)

Environmental Justice Indexes for the Selected Area Compared to All People's Block Groups in the US



Pollution and Sources for the Selected Area Compared to All People's Block Groups in the US



People of Color: 88%
Low-Income: 51%

Redding, CA vs Albuquerque, NM

Redding, CA

(3-mile buffer)

2017 Air Toxics Cancer Risk: 40 per
1 million people
Percentile in U.S.: 95-100th percentile

Total Population: 56,527
Percent Minority: 24%
Percent Low-Income: 39%

Demographic Index = $\frac{24+39}{2} = 31.5\%$
National Average = 35.5%

Raw Value = -90,443.2
U.S. EJ Index Percentile = **46th**

Albuquerque, NM

(3-mile buffer)

2017 Air Toxics Cancer Risk: 29 per
1 million people
Percentile in U.S.: 70-80th percentile

Total Population: 103,801
Percent Minority: 88%
Percent Low-Income: 51%

Demographic Index = $\frac{88+51}{2} = 69.5\%$
National Average = 35.5%

Raw Value = +1,023,477.86
U.S. EJ Index Percentile = **91st**

EJScreen Rules of the Road

“Tools are not a silver bullet to address complex EJ problems, but ammo in an arsenal.”

- EJScreen not the end of the analysis.
- EJScreen cannot replace on the ground information gathering and study of an area.
- EJScreen does not predict impacts from a single facility.
- Environmental Indicators are mostly screening-level proxies for actual exposure risk.
- EJScreen results can be paired with other tools.
- Only communities have the right to call themselves EJ Communities.
- Census data has limitations and can obscure small communities.
- Limited by available data. Indicators vary in vintage.



What's Ahead for EJScreen

- EPA EJScreen Office Hours: December 21, 2022 @ 12 pm EDT.
- EPA Virtual Public Training: <https://www.epa.gov/ejscreen/ejscreen-office-hours-training>
- EJScreen Tutorial Videos: <https://www.epa.gov/ejscreen/ejscreen-videos>
- EJScreen Glossary: <https://www.epa.gov/ejscreen/ejscreen-map-descriptions>
- EPA Email Subscriptions for EJ News Releases:
 - <https://www.epa.gov/newsroom/email-subscriptions-epa-news-releases>
 - EJ is under the “Interest” subcategory.
- National Environmental Justice Advisory Council Meetings:
 - <https://www.epa.gov/environmentaljustice/national-environmental-justice-advisory-council-meetings>
- Technical Guidance Document:
https://www.epa.gov/sites/default/files/2021-04/documents/ejscreen_technical_document.pdf
 - **EPA expects to release an updated Technical Guidance Document early 2023**
- States also have their own EJ screening tools: CA, CO, NC, MD, VA, MI, WA.
 - California’s tool evaluates cumulative impacts (CalEnviroScreen).

AUSTIN

BRUSSELS

DALLAS

DUBAI

HOUSTON

LONDON

NEW YORK

PALO ALTO

RIYADH

SAN FRANCISCO

WASHINGTON

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