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DETERMINATION OF LANDSCAPE HOTSPOTS OF SLOVENIA

DOLOČANJE POKRAJINSKIH VROČIH TOČK SLOVENIJE

Drago Perko, Mauro Hrvatin, Rok Ciglič

The landscape hotspot around Kamnik, as seen by the painter Franz Kurz zum Thurn und Goldenstein (1807–1878). The original painting is kept at the National Museum of Slovenia.
Pokrajinska vroča točka okoli Kamnika, kot jo je videl slikar Franz Kurz zum Thurn und Goldenstein (1807–1878). Izvirnik slike hrani Narodni muzej Slovenije.

Determination of landscape hotspots of Slovenia

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ABSTRACT: Based on digital data on relief, rock, and vegetation, the most significant elements of the internal structure of Slovenian landscapes, and their external appearance, a geographic information system was used to calculate landscape diversity of Slovenia. Areas with high landscape diversity are landscape hotspots, and areas with low landscape diversity are landscape coldspots. One-tenth of Slovenia with the highest landscape diversity was defined as landscape hotspots, and one-tenth of Slovenia with the lowest landscape diversity was defined as landscape coldspots. Most landscape hotspots are located in the Alpine part of Slovenia (more than two-thirds of their total area), and most landscape coldspots in the Dinaric part of Slovenia (almost half of their total area).

KEY WORDS: geography, relief, rocks, vegetation, landscape diversity, landscape hotspot, landscape coldspot, geographic information system, Slovenia

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1 Introduction

Increasingly more researchers are dealing with the evaluation and importance of landscape diversity (Runhaar and Udo de Haes 1994; Bailey 1996; Bunce et al. 1996; Bastian 2000; Mücher et al. 2003; Loveland and Merchant 2004; Šímová and Gdulová 2012; Mocior and Kruse 2016). Areas where there is a mix of various natural factors are important for biodiversity, habitats, and species diversity (Dramstad et al. 2001; Hou and Walz 2013; Walz and Syrbe 2013).

Areas with landscape diversity may also have an advantage in economic development, especially in tourism, because »*human perception respects diversity, complexity, patterns, and local character*« (Erhartič 2012). Gray (2004) believes that the significance of diverse types of relief and richness of terrain details for the popularity of tourism areas is greatly underestimated. On the other hand, areas where various natural influences mix can also be areas where it is not simple to transfer best practices because of the varying responses of the landscape to human intervention.

The landscape diversity of an area may therefore offer some advantages, but also some disadvantages and challenges. High landscape diversity mainly characterizes areas at the junction and interweaving of different landscape types. Analysis of various geographical classifications of Europe shows that the most diverse areas are located in southern Scandinavia and on the margins of the Pyrenees and the Alps. Slovenia is also included in these very diverse areas (Ciglič and Perko 2013).

The main purpose of the study is to determine the contiguous areas in Slovenia with the greatest and least landscape diversity, which is related to certain economic and other advantages or disadvantages. The article presents the first part of the study, which is primarily a quantitative approach to defining areas with increased natural landscape diversity. In the future, evaluation based on actual data, field research, and expert assessment will define the role of natural landscape diversity for the risk of natural hazards. It will also be used in relation to settlement patterns (i.e., spatial planning), agriculture, tourism, and the economy overall. The defined evaluation system for landscape heterogeneity can potentially be used in various areas around the globe.

2 Methods

Three natural landscape elements are the most significant for the internal structure, function, and appearance of Slovenian landscapes: relief, rocks, and vegetation. They are so strongly linked with other natural landscape elements that a natural-geographical regionalization or typology of appropriate quality can only be created by considering these three landscape elements (Perko, Hrvatin, and Ciglič 2015).

Because Slovenia has sufficiently accurate digital data on relief, rocks, and vegetation at its disposal, it is possible to use a geographic information system to determine landscape diversity as well as landscape hotspots and coldspots.

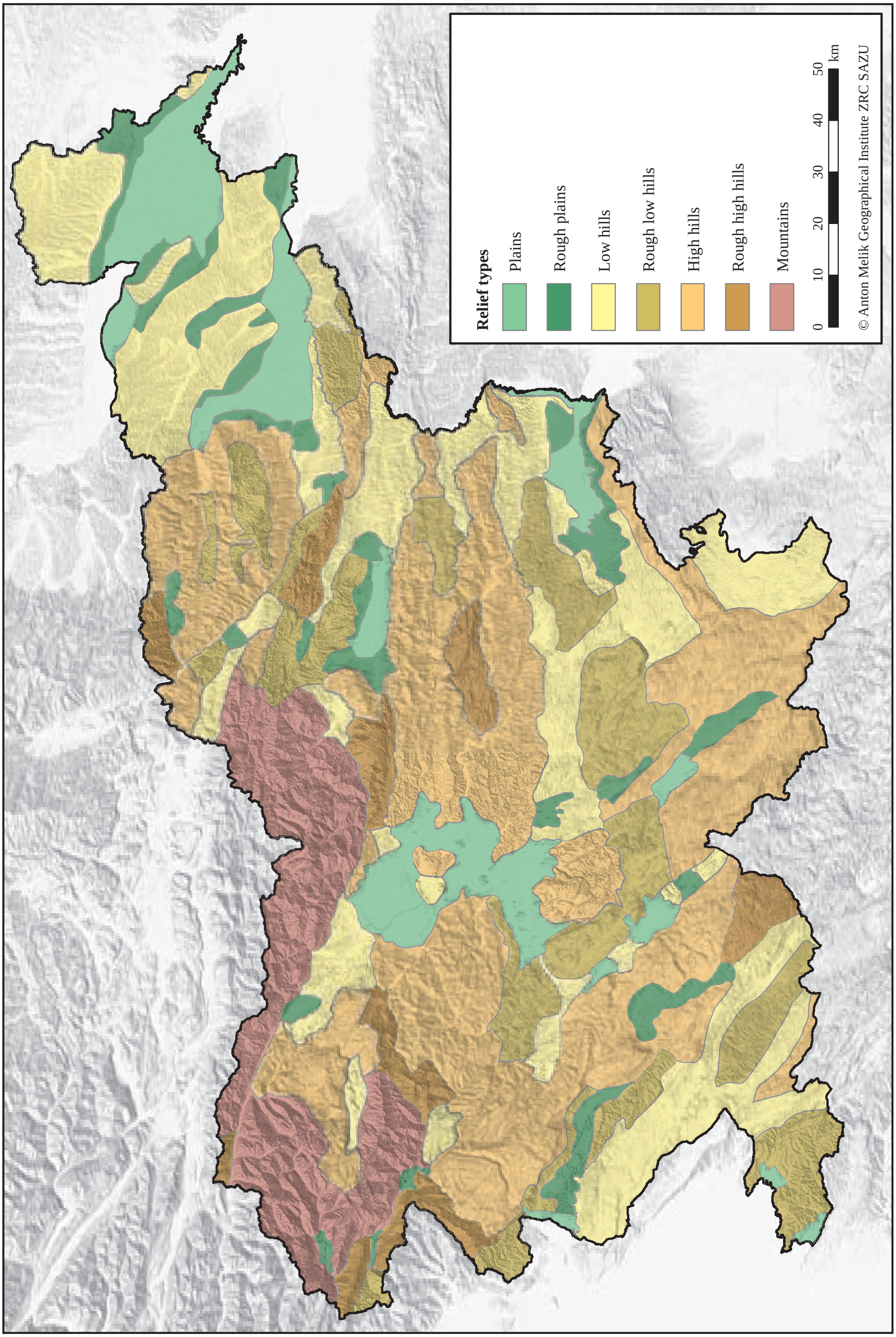
As a base layer in a geographic information system, a geomorphologically tested 25 m digital elevation model (Podobnikar 2002, Digitalni model višin … 2014) was used, which provides 32,436,693 square cells with a baseline of 25 m and an area of 6.25 ares.

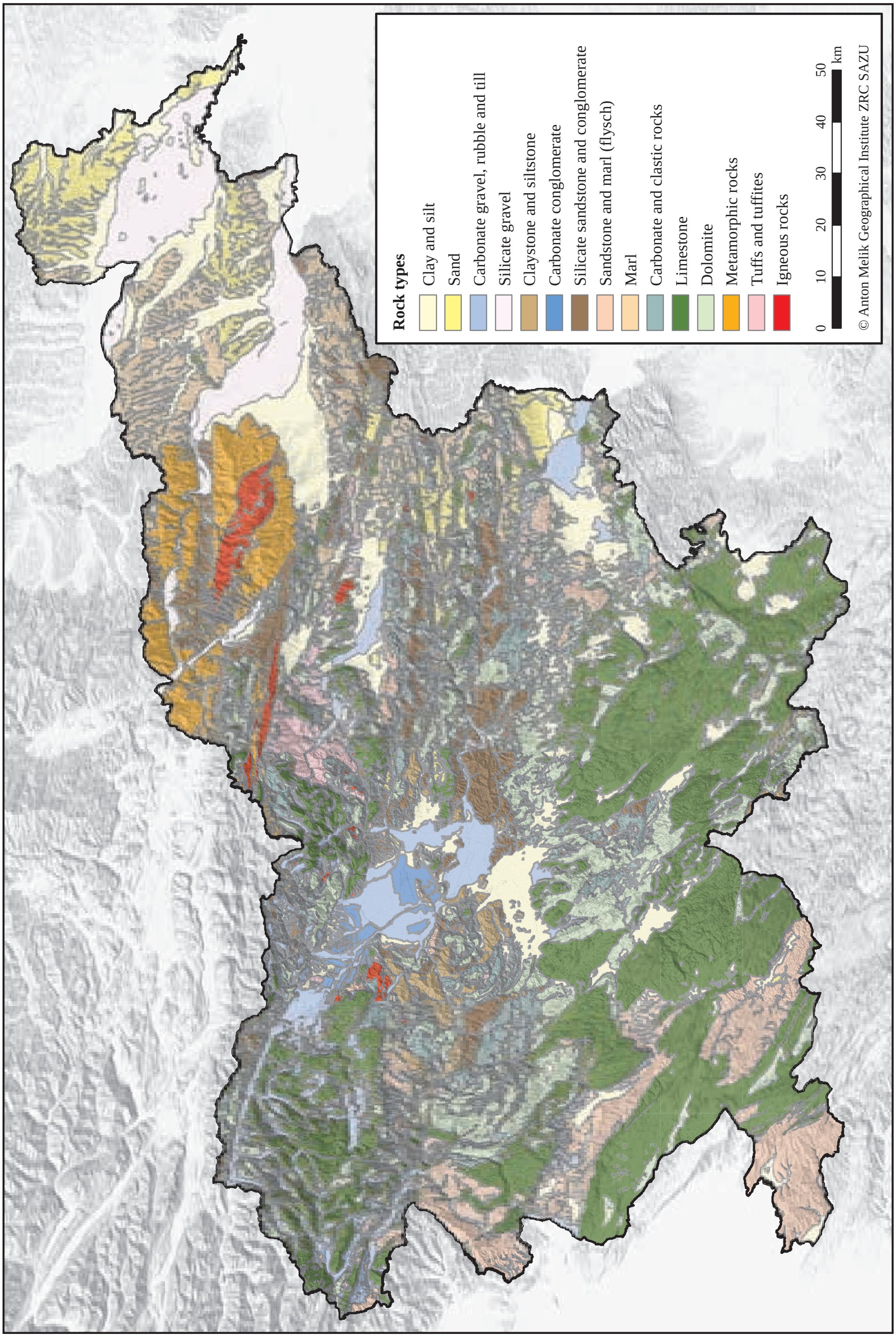
Vector layers with relief, lithological, and vegetation types were added. They were transformed from vector format to 25 m raster format because the remainder of the study used geoinformation tools for processing raster data layers.

The relief layer (Figure 1) is based on a 1:400,000 map of morphological units (Perko 2001). The map has 195 units, which were combined into seven relief types (Perko, Hrvatin, and Ciglič 2015):

- Plains;
- Rough plains;
- Low hills;
- Rough low hills;
- High hills;
- Rough high hills;
- Mountains.

Figure 1: Relief layer with seven types. ➤ p. 10
Figure 2: Lithology layer with fifteen types. ➤ p. 11


Relief types
Plains
Rough plains
Low hills
Rough low hills
High hills
Rough high hills
Mountains
0
10
20
30
40
50
km
© Anton Melik Geographical Institute ZRC SAZU


Rock types
Clay and silt
Sand
Carbonate gravel, rubble and till
Silicate gravel
Claystone and siltstone
Carbonate conglomerate
Silicate sandstone and conglomerate
Sandstone and marl (flysch)
Marl
Carbonate and clastic rocks
Limestone
Dolomite
Metamorphic rocks
Tuffs and tuffites
Igneous rocks
0 10 20 30 40 50 km
© Anton Melik Geographical Institute ZRC SAZU

The lithology layer (Figure 2) is based on a vector map of rock types of Slovenia (Litostratigrafska karta Slovenije 2011), which was produced by the Geological Survey of Slovenia and primarily based on 1:25,000 vectorized geological maps of Slovenia. The map has 938 units, which were combined into fifteen lithological types (Perko, Hrvatin, and Ciglič 2015):

- Clay and silt;
- Sand;
- Carbonate gravel, rubble, and till;
- Silicate gravel;
- Claystone and siltstone;
- Carbonate conglomerate;
- Silicate sandstone, and conglomerate;
- Sandstone and marl (flysch);
- Marl;
- Carbonate and clastic rocks;
- Limestone;
- Dolomite;
- Metamorphic rocks;
- Tuffs and tuffites;
- Igneous rocks.

The vegetation layer (Figure 3) is based on a 1:400,000 map of potential natural vegetation (Zemljevid potencialne naravne vegetacije 1998), which was produced by the ZRC SAZU Jovan Hadži Biology Institute. The map has sixty-two different units, which were combined into fifteen vegetation types (Perko, Hrvatin, and Ciglič 2015):

- Downy oak, European hophornbeam;
- Downy oak;
- Durmast;
- European hornbeam, oak, occasional black alder;
- Oak, occasional elm;
- European hornbeam, fir;
- European hornbeam;
- Beech;
- Beech, fir;
- Beech, European hophornbeam, occasional European hophornbeam;
- Beech, chestnut, oak;
- Fir;
- Spruce;
- Red pine;
- Dwarf pine and other highland vegetation.

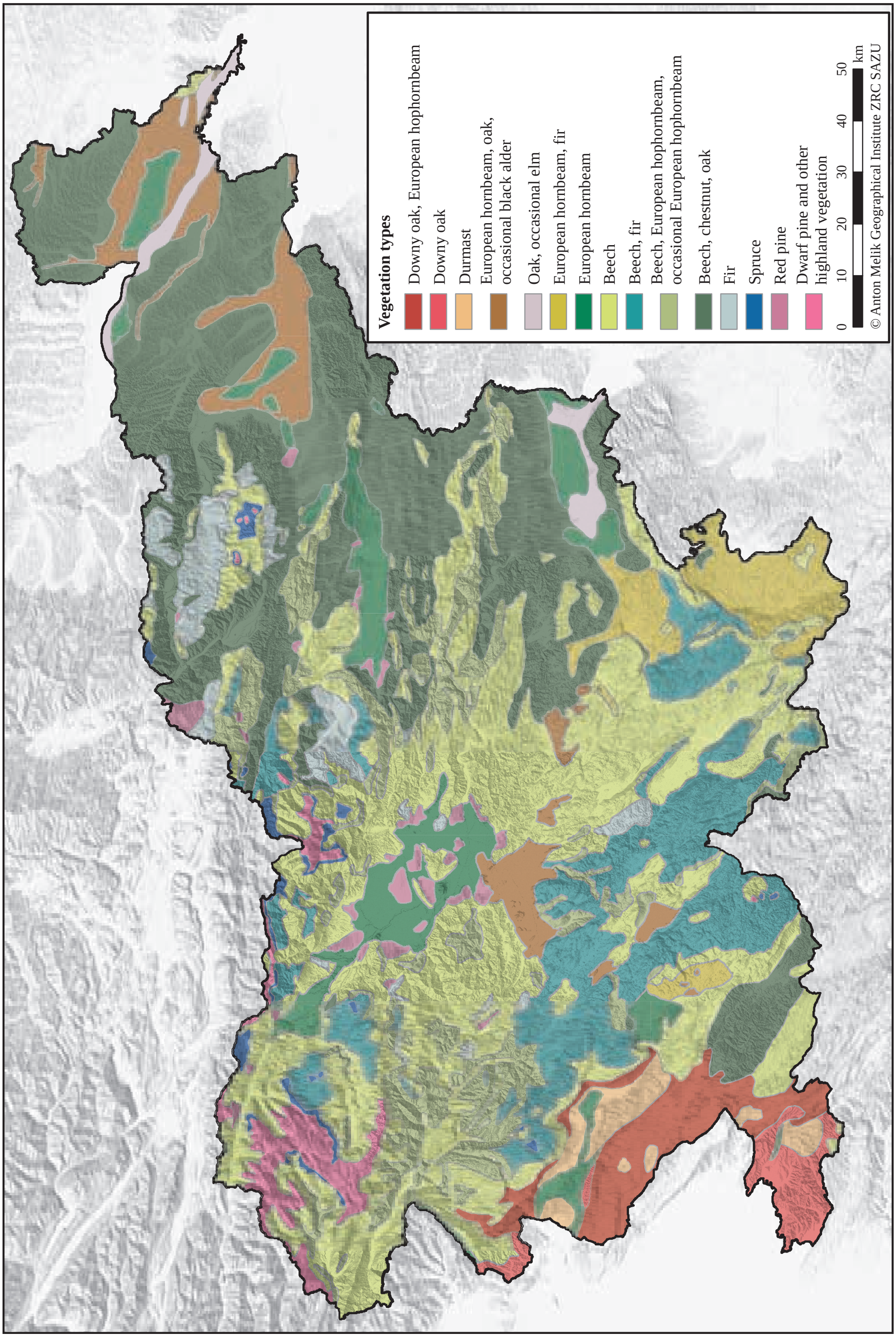
First, we calculated the relief diversity (Figure 5). Using a moving window, we calculated the ratio between the number of relief types that occur within a radius of 1 km and the total number of relief types for each cell. The number of all relief types is seven, so the minimum ratio is 1:7 or 0.1429 if only one relief type occurs in a 1 km radius, and the maximum ratio is 7:7 or 1.0000 if all seven relief types occur in a 1 km radius.

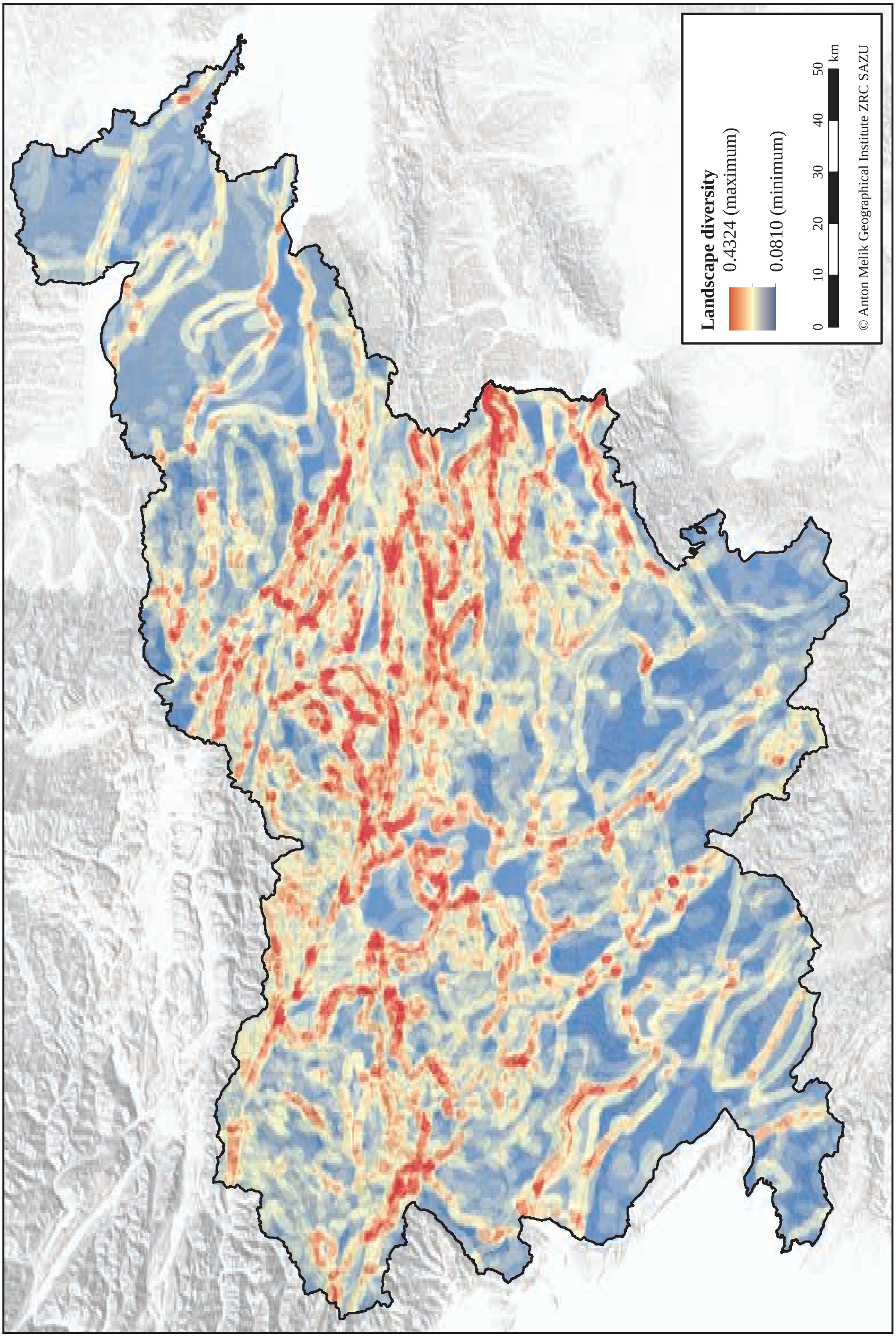
We calculated the lithological and vegetation diversity in the same way. Their minimum ratio is 1:15 or 0.0667 if only one lithological or vegetation type out of a possible fifteen occurs in a 1 km radius.

Finally, we calculated the average of these three partial diversities. This is the landscape diversity (Figure 4). The minimum ratio is 3:37 or 0.0810 if only one relief type, one lithological type, and one vegetation type occur in a 1 km radius, and the maximum ratio is 37:37 or 1.0000 if all seven relief types, fifteen lithological types, and fifteen vegetation types occur simultaneously in a 1 km radius.

For example, a landscape diversity of 0.2500 means that 25% or a quarter of all thirty-seven possible relief, lithological, and vegetation types occur in a 1 km radius.

Figure 3: Vegetation layer with fifteen types. ➤
Figure 4: Landscape diversity of Slovenia. ➤ p. 14


Vegetation types
Downy oak, European hophornbeam
Downy oak
Durmast
European hornbeam, oak, occasional black alder
Oak, occasional elm
European hornbeam, fir
European hornbeam
Beech
Beech, fir
Beech, European hophornbeam, occasional European hophornbeam
Beech, chestnut, oak
Fir
Spruce
Red pine
Dwarf pine and other highland vegetation
0 10 20 30 40 50 km
© Anton Melik Geographical Institute ZRC SAZU


Landscape diversity
0.4324 (maximum)
0.0810 (minimum)
0 10 20 30 40 50 km
© Anton Melik Geographical Institute ZRC SAZU

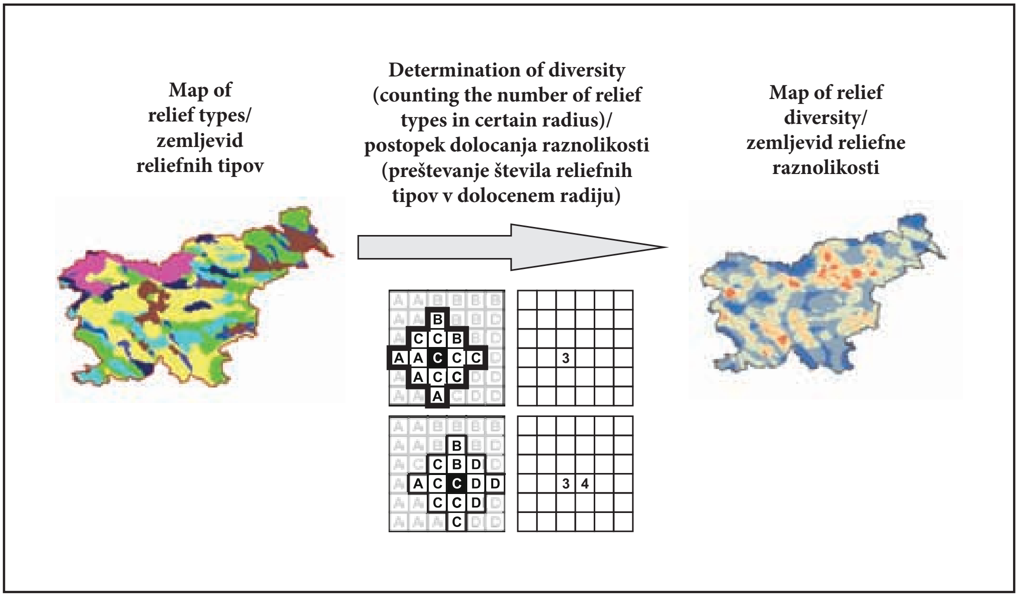


Figure 5: Schematic presentation of the determination of landscape diversity.

3 Landscape hotspots and landscape coldspots

Areas with high landscape diversity are landscape hotspots, and areas with low landscape diversity are landscape coldspots.

One-tenth of Slovenia with the highest landscape diversity was defined as landscape hotspots, and one-tenth of Slovenia with the lowest landscape diversity was defined as landscape coldspots (Figure 6).

The number of landscape hotspots is 912 and the number of landscape coldspots is 681, which is 25% less. The total area of the hotspots is 1,688.85 km² and the total area of coldspots is 1,805.69 km², which is 7% more. The average size of the hotspots is 185 ha and the average size of the coldspots is 265 ha, which is 43% more. The largest hotspot covers 12,453 ha and the largest coldspot covers 16,187 ha, which is 30% more.

Most landscape hotspots are located in Alpine Slovenia, encompassing more than two-thirds of their total area, and the fewest in the Mediterranean Slovenia, corresponding to barely one-tenth of their total area. Most landscape coldspots are located in Dinaric Slovenia, encompassing almost half of their total area, and the fewest in Alpine Slovenia, corresponding to one-sixth of their total area.

The ratio between landscape hotspots and coldspots varies greatly between landscape types. On the Mediterranean plateaus, the area of hotspots is almost one hundred times less than the area of coldspots. In the Alpine mountains, the area of hotspots is ten times greater than the area of coldspots (Table 1).

4 Conclusion

The results have applicability in various fields, such as tourism (development and promotion of tourist destinations), spatial planning (transfer of good practices), environmental protection, education, and research (Gray 2004; Erhartič 2012). Biodiversity is a common topic in environmental studies. Peters and Goslee (2001) stated that maintenance of biodiversity requires management at higher levels of organization, particularly

Figure 6: Landscape hotspots and coldspots of Slovenia. ➤ p. 16

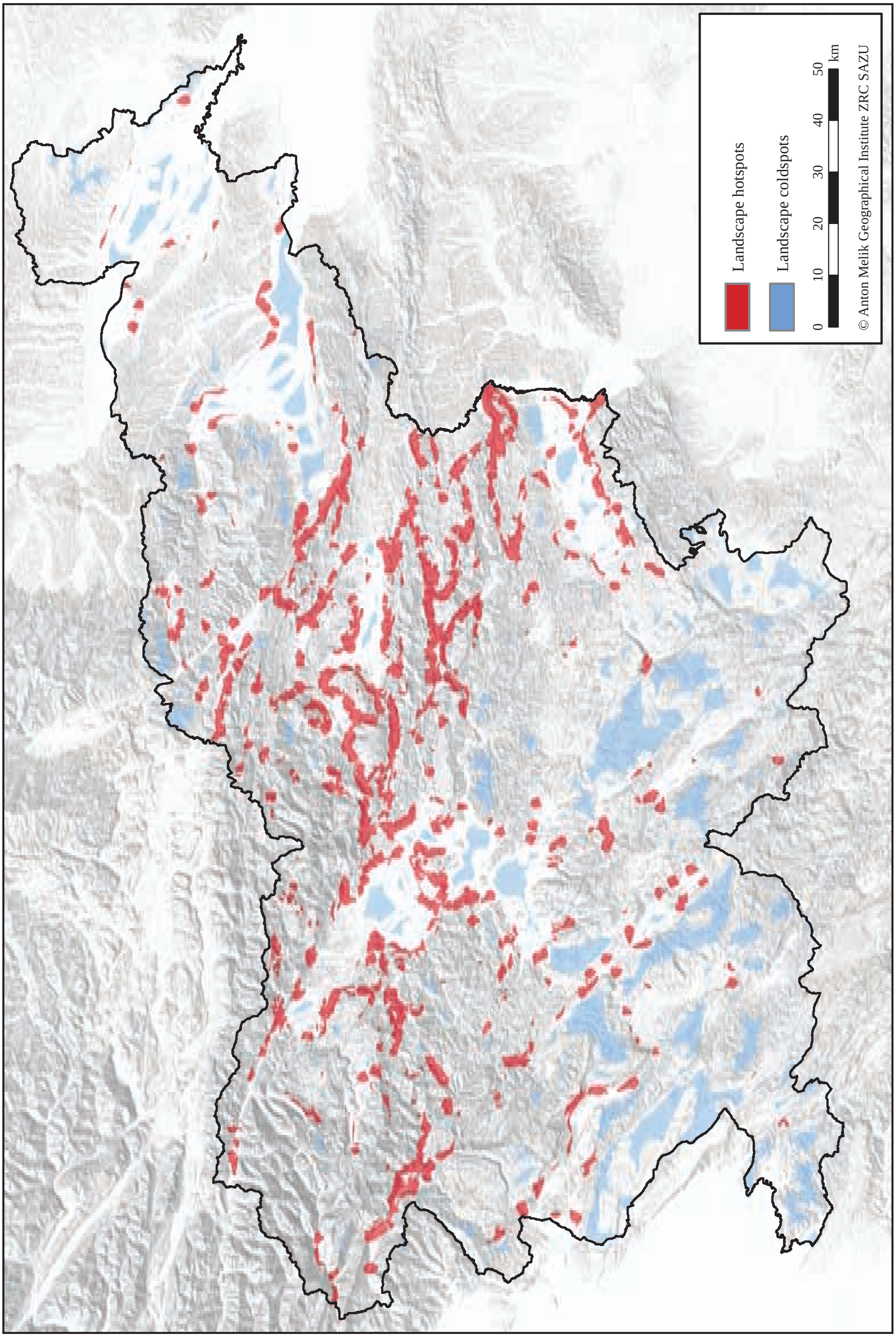

Landscape hotspots
Landscape coldspots
0 10 20 30 40 50 km
© Anton Melik Geographical Institute ZRC SAZU

Table 1: Area of landscape hotspots and coldspots by landscape types in Slovenia.

Landscape types	Area of hotspots (%)	Other areas (%)	Area of coldspots (%)	Total (%)
Alpine mountains	12.46	86.33	1.21	100.00
Alpine hills	14.10	82.55	3.35	100.00
Alpine plains	15.84	72.79	11.37	100.00
Pannonian hills	6.31	89.90	3.80	100.00
Pannonian plains	5.31	77.71	16.98	100.00
Dinaric plateaus	3.20	80.43	16.37	100.00
Dinaric plains	5.17	82.92	11.90	100.00
Mediterranean hills	3.86	81.95	14.18	100.00
Mediterranean plateaus	0.29	72.24	27.46	100.00
Slovenia	8.33	82.76	8.90	100.00
Alpine mountains	22.59	15.75	2.05	15.10
Alpine hills	38.90	22.93	8.65	22.99
Alpine plains	7.68	3.55	5.16	4.04
Pannonian hills	11.18	16.04	6.30	14.77
Pannonian plains	4.07	6.01	12.20	6.40
Dinaric plateaus	7.22	18.26	34.55	18.79
Dinaric plains	5.81	9.38	12.51	9.36
Mediterranean hills	2.43	5.18	8.34	5.23
Mediterranean plateaus	0.12	2.90	10.24	3.32
Slovenia	100.00	100.00	100.00	100.00

at the landscape scale. Mocior and Kruse (2016) proved that spatial heterogeneity or diversity is the most important criteria of landscape features (both biotic and abiotic) for evaluating educational values. Landscape diversity also plays an important role in various studies that include sampling. In homogeneous areas, the monitoring or sampling network may be smaller, but in diverse areas it must be denser (Bonar, Fehmi, and Mercado-Silva 2011)

Thus high importance is given by the European Union to landscape diversity. Diversity is also regarded as an important natural resource by European landscape convention (2000), which acknowledges that »*the quality and diversity of European landscapes constitutes a common resource, and that it is important to co-operate towards its protection, management and planning.*« Diversity was also emphasized in the older EU document »Pan-European Biological and Landscape Diversity Strategy«, which was published in 1996 (Pan-European … 1996).

As this is an ongoing research, in the next phases we will identify, analyze, classify, and evaluate Slovenia's landscape hotspots. Fieldwork will be of great importance in verifying the theoretical findings on particular landscape hotspots.

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Določanje pokrajinskih vročih točk Slovenije

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UDK: 911.52(497.4)
COBISS: 1.01

IZVLEČEK: Na temelju digitalnih podatkov o reliefu, kamninah in rastlinstvu, ki so najpomembnejše sestavine notranje sestave slovenskih pokrajin in hkrati njihove zunanje podobe, smo z uporabo geografskega informacijskega sistema izračunali pokrajinsko raznolikost Slovenije. Območja z visoko pokrajinsko raznolikostjo so pokrajinske vroče točke, območja z nizko pokrajinsko raznolikostjo pa pokrajinske mrzle točke. Kot vroče točke smo opredelili desetino Slovenije z najvišjo pokrajinsko raznolikostjo, kot mrzle točke pa desetino Slovenije z najnižjo pokrajinsko raznolikostjo. Največ pokrajinskih vročih točk leži v alpskem delu Slovenije (več kot dve tretjini njihovih površin), največ pokrajinskih mrzlih točk pa v dinarskem delu Slovenije (skoraj polovica njihovih površin).

KLJUČNE BESEDE: geografija, relief, kamnine, rastlinstvo, pokrajinska raznolikost, pokrajinska vroča točka, pokrajinska mrzla točka, geografski informacijski sistem, Slovenija

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1 Uvod

Vse več raziskovalcev se ukvarja z vrednotenjem in pomenom pokrajinske raznolikosti (Runhaar in Udo de Haes 1994; Bailey 1996; Bunce s sodelavci 1996; Bastian 2000; Mücher s sodelavci 2003; Loveland in Merchant 2004; Šímová in Gdulová 2012; Mocior in Kruse 2016). Območja, kjer se prepletajo različni naravni dejavniki, so pomembna za biodiverziteto ter raznolikost habitatov in vrst (Dramstad s sodelavci 2001; Hou in Walz 2013; Walz in Syrbe 2013).

Pokrajinsko pestra območja imajo lahko prednost v gospodarskem razvoju, še posebej v turizmu, saj »*… človekovo zaznavanje ceni raznolikost, kompleksnost, vzorce in lokalni značaj …*« (Erhartič 2012). Gray (2004) meni, da je pomen različnih tipov reliefnih oblik in bogastva površinskih detajlov za priljubljenost turističnih območij močno podcenjen. Po drugi strani pa so območja, kjer se prepletajo raznoliki naravni vplivi, lahko tudi območja, kjer prenos dobrih praks zaradi različnega odziva pokrajine na človekove posege ni preprost.

Pokrajinska raznolikost nekega območja lahko torej ponuja nekaj prednosti, pa tudi slabosti in izzivov.

Velika pokrajinska raznolikost je značilna predvsem za območja na stiku in prepletu različnih pokrajinskih tipov. Analiza različnih geografskih členitev kaže, da pokrajinsko najbolj raznolika območja v Evropi ležijo v južni Skandinaviji ter na obrobju Pirenejev in Alp. Med najbolj raznolika območja spada tudi Slovenija (Ciglič in Perko 2013).

Glavni namen raziskave je torej poiskati pokrajinsko najbolj in najmanj raznolika zaokrožena območja v Sloveniji, na katere se navezujejo gospodarske in druge prednosti ali pomanjkljivosti. V članku predstavljamo prvi del raziskave, to je predvsem kvantitativen način določanja območij s povečano pokrajinsko raznolikostjo. S pomočjo vrednotenja, ki bo temeljilo tako na dejanskih podatkih, terenskemu delu kot tudi na ekspertni oceni bomo v prihodnje opredelili še pomen pokrajinske raznolikosti za na primer pogostost in vrste pojavljanja naravnih nesreč, za poselitev (prostorsko načrtovanje), kmetijstvo, turizem in gospodarstvo nasploh. Tako vzpostavljen sistem vrednotenja pokrajinske heterogenosti bo mogoče uporabiti na različnih območjih po svetu.

2 Metode

Za notranjo sestavo, delovanje in zunanjo podobo slovenskih pokrajin so najpomembnejše tri naravne pokrajinske sestavine: relief, kamnine in rastlinstvo. Z ostalimi naravnimi pokrajinskimi sestavinami so povezane tako močno, da lahko dovolj kakovostno naravno regionalizacijo ali tipizacijo izdelamo samo z upoštevanjem teh treh pokrajinskih sestavin (Perko, Hrvatin in Ciglič 2015).

Ker so v Sloveniji na razpolago dovolj natančni digitalni podatki o reliefu, kamninah in rastlinstvu, je mogoče s pomočjo geografskega informacijskega sistema določiti pokrajinsko raznolikost ter pokrajinske vroče in mrzle točke.

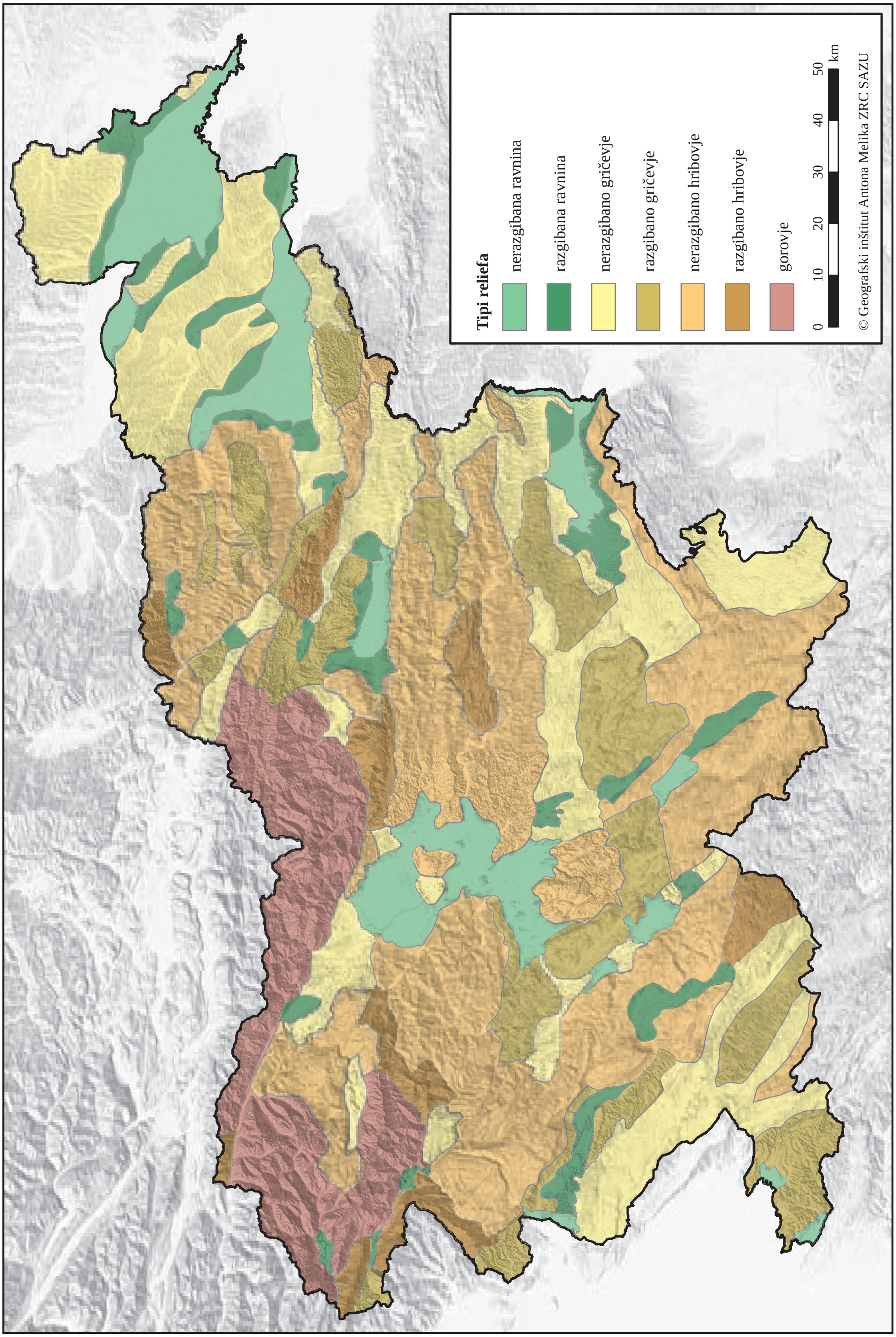
Kot temeljni sloj v geografskem informacijskem sistemu smo uporabili geomorfološko testirani 25-metrski digitalni model višin (Podobnikar 2002, Digitalni model višin … 2014), ki nudi kar 32.436.693 celic z osnovnico 25 m in površino 6,25 ara.

Dodali smo vektorske sloje z reliefnimi, litološkimi in vegetacijskimi enotami oziroma tipi ter jih rasterizirali na 25-metrski rastrski zapis, saj smo uporabili geografska informacijska orodja za obdelavo rastrskih podatkovnih slojev.

Reliefni sloj (slika 1) temelji na zemljevidu enot razgibanosti površja v merilu 1 : 400.000 (Perko 2001). Na zemljevidu je 195 različnih enot, ki smo jih smiselno združili v 7 tipov reliefa (Perko, Hrvatin in Ciglič 2015):

- ravnine,
- razgibane ravnine,
- gričevja,
- razgibana gričevja,
- hribovja,
- razgibana hribovja,
- gorovja.

Slika 1: Reliefni sloj s 7 tipi. ➤ str. 22


Tipi reliefa
nerazgibana ravnina
razgibana ravnina
nerazgibano gričevje
razgibano gričevje
nerazgibano hribovje
razgibano hribovje
gorovje
0 10 20 30 40 50 km
© Geografski inštitut Antona Melika ZRC SAZU

Litološki sloj (slika 2) temelji na vektorski Litostratigrafski karti Slovenije (Litostratigrafska karta Slovenije 2011), ki jo je izdelal Geološki zavod Slovenije, predvsem na podlagi vektoriziranih geoloških kart Slovenije v merilu 1 : 25.000. Na zemljevidu je 938 različnih enot, ki smo jih smiselno združili v 15 tipov kamnin (Perko, Hrvatin in Ciglič 2015):
- glina in melj,
- pesek,
- karbonatni prod, grušč in til,
- silikatni prod,
- glinavec in meljevec,
- karbonatni konglomerat,
- silikatni peščenjak in konglomerat,
- peščenjak in laporovec (fliš),
- laporovec,
- karbonatno-klastične kamnine,
- apnenec,
- dolomit,
- metamorfne kamnine,
- tuf in tufit,
- magmatske kamnine.

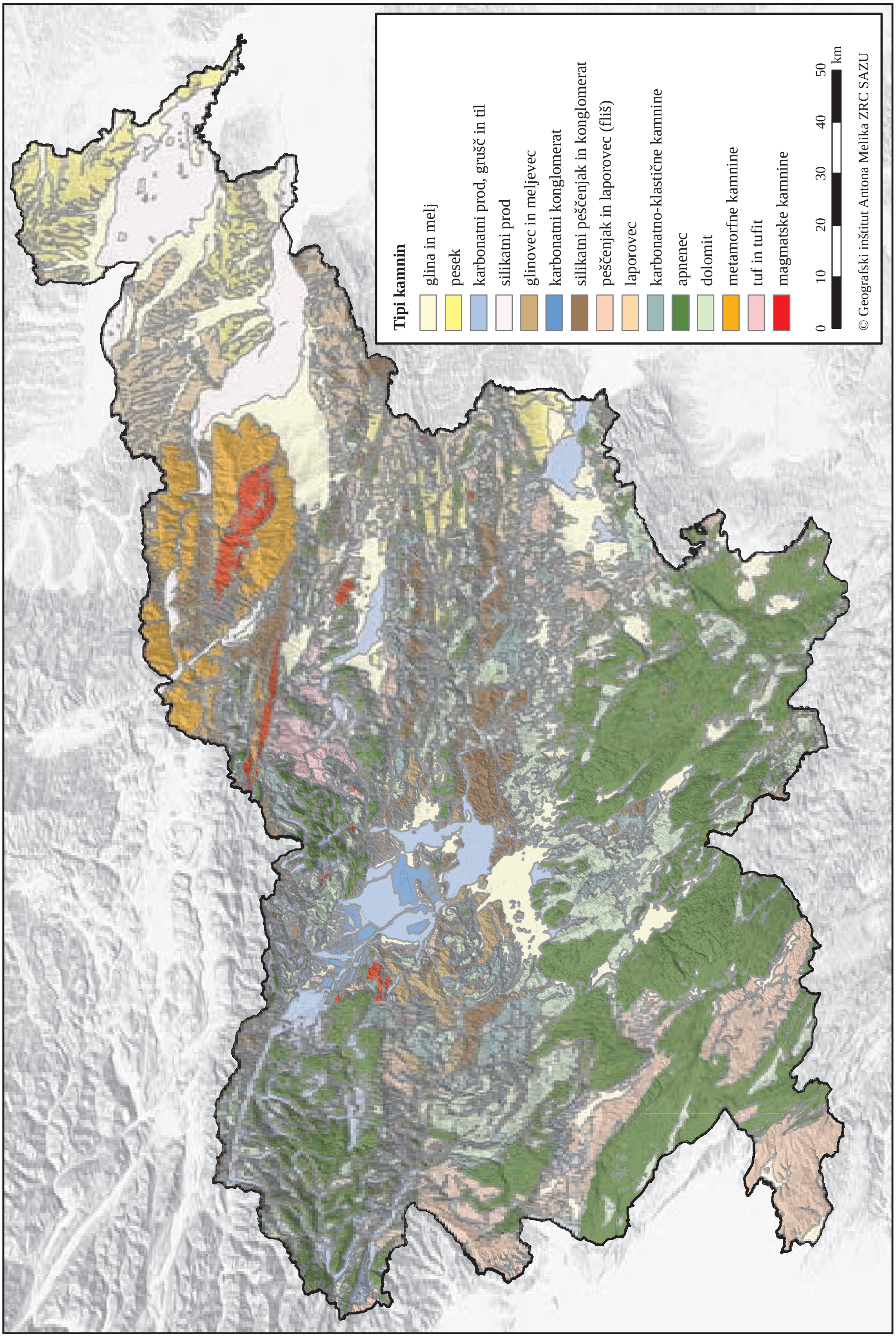
Vegetacijski sloj (slika 3) temelji na zemljevidu potencialne naravne vegetacije (Zemljevid potencialne naravne vegetacije 1998), ki ga je v merilu 1 : 400.000 izdelal Biološki inštitut Jovana Hadžija ZRC SAZU. Na zemljevidu je 62 različnih enot, ki smo jih smiselno združili v 15 tipov potencialne vegetacije (Perko, Hrvatin in Ciglič 2015):
- puhasti hrast, gabrovec,
- puhasti hrast,
- graden,
- beli gaber, dob, ponekod črna jelša,
- dob, ponekod z brestom,
- beli gaber, jelka,
- beli gaber,
- bukev,
- bukev, jelka,
- bukev, gabrovec, ponekod gabrovec,
- bukev, kostanj, hrasti,
- jelka,
- smreka,
- rdeči bor,
- ruševje in drugo visokogorsko rastje.

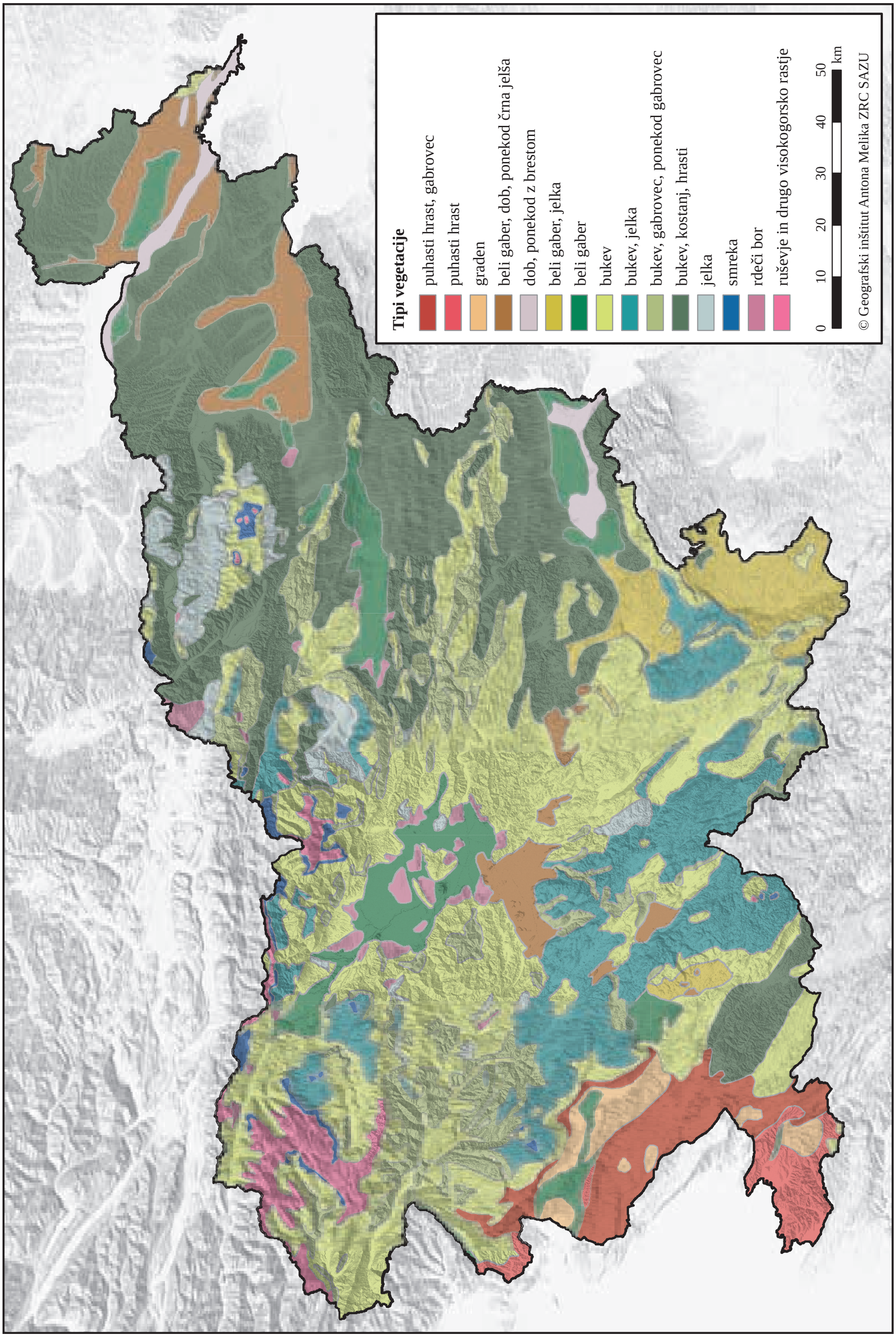
Najprej smo izračunali reliefno raznolikost (slika 4). Za vsako celico smo s pomočjo premičnega okna izračunali razmerje med številom reliefnih tipov (enot), ki se pojavljajo v radiju 1 km, in številom vseh reliefnih tipov (enot). Število vseh reliefnih tipov je 7, zato je najmanjše možno razmerje 1 proti 7 ali 0,1429, če se v kilometrskem radiju pojavi le 1 reliefni tip, največje možno razmerje pa 7 proti 7 ali 1,0000, če se v kilometrskem radiju pojavi vseh 7 reliefnih tipov.

Na enak način smo izračunali tudi litološko in vegetacijsko raznolikost. Pri njiju je najmanjše možno razmerje 1 proti 15 ali 0,0667, če se v kilometrskem radiju pojavi le 1 litološki ali vegetacijski tip od 15 možnih.

Na koncu smo izračunali povprečja teh treh delnih raznolikosti. To je pokrajinska raznolikost (slika 5). Najmanjše možno razmerje je 3 proti 37 ali 0,0810, če se v kilometrskem radiju pojavi le po 1 reliefni, litološki in vegetacijski tip, največje možno razmerje pa 37 proti 37 ali 1,0000, če se v kilometrskem radiju pojavi hkrati vseh 7 reliefnih tipov, 15 litoloških tipov in 15 vegetacijskih tipov.

Slika 2: Litološki sloj s 15 tipi. ➤ str. 24
Slika 3: Vegetacijski sloj s 15 tipi. ➤ str. 25


Tipi kamnin
glina in melj
pesek
karbonatni prod, grušč in til
silikatni prod
glinovec in meljevec
karbonatni konglomerat
silikatni peščenjak in konglomerat
peščenjak in laporovec (fliš)
laporovec
karbonatno-klastične kamnine
apnenec
dolomit
metamorfne kamnine
tuf in tufit
magmatske kamnine
0 10 20 30 40 50 km
© Geografski inštitut Antona Melika ZRC SAZU


Tipi vegetacije
puhasti hrast, gabrovec
puhasti hrast
graden
beli gaber, dob, ponekod črna jelša
dob, ponekod z brestom
beli gaber, jelka
beli gaber
bukev
bukev, jelka
bukev, gabrovec, ponekod gabrovec
bukev, kostanj, hrasti
jelka
smreka
rdeči bor
ruševje in drugo visokogorsko rastje
0 10 20 30 40 50 km
© Geografski inštitut Antona Melika ZRC SAZU

Na primer pokrajinska razlika 0,2500 pomeni, da se v kilometrskem radiju hkrati pojavi 25 % ali četrtina od vseh 37 možnih reliefnih, litoloških in vegetacijskih tipov.

Slika 4: Shematičen prikaz določanja pokrajinske raznolikosti.
Glej angleški del prispevka.

3 Pokrajinske vroče in mrzle točke

Območja z visoko pokrajinsko raznolikostjo so pokrajinske vroče točke, območja z nizko pokrajinsko raznolikostjo pa pokrajinske mrzle točke.

Kot vroče točke smo opredelili desetino Slovenije z najvišjo pokrajinsko raznolikostjo, kot mrzle točke pa desetino Slovenije z najnižjo pokrajinsko raznolikostjo (Slika 6).

Pokrajinskih vročih točk je 912, pokrajinskih mrzlih točk pa 681, kar je 25 % manj. Skupna površina vročih točk meri 1688,85 km^2, mrzlih točk pa 1805,69 km^2, kar je 7 % več. Povprečna velikost vročih točk je 185 ha, mrzlih točk pa 265 ha, kar je 43 % več. Največja vroča točka meri 12.453 ha, največja mrzla točka pa 16.187 ha, kar je 30 % več.

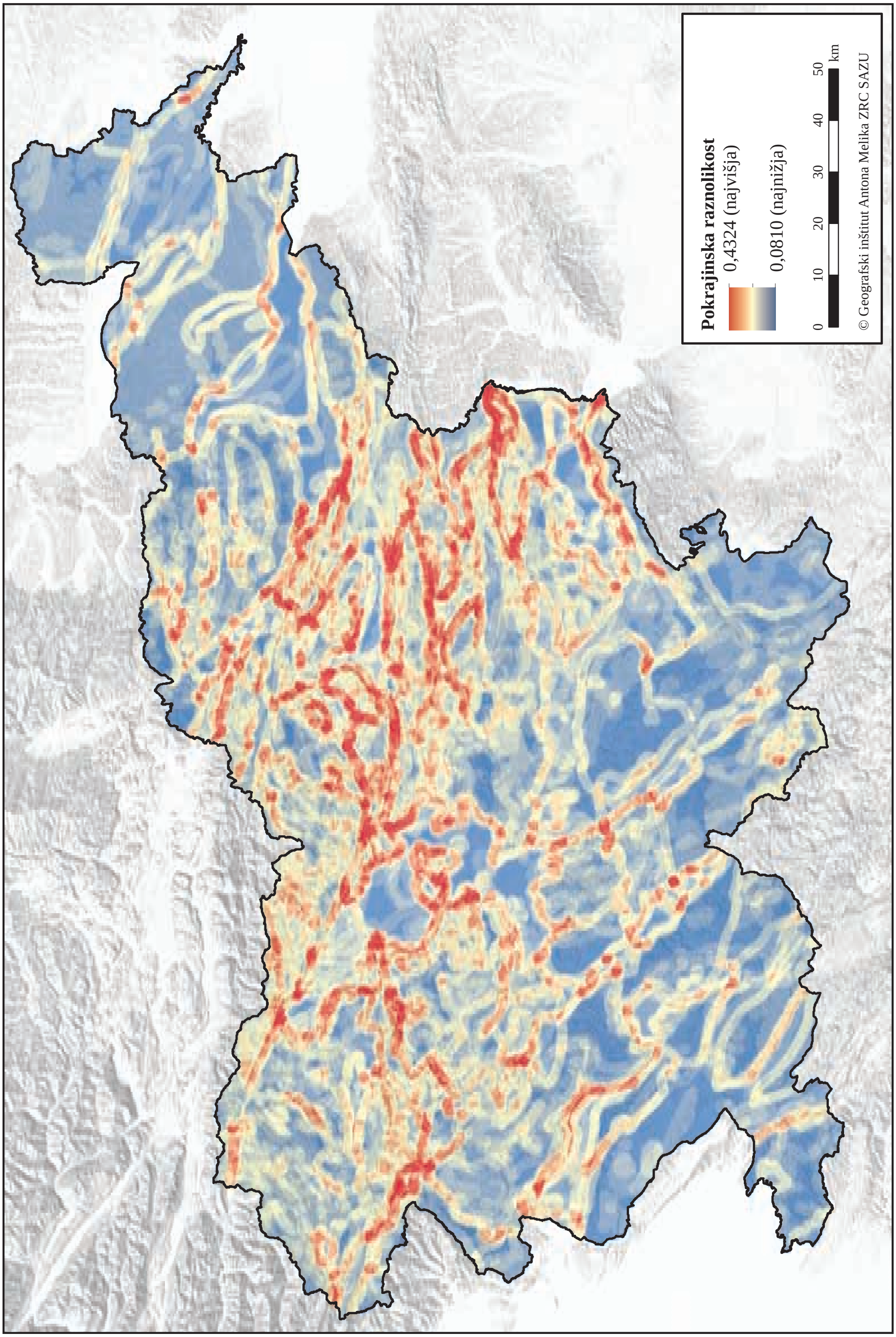
Največ pokrajinskih vročih točk leži v alpski Sloveniji, več kot dve tretjini njihovih površin, najmanj pa v sredozemski Sloveniji, komaj slaba desetina njihovih površin. Največ pokrajinskih mrzlih točk leži v dinarski Sloveniji, skoraj polovica njihovih površin, najmanj pa v alpski Sloveniji, šestina njihovih površin.

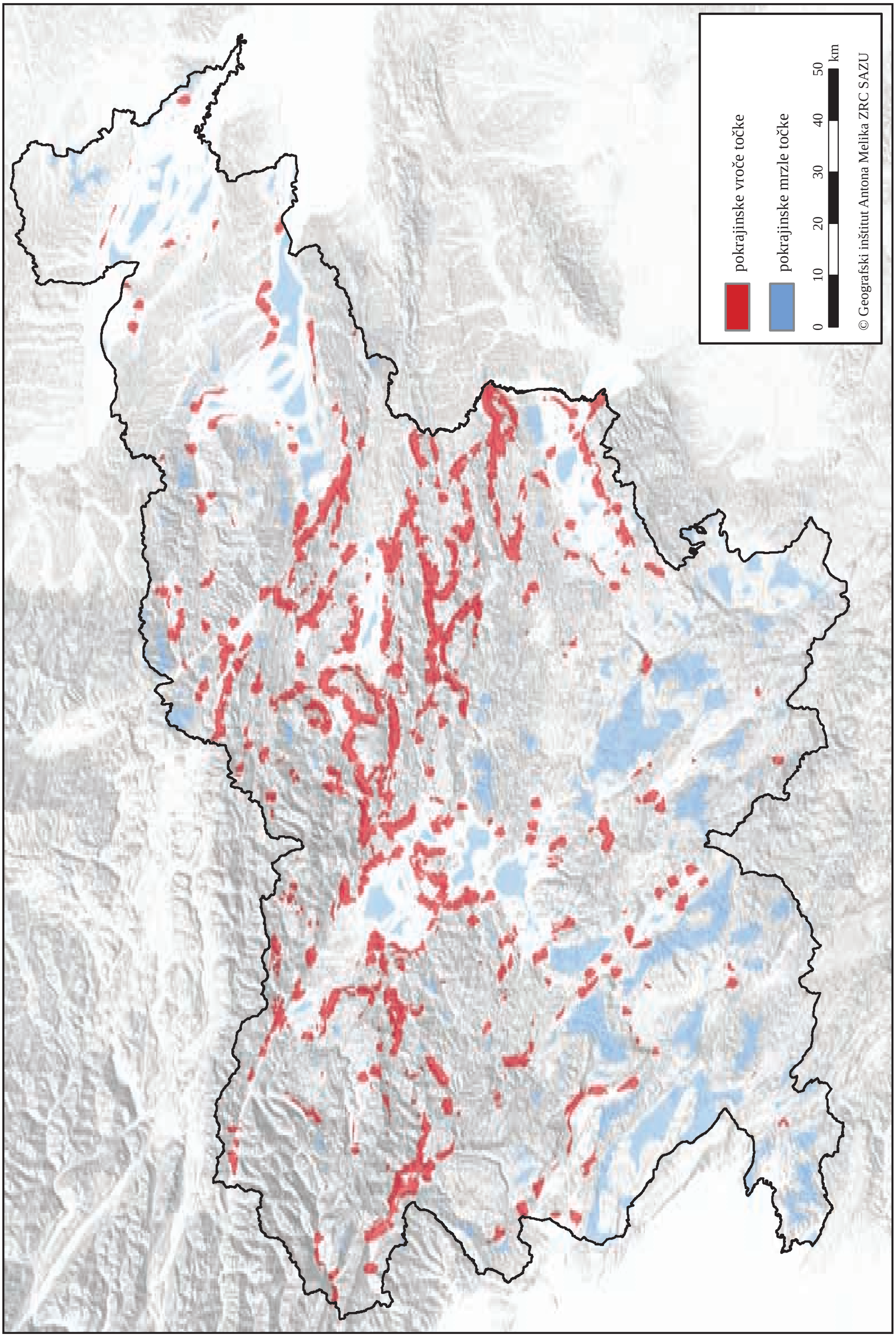
Razmerje med pokrajinskimi vročimi in mrzlimi točkami je med pokrajinskimi tipi zelo različno. Na sredozemskih planotah je površina vročih točk skoraj stokrat nižja od površine mrzlih točk, v alpskih gorovjih pa je površina vročih točk desetkrat večja od površine mrzlih točk (preglednica 1).

Preglednica 1: Razporeditev pokrajinskih vročih in mrzlih točk po pokrajinskih tipih v Sloveniji.

pokrajinski tipi	površina vročih točk (%)	ostale površine (%)	površina mrzlih točk (%)	skupaj
alpska gorovja	12,46	86,33	1,21	100,00
alpska hribovja	14,10	82,55	3,35	100,00
alpske ravnine	15,84	72,79	11,37	100,00
panonska gričevja	6,31	89,90	3,80	100,00
panonske ravnine	5,31	77,71	16,98	100,00
dinarske planote	3,20	80,43	16,37	100,00
dinarska podolja in ravniki	5,17	82,92	11,90	100,00
sredozemska gričevja	3,86	81,95	14,18	100,00
sredozemske planote	0,29	72,24	27,46	100,00
Slovenia	8,33	82,76	8,90	100,00
alpska gorovja	22,59	15,75	2,05	15,10
alpska hribovja	38,90	22,93	8,65	22,99
alpske ravnine	7,68	3,55	5,16	4,04
panonska gričevja	11,18	16,04	6,30	14,77
panonske ravnine	4,07	6,01	12,20	6,40
dinarske planote	7,22	18,26	34,55	18,79
dinarska podolja in ravniki	5,81	9,38	12,51	9,36
sredozemska gričevja	2,43	5,18	8,34	5,23
sredozemske planote	0,12	2,90	10,24	3,32
Slovenia	100,00	100,00	100,00	100,00

Slika 5: Pokrajinska raznolikost Slovenije. ➤
Slika 6: Pokrajinske vroče in mrzle točke Slovenije. ➤ str. 28


Pokrajinska raznolikost
0,4324 (najvišja)
0,0810 (najnižja)
0 10 20 30 40 50 km
© Geografski inštitut Antona Melika ZRC SAZU


pokrajinske vroče točke
pokrajinske mrzle točke
0 10 20 30 40 50 km
© Geografski inštitut Antona Melika ZRC SAZU

4 Sklep

Rezultati so uporabni na različnih področjih, kot so na primer turizem (razvoj in promocija turističnih destinacij), prostorsko planiranje (prenos dobrih praks), varstvo okolja, izobraževanje in raziskovanje (Gray 2004; Erhartič 2012). Pogosto se na področju ved o okolju omenja biodiverziteta. Peters in Goslee (2001) sta omenila, da je za ohranjanje biodiverzitete treba pravilno ukrepati tudi na višji ravni, ravni pokrajine. Mocior in Kruse (2016) sta v svoji raziskavi dokazali, da je raznolikost pokrajine najbolj pomemben dejavnik pri ocenjevanju izobraževalnega pomena pokrajine oziroma njenih prvin. Raznolikost pokrajine je pomembna tudi pri marsikateri raziskavi, kjer se uporablja vzorčenje. Na homogenih območjih je lahko mreža za opazovanje ali vzorčenje redkejša, na raznolikih območjih pa mora biti gostejša (Bonar, Fehmi in Mercado-Silva 2011).

Evropska unija daje zaradi navedenih in drugih vzrokov pokrajinski raznolikosti že od nekdaj velik pomen, saj se pokrajinska raznolikost (pestrost) kot pomemben naravni vir omenja v Evropski konvenciji o (po)krajini (European landscape convention 2000), ki izpostavlja, »*… da sta kakovost in pestrost evropskih krajin skupen vir in da si je treba skupaj prizadevati za njegovo varstvo, upravljanje in načrtovanje …*«. Raznolikost (pestrost) poudarja tudi predhodni dokument »*Pan-European Biological and Landscape diversity strategy*« iz leta 1996 (Pan-European … 1996).

V nadaljevanju raziskave bomo pokrajinske vroče točke Slovenije opredelili, analizirali, razvrstili in ovrednotili. Pomembno bo terensko delo s katerim bomo preverjali teoretične rezultate.

ZAHVALA: Prispevek temelji na raziskovalnem projektu Pokrajinska raznolikost in vroče točke Slovenije (L6-6852), ki sta ga sofinancirali Javna agencija za raziskovalno dejavnost Republike Slovenije ter Slovenska akademija znanosti in umetnosti.

5 Literatura

Glej angleški del prispevka.