



Environmental response to rapid climatic oscillations in NW-Europe during Greenland Interstadial 1

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Rapid climatic oscillations are recorded in the Greenland oxygen isotope records. During Greenland Interstadial 1 (comparable to Bølling-Allerød or Lateglacial Interstadial), two distinct cold phases GI-1b and GI-1d occurred (Björck *et al.*, 1998).

Comparable cold events are recognised in oxygen isotope records from lake carbonates: the Aegelsee and Gerzensee oscillations (Lotter *et al.*, 1992).

Palynological records show one or more temporary regressive phases within the progressive vegetation development of the Bølling-Allerød, which can be compared to above mentioned climatic events. At the moment, the lack of a common dating framework impedes a precise correlation between the different proxies. Therefore, reliable lead and lag relationships cannot be established.

The objective of this research (2007-2011, PhD project N. van Asch) is to establish the impact of these cold events on the environment in NW-Europe. The main research questions are:

- Did temperature changes during the Bølling-Allerød interstadial occur synchronous in a west-east transect?
- Can we determine a west-east gradient in the amplitude of temperature change associated with a decreasing Atlantic influence?
- Did changes in vegetation occur synchronous to temperature changes?

High-resolution (~20 yrs) multi-proxy analyses will be carried out on selected calcareous lake deposits along a European west-east transect (oceanic-continental). Environmental reconstructions of these sites will be based on palynology (regional and local vegetation) and chironomids (temperature reconstruction). The chronological framework will be based on: 1) oxygen isotope analyses of bulk carbonates for correlation of the sites with NGRIP; 2) tephrochronology; and 3) AMS ¹⁴C dating. Comparison of multiple sites along the transect will show differences in timing and amplitude of temperature changes. The multi proxy approach used in this research enables us to determine the (a)synchronicity of climatic and related environmental changes.

References

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