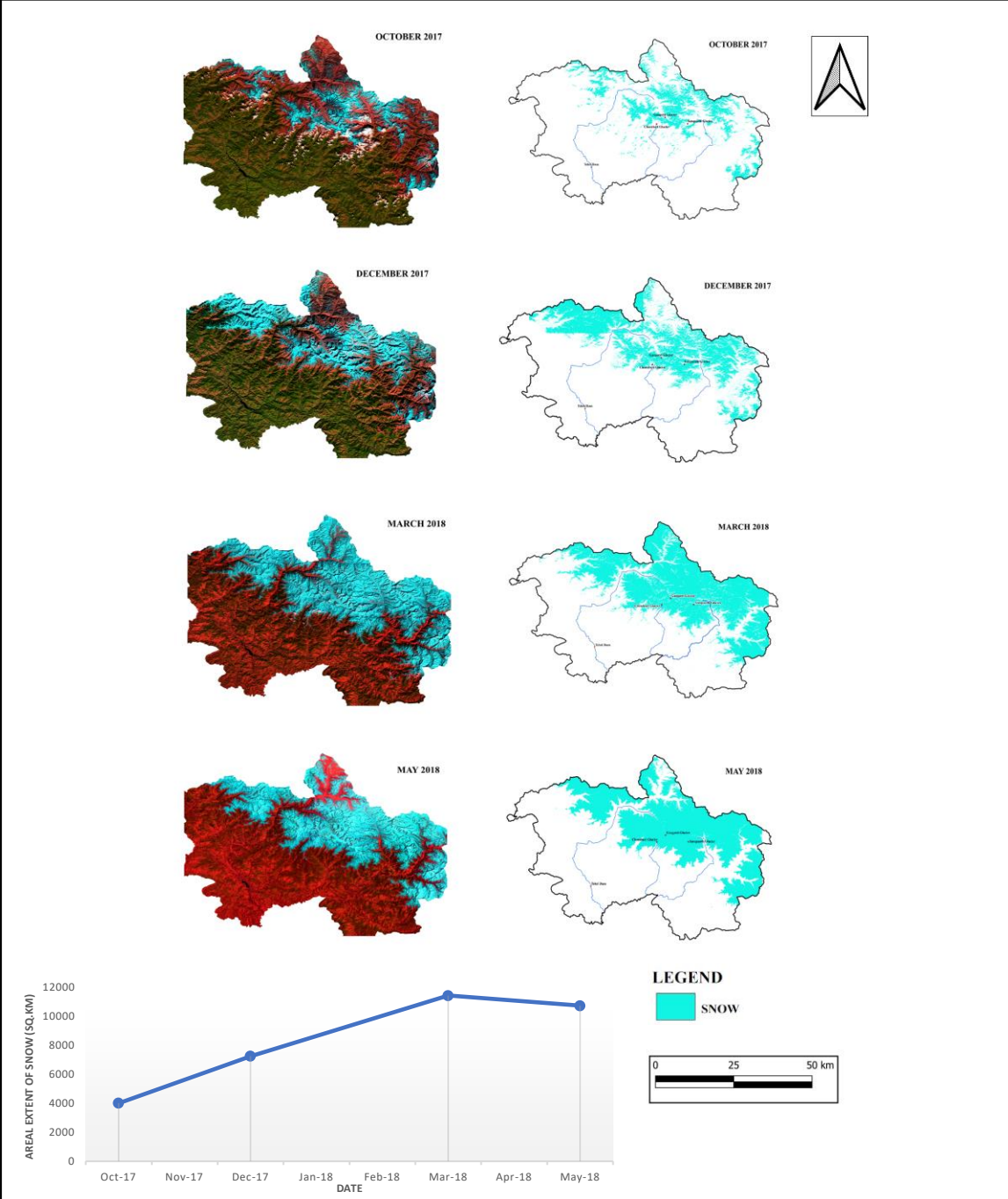


Title: Snow cover map of Uttarakhand

Map Description and Analysis



**Introduction** : The map comprises of 4 districts of Uttarakhand namely Uttarakashi, Chamoli, Rudraprayag and Tehri Garhwal. Snow cover variations of different months are depicted in the map.

**Data Used** : Raw data of AWiFS sensor of Resourcesat-1 was taken from the ISRO’s geoportal platform Bhuvan. Toposheet no. H44A, H44B, H44G H44H were downloaded for the month of May 2017, October 2017, November 2017, December 2017, January 2018, March 2018, May 2018 etc. District shape file was taken.

**Steps used in QGIS to make the snow cover map**

Data of all months were processed individually.  
FCC images were made then merged using the tool “Merge”.  
Band combination of the merged image was set to 4,3,2.  
The merged image was further processed using the Raster calculator to make the NDSI (Normalized difference Snow Index).

**NDSI = (Green (B2) - SWIR (B5) / Green (B2) + SWIR (B5))**

Exploring the histogram on a raster's properties would give us the value of the pixels which range in between -1 to +1. Pixels having high negative values are mainly cloud. Pixels with high positive values indicate vegetation/land with no snow. So, snow pixels ranged in between 0.4 and 0.7 according to the image.

To delineate the snowy pixels NDSI image was given a threshold of greater than or equal to 0.4 (NDSI≥0.4)

Required Districts for the Study area were extracted from all the districts of the shape file.


Merged and Threshold images were clipped with the Districts of selected areas.

For creating the graph of areal extent of snow w.r.t time, the area of individual snow maps were calculated and were plotted in excel sheet.

Shape Files for the Gangotri glacier, Chorabari glacier, Satopanth glacier, Mandakini river, Alaknanda River, Bhagirathi river, and Tehri Dam was created.

**Purpose**

A long record of snow map may indicate the climatic variations in past and how it is currently help us to determine the effect of global warming affecting the Himalayas. A melt runoff model for river and glaciers can be established by analysing 10-20 days of satellite imagery .Constant monitoring of snow in Himalayan glaciers is required for hydroelectric power generation and for determining the areas which are disaster prone. Protecting biodiversity and environment in the northern parts of India is utmost importance by keeping track of areal extent of snow.

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