

KOLYMA WATER BALANCE STATION – UNIQUE RESEARCH STATION IN THE ZONE OF CONTINUOUS PERMAFROST: HALF CENTURY HISTORY AND FUTURE PERSPECTIVES

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In the former USSR the network of hydrological research watersheds (water-balance stations) with standard program of observations existed. The data of water-balance stations served as the basis for complex studies of hydrological processes and development of methods to estimate design-flood characteristics in different climate regions.

The Kolyma Water Balance Station (KWBS), 21.2 km², was found in 1948 in the upper Kolyma River basin in the zone of continuous permafrost with mountainous relief. Soil thaw depth varies from 20 cm in bogged lowlands to more than 3 m at south-oriented rocky slopes. Landscape conditions and runoff regime of the KWBS are representative for vast territories of the North-Eastern Russia.

Extent program of standard hydrometeorological and special research and experimental observations were carried out at KWBS within 1948 to 1997 years. They included observation on heat and radiation balance, meteorological components and runoff, thaw/freeze processes and soil temperature, groundwater depths in wells, evaporation from soil cover, snow surveys in different landscapes, water balance studies at special plots and many other. More than thirty cryopedometers, twenty six precipitation gauges, seven discharge gauges, two water balance plots functioned at previous period. The data of long-term measurements was supported by detailed description of natural conditions enabling to study the interactions of particular hydrological processes with landscape components.

Starting from 1997 all special studies were ceased and nowadays the observational program of the KWBS has kept only one running meteorological station and supposedly several runoff gauges.

Collected for more than 50 years data are invaluable for building and testing the models of different types: runoff formation, climatic, environmental, vegetation dynamics. There is an urgent need to restart the studies at the Kolyma station due to increased interest to natural processes of the Arctic. The KWBS data if prolonged could become effective indicator of climate changes and the basis for the study of their impact on state of permafrost and hydrological regime.

The attention of international scientific community to unique research station with long and rich history could help to rebuild it and continue the mission of science.