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A geotechnical view on glacial sediment profiles

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The characterisation and genetic interpretation of glacial (*sensu lato*) sediment profiles is not always straightforward, especially if observations are limited to the narrow window that a drill core offers. Geotechnical data has proven valuable for, among others, the identification of a glacial sediment component, of previous mechanical loading by ice, or of the modification of a deposit by non-glacial processes. Such data can be gathered with often very simple and cost-effective techniques adopted from applied geosciences, but nevertheless appear to have lost some attention by Quaternary geologists in recent years.

We investigate sediment records from overdeepened basins in the Alpine foreland and in the Black Forest, and routinely apply standard geotechnical methods to reconstruct their deglaciation and, where applicable, phases of readvance. These methods include the determination of:

- i) the deposits' shear strength that can be used as an indicator of loading and compaction (i.e. overconsolidation) by an overriding glacier

- ii) consistency limits (i.e. water contents at which the sediment's mechanical behaviour changes), which are a measure of the 'glaciality' of a sample and, in relation to its natural water content, further indicators of a potential overconsolidation

- iii) the settlement in response to an applied load that allows the determination of a preconsolidation pressure (i.e. a pressure that the sample has previously been exposed to)

- iv) water uptake capacities in disturbed and undisturbed state that can provide further information on a sample's internal structure.

We present sedimentological and geotechnical data from several basin infill-profiles, and demonstrate the application and the prospects of, as well as the conclusions that can be drawn from geotechnical testing.

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