Geophysical Research Abstracts
Vol. 17, EGU2015-9935, 2015
EGU General Assembly 2015

Do Russian boreal peatlands dominate the natural European methane budget?

Julia Schneider (1), Hermann F. Jungkunst (1), Ulrike Kerstin Wolf (2), Peter Schreiber (3), Michal Gažovič (4), Mikhail Miglovets (5), Oleg Mikhaylov (5), Dennis Grunwald (6), Stefan Erasmi (6), Martin Wilmking (7), and Lars Kutzbach (3)

(1) University of Koblenz-Landau, Institute for Environmental Sciences, Geoecology/Physical Geography, Landau, Germany (schneider_julia@uni-landau.de), (2) Thünen Institute of Climate-Smart Agriculture, Bundesallee 50, 38116 Braunschweig, Germany, (3) Institute of Soil Science, Klima Campus, University of Hamburg, Allende-Platz 2, 20146 Hamburg, Germany, (4) Department of Forest Ecology and Management, Swedish University of Agricultural Sciences, Skogmarksgränd, SE-90183, Umeå, Sweden, (5) Institute of Biology, Komi SC UrD RAS, 28 Kommunisticheskaya st., 167982 Syktyvkar, Komi Republic, Russia, (6) Institute of Geography, Georg-August University of Göttingen, Goldschmidtstr. 5, 37077 Göttingen, Germany, (7) Institute of Botany and Landscape Ecology, Ernst Moritz Arndt University Greifswald, Grimmer Straße 88, 17487 Greifswald, Germany

Methane (CH4) emissions of boreal peatlands have previously been reported from Alaska, Canada, Scandinavia, and Western Siberia, but not from the European part of the Russian Federation, which is covered by vast areas of peatlands (8 % of the total surface area). To help to fill this research gap, CH4 emissions were measured during a period of one year from March 2008 to February 2009 in a boreal peatland (61°56'N, 50°13'E) in the Komi Republic, European Russia using the closed chamber technique. Additionally, soil water for analysis of dissolved CH4 and dissolved organic carbon was sampled once per month. Further closed chamber measurements were conducted during the summer 2011.

While winter fluxes were well within the range of what has been reported for the peatlands of boreal regions before, the summer fluxes exceeded by far the average of 5-80 mg CH4 m-2d-1 for the boreal zone, as about the half of the measured fluxes ranged between 150 and 450 mg CH4 m-2d-1. There was no evidence that high or low CH4 surface fluxes coincided with high or low values of dissolved CH4 in the soil water.

In statistical terms, the environmental conditions during the year 2008 were normal, the air temperature and the precipitation did not show strong deviations from the long term mean. Whereas the summer of 2011 was warmer and noticeable drier than the long term mean. These conditions led to even higher CH4 emissions, with peaks up to seven times higher than the values measured in 2008.

These new data sets lead to the assumption that the Russian boreal peatlands play an even more important role in the European CH4 budget than previously thought and should be included into the newest inventories.