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Abstract:	This paper covers a detailed methodology to process passive microwave remote sensing by using NASA'S SMAP (Soil moisture active passive) soil moisture data of Rabi season (2017-18) to generate monthly and weekly average soil moisture maps for surface, root-zone and profile soil moistures for entire India using each day data of 2 durations i.e. 6-9 a.m and 12-3 p.m. In order to demonstrate the developed methodology, Rabi season (2017-18) was selected wherein a total of 1271 SMAP L-4 daily scenes were processed and analysed. The paper also discusses and investigates the soil moisture variations with respect to monthly rainfall over the entire area for each state of India for the overall time duration by analysing soil moisture data provided by SMAP (L4 Global 3-hourly 9 km EASE-Grid Soil Moisture Geophysical Data) using ArcGIS. For the purpose of demonstrating the results on weekly average soil moisture, comparisons between soil moisture (30 weeks) and crop acreage (state-wise) was carried out to check the feasibility of acreage sensitivity towards soil moisture by assessment of crop acreage for a very large area. This assessment of sensitivity for crop acreage towards soil moisture was analysed using regression modelling tool in IBM SPSS modeller.

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