



## **Sub-recent sediment dynamics and sediment budget of the braided sandur system at Sandane, Erdalen (Nordfjord, Western Norway)**

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This study analyses the sub-recent sediment budget of a braided sandur system in a U-shaped valley with connection to the Jostedalsbreen ice cap in Nordfjord, western Norway. The sandur, located in the upper Erdalen valley at Sandane, is characterized by a gravely braid plain 1600 meters long and maximum 700 metres wide. The elevation of the braid plain is ca. 480 m a.s.l. up-stream at the confluence of two tributaries and approximately 460 m a.s.l. at its down-stream end where channels merge to one channel passing over a threshold of moraine and bedrock. Upvalley the sandur system is characterised by coarse deposits build up in a period of increased sediment delivery during the Little Ice Age advance. Downvalley are younger fine-grained flood sediments.

Special focus of this study is on (i) the detection of different zones with negative, positive or balanced sub-recent (following the Little Ice Age advance) sediment budget within the braided sandur system, (ii) the identification of sediment sources upstream of Sandane and at the slope systems to both sides of the braided sandur system and (iii) the analysis of the sub-recent (following the Little Ice Age advance) sediment budget of the entire Sandane system.

A combination of methods is applied including geomorphologic mapping, detailed granulometric and morphometric analyses in selected channel stretches of the braided sandur system,  $^{14}\text{C}$  dating of flood deposits in the lower part of Sandane, dendrochronology as well as detection of stable/mobile channel stretches and monitoring of current fluvial sediment transport using stationary stations in combination with different tracer techniques (painted stone lines, shock sensors, biofilm analysis).

The upper part of Sandane is characterised by a negative sub-recent sediment balance, with erosion of coarse sediments from the Little Ice Age advance. In comparison, the lower part of Sandane has a balanced to slightly positive sub-recent sediment budget with formation of younger flood sediments and more stable channels. Altogether, the sub-recent sediment budget of Sandane, following the Little Ice Age advance, appears to be slightly negative.

Present-day coupling of slope and fluvial systems is limited and only a rather small amount of material is directly transported from the slopes into the braided sandur. Sediments from upstream tributaries are transported through the upper part of Sandane without storage. Apart from flood deposits, material is only temporally stored in channels in the lower part of Sandane before export during peak-runoff. Altogether, fluvial sediment transport following the Little Ice Age appears to be supply-limited.