



Observations of wetland methane fluxes in West Siberia with automated chamber system

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An automatic sampling and analysis system for measuring methane and CO₂ fluxes from soil was developed and applied to the flux measurements at boreal wetland near Plotnikovo, Tomsk region in the southern part of West Siberia in 2012. Measurements were performed on mesotrophic open bog at the bog periphery. Solar powered automated system is used to open and close six static chambers equipped with air actuators. Analysis system uses semiconductor sensor for methane and NDIR for carbon dioxide. Air and soil temperatures, as well as groundwater table are recorded. Seasonal variations of the emissions summarized as weekly mean fluxes correlate well with soil temperature. Season-high fluxes vary from 3.9 to 22 mgCH₄/m²/h between chambers. The vegetation map created from high resolution aerial photos and ground survey data was used for analysis of the spatial flux distribution. The methane and CO₂ fluxes appear clearly related to the vegetation and soil conditions. Higher emission rates are observed over waterlogged surfaces with presence of sedge and cotton-grass while lowest emission rates correspond to dry hummocks.