

Proof



CONTROL ID: 1795692

TITLE: Urban Landscapes on Permafrost: Oganer Case Study

ABSTRACT BODY: Norilsk with a population of 205,000 is by far the biggest city ever built on permafrost. Oganer, located near Norilsk is the latest administrative unit of the city with a population of about 7,000 people. It was originally designed as a satellite city for about 50-80 thousand workers and their families. Idea of a satellite city became apparent in mid-80th, when Norilsk was unable to grow to extent needed to accommodate large workforce. Located in a valley, the city was already surrounded by two metallurgy plants and steep mountains slopes. The only direction of city limit extension was east, but the area was previously occupied by garages and barracks resulting in deterioration of cold permafrost and decrease in high bearing capacity of the ground required for construction of large residential houses. Oganer was built 8 km east from the Norilsk, where initial geologic survey shown close location of bedrock to the surface making possible construction of large structures on permafrost. First houses were built in 1986 according to the passive principle of construction on permafrost. Additional geologic surveys in Oganer revealed that original bedrock extent is quite small and subsequent construction had to deal with ice-reach (40-60%) permafrost in fine-grained sediments (silt and clay). The change in economic direction in the beginning of 1990s resulted in population outmigration from Norilsk, so Oganer originally planned as a large 5-district city was never complete. Presently, it is represented by only one district, with several 9-storey tall buildings which were never complete. Despite that mean annual temperature is -9.7 C, permafrost temperature is relatively warm -1..-3 C. High permafrost temperature, presence of ground ice and large bodies of tabular ground ice in the area made construction quite challenging. In the paper we demonstrate how climate and various construction practices and designs used in the city modified natural landscapes, and how periglacial processes, such as thermokarst and frost heave in turn reacted on those changes affecting roads, utility lines, buildings and structures.

CURRENT SECTION/FOCUS GROUP: Global Environmental Change (GC)

CURRENT SESSION: GC049. Environmental, Socio-Economic and Climatic Changes in Northern Eurasia and their Feedbacks to the Global Earth System

INDEX TERMS: 0702 CRYOSPHERE Permafrost, 0760 CRYOSPHERE Engineering, 0710 CRYOSPHERE Periglacial processes.

AUTHORS/INSTITUTIONS: D.A. Streletskiy, Department of Geography, The George Washington University, Washington, District of Columbia, UNITED STATES;

V.I. Grebenets, Faculty of Geography, Lomonosov Moscow State University, Moscow, RUSSIAN FEDERATION;

CONTACT (E-MAIL ONLY): strelets@gwu.edu

TITLE OF TEAM:

(No Image Selected)

(No Table Selected)

PRESENTATION TYPE: Poster Requested