



Background

- The percent of urban/suburban land provides a coarse view of the intensity of development, which affects:¹
 - Quality of life for residents and workers; and
 - Health of ecosystems within urban/suburban areas.
- Urban and suburban areas are classified as having greater than 30% impervious surface cover. High impervious cover can contribute to:¹
 - Increased stormwater runoff leading to higher peak flows, reduced groundwater recharge, and changes in stream habitat; and
 - Reductions in the amount of natural lands that provide ecosystem services.
- Indicator values were projected into future epochs using EPA's Integrated Climate and Land Use Scenarios (ICLUS).²
- Higher values suggest higher vulnerability relative to other watersheds.

THIS INDICATOR MEASURES THE LAND AREA THAT IS URBAN OR SUBURBAN AS A PERCENTAGE OF TOTAL LAND AREA.

Data Sources

Data Source	Description	Spatial Resolution	Temporal Resolution
EPA - ICLUS Version 1.3.2, 2013	Percent impervious surface cover	1 km x 1 km	2000-2100; data available at 5-year intervals

This Indicator Was Used to Assess the Vulnerability of One of USACE's Eight Business Lines

Business Line	Importance Weight (Varies from 1 to 2 for USACE)
Navigation	1

Calculation

- In a geographic information system, tabulate the total number of pixels within each 4-digit hydrologic unit code (HUC-4) watershed to determine the total land area in the HUC-4 watershed.
 - Area within the Great Lakes was removed prior to tabulation.
- Tabulate the total number of pixels with greater than 30% impervious surface cover within each HUC-4 watershed to determine the amount of urban/suburban area in the HUC-4 watershed. Indicator calculations use ICLUS projections from 2010 (Base epoch), 2050 (Future 1 epoch) and 2090 (Future 2 epoch).
- Divide the total urban/suburban area by the total land area to determine the percentage of urban/suburban area within each HUC-4 watershed.

¹ The H. John Heinz III Center for Science, Economics, and the Environment. 2008. *The State of the Nation's Ecosystems: Measuring the Lands, Waters, and Living Resources of the United States*. Washington, D.C.: Island Press.
² This indicator uses population projections generated by ICLUS, which models population distributions using demographic and land cover data.



LOW

LOW INDICATOR VALUE
 A forested landscape in Alaska contains limited impervious cover. This landscape would receive an indicator value of 0.

HIGH INDICATOR VALUE
 Highly developed urban landscapes contain greater proportions of impervious surface cover. This landscape would receive an indicator value of 99.



HIGH

New York, NY - Courtesy of FEMA

Tok, AK - Courtesy of NASA