Percent Population with Income below Twice Poverty Level

This EnviroAtlas community demographics map layer estimates the percent population in each US census block group with incomes less than two times the relative household poverty level for 2010.

Why are data on low-income populations important?

The health of community residents is partially determined by the environmental conditions in which they live. Low-income and minority populations in the U.S. are disproportionately exposed to environmental hazards; this fact is the basis for the environmental justice movement.[1] The environmental justice movement was prompted by the disproportionate distribution of toxic emissions and landfill waste in disadvantaged communities. Environmental inequalities can result in the inequitable distribution of both public assets and risks and in weakened individual and community resiliency.

Between 2007 and 2011, the number of low-income families increased from 28 to 32 percent of the US population.[2] Low-income populations are more likely to live in degraded or hazardous physical environments, exposed to toxic substances, including lead, asbestos, air pollutants, and industrial waste.[1] Low-income neighborhoods often occur near busy roadways and associated vehicular pollution.[3] Exposure to natural hazards such as flooding is also more common in low-income neighborhoods.

Low property values can reflect natural hazard risk and attract noxious land uses. Hazardous facility siting practices have targeted low-income and minority neighborhoods because of their limited ability to generate political or legal resistance.[1] The result is that many such neighborhoods are at risk from cumulative health impacts because of the occurrence of multiple hazards in close proximity.

Ecosystem services from green infrastructure can help to buffer populations from harmful pollution and natural hazards. Trees can filter airborne pollutants including particulates, carbon monoxide, sulfur dioxide, and ozone. Trees and other green spaces absorb stormwater and reduce summer temperatures that play a key role in ozone formation and heat illness. They also promote healthy child development and healthful behaviors throughout adulthood. Green infrastructure is a community asset that can be managed to reduce environmental and health inequities.

Low-income status and income inequality have been linked to health problems including asthma, low birth weight, obesity, high blood pressure, diabetes, arthritis, cancer, and heart disease. Low-income families generally have poor access to health care facilities and primary care physicians. Mortality rates are higher for low-income groups that do not receive adequate medical care or health screenings.[1]

Stress plays a key role in poor health. The psychological effects of income inequality can influence negative eating behaviors as stress responses—excess caloric intake and unhealthy food choices.[4] High obesity rates in low-income populations are due in part also to a lack of public parks and physical activity facilities, inability to pay for physical activity fees, transportation problems, and neighborhood safety concerns.[4,5] Regular exercise is known to reduce stress, obesity, and the risk of many diseases. Where feasible, simply walking is a healthful means to accomplish routine daily errands. Social interaction and contact with nature have also been shown to significantly reduce stress. The availability of parks, street trees, and open space in lower income neighborhoods can promote several types of healthful behaviors, helping to reduce health disparities among income groups.[5]

Environmental justice and environmental movement activists have addressed issues in transportation, pollution reduction, public health, housing, community gardens, and access to healthier food in low-income communities.[1] Equitable access to beneficial natural amenities can help to improve overall public health and well-being in these neighborhoods.

How can I use this information?

Income-related demographic information can be used in conjunction with other EnviroAtlas data to explore the density and distribution of low-income populations relative to the presence of risk factors and beneficial ecosystem services. Planners can consider additional greenspace or recreation facilities for areas with overlapping low-income status, health risk factors, and lack of green infrastructure. Income data can be overlaid with EnviroAtlas community demographics minority population data. Low-income population data can be combined with maps of pollution sources such as busy roadways and industrial facilities. Block groups may be ranked by the highest number of people who would be served by additional resources.

Other pertinent EnviroAtlas data layers relate to the health benefits gained from pollutants removed by tree cover, including data layers addressing negative health outcomes avoided (e.g., asthma exacerbation and acute respiratory symptoms) and the estimated monetary value of health and productivity losses avoided. In addition, users may examine populations within 300 meters of busy roadways and roadways with and without tree buffers.

How were the data for this map created?

The map was created by combining the US Census 2010 TIGER/Shapefile census block boundary data with select U.S. Census data. The block group population with income less than two times relative poverty level came from US Census Bureau American Community Survey (ACS) Table C17002: Ratio of Income to Poverty Level in the Past 12 Months. This number divided by total population of the block group gave the percent population.

The ACS relative poverty statistics vary from the Current Population Survey Annual Social and Economic Supplement (CPS ASEC), which is the official source of poverty statistics for the United States. The ACS poverty statistics are relative, meaning the sampling is ongoing throughout the year; as a result, the thresholds are constantly adjusted for the month in which the data are reported using the Consumer Price Index. This differs from the CPS ASEC surveys that are based on the previous calendar year. For the ACS, each person or family is placed in one of 48 possible poverty threshold classes depending on the size of the family and the ages of family members. The same thresholds are used across the U.S. and do not vary by regional cost of living. To determine whether someone is in poverty, the total family income is compared with the poverty threshold appropriate for that person's family size and composition.

What are the limitations of these data?

These data are presented at the census block-group scale. A block-group is a collection of census blocks, the smallest area mapped by the U.S. Census Bureau. It is important to remember that residents are not distributed evenly throughout the area of a block-group. The U.S. Census Bureau maintains a website on methodology and reliability of data.

How can I access these data?

EnviroAtlas data can be viewed in the interactive map, accessed through web services, or downloaded. Census and ACS Data may be viewed and downloaded from their respective websites.

Where can I get more information?

A selection of resources on environmental justice, income inequality, and public health is listed below. For additional information on the data creation process, access the metadata for the data layer from the drop down menu on the interactive map table of contents and click again on metadata at the bottom of the metadata summary page for more details. To ask specific questions about this data layer, please contact the EnviroAtlas Team.

Acknowledgments

Selected Publications

1. Brulle, R.J., and D.N. Pellow. 2006. Environmental justice: Human health and environmental inequalities. *Annual Review of Public Health* 27:103–124.

2. Population Reference Bureau. 2013. U.S. low-income working families increasing. Accessed June 2014.

3. Tian, N., J. Xue, and T.M. Barzyk. 2013. Evaluating socioeconomic and racial differences in traffic-related metrics in the United States using a GIS approach. *Journal of Exposure Science and Environmental Epidemiology* 23:215–222.

4. Pickett, K.E., S. Kelly, E. Brunner, T. Lobstein, and R.G. Wilkinson. 2005. Wider income gaps, wider waistbands? An ecological study of obesity and income inequality. *Journal of Epidemiology and Community Health* 59:670–674.

5. Powell, L.M., S. Slater, F.J. Chaloupka, and D. Harper. 2006. Availability of physical activity related facilities and neighborhood demographic and socioeconomic characteristics: A national study. *American Journal of Public Health* 96(9):1676–1680.