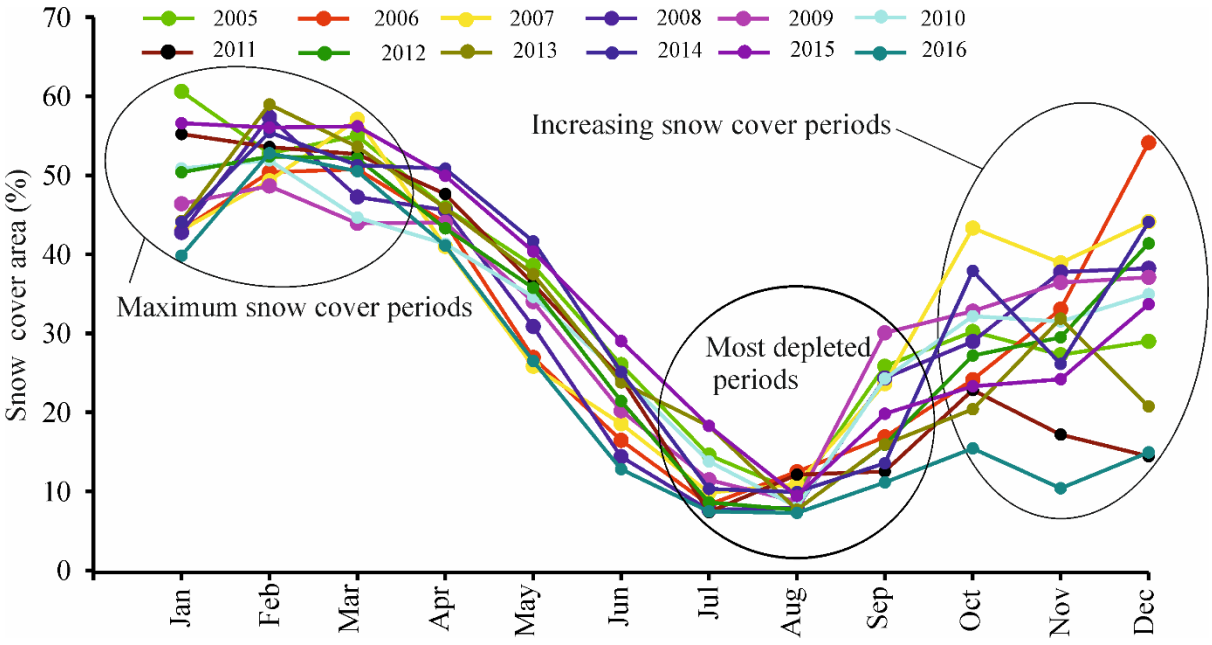
Spatio-temporal analysis of snow cover and effect of terrain attributes in the Upper Ganga River Basin, central Himalaya

Snow Cover Area (SCA) was studied in the upper Ganga River basin, Central Himalaya for the period from 2005-2016 by using MODIS/Terra SCA 8 days L3 global 500m grid (MOD10A2) and ASTER DEM. The minimum annual mean SCA was found in the year 2016 (~24.18 %) and maximum was found~ 34.65%, ~ 34.19% and ~ 34.74% in the year 2005, 2014 and 2015, respectively. The average SCA reaches to its maximum ~51.26 to~53.30 % in February and March and minimum ~9.35 % to ~11.34 % in July and August during the study period (Figure). The SCA tends to increase from September (~19.50 %) onwards, when wind is colder with the offset of monsoon (Figure). January to March is considered the maximum accumulation period, but occurrence of snowfall takes place throughout the year in the greater Himalaya. In the middle Himalaya, temperature tends to increase and thus, melting of lower reaches snow takes place. During the winter, SCA tends to ~39.74 % in the winter season, whereas ~26.15 %, ~10.46 % and ~23.65 % in the premonsoon, monsoon and post monsoon seasons.

The most favourable conditions for snow accumulation was found in the slope class 20°-30° while north and north-west aspects have higher snow accumulation with maximum positive attribution in January and minimum in July.



SCA depletion map indicating the most depleted period between July and September in Upper Ganga River basin

Meetei PN, Ahluwalia RS, Rai SP, Khobragade S., Sarangi S., Goel M, and Kumar S. (2020). Spatio-temporal analysis of snow cover and effect of terrain attributes in the Upper Ganga River Basin, central Himalaya. (J. of Geocarto International)