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Research Institute of Geodesy, Topography and Cartography

Digitizing of old maps and on-line tools for using them

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Digital Approaches to Cartographic Heritage, Venice 26-28 April 2017

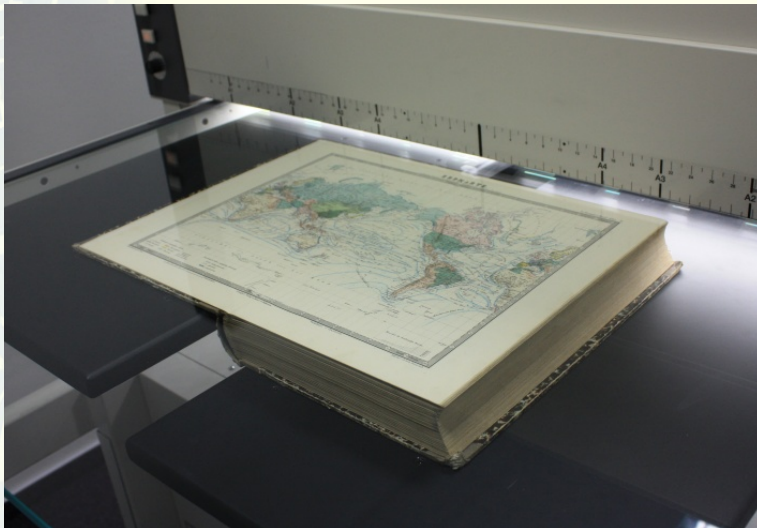
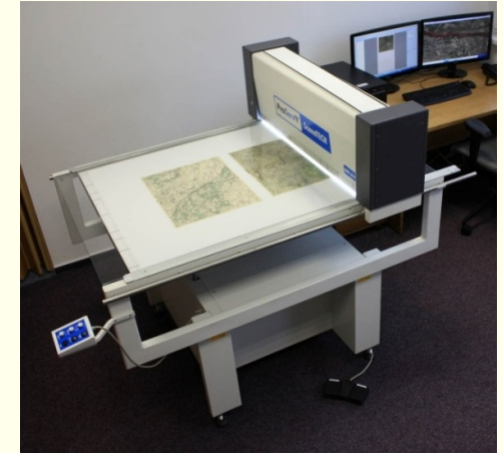
Motivation

- **Today's modern methods of digitization and on-line accessing of old maps allow much more than just making copies for viewing them.**
- **These modern methods allow to fully exploit the potential of old maps as cartographic works with all of their specific characteristics.**
- **This contribution will show good practice for digitization and on-line accessibility of old maps.**

Good practice by digitizing of old maps and atlases (requirements for proper digitization)

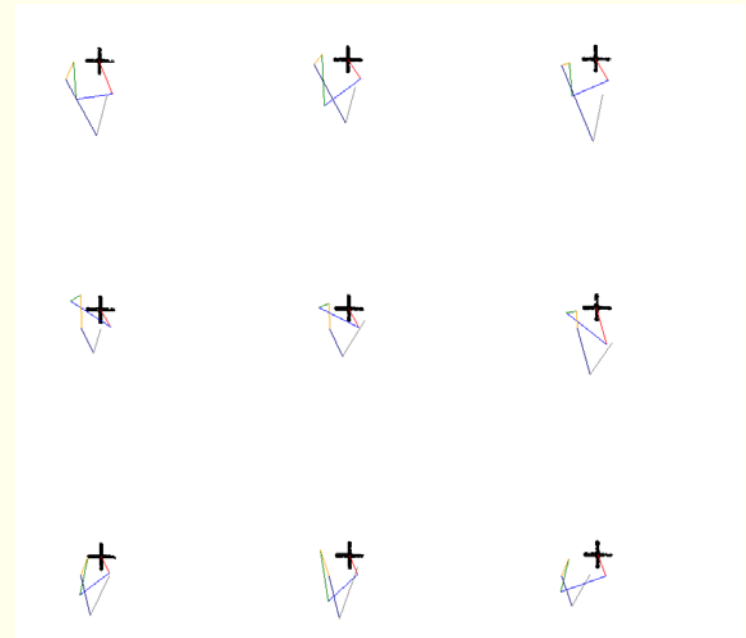
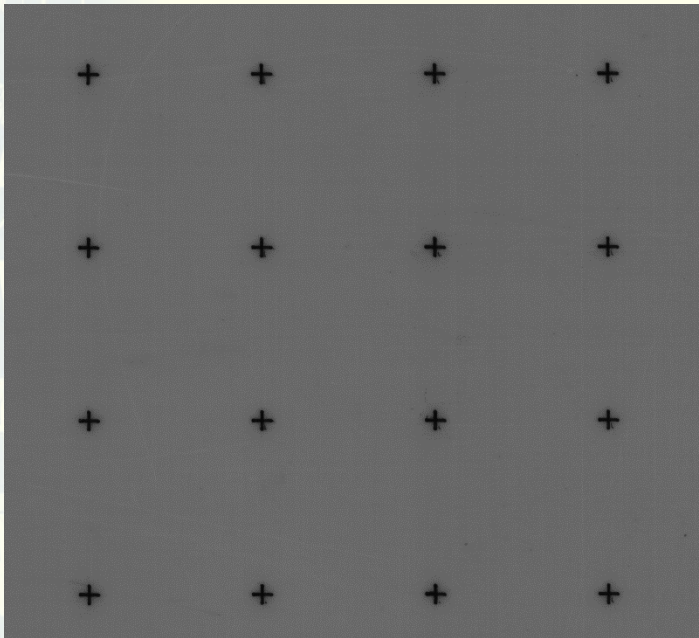
Maps and atlases – precise cartometric scanner (e.g. ScannTech 800i)

- format A0+,
- optical resolution **800 dpi**,
- color depth 24-bit, ICC profile,
- maximal deviation in positioning **0.2 mm**,
- **maintaining cartographic map properties**,



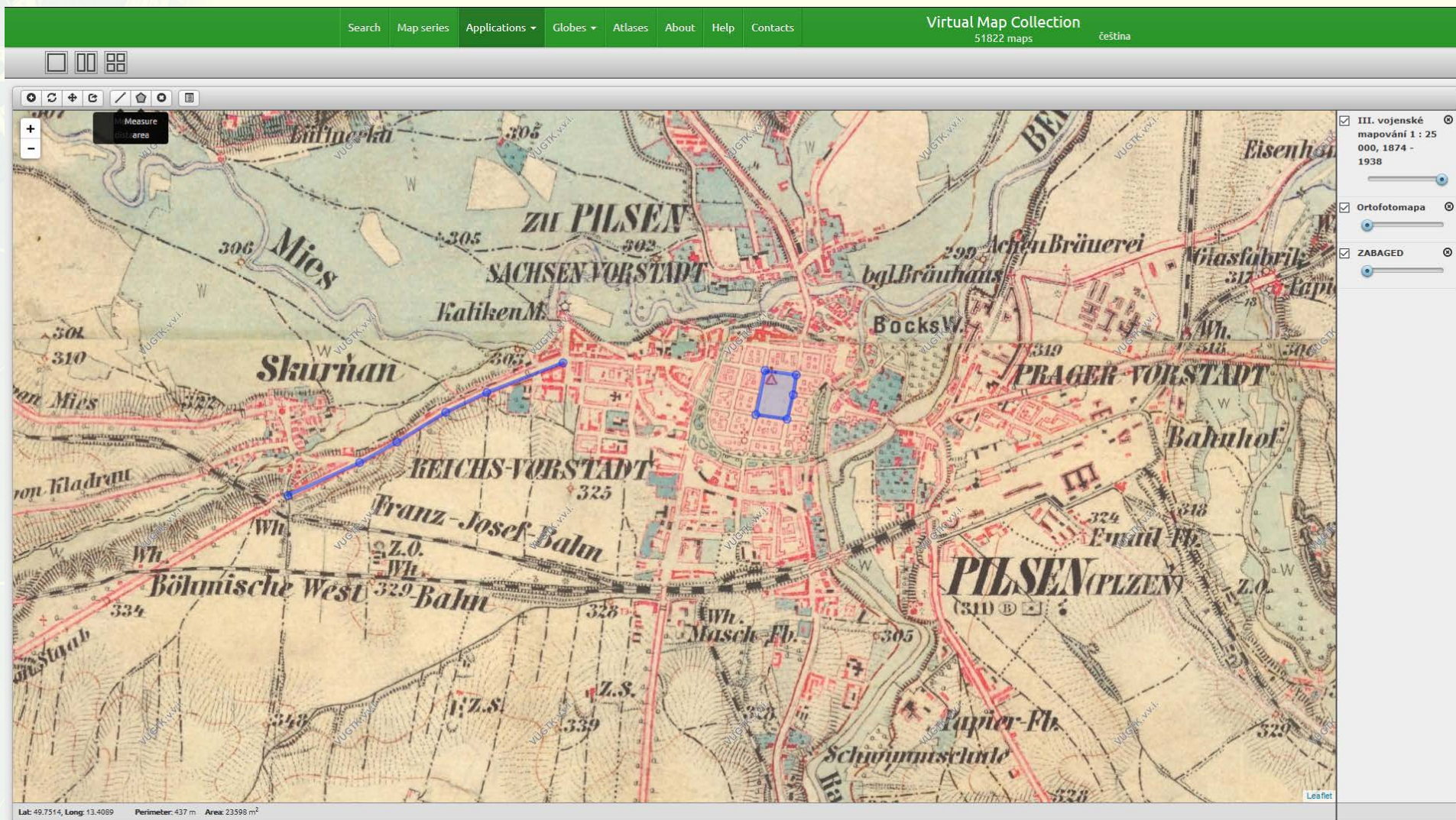
Accuracy Testing of Cartometric Scanners

- Testing by scanning of special template – rectangular grid of points with know real coordinates
- **Absolute Accuracy** - Differences between reproduction and original (Good accuracy is < 0.3 mm difference)
- **Relative Accuracy** - Differences between multiple reproductions of original (change of accuracy over time), detects sudden loss of accuracy (scanner defect)



Good practice for using of on-line available old maps

MapComparer - web application for comparing old maps, tools for measuring distances and areas, layering associated with opacity



Good practice for using of on-line available old maps

MapComparer - dividing the window into 2 or 4 sections, synchronization

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Top Left Panel:

Map of Pilsen (Plzeň) showing historical features. Labels include: ZU PILSEN, SACHSEN VORSTADT, Katiken M., Achen Bräuerei, Bocksw., PRAGER VORST., Reichs Vorstadt, Franz-Josef-Bahn, Pilsen (Plzeň), Email Pl., Müschle Pl., Lat: 49.7463, Long: 13.3946.

Legend:

- III. vojenské mapování 1 : 25 000, 1874 - 1938
- III. vojenské mapování 1 : 75 000, 1935 - 1947

Top Right Panel:

Map of Pilsen (Plzeň) showing historical features. Labels include: Pilsen, Sackau Vorstadt, Achen Bräuerei, Bocksw., PRAGER VORST., Reichs Vorstadt, Franz-Josef-Bahn, Pilsen (Plzeň), Email Pl., Müschle Pl., Lat: 49.746, Long: 13.3526.

Bottom Left Panel:

Aerial view of Pilsen (Plzeň) showing modern urban layout. Labels include: Pilsen (Plzeň), Lat: 49.7174, Long: 13.356.

Bottom Right Panel:

Map of Pilsen (Plzeň) showing historical features. Labels include: Pilsen, Sackau Vorstadt, Achen Bräuerei, Bocksw., PRAGER VORST., Reichs Vorstadt, Franz-Josef-Bahn, Pilsen (Plzeň), Email Pl., Müschle Pl., Lat: 49.7544, Long: 13.373.

Legend:

- Müllerova mapa Čech 1 : 132 000, 1720

Good practice for using of on-line available old maps

Map symbols - web application for automated search of map symbols on maps III. Military Survey

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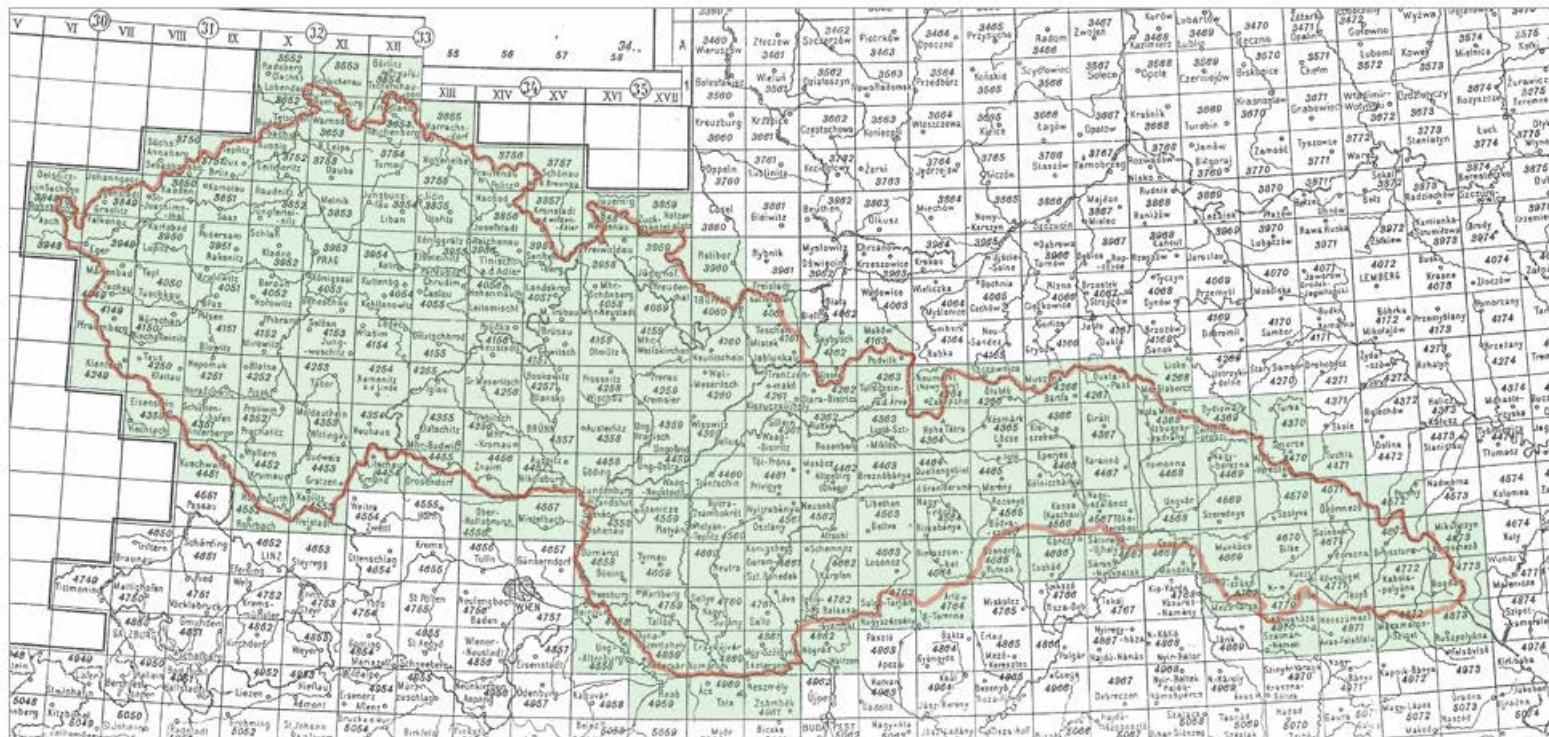
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Map symbols of 3rd. Military Survey

3rd Military Survey 1 : 75 000 are one of the most important and attractive mapsets covering the territory of the Czech Republic. The importance if these maps lies in their rich set of map symbols, detailed coverage of the Czech Republic (and Slovakia) and long period of use.

This application show the positions of map sybols of 3rd Military Survey. These positions were found out by certified technology for map symbol detection on scanned images of maps from the collection of [The Institute of History, Academy of Sciences of the Czech Republic](#). The maps were scanned with 400DPI resolution.

The image below shows the map layout if 3rd Military survey, each sheet pointing to a detailed view showing the map symbol positions.



Good practice for using of on-line available old maps

Map symbols - web application for automated search of map symbols

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
















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3rd Military Survey III. - sheet nr. 4156



<input type="checkbox"/>	Zámek	
<input type="checkbox"/>	Studna	
<input type="checkbox"/>	Hostinec	
<input type="checkbox"/>	Zřícenina	
<input type="checkbox"/>	Rozhledna	
<input type="checkbox"/>	Kostel	
<input type="checkbox"/>	Kaple	
<input type="checkbox"/>	Synagoga	
<input type="checkbox"/>	Socha	
<input type="checkbox"/>	Kříž	
<input type="checkbox"/>	Vápenka	
<input type="checkbox"/>	Továrna	
<input type="checkbox"/>	Vysoká pec	
<input type="checkbox"/>	Mlýn	
<input type="checkbox"/>	Pila	
<input type="checkbox"/>	Větrný motor	
<input type="checkbox"/>	Pramen	
<input type="checkbox"/>	Minerální vody	
<input type="checkbox"/>	Lázně	
<input type="checkbox"/>	Trigonometrický bod	

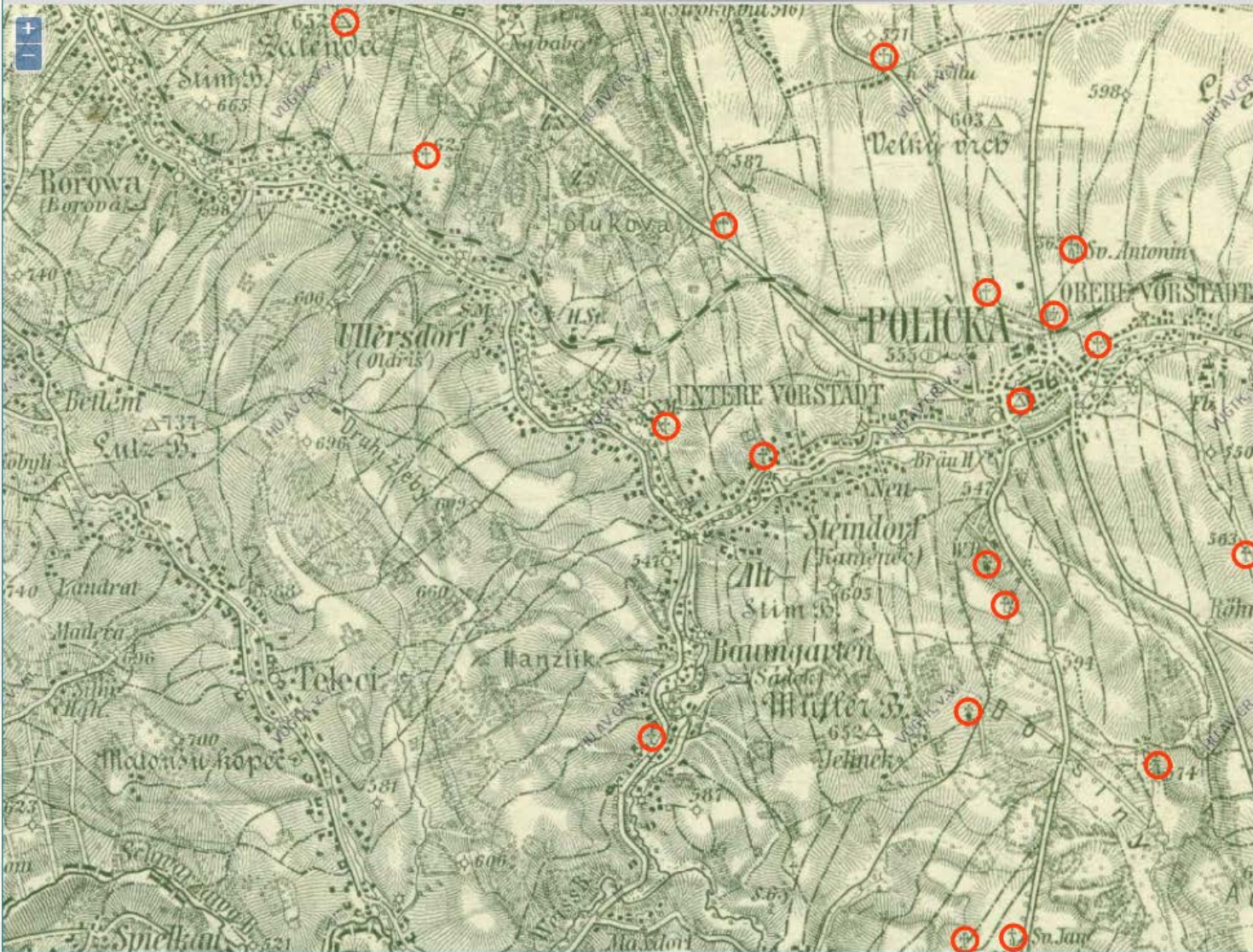
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Map symbols - web application for automated search of map symbols

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3rd Military Survey III. - sheet nr. 4156

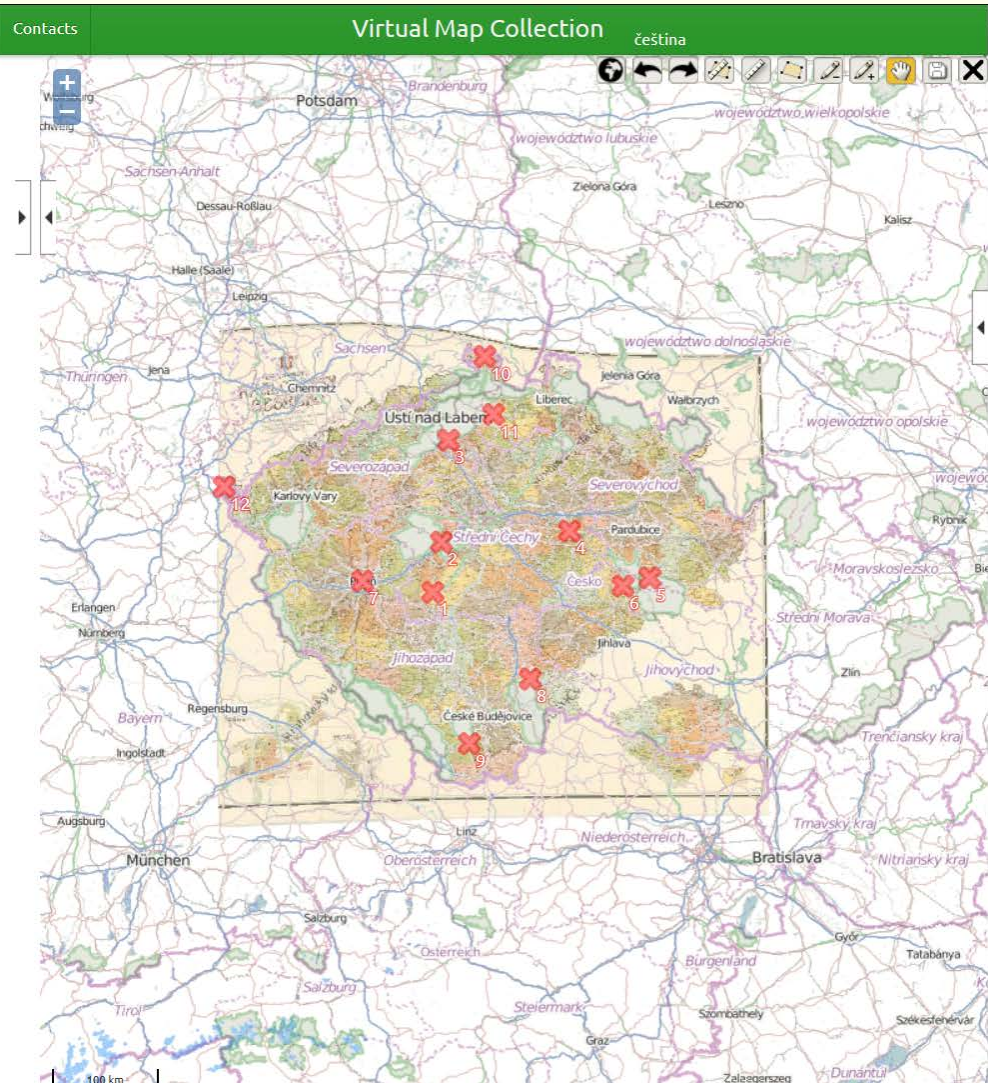
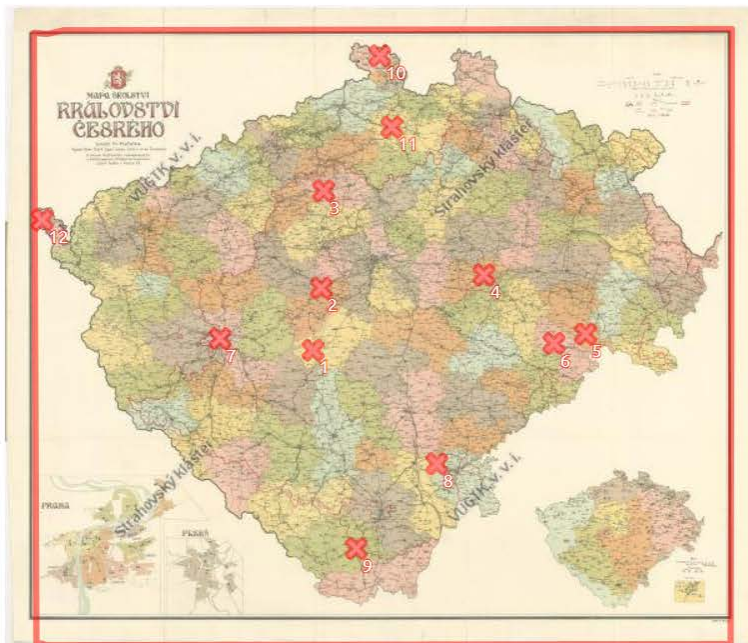


A detailed topographic map from the 3rd Military Survey III, sheet nr. 4156, showing the Policka area. The map features contour lines, roads, and various geographical features. Several points are marked with red circles, indicating specific locations of interest. The map is displayed in a web application interface with a green header bar containing navigation links and a search bar. On the right side, there is a legend titled 'Map symbols' with a list of symbols and their corresponding map features.

<input type="checkbox"/>	Zámek	
<input type="checkbox"/>	Studna	
<input type="checkbox"/>	Hostinec	
<input type="checkbox"/>	Zřícenina	
<input type="checkbox"/>	Rozhledna	
<input checked="" type="checkbox"/>	Kostel	
<input checked="" type="checkbox"/>	Kaple	
<input checked="" type="checkbox"/>	Synagoga	
<input checked="" type="checkbox"/>	Socha	
<input checked="" type="checkbox"/>	Kříž	
<input type="checkbox"/>	Vápenka	
<input type="checkbox"/>	Továrna	
<input type="checkbox"/>	Vysoká pec	
<input type="checkbox"/>	Mlýn	
<input type="checkbox"/>	Pila	
<input type="checkbox"/>	Větrný motor	
<input type="checkbox"/>	Pramen	
<input type="checkbox"/>	Minerální vody	
<input type="checkbox"/>	Lázně	
<input checked="" type="checkbox"/>	Trigonometrický bod	

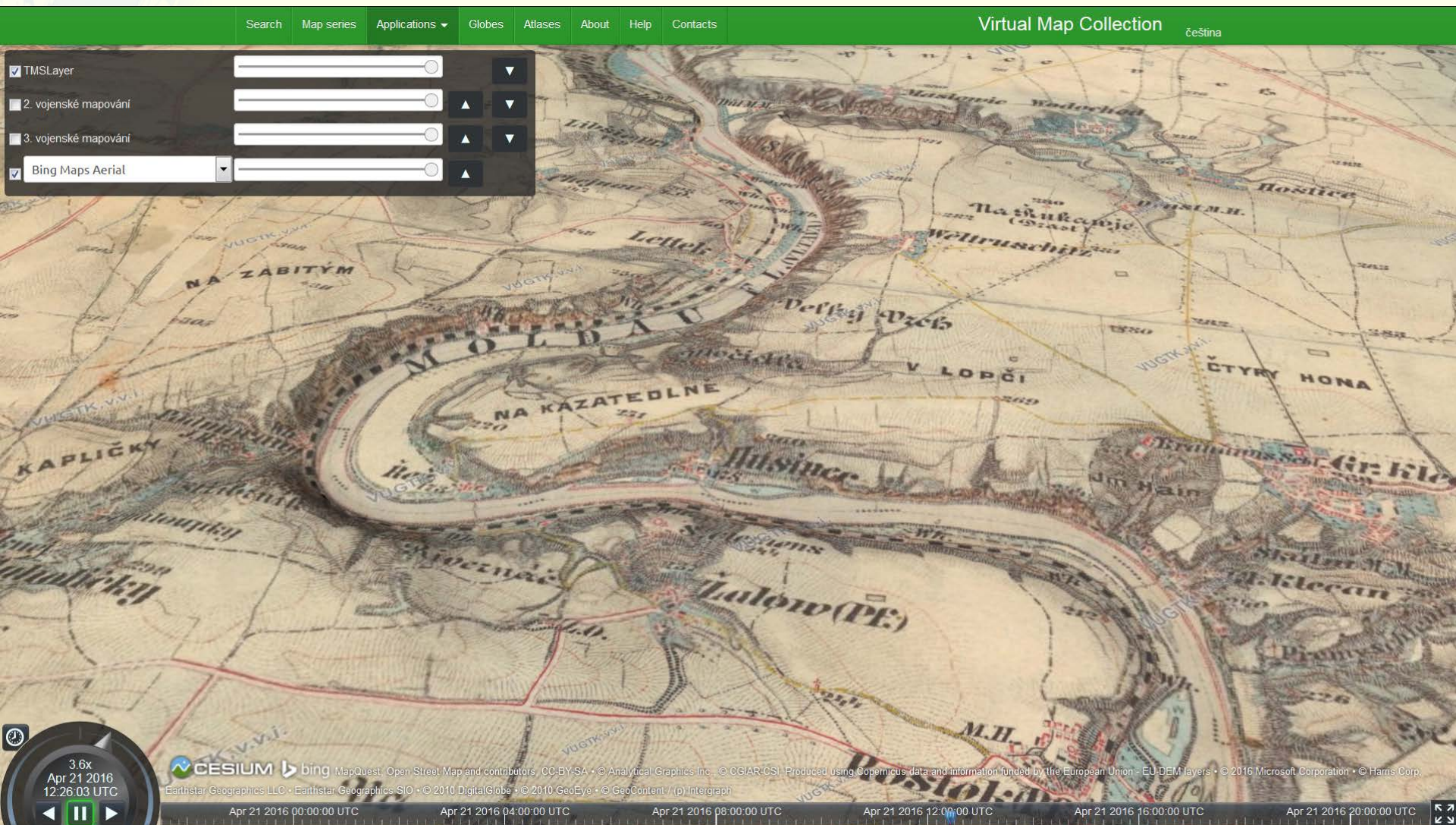
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Zoomify to WMS - web application for Georeferencing of your own maps accessible in Zoomify



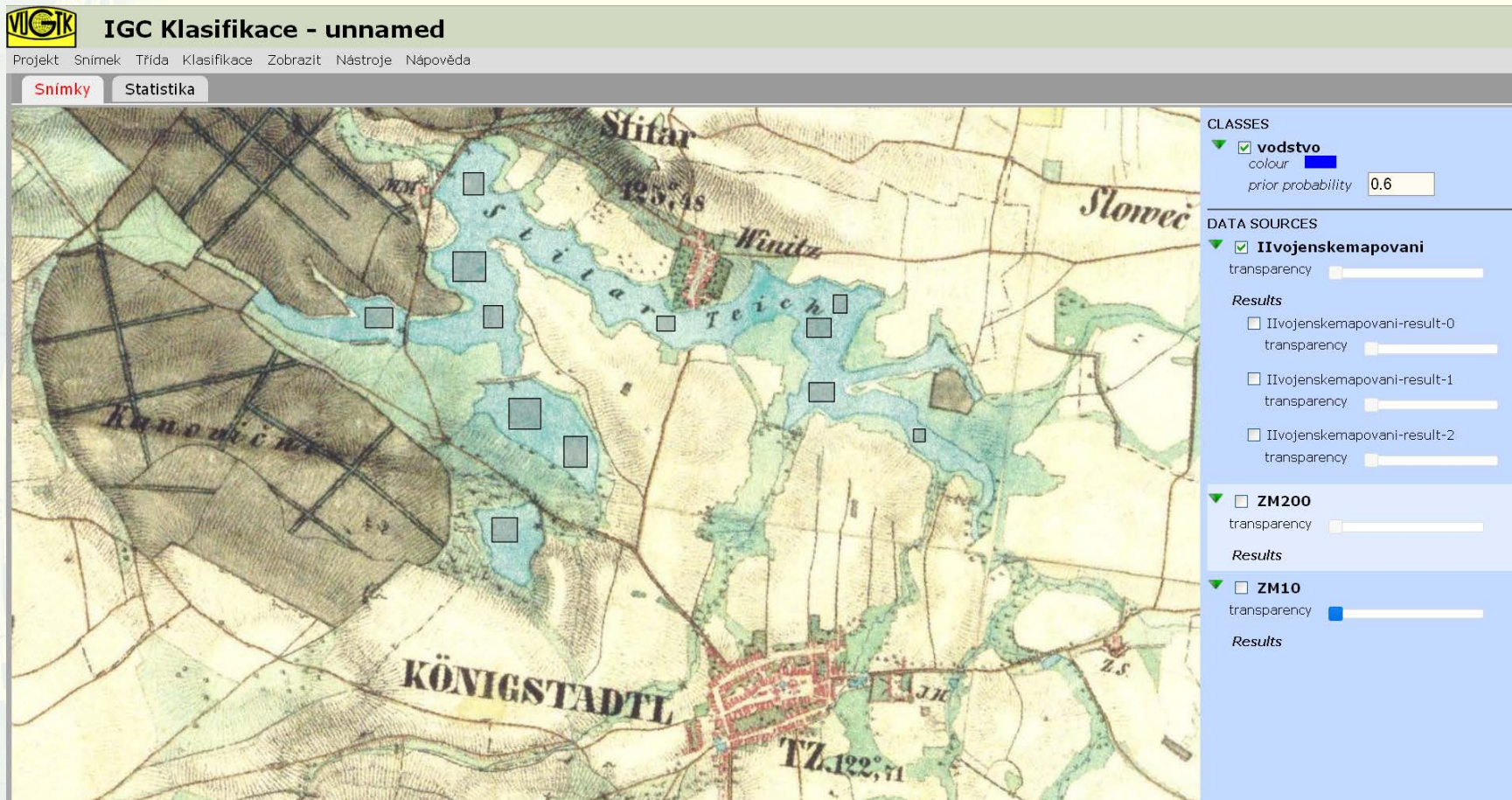
Good practice for using of on-line available old maps

display WMS or TMS in 3D view - web application for displaying of your own georeferenced old maps accessible in WMS or TMS on 3D terrain model



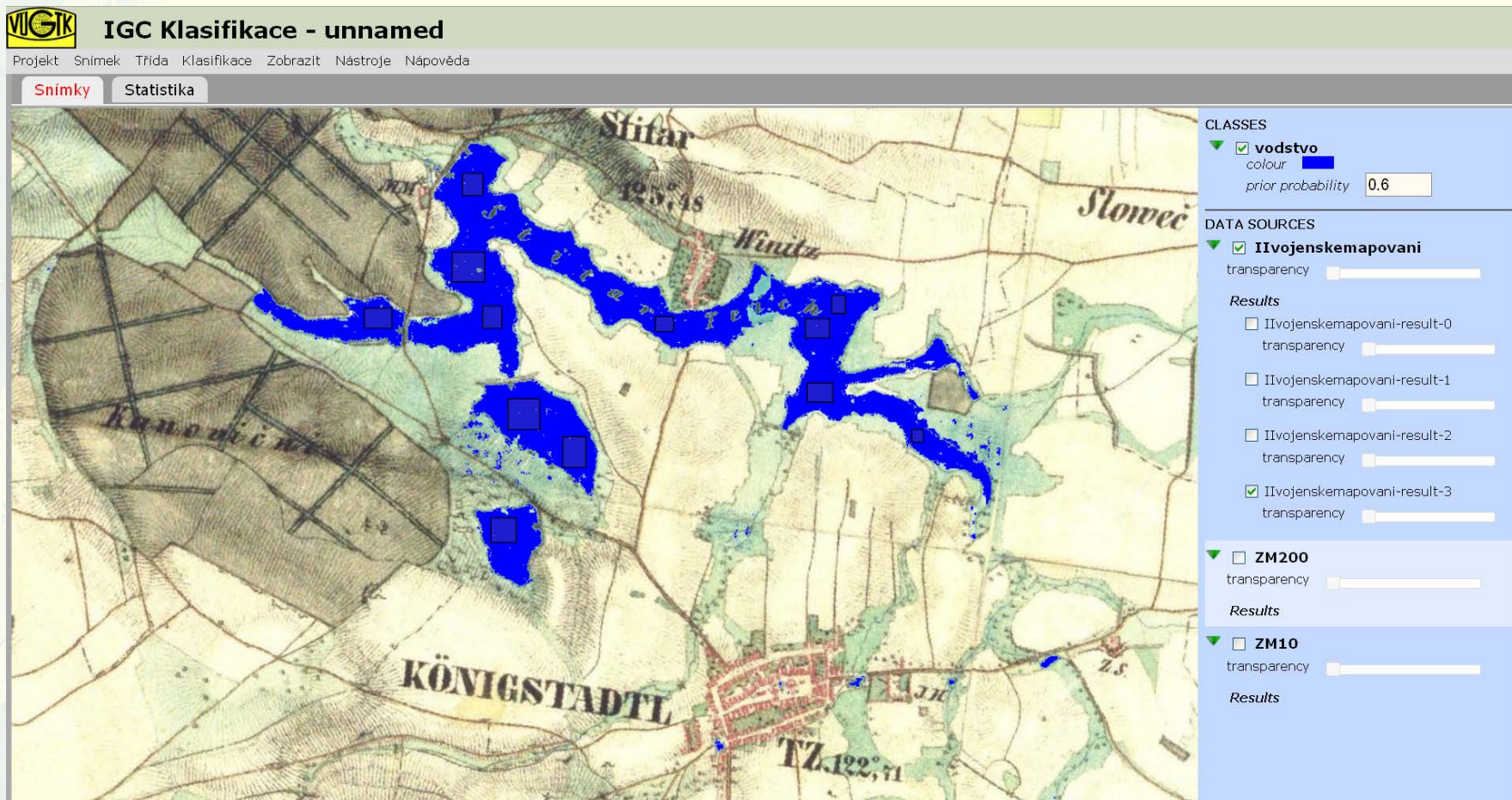
Good practice for using of on-line available old maps

Classification of digitised old maps - Practical example - Estimating the surface area of former lake Štítarský in the first half of 19th century from II. Military Survey maps



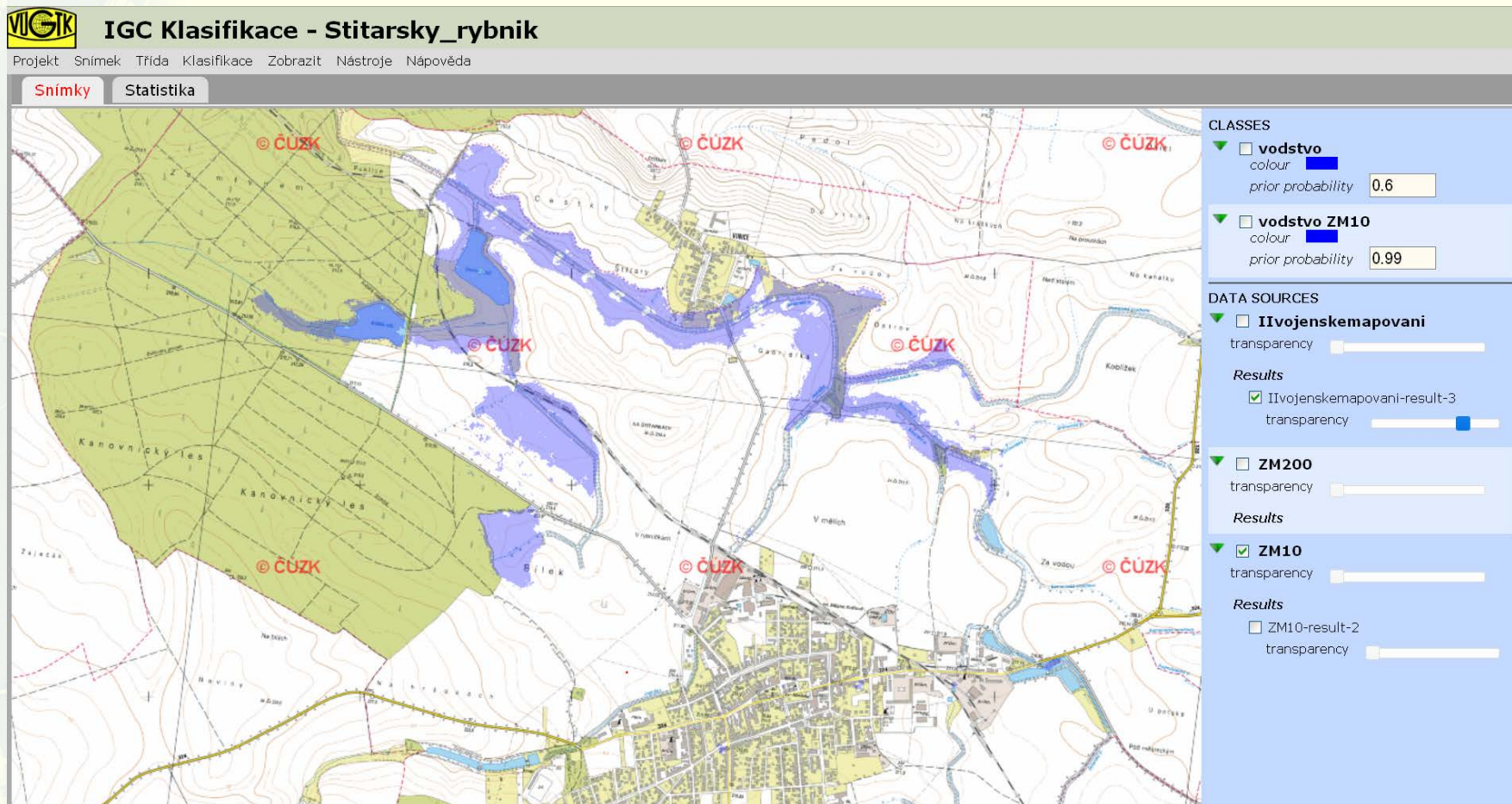
Good practice for using of on-line available old maps

Classification of digitised old maps - Practical example - Lake Štítarský,
result of classification with training areas selection



Good practice for using of on-line available old maps

Classification of digitised old maps - Practical example - Lake Štítarský, classification result displayed over contemporary map source



TALICH M., BÖHM O., SOUKUP L.: **Classification of digitized old maps and possibilities of its utilization.**
e-Perimtron, Volume 7, No. 3: 136-146, ISSN 1790-3769, http://www.e-perimtron.org/Vol_7_3/Talich_et_al.pdf

Conclusion

- **User are no longer satisfied only by simple digitization and on-line publication of old maps for viewing them.**
- **Users demands more, some added value, that would simplify the use of digitized old maps and allow to gain more information than from classic use of paper maps.**
- **The future life of old maps is to shift their understanding from nice pictures (artifacts) to an online service available.**

Thank you for your attention

chartae-antiquae.cz

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