

# **The climatology analysis of the terrestrial snow parameters derived from remote sensing data and ground station observation**

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Continental-scale seasonal snow parameters (snow cover extent, SCA / snow equivalent water) are potentially sensitive indicators in global climate change, especially over the extra-tropical Northern Hemisphere. The climatology features for a long time series of snow parameters over land could provide the signature of climate changes across the globe. According to the IPCC AR4 report, the snow extent is sharply decreasing over Northern Hemisphere from the prediction of the nine general circulation models from 2000. This paper provides a climatology analysis of the snow cover extent (SCA) and snow equivalent water (SWE) from the satellite derivation and ground station observation globally or locally. The data includes SCA from optical remote sensing and SWE from passive remote sensing (PSW) and observation station for over 30 year's extent.

In the traditional view, the satellite data could provide more reliable large-scale snow parameters than the local observational station, the trend from several snow products provide the same continental regime over Northern American, it looks like snow cover get a negative response to the global warming, while, a near local look over the Tibet Plateau, the result shows that the snow cover area appears a different trend with snow equivalent water from PSW dataset, and the situation is also the same over the China West Area. We compare several snow products available, also with the station observations, we find that more precise snow derivation algorithms are needed over China West Area, and the data inter-calibrate between the different satellites is also pivotal in the long time series over the time span of the single satellite lifetime. At the end of this paper, we call for the local precise snow parameters over Northern China vast area operationally.

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