SWISS MIRE MONITORING: COMBINING REMOTELY SENSED DATA AND DIGITAL SURFACE MODELS FOR FINE-SCALE MODELLING OF CHANGES IN MIRE ECOSYSTEMS

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The detection and evaluation of changes in vegetation community patterns is a prerequisite for monitoring programs. The Swiss mire monitoring program aims to assess the changes in mire vegetation in order to examine the efficiency of the management measures. A promising way to explore the vegetation structure and to give prominence to possible changes is the application of predictive vegetation mapping that combines image classification and predictive habitat distribution models. These models deal with predictor variables derived from remotely sensed spectral data and from environmental measured variables such as a digital surface model (DSM). The use of high resolution spectral and topographical data sets of 50 cm pixel size and below improves the simulation of fine-scale vegetation properties at the very local scale.

The spectral data for fine-scale modelling are based on CIR ortho-images with a ground resolution of 32 cm. Various spectral variables and spectral-textural variables are derived for the modelling process. Mean indicator values for moisture, nutrients and light derived from vegetation data are used as response variables.

Change detection may be affected by bias resulting from different measurement accuracies at different observation dates, e.g. differences in aerial photos due to different atmospheric conditions. Methods, examples and results of estimating and eliminating such bias are presented.