

## **On the broad scale relationship between climate and land cover in a savanna ecosystem**

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Measuring and monitoring land cover change across differing management areas and land use types, has most frequently been addressed at very local scales through the use of field survey techniques and analyses of discrete date satellite imagery. Field surveys are cost prohibitive and inadequate for monitoring changes across expansive landscapes, while analyses which rely on only a few temporal snapshots of the landscape are limited in their ability to generate a historical context of change within a region. We use a novel, regional-scale approach to examine time-series based analysis of vegetation trends (1982-2009) in response to shifts in climate. The multi-national study region is located within KAZA, and is delineated by the Okavango, Kwando, and Zambezi watersheds. A continuous vegetation index(NDVI) is employed to provide an estimation of the amount of variation and the spatial heterogeneity in vegetation across the study area. Using a mean-variance time-series analysis we quantify vegetation dynamics and characterize land cover response to climate. In addition, a spatially explicit analysis of persistence of trends over the region is also undertaken. The combination of both time-series and spatial persistence, allows for extraction of information for the entire region, but also by country, management type and protected areas. Significant patterns of change across time are discovered, with significant differences regionally, as a function of land use/cover and management. This large scale regional analysis is linked to field based surveys, interviews and management strategies providing a powerful tool for understanding regional scale dynamics.