



The thermal regime beneath cultural blocky materials: Ground temperature measurements in and around the Scythian Kurgans of the Russian Altay Mountains.

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During historical times, the Altay Mountains were repeatedly occupied by several, mainly nomadic, cultures. Among them were the Scythians who lived in the area (and far beyond), from the 8th until the 2nd century BC. This culture is widely known for their specific burial rituals, including the burying of their death in a kurgan: a burial mound consisting of a coarse debris surface layer, overlaying a burial chamber. Due to this composition, together with the continental alpine climate of the Altay Mountains, several of these graves were found frozen, thanks to the existence of ice lenses and permafrost beneath the structures. If frozen, these kurgans contained well preserved bodies, often with the tattoos on their skin intact.

As nowadays a distinct temperature rising is showed in these continental mountain ranges, the hundreds of kurgans, and especially these ones located at the lower fringe of the permafrost area, are likely to defrost within decades. As a result, the valuable, frozen, organic and inorganic content will get lost, resulting in a loss of extremely valuable cultural heritage and knowledge. Therefore, extensive permafrost research regarding the thermal state of the frozen tombs and the spatial distribution of the mountain permafrost is necessary to forecast which of the tombs are endangered by thawing.

In the framework of this project a first expedition was organized in the Russian Altay Mountains during the summer of 2008. During this expedition, the valleys of Dzhazator, Tarkhata, Kalanegir and Ulandryk were visited in succession and temperature installments were made in order to give an overview of the thermal regime in the area. Beside installments intended for regional modelling, special sensors were placed in order to focus on the specific thermal regime related to the Scythian kurgans.

This poster gives the first results of the temperature data as recorded by sensors located in and around the burial mounds. At first attention is given to the difference in surface thermal regime between the kurgans and their immediate vicinity and differences with comparable natural surfaces (e.g. rock glaciers, blocky talus). Furthermore the first results of an archaeological/periglacial experiment carried out in the Ulandryk Valley are outlined: an in 1972 excavated kurgan, reconstructed by archaeologist A.V. Ebel (Gorno Altaisk State University) in 2008, and equipped with temperature sensors, allowed us to simulate relative temperature anomalies comparable to the situation created after an original Scythian burial ritual. Measurements were performed inside and just outside the kurgan at several depths and clearly showed the dramatic temperature lowering effect during winter months. Finally also the different installations at the Ukok-Plateau, an area known for its frozen burial mounds, made during the 2009 expedition are outlined and discussed.