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Methane emission observations and inventory for West Siberian mires
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West Siberia is one of the most paludified regions in the world with the mire area of 68.5 Mha. Since the previously published estimations of the regional CH4 flux varied widely from 2 to 22 MtCH4yr^{-1}, long-term and large-scale investigations of CH_4 emission were established to complement existing data. About 1900 methane flux measurements were made during the summer-autumn of 2007-2010 by a static chamber method. Seasonal variation is observed at one site with automatic chambers for various micro-landscapes. All variety of wetland types was reduced to 8 micro-landscape types: palsas, peat mats, ponds, forested bogs, fens, poor fens, oligotrophic hollows and ridges. Mire micro-landscapes of 36 key sites distributed in 7 zones of West Siberia were observed. Emission data were generalized into a spatial emission model based on a fractional area coverage map of mire micro-landscapes, methane emission periods for each zone and methane flux probability density distributions for each micro-landscape type in these zones. The methane emission map with the resolution 0.5x0.5 deg was created. It was confirmed that palsas, forested bogs and ridges had the lowest methane fluxes (1st/2nd/3rd quartiles are -0.04/0/0.05 mgCH_4m^{-2}h^{-1} for palsas, 0.06/0.26/0.7 mgCH_4m^{-2}h^{-1} for forested bogs, 0.01/0.28/0.67 mgCH_4m^{-2}h^{-1} for ridges) while the peat mats and non-forested mires had the highest ones (2.05/4.1/5.89 mgCH_4m^{-2}h^{-1} for peat mats, 1.23/2.84/5.55 mgCH_4m^{-2}h^{-1} for fens combined with poor fens and oligotrophic hollows). Very high fluxes, reaching hundreds of mgCH_4 m^{-2}h^{-1}, were observed in some ponds (1.44/7.85/33.84 mgCH_4m^{-2}h^{-1}). The version Bc8 of the model estimates the total flux from all Western Siberia mires at 3.91 MtCH_4yr^{-1}.

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