



Using terrestrial investigations and remote sensing techniques for the estimation of the anthropogenic influence on water discharge in an urban catchment

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Scarcely anywhere else than in urbanised regions is the anthropogenic influence on hydrological processes higher. Percentage and spatial distribution and even there change over time are crucial values for the rainfall-runoff transformation process and discharge formation. Additional type and expansion of different urban surfaces affect in combination with the applied methods for rainwater treatment and sewer management the quality of urban drainage. For sustainable management plans as required by the European Water Framework Directive, not only intensified point measurements of water quality and discharge are indispensable but also spatial information on the distribution and the temporal change of impervious surfaces are needed.

In a close cooperation between the City of Trier and the Trier University the lower section of the Olewiger Bach was chosen as an experimental basin to investigate in the development of effective data gathering tools as key to prioritize further measures and to develop sustainable management plans. One main component of this intention is the development of methods for mapping and assessment of impervious surfaces by remote sensing techniques. First step was to quantify the increase of impervious surfaces for some of the urban catchments within the city of Trier. Because of the coarse resolution of available data, linear spectral unmixing has to be applied on the Landsat imagery of the years 1984 and 2000 to identify first trends within stratified districts. Results were assessed by employing visual interpretation of high-resolution airborne photographs. For the identification of different urban surface types multispectral data of different spatial resolutions was used. Parallel the mapping of the test site by airborne laser scanning (ALS) was initiated and will be performed in spring 2009.

Further investigations are focused on the evaluation of applied methods for the preparation of management plans and especial on the alignment with the parallel performed discharge measurements. Additional Landsat imagery from 1975 and Corona data from 1962 seem to provide an opportunity to extend the assembled trend in increasing of impervious surfaces.