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Quaternary landforms and sediments in the southern Black Forest

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The Bergsee lake is a favoured and important recreation area due to its special glacial geomorphology and is promoted by the city of Bad Säckingen. For current landscape architecture it is essential to be aware of the glacial past and to be appreciative of the materials originated during the last ice age.

During the Riss ice age large parts of Switzerland and south-west Germany have been covered with glaciers oncoming from the Alps and the Black Forest. Various extensions are investigated and described in detail. The extent of the frontal moraine of the Rhein-Aare-glacier (Riss ice age) appears to be certain while the northern extension and the confluence with glaciers from the Black Forest and the associated landforms are still disputed.

The Bergsee lake is located in a Quaternary landscape, situated south-west of the Black Forest near to Bad Säckingen in the Rhine valley, Germany. The bedrock is composed mainly of gneisses, granites and Permian clastics and is covered by a thin layer of Quaternary deposits. The Bergsee lake and the surrounding valley system presumably were formed in the Riss ice age. The valley system is assumed to consist of subglacial channels with unequilibrated gradients and very steep valley flanks. The geometric alignment of the channels is non-uniform and their size and incision can hardly be explained by discharge generated in their catchments. To understand the development of the valley system it is necessary to know the exact extent of the Riss-Glacier. Various explanations about the stages exist.

In this study we conducted geomorphological mapping and analysed physical and geochemical parameters of sediments (e.g. Quaternary weathered loess-sediments, pebbles and periglacial debris cover). The oldest sediments in the Bergsee lake were dated to 29'110 years BP, while Radiocarbon dating of snails found in the surrounding loess deposits resulted in an age of more than 14'000 years BP. This suggests that the sediments were rearranged during the Würm ice age. The most important formation of landscape, however, took place during the Riss ice age. As a consequence, geoecologic conditions are highly variable and have to be considered in environmental management.