



ENVIRONMENTAL JUSTICE SCREENING AND MAPPING TOOL (EJSCREEN) USER GUIDE

A brief guide designed to assist
with data collection for grant
applications and reporting
using the EJScreen tool

**EPA PREPARED: Building evidence-based
tools to integrate community experiences**

September 2024

ABOUT THIS GUIDE

This document is developed by the EPA PREPARED Building evidence-based tools to integrate community experiences under the U.S. Environmental Protection Agency cooperative agreement for Promoting Readiness and Enhancing Proficiency to Advance Reporting and Data.

The guide serves as a resource on navigating EPA's Environmental Justice Screening Tool (EJScreen) to collect socioeconomic, environmental, public health, and other community data to be used for grant applications and reporting. The guide provides an abbreviated summary of the main steps of using the online mapping tool, focusing on data collection for grant narratives and reports.

A comprehensive technical guide for the tool is available on the EJScreen's website:

<https://screeningtool.geoplatform.gov/en/downloads>

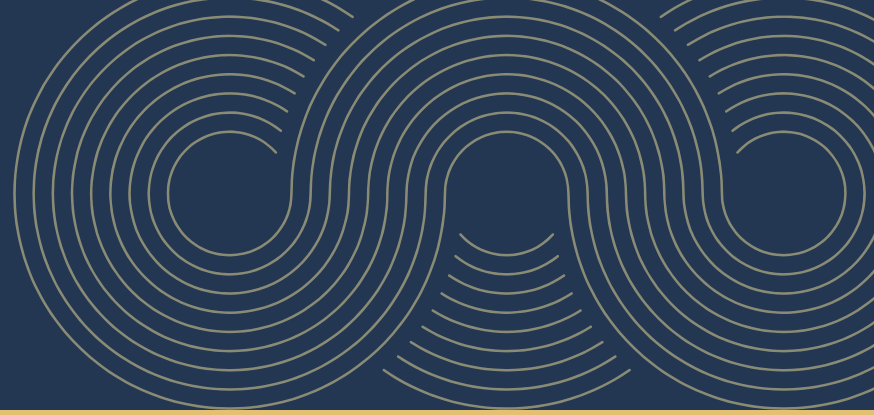
Electronic Access

The document is electronically available at EPA PREPARED website at UMass Dartmouth: <https://epaprepared.sites.umassd.edu/>

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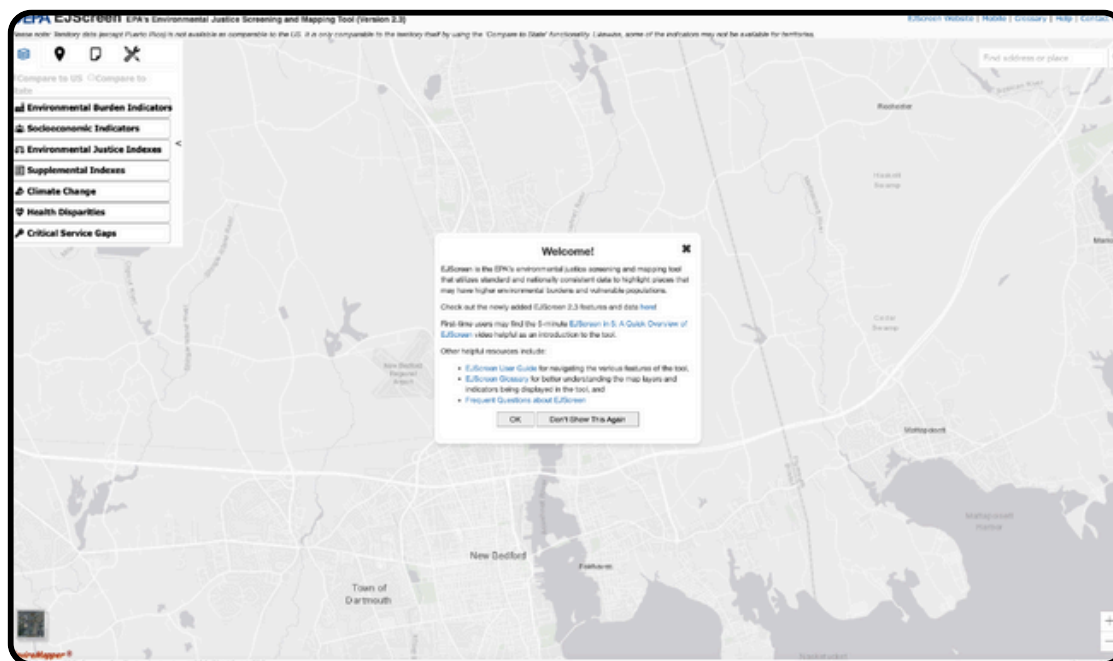
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1. Introduction

EJScreen is a mapping and screening tool developed by the U.S. Environmental Protection Agency (EPA). It is designed to provide a nationally consistent dataset that combines environmental and demographic indicators in maps and reports. The tool is primarily used to identify areas that may be experiencing environmental justice concerns including communities facing disproportionate environmental burdens due to presence of pollution, hazardous waste sites, or other socioeconomic burdens.

EJScreen is widely used by government agencies, non-profit organizations, researchers, and community groups to support environmental justice initiatives and collect data for grant applications and reports.

To access EJScreen, visit [EPA EJScreen](#).

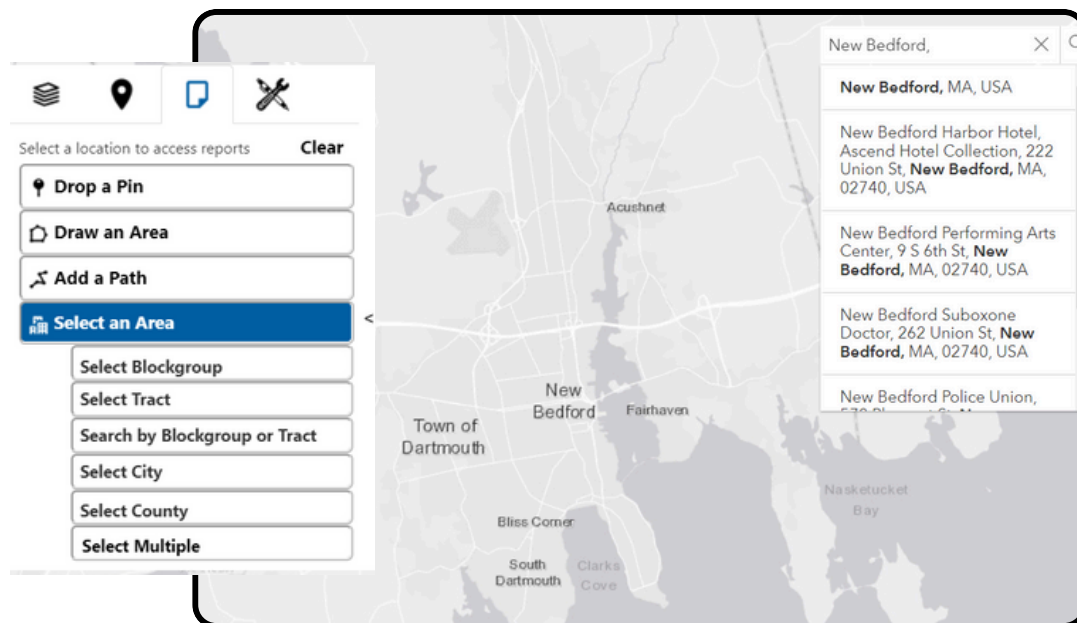


2. Identify Locations

Find Address

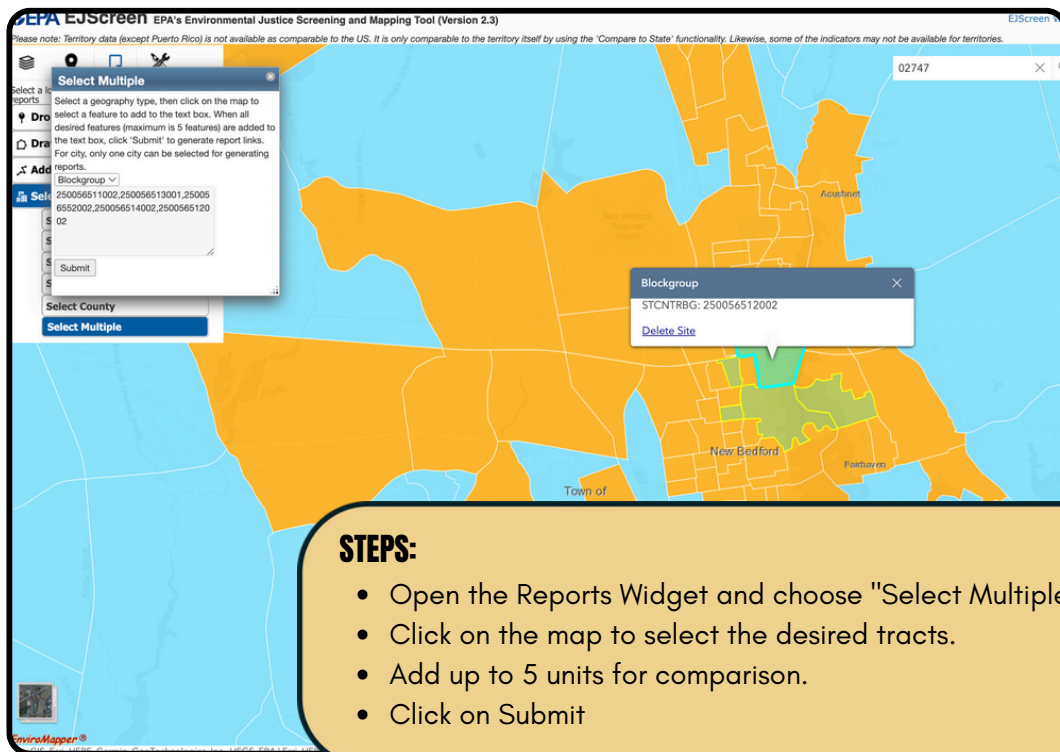
Type an address or another location in the "Find address or place" in the right text box.

Once you identify the area of interest, you further select the target location under the left reports menu by dropping a pin, draw the perimeters of the area or add a path, or a select a specific blockgroup, census tract, city or county. There is also an option to select multiple geographic units which is further explained in the next section.



Selecting Multiple Geographic Units

This Select Multiple option allows to analyze data across several blockgroups, census tracts, cities or counties. This option enables users to generate reports for one or more geographic areas of the same scale. For instance, the user can select multiple blockgroups in an area it does not allow for a combination of blockgroups and census tracts.



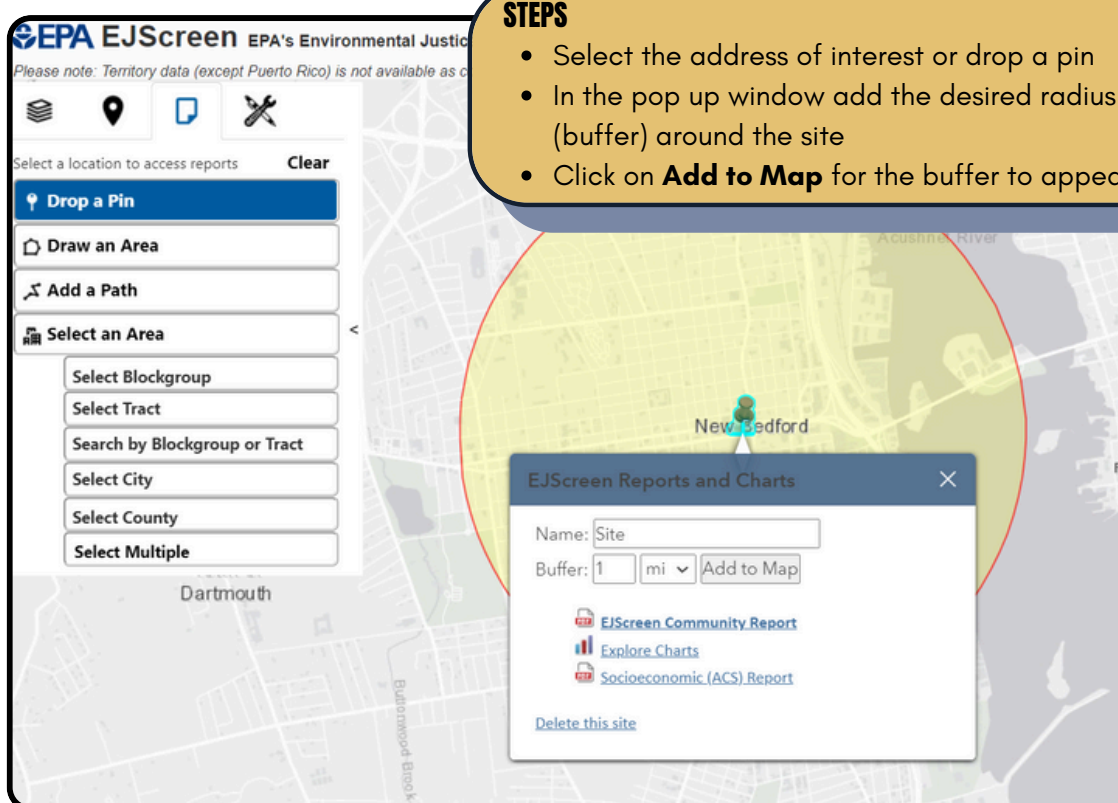
As an example, the map shows 5 blockgroups selected in New Bedford, MA. The selected tracts are highlighted in green, and their boundaries are outlined in yellow. This selection allows the user to analyze the environmental and socioeconomic data for these specific blockgroups through generating reports. The reports function is discussed in Section 6 of the guide.

Draw a buffer around the selected location

The location selection and Buffer Options enables users to examine environmental justice data across specific geographic areas by creating buffer zones around a specific location. This feature allows for more focused analysis around the site of interest compared to selecting blockgroups or census tracts.

STEPS

- Select the address of interest or drop a pin
- In the pop up window add the desired radius (buffer) around the site
- Click on **Add to Map** for the buffer to appear



How it works

The buffer gathers data from nearby areas, and for each indicator, it provides an average value based on all the residents located within the buffer. You could select a radius beginning from 0.5-1 from the point of interest or any other distance based on your data search.

3. EJScreen Parameters

EJScreen's environmental, socioeconomic, climate change, health disparities, and critical service gaps indicators are summarized in the tables below.

Environmental Indicators

Parameter	Variable Description & Reporting Units
Particulate matter 2.5	Annual average PM2.5 levels in air (in $\mu\text{g}/\text{m}^3$)
Ozone	Average of the annual top ten daily maximum 8-hour ozone concentrations in air (in ppb)
Nitrogen Dioxide (NO_2)	Average annual nitrogen dioxide levels (in ppb)
Diesel Particulate Matter	Diesel particulate matter level in air (in $\mu\text{g}/\text{m}^3$)
Toxic Releases to Air	RSEI modeled toxicity-weighted concentrations in air of TRI listed chemicals.
Traffic Proximity	Count of vehicles at major roads (as daily count/distance to road)
Lead Paint	Housing units built pre-1960, as indicator of potential lead paint exposure (in %)
Superfund Proximity	Count of proposed or listed superfund sites (as count/km)
RMP Facility Proximity	Count of potential chemical accident management plan facilities (as count/km)
Hazardous Waste Proximity	Count of hazardous waste facilities (as count/km)
Underground Storage Tanks	Count of LUSTs (multiplied by a factor of 7.7) and the number of USTs within a 1,500-foot buffered block group (as count/km)
Wastewater Discharge	RSEI modeled toxic concentrations at stream segments (as toxicity weighted concentrations/m)
Drinking water non-compliance	Number of Safe Drinking Water Act violations not compliant that water systems have received over the past 5 years (score-based)

Socioeconomic Indicators

Parameter	Variable Description & Reporting Units
People of Color	People multiracial, Hispanic, and/or not white (%)
Low Income	Households with a household income less than or equal to twice the federal "poverty level" (%)
Unemployment Rate	People that did not have a job during the reporting period (%)
Limited English Speaking	People in households where all 14+ people speak another language and have difficulty with English (%)
Less Than High School Education	People 25+ whose education is less than a high school diploma (%)
Under Age 5	People less than 5 years old (%)
Over Age 64	People more than 64 years old (%)

Climate Change Indicators

Parameter	Variable Description & Reporting Units
Flood Risk	Risk of flooding due to rainfall (pluvial), riverine flooding (fluvial), and coastal surge flooding (percentile)
Wildfire Risk	Risk of wildfire exposure today and projected with 30-year future climate change (percentile)
100 Year Floodplain	Map of 100-year floodplain (locations with 1% chance of flooding in any given year) (shaded areas)
Sea Level Rise	6 map layers of 1-6 feet of projected sea level rise (shaded areas)
Extreme Heat	Average and maximum days with temperature above 90 degrees from 2019-2023 (number of days)

Public Health Indicators

Parameter	Variable Description & Reporting Units
Low Life Expectancy	Life expectancy at birth for 2010-2015 (percentile and index)
Heart Disease	Heart disease prevalence among adults aged 18 years or older (%)
Asthma	Asthma prevalence among adults aged 18 years or older (%)
Cancer	Cancer (excluding skin cancer) prevalence among adults aged 18 years or older (%)
Persons With Disabilities	People with disabilities including hearing, vision, cognitive, ambulatory, self-care, and independent living difficulties (%)

Critical Service Gaps Indicators

Parameter	Variable Description & Reporting Units
Housing Burden	Households earning less than 80% of households and spending more than 30% of their income on housing costs (%)
Transportation Access	Average of 4 transportation indicators including Transportation Cost Burden, National Walkability Index, Percentage of Households with No Vehicle Available, and Mean Commute Time to Work (percentile)
Food Desert	Low income and at least 500 or 1/3 of people or in the tract are more than 1 mile away from a supermarket for urban areas or 10 miles for rural areas (shaded areas)

Environmental Justice Indexes

There are 13 EJ indexes in EJScreen reflecting the 13 environmental indicators, combined with socioeconomic parameters. EJ indexes are calculated as:

$$\text{EJ index} = (\text{The Environmental Indicator Percentile for Blockgroup}) \times (\text{Demographic Index for Blockgroup})$$

Where the Demographic Index is the average of low income and people of color populations

Supplemental Environmental Justice Indexes

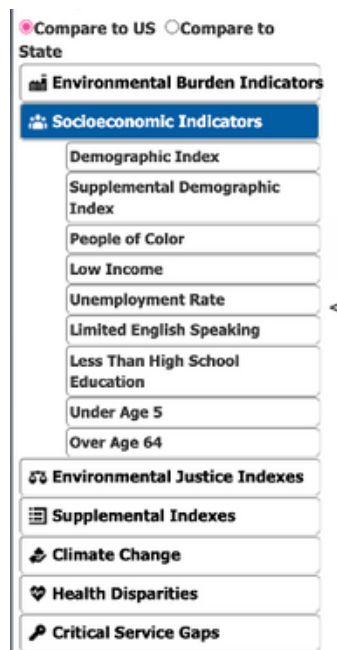
There are 13 supplemental indexes that use the same EJScreen methodology but include a 5-factor supplemental demographic index with percentages of low Income populations, persons with disabilities, limited English speaking, less than high school education, and low life expectancy. Supplemental EJ indexes are calculated as

$$\text{Supplemental EJ index} = (\text{The Environmental Indicator Percentile for Blockgroup}) \times (\text{Supplemental Demographic Index for Blockgroup})$$

Where the Demographic Index is the average of low income and people of color populations

4. Understanding the Maps

EJScreen's parameters appear on the left menu as a selection of different maps. The majority parameters will appear as a **percentile** in a graded color scale. The user has the choice of illustrating this percentile compared to other blockgroups in the US or the State.



Compare to US

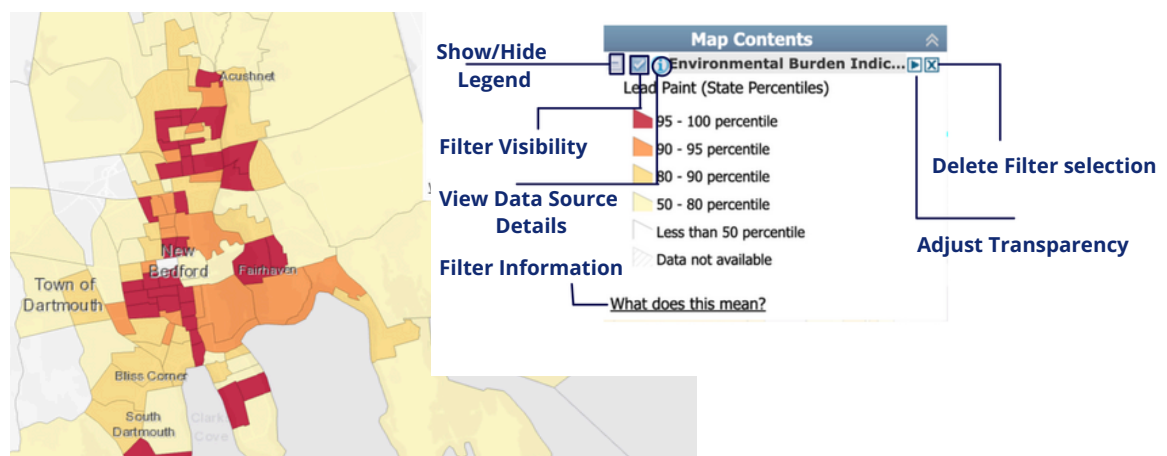
Compares the selected variable's data within the chosen geographic area to the blockgroups in the US, and calculates the percentiles. This shows how the area compares to other areas within the US and can providing an understanding of how a local issue relates to nationwide data.

Compare to STATE

Compares the selected data within the chosen geographic area against the blockgroups within the state, and calculates the percentile. This shows how the area stands in comparison to other areas within the same state, and can this can provide a more localized approach.



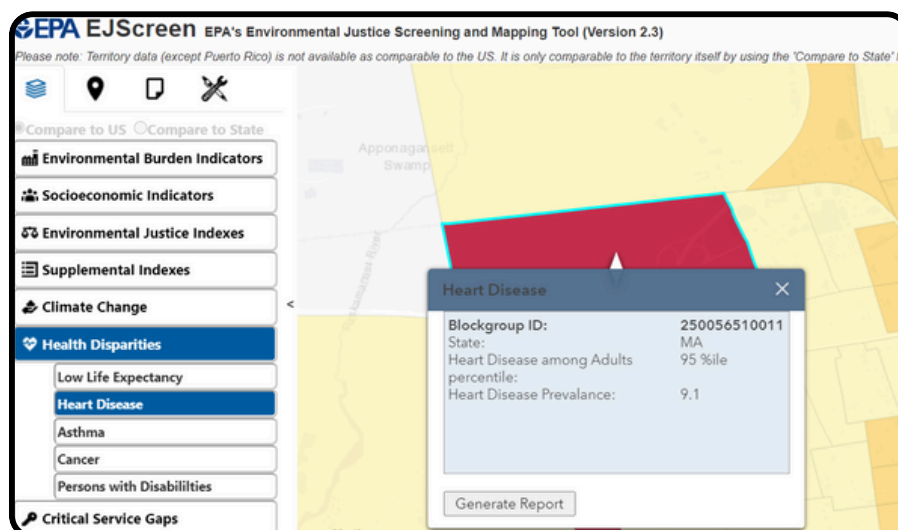
Under the Map Contents window, the users can interact with a data layer, including turning the layer on or off, adjusting its transparency, viewing a description of the variable and metadata.



Finding Demographic Data of a Block Group

Begin by activating any Map EJ Indexes layer. Then, click on the block group area of interest on the map, which will open a pop-up window. This window includes location details, population count, and the values and percentiles of the selected EJ parameters.

Example - Health Disparities (Heart Disease)



This is the unique identifier for the specific block group within Bristol County, MA.

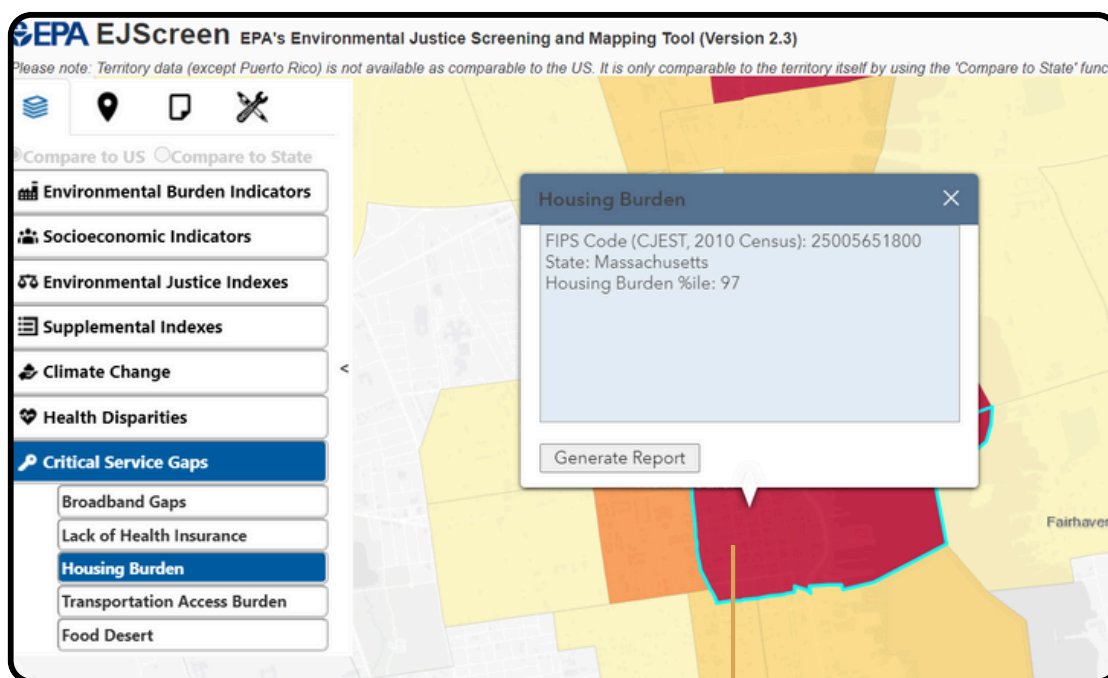
This indicates that the selected area ranks higher than 95% of other areas in Massachusetts for the prevalence of heart disease among adults. This high percentile signals a significant health concern in this block group, suggesting that heart disease is more prevalent here compared to most other areas in the state.

Heart Disease	
Blockgroup ID:	250056510011
State:	MA
Heart Disease among Adults percentile:	95 %ile
Heart Disease Prevalance:	9.1

This value represents the prevalence rate of heart disease among adults in the selected block group. A rate of 9.1 indicates that heart disease affects 9.1% of the adult population in this area.

Example - Critical Service Gaps (Housing Burdens)

Areas with critical service gaps are locations where essential services are lacking such as broadband access, health insurance, transportation, and food deserts. For example under *Housing Burdens*, residents may be facing significant economic stress due to high housing costs relative to their income. In areas with high housing burdens, this data helps to highlight the urgent need for interventions such as affordable housing projects, rent assistance programs, or economic support services.



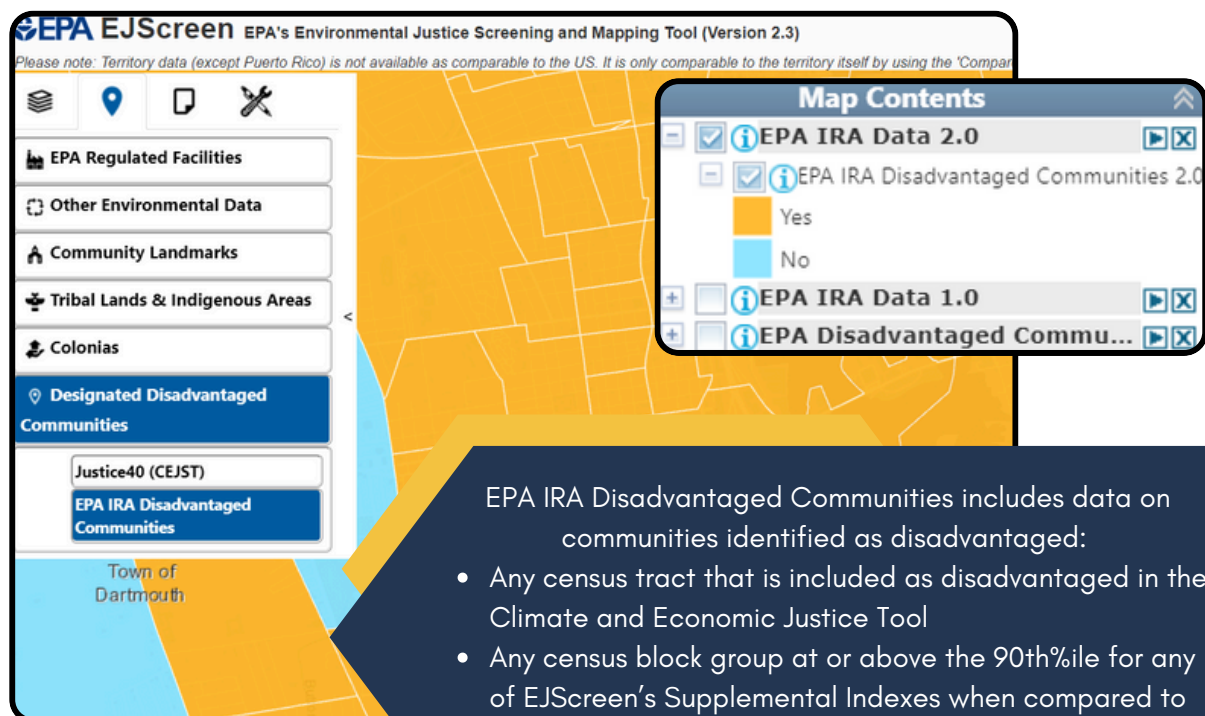
The 97th percentile indicates that residents in this area are facing substantial economic stress due to high housing costs relative to their income. This is a critical factor for addressing housing affordability, economic upliftment, and other support programs.

5. Places Widget Overview

This widget offers additional map layers that include critical data points such as EPA-regulated facilities, community landmarks, tribal and indigenous areas, colonias, and designated disadvantaged communities. Users can easily activate these layers by selecting the appropriate category from the widget menu.

Example - EPA IRA Disadvantaged Communities

EPA IRA Disadvantaged Communities includes data on communities identified as disadvantaged under the EPA's Inflation Reduction Act (IRA) criteria. The user has the option to select between different versions of the EPA IRA map, with the version 2.0 to be the most recent.

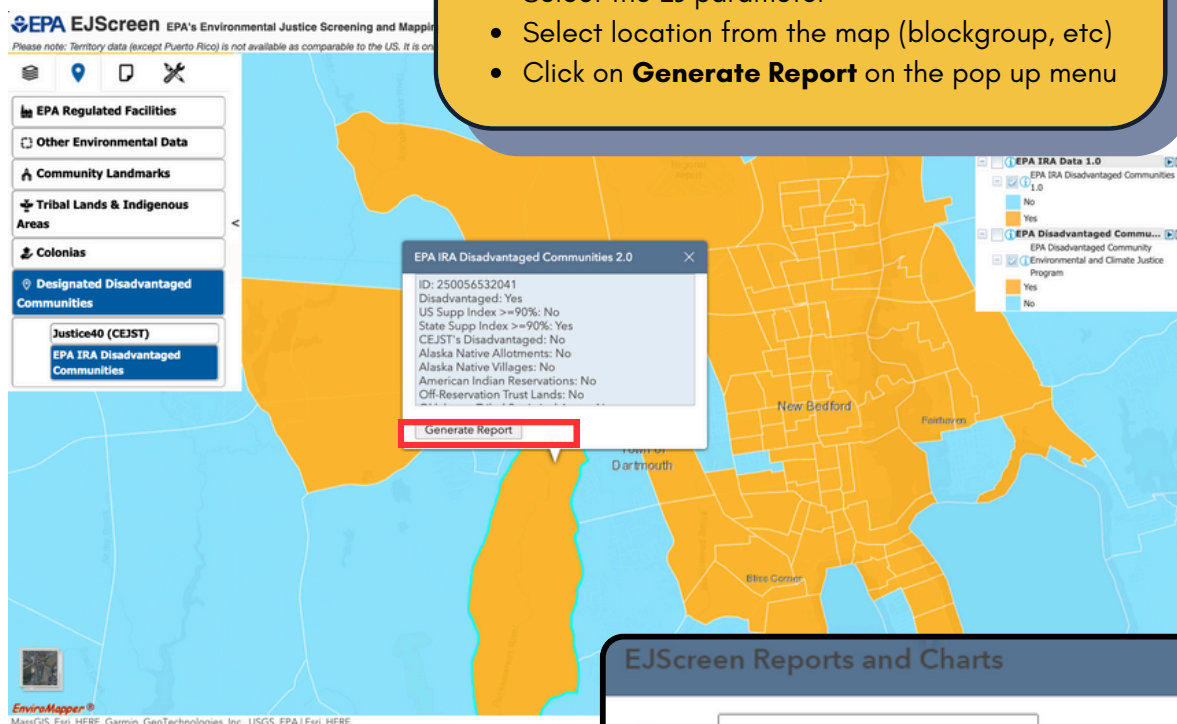


6. Reports Widget Overview

The Reports Widget allows users to generate detailed reports on environmental and demographic data for specific locations. These reports can be customized to compare local data with state and national benchmarks, and are available for download in various formats.

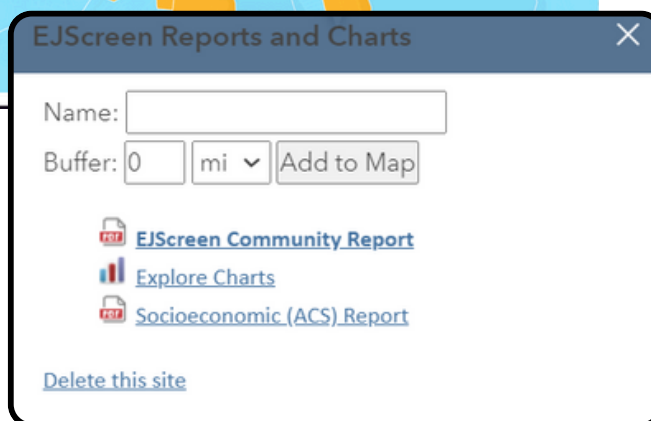
STEPS

- Select the EJ parameter
- Select location from the map (blockgroup, etc)
- Click on **Generate Report** on the pop up menu



Under the EJScreen Reports and Charts Menu, the user has the option to select between:

- EJScreen Community Report
- Explore Charts
- Socioeconomic (American Community Survey) Report



EJScreen Community Report

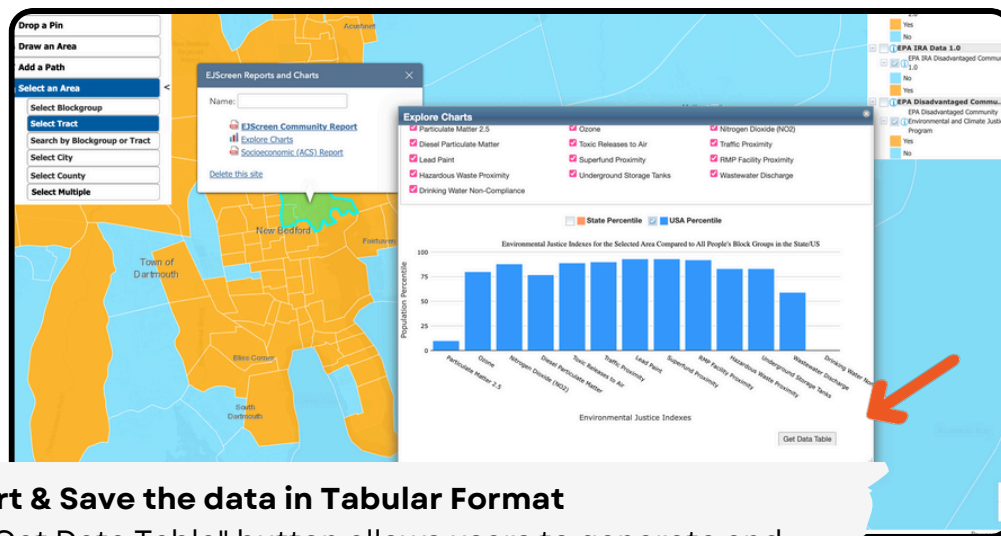
The EJScreen Community Report exports a report with a comprehensive overview of parameters for the selected location including demographic breakdowns, environmental indicators, and comparison metrics with state and national averages.

Socioeconomic (ACS) Report

The socioeconomic ACS report provides a table with values and percentages of socioeconomic data for the selected area based on the 2018-2022 American Community Survey.

Explore Charts

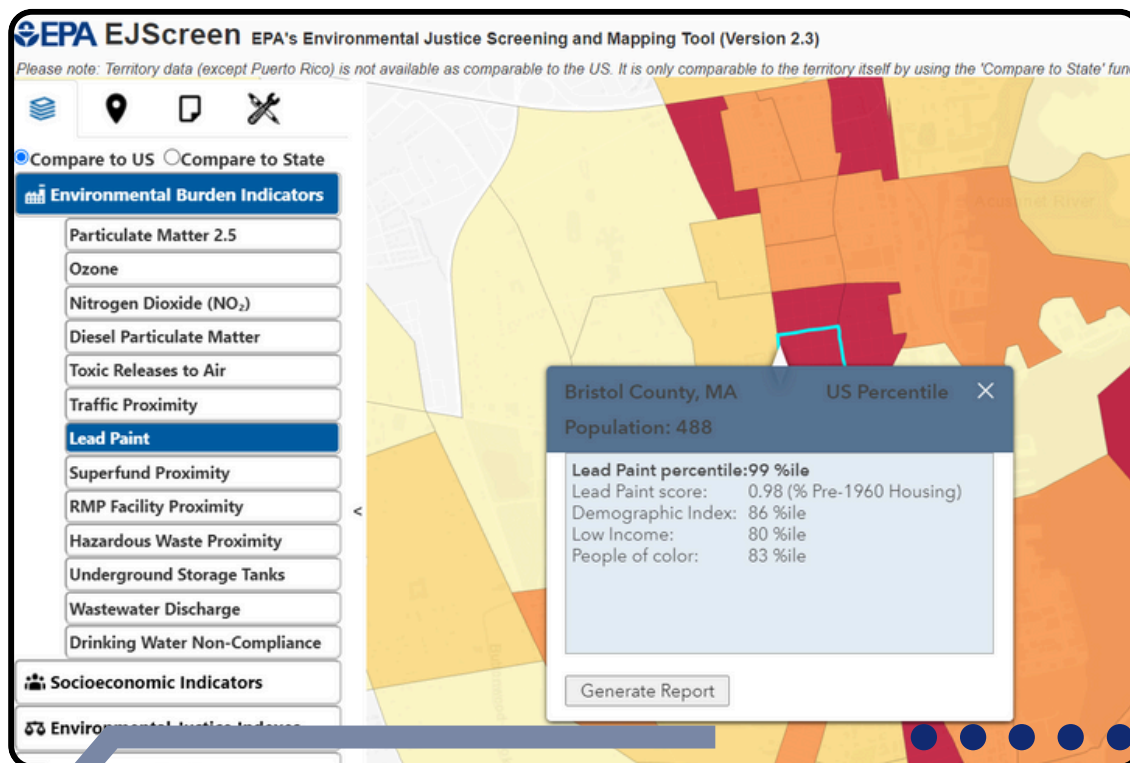
To visually compare environmental and demographic data for a selected location against state and national benchmarks, click on the Explore Charts feature. Users can customize the charts by selecting different data variables, which are then displayed alongside comparative metrics.



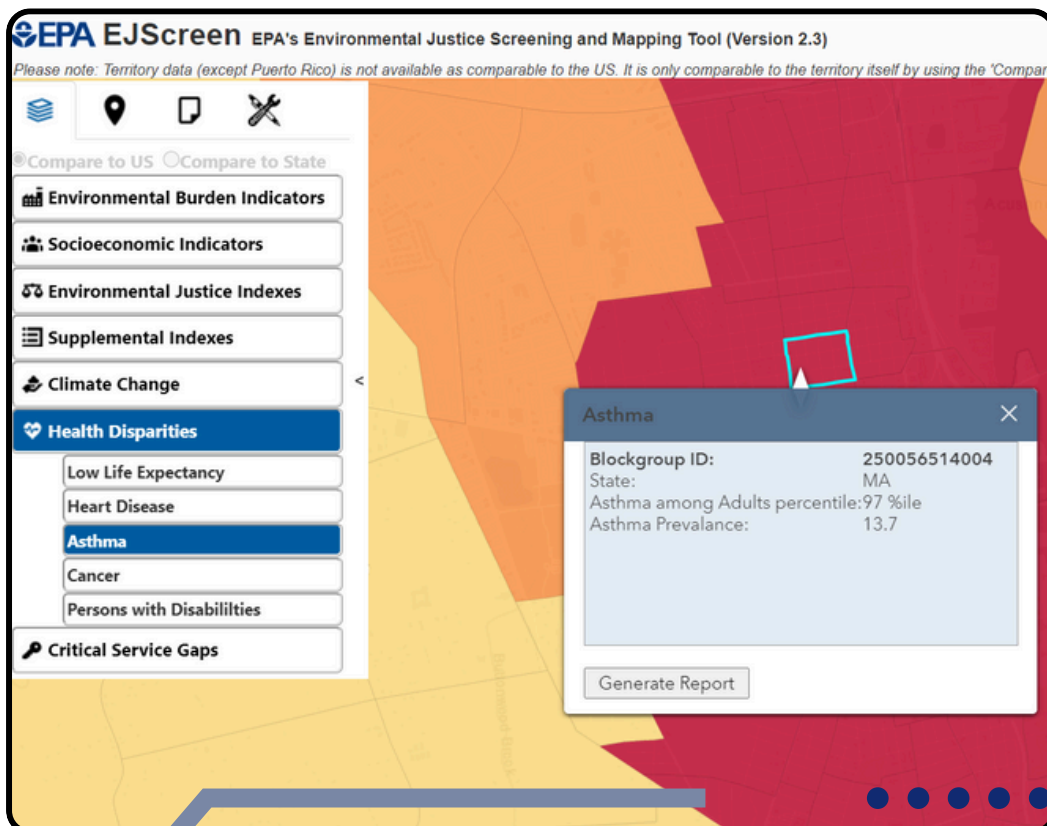
Export & Save the data in Tabular Format

The "Get Data Table" button allows users to generate and download the data displayed in the "Explore Charts" section in a tabular format. This data table includes detailed information about the selected environmental justice indicators in both state and national percentiles. The user may download the file in a CSV format to further analyze data for the particular area.

7. Example - Lead Paint & Socioeconomic Burdens



The selected blockgroup is located in Bristol County and has a population of 488. The area is ranking at 99th percentile nationally for **lead paint**, indicating a significant proportion of housing built before the 1960s, which raises concerns about lead paint exposure. Additionally, the **demographic index** places this area in the 86th percentile, meaning it ranks among the top 14% nationwide for low-income populations and communities of color. The presence of vulnerable populations in areas facing environmental burdens indicates that these communities should be prioritized for interventions and public investment.



In addition, the community in the selected blockgroup is experiencing **high asthma levels** among adults of 18 years of age and older. The blockgroup ranks at the 97th percentile nationally which reflects a significant health concern that may be associated poor air quality or other environmental parameters.

