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Greenland natural variability and recent warming – updating old ice core records to here and now

Content

Ice-core proxy records such as stable water isotopes exhibit non-climatic variability lowering the signal-to-noise ratio in the derived climate time series. Analyzing and combining spatial arrays of ice cores improves the signal-to-noise ratio and allows an in-depth analysis of natural climate variability. In the 1990ies such an ice-core array was drilled in North- and Central Greenland during the North-Greenland Traverse (NGT). At that time anthropogenic driven warming was not detectable in central Greenland. In this study we re-visit the NGT sites and re-drill ice cores to the second decade of the 21st century. By analyzing the overlapping period between old and new cores, we explore the potential and methodological feasibility to extend the old NGT records to more recent times. The newly derived and updated NGT stable water-isotope record allows us to assess the warming during the most recent decade of the record with respect to natural variability over the past 1000 years. We place the retrieved temperature record into the context of the Arctic warming and discuss potential drivers of variability.

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