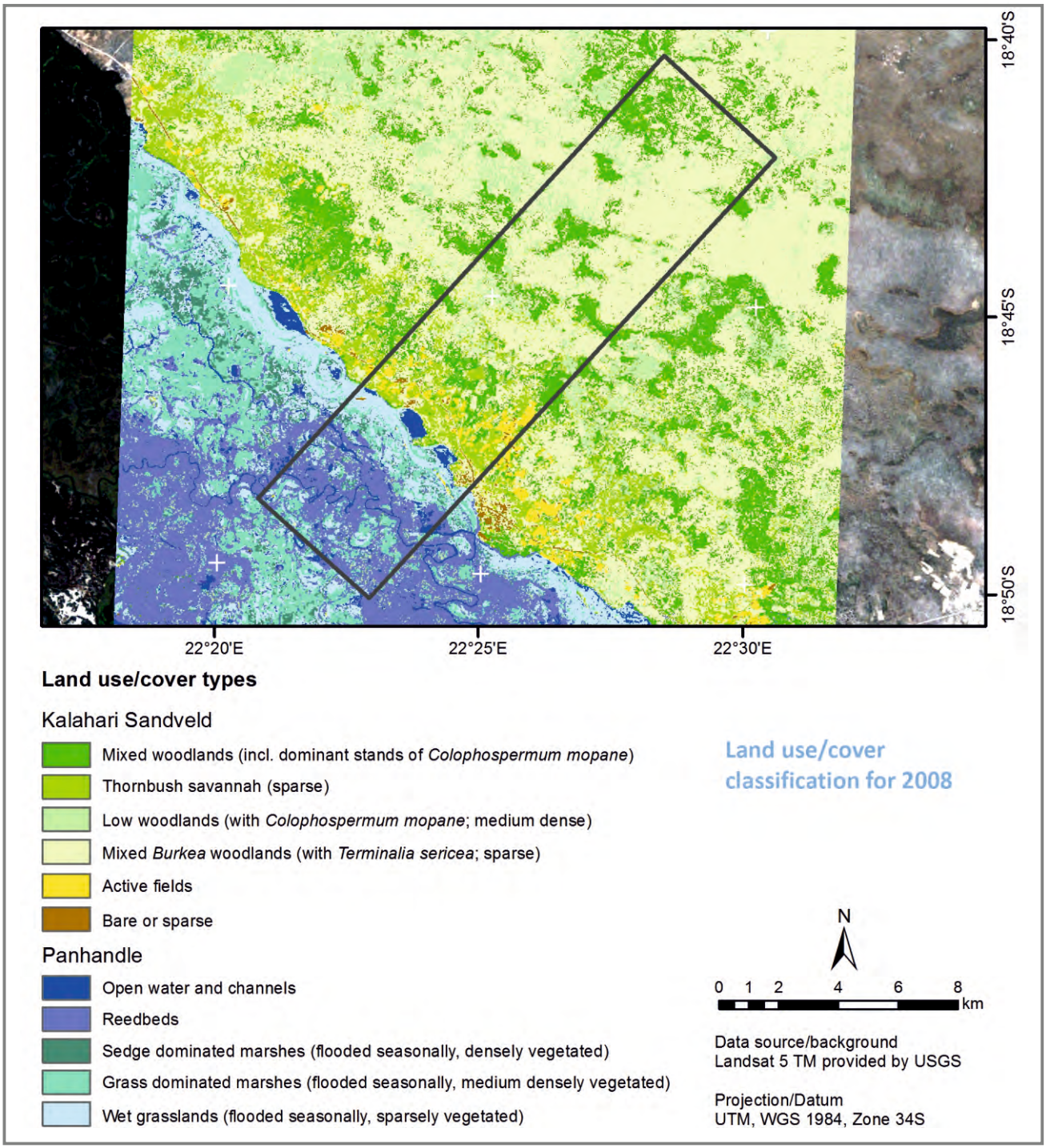

Fig. 1: Land use/cover classification based on Landsat 5 TM data for 2008.

The core site of Seronga is located at the bottom of the Okavango Panhandle and is characterized by two major landscapes: the non-inundated areas in the hinterland and the wetlands of the Panhandle. The distinct boundary between both areas can be clearly seen in the land cover map which is based on multi-seasonal images from March, April, May, and August 2008 (Fig. 1). The Panhandle is traversed by major permanent water courses; the inundation zone is covered by different vegetation communities, which are partly determined by the duration of flooding. The settlements and fields are located near to the Panhandle, with farming being mainly restricted to rainfed agriculture. The hinterland is covered by grasslands, shrublands and woodlands of different densities. Depending on the substrate, the dominant trees are Mopane or *Terminalia*. The woodlands are mainly used as grazing grounds for cattle.

In: Oldeland, J., Erb, C., Finckh, M. & Jürgens, N. (2013) [Eds.]: Environmental Assessments in the Okavango Region. – Biodiversity & Ecology **5**: 139–141. DOI: 10.7809/b-e.00268.

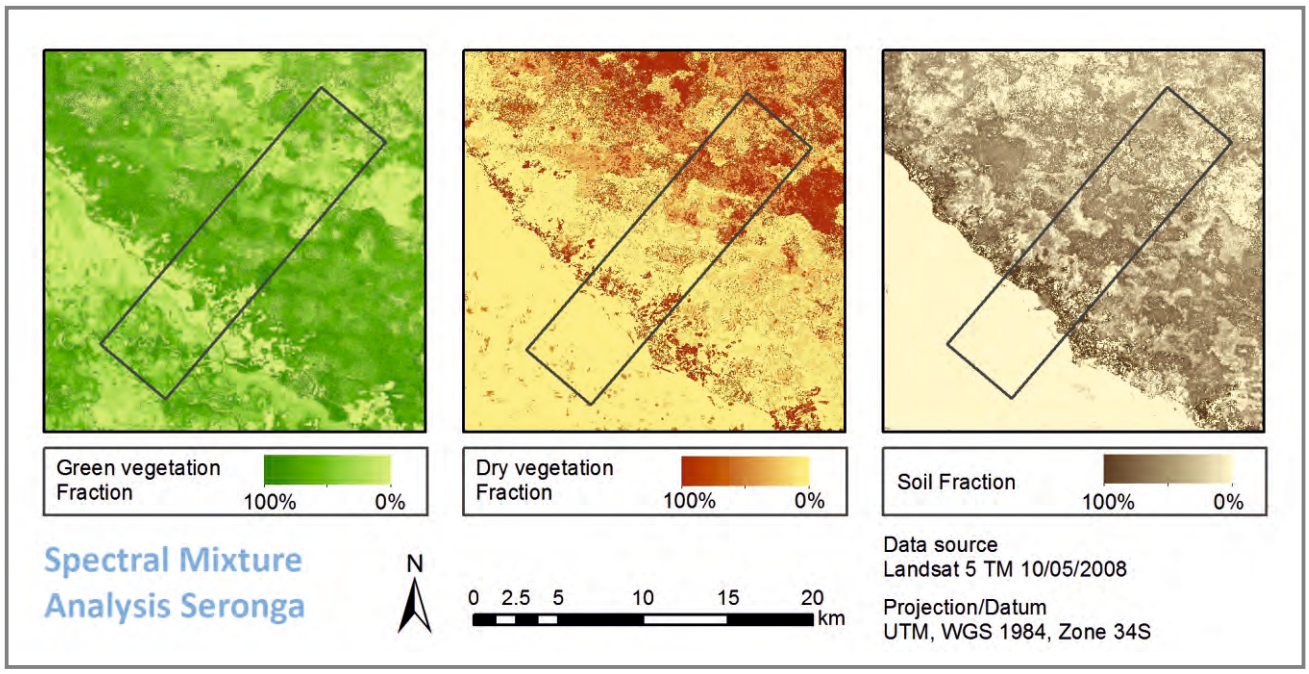

Fig. 2: Spectral unmixing result of Landsat 5 TM data (2008). Displayed are the fractions of the three endmembers "green vegetation" (left), "dry vegetation" (centre) and "soil" (right).

The resulting fractions of the spectral mixture analysis show that in May 2008 both agricultural fields and grass-dominated areas have higher fractions of dry vegetation cover. Meanwhile, parts of the Panhandle, especially woodlands, are characterized by high fractions of photosynthetically active green vegetation (Fig. 2). Some areas in the hinterland exhibit a substantial proportion of bare soil surface ("soil fraction"). In contrast, the Panhandle consistently has near-zero values of bare soil surface. This is due to the open water, which is not illustrated here but contributes substantially to the spectral signal of the floodplain.

The MODIS 16-day EVI time profiles illustrate the temporal behaviour of two examples of densely vegetated areas, one in a regularly inundated area in the floodplain and one in the dryland areas (Fig. 3). The annual cycle of the dense woodland in the dry areas is more distinct with lower minima and higher maxima than the densely vegetated areas in the floodplain. Another striking difference is the shift in the annual cycle with the start of season and the maximum EVI values occuring about two months earlier compared to the woodlands in the non-inundated areas. Many of these differences can be attributed to the different water availability in the two systems.

The derived phenology parameters also underpin the different system of the Panhandle compared to the surrounding areas (Fig. 4). As mentioned before, the phenology of the vegetation within the floodplain differs strongly from the solely rainfed areas, thus the "start of season" begins much earlier. The "base value" is very high in large parts of the floodplain, indicating a high standing biomass.

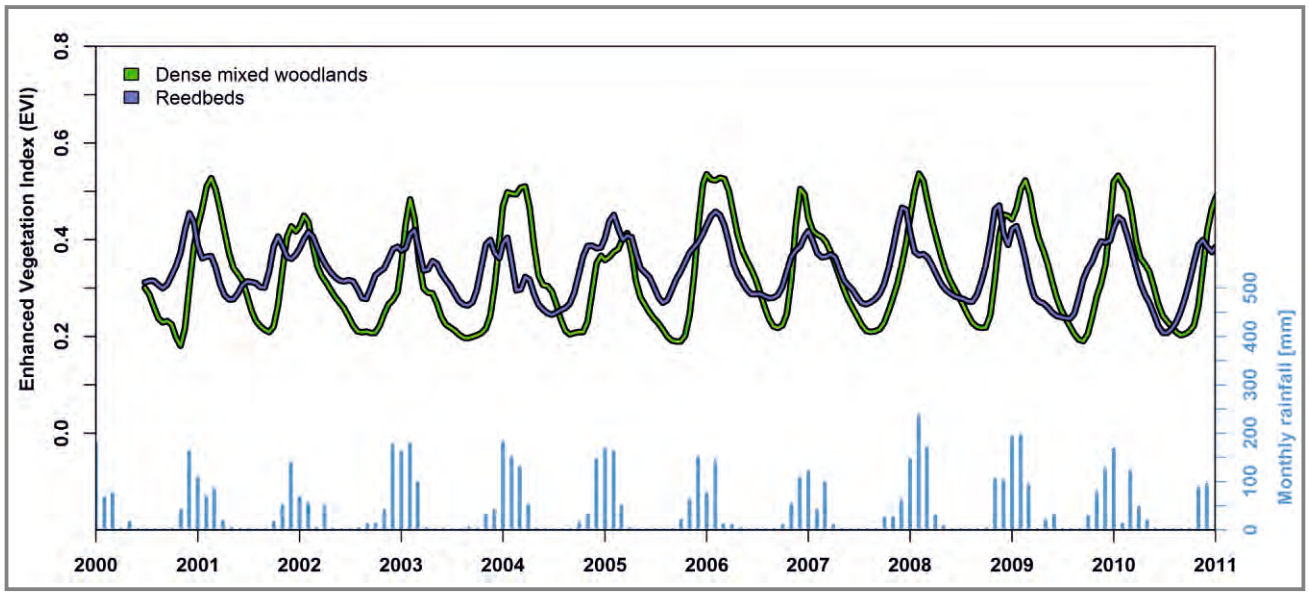

Fig. 3: MODIS EVI profiles for a dense mixed woodland and reed bed from 2000 to 2010. Also given is the monthly rainfall for this time period.

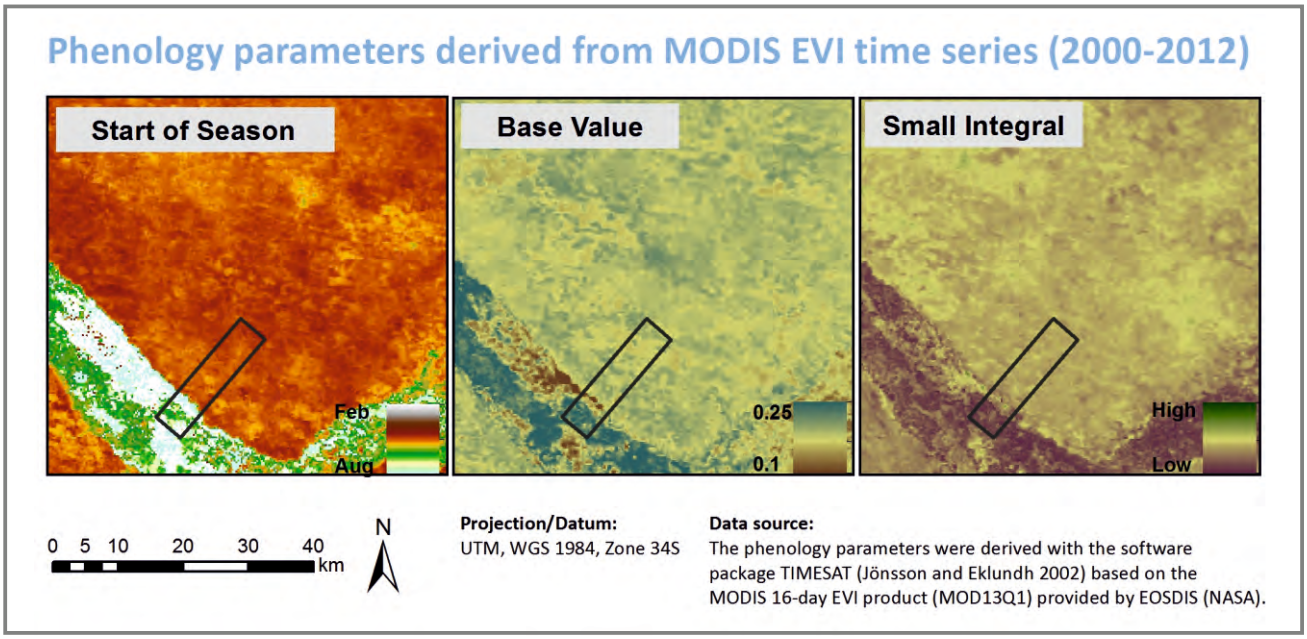

Fig. 4: Phenology parameters derived from MODIS EVI time series with the software package TIMESAT. Displayed are the "start of the season" (left), the "base EVI value" (centre) and the "small integral" (right).

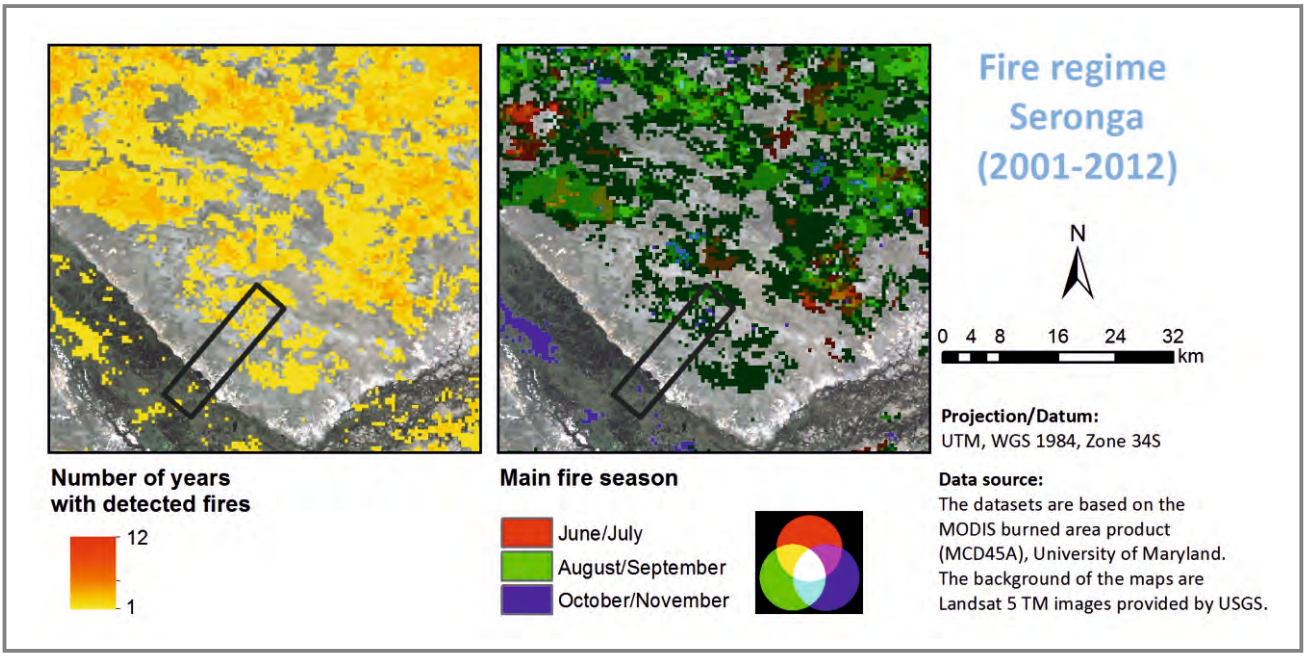

Fig. 5: Number of years with detected fires (left) and main fire season (right) derived from the MODIS burned area product within the observation period 2001 to 2012.

Areas that are flooded for long periods show very low base values due to the low EVI of open water surfaces. The dry land areas show medium base values, with differences depending on the vegetation community. Usually, woodland areas have a higher permanent green vegetation cover than grass-dominated areas. The "small integral", which is related to variable biomass, is quite low in the floodplain due to the low seasonality. Compared to the floodplain, the dryland areas have a higher "small integral", but its seasonality is not nearly as distinct as for the grasslands in the Cusseque region.

Fires occur in large parts of the hinterland (Fig. 5), mainly in areas that are distant from settlements and fields situated at the border of the floodplain. In comparison to the other core sites, the fire frequency is much lower. Nevertheless, major parts of the hinterland have been affected by fires within the last decade. Most fires occur in August and September.

Acknowledgements

This study was funded by the BMBF (The Future Okavango project). For details see authors' general acknowledgements in this volume.

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