



## **Eurasian snow depth in long-term climate reanalysis**

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Snow cover variability has significant effects on local and global climate evolution. By changing surface energy fluxes and hydrological conditions, changes in snow cover can lead to remote climate effects. By combining high temporal and spatial resolution, climate reanalysis and derived products offer the opportunity to analyze snow variability in great detail. So far only little is known about the quality of their performance.

Comparing four long term reanalysis datasets with Russian in situ snow depth data, a good representation of daily to sub-decadal snow variability was found. However, the representation of pre-1950 inter-decadal snow variability is questionable, since datasets divert towards different base states. Investigating Eurasian snow depth changes in years of low Arctic sea ice reveals increased snow depths over southern Siberia. Such signal is found for both the recent and the early twentieth century Arctic warm period. This study underlines the importance of cryosphere atmosphere feedbacks and demonstrates the ability of long term reanalysis to reproduce snow variability accordingly.