Impervious Cover

Park analysis of increasing urban development

What and why

Increased urbanization replaces forest cover and increases impervious surfaces, such as pavement and rooftops, preventing water from soaking into the ground. Impervious cover change provides an indicator of ecosystem condition that includes impacts on the physical environment, both terrestrial (forests, agriculture) and aquatic (streams, rivers, lakes). Future predictions of urbanization and impervious cover are useful for assessing these changes, under different scenarios, and the associated impacts on park resources.

How it works

We calibrated an urban growth model using estimates of past change in impervious cover mapped by satellites, reflecting residential and commercial development (broadly "urbanization"), and then predict change into the future. Different scenarios describing current trends, conservation oriented development, and accelerated growth inform the model and provide insights into how impervious cover may change by 2030 across four counties in the Delaware River basin: Delaware, Pike, Sullivan and Wayne.

Results

Predicted impervious cover change in the region varies substantially depending upon the type of future scenario that occurs. The conservation oriented growth scenario results in substantially less impervious cover than the high growth scenario. Predicted growth for all scenarios tends to radiate from existing urban centers, with the highest growth taking place in Pike County and the southern regions of Wayne and Sullivan counties.

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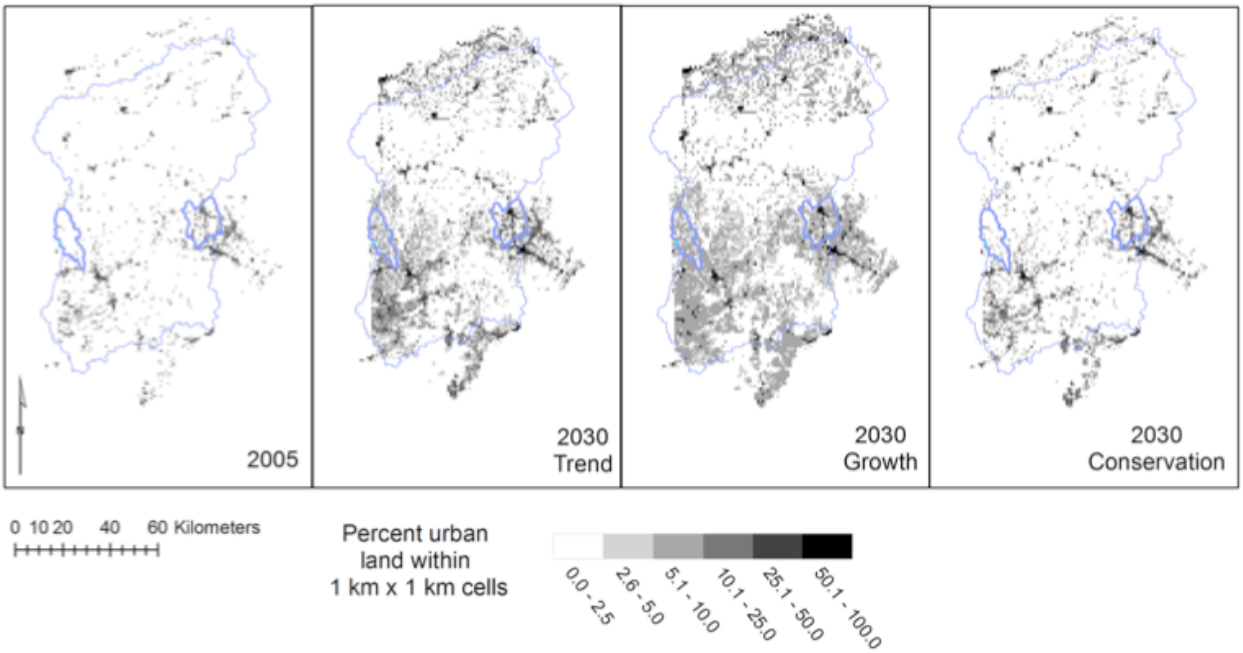
http://science.nature.nps.gov/im/monitor/lulc/palms/index.cfm



Change in impervious cover from year 2005 (left), as mapped with satellite imagery, to year 2030 under a current trends scenario (2nd frame), an accelerated growth scenario (3rd frame) and a conservation scenario (right frame). The Upper Delaware watershed and two smaller catchments (Mongaup and Prompton) are outlined in blue.