A06-P06

INTERANNUAL VARIATION IN CH4 EFFLUX AT TAIGA-TUNDRA BOUNDARY ON THE LOWLAND OF INDIGIRKA RIVER

Ryo Shingubara *(Hokkaido University, Japan)*
Atsuko Sugimoto *(Hokkaido University, Japan)*
Jun Murase *(Nagoya University, Japan)*
Shunsuke Tei *(National Institute of Polar Science, Japan)*
Shinya Takano *(Hokkaido University, Japan)*
Tomoki Morozumi *(Hokkaido University, Japan)*
Go Iwahana *(Hokkaido University, Japan)*
Trofim Christoforovich Maximov *(Institute for Biological Problems of Cryolithozone, Russian Federation)*

shingu_bara@ees.hokudai.ac.jp

Natural wetlands, as the largest source of atmospheric CH_4, are considered to be the main driver of the interannual variation in global CH_4 emission [*Cias et al., 2013, IPCC AR5*]. Under the amplified warming Arctic wetlands might change in the CH_4 emission. Controls on the CH_4 efflux, such as water level, soil temperature and vegetation have been found [*Olefeldt et al., 2013*], while the quantitative relationship between the environmental factors and CH_4 efflux can vary from region to region [*Turetsky et al., 2014*]. Indigirka Lowland in the Northeastern Siberia has wetlands in a taiga-tundra boundary on permafrost, possibly sensitive to the climate change. There we assessed year-to-year variation of chamber CH_4 efflux from 2009 to 2013 near Chokurdakh (70.62 N, 147.90 E), aiming to understand the variation based on processes.

Active CH_4 emission was observed at wet areas of *Sphagnum* moss or sedge, while not at dry tree mounds. Wet event occurred in 2011 with the highest precipitation [*Jones & Harris, 2013, CRU TS3.21*] and CH_4 efflux at wet areas increased from 2009 and 2010 to 2011. After 2011 till 2013 water level at wet areas decreased, while high CH_4 emission continued. In addition, CH_4 efflux in 2012 and 2013 were higher than in 2011 at the same soil temperature. Dissolved CH_4 concentration in soil pore water was also higher in 2012 and 2013. This increase of CH_4 efflux may be explained by depressed CH_4 oxidation and/or increased CH_4 production. Low delta-D values of the dissolved CH_4 observed in 2012 also supported the low CH_4 oxidation. These results imply slow process of soil reduction and that high water level in 2011 caused increase in CH_4 efflux over years in 2012 and 2013.