Study of Dynamics of Some Glaciers of the Caucasus Using the Future-oriented OGGM Model

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Abstract:

Glaciers play an important role in regulating the Earth's climate and at the same time send early warning signals of expected climate change. In addition, since glaciers play an important role in supplying fresh water and energy, and are also often the cause of landslides, avalanches and mudflows, the current and future state of glaciers is at the center of modern scientific research.

Over the past half century, warming-induced climate change has led to permafrost degradation in the Caucasus (Georgia). Recently, accelerated glacier melting in Georgia has led to an increase in the frequency of landslides, avalanches and mudflows. Unfortunately, the fluctuations of Georgian glaciers have not been studied using mathematical modeling methods so far. The Open Global Glacier Model (OGGM) is designed to simulate glacier mass balance, flow and geometric changes over time and is mainly aimed at providing scientifically sound predictions about the future evolution of the glacier.

The main focus of this study is on seasonal, interannual and long-term forecasts and projections of the Caucasus (Georgia) glaciers based on OGGM modeling under regional climate change conditions. For this purpose, a more focused analysis of glacier contours, flow lines, geometric width, mass balance, thickness, and surface and volumetric fluctuations is being conducted, which is of particular interest for this study.

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