STAND-ALONE PROJECT

FINAL REPORT

Project number **P 24278-G18**

Project title[1]: How skiers´ sensations shaped Alpine valleys during the 20th century
Alpine Skiläufer und die Umgestaltung alpiner Täler im 20. Jahrhundert

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Project website[2]:

http://www.umweltgeschichte.aau.at/index,4710,How+skiers%C2%B4sensations+shaped+Alpine+valleys.html

[1] Short title in English and German language
[2] Projects that started after January 1, 2009 are encouraged to have a website.

I. Summary for public relations work

1. Zusammenfassung für die Öffentlichkeitsarbeit

Wie wurden aus nur auf Saumpfaden erreichbaren, alpinen Dörfern, die durch Abwanderung vom Untergang bedroht waren, Orte des internationalen Skitourismus? Was geschah in diesem Transformationsprozess mit den alpinen Landschaften? Am Beginn stand die Skitour. Nach stundenlangem Aufstieg konnte eine einzige Abfahrt absolviert werden. Ein Vergnügen für wenige. Die Bereitstellung von mechanischen Aufstiegshilfen veränderte den Sport völlig. Auch Ungeübte zog es in die winterlichen Alpen. Um sie zu unterstützen, wurden Pistenraupen unumgänglich. Eine Spirale von Modernisierung, Ausweitung und Intensivierung begann sich zu drehen, an deren vorläufigem Ende gänzlich verwandelte Peripheren stehen. Natur und Kultur der Dörfer sind dank einer Kombination aus ökonomischen und politischen Rahmenbedingungen, technischen Eingriffen immer größerer Tragweite und erfolgreichem Marketing völlig verwandelt.

Das Projekt „Alpine Skiläufer und die Umgestaltung alpiner Täler“ stellt die erste Umweltgeschichte der Transformation agrarischer Kulturlandschaften in Vorarlberg durch den Wintertourismus von 1920 bis 2010 dar. Die Rekonstruktion der historischen Wintersportlandschaft, von Siedlungsstrukturen und Landnutzung erfolgte auf der Basis einer im Projekt erstellten GIS-Skipistendatenbank, die auf historischen Karten, Archivmaterial, Luftbildern und Informationen pensionierter Pistenraupenfahrer basiert. Quantitative Informationen zur räumlichen Entwicklung von Skipisten wurden mit Transportstatistiken und meteorologischen Daten verknüpft, um eine integrierte Sicht auf Wintersportlandschaften als sozionaturale Hybride zu erarbeiten. Ergänzt wurde die Datenbank durch die qualitative Analyse zeitgenössischer Fachliteratur, die sich den Innovationen der Seilbahnindustrie, dem Skipistenbau und der Beschneiungsanlagen widmet. Die Analyse politischer und nationalökonomischer Interessen am Wintertourismus erfolgte durch die Auswertung amtlicher Aufzeichnungen, sowie durch eine Reihe von Interviews mit Akteuren wie z.B. NGOs, der öffentlichen Verwaltung, Landwirten und Skiliftbetreibern.

Das Projekt erbrachte neue Einsichten in den Wandel der Konflikte und Problemlösungsstrategien von Landwirten und Tourismustreibenden. Teilergebnisse wurden in zwei Fachzeitschriftenartikeln sowie fünf weiteren Artikeln und Buchkapiteln veröffentlicht. Das wichtigste Projektergebnis stellt die (noch laufende) Erarbeitung einer Monographie dar. Projektergebnisse wurden in insgesamt 20 Vorträgen bei nationalen und internationalen wissenschaftlichen Konferenzen, Workshops und Seminaren präsentiert. Die Projektergebnisse wurden auch im Rahmen von „science to public“-Aktivitäten aufbereitet. Der breiten Öffentlichkeit wurden sie durch Artikel und Interviews in Zeitungen, Zeitschriften und die Mitarbeit an TV-Dokumentationen kommuniziert.

2. Summary for public relations work

How did alpine villages, attainable only by mule paths and threatened by demographic and economic collapse, transform into hubs of international ski tourism? What happened in this transformation process with the Alpine landscapes? At the beginning there was back country skiing. After hours of ascent one downhill glide could be completed. A pleasure for only few. Providing mechanical ski lifts changed the sport completely. Even untrained people were attracted by the winter Alps. Snow groomers became inevitable to support them. A spiral of modernization, expansion and intensification began to turn, which completely transformed peripheries. Nature and culture of the villages are totally transformed due to a combination of economic and political conditions, technical interventions and successful marketing.

"How skiers´ sensations shaped Alpine valleys" produced the first integrated environmental history of cultural landscapes in Vorarlberg as transformed by practices and infrastructures of winter tourism from 1920 to 2010. For reconstructing past conditions of winter sport landscapes, settlement development and land use, a GIS-based ski slope database, combining historical maps, archival material, aerial images and interviews with retired snow groomer driver was set up. The quantitative information of the spatial development of ski slopes was combined with transport capacity- and meteorological data to create an integrated view on winter sport landscapes as socio-natural hybrids. These quantitative databases were combined with a qualitative analysis of technical magazines dealing with innovations of the ski lift industry, ski slope engineering and snow farming practices. Political aspects as well as the interests of national economy were integrated into the project by the study of official records but also by a series of interviews with actors e.g. NGO's, public administration, farmers and ski lift businessman.

Investigating the interplay of farming and tourism practices provided new insights into conflicts and problem solving strategies among the involved social groups. Results of "How skiers´ sensations shaped Alpine valleys" are to date published in two peer-reviewed journal articles and five other articles and book chapters. A monograph in the making is the most important product. The project was presented to a wide range of scientific communities at several international and national scientific conferences, workshops and seminars (in sum, 20 presentations). The project results were made available through 'science to public'-activities for different stakeholder groups. Project results were disseminated to a broader public via articles and interviews in newspapers, journals and TV documentaries.

II. Brief project report

1. Report on research work

1.1 Information on the development of the research project

The project "How skiers´ sensations shaped Alpine valleys" produced the first integrated environmental history of cultural landscapes in Vorarlberg transformed by practices and infrastructures of winter tourism from 1920 to the early 21st century. The project was carried out mainly by an early career environmental historian, building up a historical GIS of winter sport landscapes as well as databases of ski lift statistics. It created new scientific knowledge by showing the transformation of peripheral mountain villages into urbanized winter tourism centers fostered by winter tourism infrastructure. This process affected agricultural landscapes and power relations between the tourism sector and farmers. For reconstructing past conditions of winter sport landscapes and to construct the first historical ski slope database, a mix of methods combining historical maps, aerial images and oral information from retired snow groom drivers was used. The quantitative information of the spatial development of ski slopes was linked with transport capacity- and meteorological data to enable an integrated view on winter sport landscapes as socio-natural hybrids.

The project used the concepts of "socio-ecological niche construction" (Groß, Winiwarter 2015) and "socio-natural sites" as a starting point. "Socio-ecological niche construction" enabled to conceptualize power-driven relations and competition among social groups of farmers and tourism actors from a socio-ecological point of view, while not losing track of the structuring role of social institutions. With socio-natural sites as concept, one can investigate the co-evolutionary transformation of practices and arrangements, both understood as hybrids of society and nature. The particular strength of this concept lies in its ability to deal with socio-natural dynamics, which were ignored by tourism historians up to now. Both concepts avoid the analytical distinction of 'nature' and 'culture' which characterizes most other concepts used in environmental history. Socio-cultural dynamics on the one hand, and ecosystems, soil, topography and climate on the other are related as equally contributing to human history.

In accordance with the initial proposal regional case studies of Lech am Arlberg, Damüls and Silvretta-Nova, the three largest winter sport areas in Vorarlberg were prepared. The development of ski lifts, ski slopes, settlements as well as land cover change were reconstructed and analyzed in conjunction with their functions for the provision of various kinds of resources for the winter tourism industry. Conflicts between involved actors were investigated together with changing human perceptions of the winter Alps by using the concept of "the tourist gaze".

In the course of the research a range of highly significant but unpublished material was found. Thus, changes in research direction but also a broadening of the conceptual basis could be undertaken. Firstly, the concept of “socio-ecological niche construction” was complemented by the concept of “socio-natural sites” to emphasize the role of everyday practices and the momentum of material arrangements. Secondly, the role of the ski lift industry as provider of new ski lift models was integrated into the project by an analysis of the technical journals “Internationale Seilbahnrundschau” and “Motor im Schnee” from 1956 to 2010. By analyzing the technological innovations in the ski lift industry, the project focused more on the question how the upward flow of tourists was accelerated and how the acceleration was socially and technically organized. Acceleration of flows of tourists through landscapes had severe side effects on snow quality and species composition on the affected grassland. Thus, thirdly, another shift in the project became necessary to investigate how actors dealt with these side effects by legal interventions, building interventions into local agro-ecosystems, snow farming practices and last but not least by the installation of artificial snow systems.

1.2 Most important results and brief description of their significance (main points):

The project “How skiers´ sensations shaped Alpine valleys” broke new ground as it is the first environmental history of winter tourism regions, combining landscape-, regional-, visual- and tourism history approaches with aspects of history of technology. While tourism history studies are methodologically based mostly on cultural or economic history, this project integrated natural scientific- and historical- as well as qualitative and quantitative methods across time and scale. This was enabled by the generous funding situation. Methodologically a focus on rather small study regions within one province was necessary. By doing so, the project strengthened contemporary environmental history in Austria but also contributed to the visibility of the Viennese Centre of Environmental History as highly innovative research hub for topics related to alpine- and tourism history. The project stimulated tourism history research in Austria, which is almost inexistent, although winter tourism provides considerably to national economies and regional wealth.

In accordance with the original proposal, two ‘Middle Ground’-situations were studied. In Middle Ground 1 we investigated the entanglement of the tourism- and agrarian socio-ecological niche between 1930 and the late 1940s assuming that MG1 was dissolved by the intrusion of the ‘1950s syndrome’. In the course of this step, the original hypothesis was adjusted using insights from empirical research. The ‘1950s syndrome’ correlated with the European Recovery Program (ERP), a huge international reconstruction plan. The ERP

economically accelerated the transformation of agricultural niches by building ski lifts, leading into economic dependency of actors. To balance meteorological uncertainties tourism entrepreneurs integrated technologies (e.g. snow groomers and snow systems) developed in the legal and economic context of the US into Austrian villages. Actors experienced a 'lock-in' into an increasingly technologized development path, causing conflicts with property holders that were 'solved' by interventions into property rights. By this law, property holders were seasonally dispossessed and Middle Ground 1 dissolved. The major insight of this study part is that transformations in law and post war economies were essential prerequisites for the '1950s syndrome'.

The study of Middle Ground 2 among ski lift entrepreneurs and nature conservationists was adapted due to empirical findings. The hypothesis was complemented by the actor group 'spatial planning administration' in the province, which used nature conservation laws to regulate speed, direction and spatial distribution of ski lift networks in the province. As we assumed in the original proposal, ski lift entrepreneurs developed a hegemonic position within the province in the 1970s. In turn, Middle Ground 2 dissolved as the power situation between economic growth critics and the winter tourism industry tipped towards the industries' benefit. This points to another issue relevant for the study of Middle Ground 2, characterized by unequal dynamics of nature conservation law and innovation of the winter tourism industry. While nature conservation focuses until the present mainly on the preservation of a pristine state characterized by a certain biodiversity, ski lift entrepreneurs involved ecosystem construction into their activities to avoid conflicts with farmers, summer tourists and nature conservationists. The focus on environmental degradation on a very limited scale might be the major legacy of Middle Ground 2. Other environmental issues such as greenhouse gas emissions caused by traffic and land sealing due to building activities remain unsolvable, despite the existence of zoning maps and environmental laws.

In the course of the project "How skiers´ sensations shaped Alpine valleys" a GIS for the three study regions was set up. Based on different sources, e.g. historical aerial images, maps and oral information, in a first step we reconstructed distribution of ski slopes. Figure 2 depicts the evolution of ski slopes in the ski destination "Silvretta-Nova" from 1968 to 2011. This dataset exists for all case studies. It was prepared by digitizing the situation in 2011 and incorporate qualitative data from interviews with retired snow groomer drivers. Based on this, GIS layer we carried out a range of follow up explorations, such as a comparison of land use in the affected region depicted in Figure 1. Here, aerial images from 1950 were compared to 2010 to analyse changes in the terrain. As shown in Figure 3, changes in topography were common and widespread in winter sport destinations. The comparison of the left and right image in Figure 3, depicting the winter sport village Damüls shows that (1) nearly all areas used as ski slopes have a manipulated surface. (2) The landscape manipulation is in most

cases considerably larger than the actual groomed slope is. (3) The left image shows that manipulations were mostly carried out for the benefit of tourism entrepreneurs (ski slopes), farmers (road, meadow) and summer tourists (hiking trail, meadows, roads). The changes in the cultural landscapes are the biophysical infrastructure coupling different socio-ecological niches. These explorations served as starting point for semi-structured interviews with farmers in the villages.

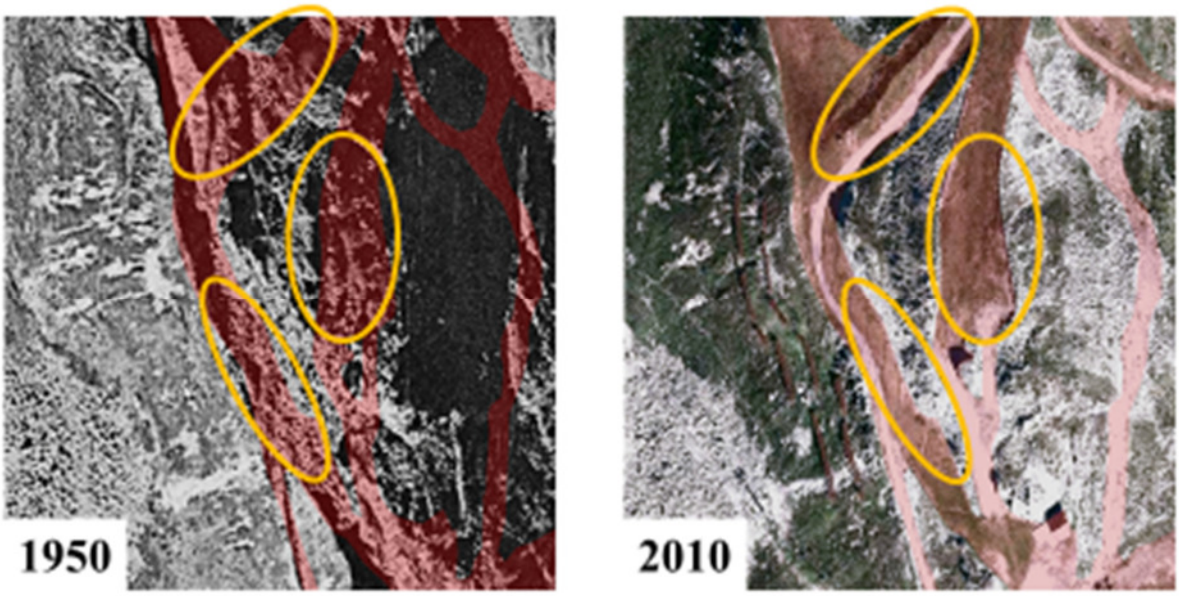

Figure 1: The comparison of aerial images in the study region Silvretta-Nova reveals the degree of building activities to level the topographies surface for increasing safety and decreasing snow dependence. Mapped by Horst Dolak.

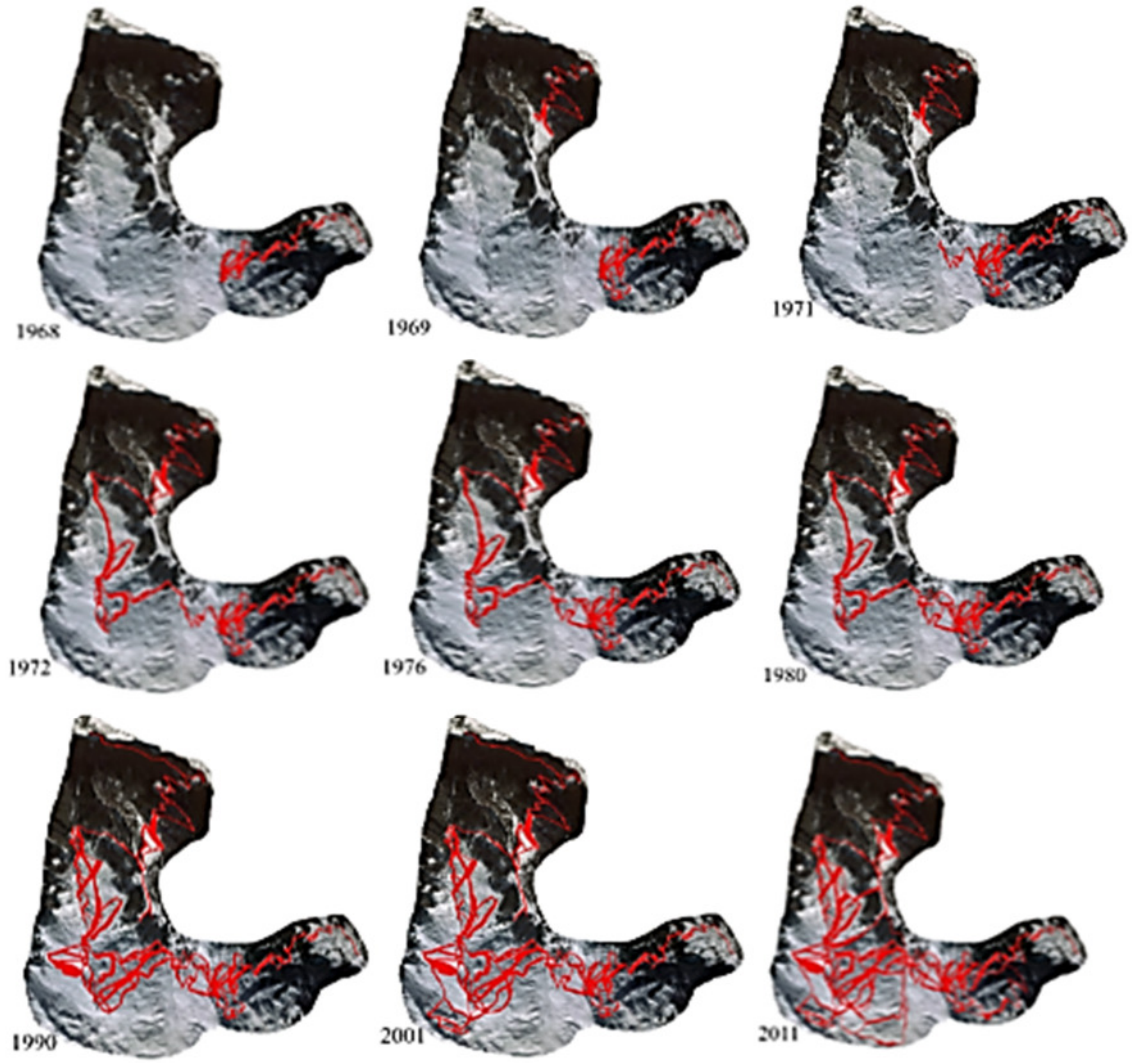

Figure 2: Evolution of ski slopes in Silvretta-Nova. Mapped by Horst Dolak.

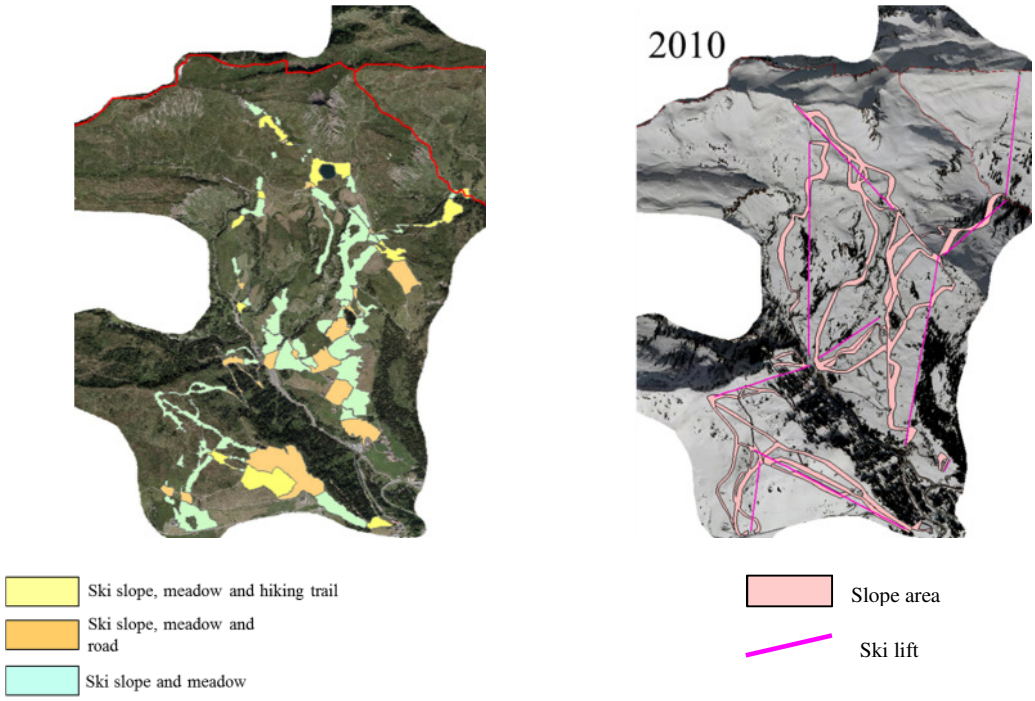

Figure 3: GIS-based comparison of land use in the study region Damüls. Mapped by Tamara Fetzel and Horst Dolak.

The set-up of a GIS in the course of the project led to the first open access database on spatial extension and historical development of ski slopes. Besides the study of the land use situation in the study villages, this database enabled a statistical exploration of the development of winter sport stations, as shown in Figure 4.

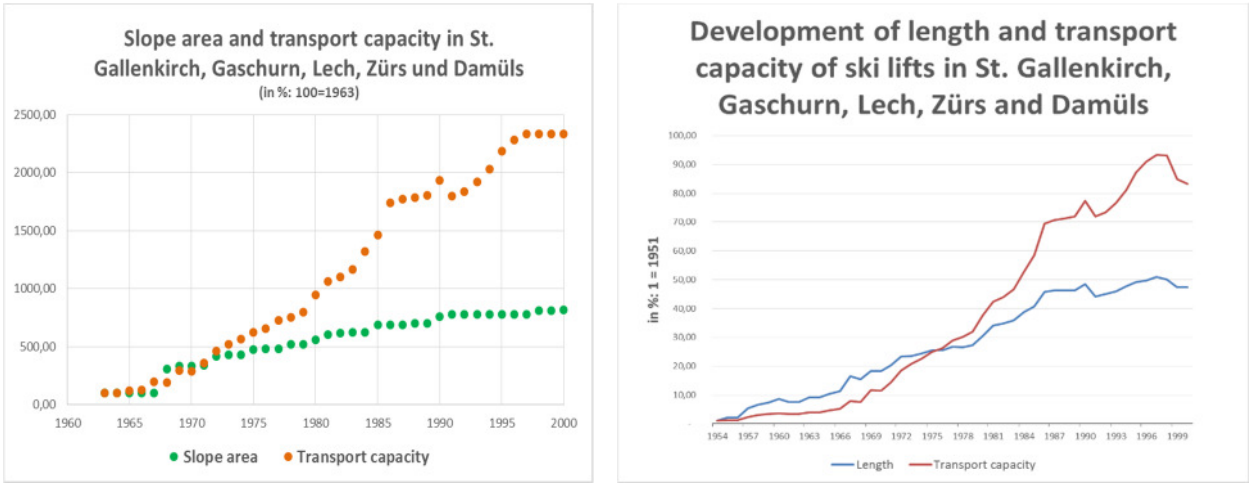

Figure 4: Quantitative assessment of the development in the study regions. Original work by Robert Gross based on the Austrian Railway Statistics and the ski slope database.

The left chart of Fig. 4 compares slope area and transport capacity. While total slope area in all study regions grew between 1960 and 2000 by about 7-fold, transport capacity of ski lifts was increased by about 25-fold. Pressure by skiers on the areas was considerable increased since 1980, making topography changes and snow farming practices inevitable. But what was the reason of the intensification? As shown in the right chart, comparing transport capacity of ski lifts and length of ski lift networks, intensification was the result of an 50-fold increase of transport capacities between 1960 and 2005, while the length of the network grew by about 8-fold.

Building on this results we focused the qualitative research on the question how the ski lift industry and the ski slopes evolved. As almost no scientific research of the history of ski lifts and ski slopes exists, it was necessary to undertake original research of technical magazines. In total, 201 journal articles covering the period from 1957 to 2010 from “Internationale Seilbahnrundschau” and “Motor im Schnee” were combined into a text corpus that was analysed by using qualitative content analysis. The ski lift designers increased transport capacity by disciplining skier’s bodily motion sequences, thus regulating and concentrating growing numbers of tourists in a given area. While in the 1950s and early 1960s almost no efforts were undertaken to improve the downhill motion, mechanized snow grooming occurred as reaction to the experienced side effects of efficiency increase of ski lifts, which lead to considerable conflicts with property holders and farmers.

The winter sport area Lech became a laboratory for ecosystem engineering practices of landscape engineers, botanists, ecologists and seeds producers to find solutions for ecosystem degradation and erosion resulting from ski infrastructure at high altitudes. Their standpoints and solution strategies were analysed by using original transcripts of the conference “Hochlagenwiederbegrünungstagung Lech 1978-1988”. It becomes evident that winter sport areas became more and more entangled with supplier industries e.g. ski lifts, snow groomers, snow systems but also fertilize and seed providers, at the same time they became increasingly debt-ridden due to growing capital investment-needs to improve uphill comfort, downhill security and overall economic performance.

1.3 Information on the execution of the project, use of available funds and (where appropriate) any changes to the original project plan relating to the following:

The project “How skiers´ sensations shaped Alpine valleys” was scheduled for a period of 36 months from March 1st 2012 to Mai 28th 2015. Due to leaves of absence and additionally raised funds e.g. a research stay at the Research Training Group "Topology of Technology" financed by the German Research Council (DFG) at the Technical University Darmstadt/Germany, a cost-neutral project extension until December 31st, 2015 was requested and accepted by FWF. The project involved one full professor of environmental history, Verena Winiwarter, as project leader. Doctoral student Robert Groß was involved as main project employee, who carried out the archival research, field studies and empirical analysis supervised by Verena Winiwarter. There were no significant deviations from the original project plan.

2. Personnel development – Importance of the project for the research careers of those involved (including the project leader)

The project “How skiers´ sensations shaped Alpine valleys” was the first interdisciplinary project in contemporary environmental history dealing with tourism regions of the Centre of Environmental History Vienna since Verena Winiwarter was appointed as professor. It contributed to strategically important goals of the Center and the professorship, i.e. the preparation of a synthetic environmental history of Austria. To date, the interdisciplinary efforts of research efforts of the project team were made visible in several scientific publications in English and German (10 in total, two of them peer-reviewed and four of them in preparation) and presentations at international and national scientific conferences and workshops. The project increased the expertise and international reputation of all team members in their specific research fields and in particular Verena Winiwarter’s experience in successfully managing interdisciplinary cutting-edge research. Robert Groß produced

important results for his doctoral thesis about the environmental history of winter tourism destinations in Vorarlberg to be submitted as monograph in 2016.
“How skiers´ sensations shaped Alpine valleys” intensified national co-operations (Univ. Prof. Martin Knoll, Salzburg University, Provincial Archive Vorarlberg, Provincial Library Vorarlberg, Regional Archive Montafon). The project deepened existing international co-operations with Ass. Prof. Bo Poulsen, Aalborg University and Univ. Prof. Dieter Schott, Technical University Darmstadt.

3. Effects of the project beyond the scientific field

Results of “How skiers´ sensations shaped Alpine valleys” were made available to a wider public by means of articles and interviews in national Austrian newspapers and journals (Die Presse, Standard, Kleine Zeitung and the journal of the Austrian Alpine Association ‘Bergauf’). A project webpage was produced. The project was presented at the seminar of nature conservation experts from the Austrian Alpine Association (Österreichischer Alpenverein), at a workshop for the secondary school BG Dornbirn and a conference of the “Grüne Bildungswerkstatt”. The project results were integrated into university lectures and seminars of the project team, such as the lectures „Ringvorlesung Soziale Ökologie“, “Forschungsseminar”, „Einführung in die Umweltgeschichte“ at the Institute of Social Ecology, as well as the Oberseminar of the history department at the Technical University Darmstadt.

The project results were made available for the science communication project "Komplexe Welt – Dynamische Simulation" carried out by the “Drahtwarenhandlung”, funded by the Wirtschaftsagentur Wien. In the course of their project, results from “How skiers´ sensations shaped Alpine valleys” were exhibited during the 8. MATHMOD (Vienna Conference on Mathematical Modelling). Furthermore, project members advised on the production of the tv-documentary “Schnee von morgen”, produced by Peter Liska for the ORF program feature “Menschen und Mächte”, to be televised in winter 2016/17.

4. Other important aspects (examples)

In total, 10 presentations were given at international and national conferences and workshops. Some of them were embedded in special sessions on the environmental history of tourism destinations organized by team members.

Groß R. (2013): European Sustainability and the Marshall Plan: The case of winter tourism in Alpine environments. Initiative for Sustainability and Change, Department of Culture and Global Studies, 2.4.2013, Aalborg, Denmark.

Groß R. (2013): Human Niche Construction in the Alps: A contribution of Environmental History to the HNC framework. TU Delft Workshop: Between Human Niche Construction and Imperial Power: Long term Trends in Ancient Water Systems, 23.4.2013, Delft, The Netherlands.

Groß R. (2013): How tourism transformed an Alpine socio-natural site (SNS): An environmental history. Conference: Challenging Ideas? Theory and Empirical Research in the Social Sciences and Humanities, Aalborg University, 30.3.2013, Aalborg, Denmark.

Groß R. (2013): Legal Legacies of the European Recovery Program (ERP)/Marshall Plan in Vorarlberg/Austria. Mountain Summer School of the European Society for Environmental History, 19.8.2013, Lavin, Switzerland.

Groß R. (2013): How American Money Aided the Circulation of Human Bodies: Impact and Legacies of the European Recovery Program (ERP)/Marshall Plan in Vorarlberg/Austria. 7th Conference of the European Society for Environmental History: Circulating Natures: Water - Food - Energy, LMU Munich, 24.8.2013, Munich, Germany.

Groß R. (2014): Enabling Skier‘s Sensations: Ski Slope Histories at the Thin Line of Erratic Snowfalls, Grassland Ecology and Farming Practices. 2nd World Congress of Environmental History at the University of Minho, 9.7.2014, Guimarães, Portugal.

Groß R. (2014): Vereinheitlichter Aufstieg – vielfältige Abfahrten. Das „European Recovery Program“ in Lech am Arlberg. 10. Österreichischer Zeitgeschichtetag an der Alpen-Adria-Universität Klagenfurt, Institut für Geschichte, 30.9.2014, Klagenfurt, Österreich.

Groß R. (2015): Technik, Temporalität und Transformation. Conference "Technospaces: Persistence – Practices – Procedures – Power”, organized by the research training group Topology of Technology of the Technical University Darmstadt, 20.3.2015, Darmstadt, Germany.

Groß R. (2015): Depicted – Visited – Transformed. A Visual History Approach to the Environmental History of the Alps. 8th Conference of the European Society for Environmental History: Greening History. Studying the environment across discipline: past, present and future, University of Versailles, 3.7.2015, Versailles, France.

Groß R. (2015): Histories of Up- and Downhill. How Winter Tourism Transformed Alpine Regions in Vorarlberg/Austria - 1945 to 1970. Workshop “Tourism and transformation: Regional development in European History, organized by M. Knoll and K. Scharf at Salzburg University, 18.9.2015, Salzburg, Austria.

One follow-up project has been funded: “Skilifte, Bildpostkarten und Massentourismus. Der Fotograf Risch-Lau als Akteur im Kulturlandschaftswandel?” (grant date June 2014; funded

by the provincial government of Vorarlberg). A second follow-up project “Curse, or blessing? Winter tourism in the Alps of Vorarlberg” (WKP 46) was declined by the FWF in November 2015.