

REVIEW OF THE SCIENTIFIC SUPERVISOR OF THE FINAL GRADUATION WORK

Topic of the final graduation work METHANE FLUXES AND GAS HYDRATES OF THE KARA AND LAPTEV SEAS SHELVES

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Educational program Cold Regions Environmental Landscapes Integrated Science (CORELIS)

Level: Master's program

Scientific Supervisor Alexey A. Krylov, docent, PhD

(Full name, academic title, academic degree)

Professional Requirements	Corresponds	Mostly correspond	Not correspond
to be able to correctly formulate and set tasks (problems) of their activities in the performance of work, analyze, diagnose the causes of problems, determine their relevance	x		
establish priorities and methods for solving set tasks (problems);	x		
to be able to use, process and analyze modern scientific, statistical, analytical information;	x		
own modern methods of analyzing and interpreting the information received, to assess their capabilities in addressing the tasks (problems)	x		
to be able to rationally plan the time of work's performance, determine the correct sequence and volume of operations and decisions in the performance of the task;	x		
be able to evaluate objectively the results of calculations and calculations;	x		
to be able to analyze the results of data interpretation;	x		
know and apply methods of system analysis;	x		
be able to implement interdisciplinary research;	x		
to be able to make independent substantiated and reliable conclusions from the work done	x		
to be able to use scientific literature and a professional orientation	x		
to be able to apply modern graphic, cartographic, computer and multimedia technologies in the study	x		
to be able to use cartographic methods using GIS	x		

Noted advantages of work All the necessary calculations related to modeling the theoretical possibilities of the gas hydrates formation within the shelf of the Laptev Sea and the Kara Sea were carried out in the work. Several scenarios related to the different composition of the hydrate forming gas mixture have been tested. The dependence of the thickness of the gas hydrates stability zone on climatic changes is shown. An important conclusion of the work is that despite the climate warming after the last glacial maximum, the thickness of the hydrate stability zone increases due to sea level rise (and, consequently, (hydrostatic) pressure increase) in the Holocene. Theoretical calculations of the maximum possible generation of methane from organic matter, in case all organic matter is completely processed by microbes, were carried out. Despite the fact that organic matter is never completely consumed in the diagenesis, (in reality, no more than 10-20% of organic carbon is consumed in the diagenesis by microbes), these calculations allow us to estimate the

maximum flux of local microbial methane in the studied seas. Any excess of this threshold indicates the supply of deep (catagenetic) methane.

Noted disadvantages of work _ All tasks at hand were successfully completed by the author of the work. Some weaknesses of the work are associated only with a number of minor errors in English grammar.

Supervisor's conclusion __ Master's work should be accepted with excellent marks

Supervisor __ Alexey A. Krylov

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