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Sediment yields of Svalbard glaciers

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Abstract.
Measurements of sediment transport in meltwater rivers from glaciers in Svalbard in the high Arctic have indicated large variations between individual glaciers. A large part of the glaciers at this latitude are cold or polythermal (partly frozen to the bed) and differ in this way from the temperate glaciers in mainland Norway. The sediment yield of the polythermal glacier Brøggerbreen and its moraine area was measured to 586 tkm-2yr-1.
Sediment yield of glaciers in the valley of De Geer, situated at Nordenskiølds land was measured to be in the order of 15 000 t/km2 yr. Only 10 % of the 79 km2 catchment draining to the monitoring station is covered by glaciers. These are assumed to be polythermal and the large sediment yield is probably due to the schistose bedrock in the area. River fan deposits and sediment concentration measurement during special campaigns do indicate that a dominating part of the sediments in transport at the monitoring station are derived from the glaciers. The sediment yields of temperate glaciers in mainland Norway are relatively low, varying from 22 t km-2 year-1 for the small cirque glaciers to 525 t km-2 year-1 for the valley glaciers and outlet glaciers from ice caps. These glaciers rest on ingenious and metamorphic bedrock. A small group of glaciers on schistose bedrock yields 1577 t km-2 year-1. Bedrock geology, degree of consolidation and fracture density is found to be important factor controlling erosion rates.