Geophysical Research Abstracts,
Vol. 10, EGU2008-A-00541, 2008
SRef-ID: 1607-7962/gra/EGU2008-A-00541
EGU General Assembly 2008

Land-cover classification for inventory of the methane fluxes in west Siberian wetlands

1. **Peregon** (1,2), S. Maksyutov (1), A. Naumov (2) and M. Glagolev (3)

(1) Center for Global Environmental Research, National Institute for Environmental Studies, Onogawa, Tsukuba, Japan (anna.peregon@nies.go.jp), (2) Institute of Soil Science and Agrochemistry SB RAS, Novosibirsk, Russia, (3) Moscow State University, Russia.

It is known that the boreal wetlands play an important role in a global carbon cycle. In particular, they sequester the atmospheric carbon in peat deposits and release methane to the atmosphere. Since a general classification of boreal and sub-arctic wetlands in Siberia does not exist to date and only crude representation of the land cover is used as a base for global modeling, the real contribution of wetlands to the land-atmosphere interactions remains uncertain. We applied a multi-scale approach to make a general and realistic estimation of land cover in western Siberia (WS), which can be used in the models of ecosystem carbon dynamics and inventory of methane emission in wetlands.

We produced a regional-scale inventory of the wetland area by digitizing a paper-based "Wetland typology map" (1:2,500,000), in which the entire area of WS is divided into 20 wetland types and complexes. The digitized map was further refined by manual classifications based on satellite imagery to provide more details on spatial structure of the patterned peatlands, which are widely distributed in the boreal region of WS. For this purpose, we chose five test sites of about 5000 to 7000 km^2 according to the climatic gradient of distribution of the major wetland types. The satellite images with medium spatial resolution (LANDSAT TM, ETM+ from Global Land Cover Facility, *glcf.umiacs.umd.edu/*) were processed via the visual interpretation in the scale of 1:200,000. At this stage, the areas of the test sites were classified into 10 wetland classes, in contrast to previously prepared regional scale map that used only 3 classes within the boreal region.

We obtained in-situ data on CH_4emission from the field campaigns and also from available literature sources, and prepared a dataset that is comprised of the fluxes from a wide range of wetland micro-landscapes (i.e. ridges, hollows, hummocks, etc.). In our work, the ground-survey data were scaled up in order to represent an average value for a particular site of wetland. For this purpose, the fractional area coverage of each micro-landscape element composing the vegetation mosaic in patterned peatlands was estimated using high resolution satellite images. We produced a set of 10-12 small key areas (0.25-0.35 km^2) per Landsat scene, where the total area of each micro-landscape, average fraction and their standard deviations were calculated automatically in GIS system.

Finally, we produced a regional estimate of the methane fluxes based on this new land-cover map with micro-landscape area fractions. Our results demonstrate that understanding the structure of wetland ecosystems is critical for quantifying the spatial distribution of trace gas fluxes.