



## **Anthropogenic influenced landscape – a multi-temporal analysis of high alpine catchments**

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Changing environment and functionality of landscape is a big challenge of today's society. Global change does not only imply natural changes but also anthropogenic effects on the environment. Therefore, it is necessary to analyse not only anthropogenic interference but also natural processes changing the landscape in order to understand the evolution of landscape. This understanding could help to estimate possible development of landscapes in future, hence allowing a sustainable adaptation.

The pressure of growing population as well as the increasing mobility implies challenges for land management and conservation. Due to this also remote areas like high alpine regions face problems finding the balance between providing space for settlement area, increasing tourist numbers with feedbacks on touristic infrastructure and accommodation facilities and the change of the earth surface. Hence, the functionality of the landscape is changed, for example from grassland to settlement area in the valley and from extensive used grassland to ski-slopes in the upper catchments.

The high relief energy in alpine areas leads surface processes to happen faster and more destructive. The changes of the land surface in high alpine areas may include increased bed load, increased number and activity of landslides, changes of the hydrological systems, etc.. However, the distinction between natural and anthropogenic causes of surface changes as well as the consequences is very complex thus important for future actions to conserve the precious functionality of landscapes.

In order to manage and elude problems connected to these changes in future a detailed analysis of the landscape over time is necessary. Remote sensing is a possibility to monitor and highlight changes of the earth surface and additionally it allows monitoring the on- and off-site anthropogenic interference in the environment.

This presentation focuses on the physical and hydrological functioning of landscapes affected by anthropogenic influence. A high alpine catchment which is also used as a skiing area is chosen for this purpose. The changes on the earth surface are focused on hydrological processes and channels by applying a multi-temporal stereoscopic analysis of aerial photographs. The results of these analyses are mapped in ArcGIS in order to enable a comparison between different periods. The present situation was studied by pre-mapping with ArcGIS on the orthophoto and field mapping afterwards. Furthermore, a statistical analysis of the results will support a better understanding of interactions and response of particular system and thus may lead to a better understanding of landscape evolution under anthropogenic pressure in general. In order to conserve precious landscapes and keep up their functionality a detailed understanding of the system is necessary and this analysis of the surface phenomenon is a first step towards a future management of high alpine ski areas facing anthropogenic interference.