SYMPOSIUM ICA SPRING OLOMOUC 2023 Atlases: their design and use



ABSTRACTS

April 3–5, 2023 Olomouc, Czechia

DEPARTMENT OF GEOINFORMATICS



Palacký University Olomouc

IN COOPERATION WITH



International Cartographic Association Association Cartographique Internationale

COMMISSIONS ON ATLASES MAP DESIGN USER EXPERIENCE

ORGANIZE

SYMPOSIUM ICA SPRING OLOMOUC 2023 ATLASES: THEIR DESIGN AND USE

UNDER THE AUSPICES OF



PROGRAM COMMITTEE

Vít VOŽENÍLEK (Palacký University Olomouc, Czechia), René SIEBER (ICA Commission on Atlases, Switzerland), Ian MUEHLENHAUS (ICA Commission on Map Design, USA), Robert ROTH (ICA Commission on User Experience, USA)

LOCAL ORGANIZING COMMITTEE

Department of geoinformatics, Palacký University Olomouc Rostislav NÉTEK, Jakub KONÍČEK, Alena VONDRÁKOVÁ, Stanislav POPELKA, Jan BRUS, Radek BARVÍŘ, Jakub ŽEJDLÍK, Tomáš VANÍČEK, Oldřich BITTNER



ATLASES: THEIR DESIGN AND USE

ABSTRACTS OF THE SYMPOSIUM ICA SPRING OLOMOUC 2023

Edited by Vít Voženílek and Alena Vondráková

Cover design by Jakub Koníček

The publication did not undergo editorial proofreading.

Published by the Czech Cartographic Society for the Department of Geoinformatics as its 103rd publication.

1st edition

© Czech Cartographic Society, 2023

April 2023, Olomouc, Czechia

https://icaspring2023.upol.cz/

ISBN 978-80-11-02999-9

CONTENT

ICA Commission on Atlases	
ICA Commission on Map Design	
ICA Commission on User Experience	. 8
International Cartographic Association	
ICA Executive Committee	. 9
Program at glance	10
Venues of the symposium	11
Dinner & Czech pub experience	12
Organ concert	13
Olomouc	14
Palacký University Olomouc	
Department of geoinformatics	15
Virtual tour	
Department of Geoinformatics, Palacký University Olomouc	16

PROGRAM

Day 1, April 3	18
Day 2, April 4	19
Day 3, April 5	20

ABSTRACTS

Philippe DE MAEYER School atlas considerations	22
<i>Timothy TRAINOR</i> Atlas Opportunities Stimulated by the UN IGIF and the SDG Data Alliance	24
<i>Igor DRECKI, Antoni MOORE</i> Managing cartographic collections spatially	26
Atlases: their design and use	3

Tengizi GORDEZIANI, Tedo GORGODZE, Saba MODEBADZE, Neli JAMASPASHVILI, Nika BERUCHASHVILI, Gocha JINCHARADZE, Mariam GAGOSHASHVILI, Tamar GORDEZIANI Complex atlas mapping of selected municipalities and administrative regions of Georgia
<i>Vít VOŽENÍLEK</i> Six periods in the history of Czech school atlases
<i>Gareth BALDRICA-FRANKLIN</i> Online Atlas Storytelling: Towards Nonlinear Narratives
Jakob LISTABARTH, Pei NIE, Menno-Jan KRAAK Crowdsourced atlas production
<i>Markus JOBST</i> Crowdsourcing for Atlas Productions – experiences from the "SDG's in action" atlas
<i>Eric LOSANG</i> Participatory Atlas Design – experiences from an SDG-Atlas pilot
<i>Revaz TOLORDAVA, Tedo GORGODZE, Gocha GUDZUADZE</i> Geographic Information System and Complex Atlas of the Autonomous Republic of Abkhazia
Robert ROTH Mobile atlases: Their design and use? 42
<i>Rostislav NÉTEK</i> Rise of Map-oriented Dashboards 44
<i>Stanislav POPELKA, Anna PORTI SUAREZ</i> Covid-19 dashboards and their usability assessment
<i>Marta KUŹMA, Francis HARVEY</i> Eye-Tracking the Digital Humanist. How do historians use maps?
<i>Stanisław SZOMBARA</i> Does the dot matter? A study of dot map users' preferences for dot size and value
<i>Tomáš VANÍČEK</i> The use of the think-aloud method for the evaluation of the atlas

<i>Zurab LAOSHVILI, Giorgi KAPANADZE</i> Map reading – spatial, temporal, and thematic analysis	54
<i>Michaela VOJTĚCHOVSKÁ</i> Visualizing User Behavior in Cartography by GazePlotter: New Eye-Tracking Sequence Chart Analysis Tool	56
Lukáš HERMAN, Barbora PLAČKOVÁ User Aspects of 3D Geovisualizations in Urban Planning	58
<i>Daniel VRBÍK</i> Maps for toponymic research	60
<i>Beata MEDYŃSKA-GULIJ</i> Hypsometric images of Europe in school atlases – the final design from the 19th century?	62
<i>Florian LEDERMANN</i> Improved cartographic rendering and design of detailed street maps and urban atlases	64
<i>Jakub KONÍČEK</i> Infographics vs maps: Czech-Brazil visual comparison in understanding spatially oriented visualization	66
René SIEBER, Michael SCHMUKI, Lorenz HURNI Designing and Implementing Storytelling in Interactive Atlases – A Case Study of the Atlas of Switzerland	68
Vít VOŽENÍLEK, Jakub KONÍČEK, Alena VONDRÁKOVÁ Conceptual changes in dialect atlases	70
<i>László ZENTAI</i> The first atlas I have created: the unpublished and banned Atlas of Lake Balaton	72
Gocha GUDZUADZE, Tedo GORGODZE Atlas mapping of urban systems of Georgia	74
<i>Václav TALHOFER</i> Map projections in atlases – a refl ection on their use	76
<i>Irene SAHAGUN LUIS</i> Application of the general procedure of the national atlas of Spain (ANE). Updating. History section	78

Tedo GORGODZE, Nodar KHORBALADZE, Sophio GORGIJANIDZE, Gocha GUDZUADZE Creation and use of special purpose atlases in Georgia on the example of "Officer's Atlas"	80
<i>Čeněk ŠAŠINKA</i> eDIVE: the use of collaborative immersive virtual environments not only for teaching geography	82
Radek BARVÍŘ, Jan BRUS, Alena VONDRÁKOVÁ Interactive tactile models creation	84
Stanislav POPELKA, Kamila FAČEVIČOVÁ, Michaela VOJTĚCHOVSKÁ, Markéta BEITLOVÁ Eye-tracking and its possibility for analyses of map-reading	86
<i>Jakub ŽEJDLÍK</i> Guide to selected monuments of Czechia for people with visual impairment	88
<i>Tomáš BAYER</i> Automated analysis of map projections	90
Robert MAGHLAKELIDZE, Giorgi MAGHLAKELIDZE, Neli GOGINASHVILI, Giorgi KAPANADZE Some issues of separation and atlas mapping of cultural natural-territorial complexes	92
<i>Karol KOWALCZYK</i> Railway Atlases as the Products of Thematic Cartography: an Attempt at Typology	94
Saba MODEBADZE, Demetre MODEBADZE, Tengiz GORDEZIANI Methodology for creating a football atlas and geographic information system of Georgia	96
<i>Mariam GAGOSHASHVILI, Saba MODEBADZE</i> Methodology of geoecological atlas mapping, on the example of Zestafoni Municipality (Georgia)	98
<i>Alena VONDRÁKOVÁ</i> Cooperation of thematic experts and cartographers in the atlas projects 1	00
<i>Manana SHARASHENIDZE, David SHAVLAKADZE, Saba MODEBADZE</i> Electronic atlas of viticulture and winemaking of Kakheti region. Challenges of practice (Georgia)	02

<i>Viktor CHABANIUK</i> Transformational cartography in Dynamic atlas information systems. Problems and solutions	104
<i>Giorgi DVALASHVILI</i> Geographical features of the photo atlas of landmark natural monuments of Georgia	106
<i>Waldemar SPALLEK</i> From the paper atlas to the geoportal and back again	108
Alexander WOLODTSCHENKO On atlas cartography, atlassemiotics and atlasgraphy	110
Jaromír KOLEJKA, Karel KIRCHNER, Eva NOVÁKOVÁ An atlas that has not been published. Unique printed map files of the Geographical Institute of the Czechoslovak Academy of Sciences	112
Jaromír KOLEJKA Inspiration from South Asian school atlases	114



ICA Commission on Atlases

The Commission is a small group of dedicated people who have caught the virus of viewing, collecting, producing and using **print and digital atlases**. The Commission was formed in 1985 on the initiative of a few adventurous and since then has been dedicated to the promotion and support of all types of atlases. Commission members are involved in the **research**, **development and production of atlases**; we want to focus in particular on smart solutions and new approaches to print and digital atlases.



ICA Commission on Map Design

The Commission is focused on producing usable media that will help ICA to better position itself as an authority on spatial visualization in the GIS sector. The Commission is promoting the **MapCarte initiative** and creating a companion podcast series featuring interviews with professional cartographers on their own tips, tricks and ideas for effective and applied map design. The Commission's activities include **organizing online workshops, giving talks, and writing blogs**. The Commission collaborates with colleagues from other ICA commissions as needed.



ICA Commission on User Experience

The Commission is continuing its work on user experience, as usability is listed as one of the ten main research themes in the ICA objectives and the UX proposal includes questions on **map use, map users and map usability**. The Commission defines **map UX design** as the set of workflows, methods, and techniques required for a successful user outcome with a map or interactive map system, as well as a productive and satisfying user experience in achieving that outcome.

INTERNATIONAL CARTOGRAPHIC ASSOCIATION

The aim of ICA is to ensure that **cartography and GIScience are employed to maximum effect and full potential** for the benefit of society and science through the promotion and representation of the disciplines and professions of cartography and GIScience internationally. To achieve its aims, the ICA works with national and international governmental and commercial bodies, and with other international scientific societies.

ICA EXECUTIVE COMMITTEE

2019-2023

Tim Trainor (USA), President

Thomas Schulz (Switzerland), Secretary-General and Treasurer

Andrés Arístegui (Spain), Vice-President Temenoujka Bandrova (Bulgaria), Vice-President Philippe De Maeyer (Belgium), Vice-President Liqiu Meng (Germany), Vice-President Terje Midtbø (Norway), Vice-President Vít Voženílek (Czechia), Vice-President László Zentai (Hungary), Vice-President



Menno-Jan Kraak (The Netherlands), Past President



Atlases: their design and use

PROGRAM

AT GLANCE

MONDAY

April 3, 2023

Morning

8:00-9:00	Registration
9:00-9:30	Opening
9:30-13:30	2 blocks of presentations

Afternoon

15:00-18:30	2 blocks of presentations
19:30	Dinner & Czech pub experience

TUESDAY

April 4, 2023

Morning

9:00-13:00	2 blocks of presentations
------------	---------------------------

Afternoon

14:50–15:10	Atlas cookbook release
15:10–16:45	Workshops
18:30	Organ concert

Free evening – optional social program

WEDNESDAY

April 5, 2023

Morning

9:00–13:30 2 blocks of presentations 13:30–14:00 Closing



42 oral presentations 3 workshops

VENUES

OF THE SYMPOSIUM



» FORT SCIENCE Interactive science centre of Palacký University Olomouc

Address: 17. listopadu 939/7, 779 00 Olomouc, Czechia GPS: 49.5928 N, 17.2580 E

MONDAY dinner

» THE ST. WENCESLAS BREWERY Stylish restaurant and pub

Address: Mariánská 845/4, 779 00 Olomouc, Czechia GPS: 49.5959 N, 17.2587 E

TUESDAY morning blocks

» CORPUS CHRISTI CHAPEL Palacký University Arts Centre

Address: Univerzitní 3, 779 00 Olomouc, Czechia GPS: 49.5954 N, 17.2555 E

TUESDAY afternoon workshops

» DEPARTMENT OF GEOINFORMATICS Faculty of Science, Palacký University Olomouc

Address: 17. listopadu 710/50, 779 00 Olomouc, Czechia GPS: 49.5938 N, 17.2654 E

TUESDAY organ concert

» JAN HUS CONGREGATIONAL HOUSE Hussite church with traditional organs

Address: U Husova sboru 538, 779 00 Olomouc, Czechia GPS: 49.5977N, 17.2471E







DINNER & CZECH PUB EXPERIENCE

MONDAY April 3

19:30

SUMTOWACL AVIS

PILIOUAP

St. Wenceslas Brewery

The brewery is situated on the ground floor of a building in the historical centre of the city near St. Wenceslas Cathedral, near the Archbishop's Palace at 4 Mariánská Street, Olomouc.

The heart of the St. Wenceslas brewery is the **copper brewhouse**, nicknamed "GOLEM", where the first stage of beer production – brewing – takes place right in front of the guests' eyes. The process then continues in the brewery cellars with fermentation and maturation. The brewery has a capacity of 110 seats, the outdoor garden has 80 seats. Free WiFi connection is available.

The brewery offers **7 types of own beer without pasteurization and filtration**, home cooking, lunch menu, tvarůžky cheese and beer specialities, juicy steaks, espresso illy and wines from Moravian winemakers.

20:45 CARTOQUIZ

- » teams of up to 8 members
- » make up a name of your team
- » the only tools allowed are **paper and pen**

Alcohol is not included in the conference fee, so everyone pays for alcoholic drinks themselves. Each table will have its own account. Thank you for your understanding.

CARTO QUIZ



ORGAN CONCERT

18:30

Jan Hus Congregational House

Martin Látal

composer, producer, GIS specialist, fencing trainer

At the age of eight, he started to learn to play the piano and trumpet. After meeting the Olomouc writer and composer, cathedral organist Stanislav Vrbík, who enabled him to take up organ playing, he organised four concerts under his direction and, after his death, another in collaboration with friends. Since 1995 he has been working on his own compositions in the style of light classical music. He founded his own studio Morpheus. In 2016 he graduated from the two-year Private Conservatory of Dezider Kardoš in Slovakia in organ performance and in 2023 from the Academy of Early Music at the Institute of Musicology of Masaryk University in Brno (postgraduate study) in organ performance.



Program

- Josef Seger: Toccata and Fugue in D major
- J. S. Bach: chorale overture *Nun komm der Heiden Heiland* J. S. Bach: Air
- J. S. Bach: Toccata and Fugue in D minor

Martin Látal: Improvisation on the theme of the Litany of Lauretania by Jan Dismas Zelenka

Husův sbor (Jan Hus Congregational House) is a church of the Czechoslovak Hussite Church in Olomouc. It is a three-nave basilica built in the neoclassical style, designed in 1924–1925 by architect Hubert Aust and built between 1925–1926 by František Petřík (the foundation stone was laid on 6 July 1925 on the anniversary of Jan Hus' death). In 1942, a columbarium in the same architectural style was built under the basilica. The urns with the ashes are on red marble walls and are behind travertine slabs. Ian Hus was a Czech theologian and philosopher, church reformer and inspirer of Hussitism, a key precursor of Protestantism and a fundamental figure of the Czech Reformation. Jan Hus is considered the first church reformer. His teachings had a strong influence, which was especially evident in the approval of the Czech Reformed denomination more than a century before Martin Luther. Hus was dean and rector of Charles University in Prague from 1409–1410. On July 6, 1415, he was burned at the stake in Constance (Kostnice) for heresy against the teachings of the Catholic Church.

OLOMOUC

Welcome to our city

Olomouc (100,000 inhabitants) is an **ecclesiastical metropolis** on the Morava River. It was the historical capital of Moravia until 1641 when it was sacked by the Swedish army during the Thirty Years' War. Today it is the **administrative centre** of the Olomouc Region and the sixth-largest city in the Czech Republic. The his-

toric centre of the town is well preserved and is protected by law as a **municipal conservation area**. The Holy Trinity Column was inscribed on the **UNESCO World Heritage List** in 2000 for its typical Baroque style and symbolic value. Since 1063 it has been the seat of the Bishopric of Olomouc, since 1777 of the Archbishopric.



Public transport in Olomouc is provided by trams and buses.

The main **railway station** in Olomouc (Olomouc hl. n.) is an important railway junction. The city is connected with Prague, Ostrava, Brno, Zlín and Břeclav. The

main train station in Olomouc is quite busy; passenger trains of all categories operated by České dráhy, RegioJet and LEO Express make stops there.

45

fountains

from the

Baroque

The city is the **cultural centre of the region**. Olomouc is home of the **Moravian Theatre** (Moravské divadlo) and the **Moravian Philharmonic Orchestra** (Moravská filharmonie). Olomouc is also the centre of the ethnographic region Haná.



Symposium ICA Spring Olomouc 2023

PALACKÝ UNIVERSITY OLOMOUC

Welcome at our university

Palacký University Olomouc is a university with a long-standing tradition. Founded in the 16th century, it is the oldest university in Moravia and the second-oldest university in the Czech Republic. Today it is a modern higher education facility with a wide range of study programmes and copious scientific and research activities. In 2023, 22,124 students studied in 840 accredited study programmes at 8 faculties. The university also provides exchange programmes and lifelong learning programmes. Palacký University Olomouc is one of the very top Czech universities, and ranks among the best universities in the world, according to international rankings.

More information available at https://www.upol.cz/en/

DEPARTMENT OF GEOINFORMATICS

Faculty of Science, Palacký University Olomouc

The Department of Geoinformatics guarantees the bachelor study programme Geoinformatics and Geography, the master study programme Geoinformatics and PhD study Geoinformatics-Cartography. It also offers doctoral studies Geoinformatics and Cartography in the English language (in full-time and combined form).

Department members ensure a lecturing of geographical and thematic cartography, RS, statistics, GIS and other geoinformatic disciplines for students from other study programmes.

Research is an important and indivisible part of department activities. A number of expert studies and grants were (re)solved here, many expertises were worked out and a dozen of consultations were required and responded. A set of publications points out the qualities of the Department.

Department was founded in 2001.

More information available at https://www.geoinformatics.upol.cz/



VIRTUAL TOUR

Department of Geoinformatics, Palacký University Olomouc



Virtual tour of the entire department. **Visit our laboratories, offices and classrooms online.**





SYMPOSIUM ICA SPRING OLOMOUC 2023 ATLASES: THEIR DESIGN AND USE

PROGRAM

Monday, April 3, 2023 Fort Science



8:00-9:00	Registration	
9:00-9:30	Opening	
9:30-11:15	BLOCK I Chairperson: Thomas Schulz	
	Philippe DE MAEYER Ghent University	School atlas considerations
	Timothy TRAINOR	Atlas Opportunities Stimulated by the UN IGIF
	International Cartographic Association	and the SDG Data Alliance
	Igor DRECKI, Antoni MOORE	Managing cartographic collections spatially
	National Library of New Zealand, University of Otago	
	Tengizi GORDEZIANI, Tedo GORGODZE, Saba MODEBADZE, Neli JAMASPASHVILI, Nika BERUCHASHVILI, Gocha JINCHARADZE, Mariam GAGOSHASHVILI, Tamar GORDEZIANI Thilisi State University Ministry of Defence of Generain	Complex atlas mapping of selected municipalities and administrative regions of Georgia
	SityMap, Technical University of Georgia	
	Vít VOŽENÍLEK Palacký University Olomouc	Six periods in the history of Czech school atlases
11:15–11:45	coffee break	
11:45-13:30	BLOCK II Chairperson: Timothy Trainor	
	Gareth BALDRICA-FRANKLIN Un. of Wisconsin-Madison	Online Atlas Storytelling: Towards Nonlinear Narratives
	JAKOD LISTABARTH, PEI NIE, MENNO-JAN KKAAK University of Twente, Enschede	Crowdsourced atlas production
	Markus IOBST	Crowdsourcing for Atlas Productions ovporionces
	Vienna Iniversity of Technology	from the "SDG's in action" atlas
	Frict LOSANG	Participatory Atlas Design _ experiences from
	Leibniz-Institute for Regional Geography Leinzia	an SDG-Atlas pilot
	Revaz TOLORDAVA Tedo GORGODZE Gocha GUDZUADZE	Geographic Information System and Complex Atlas
	Sukhumi State University Thilisi	of the Autonomous Republic of Abkhazia
13.30-15.00	lunch time	
15:00-16:30	BLOCK III Chairnerson: Andrés Aristequi	
15.00 10.50	Pohort POTH //niversity of Wisconsin Madison	Mobile atlases: Their design and use?
	Postislav NÉTEK Palachí University Olomous	Pice of Man oriented Dashboards
	Stanislav NOTEK A Appa DODTI SUADEZ	Kise of Map-oriented Dashboards
	Palacki University Alomour	Covid-19 dashboards and their usability assessment
	Marta KIIŹMA, Francis HARVEY	
	University of Warsaw,	Eye-Tracking the Digital Humanist. How do historians
	Leibniz-Institute for Regional Geography, Leipzig	use maps:
	Stanisław SZOMBARA	Does the dot matter? A study of dot map users'
	AGH University of Science and Technology, Kraków	preferences for dot size and value
16:30–17:00	coffee break	
17:00-18:30	BLOCK IV Chairperson: Robert Roth	
	Tomáš VANÍČEK	The use of the think-aloud method
	Palacký University Olomouc	for the evaluation of the atlas
	Zurab LAOSHVILI, Giorgi KAPANADZE	Man reading spatial temporal and thematic analysis
	Georgian Technical University, Tbilisi	map reading – spatial, temporal, and thematic analysis
	Michaela VOJTĚCHOVSKÁ	Visualizing User Behavior in Cartography by GazePlotter:
	Palacký University Olomouc	New Eye-Tracking Sequence Chart Analysis Tool
	Lukáš HERMAN, Barbora PLAČKOVÁ	User Aspects of 3D Geovisualizations in Urban Planning
	Masaryk University, Brno	oser Aspects of SD Geovisualizations in orban Planning
	Daniel VRBÍK Technical University of Liberec	Maps for toponymic research
19:30–23:30	dinner	

Tuesday, April 4, 2023 Corpus Christi Chapel • Department of Geoinformatics



9:00-10:45	BLOCK V Chairperson: Menno-Jan Kraak	
	Beata MEDYŃSKA-GULIJ	Hypsometric images of Europe in school atlases
	Adam Mickiewicz University, Poznan	– the final design from the 19 th century?
	Florian LEDERMANN	Improved cartographic rendering and design
	Vienna University of Technology	of detailed street maps andurban atlases
	Jakub KONIČEK, Mariane FÉLIX DA ROCHA	Infographics vs maps: Czech-Brazil visual comparison
	Palacký University Olomouc, Federal University of Paraná	in understanding spatially oriented visualization
	René SIEBER, Michael SCHMUKI, Lorenz HURNI FTH Zurich	Designing and Implementing Storytelling in Interactive Atlases – A Case Study of the Atlas of Switzerland
	Vít VOŽENÍLEK. lakub KONÍČEK. Alena VONDRÁKOVÁ	
	Palacký University Olomouc	Conceptual changes in dialect atlases
10:45–11:15	coffee break	
11:15-13:00	BLOCK VI Chairperson: René Sieber	
	László ZENTAI	The first atlas I have created: the unpublished
	Eötvös Loránd University, Budapest	and banned Atlas of Lake Balaton
	Gocha GUDZUADZE, Tedo GORGODZE	Atlas manning of urban systems of Georgia
	Tbilisi State University, Ministry of Defence of Georgia	Allas mapping of arban systems of Georgia
	Václav TALHOFER	Map projections in atlases – a reflection on their use
	University of Defence, Brno	
	Irene SAHAGUN LUIS	Application of the general procedure of the national
	National Geographic Institute of Spain, Madrid	atias of Spain (ANE). Opdating. History section
	Tedo GORGODZE, Nodar KHORBALADZE, Sophio GORGIJANIDZE, Gocha GUDZUADZE	Creation and use of special purpose atlases in Georgia
	Ministry of Defence of Georgia Thilisi State University	on the example of "Officer's Atlas"
13:00-14:50	lunch time	
14:50-15:10	Atlas cookbook release	
15:10-16:45	WORKSHOPS	
	Čeněk ŠAŠINKA	eDIVE: the use of collaborative immersive virtual
	Masaryk University, Brno	environments not only for teaching geography
	Radek BARVÍŘ, Jan BRUS, Alena VONDRÁKOVÁ	Interactive tactile models creation
	Palacký University Olomouc	
	Stanislav POPELKA et al.	Eye-tracking and its possibility for analyses
	Palacký University Olomouc	of map-reading
after 16:45	free afternoon and evening – optional social program	
18.30-19.15	organ concert	and the second se



Wednesday, April 5, 2023

Fort Science



9:00-11:00	BLOCK VII Chairperson: Eric Losang	
	Jakub ŽEJDLÍK	Guide to selected monuments of Czechia for people
	Palacký University Olomouc	with visual impairment
	Tomáš BAYER	Automated analysis of man projections
	Charles University, Prague	Automated analysis of map projections
	Robert MAGHLAKELIDZE, Giorgi MAGHLAKELIDZE, Neli GOGINASHVILI, Giorgi KAPANADZE	Some issues of separation and atlas mapping of cultural
	Tbilisi State University, The Gori State University, Georgian Technical University	natural-territorial complexes
	Karol KOWALCZYK	Railway Atlases as the Products of Thematic Cartography:
	Maria Curie-Skłodowska University, Lublin	an Attempt at Typology
	Saba MODEBADZE, Demetre MODEBADZE, Tengiz GORDEZIANI	Methodology for creating a football atlas and geographic information system of Georgia
	Tbilisi State University	
	Mariam GAGOSHASHVILI, Saba MODEBADZE	Methodology of geoecological atlas mapping,
	Tbilisi State University	on the example of Zestatoni Municipality (Georgia)
11:00-11:30	сојјее break	
11:30-13:30	BLOCK VIII Chairperson: Laszlo Zentai	
	Alena VONDRAKOVA	Cooperation of thematic experts and cartographers
	Palacký University Olomouc	in the atlas projects
	Manana SHARASHENIDZE, David SHAVLAKADZE, Saba MODEBADZE	Electronic atlas of viticulture and winemaking of Kakheti region, Challenges of practice (Georgia)
	Tbilisi State University, Ministry of Defence of Georgia	or hannet region. entiteinges of practice (deorgia)
	Viktor CHABANIUK	Transformational cartography in Dynamic atlas
	National Academy of Science of Ukraine, Kyiv	information systems. Problems and solutions
	Giorgi DVALASHVILI	Geographical features of the photo atlas of landmark
	Tbilisi State University	natural monuments of Georgia
	Waldemar SPALLEK University of Wroclaw	From the paper atlas to the geoportal and back again
	Alexander WOLODTSCHENKO	On atlas cartography atlassemiotics and atlasgraphy
	Technical University Dresden	
13:30-14:00	Closing	



SYMPOSIUM ICA SPRING OLOMOUC 2023 ATLASES: THEIR DESIGN AND USE

ABSTRACTS

MONDAY April 3 BLOCK I 9:30-11.15

School atlas considerations

Philippe DE MAEYER Ghent University

A school atlas does not only address the 'atlas' concept, but it is also characterized by a didactic method which is considered useful by the authors so as to allow the students to acquire the much needed knowledge and skills. Twenty years ago a Belgian publisher undertook the publication of a new school atlas. The background of this initiative, the discussions on the design, the choices made – both graphically and cartographically, but also on borders or other politically sensitive themes – are developed. The technical approach to production and the role of GIS in school atlases are discussed. A school atlas is also a product that evolves continuously, not only according to the needs created by new curricula or new pedagogic techniques and facilities, but also for updates of socio-economic data and new scientific knowledge (e.g. geological stratigraphy or on plate tectonics) or to take account of geopolitical changes (border, toponymic changes, ...).

An analysis will be presented of the most significant changes to the structure of the atlas over the nearly 20 years of its existence, highlighting the triggers for these changes.

NC	TE	S				0	0						•					٠	٠	0	0	0		0
•	•	•		•			•	•	•					•	•			•	•					
•	•	•	•	•	٠		٠	٠	٠	٠	٠	٠	•	•	•	•	•	•		0			٠	•
•	•	•		٠	٠		٠	٠	٠	٠	٠	٠					•	•	٠	0			•	•
•	•	•	•	٠	٠		٠	٠	٠	٠	•	٠			•		•	٠	٠		٠		•	٠
	•	•			•	0	٠	٠	٠	•	•	•		٠		٠	٠	٠	٠	•		•	٠	0
•	•	•	•	•	•		•	•	•	•	•			•	•	•	•	•	•				•	•
•	•	٠	•	•	٠	0	٠	٠	٠	•	٠	•	•	•	•	•	•	٠	٠	0	•	0	•	0
•	۰	•	٠	٠	٠	•	•	٠	•		٠	٠	•	•		•	۰		•	•	•	•	٠	•
•	•	•	•	٠	٠	•	٠	•	•	*	•	•	•		•	۰	۰	٠	•	•	٠	٠	٠	٠
*	•	•	•	٠	•		•	•	•	*	•	*	•		•	۰	٠	•	•			•	٠	٠
•	•	•	•	٠	•		•	•	•	•	•	*	•		•		•	•	•		*	*	٠	•
•	•	•	•	•	٠			٠	٠	٠	٠	٠	٠	•	•	٠	٠	٠	٠	0			٠	
•	•	•	•	٠	٠		٠	٠	٠	٠	٠	٠	•			٠	٠	٠	٠				٠	•
٠	•	•	•	•	٠	٠	٠	٠		•	•	٠	٠	•	•	•	•	•	٠	•	•	•	•	۰
•	•	•	•	•	٠		٠	٠	٠	٠	٠	٠	•	•	•		٠	٠	٠	٠	٠	٠	٠	٠

•	•	•	•	٠	•	٠	٠	•	•	•	•	٠	٠	•	•	•	•	•	•	•	•	•	•	۰
•	•	•	•	٠	•	•	•	•	•		•	•	•	•	•	•	•	•	•	•	•	•	•	•
•	•	•	•	•		٠	•	•	•	•		•	٠	0	•	•	•	٠	0	•	•	•	•	٠
•	•	•	0		•	•	•	0	•			•	٠	0	•	•	•	•	0	•	•	•	•	۰
•	•	٠	0	•	•	•	•	•	•	•	•	•	٠	0	•	•	•	•	•	•	•	•	•	•
•	•	•	•	•	•	٠	•	•	•		•	•	•	•	•	•	•	•	•	•	•	•	•	•
•	•	•	•	•	•	•	•	•	•		•	•	•	•	•	•	•	•	•	•	•	•	•	٠
•		•	•	•	•	•	•	•			•	•	•	•	•	•	•	•	•	•	•	•	•	٠
•		•	•	•	•	•	•	•			•		•	•	•	•	•	•	•	•	•	•	•	•
•		•	•	٠	•	•	•				•	•	•		•			•	•	•	•		•	•
٠		•	•	•	•	•	•	•			•	•	•	•	•	•	•	•	•	•	•	•	•	•
•	•	•	•	•	•	•	•	•	•		•	•	•	•	•	•	•	•	•	•	•	•	•	٠
•		•	•	•		•	•	•			•	•	•	•	•	•	•	•	•	•	•	•	•	•
•	0	•	0		•	•	•	0	•			•	٠	0	•	•	•	٠	0	•	•	•	•	•
•	•	•	0			•	•	0				•	•	0	•	•	•	•	0	•	•	•	•	•
•	۰	٠	0	•	•	٠	۰	0			•	۰	٠	•	•	•	•	•	0	•	•	•	•	•
•	•	•	•	•	•	٠	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	٠
•	•	•	•	•	•	•	•	•	•		•	•	•	•	•	•	•	•	•	•	•	•	•	۰
•	•	•	•	•	•		•	•			•	•	•	•	•	•	•	•	•	•	•	•	•	۰
•	•	•	•	•	•		•	•			•	•	•	•	•	•	•	•	•	•	•	•	•	•
•	•	•	•	•	•	٠	•	•		•	•	•	٠	•	•	•	•	•	•	•	•	•	•	•
•	۰	•	•	•	•	٠	٠	0	0	•	•	۰	٠	•	•	•	•	•	•	•	•	•	•	٠
•		٠	0	٠	•	•		•				•	•	0	•	•	•	•	•	•	•	•	•	٠
•	•	•	•	•	•	•	•	•	•		•	•	•	•	•	•	•	•	•	•	•	•	•	•
•		•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•
•	•	•	•	•	•	•	•	0		•	•	•	٠	•	•	•	•	•	0	•	•	•	•	•
•	۰	٠	0	٠	•	•	•	•	•	*	•	•	•	0	•	•	•	•	•	•	•	•	•	۰
•	0	٠	0	•	•	•		•	•	*			•	0	•	•	•	•	•	•	•	•	•	٠
•	•	•	•	•	•	•	•	•	•	•		•	•	0	•	•	•	•	•	•	•	•	•	٠
•	•	•	•	•	•	•	•	0	•		•	•	٠	•	•	•	•	٠	0	•	•	•	٠	•
•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•
٠	•	•	٠	٠	•	٠	٠	0		•	•	•	٠	•	•	•	•	٠	0	•	•	•	٠	۰
•	•	•	•	•	•	•	•	•			•	•	•	•	•	•	•	•	•	•	•	•	•	٠
•	٠	•	٠	•	•	0	۰	0	0	٠	•	٠	•	٠	•	•	٠	•	٠	•	٠	•	•	۰
•	•	٠	•	•	٠	•	0	0	0	•	•	•	•	•	•	•	•	٠	٠	•	•	•	٠	•
•	•	٠	٠	•	٠	•	•	•	0	•	٠	•	•	•	•	•	٠	•	•	•	•	•	•	•

MONDAY April 3 BLOCK I 9:30-11.15

Atlas Opportunities Stimulated by the UN-IGIF and the SDG Data Alliance

Timothy TRAINOR International Cartographic Association

A new geospatial framework created by the United Nations called the UN Integrated Geospatial Framework (UN-IGIF) is replacing the traditional NSDI among countries. The SDG Data Alliance focuses on Country-level Actions Plans using the UN-IGIF and a new SDG Data Hub which integrates statistical and geospatial information that addresses the UN Sustainable Development Goals (SDGs). This approach offers an opportunity to conceive new atlas constructs for showing important information and encouraging users to act on what they see. Let's discuss what is possible!

N	DTE	S	•		•	•				•	٠	•			٠	•	٠	٠	•		٠	•	•	*
•	•	•	•	•		•	٠	•	•	•	•	•	•		•	•	•	•	•		•	•	٠	
•	•	•	•	•	٠	0	•	•		•	٠	•	0	0	•	٠	•	•	•	•	•	•	0	
•	٠	•	•	٠	•	۰	•	0	•	٠	٠	•	0	0			•	•	•	•		•	•	
•	٠	•	•	٠	٠	٠	•	•		•	٠	•	۰	•	•	•	•		٠		•	•	•	
•	٠	•		•	0	0	•	0		•	٠	•	0	۰	٠	٠	•	•	٠	•	٠	٠	۰	
٠	•	•	•	•		0	•	0		•	٠	•	0	0	•	۰	٠		٠	•		٠	•	
•	•	•	•	•	•	0	•	•		•	٠	•	0	0	•	۰	•	•	•	•	•	•	0	
		•	•	•	•	0	•	•		•	٠	•	0	0	•	۰	•		•	•	•	•	•	
٠	٠	•	•	٠	٠	•	•	•		٠	٠	•	0	•		٠			•	•	٠	•	•	
٠	٠	•	•	٠		0	٠			•	٠			•	٠	٠	٠	٠	٠	•	٠	٠	•	
٠	٠	•	•	•			•				•				•	٠	٠	٠	•	•	•	٠	۰	
•	٠	•	•	•			•				•					•	٠		•			•	•	
•	٠	•		٠			٠			•	•	•				•	•	•	•			•	•	
٠	•	٠	•	٠	٠	۰	•	•	•	٠	٠	•	0	•	•	•	•	•	٠			•	•	
•	•	•	٠	•	٠	٠	•	٠	•	•	٠	٠	٠	•	•	٠	•	•	٠	•	•	•	•	
•	•	•		•	•	•	•			•	•	•			•	•	•	•	٠		٠	•	•	
•	•	•	•	•	•	•	•	•	•	•	•	•	0		•	٠	•	•	•		•	•	•	0
•	•	•		•		•	•			•	•		•		•	•	•		•			•	•	
٠	•	•	•	٠	•	•	•	•	•	٠	•	•	•		•	•	•	•	٠			•	•	
•	•	•	•	٠	٠	٠	٠	٠		٠	٠	٠	٠	•	٠	•	•	•	٠	٠	•	•	•	•
•	•	•	•	•		٠	٠	•		٠	٠	•	0	•	٠	•	٠	٠	٠	•	٠	•	•	

•	•	•	•	٠	•	٠	٠	•	•	•	•	٠	٠	•	•	•	•	•	•	•	•	•	•	٠
•	•	•	•	٠	•	•	•	•	•		•	•	•	•	•	•	•	•	•	•	•	•	•	•
•	•	•	•	•		٠	•	•	•	•		•	٠	0	•	•	•	٠	0	•	•	•	•	٠
•	•	•	0		•	•	•	0	•			•	٠	0	•	•	•	•	0	•	•	•	•	۰
•	•	٠	0	•	•	•	•	•	•	•	•	•	٠	0	•	•	•	•	•	•	•	•	•	•
•	•	•	•	•	•	٠	•	•	•		•	•	•	•	•	•	•	•	•	•	•	•	•	•
•	•	•	•	•	•	•	•	•	•		•	•	•	•	•	•	•	•	•	•	•	•	•	٠
•		•	•	•	•	•	•	•			•	•	•	•	•	•	•	•	•	•	•	•	•	٠
•		•	•	•	•	•	•	•			•		•	•	•	•	•	•	•	•	•	•	•	•
•		•	•	٠	•	•	•				•	•	•		•			•	•	•	•		•	•
٠		•	•	•	•	•	•	•			•	•	•	•	•	•	•	•	•	•	•	•	•	•
•	•	•	•	•	•	•	•	•	•		•	•	•	•	•	•	•	•	•	•	•	•	•	٠
•		•	•	•		•	•	•			•	•	•	•	•	•	•	•	•	•	•	•	•	•
•	0	•	0		•	•	•	0	•			•	٠	0	•	•	•	٠	0	•	•	•	•	•
•	•	•	0			•	•	0				•	•	0	•	•	•	•	0	•	•	•	•	•
•	۰	٠	0	•	•	٠	۰	0			•	۰	٠	•	•	•	•	•	0	•	•	•	•	•
•	•	•	•	•	•	٠	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	٠
•	•	•	•	•	•	•	•	•	•		•	•	•	•	•	•	•	•	•	•	•	•	•	۰
•	•	•	•	•	•		•	•			•	•	•	•	•	•	•	•	•	•	•	•	•	۰
•	•	•	•	•	•		•	•			•	•	•	•	•	•	•	•	•	•	•	•	•	•
•	•	•	•	•	•	٠	•	•		•	•	•	٠	•	•	•	•	•	•	•	•	•	•	•
•	۰	•	•	•	•	٠	٠	0	0	•	•	۰	٠	•	•	•	•	•	•	•	•	•	•	٠
•		٠	0	٠	•	•						•	•	0	•	•	•	•	•	•	•	•	•	٠
•	•	•	•	•	•	•	•	•	•		•	•	•	•	•	•	•	•	•	•	•	•	•	•
•		•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•
•	•	•	•	•	•	•	•	0		•	•	•	٠	•	•	•	•	•	0	•	•	•	•	•
•	۰	٠	0	٠	•	•	•	•	•	*	•	•	•	0	•	•	•	•	•	•	•	•	•	۰
•	0	٠	0	•	•	•		•	•	*			•	0	•	•	•	•	•	•	•	•	•	٠
•	•	•	•	•	•	•	•	•	•	•		•	•	0	•	•	•	•	•	•	•	•	•	٠
•	•	•	•	•	•	•	•	0	•		•	•	٠	•	•	•	•	٠	0	•	•	•	٠	•
•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•
٠	•	•	٠	٠	•	٠	•	0		•	•	•	٠	•	•	•	•	٠	0	•	•	•	٠	۰
•	•	•	•	•	•	•	•	•			•	•	•	•	•	•	•	•	•	•	•	•	•	٠
•	٠	•	٠	•	•	0	۰	0	0	٠	•	٠	•	٠	•	•	٠	•	٠	•	٠	•	•	۰
•	•	٠	•	•	٠	•	0	0	0	•	•	•	•	•	•	•	•	٠	٠	•	•	•	٠	•
•	•	٠	٠	•	٠	•	•	•	0	•	٠	•	•	•	•	•	٠	•	•	•	•	•	•	•

MONDAY April 3Managing cartographic collections spatiallyBLOCK IIgor DRECKI, Antoni MOORE9:30-11.15National Library of New Zealand, University of Otago

Ever wondered how to visualise a cartographic collection? Understanding collections' strengths and weaknesses informs the strategy that drives their development. This understanding though is often limited and reliant on written documentation and human memory. Visualising the Alexander Turnbull Library's map collection could equip us with a powerful tool that enhances the way we care for and grow the nation's cartographic taonga (treasures). This paper illuminates the process of fusing maps' library classification system with spatial tools and looks at a spatial approach to understanding cartographic collections, initially focusing on New Zealand. Since most maps do not currently have spatial coordinates recorded in their catalogue descriptions, this approach harnesses the geographic classification system (Boggs & Lewis) to extract the spatial, as well as temporal and thematic, component of maps' call numbers. The process of translating this information into data, the necessary step to visualise the collection, is explained in detail. In addition, an attempt is made to demonstrate how the temporal and thematic data embedded in the maps' call numbers could further enhance our understanding of the cartographic collections. Sample visualisations are provided to gain a sense of their usefulness in managing cartographic collections.

NC)TE	S	•	•	•	٠	•	•	•		•		•	•	•	٠	•			•	•	٠	٠	۰
٠	•	•	•	•	٠	٠	•	•	•	•	٠	۰	۰	•	•	•	•	•	•	•	•	•	•	
•	0	•	0	•	٠	٠	•		0		•	٠	•	٠	•	٠	•	•		•	•	٠	٠	•
٠	0	•	0	0	٠	٠	•		0		•	•	•	•	٠	٠	٠	•		•	•	٠	٠	
•	0	•	0	•	٠	٠	•		•		•	•	•	•	•	۰	٠	•		0	•	٠	۰	
•	0	•	•	•	٠	٠	•		•					•	•	٠	•			•	•	٠	٠	
٠	•	•	•	•	٠	٠	•		•		٠	٠				٠				•		٠	٠	
•	0	•	•	•	٠	٠	•			•	•	٠	•	•	•	٠	•	•		•	•	•	٠	•
•	•	•	•	•	٠	•					٠				•	٠	٠	٠		•	٠	٠	٠	٠
٠	0	•	0	•	٠	٠	•		•		•	•	•	•	•	۰	٠	•		0	•	٠	۰	
•	•	•	•	•	٠	٠	•		•		•			•	•	٠	•			•	•	٠	٠	
٠	•	•	•	•	٠	٠	•		•		٠	٠		•	•	٠				•		٠	•	
٠	•	•	•	•	٠	٠			٠		٠	٠			٠	٠	٠			•		•	٠	
•	•	•	•	•	•	•	•		*	٠	•	•		•	•	•	•	٠	٠	٠	•	٠	•	٠

•	•	•	•	٠	•	٠	٠	•	•	•	•	٠	٠	•	•	•	•	•	•	•	•	•	•	٠
•	•	•	•	٠	•	•	•	•	•		•	•	•	•	•	•	•	•	•	•	•	•	•	•
•	•	•	•	•		٠	•	•	•	•		•	٠	0	•	•	•	٠	0	•	•	•	•	٠
•	•	•	0		•	•	•	0	•			•	•	0	•	•	•	•	0	•	•	•	•	۰
•	•	٠	0	•	•	•	•	•	•	•	•	•	٠	0	•	•	•	•	•	•	•	•	•	•
•	•	•	•	•	•	٠	•	•	•		•	•	•	•	•	•	•	•	•	•	•	•	•	•
•	•	•	•	•	•	•	•	•			•	•	•	•	•	•	•	•	•	•	•	•	•	٠
•		•	•	•	•	•	•	•	•		•	•	•	•	•	•	•	•	•	•	•	•	•	٠
•		•	•	•	•	•	•	•			•		•	•	•	•	•	•	•	•	•	•	•	•
•		•	•	٠	•	•	•		•		•	•	•	•	•			•	•	•	•		•	•
٠		•	•	•	•	•	•	•			•	•	•	•	•	•	•	•	•	•	•	•	•	•
•	•	•	•	•	•	•	•	•	•		•	•	•	•	•	•	•	•	•	•	•	•	•	٠
•		•	•	•		•	•	•			•	•	•	•	•	•	•	•	•	•	•	•	•	•
•	0	•	0		•	•	•	0	•			•	٠	0	•	•	•	٠	0	•	•	•	•	•
•	۰	•	0			•	•	0				•	•	0	•	•	•	•	0	•	•	•	•	•
•	•	٠	0	•	•	٠	۰	0			•	۰	٠	•	•	•	•	•	0	•	•	•	•	•
•	•	•	•	•	•	٠	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	٠
•	•	•	•	•	•	•	•	•	•		•	•	•	•	•	•	•	•	•	•	•	•	•	۰
•		•	•	•	•		•	•			•	•	•	•	•	•	•	•	•	•	•	•	•	۰
•	•	•	•	•	•		•	•			•	•	•	•	•	•	•	•	•	•	•	•	•	•
•	•	•	•	•	•	٠	•	•		•	•	•	٠	•	•	•	•	•	•	•	•	•	•	•
•	۰	•	•	•	•	٠	٠	0	0	•	•	۰	٠	•	•	•	•	•	•	•	•	•	•	٠
•		٠	0	٠	•	•		•				•	•	0	•	•	•	•	•	•	•	•	•	٠
•	•	•	•	•	•	•	•	•	•		•	•	•	•	•	•	•	•	•	•	•	•	•	•
•		•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•
•	•	•	•	•	•	•	•	0		•	•	•	٠	•	•	•	•	•	0	•	•	•	•	•
•	۰	٠	0	٠	•	•	•	•	•	*	•	•	•	0	•	•	•	•	•	•	•	•	•	۰
•	0	٠	0	•	•	•		•	•	*			•	0	•	•	•	•	•	•	•	•	•	٠
•	•	•	•	•	•	•	•	•	•	•		•	•	0	•	•	•	•	•	•	•	•	•	٠
•	•	•	•	•	•	•	•	0	•		•	•	٠	•	•	•	•	٠	0	•	•	•	٠	•
•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•
٠	•	•	٠	٠	•	٠	•	0		•	•	•	٠	•	•	•	•	٠	0	•	•	•	٠	۰
•	•	•	•	•	•	•	•	•			•	•	•	•	•	•	•	•	•	•	•	•	•	٠
•	٠	•	٠	•	•	0	۰	0	0	٠	•	٠	•	٠	•	•	٠	•	٠	•	٠	•	•	۰
•	•	٠	•	•	٠	•	0	0	0	•	•	•	•	•	•	•	•	٠	٠	•	•	•	٠	•
•	•	٠	٠	•	٠	•	•	•	0	•	٠	•	•	•	•	•	٠	•	•	•	•	•	•	•

MONDAY April 3

BLOCK I

Complex atlas mapping of selected municipalities and administrative regions of Georgia

Tengizi GORDEZIANI, Tedo GORGODZE, Saba MODEBADZE, Neli JAMASPASHVILI, Nika BERUCHASHVILI, Gocha JINCHARADZE, Mariam GAGOSHASHVILI, Tamar GORDEZIANI

> Tbilisi State University, Ministry of Defence of Georgia, SityMap, Technical University of Georgia

Atlas mapping, in Georgia, originates in the 18th century. The well-known Georgian geographer, cartographer, and historian Vakhushti Bagrationi stands at the origins of Atlas mapping. In the 20th century, other well-known scientists A. Javakhishvili, A. Aslanikashvili, S. Tskhakaya, D. Kekelia, G. Liparteliani, and K. Kharadze contributed to the development of atlas mapping. Since the 80s of the last century, in Georgia, as a result of the introduction of the geoinformation concept in cartography, a new direction of geoinformation atlas mapping has been intensively developing, which was initiated by the outstanding Georgian geographer and cartographer, Professor Niko Beruchashvili.

Atlas mapping. Atlas mapping in Georgia has been intensively developed since the 60s of the last century when the first national complex geographical atlas of Georgia appeared (1964). Complex atlas mapping of municipalities and regions of Georgia began in 1990. Complex atlases of the municipalities of Samtredia (2012), Lagodekhi (2012), Gurjaani (2012), Lentekhi (2017), Bolnisi (2018), Khashuri (2019), Kareli (2022) were compiled, as well as the Complex Atlas of Adjara (1996 and 2007), atlas of the Racha-Lechkhumi region and lower Svaneti (1997) and others.

Atlases created in Georgia (1964–2021): Complex atlases – 9; Thematic atlases – 8; Atlases for special purposes – 4. Language: In Georgian – 15; In foreign languages (Russian, English, French) – 6. Size: A4 – 12; A3 – 6; A2 – 3. Type of use: Printed – 16; Electronic – 5.

Complex atlas mapping consists of several closely related processes 1) compiling the program of the atlas, 2) collection of statistical and spatial (geographical) data of the mapped area, 3) field mapping and inventory of objects of the study area, 4) cameral processing of cartographic data, 5) selection of a number of scales for maps of the atlas, 6) choice of atlas format, 7) preparation of general geographic bases for maps of the atlas, 8) compiling the structure and sequence of maps of the atlas.

Before compiling the atlas itself of a specific administrative unit (municipality or administrative region), a geographic information system (GIS) is compiled for the mapped area. The GIS structure of a particular municipality or region includes

1) parameters about the area and borders, 2) parameters about the hydrographic network, 3) survey markers, heights, and other morphometric indicators, and 4) Hypsometric parameters.

Use of atlases. Printed and electronic (geo-information) atlases are intensively used in such areas of human activity as an industry, agriculture, transport, mineral deposits, recreation and tourism, social services, healthcare and service facilities, and population.

Conclusion. Complex and thematic atlas mapping has a deep origin in Georgia. Cartographic works of various formats and practical purposes are widely used for the purposes of daily practice, as well as in the system of education (enlightenment), military affairs, capital construction, recreation, tourism, etc. Georgian cartographic products at all international exhibitions received great recognition from groups of professional cartographers from different countries. Georgian scientific cartographers delivered excellent and innovative presentations at international scientific forums. Among such scientists can be named: Alexander Aslanikashvili, Niko Beruchashvili, Jansug Kekelia, Rostom Chekurishvili, Guliko Liparteliani, Tengiz Gordeziani, Zurab Laoshvili, and others. The new generation of cartographers is also distinguished by its interesting work.

NC	TE	S	0	0	•		۰	۰	•	0			0	0	٠	0	0	•	0	۰	•	0	0	
	•	•	•																					0
	•	0	•				•	•					0	0				٠				•	•	0
	•	•	•	٠		٠	•	٠				•	•							٠	•			
•	•	•	•	•	•	•	٠	٠	•	•	•	٠	٠	•	•		•	•	•	٠	٠	•	٠	•
0	•	0	٠	•	0	٠	٠	٠	•	0			0	•	٠	•	۰	٠	0	٠	٠	•	۰	٠
•	•	0	•				٠	٠	•			•	0	0	•					٠		•	0	
•	•	•	•	•		•	٠	•	•		•	•	•	•	•			•	•	٠	٠	٠	٠	•
•	•	•	•	•	•	•	•	٠	•	•	•	٠	٠	•	•					٠	٠	٠		•
0	•	٥	٠	٠	0	٠	٠	٠	•	•	•	٠	۰	•	•	•	•	•	•	٠	٠	•	•	۰
0	•	0	•	•	0	٠	٠	٠	•	0			0	0	٠	0	•	۰	•	٠	٠	•	۰	٠
0	•	0	•	•	0		٠	٠	•	0			0	0	•	0	0	0	0	٠	•	0	٥	
	•	•	•	•		٠	٠	٠						0	•					٠	•	•	٥	
٠	•	•	٠	٠		٠	٠	٠			٠	٠	•					٠	•	٠	٠	٠	0	•
•	•	•	•	•	٠	•	•	٠	٠	•	•	•	•	•	•			•	•	٠	•		•	٠
•	•	٠	•	•	•	٠	•	٠	•	•	•	•	٠	•	٠	•	•	٠	•	٠	•	•	•	٠
•	•	0	•	•		•	٠	٠	•				0	0	•	0	0	0	0	٠	٠	•	۰	٠
•	0	•	٠	٠		٠	٠	٠			٠				•				0	۰	•	۰	٥	•
٠	•	•	٠	٠		٠	٠	٠	•	٠	٠	٠	٠	٠	•			•	•	•	•	٠	٠	•

Six periods in the history of Czech school atlases

Vít VOŽENÍLEK Palacký University Olomouc

The paper introduces a short history of Czech School atlases in periods.

The first period (until the middle of the 18th century) was the use of commonly available German and Austrian maps, globes and atlases designed specifically for schools. After 1850, the original Czech cartographic production of school atlases appeared thanks to the awakening of national consciousness.

The second period (around 1850) is the Merklas atlases. Václav Merklas (1809–1866) was mainly a copper engraver, cartography was not his main profession. Between 1842 and 1858, in cooperation with the revival society Matice česká, he published five atlases by translation of German and Austrian atlases. Although the atlases were quickly distributed to schools, the interest of the schools soon failed due to the unreliability of Merklas himself.

The third period (1850–1918) is defined by Kozenn's atlases. Blasius Kozenn (1821–1871) taught in Olomouc, where he met the bookseller Eduard Hölzel, who persuaded him to compile a school atlas, which Austrian schools were still lacking. Hölzel founded a bookshop in Olomouc in 1848, then moved it to Vienna, where it is still Verlag Ed. Hölzel. In 1861, he published Kozenn's first school atlas which became a bestseller in Austrian schools and was translated into Polish, Croatian, Czech and Italian. Atlases for Austrian schools are still published under the title Kozenn-Schulatlas.

In the fourth period (1918–1948), after the establishment of independent Czechoslovakia, the School Geographical Atlas was compiled by J. Brunclik and F. Machát, and later reworked by Šalamon and Kuchař. It was one of the best produced in the Czech lands. Geographical maps prevailed, thematic maps were more frequent, they were prepared for the whole world and did not have an index. After the Second World War, the atlas was out of date, but from the mid-1950s there was a rapid increase in the number of published works – it was divided into national and world and an index was introduced.

The fifth period (1948–1989) is characterized by the world atlases of the Unified System of School Cartographic Aids (USSCA), a unified concept for the systematization and stabilization of teaching. It was built on cartographic and pedagogic research which included an analysis of teaching aids for geography, history and national history. The aim was to maintain uniformity in all cartographic aids used in education in terms of scales, legends, cartographic means of expression, etc. In the last, current period (atlases after 1989), the publishing of atlases according to the USSCA was continued by the monopoly publisher Kartografie Praha. Later it was reworked into the School Atlas of the World for secondary schools and the Pupils' Atlas for primary schools. In the mid-1990s, Kartografie Praha began publishing atlases based on the primary school geography curriculum for individual grades. Other publishers of school atlases gradually became TERRA, SHOCart and Geodézie ČS.

The paper is supported thanks to the generous support under the Operational Program Integrated Infrastructure for the project no. 313021W479 "Research Center for Data Analysis and Protection – II. stage", co-financed by the European Regional Development Fund."

N	OTE	S	•	•	•	•	•	•	•	*		•	•	•	*	*	•	٠	•	•	•	•	٠	•
	•	•				•	•	٠	•			•	•	•				٠	٠	•	•	•	•	٠
٠	٠		•			•	•	٠	•	•	•		•		•	•	•	•	•				•	
•	۰	•	0	0			٠	٠		0	•		0		0	0	0	•	•				0	0
٠	۰	٠	0	•	٠	٠	٠	٠		•	•		•		0	•	•	•	•				•	•
٠	•	•	•	•	٠	•	•	٠	٠			•	•	٠				٠	•	•	•	•	•	٠
	•	•		•		•	•	٠	•			•	•	•			•	٠	٠	•	•	•	•	٠
•	•	٠	0		٠	•	٠	٠	•	0	•	٠	٠	٠	0	0			•	٠	•		٠	0
۰	•	٠	0	0			۰	٠	•	•	•		•	•	0	•	•	۰	•				0	
٠	۰	٠		٠	٠	٠	۰	٠	•	•	۰		•	•	•	•	•	۰	•				•	
٠	•	٠		٠	٠	٠	۰	٠			•	٠	•	۰	•	•	٠	٠	•				۰	٠
*		٠		٠	٠	•	٠	٠				٠	•	•			•	•	•		*		•	٠
•	•	•	•	•	•	•	•	٠	•	•	٠	•	•	٠			•	•	•	٠	•	•	٠	٠
	•	•		٠	•	•	•	•	•			•	•	•			*		•	•	•		•	•
•	•	٠	0	•	٠	٠	•	٠	•	0	•	•	•	•	0	0		•	•			•	•	
0	٠	٠	0	0	۰	٠	•	۰	•	0	•	۰	۰	•	0	0	•	•	•	•	•	•	•	٠
٠	0	٠	0	٠	٠	٠	۰	٠			0	0	0	۰	•	•	•	•	•	٠	٠	•	۰	٠
•	0	•	0		•	•	۰	٠	•		0			۰						٠	٠	٠	٥	٠
	۰	•	•	•	•	•	•	•	•	•	•	•	•		•	*	*	•	•	•	•	•	•	0
•	•	٠	0	0	۰	٠	•	٠	•	0			0	•	0	0	0	•	•				•	•
۰	•	٠	0	0	۰	٠	•	٠		•	•		0	•	0	0	•	•	•				•	•
•	0	•	•	•	٠	•	۰	٠	•	•	•	•	•	•			•	•	•	•	•	•	۰	۰
•	•	•	•	•	•	•	۰	٠	•			•	•	•	•	*	•	•	•	•	•	•	0	0
•	0	•	٠	•	٠	•	•	٠	•	•		•	٠	٠				•	•	٠	٠	٠	•	0
•	۰	•	٠	٠	٠	٠	٠	٠	•	•	•	٠	٠	٠	•		•	•	•	٠	•	٠	•	0

MONDAY April 3 BLOCK II 11:45-13.30

Online Atlas Storytelling: Towards Nonlinear Narratives

Gareth BALDRICA-FRANKLIN University of Wisconsin-Madison

This research extends discussions of cartographic storytelling to online atlases, which, I argue, carry unique narrative capabilities due to the online medium. Storytelling has a dual nature within atlases: individual maps can tell stories, and these maps can also coalesce into a larger story. While cartographic narrative is often conceptualized as linear—through "scrollytelling" and other online storymapping methods—online atlases, as series of interconnected webpages, possess nonlinear gualities. Thus, I conceptualized online atlases through the framework of Interactive Digital Narrative, relating them to other nonlinear narratives, such as interactive cinema, hypertext fiction and video games. Central to my exploration was the relationship between user-driven navigation and narrative. To examine how a narrative online atlas could be designed, as well as how users might respond to this design, I created an original online atlas for use in a lower-level college course, and then held a series of focus group discussions with students and instructors. In this presentation, I will present the results of these focus groups, which suggest that narrative online atlases benefit from a clear navigational strategy while also giving users multiple pathways through the narrative.

NC)TE	S	•	•	٠	•	•	0		٠	•	•		•			0	0	•			۰		
•	•	•	•	•	٠	•	•		•	•	•	•	•	•		•	•	•	•	•	•	•	٠	
•	٠	•	•	•	•	٠	•	•		•	•	•	٠	٠	•	•	•	•	•	•	•	•	•	
•	•	•	•		•	•	•			•	•	•	•	٠		•	۰	•	•		•	٠	•	
	•	•	•	•	•	•				•	•	•	•	•		•	•						•	
	•					•				٠	•	•											•	
0	٠	0	•	•	•	٠		0	0	٠	٠	٠		•		•	0	0	•	•	•	•	•	
0	٠	0	•	•	٠	۰		0	•	٠	٠	۰		۰	•	٠	۰	0	•	•	•	•	٠	
•	•	•	•		•	•	•	0			•	•		٠		•	•	•	•		•	٠	•	
	٠	•			•											•						•	•	
	•	•	•			•				•	•					•								
0	•	•	•		•	•				•	•	•				•	•	•	•					
•	•		•		•	•				•	•	•				•	•						•	
•	•				•	•								•		•	•	•			•	•	٠	

•	۰	٠	0	•	•	•	•	0	•	•	•	•	٠	٠	•	•	•	٠	٠	•	•	•	•	٠
•	•	•	•	•	•	•	•	•	•	•		•	•	•	•	•	•	•	•	•	•	•	•	٠
•	•	٠	•	•	•		•	•		•		•	•	•	•		•	•	•	•	•	•	•	۰
•	•	•	٠	•	•	٠	٠	•	•	•	•	٠	•	•	•	•	٠	•	٠	•	•	•	•	•
•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	۰
•	•	•	•	•	•	•	٠	0		٠	•	٠	٠	•	•	•	•	•	•	•	•	•	•	٠
•	•	٠	0	٠	•					•		•	•	٠	•	•	•	•	٠	•	•	•	•	٠
•	•	•	•	٠	•	•	•		•	•		•	•	•	•		•	•	•	•	•	•	•	۰
•	•	•	٠	•	•	٠	٠	٠	•	٠	•	٠	•	•	•	•	٠	•	٠	•	٠	•	•	۰
•	•	•	•	•	•	•	•	0	•	•	•	•	•	•	•	0	•	•	•	•	•	•	•	•
•	•	•	٠	•	•	•	•	0	•	•	•	•	٠	•	•	0	•	•	•	•	•	•	٠	•
•	۰	۰	٠	٠	٠	٠	۰	0	٠	۰	٠	۰	0	٠	٠	٠	٠	0	٠	•	٠	•	٠	۰
•	۰	•	٠	•	•	٠	۰	0	•	۰	•	۰		۰	٠	٠	٠	0	۰	•	•	•	٠	۰
•	•	•	٠	•	•	٠	٠	•	•	٠	•	٠	•	•	•	•	•	•	٠	•	•	•	•	•
•	•	•	٠	•	٠	٠	٠	0	•	٠		٠	•	•	•	•	٠	0	٠	•	٠	•	٠	•
•	•	٠	٠	٠	٠	٠	٠	0	٠	٠	٠	٠	•	•	•	•	٠	•	٠	•	٠	•	٠	•
•	۰	٠	0	•	•	0	0	•	•	•	•	0	•	۰	•	•	•	•	۰	•	•	•	•	•
•	•	•	۰	•	•	•	0	•	•	•	•	•	•	٠	٠	•	٠	٠	0	•	٠	•	•	۰
•	•	•	•	•	•		•	0		•	0	•	•	•	0	0	•	•	•	•	•	•	•	•
•	•	•	٠	•	٠	٠	٠	0	•	٠		٠	•	•	•	•	٠	•	•	•	٠	•	•	•
•	•	•	٠	٠	•	٠	٠	0	٠	٠	٠	٠	•	•	•	•	•	•	•	•	٠	•	•	•
•	۰	•	۰	•	•	٥	٥	•	٠	۰	•	۰	•	•	٠	•	٠	•	0	•	۰	•	•	۰
•	•	•	٠	•	•	•	•	0	•	٠	•	•	0	•	•	•	٠	0	٠	•	•	•	٠	•
•	•	٠	•	•	•	•	•	•	•	•		•	•	•	•	•	•	•	•	•	•	•	•	•
•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	٠	•	•	•	•	•	•	•
•	•	•	•	•	•	•	•	0	•	•	•	•	0	•	•	•	•	0	0	•	•	•	•	•
	•	•	•				•		•			•	•	•	•	•	•	•	•	•	•	•	•	•
														•	•		•	•	•				•	
			•																					
																								•
																								•

MONDAY April 3

Crowdsourced atlas production

BLOCK II 11:45-13.30 Jakob LISTABARTH, Pei NIE, Menno-Jan KRAAK University of Twente, Enschede

The atlas discussed in this abstract will contribute to the impact narrative of ITC. It will demonstrate to a wide audience the impact of our capacity development interventions in education, research, and institutional strengthening. The maps and diagrams express the geographic and thematic distribution of our activities over time. Their relevance is shown in context of national and international development agendas. The graphics assist to identify and analyze the best practices and lessons learned to be applied in future activities. The atlas will appear both on paper and online.

The maps and diagrams in the sections on education and research are mostly based on statistics derived from data we found in the ITC archives. As with all archives there are data gaps due to lost data, different collection methods and policies. Partly contradicting data, hinder their interpretation. This is likely familiar to those working on similar projects.

The biggest challenge, however, is gathering content for the section on institutional strengthening. Over the years hundreds of projects have been executed. The results of these projects have mainly been reported in what is known as "gray literature", and most of these reports are not stored properly in the library for all kind of reasons. Hence, we depend on the common memory of ITC staff and alumni. To tap into this memory, we have created a 6-page DIN A4 leaflet that offers a sneak preview into the atlas, to create enthusiasm within the staff. In other words, it solicits for help.

The leaflet gives an impression of what is to be expected from the Atlas. Based on the data retrieved from the archives we included a stream graph and map on our MGEO MSc. The diagram shows the genealogy of the MSc and the number of graduates per year. The map displays the origin of these students. An infographic about the influence of Dutch government policy on ITC activities is built around a set of linked timelines. Firstly, to make people aware of the wider context we operate in and secondly, to stimulate contributing staff to think about projects content and context. To further stimulate potential contributors, we included an example page on a project around Lake Naivasha, Kenya where ITC is active for decades. Here we tell the story of ITCs impact following the Theory of Change.

The leaflet has been physically distributed to all staff members and currently individual meetings are set to retrieve information on key projects. In the discussions we follow a semi-structured interview approach to steer towards a project template page, leaving enough space to allow for creativity. A crucial upcoming step is to transform the semi-structured qualitative data gathered in the staff meetings into mappable data. Only after that cartographic visualizations can be sketched out, evaluated, and lastly implemented. Finally, the resulting atlas section on project will map the breadth of ITC's project portfolio.

Acknowledgements

The authors would like to thank all ITC staff who helped to provide, acquire, and compile the data on ITC used for the prototypes, and for their feedback.

N	OTE	S			•	•	٠			•	•	٠	•	٠	٠	•	٠	٠		•	•	•	٠	
		•			•	•	•	•	•		•	•				•	•			•	•	•	•	
•	•	•	•	•	•		•					•					•	0				•	•	
٠						•	•	•			•	•					•						•	
•	0	•		•		٠	٠			•	•	٠		•	•	•	٠	0	•	•	•	•	٠	•
	0	•					•					•	•	•	•	•	•	•	•	•	•	•	•	0
	•						•																•	0
•	•		•							•	•	•	•											
•	•	•				٠					•	٠					•							
•	0	•					•				•		•	•	•	•	•	•	•	•	•	•	٠	
	0	•					•										•	•					۰	
	•	•															•						•	
•	•			•			•				•	•					•						•	
۰	•			•	•	٠	•	•		٠	٠	٠	•				•	0		•	•		•	
۰	•						•				•	٠	•		٠	•	۰	0		٠	٠	•	٠	
•			•				•					•				•	0	0				•	٠	
•							•									•	•	0				•	•	
•		•	•			٠	•				•	•					•							
•	•	•				٠	•	٠			•	•				•	•						•	
•	•	•				٠	•				•	•				•	•		•	•	•	•	•	•
•	0	•				•	۰				•	•				•	•	٠	•		•	•	٠	
٠	0	•					•				•	•					•	0	•			•	۰	
٠	•	•					•			•	•	•					•	0	•			•	•	
•	•	•	•			•	•	•		•	•	•	•			•						•	•	
•	•	•	•			•	•	•	•	•	•	•	•	•	•	•	•		•	•	•	•	•	
•	•	•				•	•		•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	
٠	٥	•	•		•	٠	۰			•	•	•	•	•	•	•	0	0	•	•	•	•	۰	
٠	•	•	•		•	٠	•				•	•	•	•	•	•	•	0	•	•	•	•	۰	
۰	۰	0	0	٠	٠	٠	٠	٠	٠	٠	٠	٠	٠	٠	٠	٠	0	0	0	٠	٠	٠	٠	0
٠	۰	0	•	٠		٠	٠	٠	٠	٠	٠	٠	٠	٠	٠	٠	•	0	0	٠	٠	٠	٠	
•	•		•	•		٠	٠	٠			•	٠		•	٠	٠	٠	0		•	٠	٠	٠	
MONDAY April 3 **BLOCK II** 11:45-13 30

Crowdsourcing for Atlas Productions: experiences from the "SDG's in action" atlas

Markus JOBST Vienna University of Technology

Map- and Atlas Production generally follows the traditional communication paradigm of sender-receiver. Therefore the producer of a map processes different kind of (spatial) information and presents the result in an understandable user-centric way, which should lead to acceptance and a successful production. The stories of the product should have an impact on the user/reader and for some extent reflect the view of the users/readers. The concept of crowdsourcing or volunteered geographic information, where some information is collected or even maps are created by the public (e.g. the successful OpenStreetMap as database of volunteered geographic information), has some impact on maps and their acceptance. Similarly, this positive effect of crowdsourcing can be adopted to atlas production and should be investigated. In our atlas project "SDGs in action – a generations view" we have investigated different ways of crowdsourcing and embedded the first results in our atlas production.

The participants of the book atlas project are selected in various groups: very small children in the kindergarten, primary and secondary school, students before they access working life and experts at the climax of their career. A general questionnaire allows for a basic understanding of the participants, whereas an introduction to the SDG topic is done by the educational staff in the kindergarten and school. Depending on the quality of the educational staff, overwhelming examples and responses could be achieved. The selection of a SDG topic is done by participants on their own, depending on their affectedness.

The view of the very young generation in terms of UN sustainable development goals is controverse and important. This young generation shapes their future and makes use of various tools of expression. The children's view on the SDG topics are almost not biased by media influences and misaligned education (Barrouillet 2015), especially in topics of sustainable development goals. This viewpoint of "influencing pre-conceptions" mainly depends on the age of children in terms of the cognitive development, their educational and living environment as well as parental guidance. The cognitive skills that allow for the usage and creation of maps follow the cognitive development steps of Piaget (1964) and have to be considered in the production of an atlas. One main important aspect to include children views of SDG's is their intuitive feeling about environmental changes and social injustices depending on their cognitive stage and knowledge (Alerby 2000, Barraza 1999, Bland 2021).

In our contribution we highlight different ways of crowdsourcing for an atlas production. We explain those ways of crowdsourcing that were explored and embedded in our example atlas production "SDGs in action – a generations view".

N	OTE	S		0	•	•	٠	0	•		٠		•		•	0	•	•	•	•	•	0	٠	
•	•	•	•		•	•	•	•	•	•	•	•	•	•	٠		•	•		•	•		•	٠
	•	•	•	•			٠	•			•	•	•		•		•	٠	•	٠	•		•	٠
															•					•			•	•
	•	•		•		•	•	0					•			0	•	•				0	•	
	•	•	•	•	•	•	•	0					•			•		0				0		
		•					•	•			•		•		•					•			•	•
	•	•					•	•			•		•		•		•	•	•	•			•	٠
							•					•			•				•				•	
	•						•																	
	•	•					۰	•			•	•	•		•	•							•	
•	0	•					۰	•			•		•		٠	•	•	•	•	•	•	•	•	•
	0	•					•	•							•	•	•	•	•	•		0	۰	•
		•					•									0		•				0	•	
		•					•									•		•				•	•	
•		•	•	•		•	•	0			•	٠	•			•		•	•			•	•	
•		0		•	•	•	•	0			٠	٠	•	•	•		•	0		•			•	
		0					0	0						•		•	•	0		•		•	٠	•
•		0						0					•				•	0						•
•		•						•									•	0						
•		•		•			•	•			•	٠			•			•					•	
•	۰	•					٠	•			•	•	•		٠	•	•	•	•	•	•	•	•	
•	0	•					۰	•				•			٠	•	•	٠	•	٠	•	•	٠	•
•	0	0					۰	0				•			•	•		٠	•		•	0	۰	
•		0	•		•		•	0					•	•				0		•			•	•
•		•					•					٠	•										•	
•	•	•	•	•			•		•		•	•	•	•	٠		•	٠	•		•		•	
•	•	•	•	•			•	•	•	•	•	•	•	•	•		•	٠	•	•	•	•	•	٠
•	•	•	•	•		•	•	•	•	•	•	•		•	٠			•	•		٠	•	•	٠
•	•	•	•	•		•	•	•		•		•		•	•			•			•	•	•	•
•	•	•	•	•		•	٠	•			•	•										•	•	•

MONDAY April 3 BLOCK II 11:45-13 30

Participatory Atlas Design: experiences from an SDG-Atlas pilot

Eric LOSANG Leibniz-Institute for Regional Geography, Leipzig

Over the course of their long history, atlases have been successively monopolized by different interest groups, constantly developing new practices and purposes. These developments went hand in hand with changes in technologies, paradigms of knowledge inscription and transmission, and underlying political and social discourses.

Following the approaches of critical cartography, the in-depth analysis of atlas productions reveals the strong influences of these discourses on the different choices and processes of atlas productions, whose foundations often reflected the producer's than the user's point of view. In order to question these approaches, one must understand the processes during ideation and planning and, if necessary, conduct reflexive atlas projects on a predefined topic.

In 2015, the United Nations defined 17 Sustainable Development Goals (SDGs) in an effort to make the broad social, economic, and environmental challenges more tangible. The sheer scope of the challenges and facets is reflected in the numerous sub-goals which are operationalized through a vast set of pre-defined indicators. Unsurprisingly the World Bank – whose databases provide the lion's share of the information related to the indicators identified as basis to assess the SDGs – already published analog and digital SDG Atlases in 2017, 2018 and 2020.

Inspired by a long tradition of counter and radical cartographies from the fields of art, science, and political activism that seek to make alternative perspectives visible, three different settings for designing an alternative atlas on the Sustainable Development Goals were implemented as part of a student course assignment in the Global Studies program at the University of Leipzig.

The chosen approaches differed in the degree of organization and specifications for the collaborative production of an atlas concept, with fewer specifications provoking stronger participation processes in early planning stages, thus reflecting a rough variety of existing atlas production environments, ranging from classical editorial-driven compilation to open concepts with a strong collaborative approach that involves users and user groups.

The paper compares, categorizes and discusses the results of the respective projects and formulates alternative atlas designs in terms of their structure, narrative, openness, transparency and sustainability.

N	DTE	S	•	٠		۰	۰	0		•		٠	٠	•	•		٠	•	•	•	•	•	•	*
	•	•	•	0	٠		0	0	•			•	٠	•	•		•	•	•		٠	•	•	۰
•	•	•	•	•					•	•				•			•	•	•		•	•	•	•
	•													•						•		•	•	۰
	•	•	•		٠	•	•						•										•	•
•	٠	٠	•	•	٠	٠	۰	٠	•			٠	•	•	•		•	•	•		•	•	•	٠
	٠	•	•		•		0	0	•			0	٠	•	•		•	•	•	•	•	•	•	٠
	•	•	•	•	•		•						•	•	•		•				•	•	•	
•	•	•	•	•	•		•		•	•		•	•	•	•			•	•	•	•	•	•	•
•	٠	۰	۰	•	٠	0	۰	0	•	•			٠	٠	٠	0	•	٠	٠	0	•	•	•	۰
	٠	•	•		٠	•	•		•	٠		•	٠	•	۰	•	٠	٠		•		•	٠	٠
•	•	٠	٠	•	٠		٠	٠	•	•	٠	٠	٠	٠	٠	*	٠	٠	٠	•	•	٠	٠	٠
•	٠	•	•	0	٠	0	•	0	•	0	•	٠	٠	٠	٠	0	٠	٠	٠	0	•	•	•	۰
	•	•	•	•	•	•	0		•				*	•	•	•				•	•	•	•	•
•	•	۰	0	•	٠		۰	٠	•	٠	٠	٠	٠	٠	٠		•	٠	٠		•	٠	•	•
•	•	٠	٠	•	٠	٠	٠	٠	٠	٠	٠	٠	٠	٠	٠	•	•	٠	٠	•	•	٠	•	۰
•	٠	۰	۰		٠		۰	0	•		٠	٠	٠	٠	٠		٠	٠	٠	0	٠	٠	•	٠
	•	٥	0		•		٥		0		٠		٠	٠	٠		٠	٠	٠		•	٠	•	۰
•	•	•	•	•	•	•	•	•	•	•	•	•	•		٠		•	٠	•	•	•	•	•	•
•	•	•	•	•	•	•	•	0	•	•		•	•	٠	٠	•	•	•	•	0	•	•	•	•
•	٠	۰	0	•	٠	•	٥	٠	•	•	•	•	•	۰	۰		•	•	•	•	•	•	•	•
•	•	•	۰	•	٠	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•
•	•	•	•	•	•	•	0	0	•		•	•	•	•	•	•	•	•	•	•	•	•	٠	•
•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•
		0	0				0																	0
		0	0				0	0																
	•	•	•		•		•	•				٠	•							•				
		•												•				•						•
	•	0	0				0	0												0				•

MONDAY April 3

BLOCK II

Geographic Information System and Complex Atlas of the Autonomous Republic of Abkhazia

Revaz TOLORDAVA, Tedo GORGODZE, Gocha GUDZUADZE Sukhumi State University, Tbilisi

The history of the creation of complex atlases in Georgia begins in the 60s of the 20 century when the first complex cartographic work the "Atlas of the SSR of Georgia" was created and published. The presented topic refers to the research planned for the creation of a complex atlas of the territory of the Autonomous Republic of Abkhazia. The novelty and innovativeness of the study lie in the fact that for the first time, a comprehensive survey of the occupied territory will be carried out and the results will be presented in the form of fundamental cartographic work.

Conducting scientific research on the Autonomous Republic of Abkhazia and creating a complete comprehensive cartographic material reflecting the current situation is extremely important and it will contribute to the difficult and long process of integrating the occupied region with Georgia. The topic is also relevant in that ten years after the occupation, a complex survey of the territory will be carried out. Taking into account that under the conditions of the current occupation, it is impossible for Georgia to carry out field research in Abkhazia, it will be necessary to use modern methods and technologies of scientific research to obtain the most up-to-date information.

The creation of a geographic information system and a complex atlas of the research area requires conducting interdisciplinary scientific research in various directions, analyzing the received information, and mapping it. Due to the complex content, it is necessary to carry out research works in geographical, cartographic, historical, archaeological, ethnographic, socio-economic, political, and other directions.

The planned works include several stages: (1) Study and processing of existing information about the research area; (2) Creation of a geographic information system of complex content; (3) Creation of digital and printed versions of the atlas; (4) Publication of the Atlas in Georgian and English.

The structural scheme of the atlas is similar to the generally accepted structural schemes for complex atlases and will be formed as follows: (1) General part – basic information, geopolitical position, Abkhazia on the map of Georgia, cartographic materials reflecting the pre-occupation and current state, aerial and satellite images; (2) Natural conditions – relief, geological structure and minerals, tectonics, geomorphology, hydrographic network, climate, soils, landscapes, vegetation, the animal world, and others; (3) Social phenomena – archeology, history, architecture,

ethnography, socio-economic and cultural spheres, and others; (4) Schematic plans of the main cities – Sukhumi, Gagra, Gali, Gudauta, Gulrifshi, Ochamchire, and Tkvarcheli.

The Atlas project envisages the creation of more than 100 different content maps. Apart from the maps, the atlas will contain additional information in the form of texts, diagrams, illustrations, and charts.

The results of the research will be available to scientific and public circles in both digital and printed forms.

In conclusion, it should be noted that the example of our work will lay the foundation for a complex atlas geoinformation mapping of the occupied territories in Georgia. And this process should continue in another occupied territory (Tskhinvali region) and territories with special status (for example, mountainous regions, border regions), which will contribute to the further development of cartography and geoinformation cartography in Georgia, the use of modern methods and technologies.

N	DTE	S	•	٠			•	•	•	•	•	•	•					•	•	•	•		•	•
	•	٠		٠		٠	٠	•	٠	•	•	•			٠	٠	٠	٠	٠	٠	٠		•	0
	•	•	•	•		•	٠	•				•		•	•	٠	٠	٠	•	٠	•	•	•	٠
•	•	•	•	•			•	•		•		•		•		•	•	٠	•	٠	•		•	
•	•	٠	•	•			•		٠			•	٠	•				•		٠			٠	0
•	•	•	•	٠	•	•	•	•	•	٠	•	•	•		•	•			•				•	
•	•	•	•	•	٠	٠	٠	٠	٠	٠	٠	٠	٠	•	•	٠	•	٠	•	٠	٠	•	•	٠
	•	•	0			٠	٠	٠	٠	٠	٠	٠	•	٠	٠	٠	٠	٠	٠	٠	٠	•	•	٠
•	0	•		•	•	٠	•	٠				٠	•		•	•		0	٠	•		0	٠	
	•	٠		•				٠	٠	٠	٠	٠	٠	•		٠	٠	•		•		•	٠	•
•	•	•	•	٠	٠	•	•	•	•	٠	•	•	•	•	•	•			•	•	•	•	•	•
•	•	•	٠	•	٠	•	•	•	•	٠	•	•	٠	•	•	•	•	•	•	•		•	•	٠
0	•	٠	0		0	٠	٠	٠	•	٠	٠	٠	•	٠	٠	٠	٠	٠	٠	٠	٠	•	•	٠
•	۰	٠		•	•		•			•		•	•	•		•		0	•	•	•	•	٠	٠
	۰	٠	•	٠		٠	٠	٠	٠	٠		•	•	•	٠	•			•	۰	٠	0	٠	•
•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	0
•	•	٠	•	•	•	٠	٠	٠	۰	٠	٠	٠	٠	•	•	٠	٠	٠	٠	٠	٠	•	٠	۰
0	•	٠	0		0	0	٠	۰	0	۰	٠	٠	0	٠	٠	٠	٠	٠	٠	٠	٠	•	٠	٠
	۰	•		•	*					•		•	•	•		•		0	•	•	•	٠	٠	٠
•	•	•	•	•	٠		•	٠	•	•	•	٠	٠	•	•	•		0	۰	0			٠	•
•	۰	٠	•	•	٠	•	•	٠	٠	٠	٠	٠	٠	•	•	•		0	٠			٠	٠	•

MONDAY April 3 BLOCK III

Mobile atlases: Their design and use?

Robert ROTH University of Wisconsin-Madison

In this presentation, I discuss possibilities for atlases designed specifically for use on mobile devices. I begin by introducing the recent research agenda "User Experience Design for Mobile Cartography" developed jointly by the ICA Commissions on Cognitive Visualization, Location Based Services, and the User Experience, which provides context for thinking about the design of mobile-first maps and visualizations. I then extend this research agenda by reviewing mobile mapping applications that share qualities with traditional atlases but also enrich the user experience with location-based services. Relevant mobile mapping projects developed in partnership with the University of Cartography Lab include: Flyover Country (https://flyovercountry.io), Global Madison (https://www.geography.wisc.edu/ globalmadison), and Mapping Teejop (https://mappingteejop.geography.wisc. edu/). I conclude with a summary vision and future research directions for the design and use of mobile atlases.

NC)TE	S	٠	•	•	٠	٠	٠	٠	•	•	۰	•			•	•	•	•		•	•	٠	•
•	•	•			•	•				٠	•			٠	•	•	٠					٠		
•	•	•			•					٠	•	٠		٠	٠	•	•					•		
•	•	•	•	•	•	•					•	•				•	•	•	•			۰		
•	•	٠	•		•	0	•	•				0				•	0	0	•	•	•	•	•	•
•	•	٠	•	•	•	٠				٠	٠	٠		٠	٠	٠	0	0				•	•	٠
•	•	٠	•	•	•	۰	•		•	٠	•	٠		•	٠	•	٠	٠	•	•	•	٠	•	٠
•	٠	•			•	٥		•		•	٠	٠	•	٠	٠	٠	٠	٠	•	•	•	٠	•	٠
•	٠	•	•	•	٠	•	•	•	•	٠	٠	0	•			٠	0	0				0		٠
•	٠	٠	•		٠	٠	•			٠	٠					٠	0	0				0	•	٠
•	•	٠	•	•	•	٠	٠	٠	٠	•	•	•	٠	•	•	•	•				•	•	•	•
٠	•	٠	•	•	٠	۰	•	•	•	٠	•	٠	٠	٠	٠	•	٠	٠	٠	٠	٠	٠	٠	٠
٠	٠	•		•	٠	0	•	•			•	0	•			•	0	0	0	0	•	۰	۰	٠
•	٠	•	•		٠		•	•	•	٠	•	0	•	•	٠	٠	0	0				0		٠
•	•	٠	•		•			•		٠	•	٠		•	٠	•						٥	•	•
•	•	٠	•	•	•	٠	٠	٠	٠	•	•	•	•	•	•	•	•	•	•		•	•	•	•
٠	•	٠	•	0	٠	0	0	٠	•	0	٠	0	•	٠	٠	٠	۰	0	0	•	0	٥	•	٠
•	٠	•	•		•	•	•	•	*	٠	٠	٠	•	٠	٠	٠	٠	•			*	٠	•	٠

•	•	•	•	٠	•	٠	٠	•	•	•	•	٠	٠	•	•	•	•	•	•	•	•	•	•	۰
•	•	•	•	٠	•	•	•	•	•		•	•	•	•	•	•	•	•	•	•	•	•	•	•
	•	•	•	•		٠	•	•	•	•		•	٠	0	•	•	•	٠	0	•	•	•	•	٠
•	•	•	0		•	•	•	0	•			•	•	0	•	•	•	•	0	•	•	•	•	۰
•	•	٠	0	•	•	•	•	•	•	•	•	•	٠	0	•	•	•	•	•	•	•	•	•	•
•	•	•	•	•	•	٠	•	•	•		•	•	•	•	•	•	•	•	•	•	•	•	•	•
•	•	•	•	•	•	•	•	•	•		•	•	•	•	•	•	•	•	•	•	•	•	•	٠
•		•	•	•	•	•	•	•	•		•	•	•	•	•	•	•	•	•	•	•	•	•	٠
•		•	•	•	•	•	•	•			•		•	•	•	•	•	•	•	•	•	•	•	•
•		•	•	٠	•	•	•		•		•	•	•	•	•			•	•	•	•	•	•	•
٠		•	•	•	•	•	•	•	•		•	•	•	•	•	•	•	•	•	•	•	•	•	•
•	•	•	•	•	•	•	•	•	•		•	•	•	•	•	•	•	•	•	•	•	•	•	٠
•		•	•	•		•	•	•			•	•	•	•	•	•	•	•	•	•	•	•	•	•
•	0	•	0		•	•	•	0	•			•	٠	0	•	•	•	٠	0	•	•	•	•	•
•	۰	•	0			•	•	0				•	•	0	•	•	•	•	0	•	•	•	•	•
•	•	٠	0	•	•	٠	۰	0			•	۰	٠	•	•	•	•	•	0	•	•	•	•	•
•	•	•	•	•	•	٠	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	٠
•	•	•	•	•	•	•	•	•	•		•	•	•	•	•	•	•	•	•	•	•	•	•	۰
•		•	•	•	•		•	•			•	•	•	•	•	•	•	•	•	•	•	•	•	۰
•	•	•	•	•	•		•	•			•	•	•	•	•	•	•	•	•	•	•	•	•	•
•	•	•	•	•	•	٠	•	•		•	•	•	٠	•	•	•	•	•	•	•	•	•	•	•
•	۰	•	•	•	•	٠	٠	0	0	•	•	۰	٠	•	•	•	•	•	•	•	•	•	•	٠
•		٠	0	٠	•	•		•				•	•	0	•	•	•	•	•	•	•	•	•	٠
•	•	•	•	•	•	•	•	•	•		•	•	•	•	•	•	•	•	•	•	•	•	•	•
•		•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•
•	•	•	•	•	•	•	•	0		•	•	•	٠	•	•	•	•	•	0	•	•	•	•	•
•	۰	٠	0	٠	•	•	•	•	•	*	•	•	•	0	•	•	•	•	•	•	•	•	•	۰
•	0	٠	0	•	•	•		•	•	*		•	•	0	•	•	•	•	•	•	•	•	•	٠
•	•	•	•	•	•	•	•	•	•	•		•	•	0	•	•	•	•	•	•	•	•	•	٠
•	•	•	•	•	•	•	•	0	•		•	•	٠	•	•	•	•	٠	0	•	•	•	٠	•
•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•
٠	•	•	٠	٠	•	٠	٠	0		•	•	•	٠	•	•	•	•	٠	0	•	•	•	٠	۰
•	•	•	•	•	•	•	•	•			•	•	•	•	•	•	•	•	•	•	•	•	•	٠
•	٠	•	٠	•	•	0	۰	0	0	٠	•	٠	•	٠	•	•	٠	•	٠	•	٠	•	•	۰
•	•	٠	•	•	٠	•	0	0	0	•	•	•	•	•	•	•	•	٠	٠	•	•	•	٠	•
•	•	٠	٠	•	٠	•	•	•	0	•	٠	•	•	•	•	•	٠	•	•	•	•	•	•	•

Rise of Map-oriented Dashboards

Rostislav NÉTEK Palacký University Olomouc

In recent years, map-oriented dashboards have become very popular. Data providers from various industries discover the benefits of a visualization strategy based on the combination of several methods of expression. Since dashboards allow visualization by graphs, tables, schemes, charts, images, and maps, the combination of interactivity and an online platform provides a unique interface for viewing, understanding, and sharing both spatial and non-spatial data like no other method. This presentation focuses on analyzing map dashboards' popularity during recent years. Dashboards have been used routinely in Business Intelligence solutions for the last decades but experienced a significant boom among the public with the onset of the COVID-19 pandemic. Especially COVID-19 dashboard developed by John Hopkins University was recognized as the first and the most visited Web-based GIS platform merging datasets from different sources, with an extreme number of visitors during the COVID-19 peak. While users benefit from a visually-oriented and user-friendly interface, developers and publishers must follow cartographic rules to provide the correct and fast interpretation within the multi-visualization data methods. The presentation discusses visualization methods, including an overall design and cartographic aspects (point vs. polygon data, choropleth map, basemaps vs. operation layers, etc.), which could be combined with different data sources (governments on the European/national/regional level, non-commercial organizations such as WHO, universities, media houses, etc.) to provide information for various topics (health, elections, finances, demography, crisis management, etc.).

N	DTE	S	•		•			•							٠	٠	٠	٠		•	٠	۰	•	*
0	•	•	•	•	•	0	0	•	0	•	•	۰	•	•	•	•	۰	•		0	•	0	0	
•	•	•	•	•	•	•	•				•	•	•	•		•	•	•	•					
•	•	•	•	٠	•	•					•	•	•			•	•							
٠	•	•	•	•	•	٠	•				•	•	•	•	•	•	•	•	•		•	•	•	•
0	٠		•			0	0									٠	٠	٠		•	٠	۰		0
0		•	•		•	•	•	•			•					•	۰				•	0		
•	•	•	•	•	•	0	0				•				•	•	•			•		•	•	
•	٠	•	•	٠	٠	۰	0	0	٠	•	٠	٠	•		•		•	•		•	•	•		
٠	٠	•	•	•	٠	•	•	•			•	•	•	•	•	•	•			•		•	•	•
•	•	•		•							•	•			•	•	•	•				•	•	•

•	•	٠	•	٠	•	٠	٠	•	•	•	•	٠	٠	•	•	•	•	•	•	•	•	•	•	۰
•	•	•	•	٠	•	•	•	•	•		•	•	•	•	•	•	•	•	•	•	•	•	•	•
	•	•	•	•		٠	•	•	•	•		•	٠	0	•	•	•	٠	0	•	•	•	•	٠
•	•	•	0		•	•	•	0	•			•	•	0	•	•	•	•	0	•	•	•	•	۰
•	•	٠	0	•	•	•	•	•	•	•	•	•	٠	0	•	•	•	•	•	•	•	•	•	•
•	•	•	•	•	•	٠	•	•	•		•	•	•	•	•	•	•	•	•	•	•	•	•	•
•	•	•	•	•	•	•	•	•	•		•	•	•	•	•	•	•	•	•	•	•	•	•	٠
•		•	•	•	•	•	•	•			•	•	•	•	•	•	•	•	•	•	•	•	•	٠
•		•	•	•	•	•	•	•			•		•	•	•	•	•	•	•	•	•	•	•	•
•		•	•	٠	•	•	•		•		•	•	•	•	•			•	•	•	•	•	•	•
٠		•	•	•	•	•	•	•			•	•	•	•	•	•	•	•	•	•	•	•	•	•
•	•	•	•	•	•	•	•	•	•		•	•	•	•	•	•	•	•	•	•	•	•	•	٠
•		•	•	•		•	•	•			•	•	•	•	•	•	•	•	•	•	•	•	•	•
•	0	•	0		•	•	•	0	•			•	٠	0	•	•	•	٠	0	•	•	•	٠	•
•	•	•	0			•	•	0				•	•	0	•	•	•	•	0	•	•	•	•	•
•	۰	٠	0	•	•	٠	۰	0			•	۰	٠	•	•	•	•	•	0	•	•	•	•	•
•	•	•	•	•	•	٠	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	٠
•	•	•	•	•	•	•	•	•	•		•	•	•	•	•	•	•	•	•	•	•	•	•	۰
•	•	•	•	•	•		•	•			•	•	•	•	•	•	•	•	•	•	•	•	•	۰
•	•	•	•	•	•		•	•			•	•	•	•	•	•	•	•	•	•	•	•	•	•
•	•	•	•	•	•	٠	•	•		•	•	•	٠	•	•	•	•	•	•	•	•	•	•	•
•	۰	•	•	•	•	٠	٠	0	0	•	•	۰	٠	•	•	•	•	•	•	•	•	•	•	٠
•		٠	0	٠	•	•		•				•	•	0	•	•	•	•	•	•	•	•	•	٠
•	•	•	•	•	•	•	•	•	•		•	•	•	•	•	•	•	•	•	•	•	•	•	•
•		•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•
•	•	•	•	•	•	•	•	0		•	•	•	٠	•	•	•	•	•	0	•	•	•	•	•
•	۰	٠	0	٠	•	•	•	•	•	*	•	•	•	0	•	•	•	•	•	•	•	•	•	۰
•	0	٠	0	•	•	•		•	•	*		•	•	0	•	•	•	•	•	•	•	•	•	٠
•	•	•	•	•	•	•	•	•	•	•		•	•	0	•	•	•	•	•	•	•	•	•	٠
•	•	•	•	•	•	•	•	0	•		•	•	٠	•	•	•	•	٠	0	•	•	•	٠	•
•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•
٠	•	•	٠	٠	•	٠	٠	0		•	•	•	٠	•	•	•	•	٠	0	•	•	•	٠	۰
•	•	•	•	•	•	•	•	•			•	•	•	•	•	•	•	•	•	•	•	•	•	٠
•	٠	•	٠	•	•	0	۰	0	0	٠	•	٠	•	٠	•	•	٠	•	٠	•	٠	•	•	۰
•	•	٠	•	•	٠	•	0	0	0	•	•	•	•	•	•	•	•	٠	٠	•	•	•	٠	•
•	•	٠	٠	•	٠	•	•	•	0	•	٠	•	•	•	•	•	٠	•	•	•	•	•	•	•

Covid-19 dashboards and their usability assessment

Stanislav POPELKA, Anna PORTI SUAREZ Palacký University Olomouc

With the outbreak of the COVID-19 pandemic, dashboards came to the forefront and began to be widely used by the general public. The user interface of dashboards is related to business intelligence, and efforts to improve their design are not new. This paper will present the results of a user evaluation of four existing COVID-19 dashboards containing geospatial information. This evaluation was conducted through a formative study using eye-tracking technology. The aim of this testing was to identify problematic aspects of user interaction and thus reveal the shortcomings of the existing dashboards. Based on these findings, two variants of the COVID-19 dashboards were subsequently developed for the region of Catalonia. These two versions differed in visual appearance but also their functionality. They were developed according to the insights from usability testing of performed testing. The user evaluation of these newly developed dashboards was done with a mixed research design combining an objective eye-tracking method and a subjective questionnaire and interview. As a result of this study, recommendations for dashboard design and optimal user interface design were formulated.

N	DTE	S	•	•		•	•	•	٠	•		•			•	•	•	•	•	•		•	•	•
•	•	0	٠		0				٠	٠	•	0	0	0	•	•	•		•	•	•	•	•	0
٠	٠	•	٠		•	٠	٠		٠	٠	۰	0	0	•		•						•	•	0
•	٠	•	٠			٠	٠		٠		•	0		•	٠	٠	٠	٠		•		٠	٠	•
•	•	•	•			•	٠	•	•		•	٠			•		•	٠	•	٠	٠	٠	•	
•	•	•	•		•	•	•	•	•		•	•	•		•		•		•	•		•	٠	
•	•	•	•		•	•	•		•		•	•	•		•		•			•		•	٠	
٠	•	٠	٠	•	٠	٠	•	•	٠	٠	۰	۰	•	•	•		•	•		•	•	٠	٠	
•	•	•	٠	٠	٠	•	•	•	٠	٠	•	•	•		•	•	•	•	•	•	•	•	•	•
•	•	•	•		•	•	•				•	•			•	٠	•	•	٠	•	•	•	•	•
•	•	•	•		•	•			•		•	•			•	•	•	•	•	•		•	٠	
•	•	•	•		•	•	•		•		•	•	•		•		•			•		•	٠	
٠	•	٠	٠	•	٠	٠	•	•	٠	٠	۰	۰	•		•		•	•	•	•	•	•	٠	
٠	٠	•	٠	•	٥	٠	٠		۰	٠	۰	0	0	•	٠	•	•	•	•	•	•	۰	•	•
٠	۰	•	•		0	٠	٠	•		٠	٥	0	0	•	٠	0	٠	٠	٠	۰	0	۰	۰	٠

•	•	٠	٠	•	•	٠	٠	•	•	•		•	٠	•	•	•	٠	•	٠	•	•	٠	•	۰
•	•	•	•	•		•	•					•		0	•	•	•	٠	•	•	•	•	•	٠
•	•	•	٠	•	•		•	•				•	•	•	•	•	•	•	•	•	•	•	•	۰
	•	•	•			•	•					•	•	•	•	•	•	•	•	•	•	•	•	•
•	•	•	•	•	•	•	•	•	•		•	•	•	•		•	•	•	•	•	•	•	•	•
•	•	٠	٠	٠	٠	•	•	٠	•	•	٠	•	٠	٠	٠	٠	•	•	•	•	٠	•	•	٠
•	٠	٠	٠	0	0	٠	•	0			0	•	•	•	•	•	٠	٠	٠	•	•	•	٠	٠
•	•		•	•	•	•	٠		0	•	•	•	•	٠	•		•	٠	0	•	•	•	٠	•
•	٠	•	•	•	•		•	•			•	٠	٠	•	•	•	•	•	•	•	•	•	•	•
•	•	•	•	•	•	•	•	•	•	•		•	•	•	•	•	•	•	•	•	•	•	•	•
•	•	•	•	•	٠	•	•	٠	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	۰
•	•	•	٠	۰	0	0	٠	0	0	0	٠	•	٠	٠	٠	٠	٠	٠	٠	•	٠	•	•	٠
•	•	٠	٠	•	•	•	•	0			0	•	•	0	0		٠	٠	•	•	•	•	٠	۰
	•	•	•	•	•		۰	•		•	•	•	٠	•	•	•	•	•	•	•	•	•	•	•
•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•
•	•	٠	•	٠	•	•	٠	٠	٠	٠	٠	•	٠	•	•	٠	•	•	•	•	٠	•	•	•
•	•	0	٠	۰	0	0	٠	0	0	0	٠	•	٠	٠	٠	٠	٠	٠	•	•	٠	•	•	۰
•	•	•	٠	•		•	•		•		0	•		0	•	•	•	٠	٠	•	•	•	٠	۰
	0	•	•	•	•		۰	•	•	•	•	0	•	•	•	٠		•	•	•	•	•	•	•
•	٠	•	•	•	•	•	•	•	•	•	•	٠	•	•	•	•	•	•	•	•	•	•	•	•
•	•	•	٠	•	•	•	•	٠	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•
•	•	0	•	•	0	0	٠	0	0	•	٠	٠	٠	٠	۰	٠	۰	٠	•	•	٠	•	•	۰
	•	•	٠	٠	•	*	۰	•	•	•	٠	•	•	٠	٠	٠	•	•	•	•	٠	•	•	•
•	•	•	•	•	•	•	•	•	•		0	•	•	•	•	0	•	•	•	•	•	•	•	•
•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•
•	•	•	•	•	•	•	•	0	0	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•
•	٠	0	٠	•	•	0	٠	0	0	•	٠	٠	٠	•	•	•	•	•	•	•	•	•	•	•
•	•	•	٠	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	۰
•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•
•	•	•	•	•	•	•	0	0	•	•	0	•	•	•	•	0	•	•	•	•	•	•	•	•
•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•
•	•	•	•	•	•	•	٥	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•
•	•	•	•	•	•	•	•	•	•	•	0	•	•	•	•	•	•	•	•	•	•	•	•	•
•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•
•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•		•	•
•	•	•	•	•		•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•		•	•

Eye-Tracking the Digital Humanist. How do historians use maps?

Marta KUŹMA, Francis HARVEY University of Warsaw, Leibniz-Institute for Regional Geography, Leipzig

In our project (People, paces, events: Innovative spatial humanities research to support interpretation and explanation) we want to identify and consider interdisciplinary differences among historians, geographers, philologists, librarians and other scientists who use maps and other visualisations in their research. In this particular study, we consider three different visualisation forms: map, table, graph in the Nodegoat software package, which provides graph/network database for network analysis including these types of visualisations. During the study prototype testing, participants are asked a set of analytical questions that define tasks for answering questions about the correspondence between Fryderyk Chopin and George Sand. We collect eye-tracking data to track how users solve the tasks, what they pay attention to, what visualisation elements (navigation bottom, temporal scroll bar, zoom in/zoom out, interactive legend) are helpful in solving tasks. In this talk, we provide a first overview of the research, preliminary findings and initial reflections for discussion. We hope this project sheds additional light on the question of how historians use maps.

N	DTE	S			٠	•	٠		٠		٠	٠	٠							٠	٠	•	٠	•
•	•	•	•	٠	•	•	٠	•	٠		•	•	•	٠		•	•	•	•	•	•	•		•
٠	٠	٠	•	•	٠	۰	۰	•	0	0	٠	٠	•	۰	•	•	۰	•	۰	۰	۰	٠	0	٠
٠	۰	٠		0	٠	٠	•	•	0	0	۰	٠	۰	٠	•	•	•	•		•	•	•	0	٠
•	•	•	•		•	•	•		0	•	•	٠	•			•	•	•			•	•	•	٠
•	•				•	•	٠				•	•		•						•	•	•	•	•
•	•	٠	•	•	•	•	•	٠	•		•	•	•	٠			•	•	•	•	•	•	•	•
•	•	٠			•	•	•	•			•	•	•	•		•	•	•	•	•	•	•	•	•
•	•	•			•	•	•	•			•	٠	•	•		•	•			•	•	•	•	
							•														•	٠		
•	•					•	•		•		•					•	•						•	•
•	•	٠		•	٠	•	٠		0	0	•		٠	•	•	•	•					•	0	•
٠	۰	٠	•	•	٠	٠	۰	•	•	۰	٠	•	•	•	•	•	•	•	•	•	•	•	0	
•	۰	٠				•	٠				•	٠		٠	•	•	•	٠	٠	•	٠	٠	0	•
																	•							

•	•	٠	•	٠	•	٠	٠	•	•	•	•	٠	٠	•	•	•	•	•	•	•	•	•	•	۰
•	•	•	•	٠	•	•	•	•	•		•	•	•	•	•	•	•	•	•	•	•	•	•	•
	•	•	•	•		٠	•	•	•	•		•	٠	0	•	•	•	٠	0	•	•	•	•	٠
•	•	•	0		•	•	•	0	•			•	•	0	•	•	•	•	0	•	•	•	•	۰
•	•	٠	0	•	•	•	•	•	•	•	•	•	٠	0	•	•	•	•	•	•	•	•	•	•
•	•	•	•	•	•	٠	•	•	•		•	•	•	•	•	•	•	•	•	•	•	•	•	•
•	•	•	•	•	•	•	•	•	•		•	•	•	•	•	•	•	•	•	•	•	•	•	٠
•		•	•	•	•	•	•	•			•	•	•	•	•	•	•	•	•	•	•	•	•	٠
•		•	•	•	•	•	•	•			•		•	•	•	•	•	•	•	•	•	•	•	•
•		•	•	٠	•	•	•		•		•	•	•	•	•			•	•	•	•	•	•	•
٠		•	•	•	•	•	•	•			•	•	•	•	•	•	•	•	•	•	•	•	•	•
•	•	•	•	•	•	•	•	•	•		•	•	•	•	•	•	•	•	•	•	•	•	•	٠
•		•	•	•		•	•	•			•	•	•	•	•	•	•	•	•	•	•	•	•	•
•	0	•	0		•	•	•	0	•			•	٠	0	•	•	•	٠	0	•	•	•	•	•
•	•	•	0			•	•	0				•	•	0	•	•	•	•	0	•	•	•	•	•
•	۰	٠	0	•	•	٠	۰	0			•	۰	٠	•	•	•	•	•	0	•	•	•	•	•
•	•	•	•	•	•	٠	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	٠
•	•	•	•	•	•	•	•	•	•		•	•	•	•	•	•	•	•	•	•	•	•	•	۰
•	•	•	•	•	•		•	•			•	•	•	•	•	•	•	•	•	•	•	•	•	۰
•	•	•	•	•	•		•	•			•	•	•	•	•	•	•	•	•	•	•	•	•	•
•	•	•	•	•	•	٠	•	•		•	•	•	٠	•	•	•	•	•	•	•	•	•	•	•
•	۰	•	•	•	•	٠	٠	0	0	•	•	۰	٠	•	•	•	•	•	•	•	•	•	•	٠
•		٠	0	٠	•	•		•				•	•	0	•	•	•	•	•	•	•	•	•	٠
•	•	•	•	•	•	•	•	•	•		•	•	•	•	•	•	•	•	•	•	•	•	•	•
•		•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•
•	•	•	•	•	•	•	•	0		•	•	•	٠	•	•	•	•	•	0	•	•	•	•	•
•	۰	٠	0	٠	•	•	•	•	•	*	•	•	•	0	•	•	•	•	•	•	•	•	•	۰
•	0	٠	0	•	•	•		•	•	*		•	•	0	•	•	•	•	•	•	•	•	•	٠
•	•	•	•	•	•	•	•	•	•	•		•	•	0	•	•	•	•	•	•	•	•	•	٠
•	•	•	•	•	•	•	•	0	•		•	•	٠	•	•	•	•	٠	0	•	•	•	٠	•
•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•
٠	•	•	٠	٠	•	٠	٠	0		•	•	•	٠	•	•	•	•	٠	0	•	•	•	٠	۰
•	•	•	•	•	•	•	•	•			•	•	•	•	•	•	•	•	•	•	•	•	•	٠
•	٠	•	٠	•	•	0	۰	0	0	٠	•	٠	•	٠	•	•	٠	•	٠	•	٠	•	•	۰
•	•	٠	•	•	٠	•	0	0	0	•	•	•	•	•	•	•	•	٠	٠	•	•	•	٠	•
•	•	٠	٠	•	٠	•	•	•	0	•	٠	•	•	•	•	•	٠	•	•	•	•	•	•	•

Does the dot matter? A study of dot map users' preferences for dot size and value

Stanisław SZOMBARA AGH University of Science and Technology, Kraków

The paper presents the results of a preliminary study of dot map users' preferences. Dot maps are one of the traditional cartographic methods. It is currently relatively rarely used compared to other quantitative mapping methods due to its inability to be done automatically in GIS programmes (with topographic rather than random distribution of dots in reference units). The study used the author's automatic topographic dot distribution method. This allowed the creation of a series of maps that differed slightly in the parameters of dot size and value. Medium-scale maps of several districts in Poland were used in the study. Using questionnaires, user preferences and the influence of dot size and value on the correctness of map interpretation were investigated. The study also considered the error of the dot maps.

NC	TE	S	•		•	•		•	•		•	٠						0	•	٠	٠	٠	0	
•	•	•	•	•	•	•	•	٠	•		•	•	•	٠		•	•	•	•		•	•	•	
٠	0	0	•		٠					٠	٠	٠	٠	٠	•	0	0	0	•		٠	٠	٠	٠
•	•	•	•	•	•						•	•		•		•	•				•	•	•	
•	•	•	•	•	•						•			•							•	•	•	•
•	•	•	•	•	٠	•	•		0	•	٠	٠		•		•	•	•	•	•	•	•	0	•
٠	0	0	٠	٠	٠	•	0		•	0	٠	٠	0	٠		٠	٠	0	•	•	•	٠	•	•
٠	•	•	•	•	٠	•	•			٠	•	٠	٠	٠	٠	٠	٠	•			•	•	٠	٠
•	•	•	•	•	•	•	•			•	•	•	٠	٠	٠	٠	٠	٠				٠	٠	•
•	•	•	•	•	•		•			•	•	•	•	٠	•	٠	٠			•	•	•	•	•
•	•	•	•	•	•		•			•	•	•	•	٠	•	•	•	•	•	•	•	•		•
•	•	•	٠	٠	٠	٠	•	•	0	•	٠	٠	٠	٠		•	•	•	•	•	•	•	•	•
٠	0	0	٠	٠	٠	0	0			0	٠	٠	۰	۰		0	0	0	0	۰	۰	٠	۰	٠
	0	0	•	•	٠						٠	٠	٠	•		0	0	0	0	0	۰	۰	٥	٠
•	•	•	•	•	٠	•	•			•	•	•	•		•	٠	•				•	٠	0	•
•	•	•	•	•	٠		•	•		•	•	•	•	•	•	•	•			•	•	•	•	•
•	•	•	٠	٠	٠	٠	•	٠	•	٠	٠	٠	•	٠	•	٠	٠	•	•	•	•	٠	•	•
٠	0	0	٠	٠	٠	۰	0		0	0	٠	۰	0	۰	٠	٠	۰	۰	۰	•	٠	٠	٠	٠
٠		0	•	•	٠		0			٠	٠	٠	٠	۰	•	٥	0	0	•	۰	۰	٠	۰	٠

•	•	٠	٠	•	•	٠	٠	•	•	•		•	٠	•	•	•	٠	•	٠	•	•	٠	•	۰
•	•	•	•	•		•	•					•		0	•	•	•	٠	•	•	•	•	•	٠
•	•	•	٠	•	•		•	•				•	•	•	•	•	•	•	•	•	•	•	•	۰
	•	•	•			•	•					•	•	•	•	•	•	•	•	•	•	•	•	•
•	•	•	•	•	•	•	•	•	•		•	•	•	•		•	•	•	•	•	•	•	•	•
•	•	٠	٠	٠	٠	•	•	٠	•	•	٠	•	٠	٠	٠	٠	•	•	•	•	٠	•	•	٠
•	٠	٠	٠	0	0	٠	•	0			0	•	•	•	•	•	٠	٠	٠	•	•	•	٠	٠
•	•		•	•	•	•	٠		0	•	•	•	•	٠	•		•	٠	0	•	•	•	٠	•
•	٠	•	•	•	•		•	•			•	٠	٠	•	•	•	•	•	•	•	•	•	•	•
•	•	•	•	•	•	•	•	•	•	•		•	•	•	•	•	•	•	•	•	•	•	•	•
•	•	•	•	•	٠	•	•	٠	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	۰
•	•	•	٠	۰	0	0	٠	0	0	0	٠	•	٠	٠	٠	٠	٠	٠	٠	•	٠	•	•	٠
•	•	٠	٠	•	•	•	•	0			0	•	•	0	0		٠	٠	•	•	•	•	٠	۰
	•	•	•	•	•		۰	•		•	•	•	٠	•	•	•	•	•	•	•	•	•	•	•
•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•
•	•	٠	•	٠	•	•	٠	٠	٠	٠	٠	•	٠	•	•	٠	•	•	•	•	٠	•	•	•
•	•	0	٠	۰	0	0	٠	0	0	0	٠	•	٠	٠	٠	٠	٠	٠	•	•	٠	•	•	۰
•	•	•	٠	•		•	•		•		0	•		0	•	•	•	٠	٠	•	•	•	٠	۰
	0	•	•	•	•		۰	•	•	•	•	0	•	•	•	٠		•	•	•	•	•	•	•
•	٠	•	•	•	•	•	•	•	•	•	•	٠	•	•	•	•	•	•	•	•	•	•	•	•
•	•	•	٠	•	•	•	•	٠	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•
•	•	0	•	•	0	0	٠	0	0	•	٠	٠	٠	٠	۰	٠	۰	٠	•	•	٠	•	•	۰
	•	•	٠	٠	•	*	۰	•	•	•	٠	•	•	٠	٠	٠	•	•	•	•	٠	•	•	•
•	•	•	•	•	•	•	•	•	•		0	•	•	•	•	0	•	•	•	•	•	•	•	•
•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•
•	•	•	•	•	•	•	•	0	0	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•
•	٠	0	٠	•	•	0	٠	0	0	•	٠	٠	٠	•	•	•	•	•	•	•	•	•	•	•
•	•	•	٠	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	۰
•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•
•	•	•	•	•	•	•	0	0	•	•	0	•	•	•	•	0	•	•	•	•	•	•	•	•
•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•
•	•	•	•	•	•	•	٥	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•
•	•	•	•	•	•	•	•	•	•	•	0	•	•	•	•	•	•	•	•	•	•	•	•	•
•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•
•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•		•	•
•	•	•	•	•		•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•		•	•

MONDAY April **3 BLOCK IV** 16:45-18.30

The use of the think-aloud method for the evaluation of the atlas

Tomáš VANÍČEK Palacký University Olomouc

The think-aloud method is a common method for evaluating the usability of websites or software. Its use can also be found for cartographic products, for which the method has been neglected so far. It is a method where test participants verbalize all their thought processes aloud. The method aims to reveal the user's subjective attitudes towards the product to evaluate its usability. This research focused on the use of the think-aloud method to evaluate the usability of the regional atlas "Atlas of the Moravian-Silesian Region". The method consists of six continuous steps, namely (I) selecting the product to be tested, (II) developing a test scenario, (III) recruiting representative participants, (IV) running the experiment, (V) processing the output data and evaluating it, and (VI) the final qualitative/quantitative evaluation of the product. Based on the respondents' statements, shortcomings of the studied atlas were identified for each topic (e.g., non-dominant maps or overly complex infographics) and recommendations were proposed to address them. The method thus proved to be an excellent choice for evaluating the usability of (not only) cartographic products.

NC	DTE	S			٠	•	•																•	
٠	0		٠	•		٠	•			•	۰	•	0	0	0	۰	•		•	•	0	•	•	0
٠	0		٠	•	٠	٠	۰			•	٠	•	0	•	•	۰	•		•		0	•	•	0
•	٠	٠	٠	*	٠	•	٠	٠	•	٠	٠			٠	٠	٠	•	٠	٠	٠		٠	٠	٠
•	•	•	•		•	٠	٠		•		•	•		•		•	٠	•	٠	٠		•	•	•
•	•	•	•		•	•	٠	•	•				•				•		٠	•		•	٠	
•	•	•	•		•	•	٠		•				•						•	•		•	٠	
٠	۰	•	٠	•	٠	٠	٠	•	٠	•	۰	•	•	•		•		•	٠	•	•	•	٠	
٠	•		٠	0	٠	٠	٠		٠	0	۰	۰	0	•	•	۰	٠	•	٠	•	٠	۰	•	0
٠	0		٠	0	0	٠	٠		•	0	0	۰	0	0	0	۰	۰	•	٠	٠	0	۰	٠	0
٠	0		•	•		٠	•		•	0	۰	•	0	0	0	۰	•		•	•	0	0	٠	0
٠	0		•	•		٠	•			•	۰	•	0	0	0	۰	٠		•	•	0	0	•	
•	0		٠	٠	٠	٠	۰		•	•	٠	•	•	•	•	۰	•		•	•	•	•	٠	
٠	۰		٠	•	٠	٠	٠		٠	0	۰	۰	0	•	•	۰	•	•	٠	•	٠	•	•	
٠	0	•	•		•	٠	۰	•	٠			•	0	•	•	٥	0	٠	۰	۰	٥	٥	۰	

•	•	٠	•	٠	•	٠	٠	•	•	•	•	٠	٠	•	•	•	•	•	•	•	•	•	•	۰
•	•	•	•	٠	•	•	•	•	•		•	•	•	•	•	•	•	•	•	•	•	•	•	•
	•	•	•	•		٠	•	•	•	•		•	٠	0	•	•	•	٠	0	•	•	•	•	٠
•	•	•	0		•	•	•	0	•			•	٠	0	•	•	•	•	0	•	•	•	•	۰
•	•	٠	0	•	•	•	•	•	•	•	•	•	٠	0	•	•	•	•	•	•	•	•	•	•
•	•	•	•	•	•	٠	•	•	•		•	•	•	•	•	•	•	•	•	•	•	•	•	•
•	•	•	•	•	•	•	•	•	•		•	•	•	•	•	•	•	•	•	•	•	•	•	٠
•		•	•	•	•	•	•	•			•	•	•	•	•	•	•	•	•	•	•	•	•	٠
•		•	•	•	•	•	•	•			•		•	•	•	•	•	•	•	•	•	•	•	•
•		•	•	٠	•	•	•		•		•	•	•	•	•			•	•	•	•	•	•	•
٠		•	•	•	•	•	•	•			•	•	•	•	•	•	•	•	•	•	•	•	•	•
•	•	•	•	•	•	•	•	•	•		•	•	•	•	•	•	•	•	•	•	•	•	•	٠
•		•	•	•		•	•	•			•	•	•	•	•	•	•	•	•	•	•	•	•	•
•	0	•	0		•	•	•	0	•			•	٠	0	•	•	•	٠	0	•	•	•	٠	•
•	۰	•	0			•	•	0				•	•	0	•	•	•	•	0	•	•	•	•	•
•	•	٠	0	•	•	٠	۰	0			•	۰	٠	•	•	•	•	•	0	•	•	•	•	•
•	•	•	•	•	•	٠	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	٠
•	•	•	•	•	•	•	•	•	•		•	•	•	•	•	•	•	•	•	•	•	•	•	۰
•		•	•	•	•		•	•			•	•	•	•	•	•	•	•	•	•	•	•	•	۰
•	•	•	•	•	•		•	•			•	•	•	•	•	•	•	•	•	•	•	•	•	•
•	•	•	•	•	•	٠	•	•		•	•	•	٠	•	•	•	•	•	•	•	•	•	•	•
•	۰	•	•	•	•	٠	٠	0	0	•	•	۰	٠	•	•	•	•	•	•	•	•	•	•	٠
•		٠	0	٠	•	•		•				•	•	0	•	•	•	•	•	•	•	•	•	٠
•	•	•	•	•	•	•	•	•	•		•	•	•	•	•	•	•	•	•	•	•	•	•	•
•		•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•
•	•	•	•	•	•	•	•	0		•	•	•	٠	•	•	•	•	•	0	•	•	•	•	•
•	۰	٠	0	٠	•	•	•	•	•	*	•	•	•	0	•	•	•	•	•	•	•	•	•	۰
•	0	٠	0	•	•	•		•	•	*		•	•	0	•	•	•	•	•	•	•	•	•	٠
•	•	•	•	•	•	•	•	•	•	•		•	•	0	•	•	•	•	•	•	•	•	•	٠
•	•	•	•	•	•	•	•	0	•		•	•	٠	•	•	•	•	٠	0	•	•	•	٠	•
•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•
٠	•	•	٠	٠	•	٠	٠	0		•	•	•	٠	•	•	•	•	٠	0	•	•	•	٠	۰
•	•	•	•	•	•	•	•	•			•	•	•	•	•	•	•	•	•	•	•	•	•	٠
•	٠	•	٠	•	•	0	۰	0	0	٠	•	٠	•	٠	•	•	٠	•	٠	•	٠	•	•	۰
•	•	٠	•	•	٠	•	0	0	0	•	•	•	•	•	•	•	•	٠	٠	•	•	•	٠	•
•	•	٠	٠	•	٠	•	•	•	0	•	٠	•	•	•	•	•	٠	•	•	•	•	•	•	•

MONDAY April 3 BLOCK IV 16.45-18.30

Map reading – spatial, temporal, and thematic analysis

Zurab LAOSHVILI, Giorgi KAPANADZE Georgian Technical University, Tbilisi

A map is a comprehensive cartographic work that has multifaceted aspects of use. It has been used since ancient times to solve all kinds of cartometric assignments. But it is not less striking to read the map, to extract from it the seemingly concealed information that can be penetrated by mastering the language of the map and the art of reading it.

Correct and multidimensional reading of the map allows for solving many practical problems. An example is a thematic map commissioned by the Ministry of Internally Displaced person Affairs of Georgia based on Georgian National Statistics Office's data.

The tabular data related to the distribution statistics of the displaced population from Abkhazia according to municipalities. As a result of processing the data in GIS software, we obtained a thematic map on which the regularity of the geographical distribution of this political and socio-economic event appeared. The map clearly shows that the displaced population is very unevenly distributed over the not-very-large territory of Georgia. Moreover, this inequality is very contrasting, which has its own reasons. Spatial and thematic analysis of the map helps us to identify these reasons and to see regularities. There can be identified several interconnected factors in the uneven distribution of the mentioned event: geographical location, level of urbanization, economic resources, and ethnocultural and religious moments.

Geographical location was found to be an important factor in the spatial distribution of IDPs. The first large concentration of IDPs near Abkhazia is in the neighboring Samegrelo region. This is due to the proximity of the region to the conflict zone – not everyone had the resources to move long distances. many people are apprehensive about leaving the graves of their ancestors, They have traditional accountability to take care of graves, etc. Most of the IDPs hoped that the conflict would end soon and they would stand a chance at homecoming.

The highest concentration of IDPs in It can be observed in Zugdidi and the capital of the country, Tbilisi. This is due to the high level of urbanization. In the case of Zugdidi, geographical location also plays a crucial role, in the case of Tbilisi, the status of the most urbanized region of the country. It is clear that the larger the settlement, the more urban benefits, and resources it has.

The characteristics of economic resources are also significant. For example, in Tskaltubo municipality and Batumi, this is the reason for the high concen-

tration of IDPs. The presence of healing thermal waters in Tskaltubo and the deserted buildings of the old sanatorium were the best prospects for the displaced, both in terms of housing and employment. Batumi was the natural hub of the newly opened trade route in Turkey. Also, the economic resources (fertile lands) led to the resettlement of part of the displaced persons from Tbilisi who were engaged in agriculture in Abkhazia in Kvemo Kartli. A kind of ethnocultural incongruous became the reason for the presence of light colors on the map.

The results of the map analysis can be the basis for state preventive measures. In particular, the spatial distribution of IDPs by the state should bear in mind the previously mentioned regularity.

N	OTE	S	•	•	•		•	•	٠	٠		•	•				•	•					٠	•
•	•	•	•			•	٠	•	٠		•	٠	٠	•	•	•	•	٠	•	•		•	٠	٠
•	٠	٠	•	0	•	0	٠	٠	•	•	0	0	۰	•	٠	•	•	•	0	•	۰	٠	٠	٠
•	•	•	•	•			•		•				•		•		•	•			•	•	•	٠
•	•	•	•	•			•						•		•		•	•			•	•	•	•
•	٠	•	•	•			•	•	٠			•	•	•			•	•		•	•		•	
•	٠	•	•	٠	٠	٠	•	•	٠	٠	•	٠	٠	•	•		•	•	•	•	•	•	•	•
•	٠	٠	•	0		0	•	٠	٠		0	•	•	۰	•	•	•	•	٠	•	٠	•	٠	•
•	•	٠	•	0		0	•	•	٠		0	•	0	0	•	0	•	٠	0	•	۰	•	٠	٠
•	•	•	•	0	•	0	•	•	٠	٠	0	•	0	0	•	0	•	٠	0	•	•	•	•	٠
•	٠	•	•	0		•			٠			•	0	0	•	0	•		0	•	•	•	•	٠
•	٠	•	•	٠	•	٠	•	•	٠	٠	•	•	٠	•	•		•	•	•	•	•	•	•	•
•	٠	٠	•	0		0	•	٠	٠		0	•	٠	۰	•	•	•	•	٠	•	•	•	•	•
•	•	•	•				٠		•								٠	٠		•		•	٠	٠
•	•	٠	•	0	•	0	•	•	٠	٠	0	•	0	0	•	0	•	٠	0	•	•	•	•	٠
•	•	•	•				•	•	٠				•				•	٠		•		•	٠	٠
•	•	•	•	•	•		•	•	٠	•		•	•		•		•	•				•	•	•
•	•	•	•	•	٠	•	•	•	٠	٠		٠	•	•	•		•	•	•		•	•	•	•
•	•	•	•	•			•	•	٠			•	•	•	٠		•	•	•		•	•	•	•
•	•	•	•	•			•	•	•				•		•		•	•	•	•	•		•	٠
•	٠	•	•	•		•	•	•	•				•				•	•		•	•		•	•
٠	٠	•	•	•	•	٠	•	•	٠	•	•	•	۰	•	•		•	•		•	•	•	•	٠
٠	٠	٠	•	0	•	0	•	٠	۰	•	0	۰	۰	•	•	•	•	٠	•	•	•	•	•	٠
•	٠	٠	•	0	0	0	٠	۰	۰	0	0	0	0	0	٠	0	٠	٠	0	٠	۰	٠	٠	۰
•	•	•	•	•	•		•	•	٠	•		•	•	•	٠		٠	•	•	•		٠	•	•
•	•	•	•	•	•		•	٠		•			•	•	•		•	•	•	•	•	•	•	•

MONDAY April 3Visualizing User BehaviorBLOCK IVin Cartography by GazePlotter:16:45-18.30New Eye-Tracking Sequence Chart Analysis Tool

Michaela VOJTĚCHOVSKÁ Palacký University Olomouc

Eye-tracking is becoming widely used in cartography to study user visual behavior while reading maps. Eye movement research in cartography can be divided into several categories – user studies focused on design principles, studies comparing 2D and 3D, studies comparing map users (experts, novices), and studies presenting eye-tracking analysis tools and methods delivered by cartographic community.

One of the most common ways to analyze eye movement data is by using Areas of Interest. Cartographers might be interested in what parts of a map attract the gaze most effectively and in what order. The most effective way to visualize such data is a Sequence chart, also known as a Scarf plot.

The lack of available and usable tools for sequence chart visualization led to a development of GazePlotter, a user-friendly web-based ready-to-use application designed to facilitate the visualization and analysis of eye-tracking data via interactive sequence charts.

The app allows researchers to effortlessly upload and integrate data from eye-tracking software platforms like SMI, Tobii, and GazePoint Analysis, eliminating the need for time-consuming manual data transformation or programming tasks. With its user-friendly interface, GazePlotter can be a valuable tool for cartographers and researchers in the field of eye-tracking and map usage.

NC)TE	S	•	0	٠	•	•	•	0	•	0	0	0			•	0	0	٠	•	٠	٠	٠	۰
•	•		•	•	٠	•	•		۰	٠	•	•	•			•	0	0			٠	٠	•	
•	•	•	•	•	٠	•	•	•	0	•	•	•	•		•	•	•	0	•	•		•	•	•
٠	٠	•	•	•	٠	٠	•	٠		•	٠	٠	•			•	•		•	•		•	٠	•
٠	٠	٠	•		٠	۰	•	٠		•	٠	•	•			•	٠	٠	٠	•	٠	•	٠	٠
•	٠	•	•		•	•	•	•			•	•		•		•	٠		•	•	•	•	•	•
	•	•	•	•				•			•		•			•	•		•	•		•	•	•
	•	•	•		•			•					•				•		•	•		•	•	
•	•	٠	•		•		•	•		•	•												•	
•	٠	٠	•	•	٠	0		•	•	•	٠	0	•			•	0	0	•	•	٠	•	٠	•
0	٠	•		•	٠	0			•	•	•	0	•			٠	۰	0	•	•	٠	۰	٠	•

•	•	٠	•	٠	•	٠	٠	•	•	•	•	٠	٠	•	•	•	•	•	•	•	•	•	•	۰
•	•	•	•	٠	•	•	•	•	•		•	•	•	•	•	•	•	•	•	•	•	•	•	•
	•	•	•	•		٠	•	•	•	•		•	٠	0	•	•	•	٠	0	•	•	•	•	٠
•	•	•	0		•	•	•	0	•			•	•	0	•	•	•	•	0	•	•	•	•	۰
•	•	٠	0	•	•	•	•	•	•	•	•	•	٠	0	•	•	•	•	•	•	•	•	•	•
•	•	•	•	•	•	٠	•	•	•		•	•	•	•	•	•	•	•	•	•	•	•	•	•
•	•	•	•	•	•	•	•	•	•		•	•	•	•	•	•	•	•	•	•	•	•	•	٠
•		•	•	•	•	•	•	•	•		•	•	•	•	•	•	•	•	•	•	•	•	•	٠
•		•	•	•	•	•	•	•			•		•	•	•	•	•	•	•	•	•	•	•	•
•		•	•	٠	•	•	•		•		•	•	•	•	•			•	•	•	•	•	•	•
٠		•	•	•	•	•	•	•	•		•	•	•	•	•	•	•	•	•	•	•	•	•	•
•	•	•	•	•	•	•	•	•	•		•	•	•	•	•	•	•	•	•	•	•	•	•	٠
•		•	•	•		•	•	•			•	•	•	•	•	•	•	•	•	•	•	•	•	•
•	0	•	0		•	•	•	0	•			•	٠	0	•	•	•	٠	0	•	•	•	•	•
•	۰	•	0			•	•	0				•	•	0	•	•	•	•	0	•	•	•	•	•
•	•	٠	0	•	•	٠	۰	0			•	۰	٠	•	•	•	•	•	0	•	•	•	•	•
•	•	•	•	•	•	٠	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	٠
•	•	•	•	•	•	•	•	•	•		•	•	•	•	•	•	•	•	•	•	•	•	•	۰
•		•	•	•	•		•	•			•	•	•	•	•	•	•	•	•	•	•	•	•	۰
•	•	•	•	•	•		•	•			•	•	•	•	•	•	•	•	•	•	•	•	•	•
•	•	•	•	•	•	٠	•	•		•	•	•	٠	•	•	•	•	•	•	•	•	•	•	•
•	۰	•	•	•	•	٠	٠	0	0	•	•	۰	٠	•	•	•	•	•	•	•	•	•	•	٠
•		٠	0	٠	•	•		•				•	•	0	•	•	•	•	•	•	•	•	•	٠
•	•	•	•	•	•	•	•	•	•		•	•	•	•	•	•	•	•	•	•	•	•	•	•
•		•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•
•	•	•	•	•	•	•	•	0		•	•	•	٠	•	•	•	•	•	0	•	•	•	•	•
•	۰	٠	0	٠	•	•	•	•	•	*	•	•	•	0	•	•	•	•	•	•	•	•	•	۰
•	0	٠	0	•	•	•		•	•	*		•	•	0	•	•	•	•	•	•	•	•	•	٠
•	•	•	•	•	•	•	•	•	•	•		•	•	0	•	•	•	•	•	•	•	•	•	٠
•	•	•	•	•	•	•	•	0	•		•	•	٠	•	•	•	•	٠	0	•	•	•	٠	•
•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•
٠	•	•	٠	٠	•	٠	٠	0		•	•	•	٠	•	•	•	•	٠	0	•	•	•	٠	۰
•	•	•	•	•	•	•	•	•			•	•	•	•	•	•	•	•	•	•	•	•	•	٠
•	٠	•	٠	•	•	0	۰	0	0	٠	•	٠	•	٠	•	•	٠	•	٠	•	٠	•	•	۰
•	•	٠	•	•	٠	•	0	0	0	•	•	•	•	•	•	•	•	٠	٠	•	•	•	٠	•
•	•	٠	٠	•	٠	•	•	•	0	•	٠	•	•	•	•	•	٠	•	•	•	•	•	•	•

MONDAY April 3 BLOCK IV 16:45-18.30

User Aspects of 3D Geovisualizations in Urban Planning

Lukáš HERMAN, Barbora PLAČKOVÁ Masaryk University, Brno

The enormous technological leap in recent years brought extensive possibilities for 3D geovisualizations in urban planning. A wide range of 3D geovisualizations exists, from simplified 3D models based on cartographic principles (abstraction, symbolization) to highly realistic visualizations in virtual reality (VR). 3D geovisualizations of the surroundings of Nové sady street (Brno, Czechia) were created as a case study. Specifically, four variants of the 3D model were prepared in the ESRI City Engine software. These variants represent two different types of visualizations (abstract and realistic) a demonstration of the current state and a simulation of the future design state. These visualizations were provided to users using panoramic images in ArcGIS 360 VR web application. This technology enables users to view 3D scenes on computers, tablets, mobile and even in VR headsets (verified in the Pico Neo 3 Pro Eye headset). The suitability of the simplified (symbolized) and photorealistic 3D model was verified using a structured web guestionnaire completed by 100 respondents (a significant part was made up of architecture students). Each respondent answered questions focusing on the abstract and models model after viewing 360° panoramic images. This user study showed a significant difference between a simplified and photorealistic 3D model based on the correctness of the answered guestions. The suitability of abstract visualization for urban and spatial planning has been proved, especially by expert users. When comparing the preferences of non-expert users between abstract and more realistic visualizations, the results were more balanced. In general, such 3D geovisualizations in the scope of urban planning can help the general public interact with potential spaces and troubleshoot possible issues before construction. Moreover, they bring the opportunity to better immerse professionals in proposed designs to make better decisions about important aspects like zoning, traffic, and public transportation.

NC)TE	S	•		•		•	•	•	•	•	•	•	•	•	٠	٠	•	•	•	•	٠	•	
	•	•	•	•	•	•	•			٠	•	•				•	٠	•	•	•	•	•	•	•
•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•
•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•		•	•	
•	•	•		•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•
•	0	•	•	•	•	•	•			•	٠	٠		•	•	•	٠	•	•	•	•	•	٠	•
																	0			0	0	•		

•	•	٠	•	٠	•	٠	٠	•	•	•	•	٠	٠	•	•	•	•	•	•	•	•	•	•	۰
•	•	•	•	٠	•	•	•	•	•		•	•	•	•	•	•	•	•	•	•	•	•	•	•
	•	•	•	•		٠	•	•	•	•		•	٠	0	•	•	•	٠	0	•	•	•	•	٠
•	•	•	0		•	•	•	0	•			•	٠	0	•	•	•	•	0	•	•	•	•	۰
•	•	٠	0	•	•	•	•	•	•	•	•	•	٠	0	•	•	•	•	•	•	•	•	•	•
•	•	•	•	•	•	٠	•	•	•		•	•	•	•	•	•	•	•	•	•	•	•	•	•
•	•	•	•	•	•	•	•	•	•		•	•	•	•	•	•	•	•	•	•	•	•	•	٠
•		•	•	•	•	•	•	•			•	•	•	•	•	•	•	•	•	•	•	•	•	٠
•		•	•	•	•	•	•	•			•		•	•	•	•	•	•	•	•	•	•	•	•
•		•	•	٠	•	•	•		•		•	•	•	•	•			•	•	•	•	•	•	•
٠		•	•	•	•	•	•	•			•	•	•	•	•	•	•	•	•	•	•	•	•	•
•	•	•	•	•	•	•	•	•	•		•	•	•	•	•	•	•	•	•	•	•	•	•	٠
•		•	•	•		•	•	•			•	•	•	•	•	•	•	•	•	•	•	•	•	•
•	0	•	0		•	•	•	0	•			•	٠	0	•	•	•	٠	0	•	•	•	٠	•
•	۰	•	0			•	•	0				•	•	0	•	•	•	•	0	•	•	•	•	•
•	•	٠	0	•	•	٠	۰	0			•	۰	٠	•	•	•	•	•	0	•	•	•	•	•
•	•	•	•	•	•	٠	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	٠
•	•	•	•	•	•	•	•	•	•		•	•	•	•	•	•	•	•	•	•	•	•	•	۰
•		•	•	•	•		•	•			•	•	•	•	•	•	•	•	•	•	•	•	•	۰
•	•	•	•	•	•		•	•			•	•	•	•	•	•	•	•	•	•	•	•	•	•
•	•	•	•	•	•	٠	•	•		•	•	•	٠	•	•	•	•	•	•	•	•	•	•	•
•	۰	•	•	•	•	٠	٠	0	0	•	•	۰	٠	•	•	•	•	•	•	•	•	•	•	٠
•		٠	0	٠	•	•		•				•	•	0	•	•	•	•	•	•	•	•	•	٠
•	•	•	•	•	•	•	•	•	•		•	•	•	•	•	•	•	•	•	•	•	•	•	•
•		•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•
•	•	•	•	•	•	•	•	0		•	•	•	٠	•	•	•	•	•	0	•	•	•	•	•
•	۰	٠	0	٠	•	•	•	•	•	*	•	•	•	0	•	•	•	•	•	•	•	•	•	۰
•	0	٠	0	•	•	•		•	•	*		•	•	0	•	•	•	•	•	•	•	•	•	٠
•	•	•	•	•	•	•	•	•	•	•		•	•	0	•	•	•	•	•	•	•	•	•	٠
•	•	•	•	•	•	•	•	0	•		•	•	٠	•	•	•	•	٠	0	•	•	•	٠	•
•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•
٠	•	•	٠	٠	•	٠	٠	0		•	•	•	٠	•	•	•	•	٠	0	•	•	•	٠	۰
•	•	•	•	•	•	•	•	•			•	•	•	•	•	•	•	•	•	•	•	•	•	٠
•	٠	•	٠	•	•	0	۰	0	0	٠	•	٠	•	٠	•	•	٠	•	٠	•	٠	•	•	۰
•	•	٠	•	•	٠	•	0	0	0	•	•	•	•	•	•	•	•	٠	٠	•	•	•	٠	•
•	•	٠	٠	•	٠	•	•	•	0	•	٠	•	•	•	•	•	٠	•	•	•	•	•	•	•

MONDAY April 3 BLOCK IV 16:45-18.30

Maps for toponymic research

Daniel VRBÍK Technical University of Liberec

Toponyms are part of collective memory, as they document the gradually evolving relationship of humans to the landscape and reflect the perception of it as a settlement, economic, ideological, or recreational space. In addition to official (standard-ized) toponyms, unofficial (popular) toponyms can also be found and used in every-day, unofficial, or semi-official communication (mostly oral). The popular toponyms are perceived as a specific manifestation of their users' social and geographical stratification. This leads to the fact that they are more variable than relatively stable standardized names and why it is problematic to collect them. To replace traditional methods of collecting toponymic data with time-consuming personal interviews of the inhabitants of a given place, the Living Names project was created, using crowdsourcing methods and modern web maps to involve a large group of the public living in Liberec. The project was focused on (1) collecting toponyms, (2) determining their familiarity among residents, and, for selected names, (3) collecting their spatial delineation. Over a thousand respondents actively participated and entered over three thousand toponyms and additional information.

Maps played an important role in all phases of the project. It was necessary to design the web maps to be easy to understand and use, to motivate the public to participate actively (done mainly using gamification methods), and not to influence the respondent's answers in the third phase. Once the collection is complete, the maps serve as a way of communicating the collected data back to the public, both in the form of a web map and a printed atlas, which is being prepared as a popularisation output, including data interpretation. The presentation will discuss all the maps used in the project, their role, and how they fulfill user needs.

NC)TE	S	•		٠	0	•	•	•	0	•	0	•	•	•	•	٠	•	•	•	•	•	•	•
۰	٠	٠	٠	•	٠	۰	•	•	•	٠	۰	•	•	•		•	•	•	•	•	•	•	•	•
٠	•	•	•	•	•	٠	٠	٠	•	•	٠	•	٠	•	٠	•	•	•	•	•	•	•	•	٠
٠	•	•	•	•	•	•	•	•		•	•	•	•	•	٠	•	•	٠	•	•	•	•	•	•
•	•	•	•	•	•		•	•		•			•			•	•	•	•	•	•	•	•	
	•				•							•										•	•	•
•	•	•	•	•	•	•		•	•	•	•	•		•	•	•	•	•				•	•	0
•	•	•	•	•	•	•	•	•	•	•	•	•		•	•	•	•		•	•	•	•	•	0
0	•	•			•	0	•	•	•	•	0	0	•	•	•	٠	٠	•	•	•	•	٠	•	•

•	•	٠	٠	•	•	٠	٠	•	•	•		•	٠	•	•	•	٠	•	٠	•	•	٠	•	۰
•	•	•	•	•		•	•					•		0	•	•	•	٠	•	•	•	•	•	٠
•	•	•	٠	•	•		•	•				•	•	•	•	•	•	•	•	•	•	•	•	۰
	•	•	•			•	•					•	•	•	•	•	•	•	•	•	•	•	•	•
•	•	•	•	•	•	•	•	•	•		•	•	•	•		•	•	•	•	•	•	•	•	•
•	•	٠	٠	٠	٠	•	•	٠	•	•	٠	•	٠	٠	٠	٠	•	•	•	•	٠	•	•	٠
•	٠	٠	٠	0	0	٠	•	0			0	•	•	•	•	•	٠	٠	٠	•	•	•	٠	٠
•	•		•	•	•	•	٠		0	•	•	•	•	٠	•		•	٠	0	•	•	•	٠	•
•	٠	•	•	•	•		•	•			•	٠	٠	•	•	•	•	•	•	•	•	•	•	•
•	•	•	•	•	•	•	•	•	•	•		•	•	•	•	•	•	•	•	•	•	•	•	•
•	•	•	•	•	٠	•	•	٠	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	۰
•	•	•	٠	۰	0	0	٠	0	0	0	٠	•	٠	٠	٠	٠	٠	٠	٠	•	٠	•	•	٠
•	•	٠	٠	•	•	•	•	0			0	•	•	0	0		٠	٠	•	•	•	•	٠	۰
	•	•	•	•	•		۰	•		•	•	•	٠	•	•	•	•	•	•	•	•	•	•	•
•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•
•	•	٠	•	٠	•	•	٠	٠	٠	٠	٠	•	٠	•	•	٠	•	•	•	•	٠	•	•	•
•	•	0	٠	۰	0	0	٠	0	0	0	٠	•	٠	٠	٠	٠	٠	٠	•	•	٠	•	•	۰
•	•	•	٠	•		•	•		•		0	•		0	•	•	•	٠	٠	•	•	•	٠	۰
	0	•	•	•	•		۰	•	•	•	•	0	•	•	•	٠		•	•	•	•	•	•	•
•	٠	•	•	•	•	•	•	•	•	•	•	٠	•	•	•	•	•	•	•	•	•	•	•	•
•	•	•	٠	•	•	•	•	٠	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•
•	•	0	•	•	0	0	٠	0	0	•	٠	٠	٠	٠	۰	٠	۰	٠	•	•	٠	•	•	۰
	•	•	٠	٠	•	*	۰	•	•	•	٠	•	•	٠	٠	٠	•	•	•	•	٠	•	•	•
•	•	•	•	•	•	•	•	•	•		0	•	•	•	•	0	•	•	•	•	•	•	•	•
•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•
•	•	•	•	•	•	•	•	0	0	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•
•	٠	0	٠	•	•	0	٠	0	0	•	٠	٠	٠	•	•	•	•	•	•	•	•	•	•	•
•	•	•	٠	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	۰
•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•
•	•	•	•	•	•	•	0	0	•	•	0	•	•	•	•	0	•	•	•	•	•	•	•	•
•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•
•	•	•	•	•	•	•	٥	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•
•	•	•	•	•	•	•	•	•	•	•	0	•	•	•	•	•	•	•	•	•	•	•	•	•
•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•
•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•		•	•
•	•	•	•	•		•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•		•	•

TUESDAY April 4 **BLOCK V** 9:00-10.45

Hypsometric images of Europe in school atlases – the final design from the 19th century?

Beata MEDYŃSKA-GULIJ Adam Mickiewicz University, Poznan

Geographers and cartographers from the nineteenth century solved the problem of demonstrating measurability and plasticity of main landforms for Europe in a complementary way as they provided intuitive perception of shapes and features of landforms along with reading measured lowlands, highlands, and mountains in the form of chromatic hypsometric levels. This paper will present arguments supporting this statement using the following criteria: main landform types in terms of hypsometric level, colour tints, surface measurability, plasticity, and map design principles.

N	DTE	S	•	•	٠	0	0			•	•	۰	•	•	٠	٠	٠	0	0	0	٠	٠	0	
•					•											•	•					•		
•	•	٠	•	•	•	•	•	•		•	•	•	٠	•	•	•	•				•	•	•	
•	•	•	•	•	•	•		•			•				•	•	٠	•	•		•	•	•	
•	•	•	•		٠	0	0			٠	•	•			٠	٠	٠	0	•	•	•	٠	•	0
•	•	•		•	•									•	•	•	•				•	•	•	
•	•	•												•	•	•	•				•	•	•	
•	•	•	•	•	•	•	•					•	•			•	•				•	•	•	
٠	•	٠	•	٠	٠	٠	٠			٠	٠	•	•	•	•	•	•	•	•		•	•	•	
٠	0	٠		٠	٠	۰	0			٠	•	•	•	٠	•	•	•	٠	•		٠	٠	٠	٠
•	0	•	•		٠	0	0					•		٠	٠	٠	٠	0	•	0	٠	٠	٠	0
•	0	•	•	•	٠	0	0			٠	۰	•	•	•	•	•	٠	0	•	0	٠	٠	0	0
•	•	•	•	٠	•	•	0	٠		•	٠	•		•		•		0	٠		٠	٠	•	0
•	•	٠	•	٠	٠	•	•	•	•	•	•	٠	•	•	•	•	•				•	•	•	
•	•	٠	•	٠	٠	٠	•	•	•	٠	٠	٠	٠	•	•	•	•	•			•	•	٠	٠
•	•	•		•	٠	•					•	•	٠	٠	•	•	•	•			•	•	•	
•	•	•		•	•	•								•	•	•	•		•		•	•	•	
•	•	•		•	•	•								•	•	•	•		•		•	•	•	
٠	0	٠	٠	٠	٠	•	•			٠	٠	•	•	•			+	0	•	•	٠	٠	•	
٠	0	٠	•	٠	٠	0	0	٠	•	٠	0	0	٠	٠	٠	٠	٠	0	۰	•	•	٠	٠	0
٠	0	٠	0	•	٠	0	0	•		۰	0	٠	٠	٠	٠	٠	٠	٥	•	•	٠	٠	٠	0

•	•	٠	•	٠	•	٠	٠	•	•	•	•	٠	٠	•	•	•	•	•	•	•	•	•	•	۰
•	•	•	•	٠	•	•	•	•	•		•	•	•	•	•	•	•	•	•	•	•	•	•	•
	•	•	•	•		٠	•	•	•	•		•	٠	0	•	•	•	٠	0	•	•	•	•	٠
•	•	•	0		•	•	•	0	•			•	٠	0	•	•	•	•	0	•	•	•	•	۰
•	•	٠	0	•	•	•	•	•	•	•	•	•	٠	0	•	•	•	•	•	•	•	•	•	•
•	•	•	•	•	•	٠	•	•	•		•	•	•	•	•	•	•	•	•	•	•	•	•	•
•	•	•	•	•	•	•	•	•	•		•	•	•	•	•	•	•	•	•	•	•	•	•	٠
•		•	•	•	•	•	•	•			•	•	•	•	•	•	•	•	•	•	•	•	•	٠
•		•	•	•	•	•	•	•			•		•	•	•	•	•	•	•	•	•	•	•	•
•		•	•	٠	•	•	•		•		•	•	•	•	•			•	•	•	•	•	•	•
٠		•	•	•	•	•	•	•			•	•	•	•	•	•	•	•	•	•	•	•	•	•
•	•	•	•	•	•	•	•	•	•		•	•	•	•	•	•	•	•	•	•	•	•	•	٠
•		•	•	•		•	•	•			•	•	•	•	•	•	•	•	•	•	•	•	•	•
•	0	•	0		•	•	•	0	•			•	٠	0	•	•	•	٠	0	•	•	•	٠	•
•	۰	•	0			•	•	0				•	•	0	•	•	•	•	0	•	•	•	•	•
•	•	٠	0	•	•	٠	۰	0			•	۰	٠	•	•	•	•	•	0	•	•	•	•	•
•	•	•	•	•	•	٠	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	٠
•	•	•	•	•	•	•	•	•	•		•	•	•	•	•	•	•	•	•	•	•	•	•	۰
•		•	•	•	•		•	•			•	•	•	•	•	•	•	•	•	•	•	•	•	۰
•	•	•	•	•	•		•	•			•	•	•	•	•	•	•	•	•	•	•	•	•	•
•	•	•	•	•	•	٠	•	•		•	•	•	٠	•	•	•	•	•	•	•	•	•	•	•
•	۰	•	•	•	•	٠	٠	0	0	•	•	۰	٠	•	•	•	•	•	•	•	•	•	•	٠
•		٠	0	٠	•	•		•				•	•	0	•	•	•	•	•	•	•	•	•	٠
•	•	•	•	•	•	•	•	•	•		•	•	•	•	•	•	•	•	•	•	•	•	•	•
•		•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•
•	•	•	•	•	•	•	•	0		•	•	•	٠	•	•	•	•	•	0	•	•	•	•	•
•	۰	٠	0	٠	•	•	•	•	•	*	•	•	•	0	•	•	•	•	•	•	•	•	•	۰
•	0	٠	0	•	•	•		•	•	*		•	•	0	•	•	•	•	•	•	•	•	•	٠
•	•	•	•	•	•	•	•	•	•	•		•	•	0	•	•	•	•	•	•	•	•	•	٠
•	•	•	•	•	•	•	•	0	•		•	•	٠	•	•	•	•	٠	0	•	•	•	٠	•
•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•
٠	•	•	٠	٠	•	٠	٠	0		•	•	•	٠	•	•	•	•	٠	0	•	•	•	٠	۰
•	•	•	•	•	•	•	•	•			•	•	•	•	•	•	•	•	•	•	•	•	•	٠
•	٠	•	٠	•	•	0	۰	0	0	٠	•	٠	•	٠	•	•	٠	•	٠	•	٠	•	•	۰
•	•	٠	•	•	٠	•	0	0	0	•	•	•	•	•	•	•	•	٠	٠	•	•	•	٠	•
•	•	٠	٠	•	٠	•	•	•	0	•	٠	•	•	•	•	•	٠	•	•	•	•	•	•	•

TUESDAY April 4Improved cartographic rendering and designBLOCK Vof detailed street maps and urban atlases9:00-10.45Florian LEDERMANN

Vienna University of Technology

Services like Google Maps and OpenStreetMap have for a long time defined the level of graphical detail users commonly expect from a digital street map. Based mainly on a model that represents streets and other transportation routes as linear features, and intersections as points shared by two or more such routes, these maps are effective for representing a network of routes for a single transport mode (usually car-centric) at medium and small scales with appropriate detail. However, recent shifts in what users demand from a map of public space, particularly in urban environments, have challenged the hegemony of traditional street map products and their representation of mobility infrastructure: Multimodal and heterogeneous forms of sustainable mobility need a more detailed representation of transportation opportunities (car, bicycle, public transport, walking, ...); Current political struggles question the car-centric allocation of public space and demand a fair allocation of real-world space and corresponding representation of the status quo on maps; The concept of the 15-minute-city asks for new small-scale maps and urban atlases representing the richness of opportunities in public and semipublic spaces. Consequentially, methods for a more detailed representation of heterogeneous mobility infrastructure on large-scale maps, that seamlessly blend in with existing data models and cartographic rendering conventions, would be highly desirable.

In my talk, I will present current developments and new research directions for improving the depiction of urban mobility infrastructure on large- to medium-scale maps, while maintaining a fundamental node-line representation as the basic data model. I will review recent developments in this area of online street map providers (Google Maps, Bing, Apple Maps, OpenStreetMap), and existing prototypes based on open source software that improve the representation of multimodal mobility infrastructure, such as recent work by Carlino and others [1], Coppinger [2], Seidel an others [3] and the Streetmix project [4]. Furthermore, I will present initial experiments for improved rendering of multi-lane streets and intersections based on an annotated node-line data model compatible with OpenStreetMap, and conclude with an overview of research challenges and opportunities for street map design and the creation of new, highly detailed urban atlases for the future.

- [1] https://github.com/a-b-street/osm2streets https://github.com/a-b-street/osm2lanes https://a-b-street.github.io/docs/tech/map/geometry/index.html
- [2] https://github.com/jakecoppinger/safe-cycling-map

https://jakecoppinger.com/2023/01/lane-accurate-street-maps-with-openstreetmap -writing-a-vector-tileserver-for-osm2streets/

- [3] https://parkraum.osm-verkehrswende.org/project-prototype-neukoelln/ methodenbericht-2021-03.pdf
- [4] https://github.com/streetmix/streetmix/

N	OTE	S	•	•	•	•	•	•	٠	•	•	٠	٠	•	•		•	٠		•	•		•	•
٠	•	•	٠			•	•	•	٠	٠	•	٠	•	٠	•	•	•	٠	•	•	•	•	•	•
•	•	•	•			•	•	•	•	•		•		٠	٠		•	•	•	•	•		•	٠
•	•	•	•	•	•	•	•	•	٠	•	•	•	•	•	•			•		•	•		•	•
•	•	•	•			•	•	•	٠	•	•	•	•								•			•
•	•	٠	•			•	•	•	٠	•	•	•	•					٠	•			•	•	٠
٠	•	•	٠		•	•	•	•	٠	٠	•	٠	٠	٠	•	•	•	٠	•	•	•	•	•	•
•	•	•	•			•	•	•	•	•	•	٠	•	٠	٠		•	٠	•	•	•		•	•
٠	۰		•	•		•	•		٠	•	•	٠	٠	•	•			0	0	•	•	0	0	۰
٠	٠	٠	•	•			٠		٠			٠	•	•	•			0	0	•	•		0	٠
•	٠	٠	•	٠	٠	٠	٠	٠	٠	٠	٠	•	٠			٠	٠	٠		•	٠	٠	•	•
•	٠	•	•	*	٠	٠	٠	٠	٠	•	٠	٠	•	•	•	٠	٠	٠	٠	•	٠	٠	٠	•
•	•	•	•			•	•	•	٠	•	•	٠	•	٠	٠		•	٠	٠	•	•	•	•	۰
٠	•	٠	•	0	•	٠	•	۰	۰	٠	٠	٠	٠	٠	٠		٠	0	0	•	٠	•	•	۰
٠	•	٠	•	0		٠	•	٠	۰	٠	٠	٠	٠	٠	٠		٠	0	0	•	٠	•	•	۰
٠	۰	٠	•	•		٠	٠	٠	٠	•	٠	٠	•					•	•	•	•		0	•
٠	٠	٠		•	٠	٠	٠	٠	٠	٠	٠	٠	•	٠	٠		•	0	0	٠	٠	•	٠	٠
•	٠	•	•		•	•	٠	•	٠	•	•	•	•	•	•		•	٠	•	•	•		•	٠
•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	٠	•	٠	•	•		٠	•	٠	۰
٠	•	٠	•	0		•	•	•	۰	•	•	٠	•	•	•		•	0	0	•	•	0	•	۰
٠	•	٠	•	0		٠	•	٠	٠	٠	٠	٠	•	٠	٠			0	0	•	٠		٠	•
٠	۰	•	•	•	•	•	٠	•	٠	•	•	٠	•	•	•			٠		•	•		•	۰
٠	٠	•	•	•	•	٠	٠	•	٠	۰	٠	٠	•	•	٠	•	٠	٠	٠	•	٠	•	٥	۰
•	•	•	•	0		•	٠	•	۰	•	•	٠	•	•	•			0	0	•	•	0	•	•
•	•	•	•	0		•	•	•	•	•	•	٠	۰	•	•			0	0	•	•	•	•	•
•	•	•	•	•	•	•	٠	•	٠	•	•	•	•	•	•	•				•	•		•	•
٠	۰	•	•	•	•	•	٠	•	٠	•	•	٠	•	•	•	•	•	•	•	•	•		•	۰
٠	۰	•	•	•	•	•	٠	•	۰	•	•	٠	•	•	•	•	•	•	•	•	•	•	•	۰
•	•	•	•		•	•	٠	٠	•	•	•	•	•	•	•	٠	٠	•	•		•	٠	٠	•
•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•
•	•	•	•	0	•	•	•	•	•	•	•	•	•	•	•	•	•	0	0	0	•	•	•	•

TUESDAY April 4 **BLOCK V** 9:00-10.45

Infographics vs maps: Czech-Brazil visual comparison in understanding spatially oriented visualization

Jakub KONÍČEK, Mariane FÉLIX DA ROCHA Palacký University Olomouc, Federal University of Paraná

Spatially oriented infographics, a full-fledged category focused on presenting various spatial data effectively, has become a popular way of data presentation alongside maps. A combination of elements such as graphs, diagrams, pictures, tables and especially maps with a strong focus on modern graphic execution in one image is used worldwide nowadays. Thanks to our general knowledge of infographics, we have some idea of its look. But is it the same? Can the user recognise the difference between a spatially oriented infographic and a map? Is there still a difference between them?

In this contribution, we would like to follow up on the poster presentation oriented on the visual representation of results from an international survey about understanding spatially oriented infographics during the Eurocarto 2020 (https://doi. org/10.5194/ica-abs-5-108-2022) with the advanced analyses results. Through aninteractive questionnaire survey, we tried identifying the key elements of spatially oriented infographics, which could distinguish from the map's long-known definition. Thanks to international collaboration via the UNIGOU Remote Program between the Federal University of Paraná, Brazil, and Palacký University Olomouc, Czechia, we could extend this research by comparing understanding of the topic of the infographic between these two international groups. It enables us to implement this research into completely different nationalities, schools, and educational systems, an important factor in the diversity of responses. The visual structure of more than 300 participants involved in the research is available online https://public.flourish. studio/visualisation/10677376/.

The survey was designed in a Limesurvey.org platform with two public language mutations (Czech and Portuguese) according to understanding limitations in Brazil and the Czech group. The questionnaire was spread into four thematic areas: (1) Informational – specifying participant structure (already presented in an online overview above). (2) Theoretical – determining definitions (infographics, spatially oriented infographics, maps). (3) Identificational – interactive recognition of graphical elements on the selected image (map, data visualisation, text, picture, heading). (4) Understanding of meaning – identification of the topic of the image through graphic content without understanding to written text.

A visual overview of included questions is available online https://public.flourish. studio/visualisation/10699935/.

The analytical process was based on mixed research methodology with a strong emphasis on visual analysing – combining quantitative and qualitative approaches for visualising connections between answers, aiming to achieve comprehensive results. Several tools were used – from MS Excel (pre-processing and unification of data), through R-Studio (performing overall statistics and explorational analysis of data), and Flourish studio (data visualisation creation) to QGIS (design of the pseudo-spatial study of user interaction with image).

Results uncovered differences between researched groups of participants in how they see infographics and maps. From the basis, for most respondents – 90,3 %, there is a difference between infographics and maps. But 9 % of respondents (all Brazilians) stated there is no difference between these two phenomena. Less than 1 % considered infographics or maps as their subtype.

Based on the responses, no detailed description was detected when we looked deeper into terminological knowledge and the definition of infographics and maps. Clearer and more unified responses were stated for an infographic description. Most respondents from both national groups identify infographics as visual or graphic information – a product of pictorial creation. Dominantly, the Czech participants marked infographics as a tool for easier communication. Brazilian respondents used to mark infographics as a type of chart, diagram or image with information and, surprisingly, as a map.

Based on 50 % of responses, maps represent the same spatial information using cartographical and mathematical methods. This tool for easier interpretation, which 6 % of participants recognised as a synonym for a map, and 14 % of respondents from Czechia identified it as just a visualisation.

All the answers reflect the current knowledge status of given topics. Even though both groups fall under geosciences, there were different levels of knowledge in cartography or graphic design. During the contribution, specifics in relationships between educational level, style or practical expertise will be presented, and recorded responses along with other interesting results will be processed into visual form.

NO	TE	S	•	•	•	•	•	•	•	•	•	•	•		•	•	•	•	•	•	•	•	•	٠
	•	•	•	•	•	•	•	•	•	•	•	•	•		•	•		•	•	•	•	•	•	٠
•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•		•	•
•	•	•	•	•	•	٠	•	•	•	•	٠	•	•	٠	•	٠	•	•	•	•	•	•	•	•
•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•
•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	٠	٠	•	•	٠
•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•		•	•	•	•	•	•	٠
•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•		•	•	•	•	•	•	٠
			•				•	•				•	•										•	

TUESDAY April 4 **BLOCK V** 9:00-10.45

Designing and Implementing Storytelling in Interactive Atlases – A Case Study of the Atlas of Switzerland

René SIEBER, Michael SCHMUKI, Lorenz HURNI ETH Zurich

The use of storytelling with maps has become a widely accepted method for helping users to com¬prehend, clarify, or emphasize the topic and underlying information in a geographic context (Denil 2017, Segel and Heer, 2010). But how does this approach work in interactive atlases? Can the same design structure and techniques be applied and how can the interactive nature be utilized to give the user more freedom beyond a linear storyline?

Intrinsic storytelling is propagated to be a viable approach (Bonassi and Sieber 2017), as it directly connects the narrative of the story to the content of the map and gives the user a sense of immer¬sion (Thöny et al. 2018). In this contribution, we want to explore the options of intrinsic storytelling and outline exemplary implementations in terms of general story design, technical implementation and graphic design in the 'Atlas of Switzerland' (AoS).

Concerning the story design, all stories are consistently divided into 'Chapters', 'Sections', and 'Details'. Like in a book, Chapters represent the logical subdivisions of a story (e.g., Tsunamis worldwide / Tsunamis in Switzerland), while Sections are different events within a chapter (e.g., Lake Geneva event 563, Lake Lucerne events 1601 and 1687). Details describe the event by means of multimedia elements (text, figures, movies, etc.) which complement the information displayed on the map. At each point in the story, internal references or connections to other sections can be visualized and navigated by the user. This general model of a story allows a flexible use of different storytelling modes and techniques with the same definition of a story (Sieber et al. 2021).

The current implementation of the storytelling module is based on three modes: An author-driven 'Slideshow', and the user-driven 'Timeline' or 'Exploration' modes. In the Slideshow, the narrative concept of 'story focus', originating from literature is applied, in which "[e]verything that is irrelevant [...] remains unrepresented" (Mocnik and Fairbairn 2018, p. 50). Thus, the teaser function is pre¬dominant. The two user-driven modes of Timeline and Exploration are applied according to the story content, whether it has a temporal or spatial structure.

The contribution will explain the designed data model, delve into its technical elements, and illustrate how the editorial team of the Atlas of Switzerland can use it to create stories. The graphic design was derived from the general AoS design specifications and augmented with new storytelling components, e.g., navigation and partitioning (Roth 2021). Ensuring the user can distinguish between the 'map' and 'story' modes of the atlas is essential. When inside a story, the user should always be aware of the story's structure and its progression.

In summary, this contribution showcases the advancements in intrinsic storytelling and will close with an interactive demonstration for each of the three modes.

Bonassi, N., & Sieber, R. (2017). Story Telling in Atlases—The intrinsic way. 28th International Cartographic Conference (ICC 2017). https://www.research-collection.ethz.ch/handle/20.500.11850/225474

Denil, M. (2017). Storied Maps. Cartographic Perspectives, 84, Forthcoming issue. https://doi.org/10.14714/CP84.1374

Mocnik, F.-B., Fairbairn, D. (2018). Maps Telling Stories? The Cartographic Journal, 55(1), 36–57. https://doi.org/10.1080/00087041.2017.1304498

Roth, R. E. (2021). Cartographic Design as Visual Storytelling: Synthesis and Review of Map-Based Narratives, Genres, and Tropes. The Cartographic Journal, 58(1), 83–114. https://doi.org/10.1080/00087041.2019.1633103

Segel, E., Heer, J., (2010). Narrative Visualization: Telling Stories with Data. IEEE Trans. Vis. Comput. Graph.

Sieber, R., Schmuki, M., Hurni, L. (2021). Storytelling in Interactive Atlases – Following the Intrinsic Map-Centered Approach. Abstracts of the ICA, 3, 1–1. https://doi.org/10.5194/ica-abs-3-248-2021

Thöny, M., Schnürer, R., Sieber, R., Hurni, L., Pajarola, R., (2018). Storytelling in Interactive 3D Geographic Visualization Systems. International Journal of Geo-Information.

NC)TE	S	•	•	۰	۰	٠	0	•	۰	۰	۰	۰		•	٠	۰	٠	0	•	0	٠	٠	٠
•	•	٠			0	0	٠	0		•	•		•		٠	٠	•	•	•	•	•	•	٠	٠
•	•	•	0		•	•		0		•		٠	•		•			٠	0			٠	•	
•		•		٠			•									•		٠		•		•	•	
٠	•	•	•	•	•	•	•	٠	•	٠	٠	•			•	٠	•	•	•	٠		•	•	•
•	٠	٠	0	•	•	٥	•	0		٠	٠	۰	۰	•	•	•	•	٠	•	•	•	•	•	۰
٠	۰	٠	0	•		•	٠	0	٠	٠	٠			•	٠	۰	0	٠	0	۰	٠	٠	٠	٠
•	•	•	0	•	•		٠	0		•	•			0	•	•		٠	0			٠	٠	۰
•	•	•	0	•			•	0	٠		٠	٠	٠	•	•	•		*	0	•		•	٠	۰
•	•	•	•	٠	•	•	•	•	•	•	•	•	•	•	•	•		•		•		•	٠	•
•	•	•	٠	٠	٠	*	٠	٠	٠	٠	٠	٠	٠			٠	٠	٠	•	٠		٠	٠	•
•	•	•	٠	•	٠		٠	٠	٠	٠	٠	٠	٠		•	٠	٠	٠	٠	٠	٠	٠	٠	•
•	•	•	•	•	•		٠	•	٠	•	•	•	•		٠	٠	٠	•	٠	٠	*	٠	•	٠
•	•	•		٠	•		•		•	•	•		•		•	•		٠		•	*	•	•	•
•	•	•		•			٠		٠	٠	٠	٠	•	•	•	٠		٠	0	٠		•	•	٠

TUESDAY April 4

Conceptual changes in dialect atlases

BLOCK V 9:00-10.45 Vít VOŽENÍLEK, Jakub KONÍČEK, Alena VONDRÁKOVÁ Palacký University Olomouc

A dialect is a traditional object of research for linguists who collect and analyse data from both linguistic and spatial perspectives. Detailed research on the spatial distribution of dialects and their specifics is an important part of preserving the cultural heritage of any nation. With the gradual disappearance of dialects, this issue is very topical. This paper briefly describes the methods of cartographic processing of dialectological data. It comments on dialect maps in atlases and compares them with three dialect atlases of the Czech language produced by Palacký University Olomouc. In addition to the map language and symbology, the internal structure of the atlases is described, which corresponds to the theory of the cartographic atlas as a system and includes both analytical and synthetic maps.

The paper is supported thanks to the generous support under the Operational Program Integrated Infrastructure for the project no. 313021W479 "Research Center for Data Analysis and Protection – II. stage", co-financed by the European Regional Development Fund."

N	DTE	S	•			٠	•		•	•						•	•				٠	٠	•	•
٠	•	0	•		0	•	•		٠	•	•	•	0	0	0	۰	•			•	•	•	•	
•	•		•	•	0	•	•		٠	٠	•	•	0	0	0	۰	•	•	•	•	•	•	•	
	•	0	٠		0		•		٠	٠	۰	•	0	0	0	۰	•	•	•	•	•	•	•	
•	•	٠	٠	•		٠	٠	٠	٠	•	٠					•	•				٠	٠	•	
٠	٠	•	٠			٠	٠		٠		•			•		۰	٠			•	٠	٠	•	•
٠	•		•			٠	•		•							•					•	٠		
•	•		•	•	0	•	•		٠	٠	۰	•	0	0	0	0	•	•	•	•	•	•	0	0
	•	0	•		0		•		٠	٠	۰	•	0	0	0	۰	•	•	•	•	•	•	•	0
•	٠	•	٠	•	٠	•	•		٠	٠	•	•	•	•		•			•		•	•		
•	٠	•	٠	•	٠	•	٠		٠	٠	٠	•	0	•	•	۰	•	•	•	•	•	•	•	٠
٠	٠		٠	0	0	٠	•		٠		•	•	0	0	•	۰	•	•	•	٠	٠	•	•	0
•	•	•	•				•										•	•	•	•	•	•	•	
•	•	•				•	•														•	•		
•	•	•	٠	•	•	•	•	•	٠	•	•	•	•				•	•	•	•	•	•		
•	•	•	•			•	•	•	٠	•	•	•					•	•	•		•	•		
٠	•	•	•			•	٠	٠	•							•					•	•	•	•

•	•	٠	•	٠	•	٠	٠	•	•	•	•	٠	٠	•	•	•	•	•	٠	•	•	•	•	۰
•	•	•	•	٠	•	•	•	•	•		•	•	•	•	•	•	•	•	•	•	•	•	•	•
•	•	•	•	•		٠	•	•	•	•		•	٠	0	•	•	•	٠	•	•	•	•	•	٠
•	•	•	0		•	•	•	0	•			•	٠	0	•	•	•	•	•	•	•	•	•	۰
•	•	٠	0	•	•	•	•	•	•	•	•	•	٠	0	•	•	•	•	•	•	•	•	•	•
•	•	•	•	•	•	•	•	•	•		•	•	•	•	•	•	•	•	•	•	•	•	•	•
•	•	•	•	•	•	•	•	•	•		•	•	•	•	•	•	•	•	•	•	•	•	•	٠
•		•	•	•	•	•	•	•			•	•	•	•	•	•	•	•	•	•	•	•	•	٠
•		•	•	•	•	•	•	•			•		•	•	•	•	•	•	•	•	•	•	•	•
•		•	•	٠	•	•	•		•		•	•	•	•	•			•	•	•	•	•	•	•
•		•	•	•	•	•	•	•			•	•	•	•	•	•	•	•	•	•	•	•	•	•
•	•	•	•	•	•	•	•	•	•		•	•	•	•	•	•	•	•	•	•	•	•	•	٠
•		•	•	•		•	•	•			•	•	•	•	•	•	•	•	•	•	•	•	•	•
•	0	•	0		•	•	•	0	•			•	٠	0	•	•	•	•	•	•	•	•	٠	•
	۰	٠	0			•	•	0				•	•	0	•	•	•	•	•	•	•	•	•	•
•	•	٠	0	•	•	٠	۰	0			•	۰	٠	•	•	•	•	•	•	•	•	•	•	•
•	•	•	•	•	•	٠	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	٠
•	•	•	•	•	•	•	•	•	•		•	•	•	•	•	•	•	٠	•	•	•	•	•	۰
•		•	•	•	•		•	•			•	•	•	•	•	•	•	•	•	•	•	•	•	۰
•	•	•	•	•	•		•	•			•	•	•	•	•	•	•	•	•	•	•	•	•	•
•	•	•	•	•	•	٠	•	•		•	•	•	٠	•	•	•	•	•	•	•	•	•	•	•
•	۰	٠	•	•	•	٠	٠	0	0	•	•	۰	٠	•	•	•	•	٠	•	•	•	•	•	٠
•		٠	0	٠	•	•		•				•	•	0	•	•	•	•	•	•	•	•	•	٠
•	•	•	•	•	•	•	•	•	•		•	•	•	•	•	•	•	٠	•	•	•	•	•	•
•	•	•	•	•	•	•	•	•		•	•	•	•	•	•	•	•	•	•	•	•	•	•	•
•	•	•	•	•	•	•	•	0		•	•	•	٠	•	•	•	•	•	•	•	•	•	•	•
•	٠	٠	۰	•	•	۰	٠	0		•	•	٠	٠	•	•	•	•	٠	•	•	•	•	٠	•
•	0	٠	0	•		•	•	0			•	•	٠	۰	•	•	•	٠	٠	•	•	•	٠	٠
•	•	٠	•	•	•	•	•	•	•	•		•	•	0	•	•	•	•	•	•	•	•	•	٠
•	•	٠	•	•	•	•	•	•	•	•		•	•	•	•	•	•	•	•	•	•	•	•	•
•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•
٠	•	٠	٠	٠	•	٠	٠	0		•	•	•	٠	•	•	•	•	٠	•	•	•	•	٠	۰
•	•	•	•	•	•	•	•	•			•	•	•	•	•	•	•	٠	•	•	•	•	•	٠
•	٠	0	•	•	•	•	0		0	•	•	•		۰	•	•	٠	٠	0	•	•	٠	٠	۰
•	٠	•	٠	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•
•	۰	•	٠	٠	•	•	•	•	•	٠	٠	•	•	٠	•	•	•	•	•	•	•	•	•	•
TUESDAY April 4 **BLOCK VI** 11:15-13.00

The first atlas I have created: the unpublished and banned Atlas of Lake Balaton

László ZENTAI Eötvös Loránd University, Budapest

In 1984, after graduating from university, I looked for the right job: first I tried to make a living by making orienteering maps (which was not really possible then, nor is it now), then I started to make an atlas as a joint project of the Department of Cartography of ELTE and the Institute of Environmental Protection. In the 1980s, environmental protection was not nearly as important as it is today, especially in the countries of the Eastern Bloc.

Lake Balaton is the largest lake in Central Europe. The most common potential danger is the very low or very high water level, pollution, and storms. This area has been continuously researched and mapped for hundreds of years and due to its popularity as the main tourist area of Hungary the citizens are aware of all kinds of danger. As for Lake Balaton, the development of easily understandable representation techniques for mapping is extremely important due to the extensive interest.

In the mid to late eighties, I spent many months preparing this atlas, initially as a staff member of the Institute of Environmental Protection (although locally at the Department of Cartography). I edited the Atlas of Lake Balaton using the thematic data, I made the drawings myself, and I also did some technological work (create colour proofs).

Then the project was abandoned, the maps were left in manuscript form, and it could be argued that the maps were so graphic in their depiction of the environmental problems affecting the lake that they effectively banned further work. In 1990, when I was already a lecturer at the department, two students "dusted off" the maps of the atlas and updated them as a thesis, but the political and economic regime change did not allow the atlas to be published, but by then this was mainly for financial reasons.

N	DTE	S	•			•	•	•		•	•	•				•		٠	•	•	•	•	٠	
•	•	•	•	•	۰	•	•	•	•	•	•	0		•			•	•	•	•	•	•	0	
•	•	٠	٠	•	•	•	•		•		•	•	•	•		•	•	•	•	•	•	•		
٠		•	•			•	٠				•	•				•	•	•	•	•	•	•	•	٠
•					0	۰		•				0		•	•	۰	۰	•	•	•	٠	٠	0	•
						•						0					•						0	

•	•	٠	•	٠	•	٠	٠	•	•	•	•	٠	٠	•	•	•	•	•	•	•	•	•	•	۰
•	•	•	•	٠	•	•	•	•	•		•	•	•	•	•	•	•	•	•	•	•	•	•	•
	•	•	•	•		٠	•	•	•	•		•	٠	0	•	•	•	٠	0	•	•	•	•	٠
•	•	•	0		•	•	•	0	•			•	٠	0	•	•	•	•	0	•	•	•	•	۰
•	•	٠	0	•	•	•	•	•	•	•	•	•	٠	0	•	•	•	•	•	•	•	•	•	•
•	•	•	•	•	•	•	•	•	•		•	•	•	•	•	•	•	•	•	•	•	•	•	•
•	•	•	•	•	•	•	•	•	•		•	•	•	•	•	•	•	•	•	•	•	•	•	٠
•		•	•	•	•	•	•	•			•	•	•	•	•	•	•	•	•	•	•	•	•	٠
•		•	•	•	•	•	•	•			•		•	•	•	•	•	•	•	•	•	•	•	•
•		•	•	٠	•	•	•		•		•	•	•	•	•			•	•	•	•	•	•	•
٠		•	•	•	•	•	•	•			•	•	•	•	•	•	•	•	•	•	•	•	•	•
•	•	•	•	•	•	•	•	•	•		•	•	•	•	•	•	•	•	•	•	•	•	•	٠
•		•	•	•		•	•	•			•	•	•	•	•	•	•	•	•	•	•	•	•	•
•	0	•	0		•	•	•	0	•			•	٠	0	•	•	•	٠	0	•	•	•	•	•
•	۰	•	0			•	•	0				•	•	0	•	•	•	•	0	•	•	•	•	•
•	•	٠	0	•	•	٠	۰	0			•	۰	٠	•	•	•	•	•	0	•	•	•	•	•
•	•	•	•	•	•	٠	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	٠
•	•	•	•	•	•	•	•	•	•		•	•	•	•	•	•	•	•	•	•	•	•	•	۰
•		•	•	•	•		•	•			•	•	•	•	•	•	•	•	•	•	•	•	•	۰
•	•	•	•	•	•		•	•			•	•	•	•	•	•	•	•	•	•	•	•	•	•
•	•	•	•	•	•	٠	•	•		•	•	•	٠	•	•	•	•	•	•	•	•	•	•	•
•	۰	•	•	•	•	٠	٠	0	0	•	•	۰	٠	•	•	•	•	•	•	•	•	•	•	٠
•		٠	0	٠	•	•		•				•	•	0	•	•	•	•	•	•	•	•	•	٠
•	•	•	•	•	•	•	•	•	•		•	•	•	•	•	•	•	•	•	•	•	•	•	•
•		•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•
•	•	•	•	•	•	•	•	0		•	•	•	٠	•	•	•	•	•	0	•	•	•	•	•
•	۰	٠	0	٠	•	•	•	•	•	*	•	•	•	0	•	•	•	•	•	•	•	•	•	۰
•	0	٠	0	•	•	•		•	•	*		•	•	0	•	•	•	•	•	•	•	•	•	٠
•	•	•	•	•	•	•	•	•	•	•		•	•	0	•	•	•	•	•	•	•	•	•	٠
•	•	•	•	•	•	•	•	0	•		•	•	٠	•	•	•	•	٠	0	•	•	•	٠	•
•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•
٠	•	•	٠	٠	•	٠	٠	0		•	•	•	٠	•	•	•	•	٠	0	•	•	•	٠	۰
•	•	•	•	•	•	•	•	•			•	•	•	•	•	•	•	•	•	•	•	•	•	٠
•	٠	•	٠	•	•	0	۰	0	0	٠	•	٠	•	٠	•	•	٠	•	٠	•	٠	•	•	۰
•	•	٠	•	•	٠	•	0	0	0	•	•	•	•	•	•	•	•	٠	٠	•	•	•	٠	•
•	•	٠	٠	•	٠	•	•	•	0	•	٠	•	•	•	•	•	٠	•	•	•	•	•	•	•

TUESDAY April 4 **BLOCK VI** 11:15–13 00

Atlas mapping of urban systems of Georgia

Gocha GUDZUADZE, Tedo GORGODZE Tbilisi State University, Ministry of Defence of Georgia

The first stage in the mapping of urban systems can be considered the period when the simplest schematic plans of ancient cities began to be created. Especially note-worthy is the 70s of the 16th century, when schematic plans of a number of cities in Europe, Asia, and Africa were created. Among Georgian cities, Tbilisi (1735) and Kutaisi (1833) had the oldest schematic plans. The creation of relatively accurate, detailed, and substantively diverse maps and plans for urban systems began in the 20th century. Today, there is a huge system of digital data about any urban area, on the basis of which numerous digital and printed versions of cartographic works are created.

The period of our research covers more than two decades. The subject of our research is the urban systems of Georgia and their atlas mapping. The research was conducted on all important cities of Georgia, from which we will single out the three most prominent and busiest urban systems in terms of size, importance, and location: Tbilisi, Kutaisi, and Batumi, and we will discuss our research on their example.

Within the framework of the research, it was planned to create complex geoinformation atlases of the above urban systems, the purpose of which was defined as scientific and reference. A comprehensive study of the natural conditions and public sphere urban systems was carried out, along with a large volume of cameral and field works. A scheme of the internal structure of the atlases was processed, involving the classification of the entire arsenal of maps included in them.

The planning of work necessary for the creation of urban system atlases derives from the general principles of cartography and can be considered in two main parts: general geographic and thematic. In general, geographical mapping, a detailed study, and mapping of the main geographical elements of the urban system should be carried out. In thematic cartography, any topic of the research area is studied and mapped in depth, which is based on the general geographical elements of the content.

Through special geo-informational software, vectorization of the cartographic bases of the study areas was carried out, and then their generalization according to the scale. At the same time, a geographical information system was created for each urban system, which contained all the necessary information. Maps were then designed and edited using graphic software. As a result of the performed works, the vector basis of the research urban systems and topographic and schematic maps and plans of different scales were obtained. Digital and printed versions of complex atlases are in the process of being created, which will be a kind of novelty for Georgian cartography. Atlas mapping of urban systems is directly related to the growth of population and density in modern urban spaces. Under the conditions of modern techniques and technologies, the effective management of the urban system as the most complex natural-social system requires the creation of complex atlases and geographic information systems that contribute to the development of cartography as a practical scientific field, and specifically, "urban cartography".

N	OTE	S	٠			•	•	•	٠	٠	•	•	•	٠	•	•	•	٠	•	٠	•	•	•	٠
	•	•	•	•	•	•	•	٠	٠	•	•	•	•	•	٠	٠	•	٠	•	•	•		•	•
		•				•	•	٠	•		•	•									•		•	•
	۰	٠	•	•		•	•		٠				•	•			•	0	0	•		•	0	۰
•	۰	•	٠	٠		•	•	•	٠	٠	٠	•	•	•				•	•	•	•		•	•
	٥	٠	٠	0		•	•	٠	٠	•	•	•	•	•			•	٠	٠	٠	٠	•	۰	٠
	٥	٠	٠	0		•	•	٠	٠	•	•	•	•	•			•	۰	0	٠	•		0	۰
	۰	٠	•	•		•	•		٠	•	•	•	•	•				0	0	•	•	0	0	•
	۰	•	•	•					٠				•	•			•	0	0	•	•	0	0	•
	۰	٠	•	•		٠	٠		٠		٠	٠	•					0	0	•		•	•	•
•	•	•	٠		•	•	•	•	٠	٠	•	•	٠	•	•	•	•	٠	•	٠	•		•	٠
	•	•	•			•	•	•	٠	•	•	•	•	٠	•	•	•	•	•	٠	•		•	۰
•	•	•	•			•	•	•	•		•	•		•	•			•	•		•		•	•
	۰	٠	•	•			•		٠	•			•	•				0	0	•	•		0	•
	۰	٠	•	•		٠	٠	٠	٠	•	٠	٠	•	•				•	•		•		•	•
*	۰	٠	•			٠	٠	٠	٠	•	٠	•	•	•				•	•	•	٠		•	•
	•	٠	•			•	٠	٠	٠	•		•	•		*			•		•	•		•	٠
٠	•	•	•		•	•	•	٠	٠	•	•	•	•		•			•		•				•
•	•	٠	•			•	•	•	٠	•	•	•	•	•			•	•	0	•	•		•	•
	۰	٠	•	0		٠	٠		٠	٠	٠	٠	•	٠	•			0	0	•	٠	•	•	•
•	٠	٠	۰	0		٠	•	٠	۰	٠	•	٠	•	•	•	•	•	•	0	•	•	•	•	•
	۰	٠	•	0		•	•		٠	•	•	•	•	•	•		•	۰	0	٠	•	•	٠	•
•	•	•	•		•	•		•	٠	•		•	•	•	•		•	•	•	•			0	•
•	•	•	•	•	•	•	٠	•	•	•	۰	•	•	•	•	•	•	•	•	•	•	•	•	•
	٠	٠	•	•		•	•		۰	•	•	•	•	•			•	0	0	•	•	0	•	•
•	٠	٠	٠	•		٠	•	٠	۰	•	•	٠	•	•			•	•	0	•	٠	•	•	۰
	۰	٠	•	•		٠	•	0	٠	•	•	٠	•	•	•		•	•	0	٠	•	•	٠	٠
•	•	٠	•	0		•	٠		۰	٠	•	٠	•	•	•		0	0	0	•	٠	•	•	۰
•	•	٠	•	0		•	*		•	٠	•	٠	٠	•	•			0	0	•	٠	•	•	•
•	•	•	•	•	٠	٠	•	٠	۰	٠	٠	•	•	•	•	•	•	•	•	•	•	•	•	•

TUESDAY April 4 **BLOCK VI** 11:15-13.00

Map projections in atlases: a reflection on their use

Václav TALHOFER University of Defence, Brno

Map projections are one of the structural foundations of maps. Their properties are precisely defined, which should lead to their correct use in map making. Several publications have been published in the past on the selection of appropriate projections, suggesting suitable procedures for the selection of map projections for different territories and different purposes. Nowadays, it is possible to use current publications and tools, as well as external web services or built-in tools in GIS software products, to select projection.

Atlases are created as logical sets of different maps with different levels of detail. The creators of the atlases have always tried to make sure that this logic is matched by the projection of the individual maps. However, it is questionable whether they have always managed to find the optimal projection and whether they have informed or are informing the users about the selected projections. Another question arises now that powerful web mapping services are available, through which both geographical and thematic information is published. As this gives the user the opportunity to compare the information obtained from atlases with the actual information obtained from the web map service, it often resolves the discrepancy in the views used.

It is therefore worth considering how to address the choice of projection in current atlases with regard to the possibility of confronting information from paper maps and web map services. A related issue is how to educate map and atlas users in the map projection theory. A final question is whether information on the map projections used in atlases has been and is being provided, or whether this information is also available for web map services.

This paper gives examples of solutions in several atlases and compares approaches in current publications.

NC	TE	S	•	•	٠	•	•	•	•	•	•	•	0	•	•	•		0	•	•	0	0	0	•
•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•
٠	•	٠	•	•	٠	٠	٠	•	•	٠	•	•	•	•	•	•	•	•	•	•	•	•	•	•
•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	
•	•				•	٠	•		•	•	•	0	•	•	•	•	•	•	•	•	٠	٠	٠	•
•					•	•					•						•				•	•	•	

•	•	٠	•	٠	•	٠	٠	•	•	•	•	٠	٠	•	•	•	•	•	•	•	•	•	•	۰
•	•	•	•	٠	•	•	•	•	•		•	•	•	•	•	•	•	•	•	•	•	•	•	•
	•	•	•	•		٠	•	•	•	•		•	٠	0	•	•	•	٠	0	•	•	•	•	٠
•	•	•	0		•	•	•	0	•			•	٠	0	•	•	•	•	0	•	•	•	•	۰
•	•	٠	0	•	•	•	•	•	•	•	•	•	٠	0	•	•	•	•	•	•	•	•	•	•
•	•	•	•	•	•	•	•	•	•		•	•	•	•	•	•	•	•	•	•	•	•	•	•
•	•	•	•	•	•	•	•	•	•		•	•	•	•	•	•	•	•	•	•	•	•	•	٠
•		•	•	•	•	•	•	•	•		•	•	•	•	•	•	•	•	•	•	•	•	•	٠
•		•	•	•	•	•	•	•			•		•	•	•	•	•	•	•	•	•	•	•	•
•		•	•	٠	•	•	•		•		•	•	•	•	•			•	•	•	•	•	•	•
٠		•	•	•	•	•	•	•			•	•	•	•	•	•	•	•	•	•	•	•	•	•
•	•	•	•	•	•	•	•	•	•		•	•	•	•	•	•	•	•	•	•	•	•	•	٠
•		•	•	•		•	•	•			•	•	•	•	•	•	•	•	•	•	•	•	•	•
•	0	•	0		•	•	•	0	•			•	٠	0	•	•	•	٠	0	•	•	•	•	•
•	۰	•	0			•	•	0				•	•	0	•	•	•	•	0	•	•	•	•	•
•	•	٠	0	•	•	٠	۰	0			•	۰	٠	•	•	•	•	•	0	•	•	•	•	•
•	•	•	•	•	•	٠	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	٠
•	•	•	•	•	•	•	•	•	•		•	•	•	•	•	•	•	•	•	•	•	•	•	۰
•		•	•	•	•		•	•			•	•	•	•	•	•	•	•	•	•	•	•	•	۰
•	•	•	•	•	•		•	•			•	•	•	•	•	•	•	•	•	•	•	•	•	•
•	•	•	•	•	•	٠	•	•		•	•	•	٠	•	•	•	•	•	•	•	•	•	•	•
•	۰	•	•	•	•	٠	٠	0	0	•	•	۰	٠	•	•	•	•	•	•	•	•	•	•	٠
•		٠	0	٠	•	•		•				•	•	0	•	•	•	•	•	•	•	•	•	٠
•	•	•	•	•	•	•	•	•	•		•	•	•	•	•	•	•	•	•	•	•	•	•	•
•		•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•
•	•	•	•	•	•	•	•	0		•	•	•	٠	•	•	•	•	•	0	•	•	•	•	•
•	۰	٠	0	٠	•	•	•	•	•	*	•	•	•	0	•	•	•	•	•	•	•	•	•	۰
•	0	٠	0	•	•	•		•	•	*		•	•	0	•	•	•	•	•	•	•	•	•	٠
•	•	•	•	•	•	•	•	•	•	•		•	•	0	•	•	•	•	•	•	•	•	•	٠
•	•	•	•	•	•	•	•	0	•		•	•	٠	•	•	•	•	٠	0	•	•	•	٠	•
•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•
٠	•	•	٠	٠	•	٠	٠	0		•	•	•	٠	•	•	•	•	٠	0	•	•	•	٠	۰
•	•	•	•	•	•	•	•	•			•	•	•	•	•	•	•	•	•	•	•	•	•	٠
•	٠	•	٠	•	•	0	۰	0	0	٠	•	٠	•	٠	•	•	٠	•	٠	•	٠	•	•	۰
•	•	٠	•	•	٠	•	0	0	0	•	•	•	•	•	•	•	•	٠	٠	•	•	•	٠	•
•	•	٠	٠	•	٠	•	•	•	0	•	٠	•	•	•	•	•	٠	•	•	•	•	•	•	•

TUESDAY April 4 **BLOCK VI** 11:15–13.00

Application of the general procedure of the national atlas of Spain (ANE). Updating. History section

Irene SAHAGUN LUIS National Geographic Institute of Spain, Madrid

The National Atlas of Spain follows a rigorous procedure to update/complete the contents of each thematic section that compose the Atlas. Spanish History is one of the topics which is the most downloaded, consulted online and used in teaching. The History of Spain section is integrated by Prehistory, Ancient Age, Middle Ages, Modern Age and Contemporary Age.

The production follows a solid system to ensure that quality and standards are achieved, as we use a variety of management, editing and design tools, and people in different roles are involved.

We are currently updating the compendium of the National Atlas of Spain (CANE), that is, from the 2018 edition the contents will be updated and modified without leading to a complete revolution or change, according to the criteria of a series of experts in Spanish History who have reviewed/added the resources to the new layout and have written the explanatory texts.

These maps have been edited with ArcGis because the complexity of the data that need to be represented requires the use of all types of qualitative symbology. This application demands an exhaustive internal digital quality control. The layers must have a specific formulation on standardised cartographic bases. These layers will be used in ArcGIS Online, another of the output formats of our publication, therefore the user will benefit from their accessibility.

This section has an added complexity with historical toponyms. The criteria for the treatment of the toponymy of the ANE postulate the labelling of the endonym and we have worked in this way whenever possible. In the maps, the labelled names vary according to the historical age in which they appear, following the chronology established by experts for the Iberian Peninsula.

N	ΟΤΙ	ES	•	•	•				•		•	•	٠	٠	٠	٠	٠							
۰	•	•			٠	•	•	•	•	•	٠		•			0	0	•		•	•	٠	•	•
•	٠	•			•	•	•	•	•		•	•	•					•				•	•	
•	•	٠	•	•	•	•	٠	٠	٠		•	•	•	•		•	•	٠	•		•	•	•	•
٠	•				•	•	•	•	•		•	•				•	•	•			•	•	•	
																		•				•	•	

•	•	٠	٠	•	•	٠	٠	•	•	•		•	٠	•	•	•	٠	•	٠	•	•	٠	•	۰
•	•	•	•	•		•	•					•		0	•	•	•	٠	•	•	•	•	•	٠
•	•	•	٠	•	•		•	•				•	•	•	•	•	•	•	•	•	•	•	•	۰
	•	•	•			•	•					•	•	•	•	•	•	•	•	•	•	•	•	•
•	•	•	•	•	•	•	•	•	•		•	•	•	•		•	•	•	•	•	•	•	•	•
•	•	٠	٠	٠	٠	•	•	٠	•	•	٠	•	٠	٠	٠	٠	•	•	•	•	٠	•	•	٠
•	٠	٠	٠	0	0	٠	•	0			0	•	•	•	•	•	٠	٠	٠	•	•	•	٠	٠
•	•		•	•	•	•	٠		0	•	•	•	•	٠	•		•	٠	0	•	•	•	٠	•
•	٠	•	•	•	•		•	•			•	٠	٠	•	•	•	•	•	•	•	•	•	•	•
•	•	•	•	•	•	•	•	•	•	•		•	•	•	•	•	•	•	•	•	•	•	•	•
•	•	•	•	•	٠	•	•	٠	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	۰
•	•	•	٠	۰	0	0	٠	0	0	0	٠	•	٠	٠	٠	٠	٠	٠	٠	•	٠	•	•	٠
•	•	٠	٠	•	•	•	•	0			0	•	•	0	0		٠	٠	•	•	•	•	٠	۰
	•	•	•	•	•		۰	•		•	•	•	٠	•	•	•	•	•	•	•	•	•	•	•
•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•
•	•	٠	•	٠	•	•	٠	٠	٠	٠	٠	•	٠	•	•	٠	•	•	•	•	٠	•	•	•
•	•	0	٠	۰	0	0	٠	0	0	0	٠	•	٠	٠	٠	٠	٠	٠	•	•	٠	•	•	۰
•	•	•	٠	•		•	•		•		0	•		0	•	•	•	٠	٠	•	•	•	٠	۰
	0	•	•	•	•		۰	•	•	•	•	0	•	•	•	٠		•	•	•	•	•	•	•
•	٠	•	•	•	•	•	•	•	•	•	•	٠	•	•	•	•	•	•	•	•	•	•	•	•
•	•	•	٠	•	•	•	•	٠	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•
•	•	0	•	•	0	0	٠	0	0	•	٠	٠	٠	٠	۰	٠	۰	٠	•	•	٠	•	•	۰
	•	•	٠	٠	•	*	۰	•	•	•	٠	•	•	٠	٠	٠	•	•	•	•	٠	•	•	•
•	•	•	•	•	•	•	•	•	•		0	•	•	•	•	0	•	•	•	•	•	•	•	•
•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•
•	•	•	•	•	•	•	•	0	0	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•
•	٠	0	٠	•	•	0	٠	0	0	•	٠	٠	٠	•	•	•	•	•	•	•	•	•	•	•
•	•	•	٠	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	۰
•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•
•	•	•	•	•	•	•	•	0	•	•	0	•	•	•	•	0	•	•	•	•	•	•	•	•
•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•
•	•	•	•	•	•	•	۰	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•
•	•	•	•	•	•	•	•	•	•	•	0	•	•	•	•	0	•	•	•	•	•	•	•	•
•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•
•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•		•	•
•	•	•	•	•		•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•		•	•

TUESDAY April 4 **BLOCK VI** 11:15-13.00

Creation and use of special purpose atlases in Georgia on the example of "Officer's Atlas"

Tedo GORGODZE, Nodar KHORBALADZE, Sophio GORGIJANIDZE, Gocha GUDZUADZE *Ministry of Defence of Georgia,*

Tbilisi State University

Atlases of different content and purpose occupy a special place among cartographic works and can be considered the best way of gathering and conveying enormous information. A number of atlases for different purposes have been created in Georgia to date: scientific, reference, educational, tourist, and special. It needs to be mentioned that special-purpose atlases with specific characteristics are rare.

Among the cartographic structures in Georgia, the Department of Cartography-Geodesy of the Ministry of Defense has one of the prominent places which has implemented several major cartographic projects in the last ten years. We can single out the following atlases:

1. Officer's Atlas (in Georgian) – fundamental cartographic work, due to its volume and diversity of content.

2. Military Atlas of Georgia (in Georgian) – Created on the basis of 1:200,000 scale topographic maps and intended for official use. Contains information about terrain, hydrographic network, settlements, roads, and communications. In addition, numerical and other characteristics of objects are given.

3. Military-historical atlas of Georgia, Russia's aggressive policy and intervention in Georgia, 1783–2008 (In Georgian and English) – based on various sources, mainly for cognitive and educational purposes. It details all the important historical events of more than two centuries.

The main subject of our paper is the "Officer's Atlas", created by a large group of specialists for several years. It is the first cartographic work created with this purpose and content in Georgia.

"Officer's Atlas" is an interdisciplinary work and represents a synthesis of cartography, geography, and history. The concept, compositional layout, content, and design of the atlas are new for Georgian cartographic science.

"Officer's Atlas" is the largest and most informative among the existing atlases in the Georgian language. It contains 358 maps and charts of different content and scale. Atlas consists of several chapters and has the following structure: General information; Georgia and bordering countries, continents, regions, and oceans; Military-historic maps (world, Georgia); Additional information.

The main maps in the atlas are general geographic maps that cover continents and individual regions and are quite busy and informative. A total of 44 maps of such content are placed in the atlas.

An important component of the atlas is the schematic maps of the world's 69 cities. Cities are selected based on several key parameters – size, population, spatial distribution, location, political and administrative status, etc.

The historical map series deserve additional attention because it depicts the important facts and events of world history (as well as Georgian history) and includes 181 maps and charts.

The additional information block contains: General information about the world countries; Numerical data of important geographical objects; Search for geographical names and objects.

According to the classification scheme of atlases accepted in cartographic science, the "Officer's atlas" is for scientific and reference purposes. Apart from this "Officer's Atlas" can also be used for educational purposes. In 2021, the atlas received Georgian National Award – the highest scientific award in the county. It is the only National Award in the last 50 years of Georgian cartographic history.

NC	ЭТЕ	S	•	•		•	•	•	•	•		•	•		•			•					•	
•		•	•	•			•	•									•	•	•				•	•
0		•			0		٠	•				0	•	•		•	٠	•	0	0	0	•	•	•
			•				•										٠	0	0					0
			•				•																•	
•	•	•	•	٠	•	•	٠	٠			۰	•	•					•	•	•			•	
•	•	•	0	٠	•		٠	٠				۰	۰				٠	•	0	0	•	•	•	•
•		•					٠					•				•	٠	۰	0	0	•	•	٠	٠
		•					٠										٠	0	0		•		•	0
			•				•							•	•		•	•					•	•
•	•	•	•	•			•	•	•	•			•				•	•					•	•
•	•	٠	•	٠	٠	•	•	•	•	٠	•	٠	•	•	•	•	•	•	•	•			•	•
0	0	٠		٠	0		•	٠		•	•	•	•	•	•	٠	•	٠	٠	•	•	•	٠	٠
•		•		•			٠	•	•	•				٠	٠	٠	٠	0	0	0	0	0	٠	0
•	•	•		•	•				•	•	•	٠	٠	•	•	•		0	0	0			•	
•	•	•	•	٠		•	٠	٠				٠	•	•	•	•			0	0			٠	

TUESDAY April 4 WORKSHOP 15:10-16.45

eDIVE: the use of collaborative immersive virtual environments not only for teaching geography

Čeněk ŠAŠINKA Masaryk University, Brno

As part of an applied research project, Masaryk University has developed software for teaching geography using collaborative immersive virtual reality – the opensource platform eDIVE. The solution was developed based on the analysis of the needs of target users, i.e. students and teachers at secondary and higher education institutions. The eDIVE platform also includes selected teaching scenarios, such as hypsography, which have been implemented in practice and empirically tested. The authors of the concept (Šašinka, Chmelík, Šašinková, and Stachoň) designed eDIVE with a vision for its wider use. Among other things, the platform is used for teaching English as a foreign language. The workshop aims to familiarize the participants with the eDIVE platform and to show the current solution in practice, as well as with the broader concept and vision of its development.

NC)TE	S	•	•	•	٠	•		•	•	٠	•	•	•	•	•	•	•	•	•	•	•	•	
•	•	•	•		•	•	•			•	•	•	•	•	•	•	•	•	•	•	•	•	•	
•	•	•	•		•							•	•	•		•	•	•	•	•	•	•	•	
•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	
•	٠	0	•	٠	•	•	0	٠	•	•	٠	•	•	•		•	•	0	•	•	•	•	•	
•	•	•	•	•	•	•	•		•	•	•	•	•	•		•	•	•	•	•	•	•	•	
•	•	٠	•	•	٠	٠	٠	٠		•	٠	٠	٠	٠	•	•	•	•	•	•	•	٠	•	۰
٠	•	•	•	0	•	0	0	0	•	0	0	•	•	•	0	0	0	•	•	•	•	•	•	
•	•	•	•	•	٠	•	0	•	•	•	٠	0	٠	٠	•	•	0	0	•	•	0	•	•	۰
•	•	•	•	٠	•	٠	•	٠			٠	0	٠	٠	•	•	•	0	•	•	•	•	•	٠
•	•	•	•	•	٠	•	•	•	•	•	•	•	٠	•	•	•	•	•	•	•	•	•	•	•
٠	•	•	•	٠	٠	٠	٠	٠	•	•	٠	•	•	•	٠	•	٠	٠	•	•	•	٠	•	
•	٠	0	•	•	•	0	0	٠		•		0	۰	۰	٠	٠	0	0	•	•	•	٠	•	•
•	•	•	•	•	•	•		•			٠	0	٠	۰	•	٠	0	0	•	0	0	•	•	•
•	•	•	•	•	•	•	•	•	•	•	•	•	•	*	•	•	•	•	•	•	•	•	•	
٠	•	٠	•	٠	٠	٠	٠	٠	•	٠	٠	٠	•	•	•	•	•	•	•	•	•	•	•	•
•	۰	٠	•	٠	•	٠	•	٠		•	٠	•	•	٠	٠	٠	•	•	•	•	•	•	•	
•	۰	٠	•	٠	•	٠	•	٠	*	•	٠	•	•	•	٠	٠	•	٠	٠	•	•	•	•	

•	•	•	•	٠	•	٠	٠	•	•	•	•	٠	٠	•	•	•	•	•	•	•	•	•	•	۰
•	•	•	•	٠	•	•	•	•	•		•	•	•	•	•	•	•	•	•	•	•	•	•	•
	•	•	•	•		٠	•	•	•	•		•	٠	0	•	•	•	٠	0	•	•	•	•	٠
•	•	•	0		•	•	•	0	•			•	•	0	•	•	•	•	0	•	•	•	•	۰
•	•	٠	0	•	•	•	•	•	•	•	•	•	٠	0	•	•	•	•	•	•	•	•	•	•
•	•	•	•	•	•	٠	•	•	•		•	•	•	•	•	•	•	•	•	•	•	•	•	•
•	•	•	•	•	•	•	•	•	•		•	•	•	•	•	•	•	•	•	•	•	•	•	٠
•		•	•	•	•	•	•	•			•	•	•	•	•	•	•	•	•	•	•	•	•	٠
•		•	•	•	•	•	•	•			•		•	•	•	•	•	•	•	•	•	•	•	•
•		•	•	٠	•	•	•		•		•	•	•	•	•			•	•	•	•	•	•	•
٠		•	•	•	•	•	•	•			•	•	•	•	•	•	•	•	•	•	•	•	•	•
•	•	•	•	•	•	•	•	•	•		•	•	•	•	•	•	•	•	•	•	•	•	•	٠
•		•	•	•		•	•	•			•	•	•	•	•	•	•	•	•	•	•	•	•	•
•	0	•	0		•	•	•	0	•			•	٠	0	•	•	•	٠	0	•	•	•	٠	•
•	۰	•	0			•	•	0				•	•	0	•	•	•	•	0	•	•	•	•	•
•	•	٠	0	•	•	٠	۰	0			•	۰	٠	•	•	•	•	•	0	•	•	•	•	•
•	•	•	•	•	•	٠	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	٠
•	•	•	•	•	•	•	•	•	•		•	•	•	•	•	•	•	•	•	•	•	•	•	۰
•		•	•	•	•		•	•			•	•	•	•	•	•	•	•	•	•	•	•	•	۰
•	•	•	•	•	•		•	•			•	•	•	•	•	•	•	•	•	•	•	•	•	•
•	•	•	•	•	•	٠	•	•		•	•	•	٠	•	•	•	•	•	•	•	•	•	•	•
•	۰	•	•	•	•	٠	٠	0	0	•	•	۰	٠	•	•	•	•	•	•	•	•	•	•	٠
•		٠	0	٠	•	•		•				•	•	0	•	•	•	•	•	•	•	•	•	٠
•	•	•	•	•	•	•	•	•	•		•	•	•	•	•	•	•	•	•	•	•	•	•	•
•		•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•
•	•	•	•	•	•	•	•	0		•	•	•	٠	•	•	•	•	•	0	•	•	•	•	•
•	۰	٠	0	٠	•	•	•	•	•	*	•	•	•	0	•	•	•	•	•	•	•	•	•	۰
•	0	٠	0	•	•	•		•	•	*		•	•	0	•	•	•	•	•	•	•	•	•	٠
•	•	•	•	•	•	•	•	•	•	•		•	•	0	•	•	•	•	•	•	•	•	•	٠
•	•	•	•	•	•	•	•	0	•		•	•	٠	•	•	•	•	٠	0	•	•	•	٠	•
•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•
٠	•	•	٠	٠	•	٠	٠	0		•	•	•	٠	•	•	•	•	٠	0	•	•	•	٠	۰
•	•	•	•	•	•	•	•	•			•	•	•	•	•	•	•	•	•	•	•	•	•	٠
•	٠	•	٠	•	•	0	۰	0	0	٠	•	٠	•	٠	•	•	٠	•	٠	•	٠	•	•	۰
•	•	٠	•	•	٠	•	0	0	0	•	•	•	•	•	•	•	•	٠	٠	•	•	•	٠	•
•	•	٠	٠	•	٠	•	•	•	0	•	٠	•	•	•	•	•	٠	•	•	•	•	•	•	•

TUESDAY April 4

Interactive tactile models creation

WORKSHOP 15:10–16.45

Radek BARVÍŘ, Jan BRUS, Alena VONDRÁKOVÁ Palacký University Olomouc

The workshop aims to describe the whole process of designing interactive tactile maps and 3D models with the use of TouchIt3D technology. First, we will introduce tactile cartography, tactile maps, and tactile atlases, followed by the history of TouchIt3D maps development from early attempts verifying and testing the functionality. Subsequently, the design process of the interactive auditive tactile maps linkable with mobile devices will be demonstrated including all three key steps of the workflow. Such steps include the process of 3D modelling, 3D printing and preparing a respective template for the TactileMapTalk mobile map. Finally, the most up-to-date production of 3D models representing famous Czech monuments and historic sites will be presented. During the workshop, we will visit the 3D Geospatial Laboratory lab at the Department of Geoinformatics, Palacký University Olomouc to show technologies (including multi-extruder 3D printers) used for map and model manufacturing.

NC)TE	S	•	•	•	•	٠	•	•	•	•	•	•	•		•	•	•	٠	•	•	•	•	
•	٠	•	0	•	0	•		•	۰	•	•	٠	۰	٠	•	٠	٠	•	•	٠	٠	•	٠	٠
•	0	0	•	•	•	٠	•	•				٠	•	٠		0	0	0	0	•	٠	0	0	۰
•	•	•	•	•	•	•	•	•	•		•	•	•	•	•	•	•	•	•	•	•	•	•	•
٠	۰	0	٠	٠	•	٠	٠	•	•	٠	0	٠	٠	•	•	•	•	0	•	•	•	•	•	
٠	•	٠	٠	٠	٠	٠	٠	٠	•	٠	٠	•	٠	٠	•	•	٠	٠	•	•	•	•	•	
٠	٠	•	•	•	•	٠	٠	•	•	•	٠	•	٠	٠	٠	٠	٠	٠	٠	•	٠	٠	٠	
•	0	0	•	•	•	٠	•	•	0	•		۰	۰	۰	٠	•	0	0	•	•	٠	0	0	
•	٠	•	•	•	•	٠	•	•		•	•	٠	٠	•	•	•	•	•	•	•	•	•	•	
٠	٠	0	•	٠	•	٠	٠	٠	•	٠	۰	•	٠	٠	•	0	0	0	0	•	•	0	•	
•	•	•	•	•	٠	•	•	٠	•	•	•	٠	٠	•	•	•	•	•	•	•	•	•	•	
٠	٠	0	•	٠	•	٠	۰	•	•	•	0	٠	٠	٠	•	٠	٠	•	•	•	•	•	•	•
•	0	•	•	•	•	•	•	•			•	۰	•	۰	•	•	•	•	•	•	•	•	•	
•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	0		0	•	
•	•	•	•	•	•	٠	٠	•		•	•	•	•	•	•	•	•	0	•	•	•	•	•	
•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•
•	•				•	•	•			•	•	•		•	•	•	•	•	•	•	•	•	•	•
			-											-	-				-					

•	•	٠	•	٠	•	٠	٠	•	•	•	•	٠	٠	•	•	•	•	•	•	•	•	•	•	۰
•	•	•	•	٠	•	•	•	•	•		•	•	•	•	•	•	•	•	•	•	•	•	•	•
	•	•	•	•		٠	•	•	•	•		•	٠	0	•	•	•	٠	0	•	•	•	•	٠
•	•	•	0		•	•	•	0	•			•	•	0	•	•	•	•	0	•	•	•	•	۰
•	•	٠	0	•	•	•	•	•	•	•	•	•	٠	0	•	•	•	•	•	•	•	•	•	•
•	•	•	•	•	•	٠	•	•	•		•	•	•	•	•	•	•	•	•	•	•	•	•	•
•	•	•	•	•	•	•	•	•	•		•	•	•	•	•	•	•	•	•	•	•	•	•	٠
•		•	•	•	•	•	•	•			•	•	•	•	•	•	•	•	•	•	•	•	•	٠
•		•	•	•	•	•	•	•			•		•	•	•	•	•	•	•	•	•	•	•	•
•		•	•	٠	•	•	•		•		•	•	•	•	•			•	•	•	•	•	•	•
٠		•	•	•	•	•	•	•			•	•	•	•	•	•	•	•	•	•	•	•	•	•
•	•	•	•	•	•	•	•	•	•		•	•	•	•	•	•	•	•	•	•	•	•	•	٠
•		•	•	•		•	•	•			•	•	•	•	•	•	•	•	•	•	•	•	•	•
•	0	•	0		•	•	•	0	•			•	٠	0	•	•	•	٠	0	•	•	•	•	•
•	۰	•	0			•	•	0				•	•	0	•	•	•	•	0	•	•	•	•	•
•	•	٠	0	•	•	٠	۰	0			•	۰	٠	•	•	•	•	•	0	•	•	•	•	•
•	•	•	•	•	•	٠	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	٠
•	•	•	•	•	•	•	•	•	•		•	•	•	•	•	•	•	•	•	•	•	•	•	۰
•		•	•	•	•		•	•			•	•	•	•	•	•	•	•	•	•	•	•	•	۰
•	•	•	•	•	•		•	•			•	•	•	•	•	•	•	•	•	•	•	•	•	•
•	•	•	•	•	•	٠	•	•		•	•	•	٠	•	•	•	•	•	•	•	•	•	•	•
•	۰	•	•	•	•	٠	٠	0	0	•	•	۰	٠	•	•	•	•	•	•	•	•	•	•	٠
•		٠	0	٠	•	•		•				•	•	0	•	•	•	•	•	•	•	•	•	٠
•	•	•	•	•	•	•	•	•	•		•	•	•	•	•	•	•	•	•	•	•	•	•	•
•		•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•
•	•	•	•	•	•	•	•	0		•	•	•	٠	•	•	•	•	•	0	•	•	•	•	•
•	۰	٠	0	٠	•	•	•	•	•	*	•	•	•	0	•	•	•	•	•	•	•	•	•	۰
•	0	٠	0	•	•	•		•	•	*		•	•	0	•	•	•	•	•	•	•	•	•	٠
•	•	•	•	•	•	•	•	•	•	•		•	•	0	•	•	•	•	•	•	•	•	•	٠
•	•	•	•	•	•	•	•	0	•		•	•	٠	•	•	•	•	٠	0	•	•	•	٠	•
•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•
٠	•	•	٠	٠	•	٠	٠	0		•	•	•	٠	•	•	•	•	٠	0	•	•	•	٠	۰
•	•	•	•	•	•	•	•	•			•	•	•	•	•	•	•	•	•	•	•	•	•	٠
•	٠	•	٠	•	•	0	۰	0	0	٠	•	٠	•	٠	•	•	٠	•	٠	•	٠	•	•	۰
•	•	٠	•	•	٠	•	0	0	0	•	•	•	•	•	•	•	•	٠	٠	•	•	•	٠	•
•	•	٠	٠	•	٠	•	•	•	0	•	٠	•	•	•	•	•	٠	•	•	•	•	•	•	•

TUESDAY April 4 WORKSHOP 15:10-16.45

Eye-tracking and its possibility for analyses of map-reading

Stanislav POPELKA, Kamila FAČEVIČOVÁ, Michaela VOJTĚCHOVSKÁ, Markéta BEITLOVÁ Palacký University Olomouc

This workshop aims to provide participants with an understanding of eye-tracking technology and its potential for analysing map-reading behaviour. The workshop will cover the basics of eye-tracking technology, including its history, principle, strengths, and limitations. It will focus on how this technology can be used to gain insights into the cognitive processes involved in map reading.

Besides this introductory part, practical examples of cartographic case studies will be presented. The core of the workshop will focus on introducing methods, approaches, and tools used and developed at the Department of Geoinformatics, Palacký University in Olomouc. The method of **compositional data analysis** (CoDA) will be presented. CoDA methods are designed to treat data of a relative nature and are based on the log-ratio representation of the measured values (e.g. the number of fixations or their length). Visualization of the distribution of attention among Areas of Interest in **GazePlotter** software will be presented. The order of visited Areas of Interest might be analysed using scanpath comparison methods implemented in **ScanGraph** software. Finally, the software for georeferencing eye movements recorded over a web map called **ET2Spatial** will be introduced.

This workshop offers a unique opportunity to gain knowledge and practical skills related to eye-tracking technology and its potential for analysing map-reading behaviour. Through case studies and practical examples, participants will learn about the methods, approaches, and tools used and developed at the Department of Geoinformatics, Palacký University in Olomouc. This knowledge can be of great benefit to cartographers and other professionals working in geospatial fields, allowing them to understand better how people interact with maps and to design more effective visualizations.

NC	DTE	S	•	•	٠	•	•	٠	٠	•	٠	٠	٠	•	٠	•	•	•	٠	٠	•	•	•	
٠	0	•	•	•	•	٠	•			•	٠			•	•	٠	٠	•	•		•	٠	0	
•	•	•	•	•	•	•	•	•		•	•	•		•	•	•	•	•		•	•	•	•	
•	•	•				•			•	•			•								•		0	
٠	0	•	•	•	٠	۰	٠	٠	•	٠	٠	٠	•					•	•		•	•	•	
•	•	•			•	•	•	•		•	•	•		•	•	•	•	•				•	•	
•					•	•				•					•	•	٠	•			•	٠	•	

•	•	٠	٠	•	•	٠	٠	•	•	•		•	٠	•	•	•	٠	•	٠	•	•	٠	•	۰
•	•	•	•	•		•	•					•		0	•	•	•	٠	•	•	•	•	•	٠
•	•	•	٠	•	•		•	•				•	•	•	•	•	•	•	•	•	•	•	•	۰
	•	•	•			•	•					•	•	•	•	•	•	•	•	•	•	•	•	•
•	•	•	•	•	•	•	•	•	•		•	•	•	•		•	•	•	•	•	•	•	•	•
•	•	٠	٠	٠	٠	•	•	٠	•	•	٠	•	٠	٠	٠	٠	•	•	•	•	٠	•	•	٠
•	٠	٠	٠	0	0	٠	•	0			0	•	•	•	•	•	٠	٠	٠	•	•	•	٠	٠
•	•		•	•	•	•	٠		0	•	•	•	•	٠	•		•	٠	0	•	•	•	٠	•
•	٠	•	•	•	•		•	•			•	٠	٠	•	•	•	•	•	•	•	•	•	•	•
•	•	•	•	•	•	•	•	•	•	•		•	•	•	•	•	•	•	•	•	•	•	•	•
•	•	•	•	•	٠	•	•	٠	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	۰
•	•	•	٠	۰	0	0	٠	0	0	0	٠	•	٠	٠	٠	٠	٠	٠	٠	•	٠	•	•	٠
•	•	٠	٠	•	•	•	•	0			0	•	•	0	0		٠	٠	•	•	•	•	٠	۰
	•	•	•	•	•		۰	•		•	•	•	٠	•	•	•	•	•	•	•	•	•	•	•
•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•
•	•	٠	•	٠	•	•	٠	٠	٠	٠	٠	•	٠	•	•	٠	•	•	•	•	٠	•	•	•
•	•	0	٠	۰	0	0	٠	0	0	0	٠	•	٠	٠	٠	٠	٠	٠	•	•	٠	•	•	۰
•	•	•	٠	•		•	•		•		0	•		0	•	•	•	٠	٠	•	•	•	٠	۰
	0	•	•	•	•		۰	•	•	•	•	0	•	•	•	٠		•	•	•	•	•	•	•
•	٠	•	•	•	•	•	•	•	•	•	•	٠	•	•	•	•	•	•	•	•	•	•	•	•
•	•	•	٠	•	•	•	•	٠	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•
•	•	0	•	•	0	0	٠	0	0	•	٠	٠	٠	٠	۰	٠	۰	٠	•	•	٠	•	•	۰
	•	•	٠	٠	•	*	۰	•	•	•	٠	•	•	٠	٠	٠	•	•	•	•	٠	•	•	•
•	•	•	•	•	•	•	•	•	•		0	•	•	•	•	0	•	•	•	•	•	•	•	•
•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•
•	•	•	•	•	•	•	•	0	0	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•
•	٠	0	٠	•	•	0	٠	0	0	•	٠	٠	٠	•	•	•	•	•	•	•	•	•	•	•
•	•	•	٠	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	۰
•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•
•	•	•	•	•	•	•	0	0	•	•	0	•	•	•	•	0	•	•	•	•	•	•	•	•
•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•
•	•	•	•	•	•	•	٥	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•
•	•	•	•	•	•	•	•	•	•	•	0	•	•	•	•	•	•	•	•	•	•	•	•	•
•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•
•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•		•	•
•	•	•	•	•		•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•		•	•

WEDNESDAY April 5Guide to selected monuments of CzechiaBLOCK VIIfor people with visual impairment9:00-11.00Jakub ŽEJDLÍK

Palacký University Olomouc

The study deals with the design and creation of a guide to selected monuments in the Czech Republic. The target group of the guide is people with severe visual impairment and their guides (e.g. professional assistants, teachers, family members). The guide includes a presentation of monuments in terms of history and architecture, with an emphasis on geospatial characteristics and context. The guide includes pages for normally sighted people with detailed descriptions and tactile maps, using Braille and simplified typhlography. The pages containing the typhlomaps are printed in the quide using a special device – a fuser. This allows printing on special microcapsule paper with a heat-sensitive layer, which, when heated, allows the black printed parts to rise above the surface of the paper and create so-called relief graphics. The guide has been subjected to several practical user tests in the course of its creation. The OpenStreetMap database was used as a source of spatial data. These data were processed in ArcGIS Pro and QGIS, where map outputs were subsequently prepared. Graphical processing of maps and other graphical elements was carried out in Adobe Illustrator CS6. Completion of the typhloguide, including pre-press preparation, was done in Adobe InDesign CS6.

N	DTE	S	•	٠		•	•	•	٠	•	•	•	•				•	•	•	•		•	•	
٠	•	•	•	٠	٠	•	•	•	•		٠	•					•	•	٠			•	•	
•			•	٠		٠	٠				•			•		٠	٠		٠			•	•	٠
			•	•		٠											٠		•			•		٠
			٠	•		٠	•										•		•					
0	•	•		•	٠					•	۰	•	0	0	0	•	•	•	•		•	0	•	0
•	•		•	٠	٠	٠	٠			•	٠	•	0	0	•	۰		•	•			0	•	0
٠	•	0		٠	٠	٠	•		٠	•	٠	•	0	•	•	•	•	•	٠		•	٠	•	٠
•	•	•	•	•	•	•	•	•	•		•	•	•	•	•	•	•	٠	٠		•	•	•	
•	•	•	•	•		•	•	•			•	•	0			•	•	•	•		•	۰	•	
•		•	•			•													•					
٠	•	•	•	•	•	•	•		•		•	•	•				•		•			•		
٠	•	•	•	•	٠	•	•	•	٠		•	•	•	•		•	•	•	٠	•		•	•	
•	•	•	•	•		•	•	•	•		•	•				•	•	•	•			٠	•	

•	•	٠	٠	•	•	٠	٠	•	•	•		•	٠	•	•	•	٠	•	٠	•	•	٠	•	۰
•	•	•	•	•		•	•					•		0	•	•	•	٠	•	•	•	•	•	٠
•	•	•	٠	•	•		•	•				•	•	•	•	•	•	•	•	•	•	•	•	۰
	•	•	•			•	•					•	•	•	•	•	•	•	•	•	•	•	•	•
•	•	•	•	•	•	•	•	•	•		•	•	•	•		•	•	•	•	•	•	•	•	•
•	•	٠	٠	٠	٠	•	•	٠	•	•	٠	•	٠	٠	٠	٠	•	•	•	•	٠	•	•	٠
•	٠	٠	٠	0	0	٠	•	0			0	•	•	•	•	•	٠	٠	٠	•	•	•	٠	٠
•	•		•	•	•	•	٠		0	•	•	•	•	٠	•		•	٠	0	•	•	•	٠	•
•	٠	•	•	•	•		•	•			•	٠	٠	•	•	•	•	•	•	•	•	•	•	•
•	•	•	•	•	•	•	•	•	•	•		•	•	•	•	•	•	•	•	•	•	•	•	•
•	•	•	•	•	٠	•	•	٠	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	۰
•	•	•	٠	۰	0	0	٠	0	0	0	٠	•	٠	٠	٠	٠	٠	٠	٠	•	٠	•	•	٠
•	•	٠	٠	•	•	•	•	0			0	•	•	0	0		٠	٠	•	•	•	•	٠	۰
	•	•	•	•	•		۰	•		•	•	•	٠	•	•	•	•	•	•	•	•	•	•	•
•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•
•	•	٠	•	٠	•	•	٠	٠	٠	٠	٠	•	٠	•	•	٠	•	•	•	•	٠	•	•	•
•	•	0	٠	۰	0	0	٠	0	0	0	٠	•	٠	٠	٠	٠	٠	٠	•	•	٠	•	•	۰
•	•	•	٠	•		•	•		•		0	•		0	•	•	•	٠	٠	•	•	•	٠	۰
	0	•	•	•	•		۰	•	•	•	•	0	•	•	•	٠		•	•	•	•	•	•	•
•	٠	•	•	•	•	•	•	•	•	•	•	٠	•	•	•	•	•	•	•	•	•	•	•	•
•	•	•	٠	•	•	•	•	٠	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•
•	•	0	•	•	0	0	٠	0	0	•	٠	٠	٠	٠	۰	٠	۰	٠	•	•	٠	•	•	۰
	•	•	٠	٠	•	*	۰	•	•	•	٠	•	•	٠	٠	٠	•	•	•	•	٠	•	•	•
•	•	•	•	•	•	•	•	•	•		0	•	•	•	•	0	•	•	•	•	•	•	•	•
•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•
•	•	•	•	•	•	•	•	0	0	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•
•	٠	0	٠	•	•	0	٠	0	0	•	٠	٠	٠	•	•	•	•	•	•	•	•	•	•	•
•	•	•	٠	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	۰
•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•
•	•	•	•	•	•	•	0	0	•	•	0	•	•	•	•	0	•	•	•	•	•	•	•	•
•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•
•	•	•	•	•	•	•	٥	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•
•	•	•	•	•	•	•	•	•	•	•	0	•	•	•	•	•	•	•	•	•	•	•	•	•
•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•
•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•		•	•
•	•	•	•	•		•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•		•	•

Automated analysis of map projections

WEDNESDAY April 5 BLOCK VII 9:00-11.00

Tomáš BAYER Charles University, Prague

Analysis of the map projection, involving the estimation of the constant values of the projection and the map parameters, minimizing L_{2}norm of residuals on identical points, belongs to modern methods of cartometric analysis. Such an analysis is beneficial for early, historical, or current maps without information about the map projection. The importance of the map projection analysis refers primarily to the refinement of spatial georeference for medium- and small-scale maps or to the appropriate cataloging of maps. In georeferencing small-scale maps, it is incorrect to directly transform the analyzed map into a projected coordinate system and neglect the influence of the different map projections.

Since the publication of the method in 2006, a considerable amount of improvements have been made, especially in the stability of the detection process and the convergence rate. In addition, an open-source software tool detectproj has been developed as a practical application. Currently, more than a hundred map projections are supported, and ten parameters of the map projection (constant values of the mp projection) and analyzed map (map scale, rotation, shifts) are estimated. Furthermore, another improvement, the possibility of georeferencing the analyzed map using the method of inverse reprojection, was added.

The software tool has been used to analyze different types of maps, namely the world maps in the planisphere, hemispheres, maps of continents, or larger territories. Several attempts were undertaken to analyze maps in selected atlases, namely the historical and geographical, but also some rare ones (celestial). The research links the most commonly used map projections with specific types of maps. Azimuthal projections proved very popular for world maps in hemispheres, especially the stereographic projection in the transverse aspect. For world maps in the planisphere, cylindrical projections are widely used (Lambert equal area or Mercator) in older atlases; the pseudocylindrical projections are particularly popular for maps of the continents. Finally, the azimuthal projections (stereographic) were predominant for celestial maps studied in additional research.

NC)TE	S	•	•	•	•	•	•	•	•	•	٠	٠	•	•	•	•	0	•	•	•	•	•	•
٠	•	•	•	•	•	٠	٠	•	•	٠	٠	•	•	•	•	•	•	•	•	•	•	•	•	•
•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•
	•	•	•	•		•	•			•	•	•	•	•	•	•	0	•	•			•	•	0

•	•	٠	•	٠	•	٠	٠	•	•	•	•	٠	٠	•	•	•	•	•	•	•	•	•	•	۰
•	•	•	•	٠	•	•	•	•	•		•	•	•	•	•	•	•	•	•	•	•	•	•	•
	•	•	•	•		٠	•	•	•	•		•	٠	0	•	•	•	٠	0	•	•	•	•	٠
•	•	•	0		•	•	•	0	•			•	٠	0	•	•	•	•	0	•	•	•	•	۰
•	•	٠	0	•	•	•	•	•	•	•	•	•	٠	0	•	•	•	•	•	•	•	•	•	•
•	•	•	•	•	•	•	•	•	•		•	•	•	•	•	•	•	•	•	•	•	•	•	•
•	•	•	•	•	•	•	•	•	•		•	•	•	•	•	•	•	•	•	•	•	•	•	٠
•		•	•	•	•	•	•	•			•	•	•	•	•	•	•	•	•	•	•	•	•	٠
•		•	•	•	•	•	•	•			•		•	•	•	•	•	•	•	•	•	•	•	•
•		•	•	٠	•	•	•		•		•	•	•	•	•			•	•	•	•	•	•	•
٠		•	•	•	•	•	•	•			•	•	•	•	•	•	•	•	•	•	•	•	•	•
•	•	•	•	•	•	•	•	•	•		•	•	•	•	•	•	•	•	•	•	•	•	•	٠
•		•	•	•		•	•	•			•	•	•	•	•	•	•	•	•	•	•	•	•	•
•	0	•	0		•	•	•	0	•			•	٠	0	•	•	•	٠	0	•	•	•	•	•
•	۰	•	0			•	•	0				•	•	0	•	•	•	•	0	•	•	•	•	•
•	•	٠	0	•	•	٠	۰	0			•	۰	٠	•	•	•	•	•	0	•	•	•	•	•
•	•	•	•	•	•	٠	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	٠
•	•	•	•	•	•	•	•	•	•		•	•	•	•	•	•	•	•	•	•	•	•	•	۰
•		•	•	•	•		•	•			•	•	•	•	•	•	•	•	•	•	•	•	•	۰
•	•	•	•	•	•		•	•			•	•	•	•	•	•	•	•	•	•	•	•	•	•
•	•	•	•	•	•	٠	•	•		•	•	•	٠	•	•	•	•	•	•	•	•	•	•	•
•	۰	•	•	•	•	٠	٠	0	0	•	•	۰	٠	•	•	•	•	•	•	•	•	•	•	٠
•		٠	0	٠	•	•		•				•	•	0	•	•	•	•	•	•	•	•	•	٠
•	•	•	•	•	•	•	•	•	•		•	•	•	•	•	•	•	•	•	•	•	•	•	•
•		•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•
•	•	•	•	•	•	•	•	0		•	•	•	٠	•	•	•	•	•	0	•	•	•	•	•
•	۰	٠	0	٠	•	•	•	•	•	*	•	•	•	0	•	•	•	•	•	•	•	•	•	۰
•	0	٠	0	•	•	•		•	•	*		•	•	0	•	•	•	•	•	•	•	•	•	٠
•	•	•	•	•	•	•	•	•	•	•		•	•	0	•	•	•	•	•	•	•	•	•	٠
•	•	•	•	•	•	•	•	0	•		•	•	٠	•	•	•	•	٠	0	•	•	•	٠	•
•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•
٠	•	•	٠	٠	•	٠	٠	0		•	•	•	٠	•	•	•	•	٠	0	•	•	•	٠	۰
•	•	•	•	•	•	•	•	•			•	•	•	•	•	•	•	•	•	•	•	•	•	٠
•	٠	•	٠	•	•	0	۰	0	0	٠	•	٠	•	٠	•	•	٠	•	٠	•	٠	•	•	۰
•	•	٠	•	•	٠	•	0	0	0	•	•	•	•	•	•	•	•	٠	٠	•	•	•	٠	•
•	•	٠	٠	•	٠	•	•	•	0	•	٠	•	•	•	•	•	٠	•	•	•	•	•	•	•

WEDNESDAY April 5 BLOCK VII

Some issues of separation and atlas mapping of cultural natural-territorial complexes

Robert MAGHLAKELIDZE, Giorgi MAGHLAKELIDZE, Neli GOGINASHVILI, Giorgi KAPANADZE *Tbilisi State University.*

The Gori State University, Georgian Technical University

UNESCO's World Heritage Convention of 1992 and Council of Europe's Landscape Convention of 2000 discuss the concept of "landscape" and "cultural landscape" as "an area perceived by people," the common creature of nature and human." The new approach is dramatically different from the traditional one, and many scientists have recently shared it.

Since the new approach to today's "landscape" and "cultural landscape" is different from the traditional approaches to these concepts, many things need to be reassessed in landscape science and research, a new approach should be developed in landscape mapping and, of course, in atlas landscape mapping.

When mapping cultural-natural and territorial complexes, allocating the boundaries depends on the degree of natural non-homogeneity of the territory as far as it has influenced the type of natural management. If different natural-territorial complexes are assimilated in the same way, they could be combined into a single cultural natural-territorial complex. Consequently, the natural-territorial complex is distinguished with a uniform naturalness – differentiated as a different cultural complex in the case of the realization of various models of natural management.

We think that when mapping cultural natural-territorial complexes, the natural features and material signs of culturing should be considered comprehensively, using the method of transitional advantage "floating indicator".

On this basis, we apply the approach of mapping the cultural natural-territorial complexes of the foothills' landscapes of the Saguramo-Yalno Range for the smaller territories (at the level of facies). It is necessary to extend this approach of land-scape mapping to cultural natural-territorial complexes of different ranks. This will allow us to develop the optimal concept of the landscape atlas of the region and to present a modern and realistic picture of complexes of different ranks in the atlas.

The report discusses some issues of mapping and atlas mapping of cultural natural-territorial complexes on the example of foothills landscapes of Saguramo-Yaloni ridge (Physical-Geographical Polygon of Martkopi). A comparative analysis is also presented between the new map compiled by us and the map of the natural-territorial complexes of the Martkopi physical-geographic station area, which was compiled by the old traditional method.

NC	DTE	S		•		٠	•	٠	•	•		•	٠	٠	•		•	٠	0	•	•		•	٠
	•	•	•		•		•	•	•				•	•	•	•		•	•	•	•	•	•	٠
		•	•					•	•				•	•	•			•	•		•	•	•	•
			•	•	•						•					•	•	•	٠	•		•	•	•
•	•	0	•	•	٠	•	۰	•		0		۰	•			•		•	•	•	•	•	•	٠
٠	•	٠	•	•	٠	٠	•	•	•	•		•	٠	•	•		•		0		٠	•	•	۰
•	•	•	٠	*	٠	•	٠			*	٠	٠			•	٠	٠	•	٠		٠	•	٠	٠
	•	•	•	•	•		٠	•	•	•		٠	•			٠	٠	٠	٠	•	•	٠	•	۰
٠	•	•	0	•	٠	٠	0	•				0	•		•	•		٠	0	0	•	٠	•	٠
•	•	•	٠	•	•	•	٠	•	•	•	•	٠	•	•	•	٠	•	•	•	•	•	٠	•	۰
٠	۰	•	•	•	٠	٠	٠			٠	٠	٠	•	•	٠	٠	•	٠	0	0	•	٠	٠	٠
0	•	0	•	0	٠	•	٠	0		0	0	٠	0	•	٠	٠	٠	٠	٠	٠	٠	•	٠	٠
•	•	•	•	•	•	•	•					•		•	•	•	•	٠	0	•	٠	•	•	•
•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•
•	•	•	•	0	•	•	٠	•	•	•		٠	•	•	•	٠	•	•	0	0	•	•	•	•
•	۰	•	0	•	٠	•	٥	•	•	•	•	٥	•	•	•	•	•	•	•	•	•	•	•	۰
•	•	0	•	0	•	•	٠	0	•	0	•	٠	0	•	•	٠	۰	٠	0	0	•	٠	٠	•
•	•	•	•	•	•	•	۰	•	•	*	•	۰	•	•	•	٠	٠	•	•	•	•	•	•	•
•	0	•	0	•	•	•	0	•	•	•	•	0	•	•	•	•	•	•	0	0	0	•	•	•
												•												
																	•		•				•	
																								•
			•				•																	
•		•		•						•									•	•				
	•	•	•	•			•					•	•						•					•
	•						•									•	•	•	•			•	•	•
•		0	•	0		•	•			0		•						٠	0	0			•	
		•	•															•			•	•		•
	•	•	0	•			۰			•		۰	•						•	•	•			
•	•	•	٠		٠	•	٠				٠	٠				•		٠	0	0	•	•	٠	۰
•	•	•	•	•	•		٠	•			•	٠	•		•	٠	•	٠	•	•	•	٠	•	•
	٠		•	•	•						٠	•				٠	٠	٠	0	•	•	٠	٠	٠
•	•	•	•	•	•	•	•		•		•	•		•	•	•	•	٠	•	•	•	•	•	٠
٠	٠	•	•	•	٠	٠	۰	•	•	•		٠	٠	•	•	٠		٠	0	•	•	•	•	•

WEDNESDAY April 5 BLOCK VII 9:00-11.00

Railway Atlases as the Products of Thematic Cartography: an Attempt at Typology

Karol KOWALCZYK Maria Curie-Skłodowska University, Lublin

Railway atlases may be considered a niche category within thematic cartography. However, these specific products shouldn't be perceived as a homogeneous group. In fact, a significant diversity in terms of design and use occurs reflecting the legacy of almost two centuries. The global diffusion of railways since the 1820s resulted in the appearance of graphic representations of the new mode of transport on maps. With the expansion of complex rail networks came an evolution of dedicated cartographic products, including the atlases. For many decades they had been used by both professionals (management of the rail industry) and passengers (travel planning). The decline of railways, observed since the mid-20th century, hasn't reduced a supply of the products. Nostalgia for the traditional way of travelling has become a leading factor. In addition, in case of Central and Eastern Europe, the emergence of publicly accessible products was influenced by the collapse of communist regime, meaning the end of map censorship. The field of railway atlases has especially flourished in the 21st century. New elaborations and reprints of old releases have been issued. However, in the age of digital cartography, the user group of printed atlases has changed, with railway enthusiasts and scholars in particular. So far there have been not many scientific studies on railway atlases. Therefore, a typology sorting out this kind of products seems to be justified. The typology is based on the author's analysis of the content of more than 250 individual, as well as multi-volume, old and contemporary atlases covering different parts of the world. Criteria for distinguishing the types involve: temporal aspect (relation between the moment of publication and the mapped state), style of maps, and intended purpose. The conference presentation will be illustrated with selected examples of the surveyed titles.

NC	TE	S	•	•	•	•	•	•	•	•	٠	٠	•	•	•	•	•	•	•	•	•	٠	•	
•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	0
•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•
•	•	•	•	•	•	•	•	•	•	•	•	•	•		•	•	•	•	•		•	•	•	
•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	
•	•	•	•	•	•	•	•	•		•	•	•	•		•	•	•	•	•	•	•	•	•	
																						•		

•	•	٠	•	٠	•	٠	٠	•	•	•	•	٠	٠	•	•	•	•	•	•	•	•	•	•	۰
•	•	•	•	٠	•	•	•	•	•		•	•	•	•	•	•	•	•	•	•	•	•	•	•
	•	•	•	•		٠	•	•	•	•		•	٠	0	•	•	•	٠	0	•	•	•	•	٠
•	•	•	0		•	•	•	0	•			•	•	0	•	•	•	•	0	•	•	•	•	۰
•	•	٠	0	•	•	•	•	•	•	•	•	•	٠	0	•	•	•	•	•	•	•	•	•	•
•	•	•	•	•	•	٠	•	•	•		•	•	•	•	•	•	•	•	•	•	•	•	•	•
•	•	•	•	•	•	•	•	•	•		•	•	•	•	•	•	•	•	•	•	•	•	•	٠
•		•	•	•	•	•	•	•			•	•	•	•	•	•	•	•	•	•	•	•	•	٠
•		•	•	•	•	•	•	•			•		•	•	•	•	•	•	•	•	•	•	•	•
•		•	•	٠	•	•	•		•		•	•	•	•	•			•	•	•	•	•	•	•
٠		•	•	•	•	•	•	•			•	•	•	•	•	•	•	•	•	•	•	•	•	•
•	•	•	•	•	•	•	•	•	•		•	•	•	•	•	•	•	•	•	•	•	•	•	٠
•		•	•	•		•	•	•			•	•	•	•	•	•	•	•	•	•	•	•	•	•
•	0	•	0		•	•	•	0	•			•	٠	0	•	•	•	٠	0	•	•	•	٠	•
•	۰	•	0			•	•	0				•	•	0	•	•	•	•	0	•	•	•	•	•
•	•	٠	0	•	•	٠	۰	0			•	۰	٠	•	•	•	•	•	0	•	•	•	•	•
•	•	•	•	•	•	٠	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	٠
•	•	•	•	•	•	•	•	•	•		•	•	•	•	•	•	•	•	•	•	•	•	•	۰
•		•	•	•	•		•	•			•	•	•	•	•	•	•	•	•	•	•	•	•	۰
•	•	•	•	•	•		•	•			•	•	•	•	•	•	•	•	•	•	•	•	•	•
•	•	•	•	•	•	٠	•	•		•	•	•	٠	•	•	•	•	•	•	•	•	•	•	•
•	۰	•	•	•	•	٠	٠	0	0	•	•	۰	٠	•	•	•	•	•	•	•	•	•	•	٠
•		٠	0	٠	•	•		•				•	•	0	•	•	•	•	•	•	•	•	•	٠
•	•	•	•	•	•	•	•	•	•		•	•	•	•	•	•	•	•	•	•	•	•	•	•
•		•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•
•	•	•	•	•	•	•	•	0		•	•	•	٠	•	•	•	•	•	0	•	•	•	•	•
•	۰	٠	0	٠	•	•	•	•	•	*	•	•	•	0	•	•	•	•	•	•	•	•	•	۰
•	0	٠	0	•	•	•		•	•	*		•	•	0	•	•	•	•	•	•	•	•	•	٠
•	•	•	•	•	•	•	•	•	•	•		•	•	0	•	•	•	•	•	•	•	•	•	٠
•	•	•	•	•	•	•	•	0	•		•	•	٠	•	•	•	•	٠	0	•	•	•	٠	•
•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•
٠	•	•	٠	٠	•	٠	٠	0		•	•	•	٠	•	•	•	•	٠	0	•	•	•	٠	۰
•	•	•	•	•	•	•	•	•			•	•	•	•	•	•	•	•	•	•	•	•	•	٠
•	٠	•	٠	•	•	0	۰	0	0	٠	•	٠	•	٠	•	•	٠	•	٠	•	٠	•	•	۰
•	•	٠	•	•	٠	•	0	0	0	•	•	•	•	•	•	•	•	٠	٠	•	•	•	٠	•
•	•	٠	٠	•	٠	•	•	•	0	•	٠	•	•	•	•	•	٠	•	•	•	•	•	•	•

WEDNESDAY April 5 BLOCK VII 9:00-11.00

Methodology for creating a football atlas and geographic information system of Georgia

Saba MODEBADZE, Demetre MODEBADZE, Tengiz GORDEZIANI *Tbilisi State University*

The paper presents the methodology of compiling an atlas and geographic information system for the most popular type of sport in Georgia—football. The first attempt to create an electronic football atlas is given in the example of Georgia. The paper contains a specific sign system selected to compile maps, cartograms, and cartography (map language). The atlas consists of four parts: 1) the general part; 2) the thematic part; 3) the regional part and 4) the scientific-popular part.

1. The general part consists of both text and cartographic information. The text section contains a geographical and component analysis of the region, and the cartographic part is represented by maps in which the content reflects the formation of football and its development in Georgia. Physical maps, political-administrative maps, climatic maps, and landscape maps are examples of these maps.

2. The thematic section presents the following information maps: a) Classification of cities by football level; b) Classification of National League Clubs by Region; c) Important stadiums in Georgia; d) National Team Achievements at European Chapionships; e) Achievements of Georgian clubs in Euro Cups; f) Transfers of Georgian players; g) Legionnaires; h) Georgian players at European and world football championships.

3. The regional part is dedicated to the maps of advanced football clubs in Georgia. Maps of the content of such football clubs in Georgia are presented here: Tbilisi's Dinamo, Batumi's Dinamo, Gori's Dila, Tbilisi's Saburtalo, Kutaisi's Torpedo, Sachkhere's Chikhura, Tskhaltubo's Samgurali, Tkhinvali's Tskhinvali, Telavi's Telavi, Zestafoni's Zestafoni, Tbilisi's Gagra, Tbilisi's Merani, Samtredia's Samtredia, Bolnisi's Sioni, Terjola's Sapovnela, Rustavi's Rustavi, Tbilisi's Lokomotivi, Lanchkhuti's Guria, Kobuleti's Shukura, Tbilisi's WIT Georgia, Martvili's Merani, Zugdidi's Zugdidi, Poti's Kolkheti-1913. A series of separate maps is dedicated to the Georgian national team.

4. The popular reference section contains statistical information and photo material on the achievements of Georgian football.

Georgia's football geo-pharmaceutical atlas is accompanied by a geographical information system about Georgian football, which is represented by a database and a certain-dimensional basis. The paper presents an example of the structure of the football database of the Imereti region, which contains the following information: The number of football leagues in the national championship of Georgia; the Number of municipalities in the Imereti region; the Number of football clubs in the municipalities of the Imereti region; Number of football stadiums in Imereti region; Imereti municipalities with the most stadiums; Highest and lowest stadiums above sea level.

N	DTE	S	•	•		•	•	•	٠	٠	•	•	٠	٠	•	•	•	٠	•	٠	•	•	•	٠
	•				•	•		•	•	•	٠		٠	•	•		•	•	0			•	0	٠
	•	•				•	•					•		•	•			•		•	•		•	•
	•	•				•	•	•		•		•	٠								•			•
•	•	•	•			•	•	•	٠	•	•	•	٠					•			•		•	٠
	•	•	•			•	•	•	٠	•	•	•	٠	•	•			٠		•	•		•	٠
	•	•	•			•	•		•	•		•	•	•	•		•	٠	•	•	•		•	٠
	•	•				•	•					•	•	•	•			•		•	•		•	•
	•	•				•	•					•	•							•	•			•
٠	٠	٠				٠	٠	٠	٠		٠	٠	٠					0	0	•		•	•	٠
	٠	•				•	٠	٠	٠		٠	٠	٠					•	0	•	•		۰	٠
	•						٠		•			•	•					•	0		•		•	٠
	•	•	•	•		•	•	•	•		•	•	•	•	•			•	•		•		•	
0	•	•	•		0	٠	٠	٠	٠	٠	•	٠	٠	•	•		•	٠	0	•	•	•	٠	
•	٠	٠	•		0	٠	٠	٠	٠	٠	۰	٠	٠	•	•			٠	0	•	٠	•	٠	•
٠	٠	٠		*	٠	٠	٠	٠	٠	•	۰	٠	٠	•	•			•	•	•	٠		•	٠
*	•	٠		*	٠	•	٠	•	٠	•		•	•		•			•		•	•		•	٠
*	•	٠	•		٠	•	•	•	٠	•		•	•		•			•		•			•	•
0	•	•	•		•	•	•	•	٠	•	•	٠	٠	•	•		•	•	0	•	•		•	•
٠	•	•	•	•	•	•	•	•	٠	•	•	•	٠	•	•	•				•	•		•	•
0	•	٠	•		0	٠	•	۰	۰	٠	٠	٠	٠	•	•	•	•	•	0	•	•	•	•	•
0	٠	•	•		0	•	•	۰	٠	•		٠	٠	•	•		•	۰	0	٠	•	•	٠	٠
	•		•				•		•	•	•	٠	٠	•	•			0	0	•	•		۰	•
	•	٠	0				•	٠	٠		۰	•	٠	•	•				0	•	٠	•	۰	•
•	٠	•	•	•	•	•	٠	•	٠	•		•	٠	•	•	•	•	•	•	•	•		•	•
٠	•	•	•	٠	•	•	•	•	٠	٠	•	•	٠	•	•	•	•	•	•	•	•	•	•	•
0	•	٠	•			•	•	•	٠	•	•	٠	٠	•	•	•	•	•	٠	٠	•	•	٠	٠
	•	•	•	•		•	•	٠	٠	•		•	٠	٠	•		٠	٠	٠	•	٠	٠	٠	٠
0	٠	•	0		•	•	٠	۰	•	•	•	•	٠	•	•	•	٠	۰	0	•	•	•	۰	•
۰	٠	•	0	•	•	٠	٠	٠	٠	٠	•	٠	٠	•	•			0	0	•	•	•	•	

WEDNESDAY April 5 BLOCK VII 9:00-11.00

Methodology of geoecological atlas mapping, on the example of Zestafoni Municipality (Georgia)

Mariam GAGOSHASHVILI, Saba MODEBADZE *Tbilisi State University*

Based on growing geoecological problems it's authentic to create adequate cartographic products. Among them, we can mention geoecological maps, atlases, and electronic interactive maps, which adequately reflect the spatial features of various environmental problems (geodynamic processes, air pollution, water pollution, soil pollution, etc.) at the level of local and regional distribution.

Because Georgia does not have much experience in this field, it's quite challenging to create geoecological atlases and develop the appropriate methodology. For this purpose, the municipality of Zestafoni, which faces the challenge of various geoecological problems, was chosen as the mapping object. Accordingly, it is important to develop a geoecological atlas methodology on its example, which can be used on the example of other municipalities of Georgia.

The municipality is located in the central part of the territory of Georgia, on the extreme part of the Kolkheti plain and Imereti plateau. It is distinguished by a variety of relief forms. Active geodynamic processes are also characteristic. Ferrous metallurgy, on the example of ferromanganese, as well as the electrotechnical and food industries are developed. In terms of farming, viticulture is leading. This territory is one of the transport hubs. Highways of international and domestic importance pass here. The development of tourism is also growing, which is due to the cultural heritage and diversity of nature.

Based on all of the above, it can be said that it is important and promising to develop a geoecological atlas methodology on the example of Zestafoni.

Atlas will have a scientific-reference nature, where complex geographical and cartographic works will be presented. It will contain various thematic maps. The structure of the atlas is developed on, and its' mapping is underway by applying modern geographic information systems (GIS). During the process, there are certain challenges, which lead to a certain change in the methodology in terms of improvement.

The process of developing and implementing the geoecological atlas methodology is ongoing with the participation of the Department of Geography of Exact and Natural Sciences of Ivane Javakhishvili Tbilisi State University.

During creating thematic maps for the atlas, we are using data from the Ministry of Environment and Agriculture of Georgia, the National Environmental Agency

of Georgia, the Ministry of Regional Development and Infrastructure of Georgia, the National Statistics Office of Georgia, and the Administration of State Trustees. Apart from this the materials from works of Georgian scientists.

Around 20 thematic maps will be displayed in the atlas, and a number of these maps may be changed during the mapping process. Currently, the following types of maps are defined: physical, geological, orographic, geodynamic processes, climatic, soil, flora, and fauna, historical-architectural and cult monuments, population distribution by councils, agricultural, industrial, air, water, soil pollution maps, by councils.

The atlas will be in electronic format and will have an open database. The use of the developed cartographic methodology will be available to all interested persons.

N	DTE	S	0	0	۰		٠	0	0	•	٠	٠	•	•	٠		۰	۰	•	•	٠	•	۰	۰
•	•		•	•			٠		•	•		•			•			•			•	•	•	٠
•	•	•	•	•		•	•	0	•			•	•	•	•		•	•	0	•	•	•	•	•
•	•	•	•	•			•	•	•			•			•					•	•	•		•
•	٠	٠	•	•	•	•	•	٠	•	٠	•	•	•	•	•			•	•		•	•	•	•
	٠	٠	0				•	0	•	٠	٠	•	•	•	٠		٠	٠	•	•	٠	•	٠	•
•	•		•	•			٠		•	•		•			•			•	0		•		•	٠
•	•	•	•	٠			•		•	•		•			•							•		
•	•	•	٠	•		•	•	•	٠	•	•	•		•	٠	•		•	•	•	•	٠	•	•
•	•	٠	٠	•	•	•	•	•	•	٠	٠	•	•		٠		•	•		•	•	•	•	٠
•	٠	0	۰	•	•	•	٠	0	•	۰	٠	٠	۰	•	٠		٠	۰	0	•	•	•	٠	۰
	٠	0	0		0		٠	0	•	٠	•	٠	•	•	٠		٥	۰	0	•	٠	•	۰	۰
	٠	•	•	•	•	٠	٠	0	•			٠	•		۰			0	0	0	•	٠		•
	•	0	0		٠		•	•	•	•			•	•	•		0	0	0	•	•	•	0	٠
٠	٠	•	0	•	•		•	•	•	٠	٠	٠	•	•	•		•	•	0	•			•	
•	•	٠	•	•	٠	•	•	•		٠	•	•	٠	•	٠	•	٠	•	•	•	٠	•	•	٠
•	•	٠	•	•			•	•		٠	•	•	•	٠	•	•	٠	٠	•	•	•	•	•	۰
•	٠	0	٠		•		٠	0	٠	۰	٠	٠	•	•	٠		0	٠	0	•	•	٠	٠	۰
	•	•	0	•	•		•	•	•				•	•	•			•		•	*	•	•	•
٠	٠	•	0	•	•		•	•	•	٠	٠	٠	•		•			•		•		•	•	•
•	•	٠	٠	•	٠	•	•	•	٠	٠	•	•	•	•	•	•	•	•	•	•	•	•	•	۰
•	•	0	٠		0	0	٠	0	٠	۰	٠	٠	0	٠	٠	•	٠	٠	٠	٠	٠	٠	٠	٠
•	٠	0	•		•		٠	0	0	•	٠	٠	•	•	۰		0	0	0	0	٠	٠	٠	٠
•	•	0	٠		۰		٠	0	٠	•	٠	٠	۰	۰	٠		0	0	0	•	٠	٠	٠	•
•	٠	•	•	•		•	٠	۰	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	۰

WEDNESDAY April 5 BLOCK VIII

Cooperation of thematic experts and cartographers in the atlas projects

Alena VONDRÁKOVÁ Palacký University Olomouc

Atlas creation is one of the most complex tasks of cartography. Of course, this complexity depends on many aspects. But let's talk about "typical" thematic atlases that are published at the national level.

A single map can be prepared by one person. You can collect data, process it in GIS software, demonstrate the topic using cartographic visualization methods and publish it. In fact, I describe the common practice of a geoinformatics student who should be able to handle all these activities. In the case of an atlas, a cartographic product much more extensive than a single map, we are talking about multiple teams. There can be a different person (or a team of people) for each job, in the case of smaller works, there will be a cumulation of functions (such as GIS expert and cartographer). The most common phases of atlas creation include (for example) workflow management, economics, data preparation and processing, cartographic visualization, graphic processing and DTP, publishing and distribution etc. At the Geoinformatics Department, Faculty of Science, Palacký University Olomouc, we (are able to) do everything. Each employee has a slightly different specialization and together we make a great team. But whom we need for the creation of thematic atlases, and usually are not from our department, are experts on the issues being addressed (the atlas topic). And the "Tower of Babel phase" occurs. Although we have comparable academic degrees and speak the same national language, it is very difficult (but also very rewarding) to find a common language, to explain the "completely clear issues" that are not so clear in interdisciplinary cooperation, and to find a compromise that takes into account and maximally utilise the knowledge on both sides.

The contribution is focused on the implementation of thematic atlas projects, which were realized at the Department of Geoinformatics, Faculty of Science, Palacký University Olomouc, and in which I participated in some work, and therefore I have personal experience. As a bonus, the contribution will answer the question of why I learned to be not only a cartographer, but also a graphic designer, and why we (usually) prefer to cover the whole process of atlas creation on our own playground (in cooperation with external thematic experts).

NOTES

•	•	٠	•	٠	•	٠	٠	•	•	•	•	٠	٠	•	•	•	•	•	•	•	•	•	•	۰
•	•	•	•	٠	•	•	•	•	•		•	•	•	•	•	•	•	•	•	•	•	•	•	•
	•	•	•	•		٠	•	•	•	•		•	٠	0	•	•	•	٠	0	•	•	•	•	٠
•	•	•	0		•	•	•	0	•			•	٠	0	•	•	•	•	0	•	•	•	•	۰
•	•	٠	0	•	•	•	•	•	•	•	•	•	٠	0	•	•	•	•	•	•	•	•	•	•
•	•	•	•	•	•	•	•	•	•		•	•	•	•	•	•	•	•	•	•	•	•	•	•
•	•	•	•	•	•	•	•	•	•		•	•	•	•	•	•	•	•	•	•	•	•	•	٠
•		•	•	•	•	•	•	•	•		•	•	•	•	•	•	•	•	•	•	•	•	•	٠
•		•	•	•	•	•	•	•			•		•	•	•	•	•	•	•	•	•	•	•	•
•		•	•	٠	•	•	•		•		•	•	•	•	•			•	•	•	•	•	•	•
٠		•	•	•	•	•	•	•			•	•	•	•	•	•	•	•	•	•	•	•	•	•
•	•	•	•	•	•	•	•	•	•		•	•	•	•	•	•	•	•	•	•	•	•	•	٠
•		•	•	•		•	•	•			•	•	•	•	•	•	•	•	•	•	•	•	•	•
•	0	•	0		•	•	•	0	•			•	٠	0	•	•	•	٠	0	•	•	•	•	•
•	۰	•	0			•	•	0				•	•	0	•	•	•	•	0	•	•	•	•	•
•	•	٠	0	•	•	٠	۰	0			•	۰	٠	•	•	•	•	•	0	•	•	•	•	•
•	•	•	•	•	•	٠	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	٠
•	•	•	•	•	•	•	•	•	•		•	•	•	•	•	•	•	•	•	•	•	•	•	۰
•		•	•	•	•		•	•			•	•	•	•	•	•	•	•	•	•	•	•	•	۰
•	•	•	•	•	•		•	•			•	•	•	•	•	•	•	•	•	•	•	•	•	•
•	•	•	•	•	•	٠	•	•		•	•	•	٠	•	•	•	•	•	•	•	•	•	•	•
•	۰	•	•	•	•	٠	٠	0	0	•	•	۰	٠	•	•	•	•	•	•	•	•	•	•	٠
•		٠	0	٠	•	•		•				•	•	0	•	•	•	•	•	•	•	•	•	٠
•	•	•	•	•	•	•	•	•	•		•	•	•	•	•	•	•	•	•	•	•	•	•	•
•		•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•
•	•	•	•	•	•	•	•	0		•	•	•	٠	•	•	•	•	•	0	•	•	•	•	•
•	۰	٠	0	٠	•	•	•	•	•	*	•	•	•	0	•	•	•	•	•	•	•	•	•	۰
•	0	٠	0	•	•	•		•	•	*		•	•	0	•	•	•	•	•	•	•	•	•	٠
•	•	•	•	•	•	•	•	•	•	•		•	•	0	•	•	•	•	•	•	•	•	•	٠
•	•	•	•	•	•	•	•	0	•		•	•	٠	•	•	•	•	٠	0	•	•	•	٠	•
•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•
٠	•	•	٠	٠	•	٠	٠	0		•	•	•	٠	•	•	•	•	٠	0	•	•	•	٠	۰
•	•	•	•	•	•	•	•	•			•	•	•	•	•	•	•	•	•	•	•	•	•	٠
•	٠	•	٠	•	•	0	۰	0	0	٠	•	٠	•	٠	•	•	٠	•	٠	•	٠	•	•	۰
•	•	٠	•	•	٠	•	0	0	0	•	•	•	•	•	•	•	•	٠	٠	•	•	•	٠	•
•	•	٠	٠	•	٠	•	•	•	0	•	٠	•	•	•	•	•	٠	•	•	•	•	•	•	•

WEDNESDAY April 5 BLOCK VIII 11:30-13.30

Electronic atlas of viticulture and winemaking of Kakheti region. Challenges of practice (Georgia)

Manana SHARASHENIDZE, David SHAVLAKADZE, Saba MODEBADZE Tbilisi State University, Ministry of Defence of Georgia

One of the important directions in modern thematic cartography is agricultural cartography. The requirements of the practice further increased the need to create evaluative and predictive maps and atlases. Which are the basis of management of every field of agriculture. To date, certain steps have been taken in this direction in both Georgian and foreign cartography. When creating maps and other cartographic images for agricultural purposes, special attention is paid to the mapping of such priority sectors of agriculture as viticulture-winemaking, which produces raw materials for the development of the wine industry. For a country like Georgia, it is a practical necessity to study this field and map space-time.

Due to the modern structure of the Georgian economy, priority can be given to those sectors that currently operate with a certain load and create competitive products. In this regard, viticulture and winemaking are considered to be one of the most important fields for Georgia, we think even more efforts are needed for information provision, management, and development of this field. (To be added here on wine tourism)

At present, Georgia does not have an atlas or a series of maps created by geoinformation technologies in the field of agriculture. Thus, it is advisable for Georgia to create a cartographic work of this profile for such a priority field as viticulture and winemaking and for a traditional region where there are special natural conditions conducive to the development of viticulture and winemaking. Kakheti is such a region. Creating a series of maps of the region, as well as the existence of textual, and graphic data based on an atlas based on geoinformation technologies is an effective means for planning, forecasting, managing, and developing the field. Thus, the geoinformational mapping of the Kakheti viticulture and winemaking sector, the product of which will be an atlas created with geoinformation technologies, is relevant for the further development of the viticulture and winemaking sector in the Kakheti region.

Research novelty and innovation. The scientific novelty of the work is the study of a specific profile of the agriculture and food industry of the Kakheti region (viticulture-winemaking), evaluation of priority areas (areas) for viticulture development, and medium-scale mapping. In this regard, the research of the Kakheti region and the compilation of relevant assessment maps was carried out for the first time in Georgia, which indicates its scientific value. The completed work has some practical significance, which is as follows:

1) The compiled series of maps gives a clear idea of the spatial organization of the vineyards in the region, according to the municipalities;

2) Based on the statistical information presented in the paper, it is possible to assess the current state of the mentioned fields in the study region;

3) A series of compiled maps allow us to analyze and evaluate the quantitative characteristics of viticulture and winemaking in terms of their territorial distribution;

4) Compiled maps allow us to predict the development of this priority area with some accuracy;

5) The created geo-information system will provide full information about the territorial organization of viticulture and winemaking in the Kakheti region to the interested persons and relevant services. It is also possible to regularly update the GIS with new geoinformation.

NC)TE	S	٠	•		•	٠	٠	٠			٠	•	•	•		•	•	٠	٠	•	•	•	٠
•	•	•	•	•			•	•				•	•	•				•	•	٠	•	•	•	٠
•	•		•		•		•	•	0					•	0	•	0	0	•			•	٠	•
	•	•					•					•											•	
•	•	•		٠		٠	•	•		•		•	•							٠	•		•	
•	•	•	•	•		•	•	•		•	•	•	•	•				•	•	٠	٠	•	•	٠
•	•	•	•	•		•	•	•				•	•	•				•	•	٠	•	•	•	٠
•	•	•		•		•	•			•			•	٠						٠	٠		•	
	•	•	•	•		•	•					•								•	•		•	•
•	٠	•	•		•	•	•	•	•			•	•							•	•		•	
٠	٠	•	•	•	٠	٠	٠	•	۰			•	•	•	•			•	•	٠	•	•	•	•
٠	٠	٠	0	•	0	٠	٠	٠	0			٠	٠	0	0	•	•	•	•	۰	۰	٠	٠	٠
•	•	•		•		•	•					•	•								•		٠	٠
•	•	•		•		•	•					•	•							•	•		•	•
•	•	•	•	٠		•	•	•		•		•	•							•	•		•	•
•	•	•	•	•	٠	•	•	٠		•	•	•	•	•				•	•	٠	•	•	•	•
•	•	•	•	٠	*	٠	٠			٠	٠	•	٠	٠		٠	٠	٠		٠	٠	٠	٠	٠
•	•	•	•	•		•	•	•		•	•	•	•	٠		٠		•		٠	٠	•	•	٠
•	•	•	•	•		•	٠	•	•	•	•	•	•	٠		٠			•	٠	٠	•	٠	•
•	•	•	•	٠		٠	•			٠	٠	٠	٠	٠									٠	•

WEDNESDAY April 5 BLOCK VIII 11:30-13.30

Transformational cartography in Dynamic atlas information systems. Problems and solutions

Viktor CHABANIUK National Academy of Science of Ukraine, Kyiv

War in Ukraine raised many problems in all spheres of society. The article considers those of them that are determined to be relevant in 2023 in the cartography department of the Institute of Geography of the National Academy of Sciences of Ukraine. For the purposes of the article, they can be reduced to two scientific and practical topics: transformational cartography and dynamic atlas information systems (AtIS).

We are starting with transformational cartography of (Cauvin, Escobar, Serradj, 2010) and are discussing needs to have new tools to work dynamically with base maps layers and the thematic layers of maps. Prototype realization is presented and discussed.

First topic of the article is finished by explanation why "classic" horizontal transformational cartography must be supplemented by the so called "non-classic" vertical transformational cartography.

Second topic of the article is related with the problems and possible solutions around Dynamic AtIS. Dynamic AtIS are proposed as supplementing the usual static AtIS (like National atlas of Ukraine) as more reach models to describe and work with large territorial systems. Vertical transformational cartography is cartographic basis for Dynamic AtIS.

NC	TE	S	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	٠
•	•	•	•	•	•	•	0	0	0	•	۰	•	•	•	•	•	•	•	•	•	•	•	•	٠
•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•
•	•	•	•		•	•	•	•	•	•	•	•	•	•	•	•	•	•			•	•	•	•
•	•	•	•	•	•	•	•	•	•	٠	•	•	•	•	•	•	•	•	•	•	•	•	•	
٠	•	•	•	•	•	•	0	0	•	٠	٠	•	•	•	•	٠	٠	٠	•	•	•	٠	٠	
٠	•	•			•	•	0	0	0	•	•	•	•	•	•	•	•	•	•		•	•	•	
•	•	•	•	•	•	•	0	0	0	•	•	•	•	•	•	•	•	•	•	•	•	•	•	
•	•		•				•	•	•	•	•		•					•	•		•	•		•
•	•	•	•		•	•	•	•		•	•	•	•	•	•	•	•	•	•	•		•	•	•
•	•	•	•		•	•	•		•	•	•	•	•		•	•	•	•	•			•	•	
•	•	•			0	•	•	•			•	•	•	•	•	•	٠	•	•	•		•	٠	
																•	•	•				•	•	

•	•	٠	•	٠	•	٠	٠	•	•	•	•	٠	٠	•	•	•	•	•	٠	•	•	•	•	۰
•	•	•	•	٠	•	•	•	•	•		•	•	•	•	•	•	•	•	•	•	•	•	•	•
•	•	•	•	•		٠	•	•	•	•		•	٠	0	•	•	•	٠	•	•	•	•	•	٠
•	•	•	0		•	•	•	0	•			•	•	0	•	•	•	•	•	•	•	•	•	۰
•	•	٠	0	•	•	•	•	•	•	•	•	•	٠	0	•	•	•	•	•	•	•	•	•	•
•	•	•	•	•	•	٠	•	•	•		•	•	•	•	•	•	•	•	•	•	•	•	•	•
•	•	•	•	•	•	•	•	•	•		•	•	•	•	•	•	•	•	•	•	•	•	•	٠
•		•	•	•	•	•	•	•	•		•	•	•	•	•	•	•	•	•	•	•	•	•	٠
•		•	•	•	•	•	•	•			•		•	•	•	•	•	•	•	•	•	•	•	•
•		•	•	٠	•	•	•		•		•	•	•	•	•			•	•	•	•	•	•	•
•		•	•	•	•	•	•	•	•		•	•	•	•	•	•	•	•	•	•	•	•	•	•
•	•	•	•	•	•	•	•	•	•		•	•	•	•	•	•	•	•	•	•	•	•	•	٠
•		•	•	•		•	•	•			•	•	•	•	•	•	•	•	•	•	•	•	•	•
•	0	٠	0		•	•	•	0	•			•	٠	0	•	•	•	•	•	•	•	•	٠	•
	۰	٠	0			•	•	0				•	•	0	•	•	•	•	•	•	•	•	•	•
•	•	٠	0	•	•	٠	۰	0			•	۰	٠	•	•	•	•	•	•	•	•	•	•	•
•	•	•	•	•	•	٠	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	٠
•	•	•	•	•	•	•	•	•	•		•	•	•	•	•	•	•	٠	•	•	•	•	•	۰
•		•	•	•	•		•	•			•	•	•	•	•	•	•	•	•	•	•	•	•	۰
•	•	•	•	•	•		•	•			•	•	•	•	•	•	•	•	•	•	•	•	•	•
•	•	•	•	•	•	٠	•	•		•	•	•	٠	•	•	•	•	•	•	•	•	•	•	•
•	۰	٠	•	•	•	٠	٠	0	0	•	•	۰	٠	•	•	•	•	٠	•	•	•	•	•	٠
•		٠	0	٠	•	•		•				•	•	0	•	•	•	•	•	•	•	•	•	٠
•	•	•	•	•	•	•	•	•	•		•	•	•	•	•	•	•	٠	•	•	•	•	•	•
•	•	•	•	•	•	•	•	•		•	•	•	•	•	•	•	•	•	•	•	•	•	•	•
•	•	•	•	•	•	•	•	0		•	•	•	٠	•	•	•	•	•	•	•	•	•	•	•
•	٠	٠	۰	•	•	۰	٠	0		•	•	٠	٠	•	•	•	•	٠	•	•	•	•	٠	•
•	0	٠	0	•		•	•	0			•	•	٠	۰	•	•	•	٠	٠	•	•	•	٠	٠
•	•	٠	•	•	•	•	•	•	•	•		•	•	0	•	•	•	•	•	•	•	•	•	٠
•	•	٠	•	•	•	•	•	•	•	•		•	•	•	•	•	•	•	•	•	•	•	•	•
•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•
٠	•	•	٠	٠	•	٠	٠	0		•	•	•	٠	•	•	•	•	٠	•	•	•	•	٠	۰
•	•	•	•	•	•	•	•	•			•	•	•	•	•	•	•	٠	•	•	•	•	•	٠
•	٠	0	•	•	•	•	0		0	•	•	•		۰	•	•	٠	٠	0	•	•	٠	٠	۰
•	٠	•	٠	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•
•	۰	•	٠	٠	•	•	•	•	•	٠	٠	•	•	٠	•	•	•	•	•	•	•	•	•	•

WEDNESDAY April 5Geographical features of the photo atlasBLOCK VIIIof landmark natural monuments of Georgia

11:30-13.30

Giorgi DVALASHVILI Tbilisi State University

The photo atlas of natural landmarks of Georgia presents the photographic materials of outstanding geographical objects taken by ground and aerial devices, with explanatory text attached to the photographs. Geographic parameters of natural objects are discussed in the photo atlas: location, geographic coordinates, geographic assessment of landmarks.

The nature of Georgia, in spite of the diligent work of scholars for many years, still hides many natural beauty spots remaining still beyond scientist eye. Search for them, their study, making access roads and inclusion in tourist routes will raise tourist potential of the nation and will make Georgia attractive for local and foreign visitors. At the same time, it would create conditions for effective protection of these objects and preservation of their original face

The word "Monument", as a rule, is associated with important historical event or item of culture created to glorify famous individual. In the figurative meaning, we brand monument a piece of literature, or remnant of material culture in the past, code of laws, sentence, writ, and behind all this is a human being and each and every of his/her undertaking. Natural pillars and columns of rocks, deep canyons and valleys rich with biodiversity, volcanic shapes, natural bridges, lakes and waterfalls, fossilized forest... each and every item with its beaty, one-of-a-kind and perfect character stun visitors and prove once again that nature is unmatched maker.

Exclusive geographic location of Georgia, broadly contrasting natural conditions and high quotient of landscape placement in this country make possible abundance and divergence of unique natural monuments. A natural monument is a geomorphological and hydrological makeup, separate specimens of plants and/or fossilized objects of live organizms, as well as a territory where rare, unique, limited in space ecosystems having high esthetic chracteristics are distributed. A natural monument may be a cave, a gorge, a mouth of a river, a waterfall, a lake, a grove of the forest, a sanctuary of rare plants and animals and even one tree (for example, 1800-year old conifer tree in Batsari preserve). Each monument has scientific, historical, ecological and educational and esthetic value and it needs special protection.

N	DTE	S	٠	•	٠	۰	٠	٠	۰	٠	•	٠	٠	•	•	•	٠	•	٠	•	•	•	•	٠
	٠	•	•	•			٠		•			•				•	٠	٠	٠	•	•	٠	•	٠
•	•	•	•	•	•		٠	•	•	•		٠	•	•	•		0	٠		•		•	0	
•	•	•	•	•	•		٠	•	•	•		•	•	•	•		•	•	•	•		•	•	٠
•	•	•	•	٠	•		•	•	٠	٠	•	•	•				•	•	•		•	•		•
٠	•	٠	•	٠	٠	٠	•	٠	٠	٠	•	•	٠	٠	٠	٠	•	•	•	٠	٠	•	•	
0	۰	٠	٠	٠	0	0	٠		۰	•	0	٠	•			•	٠	٠	٠	•	•	•	٠	٠
•	•		٠	•	•		٠	•	٠	•		٠	٠	٠	•		•	٠		•	•	•	0	٠
0	•	•	•	٠	•	•	٠	٠	٠	٠	0	•	٠	•	•	٠	0	٠	•	۰	٠	•	0	•
•	٠	•	•	٠	•		۰	٠	•	•		٠	٠			0	•	•	*	•	0	•	•	•
•	•	٠	•	٠	•	٠	٠	٠	٠	٠	٠	•	٠	٠	•	٠	•	•	•	٠	٠	•	٠	•
•	۰	•	٠	•	*	٠	٠	٠	۰	*		۰	٠	٠	٠	٠	•	٠	0	٠	٠	•	•	٠
•	•	•	•	•	•	•	٠	•	•	•		•	•	٠	٠	•	•	٠	•	٠	٠	•	•	•
•	•	•	•	•	•	•	٠	•	•	•	•	•	•	•	•	٠	0	٠		•	٠	•	0	•
•	•	•	•	•	•	•	٠	٠	•	•		•	•	•	•	•		•	•	•	•	•	•	•
0	•	0	•	•	•	۰	٠	٠	٠	٠	0	٠	٠	•	•	•	•	•	•	•	•	•	•	•
•	٠	•	•	•	•	٠	•	•	٠	•	*	٠	•	٠	٠	٠	•	•	•	٠	٠	•	•	•
0	•	•	•	•	0	•	۰	•	•	•	0	•	•	٠	•	•	•	•	•	•	•	•	•	•
•	•	•			•	•	•	•	•		•	•	•			•	•	•			•		•	•
	•																							
	•																						•	
•		•									•						•						•	
	•	•		•		•		•	•				•	•						•		•		
							•							•	•		•	•	0	•			•	•
	•		•									•		•				•		•		•	•	•
			•			•	•		•											•	•	•		
•	٠	•	•	•	•	•	٠	•	•		•	•	•									•	•	
•	٠	•	٠	٠	•	٠	٠	٠	٠	٠	•	٠	٠				•	•	•	•	•	•	•	
	•	•	•	•		٠	•	•	•			•	•	٠	٠	•		•		٠	•	•	•	٠
0	•	0	٠	•	0	•	٠	٠	٠	•	0	•	٠	٠	•		0	٠	•	٠	•	0	٠	۰
	٠	•	•	•		٠	٠	٠					٠	•	•	٠		•		•	•	•	•	•
•	٠	•	•	٠	•	•	٠	٠	٠	•		•	٠	٠	•	•	•	•	•	•	•	•	•	•
	•			•			•																	
WEDNESDAY April 5 BLOCK VIII 11:30-13.30

From the paper atlas to the geoportal and back again

Waldemar SPALLEK University of Wroclaw

In the beginning of digital cartography the paper maps served as the main source of geoinformation, especially on natural components of environment, like geology, soils, biogeography, as well as relief, etc. In next decades, particularly in the 21st century, we observe rapid growth of web cartography, including perhaps the most complex forms, which are geoportals. Some of them contain many thematic maps (geovisualisations) and in a matter of fact play a role of the paper atlases, both thematic and complex ones.

The paper maps and atlases are still published, though digital cartography seems to take a place of them. However, now we can notice, that the geoportals become the foundation for the designing of paper atlases. One of a such example is the "Atlas of the Karkonosze | Krkonoše" (2021), joint work of Polish and Czech National Parks and scientists.

The paper focuses on some problems of designing the atlas, especially on transformation of virtual, interactive geovisualizations (maps) from the KPN | KRNAP Geoportal to static paper maps in the atlas. Another question is cartographic generalisation of databases, and the capabilities of automatic generalisation tools in comparison to cartographer and users need.

NO	TE	S	•	•	•	•	•	•	•	•	•	•	•	•		•	•	•	•	•	•	•	•	•
٠	•	•	•	•	٠	٠	٠	•	•	•	٠	•	•	•	•	•	•	•	•	•	•	٠	•	٠
•	0	•	•	•	•	•	٠			•	٠	•	0	•	0	•	•	•	•	•	•	•	•	۰
•	•	•	•	•	•	•	•	•	•	•	•	0	0	•	0	0	•	•	•	•	•	•	•	۰
•	•	•	•	•	•	•	•	•	•	•	•	•	0	•	0	•	•	•	•	•	•	•	•	٠
٠	•	•	•	٠	٠	٠	٠	•	•	٠	٠	•	•	•	•	•	•	•	•	•	•	•	•	•
٠	•	•	•	•	•	٠	٠			•	٠	•	•	•	•	•	•	•	•	•	•	•	٠	•
•	0	•	0	•	•	٠	٠	0	0	•	٠	•	0	٠	•	٠	•	•	•	•	•	•	•	۰
•	•	•	•	•	•	•	•		•		•	•	•	•		•	•	•	•	•	•	•	•	•
•	•	•	•	•	•	•	•	•	•	•	•	•		•			•	•	•	•	•	•	•	•
•	•	•	•	•	•	•	•	•	•	•	•	•	•	•			•	•	•	•	•	•	•	•
•	•	•	•	•	•	٠	•	•	٠	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•
•	•	•	•	•	•	٠	•	•	•	٠	•	•	•	•	•	•	•	•	•	•	•	•	•	٠

٠	٠	0	0	0	•	٠	٠	۰	۰	•	•	٠	٠	•	•	•	٠	٠	٠	٠	•	•	•	٠
•	•	•	•	•	•	•	•	٠	•			•	٠	•	•	•	•	•	•	•	•	•	•	٠
•	•	٠	٠		•	•	•	٠	•	•	0	•	•	٠	٠	•	•	•			٠	٠	•	۰
•	•		•	•	•	•	•	•	•			•	•	•			•	•	•	•	•	•	•	•
•	•	•	٠	•	٠	•	•	٠	•	•		•	٠	•			•	•	•	•	•	•	•	۰
•	•	•	•	•	٠	•	•	٠	٠		٠	•	٠	•			•	•	•	٠	•	•	•	٠
•	•	•	•	•	٠	•	•	٠	•			•	٠	•	•		•	•	•	•	•	•	•	٠
•	•	0	0		•		•	٠	•	•	0	•	٠				٠	٠	٠	•	•	0	0	
•	•	•	0		•		•	٠	•	•	•		٠				٠	٠	•	•	•	0	•	۰
•	•	٠	٠	٠	٠	٠	٠	٠				٠	٠					•	•	•	٠	•	٠	•
•	•	•	•	•	٠	•	•	٠	٠	•	٠	•	٠	•	•		•	•	•	٠	•	•	•	٠
•	•	٠	٠		٠	٠	•	٠		0	0	٠	٠	٠	٠	٠	٠	٠	٠	٠	٠	•	•	٠
•	•	0	٠		٠	•	•	٠	•	0	0	٠	٠	٠	•		0	•	•		٠	٠	٠	۰
•	•	•	•	٠	٠	•	٠	•	•			•	٠	•	•	•				•	۰	•	٠	•
•	•	•	0	•	٠	•	•	٠		•	•	٠	٠				•	•	*	*	•	0	•	•
•	•	•	•	•	٠	•	•	٠	٠	•	•	•	٠	•	•	•	•	•	•	•	•	•	•	٠
•	•	•	•	•	٠	•	•	٠	٠			•	٠	•	•	•	•	•	•	•	•	•	•	٠
•	•		0	•	•		٠	٠					٠	•	•		•	٠	٠	•	•	•	•	•
•	•	0	٠		٠	٠	•	٠	•	0	0	٠	٠	•	•	•	0	0	0	•	٠	٠	٠	۰
•	•	•	0	•	٠	•	•	٠				•	٠				•	•	•	•	•	0	•	
•	٠	•	0	٠	٠	•	٠	٠	٠	•	•	•	٠	•			•	•	•	•	•	0	•	
•	٠	•	0	•	٠	•	٠	٠	٠	•	•	•	٠	•	•		•	•	•	٠	•	•	•	٠
•	•	0	٠	0	•	٠	•	۰	•	0	0	٠	۰	•	•	0	0	0	0	•	•	٠	٠	٠
•	•		•	•	•	•	•	•	•			•	•				•	•	•	•	•	•	•	•
•	•	0	٠	•	•	•	•	•	•	•	•	•	•	•	•	•	0	•	•	•	•	٠	•	
•	•	•	•	•	٠	•	٠	٠	٠	•	•	•	٠	•	•		•	•	•	•	•	•	•	•
•	٠	•	0	•	٠	•	٠	٠	•	•	•	•	٠	•	•		•	•	•	٠	•	•	•	•
•	•	•	0	•	•	•	۰	٠	•			•	٠	•	•	•	•	•	•	•	•	0	•	٠
•	•	•	0	•	•	•	۰	•	•			•	•	•	•		•	•	•	•	•	0	•	•
•	•	•	•	•	•		•	•	•	•	•		•		•		•	•	•	•	•	•	•	•
•	٠	•	0	•	•	•	•	•	•	•		•	•	•	•	•	•	•	•	•	•	•	•	
•	٠	•	•	•	۰	•	•	٠	•	•	•	•	٠	•	•	•	•	•	•	•	•	•	•	
•	٠	0	•	•	•	•	•	۰	•	0	0	•	۰	•	•	•	٠	٠	٠	•	•	•	•	•
•	٠	•	•	•	•	•	•	•	•			•	•	٠	٠	•	•	•	•	•	•	•	•	•
•	•	•	•	•	•	•	•	•	•	•	0	•	•	•	•	•	•	0	•	•	•	•	•	
•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•
0			0	0	0				0	0	0					0				0		0		

WEDNESDAY April 5 BLOCK VIII 11:30-13.30

On atlas cartography, atlassemiotics and atlasgraphy

Alexander WOLODTSCHENKO former Technical University Dresden

The 20th century will remain a landmark age for cartography (and atlas cartography). In the second half of this century, the modern society has entered the digital age. The transition from analogical to digital cartography began. This process, on the one hand, was characterized by new technologies and trends, and conceptual semiotic transformations on the other. The mainstream cartography was fascinated by geoinformatization and left these theoretical-semiotic and epistemological transformations without much attention.

The 21st century can become not only the century of digitalization, geoinfomatization, democratization in cartography but also the century of carto/atlas semiotization (competent mastery of semiotic knowledge and various map/atlas languages, communication skills, etc.) of modern society.

This presentation reports on the appearance and development of three selected interdisciplinary directions – atlas cartography, atlassemiotics and atlasgraphy, their definitions and terminologic status, the role of cartographic and non-cartographic traditions and meta-scientific tendencies as well as connection to mother disciplines – cartography and semiotics.

As a part of practical or technological cartography, the atlas cartography was formed in 20th century. From theoretical point of view the atlas cartography remains true to the concept of conservative traditions (for example, creation of positivist national atlases). Compared to the atlas cartography, atlassemiotics and atlasgraphy are new terms and notions in the scientific theory and practice of the 21st century. Atlassemiotics and atlasgraphy are products of the evolutions process in theoretical cartography and semiotics. They are focused on study and analysis of conceptual semiotic and epistemological transformations with creation and acquisition of new knowledge.

NO	TE	S	•	•	•	•	•	•	•	•	•	0	•	•	•	•	٠	•	•	•	٠	٠	•	•
•	•	•	•	•	•	•	•	•	•	•	•	•	•	•		•	0	•	•	•	•	•	•	•
•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•
•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•
٠	•	•	•	•	•	٠	٠	•	•	•	•	•	0	•	•	•	•	•	•	•	•	•	•	•
•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•
•																								

•	•	٠	٠	•	•	٠	٠	•	•	•		٠	٠	•	•	•	٠	•	•	•	•	•	•	۰
•	•	•	•	•		•	•					•	•	0	•	•	•	•	•	•	•	•	•	٠
•	•	•	٠	•	•		•					•	•	•	•		•	•	•	•	•	•	•	۰
	•	•	•			•	•						•	•	•		•	•	•	•	•	•	•	•
•	•	•	•	•	•	•	•	•	•			•	•	•			•	•	•	•	•		•	•
•	•	٠	٠	•	•	٠	٠	0		•	•	٠	٠	•	•	•	•	•	•	•	•	•	•	٠
•	٠	٠	٠	0	0	٠	•	0			0	0	٠	•	•	•	•	٠	٠	•	•	•	٠	٠
•	•		•	•	•	•	٠	0	•	•	•	•		٠	•	•	٠	0	0	•	•	•	٠	•
•	٠	•	•	•	•		•	0				•	•	•	•	•	•	•	0	•	•	•	•	•
•	•	•	•	•	•	•	•	•	•	•		•	•	•	•	•	•	•	•	•	•	*	•	•
•	•	•	•	•	٠	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	۰
•	•	•	٠	۰	0	0	٠	٠	•	0	•	٠	•	٠	٠	٠	•	٠	•	•	٠	•	•	٠
•	•	0	٠	۰	0	0	•	0	0	•	•	•	0	٠	٠	•	•	•	٠	•	٠	٠	•	•
	•	•	•	•	•		۰	•	٠	•	٠	٠	•	•	•	•	•		0	•	•	•	•	•
•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•
•	•	٠	•	٠	•	•	٠	٠	٠	٠	٠	٠	•	•	•	•	٠	•	٠	•	٠	•	•	•
•	•	0	٠	۰	0	0	٠	0	0	0	•	٠	0	٠	٠	٠	•	٠	٠	•	٠	٠	•	۰
•	•	•	٠	•		•	•					•	•	0	•	•	•	٠	٠	•	•	•	٠	۰
	0	•	•	•	•		۰	•	٠	•	•	۰	•	•	•	٠	٠	•	0	•	•	•	•	•
•	٠	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•
•	•	•	٠	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•
•	•	0	•	•	0	0	٠	0	0	•	•	٠	0	٠	۰	۰	٠	۰	٠	•	٠	٠	•	۰
	•	•	٠	٠	•	*	۰	•	٠	•	•	۰	•	٠	٠	٠	٠	•	٠	•	٠	٠	•	•
•	•	•	•	•	•	•	•	•				•	•	•	•	•	•	•	•	•	•	•	•	•
•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•
•	•	•	•	•	•	•	•	•	•	•	•	•	0	•	•	•	•	•	0	•	•	•	•	•
•	٠	0	٠	•	•	0	٠	0	•	•	•	٠	0	•	•	•	٠	•	•	•	•	•	•	•
•	•	•	٠	•	•	•	•	•	•	•		•	•	•	•	•	•	•	•	•	•	•	•	۰
•	•	•	•	•	•	•	•	•	•	•		•	•	•	•	•	•	•	•	•	•	•	•	•
•	•	•	•	•	•	•	•	0	•	•	•	0	•	•	•	•	0	•	•	•	•	•	•	•
•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•
•	•	•	•	•	•	•	۰	•	•	•	•	٥	•	•	•	•	۰	•	•	•	•	•	•	•
•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•
•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•
•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•
•	•	•	•	•		•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•

UNSCHEDULED alternative presentation in case of program change

An atlas that has not been published. Unique printed map files of the Geographical Institute of the Czechoslovak Academy of Sciences

Jaromír KOLEJKA, Karel KIRCHNER, Eva NOVÁKOVÁ Institute of Geonices, Czech Academy of Sciences

The Geographical Institute of the Czechoslovak Academy of Sciences, operated in Brno in the period 1963–1993, was engaged in basic geographical research, which also presented a number of cartographic outputs. The employees of the institute participated in the preparation of atlas works of the entire republic (e.g. Atlas of the Czechoslovak Socialist Republic – 1966, Czechoslovak Military Atlas – 1965, Atlas of Czechoslovak History). The Institute of Geography also published its own atlases (e.g. The set of maps for spatial planning needs for the development of heavy industry in the Czechoslovak Socialist Republic – 1981, Atlas of the Population of the Czechoslovak Socialist Republic – 1987, Atlas of the Environment and Health of the Population of the Czechoslovak Federal Republic – 1992). An unique cartographic product is represented by sets of physical-geographical and economic-geographical maps of Czech Socialist Republic, which were the outputs of the Geographical Regionalization project. The project consisted of sub-tasks: Physical-geographical regionalization and Economic-geographical regionalization. These projects were solved from the 1960s to the 1980s and were mainly presented with maps on a scale of 1:500,000, selected maps were also on a scale of 1:1 million. Sets of maps of geographic regionalization were published gradually from 1971 to 1977. The maps showed the spatial distribution of individual physical-geographical components of the landscape (e.g. Climatic regions, Biogeographic divisions, Density of running water, Regions of shallow groundwater, etc.). The relief was processed in detail, including morphometric maps (Vertical Terrain Dissection, Medium terrain elevation). The map of the Medium Terrain Inclination of the Czech Socialist Republic - was classified at the time.

These partial (analytic) maps were then followed by synthetic maps: Typological relief division and Regional relief division. The last map in particular reached a number of editions and became part of the Geographical Lexicon of the Czech Republic and the Landscape Atlas of the Czech Republic. As part of the Set of economic-geographical regionalization maps, the map of Agricultural Regions was published. It is a pity that these maps did not reach a comprehensive atlas edition, as they represented unique cartographic outputs in their time. Exceptionally and despite a long time gap, also some other maps from the unique set of Physical-geographical regionalization entered the recent national atlas effort – the Landscape Atlas of the

Czech Republic published in 2009. The Climate regions map and The environment map of the Czech Republic at a scale of 1:500,000 due to a timeless concept and so far unsurpassed creation methodology complement the modern atlas very well. They are of course a reflection of their time, as both climatic conditions and the state of the environment have changed significantly over the past 50 years. However, these maps symbolize the continuity of atlas production in the Czech lands.

NO	TE	S	•	•	٠		٠	•	*	*	٠		٠	٠	٠		٠	٠	٠		٠	٠	٠	•
	•	•	0	•		۰	•	•	•	•	•	0		•	•	•	•	٠			•		0	٠
•	•	•	0	•	•	•	•	٠	0	•	•	0	٠	•	•	0	•	٠	•	•			0	•
•	•	•	•	•	•		•	•	•			•	•					•				•		•
•	•	•	•		٠	•	•	•					•	•			•	•	•			•	•	•
٠	•	•		•	•	•	•	•				•	٠	•			•	•		•		•	•	٠
•	•	•	•	•	•		•	•					•	•			•	•	•	•		•	•	
•	•	•	•	•				•					•					•	•	•		•	•	
•	•	•	•	•			•	•					•					•		•		•		•
•	•	•	•	•	٠	٠	۰	٠	•	•	•	٠	•		•			•		•		•	•	•
٠	•	•	0		٠		•	•			•	•	٠	٠	•	•	٠	٠		•		•	۰	٠
•	•	•			•		•								•		•	٠					•	
•	•	•	•		•		•						٠		•							•	•	
٠	•	•	•	•	•		•	•				•	•		•			•	•	•		•	•	•
٠	•	٠	٠	•	٠	•	•	٠	•	•	•	٠	٠		•			•	•	•		•	•	•
0	•	٠	0	0	٠	•	۰	٠	0	0	•	٥	٠	•	•		•	٠	•	٠	•	•	•	٠
•	•	٠	•	•	•			•		*		*	٠	٠	•		•	•		•		•	•	٠
	•	•	0	•	•	•	0	•	0	•	0	0	٠		•	0	•	۰	0	•		•	0	
•	•	•	•	•	•		•	•			•		•	•	•	*		•	•	•	*		•	•
٠	•	•	•	٠	٠	•	•	•	•	•		٠	•	•	•			•	•	•	•		•	•
٠	•	•	•	٠	٠	٠	•	٠	٠	•	•	٠	•	•	•		•	•	•	٠	•	•	•	٠
٠	•	•	•	•	٠	•	•	٠				•	٠	•		•	٠	٠	•	٠	•	•	•	٠
•	•	•	0	•	•	•	0	•		•	0	0	٠		•	•	•	۰	•	•		•	۰	•
•	•	•	•	•	٠		۰	•			۰		٠	٠	٠				0	•	•	•	۰	•
•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•		•	•	•	•	•		•	•
٠	•	•	٠	٠	٠	•	•	٠	•	•	•	٠	•	•	•		•	•	•	•	•	•	•	•
٠	•	٠	•	0	٠	•	•	٠	0	0		٥	٠	•	•		٠	•	•	٠	•	•	٠	•
٠	•	•	•	•	•	•	۰	•	•	•		•	•	٠	٠		•	٠	٠	•	٠	٠	٠	•
٠	•	•	•	•	•	•	۰	•	•	•	•	•	•	•	•		•	•	•	•	•	•	•	•
•	•	•	•	•	٠		•	•	0		•	•	٠	٠	٠			•	•	•	•	٠	•	•

UNSCHEDULED

Inspiration from South Asian school atlases

alternative presentation in case of program change

Jaromír KOLEJKA Masaryk University

The South Asian states of the Indian subcontinent and Farther India peninsula publish a large number of school atlases in both English and local languages. The presented text is based on 15 school atlases published in India (4), Nepal (5), Sri Lanka (3), Myanmar (1) and Thailand (2). These are school atlases, often with a very different concept, structure, content and cartographic design. However, it should be noted that the examined school atlases represent only a certain selection of the available school atlases of these countries published recently (in the years 2005–2021). The subject of the study of these atlases is not their comprehensive analysis, but rather the search for lessons and inspiration for the improvement of atlas production in the Czech Republic, or in the Euro-Atlantic educational area.

Ancient and contemporary British influence is applied in the appearance of school atlases in the Indian peninsula (Indian subcontinent: India, Nepal, Sri Lanka). After all, the Indian branch of Oxford University Press is one of the most important publishers of school atlases in this region. The atlases of these countries are very similar in their content arrangement. In principle, their content can be divided into 3 blocks: (1) astronomical and cartographic introduction; (2) national maps and cartograms; (usually around a half of an issue); (3) maps of the world and individual continents.

Despite the variety of processing, the concept of blocks 1 and 3 is more or less traditional in the scheme: the whole world (global aspects of the natural environment, economy and population); continents (physical map, political division, climate (temperatures and precipitation), natural vegetation + agriculture, minerals + land use + industry, population density).

The detailed national part of the atlases provides information on the characteristics of the natural environment (by individual nature components), transport (types and nodes), population (many characteristics), agriculture (crop production by administrative units) and industry (by sectors). Compared to most school atlases of European origin, non-traditional topics appear in the atlases here: types of natural environment (natural landscapes); climate types and climate regions; air pressure in seasons; regional centres; planning or development regions and projects (including planned construction and changes in management); environmental risks (seismic threat, soil erosion, cyclones, development of precipitation - drought, threat to flora and fauna, environmental degradation, soil erosion,...); social issues (household equipment, level of human development, poverty,...); key historical territorial changes of the state, ethnographic and historical regions; schools and education. Unconventional arrangement of topics in complex maps: natural environment + typical agricultural crops; transport + industry; land use + industry.

Atlases of various concepts were available from the school atlas production on the Farther India peninsula (Myanmar, Thailand): 1) the world and regions of the continents on physical- and political maps accompanied by maps with climatic data and economy map (Thailand); 2) an atlas dedicated to the continent of Africa describing, after a political introduction, individual states using physical maps accompanied with text and photos (Thailand) and 3) continents (with political division maps) and their regions (groups of states) according to physical maps, rich text and photo. From these atlases (2 and 3) the abundant use of photographs of representative samples of the landscape, objects and inhabitants activities of the described regions is inspiring.

N	DTE	S	•	•		•	•	•	•					•	•		•	•	•	•	*		•	٠
•	•	•	•			•	•	•		•			•				•	•	•		•		•	•
•	•	•				•	•						•				•	•					•	
•	•	٠	٠	•		•	٠	•	•	•	•	٠	٠	•			•	•					•	
٠	•	٠	٠		٠	•	٠	٠			٠	٠	٠		•		٠	•	٠	٠	٠		•	٠
•	•	•	٠	•		•	•	•	•	•		•	•	٠	٠	•	•	•	•	•		•	•	•
•	•	•	٠			•	٠	٠	•	•			0	•	•	٠	•	٠	٠	٠	•		•	۰
•	•	0	٠			٠	٠	٠	•	•	0	•	0	•	•	٠	•	٠	٠	٠	٠	0	•	•
٠	٠	٠	٠	٠	٠	٠	٠	٠	•	٠	٠	٠	٠			٠	٠	٠	٠	٠	٠		٠	•
٠	•	٠	٠	٠	٠	٠	٠	٠	٠	•	٠	٠	٠	•	٠	•	٠	٠	٠	٠	٠	•	•	٠
•	•	0	٠		•	•	۰	٠		0			0	•	٠	۰	٠	٠	٠	٠	٠	•	٠	٠
•	•	•	•		٠	•	٠	٠		۰					•	0	٠	٠	٠	٠	•		٥	•
•	٠	•	•	•	•	•	٠	٠			•	•	•	•	•		•	•	•	•	٠	•	٠	•
٠	٠	٠	٠	٠	٠	•	۰	•	•	•		•	٠			•	•	•	•		•		•	•
•	٠	•	٠	٠	•	٠	٠	•	٠	٠	•	٠	٠	•	٠	۰	٠	٠	٠	٠	۰	٠	۰	•
٠	•	0	•	*		•	٠	•		•		•		•	•	•	٠	٠	٠	•	•	•	•	•
•	•	•	•	•	•	•	٠	٠	•	•		•	•		•	•	•	٠	٠	٠	٠		٠	•
•	•	•	•	•	•	•	•	•	•	•	•	•	0	•	•	•	•	•	•	•	•	•	•	•
•	•	•	٠	•	•	•	٠	•	•	•		•	•	•	•	•	•	•	•	•	•		•	•
•	٠	•	٠	•	•	•	٠	•	•	•	•	•	•	•	•	•	•	•	•	•	۰	•	•	•
•	۰	•	•	•	•	•	۰	٠	•	0	•	•	•	•	•	•	•	•	•	•	•	•	•	•
•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•
	•																							
	•																							

NC)TE	S	•	٠		•	•	•	٠			•	•		٠	•		•	•	•	•	•	•	
•	•	•			•		•	•					0		•		•	0	0		•	•	•	٠
•	•	•	•		•	•	•	•				٠	٠				٠	٠	•	•	•	٠	٠	
	•						•												•		•		•	
•	•	•	•	•	•	•	•	•		•		•	٠				•	•	•		•	•	•	
٠	٠	•	•	•	•	•	٠	٠	٠	•	•	٠	٠	•	•	•	•	•	•	•	•	•	•	•
٠	٠	٠	0			٠	٠	٠		0	0	0	0	0	٠	٠	•	٠	0	•	٠	۰	٠	۰
•	•	•	•	•	•	•	•	•	•			•	•	•	•	•	٠	٠	٠	•	•	٠	٠	٠
•	٠	٠	0	•		٠	٠	٠					0	0	•	•			0	0	٠	•	•	٠
٠	•	٠	٠	•	•	٠	•	٠	•	•		٠	٠	•	•	•	•	•	•	•	•	•	•	•
٠	•	٠	٠	٠	•	٠	•	٠	•	٠	٠	٠	٠	٠	•	•	٠	٠	٠	٠	•	•	•	۰
٠	٠	٠	•	•	•	٠	٠	٠	•			٠	٠		•	٠	٠	٠	٠	٠	٠	٠	•	٠
۰	•	٠	•	0	0	٠	•	۰	•	0	0	۰	0	•	•	٠	•	٠	0	•	٠	•	٠	٠
•	•	•	0	•	•	•	۰	•	•			٠	٠	0	*	•	٠	•		0	۰	٠	٠	•
•	•	•	•	•	•	•	•	•	•	•	•	•	٠	•	•	•	•	•	•	•	٠	•	•	•
•	•	•	٠	•	•	•	٠	٠		•		٠	0	•	•	٠	•	•	0	•	٠	•	٠	•
٠	•	•	•	0	•	٠	٠	۰	•	0	•	٠	0	•	•	٠	۰	•	0	•	٠	۰	٠	•
•	•	•	0	•	•	•	•	•	•	•		•	0	0	•	٠	٠	٠	0	0	•	٠	٠	•
•	•	•	•	•	•	•	•	•	•	•		•	•	•	•	•	•	•	•	•	•	•	•	•
•	•	•	0	•	•	•	•	•	•	•	•	•	•	•			•	•	•	•		•	•	•
			0										0	0						0				
			•																					
•	•	•			•			•		•	•	•	0					•	0					
		•	•					•				•	•					•	•	•				•
	•		0				٠							0				•	•	0	•		•	
•		•	•	•				•		0	•		0			•		•	0	•			•	
•	•	•	•			•	•	•				•	٠				•	•	•		•		•	
٠	٠	٠	•	•	•	٠	٠	٠		٠	•	٠	٠	0			•	•	•	•	٠		•	•
•	•	•	•			•	•	•				٠	0	•			٠	٠	0	•	•	٠	٠	٠
•	0	•	•	•		•	•	٠		•		٠	٠	•	•	٠	٠	٠	٠	•	٠	•	•	٠
•	•	•	•		٠	•	•	٠				٠	٠				•	٠	•	•	•	•	٠	•
•	•	٠	•	•	•	٠	•	٠	•	•		٠	٠	•	•	•	•	•	•	•	•	•	•	•