Adding spatial attributes to landcover data – an ecological perspective.

Martin Wegmann*, Michael Schmidt#* & Stefan Dech#*

German Aerospace Center (DLR) – German Remote Sensing Data Center (DFD), Oberpfaffenhofen, 82234 Wessling, Germany
* University of Wuerzburg, Department of Geography, Remote Sensing Unit, Am Hubland, 97074 Wuerzburg, Germany

contact: Martin Wegmann martin.wegmann@uni-wuerzburg.de

keywords: landcover data, forest, West Africa, fragmentation, connectivity

Information on landcover and landcover change are the basis for many analyses of ecological, climatological or hydrological questions. Especially the loss of tropical forests is globally recognized to be an important issue. However, the spatial arrangement of the landcover has often been neglected although it is important for various ecological functions, e.g. for species migration. Landcover provides information on the spatial extent of (a certain) land cover class, however based on this data further differentiation between small or large, connected or isolated patches can be conducted. The change in the spatial arrangement of an ecosystem is subsumed under the word *fragmentation,* certain arrangements might be capable to compensate for habitat loss by sustaining landscape connectivity. Hence the question remains, if the analysis of the spatial arrangement of landcover classes can provide further ecologically relevant attributes for the remaining fragments.

In this study we used satellite derived landcover data of West African rainforest and subsequently applied existing indices as well as newly developed indices which describe the spatial patterns. To calculate indices for large satellite datasets we employed our software package *r.pi*, that consists of more than 20 modules providing different kinds for spatial pattern analyses. Our focus was on the incorporation of matrix attributes for the analysis of patch connectivity.

The results show that, using information of spatial patterns of a forest provides further relevant parameters for ecological research questions. The amount of forest cover does not render meaningful information on the importance for the landscape without the knowledge how this forest is spatially distributed. The incorporation of matrix attributes delivers important information on the isolation of individual forest patches. We conclude that spatial analysis on landcover data is needed when landcover data is assessed for ecological relevance.