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Environmental Inequality Dataset

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Subject	Environmental Inequality Environmental Policy Environmental Justice State Politics
Rights	EPA's Risk-Screening Environmental Indicators (RSEI) model, public domain (https://edg.epa.gov/EPA_Data_License.html) Brown University Longitudinal Tract Database American Community Survey, public domain
Language	English
Dates	1989 - 2015
Location	United States
Data processing	The Disaggreated RSEI model data (also known as RSEI-GM, or Geographic Microdata) version 2.3.4 was downloaded from the Amazon Web Service created by EPA. The RSEI-GM provides detailed air model results from EPA's Risk-Screening Environmental Indicators (RSEI) model. The results include chemical concentration, toxicity-weighted concentration and score, calculated for each 810 meter square grid cell in a 49-km circle around the emitting facility, for every year from 1988 through 2014. The data can be used to examine trends in air pollution from industrial facilities over time and across geographies. In order to allow for evaluation of toxic-weighted concentration over time, we used only the core chemicals and industries that have been consistently required to report since 1988. Thus we filtered the RSEI-GM disaggregated dataset to exclude additional chemicals and industries added after 1988. Crosswalks to translate data from the RSEI grid cell system to U.S. census block geographies, provided by EPA, were used to combine RSEI results with census data

and aggregate the results to the census tract level. We used the Longitudinal Tract Database created by Brown University, which adjusts data from previous years to 2010 census tract boundaries, to combine census demographic information for years 1989 through 2004. We used the 2006-2010 American Community Survey (ACS) for years 2005 through 2009 and the 2010-2014 ACS for years 2010 through 2014. This data were then used to calculate measures of environmental inequality.

File formats   CSV

Exposure Ratios   Exposure Ratio compare the levels of exposure at a given percentile between two populations. Let D and E denote two demographic populations like non-white and white or poor and non-poor. The notation T(p) is the toxic concentration experienced by an individual p and T(D) or T(E) is a collection of exposures experienced by the corresponding demographic. Further, let Tn(D) be the toxic concentration experienced by an individual in D at the nth percentile. For example T50(D) is the median exposure of demographic D. The exposure ratio, ER, is the ratio of these exposures:

$$ERn(D, E) = \frac{Tn(D)}{Tn(E)}.$$

Variable List
State   US State

Variation   Coefficient of variation of exposure values by state. This is a measure of spatial inequality that allows comparison of the exposure among states, standardized by the mean exposure. The CV aims to describe the dispersion of exposure values in a way that does not depend on the variable's measurement unit. When the CV is zero, exposure is equal across all census tracts in a state. The higher the CV, the greater the dispersion in the variable, the more inequality in exposure.

percentile50   Exposure values at the 50th percentile by state. This allows comparison of the relative risk of exposure among states, based on a percentile of a cumulative distribution of exposure at the census tract level within a state.

percentile60   Exposure values at the 60th percentile by state. This allows comparison of the relative risk of exposure among states, based a percentile of a cumulative distribution of exposure at the census tract level within a state.

percentile70   Exposure values at the 70th percentile by state. This allows comparison of the relative risk of exposure among

states, based on a percentile of a cumulative distribution of exposure at the census tract level within a state.

percentile80   Exposure values at the 80th percentile by state. This allows comparison of the relative risk of exposure among states, based on a percentile of a cumulative distribution of exposure at the census tract level within a state.

percentile90   Exposure values at the 90th percentile by state. This allows comparison of the relative risk of exposure among states, based on a percentile of a cumulative distribution of exposure at the census tract level within a state.

ratioEthnicity50   Exposure Ratio, ER50, of persons of color to non-Hispanic whites at the 50th percentile exposure level. This is a measure of patterned inequality that allows comparison of the exposure between persons of color and non-Hispanic whites at the census tract level within a state. Values above 1 indicate that persons of color are more exposed than non-Hispanic whites. The higher the value, the greater the degree of disparity in exposure. Conversely, values below 1 indicate that persons of color are less exposed than non-Hispanic whites.

ratioEthnicity60   Exposure Ratio, ER60, of persons of color to non-Hispanic whites at the 60th percentile exposure level. This is a measure of patterned inequality that allows comparison of the exposure between Persons of color and non-Hispanic whites at the census tract level within a state. Values above 1 indicate that persons of color are more exposed than non-Hispanic whites. The higher the value, the greater the degree of disparity in exposure. Conversely, values below 1 indicate that persons of color are less exposed than non-Hispanic whites.

ratioEthnicity70   Exposure Ratio, ER70, of persons of color to non-Hispanic whites at the 70th percentile exposure level. This is a measure of patterned inequality that allows comparison of the exposure between Persons of color and non-Hispanic whites at the census tract level within a state. Values above 1 indicate that persons of color are more exposed than non-Hispanic whites. The higher the value, the greater the degree of disparity in exposure. Conversely, values below 1 indicate that persons of color are less exposed than non-Hispanic whites.

ratioEthnicity80   Exposure ratio, ER80, of persons of color to non-Hispanic whites at the 80th percentile exposure level. This is a measure of patterned inequality that allows comparison of the exposure between Persons of color and

non-Hispanic whites at the census tract level within a state. Values above 1 indicate that persons of color are more exposed than non-Hispanic whites. The higher the value, the greater the degree of disparity in exposure. Conversely, values below 1 indicate that persons of color are less exposed than non-Hispanic whites.

ratioEthnicity90   Exposure Ratio, ER90, of persons of color to non-Hispanic whites at the 90th percentile exposure level. This is a measure of patterned inequality that allows comparison of the exposure between Persons of color and non-Hispanic whites at the census tract level within a state. Values above 1 indicate that persons of color are more exposed than non-Hispanic whites. The higher the value, the greater the degree of disparity in exposure. Conversely, values below 1 indicate that persons of color are less exposed than non-Hispanic whites.

ratioPoverty50   Exposure Ratio, ER50, of households in poverty to households not in poverty at the 50th percentile exposure level. This is a measure of patterned inequality that allows comparison of the exposure between households in poverty and households not in poverty at the census tract level within a state. Values above 1 indicate that households in poverty are more exposed than households not in poverty. The higher the value, the greater the degree of disparity in exposure. Conversely, values below 1 indicate that households in poverty are less exposed than households not in poverty.

ratioPoverty60   Exposure Ratio, ER60, of households in poverty to households not in poverty at the 60th percentile exposure level. This is a measure of patterned inequality that allows comparison of the exposure between households in poverty and households not in poverty at the census tract level within a state. Values above 1 indicate that households in poverty are more exposed than households not in poverty. The higher the value, the greater the degree of disparity in exposure. Conversely, values below 1 indicate that households in poverty are less exposed than households not in poverty.

ratioPoverty70   Exposure Ratio, ER70, of households in poverty to households not in poverty at the 70th percentile exposure level. This is a measure of patterned inequality that allows comparison of the exposure between households in poverty and households not in poverty at the census tract level within a state. Values above 1 indicate that households in poverty are more exposed than households not in poverty. The higher the value, the greater the degree of disparity in exposure. Conversely, values below 1 indicate that households in poverty are less exposed than households not in poverty.

ratioPoverty80   Exposure Ratio, ER80, of households in poverty to
                  households not in poverty at the 80th percentile
                  exposure level. This is a measure of patterned
                  inequality that allows comparison of the exposure
                  between households in poverty and households not in
                  poverty at the census tract level within a state. Values
                  above 1 indicate that households in poverty are more
                  exposed than households not in poverty. The higher the
                  value, the greater the degree of disparity in exposure.
                  Conversely, values below 1 indicate that households in
                  poverty are less exposed than households not in poverty.

ratioPoverty90   Exposure Ratio, ER90, of households in poverty to
                  households not in poverty at the 90th percentile
                  exposure level. This is a measure of patterned
                  inequality that allows comparison of the exposure
                  between households in poverty and households not in
                  poverty at the census tract level within a state. Values
                  above 1 indicate that households in poverty are more
                  exposed than households not in poverty. The higher the
                  value, the greater the degree of disparity in exposure.
                  Conversely, values below 1 indicate that households in
                  poverty are less exposed than households not in poverty.

giniCoefficient   This is a measure of spatial inequality that allows
                  comparison of the relative inequality of exposure among
                  states, based on each census tract's proportion of the
                  estimated toxic concentration, compared to the
                  cumulative estimated concentration in each state. A Gini
                  coefficient of zero expresses perfect equality within a
                  state, where all values are the same (for example, where
                  all census tracts have the same exposure). A Gini
                  coefficient of 1, conversely, expresses maximum
                  inequality among exposure values (where all exposure is
                  concentrated in one census tract).