Far away, yet at the heart of science – the Macun lake plateau

By Stefanie Gubler (SCNAT), column “Research in Graubünden”, originally published in German in the daily newspaper “Bündner Tagblatt”, June 10, 2025, p. 3.

View over the Macun lake plateau with its many lakes and impressive rock glaciers (Photo: SNP / Hans Lozza).

From the valley floor of the Lower Engadine to the Macun lake plateau in the Swiss National Park, the path is long and steep – both literally and figuratively. Anyone setting out from Zernez passes through quiet spruce and larch forests, alpine meadows and rocky slopes, climbing nearly 1,500 meters in elevation before reaching Spi da Baselgia, a mountain ridge that separates the main valley from the Macun cirque. From here the view opens onto a beautiful, striking, unique and austere landscape shaped by twenty sparkling mountain lakes and countless rock glaciers. Yet the Macun lake plateau is not only a scenic jewel, but also an alpine ‘open-air laboratory’ where geology, biology, ecology and climate research intersect.

The area at over 2,600 meters above sea level has always been significant for the people of the valley, as reflected in the legend of the dragon in Lai dal Dragun. The plateau was also used for agriculture, hunting and fishing. Each year, twenty to thirty cattle grazed on Macun for four to six weeks. For fishing, fish were even released into the larger lakes from 1964 until 1993. During the Second World War, the area also held strategic importance for Switzerland as an observation post for air defense. In 1976, the Engadine power company even planned the construction of a pumped-storage power plant on Macun – plans that, from today’s perspective, were fortunately abandoned.

Since its integration into the Swiss National Park in 2000, the area has been largely protected from human influence. Even researchers are only allowed to leave the hiking trails on Macun for one week per year in order to collect data for their studies. Thanks to this research, we now understand certain aspects of the state and changes of this alpine ecosystem in considerable detail. For example, since around 2010 a clear shift in the species composition of aquatic organisms has been observed in the southern catchment area of Macun. This development is accompanied by changes in water chemistry that indicate a decreasing supply of meltwater from the rock glaciers, which in turn

suggests the influence of rising air temperatures on the permafrost. In addition, the larger lakes on Macun that have been continuously monitored show a warming trend in summer similar to that of the air, whose temperature has increased by around 0.4 °C per decade since 2000. Cold-adapted invertebrates are still present in the lakes today. However, as water temperatures continue to rise, their disappearance is likely, potentially followed by species from lower elevations. Whether this will enrich the biodiversity of the Macun lakes or destabilize the existing ecosystems remains unknown.

The book “Alpine Ecosystems in the Swiss National Park – The Macun Lake Plateau” (Haupt Verlag), to be published in early autumn, presents the current state of scientific knowledge about Macun in an accessible and richly illustrated way. Even though many questions remain unanswered, one thing is clear: even the strict protection within the Swiss National Park cannot completely shield alpine ecosystems from human influences such as the effects of climate change. Scientific research is therefore essential – to record and document the condition of these sensitive habitats and to better understand ecological processes and climate-related changes.

The Swiss National Park makes an important contribution to research in Graubünden and the Alpine region. The SNP is a member of Academia Raetica, the network of research institutions, universities and clinics in the canton of Graubünden.

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