



Exploring the Tephrochronological Potential of several long Lacustrine Records from West Eifel covering the Last Glacial Cycle

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The complex environmental changes associated with the rapid climate variability which occurred during the Last Glacial Cycle make direct correlation between records very difficult even on regional scale. We present here new results of a tephrostratigraphic and tephrochronologic investigation of several long lacustrine sequences recovered from the dry maars of West Eifel Volcanic Field by the Eifel Laminated Sediment Archive (ELSA) project. The high-resolution records that make up the ELSA permitted detailed paleoenvironmental reconstruction that showed clearly that the region experienced and responded to the millennial-scale climate variability (e.g. Dansgaard-Oeschger cycles and Heinrich events) specific of the North Atlantic region.

Circa 75 basaltic to trachytic primary ash-layers have been identified in sediments covering the Last Glacial Cycle. Several tephra layers could be geochemically correlated with established regional markers such as Laacher See or Dümpelmaar tephtras, providing additional chronological points to the stacked chronological scale constructed for the ELSA cores. However, most of the tephra layers found in sediments spanning Marine Isotope Stages (MIS) 3-5 have not been previously reported. Apart from the tephrostratigraphic importance of the ash-layers in linking the cores, they can potentially provide new data on the eruptive history of the Eifel volcanic field during MIS

3-5. Moreover, a regional tephrostratigraphic framework could be constructed in case some of these eruptive events are identified in other palaeoclimatic records (e.g. loess, lake sediments). The stacked ELSA record provides also a high-resolution record of climate change for central Europe, highly comparable to data from the North Atlantic region. The new tephrochronological framework presented here raises the possibility of extending the search for these volcanic events also in the Greenland ice-core records. Such a find would significantly strengthen the correlation of European continental archives with the North Atlantic region.