

COMPARING INFORMATION DERIVED FROM GLOBAL LAND COVER DATASETS WITH LANDSAT IMAGERY FOR THE HUAMBO PROVINCE AND GUINEA-BISSAU

A. Cabral^{*a} M. Vasconcelos^a D. Oom^a

^a Tropical Research Institute, Geo DES, Travessa Conde da Ribeira, n° 9, 1300, Lisbon, Portugal

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ABSTRACT:

Land cover maps, derived from satellite data, are a valuable tool for various global research studies including ecosystem assessment, climate change and environmental modelling, and are often used in multi-temporal approaches to document the dynamics of processes such as agricultural expansion or deforestation. In this study we show how the observed land cover change tendencies diverge widely depending on the scale of observation and on the characteristics of the data sources used. For the analysis we compared land cover change trends using two different scale map time-series in the period 1990 - 2009. Two regions were selected, for which there are also high resolution aerial photography and/or ground data for verification and validation purposes: the entire country of Guinea-Bissau and the Huambo province in Angola. The first map time series consists of data available through international initiatives or institutions (IGBP, GLC2000, and MODIS) that was produced by classification of 1 Km resolution imagery corresponding to three dates in the study period. The second map-set results from classification and validation of 30 meter resolution images (Landsat TM and ETM+), covering the same area in approximately the same dates. For the comparisons, the different map legends were aggregated into a common nomenclature to define five different classes: Forests, Savannas/Shrublands, Grasslands, Croplands/Bare soil and Wetland. The results show large discrepancies in the observed trends in agricultural areas and in deforestation rates. For both regions, the verified significant increase in agricultural land during the analyzed period is not captured in the coarse resolution maps, which portray an opposite trend. Moreover, the deforestation rates calculated based on the coarse resolution maps are not confirmed when validated maps obtained with high resolution imagery, are used. The implications of these results are discussed and future work is proposed.

TOPIC: Land cover classification

ALTERNATIVE TOPIC: Land cover classification