Master en Sciences de l'Environnement (MUSE)

Remote Sensing of Vegetation in conservation, a Case Study from the Dry and Transitional Forests of Andrafiamena, Northern Madagascar

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Abstract

Environmental organizations in developing countries need rapid techniques to accurately assess the type and quality of vegetation in areas of tropical forest they operate in. Detailed, explicit, land-cover maps are crucial for making informed decisions on land management and conservation. Such tools are especially suited for participative processes.

In this study, a cheap, rapid method of vegetation assessment is proposed. Its implementation is illustrated in the case of the primary and secondary forests within the protected area Andrafiamena-Andavakoera, northern Madagascar.
An object-oriented classification is applied to a high resolution satellite image, resulting in 11 land-cover classes, corresponding to different vegetation types. Brightness of the image, geology, elevation, and proximity to rivers are the principal variables used to define the classes.

Assessment of the forest structure and species composition by means of linear and surface relevés is carried out to show that primary and secondary forest, as well as other forest classes, differ in their species richness, composition, wood volume, stem density, and especially, forest canopy heterogeneity. It is demonstrated that a) canopy heterogeneity is higher in undisturbed forest and, b) increasing canopy heterogeneity is linearly correlated with decreasing satellite image brightness.

Data gathered from the linear relevés, together with 350 fertile specimens collected in the field, are used to compile a provisional floristic checklist and vegetation type characterization of the study area. The resulting floristic checklist and classification map are intended to help devise a sound environmental management plan for the protected area Andrafiamena-Andavakoera, one of only two forests where a highly endangered lemur species, *Propithecus perrieri*, occurs.
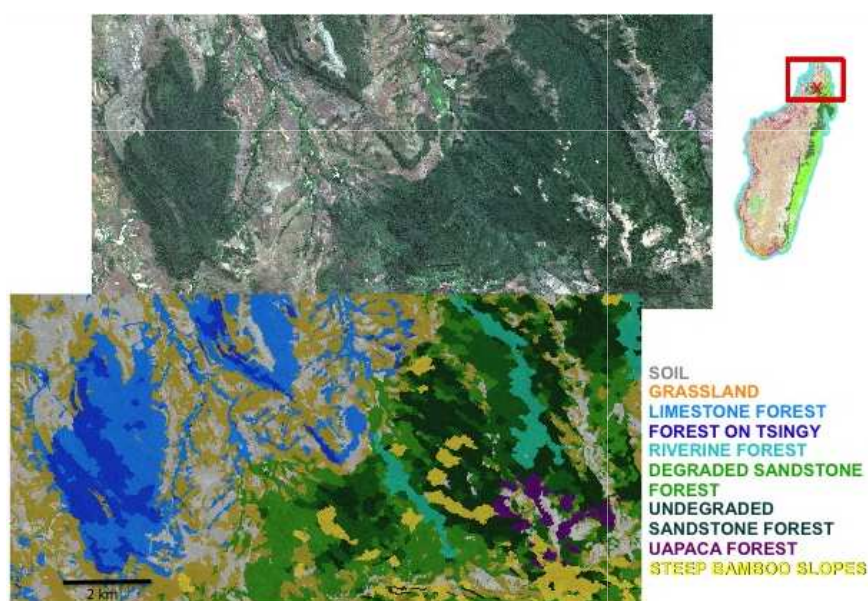
« Vegetation classification map of two forest blocks in Andrafiamena, Madagascar » Z. Burivalova

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