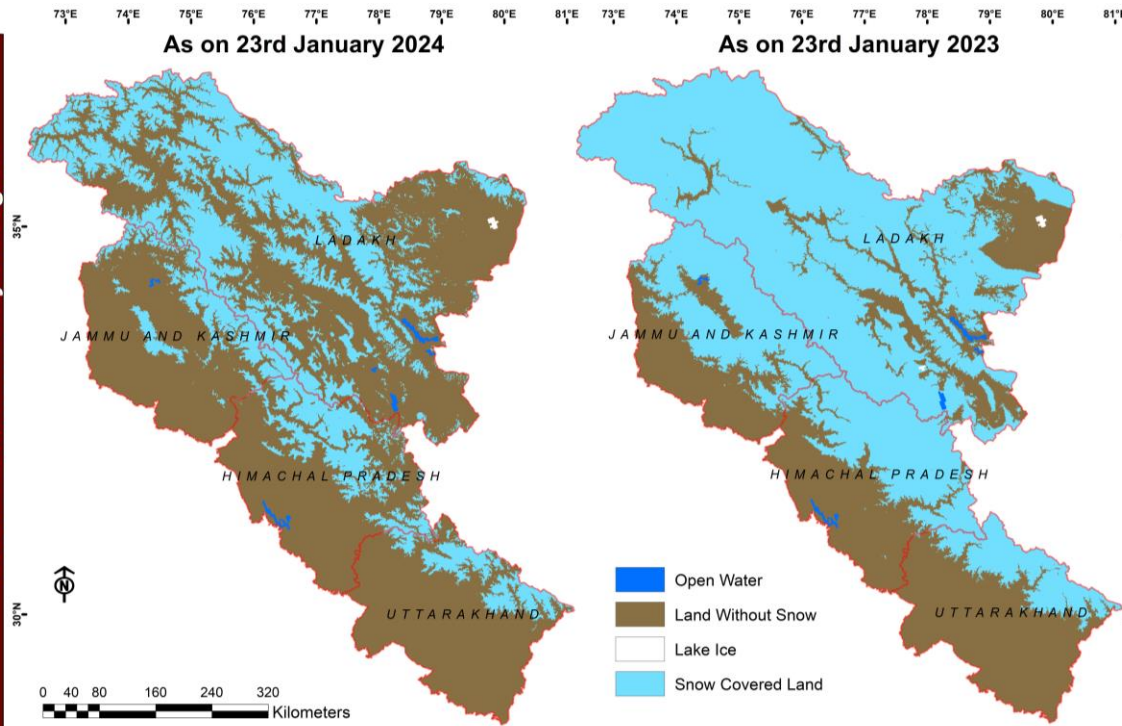
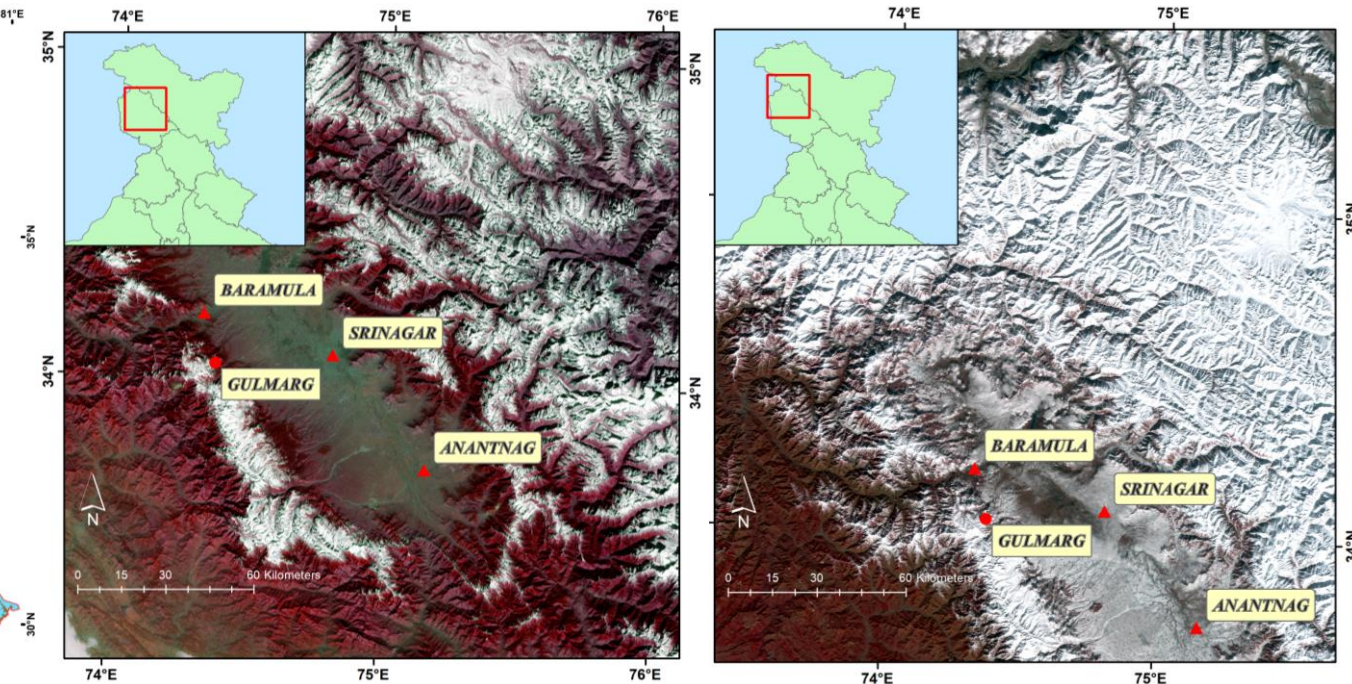


# Significant Reduction in December 2023-January 2024 Snowfall and Snow Cover Area of North-Western Himalayan Region

Snow Cover Comparison in North Western Himalayan Region



Data Source: U.S. National Ice Center. (2008).

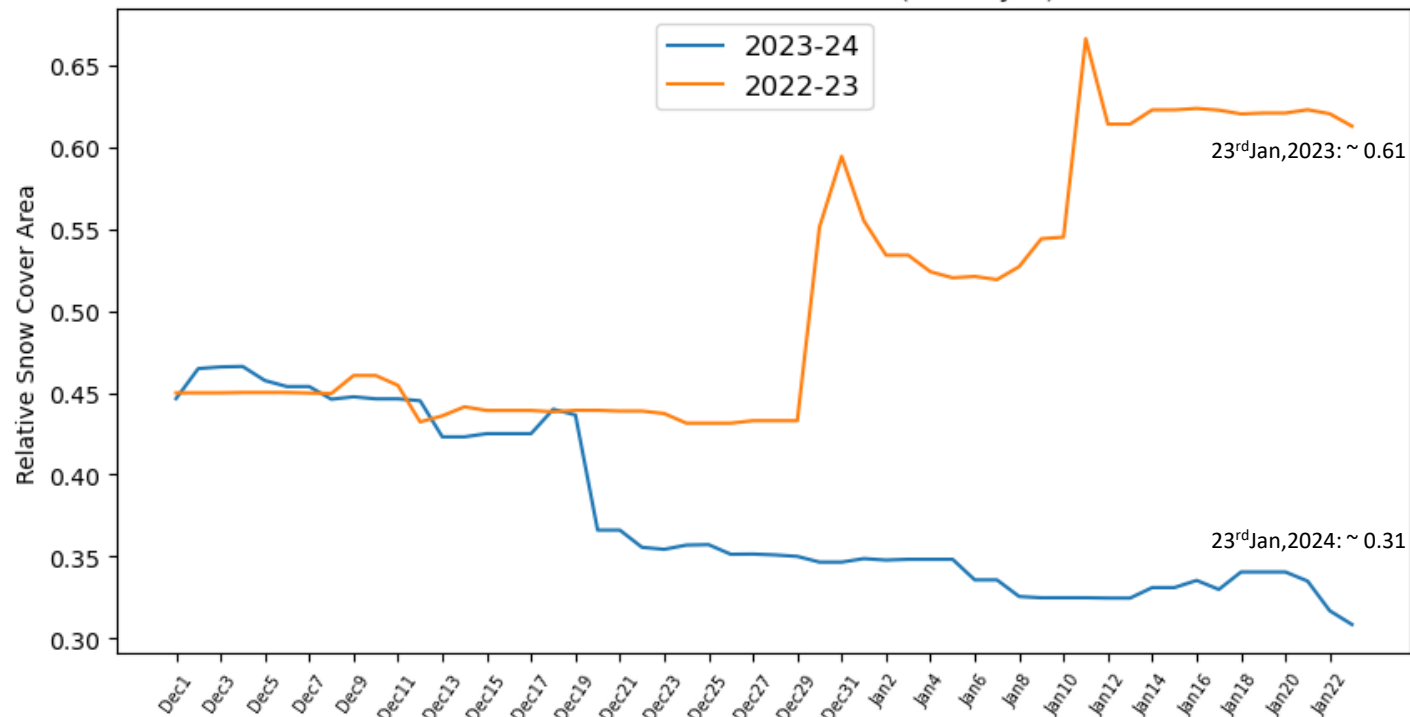


Standard False Colour Composite of J&K districts in January 2023 and 2024.  
(Source: Resourcesat-2A AWiFS Imagery)

The snow cover area map of North West Himalayas has been prepared by data extracted from IMS Daily Northern Hemisphere Snow and Ice Analysis at 1 Km resolution showing relative snow cover area in this region has decreased by approximately 50% as seen on 23rd January 2024 (**~1,48,225 km<sup>2</sup>**) compared to 23<sup>rd</sup> January 2023 (**~2,94,635 km<sup>2</sup>**).

From Resourcesat-2A AWiFS imagery it is evident that the areas of Jammu and Kashmir like Gulmarg were fully covered with snow last year as compared to this winter season of 2024. It is matter of concern for future water scarcity and water availability for agriculture and habitat in the region.

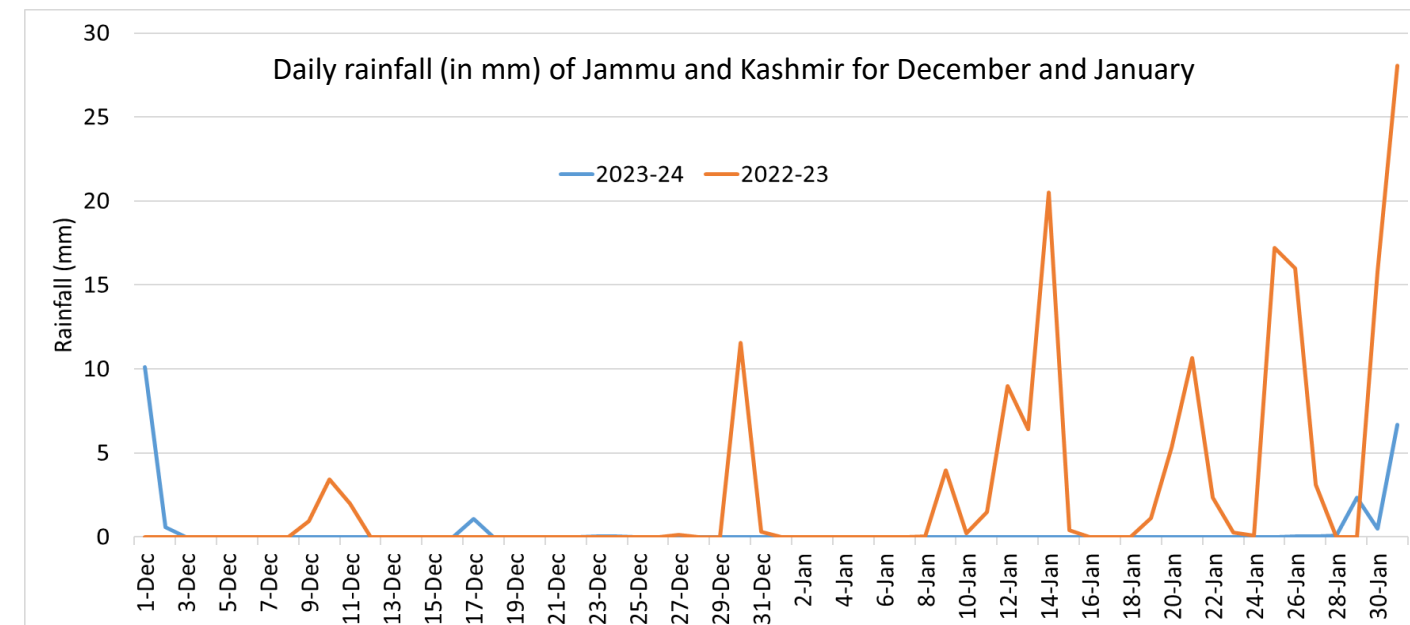
Relative Snow cover area of NWH in Winters (Dec & Jan) 2023 vs 2024



The top graph shows relative snow cover area comparison of North-Western Himalayan regions in winters months i.e. December 2022 to January 2023 and December 2023 to January 2024

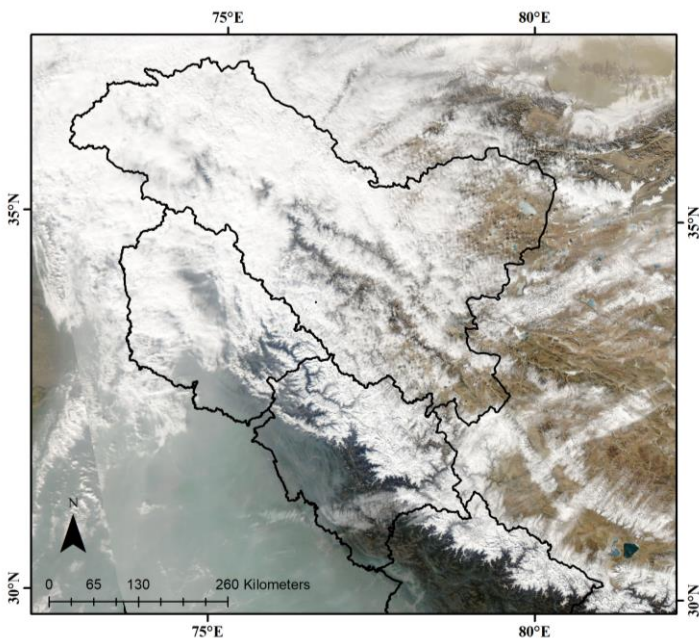
- The relative snow cover area in winters of 2023-24 was comparatively lower (50%) than winters of 2022-23 due to lack of snow spell (or snow drought).
- As observed on 23<sup>rd</sup> Jan,2023 , the relative snow cover area was approximately 61% whereas on 23<sup>rd</sup> Jan, 2024 , it was approximately 31% showing significant reduction of around 50% in SCA in 2023-2024 winter season.

Daily rainfall (in mm) of Jammu and Kashmir for December and January

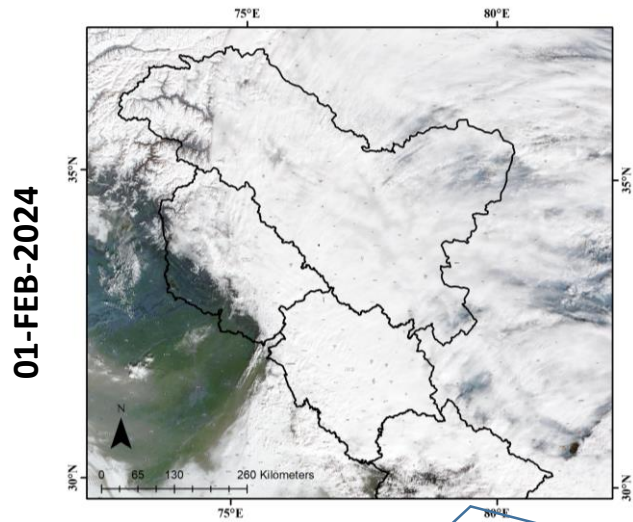


The bottom graph shows the comparison of daily rainfall (in mm ) of Jammu and Kashmir for December and January in 2022-23 & 2023-24

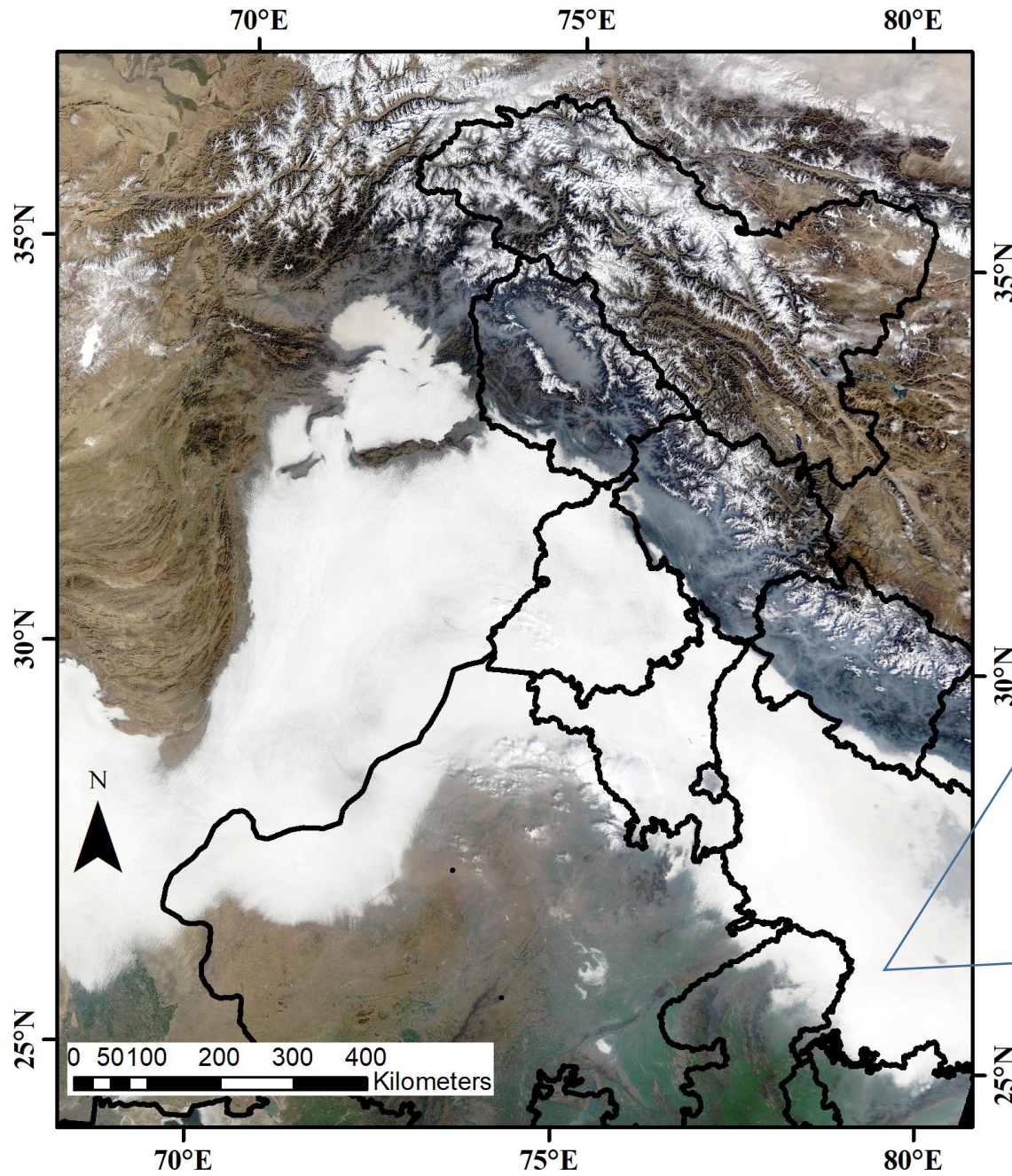
- In January, the amount of rainfall is comparatively lower in year 2024 as compared to year 2023.
- The accumulated rainfall observed during December 2022 - January 2023 was **160.4 mm** whereas, it was **21.48 mm** during same time in the year 2023-2024.



**23-JAN-2023**



**01-FEB-2024**

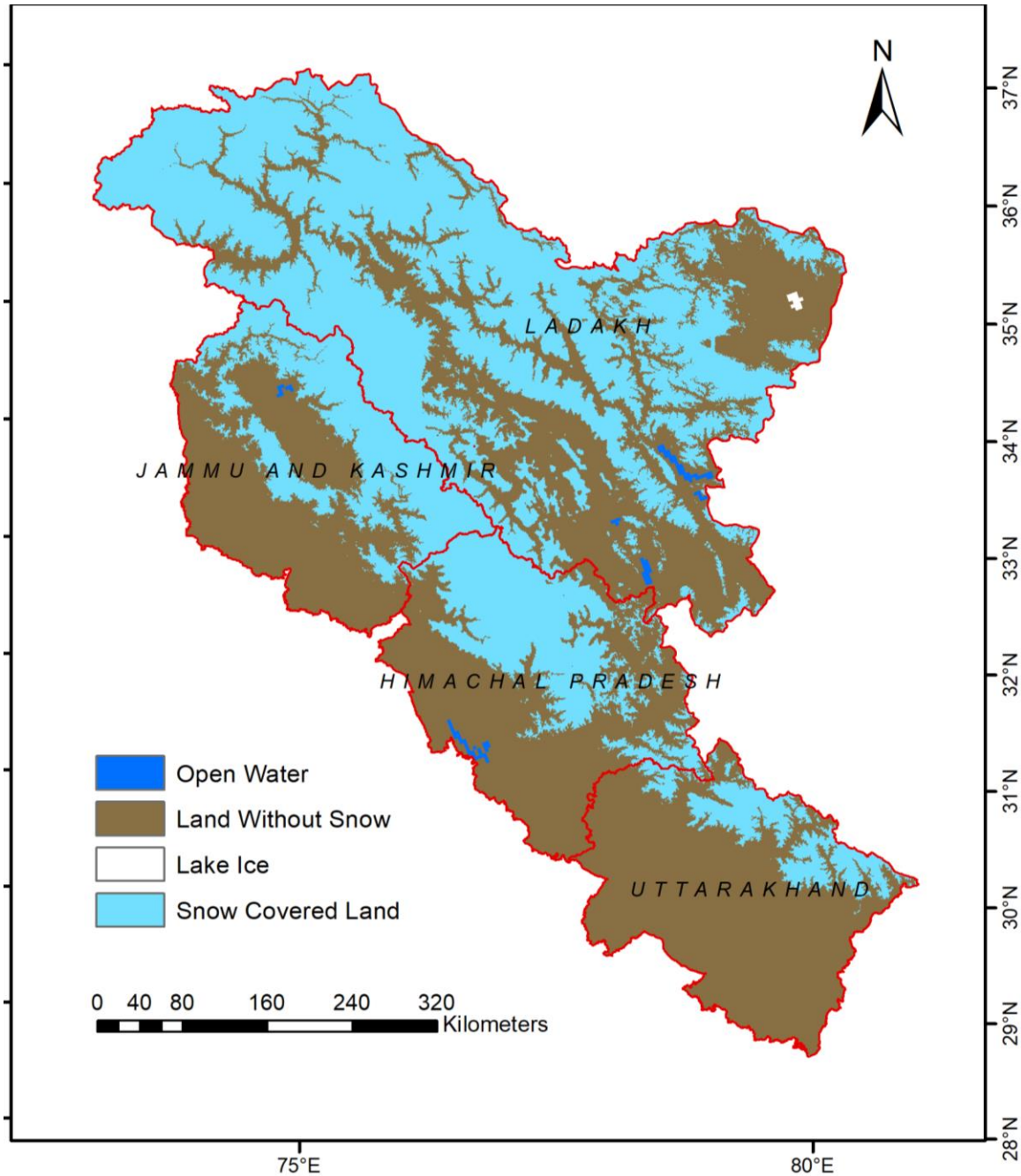


**23-JAN-2024**

MODIS Imagery shows snow cover difference in the North-Western Himalayan region on 23<sup>rd</sup> January 2024, compared to 2023. The persistence of fog cover seen in Indo-Gangetic plains from December 24 till last week of January 2024 can also be attributed to due to reduced western disturbances and lack of precipitation in the winter season of 2023-24 in NWH.

Latest MODIS Imagery showing clouds resulting in fresh snow spell in the North-Western Himalayas on 1st February, 2024.

## Snow Cover in NWH region on 31<sup>st</sup> January, 2024



## Significant Reduction in December 2023-January 2024 Snowfall and Snow Cover Area of North-Western Himalayan Region

In North West Himalayan region, Snowfall is a vital component for the livelihoods dependent on agriculture and water resources for their sustenance but the unusual winter of 2023-24 with scarcity in snowfall has directly affected hydrological regimes in this region. In regard to this issue, the snow cover area map of North West Himalayas has been prepared by data extracted from IMS Daily Northern Hemisphere Snow and Ice Analysis at 1 Km resolution showing relative snow cover area in this region has decreased by approximately 50% in January 2024 (~1,48,225 km<sup>2</sup>) as compared to January 2023 (~2,94,635 km<sup>2</sup>). Moreover, the daily rainfall (in mm) trends of IMD 0.25° X 0.25° gridded dataset for Jammu and Kashmir, from 01-Dec-2023 to 31-Jan-2024 showed that the rainfall was comparatively lower as compared to the previous year for the same duration which can be attributed to due to reduced NW disturbances. There is a strong need to address the concerns as the prolonged snow drought is a challenge to the water security and increased chances of wildfire disasters in these regions.

As, fresh snowfall was observed on January 31 and February 01, 2024 in North West Himalayan Region, the snow cover area has increased to ~2,19,669 km<sup>2</sup>, (45.7%) on 31 January 2024 as compared to SCA of 30% on 23 January 2024, ending the dry winters but still remained lower as compared to previous year. The accumulated snow depth and snow water equivalent remains significantly lower than previous years