



## Contemporary and future change of Kamchatka glacier systems

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The paper presents the simple method and results of maritime glacier systems' change projection for the second part of 21<sup>th</sup> century by two GCM scenarios (maximal and minimal response of global temperature on CO<sub>2</sub> doubling).

We considered 10 glacier systems embraced the entire glaciation of Kamchatka. The method is based on the balance vertical profiles (ablation and accumulation) constructed by meteorological records and hypsographical schemes of ice distribution via altitude, designed for each system. The scenario parameters are then introduced in these balance and hypsographic schemes.

The spatial patterns of the equilibrium line altitude (ELA) and the level of glacier termini (GTL) are obtained for the future of the scenario EHAM4 (maximum global warming).

The altitudinal distributions of the areas, covered with glacier ice, were built for modern and future state of the glacier systems taking into account the correlation of the change of the ELA and GTL. Possible changes of the areas and morphological structure of Kamchatka glacier systems and their mass balance were estimated. For two key systems (Ichinskiy Vocano and Kronotskiy Range) a similar calculation using the scenario of Hadley Centre Unified Model (Cullen, 1993) was done.

The glacier nourishment in Kamchatka conditions will vary widely. By the maximal scenario, the reaction of these glacier systems to climate warming is found to also vary considerably. Calculation of projected changes predicted that the shift upward in Kamchatka ( $ELA_{modern} - ELA_{projected}$ ) is greater than in continental part of Siberia (Ananicheva, Krenke, 2007, in press) and depends on precipitation rate. Our calculations also predict the disappearance of some glacier systems, while others will pre-

serve 70% of their present area.