

**Remote sensing techniques applied to the discrimination of pasture degradation levels in watersheds in the municipality of Guararapes, Brazil**

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In the last decades the global scientific community has emphasized in the media the importance of conservation and sustainable use of natural resources. The scenarios of global climate change and its effects on the environment, for example, have been a constant concern for humanity. In this context, the sustainable use of pasture areas is of a great importance, given that a large proportion of cultivated pastures in Brazil present some level of degradation. Remote sensing, due to its low cost, repeatability and compatible scale, can greatly contribute to subsidizing policies for the recovery of degraded pastures. Information from remote sensors are being used in many researches focused on the identification, quantification and spatial and temporal monitoring of vegetation cover, for example for the quantification of deforestation and the identification and monitoring of pasture productivity. Thus, remote sensing data can contribute to the discrimination of different levels of pasture degradation by analyzing the spectral behavior of targets of interest. In this context, this study aimed to conduct a preliminary classification of degraded pasture levels in three watersheds located in the municipality of Guararapes, São Paulo State, Brazil. A Landsat 5 - TM image of the study area acquired on 2/2/2010 was used. Four levels of pasture degradation were stipulated by analyzing the pasture vegetation cover (PVC), which was based on the relationship between the NDVI of the pasture and the maximum and minimum NDVIs found in the study area. In addition, pasture degradation indices (PDI) were obtained for each watershed. The results based on the PVC indicate that 26% of the pastures in the study area (11.88 km<sup>2</sup>) are degraded; 21%, 4% and 1% of the pastures are slightly, moderately and strongly degraded, respectively. By comparing the map of pasture degradation levels with in situ data, it is observed that areas classified as severely degraded pastures correspond to areas of bare soil. Overall the results of this study are consistent with the ground truth. However, some areas identified in the field as moderately degraded pastures were mistakenly classified as slightly degraded pastures. This confusion is due the fact that a pasture infested with weeds, which is one of the factors taken into account for classifying pasture degradation levels, may have high vegetation cover. In this case, the PVC seems appropriate to analyze the pasture quantitatively, but is limited for qualitative analysis. Nevertheless, the methodology proposed in this study proved effective in identifying the most critical areas of pasture degradation, which must be recovered more urgently. Based on the PDI, the pastures in the analyzed watersheds were classified as slightly degraded. However, further studies are needed to obtain a temporal series of PDI, and thus detect possible positive or negative trends in the process of pasture degradation.