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Re-evaluation of the Bispingen palaeolake record – a revised chronology for the Eemian in Northern Germany

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Detailed studies of climate development during past interglacials, i.e. prior to significant human interference, can provide important information about natural climate variability and thus the extent of anthropogenic impact on present and future climate. However, comparison of palaeoclimate records from different regions and archives is often hampered by chronological uncertainties. For example, an asynchronous climate development with a several-thousand-year-long steep climatic gradient in Central Europe at the end of the Last Interglacial has been inferred from differences in the duration of the Eemian in German and French palaeoclimate records (Kukla et al. 1997). One of the key sites in this context is the Bispingen palaeolake sequence in Northern Germany, where a length of about 11 000 years for the Eemian has been estimated from varve counting (Müller 1974), which is a couple of thousand years shorter than in other sediment records in the North Atlantic realm (cf. Kukla et al. 2002). Here we present detailed microfacies analyses on new sediment cores from the Bispingen palaeolake combined with geochemical and pollen analyses, documenting changes in the depositional environment and vegetation during the Last Interglacial. Microscopic varve counting in the distinctly laminated lower part and sedimentation rate estimates for the faintly laminated upper part of the sequence enable a better assessment of the length of the Eemian in Northern Germany than in previous studies. Detailed lithological and palynological comparison of the new Bispingen cores with the record from Müller (1974) indicates the existence of major gaps in the old profile, leading to an underestimation of the duration of the Eemian in Northern Germany. The duration of about 17 000 years obtained from the new Bispingen cores is in good accordance with results from a marine record off Portugal (Shackleton et al. 2002) and the varve-dated Lake Monticchio record in southern Italy (Brauer et al. 2007). In contrast to previous assumptions, this indicates that the Eemian in Northern Germany comprises MIS 5e but also a part of MIS 5d. This questions the idea of a steep climatic gradient between northern and southern Europe at the end of the Last Interglacial.

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