



Near surface geophysics and sediment analysis to precisely date the outburst of glacial Lake Devlin, Front Range Colorado, USA

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Beside the geomorphological setting and the associated lithologic sphere the distribution and genesis of glacial, periglacial and paraglacial sediments is affected also significantly by climatic parameters. The time of deglaciation of the last glacial period is especially valuable to investigate the correlation between climatic shifts and possible geomorphological response. Ice-dammed lakes and their outbreaks are ideal archives to study this climate-geomorphological link.

Glacial Lake Devlin is a key area of Pinedale deglaciation in the Front Range of Colorado, USA, because it catastrophically drained after the retreat of North-Boulder-Creek-Glacier. The breaching of the moraine is determined by Radiocarbon data from disperse organic matter within the uppermost lake sediments to about 14.3 – 15.3 ka BP, an important date of the Front Range deglaciation (MADOLE 1986). A reinvestigation of the site allows a 3-dimensional mapping of the distribution and the depth of different glacial, periglacial, fluvial and lacustrine sediments by using various near surface geophysical methods such as seismic refraction, ground penetrating radar and electric tomography. Results of shallow geophysics help to determine positions to dig for sediment exposures. Detailed images of the different sediment units enable to reconstruct a stratigraphic and genetic model of lake sediments, deltaic deposits, glacial till and fluvial sediments from the outbreak of the lake. Together with that 3-dimensional sedimentary model, new AMS-radiocarbon data combined with data derived from optical stimulates luminescence (OSL) precise the date of the outbreak.

Here OSL data from the youngest sediments of the delta, which was deposited into the lake, give indications of an outburst around 14 ka with a possibility of a re-blocking of the outlet channel and a final outburst at about 12 ± 1.0 ka. In general all OSL data imply that a lake existed from 21.5 ± 1.4 ka to 12 ± 1.0 ka.

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MADOLE R.F. (1986): Lake Devlin and Pinedale glacial history, Front Range, Colorado. - *Quaternary Research* **25**: 43–54.