



## Glaziale und periglaziale Lebensräume im Raum Obergurgl

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## Glaziale und periglaziale Lebensräume im Raum Obergurgl

Edited by Eva-Maria Koch and Brigitta Erschbamer. Innsbruck, Austria: University of Innsbruck Press, 2010. 304 pp. € 26.90. ISBN 978-3-902719-50-8.

The Austrian Oetztal has a beautiful and impressive alpine landscape: high alpine summits, glaciers, and specialized plants and animals characterize this wonderful environment. Fortunately, and possibly because of that, the Inner Oetztal is one of the best studied alpine areas of Europe and probably the world: since 1951, the Alpine Research Centre Obergurgl has monitored the entire region carefully, creating a wealth of successful research projects. Decades of research have now culminated in the publication of *Glaziale und periglaziale Lebensräume im Raum Obergurgl* (Glacial and periglacial habitats in the region of Obergurgl, German with English abstracts).

The history of research in the Inner Oetztal goes back to 1951, when Prof Wolfgang Burger founded the Alpine Research Centre Obergurgl (part of University of Innsbruck) to study alpinism and undertake alpine research, and to provide a research station available for scientists from around the world. Since then, the priorities of the center have been research into plants and animals, the alpine environment, and mountain medicine. In 1973, research in Obergurgl was intensified when the area became a study region of the UNESCO Man and Biosphere program, in which ecological and economic aspects were studied in

collaboration with the local population. Today still, or even more than ever, the Alpine Research Centre enables and fosters research from a wide array of disciplines, which has now resulted in the publication of this interesting and comprehensive book.

History, geology, climate, glaciers, vegetation history, soils, succession on glacier forefields, plants, animals, and microbes in terrestrial and aquatic habitats (even on snow and ice!) are all covered and nicely illustrated in 10 chapters. Changes in the environment and society are apparent in many chapters. For instance, the social and economic structure of the village of Obergurgl has changed dramatically in past 3 centuries. What used to be a farming village has now become a popular tourist destination, with subsequent impacts on the environment. The geomorphology of the area shows impressively how glaciers have shaped the landscape during the Ice Age. In the past millennium, glaciers reached their maximum extent at the end of the Little Ice Age (around 1850). Since then, the glaciers have lost almost 50% of their area, which is not surprising because the climate has warmed by about 1.2°C since the foundation of the Alpine Research Centre Obergurgl. Climate change after the last Ice Age is also reflected in the vegetation history of the area. Interestingly, pollen analysis shows that, shortly after the end of the Ice Age, trees had already established at a similar elevation as today. Today, as glaciers retreat, the colonization by plants and animals of formerly ice-covered areas enables interesting insights into the succession of high-alpine habitats. Studies of invertebrate animals have shown that the

most important changes in species assemblages and diversity happened within the first 50 years after glacial retreat. After that, the animal communities largely resemble those in adjacent areas. Finally, the book presents studies on organisms that may not be so easy to discover for a nonspecialist. In aquatic communities, species numbers were low, but the discovered species were interesting specialists in this extreme environment. In soils, fungi and microbes turned out to play a very important role for the development of the ecosystem, which illustrates that these organisms, largely invisible to the naked eye, cannot be neglected in alpine habitats. Even on snow and ice, living organisms could be found. Not only do the famous red snow algae live in the snow cover, but an entire food web can be sustained in small melt water pockets in snow and ice.

This book illustrates the importance of research in high-alpine habitats and also points to remaining research gaps. Much of the basic research that has been carried out in the Inner Oetztal helps us to understand the functioning of the ecosystem and is necessary to address applied issues such as high-altitude restoration, climate and vegetation change, or water budgets. The book is nicely designed and illustrated, and will hence be a delight to all scientifically interested people.

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