



Polygonal tundra soil water balance and changing climate - Lena Delta, Siberia

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The upper few meters of the ground in permafrost regions control energy and moisture exchanges between the Earth and its atmosphere. Warming surface and permafrost temperatures are resulting in dramatic changes to this layer, such as changes in lake abundance and area in Siberia and thermokarst activity in Alaska. In this context, we ask, "What is the sensitivity of the water budget at a polygonal tundra site in the Lena River Delta, Siberia to changes in atmospheric forcing?" Multidisciplinary environmental research has been carried out since 1998 on Samoilov Island, Lena River Delta, which lies within the zone of continuous permafrost and is covered by polygons. We measure the tundra soil's water balance to investigate the observed high interannual variability in soil moisture levels. Measurements include precipitation, unfrozen soil water content profiles and evapotranspiration. A multiyear record of the components of the soil profile water budget is discussed with respect to the extreme hydrological events of the summer of 1999, which was dry enough to desiccate the normally saturated polygon center, and of the very wet summer of 2003.