

Response of vegetation growth to the climatic parameters in different districts of Andhra Pradesh

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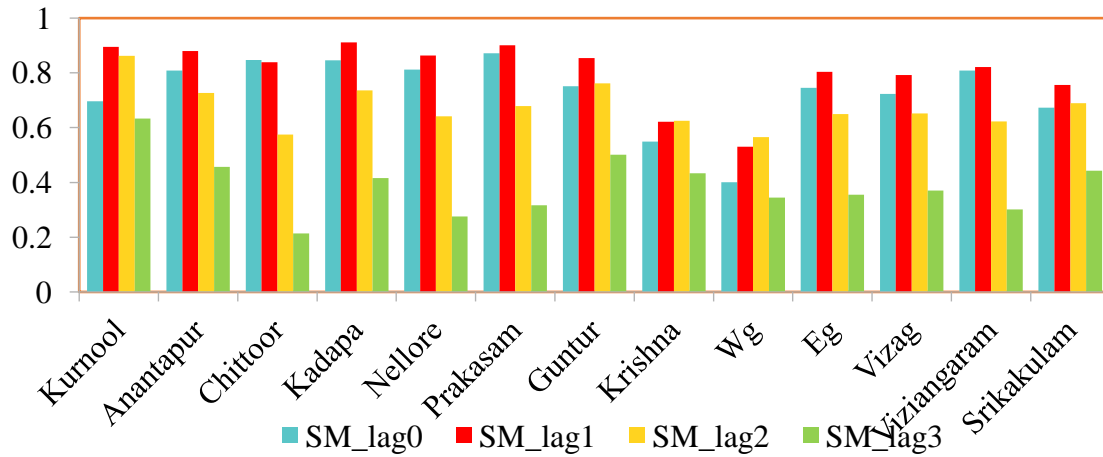
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Abstract

Prediction of vegetation dynamics is very essential for assessment of crop growing period and yield estimation. NDVI (Normalized difference vegetation index) is the most widely used parameter for vegetation index, which is available at various spatial and temporal resolutions from different remote sensing platforms. Agriculture is the main source of economy over the drought prone area of Andhra Pradesh (AP) due to the low rainfall coupled with extreme temperatures. There is a need to understand the regional changes in vegetation and the drivers for the vegetation anomalies. The present study utilized the MODIS (Moderate Resolution Imaging Spectroradiometer) NDVI (0.05°x0.05°), TRMM rainfall (0.25°x0.25°), and ESA CCI soil moisture (0.25°x0.25°) monthly data to study the relationship between the vegetation growth and climatic parameters like rainfall and soil moisture during the period 2000-2016 over different districts in AP. In case of extensive irrigated areas like Punjab, Haryana, and Uttar Pradesh, the soil moisture is not a limiting factor, and the crop growth is depending on the cropping patterns and agricultural practices. Whereas the vegetation growth in most of the districts in Andhra Pradesh is mainly depends on the rainfall availability during south west Monsoon and North east monsoon season and the ground water irrigation. The spatial analysis of NDVI shows that the NDVI is very low (0.4) over Rayalaseema region and high (>0.8) over Coastal AP. We have computed the correlation between the NDVI and rainfall, NDVI and soil moisture over different district to understand the effect of climatic factors on vegetation growth. Our study found that the immediate rainfall and soil moisture have poor correlation with NDVI over most of the districts in AP. To understand the climatic impact the lag correlation analysis performed, and the results shows that the strong positive correlation between NDVI and soil moisture observed especially when soil moisture precedes NDVI by 1 month. In case of rainfall the strong positive correlation found when the rainfall precedes NDVI by 2 months. It was also observed that the correlations were weak over Krishna and West Godavari regions compare to the other districts in AP due to the extensity irrigation from the river system. In this study we have not considered the effect of land use land cover change, fertilization in vegetation growth, detailed analyses of these factors

and its linkages may further reveal the mechanisms that are driving the vegetation dynamics over different districts in AP.

Correlation Coefficient of NDVI vs SM



Correlation Coefficient of NDVI vs RF

