

# SESSION 4

## S4: TROPICAL WETLAND ECOLOGY

Chairs: Pia Parolin & Leandro V. Ferreira  
 Contact: piaparolin@gmx.de

### SESSION 4-01 - TROPICAL WETLAND ECOLOGY

## LINKING LAND SURFACE PHENOLOGY AND VEGETATION-PLOT DATABASES TO PREDICT SPECIES DIVERSITY AND DISTRIBUTIONS IN THE OKAVANGO BASIN

Rasmus Revermann<sup>1</sup>, Manfred Finckh<sup>1</sup>, Marion Stellmes<sup>2</sup>, Vera de Cauwer<sup>3</sup>, David Frantz<sup>2</sup>, Ben Strohbach<sup>3</sup>, Jens Oldeland<sup>1</sup>

<sup>1</sup>University of Hamburg, Department Biodiversity, Ecology and Evolution of Plants, Hamburg, DE, rasmus.revermann@uni-hamburg.de

<sup>2</sup>University of Trier, Department of Remote Sensing, Trier, DE

<sup>3</sup>Polytechnic of Namibia, Department of Geospatial Sciences and Technology, Windhoek, NA

The Okavango Basin is a hot spot of accelerated land use change. However, baseline information on ecosystem properties such as species diversity and distribution is missing. In this contribution we used the Okavango Basin as a study area to show how information stored in vegetation-plot data bases can be linked to MODIS land surface phenology (LSP) metrics to extrapolate plot based ecological data to unsurveyed areas.

LSP metrics describe temporal changes of vegetation development, biomass and seasonal aspects. Vegetation types exhibit unique combination of LSP metrics hence making them suitable predictor variables for spatial modelling. We derived response variables on alpha diversity and species occurrences from the vegetation-plot database of The Future Okavango project ([www.future-okavango.org](http://www.future-okavango.org)). Using species distribution models and predictive modelling of species density we compared the predictive power of climatic predictors with LSP metrics.

Although climate based models showed better statistical performance, LSP only models delivered more realistic maps on species density. Maps of climate based models showed artefacts and predicted homogenous belts of species density. In contrast, LSP models provided realistic large scale trends and even revealed local patterns of the landscape mosaic. The Miombo woodlands of the upper reaches of the Okavango River harbour highest species density. Values decreased southwards with lowest values reached in the thornbush savannas surrounding the Okavango Delta. Furthermore, the information of modelled distributional ranges of all frequent woody species offers an important data source for further ecological analysis such as regionalization of tree communities and maps for forest management.

Our framework demonstrates the high potential of LSP metrics in conjunction with the information stored in vegetation-plot data bases to generate the much needed spatial information for conservation planning and natural resource management.

