Spatial pattern of NDVI and its sensitivity to climate change simulated by a simple model

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The long-term remote sensing products of normalized difference vegetation index (NDVI) are widely used in the study of vegetation-climate interaction. In this work, a multiple linear regression model between different statistics of NDVI (annual mean, maximum and minimum) and climate data (annual precipitation and annual mean temperature) over 1982-2015 is developed. The nonlinearity responses of vegetation to climate are represented by applying the fractional coverage of different land cover types as the weighted functions. The model sensitivities are investigated according to several criteria. Results show that the model can very well capture the global distribution of NDVI, particularly over the tropical forests, desert and temperature shrub, and the spatial correlation coefficients between observed and simulated NDVIs range from 0.92 to 0.96. The sensitivities of NDVI to precipitation and temperature over different ecoregions are also investigated.