Geophysical Research Abstracts
Vol. 15, EGU2013-2733, 2013
EGU General Assembly 2013


# Rimmed depressions in the central part of the East-European Plain

Alexander Makkaveev (1) and Vadim Bronguleev (1)

(1) Institute of Geography RAS, Moscow, Russian Federation (geomorph@rinet.ru), (2) Institute of Geography RAS, Moscow, Russian Federation (bronguleev@gmail.com)

During recent years, in the Moscow region we found and analyzed several isometric lake or bog basins, surrounded by ramparts, which have a strong resemblance to the remnants of degraded pingo (though they are mainly of a larger size) or to meteoritic craters. In this region such landforms have not been described earlier, except one, which is considered to be an astrobleme, although this is not yet definitively established. The catalogue of these depressions was made; it contains their basic morphometric characteristics and geological-geomorphological positions. The total number of rimmed depressions in this region is about 30. The diameters of ramparts vary from 300 to 2000 m, their height – from 1 to 10 m, depth of basins – from several to several tenths of meters. They are mostly located on the low fluvioglacial plains, glaciolacustrine lowlands, and river terraces which territories are situated mainly within the marginal zone of Moscow glaciation.

We analyzed several cross-sections of the ramparts; their structures indicate the existence of several types of their origin. For instance the rampart of the lake Svetloye consists of layered sandy sediments accumulated obviously by fluvial processes under variable hydrodynamic conditions. The mechanism of such rampart formation was suggested. It was supposed that the lake, apparently of karst origin, had existed there before the Moscow Ice Age. It was overlaid by the thin edge of the ice shield. As a result there intraglacial lake was formed, bounded by the ice walls. At their foot deposits of ice water were accumulated; after the ice melting they formed the rampart surrounding the lake basin.

Rampart of the lake Krasnoye (the small one) consists of the deposits deprived of a clear layering, with lumpy structure, which are similar to that of solifluction-deluvial deposits. This form is located on a level surface of terrace and the only slopes from which these deposits might slide down could be the slopes of large pingo existed here in cold conditions of the Last (Valdai) Ice Age. Remnants of ancient pingo are widespread in Europe and North America, but in the center of the East European Plain such a large form is discovered for the first time.