Tree Cover per Capita

This EnviroAtlas community map estimates the square meters of land per person covered by trees within each census block group. In EnviroAtlas, tree coverage takes many forms, including street trees, parks, urban forests, and single trees on various properties.

Why is tree cover important?

Tree cover provides many benefits, including air and water filtration, water and carbon storage, natural hazard mitigation, and appealing settings that encourage people to spend time outdoors. Trees can reduce noise, buffer pedestrians from traffic, and cool summer temperatures, making urban spaces more hospitable environments. Trees also provide vital habitat for a wide range of species. Humans gain many health benefits from the natural services that trees provide; examples from scientific studies include decreases in asthma, obesity, and cardiovascular symptoms.

Trees often increase the aesthetic value, comfort, and safety of populated areas. In urban centers, people frequent parks and tree-lined districts to socialize, recreate, and engage with nature. Areas with trees also provide opportunities to observe and appreciate wildlife. Spending time in these settings has been shown to decrease stress, depression, and feelings of hostility. Additionally, simply viewing trees through a window may increase cognitive function and overall satisfaction, and aid in physical healing.

Urban trees also filter and divert airflow, reducing concentrations of nitrogen oxides (NOx), particulate matter (PM), ozone, and other harmful air pollutants. The efficiency of trees to reduce ambient concentrations of air pollutants varies by species. Given the fact that air pollutants negatively affect health by exacerbating and even causing conditions such as asthma and bronchitis, their removal or dilution has the potential to decrease cases of respiratory illnesses. Though pollen from trees can potentially act as an allergen, it has been found that higher street tree density is associated with lower prevalence of childhood asthma.

Green spaces, especially those with trees, are generally cooler and more shaded than other areas in the same vicinity and thus can offer a reprieve from extreme summer temperatures. Trees help reduce day- and nighttime ambient temperatures through shading and evapotranspiration. During heat events, tree cover can significantly reduce local ambient air

temperatures, helping to reduce stress, hospital admissions, and mortality associated with extreme heat.

Tree cover further serves communities by filtering and absorbing water that flows off of impervious surfaces like roads and parking lots. Natural vegetation can increase downstream drinking water quality by filtering out high percentages of contaminants such as nitrogen, phosphorus, sediment, and certain pesticides. In addition, tree cover helps to regulate the flow of water through a watershed by intercepting, absorbing, and slowly releasing water. This "sponge" effect can reduce adverse impacts of stormwater runoff such as stream bank erosion, sediment transport, and the frequency and severity of floods and drought. The lack of significant tree cover and other vegetation in and around populated areas can result in more frequent and/or severe flooding, potentially resulting in adverse risks associated with these events.

How can I use this information?

The map, Tree Cover per Capita, provides a baseline for the percent of tree cover per capita in any given block group in the greater community. The map can be used to select neighborhoods and areas for restoration and reforestation projects. Used in conjunction with demographic data available in EnviroAtlas, this map can highlight which populations are likely receiving the benefits of tree cover and which populations may be more vulnerable to the potential risks associated with minimal tree cover. Urban planners may also determine current and potential future benefits at risk from changes to tree cover in developing areas.

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How were the data for this map created?

This map is based on land cover data derived for each EnviroAtlas community. The land cover data was created from one-meter aerial photography through remote-sensing methods. Land cover that is considered to be green space includes all land that is vegetated; it excludes barren land, water, and impervious surfaces. This calculation was summarized by 2010 U.S. Census block group boundaries.

What are the limitations of these data?

All of the EnviroAtlas community maps that are based on land cover use remotely-sensed data. Remotely-sensed data in EnviroAtlas have been derived from imagery and have not been verified. These data are estimates and are inherently imperfect. The land cover maps used in the community component of EnviroAtlas typically have an overall accuracy of between 80 and 90 percent. This level of accuracy means that there is a probability of at least 80 percent that the land cover reported at any given point on the map is correct.

The land cover maps will be updated over time; updates may have improved accuracy as data and classification methods improve. Block-group population data for per capita estimates derive from the 2010 U.S. Census of the Population. This map is not meant to be used for inferring numbers or types of residents that are at risk for developing specific health conditions.

How can I access these data?

EnviroAtlas data can be viewed in the interactive map, accessed through web services, or downloaded. To find the EnviroAtlas 1-meter land cover grids created for each community, enter *land cover community* in the interactive map search box.

Where can I get more information?

There are numerous resources on the relationships between trees and forests, ecosystem services, and human health and well-being; a selection of these resources is listed below. In-depth information on the relationships between forests and human health and well-being can be found in EPA's Eco-Health Relationship Browser. For additional information on the data creation process, access the metadata found in the layer list drop-down menu for map layers in the EnviroAtlas interactive map. To ask specific questions about these data, please contact the EnviroAtlas Team.

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