

Remote sensing of biodiversity: measuring ecological complexity from space

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Abstract

Remote sensing represents a powerful tool to derive quantitative and qualitative information about ecosystem biodiversity. Environmental heterogeneity is considered to be one of the main factors associated with biodiversity given that areas with highly heterogeneous environments can host more species due to their higher number of available niches.

In this view, species richness and turnover as fundamental indicators of biodiversity at different spatial scales can be predicted by the spectral variability of remote sensing signal over space.

The aim of this talk is to provide an overview of the state of the art in the use of spectral heterogeneity for estimating species diversity. I will examine a number of issues related to this theme, dealing with: i) the main sensors used for biodiversity monitoring, ii) scale matching problems between remotely sensed and field diversity data, iii) spectral heterogeneity measurement techniques, iv) types of species taxonomic diversity measures and how they influence the relationship between spectral and species diversity, v) modeling procedures for relating spectral and species diversity. I will demonstrate that remotely sensed spectral heterogeneity information provides a crucial baseline for rapid estimation or prediction of biodiversity attributes and hotspots in space and time.