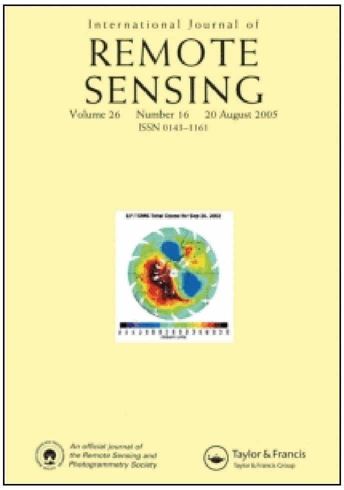

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NDVI seasonal amplitude and its variability

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NDVI (Normalized Difference Vegetation Index) is a remotely sensed index of vegetation greenness. Its yearly cycle gives information on vegetation type or health, and monitoring its temporal evolution allow identifying the long-term processes

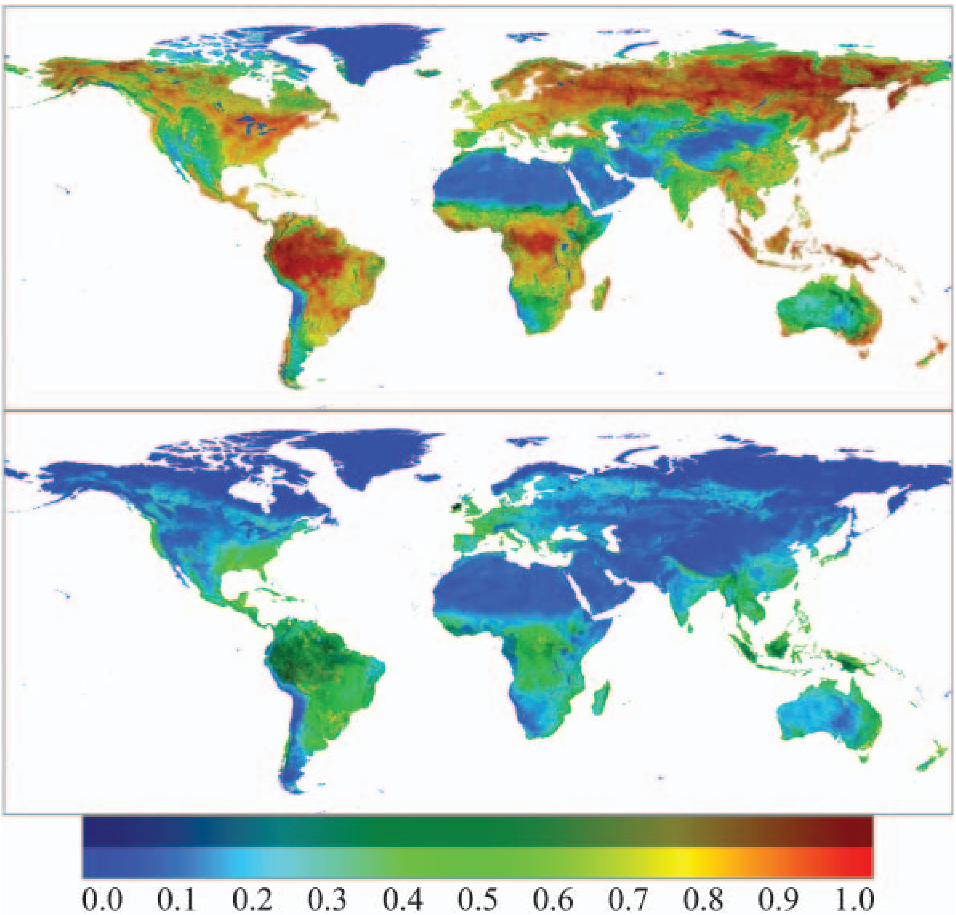

Figure 1. NDVI seasonal amplitude and its variability. Average maximum NDVI (upper image) and minimum NDVI (lower image) values over the 1982–2003 period are presented following the traditional rainbow color code, the intensity of the image being related to their variability (the darker the color, the more variable the NDVI value). Upper color bar corresponds to high interannual variability in NDVI extreme values, while lower refers to low interannual variability. These images are obtained from statistical analysis of GIMMS data after cloud filtering using the HANTS software.

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undergone by vegetation, such as desertification, phenological changes, etc. However, to monitor vegetation changes, one has to distinguish between natural variability and actual change. A brief explanation of Figure 1 (also shown on the cover) is presented below.

To obtain Figure 1 images, a yearly harmonic analysis has been carried out to the whole GIMMS dataset (Tucker *et al.*, 2005), using the HANTS software (Roerink *et al.*, 2000). This harmonic analysis allows reconstructing cloud-free NDVI time series, since the Maximum Value Compositing technique used for GIMMS data process does not warrantee a total absence of clouds, especially in areas with enduring cloud cover, such as rainforests or regions under monsoon regime. Then, maximum and minimum NDVI values are retrieved for each year of data. Finally, average and standard deviation values are calculated for minimum and maximum NDVI time series. The results are presented using the IHS convention (Intensity – Hue – Saturation), using the hue component for average value, the intensity component for standard deviation value, the saturation component being fixed to 100%. As a result, figure 1 shows NDVI extreme values in the traditional rainbow color code, with their variability coded in the intensity of the image: dark blue areas correspond thus to low NDVI values with high interannual variability, while bright red correspond to high NDVI values with low interannual variability.

One can observe that the areas with the highest yearly NDVI amplitude are located near the poles, due to the influence of snow on NDVI values during winter. It is interesting to note that tropical rainforests also show considerable yearly NDVI amplitude. The areas with greater interannual variability in NDVI extreme values are boreal forests (due to snowmelt timing), tropical rainforests (due to cloud cover) and deserts (due to low noise to signal ratio), while temperate areas have relatively stable NDVI levels.

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