



## **A frozen slope formation as a permafrost record of Holocene environmental and climate change in Chukotka, NE Siberia**

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Frozen sedimentary sequences and ground ice phenomena such as wedge ice, segregated ice, and texture ice serve as valuable indicators of environmental dynamics in Late Pleistocene to Holocene time at impact crater Lake El'gygytyn area, Chukotka, NE Siberia. The stratigraphy of a prominent accumulative five-meter terrace was analysed using dating, sedimentology, mineralogy, single grain surface microscopy, stable isotope (oxygen, deuterium) and hydrochemical techniques, as well as ground penetrating radar. Active ice wedges contained in the slope formation were sampled, in addition. The results show climate dependent sediment properties for the time of slope sedimentation. Stable oxygen isotope signatures and composition of light soluble cations within supernatant texture ice shows prominent relative maxima and minima. They are associated with more humid and more arid phases during the terrace formation. Single grain surface textures reveal tracks of cryogenic weathering. Increased mobility of sedimentary permafrost deposits during the current interglacial period is documented in higher sedimentation rates at the slopes during early Holocene time, a time when regional summer temperatures throughout Beringia are known to have been much warmer than present. Finally, a conclusive sedimentation model is given. It illustrates solifluctional terrace formation during interglacial time at a continental permafrost site.