

## REVIEW OF THE REVIEWER OF THE FINAL GRADUATION WORK

Topic of the final graduation work METHODS FOR PREDICTING HAZARDOUS HYDROLOGICAL PHENOMENA IN URBANIZED MOUNTAIN (ALPINE) COUNTRIES

Author (student) Grigoriy Kobzar

Educational program Cold Regions Environmental Landscapes Integrated Science (CORELIS)

Level: Master's program

Scientific Supervisor Dr. Irina Fedorova, Associate Professor, Chief of the Department of Geocology and Environmental Managements, Institute of Earth Sciences, St. Petersburg State University, St. Petersburg, Russia (Full name, academic title, academic degree)

Reviewer Dr. Povazhnyi Vasilii, Chief of the Russian-German Laboratory for Polar and Marine Research, Arctic and Antarctic Research Institute, Saint Petersburg, Russia (Full name, place of work, position, academic title, academic degree)

Professional Requirements	5	4	3	2	*
Relevance of the final graduation work topic	x				
The degree of the question's survey completeness and the correctness of the problem's statement			x		
Level and correctness of use in the work of research methods, mathematical modeling, calculations, etc. ;			x		
The degree of work's complexity, application of knowledge of general professional and special disciplines in it;			x		
Clarity, consistency of research and validity of the presentation;		x			
Application of modern software, cartographic using GIS, computer and other technologies;			x		
Quality of work's design (general level of literacy, writing style, quality of illustrations, compliance with the standard);		x			
The volume and quality of the execution of the graphic material, its conformity to the text;		x			
Originality and novelty of the results, research and application solutions			x		
The degree of independence of the work performed;			x		

\* - not evaluated (difficult to assess)

Noted advantages of work The topic of the work is relevant in connection with the rapidly changing climatic conditions and the increasing risk of frequent flooding in mountainous areas.

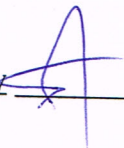
The author offers general recommendations for improving methods of forecasting and reducing the potential damage from flooding.

G. Kobzar have reviewed some amount of scientific data and studied the problems of modeling and forecasting of the hydrometeorological conditions of the catchment areas of mountain territories on good theoretical and methodological levels. The material in the graduate qualifying work is moderately structured, yet written in the good scientific manner. The author had carried out rather general analysis of the theoretical bases for hydrological modeling in Australia and in the Alpine countries of Europe. The concept, main aspects and normative regulation of flood warning systems in the studied regions are described in general terms as well.

The specific features of flood formation in the tropical climate of the eastern coast of Australia and in the temperate climatic zone of the Alpine mountains are revealed. The author provides a qualitative comparison of simulations and measured hydrological data in the studied areas. The forthcoming climate changes are described in detail in accordance with the main climate change scenarios developed by IPCC (RCP 4.5 and RCP 8.5). The dependence between the model data and the cost of flood damage in Switzerland over the past decades has been revealed. The general recommendations are developed to improve the forecasting methodology and increase the protection against floods, considering microclimatic features.

Noted disadvantages of work \_\_ Several drawbacks of the study have been revealed: general and review-type of the study, discrepancy between the study aim and statistics used, difficulties of perception of the provided graphic information, insufficient number of displayed data for some areas of research (Australia), style of presentation is not always consistent. At different stages of scientific research, different amounts of catchment basins are studied. The Introduction part lacks any mention of Russian experience in flood management, developed after Krymsk flood. The methodology for changing microclimatic conditions is not described in sufficient detail. However, the drawbacks found permit to put the positive mark to this issue.

Reviewer's conclusion \_\_ The author of the graduate qualifying work showed a good ability to analyze the general information on the selected topics. The conclusions formulated in the work are sufficiently substantiated and can be used in practical management of hydrographic models in mountain areas. Graduation qualifying work of Kobzar G. is made in accordance with the requirements, recommended for defense and deserves the positive mark.

Reviewer Dr. Povazhnyi Vasiliy  « 8 » June 2018 year.