

1. Kulkarni, A. V., Rathore, B. P., Singh, S. K. and Bahuguna, I. M., 2011, **Understanding changes in Himalayan cryosphere using remote sensing technique, *International Journal of Remote Sensing*, 32(3), pp 601-615.**

Abstract:

In the Himalayas, a large area is covered by glaciers and seasonal snow and changes in its extent can influence availability of water in the Himalayan Rivers. In this paper, changes in glacial extent, glacial mass balance and seasonal snow cover are discussed. Glacial retreat was estimated for 1868 glaciers in 11 basins distributed in the Indian Himalaya since 1962. The investigation has shown an overall reduction in glacier area from 6332 to 5329 km² from 1962 to 2001/2 – an overall deglaciation of 16%. Snow line at the end of ablation season on the Chhota Shigri glacier observed using field and satellite methods suggests a change in altitude from 4900 to 5200 m from the late 1970s to present. Seasonal snow cover was monitored in the 28 river sub-basins using normalized difference snow index (NDSI) technique in Central and Western Himalaya. The investigation has shown that in the early part of winter, i.e. from October to December, a large amount of snow retreat was observed. For many basins located in lower altitude and in the south of the Pir Panjal range, snow ablation was observed throughout the winter season. In addition, average stream runoff of the Baspa basin for the month of December increased by 75%. This combination of glacial retreat, negative mass balance, early melting of seasonal snow cover and winter-time increase in stream runoff might suggest an influence of global warming on the Himalayan cryosphere.