



## Cities occupy 0.5 per cent of the world's total land

**A new global map of urban areas<sup>1</sup> is available for use which shows that cities occupy less than 0.5 per cent of the world's total land area.**

**Growing populations** and increased rural-to-urban migration in developing countries mean that over 50 per cent of the global population now live in urban areas. Locally, cities have a considerable impact on the environment: they create microclimates (such as the urban heat island effect), pollute water and air, destruct natural habitats with a consequent loss of biodiversity and degrade soil. These influences can extend to regional and possibly global scales, for example, through the transport of air pollutants in the atmosphere.

There is therefore a need for accurate maps on a global scale to monitor the extent, location and size of the urban environment to help policy makers and researchers understand the collective impact of urban development and anticipate future growth.

For this map, the researchers defined urban areas as places dominated by the built environment: this includes all man-made constructions, such as roads, buildings and runways, covering more than 50 per cent of the landscape mapping unit. Patches of vegetation, such as parks, stretching over 50 per cent of the mapping unit are excluded. The urban area mapping unit is defined as continuous patches of built-up land covering more than 1 km<sup>2</sup>.

The researchers used data covering one year (2001-2002) from the MODIS satellite to map large areas of urban land cover. This map incorporates improvements to an earlier version of the map, including a four-fold increase in spatial detail. The detail is much greater, such as at the edges of cities and within the make-up of the urban area.

The new map reveals that previous global urban maps may have over-estimated the extent of built-up areas. This map estimates the total urban land footprint as less than 0.5 per cent of the world's total land area. There are variations between continents: urban land areas in Africa cover 0.17 per cent of the continent, 0.67 per cent in North America, 0.47 per cent in South America and per cent Asia 0.53. Urban land extent in Europe is higher than the average at 1.78 per cent, reflecting the extent of the built environment.

The accuracy of the map was assessed by comparing the global map with very detailed local maps of urban areas compiled from high resolution independent data for 140 randomly chosen cities. Compared with the other global mapping systems, this map has the highest overall accuracy of 93 per cent.

1. See: <http://sage.wisc.edu/urbanenvironment.html> MODIS Collection 5 map of urban extent

**Source:** Schneider, A., Friedl, M.A. and Potere, D. (2009). A new map of global urban extent from MODIS satellite data. *Environmental Research Letters*. 4: 044003 (11pp). This study is free to download from: <http://www.iop.org/EJ/abstract/1748-9326/4/4/044003>

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