



The Definition of Mountainous Areas in Slovenia

3

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Abstract

Slovenia is very diverse in terms of landscapes. Most differences between them refer to landforms. Flatlands account for barely a tenth of Slovenia, and the remainder comprises various forms of dynamic terrain, from rounded low hills on the edges of the Pannonian and Mediterranean areas to high and steep mountains in the Alps. Taking into account all landscape typologies of Slovenia, more than half of the country is mountainous, primarily comprised of mountains, hills, and high plateaus. Nearly all these landforms belong to three landscape types: Alpine mountains (15% of Slovenia), Alpine hills (23%), and Dinaric plateaus (19%), which together cover a total of 11,531 km². Slovenia's highest Alpine mountain is Mount Triglav (2,864 m) in the Julian Alps, its highest Alpine hill is Mount Porezen (1,630 m), which is part of the Cerklje Hills, and its highest Dinaric plateau is the Snežnik Plateau with Big Mount Snežnik (*Veliki Snežnik*, 1,796 m). Beyond these three landscape types, there are only two other elevations that could partially be considered mountainous: Mount Boč (978 m) in the Pannonian

part of Slovenia and Mount Slavnik (1,028 m) in its Mediterranean part.

Keywords

Mountain · Hill · Plateau · Alps · Dinaric Alps · Landform · Landscape

3.1 Mountains and Related Terms in Slovene

Slovenia is a country with a distinctly dynamic terrain, which is why Slovenian uses numerous expressions for convex and concave landforms. The most common terms referring to convex forms are *grič* 'low hill', *hrib* 'high hill', and *gora* 'mountain'. Their plural forms are *griči*, *hribi*, and *gore*, and their collective nouns are *gričevje*, *hribovje*, and *gorovje*. Collective nouns predominate over plural forms in Slovenian geographical names; for example, *Posavsko hribovje* 'Sava Hills' rather than *Posavski hribi*. Slovenian also uses a common term for basic convex landforms: *vzpetina* 'elevation'.

Differences between the terms *grič*, *hrib*, and *gora* are not very precisely defined. Usually, a *grič* is an elevation with a 200 m difference between its foot and top, a *hrib* is an elevation with a difference of up to 600 m between its foot and top, or an elevation that rises up to the tree line, and a *gora* is an elevation with a difference of over 600 m between its foot and top or an elevation that rises

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beyond the tree line (Badjura 1953; Demek 1976; Gams 1984, 1985, 1986, 1987; Natek 1993; Perko 1992, 2001).

In western Slovenia, a *grič* is also called a *brdo* and in eastern Slovenia it is called a *gorica* (literally ‘little mountain’), which usually denotes a low hill with vineyards.

Other common Slovenian terms for convex and concave landforms are *dolina* ‘valley’, *podolje* ‘elongated lowland’, *kotlina* ‘basin’, *ravnina* ‘flat, plain’, *ravnik* ‘corrosion plain’, *planota* ‘plateau’, *višavje* ‘highlands’, and *nižavje* ‘lowlands’.

Slovenian also distinguishes between the following:

- *razgibano površje* ‘rough terrain’, which primarily includes mountains, high hills, low hills, and plateaus, versus *nerazgibano površje* ‘level terrain’, which includes plains;
- *gorato površje* ‘mountainous terrain’, which primarily includes mountains, high hills, and high plateaus, versus *negorato površje* ‘non-mountainous terrain’, which primarily comprises plains, low hills, and low plateaus; and
- *gorsko površje* ‘mountain terrain’, which only includes mountains, versus *negorsko površje* ‘non-mountain terrain’, which includes all other landforms.

If Slovenia, which is located at the intersection between the Alps, the Pannonian Basin, the Dinaric Alps, and the Mediterranean (Perko et al. 2021), is graphically depicted as a square (Fig. 3.1), the northwestern part of its central section is covered in Alpine mountains, high plateaus, and high hills with intermittent basins and valleys, and the southeastern part of its central section is occupied by Dinaric high plateaus, high hills, and elongated lowlands in between. The Alps and Dinaric Alps gradually turn into Pannonian low hills and plains toward the northeastern corner of the square and into Mediterranean low hills and low plateaus toward its northwestern corner.

Mountainous areas in Slovenia usually primarily include mountains, high hills, and

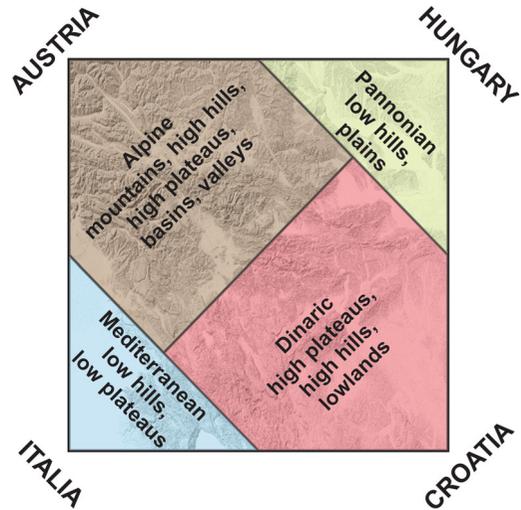


Fig. 3.1 Simplified schematic representation of Slovenia's landform and landscape types

high plateaus with small intermittent concave landforms (e.g., the Bohinj Basin in the Julian Alps). They do not include large basins (e.g., the Ljubljana Basin), plains (e.g., the Drava Plain), lowlands (e.g., the Inner Carniola Lowland), corrosion plains (e.g., White Carniola), and low plateaus (e.g., the Karst Plateau) with small intermittent convex landforms, such as Mount Boč in the middle of the Pannonian lowland.

3.2 Landscape Typologies

Landscape typologies can be used to delineate Slovenia's mountainous terrain because they all heavily rely on the dynamic nature of terrain, which is the main reason for landscape differences in Slovenia. Geographers have produced five landscape typologies for all of Slovenia to date (Perko et al. 1996; 2015; 2021; Melik 1946; Ilešič 1958; Špes et al. 2002). Due to the different methodologies used for defining these types, it is primarily the first four that are suitable for delineating mountainous terrain.

The first landscape typology of Slovenia was produced by Anton Melik (1946), who divided territory in terms of geomorphology, rocks, and climate into eight basic landscape types (Perko et al. 2021):

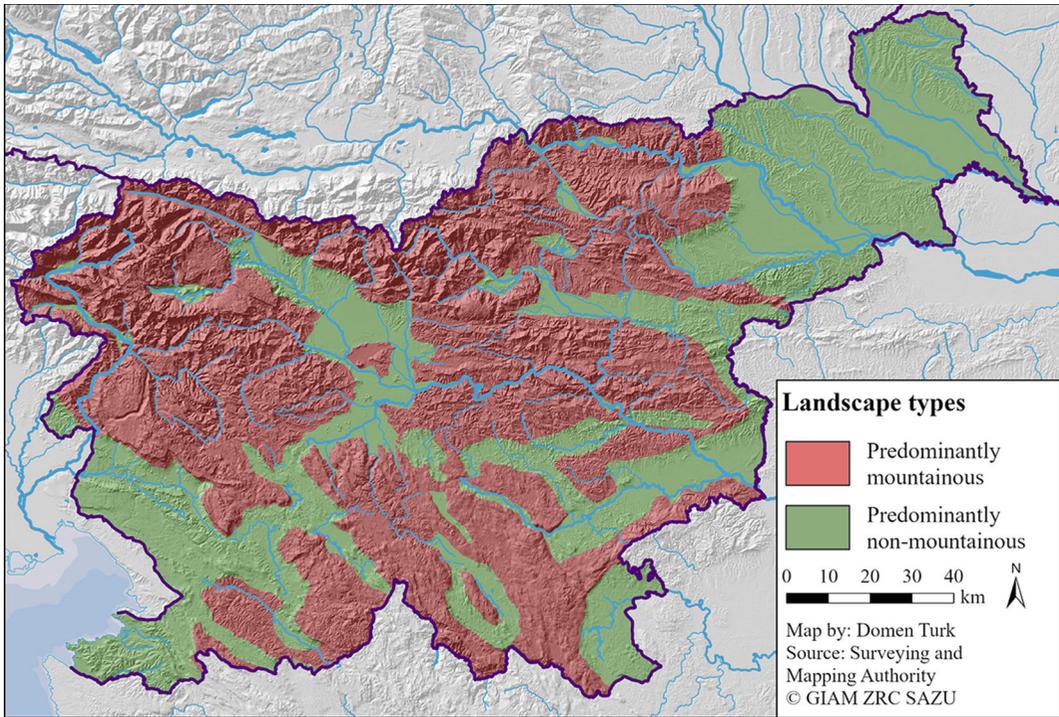


Fig. 3.2 Predominantly mountainous types in Melik’s landscape typology of Slovenia

1. high Alpine mountains;
2. low Alpine mountains;
3. high hills;
4. low hills;
5. plains and wide valleys;
6. Dinaric high plateaus;
7. karst hills with low plateaus and lowlands; and
8. karst poljes.

The following types may primarily be deemed mountainous: Type 1 (11.2% of Slovenia), Type 2 (7.9%), Type 3 (23.8%), and Type 6 (14.9%), which account for a total of 57.8% of Slovenia (Fig. 3.2).

The second landscape typology was produced by Svetozar Ilešič (1958). The basic landscape types in his division were (Perko et al. 2021):

1. western Alpine landscapes;
2. eastern Alpine landscapes;
3. western sub-Alpine landscapes;
4. eastern sub-Alpine landscapes;
5. northeastern sub-Alpine landscapes;

6. sub-Pannonian landscapes;
7. sub-Pannonian–sub-Dinaric landscapes;
8. karst landscapes of inner Slovenia;
9. sub-Mediterranean–sub-Alpine landscapes;
10. sub-Mediterranean landscapes; and
11. sub-Mediterranean–Dinaric landscapes.

The following types may primarily be considered mountainous: Type 1 (8.2% of Slovenia), Type 2 (2.9%), Type 3 (11.6%), Type 4 (14.5%), Type 5 (6.5%), and Type 8 (20.2%), which account for a total of 63.9% of Slovenia (Fig. 3.3).

The third landscape typology was produced half a century after Melik in 1996 by Drago Perko (Perko 1998; Perko and Ciglič 2020a), who divided the territory in terms of mostly physical landscape components into nine landscape types using a geographic information system (Perko et al. 2021):

1. Alpine mountains;
2. Alpine hills;
3. Alpine plains;

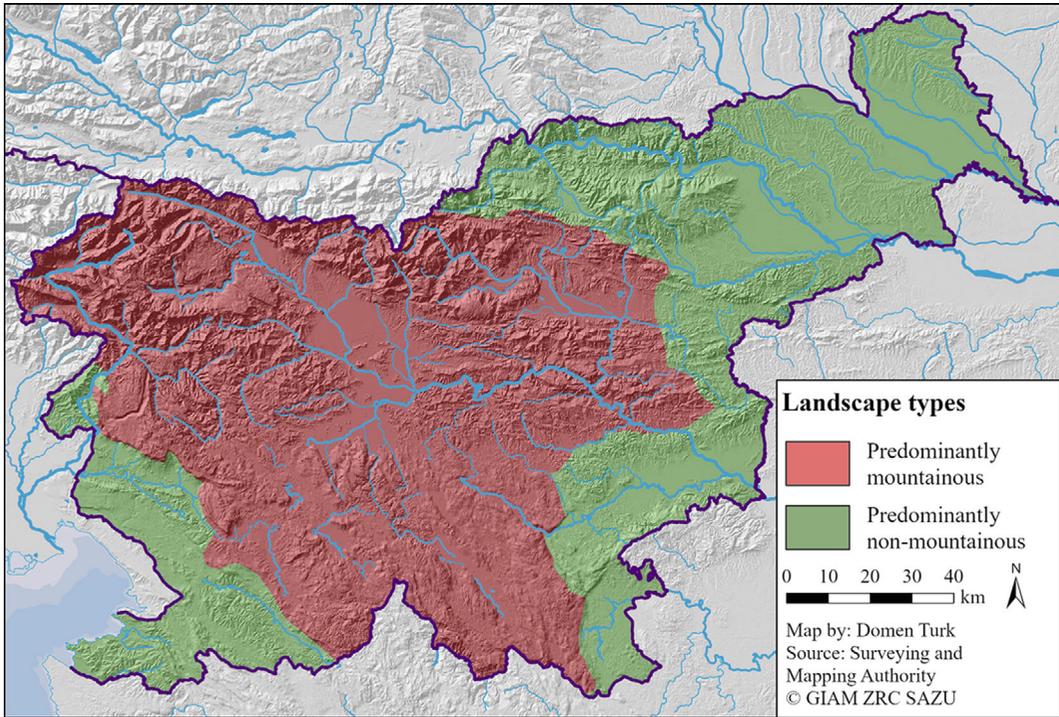


Fig. 3.3 Predominantly mountainous types in Ilešič's landscape typology of Slovenia

4. Pannonian hills;
5. Pannonian plains;
6. Dinaric plateaus;
7. Dinaric lowlands;
8. Mediterranean hills; and
9. Mediterranean plateaus.

The following types may primarily be considered mountainous: Type 1 (15.1% of Slovenia), Type 2 (23.0%), and Type 6 (18.8%), which account for a total of 56.9% of Slovenia (Fig. 3.4).

Metka Špes et al. (2002) divided Slovenia into 223 landscape ecological units and combined them into thirteen landscape types (Perko et al. 2021):

1. mountains;
2. wide valleys in mountains, high hills, and karst;
3. high karst plateaus and high hills of carbonate rocks;
4. high hills of non-carbonate rocks;
5. inter-mountain basins;

6. low hills in inner Slovenia;
7. plains and wide valleys in low hills in inner Slovenia;
8. karst poljes and lowlands;
9. low karst of Inner Carniola and Lower Carniola;
10. low karst of White Carniola;
11. Karst and Podgorje Karst plateaus;
12. low hills in the Littoral; and
13. wide valleys and plains in the Littoral.

The following types may primarily be considered mountainous: Type 1 (8.3% of Slovenia), Type 2 (3.6%), Type 3 (17.7%), Type 4 (22.4%), and Type 9 (5.4%), which account for a total of 57.4% of Slovenia (Fig. 3.5).

In 2013, Drago Perko et al. produced several typologies with a different number of types, based on the spatial overlap of 195 landform units, 938 lithological units, and sixty-five vegetation units in the geographical information system.

The most generalized typology includes twenty-four landscape types (Perko et al. 2015):

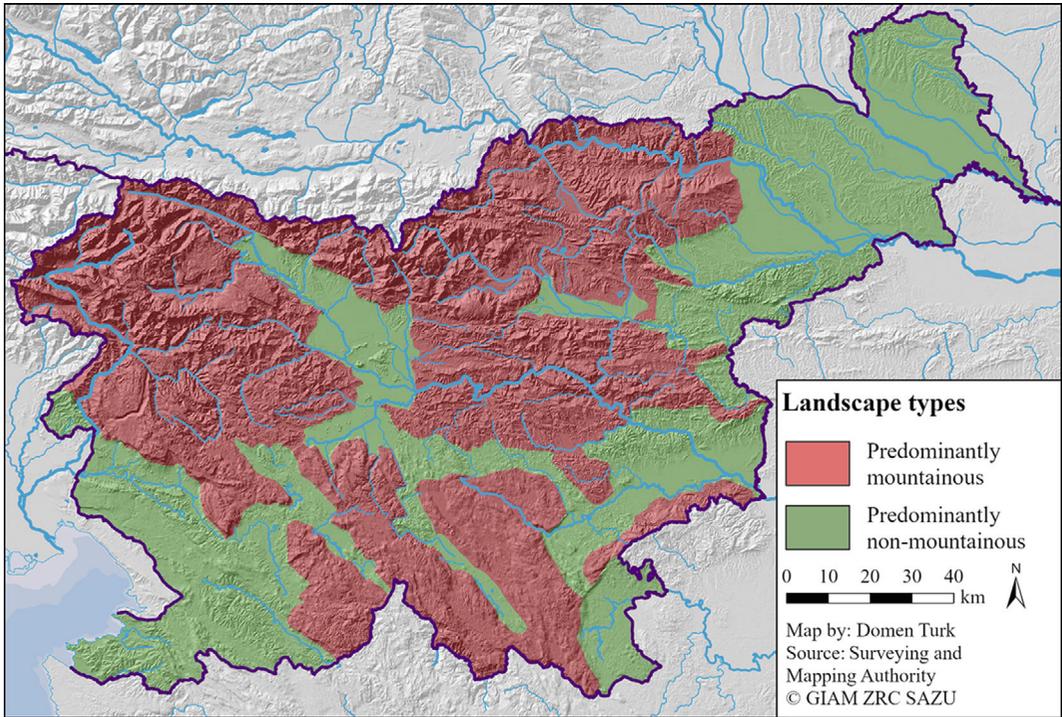


Fig. 3.4 Predominantly mountainous types in Perko's landscape typology of Slovenia

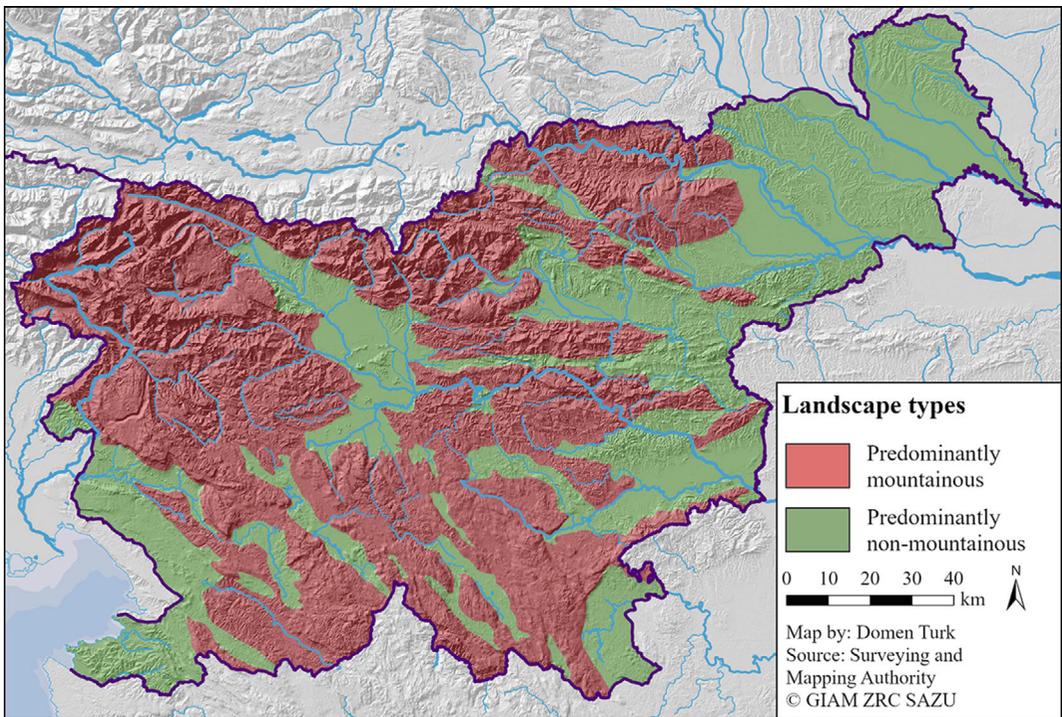


Fig. 3.5 Predominantly mountainous types in Špes et al.'s landscape typology of Slovenia

1. plains + non-carbonate sediments + European hornbeam, oak, red pine;
2. plains + non-carbonate sediments + beech, chestnut, various oaks;
3. plains + carbonate sediments + European hornbeam, oak, red pine;
4. other plains;
5. low hills + non-carbonate sediments + European hornbeam, oak, red pine;
6. low hills + non-carbonate sediments + beech, chestnut, various oaks;
7. low hills + fine clastic rocks + beech, chestnut, various oaks;
8. low hills + flysch + downy oak, sessile oak;
9. low hills + flysch + beech, chestnut, various oaks;
10. low hills + carbonate rocks + downy oak, sessile oak;
11. low hills + carbonate rocks + European hornbeam, oak, red pine;
12. low hills + carbonate rocks + beech;
13. low hills + carbonate rocks + beech, fir;
14. low hills + carbonate rocks + beech, chestnut, various oaks;
15. other low hills;
16. high hills + coarse clastic rocks + beech;
17. high hills + carbonate rocks + beech;
18. high hills + carbonate rocks + beech, fir;
19. high hills + carbonate rocks + beech, European hophornbeam;
20. high hills + metamorphic and igneous rocks with tuffs + beech, chestnut, various oaks;
21. other high hills;
22. mountains + carbonate rocks + beech;
23. mountains + carbonate rocks + fir, spruce, highland vegetation; and
24. other mountains.

The following types may primarily be considered mountainous: Type 16 (1.8% of Slovenia), Type 17 (8.7%), Type 18 (7.1%), Type 19 (3.5%), Type 20 (2.1%), Type 21 (14.9%), Type 22 (2.5%), Type 23 (1.8%), and Type 24 (5.3%), which account for a total of 47.7% of Slovenia (Fig. 3.6).

The largest share of mountainous terrain is included in Ilešič's typology (i.e., 63.9%) and the smallest in that of Perko et al. (i.e., 47.7%); roughly all five landscape typologies define

approximately half of Slovenia as predominantly mountainous (Table 3.1).

The correlation between the landscape typologies or the spatial overlap of individual typologies calculated using contingency tables shows that all typologies correlate most highly with Perko's typology from 1996 (Perko et al. (2021)). Therefore, a decision was made to define and treat the following three landscape types from his typology (Fig. 3.7) as mountainous areas in Slovenia: Alpine mountains, Alpine hills, and Dinaric plateaus, which account for a total of 56.9% of Slovenia.

3.3 Mountainous Regions

Together with the landscape typology, Perko et al. also produced a geographical regionalization of Slovenia with four macroregions and forty-eight mesoregions (Kladnik 1996; Perko 1998; Perko and Ciglič 2020b). This division relies on four major European geographical units intersecting in Slovenia: the Alps, the Pannonian Basin, the Dinaric Alps, and the Mediterranean.

The Alps are the highest and largest mountain chain in Europe. They cover about 200,000 km² and run from France in the west to Austria in the east. The Alps are more than 1,200 km long and up to 250 km wide. The southeastern part of the Alps extends into Slovenia. Slovenia's Alps macroregion lies in northern and northwestern Slovenia, covering 42.1% of the country.

The Dinaric Alps are the southeastern continuation of the Alps. They are 700 km long and up to 200 km wide, and they cover less than half the area of the Alps. The northwestern part of the Dinaric Alps extends into Slovenia. Slovenia's Dinaric Alps macroregion lies in the southern and southeastern part of the country, encompassing 28.2% of Slovenia.

The Pannonian Basin lies east of the Alps and north of the Dinaric Alps. It runs about 600 km from north to south and 700 km from east to west, and it is almost twice as large as the Alps. Only the southwestern margin of the Pannonian Basin extends into Slovenia. Slovenia's Pannonian Basin macroregion lies in

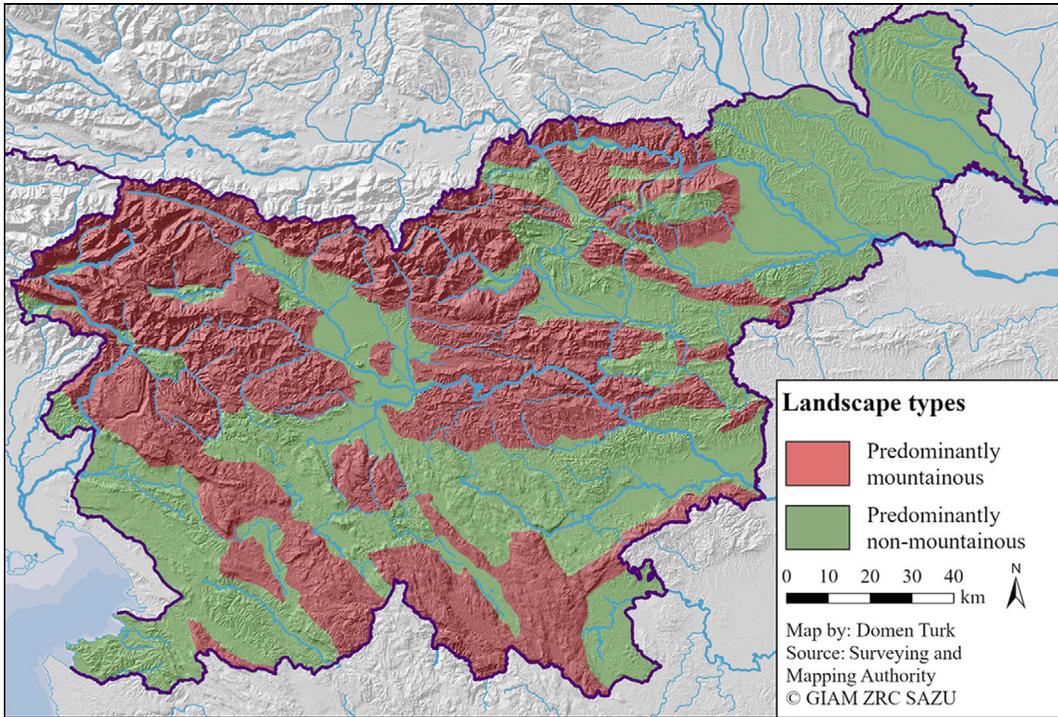


Fig. 3.6 Predominantly mountainous types in Perko et al.’s landscape typology of Slovenia

Table 3.1 Comparison of landscape macrotypologies of Slovenia

Author(s)	Year	No. of basic types	Average basic type size (km ²)	No. of mountainous types	Proportion of no. of mountainous types (%)	Area of mountainous types (km ²)	Proportion of area of mountainous types (%)
Melik	1946	8	2,534	4	50.0	11,709	57.8
Ilešič	1958	11	1,843	6	54.5	12,958	63.9
Perko	1996	9	2,253	3	33.3	11,532	56.9
Špes et al	2002	13	1,559	5	38.5	11,634	57.4
Perko et al	2013	24	845	9	37.5	9,671	47.7

the eastern and northeast part of the country, covering 21.2% of Slovenia.

The Mediterranean region surrounds the Mediterranean Sea. Its arm known as the Adriatic Sea stretches almost 700 km between the Italian Apennines to the southwest and the Dinaric Alps to the northeast. With an area of 132,000 km², the Adriatic Sea is somewhat larger than the Dinaric Alps. The extreme northern margin of the Mediterranean extends into Slovenia. Slovenia’s Mediterranean macroregion lies along the Gulf of Trieste and its hinterland in southwestern Slovenia, encompassing 8.6% of the country.

The typology and regionalization are interconnected in the sense that the borders of macroregions and mesoregions overlap with those of the landscape types (Perko et al. 2021). The area covered by the Alps macroregion (42.1% of Slovenia) is the same as the total area covered by the Alpine mountains, Alpine hills, and Alpine plains landscape types. The area covered by the Pannonian Basin macroregion (21.2%) corresponds to the total area covered by the Pannonian hills and Pannonian plains landscape types, the area covered by the Dinaric Alps (28.2%) corresponds to the total area covered by Dinaric

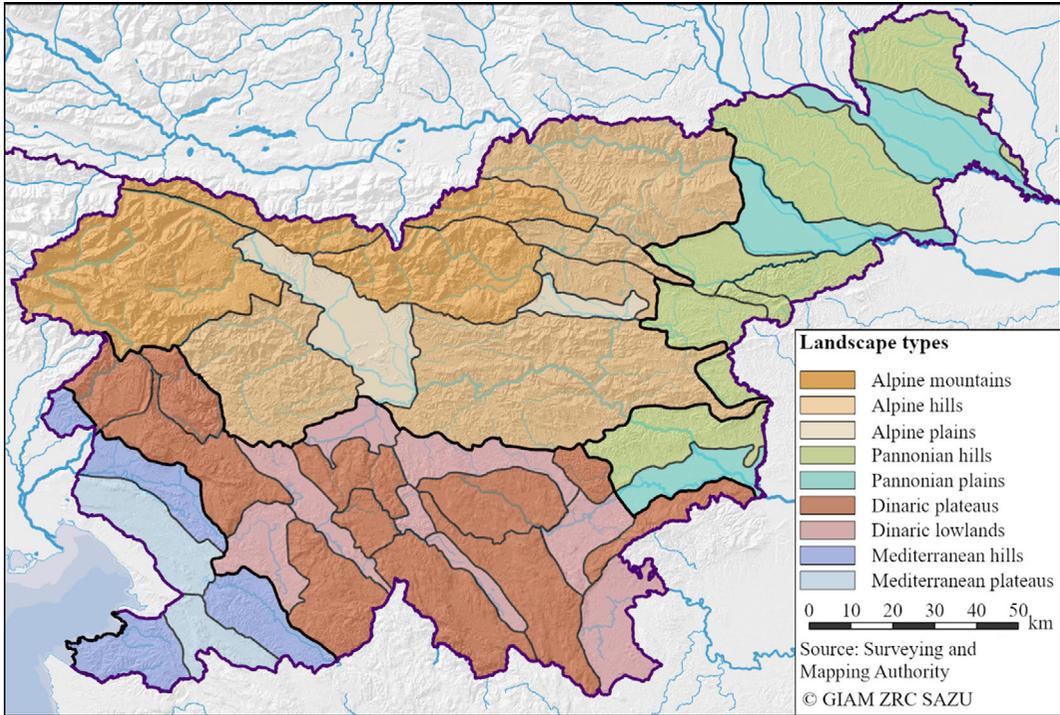


Fig. 3.7 Perko's landscape typology. (Perko 1998; Perko et al. 2021)

plateaus and Dinaric lowlands, and the area covered by the Mediterranean region (8.5%) corresponds to that of Mediterranean hills and Mediterranean plateaus combined (Perko 1998; Perko et al. 2021).

Mountainous regions (Fig. 3.8, Table 3.2) are the ones that are part of Alpine mountains, Alpine hills, or Dinaric plateaus (Fig. 3.7).

3.4 Regions Within Alpine Mountains

Alpine mountains cover 15.1% of Slovenia. They rise in the country's northwest, in the corner between Italy and Austria, and are divided into four regions (Perko 1998; Perko et al. 2015):

- *Julijske Alpe* 'Julian Alps' (Figs. 3.9, 3.10, 3.11 and 3.12);
- *Zahodne Karavanke* 'Western Karawanks' (Fig. 3.13);

- *Vzhodne Karavanke* 'Eastern Karawanks' (Fig. 3.14); and
- *Kamniško-Savinjske Alpe* 'Kamnik–Savinja Alps' (Figs. 3.15 and 3.16).

The Karawanks extend along the Slovenian–Austrian border in an east–west direction (highest peak: Mount Stol, 2,236 m). They are divided into two regions: the Western Karawanks and the Eastern Karawanks. South of them, the Kamnik–Savinja Alps (highest peak: Mount Grintovec, 2,558 m) descend into the Ljubljana Basin. The Skuta Glacier, the southeasternmost glacier in the Alps, lies below nearby Mount Skuta (2,533 m). Continuing from Italy south of the Sava River are the Julian Alps, the most magnificent Slovenian mountain range. This is where Mount Triglav (2,864 m), Slovenia's highest peak, rises. The remnants of the Triglav Glacier lie on its northeastern slopes, and Triglav National Park extends around the mountain. Located nearby are two glacial lakes: Lake Bohinj (328 hectares),

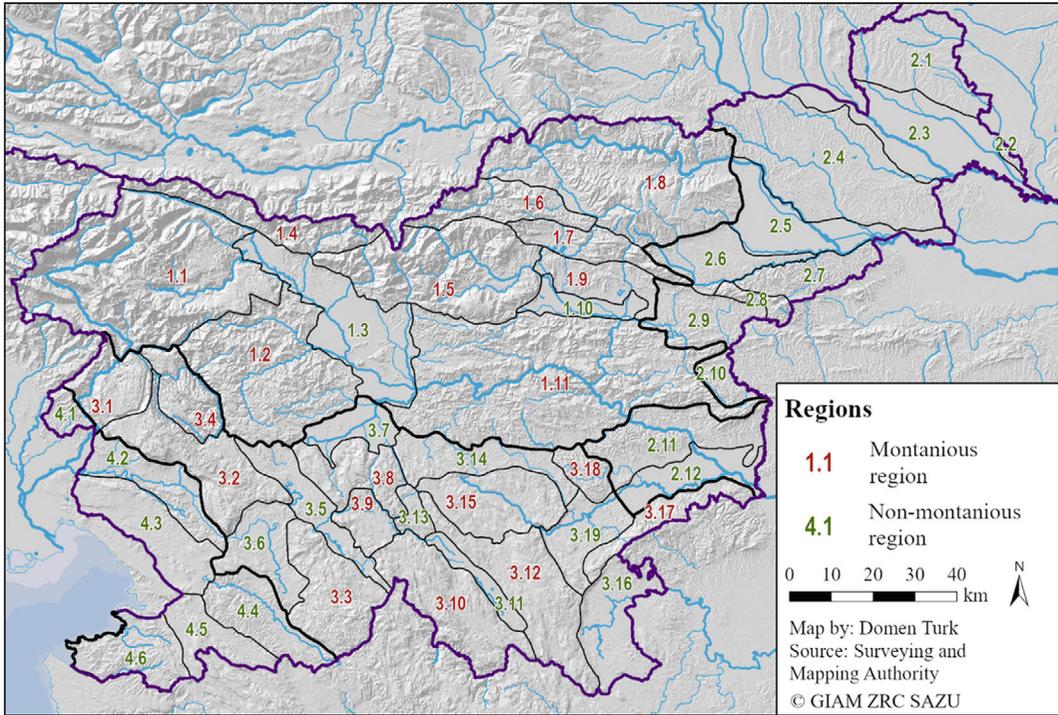


Fig. 3.8 Predominantly mountainous regions in Perko et al.’s geographical regionalization of Slovenia. (Perko 1998)

Slovenia’s largest natural lake (Fig. 3.11), and cosmopolitan tourism-oriented Lake Bled (145 hectares; Fig. 3.13). The Julian Alps are the divide between the Adriatic Sea to the south, which the emerald-color Soča River empties into (Fig. 3.12), and the Black Sea to the east, which Slovenia’s largest river, the Sava, flows toward.

3.5 Regions Within the Alpine Hills

Alpine hills cover 23.0% of Slovenia. They surround the Alpine mountains in a wide arc to the south and east, and they are divided into five regions (Perko 1998; Perko et al. 2015):

- *Cerkljansko, Škofjeloško, Polhograjsko in Rovtarsko hribovje* ‘Cerkno, Škofja Loka, Polhov Gradec, and Rovte Hills’ (Fig. 3.17);
- *Pohorje, Strojna in Kozjak* ‘Pohorje, Strojna, and Kozjak Hills’ (Fig. 3.18);

- *Velenjsko in Konjiško hribovje* ‘Velenje and Konjice Hills’;
- *Ložniško in Hudinjsko gričevje* ‘Ložnica and Hudinja Hills’ (Fig. 3.19); and
- *Posavsko hribovje* ‘Sava Hills’ (Fig. 3.20).

Extending furthest to the west are the Cerkno, Škofja Loka, Polhov Gradec, and Rovte Hills, and furthest to the north are the Pohorje, Strojna, and Kozjak Hills, which are the southern outcroppings of the Central Eastern Alps, where the Drava River has cut a deep valley. From there, the Velenje and Konjice Hills extend to the south, where many years of lignite mining resulted in subsidence, forming artificial lakes. Further to the south, the hills transition into the lower Ložnica and Hudinja Hills, which form the northern edges of the Celje Basin. To the south of this basin, the Sava Hills extend from Ljubljana in the west to the Croatian border in the east, in a stretch nearly 100 km long, making it the largest region in Slovenia (1,909 km²).

Table 3.2 English and Slovenian names of predominantly mountainous regions and predominantly non-mountainous regions (Fig. 3.8)

No. in Fig. 3.8	English names	Slovenian names
	macroregion	makroregija
	mountainous regions	gorata regija
	non-mountainous regions	negorata regija
	Alps	Alpe
1.4	Western Karawanks	Zahodne Karavanke
1.6	Eastern Karawanks	Vzhodne Karavanke
1.5	Kamnik–Savinja Alps	Kamniško-Savinjske Alpe
1.1	Julian Alps	Julijske Alpe
1.2	Cerkno, Škofja Loka, Polhov Gradec, and Rovte Hills	Cerkljansko, Škofjeloško, Polhograjsko in Rovtarsko hribovje
1.6	Sava Hills	Posavsko hribovje
1.7	Velenje and Konjice Hills	Velenjsko in Konjiško hribovje
1.8	Pohorje, Strojna, and Kozjak Hills	Pohorje, Strojna in Kozjak
1.9	Ložnica and Hudinja Hills	Ložniško in Hudinjsko gričevje
1.3	Sava Plain	Savska ravan
1.10	Savinja Plain	Savinjska ravan
	Pannonian Basin	Panonska kotlina
2.1	Goričko	Goričko
2.2	Lendava Hills	Lendavske gorice
2.4	Slovenian Hills	Slovenske gorice
2.6	Dravinja Hills	Dravinjske gorice
2.7	Haloze	Haloze
2.8	Mount Boč and the Macelj Ridge	Boč in Macelj
2.9	Vogljajna and Upper Sotla Hills	Vogljajnsko in Zgornjesotlesko gričevje
2.10	Central Sotla Hills	Srednjesotlesko gričevje
2.11	Krško, Senovo, and Bizeljsko Hills	Krško, Senovsko in Bizeljsko gričevje
2.3	Mura Plain	Murska ravan
2.5	Drava Plain	Dravska ravan
2.12	Krka Plain	Krška ravan
	Dinaric Alps	Dinarsko gorovje
3.1	Kambreško and Banjšice Plateaus	Kambreško in Banjšice
3.2	Trnovo Forest Plateau, Mount Nanos, and Hrušica Plateau	Trnovski gozd, Nanos in Hrušica
3.4	Idrija Hills	Idrijsko hribovje
3.3	Javornik Hills and Snežnik Plateau	Javorniki in Snežnik
3.6	Pivka Lowland and Mount Vremščica	Pivško podolje z Vremščico
3.5	Inner Carniola Lowland	Notranjsko podolje
3.8	Krim Hills and Menišija Plateau	Krimsko hribovje in Menišija
3.9	Bloke Plateau	Bloke
3.10	Big Mountains, Mount Stojna, and Mount Gotenica	Velika gora, Stojna in Goteniška gora
3.11	Ribnica–Kočevje Lowland	Ribniško-Kočevsko podolje
3.12	Little Mountains, Kočevje Rog Plateau, and Mount Poljane	Mala gora, Kočevski rog in Poljanska gora
3.13	Velike Lašče Region	Velikolaščanska pokrajina
3.7	Ljubljana Marsh	Ljubljansko barje
3.19	Novo Mesto Region	Novomeška pokrajina
3.14	Lower Carniola Lowland	Dolenjsko podolje
3.18	Radulja Hills	Raduljsko hribovje
3.15	Dry Carniola and Dobropolje	Suha krajina z Dobropoljem
3.16	White Carniola	Bela krajina
3.17	Gorjanci Hills	Gorjanci
	Mediterranean	Sredozemlje
4.1	Gorica Hills	Goriška brda
4.2	Vipava Hills	Vipavska brda
4.3	Karst Plateau	Kras
4.4	Brkini Hills and Reka Valley	Brkini in dolina Reke
4.5	Podgorje Karst Plateau, Čičarija Plateau, and Podgrad Lowland	Podgorski kras, Čičarija in Podgrajsko podolje
4.6	Koper Hills	Koprška brda

Fig. 3.9 Julian Alps are the northwesternmost region in Slovenia. Triglav, the highest mountain in Slovenia (2,864 m), stands out the most. The view from the Karawanks also shows Lake Bled on the left, the Sava River in front, and the town of Jesenice on the right. (Photo by Aleš Krivec, Shutterstock.com)



Fig. 3.10 Planica is a picturesque glacial valley on the north side of the Julian Alps. It is the cradle of ski flying, one of Slovenia's most popular winter spectator sports. The picture shows the valley in winter with the facilities of the new Nordic Center. (Photo by Planica Nordic Centre, GIAM ZRC SAZU archive)



3.6 Regions Within the Dinaric Plateaus

Dinaric plateaus cover 18.8% of Slovenia. They lie in the southern part of the country; they are almost entirely made of limestone and dolomite, and covered in forest.

They are divided into eleven regions (Perko 1998; Perko et al. 2015):

- *Kambreško in Banjšice* ‘Kambreško and Banjšice Plateaus’;
- *Trnovski gozd, Nanos in Hrušica* ‘Trnovo Forest Plateau, Mount Nanos, and Hrušica Plateau’ (Fig. 3.21);
- *Idrijsko hribovje* ‘Idrija Hills’;
- *Javorniki in Snežnik* ‘Javornik Hills and Snežnik Plateau’ (Fig. 3.22);
- *Krimsko hribovje in Menišija* ‘Krim Hills and Menišija Plateau’ (Fig. 3.23);
- *Bloke* ‘Bloke Plateau’;
- *Velika gora, Stojna in Goteniška gora* ‘Big Mountains, Mount Stojna, and Mount Gotenica’ (Fig. 3.24);

Fig. 3.11 Lake Bohinj is a picturesque glacial lake located among the alpine plateaus in the southwestern part of the Julian Alps. With an area of 328 hectares, it is Slovenia's largest natural lake. Its tributary, the Savica River, is one of the two headwaters of the Sava River. (Photo by Bojan Erhartič, GIAM ZRC SAZU archive)

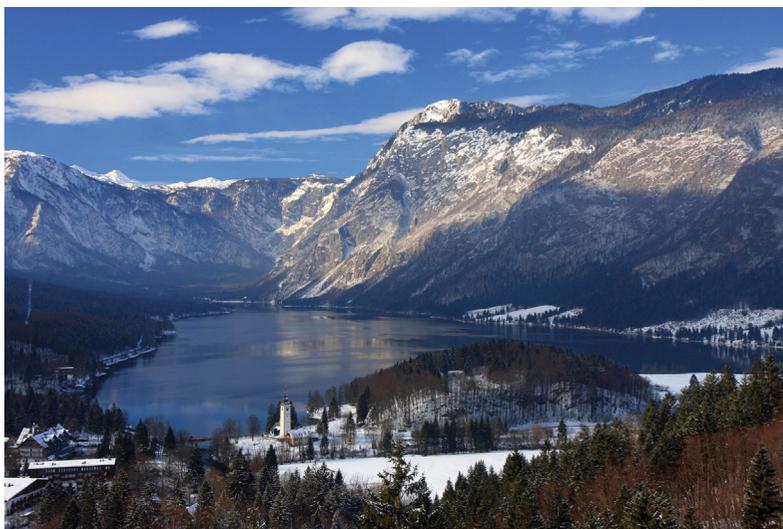


Fig. 3.12 Source of the Soča River is west of Mount Triglav in the Julian Alps. It is known for its emerald color. It is the most important river in Slovenia's Adriatic catchment. Its upper valley is one of the best-preserved natural areas in the Alps. (Photo by Bojan Erhartič, GIAM ZRC SAZU archive)



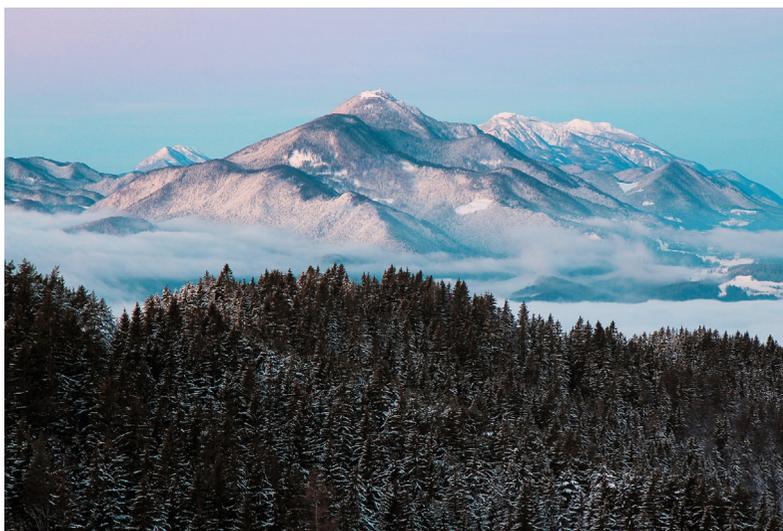
- *Mala gora, Kočevski rog in Poljanska gora* ‘Little Mountains, Kočevje Rog Plateau, and Mount Poljane’;
- *Raduljsko hribovje* ‘Radulja Hills’;
- *Suha krajina in Dobropoljem* ‘Dry Carniola and Dobropolje’; and
- *Gorjanci* ‘Gorjanci Hills’.

In the northwesternmost part of the Dinaric region, the Alpine mountains come into contact with the region of the Kambreško and Banjšice high plateaus, which toward the southeast, beyond the deeply cut Soča Valley, continues into the plateau-like Idrija Hills region and the Trnovo Forest, Nanos, and Hrušica high Dinaric plateau

Fig. 3.13 Western Karawanks (highest peak: Stol, 2,236 m) are a beautiful backdrop to glacial Lake Bled (145 ha) in a moraine landscape on the eastern edge of the Julian Alps. It is known for its castle above a rock wall and islet with a church. (Photo by Bojan Erhartič, GIAM ZRC SAZU archive)



Fig. 3.14 Of all the mountains in Slovenia, the Eastern Karawanks extend the farthest east, where scenic Mount Saint Ursula (*Uršlja gora*, 1,699 m) especially dominates. At its top stands Saint Ursula's Church, a television transmitter, and a mountain lodge (view from Pohorje). (Photo by Bojan Erhartič, GIAM ZRC SAZU archive)



region. This series of western Dinaric plateaus ends in the region of the Javornik Hills and Snežnik Plateau, which extends to the border with Croatia.

The central part of the Dinaric plateaus is composed of a series of plateaus of varying elevations extending nearly from Ljubljana in the north to the Kolpa River in the south. They are

separated by elongated lowlands. All these series of Dinaric plateaus and lowlands in between run in the Dinaric direction from the northwest to the southeast; the only exception is the easternmost region of the Dinaric plateaus—that is, the Gorjanci Hills—which predominantly run in a southwest–northeast direction. They form the border with Croatia (Perko and Ciglič 2020b).



Fig. 3.15 Kamnik–Savinja Alps (highest peak Grintovec, 2,558 m) rise between the Karawanks to the north and the edge of the Ljubljana Plain to the south. A picture taken

in a rapeseed field near the town of Kranj shows a mountain range in their western part. (Photo by Bojan Erhartič, GIAM ZRC SAZU archive)



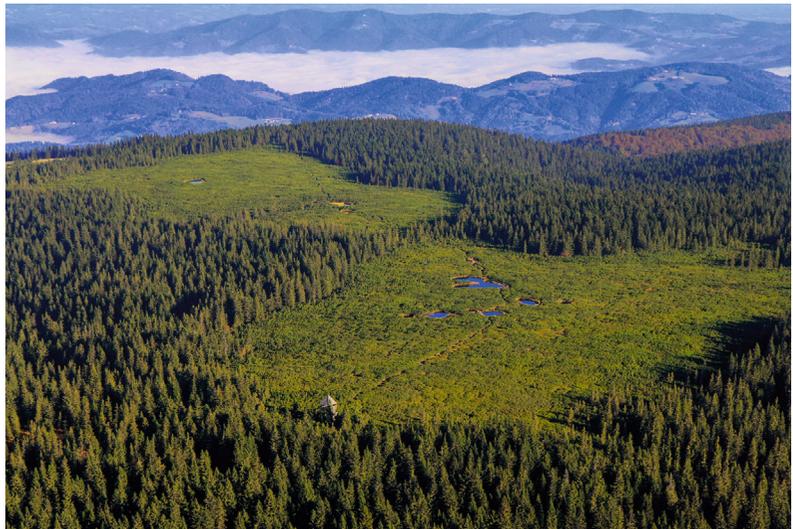
Fig. 3.16 In the eastern part of the Kamnik–Savinja Alps lies the picturesque glacial Logar Valley. Since 1987, it has been protected as a landscape park, stretching for 24

km². The Savinja River, the largest tributary of the Sava in Slovenia, has its source here. (Photo by Bojan Erhartič, GIAM ZRC SAZU archive)

Fig. 3.17 Cerkno Hills lie southeast of the Julian Alps. Their highest peak, Porezen (1,630 m), rises on the watershed between the Black Sea and the Adriatic catchments. The Sava tributaries flow to the east and the Soča tributaries to the other sides. (Photo by Bojan Erhartič, GIAM ZRC SAZU archive)



Fig. 3.18 Plateau-like Pohorje Hills are about 50 km long and 20 km wide south of the Drava River and west of Maribor (highest peak: Black Peak, *Črni vrh*, 1,543 m). Among its natural attractions are also the small Lovrenc Lakes, lying among conifers. (Photo by Bojan Erhartič, GIAM ZRC SAZU archive)



3.7 Missing Mountains

The selection of the three landscape types (i.e., Alpine mountains, Alpine hills, and Dinaric plateaus) from Perko's typology (Perko et al. 2015, 2021, 2026), which are expected to cover all predominantly mountainous areas in

Slovenia, may seem approximate at first glance, but in fact only two elevations that at least partly correspond to the definition of a mountain in Slovenia (i.e., the difference in elevation between its foot and top is over 600 m, or its peak is above the tree line) remain outside these three landscape types.

Fig. 3.19 North of the town of Celje, into which the Savinja River flows from the Alps, the mountains quickly turn into hills and then sink below the plain. The area on the southeastern Alpine edge is characterized by a mix of Alpine and Pannonian features. (Photo by Bojan Erhartič, GIAM ZRC SAZU archive)



Fig. 3.20 Sava Hills along the Sava River are the most extensive Slovenian region between Ljubljana in the west and the meandering Sotla, a border river, in the east (highest peak: Mount Kum, 1,220 m). The snowy peaks of the Kamnik–Savinja Alps rise in the back. (Photo by Matevž Lenarčič, GIAM ZRC SAZU archive)



The first is Mount Boč (978 m) in Pannonian Slovenia, which actually does not rise beyond the tree line, but it markedly stands out from the surroundings and the difference in elevation between its foot and top is over 600 m (Fig. 3.25).

The town of Poljčane to the north of Mount Boč lies 716 m lower than its peak, and Rogaška Slatina to the south of the mountain lies 754 m lower than its peak.

Fig. 3.21 Nanos Plateau (highest peak: Dry Peak, *Suhi vrh*, 1,313 m) is a typical Dinaric high plateau. It dominates west of Postojna. At the southern foot of the Nanos Plateau, the freeway branches to Gorizia to the west and Trieste to the south (both in Italy). (Photo by Matevž Lenarčič, GIAM ZRC SAZU archive)



Fig. 3.22 Cerknica Polje (front) with intermittent Lake Cerknica is surrounded by forested Dinaric plateaus. The Javornik Hills rise southwest of the polje (right rear), and Snežnik (highest peak: Big Mount Snežnik, *Veliki Snežnik*, 1,796 m) stands out in the southwest (left rear). (Photo by Bojan Erhartič, GIAM ZRC SAZU archive)



The second is Mount Slavnik (1,028 m) in Slovenia's Mediterranean region, which dominates its surroundings, even though the difference in elevation between its foot and top is smaller than 600 m (Fig. 3.26). The village of Materija north of Mount Slavnik lies only 521 m

lower than its peak, and the village of Podgorje south of the mountain lies 520 m lower than its peak. The top is not forested, but the natural tree line was originally higher because farmers cleared the area for pastures.

Fig. 3.23 South of the Ljubljana Marsh, a series of Dinaric plateaus begins with the Krim Hills (highest peak: Krim, 1,107 m), stretching across central southern Slovenia, crossing the Slovenian–Croatian border and sinking steeply into the Adriatic Sea in the Gulf of Rijeka. (Photo by Bojan Erhartič, GIAM ZRC SAZU archive)



Fig. 3.24 Kolpa is a border river between Slovenia and Croatia. It carved deep into carbonate Dinaric plateaus populated by brown bears (*Ursus arctos*). The plateaus continue along the Adriatic Sea all the way to Albania. The view is from Slovenia to Croatia. (Photo by Jure Tičar, GIAM ZRC SAZU archive)

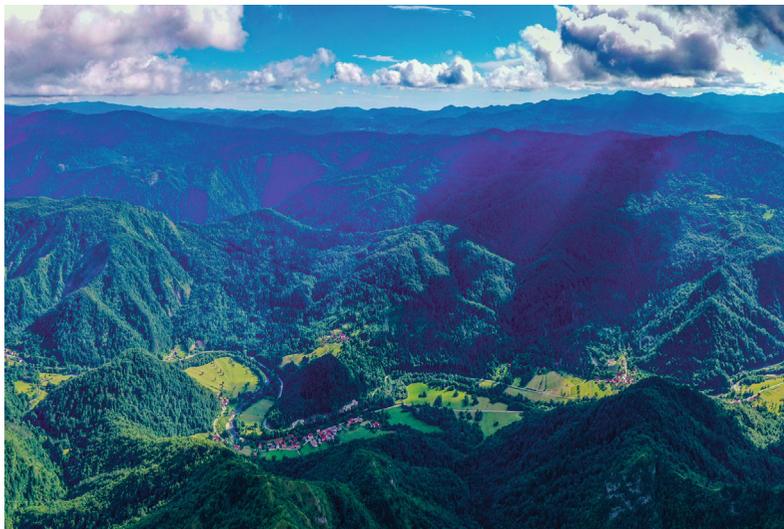


Fig. 3.25 Mount Boč (978 m) is a geological extension of the Karawanks. It rises east from Slovenia's continuous mountainous surface. A lookout and television tower are located at the top. Since 1992, the 22 km² surrounding area has been protected as a nature park. (Photo by Matej Gabrovec, GIAM ZRC SAZU archive)

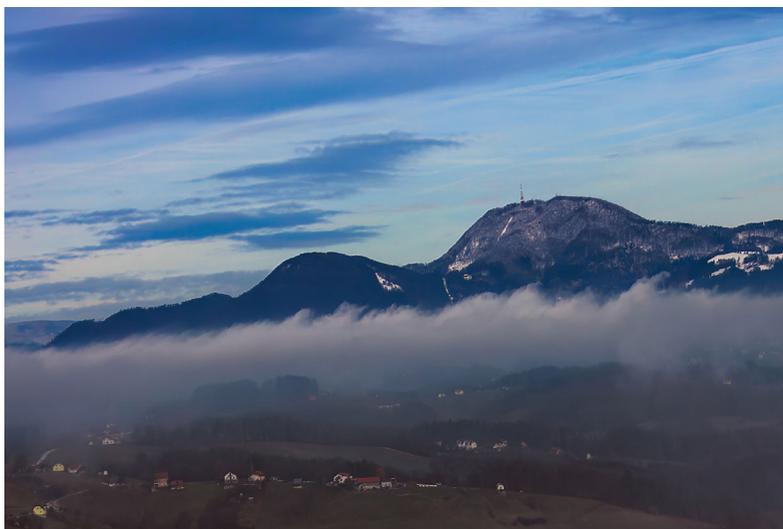
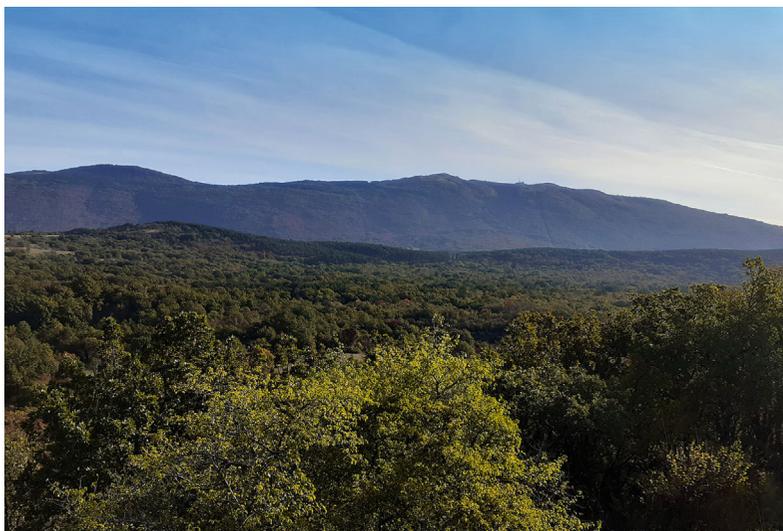


Fig. 3.26 From the sea, Mount Slavnik (1,028 m) looks like a mighty mountain, but from the mainland only an ordinary hill. It offers a beautiful view of the Adriatic Sea and the Alps. Due to endemic animal species, it has been protected as a natural monument since 1992. (Photo by Špela Čonč, GIAM ZRC SAZU archive)



Slovenians have also named many other elevations across the country *gora* 'mountain', even though they do not meet the Slovenian criteria. One example is *Šmarna gora* (Mount Saint Mary, 669 m) north of Ljubljana, which rises 369 m above the Sava River and is among the most popular hiking destinations in Slovenia.

Thus, it can be concluded that Slovenia consists of three predominantly mountainous

landscape types (Alpine mountains, Alpine hills, and Dinaric plateaus), which include all areas that can be defined as mountainous, and six predominantly non-mountainous landscape types (Alpine plains, Pannonian hills, Pannonian plains, Dinaric lowlands, Mediterranean hills, and Mediterranean plateaus), which include most of the plains, elongated lowlands, low plateaus, and low hills.

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