



## Different Human Impacts in Similar Settings

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# Different Human Impacts in Similar Settings

## Old and New World Alpine Landscapes in Comparison

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Many physical similarities exist between the European Alps and the Southern Alps of New Zealand. This may be the reason why European settlers (re)named Ka Tiritiri o te Moana—the Maori name for the long stretch of alpine country that crosses Te Wahi Pounamu or the South Island from southwest to northeast—the Southern Alps. But both major mountain ranges have very different landscape histories and cultural heritages: a centuries-old history at the heart of the

densely populated European Continent and a rich adaptation of Polynesian and European cultures on an island (fairly) recently settled and sparsely populated. This paper compares 5 representative landscape types in New Zealand and Switzerland from a geographer's viewpoint, briefly discussing physical and cultural similarities and differences. The area selected for presentation in each case covers a square of approximately 100 km<sup>2</sup>.

### Human use in 5 landscape types

#### Prealpine ranges: Lonesome outposts

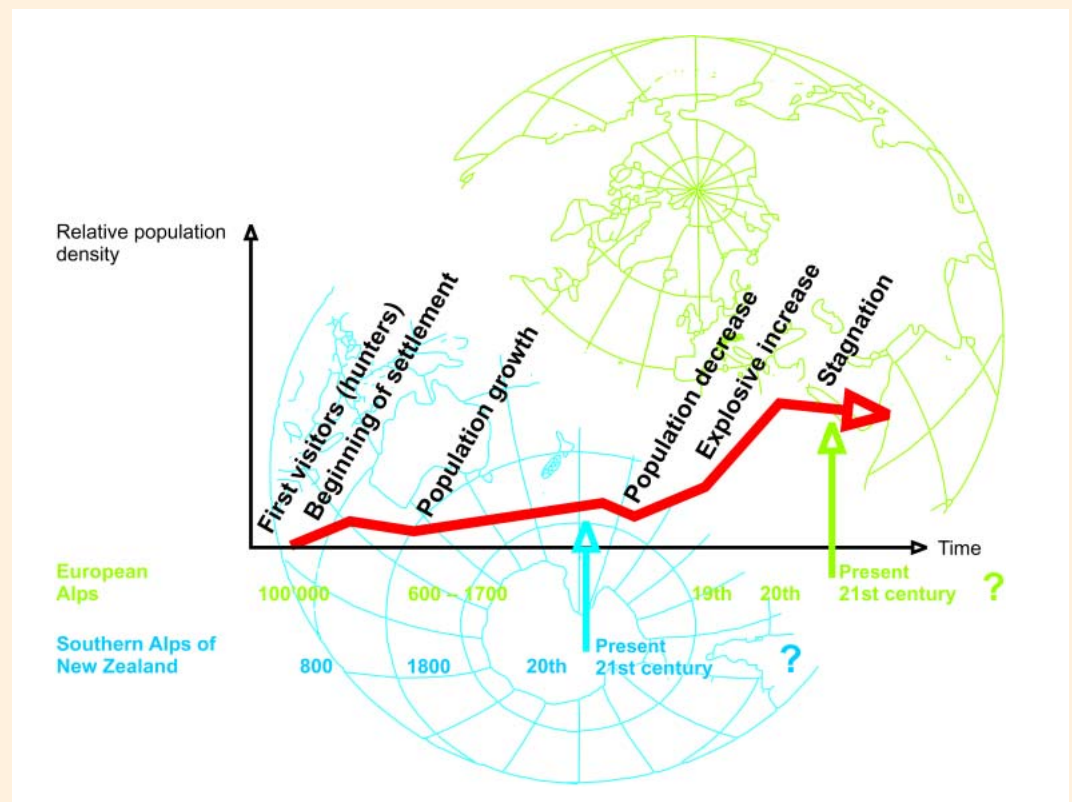
Prealpine ranges are situated on the border of central ranges and usually have lower elevations. They have a prominent position as outposts and as areas of transition.

The Craigieburn Range (Figure 2a) is not an external range, as it does not quite reach the Canterbury Plains (300–400 m); nevertheless, its character is prealpine. The range is representative of an important part of the South Island rural High Country. Rising from Waimakariri Valley (400–500 m), its highest summits reach

2000 m. The range is situated in a relatively dry part of the Southern Alps. By contrast, prealpine ranges in the Northern European Alps are rather humid, especially in summer. Many of them emerge from the surrounding flysch and molasse hill country. The Stockhorn Range (Figure 2b) culminates at more than 2000 m and drops down to valleys with elevations of 500–800 m.

Although they are relatively close to more densely populated lowlands, prealpine ranges are often very marginal mountain areas in comparison with highlands that have tourism infrastructure.

**FIGURE 1** Relative demographic development over the centuries in the European Alps and the Southern Alps of New Zealand, with a logarithmic time axis.



Agricultural activity is limited by climate and topography. In Europe, land between 1000 and 3000 m is used as summer pastureland for cattle from the lowlands. In some areas, forestry is a relatively important economic factor. In the Stockhorn Range, pastures are grazed by herds from a wide adjoining lowland farming area with a comparatively low population density living in small villages. By contrast, the rural population in the Southern Alps of New Zealand is dispersed on large farms ("stations") and villages are rare. The few remaining forests are now mostly under conservation, as is the case in Craigieburn State Forest Park.

For most international tourists, European prealpine ranges are less attractive than central ranges: They are characterized by moderate altitudes, less challenge for mountain climbers, less snow, and no glaciers. Their advantage, however, is their proximity to inhabited areas so that these ranges are appreciated for day tourism (especially hiking, as skiing is now limited by snow shortage; see Elsasser and Messerli in this issue). Infrastructure is limited and often lacks accommodation. Tourism is therefore mainly domestic, except where prealpine peaks have become famous through their mountain railways and cable cars built to attract those who appreciate spectacular views. In New Zealand, before the Mount Hutt area was

developed, the Craigieburn Range was the closest ski resort for people in Christchurch, who have easy access to it via the road to Arthur's Pass. All the infrastructure (roads, huts, and ski lifts) was developed by local ski clubs.

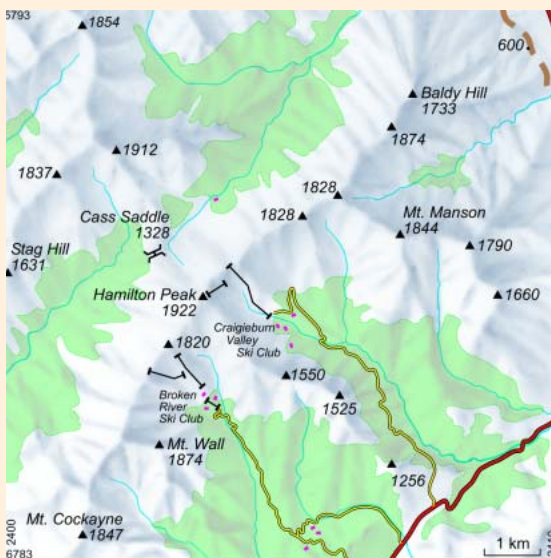
### Main valleys:

#### Deep trenches and easy outlets

Valleys typically collect runoff from higher areas, both in the physical (water, alluvium, sediments) and the more metaphorical sense (products of human activity). But imported goods, visitors, ideas, and political as well as economic influence also penetrate through valleys and upward into mountain areas.

In Europe, the major alpine valleys are long and wide; they offer favorable climatic and economic conditions, a good mountain habitat, and convenient communication between the highlands and lowlands. A long human history and central location on the continent have led to a considerable degree of human occupancy (with many villages and even major towns), mobility, and a tradition of fluvial control. The Tasman Valley in New Zealand (Figure 2a) is more accessible than other large valleys in the Southern Alps. It is the door to a major tourist destination, Mount Cook National Park, which is an island of relative centrality within a very marginal highland area.

**FIGURE 2A** The Craigieburn Range in Canterbury, New Zealand.



**FIGURE 2B** The Stockhorn Range in the Bernese Oberland, Switzerland.





**FIGURE 3** View of the Rhone Valley from the village of Vétroz towards the west, in the direction of Ovronnaz and Chamoson (see Figure 4b). (Photo by author)



Between Brig and Lake Geneva (130 km), only 7 km of the Rhone (Figure 4b) have not been channeled. The river bed is only 100–120 m wide. By contrast, the Tasman River in New Zealand flows in a braided bed more than 4000 m wide. In the Rhone Valley, rare floods such as the October 2000 event have had a catastrophic impact on humans, whereas the Tasman valley floor is largely uninhabited. Intense agricultural use of the Rhone Valley—with

vineyards on the sunny northern slopes, horticulture on the valley floor, and mainly forests on the southern slopes (Figure 3)—stands in contrast to extensive grazing of the valley floor and slopes in the Tasman Valley (Figure 5).

#### Mountain resorts:

##### Tourist traditions in alpine settings

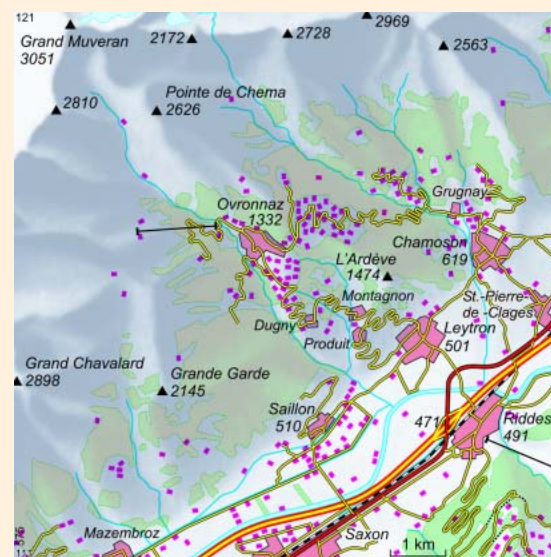
Some of the tourist resorts in both alpine regions are famous and boast a long or very long tradition due to their attractive location, their international history, and the initiative of tourist pioneers who started major development activities long ago.

At the upper end of the Tasman Valley, the first Hermitage Mount Cook (Figure 6a) was built in 1885 at the foot of New Zealand's highest peak, named Aoraki or Aorangi by the Maori. An area of 707 km<sup>2</sup> became a national park in 1953. Today a small tourist village and the National Park Center constitute the most important settlement in the central Southern Alps. The Hermitage Mount Cook is an inevitable stop on the classic tourist route through the South Island, between Christchurch, Queenstown, Milford Sound, and Westland National Park. Many activities and sports are possible, but no cable cars have been tolerated within the National Park. Planes bring in tourists for sightseeing tours, climbing, and skiing on Tasman Glacier.

**FIGURE 4A** The Tasman Valley in Canterbury, New Zealand.



**FIGURE 4B** The Rhone Valley in the Valais, Switzerland.





The two Lütschine Valleys in the Bernese Oberland (Figure 6b) were among the first visited by a cultural elite in the 18th century. Rural mountain villages such as Grindelwald started to offer accommodation; hotels were built, followed by a chalet construction boom in the 20th century. This required an important planning effort in order to preserve both traditional farming activities and attractive landscapes. The importance of tourism led to an early and spectacular development of transport infrastructure. The first narrow-gauge railway reached Grindelwald in 1890, followed by another line leading to the Kleine Scheidegg Pass and a breath-taking climb through the heart of the Eiger to the Jungfrauoch (3454 m) in 1912.

Two categories of tourists come to Grindelwald: overseas visitors for short-term visits and European (including domestic) tourists, who spend several days or weeks in the same resort. Hermitage Mount Cook welcomes mainly overseas tourists. In Grindelwald (as in other European alpine resorts), mountain tourism has a symbiotic relationship with the local economy and population, mainly agriculture. Hiking trails are usually old rural tracks or ancient thoroughfares. The tourism industry has reduced the exodus of the indigenous population.

**FIGURE 5** View of the upper Tasman Valley to the south. (Photo by author)



In the Mount Cook area, infrastructure is specifically tailored to the needs of tourism, which is designed to harmonize wherever possible with conservation needs (see Booth and Cullen in this issue).

#### **Tourist towns:**

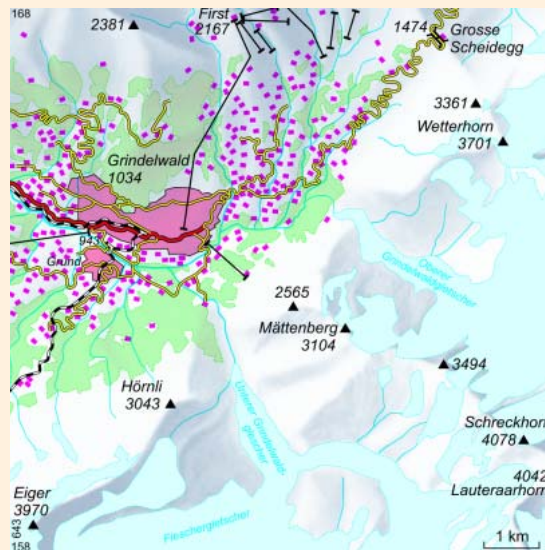
##### **Urbanized and intercontinental**

Towns or cities at the foot of high mountains have led the way in tourist develop-

**FIGURE 6A** The tourist resort of Mount Cook in Canterbury, New Zealand.



**FIGURE 6B** The tourist resort of Grindelwald in the Bernese Oberland, Switzerland.



ment; they provide access to large mountain areas. Situated at low altitudes, with easy access, multiple facilities, and often on the shore of a lake, their attractiveness is heightened by the closeness of high mountains.

Queenstown (Figure 7a) was founded on the shore of Lake Wakatipu (289 km<sup>2</sup>) during the gold rush of the 1880s. The extraordinary site, central location near numerous valleys, and good access for transport and tourism allowed the town to survive. Bus and air services link Queenstown to the major cities of the South Island.

In Switzerland, a monastery was founded in the 12th century between the lakes of Thun (48.4 km<sup>2</sup>) and Brienz (29.8 km<sup>2</sup>). Several villages followed, as well as the town of Interlaken, which has become a thriving center in the Bernese Oberland, with several transport routes, central services, and industry (Figure 7b). The 2 railway stations are the most important junction in this part of the Alps, linking international and high-speed trains from Paris, Amsterdam, Hamburg, and other destinations to numerous narrow-gauge mountain railways. Interlaken was linked to the Swiss motorway network in 1987, and its military airport is also used for private and charter flights.

**FIGURE 7A** The tourist town of Queenstown in Otago, New Zealand.



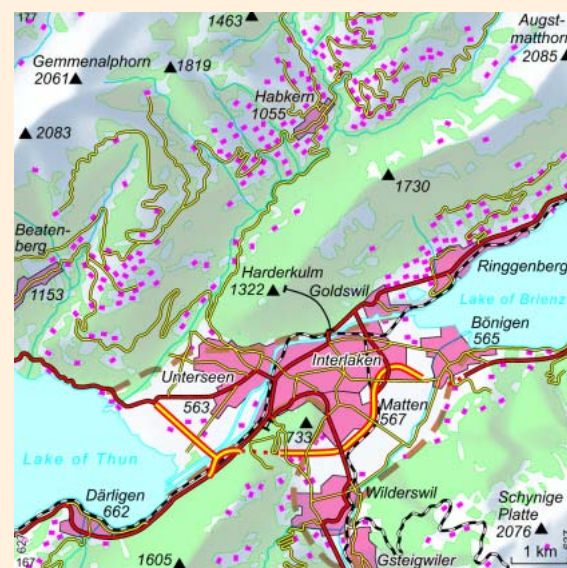
The 2 urban tourist centers are the starting point for international mountain tourism (especially day trips). Interlaken is one among several cities of this type in the European Alps, whereas there are only very few in the Southern Alps. Interlaken is particularly famous because it is so close to the Jungfraujoch, with the highest railway station in Europe. Queenstown is certainly the most important tourist center on the South Island of New Zealand. It offers a number of mountain sports and is also situated on a standard circuit for overseas tourists. But to domestic tourists (South and North Islanders, but also Australians), Queenstown is also a place for longer holidays.

#### **Transalpine passes: Long-distance transit through high mountains**

Although a great number of passes have been used for centuries in Europe, only few routes have been equipped with modern infrastructure to accommodate transit traffic, which is an important source of income. Because several countries share the European Alps, transit routes are a matter of continual political negotiation.

In New Zealand, alpine transit routes are rare: only 3 transalpine passes are equipped for major traffic. For historical reasons, Arthur's Pass (920 m) is the most

**FIGURE 7B** The tourist town of Interlaken in the Bernese Oberland, Switzerland.





**TABLE 1** Major differences between European and Southern Alps

<b>Water resources</b>	Rivers in the European Alps: often dammed in the upper basin and dammed and regulated in the lowlands. In New Zealand: some dams in lower areas only; channeling and regulation rare.
<b>Population density</b>	High in the European Alps, with significant regional differences, urbanization, and redistribution of the population for economic reasons. Extremely low density in the Southern Alps, with some areas completely uninhabited.
<b>Land use</b>	Long tradition of multipurpose agriculture, subsidies to mountain farmers, and well-established forestry practices in Europe; market orientation: local. Mainly pastoralism in New Zealand; market orientation: international, especially British until the 1960s.
<b>Tourism</b>	120 million visitors with 500 million overnight stays in the European Alps ( $\frac{1}{4}$ of the world's tourism!); high percentage of domestic and continental visitors; good tourism infrastructure spread throughout the Alps. In New Zealand: 3 million overseas visitors to the country, of which only one part visit the Southern Alps; tourism impact in the Southern Alps limited to a few areas.
<b>Conservation</b>	In Europe: 12 small national parks ( $8000 \text{ km}^2 = 5\%$ of the Alps). In the Southern Alps: 8 national parks, including most of the high peaks and nearly all glaciers ( $24,000 \text{ km}^2 = 22\%$ of the mountains in the South Island); see also maps on p 313.

important one: It was built to link the gold fields and coal mines of the West Coast to the growing towns east of the alpine range. A railway line was opened in 1923 and a large national park ( $992 \text{ km}^2$ ) established in the area in 1929.

In Switzerland, the much higher St Gotthard Pass (2108 m) became an important passage between Central Europe and Italy after the Devil's Bridge was constructed in the 13th century, bridging the most impassable gap over the gorge on the way up. This pass crosses the Alps where only one mountain range blocks the way from north to south. Roads were built over important alpine passes in Europe in the 18th and 19th centuries. The St Gotthard Pass was opened to horse-drawn vehicles in 1830. The railway line opened in 1882, built with financial contributions from Germany and Italy. A motorway followed in 1980, with a tunnel 17 km long that reduced the importance of the road over the pass. Today the Gotthard motorway is one of the 3 main transit routes through the European Alps. Because its carrying capacity is under heavy stress and air pollution is extremely high, Swiss transport policy today aims to transfer merchandise from road to rail. Accordingly, a new, major railway tunnel is currently under construction, much lower than the original tunnel.

The economic potential and impact on the landscape of a pass route depend on the hinterland. Arthur's Pass is a transit route for coal and goods and a tourist route, but traffic is not unduly heavy for 2 reasons: the population density is very low and the Southern Alps are insular and

shared only by one nation. In Europe, much higher population density and economic activity in the hinterland on both sides of the Alps imply that political and economic decisions regarding transalpine routes are usually taken in the lowlands. Alpine populations thus often have no chance to preserve their own interests.

### Similar settings, different human landscapes

Human occupation of the European Alps has a long history, and impacts have been slow but intensive; virtually no valley today is without road access. In the Southern Alps, impacts have been comparatively recent and very scattered, especially on the very wet western part of the main divide. Table 1 summarizes the main differences.

The future development of both alpine regions is likely to be influenced in different ways because of these historical dissimilarities. Though international tourism will lead to further similarities between the regions, current policy debates show how great the differences will remain: Europeans are mainly debating transit problems (eg the Alpine Convention), while New Zealanders are focusing on shared management strategies in a country that is currently reconsidering its colonial legacy (as a result of the 1997 Ngai Tahu Settlement). Both regions have one thing in common, however—the urgency of designing conservation measures that are socially and economically sustainable.

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