



Classifying Google Earth images as training sites for application to a larger scale monitoring of bush encroachment in South Africa

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Bush encroachment of rangelands in South Africa is a common form of land degradation with negative economic consequences. A monitoring of bush encroachment is needed for several reasons: on the one hand, it allows farmers to identify locations with upcoming bushes which gives them a tool for management (e.g. poisoning of bushes) and would further allow them to assess the current carrying capacity of their land. On the other hand, it serves scientists as a baseline to reveal the still unknown causes of bush encroachment.

This study aimed at providing training sites applicable for a satellite-based monitoring of woody vegetation in South Africa on the scale of medium spatial resolution satellite sensors (e.g. MODIS or Landsat). Since field surveys are time consuming and only of limited spatial extent, a satellite based creation of training sites on the basis of Google Earth images was intended.

In view to an automatic classification of the Google Earth RGB images, training pixels for woody vegetation and non woody land cover were manually digitized from 50 example images. A Random Forests model was then trained to delineate woody from non woody pixels. With an area under the ROC-curve of 0.97, the model was highly able to classify the images. The model was applied to classify further 500 Google Earth images with a spatial extent of 250x250m. The classified images form the database of training sites which can be used for a MODIS based monitoring of woody vegetation in upcoming studies.