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Method Article

Long-term trend of and correlation between vegetation greenness and climate variables in Asia based on satellite data

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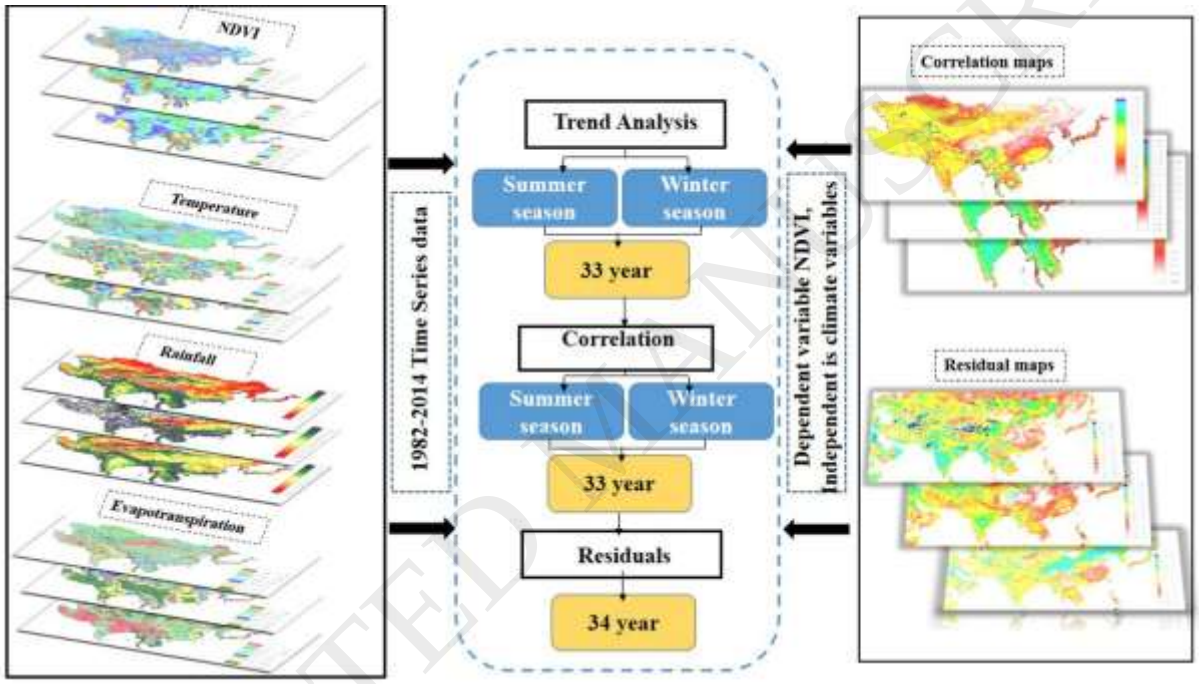
GRAPHICAL ABSTRACT



Abstract

Satellite data has been used to ascertain trends and correlations between climate change and vegetation greenness in Asia. Our study utilized 33-year (1982–2014) AVHRR-GIMMS (Advanced Very High Resolution Radiometer - Global Inventory Modelling and Mapping Studies) NDVI3g and CRU TS (Climatic Research Unit Time Series) climate variable (temperature, rainfall, and potential evapotranspiration) time series. First, we estimated the overall trends for vegetation greenness and climate variables and analyzed trends during summer (April to October), winter (November to March), and the entire year. Second, we carried out correlation and regression analyses to detect correlations between vegetation greenness and climate variables. Our study revealed an increasing trend (0.05 to 0.28) in temperature in northeastern India (bordering Bhutan), Southeast Bhutan, Yunnan Province of China, Northern Myanmar, Central Cambodia, northern Laos, southern Vietnam, eastern Iran, southern Afghanistan, and southern Pakistan. However, a decreasing trend in temperature (0.00 to -0.04) was noted for specific areas in southern Asia including Central Myanmar and northwestern Thailand and the Guangxi, Southern Gansu, and Shandong provinces of China. The