

**The declining trend in mountain snow cover**

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**Abstract**

The mountains have been getting warmer in recent years. Special interest was put on mountain snow cover change as their environment was accounted to the cooler alpine climate zone. Understanding the impact of changing snow cover patterns is critical for informing sustainable development and preparing for the potential consequences of these changes.

Mountain snow cover is expected to reduce in response to global warming. For available reanalysis and observation data, a decline in snow cover, snow depth, and snow-covered areas was detected over the last 43 years. Our study focuses on the relationship between global warming and significant changes in snow persistence. We found that mountain climate has been amplified, compared to the global mean temperature trend. In addition, the result demonstrates that polar amplification and global warming do not play a significant role in snow cover changes on individual snow persistence mountains. However, local processes can influence snow cover, and long-term changes in these radiation budgets are significant drivers of the changes being observed. We conclude that regional radiation imbalance is a major contributor to the decline in snow cover. The radiative forcing triggers intensified ablation of the snow cover. The results reveal new insights into the course of snow cover changes and their implication and impact on the mountain environment under climate change considerations.

**Keywords**

Mountain Environment, Snow Cover, Snow, Radiation