



Time Series Analysis of Remotely Sensed Surface Soil Moisture for Wheat and Rice Crops in Central Plain, India

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This study focuses on time series analysis of surface soil moisture for different spatial locations over a time period to deliver significant information regarding various factors affecting soil moisture and its influence on crop production and agriculture. As per the agro-climatic zone map of India, central plain zone in Uttar Pradesh state, hosts the highest producer of rice and wheat, exhibiting varied soil properties. The crop production is also dependent on meteorological parameters which are precipitation and temperature primarily. Mann-Kendall trend analysis is initially applied to understand the underlying trend and subsequently followed by time series modelling for fifteen years remotely sensed surface soil moisture dataset (2002 to 2016) to comprehend the dynamics of changing soil moisture. Two different satellite data are selected for this study namely, Advanced Microwave Scattering Radiometer – Earth Observation System (AMSR-E) by JAXA and NASA and Advanced Microwave Scattering Radiometer – 2 (AMSR-2) by JAXA. The study provides a thorough understanding of the variation of soil moisture spatially and temporally and also the impact of various parameters for crop specific locations. Annual and seasonal (meteorological and crop - sowing to harvesting) patterns provides essential information for optimum crop production. This study extends to estimate and understand crop water and irrigation water requirement necessary to compensate for the uncertain meteorological variations, as major crops in India are rainfed. A long-term understanding of soil moisture is a crucial indicator of the futuristic behaviour of the same.