AdaptAlp

Aims of the Project

AdaptAlp aims to:

• improve information on the potential impact of climate change at the regional level using state-of-the-art approaches (e.g. common databases, high resolution modelling, design events).
• evaluate and harmonise different methods of risk assessment, hazard mapping and risk management in the Alpine environment.
• identify best practice methods and transfer best practice experiences into adaptation measures in model regions.
• reduce risk by raising awareness among local stakeholders.

The extremely hot summer of 2003 led to drought conditions in many regions, causing rockslides and accelerating the process of glacial retreat. In 2005 the Bavarian Alps suffered flooding and other related natural disasters such as soil erosion and mudslides. These are just two of many recent examples of the consequences of climate change within the alpine region. The fact is that climate change is taking place, and its effects can have dangerous consequences.

According to the majority of available projections, the negative impact of climate change on the alpine area can no longer be avoided. What does this mean exactly? What changes can we expect? And what risks will come with them? How can we react appropriately to the situation? Which adaptation measures are needed, and which of those are realistic?

In an attempt to deal with precisely these questions leading experts from all countries containing alpine regions came together as part of the “AdaptAlp” project. Together they develop strategies within four work packages in order to prepare an appropriate response to the threat of natural disasters resulting from climatic change.

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Adaptation to Climate Change in the Alpine Space

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**Water Regime in the Alps**

Climate change is having a strong impact on hydrological balance in the Alps. Precipitation patterns—that is, the distribution of rainfall over the year—are shifting noticeably in the different alpine regions. Instances of extreme weather, such as storms or dry spells, are on the rise. Protective measures against potential flooding therefore need to reflect these changing conditions. However, very little empirical data concerning volume flow over longer periods of time is available, particularly in the case of small rivers and streams. Through close, cross-border collaboration between scientists and practitioners, existing data of the entire alpine region will be collected, harmonized and analysed. At the same time, new approaches relating to an assessment of the consequences of climate change regarding water resources will be tested. The expertise gained during the process will subsequently be integrated into the planning of protective measures. The new methods are to be tested in the catchment areas of the rivers Inn, Soča and upper Rhine. Additionally, models that simulate soil erosion will be tested in these areas in order to cover the most important risks linked to the water cycle.

**Hazard Mapping**

Hazard zones are designated areas threatened by natural risks such as avalanches, landslides or flooding. The formulation of these hazard zones is an important aspect of spatial planning. AdaptAlp will evaluate, harmonize and improve different methods of hazard zone planning applied in the alpine area. Focus will be on a comparison of methods for mapping geological and water risks in the individual countries. A glossary will facilitate transdisciplinary and translational cooperation as well as support the harmonization of the various methods. In selected model regions methods to adapt risk analysis to the impact of climate change will be tested. This should support the development of hazard zone planning towards a climate change adaptation strategy. The results will be summarized in a synthesis report.

**Risk Prevention and Risk Management**

Protection against natural hazards under climate change is a challenging task for states and societies in the alpine region. An example would be the 2005 storm in Switzerland that caused unprecedented damage totaling over 2 billion Euros. As both the financial resources and the technological possibilities for protecting human beings and facilities from natural disasters are limited, a 100-percent level of safety cannot be guaranteed. Therefore, available resources must be applied in proportion to the potential risks.

Within this work package, the most efficient methods will be identified for the rapid and cost-effective estimation of possible damage scenarios and risk situations in the regions and valley municipalities. The aim is to elaborate planning criteria that permit a comparison between risk conditions of different municipalities. This would support the definition of priorities for measure- ment packages and individual measures. Employment of a database covering the entire alpine area and examples of "best practice" (those taken from practical experience) will be included so that other practitioners can refer to them for orientation. In addition, and on the basis of these examples, expert hearings will be held and a series of recommendations for practical implementations will be elaborated. One focus in this context will centre on strategies to deal with uncertainties involved in risk assessment.

**Pilot Actions and Synthesis**

This work package is geared towards the collection and organisation of all knowledge acquired within the scope of the project, in order to make it accessible to local and regional decision-makers in the fields of civil protection and land-use planning. The strategies and methods developed in the previous working packages will be tested and put into practice within the designated pilot regions. All activities in the pilot regions aim to identify potential hazard zones and communicate possible dangers and risks. This is done in order to create an awareness of potential dangers and develop strategies and recommendations for sustainable land use that also take into account climate change. The pilot regions chosen are the Großwalsertal in Vorarlberg, Gasen/Haslau in Styria and two municipalities in Oberallgäu in Bavaria. These regions are susceptible to a variety of natural hazards such as landslides or flooding. Therefore, different methodological approaches will be tested in each region: from analysis of historical data and events to mapping of hazard zones, as well as intensive communication of potential risks relating to the natural hazard event in those municipalities involved in the project.