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New aspects of Bavarian forest glaciation

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The Bavarian forest is located at the southeastern German-Czech border as a part of the Central European Uplands, and forms a spatial link between the Pleistocene ice masses nourished in the Alps and in Scandinavia. The upland has summits rising up to 1450 m a.s.l. which has been high enough for Quaternary glaciations.
Investigations carried out over the last century, have concluded that valley glaciers have been present around the mountains higher than 1300 m a.s.l.
In a project concerning the Bavarian glacial history we have investigated the Haidel Mountain area, close to the German-Czech-Austrian border point, and used a glacier mass balance model for simulating the palaeo-climate. The Haidel Mountain reaches 1165 m a.s.l. (and is located in between two mountains reaching higher than 1300 m a.s.l.) and is therefore an interesting location for studying the elevation limits for former glaciers. Moraine ridges exist on both the eastern and western slopes of Haidel down to 860-900 m a.s.l. We have used ice surface profile models with the moraines marking a minimum extent of former glaciation and these models indicate that the top of the mountain was ice covered. To relate our findings of glacial traces to climate shifts we have used a high resolution mass balance model for an area of ca. 15000 km2 in Central Europe. The mass balance model yields positive mass balance for Haidel with a temperature decrease of 12 K, when also the higher Bavarian mountains Lusen and Rachel have positive mass balance areas of reasonable size for their documented glacial traces. Our investigation shows that palaeo-glaciers have developed in the Bavarian forest forming a link between the extensive ice masses over Scandinavia and the Alps. The ice surface profiles, based on data from contemporary glaciers, shows that the Bavarian forest mountain peaks have most likely been covered by small ice-fields – an aspect previously never reported. Furthermore, our basic mass balance model approach shows a simple way of getting climate constraints from glacial geological data.