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Research in the Grisons

**The great potential in the soil**

Soil fungi and bacteria benefit biodiversity



*Re-vegetated area of an old lift corridor, realized in 2020. The fence keeps grazing animals outside. Image: ZHAW*

Once a month, Academia Raetica presents research projects that are of social importance for Graubünden and the Alpine region. They give a preview of the conference "Graubünden forscht" on September 21 and 22, 2022, to which the public is also invited ([www.gr-forscht.ch](http://www.gr-forscht.ch)).

To ensure that we can glide downhill on freshly groomed slopes in winter and then be transported uphill again as quickly as possible, mountain resorts invest in extensive infrastructure. The construction of lifts and snowmaking systems means an intervention in alpine habitats, which react very sensitively to changes with increasing altitude. For this reason, mountain transport companies in Switzerland are required by law to restore the soil removed in the course of construction measures to its original condition by re-vegetation. In most cases, erosion control and the desire to have a green surface again as quickly as possible are given high priority.

In the ski resort of Corvatsch/Upper Engadine, at 2'500 meters above sea level, Jonathan Blank-Pachlatko examines the landscape that was re-vegetated after the construction of the Curtinella chairlift in 2017 from another, very important perspective: How successful are re-vegetations in terms of preserving or restoring biodiversity? In the Alps, the diversity of plants, fungi, animals and insects is coming under increasing pressure due to climate change. Blank, a research assistant at the Institute of Natural Resource Sciences (IUNR) at the ZHAW Zurich

University of Applied Sciences, explains his approach: “Plants on site give an initial indication of the state of biodiversity. But what interested me most was what it looks like in the soil. That’s why, in addition to plants, I took a closer look at soil bacteria and fungi. To do this, I took soil samples, determined nutrient contents and pH values, and made a genetic analysis of the soil organisms.”

The analysis of the soil has shown that the re-vegetation measures can still be improved in terms of biodiversity. Blank explains why: “Important plant species that make local biodiversity so valuable do not yet establish themselves optimally after seeding because the original soil properties have been changed too much by the construction measures. The plants are very selective. Depending on the nitrogen content in the soil, certain competitive grasses grow better. Additional knowledge of the ecology is needed to restore the environment to grow the desired combination of species. Local fungi and soil bacteria that occur in the alpine altitudinal zone could possibly act as adjusting screws. In particular, I would like to further investigate the so-called arbuscular mycorrhizal fungi, which live in symbiosis with plants. This small group of fungi drive their fungal hyphae into the plant cells and fan them out like tree branches. By fanning out, the exchange between fungus and plants increases enormously. I am fascinated by the richness of the soil: in it lies the great potential for life above.”

Jonathan Blank-Pachlatko and Daniela Heinen

The range of study programs offered by the Institute of Natural Resource Sciences (IUNR) at the ZHAW Zurich University of Applied Sciences includes a Bachelor’s degree in Natural Resource Sciences and a Master’s degree in Environmental and Natural Resources. In addition, IUNR carries out applied research and development and offers a wide range of continuing education programs. [www.zhaw.ch/de/lsvm/institute-zentren/iunr](http://www.zhaw.ch/de/lsvm/institute-zentren/iunr)

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*Jonathan Blank-Pachlatko.  
Photo provided.*