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State Borders in the Territory of Slovenia during World War II on Cartographic Materials Produced by the Occupying Forces[**]

Introduction

Historical events and landscapes are inseparably interconnected, because the former were contingent upon a specific landscape or impacted its further development or changes.[1]

Cartographic materials are highly suitable for spatial understanding of a landscape in a specific period, as well as for monitoring the spatial dynamics of phenomena or processes over longer periods.[2] Cartographic sources are not merely a means for the spatial representation of phenomena, they are a credible document of the space (landscape), time and social conditions in which they were produced and can as such be regarded as first-hand sources. They often contain information not recorded in any other source

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1 Slukan Altić, *Povijesna kartografija*, 21.

2 Zorn, Uporaba zgodovinskih, 389.

(e.g. relief forms,[3] geographical names, borders,[4] traffic routes, watercourses[5]). As a source, they are used mostly in historical geography and environmental history, in association with changes in land use and cultural landscape.[6]

Their use for a quantitative examination of historical landscapes has been expedited by geographic information systems (GIS) that "liberated them from their static nature" or from being nothing but a print on a sheet of paper. Additionally, one should not disregard the improved availability of cartographic materials[7] or different digital spatial data.[8]

Before the introduction of GIS, the use of cartographic sources was analogue, and maps were compared subjectively, i.e. by means of visual inspections. The results were thus contingent upon the readers' interpretational ability. With the implementation of GIS, cartographic sources became digitalized, which allowed for an objective comparison with other spatial data.[9]

As is the case with all historical sources, cartographic sources are subject to a critical examination. One must be familiar with the historical context in which they were produced, because they reflect the needs of those who commissioned them. It is important to know if a map was produced by a cartographer who worked on site (and is thus a first-hand source) or if existing maps were used for its production (which makes it a second-hand source), which can bring about the inclusion of obsolete data. Last but not least, the authorship is also important because cartographers come from different cartographic schools, as is the technological development of mapping techniques, which is reflected in their accuracy. One must be aware also that a cartographic source may contain deliberate errors (e.g. military maps) or errors associated with the lack of knowledge of the landscape at hand.[10]

To monitor changes of the landscape (including borders), large-scale cartographic sources are particularly important. German and Hungarian military maps of this kind are discussed in this paper. They were produced in the period of World War II and show the then-current state boundaries in the Slovene territory. The representation of borders allowed for determining their respective courses between occupied territories of all of Slovenia and its immediate surroundings.

3 Gašperič, Zorn, Gorski relief.

4 Gašperič et al., Cartographic presentations.

5 Perko et al., Changing river.

6 Zorn et al., Kartografski viri, 208.

7 There are numerous digital cartographic collections of libraries and archives (Jenny et al., Alte Karten, 129, 144), such as maps that are accessible on the website Digitalna knjižnica Slovenije (http://www.dlib.si/), Open Culture (http://www.openculture.com/2016/04/download-67000-historic-maps-in-high-resolution-from-the-wonderful-david-rumsey-map-collection.html) or Mapire (https://mapire.eu/en/).

8 Perko et al., Od krtine.

9 Rumsey, Williams, Historical maps, 3; Zorn et al., Kartografski viri, 209.

10 Zorn et al., Kartografski viri, 209; Gašperič, Stari zemljevidi.

Preparing Cartographic Sources for Obtaining Spatial Data

Historical sources must be prepared to use them in GIS. As a rule, they are subject to three stages of preparation:[11] digitalization, georeferencing, and vectorization. Digitalization is the process of translating a cartographic source into a digital from, usually by scanning, which results in a digital raster image. Georeferencing is the process of taking a digitalized cartographic source and placing it in a coordinate system. By using computer software (e.g. ArcGIS Desktop, QGIS, Erdas Imagine) this source is placed in its geographic location.[12] Topographic maps (1:25,000, 1:50,000), topographic plans (1:5,000), digital orthoimages (orthorectified aerial images) or digital cadastral maps can serve as a basis for georeferencing. The selection of the basis is contingent upon the accuracy that we want to achieve and upon the size and scale of the georeferenced source.[13]

A scanned map that is placed in a coordinate system can be used to read different elements on a map, i.e. borders in our case. A border is a linear feature, thus it can be vectorized as linear data. Vectorization is the conversion of a scanned raster image (or its elements) to a vector structure, which allows for additional spatial analyses. Vectorization makes sense particularly in the case of simple, distinguishable elements (e.g. roads, rivers, boundaries).[14] A vectorized line of borders enabled us to carry out additional analyses, such as the calculation of lengths (Table 2) and overlapping with other spatial layers, e.g. natural elements (Fig. 10).

Errors can occur in all stages of data processing. These are associated with the source itself because their accuracy deteriorates with the age of cartographic sources. They can be associated with scanning as well, as a cartographic source can be damaged. Errors also occur in georeferencing (Fig. 3). This is based on the identification of reference points, i.e. points featured on old cartographic sources and modern-day cartographic material that serve as a reference for georeferencing. Practice has shown that reference points that were subject to no or slight changes, e.g. churches or intersections (Fig. 1) are the most reliable. Their number is contingent upon the size and scale of the map that we want to georeference. It is important that they are distributed as evenly as possible on a map that is georeferenced, as well as closely set in spots where the deviation in location is the most significant. This occurs mostly on the edges of maps, which is caused by the different cartographic projections in which maps were produced.[15] Additionally, on some maps we can make use of degrees marked on them,

11 Bec, Podobnikar, Spreminjanje struge, 114.

12 The exact process is described in: Petek, Fridl, Pretvarjanje listov; Jenny et al., Alte Karten; Podobnikar, Georeferencing.

13 Zorn et al., Kartografski viri, 210.

14 Ibid.

15 Petek, Fridl, Pretvarjanje listov, 79; Zorn et al., Kartografski viri, 211.

which – taking into consideration differences between coordinate systems – allows for more accurate georeferencing (Fig. 2).

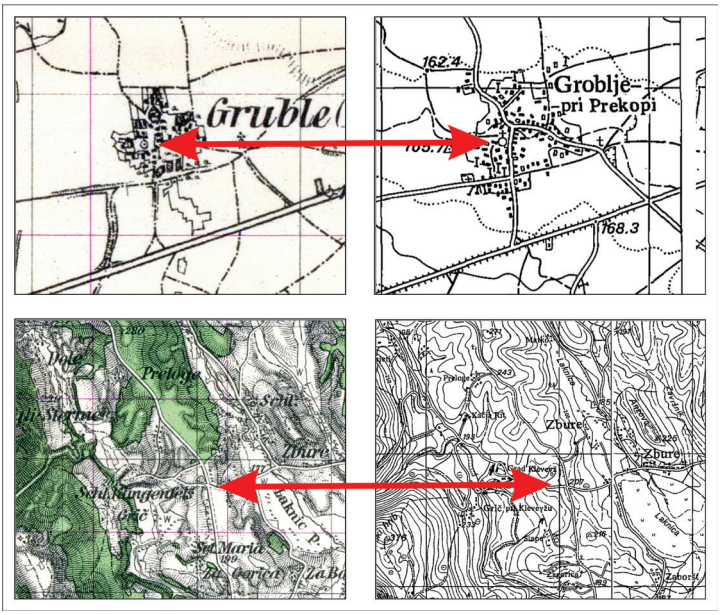


Fig. 1: Reference points are used in georeferencing; these are points whose exact location in a modern coordinate system is known. The most reliable are structures that have not undergone many changes over a long period of time. The details on the left show a church (above) and an intersection (below) on a German map in a scale of 1:25,000, which was produced during World War II. The details on the right show the same structures on a modern topographic map in a scale of 1:25,000.

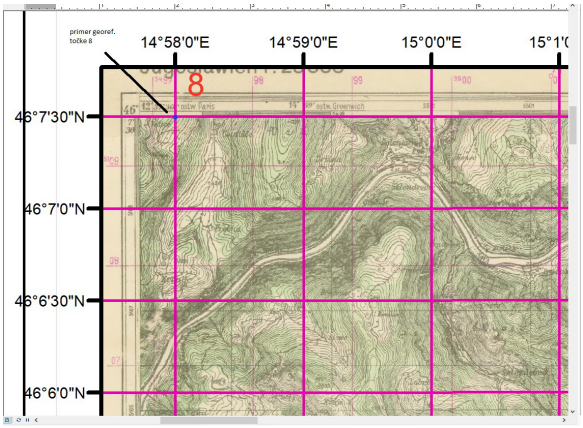


Fig. 2: When georeferencing German military maps from the period of World War II, a grid with degree intervals was also used, which can be seen on the maps.

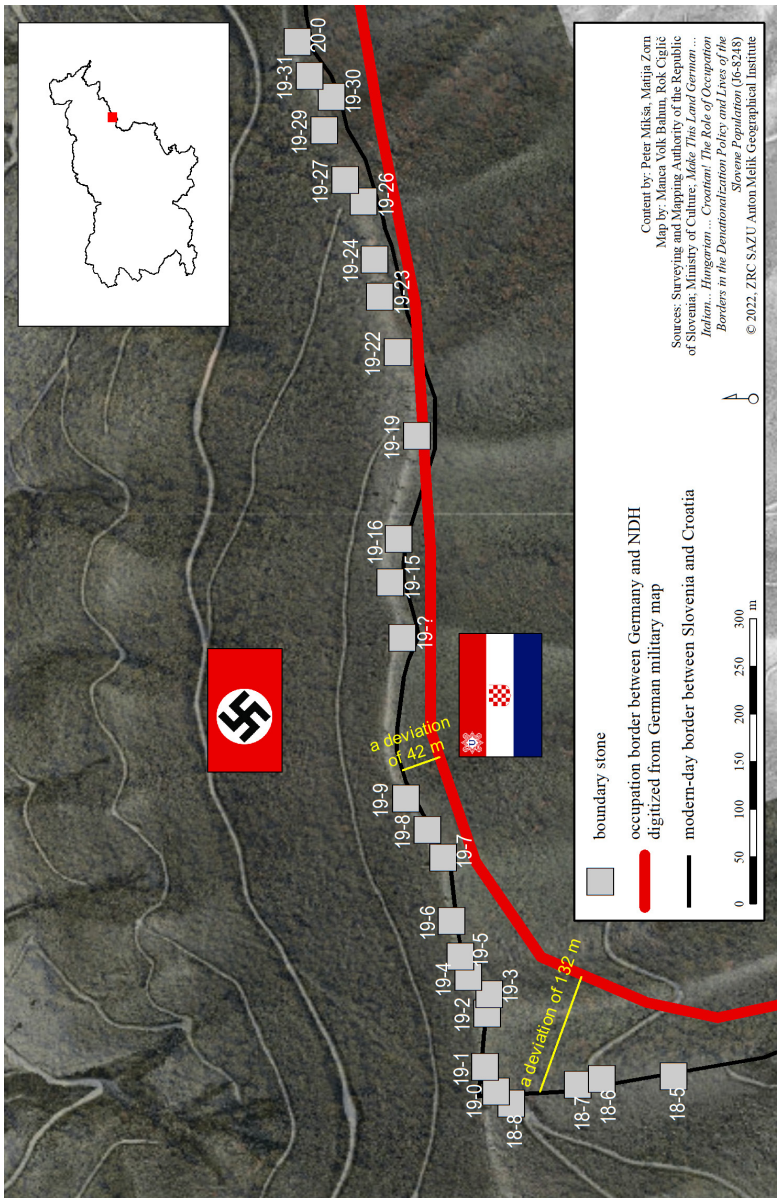


Fig. 3: We used mostly maps in a scale of 1:25,000 and 1:50,000 (Table 1) to outline occupation borders. When georeferencing maps with these scales, positional errors can result in a few dozen metres. Small-scale maps, including 1:200,000, were available for some areas. In this case the error can exceed 100 m. The image shows the deviation of the occupation border between Germany and the NDH from the actual course that is on location, i.e. on the ridge of Macelj, represented by the recorded occupation boundary stones or by the modern-day course of the border between Slovenia and Croatia. Used georeferenced German military map from 1943 (map sheet Celje 33-46) is in a scale of 1:200,000.

Occupation Maps Used

The occupying states produced maps of parts of the Slovene territory that they occupied (Figs. 4 and 5), and this was seen as a basic need. These maps were uniform in one respect, namely they featured mostly foreign – i.e. non-Slovene – place names (Fig. 6).[16] Germany[17] could build upon the legacy of the pre-World War I German place names in former Carniola (*Gorenjska* and parts of *Dolenjska*)[18], as well as in Styria (*Štajerska*) and Carinthia (*Koroška)*. Similarly, the Hungarian occupation of Prekmurje could make use of the legacy of Hungarian place names before World War I.[19] By contrast, the Italian occupying troops could not do this and, consequently, partial Italianization took place,[20] although not to the extent[21] that was typical of the Italianization of Slovene territory in the area to the west of the Rapallo border after World War I.[22]

We used 54 maps to determine the occupation borders, of which 44 were in a scale of 1:25,000, eight in a scale of 1:50,000 and two in the scale of 1:200,000. They were all published between the years 1941 and 1944 (Table 1). To determine the border between Germany and Italy, Germany and the Independent State of Croatia (NDH), and Italy and the NDH, we used German *Deutsche Heereskarte* maps[23] that were published in 1942 and 1943 in a scale of 1:25,000 and bear the title "Jugoslawien", along the Rapallo border those entitled "Italien". Hungarian military maps in a scale of 1:50,000, which were published in 1944, were used to define the border between Germany and Hungary. The German maps were produced in Berlin by the Directorate for War Maps and Surveying (*Abteilung für Kriegskarten und Vermessungswesen*) of the German Army General Staff (*Oberkommando des Heeres*) and the Hungarian maps were produced in Budapest by the Royal Hungarian Cartographic Institute (*M. Kir. Honvéd Térképészeti Intézet*). They both used as cartographic basis maps in a scale of 1:25,000, which were produced in Yugoslavia in the interwar period and published in the 1930s. Italian pre-war maps served as a basis for a few German map sheets along the Rapallo border. Italian and Croatian maps that were published during the occupation were not used.

16 Buga et al., *100 Years of Hungarian*.

17 Tomasevich, *War and Revolution*, 91.

18 E.g. on the basis of the "third" military survey of the Habsburg Monarchy (1869–1887) in a scale of 1:25,000 (www.https://mapire.eu/en/).

19 Ibid.

20 Geršič, Kladnik, Street name.

21 Fontanot, The Italianization, 36

22 Kacin-Wohinz, Italijanizacija, 186–187.

23 Oehrli, Rickenbacher, Deutsche Heereskarte.

Fig. 4: A German map of Ljubljana's surroundings in a scale of 1:25,000 from 1943. The occupation border between Germany and Italy to the north of Ljubljana is marked. It says in the legend that the border's course is based on the minutes of the German-Italian Delimitation Commission from 13 September 1941 (source: Deutsche Heereskarte. Jugoslawien 1:25.000, Blatt Nr. 11-3-d Ljubljana (Laibach). Berlin: Oberkommando des Heeres, Abteilung für Kriegskarten und Vermessungswesen, 1943).

Fig. 5: A Hungarian map of the surroundings of Murska Sobota (*Muraszombat* in Hungarian) in a scale of 1:50,000 from 1944. The border between Hungary and Germany ran along the river Mura (source: Muraszombat, map sheet no. 5356 K, 1:50,000. Budapest: M. Kir. Honvéd Térképészeti Intézet, 1944).

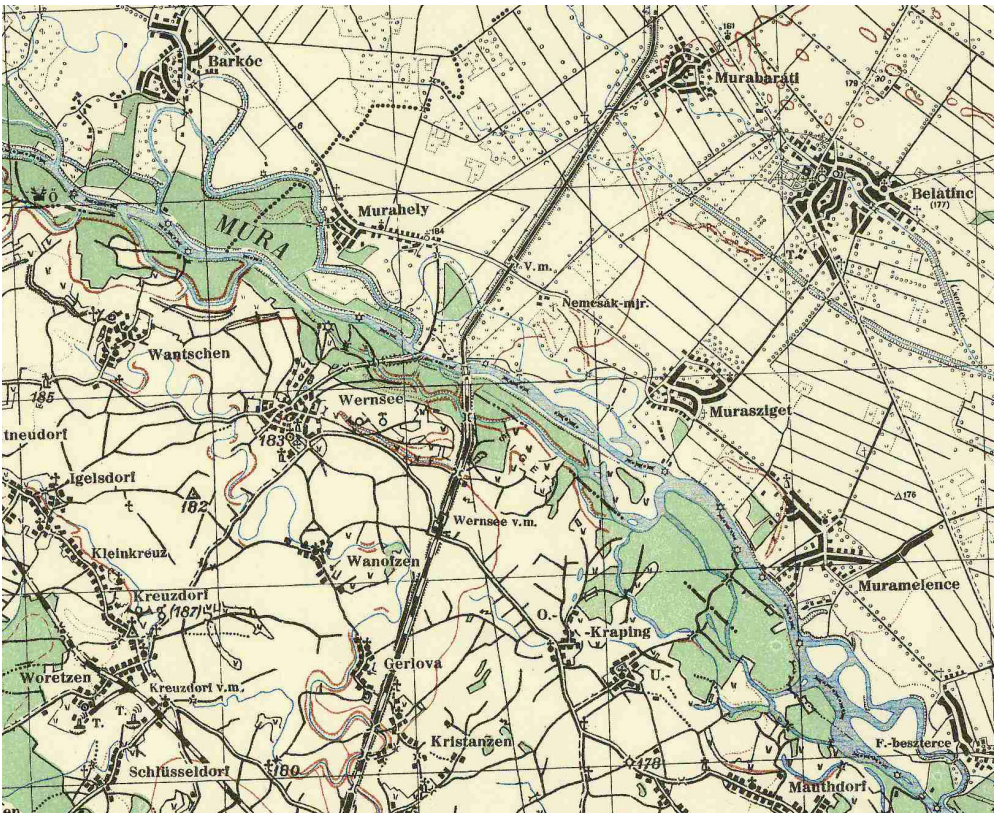


Fig. 6: A detail of a Hungarian map (Fig. 5) showing the surroundings of Veržej (*Wernsee* in German) and Beltinci (*Belatinc* in Hungarian). Place names on the left (Hungarian) bank of the river Mura are written in Hungarian, on the right (German) bank in German.

Table 1: Maps used when outlining the course of occupation borders (a. FF Geo – Department of Geography, Faculty of Arts, University of Ljubljana, b. NUK – National and University Library, c. GIAM – Anton Melik Geographical Institute, Research Centre of the Slovenian Academy of Sciences and Arts, d. HIM – Hadtörténeti Intézet és Múzeum/Military History Institute and Museum, Budapest; DHk –Deutsche Heereskarte, VGIB – Vojnogeografski institut Beograd, Gk – Generalkarte von Mitteleuropa).

Collection	Year of publication	Scale	Map sheet	Map sheet number	Kept in
DHk	1943	1 : 25.000	Novo mesto	26-1-a	[a]FF Geo
DHk	1942	1 : 25.000	Ogulin	39-1-a	[a]FF Geo
DHk	1942	1 : 25.000	Ogulin	39-1-b	[a]FF Geo

Collection	Year of publication	Scale	Map sheet	Map sheet number	Kept in
DHk	1942	1 : 25.000	Ogulin	39-2-a	[a]FF Geo
DHk	1942	1 : 25.000	Bled	10-3-a	[a]FF Geo
DHk	1942	1 : 25.000	Bled	10-3-b	[a]FF Geo
DHk	1942	1 : 25.000	Bled	10-3-d	[a]FF Geo
DHk	1942	1 : 25.000	Bled	10-4-a	[a]FF Geo
DHk	1942	1 : 25.000	Bled	10-4-c	[a]FF Geo
DHk	1942	1 : 25.000	Bled	10-4-d	[a]FF Geo
DHk	1943	1 : 25.000	Trenta	14A-II-SW	[a]FF Geo
DHk	1943	1 : 25.000	Triglavseen Hutte	26A-I-NW	[a]FF Geo
DHk	1943	1 : 25.000	Sairach	26A-III-SO	[a]FF Geo
DHk	1943	1 : 25.000	Polland	26A-III-NO	[a]FF Geo
DHk	1943	1 : 25.000	Zarz	26A-IV-SW	[a]FF Geo
DHk	1943	1 : 25.000	Circhina	26A-III-NW	[a]FF Geo
DHk	1943	1 : 25.000	Tolmin	9-2-a	[a]FF Geo
DHk	1943	1 : 25.000	Tolmin	9-2-b	[a]FF Geo
DHk	1943	1 : 25.000	Tolmino	26A-I-SW	[a]FF Geo
DHk	1943	1 : 25.000	Tolmin	9-2-d	[a]FF Geo
DHk	1943	1 : 25.000	Novo mesto	26-4-c	[a]FF Geo
DHk	1943	1 : 25.000	Samobor	27-2-a	[a]FF Geo
DHk	1943	1 : 25.000	Samobor	27-2-c	[a]FF Geo
DHk	1943	1 : 25.000	Samobor	27-1-d	[a]FF Geo
DHk	1943	1 : 25.000	Samobor	27-1-c	[a]FF Geo
DHk	1943	1 : 25.000	Samobor	27-1-a	[a]FF Geo
DHk	1942	1 : 25.000	Celje	12-3-d	[a]FF Geo
DHk	1942	1 : 25.000	Celje	12-4-c	[a]FF Geo
DHk	1943	1 : 25.000	Novo mesto	26-4-b	[a]FF Geo
DHk	1942	1 : 25.000	Celje	12-3-c	[a]FF Geo
DHk	1943	1 : 25.000	Cerknica	25-2-b	[a]FF Geo
DHk	1943	1 : 25.000	Cerknica	25-4-c	[a]FF Geo
DHk	1943	1 : 25.000	Cerknica	25-4-d	[a]FF Geo
DHk	1943	1 : 25.000	Ljubljana	11-4-d	[a]FF Geo
DHk	1943	1 : 25.000	Ljubljana	11-4-c	[a]FF Geo
DHk	1943	1 : 25.000	Ljubljana	11-3-d	[a]FF Geo
DHk	1943	1 : 25.000	Ljubljana	11-3-c	[a]FF Geo
DHk	1943	1 : 25.000	Novo mesto	26-4-a	[a]FF Geo
DHk	1943	1 : 25.000	Novo mesto	26-3-d	[a]FF Geo
DHk	1943	1 : 25.000	Novo mesto	26-3-c	[a]FF Geo

Collection	Year of publication	Scale	Map sheet	Map sheet number	Kept in
DHk	1943	1 : 25.000	Novo mesto	26-1-b	[a]FF Geo
DHk	1943	1 : 25.000	Susak	38-2-b	[a]FF Geo
DHk	1943	1 : 25.000	Novo mesto	26-2-a	[c]GIAM
DHk	1943	1 : 25.000	Novo mesto	26-2-b	[c]GIAM
DHk	1943	1 : 50.000	Rogatec	13-4	[c]GIAM
VGIB	1941	1 : 50.000	Ptuj	2	[c]GIAM
DHk	1943	1 : 50.000	Ptuj	14-1	[b]NUK
DHk	1943	1 : 200.000	Celje	33-46	[a]FF Geo
Gk	1941	1 : 200.000	Ljubljana	32-46	[a]FF Geo
	1944	1 : 50.000	Szentgotthárd	5256 K.	[d]HIM
	1944	1 : 50.000	Feldbach	5256 NY.	[d]HIM
	1944	1 : 50.000	Radkersburg	5356 NY.	[d]HIM
	1944	1 : 50.000	Muraszombat	5356 K.	[d]HIM
	1944	1 : 50.000	Petrijanec	5456 K.	[d]HIM

None of the Slovene institutions that keep large scale maps (mostly in a scale of 1:25,000) showing a more detailed delimitation of the occupied Slovene territory have a complete collection of maps. Institutions that keep the bulk of cartographic materials of this kind include the Department of Geography, Faculty of Arts, University of Ljubljana, the National and University Library in Ljubljana, as well as Anton Melik Geographical Institute of the Research Centre of the Slovenian Academy of Sciences and Arts. In the case of the German military maps (*Deutsche Heereskarte*) relating to Slovenia, an institution abroad that deserves particular mention in this regard is the Military Geographic Institute (*Istituto Geografico Militare*)[24] in Florence that keeps the complete collection of maps in a scale of 1:25,000. As to the Hungarian maps, mention must be made of the Military History Institute and Museum (*Hadtörténeti Intézet és Múzeum*)[25] in Budapest, which keeps all map sheets for the occupied territory in Prekmurje in a scale of 1:50,000.

24 Low resolution maps can be seen on the institute's website. http://www.igmi.org/

25 http://www.militaria.hu/. Acknowledgement: Dr János Suba and Ábel Hegedüs from the Archive of the Military History Institute (*Hadtörténeti Intézet és Múzeum*) in Budapest helped us obtain maps. We would like to express our gratitude also to Dr Gábor Gercsák from the Department of Cartography and Geoinformatics, Faculty of Informatics, Eötvös University (ELTE *Térképtudományi és Geoinformatikai Tanszék, Informatikai Kar, Eötvös Loránd Tudományegyetem*) in Budapest.

A Few Characteristic Features of Occupation Borders

With the occupation of the Slovene territory, there were four state borders in Slovenia in 1941 (Fig. 7): the border between Germany and Italy, Germany and Hungary, Germany and the NDH, as well as Italy and the NDH. In total, 665.5 km of occupation borders ran along the territory of modern-day Slovenia (Table 2). Totalling almost 277 km (i.e. almost 42% of all occupation borders), the border between Germany and Italy was the longest. It was followed by the border between Italy and the NDH (172 km or 26%), Germany and the NDH (133 km or 20%), and Germany and Hungary (83 km or 13%) (Fig. 8). Slightly more than half its course (51.3%) corresponds to Slovenia's modern-day borders, while the remaining part (48.7%) ran within modern-day Slovenia. The longest border running within the boundaries of modern-day Slovenia was that between Germany and Italy, i.e. 264 km or 95% of the border. The remaining borders had a higher share of the border that corresponds to modern-day borders: Italy and the NDH 171 km (99%), Germany and the NHD 115 km (86%), Germany and Hungary 44 km (52%) (Table 2, Fig. 9).

A few shorter sections of occupation borders ran outside modern-day Slovenia (39 km), mostly on Germany's borders (a good 25 km) and Italy's borders (a good 12 km) with the NDH; consequently, the total length of occupation borders in Table 2 exceeds 700 km.

With respect to relief units, the bulk of occupation borders (47%) ran along the beds of watercourses or in their immediate proximity. Considering Slovenia's dynamic relief, it is not surprising that 45% are followed by hilly and mountainous terrain. A good one-seventh of the border ran along ridges of mountains, hills or low hills, and almost one-third on their slopes. Just one-tenth of borders ran along the lowlands (Fig. 10).

The bulk of the Slovene territory, which comprised the area of the Drava Banovina in the Kingdom of Yugoslavia, was occupied by Germany, i.e. almost two-thirds. Almost 6% were occupied by Hungary and only 0.08% by the NDH. Almost one-third of the territory became part of Italy (Table 3, Fig. 11). Along with modern-day Slovene territory to the west of the Rapallo border,[26] Italy occupied more than 9,062 km^2 or more than 44% of modern-day Slovenia.

26 Mikša, Zorn, Rapalska meja.

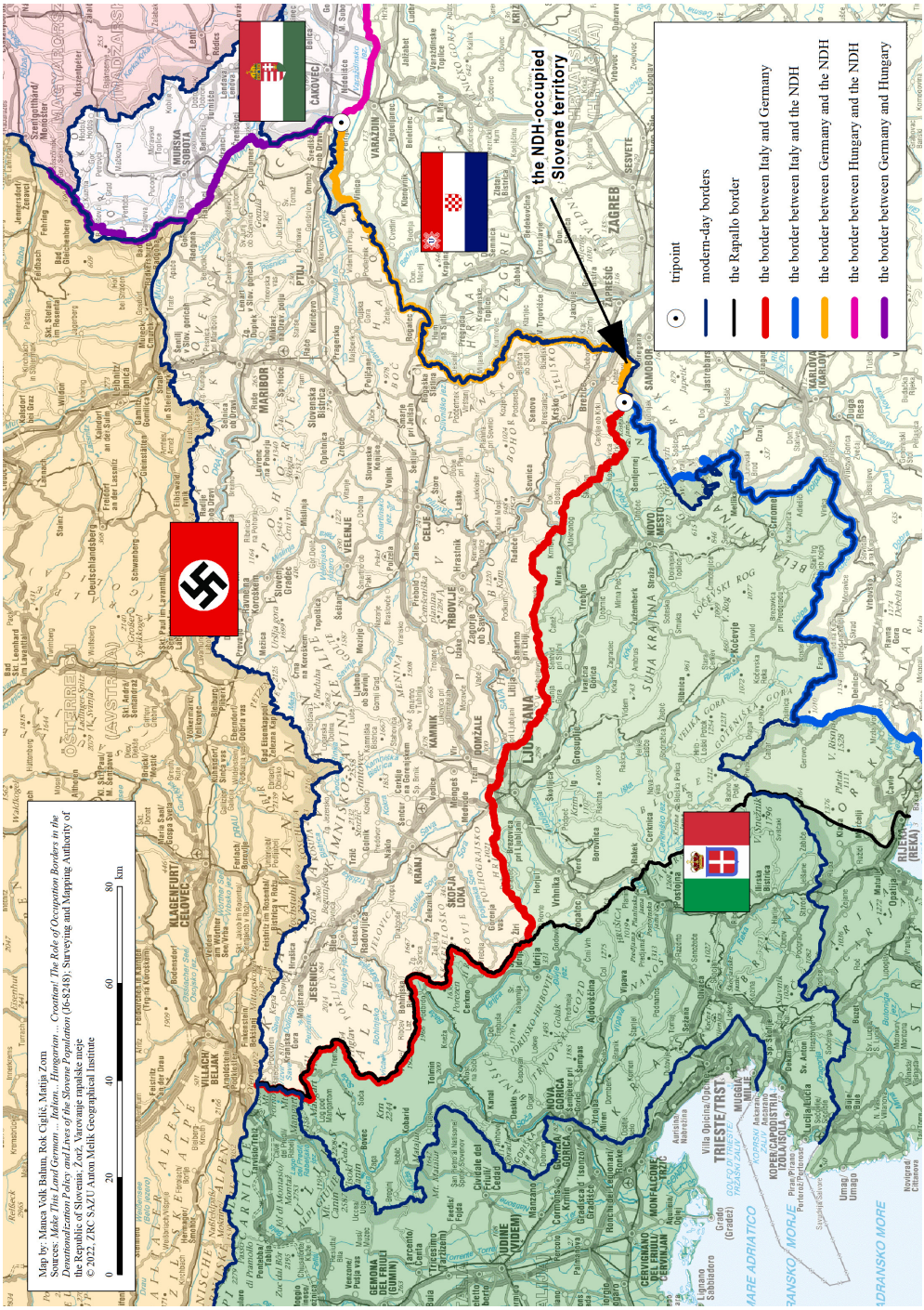


Fig. 7: The Slovene territory was divided among the four occupying states.

Table 2: The length of occupation borders on the basis of the vectorization of the borders' course on maps produced by occupiers. Column 2 shows the length of occupation borders that correspond to modern-day borders. Column 5 shows the length of occupation borders that ran within modern-day Slovenia. Column 8 shows lengths of occupation borders that ran outside modern-day Slovenia. The total length of occupation borders running in modern-day Slovenia is 665.5 km. The total length of all measured occupation borders (including those outside the modern-day Republic of Slovenia) is upwards of 704 km

Border	Running along modern day border (km)	Share (running along modern-day border and within Slovenia) (%)	Share (running along modern-day border and within and outside Slovenia) (%)	Running within Slovenia (km)	Share (running along modern-day border and within Slovenia) (%)	Share (running along modern-day border and within and outside Slovenia) (%)	Running outside Slovenia (km)	Share (running along modern-day border and within and outside Slovenia) (%)	TOTAL (running along modern-day border and within Slovenia) (km)	TOTAL (running along modern-day border and within Slovenia) (%)	TOTAL (running along modern-day border within and outside Slovenia) (km)	TOTAL (running along modern-day border and within and outside Slovenia) (%)
Germany - Italy	12.71	4.59	4.59	264.24	95.41	95.41	0	0	**276.95**	**41.62**	276.95	39.30
Germany - Hungary	43.59	52.24	51.40	39.86	47.76	46.99	1.36	1.60	**83.45**	**12.54**	84.81	12.03
Germany - the NDH	114.84	86.35	72.45	18.16	13.65	11.46	25.51	16.10	**133.00**	**19.98**	158.51	22.49
Italy - the NDH	170.59	99.12	92.46	1.51	0.88	0.82	12.39	6.72	**172.10**	**25.86**	184.49	26.18
TOTAL	**341.73**	51.35	48.49	**323.77**	48.65	45.94	**39.26**	5.57	**665.50**	100.00	**704.76**	100.00

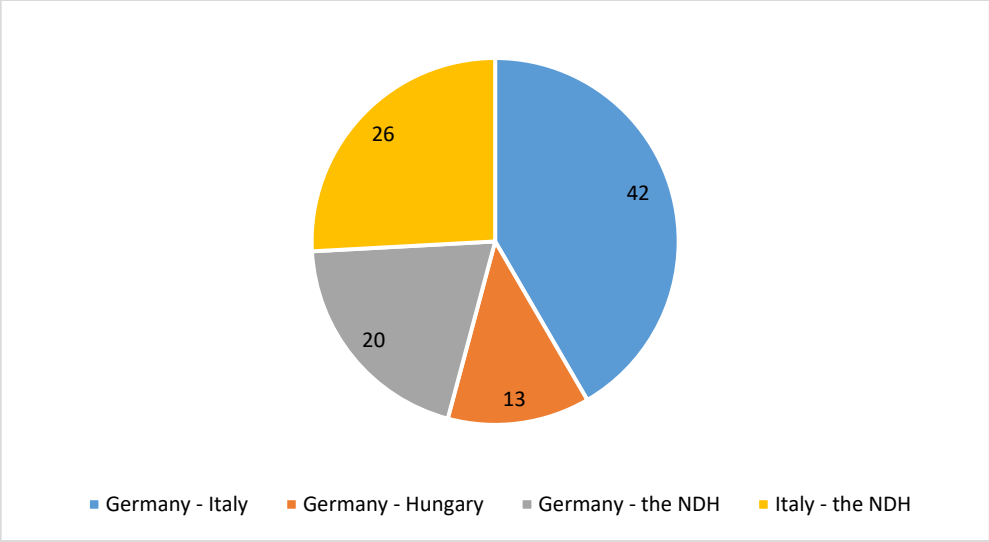


Fig. 8: Share (%) of respective occupation borders within modern-day Slovenia.

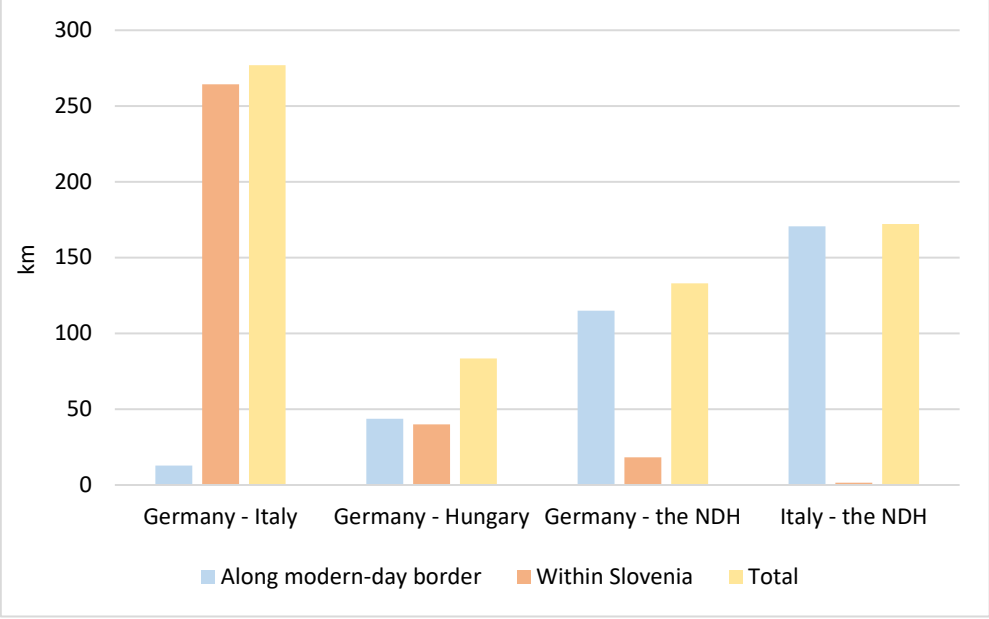


Fig. 9: Length of occupation borders within modern-day Slovenia and along Slovenia's existing borders and in total.

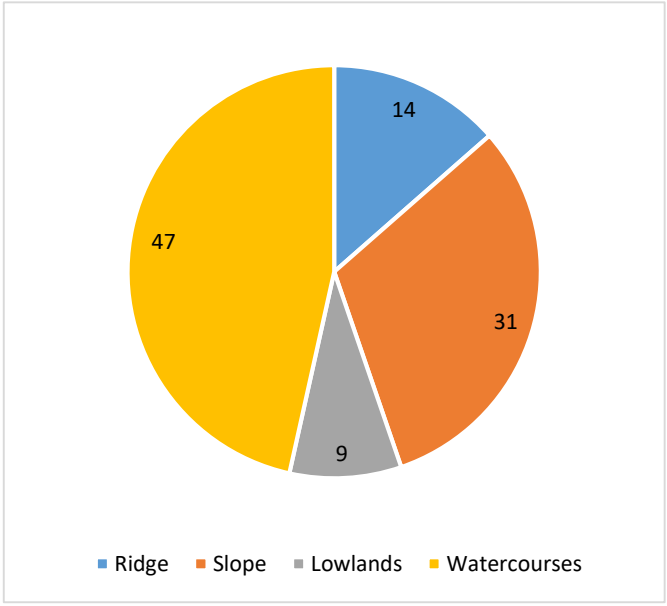
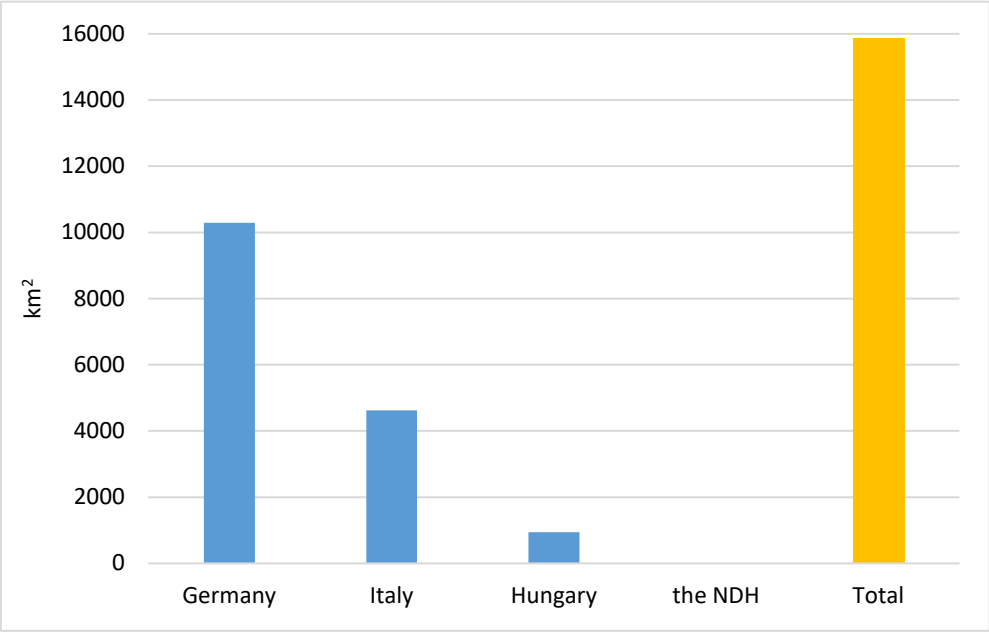


Fig. 10: The course of occupation borders along relief units (including the course of the borders outside modern-day Slovenia).

Table 3: Size of occupied areas in the territory of the former Drava Banovina during World War II.

Occupying state	Area (km²)	Share (%)
Germany	10,291.0	64.85
Italy (Province of Ljubljana)	4621.2	29.12
Hungary	943.6	5.95
the NDH	12.0	0.08
TOTAL	15,867.8	100.00

Fig. 11: The division of modern-day Slovene territory (excluding the area to the west of the Rapallo border) among the four occupying states.



A Few "Deviations" of the Occupation Borders' Course

When vectorizing occupation borders, we noticed that a few sections do not correspond to the modern-day border. On the border between Germany and the NDH these deviations were beneficial to the NDH (e.g. in the area of Obrežje, in the east of the Gorjanci hill range and Haloze; Figs. 12, 14 and 15), while in some places Germany occupied parts of the modern-day Croatian territory (e.g. the right bank of Drava near Ormož; Fig. 13). Additionally, Germany occupied a small part of western Goričko, which unlike the rest of Prekmurje, did not become part of Hungary (Fig. 16).

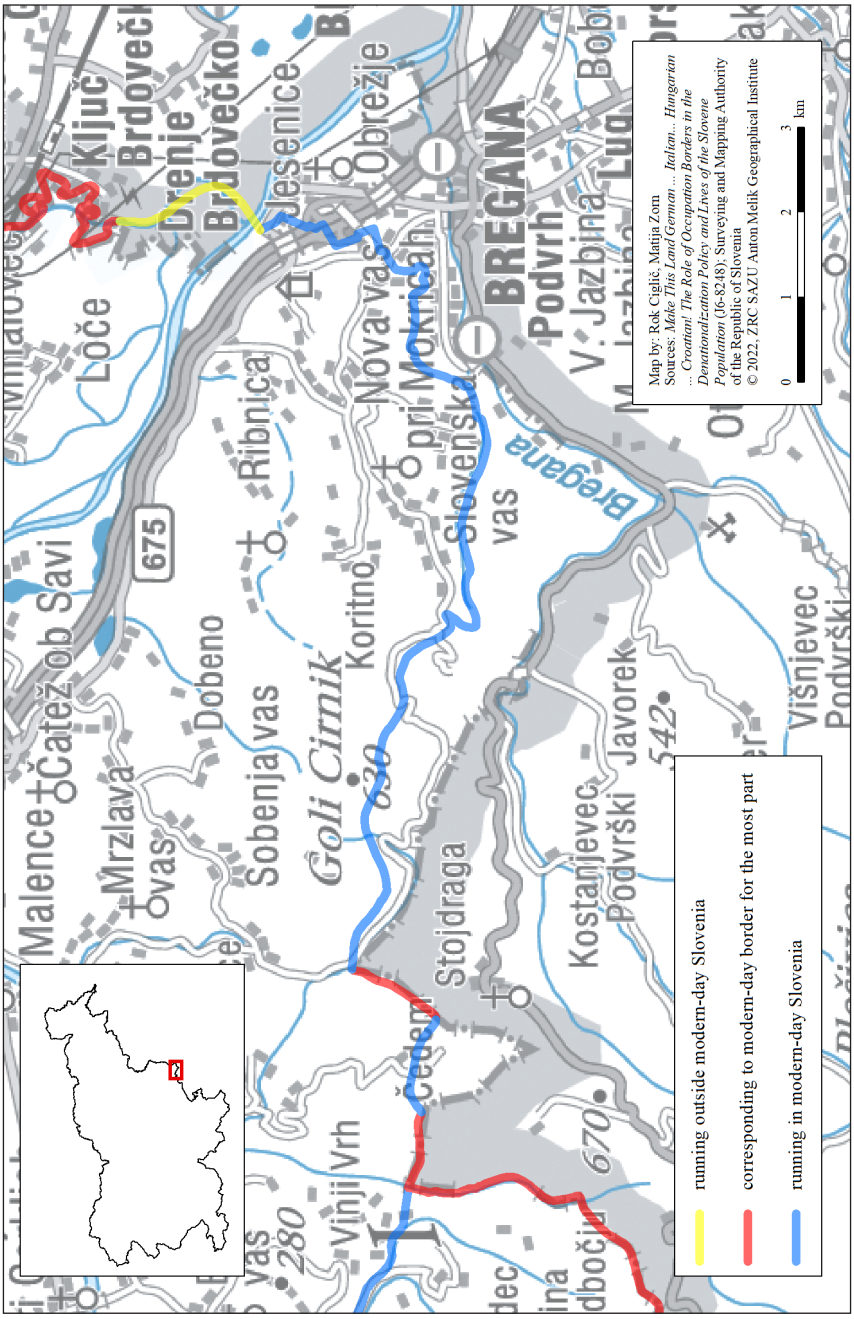


Fig. 12: The border between Germany and the NDH in the area of Obrežje and in the east of the Gorjanci hill range. The occupation border to the north of Sava ran to the "detriment" of the modern-day Croatian territory (0.9 km²) and to the west of Sava to the "detriment" of the modern-day Slovene territory (11.5 km²).

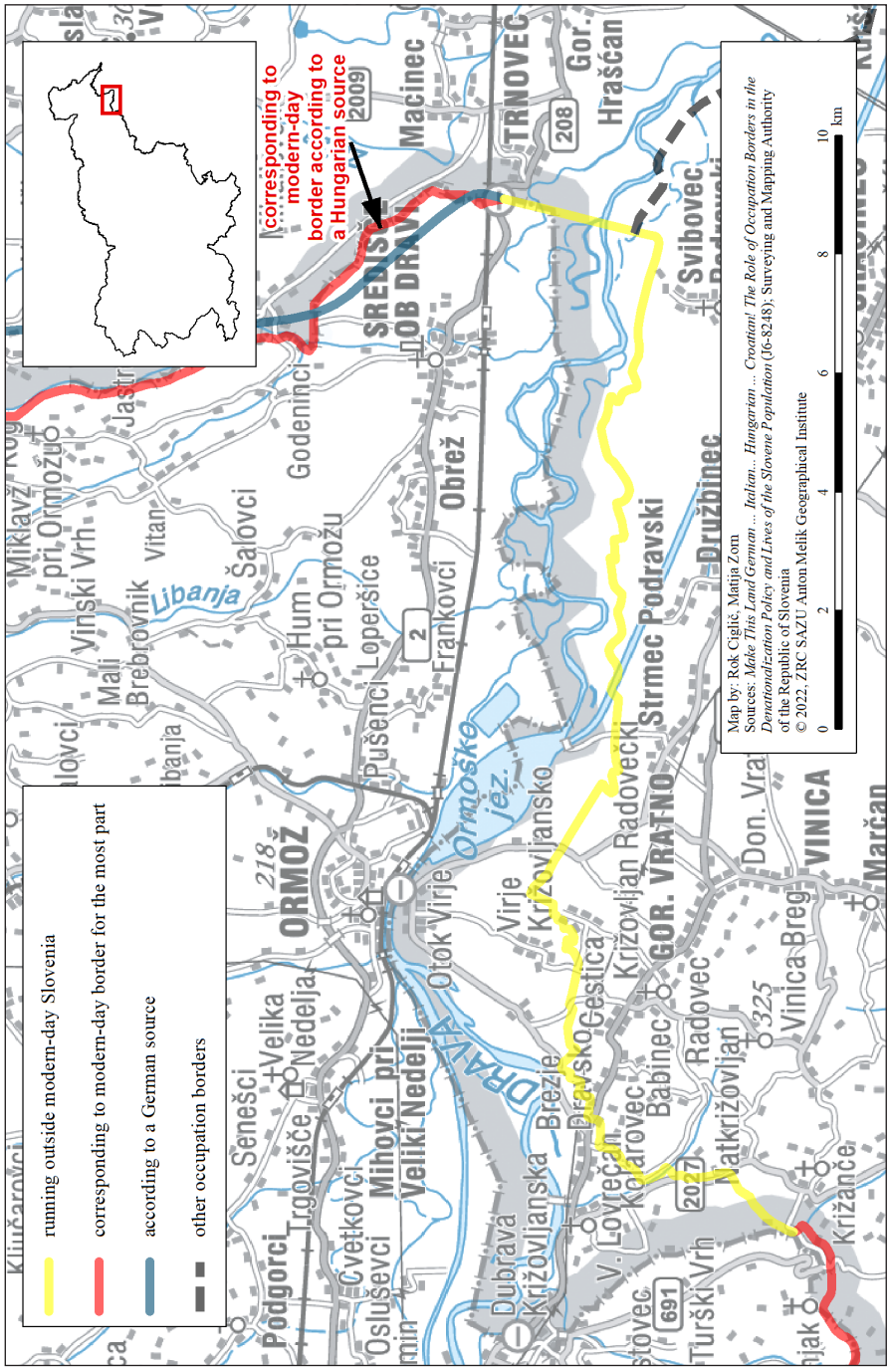


Fig. 13: In the area of Ormož, the border between Germany and the NDH ran to the "detriment" of the modern-day Croatian territory (37.5 km²).

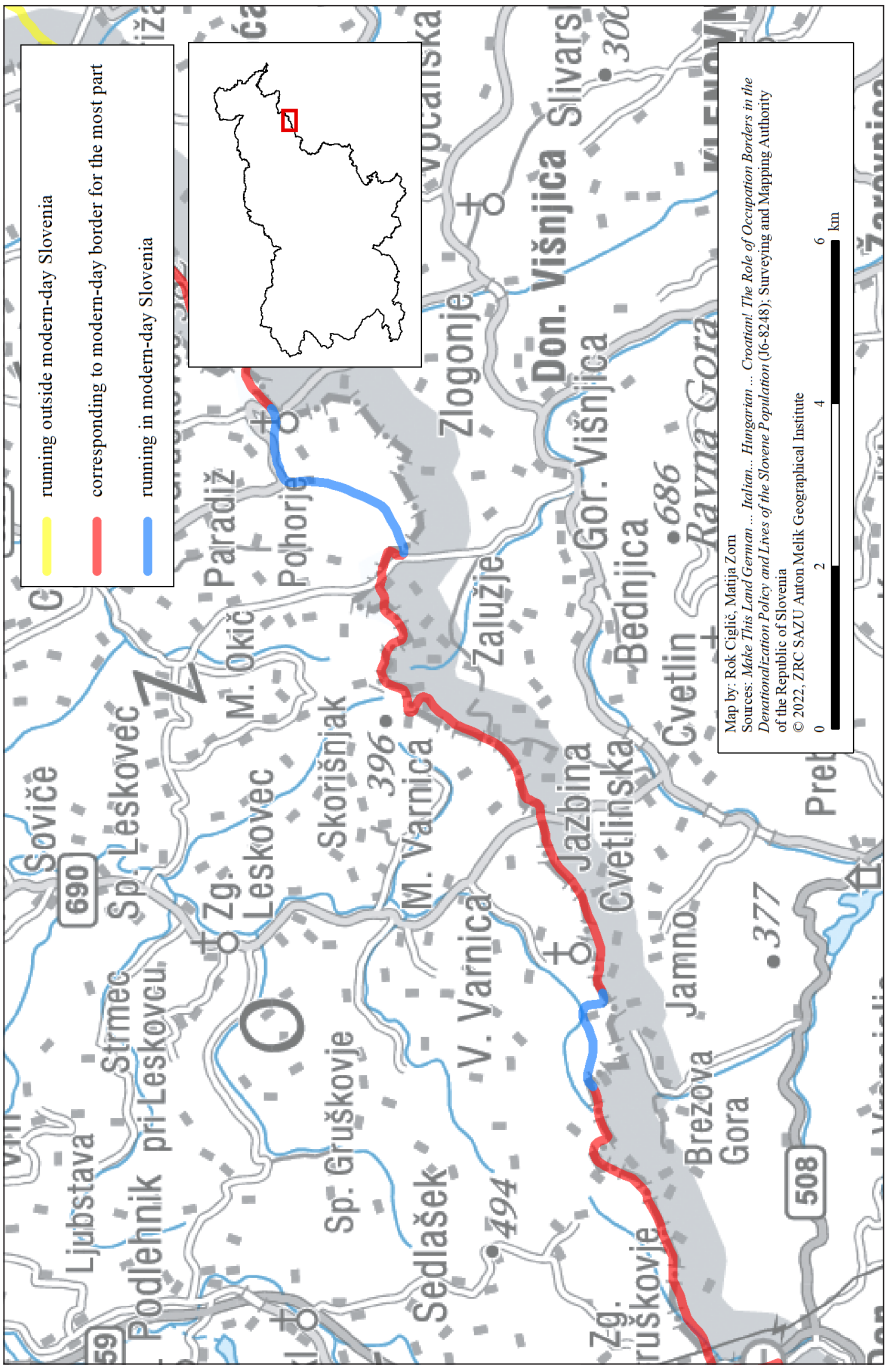


Fig. 14: In the area of Haloze, the border between Germany and the NDH ran to the "detriment" of the modern-day Slovenian territory (1.9 km^2).

Fig. 15: A boundary stone between Germany (the engraved letter D for *Deutschland* is identifiable) and the NDH (numerical marking 30-0) in Haloze, near the settlement of Velika Varnica (Fig. 14). In front of it lies a demolished Austrian-Hungarian boundary stone that marked the border between Styria and Hungary. The Austrian-Hungarian border ran southwards and the occupation border eastwards, whereby the NDH obtained a section of the modern-day Slovene territory.

A few other "deviations" were associated with the used cartographic sources. Different sources produced by the same occupying state showed different courses of the border in the valley of the river Sotla. According to a large-scale map (1:25,000) the border ran along the Sotla, while a small-scale map (1:200,000) showed that the border ran on the river's left (modern-day Croatian) bank (Fig. 17).

Different courses of the border can also be seen on maps produced by different occupying states, e.g. to the north of Središče ob Dravi. The course of the border between Germany and Hungary differs on the map produced by the Germans from that produced by the Hungarians. (Fig. 18)

The most significant deviations of actual occupation borders from those on maps occurred in Bela krajina (Fig. 19). Although German maps of this area were published in early 1943, the delimitation between Italy and the NDH is marked as "a temporary

course of the border" from early 1942. The situation with the surroundings of Kostel was similar. The border ran actually along the river Kolpa and in the Gorjanci hill range on the borders of the former Drava Banovina.[27]

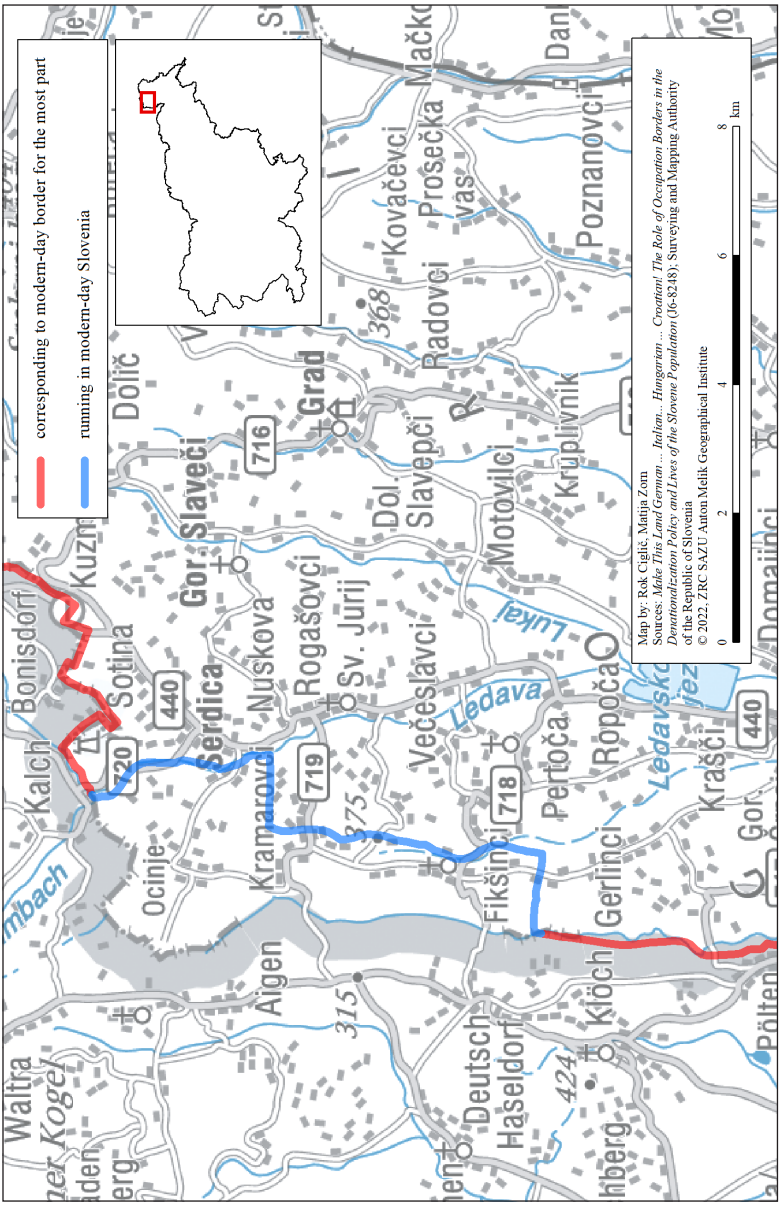


Fig. 16: In western Goričko the border between Germany and Hungary deviated from the modern-day border between Austria and Slovenia. Germany occupied 11.4 km² of Prekmurje.

27 Bohinec, *Kraljevina Jugoslavija*; *Krajevni leksikon*, 128.

Fig. 17: A section of the border between Germany and the NDH in the valley of the river Sotla according to two German cartographic sources. According to a small-scale map (see green line), Germany obtained 3.8 km² of the modern-day Croatian territory.

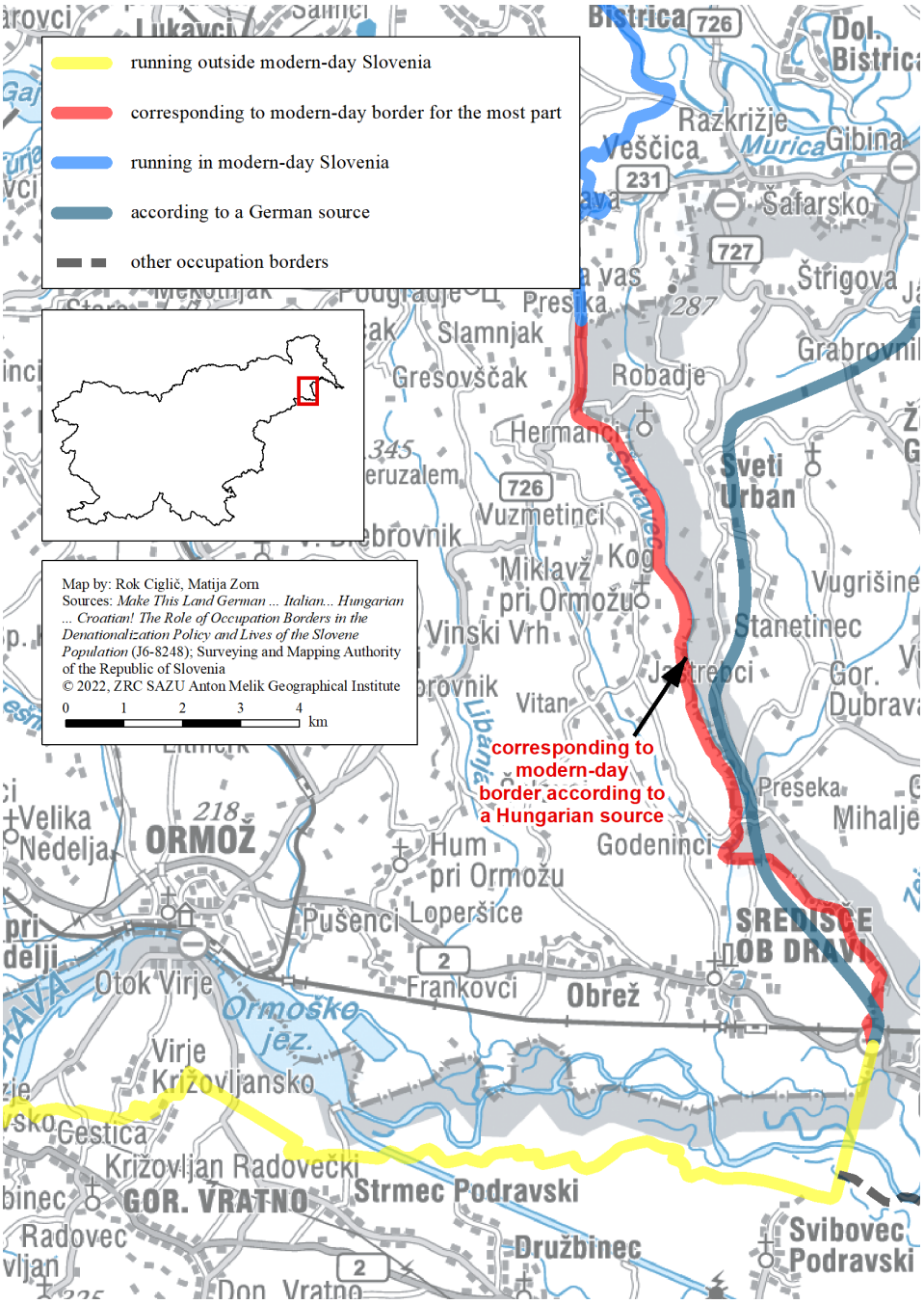


Fig. 18: The course of the border between Germany and Hungary to the north of Središče ob Dravi based on cartographic sources produced by different occupying states.

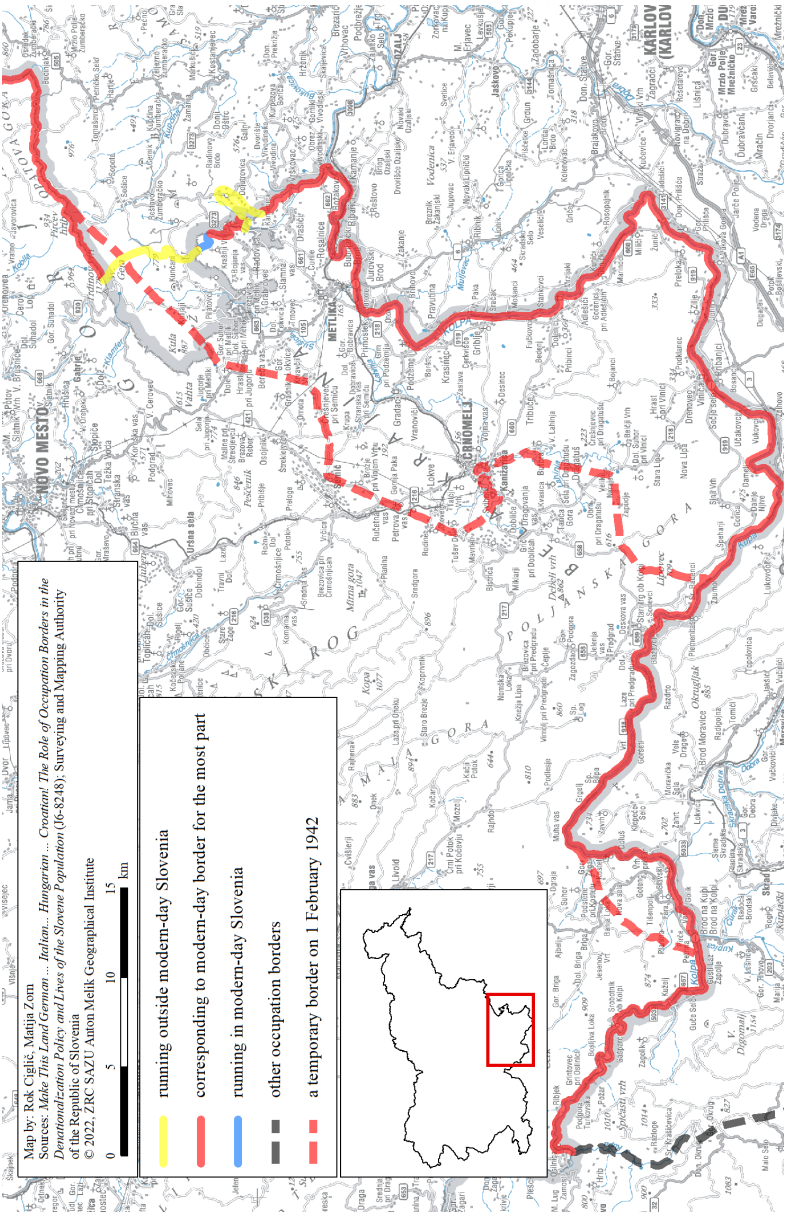


Fig. 19: The delimitation of Italy and the NDH in Bela krajina and Kostel. The "temporary" border from early 1942 was marked on a German map that was produced in 1943. The actual course of the border ran along the river Kolpa and on the Gorjanci hill range, as well as along the borders of the former Drava Banovina — the situation after 2 September 1931. On the Gorjanci hill range, the border ran somewhat more to the east than at the present; consequently, Italy obtained 38.4 km² of the modern-day Croatian territory. Somewhat more to the south, the NDH obtained 0.5 km² of the modern-day Slovene territory.

Conclusion

During World War II the territory of modern-day Slovenia was occupied by Germany, Italy, Hungary, and the NDH. A comprehensive on-site survey of occupation borders has not been conducted thus far. By digitalizing extensive archival cartographic materials, as well as processing and analysing maps by means of geographic information systems, we sought to show in the current paper the entire course of the borders in Slovenia during World War II, measure their lengths and analyse their course along natural units (rivers, ridges, lowlands). We listed a total of more than 665 km of occupation borders in modern-day Slovenia. The identified course of the border makes it possible to identify the remaining border infrastructure on location, and digitalized archival cartographic may materials facilitate further desk analyses.

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Sources and authorship of figures

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Summary

Matija Zorn, Rok Ciglič, Primož Gašperič

State Borders in the Territory of Slovenia during World War II on Cartographic Materials Produced by the Occupying Forces

Cartographic material is very useful when it comes to the spatial understanding of a landscape over a period or monitoring the spatial dynamics of phenomena and processes over long periods. Cartographic sources are not only a means of spatial representation of phenomena, but also a credible document of the space, time, and social conditions in which they were created. As such, they can be regarded as first-hand sources. Often, they contain data not recorded in any other source (e.g. relief, geographical names, borders, roads, watercourses). They are primarily used in historical geography and environmental history, in connection with changes in land use and cultural landscape. However, as with all historical sources, cartographic ones also require critical treatment.

The use of cartographic sources for the quantitative study of historical landscapes has been accelerated by geographic information systems (GIS). Historical sources must be adequately prepared before they can be used in GIS. Usually, there are three stages of processing: digitization, georeferencing, and vectorization.

Monitoring landscape changes (including borders) especially requires cartographic sources of larger scales. This paper deals with such maps made by the German and Hungarian armies during World War II, which show the state borders on Slovenian territory during that period. With the occupation of the Slovenian territory in 1941, four national borders were established: between Germany and Italy, between Germany and Hungary, between Germany and the Independent State of Croatia (NDH), and between Italy and the NDH.

54 maps were used to determine the borders, 44 of them in scale 1:25,000, eight in scale 1:50,000, and two in scale 1:200,000. All maps were issued between 1941 and 1944. To determine the border between Germany and Italy, Germany and the NDH, and Italy and the NDH,

we used mostly *Deutsche Heereskarte* maps (1:25,000), issued in 1942 and 1943. To determine the border between Germany and Hungary, we mainly relied on Hungarian military maps (1:50,000), issued in 1944.

In total, there were 665.5 kilometers of occupation borders on the territory of modern-day Slovenia. The longest was the border between Germany and Italy, long almost 277 kilometers (almost 42% of all occupation borders). It was followed by the borders between Italy and the NDH (172 km or 26%), Germany and the NDH (133 km or 20%), and Germany and Hungary (83 km or 13%). More than half (51.3%) of the borders coincided with the modern-day borders of Slovenia, while less than half (48,7%) ran inside the modern-day territory. Germany and Italy had the longest border within Slovenia's present borders - 264 kilometers or 95% of the border. Other borders had a larger share of the border that coincides with current borders: Italy-NDH 171 km (99%), Germany-NDH 115 km (86%), and Germany-Hungary 44 km (52%).

According to relief units, the majority of occupation borders (47%) ran along watercourses or close to them, while only slightly less (45%) ran in the uplands. Only a tenth of the borders ran across lowlands.

The largest part of the Slovenian territory, which covered the territory of the Drava Banovina in the Kingdom of Yugoslavia, was occupied by Germany - almost two thirds (10,291 km^2). A little less than 6% was occupied by Hungary (945 km^2), while the NDH occupied 0.08% (12 km^2). Almost a third belonged to Italy (4,621 km^2). Together with modern-day Slovenian territory west from the interwar Rapallo border, Italy occupied as much as 9,062 km^2 or more than 44% of modern-day Slovenia.