



Delayed European Climate Optimum During the Last Interglacial in Northern Europe

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Recent estimates of the Last Interglacial (127-110 kyr) suggest a global average temperature approximately 2°C above preindustrial levels, providing a potential analogue for future climate change. However, many of the temperature estimates originate from terrestrial sequences with limited temporal resolution, raising questions over the magnitude and relative timing of the warming. Here we report a new quantitative summer temperature reconstruction using non-biting midges (chironomids) from the Danish Last Interglacial site, Hollerup. We find peak average summer temperatures of 17.5°C, approximately one degree warmer than the AD1961-90 period. In contrast to the timing of the thermal maximum inferred from the pollen record, the chironomid temperature reconstruction suggests that peak warmth took place 3,200 years after the onset of Last Interglacial warming in Europe. Our results indicate a delay in the establishment of full interglacial Atlantic Meridional Overturning Circulation, most probably linked to enhanced melt of the Greenland Ice Sheet.