

Vermont Environmental Justice Mapping Tool Overview

April 13, 2022




Why does Vermont need a mapping tool?

- Mapping is a powerful way to represent social vulnerability data and make it easily digestible by a broad audience.
- Mapping tools can simplify decision making and provide transparency
- Existing mapping tools contain environmental and/or demographic and health related information, but it's not in one tool.
- Inconsistent and conflicting information in various tools:
 - Vermont Social Vulnerability Index
 - EPA's EJ SCREEN
 - Vermont Environmental Disparity Index
 - Climate and Environmental Justice Screening Tool (Justice 40 Tool)
- Existing tools are both interactive and static

Why does Vermont need a mapping tool?

- Rural environmental justice considerations are difficult to assess with existing tools
- Findings from UVM research (2021):
 - **No correlation** with increased pollution burden for low-income communities
 - **Positive correlation** between increased pollution burden and BIPOC communities.
- EJSCREEN was designed to be a tool for states and communities to use to “identify” areas for further research
- EJSCREEN does not include a significant amount of Vermont data (ex. VT’s over 1,000 Hazardous waste sites)



About Census Data

Census Block –

Smallest unit mapped, 32,580 in Vermont

Census Block Group

Generally, 600 and 3,000 people, 524 in Vermont

Census Tract

About 4,000-5,000 people, 184 in Vermont

Vermont Environmental Disparity Index

In order to identify communities that are most susceptible to environmental hazards and most vulnerable to the modifying effect of socio-economic factors, the Decolonial Science, Democracy & Just Futures Lab at University of Vermont constructed a Vermont environmental disparity index (VTEDI) based on exposure to environmental hazards and population characteristics (including underlying health risk factors and social vulnerability). This index is a combination of environmental exposure and population characteristics:

VT Environmental Disparity Index =
Environmental Exposure * (Health Risk Factors * 0.5 + Social Vulnerability * 0.5)

In the VTEDI layer, the darker a census tract is, the more combined environmental, social, and health burdens that the community carries. In the environmental exposure layer, darker colors represent higher cumulative impact of the three types of environmental hazards. The numbers (between 0-100) are percentiles that represent a relative ranking of a unit compared to all other areas in the state. The greater the percentiles, the bigger the impact of the variable.

This is an early version of the index map, and more environmental data sources may be added in the future once they become available.

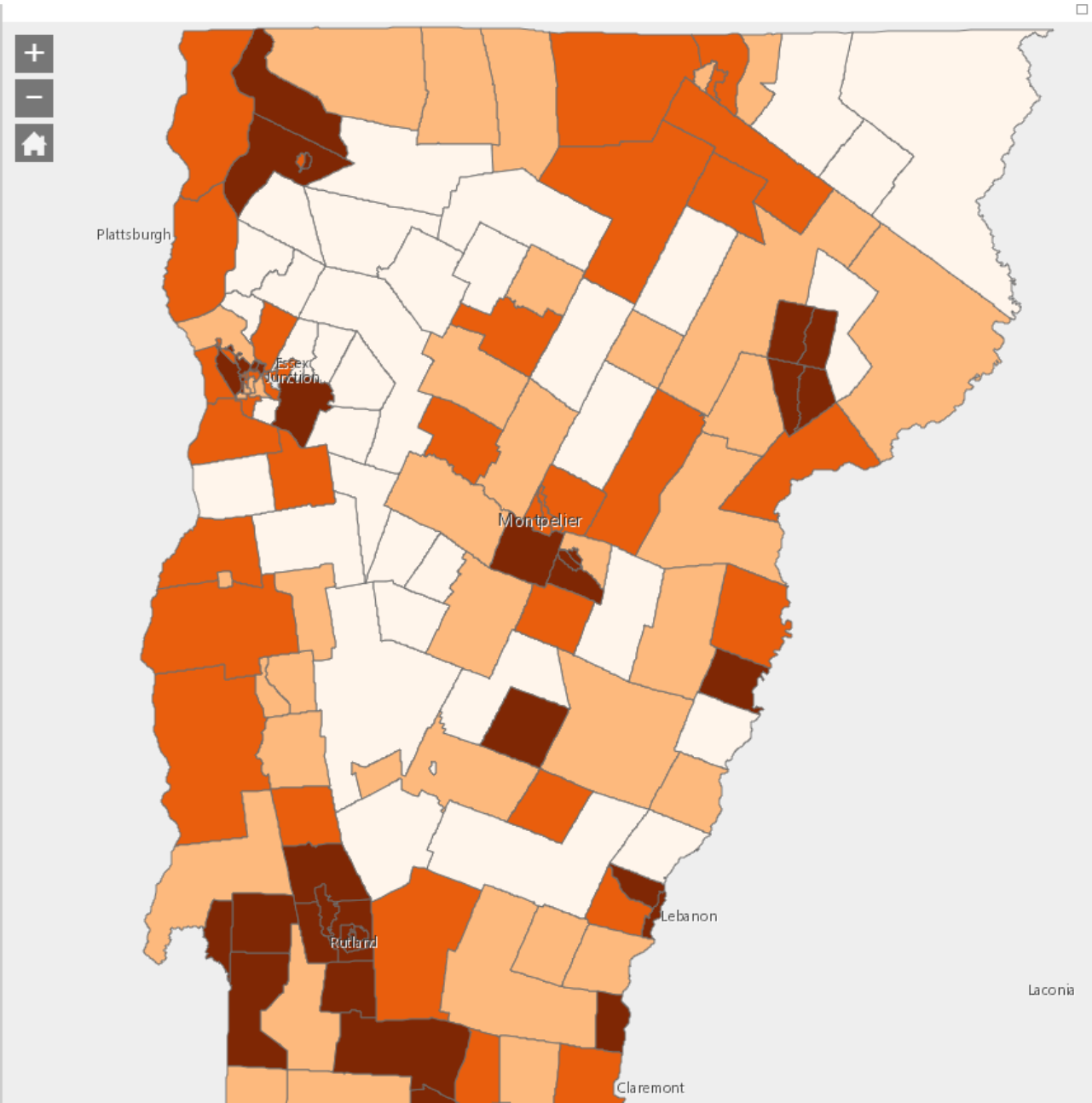
If you have any questions about this map, please contact Qing Ren (tsing0619@gmail.com) or Bindu Panikkar (bindu.panikkar@uvm.edu) at the Rubenstein School of Environment and Natural Resources of UVM.

Please cite this work as: Qing Ren and Bindu Panikkar (2021), Vermont Environmental Disparity Index, University of Vermont.

Also see the [Vermont Social Vulnerability Index](#) and the [Vermont Behavioral Risk Factor Surveillance Survey \(BRFSS\)](#) for social and health data.

See the table below for our data sources:

Variable	Definition	Data sources	Original s trans
Environmental Risk Factors			
Traffic noise	24-hr equivalent sound level (LEQ, denoted by LAeq) noise metric as of April 19, 2018	National Transportation Noise Map	Raster, value census tract
Air Pollution	Noncancer Whole-body Hazard Index from the National Air Toxics Assessment (NATA)	EPA 2014 National Air Toxics Assessment (NATA)	Census tract
Brownfields and hazardous sites	Active brownfields and hazardous sites in Vermont	VT Agency of Natural Resources	Point data, b calculated by
Landfills	Current and historic landfills/waste disposal storage sites	VT Agency of Natural Resources	Point data, b calculated by



Evolution DEC Environmental Justice Team research

In 2020, UVM Rubenstein research published the Vermont Environmental Disparity Index



Explored taking over the Vermont Environmental Disparity from UVM for use as a state mapping tool



Conversations with Agency of Digital Services raised questions



Conducted research with other states on their mapping tools

Conclusion: Development of a tool is complex, and is going to take significant resources, funding, time and outreach

Take-aways from research with other states



Outreach and ground truthing in development; formal public engagement



Outreach and user support on how to use the tool



Policy implications (both intentional and unintentional) need to be vetted and considered



Ongoing support needed for maintenance, improvements and updates

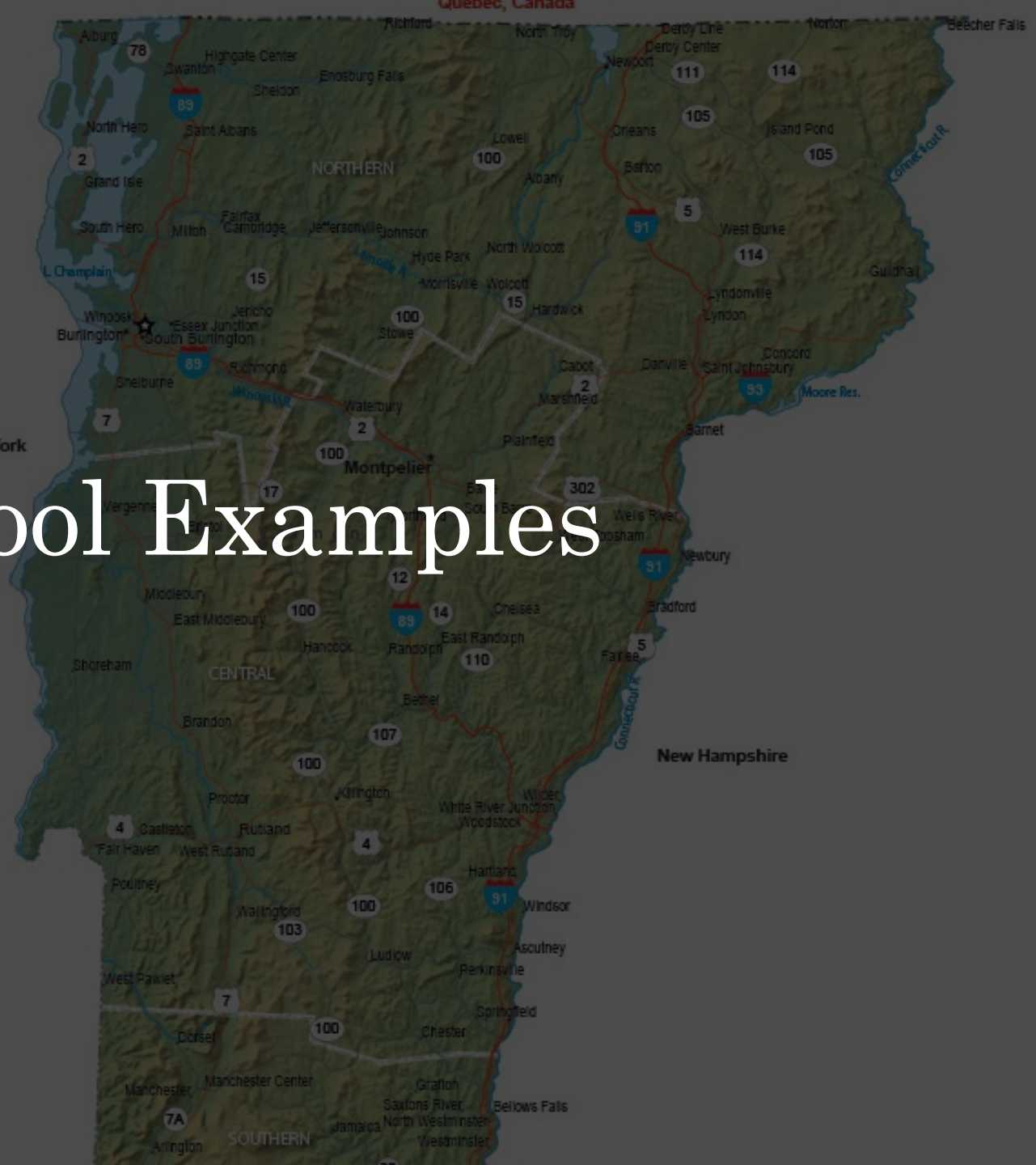


Most tool were developed as a result of a lawsuit or linked to a specific revenue source (REACTIVE vs PROACTIVE)



It can take 2-3 years to adopt a mapping tool

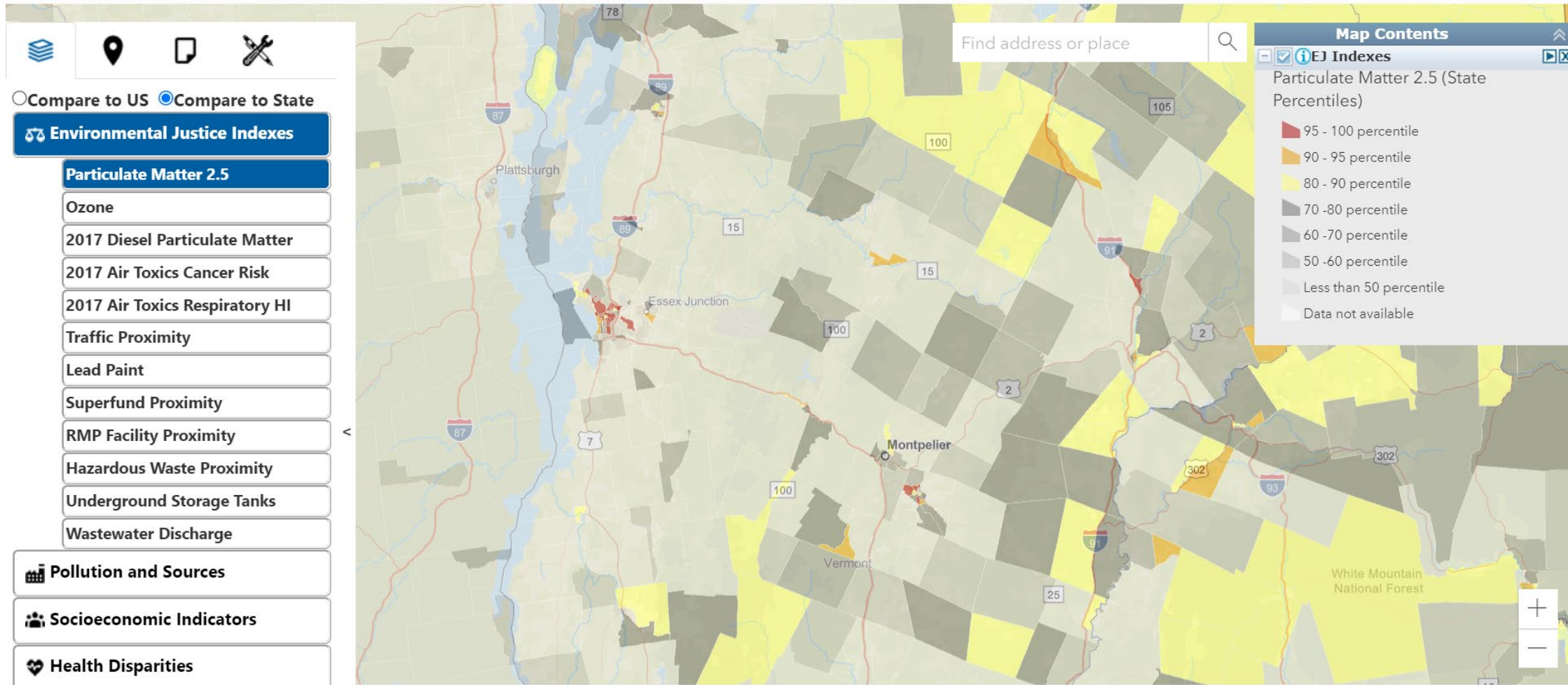
Mapping Tool Examples



VT EJ SCREEN – currently available

EPA EJScreen EPA's Environmental Justice Screening and Mapping Tool (Version 2.0)

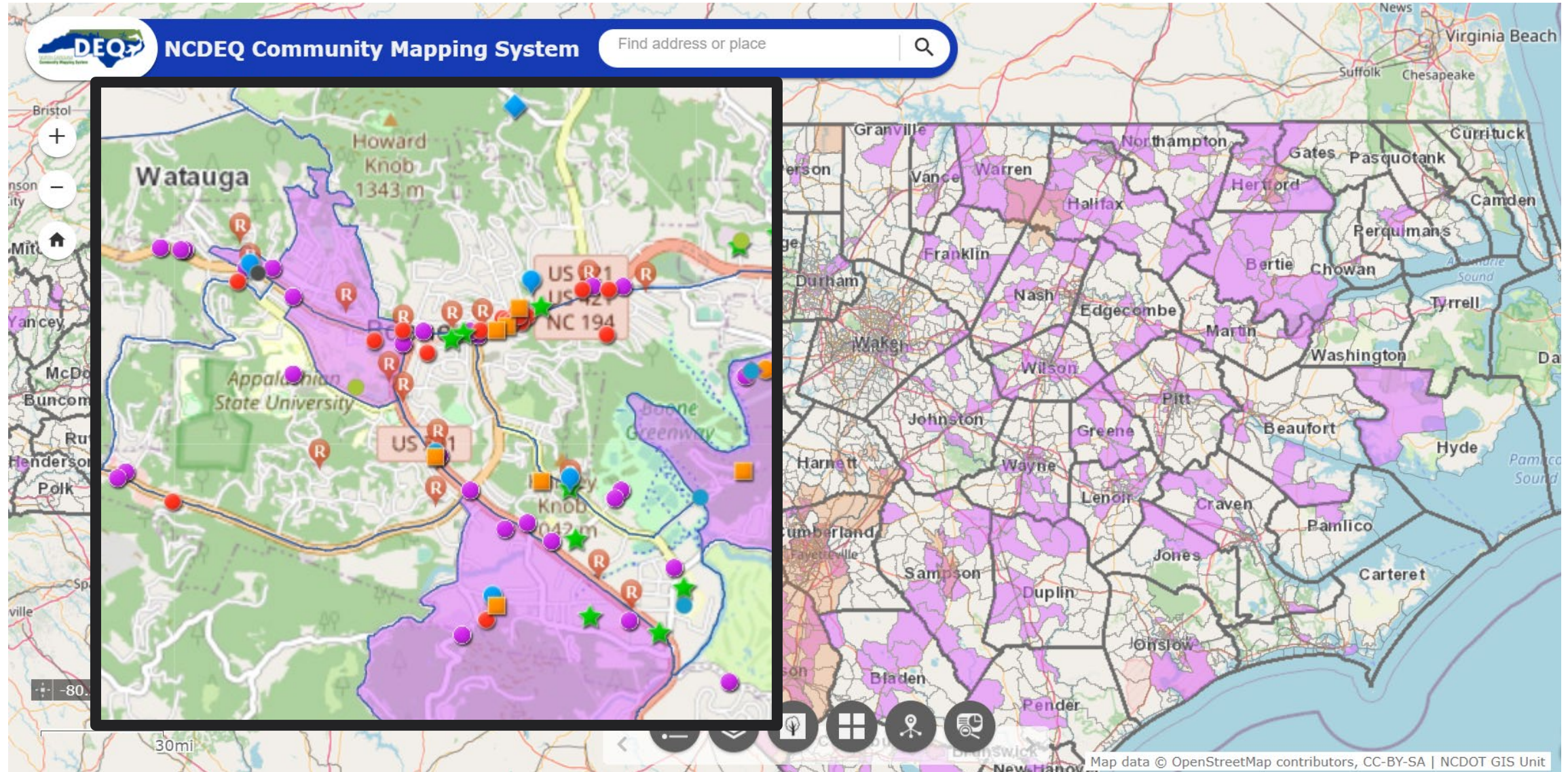
[EJScreen 1.0](#) | [EJScreen Website](#) | [Mobile](#) | [Glossary](#) | [Help](#)



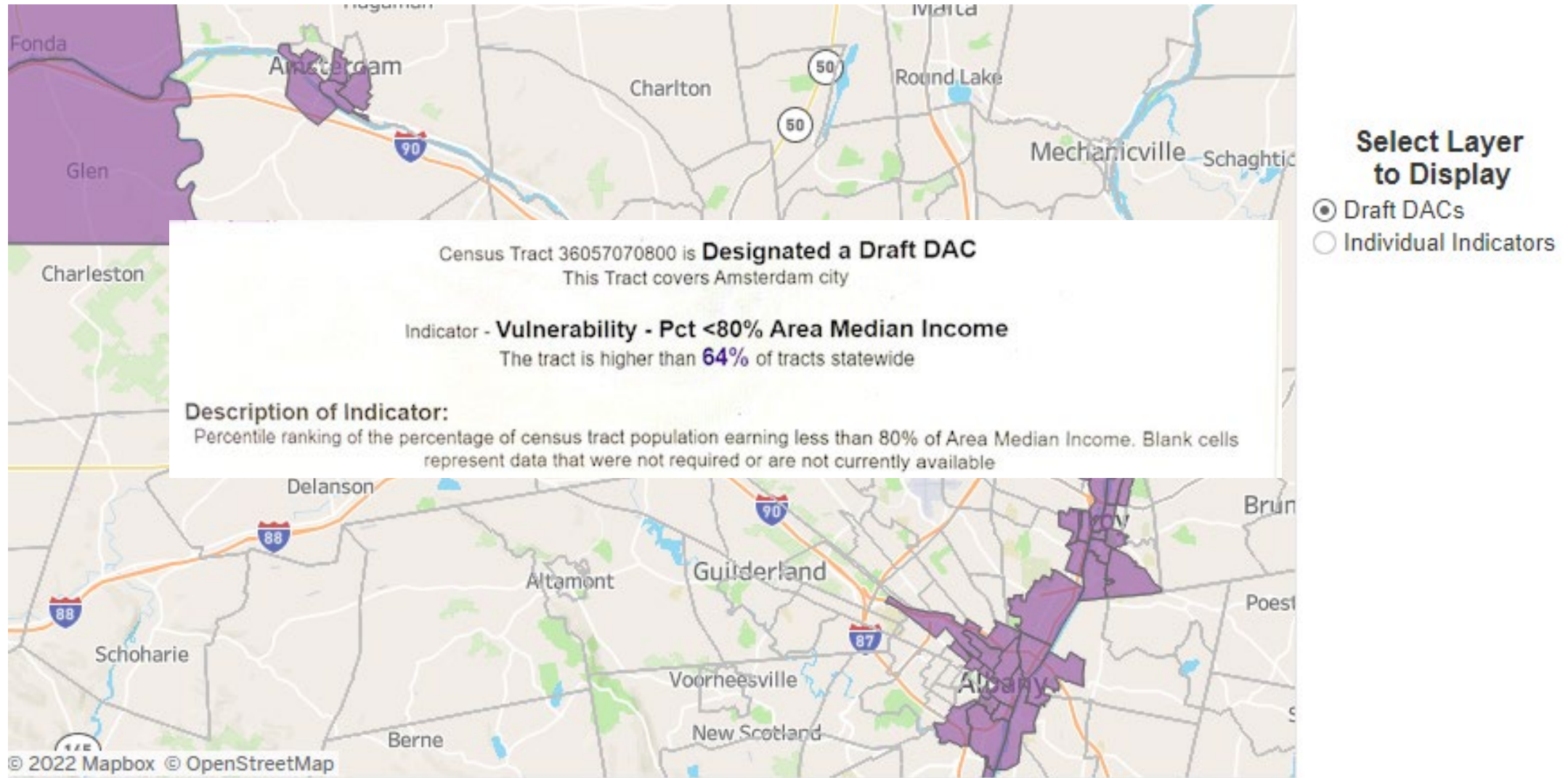
<https://ejscreen.epa.gov/mapper/>

North Carolina Example

<https://deq.nc.gov/outreach-education/environmental-justice/deq-north-carolina-community-mapping-system>

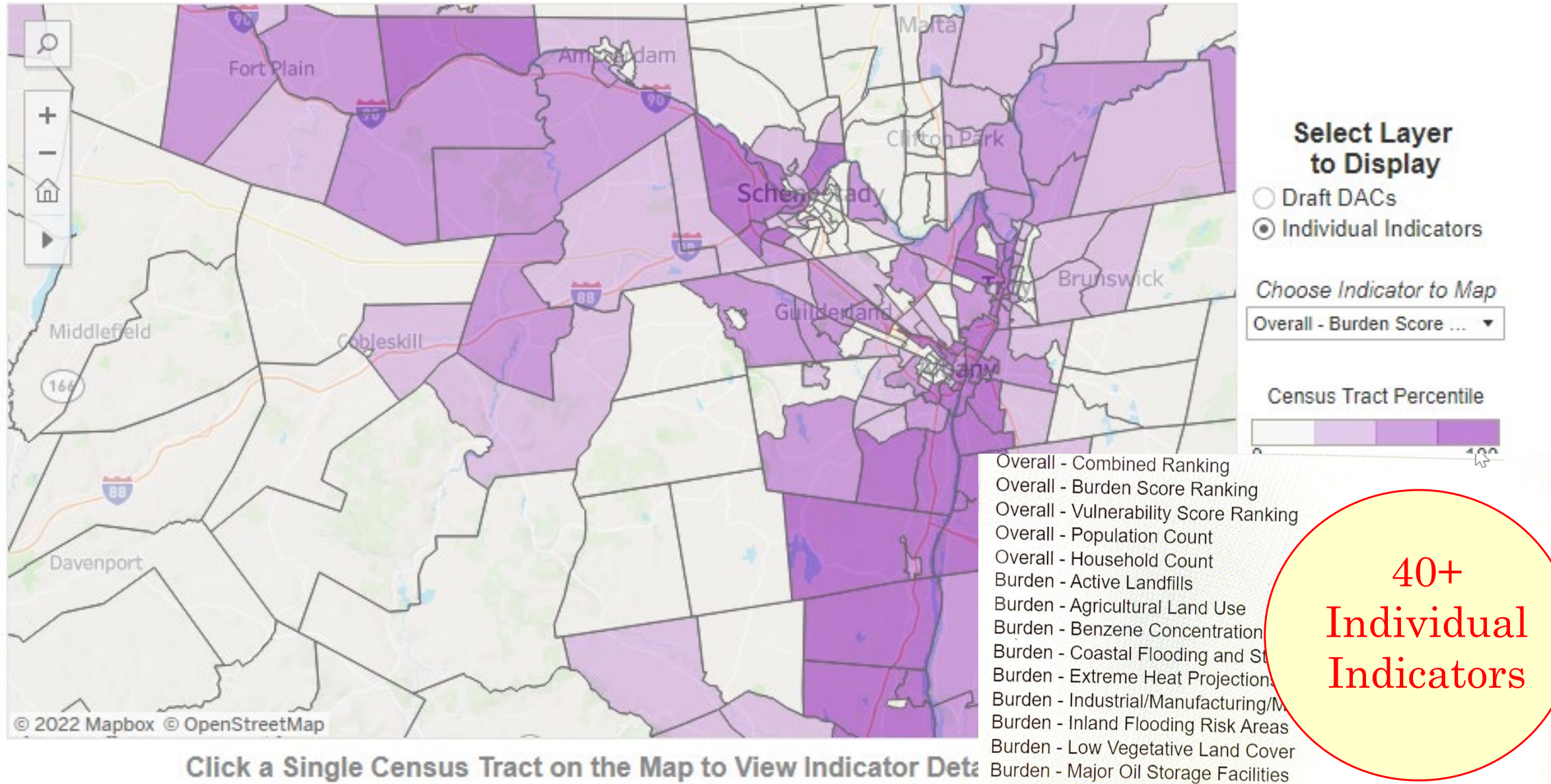


New York State Screening Tool – Disadvantaged Communities



Click a Single Census Tract on the Map to View Indicator Details 

New York State Screening Tool – EJ Screening



Cal EnvironScreen



Environmental Topics

About

Proposition 65

News and Events

Library

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Pollution Burden

- Drinking Water Contaminants
- Children's Lead Risk from Houses
- Pesticide Use
- Toxic Releases from Facilities
- Traffic Impacts
- Cleanup Sites
- Groundwater Threats
- Hazardous Waste
- Impaired Waters
- Solid Waste Sites

Population Characteristics

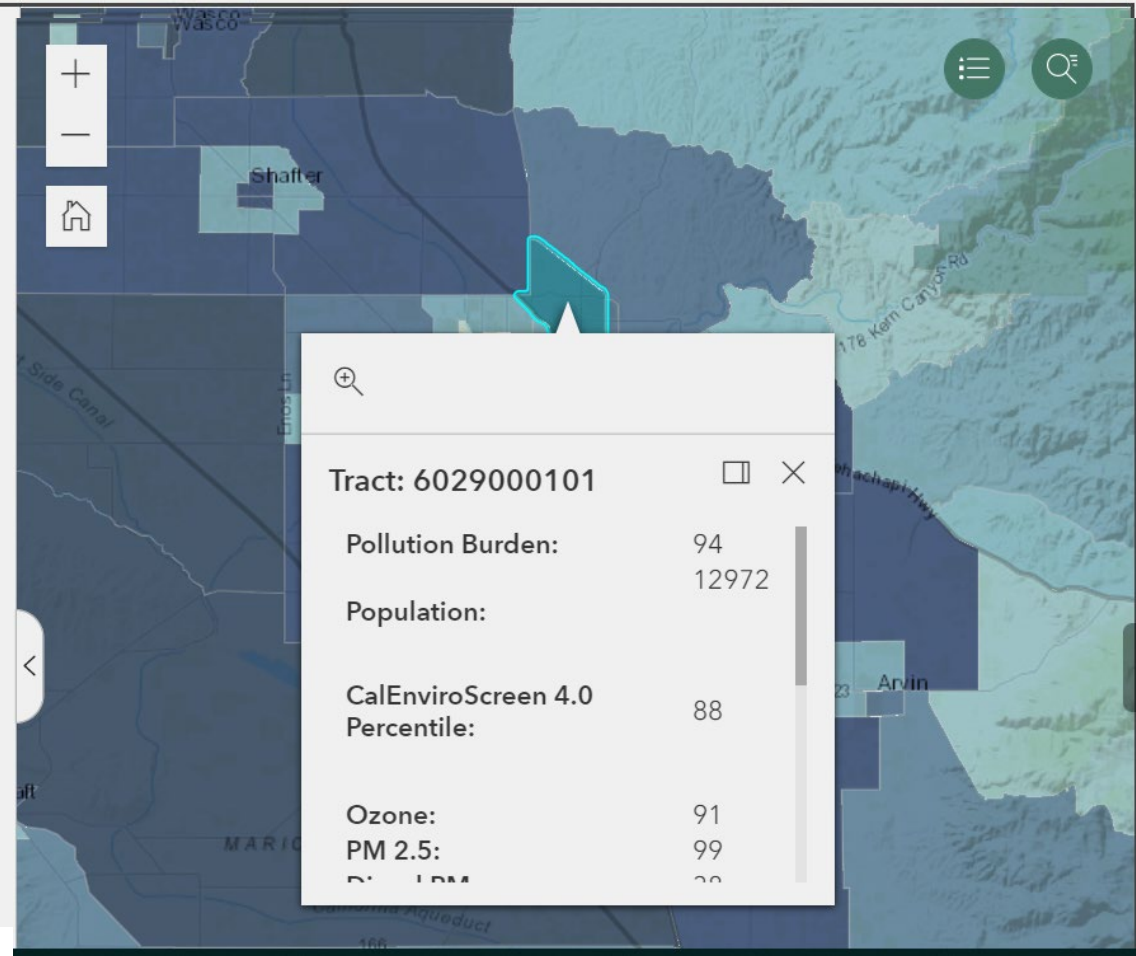
Asthma

Overall CalEnviroScreen scores are calculated from the scores for two groups of indicators: Pollution Burden and Population Characteristics.

This map shows the combined Pollution Burden scores, which is made up of indicators from the Exposures and Environmental Effects components of the CalEnviroScreen **model**. Pollution Burden represents the potential exposures to pollutants and the adverse environmental conditions caused by pollution.

To explore this map, zoom to a location or type an address in the search bar. Click on a census tract to learn more about the indicator data. The indicator maps can be viewed by clicking on the indicators to the left.

A **report** with detailed description of indicators and methodology and downloadable results is available at the **CalEnviroScreen 4.0 website**.



In Summary...

There are risks with not having a Vermont specific tool

A tool can be developed in phases

Much of this information is already available: mapping tool models from other states we can build from, and many data layers available from federal databases

A mapping tool is not going to make difficult policy decisions for us, but can help to inform

No state has incorporated environmental benefits into their screening tools

A mapping tool needs to be complimented by a staffed and funded environmental justice program to be effective

Outreach and stakeholder engagement (to all entities – EJ populations, municipalities, business communities, etc..) must be included in all aspects of tool development

Consider the audience for the tool: Policy makers, public, permit applicants?