CHAMONIX-MONT-BLANC







Chamonix Mont Blanc

A long story (short)

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Ancient glaciations

The last glacial period, called the Würm in Europe, marked the end of the Pleistocene, around **115,000 to 11,700 years ago**. This ice age profoundly reshaped the alpine landscape, particularly the Chamonix Valley and the Mont Blanc massif, leaving behind traces of the massive glaciers that once covered the region. The alpine glaciers **reached colossal thicknesses** and covered a large part of the terrain. They advanced and retreated several times, carving U-shaped valleys, shaping moraines and glacial cirques, leaving indelible marks on the landscape.

In the Chamonix Valley, these glaciers played an essential role in the formation of iconic natural sites, such as the Mer de Glace, one of the **largest glaciers in the Alps**, which still bears witness to that glacial era today. The current retreat of the Mer de Glace, due to climate change, reveals layers of polished rocks and moraines, reminding us of the power of **ancient glaciations**.

This glacial period also **shaped the local flora and fauna**, influencing the migrations and adaptation of species. The wild and rugged landscapes we know today, so cherished by climbers and mountain lovers, owe their spectacular character to this era. Understanding the last glaciation is therefore **crucial for appreciating the geological history of the Alps**, which still inspires fascination among scientists, mountaineers, and visitors to the Chamonix Valley.

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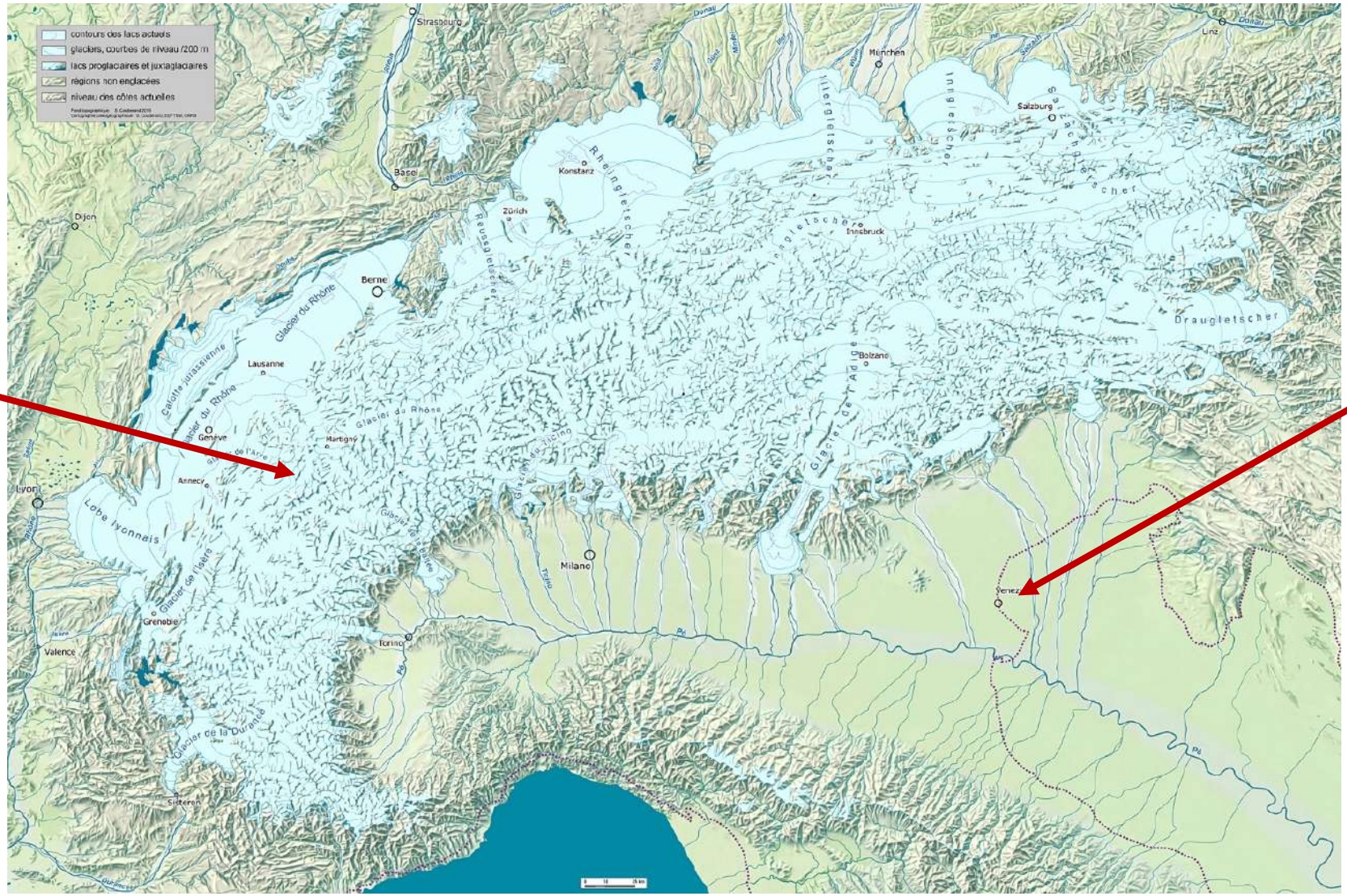
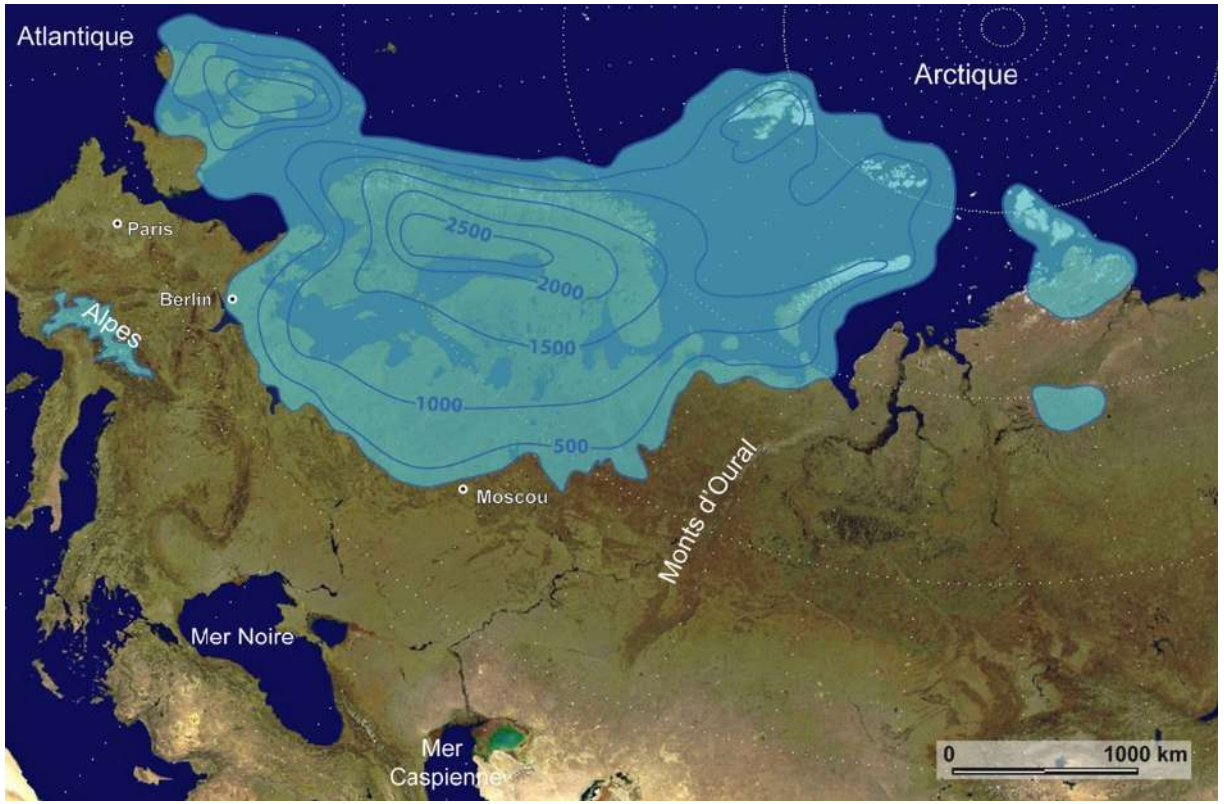
The last ice age : the «Würm»

Chamonix



Venice

The world during this ice age



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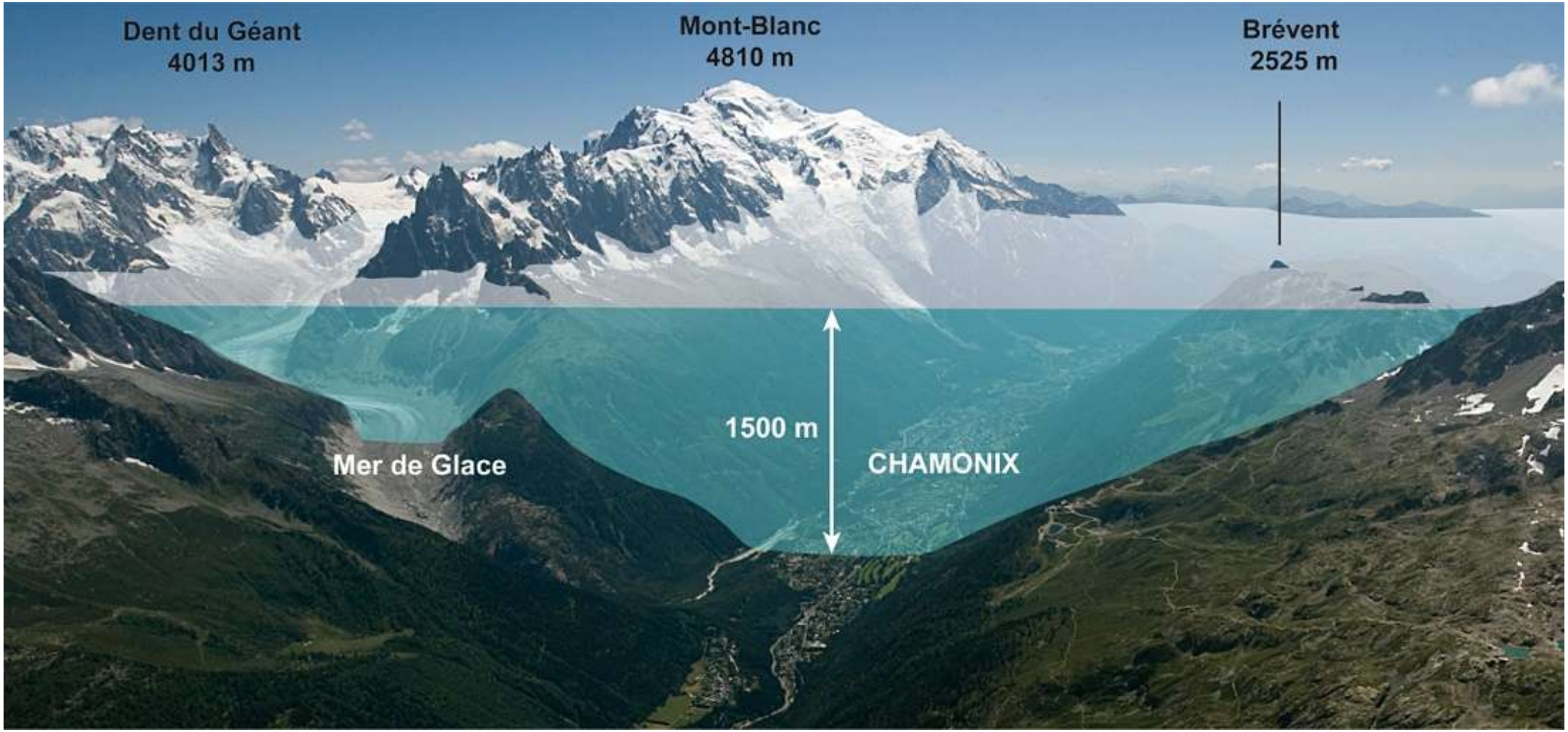
Chamonix during this ice age



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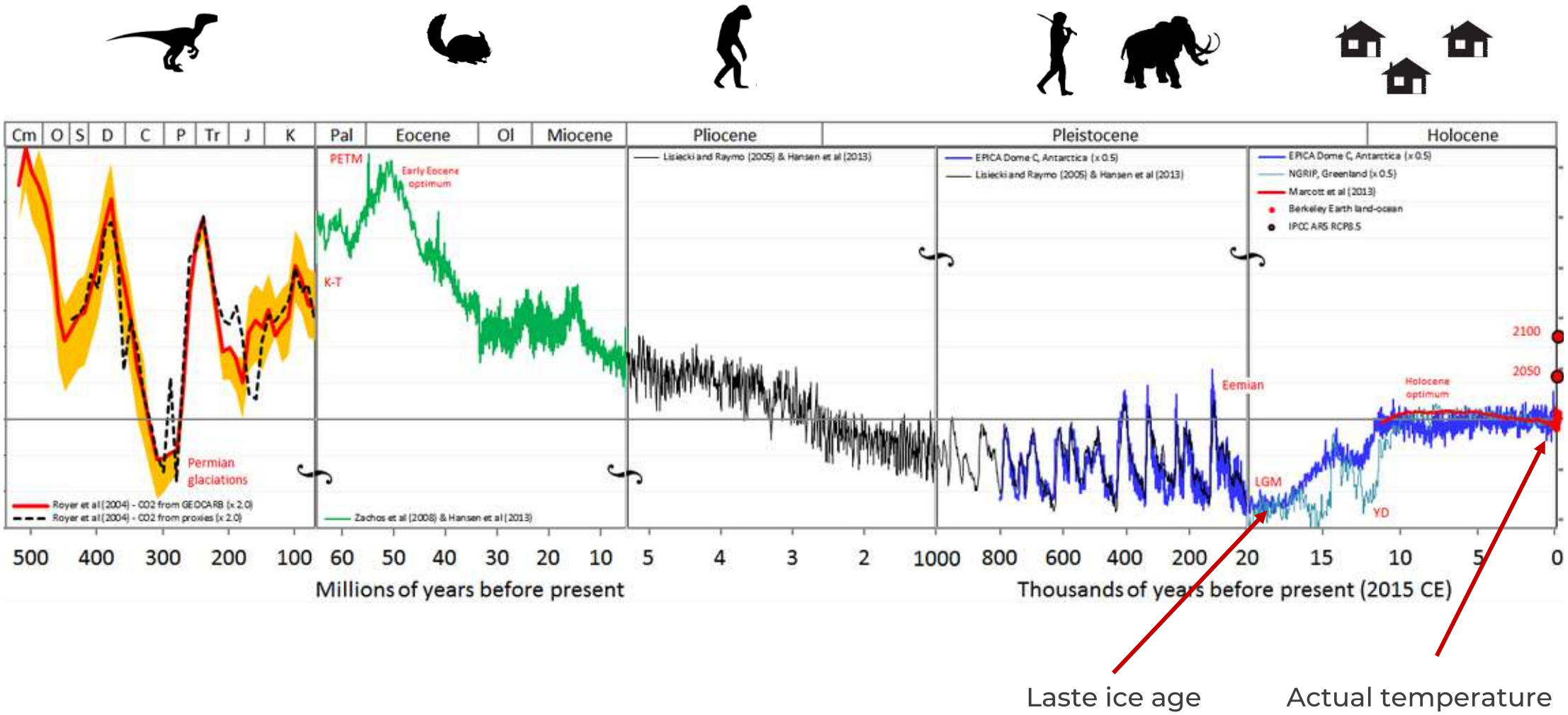
Natural climate change since 500 Millions years



Laste ice age

Actual temperature

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Few degrees warmer until today

+6°C

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First human exploration in the Alps

At the end of the last Ice Age, around **11,700 years ago**, **climate warming led to the gradual retreat of glaciers in the Alps**, opening up new territories to the early human peoples. Archaeologists estimate that the first incursions into the mountains began as early as the Mesolithic, around 8000 B.C.
These early inhabitants followed the migration paths and gathered essential resources. Initially, they **did not establish permanent colonies** in these hostile areas, but used the valleys and alpine plateaus as seasonal hunting and gathering grounds.

In the Neolithic period, populations became **more sedentary**, particularly in the valleys surrounding the Alps, such as the Chamonix valley, thanks to the **rise of agriculture and livestock farming**. The exchanges between the Alpine populations and the surrounding plains have intensified, with trade routes crossing the passes to transport **salt, minerals, and other goods**. The archaeological remains bear witness to these exchanges, particularly objects made of obsidian and metal tools from distant regions.

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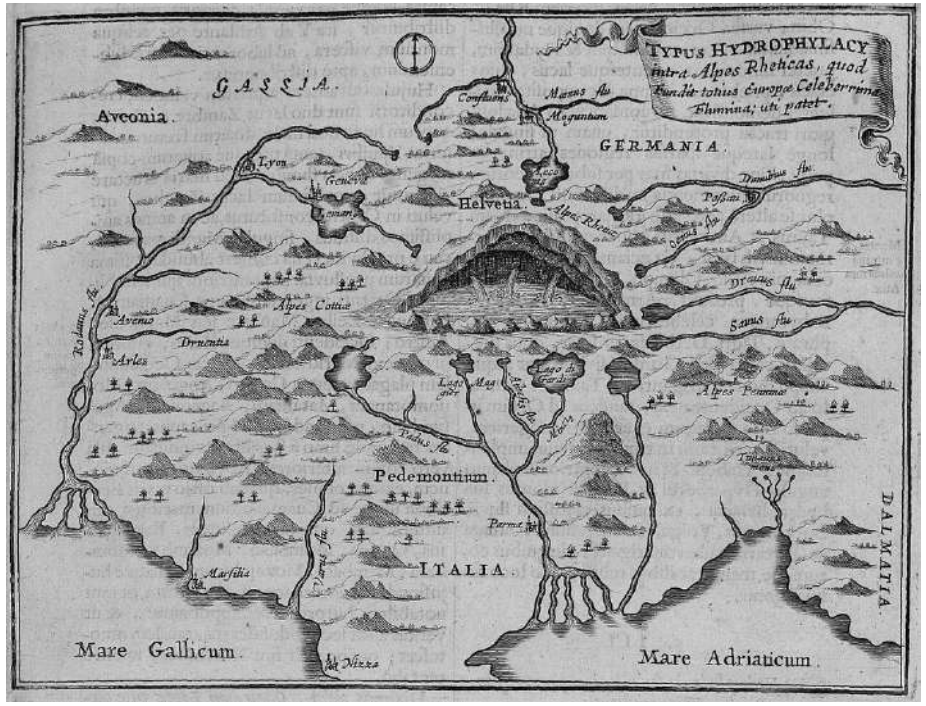
First human exploration in the Alps



During the Bronze and Iron Ages (1800–500 BC), advancements in metallurgy allowed for the creation of more robust tools suited for mountain work, **making life at high altitudes easier**. The populations began to clear small plots, creating grazing areas for their herds. The **pastoral way of life has become an essential characteristic of alpine culture**. The communities organized themselves into small autonomous units, **developing strong bonds of solidarity** and a deep understanding of the mountainous environment.

During Antiquity, the **Romans extended their empire into the Alps**, building roads and establishing outposts to control these strategic routes. The valleys, including Chamonix, benefited from this surge in trade and a certain development of infrastructure. The medieval period, marked by barbarian incursions and local conflicts, nevertheless saw mountain life retreat into itself. **The villages have become isolated communities**, living in self-sufficiency, but **developing a unique culture**, forged by adapting to the harsh conditions of the high mountains.

From the late Middle Ages and the Renaissance, the perception of mountains began to evolve. **The Alps, long considered dangerous and inhospitable places**, gradually captivated the curiosity of scholars, adventurers, and naturalists. **Explorers and cartographers**, such as the Italian geographer Josias Simler in the 16th century, undertook the study of the geography of the Alps and created the **first detailed descriptions of the region**. However, the Chamonix valley remained largely unknown to European travelers until the early 18th century.

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First human exploration in the Alps

The arrival of the **first scientists** and travelers marked the beginning of a **new era for the Chamonix Valley and the Alps in general**. The stories of those who attempted to approach the glaciers and peaks have inspired future generations of climbers. In 1741, British explorers **William Windham and Richard Pococke** undertook one of the first known expeditions in the Chamonix Valley, recounting their awe at the Mer de Glace. This visit sparked the interest of many visitors, laying the groundwork for mountaineering and mountain tourism.

Thus, from the Ice Age to the Age of Discoveries, the relationship between humans and the Alps has evolved significantly. From **inhospitable areas to pastoral territories**, then lands of exploration, the Alps have fascinated and shaped their inhabitants. The Chamonix Valley has become a symbol of this unique relationship between humans and mountain.

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The discovery of the Alps and the begenning of mountaineering

Between 1700 and 1900, the Alps, and more specifically the Chamonix Valley, gradually became a place of **growing interest for scientists**, adventurers, and European artists. Long perceived as inhospitable, even dangerous territories, the mountains are beginning to be seen from a **new perspective**. This change in perspective marks the beginning of the era of mountaineering and transforms the region, preparing Chamonix to become one of the cradles of this movement.

The turning point occurs in 1741, when two British explorers, **William Windham and Richard Pococke**, visit the Chamonix valley. They discover the **Mer de Glace**, a massive glacier that impresses them with its size and beauty. **Their writings generate unprecedented enthusiasm** among European intellectuals and aristocrats, who begin to see the Alps as a place of scientific curiosity and discovery. This initial exploration attracts the attention of **geologists, botanists, and other scientists** eager to study glacial formations and high-altitude ecosystems.

In the following decades, Chamonix becomes a favored place for scholars. **Horace-Bénédict de Saussure**, a Swiss naturalist, visited the valley several times, fascinated by Mont Blanc. In 1760, he even **offered a reward to anyone who could reach its summit**, convinced that such an ascent would allow for a better understanding of natural phenomena. This offer marks the official beginning of the quest for the summit and **modern mountaineering**.

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The first scientific explorations

The Chamonix Valley, renowned for its majestic landscapes and its appeal to climbers, also plays a crucial role in the **history of science**. Since the first explorations in the 18th century, this region has become a unique scientific testing ground, attracting researchers to study its **geological formations, glaciers, flora, and fauna**. Through the centuries, Chamonix has become a true **open-air laboratory**, contributing to the advancement of disciplines such as geology, glaciology, meteorology, and ecology.

The scientific interest in the Chamonix valley began in 1741 with the visit of William Windham and Richard Pococke. Their travel accounts attract the attention of many European intellectuals, notably the Swiss naturalist **Horace-Bénédict de Saussure**, who visits Chamonix to deepen his knowledge in geology and physics. In 1760, he offered a reward to anyone who could reach the summit of Mont Blanc, considering that this ascent would **allow the study of atmospheric phenomena** at high altitude. This challenge ultimately motivates **Jacques Balmat and Michel-Gabriel Paccard** to make the first ascent in 1786, marking a historic milestone for the science of mountains and the development of mountaineering.

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The conquest of Mont Blanc

In 1786, the history of mountaineering reached a decisive stage with the **first ascent of Mont Blanc**, the highest peak in the Alps. This historic expedition is led by **Jacques Balmat**, a local chamois hunter, and **Dr. Michel-Gabriel Paccard**. Their feat sparks enthusiasm and attracts more adventurers in search of thrills and unique challenges.

The following year, in 1787, **de Saussure** himself reached the summit **with a large scientific expedition**. These iconic ascents enhance Chamonix's reputation as a center for mountaineering and scientific research. Local mountain guides, like Balmat, become indispensable figures for ascents, thus inaugurating the tradition of the **high mountain guide profession**.

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The romantic age and the development of tourism

At the beginning of the **19th century**, the rise of Romanticism in Europe brings a renewed fascination for the Alpine landscapes, whose wild beauty inspires poets, writers, and painters. Figures such **as Percy Shelley, Lord Byron, and Mary Shelley** travel through the Alps and describe their experiences in their works, helping to shape the image of the mountains as sublime and mystical places. Mary Shelley, in ***Frankenstein***, notably evokes the Mer de Glace as a dramatic and impressive setting.

This romantic period also attracts a larger audience of tourists, often affluent, who come to Chamonix to admire the glaciers and undertake ascents. Hotels are multiplying in the valley, and in 1821, the **Chamonix Guides Company was founded** to organize and supervise mountain expeditions. This group of guides quickly becomes a pillar of the community and contributes to Chamonix's reputation as a **premier destination for mountaineering**.

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Glaciology and the study of glaciers

The glaciers of the valley, particularly the **Mer de Glace**, play a key role in the development of glaciology. In the 19th century, scientists such as the **Swiss geologist Louis Agassiz**, fascinated by these immense tongues of ice, came to study their structure and movements. Agassiz, while observing the glaciers of Chamonix, develops theories about **glacial periods and the origin of alpine valleys**. These discoveries lay the foundations of glaciology and inspire generations of researchers who continue to observe these glaciers to **understand their dynamics**.

With the advent of **climate concerns** in the 20th century, the glaciers of Chamonix have become key indicators of climate change. The Mer de Glace, whose retreat has been observable since the beginning of the century, **provides valuable data** for understanding the impact of global warming on mountain ecosystems. Today, scientists are **actively monitoring these glaciers** using advanced technologies to track changes in their volume, movement speed, and thickness.

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Joseph Vallot and Pierre Janssen : the pioneers of high-altitude observation

At the turn of the 19th century, scientific research in the Chamonix region experienced considerable growth thanks to iconic figures like **Joseph Vallot and Pierre Janssen**. Joseph Vallot, a scientist passionate about **astronomy, meteorology, and geophysics**, settles in Chamonix and becomes one of the first researchers to establish research infrastructures in high mountains. In 1890, he built an **observatory on Mont Blanc**, at an altitude of 4,362 meters, a feat for the time. This observatory allows for meteorological, physiological, and astronomical measurements in extreme conditions, providing invaluable data for the science of the time. Vallot, known for his dedication, spends several winters there, gathering essential information on **atmospheric conditions and the effects of altitude.**

Pierre Janssen, for his part, is a renowned French astronomer and physicist known for his **research on the Sun**. In 1888, he founded the Mont Blanc Observatory to study astronomical phenomena in a purer and more stable atmosphere, away from urban interferences. Janssen is one of the pioneers of modern astronomy and contributed to the discovery of **helium through his solar observations**. The observatory, located in extreme altitude conditions, paves the way for new perspectives in astronomy and high-altitude physics. The work of Vallot and Janssen embodies the pioneering spirit and dedication of these scientists who braved the rigors of the mountain to advance human knowledge.

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Joseph Vallot and Pierre Janssen : the pioneers of high-altitude observation

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The golden age of mountaineering (1850-1900)

The 1850s mark the beginning of what is called "the golden age of mountaineering." During this period, many peaks in the Alps are reached for the first time, notably by **British climbers** who play a major role in this epic. **Edward Whymper, Albert F. Mummery, and John Tyndall**, among others, contribute to pushing the boundaries of mountaineering and popularizing this sport throughout Europe.

Mont Blanc remains an iconic goal, but climbers also tackle the surrounding peaks, such as **the Drus**, the **Grandes Jorasses**, and the **Aiguille Verte**. Climbing techniques are evolving, and equipment is improving to meet the challenges of altitude and extreme conditions. The mountain guides of Chamonix continue to play an essential role, passing on their expertise and knowledge of the terrain to climbers.

The railway arrives in Chamonix in 1901, making access to the valley easier and enhancing its tourist appeal. The region then becomes a popular destination for mountain enthusiasts **from all over Europe**, and the infrastructure continues to develop to accommodate visitors.

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The transformation of Chamonix into a winter sport resort

The beginning of the 20th century marks a new era for Chamonix, with the emergence of **winter sports**. The first **ski and skating competitions** attract an international audience, and the infrastructure is adapting to accommodate snow sports, particularly with the construction of cable cars and slopes. The inhabitants of the valley, **once tied to mountain jobs in the summer**, are gradually transitioning to make Chamonix a renowned ski resort.

This transformation reaches a climax in 1924, when Chamonix is chosen to host **the first Winter Olympics**, then called the "International Week of Winter Sports." This event, held under the aegis of the **International Olympic Committee**, marks a turning point for the region and for mountain sports. It attracts athletes and spectators from around the world and helps establish Chamonix as a premier destination for skiing and other snow sports.

The 1924 Olympic Games include events in **cross-country skiing, bobsleigh, figure skating, and ice hockey**. The valley becomes the stage for exhilarating sporting feats, enhancing Chamonix's reputation and laying the groundwork for the development of winter sports on an international scale. This event is emblematic of the rise of mountain sports and the recognition of the Alps as a playground for **athletes from around the world**.

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The transformation of Chamonix into a winter sport resort

The **rise of skiing** in the French Alps, which began in the early 20th century, has shaped not only the mountain culture but also the economic and social landscape of the region. Originally, skiing was imported from Northern Europe, and for several years it remained an activity reserved for the elite. In the 1900s, the development of transportation, **particularly the railway**, made access to the Alps easier and encouraged the first resorts to organize around this activity.

The first alpine ski resorts, such as Chamonix, Megève, and Saint-Gervais, attract an affluent clientele seeking to indulge in winter sports in an impressive natural setting. With the creation **of the first ski clubs** and the organization of competitions, skiing gradually becomes a recognized leisure activity. In the 1920s-1930s, the resorts invested in infrastructure such as **ski lifts, which helped popularize the activity and made access to the slopes easier**. In 1924, Chamonix hosted the first Winter Olympics, an event that highlighted the potential of the French Alps for sliding sports and contributed to the rise of skiing.

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The raise of ski resorts in the Alps

The post-war period marks a time of decisive change, during which skiing becomes accessible to a broader audience. The **"snow plan"** launched in the 1960s by the **French State** was a turning point in the development of skiing in France. This plan, initiated to **diversify the mountain economy and encourage winter tourism**, aims to organize and modernize the infrastructure of ski resorts. He plans to build high-capacity stations, accessible to families and the middle class. These "ex-nihilo" resorts — that is, created from scratch — like **Les Arcs, La Plagne, or Tignes**, are planned around complexes of residences directly connected to the slopes. This model, nicknamed the "integrated station," is designed to meet the needs of **mass tourism**, with functional and modern buildings, often in an architectural style inspired by brutalism, aimed at optimizing space and accessibility.

The snow plan translates into unprecedented growth in ski infrastructure. The new resorts, built quickly, meet the growing demand from the **middle and urban classes** seeking mountain leisure activities. Access to the Alps is also improved by the development of **roads and cable cars**, promoting mass tourism. These resorts, equipped with modern ski lifts and elaborate trail networks, offer skiers an unparalleled sliding experience.

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Mountain meteorology and climatology

The Chamonix Valley is also suitable for studying **extreme weather** phenomena and altitude climate variations. Since the 19th century, weather stations have been set up to **record temperature, pressure, and precipitation data**. These surveys help to better understand the mountain climate and its particularities. Vallot's work, in particular, provides a valuable database on high-altitude meteorology, a rapidly growing science at that time.

Today, **Chamonix remains a research site** in mountain climatology, particularly in the context of studying climate change. The collected data help scientists model the impacts of this warming on high-altitude ecosystems and **anticipate the long-term effects on glaciers and biodiversity**.

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Alpine ecology and biodiversity

Chamonix is home to a **unique alpine biodiversity**, adapted to the extreme conditions of high mountains. Biologists have been studying plant and animal species there for decades to better understand their **resilience to seasonal and climatic changes**. The creation of the **Aiguilles Rouges Natural Reserve** in 1974 marks an important step for the protection of local biodiversity and for ecological research. Scientists are examining the effects of climate change on alpine habitats, in a context where flora and fauna must cope with increasingly marked temperature variations.

Research projects, such as those of the **Human-Environment Observatory** (OHM) or the **Centre de Recherche des Ecosystemes Alpins** (CREA), explore the interactions between human activities, climate change, and alpine ecosystems, contributing to conservation strategies **for future generations**.

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And tommorow...

The French Alps are facing **crucial challenges for the future**, balancing the imperatives of a dynamic economy supported by tourism and the preservation of the mountain environment.

The Chamonix Valley, emblematic of this region, finds itself at the **heart of this paradox**: it relies on high tourist attendance to support its economy, but this influx also creates significant environmental pressures.

At a time when **climate change is accelerating the melting of glaciers and altering alpine ecosystems**, mountain stakeholders are faced with a dilemma: **how to maintain necessary tourism activities without compromising the integrity of the environment that precisely attracts visitors?**

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From cowkeeper to ski teacher

Tourism is the main economic driver of the Alps. The region attracts millions of visitors each year, coming for winter sports, hiking, climbing, and nature tourism. This influx **generates income for the residents**, creates jobs, and supports essential infrastructure such as ski lifts, hotels, and restaurants. Indeed, tourism is essential for local communities, providing economic stability in regions **where opportunities are often limited.**

However, this dependence on mass tourism comes at a cost. The rapid development **of infrastructure in the 1960s and 1970s**, with the snow plan and the creation of resorts ex-nihilo, **profoundly transformed** the Alpine landscape. The construction of roads, parking lots, and vast ski complexes has fragmented natural habitats, disturbed wildlife and flora, and weakened the soil. CO_2 emissions related to travel (half of all our carbon emissions), the energy used for ski lifts, and accommodations also **contribute to global warming**, of which **the Alps are among the first victims**. The impact of tourism is therefore paradoxical: it helps preserve life in the villages, but contributes to degrading the natural environment, which is **the very basis of its attractiveness**.

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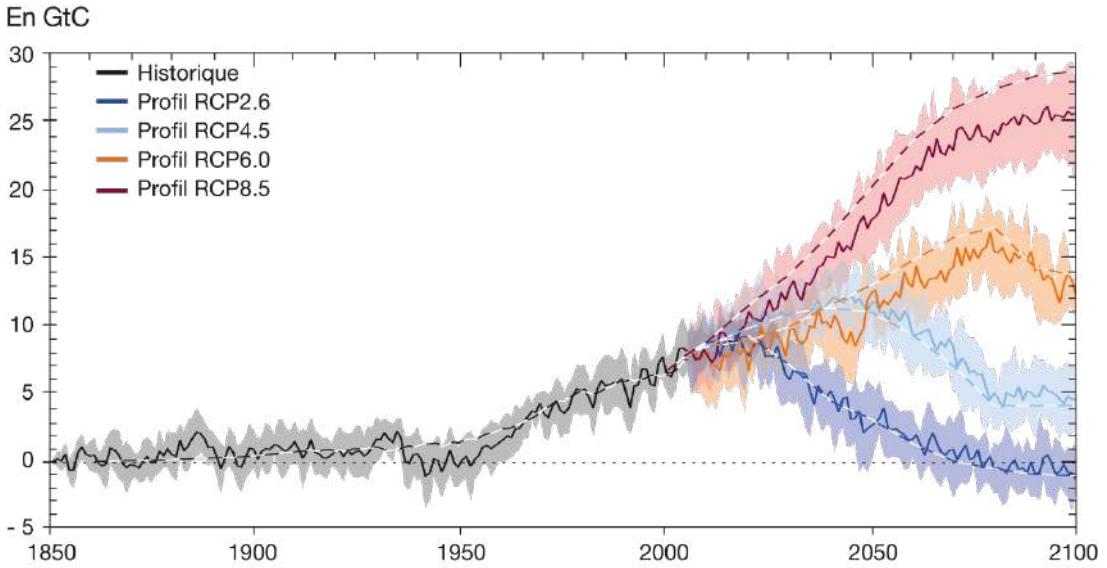
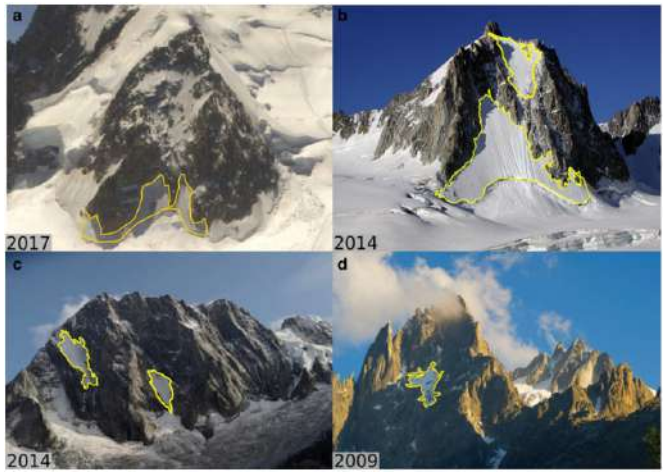
The effects of climate change

The Alps are particularly sensitive to climate change. The glaciers, **symbols of the region**, are rapidly retreating, which affects not only the aesthetics of the landscape but also the water resources. The permafrost that maintains the stability of high mountain soils is melting, which increases **the risk of landslides and avalanches**, threatening infrastructure and homes. Mountain ecosystems, already subjected to extreme conditions, are also disrupted by rising temperatures, which cause **species to migrate to higher altitudes** or lead to local extinctions. In the long term, these climate changes will also affect the ski seasons, shortening the periods of snow and **directly threatening the winter sports economy**.





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Initiatives in the Chamonix valley

Faced with these challenges, the Chamonix Valley is **mobilizing to reduce the ecological footprint of tourism**. Several initiatives have been implemented, with a strong emphasis on sustainable development and **limiting environmental impacts**. One of the primary objectives is to reduce **air pollution in the valley**. For this, sustainable mobility solutions are being promoted, such as encouraging **carpooling**, **developing public transportation**, and improving **cycling infrastructure**.

In terms of accommodations, ecological **certifications are increasingly** required for new projects. Several hotels and chalets are investing in cleaner energy installations, such as geothermal heating, solar panels, and **water recovery systems**. These efforts aim to and the impact of accommodation structures on the environment **reduce energy consumption**.

In terms of education, the Chamonix Valley also **promotes awareness actions** for environmental preservation, both for tourists and residents. Educational initiatives, such as **guided hikes with naturalist guides**, **help visitors better understand the fragility** of alpine ecosystems and the need to preserve them. Festivals and awareness events, such as conferences and global leaders meetings, inviting scientists, artists, and the general public to **reflect together on the ecological challenges of the region**.

FLOCON VERT

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Thank you for reading

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World Union of Olympic Cities
additional trip
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