



Lake status changes as response to DO-cycles and Heinrich events, exemplified from Les Echets, France.

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Dansgaard-Oeschger (DO) cycles and Heinrich events (HE) have been intensively studied in ice-cores and in marine sediment records, while studies demonstrating the impact of these events within the terrestrial environment are sparse. For this purpose two continuous sediment sequences were obtained in 2001 from the Les Echets mire in eastern France (45°54'N; 4°56'E). The lake basin formed during the penultimate deglaciation and holds an environmental record covering the last glacial period.

The focus of our multi-proxy study is to resolve the response of terrestrial and limnic ecosystems to DO-cycles and HE during OIS 3 and 2 (60-20 ka BP), a period characterised by multiple HE and DO-cycles. Diatom stratigraphy reveals a distinct pattern of change in the planktonic/benthic (P/B) ratio between 36 and 31 kyr BP coinciding with fluctuations in biogenic silica (BSi) content, while the period from 31 to 18 kyr BP is characterized by an invariable dominance of benthic diatom taxa and low BSi content. The P/B ratio most probably reflects changes in the length of the ice-cover season. Lower P/B ratios indicate more persistent lake ice cover, coinciding with low lake organic productivity as indicated by BSi. In contrast, higher P/B ratios indicate shorter ice cover seasons and correspond to higher lake organic productivity as shown by increased BSi content. The timing and duration of the changes between 36 and 31 kyr BP resemble those of DO-cycles and demonstrate that the dramatic temperature shifts typical for DO-cycles had a strong impact on terrestrial environments in western Europe during OIS 3, while OIS 2 seems to have been characterised by more stable conditions.