Pyrenees4clima

Co-funded by the European Union

Núm. exp. SE724000CO2024064

Climate modelling in Vallter ski resort (Pyrenees4clima project)

PYRENEES4CLIMA: Transforming the Pyrenees for a Resilient Future

The unique landscapes of the Pyrenees, with their deep valleys and imposing peaks, are facing a challenge that touches the heart. The mountains, custodians of a unique biodiversity, are undergoing remarkable transformations at an unprecedented pace. Climate change, a result of our own actions, poses a threat to the ecosystem services that the Pyrenees offer, ranging from water sources and natural habitats to forest resources. The scientific community has demonstrated that temperatures in mountainous areas are rising above the global average. Specifically in the Pyrenees, over the past six decades, temperatures have risen 30% more than the global average. The majesty of the Pyrenees is intertwined with the fragility of both its ecosystems and inhabitants.

Cross-border cooperation harnesses this vulnerability as a catalyst for positive and innovative action, which spreads throughout its territory in the form of a network that involves 46 entities from Spain, France and Andorra. These entities, aware of current and future changes, cooperate with a clear objective: to strengthen resilience in the Pyrenees through the implementation of measures to adapt to climate change.

The LIFE- SIP PYRENEES4CLIMA[1] project marks the starting point of the implementation of the Pyrenean Climate Change Strategy (EPiCC), the first European cross-border climate change strategy in Europe, led by the seven Pyrenean territories, involving regions from three different states, and co-designed in cooperation for a specific mountain bioregion: the Pyrenees.

This project will accelerate climate policies in the region, and reinforce governance based on territorial climate cooperation. It stands as a flagship project rooted in joint commitment, ensuring an ongoing dialogue between the stakeholders to effectively and efficiently address climate change adaptation policies.

The project is based on five fundamental pillars: understanding climate impacts, improving the resilience of natural spaces, adapting the mountain economy, safeguarding the population and the territory from natural-climate risks and the deterioration of resources, and promoting an innovative system of climate governance that involves citizens, socio-economic sectors, the scientific community and political decision-makers.

The epicentre of this project is the generation and transfer of interdisciplinary and interterritorial knowledge, the identification of good practices and the implementation of pilot cases with innovative approaches fostering the necessary interconnections between science, policy, practice and society to achieve true adaptation to climate change.

[1] More information at https://www.opcc-ctp.org/en/proyecto/life-pyrenees4clima

Recognizing our vulnerability serves as a launchpad for positive climate action. It is a question of jointly building an inspiring example by 2030 for other European mountain regions on the basis of the work in the Pyrenees. In the Pyrenees, this federated project gives climate action a new dimension. Not only in terms of its capacity for territorial impact, multiplicity of approaches and integrating vision but also in its temporal dimension (almost 8 years of joint work), and in its economic dimension (€20M), capable of propelling and consolidating efforts that go much further.

In Work Package 4: Resilient Mountain Economy, Task 4.1. Sustainable tourism and climate change adaptation, Subtask 4.1.1. Ski and mountain resorts - Development of a transitional and adapted economic model, there is a need to subcontract climate modelling to quantify the historical and future reliability of the snow cover of the pilot sites. Specifically, in Catalunya, this analysis will be carried out for the Vallter ski resort.

More details on the technical specifications and the Catalan pilot case are provided in the following sections.

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Technical specifications

This budget request is for a climate modelling to support the Vallter ski resort in the planning and definition of strategies in the context of climate change. The service covered by the contract includes the modelling of the snow cover in the historical period and in different future scenarios of climate change at a high spatial resolution. The modelling will consider the natural snow as well as the groomed capacity and snow production, incorporating the associated water and energy expenditure.

The contracted service includes the calculation of operational indicators of the ski resort focused on studying the capacity and efforts that will need to be allocated to maintain future operations.

Additional specifications to be considered in the modelling are presented below:

- Calculation of weekly indicators between the beginning of October and the end of April (i.e. average snow height, possible ski days, percentage of skiable area open to customers, water and electricity requirements for snow production, etc.).
- Results in the historical period and projections in different emission scenarios (at least RCP4.5 and RCP8.5) up to 2100.
- High spatial resolution of the resulting variables (i. e. rasters in a spatial resolution < 50 m).
    - In addition, the resulting variables must be presented on a slope scale.
- Calculation of the return rate of unfavourable seasons, evolution of cold windows and water requirements for snowmaking.
- Modelling should consider existing conditions and future development projects.
- The main outputs of the modelling must be provided in GIS format as well as data base tables.

Pilot case: Vallter

In this budget request we are looking for the results of the above specifications in a specific area. This area is the Vallter ski resort, located in the Eastern Pyrenees in Catalunya.

Context

Vallter is the easternmost ski resort in the Catalan Pyrenees. It is located in the Ripollès region, in the municipality of Setcases. Vallter resort, inaugurated 1975, is located in the middle of peaks that exceed 2,800 m in altitude. With the base located at 2,000 m, it allows to combine alpine skiing through the central slopes with the ascent with mountain skis through the Chalet area.

Vallter has been selected as the Catalan pilot case to be included in Subtask 4.1. Ski and mountain resorts. Development of a transitional and adapted economic model of the project. This resort has been chosen in collaboration with its owner, Ferrocarrils de la Generalitat de Catalunya (FGC), taking into account the need for diversity in case studies and the socio-economic importance of the resort in the area. FGC has been awarded the contract for the design of the Vallter 365 project, which aims to de-seasonalise the ski resort in order to be able to offer summer tourism and, above all, to eliminate car traffic in the high mountains. The main axis of the project is the construction of a cableway that will start at Setcases and end at an altitude of 2,535 metres.

Relevant Information

Figure 1 and Figure 2 show the Vallter technical specifications and slope map for the 2023-2024 season.

Area for skiing

Km for skiing: 13,9 km

Snow making area: 5,8 km

Snowmaking: 96

Highest point: 2,535 m

Lowest point: 2,000 m

10 ski lifts

Chairlifts: 2

Drag lifts: 5

Carpet lift: 3

Lift capacity: 9.622 skiers / hour

Special areas

Sledging slopes: 1

Snowshoeing circuits / Ski mountaineering: 4

Children playgrounds and snow parks: 1

Freeride: 3

13 alpine skiing slopes

Slopes green: 3

Slopes blue: 4

Slopes red: 6

Services provided on the slopes and at the foot of the slopes

Ski / snowboard schools: 4

Bars and restaurants: 3

Customer service office: 1

Information Center and Bookings: 1

Parking: 6

Equipment rental: 1

Medical Center: 1

Sports Shop: 1

Public toliet: 1

Locker: 1

ski room: 1

Automatic collection point for ski passes sold online: 6

Figure 1. Technical specifications (2023-2024 season)[2]

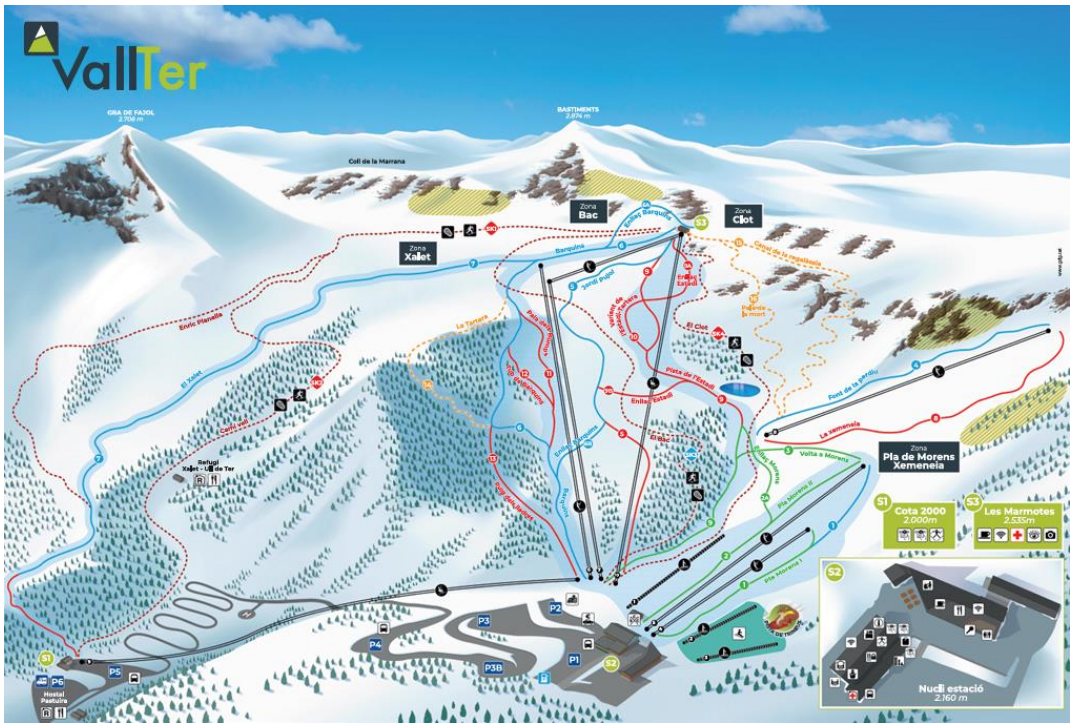

Figure 2. Vallter slope map (2023-2024 season)[3]

[2] For further information, visit https://www.vallter.cat/en/winter/resort/technical-specifications/

[3] For an interactive 3D version of this map, visit https://vallter2000.3dmap.spotlio.com/