Total Population in 0.2% Annual Chance Flood Hazard Area

This EnviroAtlas community map estimates the total residential population in each census block group living in the 0.2% annual chance of flood hazard area for 2017.

Why is the total residential population in floodplains important?

Flood hazards pose one of the greatest threats to human communities among all the natural disasters in the world. In the United States, flooding is a predominant cause of death associated with natural hazards.[1] The most common source of flooding is heavy rainfall from hurricanes, tornados, monsoons, and cyclones. Other natural causes include earthquakes, volcanos, tsunamis, and snowmelt. Flooding occurs when river or stream flow exceeds the channel's volume. Floodplains are the land areas adjacent to rivers and streams where the overflow is displaced during flooding. Urban areas are at particular risk for flood hazards because of high densities of both population and impervious surfaces. Pavement and rooftops increase stormwater runoff, which causes a surge in river and stream flow and leads potentially to overflow.[2]

Flood hazards result in numerous adverse environmental, economic, and social impacts, including ecosystem degradation, property damage, and disease. Floodwater is often contaminated by sewage, chemicals, or other harmful substances; these can be transported into streets and buildings, as well as onto farmland and drinking water source areas.[3] Underwater and flood-swept objects create physical hazards. Cattle killed by floods can exacerbate the hazards of flood water, while also affecting food safety and food production.

Floods can cause substantial damage to built infrastructure such as powerlines, roads and bridges. Repair costs are typically considerable.[4] Furthermore, floods often result in significant mortality and morbidity including injury, skin rashes, acute asthma, respiratory infections, and water- and vector-borne disease. Potential long-term health effects include post-traumatic stress disorder and mental illness.[5] These adverse psychological health effects are often more serious than physical illness or injury from flood hazards.

How can I use this information?

The map, Residential Population in 0.2% Annual Chance Flood Hazard Area, can be used by citizens, planners, and public health professionals to identify locations where the most residents and homes are likely to be affected by flood hazards. Assessed in conjunction with other EnviroAtlas community maps, such as Impervious Surface in Floodplains and Estimated Vegetated Cover in 50m Stream and Lake Buffers, managers can prioritize flood mitigation efforts such as reducing impervious surface and enhancing green infrastructure. Use of these maps can support more efficient allocation of resources, including prioritizing evacuation and clean-up efforts.


Photo source: FEMA

How were the data for this map created?

The data for this map are based on the National Flood Hazard Layer (NFHL), and downscaled (dasymetric) 2010 population estimates_for the nation. The NFHL was created by the Federal Emergency Management Agency (FEMA). The dasymetric population data were downscaled from the census block to 30m resolution by the EnviroAtlas project. Population estimates derive from a probability ruleset that includes land cover and other environmental variables such as slope.

To calculate Residential Population in Floodplains, 0.2% annual chance flood hazard areas were extracted for each EnviroAtlas community. Next, residential population in 0.2% annual chance flood hazard areas was calculated using the ArcGIS Zonal Statistics as Table function to summarize the total estimated residential population in flood hazard areas for each census block group.

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What are the limitations of these data?

EnviroAtlas uses the best data available; however, some limitations do apply. These data rely on the accuracy of FEMA's National Flood Hazard Layer and the EnviroAtlas dasymetric population map layer. Residential population estimates account for largely unpopulated areas such as public land, steep slopes, agricultural land, wetlands, and water, but may assign population incorrectly to private parcels of undeveloped land.

How can I access these data?

EnviroAtlas data can be viewed in the interactive map, accessed through web services, or downloaded. The dasymetric map layer may be found in the interactive map under People and Built Spaces – National Demographics. To find the 1-meter land cover grids created for each EnviroAtlas community, enter *land cover community* in the interactive map search box.

Where can I get more information?

There are numerous resources for additional information on flood hazards; a selection of these is provided below. To learn more about the definitions of flood zones and how they are mapped, visit the Federal Emergency Management Agency (FEMA) website. For more information on how flood hazards and their reduction may affect human health, visit the Water Hazard Mitigation section of the 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.

Acknowledgments

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Selected Publications

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