Appendix A: Methodology for Calculating Populations Living in EJ Communities in U.S. States

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By Marisa Sotolongo, Initiative for Energy Justice

This document provides an overview of our calculations found in Figures 1 and 2 of the blog post, **Justice40 and Community Definition: How Much of the U.S. Population Is Living in a "Disadvantaged Community"?** We surveyed all fifty states for legislative or administrative definitions of environmental justice communities. In searching for these definitions, we cast a broad net of understanding what an environmental justice community is - any policy that defines a community with a history of economic disinvestment or disproportionately burdened by pollution is included in this document. These states are: California, Colorado, Connecticut, Illinois, Massachusetts, Maryland, New Jersey, New York, North Carolina, Pennsylvania, Rhode Island, Virginia, and Washington. For each state, we provide the legislative or administrative authorization for these community definitions; the data sources used to calculate the environmental justice population figures; and a methodology for how we, or the states themselves, calculated results. Note, that while Virginia has environmental justice legislation that defines environmental justice communities, operationalizing this definition has proven to be difficult. We have therefore elected to not report our preliminary calculations for Virginia at this time.

California

Authorization: [Senate Bill 535](#) (2006).

Data source: [Disadvantaged Communities List](#), California Office of Environmental Health Hazard Assessment, May 2022. Excel worksheet. [Table B01003: Total Population](#), American Community Survey 5-Year Estimates (2015-2019). Excel worksheet.

Methodology: Disadvantaged communities are defined through CalEnviroScreen CES 4.0 scores and tribal area lists, with data provided at the census tract level. [CalEnviroScreen](#) uses exposure indicators (measurements of different pollutions people come into contact with); environmental effects indicators (toxic chemicals located in or near communities); sensitive population indicators (age or health factors that may lead populations to be more severely affected by pollution); and socioeconomic factors (conditions that may increase people's stress or make healthy living more difficult). See the CalEnviroScreen website for more detailed information on the indicators used to build the cumulative environmental justice score for each census tract. All data sources are based on the American Community Survey 5-Year Estimates (2015-2019). A census tract is designated as a disadvantaged community if it meets one of the following conditions:
- CES 4.0 top 25% census tracts
- CES 3.0 top 25% census tracts
- CES 4.0 high pollution burden score, low population count - census tracts which have data gaps, but are in the highest 5% of CES 4.0 cumulative pollution burden scores

The California Office of Environmental Health Hazard Assessment provides a list of all census tracts in the state that meet one or more of the criteria listed above, and so qualify as disadvantaged communities, in Excel format. This data includes the populations of these census tracts. The total state population is based on the American Community Survey 5-Year Estimates (2015-2019).

CA Total Population: 39,283,497
CA Disadvantaged Communities Population: 11,249,929
CA Disadvantaged Communities: 28.47%

Colorado

Authorization: [House Bill 21-1266](#) (2021).

Data source: [Data Viewer for Disproportionately Impacted Communities in Colorado](#), Colorado Department of Public Health and Environment, November 2021. Website.

Methodology: Environmental justice disproportionately impacted communities are defined in HB 21-1266 either through demographic factors (low-income, minority, or housing cost-burdened), through a history of environmental racism, or through cumulative health and environmental impacts. The Colorado Department of Public Health & Environment is currently in the process of identifying communities that meet the second two conditions. The state has provided a data viewer which shows census block groups that meet the demographic conditions, listed below:

- 40% of households are low-income (household income is less than 200% of the federal poverty line), OR
- 40% of households are housing cost-burdened (households that spend 30% or more of their income on housing costs), OR
- 40% of the population self-identifies as a minority (as a race that is not white, or as Hispanic/Latino)

 All data sources are based on the American Community Survey 5-Year Estimates (2015-2019) and use Census Block Group 2010 IDs.

CO Total Population: 5,610,349
CO Disproportionately Impacted Communities Population (demographic): 2,398,348
CO Disproportionately Impacted Communities: 42.75%

Connecticut

Authorization: House Bill 7008 (2020).

Data source: EJ Communities Mapping Tool, Connecticut Department of Energy and Environmental Protection, 2021. Mapping tool & Excel worksheet. List of Distressed Municipalities, Connecticut Department of Economic and Community Development, 2021. Excel worksheet. Estimated Populations in Connecticut, Connecticut Department of Public Health, July, 2019. PDF.

Methodology: HB 7008 defines environmental justice communities as (a) economically distressed municipalities and (b) census block groups with 30% low-income populations. The Connecticut Department of Economic and Community Development released a list of distressed municipalities for 2021; estimated populations for these municipalities were based on the Connecticut Department of Public Health's 2019 population estimates. The EJ communities mapping tool allows its data to be downloaded, providing a list of census block groups that are identified as EJ communities through low-income population data. Population data for these census block groups, as well as total state population estimates, is based on the American Community Survey 5-Year Estimates (2015-2019). Note that the low-income census block groups have no overlap with distressed municipalities.

CT Total Population: 3,575,074
CT Distressed Municipalities Population: 1,098,561
CT EJ Communities Population: 423,150
Total EJ Communities Population: 1,521,711

CT Distressed Municipalities: 30.73%
CT EJ Communities: 11.84%
CT EJ Communities: 42.56%

Illinois

Authorization: [Senate Bill 1592](#) ([Illinois Power Agency Act](#), 2007); [Illinois Power Agency Long-Term Renewable Resource Procurement Plan](#) (2020).

Data Source: [Analytical Results - Environmental Justice Communities](#), Illinois Solar For All, 2021. Excel worksheet. [Environmental Justice Communities Self Designation Map Data](#), Illinois Solar For All, 2021. GIS shapefile.

Methodology: The Illinois Power Agency's Long-Term Renewable Resource Procurement Plan, based on California's CalEnviroScreen mapping tool, [defines](#) environmental justice communities through a cumulative score, comprised of exposure indicators (measurements of different pollutions people come into contact with); environmental effects indicators (toxic chemicals located in or near communities); sensitive population indicators (age or health factors that may lead populations to be more severely affected by pollution); and socioeconomic factors (conditions that may increase people's stress or make healthy living more difficult). A weighted environmental justice score for each census block group was calculated by the Illinois Power Agency. All data sources are based on the American Community Survey 5-Year Estimates (2015-2019). A census block group is designated as an environmental justice community if it meets one of the following conditions:

- Top 25% census block groups (analytical results)
- Communities that have requested to be self-designated as an environmental justice community

The analytical results consist of the top 25% of the census block groups in Illinois, as ranked by their cumulative environmental justice scores. The population of these census block groups was provided in this dataset. The self-designation dataset was extracted from the GIS shapefile in Excel format. The population of these self-designated census block groups was based on the American Community Survey 5-Year Estimates (2015-2019).

IL Total Population: 12,851,106
IL EJ Communities Population (Analytical): 3,099,055
IL EJ Communities Population (Self-Designated): 70,642
IL EJ Communities Population (Total): 3,169,697

IL EJ Communities (Analytical): 24.12%
IL EJ Communities (Self-Designated): 0.55%
IL EJ Communities (Total): 24.66%

Massachusetts

Authorization: [Senate Bill 9](#) (2021).

Data Source: [2020 Environmental Justice Populations](#), MassGIS (Bureau of Geographic Information), June 2021. GIS shapefile.

Methodology: Senate Bill 9 defined environmental justice communities through demographic indicators (minority population, income, and/or linguistic isolation), codifying an executive branch [environmental justice policy](#) from 2021. A census block group is defined as an environmental justice community if it meets one of the following conditions:

- 25% or more of households have household income 65% or less than state median, OR
- 40% or more of the population self-identifies as minority (a race other than white, or Hispanic/Latino), OR
- 25% or more of households do not include anyone older than 14 who speaks English very well (linguistic isolation), OR
- 25% or more of the population self-identifies as minority AND the median household income of the municipality in which the census block group is located is less than 150% of the state median income.

All data sources are based on the American Community Survey 5-Year Estimates (2015-2019). The list of environmental justice census block groups was extracted from the GIS shapefile into an Excel worksheet. While the legislation allows some communities to self-designate as EJ communities, there's no indication that any community has done so.

MA Total Population: 6,850,553
MA EJ Communities Population: 3,100,468
MA EJ Communities: 45.26%

Maryland

Authorization: [Maryland Department of the Environment Environmental Justice Policy and Implementation Plan](#) (2020).

Data Source: [Table C17002: Ratio of Income to Poverty Level](#), American Community Survey 5-Year Estimates (2015-2019). Excel worksheet. [Table B03002: Hispanic or Latino Origin by Race](#), American Community Survey 5-Year Estimates (2015-2019). Excel worksheet. [Table B02001: Race](#), American Community Survey 5-Year Estimates (2015-2019). Excel worksheet.

Methodology: The Maryland Department of the Environment (MDE) has an internal policy defining environmental justice communities as communities with a low-income or minority population greater than twice the statewide average. While the policy does not specify the unit of analysis which the MDE considers a community, I use census block groups for this analysis. I assume that the MDE's definition of low-income mirrors that of EJSCREEN, where a household is low-income if their income is less than 200% of the federal poverty line. I also assume that MDE's definition of minority populations mirrors that of the other states in this analysis - populations that identify as a race other than white, and Hispanic/Latino populations. I calculated the statewide low-income population (21.59%) and minority population (49.12%), then categorized each census block group based on whether its low-income or minority population was more than twice these statewide average figures.

MD Total Population: 6,018,848
MD EJ Communities Population: 876,918

MD EJ Communities: 14.57%

New Jersey

Authorization: Senate Bill 232 (2020-2021).

Data Source: List of Overburdened Communities, New Jersey Department of Environmental Protection, 2021. Excel worksheet.

Methodology: Senate Bill 232 defines overburdened communities by demographic indicators (minority, linguistic isolation, and low-income status). A census block group is defined as an overburdened community if it meets one of the following conditions:
- 35% or more of the households qualify as low-income households (household income is less than 200% of the federal poverty line), OR
- 40% or more of the population self-identifies as minority (a race other than white, Hispanic or Latino, or as members of a State recognized tribal community), OR
- 40% or more of households do not include anyone older than 14 who speaks English very well (linguistic isolation).

The NJ Department of Environmental Protection (NJDEP) published an Excel worksheet list, an interactive mapping tool, and a GIS layer of overburdened communities by census block group. The NJDEP's technical document regarding how the list of communities was determined is provided here. All data sources are based on the American Community Survey 5-Year Estimates (2015-2019).

NJ Total Population: 8,878,503
NJ Overburdened Communities Population: 4,480,341
NJ Overburdened Communities: 50.46%

New York

Authorization: Senate Bill 6599 (2019).

Data Source: Disadvantaged Communities Map, New York Climate Action Council, 2022. Website.

Methodology: Senate Bill 6599, the New York Climate Leadership and Community Protection Act, instructed the Climate Justice Working Group to define disadvantaged communities based on geographic, public health, environmental hazard, and socioeconomic criteria. The Climate Justice Working Group has released a draft version of its disadvantaged communities criteria; this is the data set used for this analysis. Census tracts are defined as disadvantaged communities based on a cumulative score, comprised of environmental burdens, climate change risk, population characteristics, and health vulnerabilities. See the Climate Justice Working Group's website for more detailed information on the indicators used to build the cumulative score for each census tract. The draft definition release includes a data visualization tool, and information on the number of census tracts, households and population designated as draft disadvantaged communities. This data is used to calculate the disadvantaged communities population.

NY Total Population: 19,572,319
NY Disadvantaged Communities Population: 6,978,988
NY Disadvantaged Communities: 35.66%

North Carolina

Authorization: [North Carolina Environmental Justice and Equity Advisory Board Charter](#) (2022).

Data Source: [Potentially Underserved Block Groups 2019](#), North Carolina Department of Environmental Quality, 2020. GIS Shapefile. [Table B01003: Total Population](#), American Community Survey 5-Year Estimates (2015-2019). Excel worksheet.

Methodology: North Carolina's Department of Environmental Quality (NCDEQ) has an Environmental Justice and Equity Advisory Board. In this Board's charter, environmental justice communities are communities that are disproportionately nonwhite and disproportionately experiencing poverty. A community is defined as an overburdened community if it meets both of the following conditions:
- Racial composition is disproportionately nonwhite:
    - Nonwhite population is 50% or more, OR
    - Nonewhite population is at least 10% higher than the nonwhite population of county or state
- AND
- Population is disproportionately impoverished:
    - Population experiencing poverty is over 20%, AND
    - Population experiencing poverty is at least 5% higher than the population experiencing poverty in the county or state

The NCDEQ published a GIS map showing census block groups identified as potentially underserved using this criteria. The list of potentially underserved census block groups was extracted from the GIS shapefile into an Excel worksheet. The population of these census block groups was based on the American Community Survey 5-Year Estimates (2015-2019).

NC Total Population: 10,264,876
NC Potentially Underserved Communities Population: 1,073,038
NC Potentially Underserved Communities: 10.45%

Pennsylvania

Authorization: [Environmental Justice Public Participation Policy](#) (2004).

Data Source: [Table C17002: Ratio of Income to Poverty Level](#), American Community Survey 5-Year Estimates (2015-2019). Excel worksheet. [Table B03002: Hispanic or Latino Origin by Race](#), American Community Survey 5-Year Estimates (2015-2019). Excel worksheet. [Table B02001: Race](#), American Community Survey 5-Year Estimates (2015-2019). Excel worksheet.

Methodology: Pennsylvania Department of Environmental Protection's Environmental Justice Public Participation Policy expanded public participation requirements for projects that are located in, or affect, environmental justice areas. The policy defines a project's "area of concern," which includes a circle of radius 0.5 miles around the center of a proposed permit activity, or an area extending 0.5 miles beyond the boundary of a proposed decentralized activity. If this "area of concern" contains, entirely or in part, a census tract with 30% or more minority population or 20% or more population at or below the poverty level, it is defined as an environmental justice area. For the purposes of this analysis, I analyzed census tracts in Pennsylvania that meet these demographic requirements. I assume that the definition of minority populations mirrors that of the other states in this analysis - populations that identify as a race other than white, and Hispanic/Latino populations. All data is from the American Community Survey 5-Year Estimates (2015-2019).

PA Total Population: 12,791,530
PA Environmental Justice Areas Population: 3,820,017
PA Environmental Justice Areas: 29.86%

Rhode Island

Authorization: [Policy for Considering Environmental Justice in the Review of Investigation and Remediation of Contaminated Properties](#) (2009).

Data Source: [Table C17002: Ratio of Income to Poverty Level](#), American Community Survey 5-Year Estimates (2015-2019). Excel worksheet. [Table B03002: Hispanic or Latino Origin by Race](#), American Community Survey 5-Year Estimates (2015-2019). Excel worksheet. [Table B02001: Race](#), American Community Survey 5-Year Estimates (2015-2019). Excel worksheet.

Methodology: Rhode Island's Department of Environmental Management's environmental justice policy document defines environmental justice focus areas based on minority and low-income indicators. A census block group is defined as an environmental justice focus area if it meets one of the following conditions:
- The percent of the population that identifies as minority (a race other than white, or Hispanic or Latino) is in the top 15 percent of the state, OR
- The percent of the population that is low-income (household income is less than 200% of the federal poverty line) is in the top 15 percent of the state

Using the census data referenced above, I calculated the percentile of each census block group's minority and low-income populations. For census block groups that had minority populations or low-income populations in the top 15th percentile when compared to the rest of the state, I labeled these communities as environmental justice focus areas, then summed their populations.

Using the 5-year ACS 2019 data, the population living in poverty was found using the C17002 (income/poverty ratio for past 12 months, which is the code EJSCREEN uses) report; minority (assumed to be any race other than white, plus white Hispanic/Latino populations) percentages was found using B03002 (for ethnicity) and B02001 (for race) reports. I calculated the percentile of each census block group's minority and low-income populations. For CBGs that had minority populations or low-income

populations in the top 15th percentile in comparison to the rest of the state, I marked these CBGs are EJ Focus Areas.

RI Total Population: 1,057,231
RI Environmental Justice Focus Area Population: 220,329
RI Environmental Justice Focus Areas: 20.84%

Virginia

Authorization: Senate Bill 406 (2020).

Virginia's Environmental Justice Act defines an environmental justice community as a low-income community or community of color.
- A low-income community is a census block group in which 30% or more of the population are low-income.
  - Low income means having an annual household income that is:
    - 80 percent of the median income of the area or less, OR
    - 200 percent of the federal poverty line or less
- A community of color is a geographically distinct area where the population of color, by percent, is higher than the total population of color in Virginia.
  - "Population of color" means a population of individuals who identify as belonging to one or more of the following groups: Black, African American, Asian, Pacific Islander, Native American, other non-white race, mixed race, Hispanic, Latino, or linguistically isolated.
- However, if a community of color is composed primarily of one of the groups listed in the definition of "population of color," the percentage population of such group in the Commonwealth shall be used instead of the percentage population of color in the Commonwealth.

Note that this definition is difficult to operationalize and requires assumptions about community definition and methodology that are outside the scope of this analysis.

Washington

Authorization: Senate Bill 5116 (Clean Energy Transformation Act, 2019). Senate Bill 5141 (Healthy Environmental for All, 2021).

Data Source: Highly Impacted Communities Data Table, Washington State Department of Health, 2022. Excel Worksheet. Table B01003: Total Population, American Community Survey 5-Year Estimates (2015-2019). Excel worksheet.

Methodology: Washington's Healthy Environmental for All Act (HEAL Act) sets environmental justice requirements for certain state agencies when considering overburdened communities. Each state agency is given authorization to define overburdened communities for themselves. However, the HEAL Act

requires that, at minimum, overburdened communities include highly impacted communities. Highly impacted communities are defined in a previous piece of legislation, the Clean Energy Transformation Act (CETA) of 2019. CETA defines highly impacted communities as census tracts in which a cumulative environmental health impact score is either nine or ten (on a scale of one to ten), or is a census tract with tribal lands. The environmental health impact score can be found using Washington's Environmental Health Disparities map. See the EHD website for more detailed information on the indicators used to build the cumulative environmental justice score for each census tract.

Most state agencies are still in the process of defining overburdened communities. For this analysis, we looked at the populations contained within highly impacted communities, as this provides a useful lower bound for the definition of overburdened communities. The Washington State Department of Health provides instructions to utilities on how to identify highly impacted communities on a public website; this is the data source used to identify which census tracts are highly impacted communities. The populations for each census tract are from the American Community Survey 5-Year Estimates (2015-2019).

WA Total Population: 7,404,107
WA Highly Impacted Communities Population: 2,173,247
WA Highly Impacted Communities: 29.35%