Vulnerability Map of Alpine STDs

D.1.1.2 – October 2023

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Mission Statements

To provide a first assessment of vulnerability concerning Alpine Space small Snow Tourism Destinations currently affected or that will be affected in the future by climate change.

Who should read this report?

The intended audience of this document are:

Local and Regional Public Authorities, to increase their knowledge base and awareness regarding vulnerability to climate change in the Alpine territories they are responsible for.

Local and Regional DMOs, to increase their awareness regarding the vulnerability level of the Alpine Snow Tourism Destinations they are responsible for.

Tourism SMEs, to increase their knowledge base and awareness regarding this specific aspect of climate change impacts on their activities, and to prepare them for the challenges and the necessary enhancement of climate and socioeconomic resilience through sustainable development alternatives.

Local communities of STDs, because they are also negatively impacted by exposure to climate change and the diminishment of the attractiveness of skiing. By reading this document, and particularly by observing the maps, STDs citizens can increase their knowledge of the problem and their awareness.

Disclaimer

The data and information in this document refer to and have been proposed specifically for the purposes and activities in the Pilot areas of the BeyondSnow project. It is important to note that the selection of data and indicators has been undertaken by the authors based on specific considerations relevant to this context. However, this does not preclude the consideration of alternative indicators or datasets, and the choices made here should be viewed as illustrative examples rather than exhaustive or definitive selections.

Capitalising on the results of past Alpine Space projects, as of today (October 2023) data coverage is uneven and for large areas north of the Alpine Convention perimeter, data are not yet available even though they are being processed. This is due to the change of the Alpine Space perimeter in this programme period compared to previous ones.

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This publication is available on the project website

https://www.alpine-space.eu/project/beyondsnow/

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Contents

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1 Introduction

In recent years, the snow tourism sector has been dealing with various and in some cases highly challenging trends. Above all, climate change effects, especially increasing temperatures and decreasing snow-reliability, have been already observed and are expected to intensify in the future. This, accompanied by social and demographic changes, can lead to a potential decrease in the attractiveness of snow tourism destinations (hereinafter STDs), and a consequential weakening of their local economies. However, adaptive solutions, such as the inclusion of ecosystem services, can act as meaningful tools to counteract potential impacts of climate change and reduce the vulnerability of STDs.

Within the scope of the AS Project BeyondSnow, the exploration of vulnerability in STDs requires a meticulous analysis specifically tailored to the unique challenges inherent in Alpine regions. As a result, the Vulnerability Map, developed within the project BeyondSnow, aims at exploring the complexity of vulnerabilities and provide a comprehensive overview that integrates both biophysical and socio-ecological and -economical dimensions (see Figure 3).

Currently, the Intergovernmental Panel on Climate Change (IPCC) provides the most extensive framework for comprehending vulnerability to climate change, acknowledging the complex relationship between environmental and societal dynamics. Vulnerability is defined as "**the propensity or predisposition to be adversely affected, a quality shaped by diverse factors, including exposure, sensitivity, and adaptive capacity**" (IPCC, 2022).

The Alpine STDs Vulnerability Map represents an application of the IPCC definition for the purposes of the BeyondSnow project, building on the fundamental components of vulnerability – exposure, sensitivity, potential impact, and adaptive capacity (see the following Figure 1).

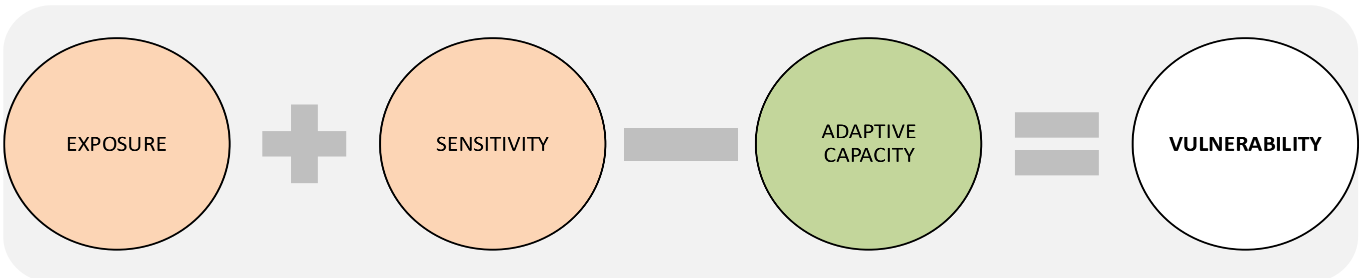

Figure 1. The components of vulnerability regarding climate change (Based on IPCC, 2022).

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2 Vulnerability Map overview

2.1 The Alpine STDs Vulnerability Map (v. 0.92)

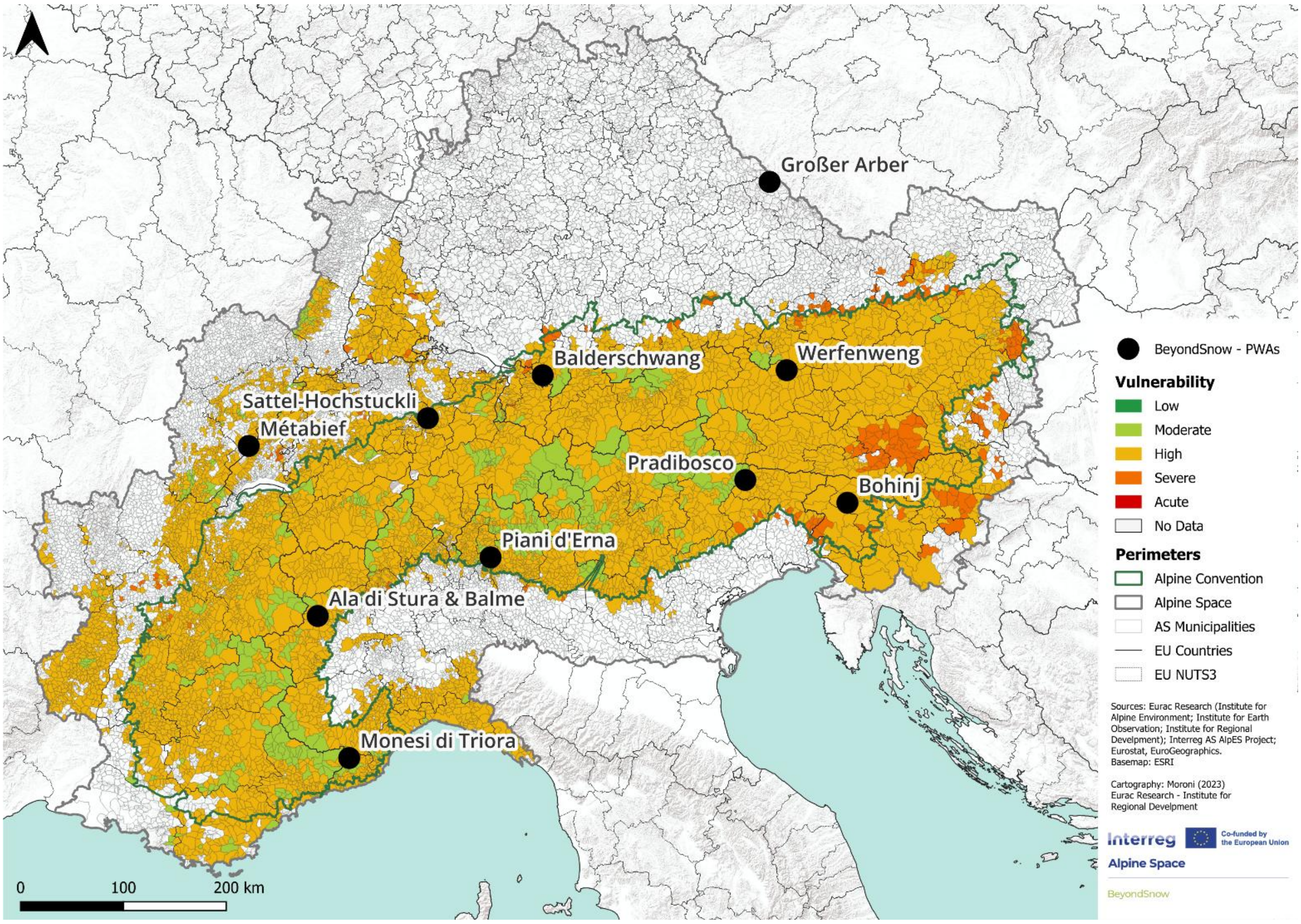

Figure 2: Vulnerability Map of Alpine STDs, Version 0.92 (October 2023) (Own Elaboration, 2023)

The map above shows the outcome of the first elaboration (version 0.92) of the Alpine STDs Vulnerability Map. Vulnerability levels range from low to acute. The most part of municipalities within the AS area reveal a high level of vulnerability. At first, it appears that mountain municipalities in innermost areas of the Alps mostly exhibit a moderate level of vulnerability, while areas in the eastern part of the Alps or close to the plain are characterized by a severe level of vulnerability. However, it is difficult to generalize results for the entire AS, and a closer and more precise look at smaller scales can provide more accurate deductions.

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2.2 Snow Vulnerability Index for STDs

The Snow Vulnerability Index (VSI) is an aggregate (synthetic) indicator of the level of vulnerability of the STDs to a particular climate change impact, the diminishment of the snow cover. It is a composite indicator constructed through the synthesis of 12 indicators related to the dimensions of vulnerability considered most relevant for understanding and raise awareness regarding the impacts, expressing the various aspects of a multidimensional phenomenon through a single value. Recently, composite indicators have become widely used, especially because they simplify the analysis of socio-economic phenomena over time and across territories through synthesis. There is an increasing explicit demand for synthetic measures, not only driven by a generic need for knowledge but also requested by decision-makers at all levels (from national to local), who require simple yet effective parameters to plan and monitor interventions, considering various factors.

2.3 Vulnerability's Dimensions for STDs

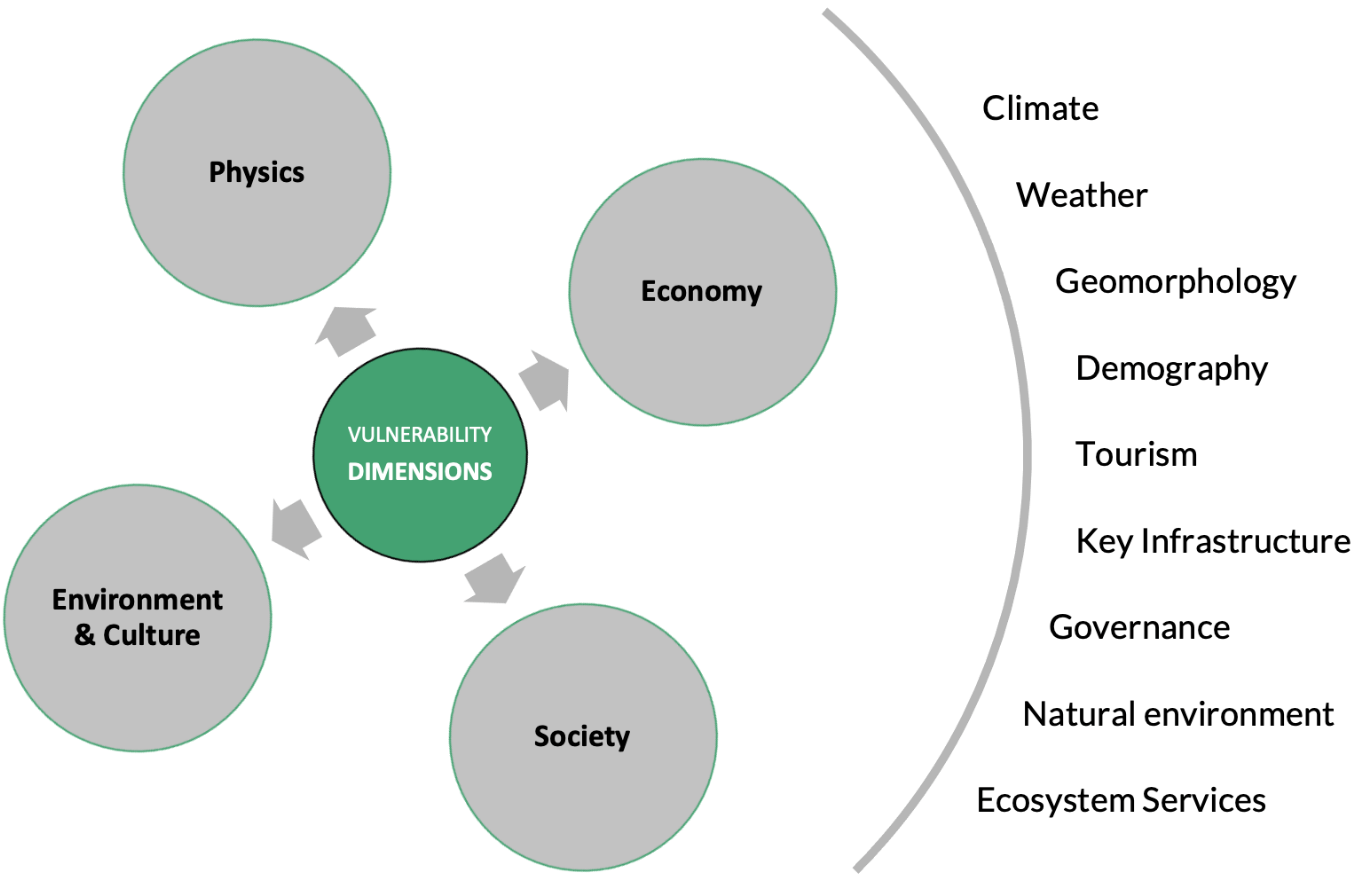

Figure 3. Considered dimensions and key aspects for the BeyondSnow project and STDs Vulnerability Map (v0.92) (Own elaboration)

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2.4 Indicators selection

An indicator is an observable value that is representative of a specific phenomenon of concern. Indicators provide a measurable proxy for scientists, managers, as well as policy- and decision-makers to understand trends in complex ecological, social, and economic processes. In the case of multidimensional phenomena whose explanation includes several elements, it is necessary to construct composite indicators, i.e., considering several components, allowing for comparisons over time and between territories.

In the specific case of the project BeyondSnow, the complexity of vulnerability as a phenomenon requires a reduction of the concept within a set of indicators and criteria that facilitate its assessment (see Figure 4). However, it should be noted that it is highly challenging to reduce it to a simple equation that can be applied to multiple levels of investigation and types of (climate change) impacts. In fact, selecting appropriate data and indicators that accurately represent both environmental and societal aspects of vulnerability as well as integrating this data, are crucial steps in the vulnerability mapping process (Preston & Stafford-Smith, 2009).

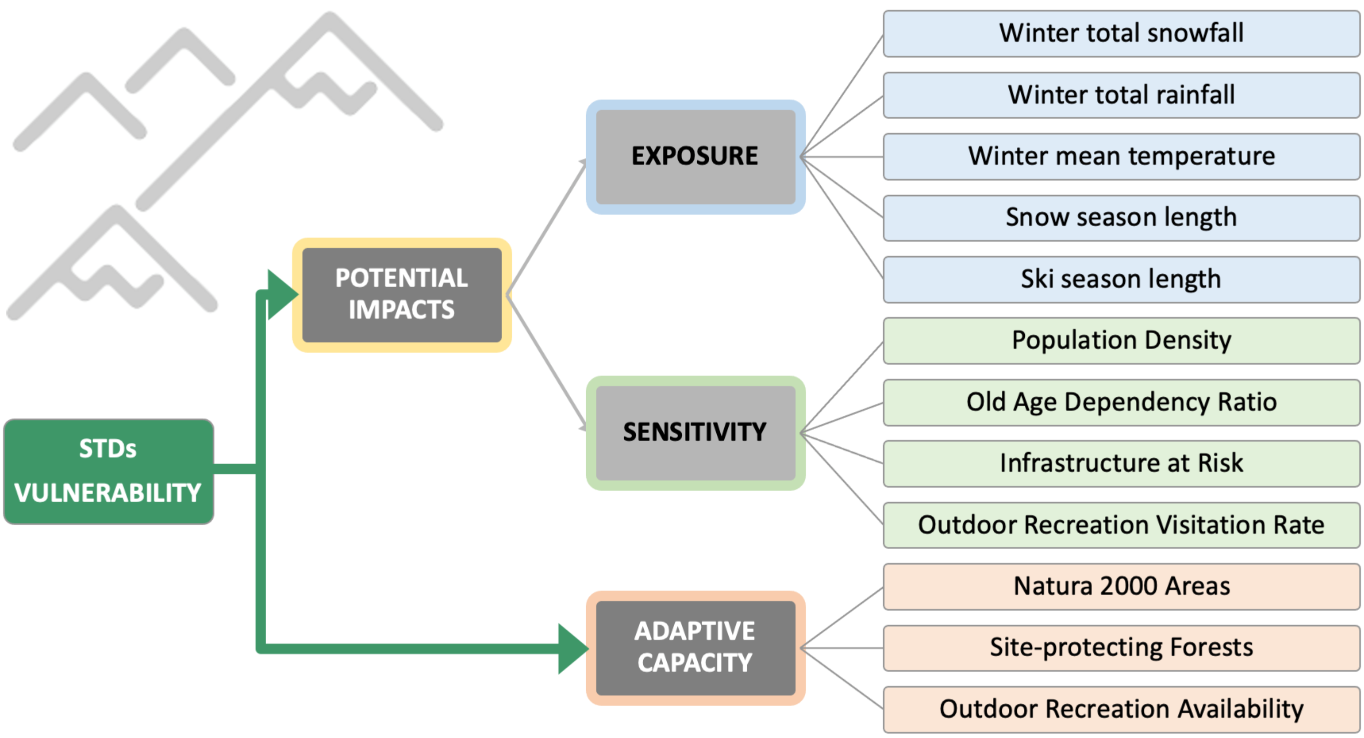

Figure 4. Scheme of the selected indicators for the first STDs Vulnerability Map

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The AS Project BeyondSnow's focus on vulnerability in STDs is an attempt of targeted analysis that considers the unique specificities of these areas. Therefore, the selection of indicators and the overall development of a STDs Vulnerability Map have mainly adhered to the methodological guidelines provided in the Vulnerability Sourcebook by Fritzsche et al. (2014), the IPCC vulnerability concept (2007), and previous Alpine Space projects (e.g., AlpES, ClimAlpTour, GreenRisk4ALPs).

However, the dataset of indicators that could potentially be included in the assessment is wider than the one presented in this first draft. Thus, depending on the availability and accuracy of data, the selection of indicators will be continuously updated for an improved vulnerability assessment of STDs throughout the project's lifetime.

2.5 Vulnerability levels

Based on key international reports on climate risk (IPCC AR6, NAPs and NASs in AS) vulnerability has been graded into 5 classes. Following the AS Programme Communication Manual and the IPCC Visual Style Guidelines (2018), 5-class proposals and a corresponding set of colours and descriptive indications for each vulnerability level have been drawn up to facilitate map comprehension (see chapter 4.5).

2.6 Confidence

When reviewing information at the indicator level it is important to note that each indicator has been assigned a level of "Confidence". Confidence is noted as "Robust" (highest confidence), "Indicative", or "Speculative" (lowest confidence). This evaluation is based on judgements that will be made during a dedicated technical workshop during the project's RP3.

2.7 Interpretation note

When consulting the aggregate vulnerability map, readers are encouraged to take advantage of these multi-point considerations. If an indicator is "Speculative" and the STD of interest is with "Considerable" uncertainty on the direction of change, the assessment provided by the map should be treated with much more caution than if the inverse confidence and uncertainty values had been given. Nevertheless, just because uncertain, it does not mean that the values provided could not be potential future outcomes. Responses to the impacts of climate change should ideally be robust to a range of different outcomes (Dessai et al., 2009).

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3 Indicators

3.1 Exposure

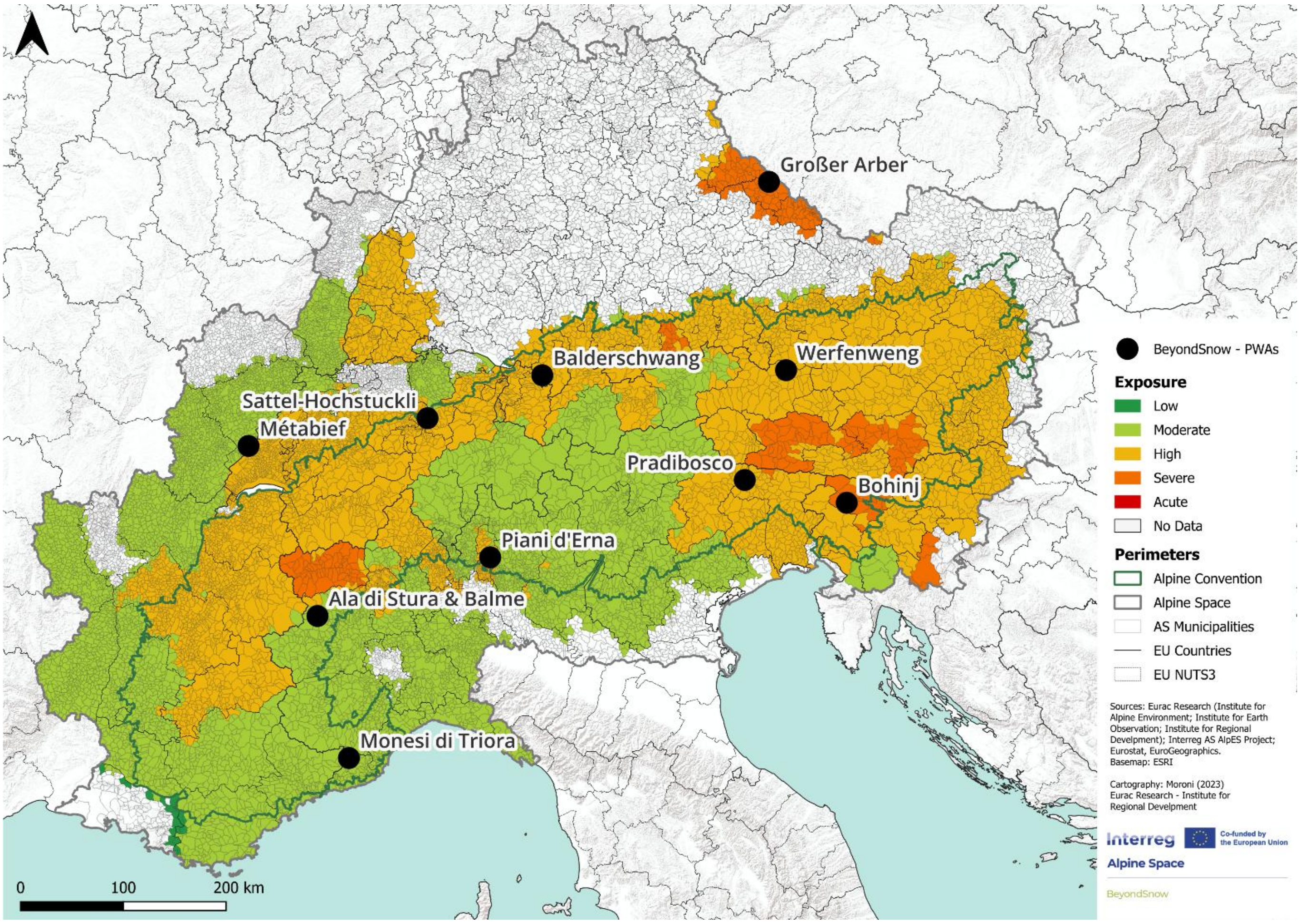

Figure 5: Exposure map (Own Elaboration, 2023)

Indicator description

Exposure is the character, magnitude, and rate of change and variation in the climate (Fritzsche et al., 2014). It is composed of 5 climatic indicators: Snowfall, Rainfall, Temperature, Snow season, and Ski season.

Map interpretation

The map shows that areas with higher values, exhibiting severe levels of climatic exposure, are spread throughout different parts of the AS area. These are: Aosta Valley, the Bavarian Forest, parts of Carinthia and Slovenia. However, most areas exhibit moderate to high levels of climatic exposure.

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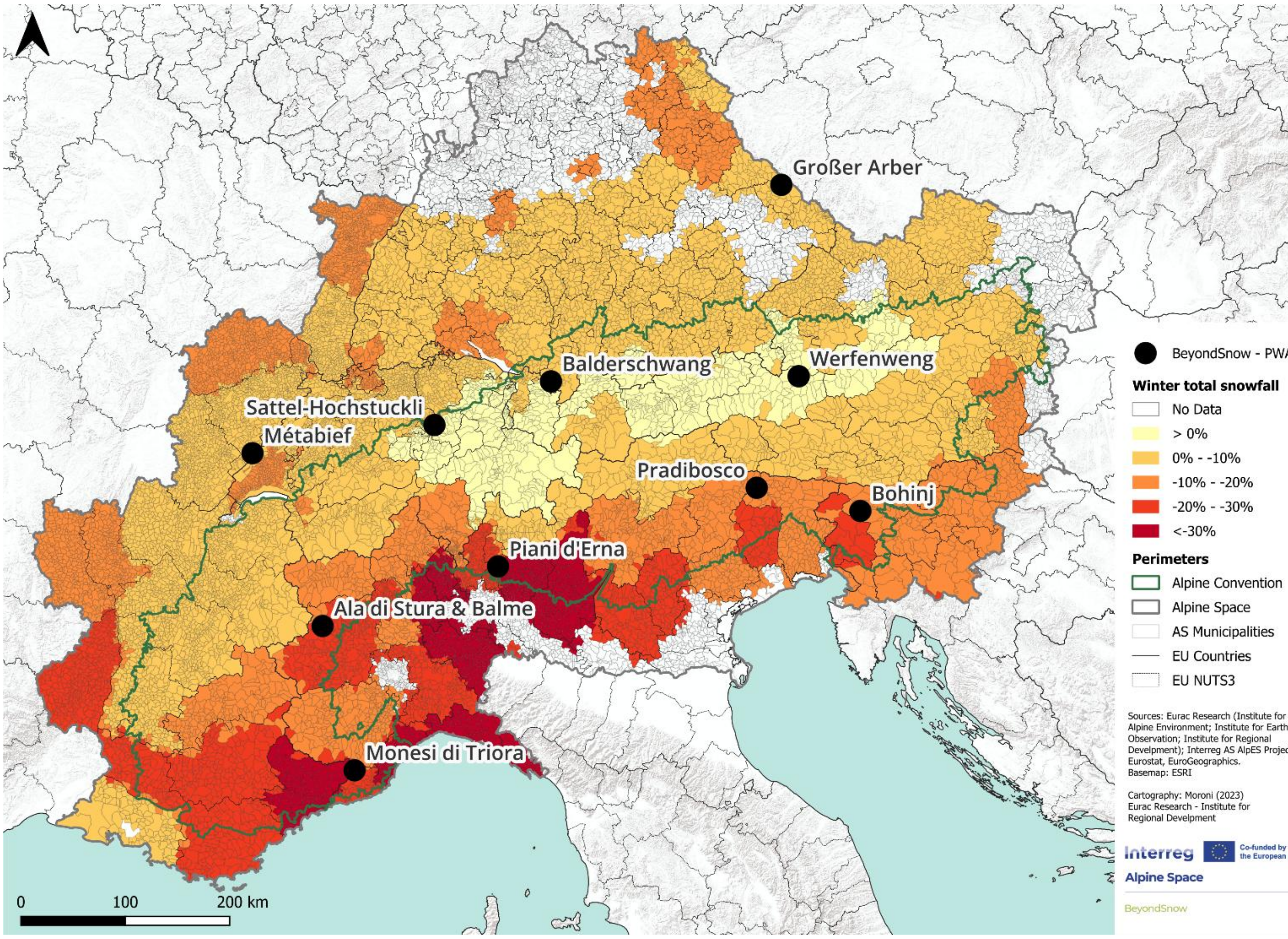
3.1.1



Winter total snowfall

Figure 6: Winter Total Snowfall map (Own Elaboration, 2023)

Indicator description

The Snowfall indicator refers to the projected changes (in percentage) of total snowfall from November to April between scenario RCP 4.5 data and historical data (1986-2005). The elevation reference is 500-1,400m. Higher percentages of snowfall difference indicate a decrease in total snowfall during the winter season compared to the period 1986-2005, which consequently implies higher exposure.

Map interpretation

Areas that are likely to experience a more significant reduction in total winter snowfall are situated in the Southern Alps, particularly in the South-West. Overall, it seems that only small parts of Switzerland and Austria could avoid a noticeable decrease in snowfall in the near future.

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3.1.2 Winter total rainfall

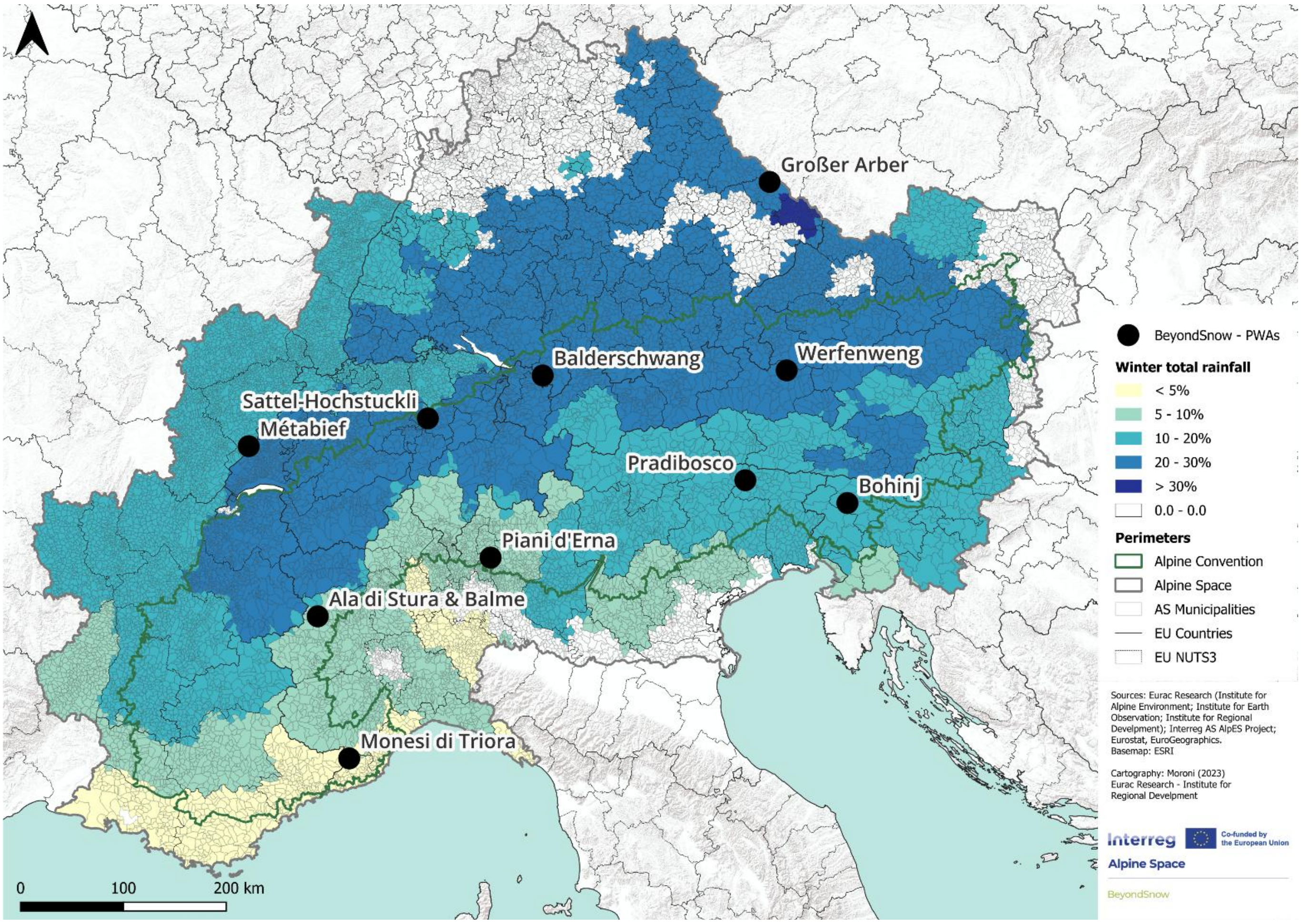

Figure 7: Winter Total Rainfall map (Own Elaboration, 2023)

Indicator description

The indicator shows projected changes (in percentage) of Total Rainfall from November to April between scenario RCP 4.5 data and historical data (1986-2005). The elevation reference is 500-1,400m. An increase in rainfall during the winter season is associated to higher exposure, as this implies a precipitation shift from snow to rain, associated with an increased risk of floods, landslides and soil erosion (Ombadi et al., 2023).

Map interpretation

Rainfall in winter is likely to increase in all areas of the AS within 500-1,400m. In particular, the map shows that the Northern Alps might see an increase of more than 10% of total rainfall in winter compared to the past decades, with peaks of 30% in the area of the Bavarian Forest.

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3.1.3 Temperature

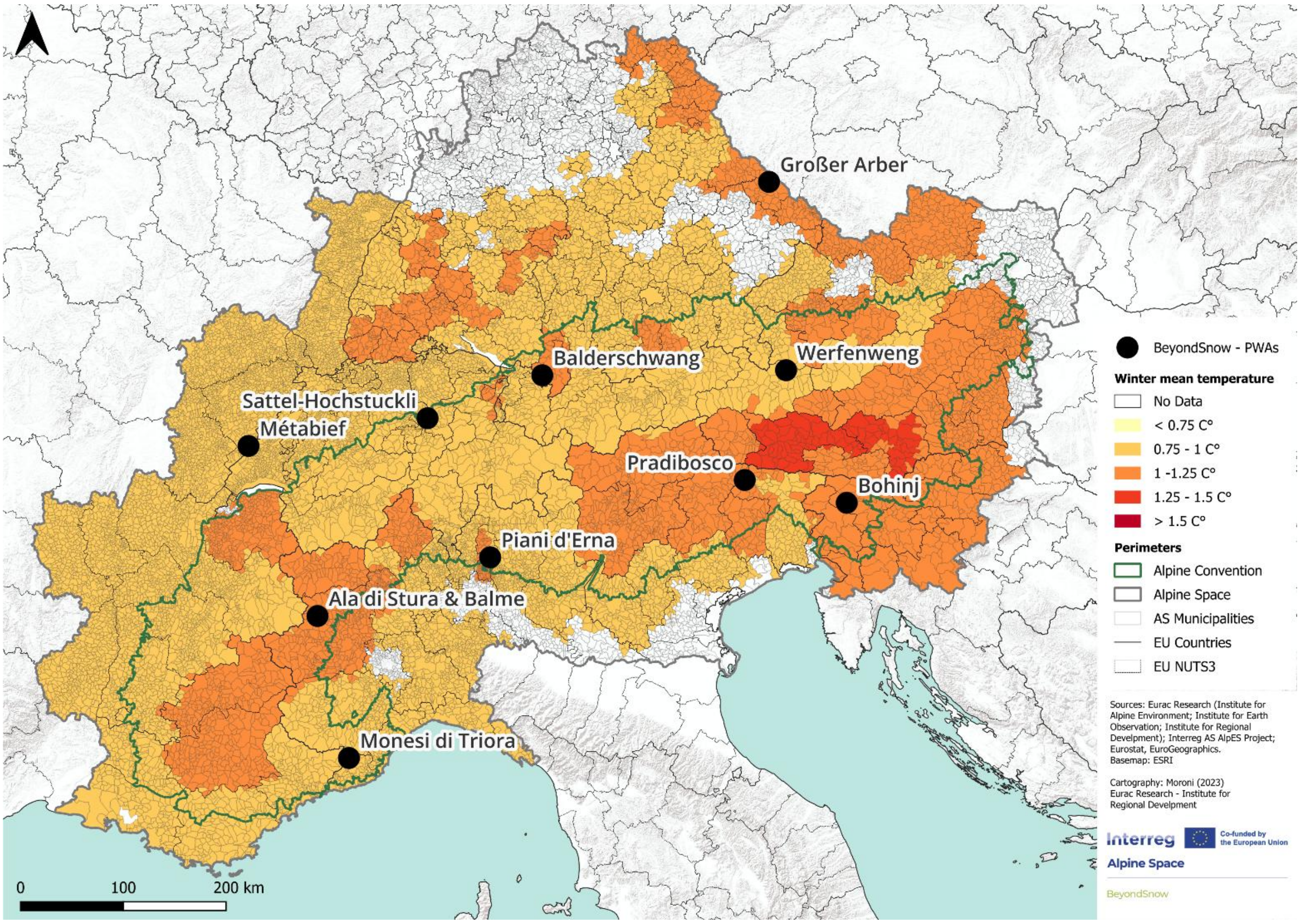

Figure 8: Winter Mean Temperature map (Own Elaboration, 2023)

Indicator description

The indicator refers to projected changes of Winter Mean Temperature from November to April, between scenario RCP 4.5 data and historical data (1986-2005). The elevation reference is 500-1,400m. An increase in temperature can influence various factors such as precipitation patterns, snow cover area and duration, hence intensifying the exposure of mountain areas.

Map interpretation

The map shows that a big proportion of areas within the AS could experience an increase of winter mean temperature of more than 0.75 C° compared to the past decades, with a trend towards even higher temperatures in the southernmost areas of the Alps, parts of Carinthia and Slovenia.

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3.1.4 Snow season length

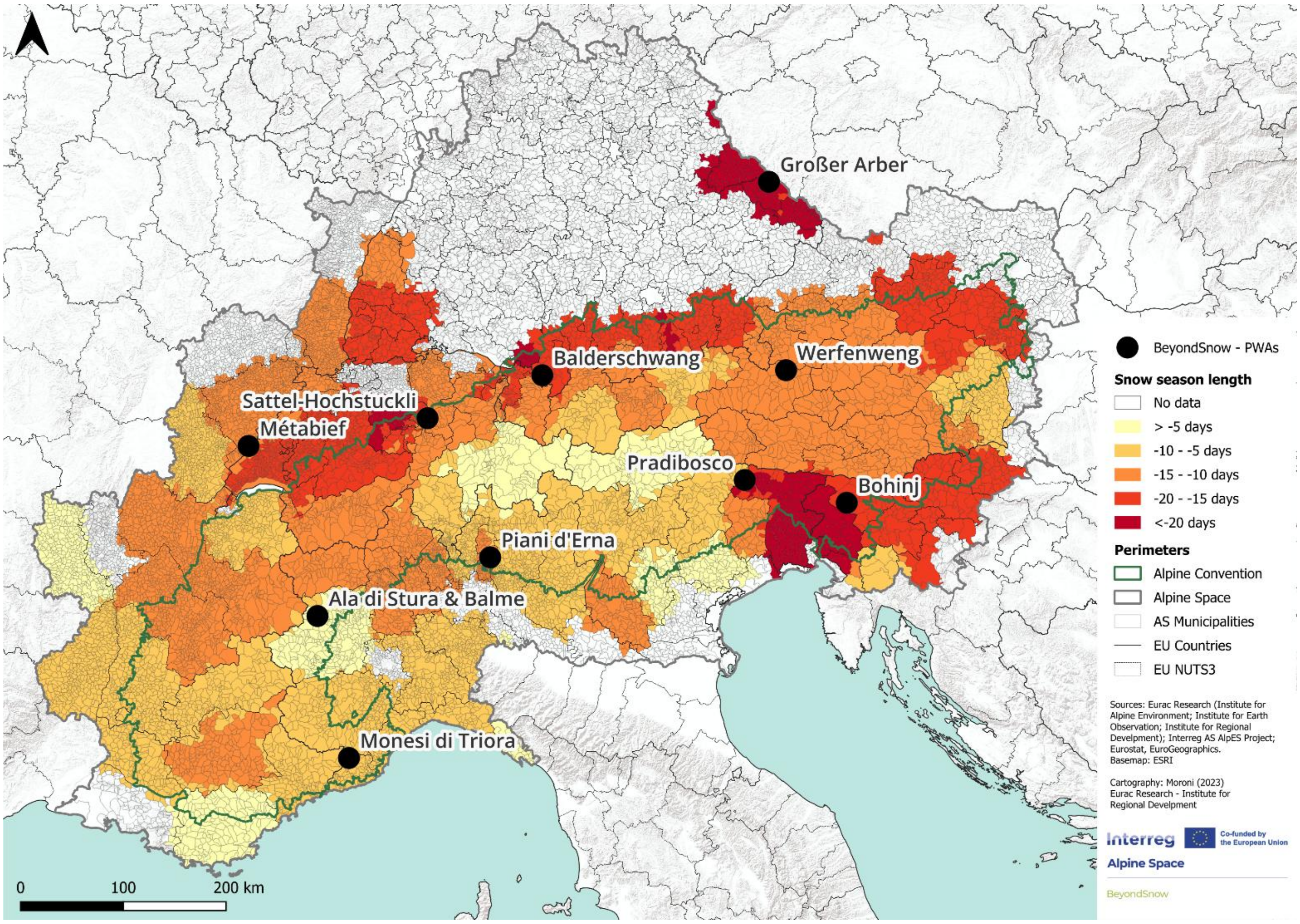

Figure 9: Snow Season Length map (Own Elaboration, 2023)

Indicator description

The indicator Snow Season Length involves projected changes in the number of days with natural snow on the ground between scenario RCP 4.5 data and historical data (1986-2005). The elevation reference is 500-1,400m. The shortening of the snow season, which is closely linked with increases in temperature and precipitation patterns, contributes to the exposure of STDs.

Map interpretation

Areas that are likely to experience a more significant reduction in their snow season length are mainly the Julian Alps and the Bavarian Forest, followed by smaller areas across the Alps. These areas could see a reduction of more than 20 days with natural snow on the ground compared to the past decades.

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3.1.5 Ski season length

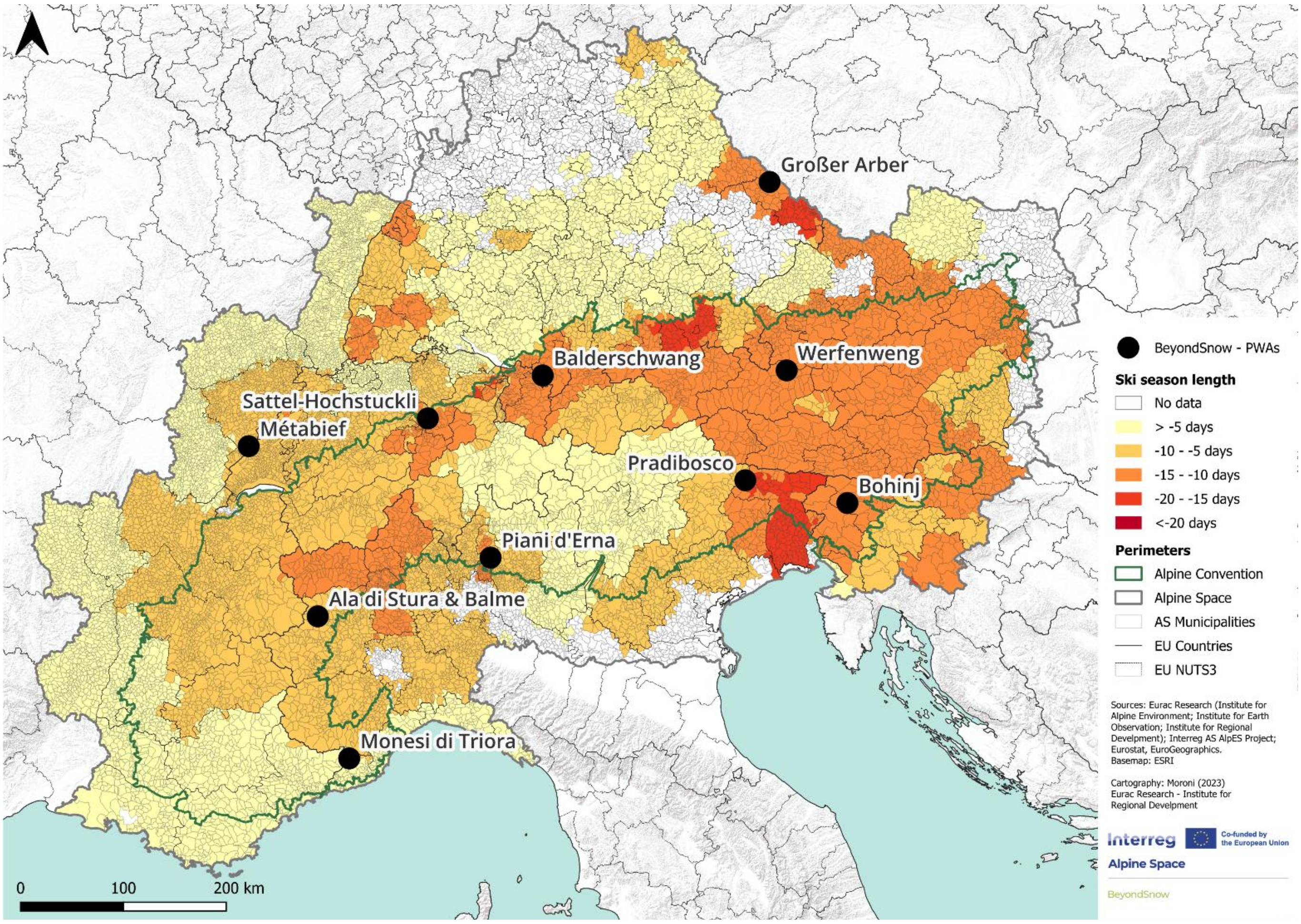

Figure 10: Ski Season Length map (Own Elaboration, 2023)

Indicator description

The indicator Ski Season Length refers to the projected changes between scenario RCP 4.5 data and historical data (1986-2005) of days with at least 30cm of snow of the ground, which is considered the minimum threshold to practice ski-related activities. The elevation reference is 1,000-1,400m. The shortening of the ski season, similarly to the snow season, contributes to the exposure of STDs.

Map interpretation

Areas that are likely to experience a more significant reduction in their ski season length are situated in the Julian Alps, Bavarian Forest, and Rosenheim district. These areas could see a reduction of more than 15 days with at least 30cm of snow on the ground compared to the past.

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3.2 Sensitivity

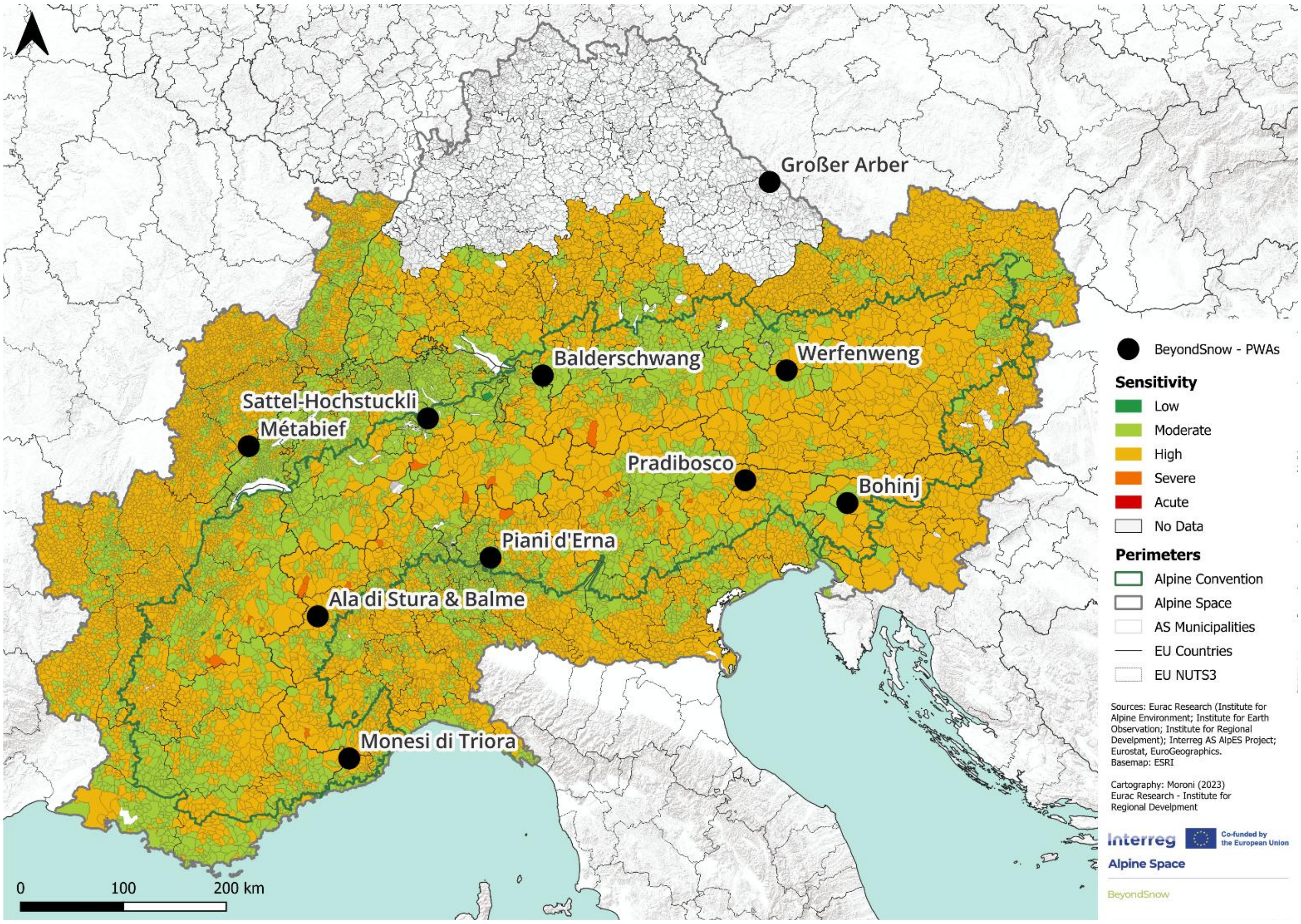

Figure 11: Sensitivity map (Own Elaboration, 2023)

Indicator description

Sensitivity is the degree to which a system is adversely or beneficially affected by a given climate change exposure. It can be shaped by natural attributes but also human activities affecting the physical constitution of a system (Fritzsche et al., 2014). Sensitivity in the context of the BeyondSnow project is composed of 4 indicators: Population density, Old age dependency ratio, Infrastructure at risk, and Outdoor recreation visitation rate.

Map interpretation

The map shows that most areas across the AS are characterized by high levels of sensitivity of the system to climate change exposure. Approximately 20 municipalities in high mountain areas are grouped into severe sensitivity, according to the indicators considered.

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3.2.1 Population Density

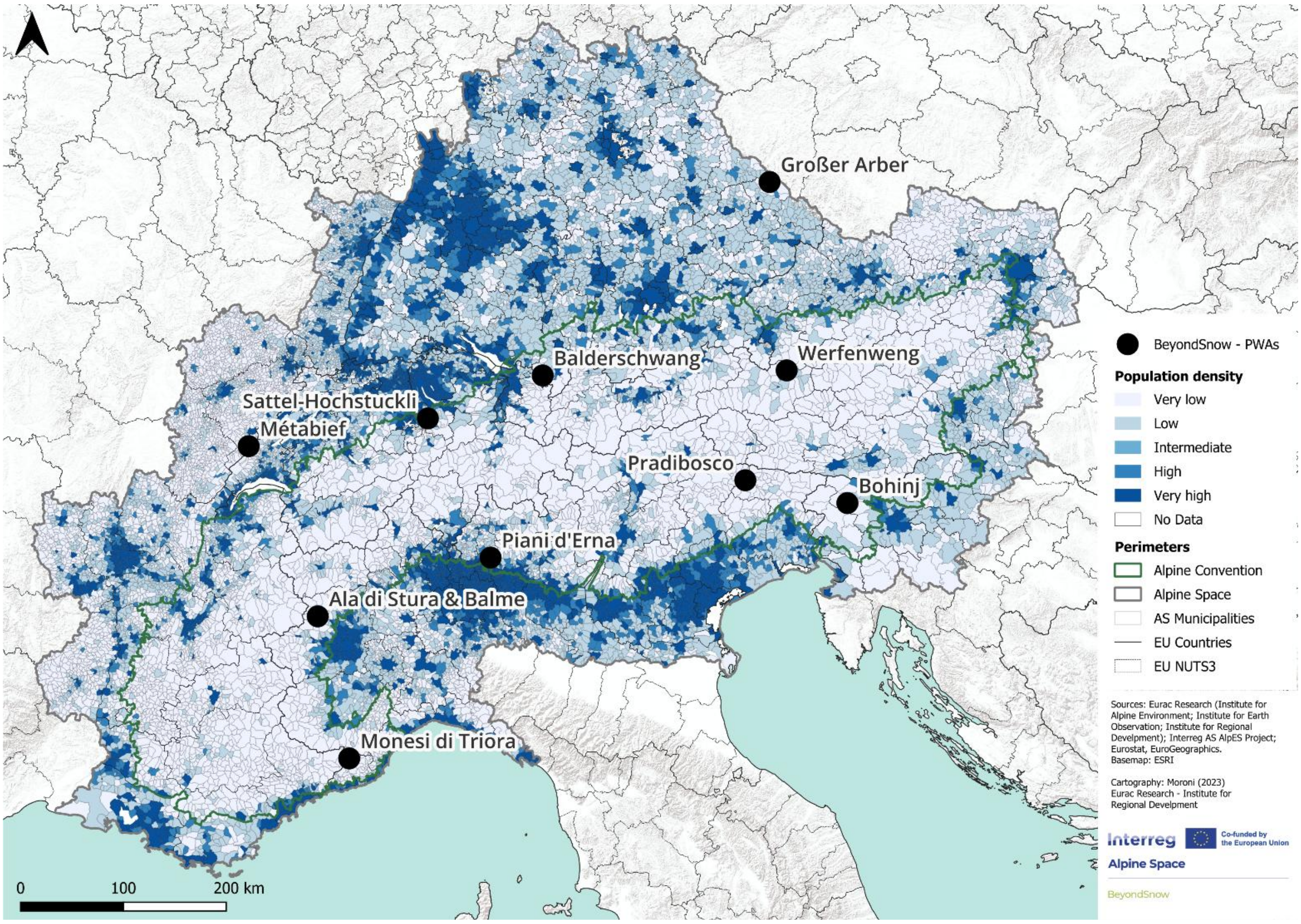

Figure 12: Population Density map (Own Elaboration, 2023)

Indicator description

Population density is the number of inhabitants in each municipal area per km^2. Population is traditionally regarded as the key indicator for the status of a municipality. A high number of inhabitants usually implies that more individuals are at risk of environmental hazards and/or are impacted by change in tourism flows.

Map interpretation

Areas showing higher population density are mainly located in lowlands such as Pianura Padana and Baden-Württemberg, and around large cities such as Zurich, Munich, Vienna etc. Alpine mountain areas, on the contrary, are less densely populated.

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3.2.2 Old Age Dependency Ratio

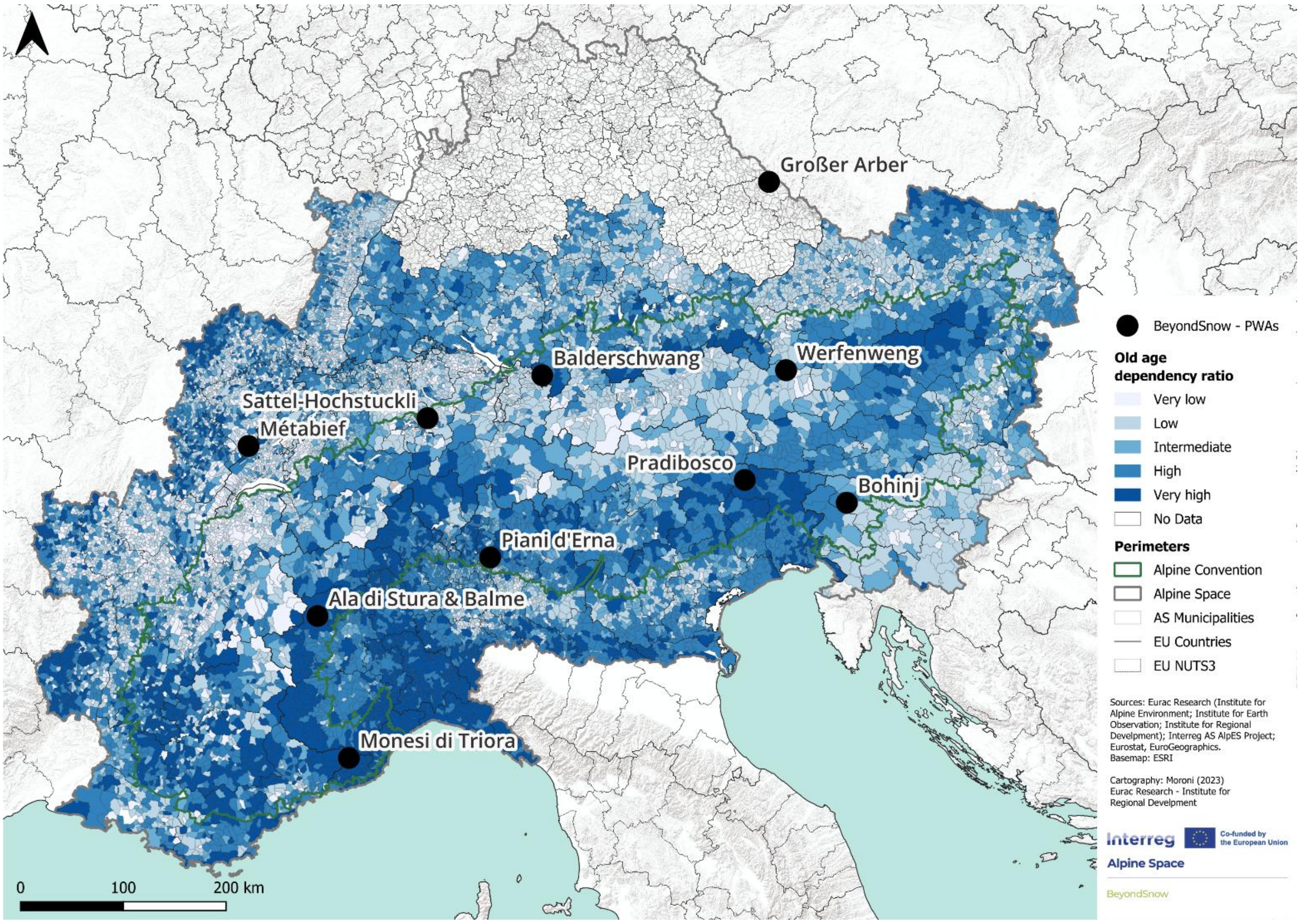

Figure 13: Old Age Dependency Ration map (Own Elaboration, 2023)

Indicator description

The indicator shows the ratio of people over 64 to those aged between 15 and 64. It shows the number of people aged 64+ for every hundred people aged 15 to 64. It expresses the socio-political responsibility of the economically active population regarding the elderly.

Map interpretation

The map demonstrates that the ratio between the number of persons in retirement age (over 64) and the number of persons in working age (15-64) cannot be immediately associated with geographical factors. Although the pattern is irregular, it seems that Italy has a generally high ratio compared to the neighbouring countries.

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3.2.3 Infrastructure at Risk

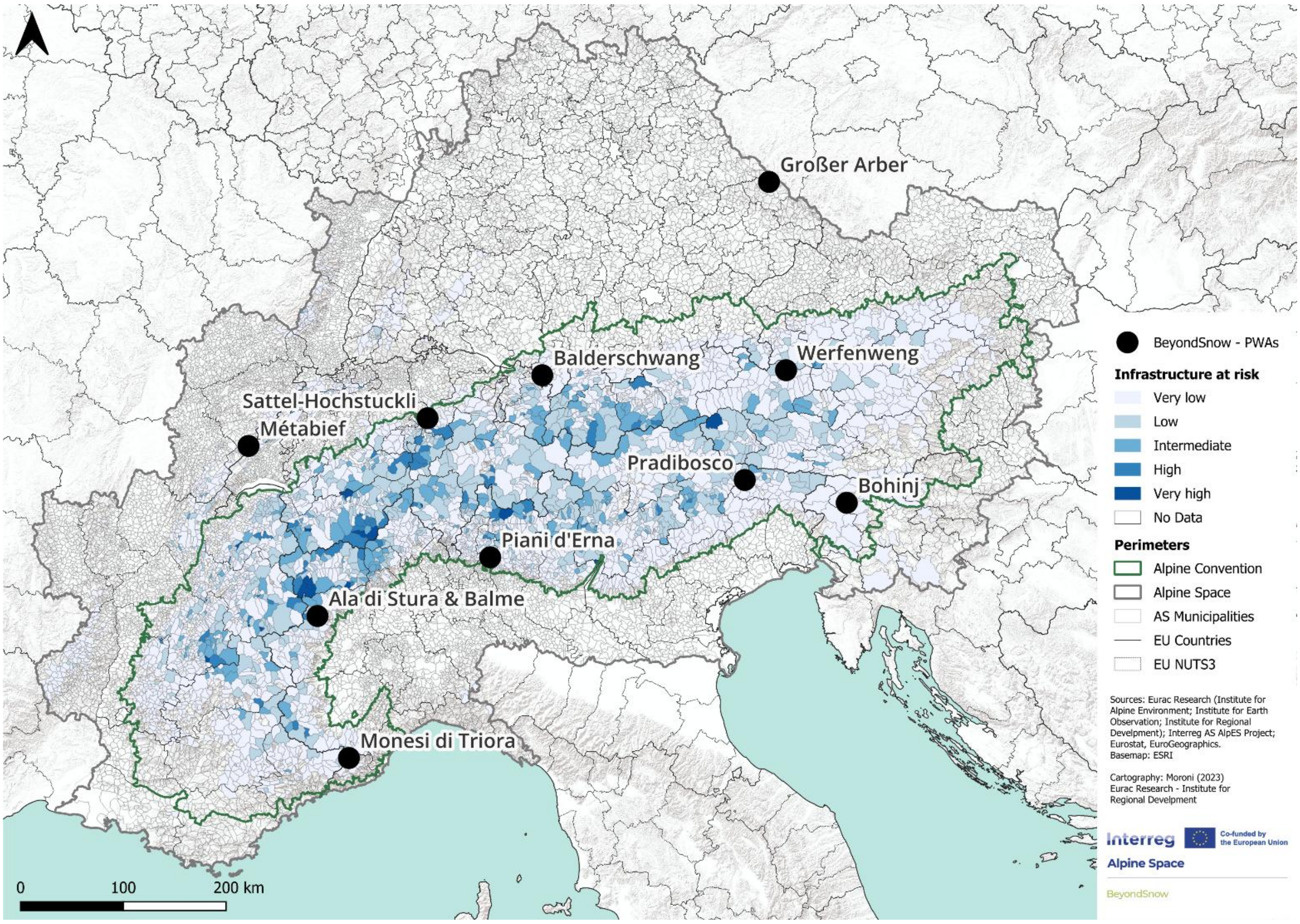

Figure 14: Infrastructure at Risk map (Own Elaboration, 2023)

Indicator description

The indicator is calculated by considering two main factors: (1) the natural hazard potential, based on avalanche and rock-fall transition zones, and (2) the damage potential, which considers all human infrastructure (i.e., settlement areas, buildings, roads, and railways). The intersection zones between these two areas identify all infrastructures that are located in potential hazard zones.

Map interpretation

Areas or infrastructure that are theoretically at risk can be found mostly within high altitude Alpine mountain municipalities, where the potential for natural hazards is higher.

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3.2.4 Outdoor Recreation Visitation Rate

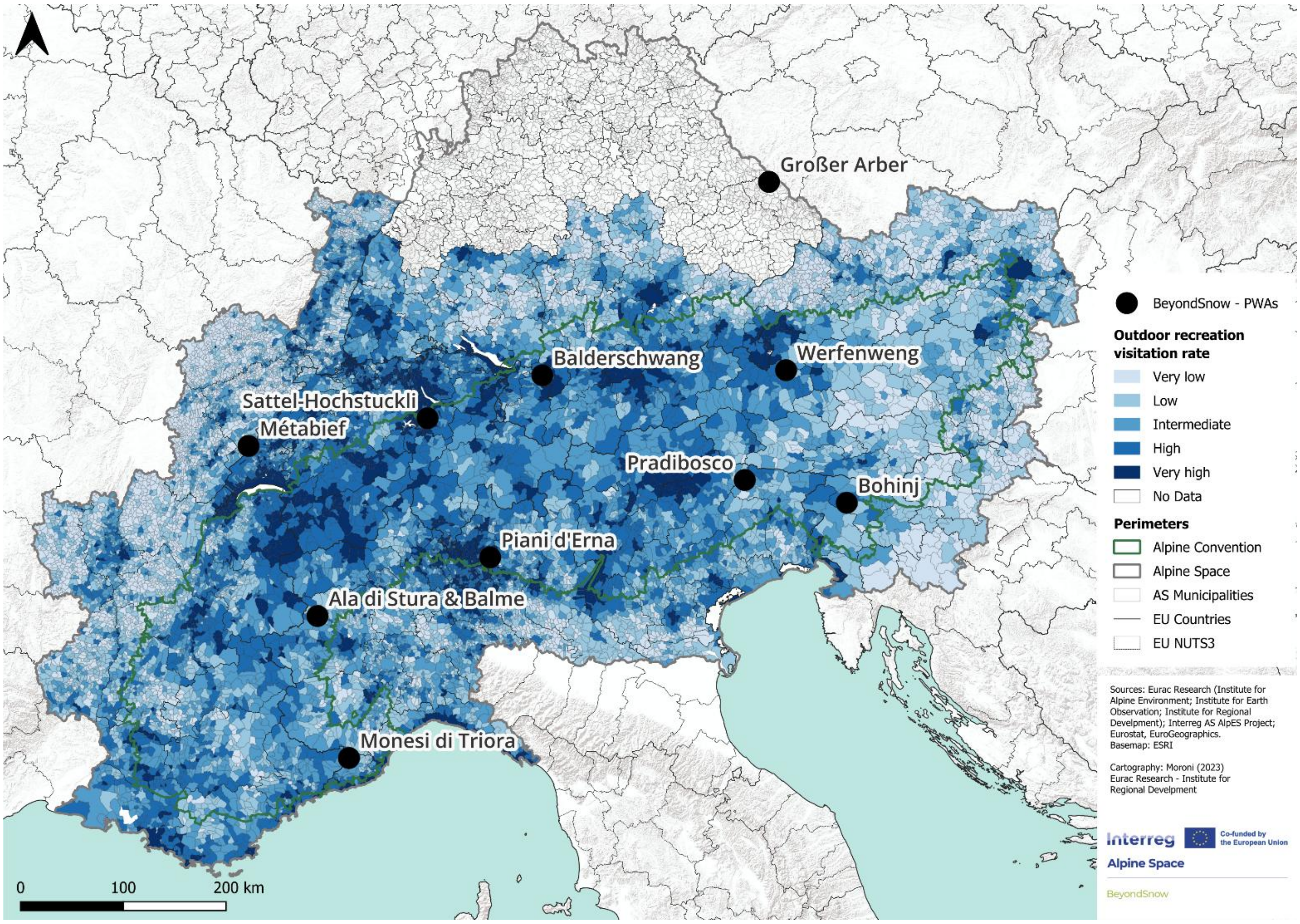

Figure 15: Outdoor Recreation Visitation Rate map (Own Elaboration, 2023)

Indicator description

The indicator aims to give an idea of how frequently these areas are visited by residents and tourists. Elevated visitation rates can be beneficial for the local economy, boosting the tourism industry, but could also have negative effects for the environment, like increased pollution levels, human disturbance to animal species, or excessive infrastructure development.

Map interpretation

Some hotspots, that are popular for outdoor recreation activities, are the municipalities located on the seaside or near lakes, but also emblematic mountain locations (the Dolomites, Chamonix-Mont Blanc, etc.) and famous ski areas. High values are also observable in big cities, which form a cluster of "urban recreational areas".

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3.3 Potential Impact

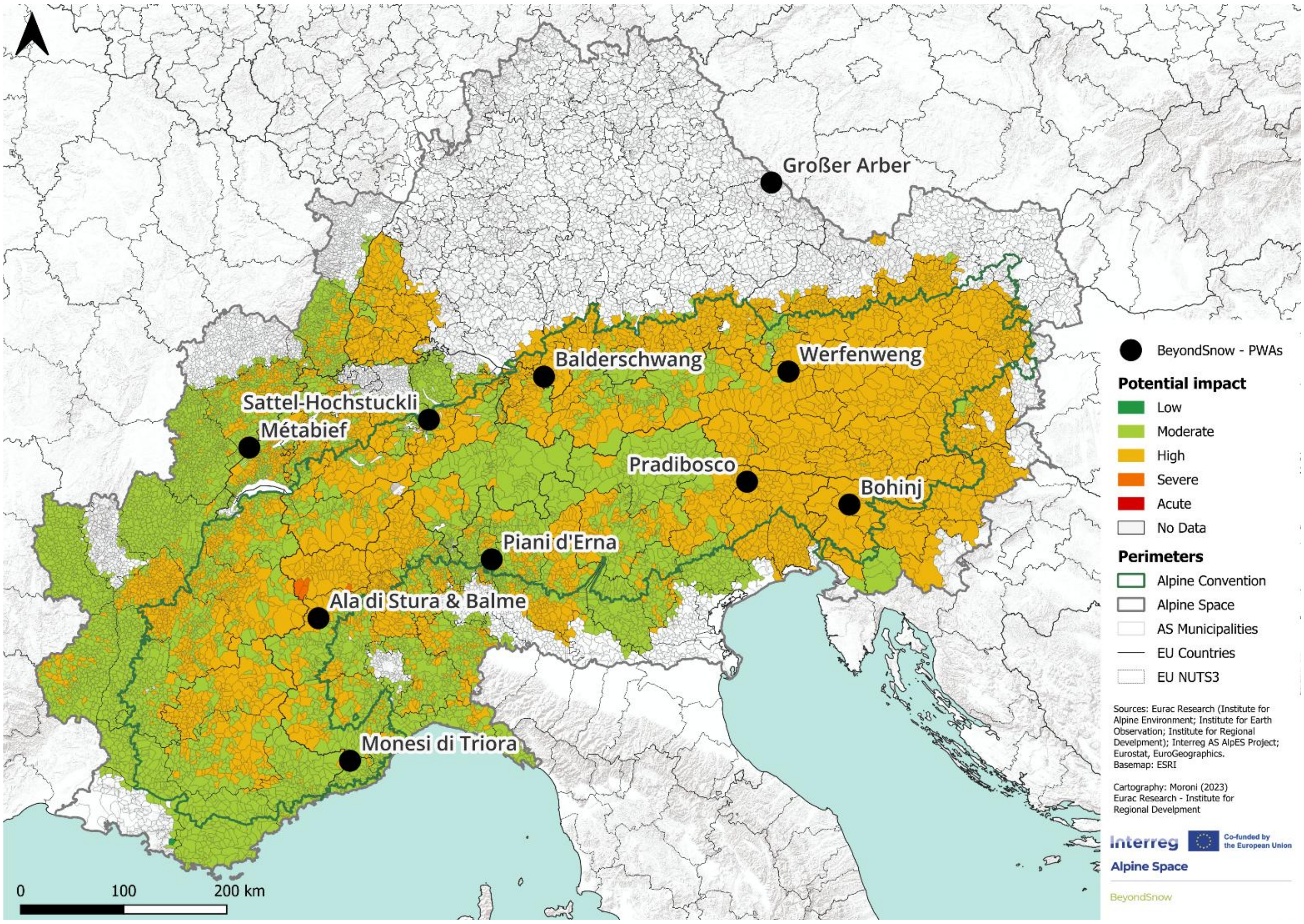

Figure 16: Potential Impact map (Own Elaboration, 2023)

Indicator description

The potential impact is determined by the combination of exposure and sensitivity. Impacts can be either direct or indirect, stretching from the biophysical to the societal sphere. In this context, the identified potential impact is a change in winter attractiveness for STDs and the consequential weakening of the local economy.

Map interpretation

The map shows that most areas are within moderate and high values of potential impact. More specifically it seems that some municipalities in Aosta Valley have the potential to be severely impacted in terms of a decrease of winter attractiveness and local economy, considering predicted climate change exposure and current levels of sensitivity.

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3.4 Adaptive Capacity

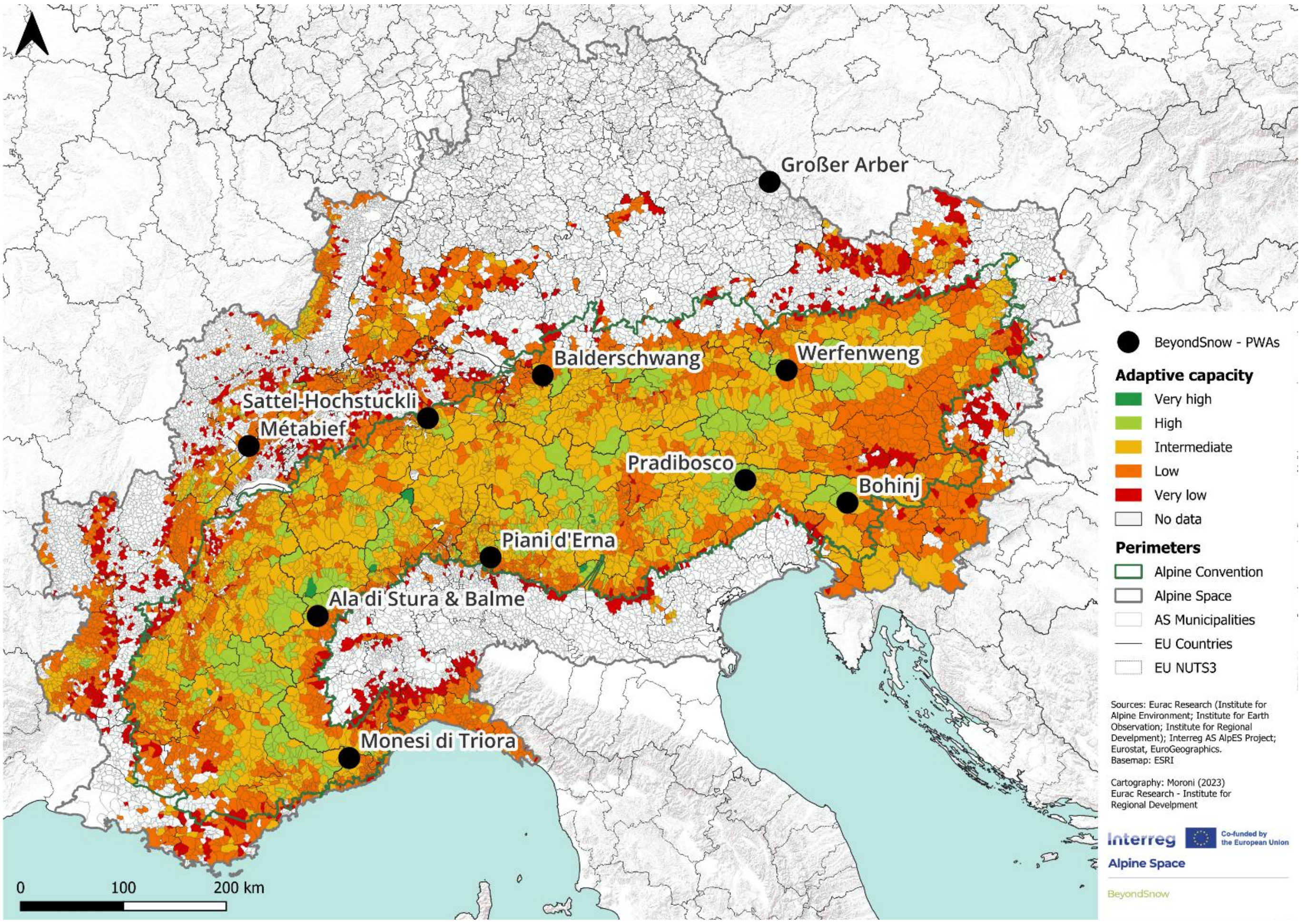

Figure 17: Adaptive Capacity map (Own Elaboration, 2023)

Indicator description

Adaptive capacity is the ability of a system to adjust to climate change. Adaptation interventions are activities that aim to reduce climate vulnerability at different levels. In the context of the BeyondSnow project, 3 indicators were considered: Natura 2000 areas, site-protecting forests, and outdoor recreation availability.

Map interpretation

The map shows a very differentiated picture in terms of adaptive capacity across the AS area, ranging from very low to high (and few 'very high') levels of adaptiveness. What can be observed in general is that areas at the extremities of the Alps tend to have lower levels of adaptive capacity than the more central ones.

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3.4.1 Natura 2000 Areas per Municipal Areas

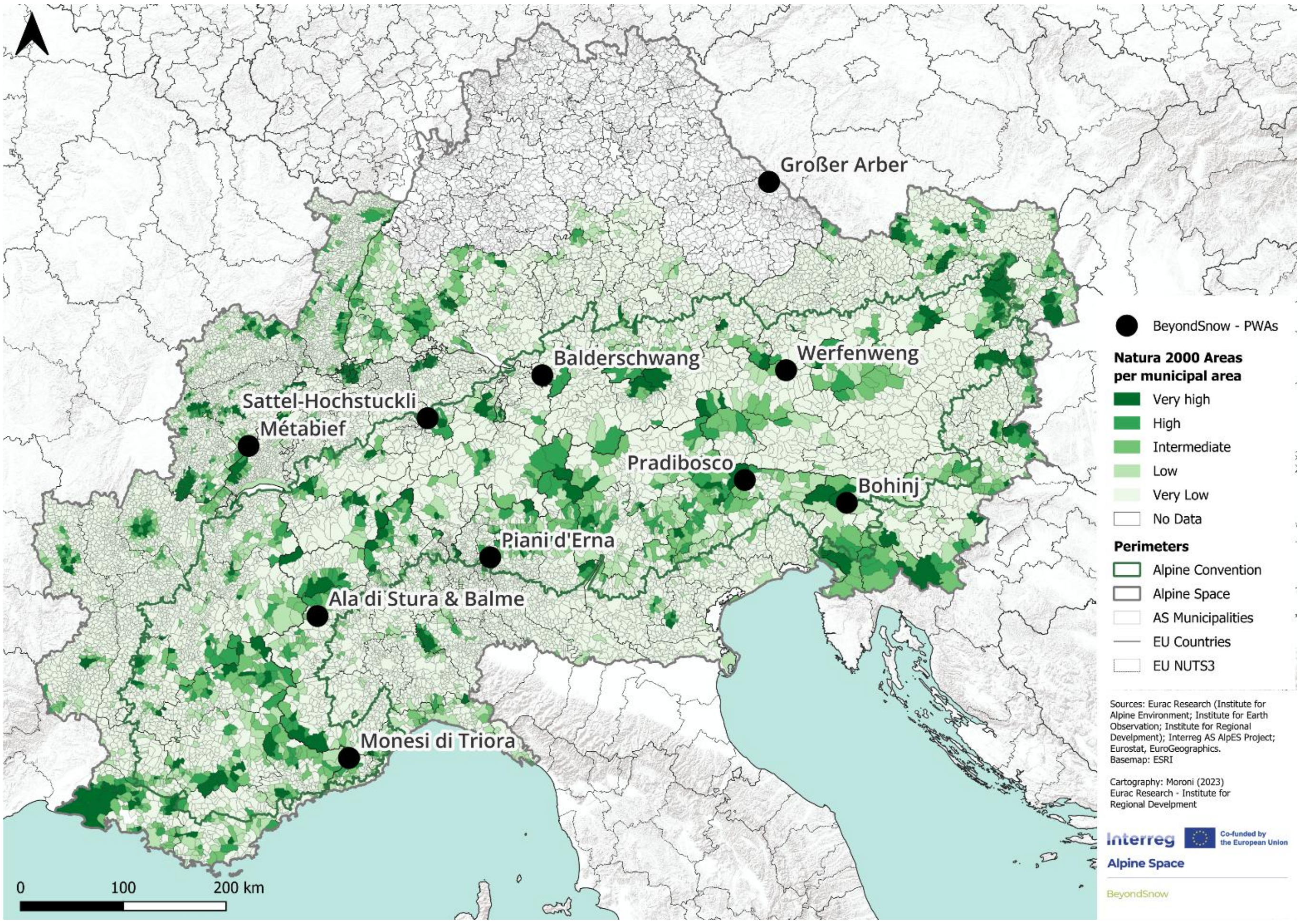

Figure 18: Natura 2000 Areas map (Own Elaboration, 2023)

Indicator description

Natura 2000 is an EU-wide network of protected areas, which was established to preserve the biological diversity in the EU. It is composed of the Sites of Community Importance (SCI) of the 1992 Habitats Directive and the Special Protection Areas (SPA) designated pursuant to the 1979 Birds Directive. The objective of Natura 2000 is to preserve important wild animal and plant species and their natural habitats in the long term; therefore, the network of conservation areas covers their entire range.

Map interpretation

Natura 2000 areas are spread across all EU Member States. The distribution is not uniform, and each country has its own unique set of designated sites. Often, however, the reason for a higher concentration of Natura 2000 sites can be attributed to the presence of a rich biodiversity.

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3.4.2 Site-protecting Forests

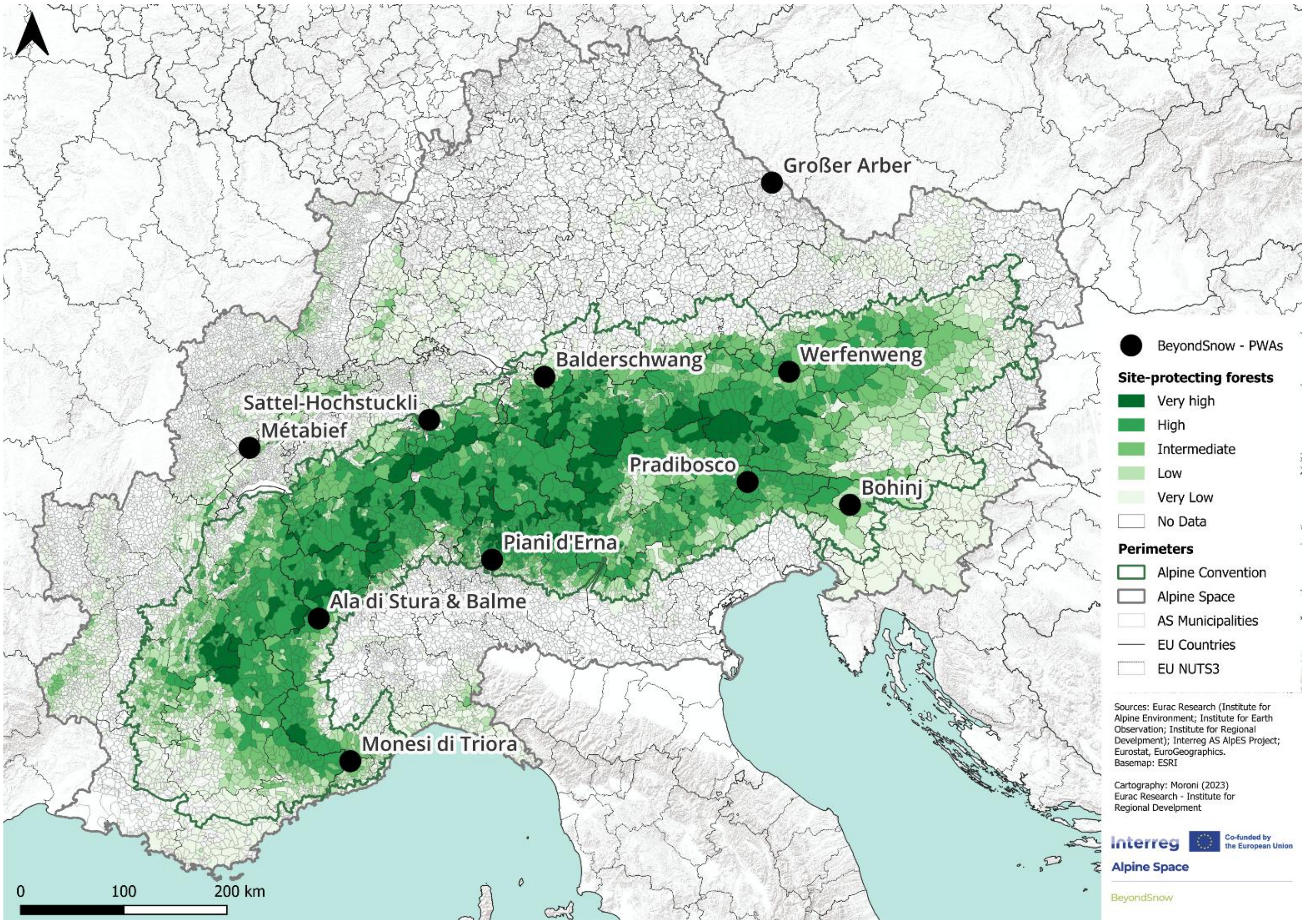

Figure 19: Site-protecting Forests map (Own Elaboration, 2023)

Indicator description

The indicator delineates areas where the biotic ecosystems (forests), known for being inexpensive and self-sustaining, contribute to the mitigation of natural hazards and the protection of human assets from hazardous natural (and sometimes also climate-change-connected) processes such as avalanches, rockfalls and mudslides.

Map interpretation

The Alpine Mountain area has the highest coverage of protection forests, due to a higher risk for gravitational hazards and mass movements due to the slope of the terrain. Forest cover is less critical in flat areas since there is a lower possibility for these types of natural hazards. Moreover, protection forests are also present in areas without any human infrastructure to protect, since they still counteract soil erosion, lessen the impact of rain limiting runoff by water, all of which help to preserve intact and functioning ecosystems.

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3.4.3 Outdoor Recreation Availability

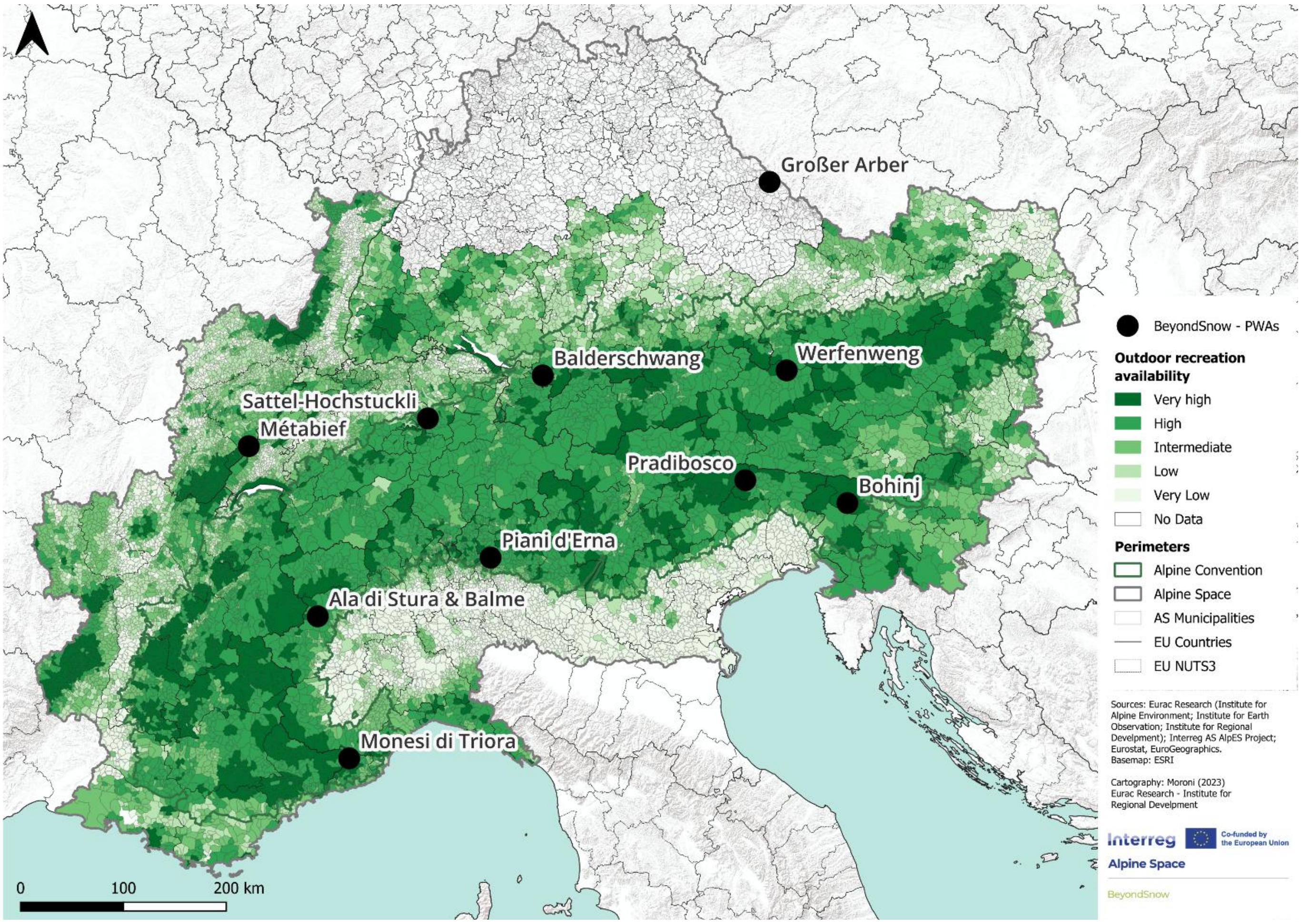

Figure 20: Outdoor Recreation Availability map (Own Elaboration, 2023)

Indicator description

This indicator is a measure of the genuineness and diversity of the landscape, which add to its recreation potential, and of the accessibility of such outdoor recreational spots. Low values of supply of outdoor recreation availability are often related to a strong anthropogenic impact on the territory.

Map interpretation

The map shows a heterogeneous spatial distribution of the outdoor recreational areas. Nevertheless, the mountains score medium to high values in their entire range. High supply rates are apparent in renowned mountain areas like, Styria (AT), the ski-town of Garmisch (DE) and the Dolomites (IT). Lakes are also very attractive in terms of recreation activities; this is particularly evident in the case of lake Garda and its surrounding municipalities.

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4 Technical Information

4.1 Data Sources

Indicator	Source	Year[1]	Source Link
Winter total snowfall	EURO-CORDEX projections and the Crocus snowpack model	2023	Eurac Research based on publica data available at https://climate.copernicus.eu
Winter total rainfall	EURO-CORDEX projections and the Crocus snowpack model	2023	Eurac Research based on publica data available at https://climate.copernicus.eu
Winter mean temperature	EURO-CORDEX projections and the Crocus snowpack model	2023	Eurac Research based on publica data available at https://climate.copernicus.eu
Snow season length	EURO-CORDEX projections and the Crocus snowpack model	2023	Eurac Research based on publica data available at https://climate.copernicus.eu
Ski season length	EURO-CORDEX projections and the Crocus snowpack model	2023	Eurac Research based on publica data available at https://climate.copernicus.eu
Population Density	Eurostat, EuroGeographics	2021	https://ec.europa.eu/eurostat/web/gisco/geodata/reference-data/administrative-units-statistical-units/lau#lau19
Old Age Dependency Ratio	Eurac Research (data from Alpine countries)	2018	AlpES Sustainability Indicators Metadata [WIKIAlps – the Alpine WIKI]
Infrastructure at Risk	Interreg Alpine Space AlpES project	2018	http://www.wikialps.eu/doku.php?id=wiki:protection_forest
Outdoor Recreation Visitation Rate	Interreg Alpine Space AlpES project	2018	http://www.wikialps.eu/doku.php?id=wiki:outdoor_recreation_activities_including_enjoyment_and_willingness_to_preserve_in_the_alps
Natura 2000 Areas	Eurac Research - Institute for Alpine Environment	2018	AlpES Sustainability Indicators Metadata [WIKIAlps – the Alpine WIKI]
Site-protecting Forests	Interreg Alpine Space AlpES project	2018	http://www.wikialps.eu/doku.php?id=wiki:protection_forest
Outdoor Recreation Availability	Interreg Alpine Space AlpES project	2018	http://www.wikialps.eu/doku.php?id=wiki:outdoor_recreation_activities_including_enjoyment_and_willingness_to_preserve_in_the_alps

Table 1: Data sources for selected vulnerability indicators

[1] Year of index/indicator elaboration

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4.2 Elaboration

Climatic data was firstly converted from raster to vector layers, calculating statistics for each feature of the overlapping polygon vector layer of municipalities. All indicators were then normalised by transforming the values into scores ranging from 0 (positive values) to 1 (negative values). Although the following step would include the weighting of indicators, no particular weights were assigned to the indicators for the first draft of the map. Subsequently, for aggregating individual indicators into composite indicators, arithmetic aggregation was used. Finally, once the indicators were aggregated, values were classified into 5 categories, with respective colors ranging from green (Low), to yellow, and red (Acute) (see 4.5).

4.3 Weighting

While acknowledging that certain factors may carry different degrees of importance (weights), it was decided, for the initial draft of the map, not to assign specific weights to individual indicators. The deliberate omission of weights highlights the provisional nature of the map. The intention is to facilitate a collaborative approach to weighting through a dedicated workshop involving project partners and stakeholders in RP3. This inclusive process will allow for collective deliberation and consensus-building, ensuring that the final map accurately reflects the diverse perspectives and expertise of those involved in the BeyondSnow project.

4.4 Data Availability

The elaboration of this map relied on the utilization of presently accessible data. It is, however, important to acknowledge that certain geographical areas, notably around the Bavarian region, exhibit gaps in data representation due to its only recent inclusion in the Alpine Space perimeter. This issue highlights that the current map serves as an initial overview, subject to improvement and updates. The ongoing dedication to refining the map ensures that it remains a dynamic and evolving tool, continually improved by a more comprehensive dataset to better reflect the vulnerability of STDs in the Alpine region.

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4.5 Map legend examples

Colours			RGB			CMYK				HEX	Degree	Description
5		Red	213	0	0	0	100	100	16	D50000	Acute	Most vulnerable
4		Orange	243	110	0	0	55	100	5	F36E00	Severe	
3		Yellow	238	181	13	0	24	95	7	EEB50D	High	
2		Light Green	166	206	57	19	0	72	19	A6CE39	Moderate	
1		Dark Green	35	150	67	77	0	55	41	239643	Low	Least vulnerable

*Table 2. Proposal of 5-class aggregate **vulnerability** map legend, 5 divergent colours version (Own elaboration, based on IPCC, 2018).*

Colour gradients			RGB			CMYK				HEX	Degree	Description
5		Red	189	0	38	18	100	84	8	BD0026		
4		Light Red	240	59	32	0	86	88	0	F03B20		
3		Orange	253	141	60	0	55	78	0	FD8D3C		
2		Yellow	254	204	92	0	22	71	0	FECC5C		
1		Light Yellow	255	255	178	4	0	39	0	FFFFB2		

*Table 3. Proposal of 5-class single **indicator** map legend, coloured gradient version (Own elaboration, based on IPCC, 2018).*

Colour gradients			RGB			CMYK				HEX	Degree	Description
5		Deep Blue	37	52	148	99	87	1	0	253494		
4		Blue	44	127	184	80	41	8	0	2C7FB8		
3		Turquoise	65	182	196	68	3	25	0	41B6C4		
2		Light Green	161	218	180	42	0	38	0	A1DAC4		
1		Pale Yellow	255	255	204	3	0	27	0	FFFFCC		

*Table 4. Proposal of 5-class single **indicator** map legend, coloured gradient version (Own elaboration, based on IPCC, 2018).*

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Colour gradients			RGB			CMYK				HEX	Degree	Description
5		**Navy Blue**	8	81	156	97	69	5	0	08519C	**Very high**	
4		**Deep Blue**	49	130	189	78	40	6	0	3182BD	**High**	
3		**Medium Blue**	107	174	214	60	18	7	0	6BAED6	**Intermediate**	
2		**Pastel Blue**	189	215	231	30	8	7	0	BDD7E7	**Low**	
1		**Light Blue**	239	243	255	7	4	0	0	EFF3FF	**Very low**	

Table 5. Proposal of 5-class single ***indicator*** *map legend, coloured gradient version (Own elaboration, based on IPCC, 2018).*

Colour gradients			RGB			CMYK				HEX	Degree	Description
5		**Dark Green**	0	109	44	90	32	93	25	006D2C	**Very high**	
4		**Forest Green**	49	163	84	77	6	84	0	31A354	**High**	
3		**Lime Green**	116	196	118	58	0	67	0	74C476	**Intermediate**	
2		**Mint Green**	186	228	179	33	0	39	0	BAE4B3	**Low**	
1		**Pastel Green**	237	248	233	10	0	13	0	EDF8E9	**Very low**	

Table 6: Proposal of 5-class single ***indicator*** *map legend, coloured gradient version (Own elaboration, based on IPCC, 2018).*

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BeyondSnow

BeyondSnow is an Interreg - Alpine Space project co-funded by the European Union. It aims at decreasing the snow-dependency of Alpine Space snow tourism destinations, strengthen their resilience to climate change and retain/increase the viability for residents and their attractiveness for tourists.