



Spatio-temporal vegetation dynamics and relationship with climate over East Africa

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Vegetation dynamics are driven by, and affect, numerous natural and anthropogenic processes on the land surface. In particular, the surface water-energy balance is highly modified by vegetation activity. In this study, spatial and temporal Leaf Area Index (LAI) trends from 1982 to 2011 over the East Africa region are estimated using the Thiel-Sen median slope method. In addition the lead/lag correlations between LAI and climate variables as well as vegetation feedback on climate based on lagged covariance ratios are analyzed. Our results show a persistent decline in vegetation from Southern Ethiopia extending through Central Kenya into Central Tanzania. Precipitation (temperature) exerts widespread positive (negative) forcing on lagging vegetation except in forests. Positive vegetation feedback on precipitation dominates across the region while a stronger negative forcing is exerted on T_{min} compared to T_{max} . The vegetation-climate interactions indicate a strong spatial dependence in the region. The results of this study therefore, provide a key point of reference for the understanding of the land-atmosphere interactions in a region that is highly susceptible to climate change impacts.