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Publication date:
2014

Document Version
Peer reviewed version

Title (150 characters)

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Abstract (300words)

In recent years it has been widely demonstrated that cities globally have become increasingly exposed to the impacts of pluvial flooding (Field et al., 2012). There is evidence that the observed change in risk may have been caused by a combination of large increases in the extent of urban cover, which is primarily driven by general population growth and 20th and 21th century urbanization trends, and climate change (Field et al., 2012) (Angel et al., 2011). Urban environments are dominated by impervious surfaces (IS), which are sealed areas through which water cannot penetrate, as road infrastructure, buildings and other paved areas occupy a large share of the urban land area (Weng, 2012). Changes in the quantity and location of IS have important implications for the hydrological response of a catchment. Water moves faster over sealed surfaces, than over natural surfaces, and replacing natural land cover with artificial surfaces subsequently increases run-off volumes, peak flows and flood frequency. In addition the location of IS is important for estimating run-off volumes during high intensity rainfall events, and is an important input in urban flood models (Butler, 2011) (Parkinson and Mark, 2005). This research investigates the accuracy of Landsat 8 maximum value composite (MVC) NDVI in quantifying sub-pixel impervious surface fractions for eight cities in Europe. The objectives are: (i) to show that NDVI is an equally accurate measure of small scale impervious surface fractions for cities with very different climatic and vegetative conditions across Europe, and (ii) to explore the potential for using Landsat based estimates of IS and changes herein in pluvial flood modelling. This will enable accurate and systematic quantification of the influence of the past 30-40 years of urban development on the changes in risk towards the occurrence and impacts of high-intensity rainfall events.

Keywords (max 5)

Remote sensing, Impervious surfaces, pluvial flood modelling, urban land cover change, NDVI

Biography (max 200 words)

Per Skougaard Kaspersen is a PhD student employed at the Climate Change and Sustainable Development group (CCSD) at the Department of Management Engineering at the Technical University of Denmark (DTU). His PhD is titled "The influence of urban development on the risk of cities towards the impacts of climate extremes". The overall aim of the PhD is to develop a remote sensing based methodology which enables the quantification of the influence of recent urban development on the occurrence and impacts of high-intensity rainfall events. Per completed his

master degree in Geography and Geoinformatics from the University of Copenhagen in October 2010 with the thesis "Climate variability and land degradation in the Sahel as monitored from earth observation data". During his time as a research assistant and now a PhD student at DTU, Per has been working with impact assessments of extreme climate events, and in particularly high-intensity rainfall events.