



Comparison of glacial periods reveals systematic cold climate variability

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On a global scale, major variations in Pleistocene temperatures correlate well with glacial-interglacial changes of northern hemisphere ice sheet sizes. While a discharge of icebergs from the ice sheets surrounding the polar North Atlantic region directly reflects the rates of growth and decay of the ice sheet margins at sea level, it is also the result of a rapidly changing climate which affected both the meridional overturning in the ocean and the pattern in ocean-atmosphere circulation. Ice cores and many deep-sea sediment records from this region have demonstrated such complex interrelations between these main environmental processes for the last glaciation (Weichselian). In ice cores, the millennial-scale climate variabilities of the Weichselian are recognized in both hemispheres, albeit with apparently a significant time lag between the southern and northern pole regions. Comparing records of iceberg discharge from the polar and subpolar North Atlantic now reveals a very similar millennial-scale variability between the Weichselian and the penultimate glaciation (Saalian) during which warmer, interstadial times alternated with rather cold polar conditions. Because cold conditions in the polar North were also time-coeval with enhanced aridity and atmospheric dust content (e.g. at least over northern Africa due to changes in the monsoon system), the glacial dust records of Antarctica, which extend back in time much farther than Greenland ice records, could be used to also make an interhemispheric climate comparison. For the last two glaciations such a comparison would indeed indicate a strong linkage between iceberg discharge events in the polar North and increased dust content in the atmosphere.