



**MOUNT
RESILIENCE**

Adapting Alpine buildings and tourism to warmer temperatures

Climate change adaptation
in mountainous areas

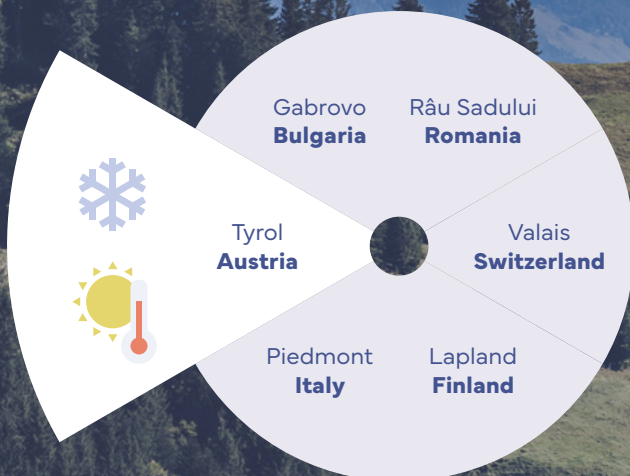
Tyrol, Austria



MOUNT RESILIENCE



MountResilience supports European regions and communities located in mountainous areas to increase their capacity to adapt to climate change and to transition towards a climate-resilient society. The project is conceptualising, testing and scaling up climate adaptation and nature-based solutions to respond to policy and societal needs. Additionally, it seeks to influence citizen behaviours to effectively address specific climate impacts in mountainous regions.



In **Tyrol**, situated in western Austria and bordering Germany, Italy, and Switzerland, mountain landscapes shape both regional identity and economic activity. Tourism is particularly important, especially in rural areas that depend strongly on seasonal income. However, **snow-based tourism** is becoming increasingly **vulnerable**, particularly at **lower elevations**: over the past century, the Alps have **warmed** at roughly three times the global average, leading to **shifts in precipitation patterns, reduced snowfall, and a rising snow line**. These changes affect mountain ecosystems, **increase climate-related risks** such as flooding, landslides, and heat stress, and place **growing pressure on local economies** that directly depend on natural resources and stable climatic conditions.

Adapting to Climate Change

Climate risks: Extreme heat



Modelling urban heat risks in Alpine regions

Rising temperatures and more frequent **heatwaves** are increasingly impacting the health of local communities, particularly vulnerable groups such as children, the elderly, and people with pre-existing health conditions. In Tyrol, buildings face a double challenge: they must **isolate from harsh winters** and from the **summer heat** too.

MountResilience partners are working with a **nursing home** to make it more resilient to rising summer temperatures. They created a **digital twin of the building** to **simulate future climate scenarios** and virtually test different adaptation measures (such as green and white roofs, green façades, improved insulation, and energy-efficient ventilation systems) to **identify the most effective and energy-efficient solutions**.

Climate risks: Ice and snow changes



Supporting the transition to sustainable mountain tourism

Snow-based winter tourism in Tyrol is at a crossroads. **Glaciers are retreating** and **snowfall is decreasing**, forcing lower-altitude ski areas to rely on **artificial snow**, which requires significant water and energy and can risk maladaptation.

To respond to this challenge, MountResilience partners in Tyrol are working closely with ski resorts and cable car companies to **explore the transition to a more sustainable year-round tourism model that is less dependent on snow**.



How to use simulations and foresight to guide adaptation in climate change?



Tyrol demonstrates the **value of simulations and foresight to guide adaptation to climate change**. By creating a **digital twin** of a vulnerable building, MountResilience is **exploring future heat scenarios** and **comparing adaptation options without costly trial and error**. At the same time, working directly with ski resorts and cable car companies opens an **honest dialogue** about the **future of tourism in a warming climate**. The approach shows that adaptation is most effective when technology and the social and economic realities are considered together.





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