



**pennsylvania**  
DEPARTMENT OF ENVIRONMENTAL PROTECTION



# Environmental Justice Overview and Environmental Justice Area Mapping

Citizens Advisory Council & Environmental Justice Advisory Board

November 15, 2022

Tom Wolf, Governor

Ramez Ziadeh, P.E., Acting Secretary

# DEP Mission

"To protect Pennsylvania's air, land, and water from pollution and to provide for the health and safety of its citizens through a cleaner environment. We will work as partners with individuals, organizations, governments and businesses to prevent pollution and restore our natural resources."

# Definitions of Environmental Justice

## U.S. EPA

Fair treatment and meaningful involvement of all people, regardless of race, color, national origin or income, in the development, implementation and enforcement of environmental laws, regulations and policies.

## Pennsylvania DEP

Environmental justice embodies the principle that communities and populations should not be disproportionately exposed to adverse environmental impacts.

## First People of Color Environmental Leadership Summit

Seventeen  
Principles of  
Environmental  
Justice.

**Distributive  
Justice**

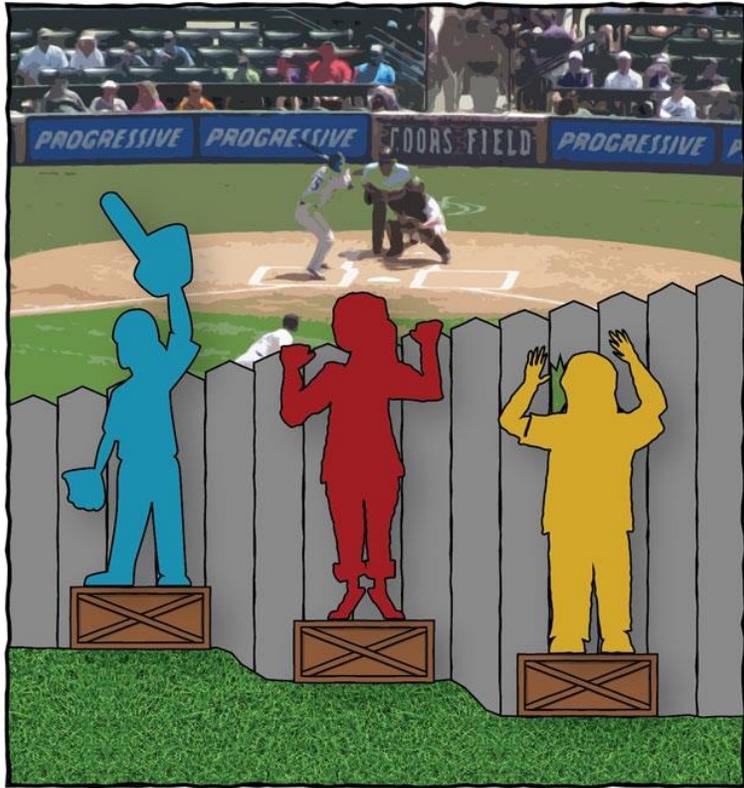
**Procedural  
Justice**

**Corrective  
Justice**

**Social  
Justice**

**Structural  
Justice**

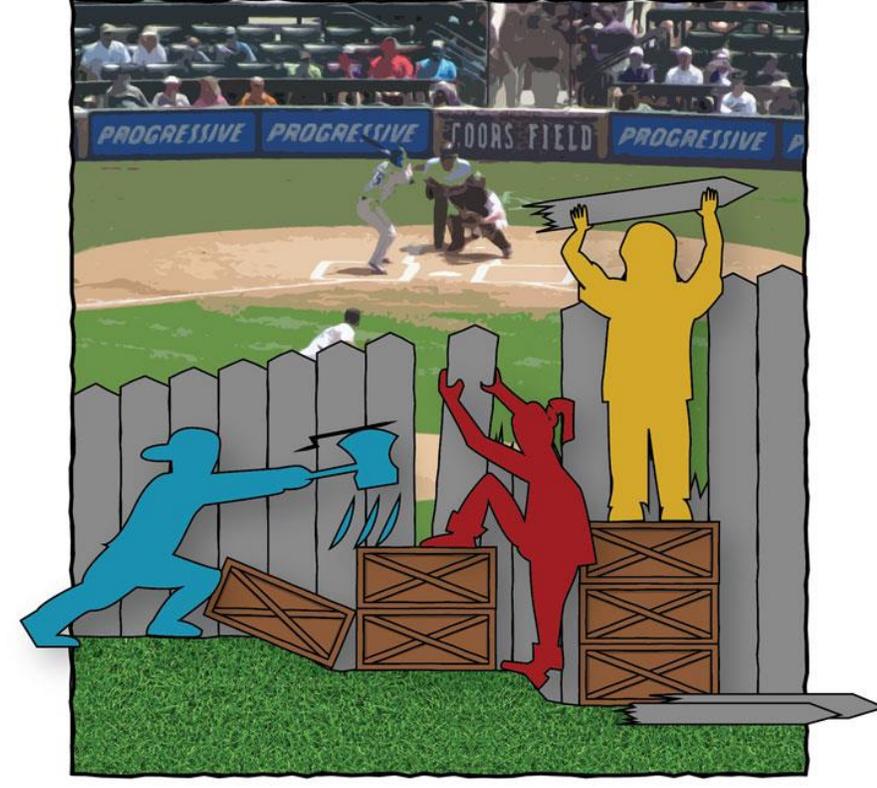
# Equality, Equity, and Justice



**EQUALITY**



**EQUITY**

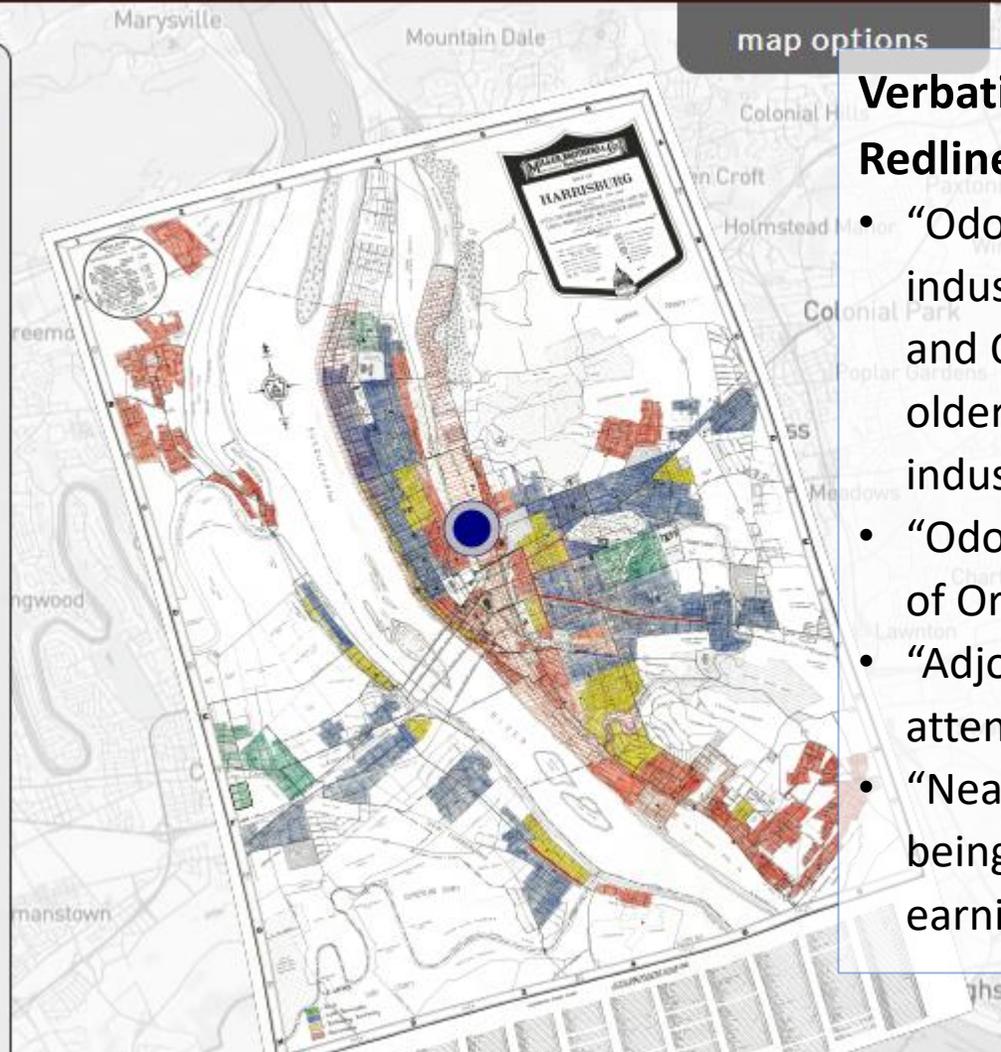
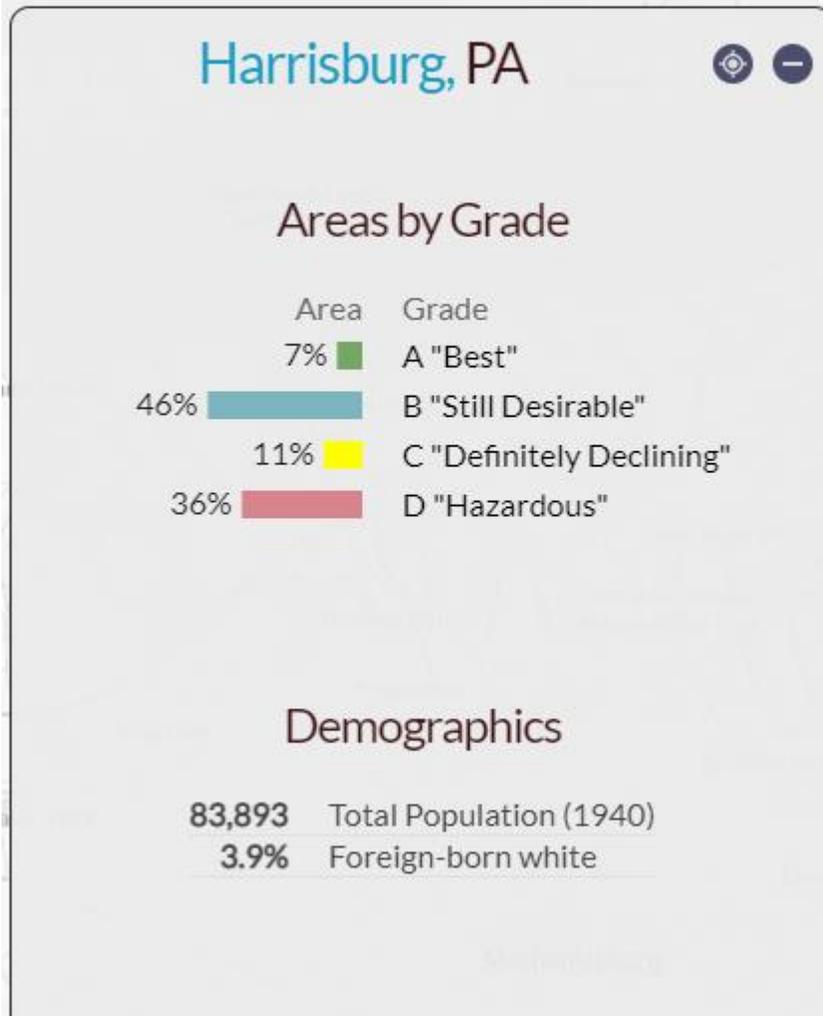


**JUSTICE**

# Historical Legacy of EJ: Redlining & Structural Racism

## Mapping Inequality Redlining in New Deal America

Introduction Downloads & Data



### Verbatim Surveyor Descriptions of Redlined Areas during 1930s:

- “Odors and noises from local industries. Infiltration of colored and Orientals. Predominance of older, cheap cottages. Zoned for industry.”
- “Odors from factories; infiltration of Orientals and colored.”
- “Adjoining industrial area with attendant odors, smoke, etc.”
- “Nearest to the industries, thereby being mainly occupied by wage earning families”

# Relationship of EJ to Civil Rights

## State programs receiving EPA financial assistance must comply with federal non-discrimination laws\*:

- Title VI of the Civil Rights Act of 1964: recipients of federal financial assistance cannot discriminate on the basis of race, color, national origin (including limited-English proficiency)

*“[C]ompliance with environmental laws does not ensure compliance with Title VI. ... [Recipients] are required to operate their programs in compliance with the non-discrimination requirements of Title VI and EPA’s implementing regulations.” EPA Title VI Public Involvement Guidance, 71 F.R. 14207, 14210*



### Other Non-discrimination Laws\*

- Section 504 of the Rehabilitation Act of 1973
- Age Discrimination Act of 1975
- Title IX of the Education Amendments of 1972
- Section 13 of Federal Water Pollution Control Act Amendments of 1972
- EPA’s nondiscrimination regulation, 40 C.F.R. Parts 5 and 7

# Historical Roots of Environmental Justice



# Historical Roots of Environmental Justice



Warren County,  
North Carolina (1982)



United Church of  
Christ Study (1987)



First People of Color  
Environmental  
Leadership Summit  
(1991)



Executive Order  
12898 (1994)

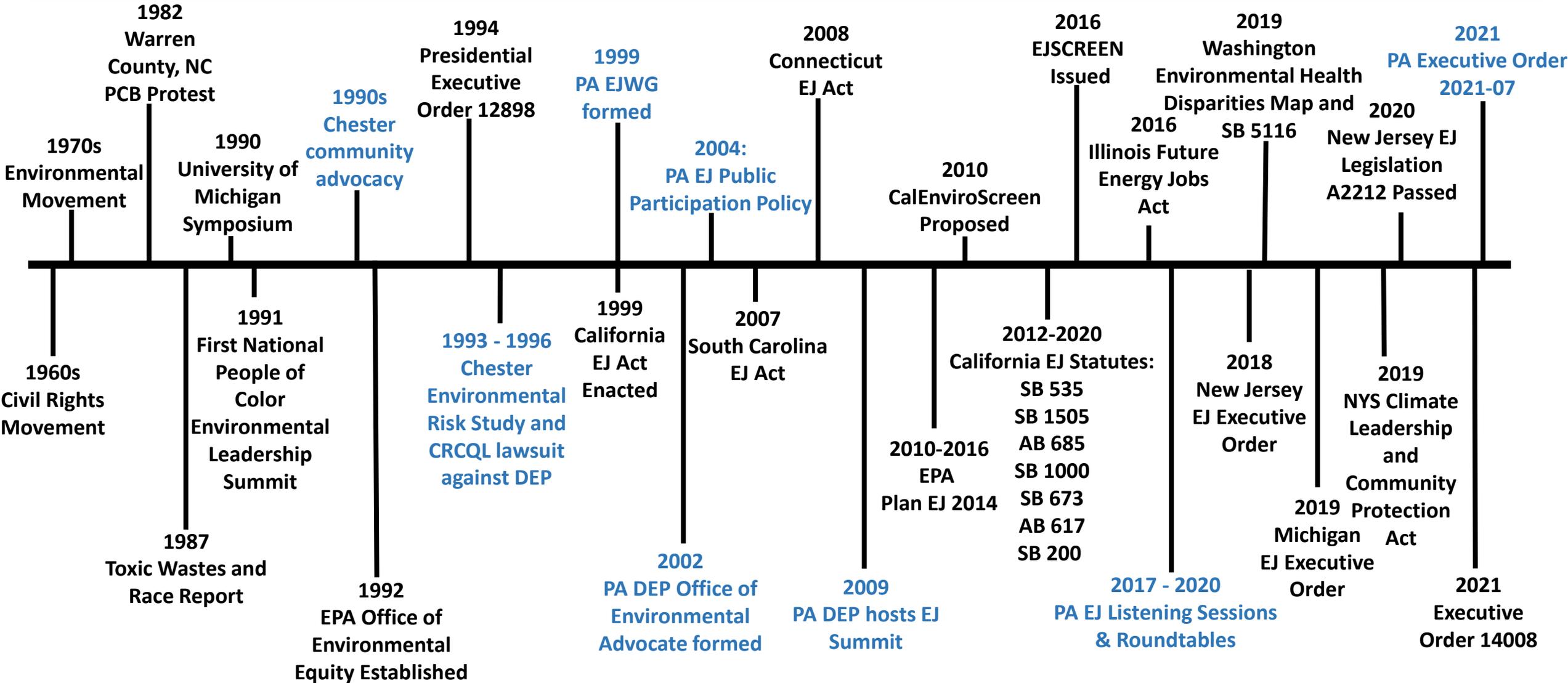
The EJ movement, started by people (primarily people of color) to address inequitable environmental protection and environmental services in their communities was grounded in civil rights and the environmental movement. The movement builds on the lived experience of disproportionately impacted communities. The work of these early advocates paved the way for program development starting in the early 1990's, over the past 30 years, have resulted in significant progress at all levels of government.

# Roots of EJ in Pennsylvania

- Organizing of Chester in early 1990s
- Environmental Risk Study by EPA in conjunction with DER in 1993
- Chester residents (CRCQL) lawsuit against DEP in 1996
- DEP Environmental Justice Work Group (EJWG) created in 1999 Report and Recommendations released in 2001



# Timeline of Federal and State Government Response



# Science of Disproportionate Environmental Impacts



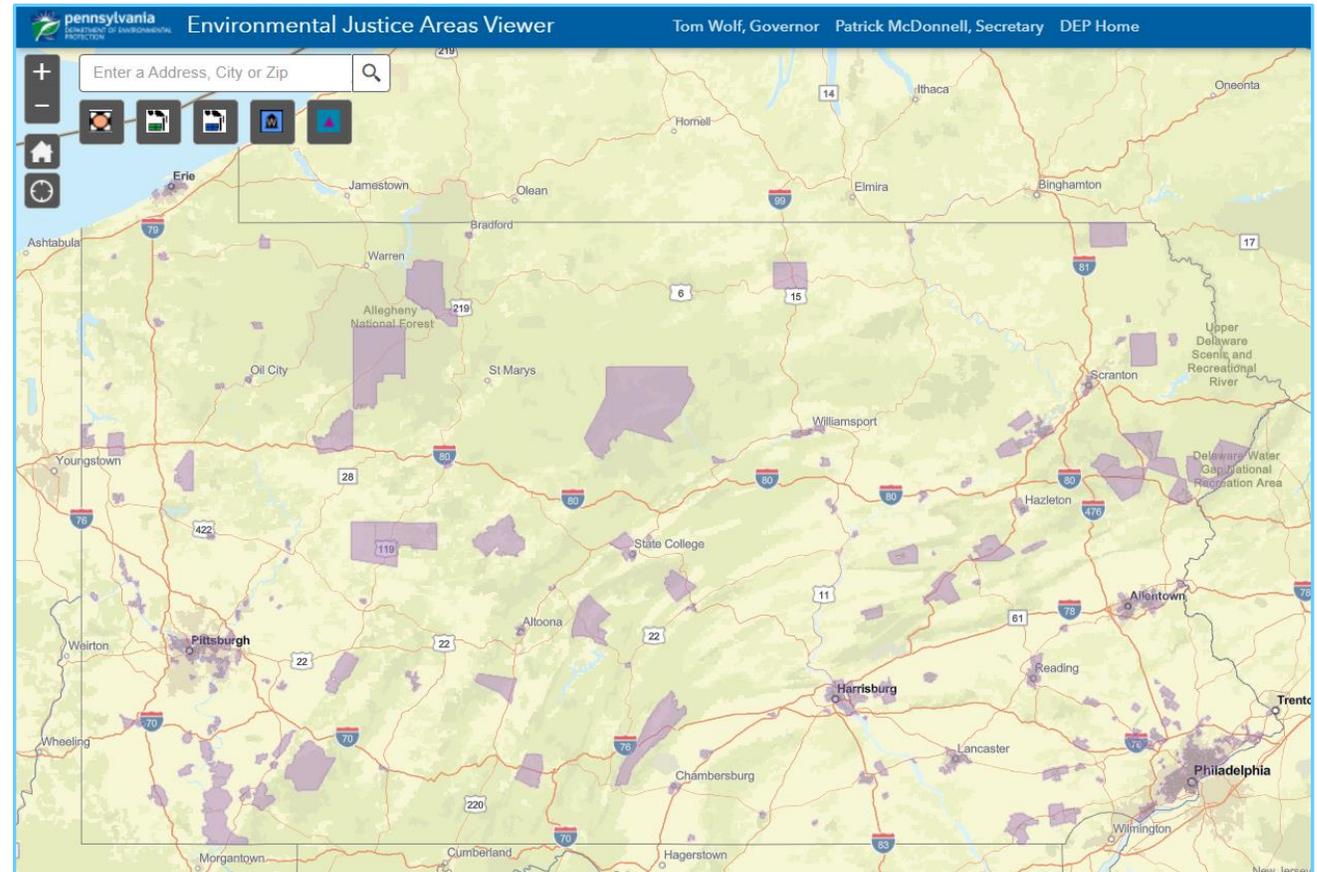
## DRIVERS

- Built Environment: Proximity to pollution sources (e.g., stationary and mobile air emissions)
- Natural Environment: Disasters (e.g., wildfires, heat waves, pandemics)
- Social Environment: Health disparities (e.g., asthma, heart disease, hypertension, diabetes)

**Environmental injustice  
is a force multiplier**

# EJ Public Participation Policy

- Applies to Trigger Permits (and Opt-in Permits).
- In Environmental Justice Areas and Area of Concern.
  - EJ Areas – 30% People of Color and/or 20% Low-income
  - Area of Concern is 0.5-mile buffer.



# Outreach Efforts

## Tools to share:

- [Press Release](#)
- [Webpage \(dep.pa.gov/EJPolicyRevision\)](http://dep.pa.gov/EJPolicyRevision)
- [Share kit](#) (evolving)
- [Recorded EJ Policy webinar](#) (March 28)

## Outreach Efforts:

- Four (4) virtual public hearings (April 5, 12, 28, and May 4)
- Press Events
- Seventeen (17) presentations scheduled
- [Video](#)
- Flier
- Social media

## ENVIRONMENTAL JUSTICE



The PA Department of Environmental Protection's draft Environmental Justice Public Participation Policy (EJ Policy) strengthens language on how DEP oversees and participates in environmental justice priorities and reform with community partners.

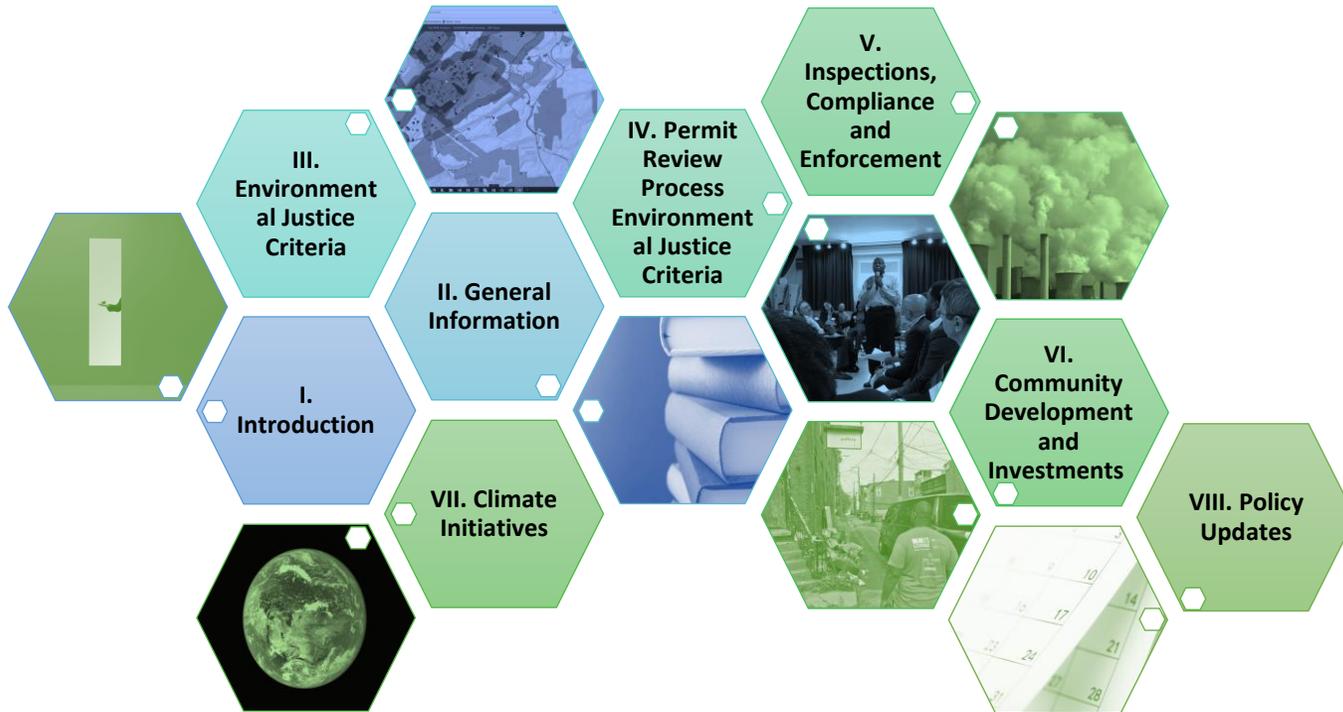
Public comment period on the policy is open through Wednesday, May 11, 2022.

**Learn more and participate:**

 [dep.pa.gov/EJPolicyRevision](http://dep.pa.gov/EJPolicyRevision)



# EJ Policy Components

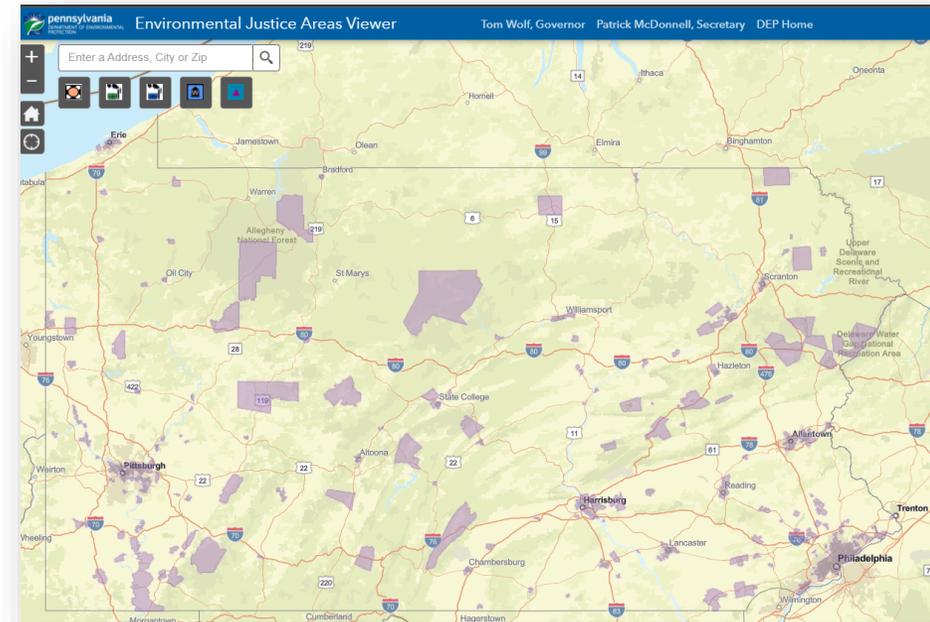


- I. Introduction
- II. General Information
- III. Environmental Justice Area Criteria
- IV. Permit Review Process
- V. Inspections, Compliance and Enforcement
- VI. Community Development and Investment
- VII. Climate Initiatives
- VIII. Policy Updates

# Environmental Justice Policy

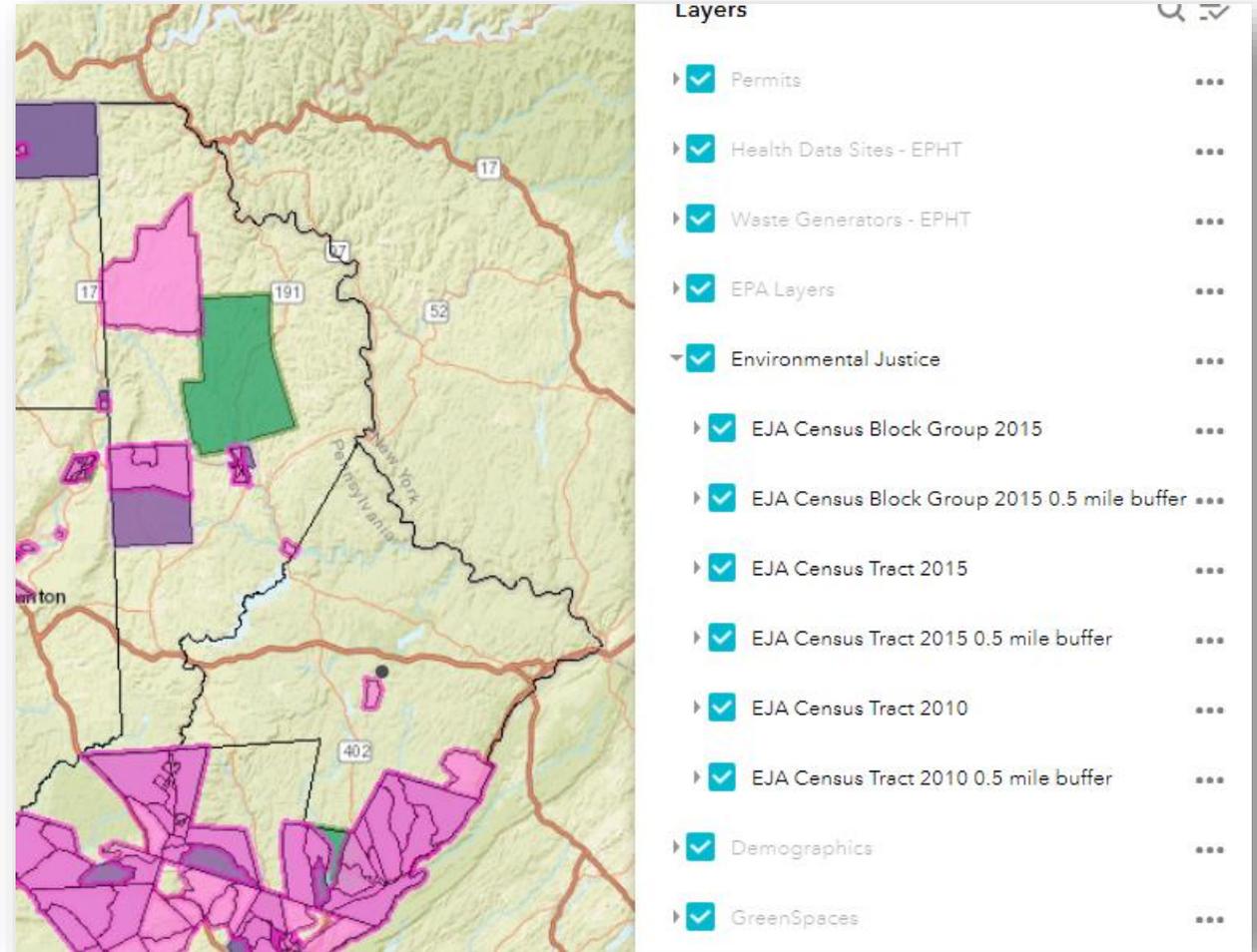
## III. Environmental Justice Criteria

- Describes **where** the policy applies
- Refers to Appendix for detailed mapping of where the policy will apply to allow for easy updating.
- Introduces EJ Areas Viewer as the tool for researching these areas.



# Tools: EJ Areas Viewer

- Mapping tool
- Allows user to search by address
- Use for DEP and community partners
- Determines whether DEP engages in enhanced public outreach
- Used by other PA agencies



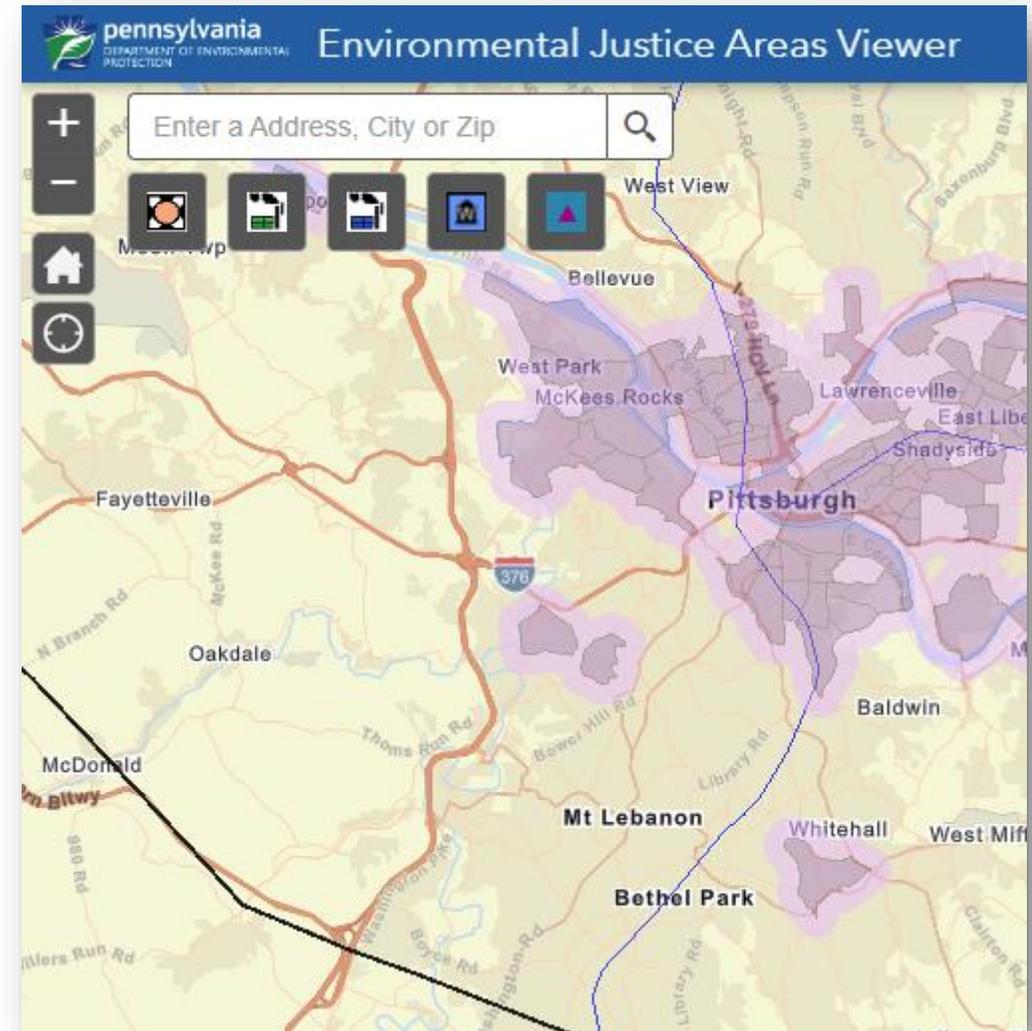
[dep.pa.gov/ejviewer](http://dep.pa.gov/ejviewer)

# Why Change It?

- Heard from community members, DEP Staff, and other agencies on the limitations of using only two demographic indicators
- More publicly available and regularly updated data available
- Being used more broadly than just our EJ Policy implementation
- Nationally tools are looking at pollution burden
- Look to have more regular updates to keep the data up to date

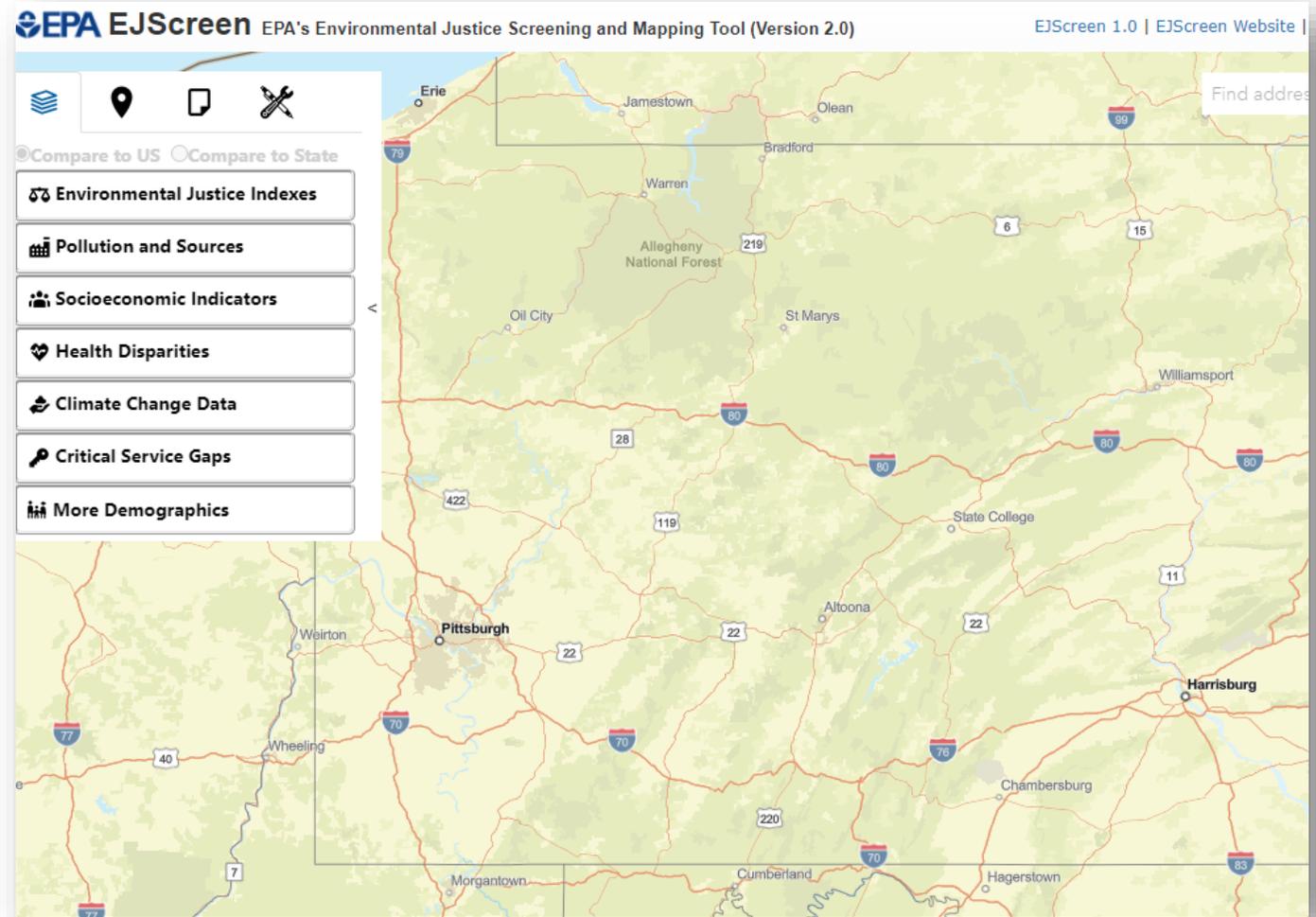
# What Isn't Changing

- Use by DEP to implement the EJ Policy
- Search by address functionality
  - Favored by DEP staff and the general public alike



# Update Process

- Brought on Temple graduate student interns, David Lawrence and Tom McKeon
- Working with DEP IT to create a tool we can maintain with existing resources.
- Will go out for public comment.



# Background

## Review of other states:

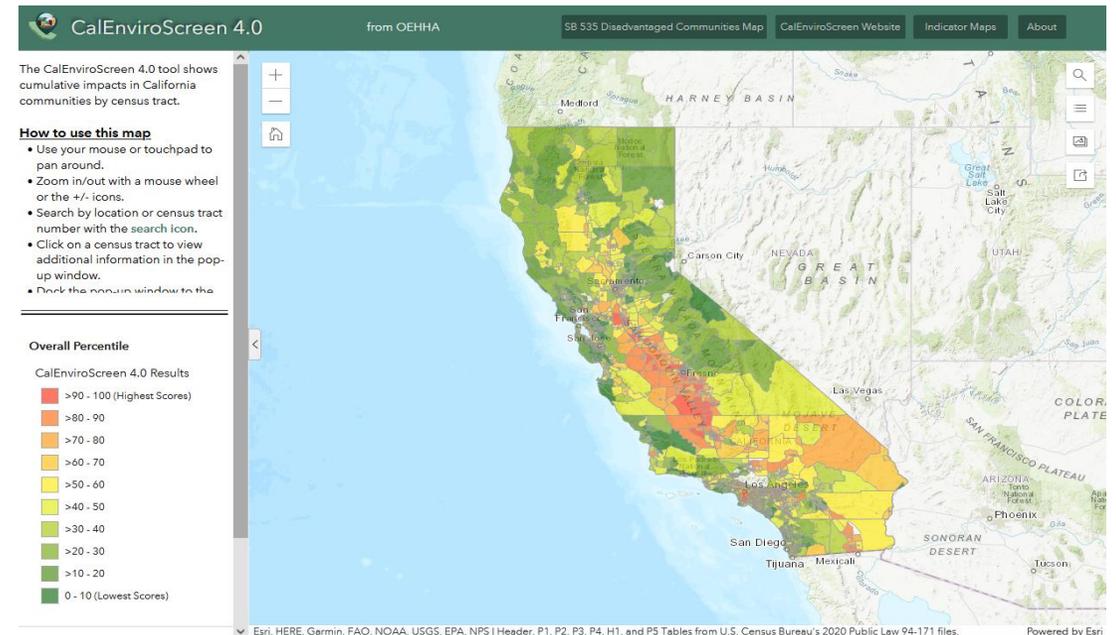
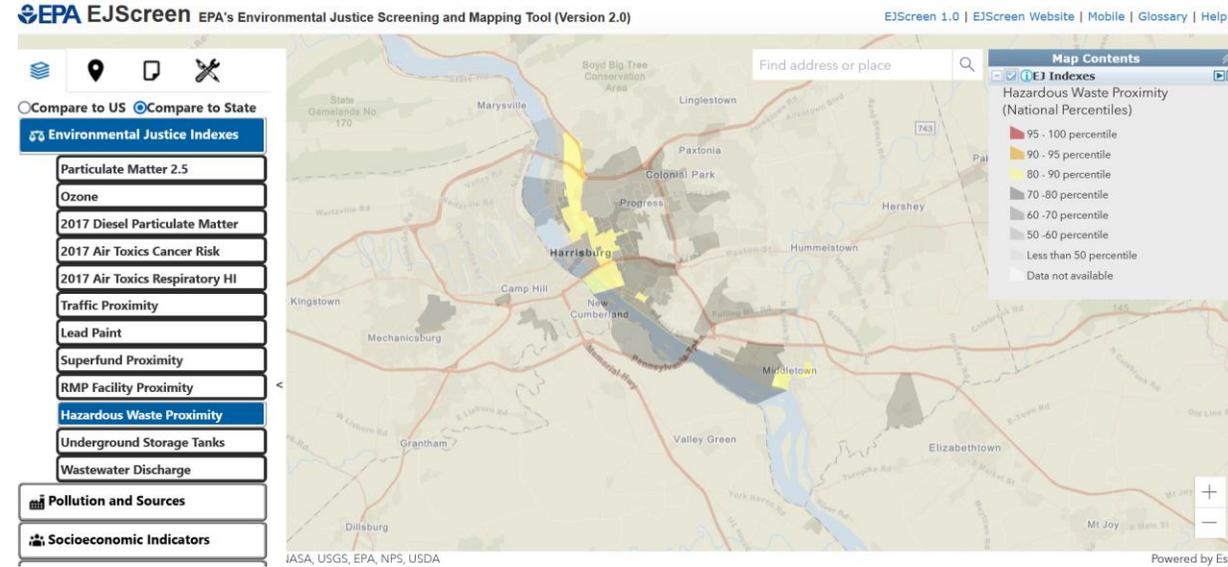
- How EJ Areas defined
- Data sets used
- Calculations performed

## Types of indicators used by other states:

- Environmental: land, water, air quality
- Population: socioeconomic, community health

## Our framework:

- Risk = pollution burden (threat) × population characteristics (vulnerability)



# Indicator Categories

## **Pollution Burden (Threat)**

- **Environmental exposures:** quantifiable levels of pollutants
- **Environmental effects:** adverse environmental conditions / risks that are not quantifiable
  - Based on proximity

## **Population Characteristics (Vulnerability)**

- **Sensitive Populations:** health characteristics that either amplify or may be caused by environmental hazards
- **Socioeconomic factors:** certain demographic characteristics may reduce communities' ability to mitigate effects of environmental hazards

# Calculating Final Score

## Pollution Burden ( $PB$ )

$$PB = \frac{E + (EE \times 0.5)}{1.5}$$

$E$  = Exposures (exposures\_score)

$EE$  = Environmental Effects (env\_effects\_score)

## Population Characteristics ( $PC$ )

$$PC = \frac{SP + SF}{2}$$

$SP$  = Sensitive Populations (sensitive\_pop\_score)

$SF$  = Socioeconomic factors (socioeconomic\_score)

- PB, PC scaled 1-10:  $\frac{\text{score}}{\text{max}} \times 10$
- Final Score =  $PB_{(scaled)} \times PC_{(scaled)}$
- Percentile assigned to final score
  - Current EJ Area Threshold: At least 80<sup>th</sup> percentile

# Data Criteria

Data acquired based on stakeholder input and literature review

Criteria for indicator data sets:

- Adequate coverage across the state
- Possible to aggregate at census block group level
- Publicly available
- Possible to automate data acquisition
- Regularly updated

# Data Process

Indicator process:

- Download data
- Calculate value of measure, aggregate to census block groups
- Calculate percentile within indicator distribution

Category score = average of indicator percentiles within category

Final score calculated using weighted formula

# Pollution Burden: Exposure Indicators

**Ozone:** 3 years (2019-2021) EPA Air Monitor points

**PM2.5:**

3 years (2019-2021) EPA Air Monitor points

2019 raster from NASA

**Diesel Particulate:** 2017 tract-level exposure concentrations, EPA AirToxScreen

**Toxic Air Emissions:**

EPA Risk-Screening Environmental Indicators (RSEI) data, 2018-2020

EPA AirToxScreen cancer risk (derived from National Emissions Inventory), 2018

EPA AirToxScreen non-cancer health risk (derived from National Emissions Inventory), 2018

**Toxic Releases (Water):** EPA RSEI Streams data, 2018-2020

# Pollution Burden: Exposure Indicators

## **Pesticide Use**

- County-level pesticide use by chemical, 2013-2017, USGS
- EPA Toxic Release Inventory (TRI; inadvertent releases) points, 2018-2020

**Children's Lead Risk from Housing** : 2019 5-year American Community Survey (ACS); percentage of housing built before 1979

**Natural Gas Compressor Stations:** DEP Emissions from Compressor Station Sites, 2018-2020

**Air pollution from Traffic:** Annual Average Daily Traffic (AADT; car and truck), PennDOT, 2019-2022

# Pollution Burden: Environmental Effects

- **Railroad Density:** Rail lines, PennDOT
- **Impaired Lakes and Streams:**
  - Non-Attaining Streams, DEP
  - Non-Attaining Lakes, DEP
- **Flood Risk:** National Flood Hazard Layer, FEMA
- **Oil/Gas Locations:**
  - Conventional wells, DEP
  - Unconventional wells (fracking), DEP

# Pollution Burden: Environmental Effects

- **Land Remediation:**
  - Superfund Sites, EPA
  - Brownfields, EPA
  - Land Recycling Cleanup Locations, DEP
  - Surface Mine Reclamation, DEP
- **Hazardous Waste and Storage Sites:**
  - Captive Hazardous Waste sites (DEP)
    - Generator, Incinerator, Recycling, Treatment, Disposal, Storage, Boiler/Industrial Furnace
  - Commercial Hazardous Waste (DEP)
    - Generator, Disposal, Recycling, Storage, Treatment, In-Transit Storage
  - Storage Tanks (Above/Below-Ground)
  - Coal Above-Ground Storage Tanks

# Pollution Burden: Environmental Effects

- **Municipal / Solid Waste Sites, DEP**
  - Composting, Land Application, Landfill, Abandoned Landfill, Multiple Waste Generator, Processing, Resource Recovery, Transfer Station
- **Coal Mining Sites, DEP**
  - Refuse Pile Reclamation
  - Long-Wall Panel Mines
  - Anthracite River Dredge
  - Discharge Points
  - Mineral Preparation Plant
  - Mining Stormwater Permit
  - NPDES Discharge Point
  - Refuse Disposal
  - Refuse Reprocessing
  - Surface Mine
  - Underground Anthracite Exploration
  - Underground Mine
  - Post Mining Treatment
- **Abandoned Mining Concerns:**
  - Abandoned Mine Land (AML) Inventory Sites
  - Mine Drainage Treatment
  - Orphan Mine Discharge

# Population Characteristics: Socioeconomic Factors

## **Housing-Burdened Low-income Households:**

- housing-burdened (paying more than 50 pct of income toward housing costs)
- low-income (earning less than 80 pct of the HUD Area Median Family Income, HAFMI)

## **Population over Age 64**

## **Population under Age 5**

**Low educational attainment:** percent of population over 25 without a high school degree

**Linguistic isolation:** percent of households that do not speak English

**Race:** percent People of Color

**Unemployment:** percent unemployed

**Poverty:** percent earning income below 200 percent of federal poverty level

# Population Characteristics

CDC PLACES tract-level data, 2021

- **Asthma** (over 18)
- **Coronary Heart Disease** (over 18)
- **Lack of health insurance** (18-64)
- **Cancer** (over 18, excluding skin cancer)

**Disability:** percent living with a disability (2019 5-year ACS)

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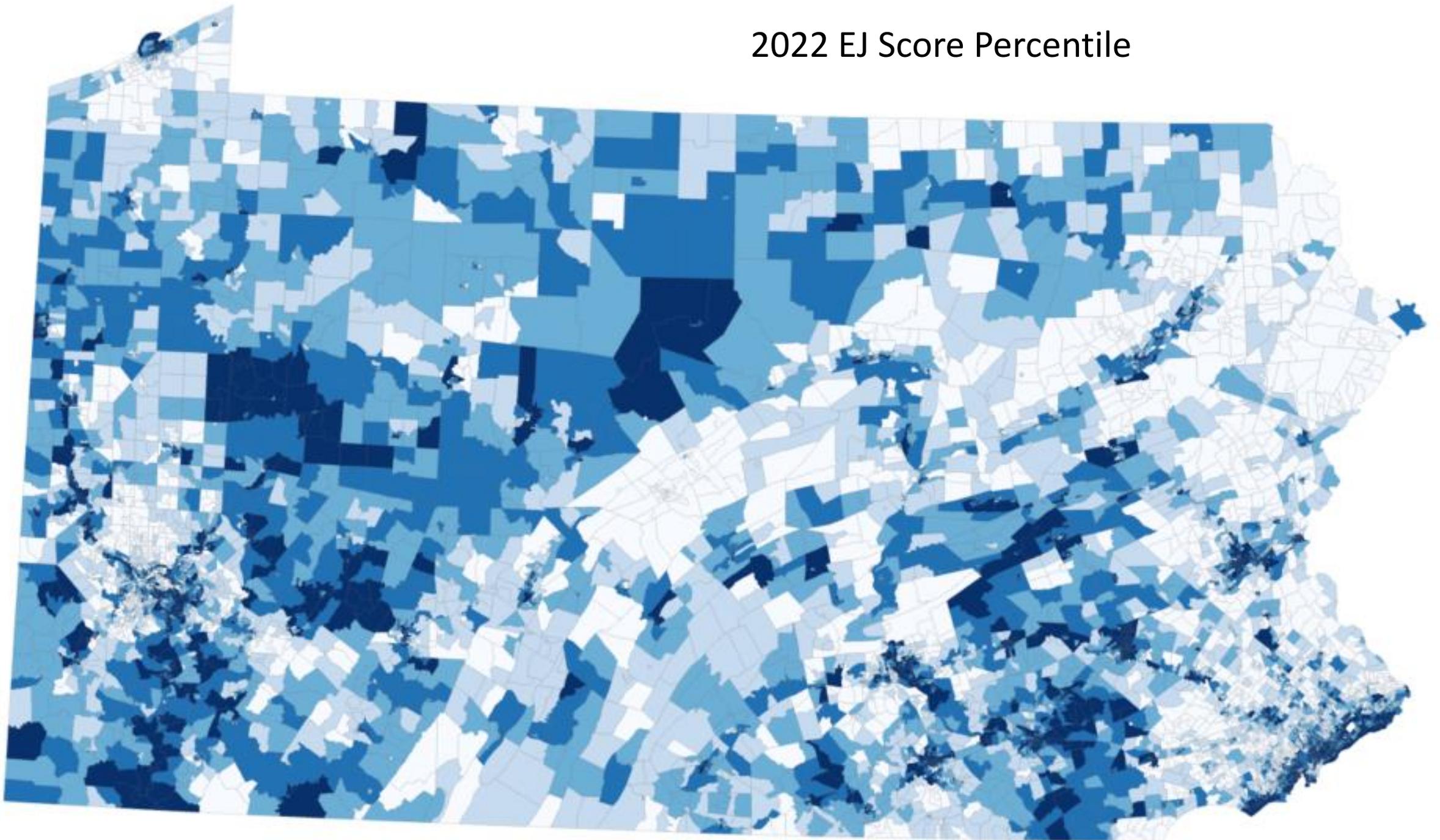
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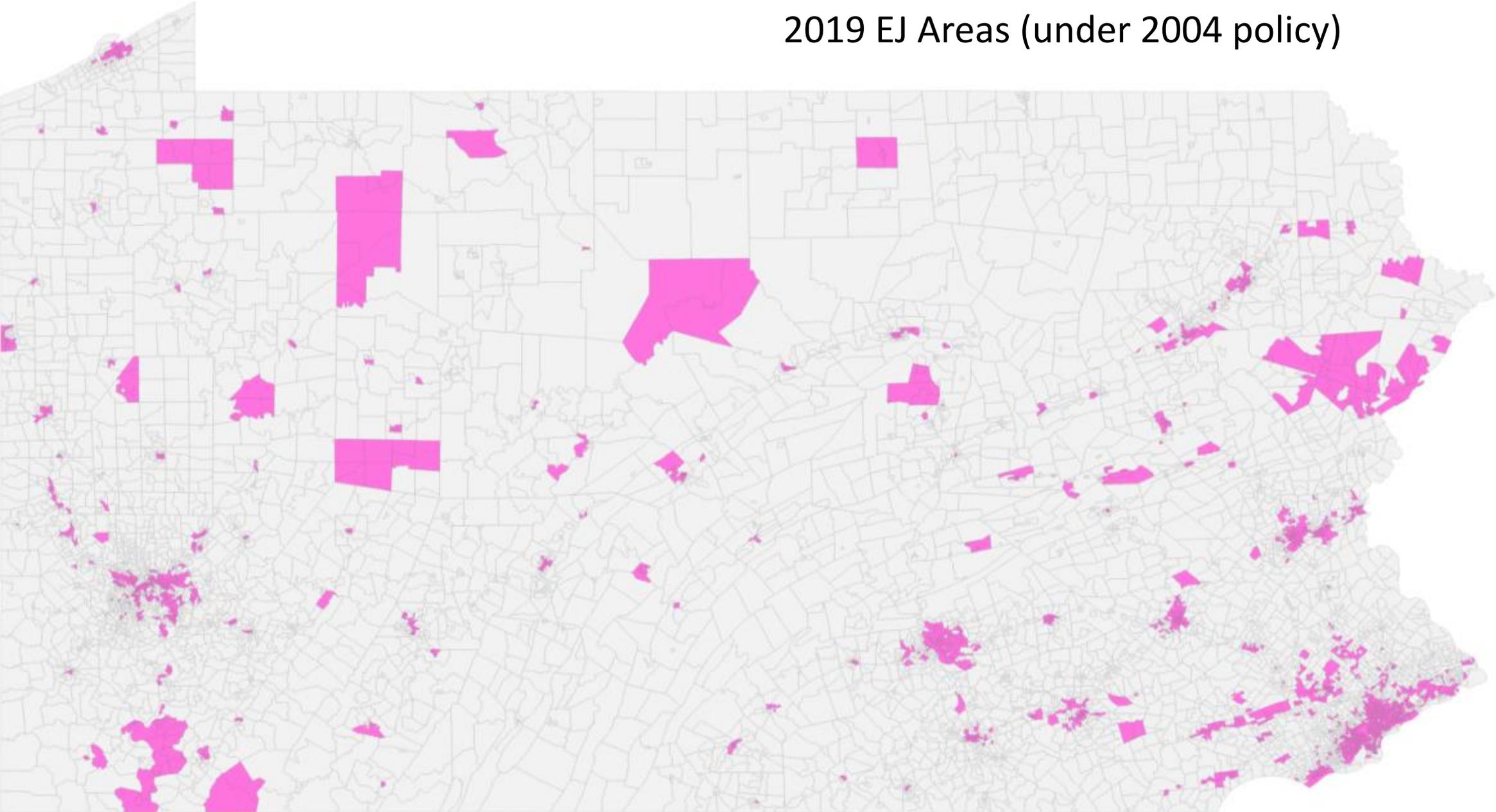
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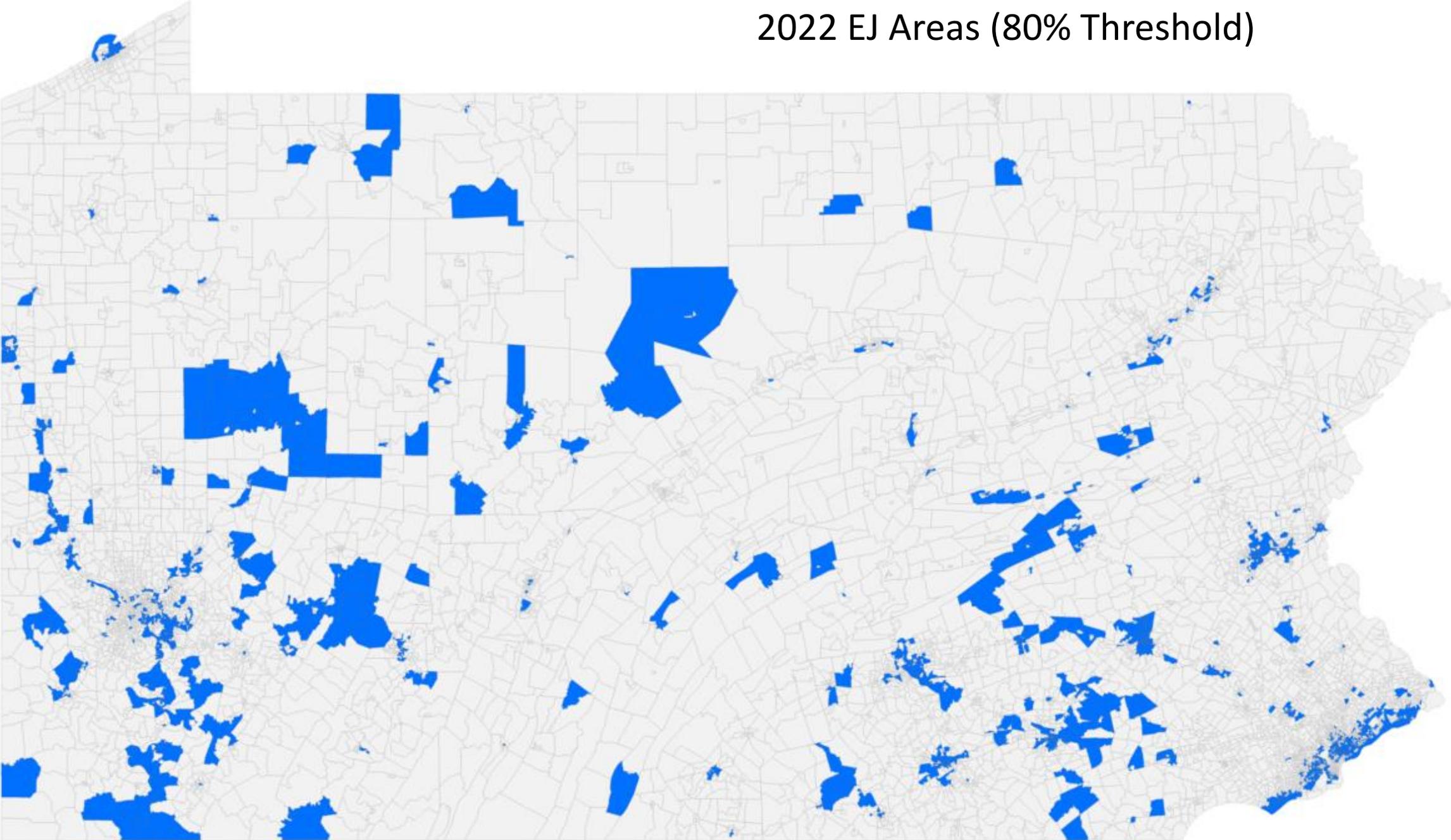
# 2022 EJ Score Percentile



2019 EJ Areas (under 2004 policy)

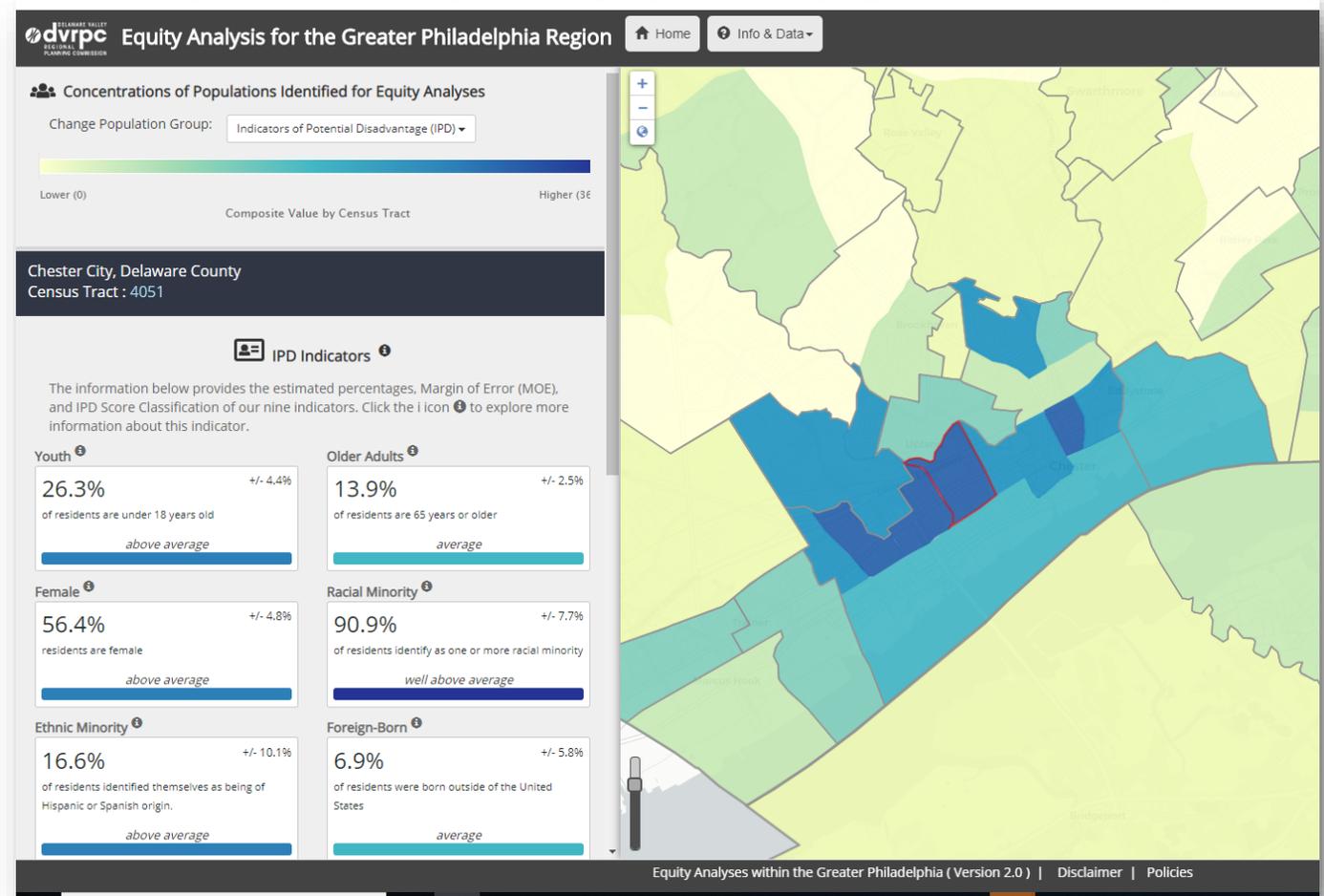


2022 EJ Areas (80% Threshold)



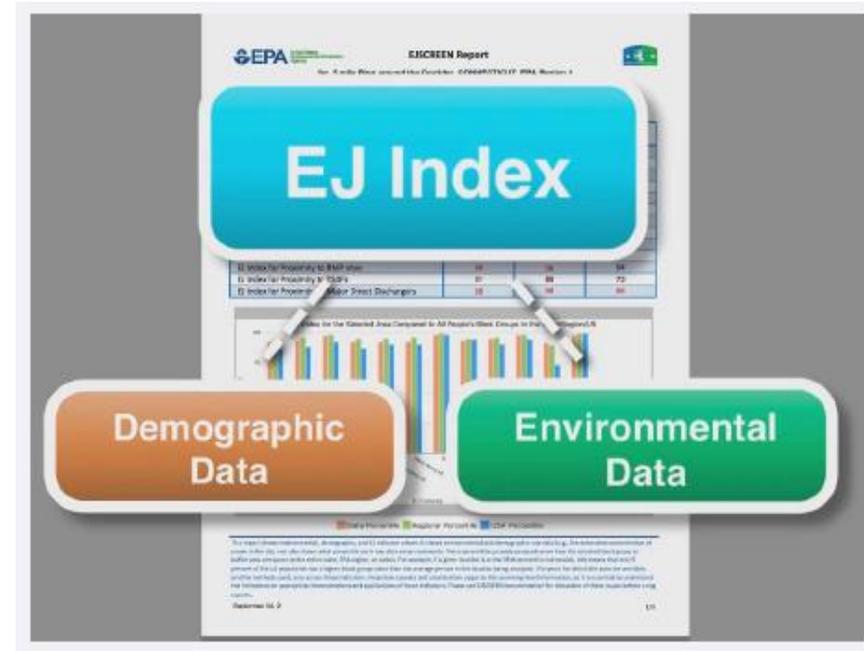
# Tools: DVRPC's Equity Analysis

- Mapping tool: [www.dvrpc.org/webmaps/IPD/](http://www.dvrpc.org/webmaps/IPD/)
- Each population group is an “indicator” in the analysis and includes the following:
  - Youth
  - Older Adults
  - Female
  - Racial Minority
  - Ethnic Minority
  - Foreign-Born
  - Limited English Proficiency
  - Disabled
  - Low-Income

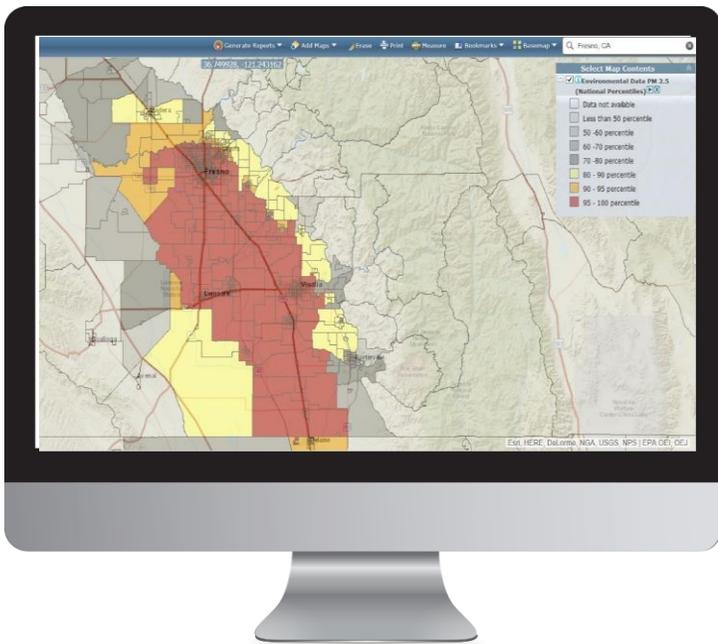


# Tools: EPA EJSCREEN

- Mapping tool: [epa.gov/ejscreen](https://epa.gov/ejscreen)
- Includes demographic and environmental data
- Nationwide
- Can produce reports at the census tract level
- Working on training with other departments.



# Tools: EPA EJSCREEN



## EJSCREEN Training Videos

<https://www.epa.gov/ejscreen/ejscreen-videos>

### Environmental Indicators

- PM 2.5
- Ozone
- NATA Diesel PM
- NATA Air Toxics Cancer Risk
- NATA Respiratory Hazard Index
- Lead Paint (pre-1960s Housing)
- Traffic Proximity
- Proximity-NPL Sites
- Proximity-RMP Facilities
- Proximity-TSD Facilities
- Proximity-Waste Water Dischargers

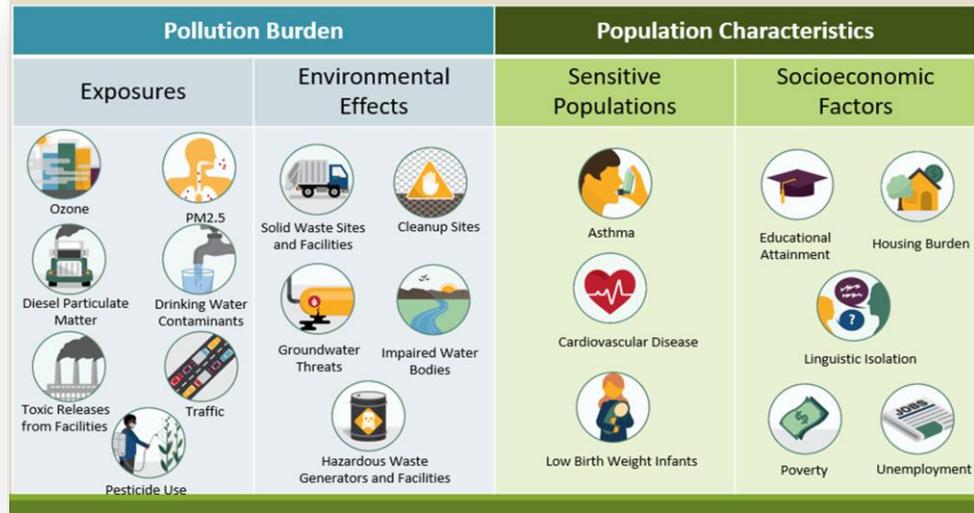
### Demographic Indicators

- Low-Income
  - Minority
  - Less than High School Education
  - Linguistic Isolation
  - Individuals under Age 5
  - Individuals over Age 64
- Index:** Calculated as (Low income + minority) / 2

# Tool Comparison

U.S. EPA EJ Screen	Updated EJ Areas Viewer
Provides data in percentiles	Will provide data in percentiles
Uses data available on a national level	Will use statewide and national data
Can explore individual factors	Will be able to explore individual factors
Updated periodically	Will have data updated on an annual schedule, with periodic larger updates
Pre-decisional analysis tool	Will be used to determine whether to implement the EJ policy

# Describing-Quantifying-Mapping Disproportionate Impacts



Disproportionate impacts is the consistent pattern of a combination of greater **pollution burden** and **population vulnerability** affecting the same communities, primarily minority, low-income, indigenous populations, as demonstrated by ample evidence.

Sources: CalEPA Office of Environmental Health Hazard Assessment and EPA EJSCREEN

# Tools: CalEnviroScreen



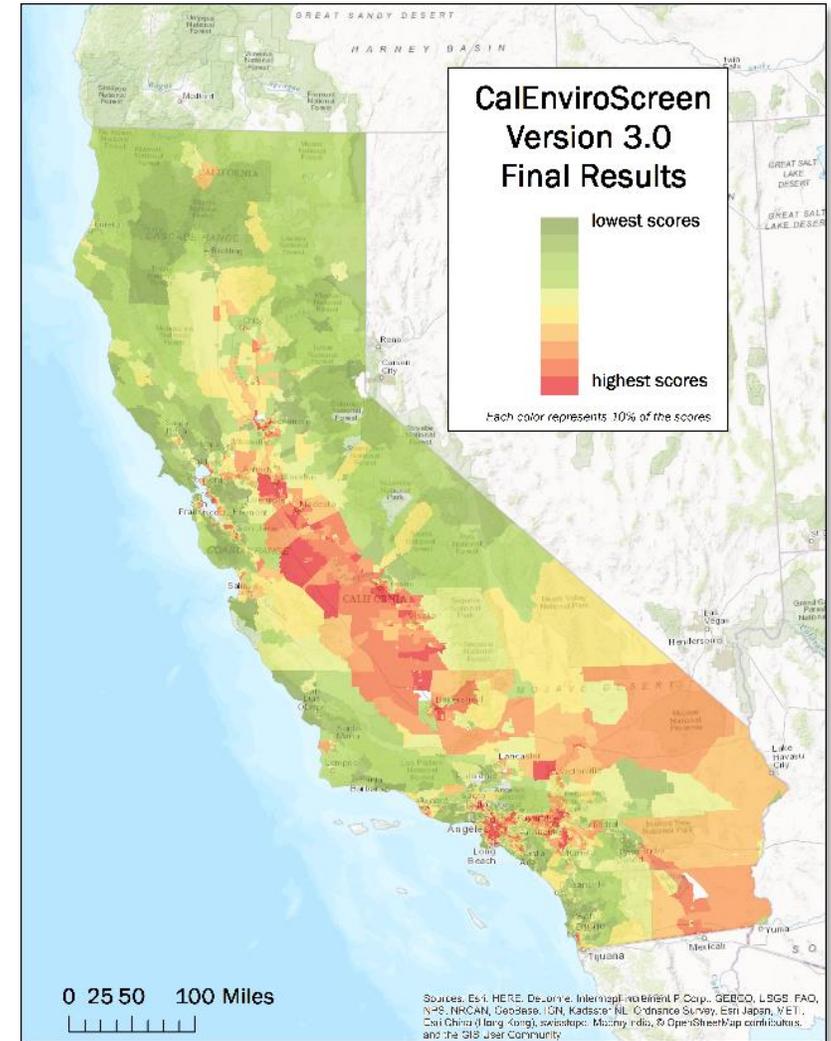
- Combines pollution burden and population characteristics
- Ranks communities according to combined scores for cumulative impacts
- Informed by significant and ongoing public input

**Pollution Burden**

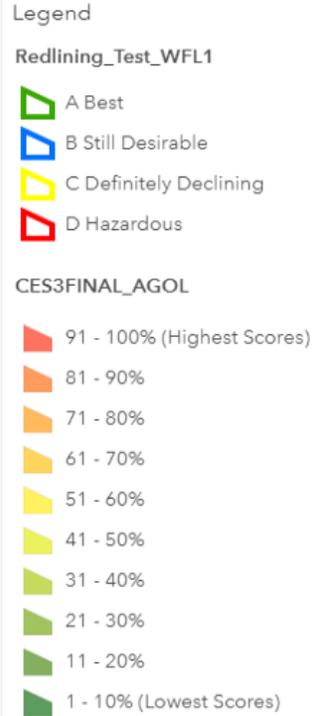
**Population Characteristics**



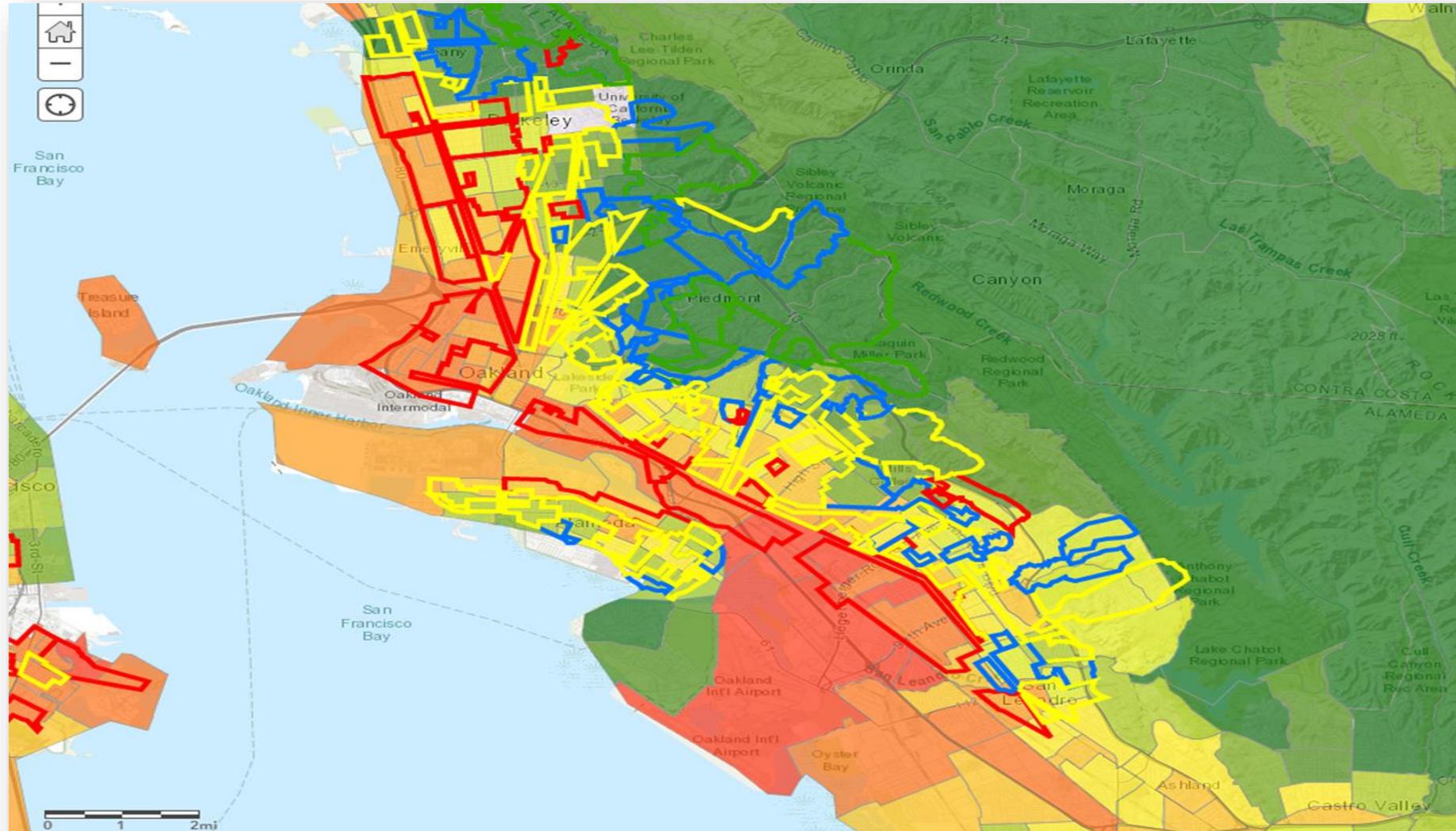
[Available as an interactive web map](#)



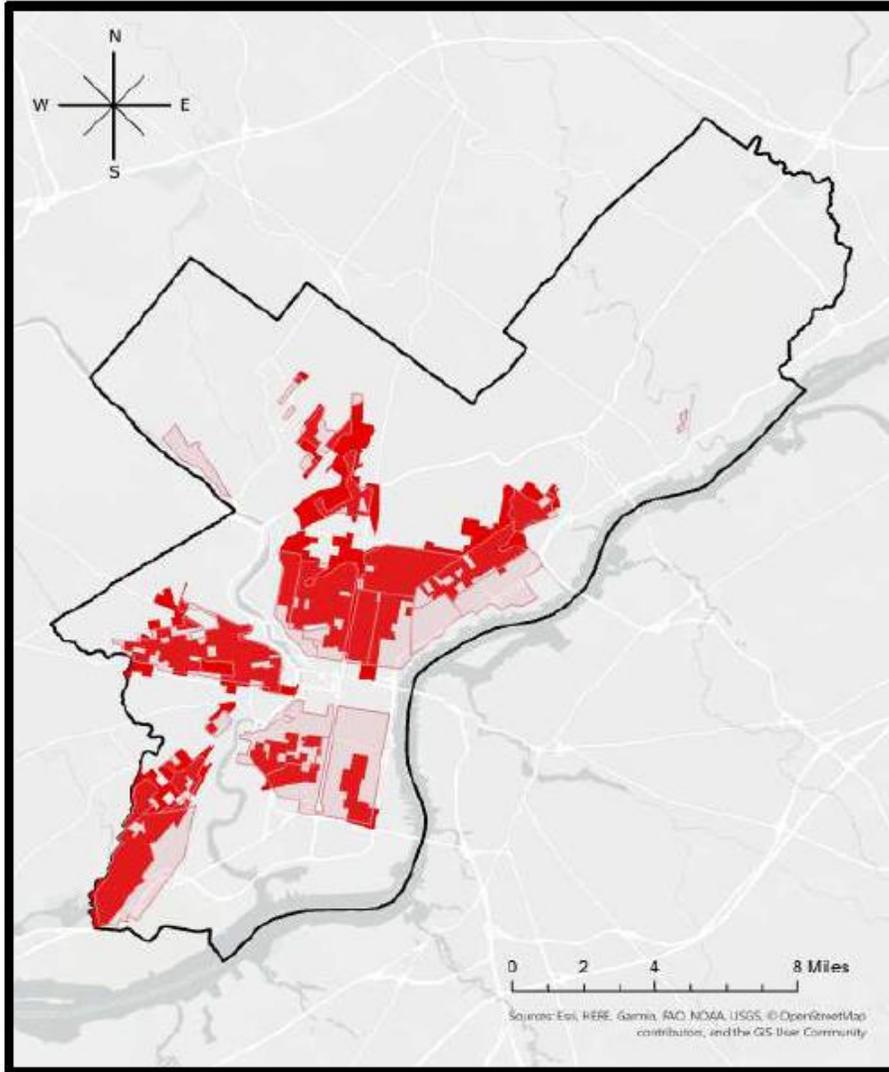
# Historical Legacy of EJ: Redlining & Structural Racism



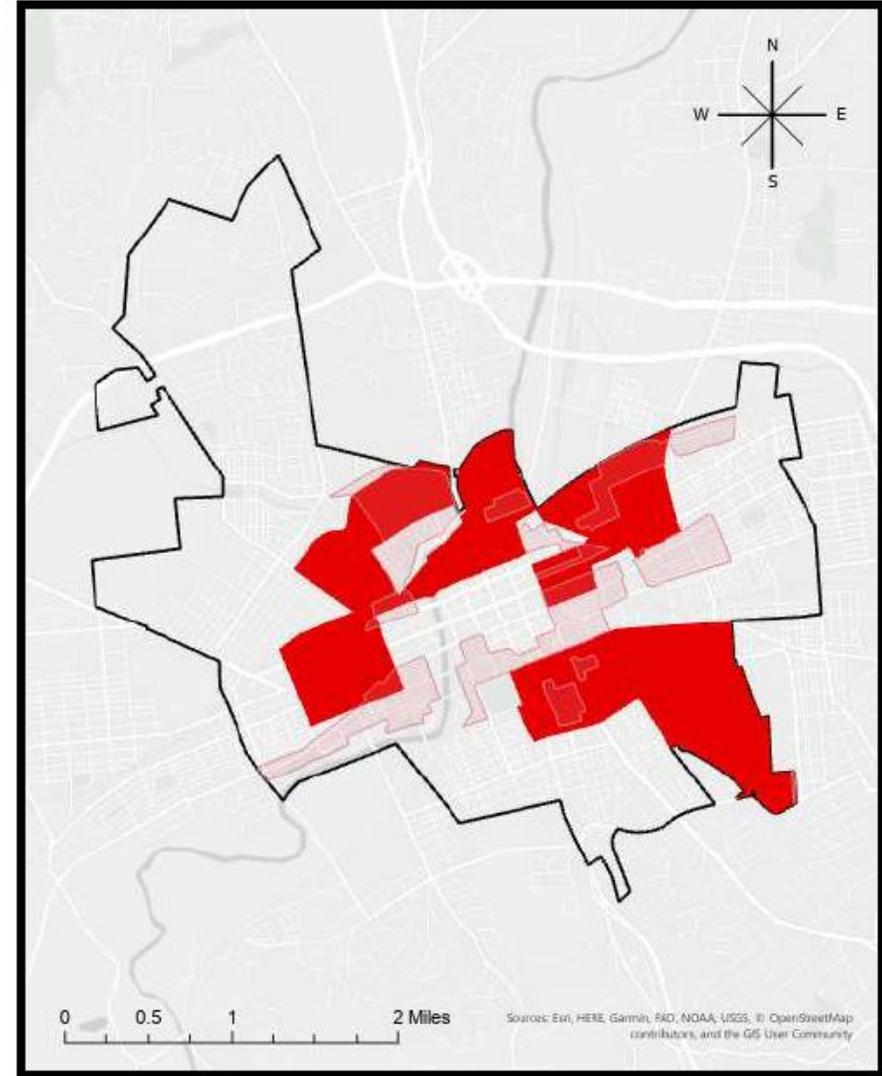
## Oakland, California



# Historical Legacy of EJ: Redlining in Pennsylvania



Philadelphia: Diesel Particulate Matter



York: Proximity to Hazardous Waste



# Office of Environmental Justice

**General Comments & Questions**

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*Sign up for*



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