

# MAPPING OF IMPERVIOUS SURFACES GREEN VEGETATION FRACTION IN THE CITY OF COLOGNE (GERMANY) USING HIGH-RESOLUTION DATA

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## **ABSTRACT**

Impervious surfaces (IS) and green vegetation fraction (VF) are two important variables for urban planning. Both are related to surface biophysical processes (e. g. urban heat island) and the quality of life in urban environments.

The new generation of spatially very high resolution satellite sensors (e. g. RapidEye, or TerraSAR-X) show promising capabilities to extract these variables in relevant detail and hence to overcome some of the limitations using traditional approaches. Particularly, the spatial resolution of medium- to high- resolution data does not describe urban patterns adequately and is frequently mentioned as the central drawback in such approaches. Another notable problem in urban areas is due to the effect of shadowing, which is especially relevant in very high resolution imagery.

In this study, we evaluate the synergistic use of optical and SAR data from the German satellites RapidEye and TerraSAR-X for the retrieval of detailed information about IS and VF for the city of Cologne. Both pixel- and object-based classification approaches (Random Forests and SVM) are compared regarding their applicability. It will also be analyzed if an explicit shadow analysis leads to a significant improvement of the products.