



Permafrost dynamics in Iceland between 18 ka BP and today – model results and geomorphological implications

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Periglacial processes and the dynamics of permafrost is a decisive factor for slope stability locally, and for understanding landscape development over longer time scales. Iceland has a highly dynamic landscape because of young bedrock and associated high geomorphological process rates, leading to large material production and frequent gravitational processes in the present periglacial realm. At present, permafrost in Iceland is widespread in mountain settings over c. 800 m a.s.l. and sporadically in palsa mires in the central Highlands. However, during the late Pleistocene and Holocene, the periglacial environment in Iceland must have varied strongly in time and space, with subsequent imprint in the landscape. To evaluate the dynamics of permafrost in Iceland since the onset of the last deglaciation, we used the forcing and output of a 3D, time-integrated ice sheet model to run a transient permafrost model (CryoGRID 2) between the onset of the last deglaciation (c. 18 ka BP) until today. The permafrost model was forced by either modeled sub-glacial temperatures if ice-covered, or air temperatures if the area was deglaciated. The results give insights into the possible age of permafrost in Iceland, distinguish areas with wide-spread paleo-permafrost and let us determine the persistence of permafrost in the different areas. The presentation discusses these results in the light of periglacial processes, landforms and landscape development.