Connecticut Environmental Justice Screening Tool: Environmental Justice for Resilient Pathways through Geospatial Information
Outline

01 About
The mapping tool aim and goals of the project

02 The Use
How can the mapping tool be used?

03 Applications
Potential of the tool and Limitations

04 Development
The development process and feedback system

05 Data & Methods
Data categorization and indicators

06 Demo
Demo of version 2.0
Environmental Justice Screening Tool

Combines environmental and demographic data to highlight areas where vulnerable populations may be disproportionately impacted by pollution.
The mapping tool aims to:

- **Data Integration**: Supplemented with local information and experience
- **Easy Access**: Web-based GIS tool for statewide
- **Policy Making**: The first screening for State, County, and Municipal decision making
How can you use the tool?

Evaluating areas that require improvements
How can you use the tool?

Prioritization

Evaluating areas that require improvements
How can you use the tool?

Guiding decision making

Evaluating areas that require improvements

Prioritization
How can you use the tool?

Guiding decision making
Evaluating areas that require improvements
Prioritization
Retrospective reporting
How can you use the tool?

Guiding decision making
Evaluating areas that require improvements
Prioritization
Retrospective reporting
Education & Research
Examples from Other States

New Jersey Environmental Justice Mapping, Assessment and Protection Tool

- Incorporated into rules for implementing New Jersey's EJ Law.
- Informs permitting decisions for new facilities in overburdened communities.
- Identifies overburdened communities and triggers additional assessment of cumulative impact during permitting process.
Examples from Other States

- Top 25 percent of census tracts in CalEnviroScreen 4.0 are targeted for investment of proceeds from the State's cap-and-trade program.

- Incorporated into grant application criteria for Transformative Climate Communities (TCC) Program.

- Department of Toxic Substance Control uses CalEnviroScreen to prioritize enforcement, complaints, and groundwater investigations.
Examples from Other States

- Informs prioritization of public water system inspections through Colorado Department of Public Health & Environment Safe Drinking Water Program.

- Informs MOU and work plan between Colorado Department of Public Health & Environmental and federal EPA Region 8 regarding compliance and enforcement activities to reduce pollution.
Examples from Other States

- Incorporated into implementation of Washington's Clean Energy Transformation Act, which requires that disproportionately impacted communities must benefit equitably from the transition to a clean energy economy.

- Utilities must identify these communities in the Clean Energy Implementation Plans submitted to the Department of Commerce every 4 years, must describe expected costs/benefits to these communities and how the utility will reduce risks to these communities.
The intended use for Connecticut

- Prioritizing DEEP and other State agency policy and legislative matters that seek to address env’t inequities
- Informing enforcement of environmental regulations
- Targeting funding for infrastructure improvements;
- Identify communities that qualify within certain funding criteria for state and local government grant applications;
- Identifying areas to conduct health assessments and providing health and environmental burdens data;
- Provide data to support local planning and zoning efforts;
- Ensure adaptation and mitigation strategies contribute towards equity rather than exacerbating existing inequalities
The mapping tool’s capacity

This Mapping Tool DOES:

• Identify potential sources of pollution.
• Identify areas that present potential hazards in the event of an accident or emergency.
• Identify census tracts near potential pollution sources.
• Identify the degree to which a community, by census tract, is vulnerable due to socioeconomic and health disparities.

This Mapping Tool DOES NOT:

• Does not reflect actual exposures to pollution
• Does not model the overall pollution burden nor reflect the number of individuals that may be affected by pollution.
• Does not model the positive or negative likelihood of an individual’s risks for poor health outcomes.
• Does not release private addresses, information, or names.
Limitations of the mapping

Various Dataset
Nothing is really “equal weight”

Resolution
Inconsistent data representation

Realistic
The impact of the pollution may be inadequate

Expert need
Evaluation of need multidisciplinary expert collaboration
Project Development

- Literature
- State Data Advisory Committee
- Mapping Tool Advisory Committee
- Forums
- Public Comment Period
- Additional Feedback
State Data Advisory Committee (SDAC)

- Office of Policy & Management
- Yale Center on Climate Change & Public Health
- DataHaven
- Department of Economic and Community Development
- Department of Transportation
- Department of Public Health
- Department of Emergency Services and Public Protection
- Clean Air Association of the Northeast States (NESCAUM)
- Connecticut Data Collaborative
Mapping Tool Advisory Committee

- **Goal:** Fund organizations and individuals to advise on environmental justice mapping efforts for Connecticut
- **Members:** 2 organizations and 4 individuals
- **Eligibility:** Individuals with lived experience or representatives from community-based organizations (CBOs)
  - Operation Fuel
  - Groundwork Bridgeport
  - Individuals from Bridgeport, Windsor, New Haven, Hartford
Forums

Bridgeport - East End NRZ
Waterbury - Waterbury Health Department and Bridge to Success
Hartford - Center for Latino Progress
Groton - City of Groton
New Haven - Junta Progressive Action
Methodology

Data Collection

• GC3 Report Suggestions
• CT Specific Data Updates
• Environmental, Pollution, Health and Socioeconomic data sources

Indicator Selection and Calculation

Cumulative Index Calculation

Mapping
Methodology

Data Collection

Indicator Selection and Calculation

Cumulative Index Calculation

Mapping

- Each indicator is equal within the category.
- If the data inside the indicator is weighted based on either proximity, value range or rate difference.
- Percentile and Rank calculation among census tracts.
- Allows relative comparison between census tracts.
Methodology

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- **Indicator Selection and Calculation**
  - “Percentiles show the placement of the data point within the dataset”
  - “Percentiles are normalized to ranks from 0 to 10 to standardized units among the indicators”

- **Cumulative Index Calculation**

- **Mapping**
Methodology

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**Indicator Selection and Calculation**

**Cumulative Index Calculation**

“Percentiles show the placement of the data point within the dataset”

“Percentiles are normalized to ranks from 0 to 10 to standardized units among the indicators”

**Mapping**
Methodology

Data Collection → Indicator Selection and Calculation → Cumulative Index Calculation → Mapping

Environmental Justice Index Score

\[ \text{Overall Score} = \text{Pollution Burden} \times \text{Sensitive Populations} \]

Pollution Burden:
\[ 0.5 \times \frac{\text{average}(PPS) + \text{average}(PPE)}{1.5} \]

Sensitive Populations:
\[ \frac{\text{average}(SF) + \text{average}(HS)}{2} \]

<table>
<thead>
<tr>
<th>Composite Category</th>
<th>Pollution Sources (PPS)</th>
<th>Potential Pollution Exposure (PPE)</th>
<th>Socioeconomic Factors (SF)</th>
<th>Health Sensitivity (HS)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Category</td>
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</tbody>
</table>
Methodology

Data Collection → Indicator Selection and Calculation → Cumulative Index Calculation → Mapping

**Darker areas = Higher rankings = Higher potential impact**

<table>
<thead>
<tr>
<th>Least impacted</th>
<th>Most impacted</th>
</tr>
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<tbody>
<tr>
<td>0-1 10% of census tracts</td>
<td>9-10 10% of census tracts</td>
</tr>
<tr>
<td>1-2 10% of census tracts</td>
<td>8-9 10% of census tracts</td>
</tr>
<tr>
<td>2-3 10% of census tracts</td>
<td>7-8 10% of census tracts</td>
</tr>
<tr>
<td>3-4 10% of census tracts</td>
<td>6-7 10% of census tracts</td>
</tr>
<tr>
<td>4-5 10% of census tracts</td>
<td>5-6 10% of census tracts</td>
</tr>
<tr>
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</tr>
<tr>
<td>6-7 10% of census tracts</td>
<td>3-4 10% of census tracts</td>
</tr>
<tr>
<td>7-8 10% or census tracts are similarly impacted</td>
<td>2-3 10% of census tracts</td>
</tr>
<tr>
<td>8-9 10% of census tracts</td>
<td>1-2 10% of census tracts</td>
</tr>
<tr>
<td>9-10 10% of census tracts</td>
<td>0-1 10% of census tracts</td>
</tr>
</tbody>
</table>

70% of census tracts are less impacted
Data Categorization

Environmental Justice Index
Data Categorization

Environmental Justice Index

- Pollution Burden
  - Potential Pollution Sources
  - Potential Pollution Exposure
Data Categorization

Environmental Justice Index

Pollution Burden
- Potential Pollution Sources
- Potential Pollution Exposure

Sensitive Population
- Socioeconomic Factors
- Health Sensitivity
<table>
<thead>
<tr>
<th>Overall Score</th>
<th>Environmental Justice Index Score</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>= Pollution Burden x Sensitive Populations</td>
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</table>

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<th>Sensitive Populations</th>
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</thead>
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<tr>
<td></td>
<td>$0.5 \times \text{average}(PPS) + \text{average}(PPE)$</td>
<td>$\frac{\text{average}(SF) + \text{average}(HS)}{2}$</td>
</tr>
</tbody>
</table>

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</thead>
<tbody>
<tr>
<td>Indicator</td>
<td>Brownfield sites</td>
<td>Diesel PM Emissions</td>
<td>Housing Burden</td>
<td>Asthma Emergency Dept. Visit Rate</td>
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<td>Proximity to Superfund Sites</td>
<td>Noise</td>
<td>Linguistic Isolation</td>
<td>Coronary Heart Disease</td>
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<td>Impervious Surfaces</td>
<td>Ozone</td>
<td>Poverty levels</td>
<td>Emergency Dept. Visits for Chronic Lung Disease</td>
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<td>Incinerators</td>
<td>Particulate Matter 2.5</td>
<td>Unemployment</td>
<td>Diabetes</td>
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<td>Landfills</td>
<td>Facilities Releasing Toxics</td>
<td>Race/Ethnicity</td>
<td>Low Birthweight Rate of Infants</td>
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<td>Housing Lead Risk</td>
<td>Major Sources of Air Pollution</td>
<td>Educational Attainment</td>
<td>Declined Mental Health</td>
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<td>Municipal Transfer Stations</td>
<td>Minor Sources of Air Pollution</td>
<td>Energy Burden</td>
<td>Depression Rates</td>
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<td>Potentially Contaminated/Clean-Up Sites</td>
<td>Minor Air Pollution Facilities</td>
<td>Median Income</td>
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<td>Recycling Processing Facilities</td>
<td>Traffic Density</td>
<td>Population Age &lt; 5</td>
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<td>Significant Environmental Hazards</td>
<td>EPA Cancer Risk Index</td>
<td>Population Age &gt; 65</td>
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<td>Underground Storage Tanks</td>
<td>EPA Respiratory Hazard Risk Index</td>
<td>No Health Insurance</td>
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<td>Facilities Managing Hazardous Chemicals</td>
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<td>Mobile Homes</td>
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<td>Wastewater Discharges</td>
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<td>Multi-unit Housing</td>
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<td>Rent-ownership Ratio</td>
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<td>Disability</td>
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<td>Single Parent Households</td>
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<td>Food Insecurity</td>
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# Resources

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<thead>
<tr>
<th>Web Interface</th>
<th>User Guides</th>
<th>Engagement Materials</th>
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<tbody>
<tr>
<td>CT EJ Screen Project</td>
<td>2-Pager User Guide explaining the interface</td>
<td>Factsheet</td>
</tr>
<tr>
<td>Website in English and Spanish</td>
<td>Widget Description User Guide</td>
<td>General Audience Guide on What to Do with CT EJ</td>
</tr>
<tr>
<td>CT EJ Screen Web Application in English and Spanish</td>
<td>Web Application Tutorial Document</td>
<td>Screen Tool</td>
</tr>
<tr>
<td>Data Hub for Shapefiles</td>
<td>Web Application Video Tutorial</td>
<td>List of Community Resources, Grants, and</td>
</tr>
<tr>
<td></td>
<td>All materials Translated into Spanish</td>
<td>Financial Assistance Opportunities</td>
</tr>
<tr>
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<td>Ideas for What to do with the CT EJ Screening</td>
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<td>Tool</td>
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<td>Applications of Statewide Mapping Tools</td>
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<td>Second Language Speaker High School Curriculum</td>
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<td>Final Report</td>
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Connect

https://connecticut-environmental-justice.circa.uconn.edu/
Thank you!

Do you have any questions?