

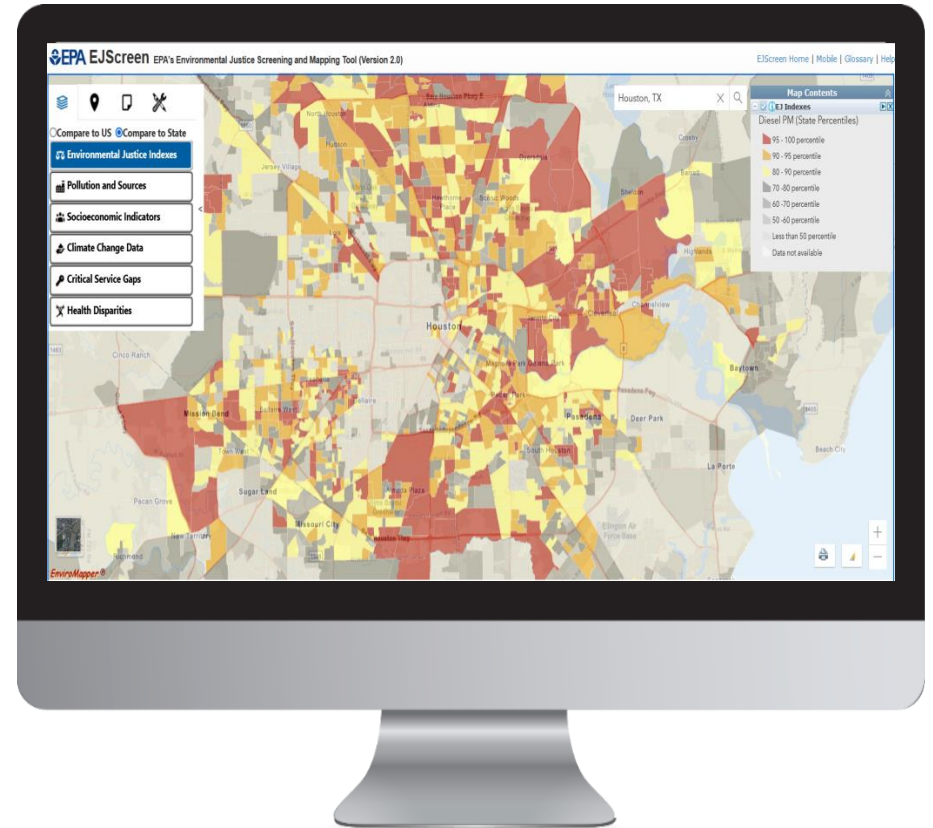
# EJScreen

## EPA's Environmental Justice Screening Tool



# What is EJScreen?

- EPA's web-based GIS tool for nationally consistent EJ screening and mapping
- Combines environmental and socioeconomic data to highlight areas where vulnerable populations may be disproportionately impacted by pollution



# Caveats & Limitations

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EJScreen does not cover all environmental or EJ issues

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Environmental indicators are mostly screening-level proxies for actual exposure or risk

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Indicators vary in vintage

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Census data has limitations and can obscure small communities

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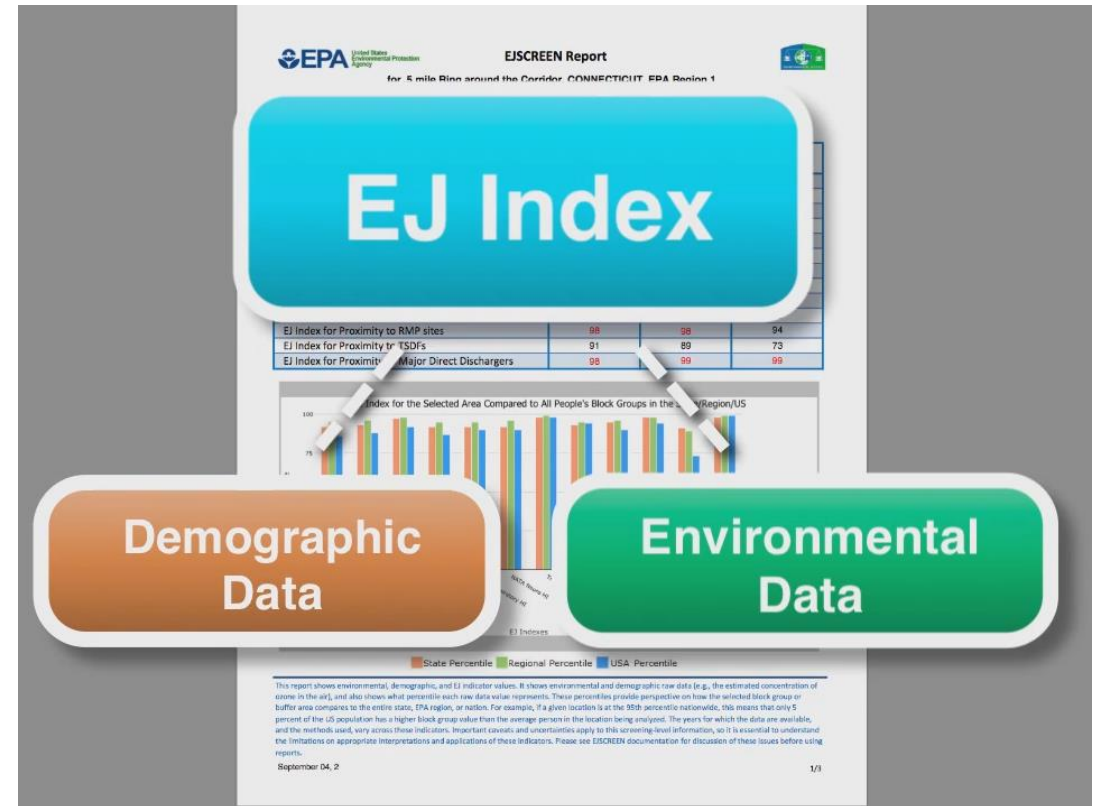
Results should be verified on the ground when possible

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**EJScreen is not a labeling tool; does not label “EJ communities”**

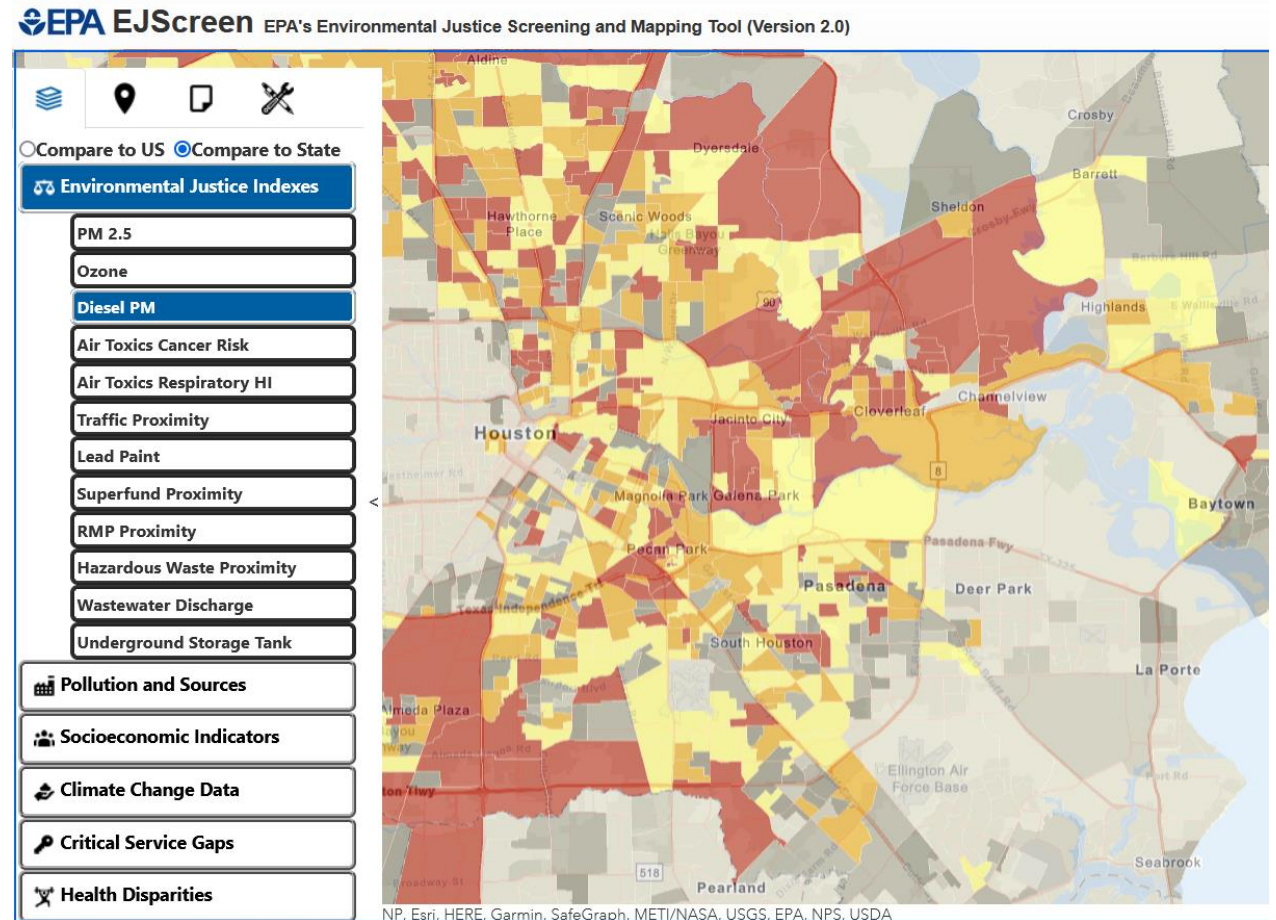
# Primary EJScreen Datasets

- **EJ Indexes (12)**
- **Supplemental Indexes (12)**
- **Environmental (12 indicators)**
- **Socioeconomic (7 indicators)**
- **Health (3 indicators)**
- **Climate (6 indicators)**
- **Critical Service Gaps (3 indicators)**



# EJScreen Key Features

- Annually updated environmental data
- Annually updated demographics – from most recent U.S. Census Bureau American Community Survey (ACS)
- Highest resolution data available
- Ability to download data
- Accessibility / ease of use



# New EJSCREEN 2.1 Features

Released 10/11/22



New Territory Data



Supplemental Indexes



Revised Calculations



Threshold Maps



Updated Demographic and Environmental Data



34.127775, -85.190921

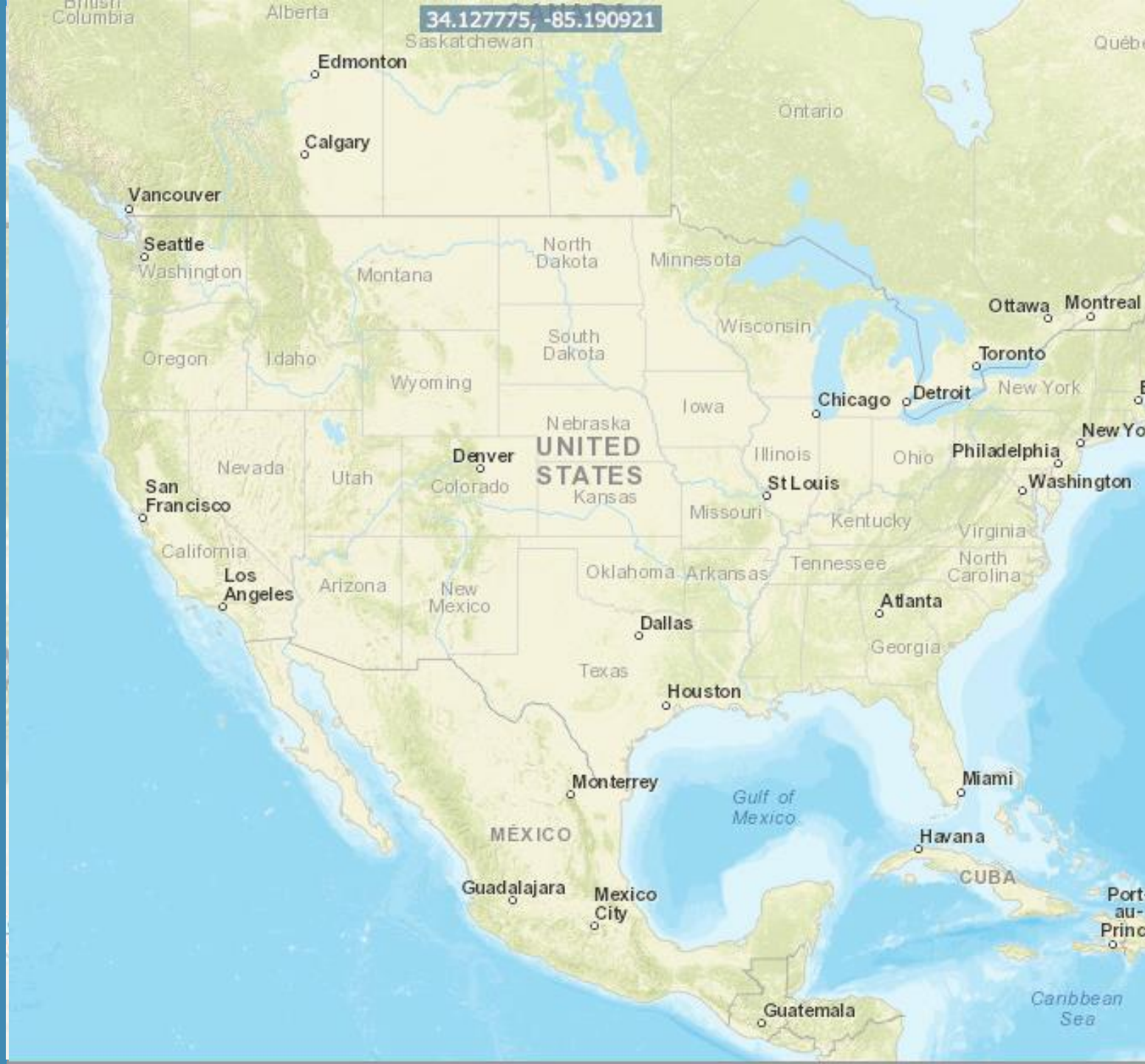
primary governmental divisions of the United States.

Largest divisions within states.

Collection of Census block groups, mostly between 1,200 and 8,000 people.

Collection of residential blocks, mostly, between 600 and 3,000 people.

Residential block, bounded on all sides by streets.



# Environmental Indicators

Indicator	Description	Year
Particulate matter 2.5	Annual average of PM 2.5 levels in the air	2018
Ozone	Ozone summer seasonal avg. of daily maximum	2018
Diesel particulate matter	Diesel particulate matter level in air	2017
Air toxics cancer risk	Lifetime cancer risk from inhalation of air toxics	2017
Air toxics respiratory hazard index	Air toxics respiratory hazard index (ratio of exposure concentration to health-based reference concentration)	2017
Traffic proximity and volume	Count of vehicles on major roads, divided by distance in meters	2019



# Environmental Indicators (cont'd)

Indicator	Description	Year
Lead paint	Percent of housing units built pre-1960, as indicator of potential lead paint exposure	2016 - 2020
Superfund proximity	Count of proposed or listed NPL - also known as Superfund - sites within 5 km, each divided by distance in kilometers	2022
Risk management plan facility proximity	Count of RMP (potential chemical accident management plan) facilities within 5 km, each divided by distance in kilometers	2022
Hazardous waste proximity	Count of hazardous waste facilities (TSDFs and LOGs) within 5 km, each divided by distance in kilometers	2022
Underground storage tanks (UST) and leaking UST (LUST)	Count of LUSTs (multiplied by a factor of 7.7) and the number of USTs within a 1,500-foot buffered block group	2021
Wastewater Discharge Indicator	RSEI modeled Toxic Concentrations at stream segments within 500 meters, divided by distance in kilometers	2019

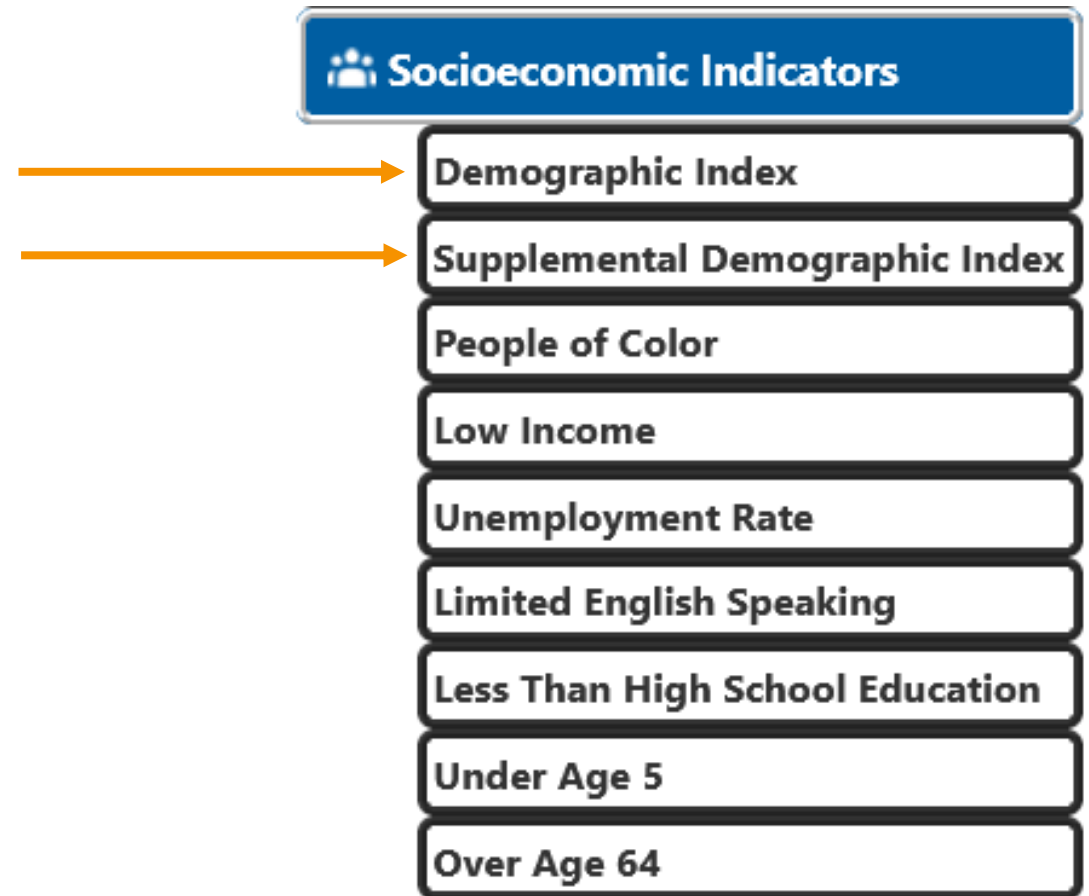
# Socioeconomic Indicators

Indicator	Definition
People of color	Individuals who list their racial status as a race other than white alone and/or list their ethnicity as Hispanic or Latino
Low-Income	Households income is less than or equal to twice the federal “poverty level”
Unemployment	All those who did not have a job at all during the reporting period, made at least one specific active effort to find a job during the prior 4 weeks, and were available for work (unless temporarily ill).
Limited English Speaking	Households in which all members age 14 years speak English less than “very well” (have difficulty with English)
Less than high school education	People age 25 or older whose education is short of a high school diploma
Under age 5	People in a block group under the age of 5
Over age 64	People in a block group over the age of 64

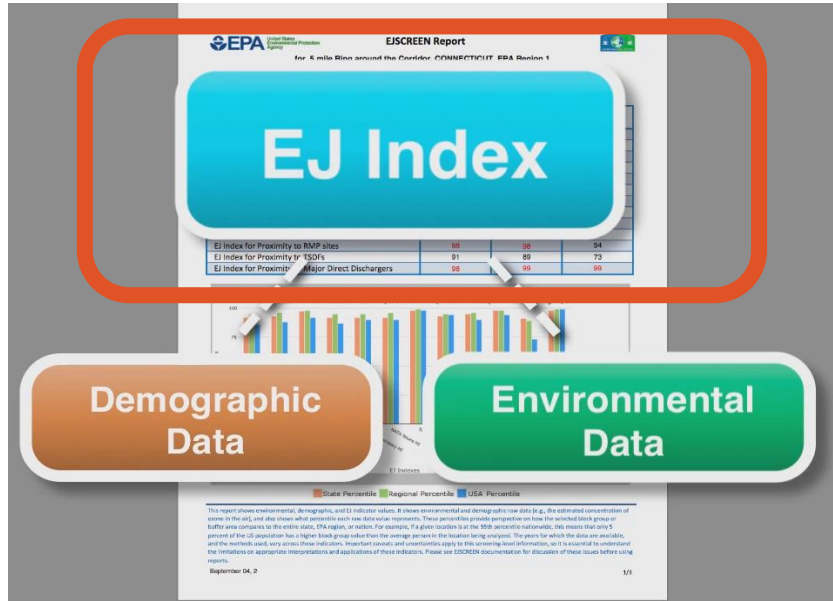
All Socioeconomic Data comes from the **2016-2020 ACS**

# Demographic Indexes

- EJScreen now features two different indexes based on socioeconomic data
  - **Demographic Index**
    - % Low Income
    - % People of Color
  - **Supplemental Demographic Index**
    - % Low Income
    - % Unemployed
    - % Limited English Proficiency
    - % Less than High School Education
    - Low Life Expectancy
- Indexes offer different perspectives on vulnerable communities



# What do the indexes help identify?



Indexes helps identify areas that may have **higher pollution burdens** and **vulnerable populations** present

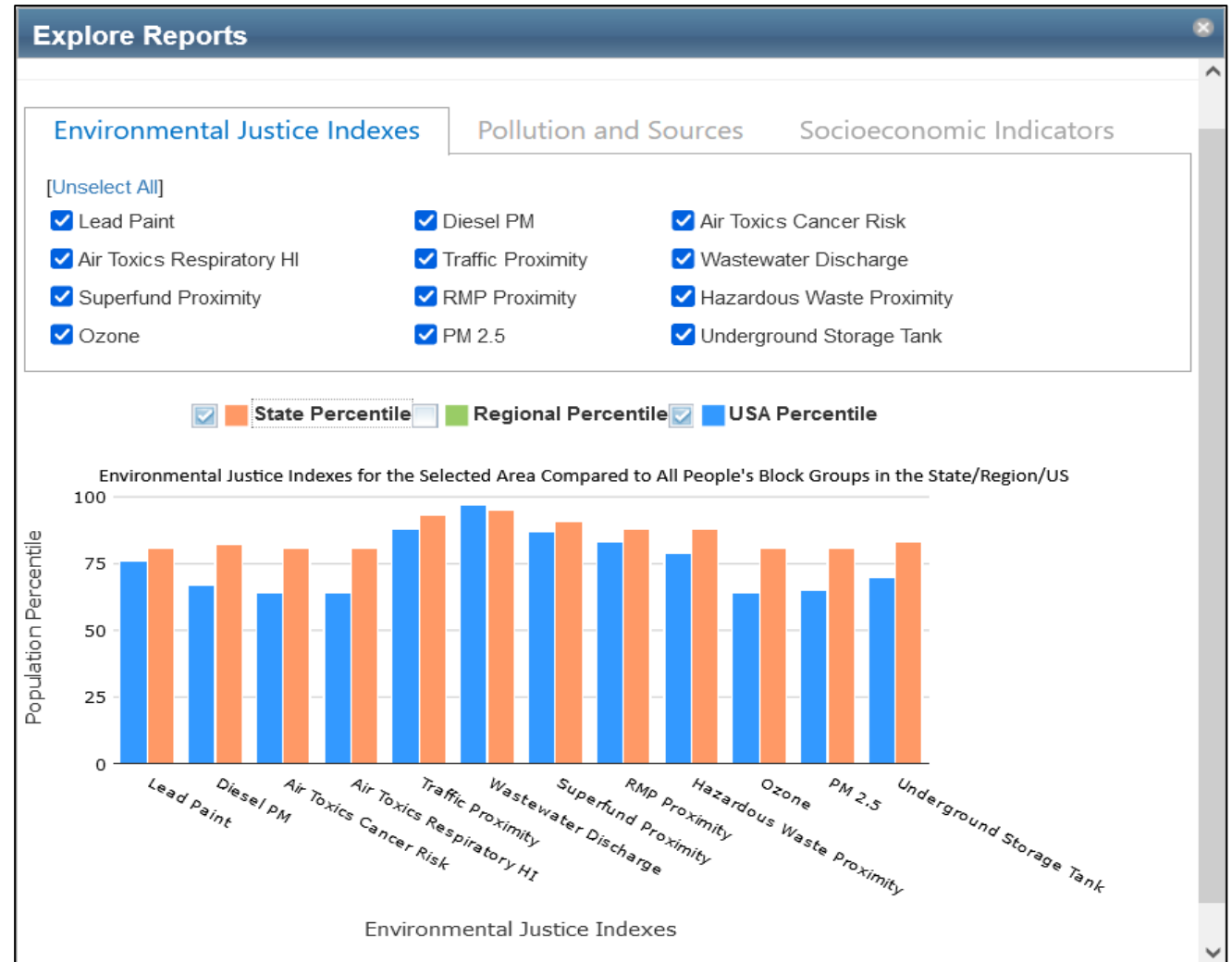
**New Calculation:**

$$\text{EJ Index} = \frac{\text{Environmental Indicator Percentile}}{\text{Demographic Index}}$$

Applies to both EJ Indexes and Supplemental Indexes

# Results are Ranked as Percentiles

- Percentiles put indicators into common units of 0 – 100.
- A place at the 80th percentile nationwide means 20% of the US population has a higher value.
- Ranking values as percentiles allows comparison of indicators measured with different units. It does not mean the risks are equal or comparable.





# Health Indicators

Indicator	Definition
Low Life Expectancy	Average life expectancy
Heart Disease	Heart disease prevalence among adults aged 18 years or older
Asthma	Asthma prevalence among adults aged 18 or older

All Health indicators come from the CDC and are at the Census tract level

# Climate Indicators

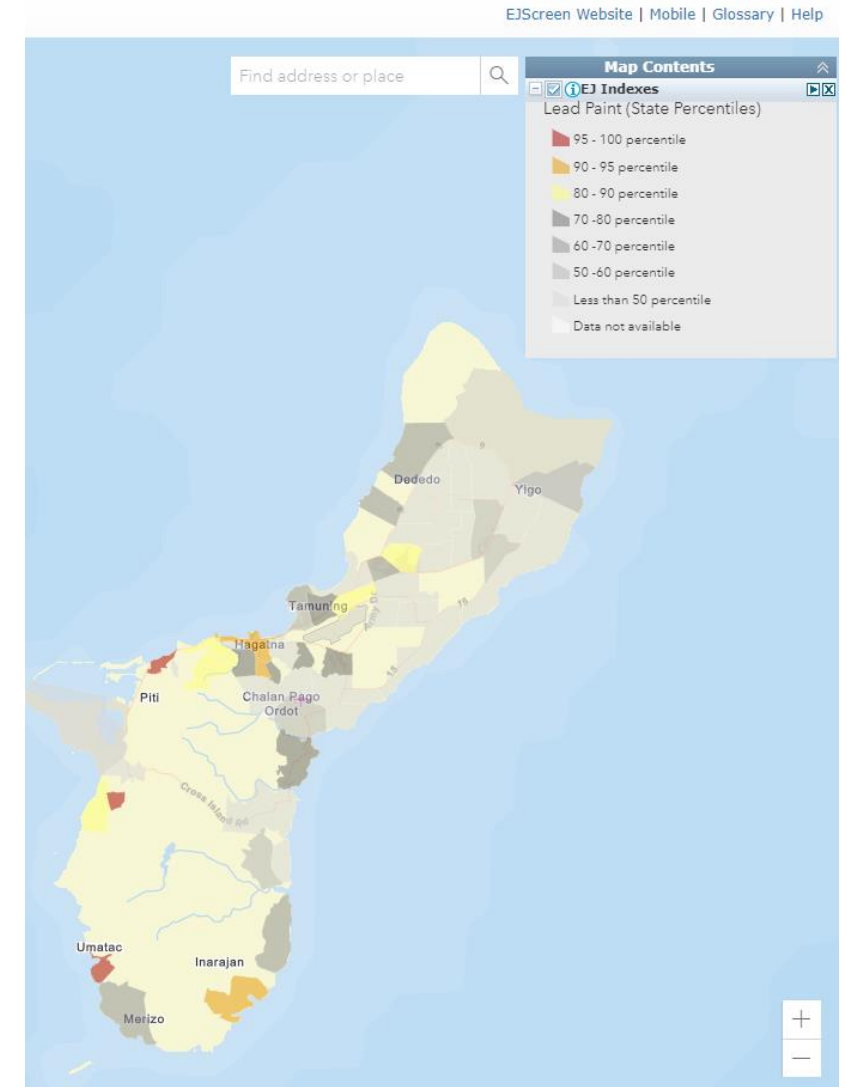
Indicator	Definition
<b>Wildfire Risk</b>	Model representing the wildfire exposure for any specific location in the contiguous US, today and with the future climate change.
<b>Flood Risk</b>	Flood model that shows the risk of flooding at any location in all 50 states and Puerto Rico due to rainfall (pluvial), riverine flooding (fluvial), and coastal surge flooding.
<b>Drought</b>	Change in drought conditions across the contiguous 48 states from 1900 to 2020
<b>Coastal Flood Hazard</b>	Areas in coastal counties that are most prone to coastal flood hazards
<b>100-year Flood Estimates</b>	Estimated 100-year floodplains for the Conterminous US for 2016
<b>Sea Level Rise</b>	Land at risk of permanent flooding when sea level rises.

# Critical Service Gaps Indicators

Indicator	Definition
<b>Food Desert</b>	Low income and low access to food from USDA
<b>Medically Underserved</b>	Areas having too few primary care providers, high infant mortality, high poverty or a high elderly population.
<b>Broadband Internet</b>	Areas where less than 50% of population has broadband

# Territory Data

- For first time ever, EJScreen features data on **US Virgin Islands, Guam, American Samoa, and Northern Mariana Islands**
- Includes select environmental indicators, demographics, & associated indexes
- Important addition for the consideration of EJ in **all** places within the U.S.
- Data will only be compared at “state” level due to different censuses and available datasets



# Territory Data

Available environmental dataset will include:

US Virgin Islands	Guam	American Samoa	Mariana Islands
Lead paint	Lead paint	Lead paint	Lead paint
Superfund proximity	Superfund proximity		
RMP proximity	RMP proximity	RMP proximity	
TSDF proximity	TSDF proximity		
Underground Tanks	Underground Tanks	Underground Tanks	Underground Tanks

*New data will be added as it is made available*

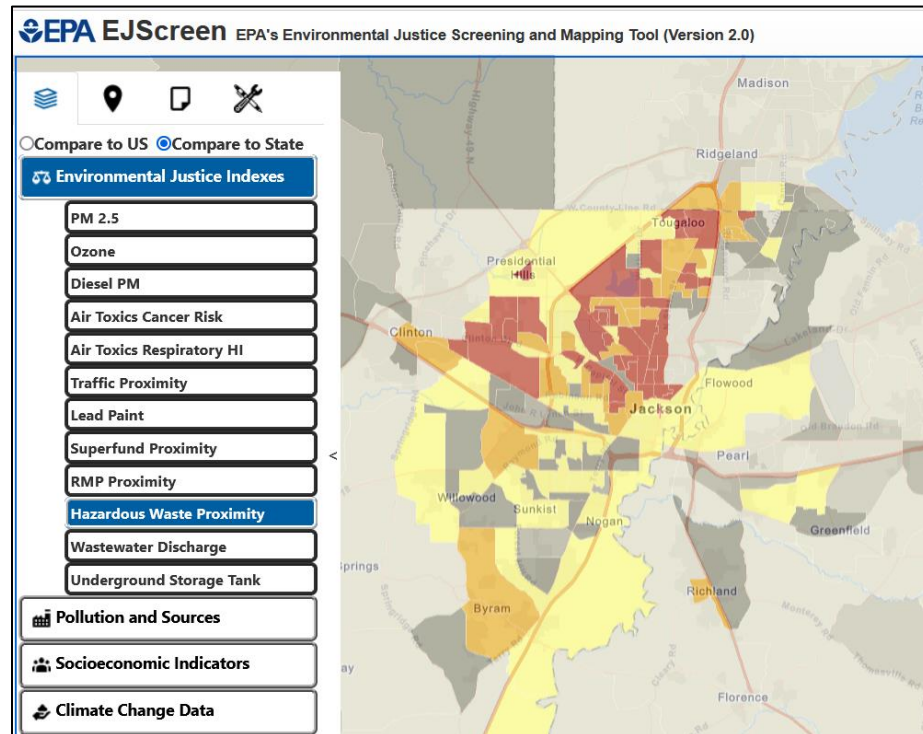


# Maps, Reports & Tools

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# Viewing EJScreen Data

You can view the data within reports or on maps.



**EJSCREEN Report**  
for 1 mile Ring Centered at 33.82864, -118.93191, CALIFORNIA, EPA Region 9  
Approximate Population: 23624

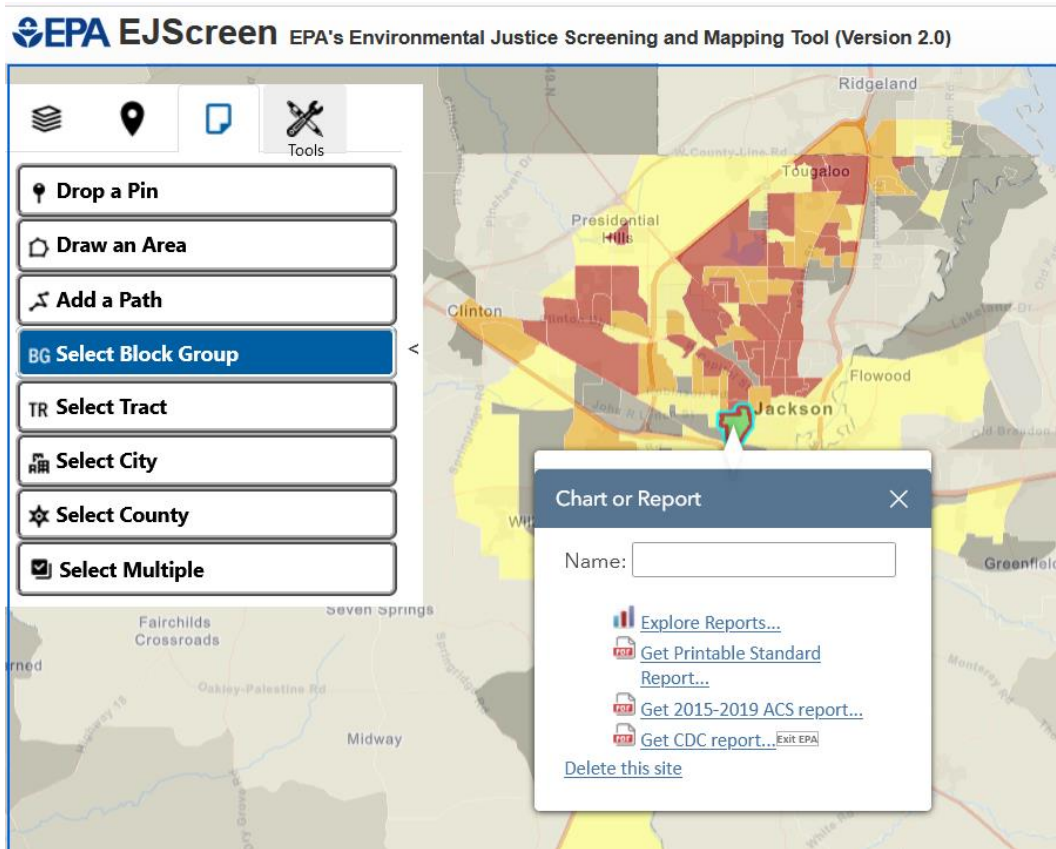
Selected Variables	Raw Data	State Avg.	%ile in State	EPA Region Avg.	%ile in EPA Region	USA Avg.	%ile in USA
<b>Environmental Indicators</b>							
Particulate Matter (PM 2.5 in $\mu\text{g}/\text{m}^3$ )	13.3	10.6	84	10.3	87	10.7	86
Ozone (ppb)	41.6	51.6	19	52.4	16	48.3	23
NATA Diesel PM ( $\mu\text{g}/\text{m}^3$ ) <sup>a</sup>	2.57	1.29	87	1.2	90-95th	0.924	90-95th
NATA Cancer Risk (lifetime risk per million) <sup>a</sup>	130	76	82	69	90-95th	49	95-100th
NATA Respiratory Hazard Index <sup>a</sup>	7.4	3.9	98	3.5	95-100th	2.3	95-100th
NATA Neurological Hazard Index <sup>a</sup>	0.18	0.072	98	0.069	95-100th	0.063	95-100th
Traffic Proximity and Volume (daily traffic count/distance to road)	810	210	91	190	92	110	95
Lead Paint Indicator (% the 1980 Housing)	0.97	0.3	78	0.28	82	0.3	79
NFL Proximity (1/4 mile count/1/4 mile distance)	0.060	0.13	81	0.11	86	0.095	71
BMP Proximity (facility count/1/4 mile distance)	1.1	0.46	90	0.41	91	0.31	94
TSD Proximity (facility count/1/4 mile distance)	0.51	0.13	95	0.12	96	0.054	99
Water Discharger Proximity (facility count/1/4 mile distance)	0.33	0.18	88	0.19	87	0.25	81
<b>Demographic Indicators</b>							
Primary Demographic Index	47%	47%	50	46%	53	35%	71
Minority Population	71%	60%	58	57%	52	30%	80
Low Income Population	23%	35%	38	35%	38	24%	36
Geographically Isolated Population	7%	11%	48	10%	53	5%	78
Population With Less Than High School Education	13%	20%	48	10%	48	15%	56
Population Under 5 years of age	5%	7%	33	7%	34	7%	36
Population over 64 years of age	16%	12%	27	12%	25	13%	59

<sup>a</sup> The National Scale Air Toxics Assessment (NSATA) is EPA's ongoing, comprehensive evaluation of air toxics in the United States. EPA developed the NSATA to prioritize air toxics, emission sources, and locations of interest for further study. It is important to remember that NSATA provides broad estimates of health risks over geographic areas of the country, not definitive risks to specific individuals or locations. More information on the NSATA analysis can be found at: <http://www.epa.gov/nsata/nsatamain/index.html>

A map gives you one indicator at a time, for each of the block groups within a wider area (e.g. across several miles)

A standard report gives you all the indicators at once for a single specified location

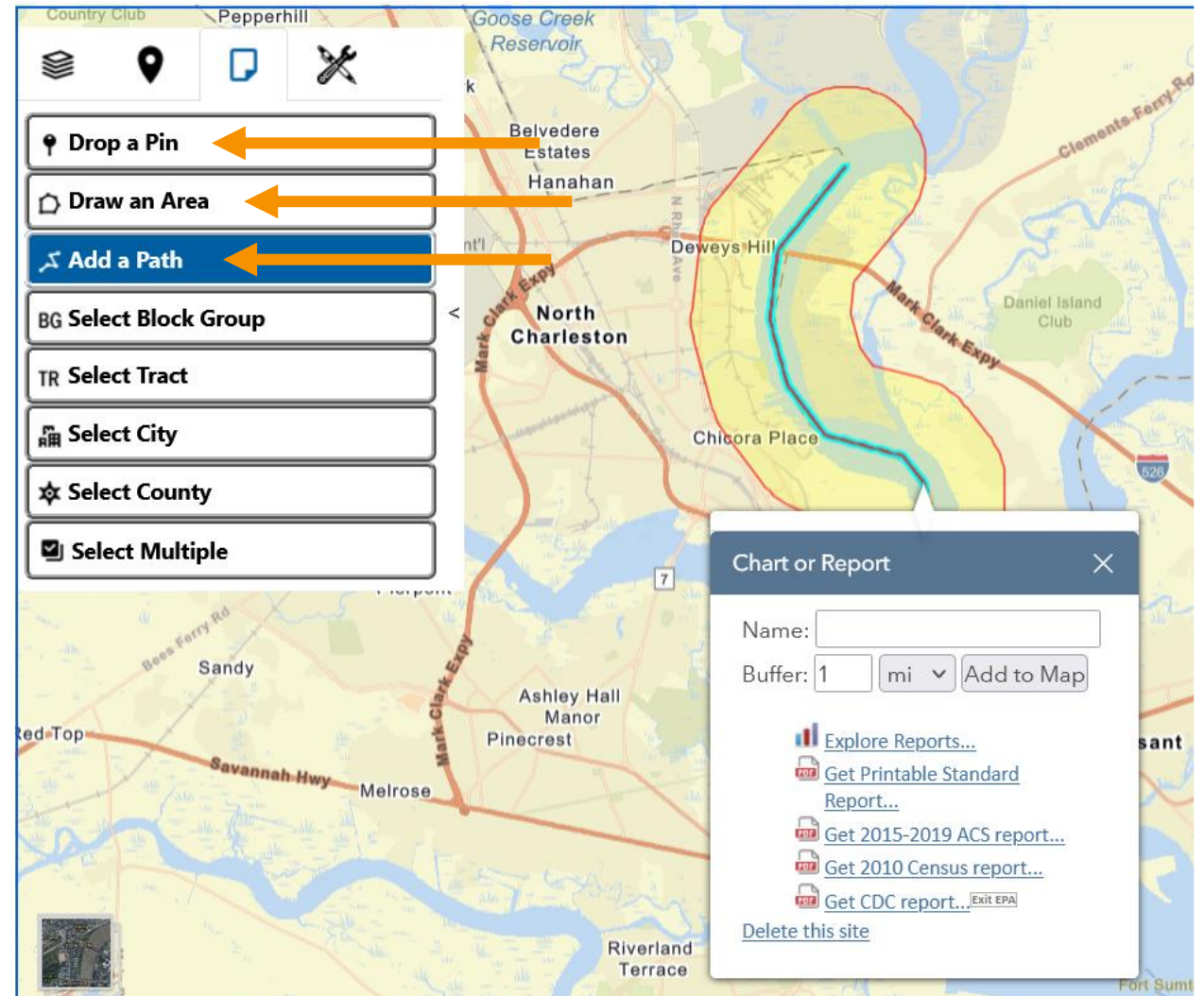
# EJScreen Reports



- Multiple reports available in EJScreen
- Printable Standard Report
  - Sharable analysis of the selected location
  - Complete with maps, graphs, EJ indices, and raw values
- American Community Survey Report
  - Detailed Breakdown of Race/Ethnicity, Linguistic Isolation, Language Spoken, etc.
- CDC Health Report
  - County Level CDC report

# EJScreen Reports (cont'd)

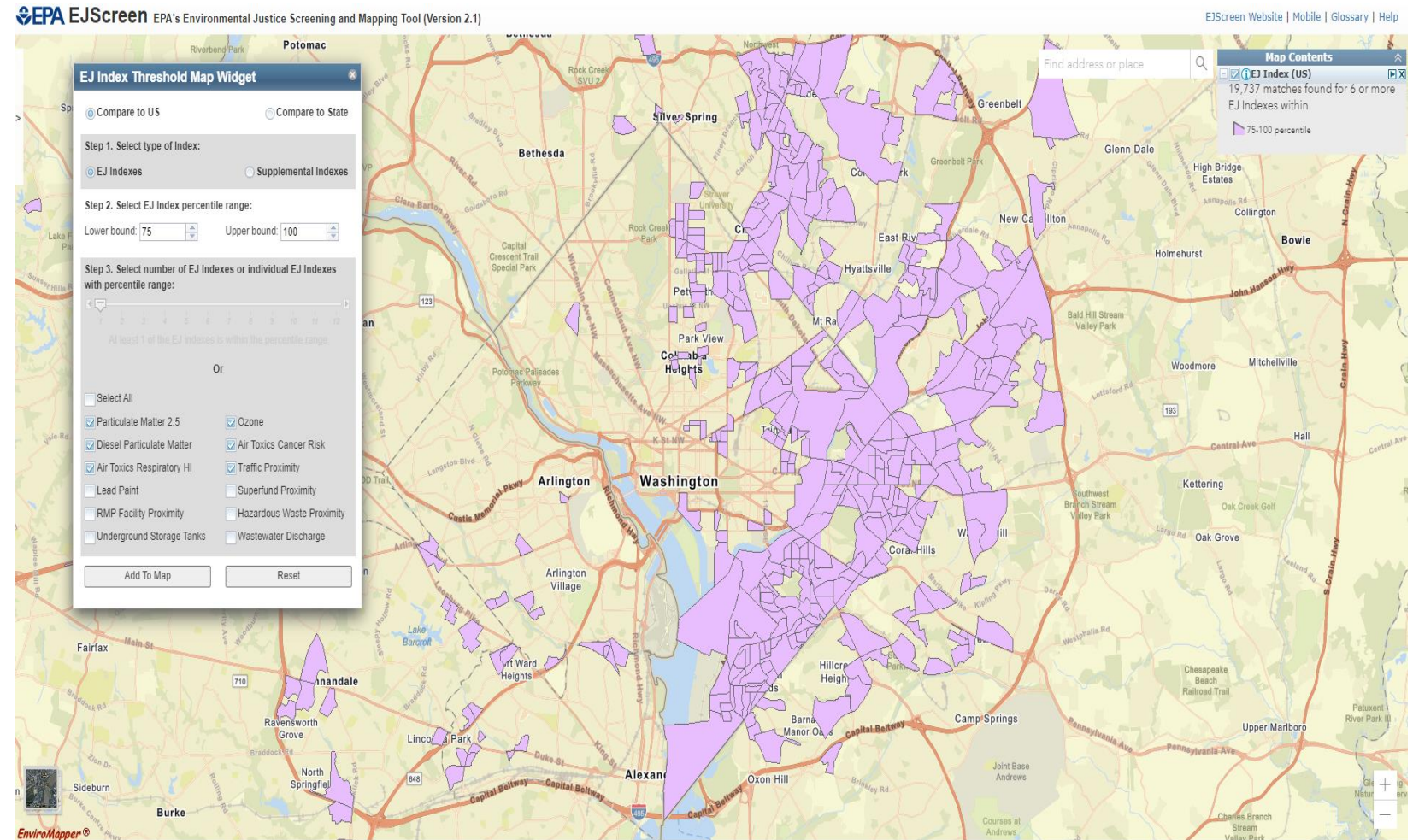
- Ability for user to define area of assessment
  - Buffer around a pin
  - User-drawn areas/polygons
    - Plumes of pollution, routes of exposure
  - User-drawn paths
    - Impaired waters, highway segments





# Threshold Maps

- Allows for user defined thresholds to customize how the results are displayed
- Initial step towards examining cumulative impacts





# Threshold Maps Widget

- Comparable to US or State
- Viewable for EJ indexes and supplemental indexes
- User selected upper and lower bounds
- Ability to choose number of indexes or the individual indexes

The screenshot shows the 'EJ Index Threshold Map Widget' interface. It has a title bar with a close button. Below the title bar, there are two radio buttons: 'Compare to US' (selected) and 'Compare to State'. The interface is divided into three steps. Step 1, 'Select type of Index:', has two radio buttons: 'EJ Indexes' (selected) and 'Supplemental Indexes'. Step 2, 'Select EJ Index percentile range:', has two input fields with arrows: 'Lower bound: 75' and 'Upper bound: 100'. Step 3, 'Select number of EJ Indexes or individual EJ Indexes with percentile range:', features a slider from 1 to 12, currently set to 1, with the text 'At least 1 of the EJ indexes is within the percentile range' below it. Below the slider is the word 'Or'. There is a 'Select All' checkbox, which is unchecked. Below it is a grid of 12 checkboxes for individual EJ indexes: Particulate Matter 2.5, Diesel Particulate Matter, Air Toxics Respiratory HI, Lead Paint, RMP Facility Proximity, Underground Storage Tanks, Ozone, Air Toxics Cancer Risk, Traffic Proximity, Superfund Proximity, Hazardous Waste Proximity, and Wastewater Discharge. The first four checkboxes are checked. At the bottom, there are two buttons: 'Add To Map' and 'Reset'.

**EJ Index Threshold Map Widget**

☒ Compare to US ☐ Compare to State

**Step 1. Select type of Index:**

☒ EJ Indexes ☐ Supplemental Indexes

**Step 2. Select EJ Index percentile range:**

Lower bound: 75 Upper bound: 100

**Step 3. Select number of EJ Indexes or individual EJ Indexes with percentile range:**

1 2 3 4 5 6 7 8 9 10 11 12

At least 1 of the EJ indexes is within the percentile range

Or

☐ Select All

☒ Particulate Matter 2.5 ☒ Ozone

☒ Diesel Particulate Matter ☒ Air Toxics Cancer Risk

☒ Air Toxics Respiratory HI ☒ Traffic Proximity

☐ Lead Paint ☐ Superfund Proximity

☐ RMP Facility Proximity ☐ Hazardous Waste Proximity

☐ Underground Storage Tanks ☐ Wastewater Discharge

Add To Map Reset

# EJScreen in Action at EPA

## EPA uses of EJScreen:

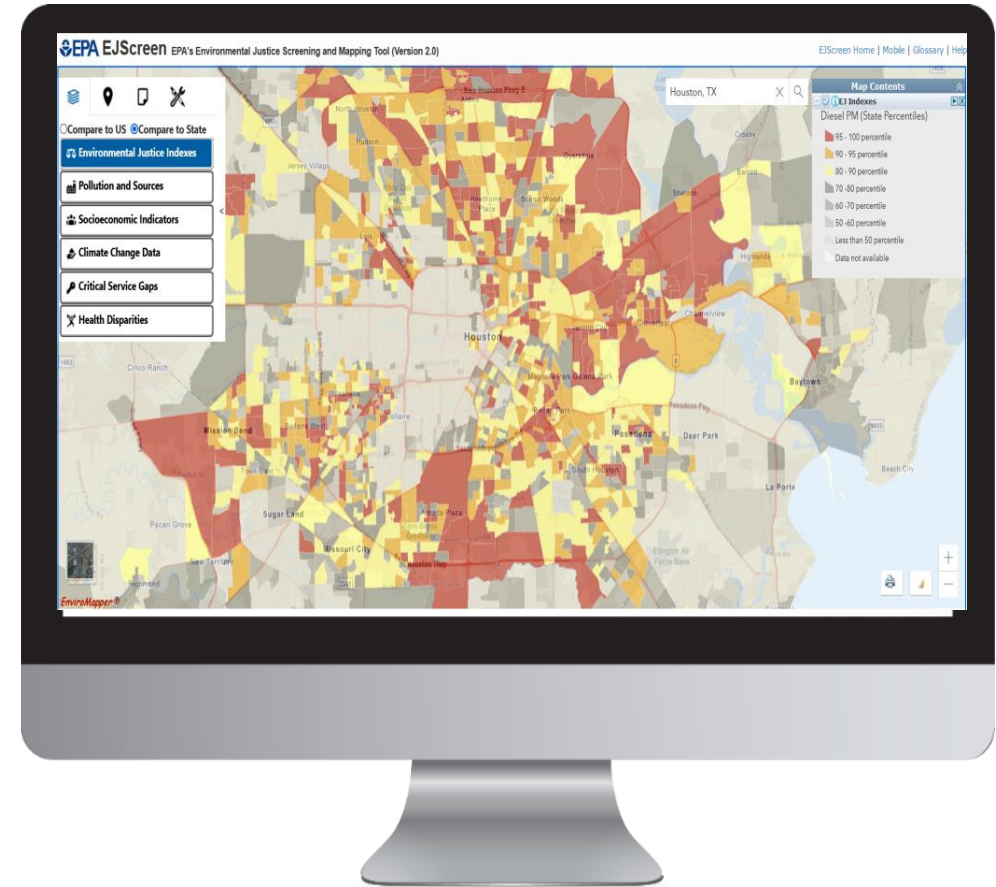
- for public outreach and engagement
- enforcement targeting
- permitting and NEPA reviews
- reviews of grant projects
- other place-based initiatives
- retrospective reporting

## Various EJScreen “platforms” for Integration:

- Web-based platform  
(<https://ejscreen.epa.gov/mapper/>)
- ArcGIS platform  
(<https://www.epa.gov/ejscreen/download-ejscreen-data> )
- ECHO platform  
(<https://echo.epa.gov/>)
- Other EPA mapping tools & databases also incorporate EJScreen data

# EJScreen Resources

- [EJScreen website](#)
- [Trainings and Office Hours](#)
- **Office Hours**
  - December 21 at 12 p.m. E.T. (Public)



[\*Click to access EJScreen Tool\*](#)

# Questions?

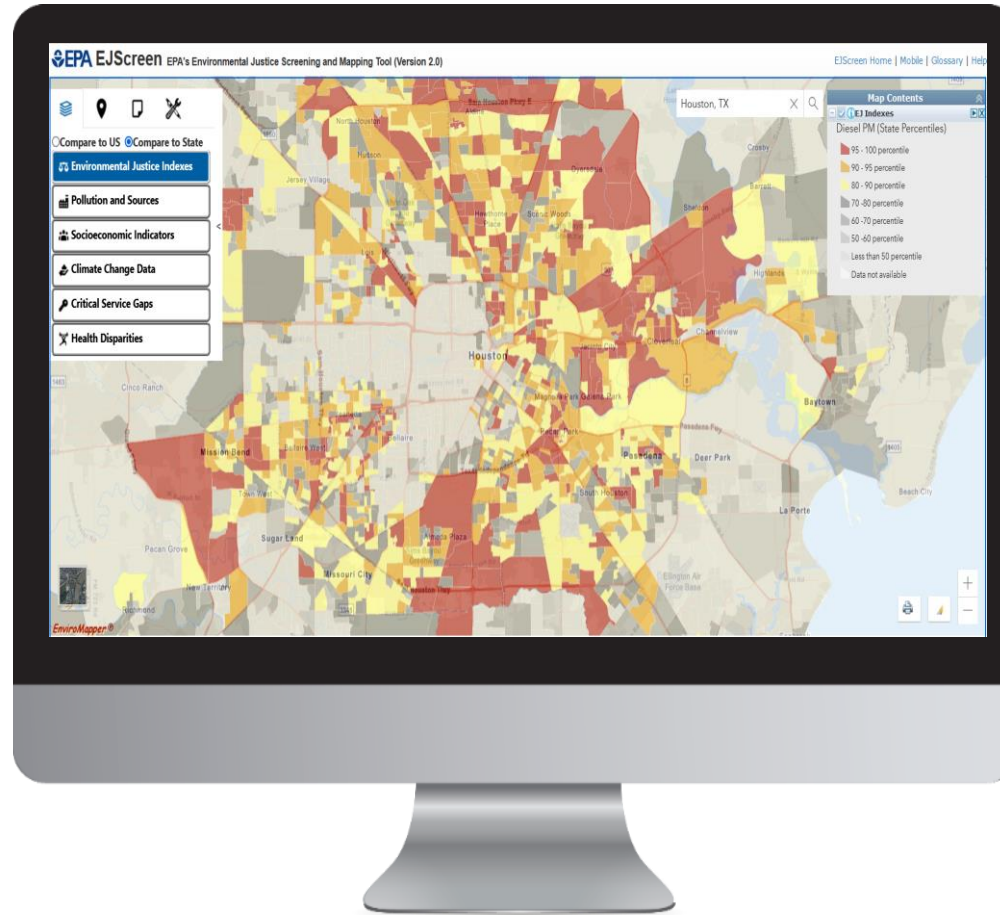
## Contact Information

Matthew T. Lee

Office of Environmental Justice and External Civil Rights

[Lee.Matthew@epa.gov](mailto:Lee.Matthew@epa.gov)

# LIVE DEMO



[Click to access EJScreen Tool](#)