

## Review

of the *member* of the dissertation council for the dissertation of *Rasputina Valeriia Alekseevna* on the topic: «Assessment of characteristics of floods formed by the outbursts of high mountain moraine lake», submitted for the degree of *candidate* of Geographical sciences in scientific specialty 1.6.16. Land hydrology, water resources, hydrochemistry.

Under a warming climate, the shrinking of glaciers significantly increases the risk of outburst floods from high mountain moraine lakes. A comprehensive study of the processes leading to the formation of these outburst floods is not only a scientific imperative but also forms the foundation for predicting such events, thereby enabling effective prevention and protection of populations and territories. This makes the issue of utmost importance.

The author of this dissertation, *Rasputina Valeriia Alekseevna*, has thoroughly addressed this critical issue. She actively participated in fieldwork conducted from 2019 to 2023 on moraine and periglacial lakes in the Altai region, where she collected and processed valuable data. In addition, she contributed to physical experiments focused on the destruction of soil dams and analyzed the resulting data. She personally interpreted satellite imagery, examined the spatiotemporal variability of lakes, and compiled a comprehensive catalog of moraine lakes in the Altai Mountains.

Through her efforts, several important results were achieved. These include the development of a methodology for calculating outburst flood characteristics that accounts for two distinct outburst mechanisms and the heterogeneous composition of moraine material; the identification of level regime features for moraine lakes at different developmental stages; and the recognition of varying trends in the spatial distribution and temporal variability of moraine and periglacial lakes in Altai, with these differences being attributed to the distinct climatic conditions of Central and Southeastern Altai.

To further enhance the quality of the dissertation, the following specific suggestions are provided:

- 1) In the English version of the dissertation, please translate the Russian text in the figures of Chapter 5 into English.
- 2) Double-check the equations and their sequence in Chapter 2, as some equations appear to be repeated.
- 3) Clarify the logical connections between Chapter 4 and the other chapters.
- 4) Chapter 5 is relatively brief. It is recommended to expand this chapter by including a table of parameters used for the simulations. Additionally, incorporating some climate scenarios from the IPCC AR6 for scenario-based simulations would further strengthen the analysis.

Considering the above, I believe that *Rasputina Valeriia Alekseevna*'s dissertation on the topic: «Assessment of characteristics of floods formed by the outbursts of high mountain moraine lake» meets the requirements of specialty 1.6.16. Land hydrology, water resources, hydrochemistry.

The dissertation is a scientific qualification work that resolves a scientific problem important for the development of the relevant field of science *or* provides new science-based technical, technological or other solutions and developments vital for the national development.

No violations of paragraphs 9 and 11 of the Order No.11181/1 as of November 19, 2021 "On the Procedure for Awarding Academic Degrees at St. Petersburg State University" have been detected.

The dissertation meets the criteria of dissertations for the academic degree of candidate of sciences, established by the specified Order. The dissertation is recommended for the defense at St. Petersburg State University.

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