

Research Unit Ecosystem Research and Landscape Ecology

As one of three sections of the [Institute of Ecology](#) of the University of Innsbruck, the section **Ecosystem Research and Landscape Ecology** aims to understand effects of global changes on ecological processes in mountain areas, covering spatial scales from plants to ecosystems and landscapes, and temporal scales from seconds to days, years and decades.

Headed by Prof. Ulrike Tappeiner and composed of three interacting research groups, which collaborate in joint projects and publications, the research unit studies at the ecosystem scale how global changes affect the carbon, water and nutrient cycles as well as their interactions in mountain ecosystems, with an emphasis on trace gas and energy exchange between ecosystems and the atmosphere and how it is modulated by land management and changing climates.

At the landscape scale the research unit explores historical, current and future scenarios of projected land use and their consequences for biodiversity and multiple [ecosystem services](#), and develops monitoring systems at local and regional scales in order to support sustainable decisions in human-environmental systems.

By contributing to several EU-projects, ESF programmes and COST Actions, the research unit is well integrated into international research activities and initiatives. For example: [AlpES Project](#), [Vital Project](#), or [econnect3](#).

The **Research Group Ecosystem and Landscape Ecology** integrates relevant ecological disciplines and methods (soil and vegetation science, hydrology, micrometeorology, [remote sensing](#), spatial statistics, ecological and geo-statistical modelling) to analyse ecosystem functions and services across spatial and temporal scales. Beneath systematic survey and monitoring of fundamental data, experiments and modelling of global change impacts on biodiversity, catchment yield, natural hazards risk and land-use/land-cover are conducted.

Research activities mainly take place in four subject areas, integrating ecosystem and landscape level (experimental and modelled) with the following research objectives:

- (i) *LUCC*, historical and current land use/cover change (LUCC) in the Alps and scenario development;
- (ii) [Ecosystem Services](#), consequences of LUCC on ecosystem functions and services;
- (iii) *Biogeochemical Cycles*: impacts of global change on carbon and water balance of mountain grasslands;
- (iv) *Sustainability*, develop, test and implement sustainable monitoring systems at local and regional scale (human-environmental decision support systems).

The central strategy of the research group is based on a wide and interdisciplinary understanding of ecological processes and functions as prerequisite to evaluate and model impacts of global change. The international collaborations and lead or participation in several international (EU: ERA-net, INTERREG) and national research projects guarantee cutting-edge research in [mountain](#) environments. The cooperation with disciplines from social and human sciences, statistics, and engineering attests the interdisciplinary dimension of the research group

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