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Sediment Model of Halslon Reservoir filling taken into account Bruarjokull Glacier recede

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Karahnjukar dam forms Halslon reservoir in the eastern highlands of Iceland, by damming the Jokulsa a Dal glacier river which originates from Bruarjokull glacier, which is an outlet glacier from Vatnajokull ice cap. The total volume of the reservoir is 2,4 km3 and its surface area is 57 km2. The total catchment area at Karahnjukar dam is about 1800 km2, whereof 1400 km2 are covered with Bruarjokull glacier. The glacier covered areas generate about 50 times more sediment per unit area than the non-glaciated areas producing large sediment load in Jokulsa a Dal river. Measurements of sediment transport in the river show that the current total sediment load is on average about 7,1 million tons per year filling the reservoir of sediment in about 500 years. However, recent studies of influence of climate warming on size of Icelandic glaciers indicate that within 100-200 years most of them will decrease considerably and some will even disappear completely. In this paper a sediment model is proposed that predicts the sediment filling for the next 500 years taken into account the decrease of the glacier and associated change in factors that influence the sediment load due to climate warming. These factors include change in sediment accumulation upstream of the reservoir due to the recede of the glacier; change in discharge of the glacier river due to melting of the glacier and change in precipitation patterns; and associated change in sediment load.