

Výzkumný ústav geodetický, topografický a kartografický, v.v.i. Research Institute of Geodesy, Topography and Cartography

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

Milan Talich

Milan.Talich@vugtk.cz

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

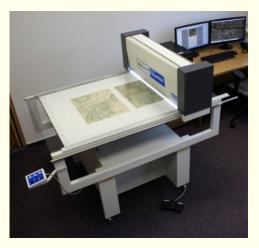
Motivation

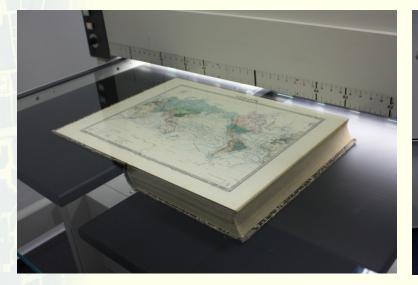
- Today's modern methods of digitization and on-line accessing of old maps allow much more than just making copies for viewing them.
- These modern methods allow to fully exploit the potential of old maps as cartographic works with all of their specific characteristics.
- This contribution will show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

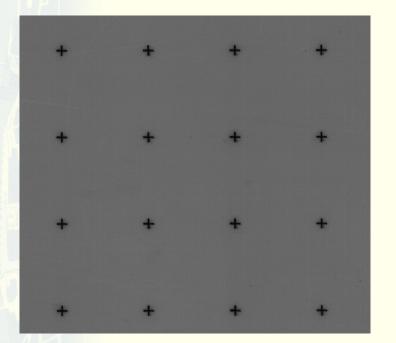


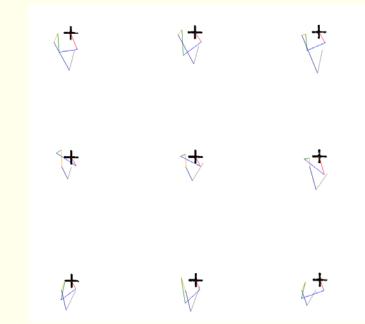




Accuracy Testing of Cartometric Scanners

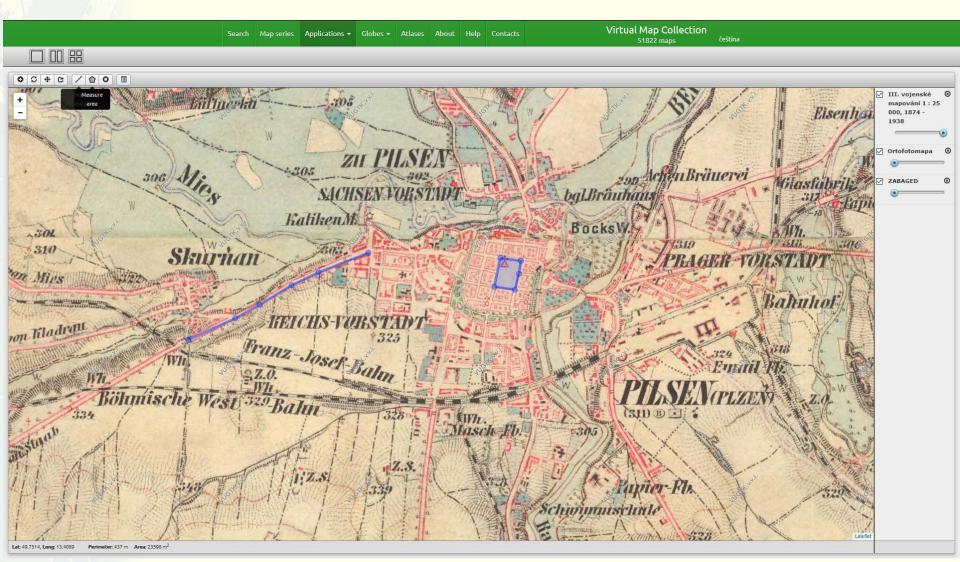
- Testing by scanning of special template rectangular grid of points with know real coordinates
- <u>Absolute Accuracy</u> Differences between reproduction and original (Good accuracy is < 0.3 mm difference)
- <u>Relative Accuracy</u> Differences between multiple reproductions of original (change of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



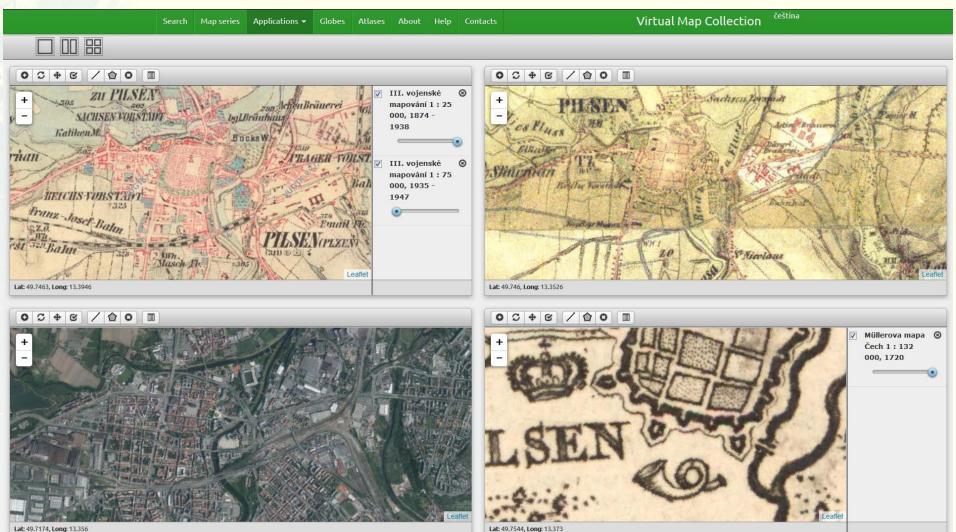


ANTOŠ F., BÖHM O., TALICH M**.: Accuracy testing of cartometric scanners for old maps digitizing** In: 9th International Workshop on Digital Approaches to Cartographic Heritage, Budapest, 4-5 September 2014, 8pp, 4

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



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



Lat: 49.7174, Long: 13.356

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

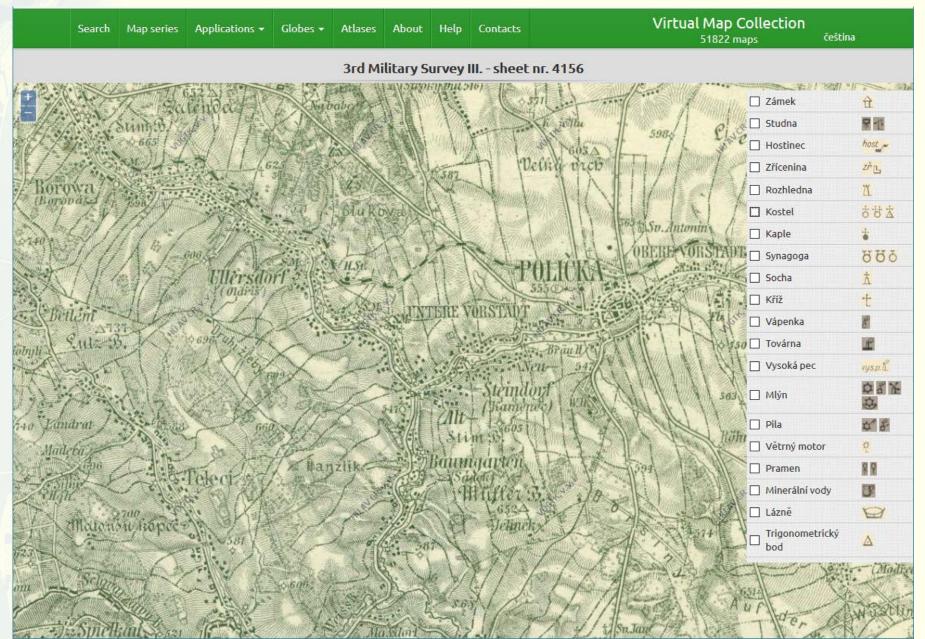
Search	Map series	Applications -	Globes 👻	Atlases	About	Help	Contacts	Virtual Map Collection 51822 maps čeština			
Map symbols of 3rd. Military Survey 3rd Military Survey 1 : 75 000 are one of the most important and attractive mapsets covering the territory of the Czech Republic. The importance if these maps lies											
in their rich set of map symbols, detailed coverage of the Czech Republic (and Slovakia) and long period of use.											
								und out by certified technology for map symbol detection on he Czech Republic. The maps were scanned with 400DPI			

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

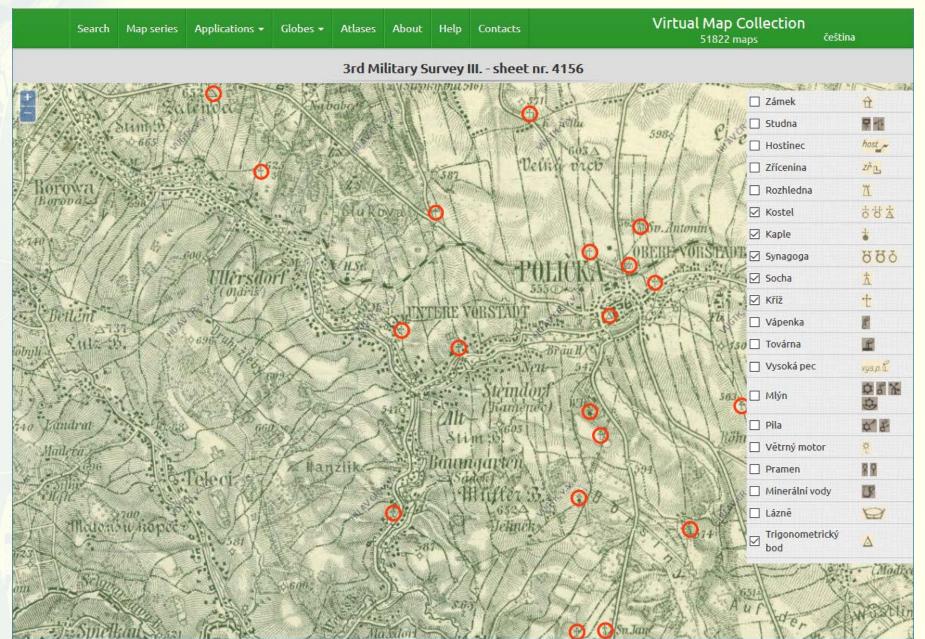
resolution.

	1	3390/9	× 1 0000 1 9 20) xoron Lobaring arra (thank) (2012 Wy2wa) weissen 5 arr
	. 34.,	3460 2 Zteczew	Sicheraten Pietrichen State	и надот и	A 3468 3469 3470 34711 Colowno 3574 2576
2 3532 String String 55	56 57 58	Weruszów 3601	3463 5 3502 3583 3584	8408 September 8507	State <th< td=""></th<>
Daries Concernant Information XIII	XIV W XV XVI W XVI	VII Balestakuz Wielui 3500 3502	Deistaszyn figuollaitensk Przedbie		Czernejów sort sort sort
Bass and Anna Bass		treuzbure Kritipice	3602 3563 3064		Krainik" 3680 3870 Grabowin Wolf 201 3873
Sterns \$7.60 Dathas 3053 Machenberg & Stracht		3000 3001	Czestochowa Konieczo	Keice a oupper	3658 Turobin 0 1 3768 Diandaw Transat Tratowice 3772 Staniatyn 3774 A778
Secaration Status of temperity Usuba Turnay Security	8750 8787 Inumenal Schimu	Dapain Uninits	Receiver aberui Jorres	2 3765 3760 \$1676	Boxwaddow Bizgoral 8770 8771 Wards 20 8874 N 8875
infactore minances 13850 etemoiau Basder - Unsture Line	Veliczo of transa	3760	3/03	9	Pudatk of 3800 3870 3871 3872 3878 Barran 0 4
Parather Starting Starting - San Purglana. Asisa San 18856	asso transladi Sala hat	Natow Bidrwitz	Bey 0 in 3803 Birdow	Neny a 3667	Banillin Martinet martin thaten and sold
Sake Aderson Schief b	Inventuali & Joint Weightan mente Reichenno 3953 (Frenwildan 395)		Water 1 1984	-Karetyn Stotscin Stotscin Stot	anes 3869 3970 Rawshatter /3972 Spreitweitweit
March Part and Association Prace Sector Prace	Theischer Party 2058	S Astiber Ayanik	Stateoin Committee Crease	Totaliscie Tarmon Basics to	4070 0,4077 4072 0 Talga
Lang Charles Turching of 4051 4052 4053 Autority of Original	4050 Landstron Co Mire Mire	uten a freistade	Wildowice Wieliczka	4005 - 4000 0 4000	au 4068 brzennyti Juzebska jaganogali * 4078 *Doctor
1100 Nicochand Philses Mitrand Color	eilamischi u Critan une Argulati 4059	1000 12 200	antig 4462 4003 Wester	Ace Cathler Organite	and
EnclyDening Brown Arts2 / 4153 Water Christebard	A1560 Separat 4358 Here	300 4700 Mistek 470	1 Saybysich 4163 41	64 Sanders Reason Duty	41588 - 2 4177 - 4278 Strietary 4
Kinettan 4250 a Mayomak altoine 4253 4254 4255 and	(1915)	- Andrew Anterest	Podvilk	Damaia Charles	Linke in \$200 in Commission (4274 Tren
majority same years english (4250 4257 4258 4258 4258 4258 4258	50 4940 Aner	Stara-Bistrice States again	anute 2200 Anth	" weightere Entry and ANT ANT with Weather Burt
A serve manner manner Militarhan sore of lane be	and the second second	350 Witzwitz San	A352 4363	Aciamaria 4500 Girall	ada una and hereinage and agreed a 4303 Cigate O
Supersonal Contingent of Supersonal	-Xanaua 4357 4358 Walist	solved -Burnty -Burnty	Reservery Males 4304	Liese strebad 4307	patricing studies of Superior & College Studies
Katchwalten 4452 8 4455 Australian	Znaim 44521 Sobro Dog-St		Wester 4402 4403 4400 Decision		a researce berge and 4471
4667 Abachterth Xability o	Lundenburg Begin	india margin	and the second sec	Accord Cases Vertilian	unite 4600 4570 4577 4573 Kolumen Za
ASSA AND ASSA AND ASSA AND ASSA	Cher. TOOL Charles and BUCKNIC	59 Peterse & Oerland	e 4563 4563 Frid	A 6505 (Nauchaw) aberte	4500 Stendage Statiges and underge 4074 St
Piriture Scharling 4052 4053 (Kremz) 4	4457 4254	1 480 Kangabert	Altrachi a Schemalit 4888 Rinksste	n- Sumarty anna) - Shine	Lang Washies Bile Hold ANTI Langer Company
14054 Aller 100 100 100 1000 1000 10000	Tulin Günberndorf Gost Boning 4058			Panak Lookid Samet	and density
Alter Arton Ator Arton Store Strengt	anghoo wien	759 Ser 2700 4702 Lins		Missolr:)	Bundle Alter and the first the first the first
4880 (D Smyhden) 4882/	seen 4757 4757 Talle	The (Sugary Sallo)	Sparriel Regiszkening E-Term	ne eros Van Mireg	Lange Abrona antigenerges Abrona Stranges
No 1 100 1 100 10 10000 10000 10000 10000 10000 10000 10000 10000 10000 10000	ener- valiad) 4857 Ung- 48	and Transfords Mar Section	4502 http://www.astron.com/ 4503 4503 4503 4503 4503 4503 4503 4503	4805 4800	ASSA 6308 (4000) - Anne Arasterian (4076)
Sales - States 220 51 4952 4955 5 Allerer Aller		10 4000 Annuku	Long Vernand Ve	10 4005 Jolange 40	4073 4073 4073 4073 4073
Sous a function and the second	4057 4058 4058 4058 405	and the appropriate	16-18 ¥4453 ****	Bearing & Aperil	tion throught and a line of the state of the
where River 6049 50 Juntary Raddant Solar States Bold Binked Trate	Strange Bossel 500		BUDA ST Natrola Jarres	awy Conce hat any Side they	State State States States Sono Land States Sono Land Son

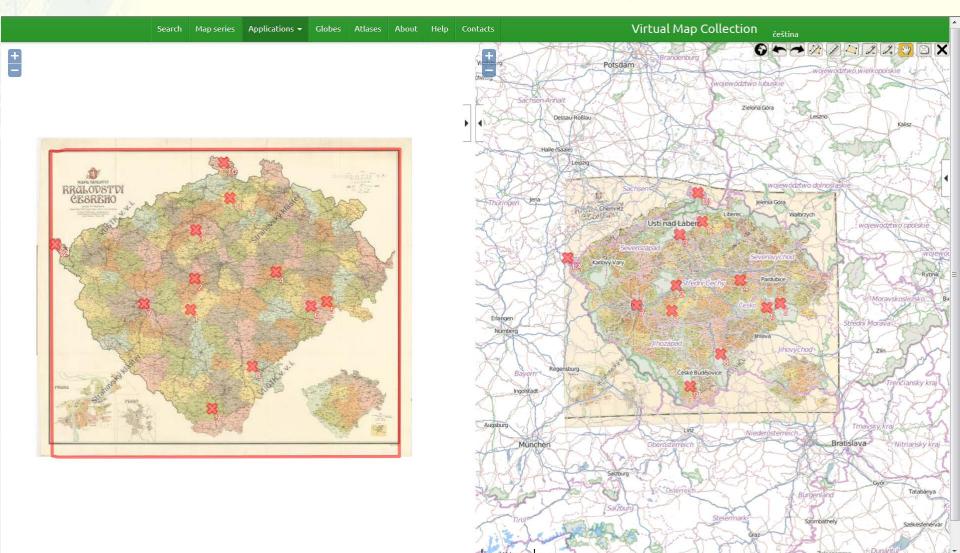
Map symbols - web application for automated search of map symbols



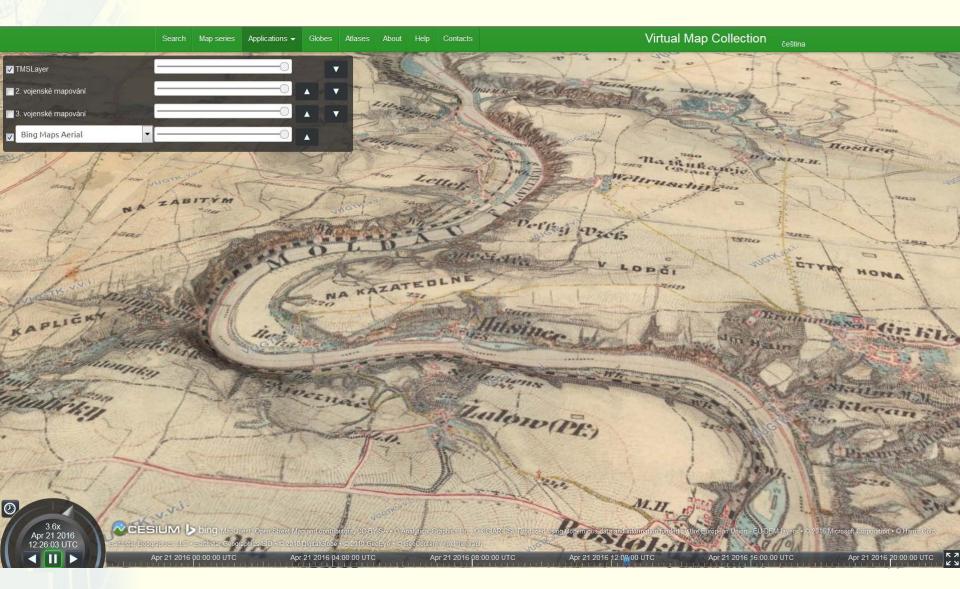
Map symbols - web application for automated search of map symbols



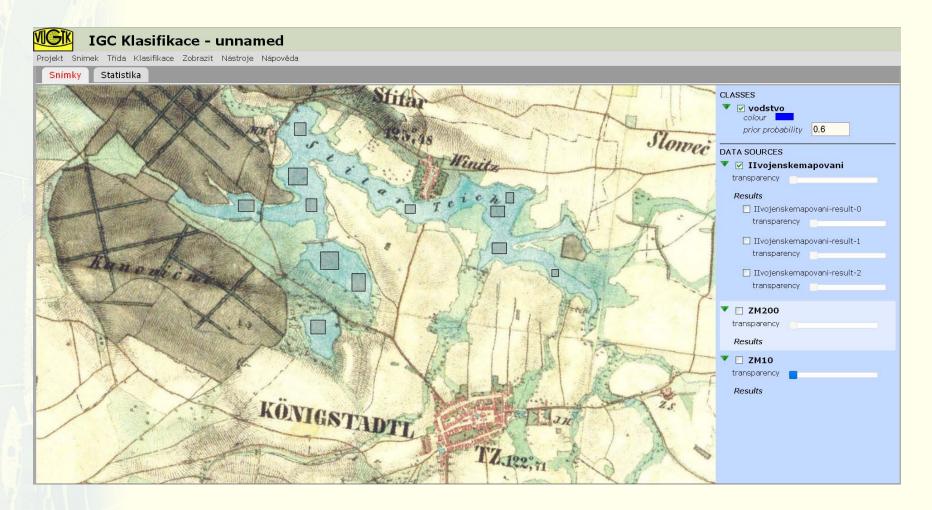
Zoomify to WMS - web application for Georeferencing of your own maps accessible in Zoomify



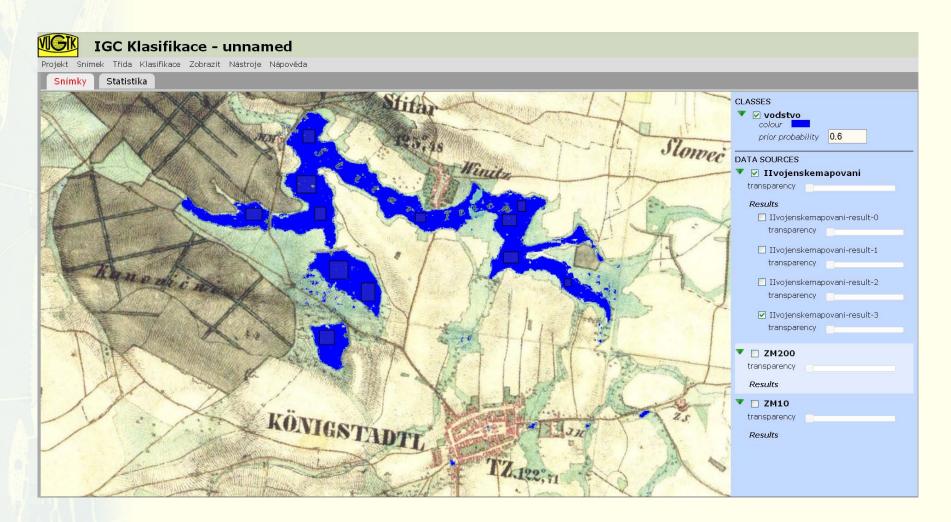
display WMS or TMS in 3D view - web application for displaying of your own georeferenced old maps accessible in WMS or TMS on 3D terrain model



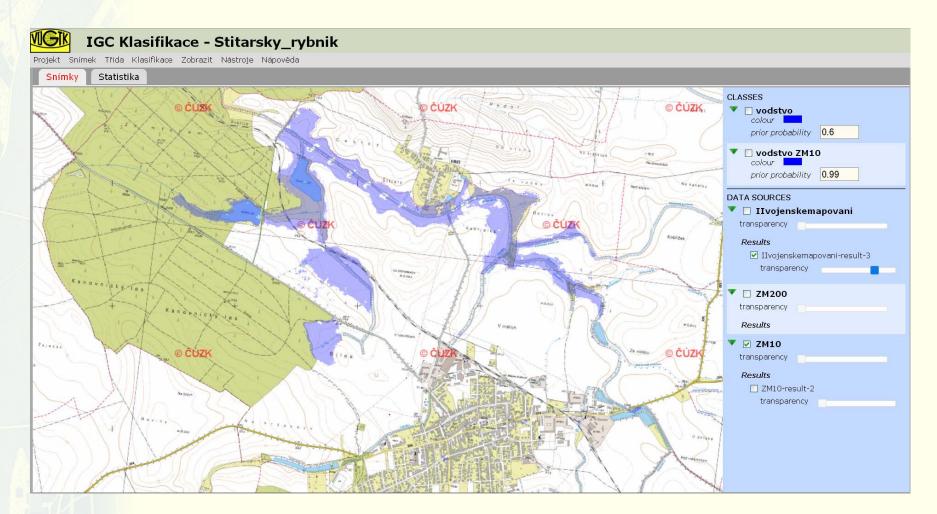
Classification of digitised old maps - Practical example - Estimating the surface area of former lake Štítarský in the first half of 19th century from II. Military Survey maps



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



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-Perimetron, Volume 7, No. 3: 136-146, ISSN 1790-3769, http://www.e perimetron.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

Milan.Talich@vugtk.cz



Výzkumný ústav geodetický, topografický a kartografický, v.v.i. Research Institute of Geodesy, Topography and Cartography