



Variability of contemporary sediment delivery rates within the glacier-fed valley Bødalen in western Norway based on lake sediment analysis

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Small alpine lakes are highly sensitive even to modest environmental changes. The lake Sætevatnet within Bødalen in the Nordfjord, western Norway is a proglacial lake in front of the Bødalsglacier formed after the rapid retreat of the outlet glacier AD 1930.

Delta and lake sediments from Sætevatnet are studied in order to characterise the impact of climate variability on the sedimentary system. The investigations are focused on i) quantifying the high contemporary sedimentation rates, ii) the temporal variability of sedimentary & geomorphic process rates and iii) the identification and characterisation of sediment sources.

To address these objectives different sediment coring techniques (e.g. freeze coring, modified Livingston piston corer, Russian corer) are applied. The cores are analysed regarding textural parameters (e.g. grain-size distribution, SEM analysis) and the sediment nature (e.g. XRF analysis, magnetic susceptibility) and the chronostratigraphic framework are defined by the radio-isotopes ^{137}Cs and ^{210}Pb . In addition, the delta growth and the suspended sediment transport into and out of the lake are continuously monitored. A defined grid of sticks on the delta is used to calculate the rapid annual sediment accumulation at the inlet of the lake. The suspended sediment transport is measured at two stationary stations at the inlet and the outlet of the lake.

The results provide new information on rates and controls of sediment dynamics in a highly-active glacier-fed environment.