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Crowd-sourcing the global human footprint on hydrology with OpenStreetMap data

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One of the most visible consequences of human influence on our planet is the amount of paved area that has been created on the surface. It can be regarded as an important environmental indicator. Global maps of constructed impervious area have been made using OpenStreetMap (OSM). The algorithm used to make the maps takes roads and urban landuse polygons from OSM to estimate fraction impervious area in each 1x1 km grid cell. Although the quality of OSM coverage varies widely per region, the resulting maps compare rather well to existing (satellite based) estimates of urban and impervious areas. It is shown that in areas with good OSM coverage the estimates may be better than those obtained from satellite measurements. By taking into account roads in rural and suburban areas – often not done in satellite based estimates – the OSM based map is potentially better in for example hydrological applications that rely on impervious area fraction to simulate runoff behaviour. Currently, maps have been made from four time periods (December 2011, December 2012, December 2013 and December 2014). Updated maps will be produced at 3 monthly intervals.