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THE ALPS

People and pressures in the mountains,
the facts at a glance

VADEMECUM



IMPRINT

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Graphics and printing:

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ISBN: 978-8-89051-582-8



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INTRODUCTION

Take a look at any satellite image of the continent of Europe (satellite image of the Alps) and one physical feature strikes the eye immediately – a white-capped arc stretching from the shores of the Mediterranean, swinging north above the vast basin of the river Po and concluding in a flourish beyond the Adriatic. It is the Alps. The satellite image of course betrays no national borders, revealing the Alps simply as a bejewelled crescent at the heart of a continent.

On the ground the picture becomes much more complex, thus it is the purpose of this Handbook or Vademecum to encapsulate the realities of the Alpine region and the challenges it faces. It has been produced by the Permanent Secretariat of the Alpine Convention, the secretariat of the treaty signed in 1991 by the eight Alpine states and the European Union with the objective of furthering sustainable development in the Alps while safeguarding community interests and the region's natural beauty and abundance.

The Alps make up one of the largest natural spaces of Europe (MAP 1: Biogeographical Regions of Europe), yet are also the home and workplace of 14 million people and the holiday destination of some 120 million guests each year. Mountainous and distinct, the region is nevertheless of immense importance to the populations of the surrounding plains – a primary source of water, hydropower and natural products including timber, and high-quality food. Less tangible, though perhaps equally important, is the value of such beautiful landscape and its rich biodiversity to the well-being of Europe's citizens and its eco-system.

Farming and forestry have always been central to the Alpine economy and way of life. Not only do they provide food and wood for local consumption and "export" to the cities, but play a vital role in anchoring local populations and maintaining a landscape that is not only attractive to tourists but also protects against soil erosion, floods and avalanches.

Water and energy are also key sectors. The Alps provide much of Europe with water for drinking, irrigation, industry and electricity generation. Water management requires a highly integrated approach to ensure a fair and rational use of this resource, particularly in an era of climate change. Energy conservation, more efficient use of technology and greater use of other forms of "green" energy, such as solar power, is also imperative.

Tourism is both a mainstay of the Alpine economy and a challenge to policymakers who must ensure that the millions of visitors do not degrade the very mountain environment they come to enjoy. Tourism helps to maintain permanent populations in the mountain towns and villages, stimulating a growth that in turn attracts other business. The Alpine Convention attaches great importance to the development of low-impact, "eco-friendly" tourism, for example through switching to public transport and the use of low energy technologies in hotels and leisure complexes.

Climate change presents a further challenge for all sectors. In the spring of 2009, environment ministers of the member countries adopted a climate action plan for the Alps. They called for greater exchange of information on the evidence and effects of climate change and of best practice in coping with them. Ideas of “climate neutral” zones in the Alps are to be pursued, along with awareness raising, itself a key duty of the Convention.

The MAPs and text in this Convention publication illustrate the physical and human geography of the Alps; those so-called “facts on the ground” that decision makers at all levels, from village to state capital, will have to grapple with in making informed decisions for a sustainable Alps.



Satellite image of the Alps

© Jacques Desclotres, MODIS Rapid Response Team NASA/GSFC



**Biogeographical regions,
Europe 2005, with national
boundaries**



MAP 1: Biogeographical Regions of Europe

www.eea.europa.eu/data-and-maps/figures/biogeographical-regions-in-europe

THE ALPS AT A GLANCE

The Alps are a geographical unit and a part of Europe

The Alps are an ecological and socio economic unit, a living space for humans, animals and plants for millennia

The Alps rich diversity of nature and cultures is an asset in their sustainable development

The Alpine Convention is a unique framework to develop a common way forward for sustainable development of the Alps

Sustainable development means to manage change

The Alps:

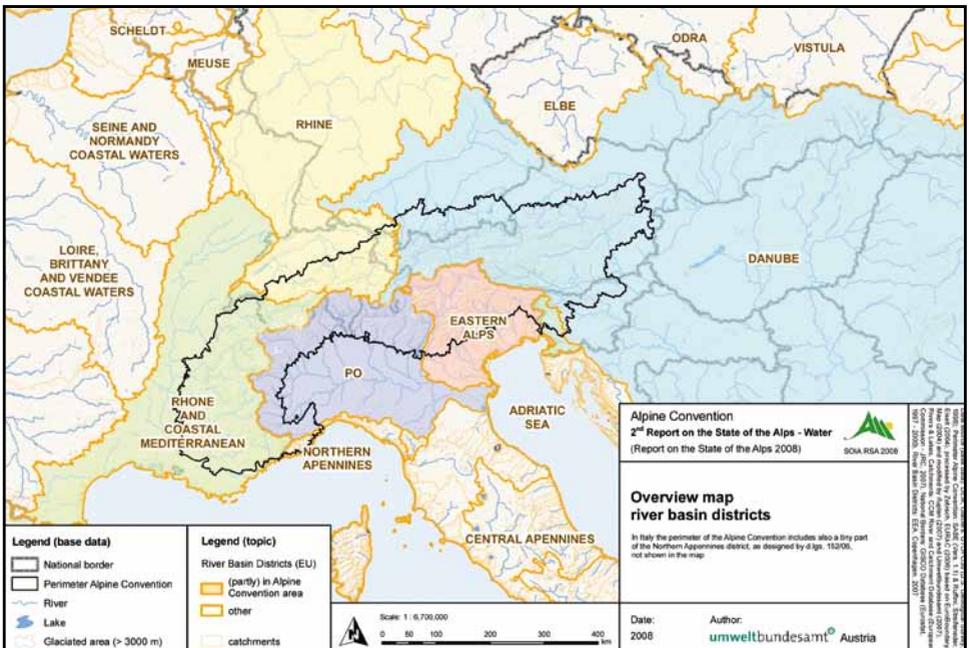
- 8 countries
- 14 million people
- 120 million guests per year
- Almost 6000 communities
- Population density in area of permanent settlement varies from less than 200 inhabitants/km² (Styria) and more than 16,000 (Principality of Monaco)
- 13,000 plant species
- 30,000 animal species
- 550 hydroelectricity plants with more than 10 MW and 2900 GWh annual output
- 4,200 km of main roads within the Alpine perimeter
- 190 million of tonnes freight crossing the Alps per year -65 % by road
- 6 million vehicles driving on Alpine arc roads each year
- Per capita GDP from 10,000 Euro (Notranjsko- Kraška) to 80,000 Euro in Liechtenstein
- 17% people older than 64
- Warming of 1.5 °C over the last century
- In 2006 the volume of water stored as ice was still 9,84 % greater than that present as liquid, but the margin is narrowing.

ALPS WITHOUT BOUNDARIES

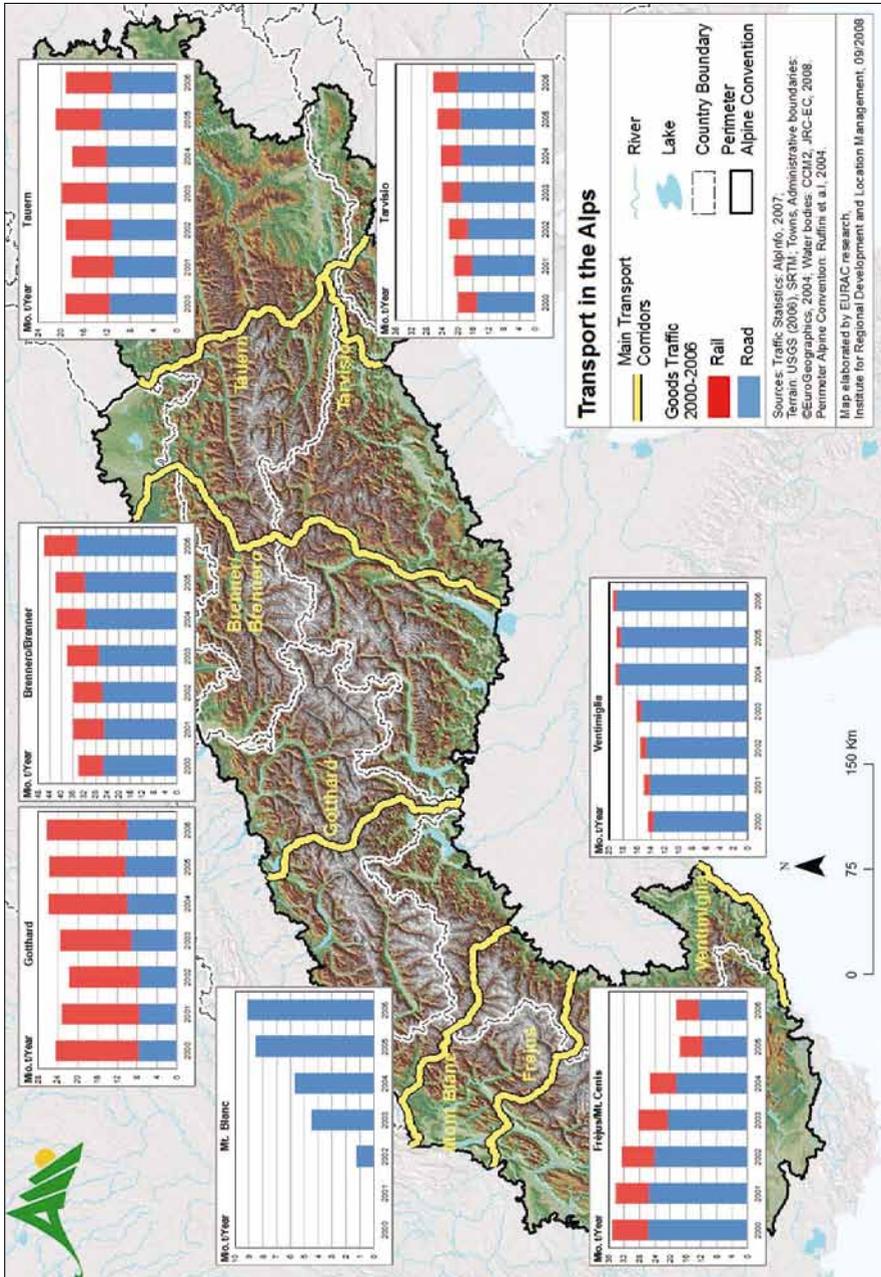
This group of MAPS (MAPS 1 – 6) shows the centrality and significance of the Alps, a 1,000 km mountainous arc that forms, after the Mediterranean, the second largest ecosystem in Europe.

Its rivers know no national boundaries, flowing from glaciers and snowfields to the North Sea, Mediterranean, Adriatic and the Black Sea. On their way they provide water for the people, farms and industries of the adjoining lowlands. For certain spells of the year, the basin of the Po river, including the cities of Milan and Turin, depends for up 80 % of its water on the Alps. Cities along the Rhone, Rhine and Danube also rely heavily on this mountain "reservoir" (MAP 2: River basin districts of alpine rivers).

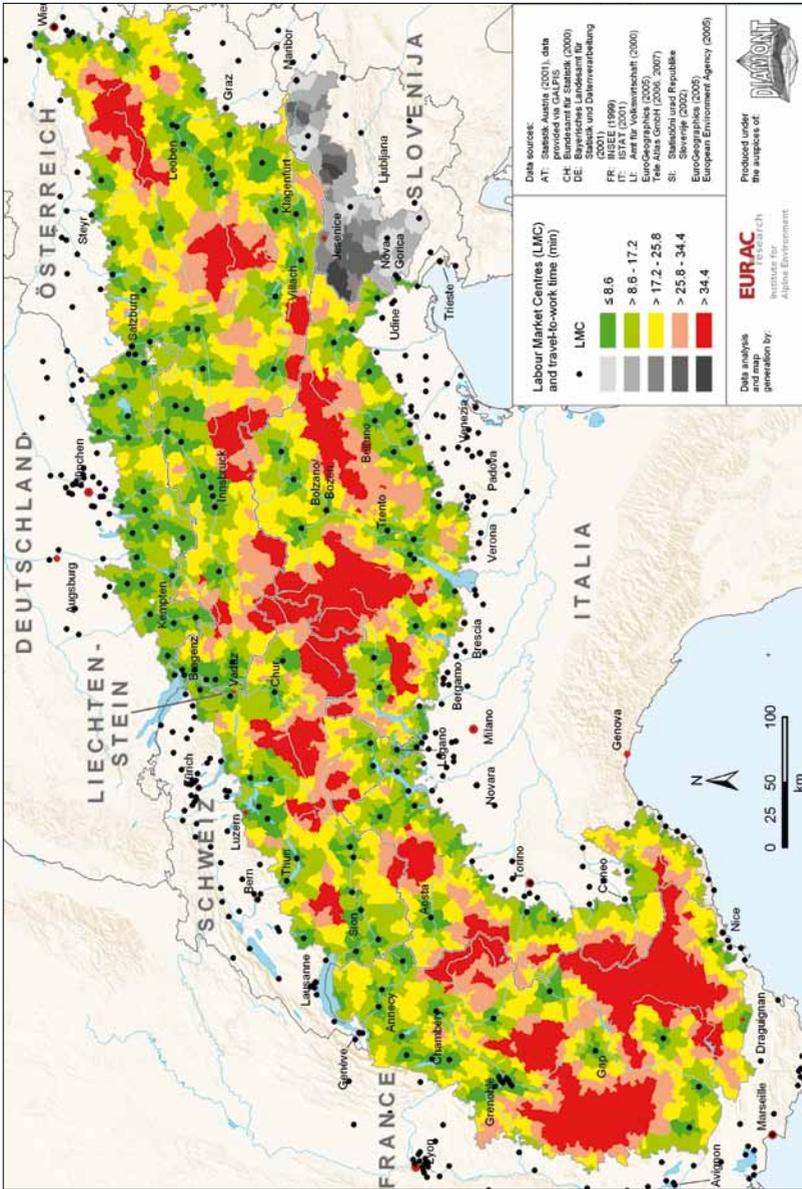
Transport systems came to terms with the Alps long ago and, as can be seen here (MAPS 3 and 4: Transports and mobility and MAP 5: Transport in the Alps), the mountains are criss-crossed by road and rail links, either over high passes or through tunnels. Good road and rail networks are vital not just as through routes but also for the people of the Alps themselves (MAP 6: Labour Market Centres and travel-to-work-time). However the sheer volume of traffic has severe impacts on the environment, causing pollution, noise and land grab.



MAP 2: River basin districts of alpine rivers



MAP 5: Transport in the Alps



MAP 6: Labour Market Centres and travel-to-work-time (min)

© TAPPEINER U., BORSODORF A., TASSER E. (eds), *Mapping the Alps*, Spektrum Akademischer Verlag, Heidelberg 2008; Labour Market Centres and Travel-to-work Time: communities with more than 10,000 inhabitants or more than 5,000 jobs and a positive commuter balance.

THE MARK OF MAN

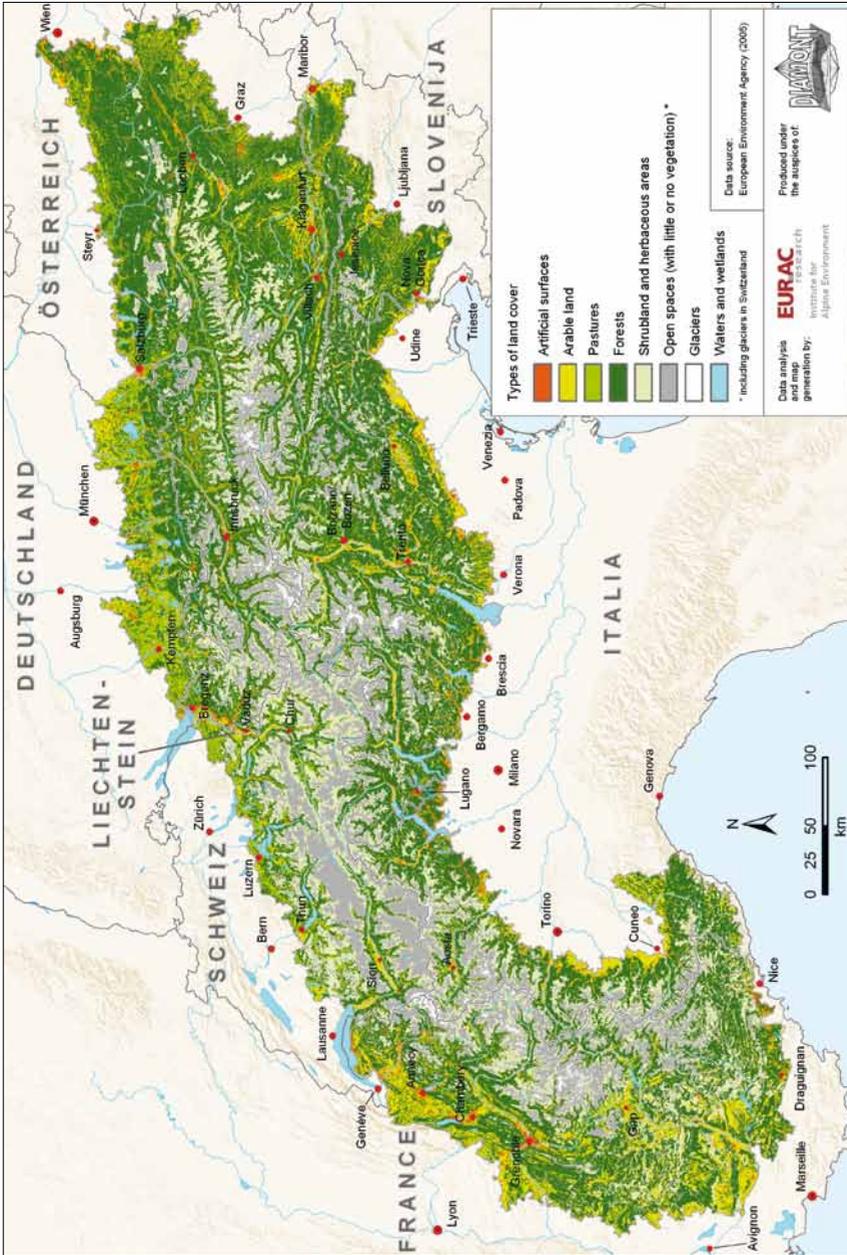
Though popularly pictured as a land of icy peaks and rugged mountainsides, the Alps is to a large extent a landscape shaped by human hand. Even at the elevation of glaciers, ski developments and power lines intrude. Farmed, grazed, forested and mined for more than 1,000 years, natural landscape has been changed to a diversity of cultural landscapes.

The MAP 7 (Land use / land cover) on land cover shows forest blanketing much of the Alps, along with pasture and high mountains. Less visible but as, if not more, significant are the hot spots of concentrated use – industry and transport in the valleys, hydropower plants and reservoirs, and ski resorts.

As can be seen from MAP 8 (Dams and reservoirs) large dams for hydro-power are spread throughout the Alps and there are also scattering multipurpose dams. Hydro-power has the benefit of being a largely CO₂ free, renewable source of energy, serving the Alpine states and helping stabilise the European grid at times of peak demand.

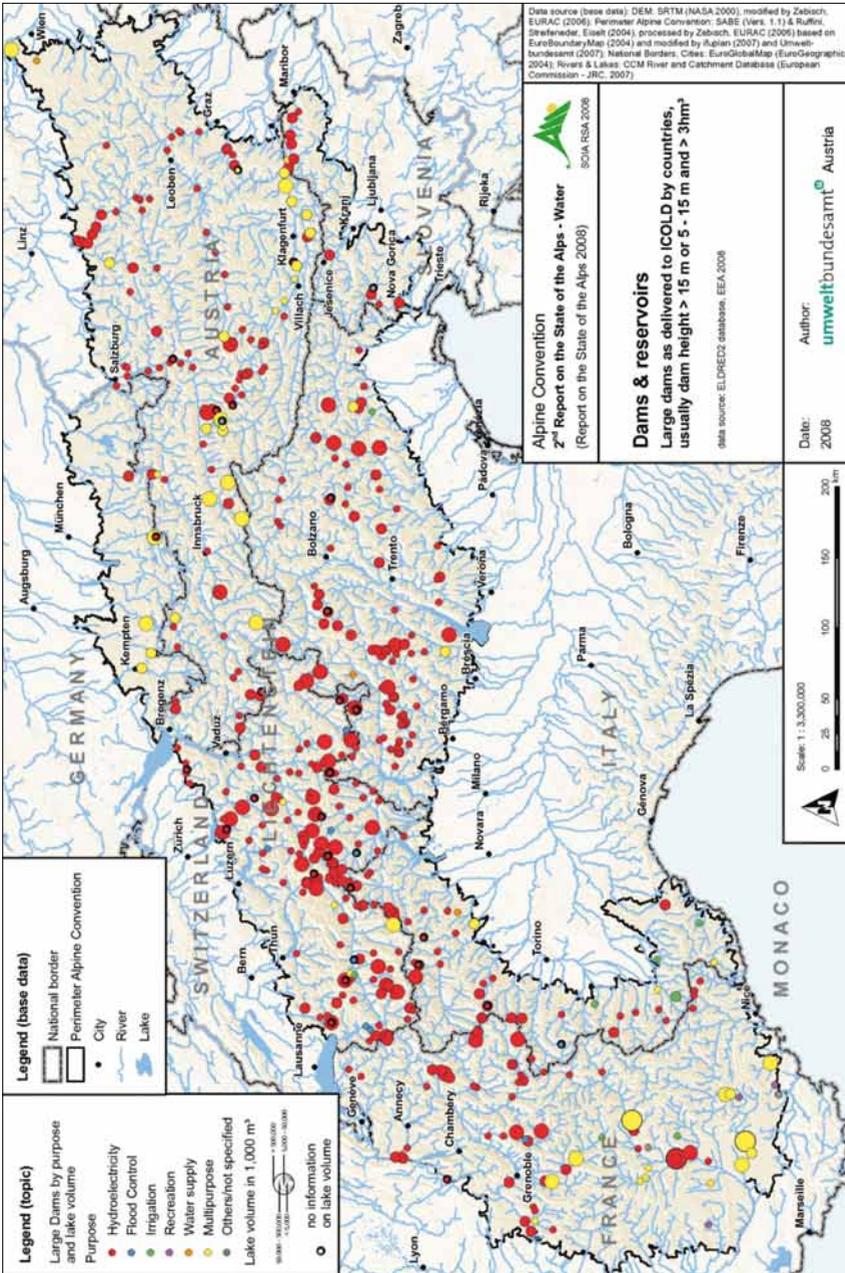
Though 120 million people are estimated to visit the Alps each year (calculated as overnight stays), the tourism map (MAP 9: Tourism intensity) shows that they are unevenly spread through the alpine space. The two air temperature maps (MAPS 10 and 11: Temperature in the Alps) illustrate how the big difference in temperatures between the mountains and the plains is an asset to tourism in the Alps both in summer and winter.

Human-generated climate warming is additionally marking the Alps, for example streams and rivers become more unnatural as even more water is diverted for irrigation or held in ski resort reservoirs for “snow making”.

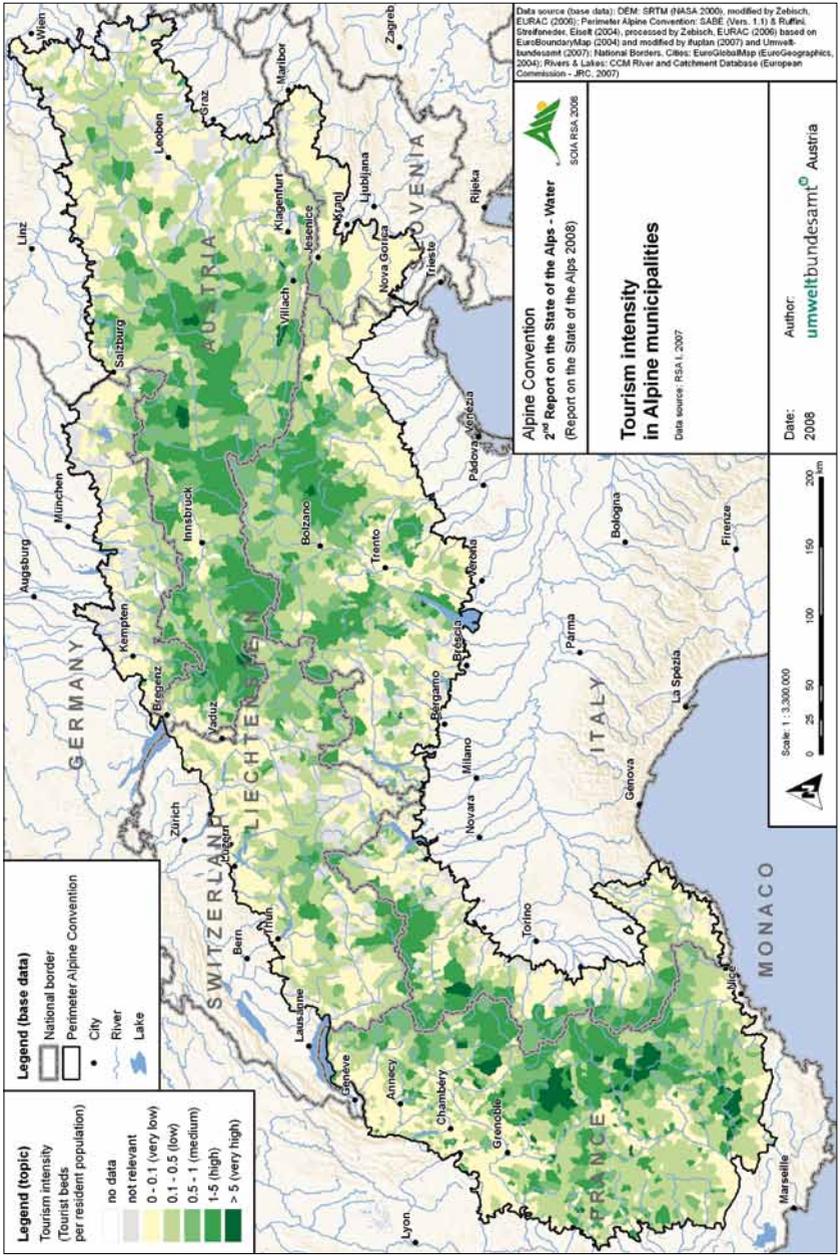


MAP 7: Land use / Land cover

© TAPPEINER U., BORSZDORF A., TASSER E. (eds), *Mapping the Alps*, Spektrum Akademischer Verlag, Heidelberg 2008



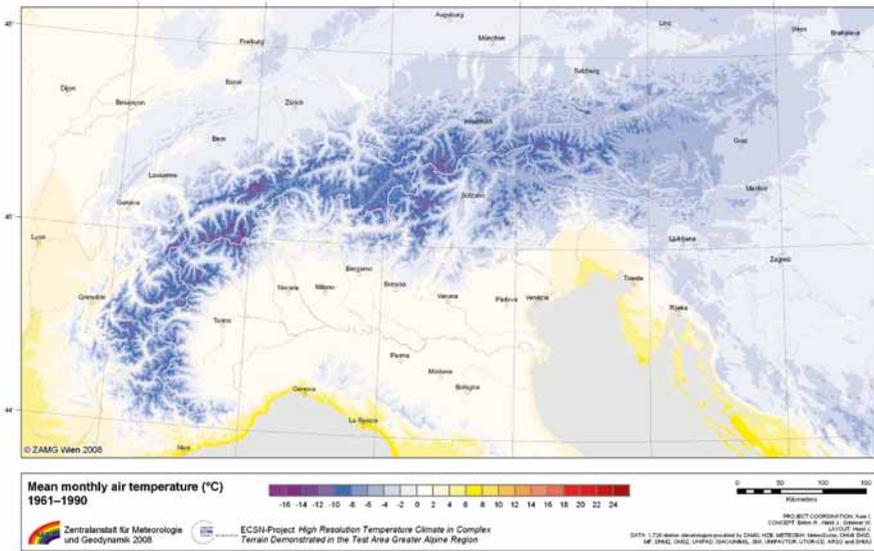
MAP 8: Dams and reservoirs



MAP 9: Tourism Intensity
Tourism intensity: number of tourist beds per resident population.

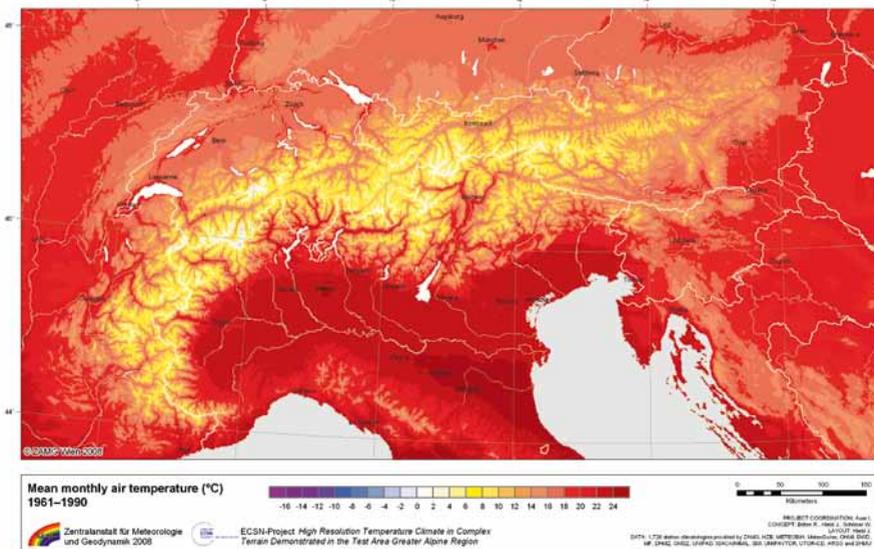
AIR TEMPERATURE

January



AIR TEMPERATURE

July



MAPS 10 and 11: Temperatures in the Alps

Temperature in the Alps and the difference to the surrounding temperature is an asset for tourism and leisure attractiveness (snowfall and comfortable temperature in summer time).

ALPINE DIVERSITY

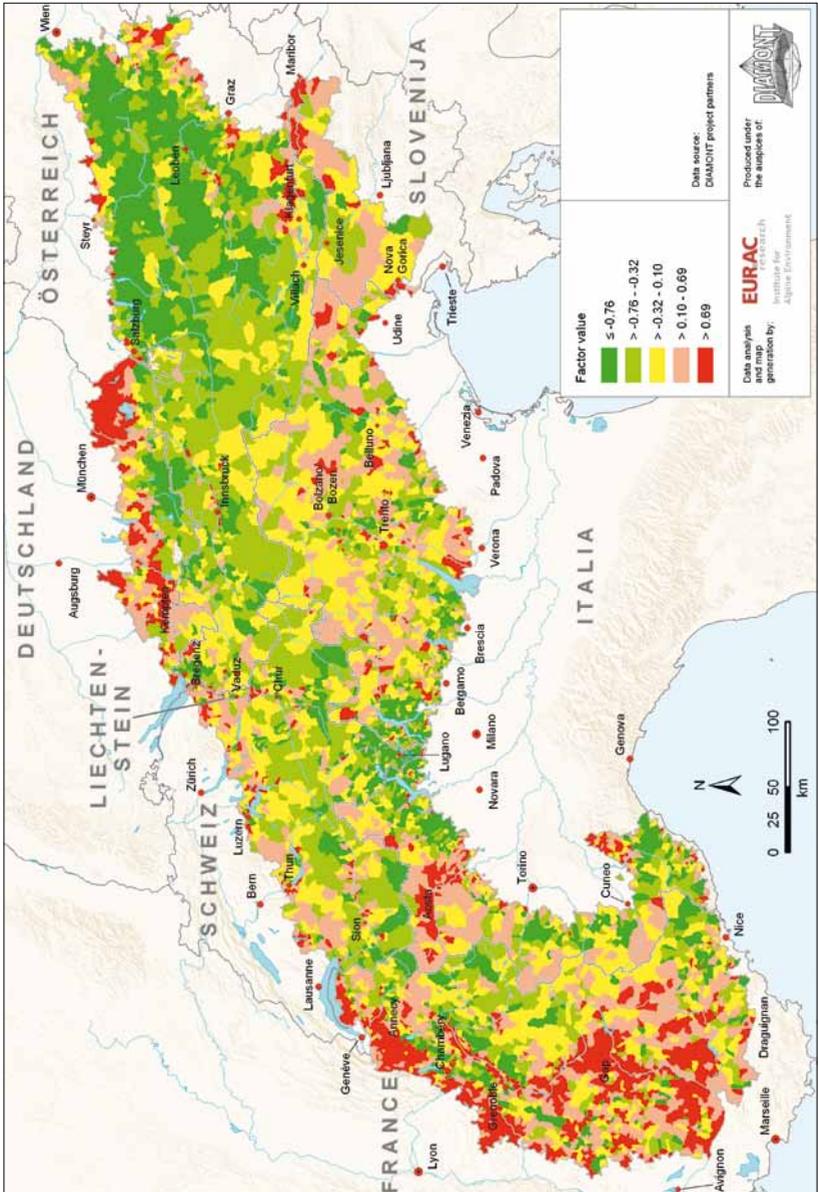
The natural and cultural diversity of the Alps is a valuable asset and insurance in the drive for sustainable development.

The Alpine region is home to 14 million people, concentrated in towns and cities around the periphery (MAP 12: Population density). This same 'rim' area of the Alps and in the main Alpine valleys where it is easier to grow crops, to build and to live, is in consequence also the most culturally diverse (MAP 13: Diversity of cultural landscape).

In addition to the four main Alpine languages, namely French, German, Italian and Slovenian, the Alps, you can still hear Occitan, Romansch and Ladin spoken in some areas, along with several dialects (MAP 14: Languages in the Alp). Several minority languages and dialects are now only spoken in remote areas and are gradually dying out.

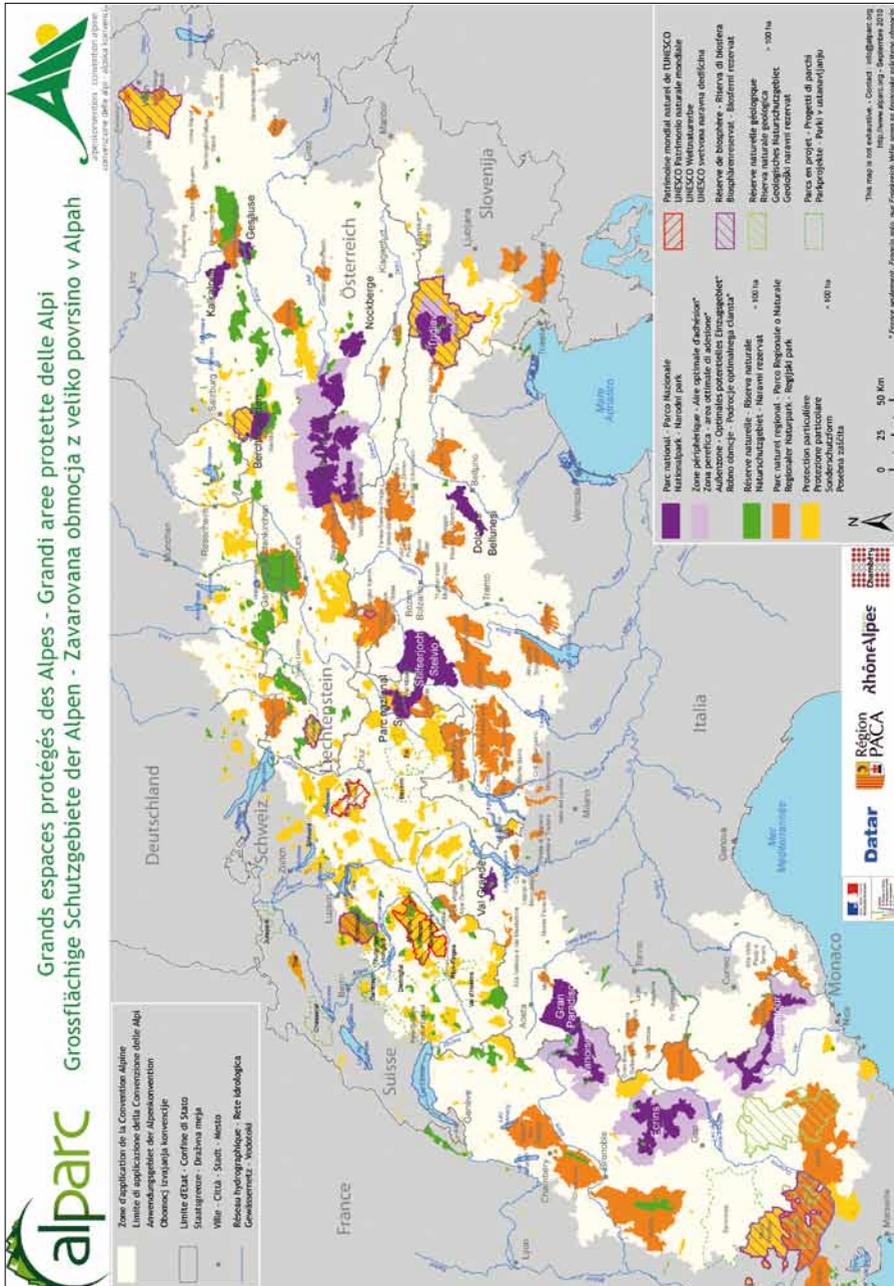
The varied Alpine landscape also gives rise to an immense diversity of flora and fauna, much of it protected in national parks and nature reserves (MAP 15: Protected areas). Some 13,000 plant species have been identified in the Alps, together with 200 different breeding birds, 80 mammals and 15 types of snakes and lizards.

The economic make up of the Alps is very diverse too. In some areas farming is still predominant, for example sheep and dairy in more mountainous parts, while elsewhere manufacturing and service industries are the main employers. The labour market is accordingly diversified (MAPS 16 – 18: Sector dominance in the Alps). Though each area must respond to the challenge of sustainable development according to local circumstances, common to all is the need for good quality services such as education and public transport.



MAP 13: Diversity of cultural landscapes

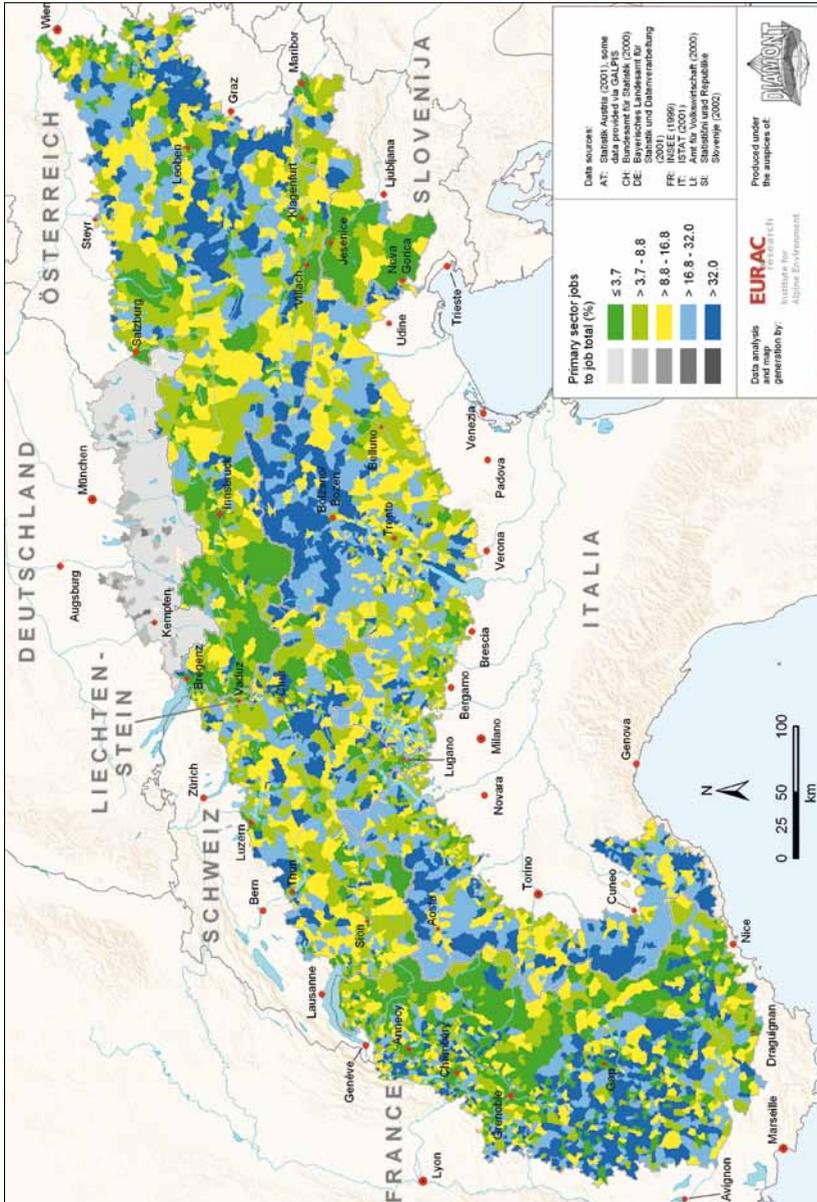
© TAPPEINER U., BORSDORF A., TASSER E. (eds), *Mapping the Alps*, Spektrum Akademischer Verlag, Heidelberg 2008; The higher the factor value, the greater the diversity of the types of cultural landscape (grassland, crops, gardening, vineyards, orchards, etc) and the smaller is each individual parcel of land, each with a different type of cultural landscape.



MAP 15: Protected areas

MAPS 16 – 18: Sector dominance in the Alps

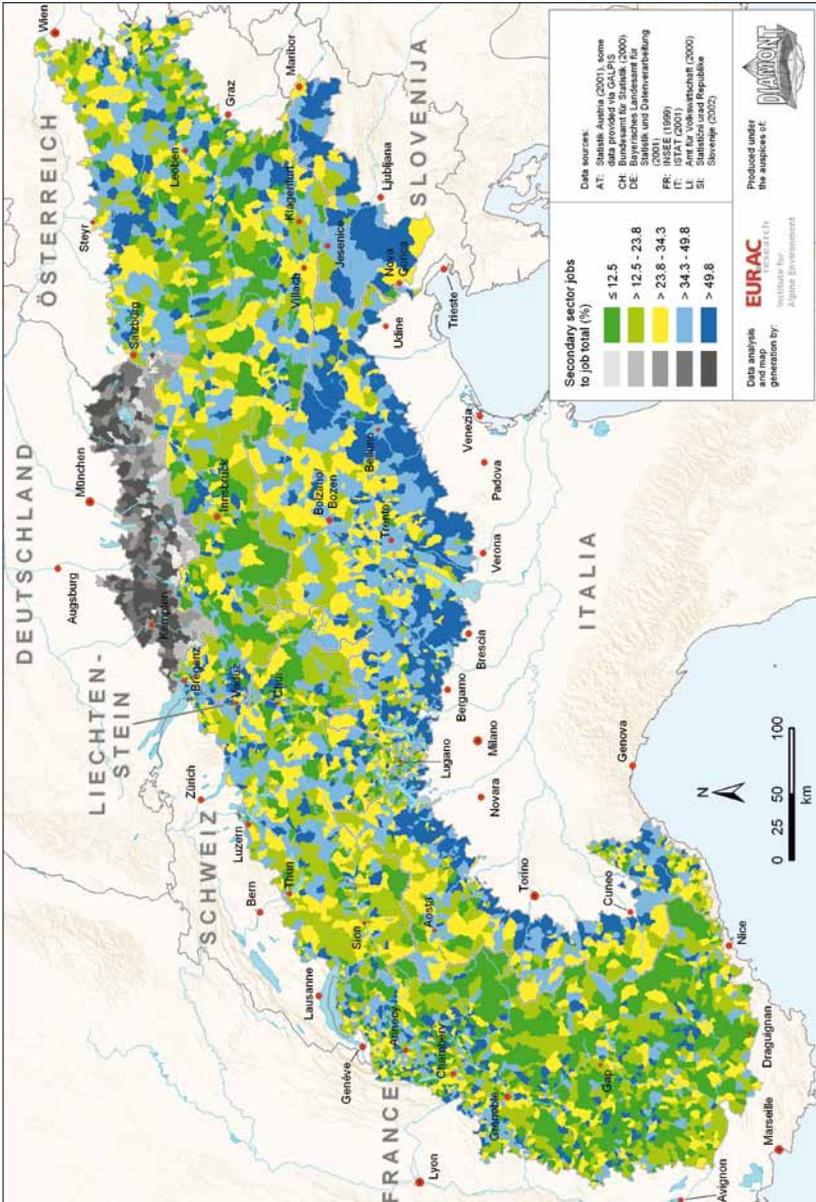
© TAPPEINER U., BORSODORF A., TASSER E. (eds), *Mapping the Alps*, Spektrum Akademischer Verlag, Heidelberg 2008



Primary sector jobs year 2000

MAP 17: Sector dominance in the Alps

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Secondary sector jobs year 2000

POPULATION DRIFT

Sustainable development in the Alps has to proceed against a background of structural change that has been underway for many decades, even centuries, as the region has moved from a mainly rural subsistence economy to a modern, multi-faceted economy.

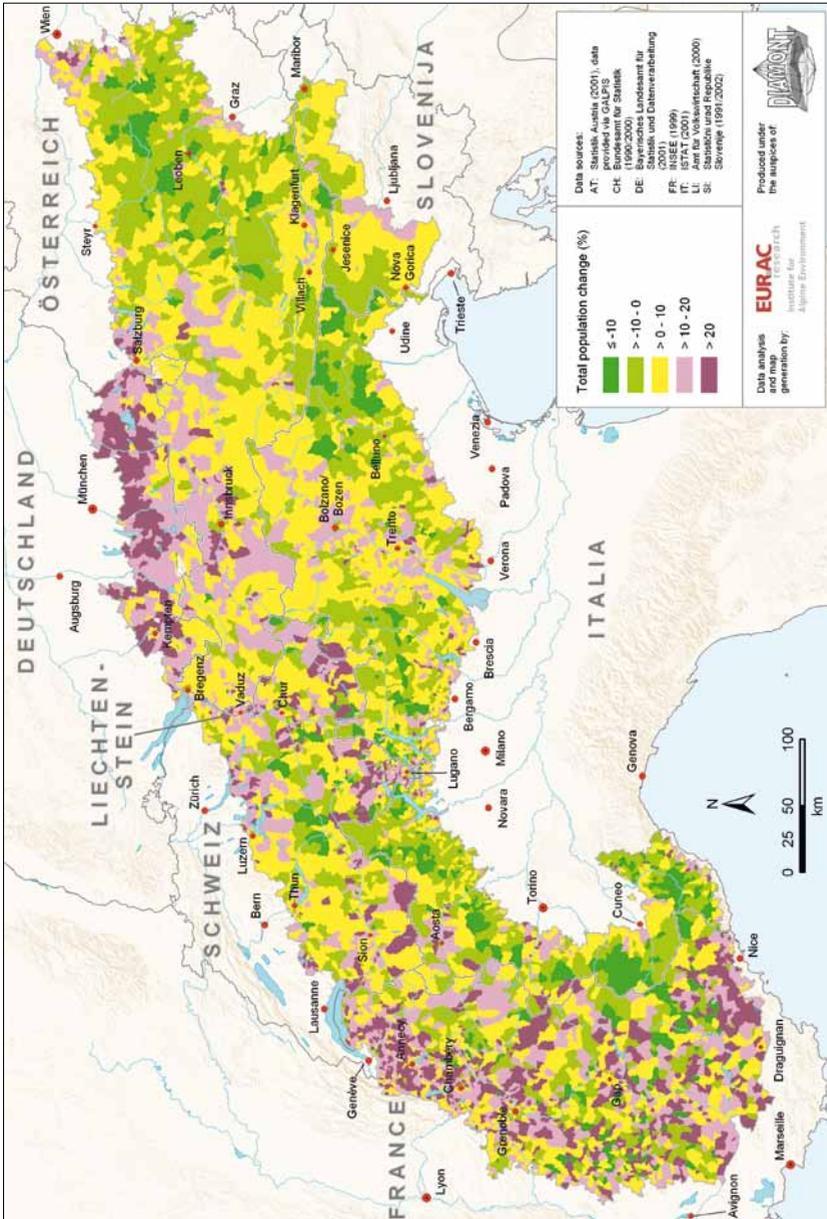
The maps in this section indicate how populations have shifted as people have migrated from the countryside to the cities and towns of the alpine periphery (MAP 19: Total Population Growth and MAP 20: Population trend in Alpine municipalities). As a result, mountain areas have declining and ageing populations (Tab. 1: Demographic development in the municipalities of the Alpine Convention). This is exacerbated by the use of residences for second homes and the inward migration of pensioners – both factors that can price local people out of the housing market.

Loss of a settled rural population and farm abandonment (MAP 21: Farm abandonment) can reduce the capability to maintain the traditional rural alpine landscape, while at the same time the burden on urban areas increases as populations rise. Changes in landscape use, particularly the encroachment of artificial areas (ski pistes, dams, new roads, etc.) can fracture species habitats and plant zones, thereby threatening biodiversity.

Inhabitant class	Percent of Alps' total population	Percent of total municipalities	Percent of which are municipalities with population decline of more than 1 %	Percent of which are stagnating municipalities (growth/decline below %)	Percent of which are municipalities with growth of more than 1 %
< 500	3,19	31,5	34,0	3,0	63,0
501-1.000	5,70	18,4	24,6	4,7	70,7
1.001-2.500	18,16	26,4	17,2	10,1	72,7
2.501-5.000	20,10	13,7	13,2	4,7	82,1
5.001-10.000	17,70	6,2	13,1	6,2	80,7
10.001-25.000	18,03	3,0	12,0	9,1	78,9
25.001-50.000	8,34	0,6	22,9	17,1	60,0
> 50.000	8,78	0,2	21,4	7,2	71,4
Total	100,0	100	24,0	4,9	71,1

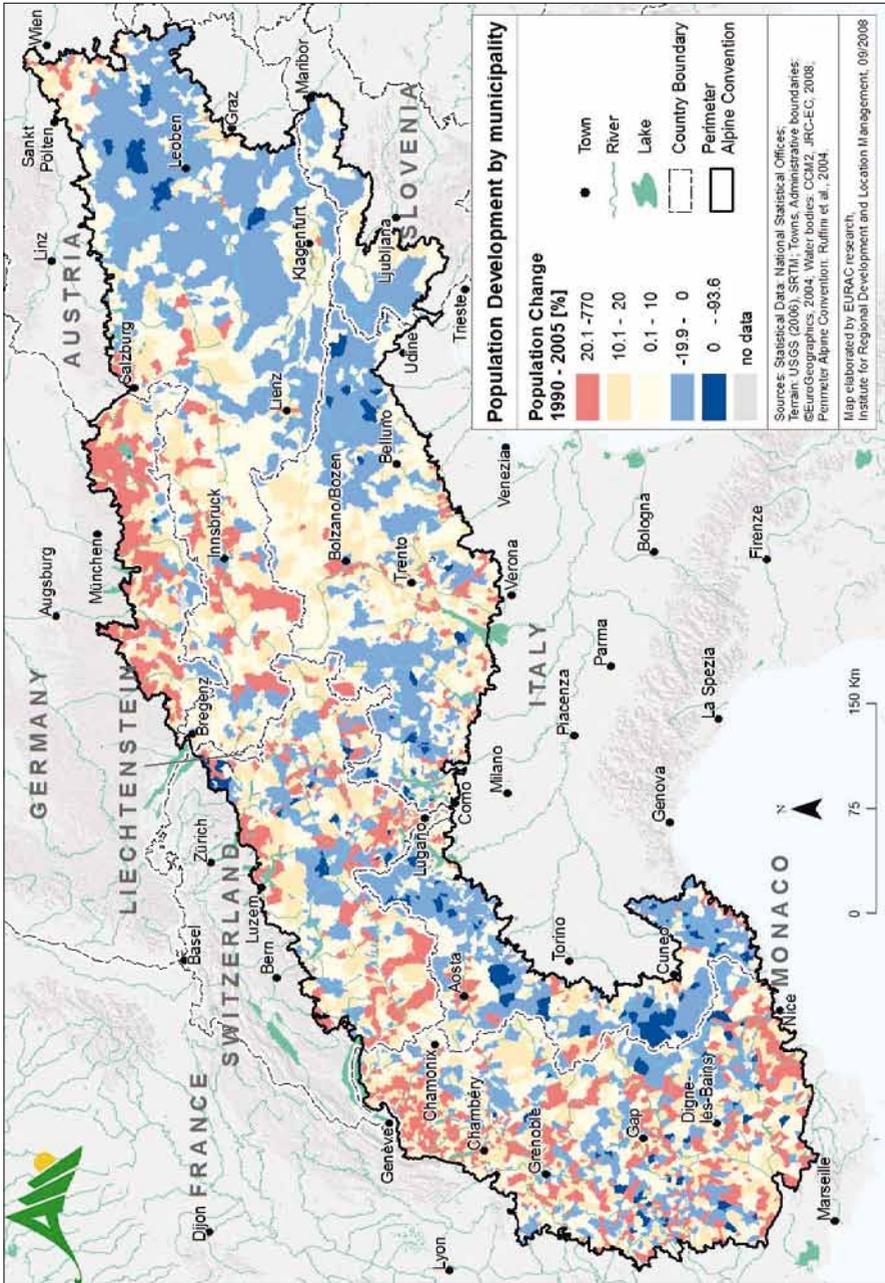
Table 1: Overview of demographic development in the municipalities of the Alpine Convention, organised by classes of size (as of 2004)

Sources: Statistik Austria (2005); INSEE: Recensement de la population de 1999; Bayerisches Landesamt für Statistik und Datenverarbeitung (2004); Istat (2004); Amt für Volkswirtschaft (2000); Statistical Office of the Republic of Slovenia, Regional Statistics (2004).

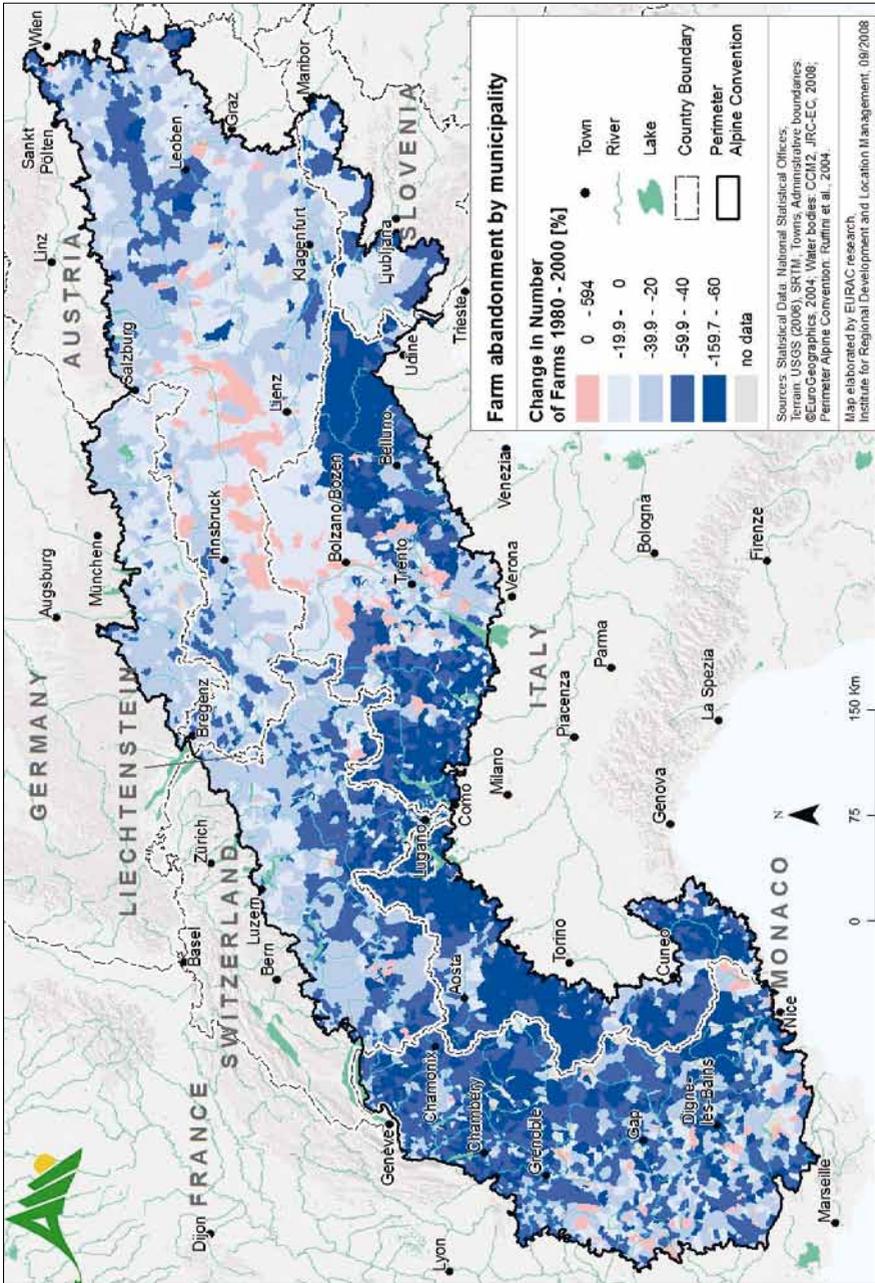


MAP 19: Total Population Growth between the Last Two Censuses

©TAPPEINER U., BORSDORF A., TASSER E. (eds), *Mapping the Alps*, Spektrum Akademischer Verlag, Heidelberg 2008; Total Population growth: population growth and migration.



MAP 20: Population trend in Alpine municipalities

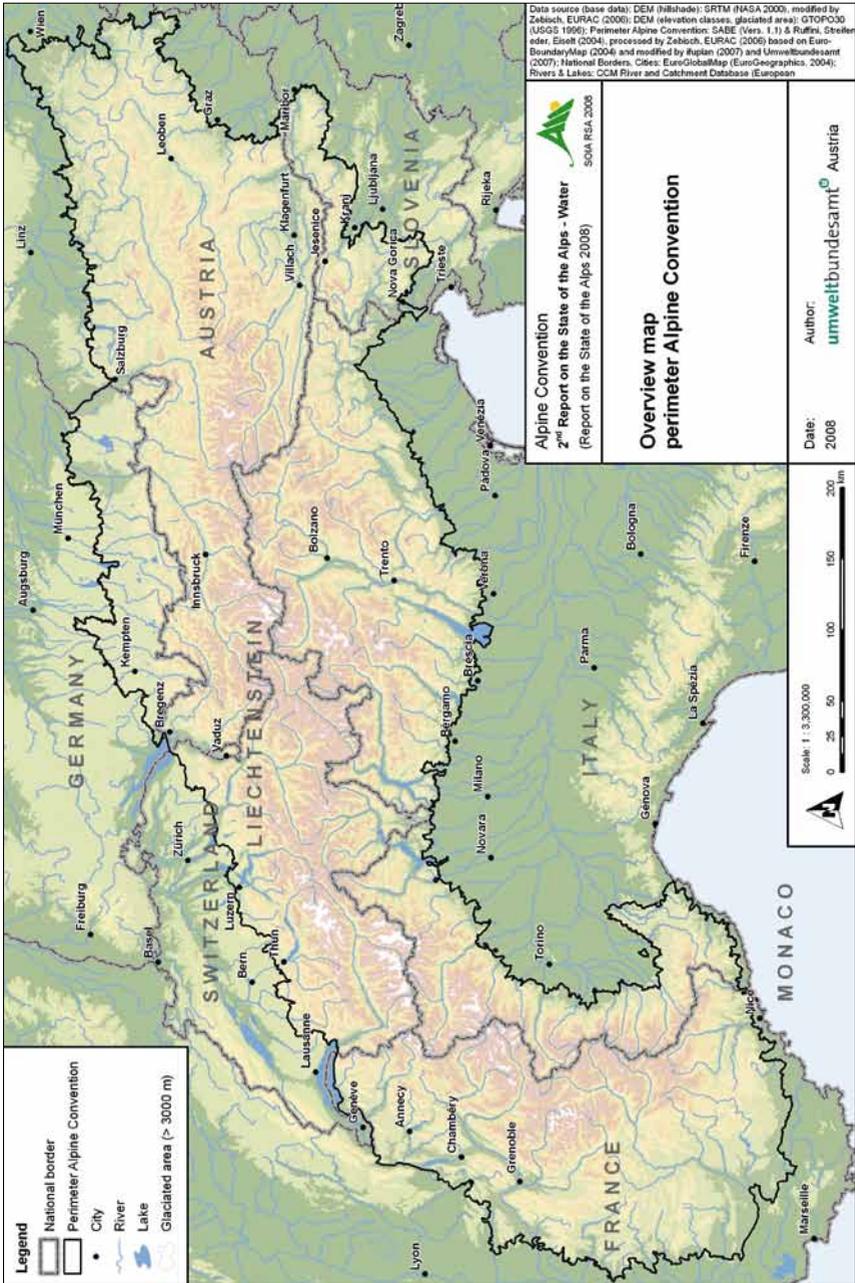


MAP 21: Farm abandonment

THE CHALLENGE OF CHANGE

Today's challenge in the Alps is to manage the long term structural and climate changes in such a way as to bring about sustainable development to the benefit of not only the people of the Alpine region but also their neighbours on the plains. As the satellite image demonstrates, the Alps constitute a single geographic unit. Its problems and potentials may sometimes be local in nature, however a concerted approach offers the opportunity to share experience and reduce disparities, leading to more harmonious and balanced development within the mountainous area itself and across the Alpine countries and the EU as a whole.

The Alpine Convention (MAP 22: Alpine Convention perimeter) offers a unique framework for the formulation of such a common policy, the goal being an Alpine region where a sustainable economy prospers and mountain cultures, landscape and wild nature are safeguarded.



MAP 22: Alpine Convention perimeter

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