

## Seasonal variation of wetland carbon dioxide and methane fluxes measured by automatic chambers at the Bakchar bog, West Siberia

\*Shamil Maksyutov<sup>1</sup>, Alexandre Fofonov<sup>2</sup>, Denis Davydov<sup>2</sup>, Oleg Krasnov<sup>2</sup>, Tadanobu Nakayama<sup>1</sup>, Mikhail Glagolev<sup>3</sup>

1. National Institute for Environmental Studies, 2. V.E. Zuev Institute of Atmospheric Optics, 3. M.V. Lomonosov Moscow State University

Wetland CO<sub>2</sub> and CH<sub>4</sub> fluxes were observed at the Bakchar bog (N56°, E82°), West Siberia. Measurements were performed by two solar powered automated systems, each consisting of NDIR Li-820 CO<sub>2</sub> analyzer, an SnO<sub>2</sub>-based methane sensor, six static chambers installed along transects, the air drying and distribution unit, and a datalogger. Observations were made during the May to October period in 2014 to 2017 at two types of open wetlands: mesotrophic open bog and patterned wetland with forested ridges, flat hollows and water pool. Each chamber is automatically opened and closed with pneumatic actuator. Water level is measured in the wetland and surrounding forest locations. Net uptake of CO<sub>2</sub> is observed from the beginning of June through the end of August with a maximum from mid-June through the end of July. Seasonal pattern of methane fluxes showed that CH<sub>4</sub> emission increases at the beginning of June, then weakens gradually in autumn. Seasonal variation of the emissions correlates well with the soil temperature at 5-10 cm depth. Carbon dioxide and methane fluxes correlate spatially; higher methane emissions are observed at wet mesotrophic locations with higher photosynthesis/respiration rates. Lower CH<sub>4</sub> emissions were observed on oligotrophic patterned wetland.

Keywords: methane emissions, wetland, Siberia, CO<sub>2</sub> fluxes