Environmental Justice Mapping Tools

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EPA EJSCREEN Mapping Tool

- The U.S. Environmental Protection Agency defines environmental justice (EJ) as the fair treatment and meaningful involvement of all people regardless of race, color, national origin, or income with respect to the development, implementation, and enforcement of environmental laws, regulations, and policies. The EPA further defines the term fair treatment to mean that "no group of people should bear a disproportionate burden of environmental harms and risks, including those resulting from the negative environmental consequences of industrial, governmental, and commercial operations or programs and policies"
- A preliminary screening analysis can be used to identify the extent to which a policy action may raise potential EJ concerns that need further evaluation, and what level of analysis is feasible and appropriate. Factors that can be used in determining the appropriate level and type of analysis include proximity of pollution sources to low-income populations, minority populations, and/or indigenous peoples and whether there has been a history of cumulative concerns associated with a pollutant.
- EPA EJSCREEN is an environmental justice mapping and screening tool that provides users with a nationally consistent dataset and approach for considering environmental and demographic indicators: https://ejscreen.epa.gov/mapper/

EPA EJSCREEN Mapping Tool (continued)

- Originally developed to help EPA identify areas in need of further review, analysis, or outreach to support cumulative impact strategies, including for compliance, enforcement, Superfund program planning, and permitting programs
- Tool provides information on environmental indicators and demographic indicators
  - An EJ Index is a single environmental indicator with the demographic index, using either national or state-level averages
  - Environmental indicators: Air toxics cancer risk, air toxics respiratory hazard index, diesel particulate matter level in air, ozone level in air, particular matter level in air, taffic proximity and volume, lead paint indicator, proximity to National Priority List (NPL) sites, proximity to risk management plan (RMP) facilities, proximity to treatment storage and disposal facilities (TSDF), and wastewater dischargers indicator
  - Demographic indicators: minority, low-income, have less than a high school education, experience linguistic isolation, are 64 years old or older, and are 5 years old or younger

Summary Table of Environmental Indicators and Data Sources				
Key	Indicator	Details	Source	Data Year
Air	National-Scale Air Toxics Assessment (NATA) air toxics cancer risk	Lifetime cancer risk from inhalation of air toxics	EPA NATA	2014
Air	NATA respiratory hazard index	Air toxics respiratory hazard index (ratio of exposure concentration to health-based reference concentration)	EPA NATA	2014
Air	NATA diesel PM	Diesel particulate matter level in air, $\mu g/m^3$	EPA NATA	2014
Air	Particulate matter	$PM_{2.5}$ levels in air, $\mu g/m^3$ annual avg.	EPA, Office of Air and Radiation (OAR) fusion of model and monitor data	2017
Air	Ozone	Ozone summer seasonal avg. of daily maximum 8-hour concentration in air in parts per billion	EPA, OAR fusion of model and monitor data	2017
Air/other	Traffic proximity and volume	Count of vehicles (AADT, avg. annual daily traffic) at major roads within 500 meters, divided by distance in meters (not km)	Calculated from 2017 U.S. Department of Transportation (DOT) traffic data, retrieved 2019	2017
Dust/ lead paint	Lead paint indicator	Percent of housing units built pre-1960, as indicator of potential lead paint exposure	Calculated based on Census/American Community Survey (ACS) data, retrieved 2020	2014-2018
Waste/ air/ water	Proximity to Risk Management Plan (RMP) sites	Count of RMP (potential chemical accident management plan) facilities within 5 km (or nearest one beyond 5 km), each divided by distance in kilometers	Calculated from EPA RMP database, retrieved 04/05/2020	2020
Waste/ air/ water	Proximity to Hazardous Waste Facilities	Count of hazardous waste facilities (TSDFs and LQGs) within 5 km (or nearest beyond 5 km), each divided by distance in kilometers	TSDF data calculated from EPA RCRAInfo database, retrieved 07/06/2020	2020
Waste/ air/ water	Proximity to National Priorities List (NPL) sites	Count of proposed or listed NPL - also known as superfund - sites within 5 km (or nearest one beyond 5 km), each divided by distance in kilometers	Calculated from EPA CERCLIS database, retrieved 04/22/2020	2020
Water	Wastewater Discharge Indicator (Stream Proximity and Toxic Concentration)	RSEI modeled Toxic Concentrations at stream segments within 500 meters, divided by distance in kilometers (km)	Calculated from RSEI modeled toxic concentrations to stream reach segments, created 07/06/2020	2020

EPA EJ History and Mapping Tool Lessons

- One 2020 study on EJ mapping tools concluded the following lessons:

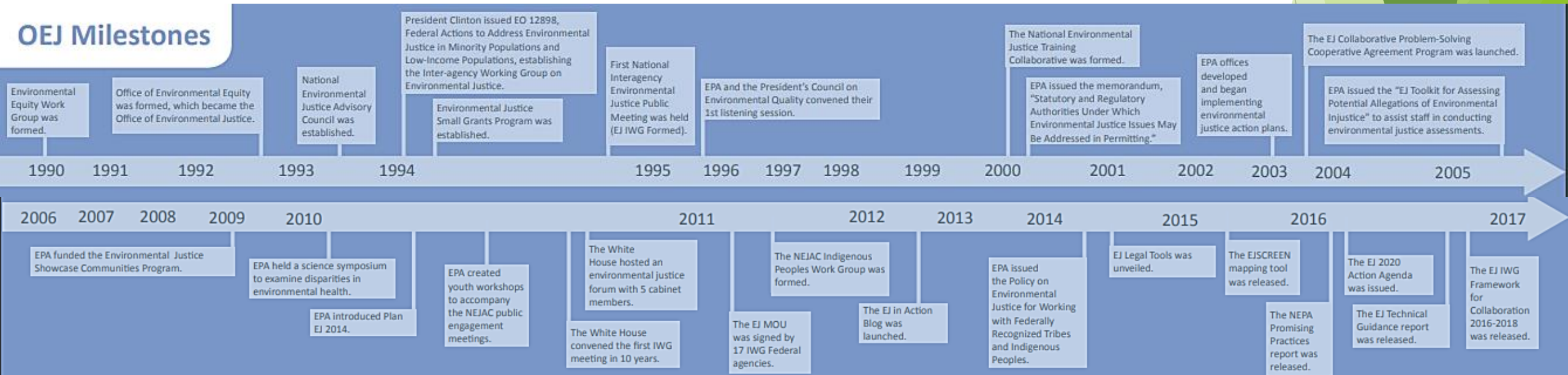
  (1) Addressing cumulative impacts is a core strategy for advancing EJ, and this is embodied in EJ mapping tool development

  (2) Guiding principles for developing an EJ mapping tool can be articulated

  (3) EJ mapping tools can help facilitate resource investment to promote health and sustainability in EJ communities

  (4) Emerging EJ mapping efforts provide a useful, straightforward, and replicable model that state and local governments can emulate

  (5) Progress in advancing EJ at the state level, including mapping tool development, has come from the combined efforts of communities, academia, and government.



Limitations and Highlights

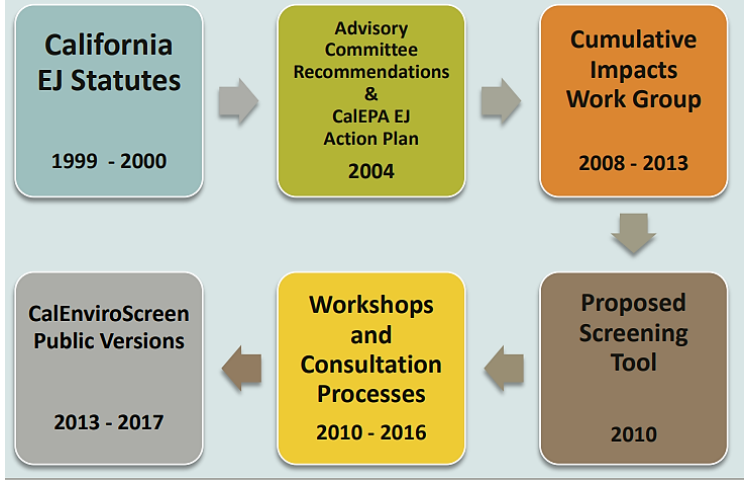
Pros:

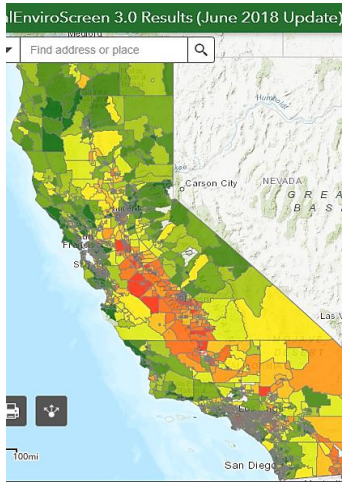
- Macro-level view of EJ issues with a color-coded map that allows for various uses, including:
  - Identification of communities with EJ-related concerns and can be used by governmental and non-governmental organizations, including for community awareness, educational programs, and the facilitation of resource investment
  - Variety of options, like cell phone usage availability, various base maps to choose from, report generation for a selected area, and a side-to-side maps tool
- Information is publicly available, and data is continually updated

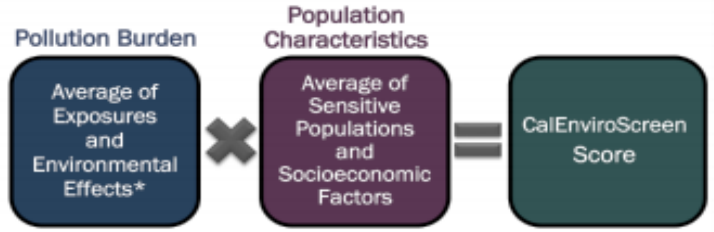
Cons

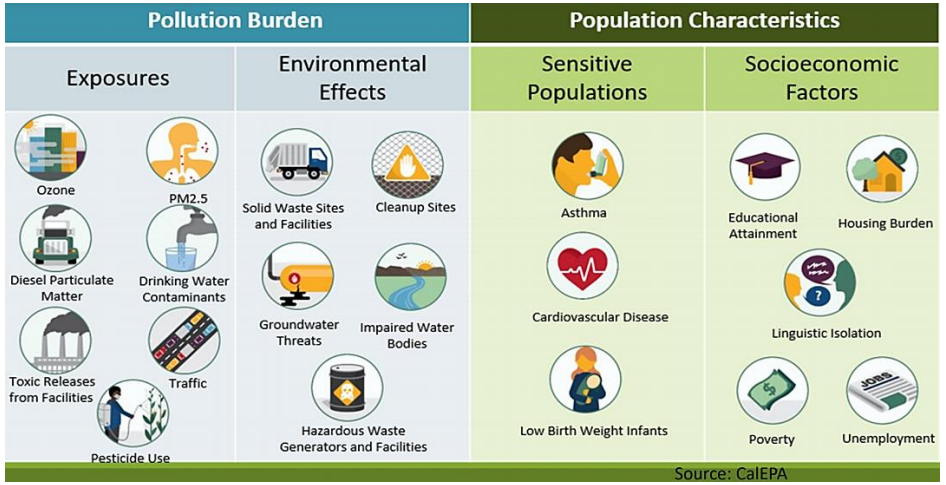
- Environmental indicators vary widely in what they indicate, and non-technical users may find it difficult to interpret the statistical language of the information
- EJSCREEN is not a detailed risk analysis and local EJ issues may not be addressed by this tool or there may be uncertainty in data if it is addressed

California Mapping Tool





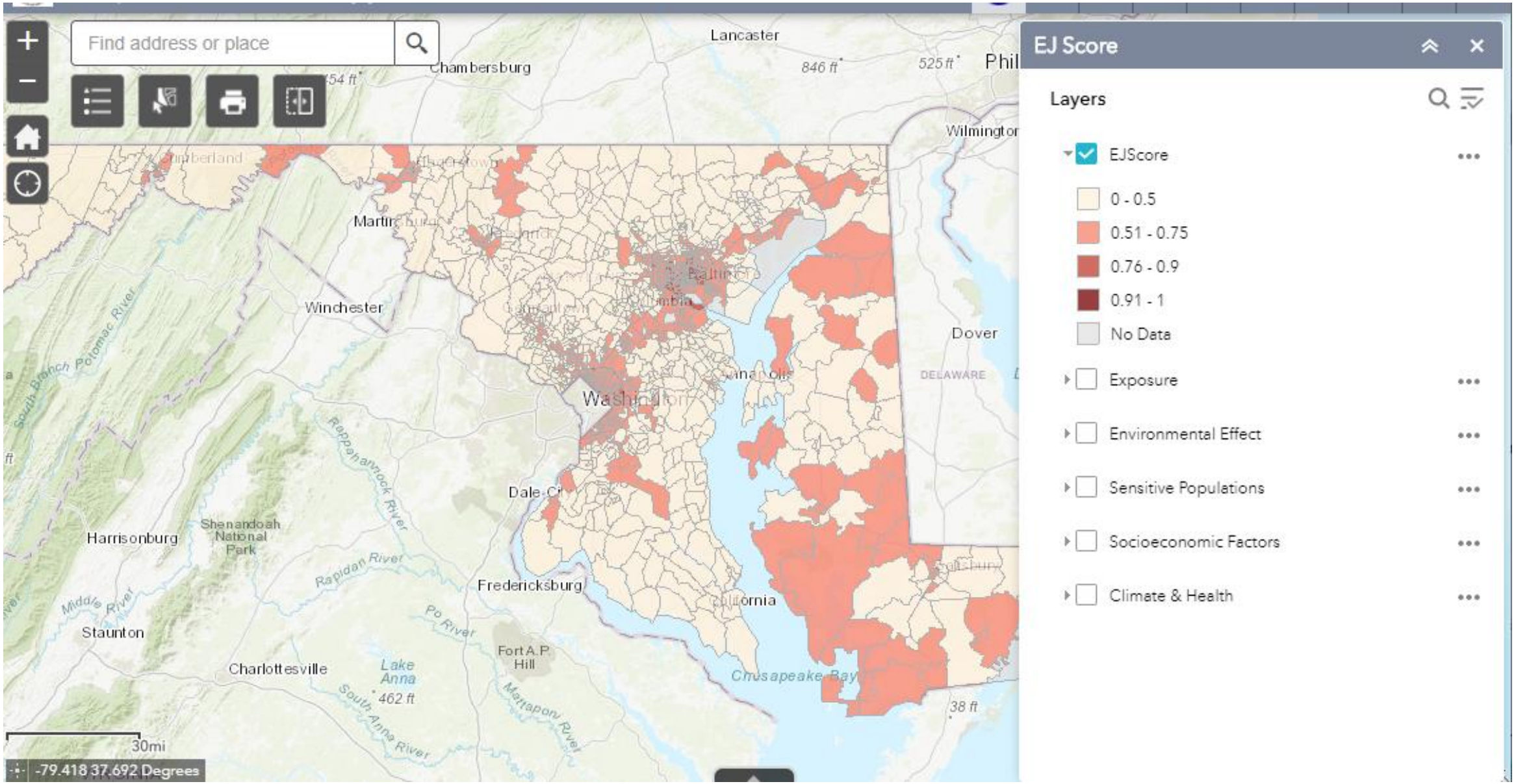




- The CalEnviroScreen tool considers an EJ Score with 20 different indicators for pollution burdens and population characteristics
- Higher scores indicate higher EJ issues in a particular census tract and scores may be compared between different geographic areas
- The latest CalEnviroScreen mapping tool version was released in June 2018 and considers input received from various stakeholders and workshops

Maryland Mapping Tool

- The University of Maryland's School of Public Health has the Community Engagement, Environmental Justice and Health (CEEJH) laboratory and manages the Maryland EJScreen tool
- Like the California tool, the Maryland EJScreen tool creates an EJ Score with a higher number indicating a variety of potential environmental or social factors associated with EJ
  - Averages environmental exposure and environmental effects to create a pollution burden
  - Averages sensitive populations and socioeconomic factors to create population characteristics
  - Multiplies the pollution burden and population characteristics figure to create an EJ Score
- Considers sensitive populations in its EJ Score, including areas experiencing high rates of asthma, myocardial infraction, and low birth rate infants
- Maryland-specific information includes county boundaries, municipal boundaries, supermarkets, public schools, EPA Superfund sites, railroads, legislative districts, 200% federal poverty line, percent of people who are Hispanic or Black, and public transit stops
- Includes the Park Equity Mapper in partnership with the Maryland Department of Natural Resources, which aims to identify areas in need of public park space and expand access for underserved communities


Find address or place
EJ Score
Layers
EJScore
0 - 0.5
0.51 - 0.75
0.76 - 0.9
0.91 - 1
No Data
Exposure
Environmental Effect
Sensitive Populations
Socioeconomic Factors
Climate & Health
Lancaster
Chambersburg
Wilmington
Winchester
Martinsburg
Dover
DELAWARE
Harrisonburg
Shenandoah National Park
Fredericksburg
Staunton
Charlottesville
Fort A.P. Hill
Lake Anna
Chesapeake Bay
Rappahannock River
Rapidan River
Po River
Middle River
South Anna River
Mattaponi River
South Branch Potomac River
846 ft
525 ft
462 ft
38 ft
30mi
-79.418 37.692 Degrees

Thank you!

- CEJSC main site: https://mde.maryland.gov/programs/CrossMedia/EnvironmentalJustice/Pages/cejsc.aspx
- Optional further reading:
  - U.S. Environmental Protection Agency. (2016, June). Technical Guidance for Assessing Environmental Justice in Regulatory Analysis. Retrieved from: https://www.epa.gov/sites/production/files/2016-06/documents/ejtg_5_6_16_v5.1.pdf