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#IMC22

SEPTEMBER 11 - 15 2022

## >> SYNTHESIZE MOUNTAINS OF KNOWLEDGE <<

## Submitted Abstract

ID IMC22-FSAbstr- 516

First Author First Name Last Name	Anastasiia (1,2) Zemlianskova
Submitting Author First Name Last Name	Anastasiia Zemlianskova
Correspondence	anastasiazemlanskova@gmail.com
Co-Authors >> E-Mails will be not listed	Makarieva, Olga (1,2); Nesterova, Nataliia (1); Alexeev, Vladimir (1); Shikhov, Andrey (3); Ostashov, Andrey (1)
Organisations	1: Melnikov Permafrost Institute SB RAS 2: Institute of Earth Sciences, St. Petersburg University 3: Perm State University
Country	Russian Federation
Region	Eurasia
Title	Distribution Of Groundwater Aufeis In The Mountains Of The North-East Of Russia According To Historical And Satellite Data.
Keywords	Aufeis, Permafrost, Groundwater, Climate Change, North-Eastern Russia
Туре	List Of Focus Session
Focus Session ID	72



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Aufeis (naled, in Russian) is a specific form of seasonal glaciation that is typical for Abstract mountainous permafrost environment. The area of aufeis fields can be measured in tens of square kilometres, and the ice thickness may reach 10-12 m. The distribution of the aufeis is closely related to the structure of the relief, with its dissection and morphological features of river valleys in the region. The goal is to assess the distribution of groundwater aufeis (area from 0.01 to 81.1 sq.km) by elevation that forms in the river valleys of the North-East of Russia using historical and modern data. The study used the data of the Cadastre of aufeis at the North-East of the USSR (1958), which was the first data generalization accounting for aufeis and their characteristics for the study area. Aufeis detection in current climate was conducted based on the Landsat-8 OLI satellite images, from 2013 to 2019, late spring images were selected to detect the maximum possible number of aufeis fields and their maximum area. The results suggest an irregular distribution of aufeis by elevation which does not relate to the size of aufeis. For large rivers of the North-East of Russia, such as the Indigirka, Yana, Kolyma, Anadyr and Penzhina, the aufeis belt is found in the altitudes of 1100-1200, 800-900, 700-800, 300-500 and 400-600 m correspondingly. The upper boundary of the seasonal glaciation is located within the heights of 1500-2000 m. The lower boundary lies at the level of 100 m, but in some basins, it can rise up to 700 m. Below these elevation, the slopes of river valleys' profile significantly decrease and do not fulfil the conditions for the release of groundwater to the surface for the formation of aufeis. In general, the aufeis distributions by elevation as assessed with the Cadastre (1958) and Landsat data are guite similar, although there are some differences that are elevation-specific. At lower elevations the number of aufeis according to Landsat data is higher than presented in the Cadastre (1958). At the upper elevations, more aufeis are identified in the Cadastre data than by recent satellite images. Changes of aufeis morphometric characteristics with the elevation may reveal the dynamic of other processes and their transformation due to climate change impact, such as permafrost, groundwater, etc. Support. RFBR projects 20-05-00666 and 19-55-80028, SPbU project id75295776.