The Effect of Atmospheric Variables on Soil Moisture over Bangladesh

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Abstract: The moisture for four different depths of soil is analyzed using 36-years reanalysis data. The spatial variation shows that moisture increases with the soil depth. This characteristic is prominent in the dry season (November-May), whereas in the wet season (June-October) moisture reaches the saturated conditions for all layers. The value of soil moisture provides an annual periodicity with maximum value of 0.28 m^3m^{-3} in July and minimum value of 0.17 m^3m^{-3} in March. Atmospheric variables of evaporation minus precipitation and relative humidity are compared to soil moisture in the surface layer which indicates the strong positive relation with the correlation coefficient value of -0.87 and 0.88, respectively. Monthly temperature variation also affects on the amount of soil moisture. The changing of surface temperature changes soil moisture after two months later with an approximate value of 0.01 m^3m^{-3}.The long-term annual variability of soil moisture provides a periodic trend for all layers which indicates about the effect of climate change.

Keywords: Soil moisture, Evaporation, Precipitation, Surface-temperature, Relative humidity.