

## Winners and losers of climate change in the Central Alps

Lena Nicklas, Martin Mallaun, Brigitta Erschbamer

### Keywords

Alpine, GLORIA, vegetation resurvey, increasing species, decreasing species, functional traits, nival, treeline ecotone.

### Summary

Climate warming is one of the essential drivers for the ongoing changes in high altitudes. The consequences are a matter of debate: alpine diversity is expected to decrease, species going extinct by the end of the 21<sup>st</sup> century, while other studies suggest a time lag of extinction or highlight escape opportunities for high altitude species, stressing the possibility of horizontal niches.

To gain empirical results, long term monitoring studies are necessary. One of the unique monitoring programmes worldwide is the project GLORIA (Global Observation Research Initiative in Alpine Environment, [www.gloria.ac.at](http://www.gloria.ac.at)) dealing with the quantification of diversity changes in high altitudes. At target regions, four summits from the treeline ecotone to the nival zone, are monitored every 5-10 years in order to detect diversity changes and to highlight potential risks. In the Central Alps, the GLORIA site IT\_TEX (Nature Park Texelgruppe, Ötztal Alps) was established in 2003; in 2011 the first resurvey was performed. Now, after 14 years, a resurvey was made to analyse and evaluate the following hypothesis: Responses of plant species to climate change (increase, decrease, no difference) depend on elevation, compass direction, community structure, species pool, environmental site factors at the summit and on functional traits of the species.

With this project, it will be possible to develop a clear indication of the consequences of climate warming in the Central Alps by outlining the direction of changes, the migration potential of the species, and the traits of winners, losers and ubiquitous species. Species pool data will be of particularly high value for modelling approaches, targeting at the identification of species being under threat of extinction vs. migrating species from lower altitudes.

### Contact

Lena Nicklas, Martin Mallaun, Brigitta Erschbamer  
[lena.nicklas@uibk.ac.at](mailto:lena.nicklas@uibk.ac.at); [martin.mallaun@uibk.ac.at](mailto:martin.mallaun@uibk.ac.at); [brigitta.erschbamer@uibk.ac.at](mailto:brigitta.erschbamer@uibk.ac.at)  
University of Innsbruck  
Institute of Botany  
Sternwartestr. 15  
6020 Innsbruck  
Austria

