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Title: Monitoring Soil Moisture of Indian Subcontinent Covering Entire Kharif Season(2018) Using SMAP Data.

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Abstract: This research work presents a detailed methodology to process SMAP soil moisture data to generate average soil moisture maps of desired durations be it weekly or monthly over a large geographical area like a continent or a sub-continent. The work also describes the utility of SMAP soil moisture product (L4_SM product) to understand the soil moisture variations over Indian subcontinent by analysing daily soil moisture data for entire duration (May-November, 2018) covering the Kharif season. In order to demonstrate the developed methodology the year 2018 was selected wherein a total of 1284 data files including profile(up to bed rock), rootzone(up to 100cm) and surface(0-5cm) soil moisture from May to November 2018 were processed and analysed. The study is based on average soil moisture maps generation for desired durations (weekly and monthly) over Indian subcontinent, from which the average volumetric soil moisture content for each state of India were extracted. Soil moisture has a number of contributing factors, but rainfall has a great effect on the variation in soil moisture, which has been studied in this paper. There are a number of applications of soil moisture in agricultural practices. Many crop parameters can be predicted by soil moisture such as production, yield, net shown area or crop acreage etc. The soundness of the detailed methodology proposed in this paper has been well supported by studying the feasibility and assessment of crop acreage variation on SMAP soil moisture variation for different states of India. A statistical relationship between the crop acreage and weekly average soil moisture is studied using IBM SPSS modeller, from which a positive correlation between these two variables is obtained.

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