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Quantitative summer and winter temperature reconstructions from pollen and chironomid data in the Baltic–Belarus area

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Quantitative reconstructions based on fossil pollen and chironomids are widely used and useful for long-term climate variability estimations. The Lateglacial and early Holocene period (15–8 ka BP) in the Baltic–Belarus (BB) area between 60°–51° N was characterized by sudden shifts in climate due to various climate forcings affecting the climate of the northern hemisphere and North Atlantic, including the proximity of receding ice sheets. Climate variations in BB during the LG were eminent as the southern part of the region was ice free during the Last Glacial Maximum over 19 ka BP, whereas northern Estonia became ice free no sooner than 13 ka BP. New pollen based reconstructions of summer (May-to-August) and winter (December-to-February) temperatures between 15–8 ka BP along a S–N transect in the BB area display trends in temporal and spatial changes in climate variability. These results are completed by two chironomid-based July mean temperature reconstructions (Heiri et al. 2014). The magnitude of change compared with modern temperatures was more prominent in the northern part of BB area than in the southern part. The 4 °C winter and 2 °C summer warming at the start of GI-1 was delayed in the BB area and Lateglacial maximum temperatures were reached at ca 13.6 ka BP, being 4 °C colder than the modern mean. The Younger Dryas cooling in the area was 5 °C colder than present as inferred by all proxies (Veski et al. in press). In addition, our analyses show an early Holocene divergence in winter temperature trends with modern values reaching 1 ka earlier (10 ka BP) in southern BB compared to the northern part of the region (9 ka BP).

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