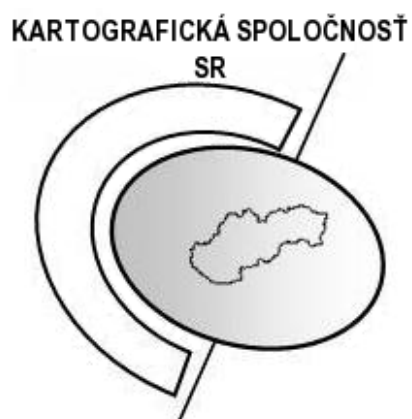


# CARTOGRAPHIC SOCIETY OF THE SLOVAK REPUBLIC

ACTIVITIES 2015 – 2019



National Report for the 18<sup>th</sup> General Assembly of the ICA

Bratislava 2019

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## **Cartographic Society of the Slovak Republic**

<http://www.slovakcarto.sk>

Activities in 2015 – 2019

Cartographic Society of the Slovak Republic (CS SR) is apolitical organization with scope in the Slovak Republic founded pursuing the Act on citizens' associations. The mission of the Cartographic Society is to associate people interested in cartography, cartographic works, and cartographic information, development of cartographic science and technologies, education of cartographers, history of cartography, compilation, production and use of different types of maps and atlases, and spatial information comprised in information systems. Members of the Society are university and superior school graduates of prevalingly technological and nature scientific specializations.

The CS SR is permanent member of the International Cartographic Association (ICA). The CS SR coordinates the collaboration of its members who are either members or corresponding members of individual commissions of the ICA. It regularly participates in the Barbara Petchenik Children's Map Competition, and successfully takes part in exhibitions of cartographic production organized at the occasion of international cartographic conferences.

The principal task of the CS SR is to organize specialized conferences and seminars involved with cartography and geo-information science and publishing activities. The CS SR in cooperation with the Institute of Geography SAS and Faculty of Natural Sciences, Comenius University in Bratislava publishes the journal *Kartografické listy* (Cartographic Letters, <http://gis.fns.uniba.sk/kartografickelisty/?p=0&l=en>, 2 issues per year). The journal was included into the European Reference Index for Humanities and Social Sciences database in 2017.

At the plenary meeting, organized 26th of November 2015 at the occasion of the seminar on Current Challenges in Cartography the members elected the following Executive Committee:

*Ing. Róbert Fencik, PhD. – Chairman,*  
*prof. RNDr. Jaroslav Hofierka, PhD. – Vice-Chairman,*  
*Mgr. Miroslav Kožuch, PhD. – Scientific Secretary,*  
*Assoc. prof. Ing. Renata Ďuračiová, PhD. – Administrator,*  
*RNDr. Monika Kopecká, PhD – Member,*  
*Ing. Martin Zeman – Auditor.*

The CS SR has 101 members at present.

## I. Specialized Cartographic Events in Slovakia in 2015 – 2019

1. The seminar "Current Challenges in Cartography" was held in Bratislava on 26th of November 2015. The seminar focused on the following themes: 3D visualization of laser scanning data, 3D modelling in urban planning, mapping the landscape changes, atlas production in Slovakia and use of old maps. Eight papers were read and presentations were published on the website of the CS SR.

2. The seminar "Scanning Old Maps" was organized by the CS SR in co-operation with the Slovak Environment Agency (SEA) in Banská Bystrica on 16th of October 2015. It took place in the SEA premises. The seminar was aimed to inform the general public about the availability of old maps and about current technologies used for digitization of maps and map collections. During the seminar was published the call (Fig. 1).

*The call – SCANNING OLD MAPS (October 2015 – September 2016)*

The CS SR in co-operation with the SEA in Banská Bystrica and the Institute of Geodesy and Cartography in Bratislava on the occasion of the International Map Year announced the call "SCANNING OLD MAPS" in order to save unique map works and map collections that are not caught in the network of state archives and other state institutions. Scanning was carried out at selected departments with appropriate technological background and expertise.



Fig. 1: The leaflet of the call – SCANNING OLD MAPS

3. The Cartographic Conference 2016 and the seminar “Activities in Cartography dedicated to Ján Pravda 2016” were carried out in co-operation with the CS SR, the Faculty of Civil Engineering in Bratislava, the Institute of Geography SAS and the Faculty of Science of Pavol Jozef Šafárik University in Košice. There were held at the Faculty of Civil Engineering in Bratislava on 20th and 21st of October 2016. Together, the events were attended by 97 participants from Slovakia and the Czech Republic. There was presented during two days 43 papers. The proceedings of abstracts was published from and seven contributions were published in the journal Cartographic Letters (Vol. 24 No. 1 and No. 2). The presentations are published and available on the website <http://www.svf.stuba.sk/sk/katedry/katedra-geodetickych-zakladov/aktivity-v-kartografii>.

4. Scientific Conference “Historical Maps in 2017”. The CS SR with the Slovak National Museum, the Museum of History and the Faculty of Civil Engineering in Bratislava organized it. The Scientific Conference was held at Bratislava Castle on 23rd of November 2017. The Scientific Conference was attended by 65 participants from Slovakia and the Czech Republic. The electronic proceedings of papers was published from the event and selected papers were published in the journal Cartographic Letters (Vol. 25 No. 1 and No. 2).

5. The conference "GeoKARTO 2018" was organized by the CS SR in co-operation with the Faculty of Forestry of the Technical University in Zvolen and the Institute of Geography SAS in Bratislava. The conference was held at the Faculty of Forestry in Zvolen on 6th and 7th of September 2018. The conference was oriented to the following themes: geovisualization, spatial analyses and modelling, remote sensing, creation and publishing of maps and atlases, web cartography and historical maps. Twenty-eight papers were presented during two days of the conference. The event was attended by 85 experts. The proceedings of abstracts was published and two papers were published in the journal Cartographic Letters (Vol. 26, No. 1).

6. National competition “Barbara Petchenik Children's World Map 2017” organized CS SR and the Institute of Geography SAS in Bratislava. There were involved 97 children from all over Slovakia. Evaluation of children works was in April 2017. Winning drawings were sent to the international round of Barbara Petchenik competition, which took place in Washington, D.C. during the 28th ICA International Cartographic Conference. Information about winners of the national competition are available on the website <http://www.geography.sav.sk/vitazi-sutaze-detska-mapa-sveta-2017/>.



Fig. 2: Gabriela Polacká – "Memory of holiday from different places of the world"

The national competition "Barbara Petchenik Children's World Map 2019" organized CS SR and the Institute of Geography SAS in Bratislava. Evaluation of children works was in April 2019. Six winning drawings (Fig. 3) were sent to the international round of competition, which took place in Tokyo, Japan during the 29th ICA International Cartographic Conference.



Information about winners of the national competition are available on the website <http://www.geography.sav.sk/detska-mapa-2019-vysledky/>.



Fig. 3: Winning drawings of the national competition  
Barbara Petchenik Children's World Map 2019

## II. Education of Cartographers

Education of specialists in cartography at a university level is carried out according to two models:

- The technical model with geodetic-topographic and technological objectives;
- Nature-scientific model with geographical objectives.

The graduate of the first model is granted the title of Ing. Geodesist – Cartographer from the technological university while the graduate of the second model obtains the title of Mgr. Geographer- Cartographer from the university focused on natural history.

Accreditation Commission of the Government of the SR approved the new curricula and programmes prepared by the technical and scientific faculties and since the academic year

2009/2010 the study of cartography is guided under the approved programmes. Cartography as the principal subject overlaps with the geo-information science, geo-information technologies, computer cartography and remote sensing.

The university studies comprise three levels:

1<sup>st</sup> level – 3-year Bachelor level and the graduate obtains the title of Bc.

2<sup>nd</sup> level – 2-3-year Master level studies at universities specialised in nature history and humanities, and the graduate obtains the title of Mgr.

– 2-3-year engineering study at a technological university and the graduate obtains the title of Ing.

3<sup>rd</sup> level – 4-year PhD studies destined to graduates possessing titles Mgr. or Ing. The study is organized in form of lectures, seminars and study stays. It ends by the defence of dissertation where the graduate should demonstrate the capacity of independent scientific work. The title granted to the graduate is PhD (*philosophiae doctor*).

Education of cartographers-engineers is carried out at the Faculty of Civil Engineering of the Slovak University of Technology in Bratislava, Faculty of Forestry and Faculty of Ecology and Environmental Science of the Technical University in Zvolen and at the Faculty of Mining, Ecology and Geotechnics of the Technical University in Košice.

Education of cartographers-geographers is accomplished at the Faculty of Natural Sciences, Comenius University in Bratislava, Faculty of Science of Pavol Jozef Šafárik University in Košice, Faculty of Natural Sciences of the University of Matthias Bel in Banská Bystrica and at the Faculty of Humanities and Natural Sciences of the Prešovská University in Prešov.

### **III. Cartographic Research**

Cartographic research in the Slovak Republic concentrates at universities of technology, humanities and nature history and at the Institute of Geography of SAS.



***Faculty of Civil Engineering of the Slovak University of Technology***

RECARE (project 7. FP, No. 603498, 2013 – 2018)

Preventing and remediating degradation of soils in Europe through land care

VEGA 1/0300/19 – 3D modelling of solar radiation on the tree vegetation represented by cloud of points from laser scanning

VEGA 1/0682/16 – Optimization of geomodelling processes using probabilistic and fuzzy data.

VEGA 1/0858/17 – Revision of the Maya Preclassic Period: From New Data to New Interpretations

VEGA 1/0710/15 – Parameterization of rainfall-runoff processes for modelling of extreme runoff on small river basins.

CANUTO, Marcello A - ESTRADA-BELLI, Francisco - GARRISON, Thomas G. - HOUSTON, Stephen D. - ACUÑA, Mary Jane - KOVÁČ, Milan - MARKEN, Damien - NONDÉDÉO, Philippe - AULD-THOMAS, Luke - CASTANET, Cyril - CHATELAIN, David - CHIRIBOGA, Carlos R. - DRÁPELA, Tomáš - LIESKOVSKÝ, Tibor - TOKOVININE, Alexandre - VELASQUEZ, Antolín - FERNÁNDEZ-DÍAZ, Juan C. - SHRESTHA, Ramesh.: Ancient lowland Maya complexity as revealed by airborne laser scanning of northern Guatemala. In Science. Vol. 361, Iss. 6409 (2018), ISSN 0036-8075.

***Faculty of Natural Sciences, Comenius University***

University Scientific Park of Comenius University in Bratislava (ITMS: 26240220086)

Environmental Medicine for twenty-first century - Geographical Information System and Environmental Health

*Klimatický atlas Slovenska* (Climate Atlas of Slovakia). Bratislava: Slovenský hydrometeorologický ústav, 2015, 132 p., ISBN 978-80-88907-90-9.

FULAJTÁR, E., JENČO, M., SAKSA, M.: Soil erosion mapping with the aid of aerial photographs tested at Pastovce, Ipeľská pahorkatina. In: ŠULC MICHALKOVÁ, M., MIŘIJOVSKÝ, J. et al., *Interdisciplinary Studies of River Channels and UAV Mapping in the V4 Region*. Bratislava: Comenius University in Bratislava, 2016, pp. 247-268, ISBN 978-80-223-4055-7.

***Faculty of Science, UPJŠ in Košice***

SURGE (European Space Agency project; 2016 – 2018)

Simulating the Cooling Effect of Urban Greenery

This project will serve as a preparatory study to assess the applicability of the multispectral satellite imagery for approximating the dynamics of solar radiation transmittance of urban greenery to assess the cooling effects of the greenery via modelling the spatial distribution of solar radiation in a complex urban environment represented by a 3-D city model.

TOKAJGIS (Intereg V-A Slovakia – Hungary, 2017 – 2019)

Development of webGIS platform based on big-geodata for the Tokaj Wine Region foster cross-border collaboration

APVV-15-0054 – Physically based segmentation of georelief and its geoscience application

VEGA 1/0963/17 – Landscape dynamics in high resolution

KEGA 007UPJŠ-4/2017 – Global navigation satellite systems - new university text book for geoinformation science

***The Institute of Geography of the Slovak Academy of Sciences***

ATBIOMAP (European Space Agency project; 2018 – 2020)

Advanced Techniques for Biomass Mapping in Abandoned Agriculture Land using Novel Combination of Optical and Radar Remote Sensing Sensors

APVV projects:

PEDO-CITY-KLIMA (2016 – 2020)

Effect of impermeable soil cover on urban climate in the context of climate change

Impervious surfaces affect the mezzo- and micro- climate of urban settlements. They contribute to formation of undesirable UHI (Urban Heat Islands), considerably reduce functions and ecosystem services of soil and limit water absorption. Land occupation and soil sealing along with the processes of global climate change bring significant negative effects not only for society and economy but they also affect the living standard and health condition of urban population. Big areas of continuous urban fabric contribute to the increase of mean temperature and extreme heats in summer in microclimatic comparison with the areas of the settlement greenery, gardens and landscape parks. The aim of the Project is to identify and assess the effects of impervious surfaces in urban agglomerations on the mezzo- and micro- climate in conditions of climate change. The basic premise for the solution is the analysis of intensity of construction and causes of its changes, as well as identification of UHI by interpretation of satellite images. The compiled database will be compared to the assessment of climate development in the cities by preparation of urban scenarios of climate change. The results will be confronted with the terrestrial meteorological measurement. The analysis will be accompanied by the impact estimate of impervious surfaces on the urban environment and urban population and the assessment of the effect of soil and greenery on sustainable management of urban territories. The Project will be applied to three cities: Bratislava, Trnava and Žilina, characterised by extremely extensive constructions with the minimal respect for the intrinsic risk of the changed climatic conditions. The outputs of the Project may bring a very important tool for the informed and scientific planning and decisionmaking processes of communal authorities in terms of environmental territorial design. Measures with stress on conservation of the environmental quality in the context of adaptat.

VEGA projects:

Recent lateral and vertical evolution of river valley bottoms under changing environmental conditions and their impact on riverine landscape ecosystem services (2018 – 2020)

Project aimed to the morphologic-sedimentary research of recent river valley bottoms evolution, conditioned by lateral movement and channel incision under changing environmental conditions. Morphological aspects of river valley bottoms evolution are

studied by identification of geomorphic evolution phases of flood benches. Research of lateral movement and channel incision is realized by multi-temporal analyses of remote sensing data, historical maps in GIS environment, hydrological records and it is combined by field research represented by UAV photogrammetric mapping, geodetic, geophysical, granulometric and dating methods. Ecosystem services are specified in accordance with generally accepted schemes used in the river landscape research. The results allow to formulate a time-spatial conceptual models of river valley bottoms development and scenarios for their further development

#### Integrated Flood Risk Assessment: A Basis for Updating of the Flood Risk Management Plans (2018 – 2020)

The aim of the project is to present a proposal for updating of the first flood risk management plans for municipalities of the Myjava District. The update is focused on integrated flood risk assessment which is based on the idea that evaluating the disaster risk, the social production of vulnerability needs to be considered with at least the same importance that is devoted to understanding and addressing natural hazards. The proposed flood risk management plans contain measures to reduce flood hazard which concern the whole basin and not just watercourses. Moreover, the management includes measures to reduce the vulnerability of households to flood hazard. The third important aspect of updated flood risk management plans is public participation in the process of designing flood prevention measures. Determination of the optimal flood risk management is a result of the assessment of several alternatives.

#### Land cover dynamics as indicator of changes in landscape (2019 – 2022)

The noticeable dynamics is one of the indicators of the changing cultural landscape and its eco-system functions. Identification of these changes requires application of new unconventional approaches facilitating the operative recording, analysis and assessment. The aim of the proposed project is to study the possibilities of application of image records obtained by remote sensing to identification of LC changes and estimation of possibilities to apply such information as indicators of changes in qualitative properties of landscape. Special emphasis will be put on the assessment of changes in urban landscape which cause changes of urban microclimate, changes in agricultural landscape which lead to its abandonment and disappearance of permanent grassland. Analyses will be based on interpretation of image

records produced by Sentinel 1 and Sentinel 2 satellites and selected data layers of the Urban Atlas (UA), High Resolution Layers (HRL), and the ), and the Land Parcel Identification System (LPIS).

KOPECKÁ, M., ROSINA, K., OŤAHEL, J., FERANEC, J., PAZÚR, R., NOVÁČEK, J.: Monitoring dynamiky zastavaných areálov. *Geographia Slovaca*, No. 30, 2015, 98 p..

ROSINA, K., HURBÁNEK, P.: Spatial disaggregation of population density using land cover and remote sensing data. *Geographia Slovaca*. No. 31, 2016, pp. 9-96.

SOUKUP, T., FERANEC, J., HAZEU, G., JAFFRAIN, G., JINDROVÁ, M., KOPECKÝ, M., ORLITOVÁ, E., JUPOVÁ, K.: Trend of Land Cover Changes in Europe in 1990-2012. In *European Landscape Dynamics: Corine Land Cover Data*. Boca Raton: CRC Press, Taylor & Francis Group, 2016, pp. 127-139, ISBN 978-1-4822-4466-3.

FERANEC, J., OŤAHEL, J., KOPECKÁ, M., NOVÁČEK, J., PAZÚR, R.: *Krajinná pokrývka Slovenska a jej zmeny v období 1990-2012*. Bratislava: Veda, 2018, 160 s., ISBN 978-80-224-1648-1.

#### **IV. Publishing Activities**

The Cartographic Society of the SR annually publishes the journal *Kartografické listy* (<http://gis.fns.uniba.sk/kartografickelisty>). So far 27 volumes have been published. The journal normally contains scientific articles of cartographers from Slovakia, Czechia and other countries. Apart from that, it also brings selected studies of students (theses of various levels and reports from the students' scientific activities) studying at technical and nature-scientific universities in Slovakia. The journal is sent to university libraries and institutions involved with cartography and geography.

Moreover, miscellanies and proceedings from specialized events, conferences and seminars are published. Publications can be found at the webpage <http://www.slovakcarto.sk>.

The publishing activity concerning cartographic works concentrates in the Institute of Geodesy and Cartography in Bratislava and at CBS spol, s.r.o. (<https://www.cbs.sk/>).

The Institute of Geodesy and Cartography in Bratislava sponsors publishing of the State Map Series – Basic Maps of the SR at scales from 1:10 000 to 1:200 000. Besides, it publishes the thematic maps that are compiled from the Basic Maps. During the period in question, technology of map compilation and manufacturing has changed as the digital processing prevails. It requires digitising of the basic materials. The Basic Database for the Geographical Information Systems (ZBGIS<sup>®</sup>) was processed. New digital products (digital terrain model, orthophotomosaic, old maps) have been publishing through new Geoportal of the Geodesy, Cartography and Cadastre Authority of the SR with using web application (Fig. 4). Basic maps of the SR and ZBGIS<sup>®</sup> cover the entire territory of Slovakia and constitute the background material for derivation of all maps.

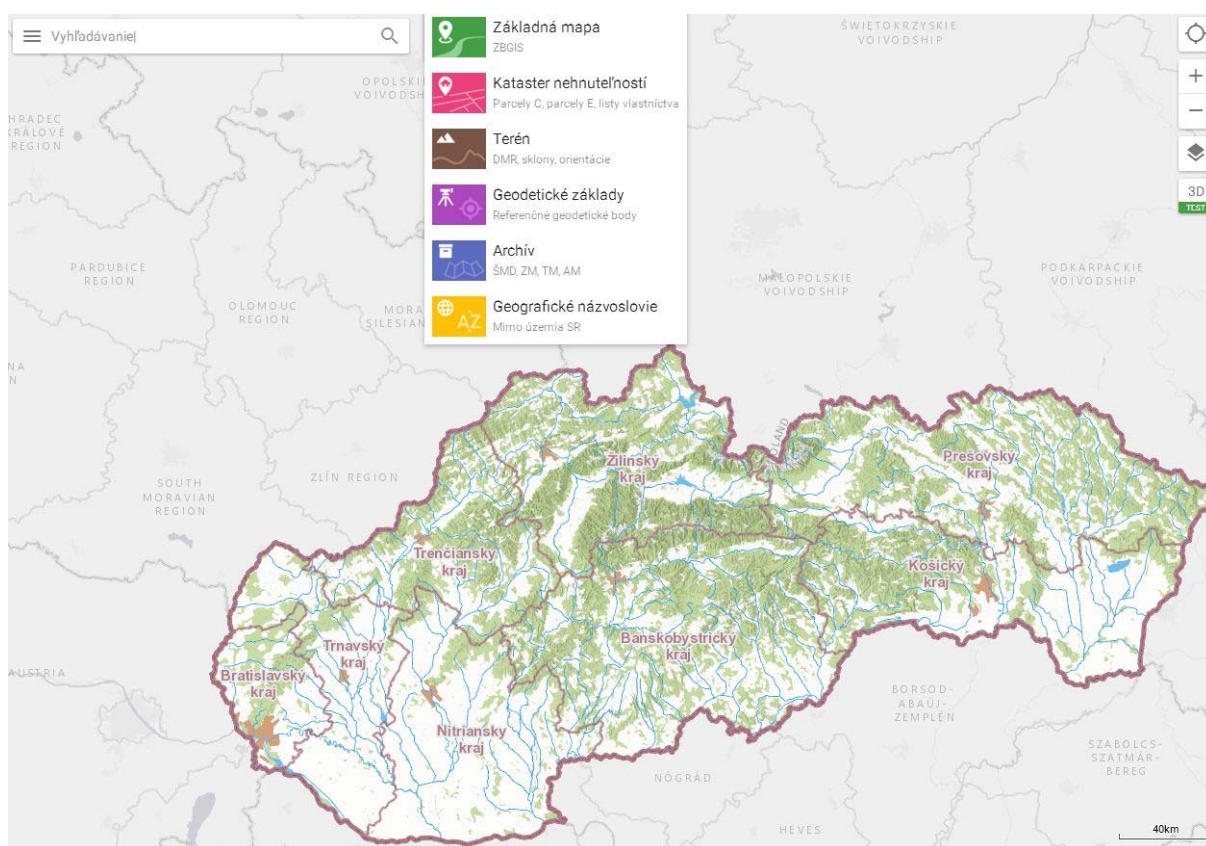


Fig. 4: Web application for publishing digital products

(<https://zbgis.skgeodesy.sk/mkzbgis?bm=zbgis&z=8&c=19.530000,48.800000#>)

CBS spol, s.r.o. is the cartographic company oriented to publishing of maps for public at large. Great part of its activity involves publishing of tourist maps (Fig. 5), painted maps and photomaps. The company established the Slovak Museum of Maps (Fig. 6) in 2018 (<https://www.muzeummap.sk/>).



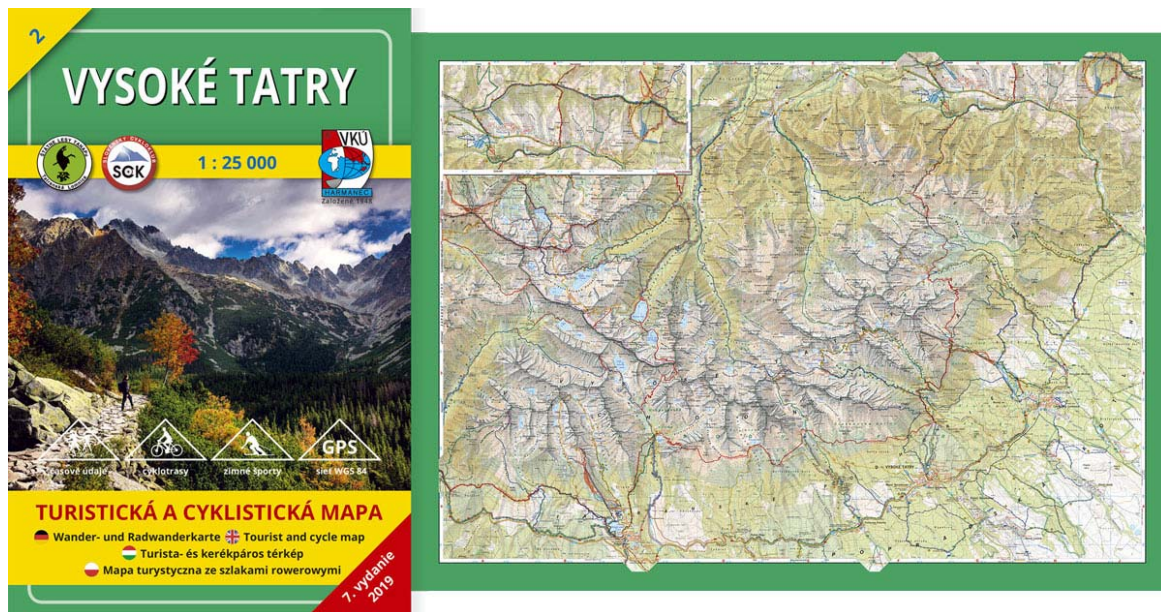


Fig. 5: The High Tatras tourist map 1:25 000 – the last edition



Fig. 6: The Slovak Museum of Maps

Apart from these dominant publishing companies in Slovakia, the creation in the field of cartography is also pursued by the following organizations and private companies: State Institute of Geology of Dionýz Štúr in Bratislava, Soil Science and Conservation Research Institute in Bratislava, Topographic Institute Banská Bystrica, Slovak Environmental Agency in Banská Bystrica, The National Forestry Centre in Zvolen, Mapa Slovakia Bratislava, EUROSENSE Bratislava, Esprit Banská Štiavnica.



CARTOGRAPHIC SOCIETY OF THE SLOVAK REPUBLIC

Executive Committee

Radlinského 11

813 68 Bratislava

SLOVAK REPUBLIC

<http://www.slovakcarto.sk>, phone +421 2 59274325, e-mail: [robert.fencik@stuba.sk](mailto:robert.fencik@stuba.sk)