## **RR7.** Water and Salt balance in Alas ecosystems in Central Yakutia

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## Abstract

Approximately 30% of the Cetral Yakutian territory is covered by grasslands called Alas which were formed 4000-5000 y BP. Their formation is related to water accumulation in small depressions that change the thermal regime of the underlying ground, producing thawing of the permafrost. The objective of this study is to evaluate the present role of alas in the water balance and its influence on the epigenetic salt accumulation of alas. Short-term flux and long-term meteorological measurements were carried out in an 800 by 600 m alas ecosystem. Pond water level and salinity changes were also monitored seasonally. A complete topographical survey as well as changes in pond area was also done. Soil sampling at different relative height levels were carried out in the dry area of alas where salt accumulates.

Evapotranspiration from alases during the summer period is higher in forest than in alas. The flow of water in spring to alas is high after snow melting starts and the soil is frozen. Water level of the pond decreased 27 cm from the time after snow melting to pond water initial freezing. Salinity in the pond increased 5 folds (EC: 0.1-0.5 mScm<sup>-1</sup>) accordingly until the end of June when it continued rather stable despite changes in water level. During this period, chemical composition of water shows drastic increase. The seasonal thawing of water and soil layers beneath the pond released salts that migrate to the bottom when pond water freezes.

The findings of this study suggests that first the dry area of alas absorbs most of the incoming water and salts, and second the wet area of alas surrounding the pond has low salt content and it is during most of the season water saturated. Thus, our conclusion is that water coming to the pond from upper areas can only occur during snow melting when the active layer forms an impermeable layer in its frozen condition. During summer runoff flows into alas only when rainfall intensity exceeds the soil infiltration rate.