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Influence of geomorphic setting on sedimentation of two adjacent alpine lakes, Triglav Lakes Valley (Julian Alps, NW Slovenia)

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The Triglav Lakes Valley is elongated, 7km long depression, located high (at places over 2000 m.a.s.l.) in the central part of the Julian Alps (NW Slovenia). It hosts 6 small isolated lakes that formed due to the combination of Neogene tectonic and Pleistocene glaciation. The study is focused on the 5th and 6th Triglav Valley Lakes that characterize lower part of the valley. The lakes are located so close to each other that they are even connected in times of high water. Thus, they share the same bedrock geology, are subjected to the same climatic forcing and share similar vegetation communities. Despite their proximity, the lakes differ in their hydrologic and geomorphic setting. The lakes have no permanent surface tributaries; however 5th is fed periodically, at times of high water level, by the Močivec spring, while additional water flows from the swamp area near its northern shore. An underground spring on the eastern side of 5th represents the lake's only permanent freshwater inflow, while drainage takes place to the west via a small ponor. 6th has only one weak underground spring on the eastern side of the lake. Water levels may fluctuate between 2 and 3 m. Additionally, the lakes have different configuration of lakes shores; the northern shores of the 5th lake are low-angle soil and debris covered plateau, while southern shores of the 5th lake and shores of the 6th lake are represented by heavily karstified carbonate base rock and covered partly by trees.

The detailed sedimentary analysis of the lakes record showed some similarities, but also some significant differences. Sediments of both lakes are represented by fine-grained turbidity current deposits that are transported from lake shores during snow melt or storms. The grain-size and sedimentary rates of the lakes are however markedly different. The 5th lake has coarser grained sediments, with mean ranging from 46 to 60 μm and records higher sedimentation rates of $\sim$0,57 cm/year, compared to the 6th lake that has sediments with mean of 23-36 μm and sedimentation rate of 0,34 cm/year. The mineralogical composition of the lake sediments is similar. Calcite predominates strongly, comprising more than 77% of total minerals, while dolomite and quartz are rare.

We attributed discrepancies in sedimentary record to different hydrologic and geomorphic setting of the lakes. The northern shores of the 5th lake contribute more and coarser grained eroded material to the lake. It is evident that the 5th lake functions as a sink for coarser and heavier mineral components, leaving only finer, suspended grain portion to be transported into the 6th lake when lakes are connected during periods of high water levels.