Numerical modelling of Transbaikalian mountain glaciations in Siberia

The Kodar Mountains (57°N, 118°E) and adjacent ranges located east of Lake Baikal currently host only small cirque glaciers confined to their highest parts. Although the region currently experiences a cold continental climate with little winter precipitation, this has likely not always been the case. Indeed, massive moraine complexes and an expansive network of U-shaped valleys indicate that the region has previously hosted much larger glaciers than today [1, 3]. During the Last Glacial Maximum, glaciers from the Kodar Mountains barred the course of the Vitim river, forming a 3000 km³ ice-dammed lake (30 times the volume of Lake Geneva), whose catastrophic drainage caused one of the largest glacial outburst floods documented in Earth’s history [2].

The goal of this project is to use the numerical, open-source, Parallel Ice Sheet Model [PISM, 4, www.pism-docs.org], to simulate glaciation of the Transbaikalian Mountains under idealized climatic conditions. You will explore model sensitivity to changes in input temperature, precipitation and surface mass balance parameters, and deduce a parameter space yielding glacial conditions compatible with the observed ice dam.

This project is open to anyone excited in understanding our planet’s glaciation history. Advanced programming skills are no prerequisite, but strong motivation to learn using open-source analysis tools such as Bash, Python and PISM is needed.

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Particularities
Validation of model results against field-based data will be done in online collaboration with Martin Margold (University of Alberta).
References


