



Project Short Title

Alp-Water-Scarce



Priority 1
Competitiveness and
Attractiveness



Priority 2
Accessibility and
Connectivity



Priority 3
Environment and
Risk Prevention

Project Long Title

Water Management Strategies against Water Scarcity in the Alps

Lead Partner

Université de Savoie, Institut de la Montagne

Project Partners

Société d'Economie Alpestre (F)
Conseil Général de la Savoie(F)
Amt der Kärntner Landesregierung, Abteilung 8 (A)
Amt der Steiermärkischen Landesregierung, FA 19A (A)
Paris Lodron Universität Salzburg, Zentrum für Geoinformatik (A)
Bundesanstalt für Agrarwirtschaft (A)
Agenzia di Sviluppo Gal Genovese (I)
Provincia di Alessandria (I)
Provincia Autonoma di Trento - Dipartimento Urbanistica e Ambiente (I)
Uncem Delegazione Piemontese (I)
Agenzia Reg. per la Prevenzione e Protezione dell'Ambiente del Veneto (I)
Geološki Zavod Slovenije (SI)
Nacionalni Inštitut za Biologijo (SI)
KGZS- Kmetijsko gozdarski zavod Maribor (SI)
Eidg. Anst. für Wasserversorgung, Abwasserreinig. u. Gewässerschutz (CH)
Bundesamt für Umwelt BAFU (CH)

Project Website

www.alpwaterscarce.eu

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3,990,903.--

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2,827,125.--

Abstract

The Alps, with their seemingly vast water resources, are of immeasurable importance for the economic and cultural development of the Alpine Arc and beyond. In the past, water scarcity problems have only affected small, distinct areas for short periods of time; however, the impact of climate change necessitates adaptation to a higher frequency of such phenomena. In this sense, the aim of Alp-Water-Scarce was to provide tools to mitigate the risk of water scarcity, and also to propose instruments for long-term water resources management that support the decision-making process in times of crisis. The active involvement of all key players concerned with water shortages (e.g., drinking water suppliers, hydropower companies, agriculture associations, the tourism industry, and the general population) was critical to the project's success. In a series of guidelines published by the project, water resources managers were informed about the challenges of monitoring and modeling Alpine catchments, about national and European legal frameworks for water governance, and about the ecological aspects of resource management. The estimation of current and future water demand and the implementation of future climate and anthropogenic scenarios led to the establishment of early warning systems to address water scarcity. These systems were designed for local and regional needs, but the theoretical concept can easily be transferred to other regions of the Alps or to other mountainous areas.

Relevance

An increase in air temperature, coupled with an increase in evapotranspiration and a decrease in precipitation in the form of snow, regionally combined with reduced precipitation, will have an important impact on the water balance of the Alps. Changes in runoff, groundwater resources, low-flow conditions, and evapotranspiration may increase the risk of periods of water scarcity, which may lead to an increase in user conflicts, especially in southern Alpine areas. The challenge of long-term water management planning in the context of climate change is to anticipate and mitigate such periods of water shortage. The need for this planning was underlined by the creation of the European Drought Center in 2005 and communications by the European Commission to the European Parliament and the European Council, by the establishment of regional and local initiatives (e.g., Drought Committees in France), and also by the preparation of a "Blueprint to Safeguard Europe's Waters" to be published in 2012 by the EC. The transnational and cross-sectoral approach of Alp-Water-Scarce provided efficient tools (e.g., early warning systems to monitor water scarcity) that will help meet the requirements of sustainable water management in the future.



Key Achievements

- The handbook "Water Management in a Changing Environment" offers an overview of the main outputs of the project.
 - Recommendations for water managers and policy-makers (translated into English, French, German, Italian, and Slovenian) summarize the main findings in a comprehensive manner.
 - A guideline on monitoring and modeling discusses the challenges of water resources management in Alpine catchments.
 - A climate scenario guideline describes possibilities for the calculation of future scenarios as a basis for projections of future water resources.
 - Five reports summarize the activities implemented in the workpackages, illustrated by the results of the pilot activities.
 - An interactive GIS-supported atlas provides a visual overview of the Pilot Sites (<http://maps.geo.sbg.ac.at:8080/aws/>).
 - A transnational Final Conference was held, at which the results of Alp-Water-Scarce were presented and water management programmes in various parts of the Alps were described to an international audience.
 - The large number of stakeholders involved through the "Stakeholder Forum" were updated by multilingual newsletters on the progress of the project.
 - Scientific publications describe results from the various Pilot Sites.
 - Two winter schools at the University of Salzburg were organized to investigate the topic of water scarcity in a transdisciplinary fashion.
 - Development of Early Warning Systems.
- All results available under: www.alpwaterscarce.eu

Lessons Learnt

The strong commitment of public institutions to cooperation at regional, national, and transalpine levels and a common understanding of the terms "water scarcity" and "drought" are the preconditions for the implementation of long-term measures to address water scarcity. The experience of Alp-Water-Scarce has shown that learning from each other by identifying and analyzing challenges related to water resource problems at a transalpine level can be very fruitful. Given the general lack of comprehensive guidelines to address the risk of water scarcity for the Alps, Alp-Water-Scarce provides much-needed recommendations on the establishment of early warning systems and other measures related to sustainable water resources management. Alp-Water-Scarce demonstrated that the key factors for decision-support tools such as early warning systems are:

- 1) identification of the drivers of water scarcity risks (e.g., climate change, management problems, infrastructure problems, pollution) ,
- 2) active involvement of the sectors involved with or affected by water shortage (e.g., drinking water suppliers, hydropower companies, tourist infrastructure, agriculture), as well as other stakeholders (NGOs, citizens, etc.),
- 3) consideration of the legal framework (at the European, national, and local levels), and
- 4) respect for ecological aspects.

Replication / Roll out

Water management takes place in an area of conflict between water demand from different users, in combination with demographic development, availability of resources, legal regulations, and ecological aspects. Climate change further affects these parameters, increasing the uncertainty of predictions regarding the availability of water resources in the future. Although Alp-Water-Scarce began raising awareness of water scarcity as a matter of concern for the water-rich Alps, a necessary step to initiate adaptation processes, short-term crisis management is still more common than long-term planning. One reason for this might be the lack of long-term data enabling detailed modeling approaches at the regional level; another is that past water scarcity problems in the Alps have only affected small, distinct areas for short time periods. The large-scale implementation of early warning systems as decision-support tools still remains a challenging task, as does the continued development of such instruments. Nevertheless, the theoretical concepts developed are explained and published and these innovations can be transferred to other regions. The establishment of an "Alpine Water Management Committee" consisting of water managers, researchers, and representatives from various sectors should be considered in order to emphasize the policy relevance of this topic, which can only be handled in a transalpine approach. Project results should feed in DG Env "Blueprint on water" 2012 and IPCC.

