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Bed deformation in under-ice rivers (result of numerical and laboratory modeling)

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It is known that significant erosions are observed after water discharges from reservoired power stations. Obviously as release wave front reaches the edge of ice cover after going through reservoir water opening, resistance of motion abruptly changes, causing rearrangement of velocity profiles and modifying processes of transport of suspended sediments and bed silt. What changes are caused in shape of bottom? Numerical experiments performed with the model of bed deformation in under-ice rivers demonstrated that disturbance wave in ice-covered flow causes bed movements in both reservoir water opening and cross-sections near ice edge, contrary to the case of flow with open surface. Silting is observed between these sections. Its amount is lesser for larger water openings, which apparently follows from conservation of total mass of transported drifts. Amount of erosions depends on volume of discharge and its duration, length of water opening, coefficient of ice roughness, size of soil particles, porosity and density of soil. Affect from increase of discharge is greater at the power site than near ice edge; as roughness of ice increases, so does erosion near the edge concurrently decreasing at the power site; increase of water opening increases erosions at the power site and decreases them near the edge; increase of size of soil particles at both power site and ice edge decreases erosions. Acquired time dependence of rate of current erosion to size of maximal erosion in a moment of completion of discharge at the power site is the same, being independent from influence of all accountable factors in the model.