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VEGETATION MAPPING AND ESTIMATION OF REGIONAL CH₄ EMISSION FOR TAIGA-TUNDRA BOUNDARY IN EAST SIBERIA

Tomoki Morozumi (*Graduate school of Environmental Science, Japan*)

Ivan Bragin (*Far East Geological Institute FEB RAS, Russian Federation*)

Ryo Shingubara (*Graduate school of Environmental Science, Japan*)

Shinya Takano (*Graduate school of Environmental Science, Japan*)

Shunsuke Tei (*National Institute of Polar Research Japan, Faculty of Environmental Earth Science, Japan*)

Trofim C. Maximov (*Institute for Biological Problems of Cryolithozone SB RAS, Russian Federation*)

Atsuko Sugimoto (*Faculty of Environmental Earth Science, Japan*)

both-horns@ees.hokudai.ac.jp

Air temperature in the arctic is rising more rapidly than the global mean, which is called Arctic amplification. Temperature rise may cause a vegetation change and it is believed that the tree line will move northward in Taiga-Tundra boundary. CH₄ has a strong greenhouse effect, which is emitted from wetlands. Hence, one of the major factors controlling spatial CH₄ emission is vegetation type ¹(Bartlett *et al.* 1992). We observed CH₄ emission from fen vegetation at our observation site, KODAK, which is one of the GRENE-TEA site and locates in Indigirka river lowland near Chokurdakh.

The objective of this study is to classify land cover vegetation for estimation of regional CH₄ flux emission. Field observation of vegetation and CH₄ flux were mainly conducted in summer from 2013 to 2014. To make a vegetation map (10 x 10km), we first conducted an in-situ visual observation and then up-scaling by remote sensing approach with aerial photographs and satellite images. Aerial photographs were taken for the area 200 x 400m and identified the vegetation type was identified with the reference of in-situ observation. High resolution multispectral images by satellite (WorldView-2) were used for classification by supervised with the result from aerial photographs. Vegetation is classified into 8 classes taking various aspects into consideration such as dominant species, soil moisture and reflectance feature. Using coverage ratio of each vegetation, regional CH₄ emission was calculated on the basis of the observed data by chamber method. Our result shows that cotton-sedge wetland vegetation contributes to 3/4 of total CH₄ emission in this region.

¹Bartlett, K. B., Crill, P. M., Sass, R. L., Harriss, R. C., & Dise, N. B. (1992). Methane emissions from tundra environments in the Yukon-Kuskokwim Delta, Alaska. *Journal of Geophysical Research*, 97, 16645–16660.