Permafrost observations in Russia: current status and further needs.

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Russia has the longest history of permafrost observations, which may be traced back to the 19th century. In 1844 the famous explorer of Siberia Middendorf organized the first periodic ground temperature measurements in 116.4 m deep shaft (so-called Shergin's well) in Yakutsk. The second phase of permafrost observations begins with the extensive exploration of Siberia in the late 19th – beginning of the 20th century. It was mainly targeted at serving the needs of engineering and construction on the frozen ground. The comprehensive review of the early Russian observations (until the beginning of the 20th century) is given by N.Shiklomanov (2005). In 1960 – 1980 systematic observations of many permafrost parameters were conducted by Yakutsk Permafrost research institute at selected locations representing various topographic, climatic, vegetation and snow conditions. Most of these observations were discontinued in the late 1980th with the collapse of the former Soviet Union.

Currently Russia participates and contributes to the Circumpolar Active Layer Monitoring project (CALM). There are more than 20 cites located in the near-coastal zone in the Russian Arctic. Most records are short, only few sites have more than 10 years of continuous observations. Locations of Russian sites and the data are available at the CALM web site http://www.udel.edu/Geography/calm/.

Alternative source of information about the thermal state of permafrost is ground temperature measurements at Russian weather stations. The measurements are taken at depths up to 3.2 m. In late 1990th efforts were made to digitize these data and now records of the ground temperature from ca. 60 stations are available. The period of observations differs by station but typically is begins in early 20th century and ends in 1960, some stations have been extended until 1990.

Temperature observations in boreholes are currently under development in Russia as part of the international GTN-P project. Although several boreholes have been selected as candidates for this project no data are available so far.

The common problem of Russian permafrost observations is that they were conducted at different sites using different methodologies and techniques. Very often meta data and auxiliary climatic, soil and vegetation data are not available. Observations are sparse, conducted at randomly selected locations and do not represent the whole range of variability of permafrost conditions at various climatic, vegetation, and topographic zones.

Shiklomanov N.I. From Exploration to Systematic Investigation: Development of Geocryology in 19th- and Early–20th-Century Russia // Physical Geography. 2005. №4. P. 249-263.