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Title:

Application of Remote Sensing Tools to Identify Forest Composition and Seasonal Dynamics in NW Mato Grosso

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Abstract:

Positioned at the transition zone between the *cerrado* and upland *terra firme* forest, Northwest Mato Grosso contains a diverse mosaic of natural vegetation communities. At our study site in the Rohden Forest near the town of Juruena, *cerrado*, palm, and typic *terra firme* eco-types occur over short distances, although the latter type predominates. Floristic heterogeneity can have substantial consequences for ecosystem processes such as net primary productivity (*NPP*) and standing biomass accumulation. Documenting the extent of areas dominated by each community should improve estimates of the regional carbon balance and also the post-logging recovery potential of specific land units. Initial analysis of floristic composition patterns suggests that vegetation type distribution in the study area is not random. Field surveys indicate that differences in soil water status are a central factor for shaping vegetation composition and that edaphic hydrology is governed jointly by intrinsic soil characteristics and landscape placement. In this study, we combine a digital elevation model (*ASTER-derived*) with remotely sensed vegetation indices (*MODIS 250m Enhanced Vegetation Index*) to investigate hydrologic controls on seasonal productivity dynamics and the occurrence of specific floristic communities in the landscape. Results reveal significant seasonal changes in EVI (*~0.65 summer to 0.45 winter, mean forest values*). Time-series EVI analysis was able to distinguish large areas of *cerrado* vegetation by segregating areas that evidence distinct patterns of decline with the onset of the dry season. Identification of minor areas of *cerrado* and palm vegetation within the *terra firme* matrix was enhanced by the application of finer-resolution *LANDSAT TM+* (30 m) imagery.

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