



## **Evolution of soil and vegetation cover on the bottom of drained thermokarst lake (a case study in the European Northeast of Russia)**

Dmitry Kaverin and Alexander Pastukhov

Institute of Biology, soil science, Syktyvkar, Russian Federation (dkav@mail.ru, +7 8212 240163)

The evolution of soils and landscapes has been studied in a lake bed of former thermokarst lake, which was totally drained in 1979. Melioration of thermokarst lakes was conducted experimentally and locally under Soviet economics program during 1970-s. The aim of the program was to increase in biomass productivity of virgin tundra permafrost-thermokarst sites under agricultural activities. The former thermokarst lake “Opytnoe” located in the Bolshezemelskaya Tundra, Russian European Northeast. The lake bed is covered by peat-mineral sediments, which serves as soil-forming sediments favoring subsequent permafrost aggradation and cryogenic processes as well. Initially, after drainage, swampy meadows had been developed almost all over the lake bed. Further on, succession of landscape went diversely, typical and uncommon tundra landscapes formed. When activated, cryogenic processes favored the formation of peat mounds under dwarf shrub - lichen vegetation (7% of the area). Frost cracks and peat circles affected flat mounds all over the former lake bottom. On drained peat sites, with no active cryogenic processes, specific grass meadows on Cryic Sapric Histosols were developed. Totally, permafrost-affected soils occupy 77% of the area (2011). In some part of the lake bed further development of waterlogging leads to the formation of marshy meadows and willow communities where Gleysols prevail. During last twenty years, permafrost degradation has occurred under tall shrub communities, and it will progress in future. Water erosion processes in the drained lake bottom promoted the formation of local hydrographic network. In the stream floodplain grassy willow-stands formed on Fluvisols (3% of the area). The study has been conducted under Clima-East & RFBR 14-05-31111 projects.