

REVIEW OF THE REVIEWER OF THE FINAL GRADUATION WORK

Topic of the final graduation work Methane flux dynamics in polygonal tundra investigated by the eddy covariance method

Author (student) Viktoriia Pastukhova

Educational program Cold Regions Environmental Landscapes Integrated Science (CORELIS)

Level: Master's program

Scientific Supervisor Irina Fedorova, Dr., PhD

(Full name, academic title, academic degree)

Reviewer Irina Grodnitskaya, V.N. Sukachev Institute of Forest, Siberian Branch, Russian Academy of Science, Krasnoyarsk, Russia., Head of laboratory, Prof. Dr.

(Full name, place of work, position, academic title, academic degree)

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

* - not evaluated (difficult to assess)

Noted advantages of work The author analyzed a large meteorological dataset (from 2009 to 2017), in order to determine the most significant methane emission drivers in the polygonal tundra on Samoylov island. Based on the calculations, the author constructed the general model FCH₄, which takes into account 4 important parameters: near-surface turbulence, air pressure, relative humidity, and soil temperature. In the Thesis, it is shown that the suggested model (which includes the above parameters) does not give a general idea of the methane emissions dynamics, because CH₄ efflux in the polygonal tundra is also affected by annual variations in the combinations of various environmental factors. Nevertheless, the average monthly methane emission calculated using the model statistically reliably corresponds to the data obtained in the field for the entire observation period. The author notes that the annual FCH₄ model, based only on meteorological data, is not accurate enough and requires to take into consideration additional factors affecting the emission of CH₄ – the physico-chemical/biochemical parameters of the soil. At the same time, the

author shows that the FCH₄ model is of practical importance, and it can be used as a tool for approximate (initial) estimates of methane emissions, and more variables can be included in it in the future

Noted disadvantages of work In my opinion, the title of the work inexactly reflects the issue of the research, because the author did not conduct any field measurements of the seasonal emission of methane dynamics by herself, but analyzed the available data, identifying the most important parameters that affect this process and constructing the model. I think that in the title it would be appropriate to use the word "Model / Modeling", which would more accurately reflect the essence of the work.

To Table. 3 and Table. 4 a Note with a description of the given coefficients (parameters) should be given.

Reviewer's conclusion Despite the noted minor shortcomings, I believe that the goal and tasks of the work have been fulfilled, a large amount of work has been done, and new interesting results of methane emissions in the Arctic zone have been obtained. The Master's thesis of Pastukhova Victoria meets all the requirements for graduation qualifications. I rate the Thesis as "excellent".

Reviewer

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/Prof., Dr. Grodnitskaya I./

