



Relationships between spatio-temporal variability of AVHRR-NDVI series over the Sahel and SST from neighbouring oceans for the 1982-2003 period.

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Vegetation density variability over the Sahel depends on local rainfall variability. The latter is governed by West African Monsoon (WAM) dynamics, and spans over a large range of spatio-temporal scales. Some vegetation indices have been derived from the National Oceanic and Atmospheric Administration (NOAA) Advanced Very High Resolution Radiometer (AVHRR). The main objective here is to get a better understanding on the interannual variability of vegetation density with an emphasis on the Sahel region (1982 –present), as a signature of WAM variability, possibly linked with known global and regional climate/environmental fluctuations. The spatio-temporal evolution of Sahelian vegetation is analyzed using the Normalized Difference Vegetation Index (NDVI) obtained from the NOAA/AVHRR sensor (1982-2003). Dominant patterns are identified using rotated EOFs. While the first four modes are associated with specific bio-geo-climatic conditions in space, significant time scales are detected using a multi-tapers method. Three interannual time scales (~6.2-, 4.5- and 3.6-year) are present in the first and third NDVI modes over the western Sahel. A quasi-biennial time scale (~2.6-year) is present in second and fourth NDVI modes over the northeast

Sahel. During summer, significant lagged correlations are found between the NDVI second (9-month lag) and third (10-month lag) modes, the meridional Atlantic Sea Surface Temperature (SST) gradient, and the zonal SST gradient in the Indian Ocean. Potential physical linkages and dynamics with known climate fluctuations are discussed.