



Machine learning and multi-sensor based modelling of woody vegetation in the Molopo Area, South Africa

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Bush encroachment is a highly relevant environmental issue in South African savannas, influencing ecological processes as well as the grazing capacity of the land. The drivers of bush encroachment are not yet fully revealed which can partly be attributed to the problem that large-scale data of woody vegetation cover are missing. The poster presents a multi-scale and a multi-sensor approach aimed to provide the status of woody vegetation cover for the Molopo Area in South Africa.

Training data for woody vegetation was derived from unsupervised classification of high-resolution aerial image tiles. Sentinel-1 and Sentinel-2 data from multiple seasons served as potential predictors in a machine learning based modelling approach. A Random Forest algorithm with a forward feature variable selection was trained to relate the spectral and radar information to fractional woody cover. The model was applied to make spatial predictions of fractional woody cover at 10 m resolution for the entire Molopo Area for the year 2016. Spatial cross-validation revealed a prediction error in fractional cover of 12%. The derived model and cover data show the potential for upcoming time series analysis of Sentinel-based woody cover estimates which can serve as a basis to bring new insights into the drivers of bush encroachment.