



The key role of multispectral remote sensing data in nitrogen flux modeling of mesoscale catchments

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Areas with high nitrogen concentrations in the leachate are detected based on a coupled agro-economic/hydrologic model system using remote sensing data. LANDSAT ETM+ scenes of June 2001 have been preprocessed by a wavelet based panchromatic sharpening method, classified by an artificial neural net and postprocessed by a probabilistic filtering approach. Exemplified by the mesoscale catchment basin of the Rur river in North Rhine-Westfalia, Germany, a detailed 14.25m spatial resolution land cover thematic map has been produced.

The agricultural sector model RAUMIS provides nitrogen surpluses on the basis of administrative districts. The classified satellite images have been used in order to spatially disaggregate these data from an average district to a crop-specific level. In parallel, remote sensing data have been used for the hydrological model GROWA which calculates the water balance components. Crop identification as obtained from image classification is e.g. important to assess evapotranspiration. Similarly classification can be used to identify sealed surfaces. Additionally, the thematic map is made use of in the submodule DENUZ, which assesses the denitrification in the unsaturated soil zone.

In the presentation it is shown that the application of remote sensing data, as compared to the CORINE landcover used so far, helps to improve the model results.