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Glacier Systems in Northeastern Asia: projection of the mass balance and size change by GSM scenarios

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To evaluate the present state and project the future changes under global warming we considered continental (Orulgan, Suntar-Khayata and Cherskiy ranges located in the Pole of Cold area at the contact of Atlantic and Pacific influences) and maritime (Kamchatka under the Pacific influence) mountain systems. The new approach, based on constructing the glacier balance curves (ablation and accumulation) by meteo-observation for the middle and end of 20th century, hypsographic distribution of ice via altitude of the system, and climatic scenarios on the 1st half of the 21st century (3 different scenarios) is discussed. The maps of spatial change (fields) of the equilibrium line altitude (ELA) and ablation-accumulation at the ELA are obtained for present day and 2049-60 (ECHAM4). The approach allows estimating the glacier termini level and therefore – the areas and morphological structure of the Northeastern Asia glacier systems and their mass balance in the future.

The paper presents also comparable characteristics of the glacier systems stability in the conditions of continental and maritime climate towards warming.