



CARTOGRAPHIC SOCIETY
of the Czech Republic

<http://www.czechmaps.cz>

**National Report
on Cartographic Activities
in the Period 2007 - 2011**

Prague, April 2011

REPORT

on Cartographic Activities in the Czech Republic in the Period 2007 – 2011

compiled by

Assoc.Prof.Miroslav Mikšovský, MSc., Ph.D.

Assoc.Prof.Col.Václav Talhofer. MSc., Ph.D.

1. Kartografická společnost České republiky

(Cartographic Society of the Czech Republic)

Address : Pod sídlištěm 9/1800, CZ 180 00 Prague 8 – Kobylisy, Czech Republic

Web site : <http://www.czechmaps.cz>

The Cartographic Society of the Czech Republic (CSCR) was established in 1993 after dividing of Czechoslovakia and its Cartographic Society of the Czechoslovak Republic. The CSCR represents the Czech Republic in the International Cartographic Association (ICA) from 1995, when the Czech Republic was readopted as a regular ICA member country by the ICA General Assembly in Barcelona (Spain).

1.1 Activities of the Society in the period 2007-2011

The 7th General Assembly of the CSCR, which was held in September 2005 in Brno, elected for the period 2005-2009 a new Executive Committee of the society as follows:

President :

MIKŠOVSKÝ Miroslav, Assoc.Prof., MSc., Ph.D., Faculty of Civil Engineering, Czech Technical University in Prague

Vice-President :

TALHOVER Václav, Assoc.Prof.Col., MSc., Ph.D., University of Defence in Brno

Secretary General :

HÁJ Bohumil, MSc., Publishing House SHOCart, Ltd., Zádveřice/Vizovice; in 2008 replaced by SKÁLA Petr, MSc., Czech Agricultural University in Prague

Treasurer :

ZIMOVÁ Růžena, MSc., Ph.D., Faculty of Civil Engineering, Czech Technical University in Prague

Members :

ČADA Václav, Assoc.Prof., MSc., Ph.D., Faculty of Applied Sciences, West-Bohemian University in Plzeň

KONEČNÝ Milan, Assoc.Prof., DSc., Ph.D., Faculty of Natural Sciences, Masaryk University in Brno (ICA President for the period 2003-2007)

NĚMEČEK Bedřich, MSc., Land Survey Office Sedlčany

ŠUMBERA Jiří, MSc., Publishing House SHOCart, Ltd., Zádveřice/Vizovice, from beginning of 2009 replaced by SVOBODOVÁ Danuše, MSc., Land Survey Office in Prague

VOŽENÍLEK Vít, Prof., DSc., Ph.D., Faculty of Natural Sciences, Palacký University in Olomouc

The 8th General Assembly of the CSCR, which was held in September 2009 in Olomouc elected for the period 2009-2013 a new Executive Committee of the society as follows:

President :

MIKŠOVSKÝ Miroslav, Assoc.Prof., MSc., Ph.D., Faculty of Civil Engineering, Czech Technical University in Prague

Vice-President :

TALHOFFER Václav, Assoc.Prof., Col., MSc., Ph.D., University of Defence in Brno

Secretary General :

SVOBODOVÁ Milada, MSc., Publishing House Kartografie Praha Ltd.,

Treasurer :

ZIMOVÁ Růžena, MSc., Ph.D., Faculty of Civil Engineering, Czech Technical University in Prague

Members :

ČADA Václav, Assoc.Prof., MSc., Ph.D., Faculty of Applied Sciences, West-Bohemian University in Plzeň

KONEČNÝ Milan, Prof., DSc., Ph.D., Faculty of Natural Sciences, Masaryk University in Brno (ICA Past President for the period 2007-2011)

SVOBODOVÁ Danuše, MSc., Land Survey Office in Prague

VEVERKA Bohuslav, Prof., MSc., DrSc., Faculty of Civil Engineering, Czech Technical University in Prague

VOŽENÍLEK Vít, Prof., DSc., Ph.D., Faculty of Natural Sciences, Palacký University in Olomouc

The main tasks of the Executive Committee of the CSCR were focused on preparation of

- a) the bi-national cartographic conferences (in collaboration with the Cartographic Society of the Slovak Republic) in Bratislava (Slovak Republic, 2007), Olomouc (Czech Republic, 2009) and Bratislava (Slovak Republic, September 2011)
- b) the national seminars and map exhibitions
- c) the national competitions „The Best Map of the Year “
- d) the national competition „Children Cartographic Drawings“
- e) the presentation of the Czech cartography on the ICA International Cartographic Conference in Moscow (2007), Santiago de Chile (2009) and Paris (2011)
- f) the issuing of the newsletter „Zpravodaj Kartografické společnosti České republiky“ (Review of the Cartographic Society of the Czech Republic) – in electronic form only
- g) continuous updating of the web site of the CSCR, i.e. <http://www.czechmaps.cz>

- a) Bi-national cartographic conferences

The bi-national cartographic conferences are traditionally prepared each second year by the Cartographic Society of the Czech Republic and by the Cartographic Society of the Slovak Republic.

The 17th bi-national cartographic conference took place in Bratislava (Slovak Republic) from 6th to 7th September 2007. The main subject of the conference was „Up-to-date trends in Cartography“. For the conference were prepared 25 papers and 27 posters. The chosen papers were published partly in No. 8–9/2007 of the periodical Geodetický a kartografický obzor (Geodetic and Cartographic Review) and in the yearbook Kartografické listy 2007 (Cartographic Sheets); all papers were displayed unabridged on a conference CD-ROM. A part of the conference program was a bi-national exhibition of maps and atlases, an exhibition of

new cartographic techniques, an exhibition of student's cartographic works and an exhibition of Slovak national competition of children cartographic drawings. At the conference took part 150 participants from both republics. The conference was combined with the General Assembly of the Cartographic Society of the Slovak Republic.

The 18th bi-national cartographic conference took place in Olomouc (Czech Republic) from 30th September to 2nd October 2009. The motto of the conference was „Quo vadis, cartography“. For the conference were prepared 83 papers and 28 posters. The chosen papers were published partly in No. 8–9/2009 of the periodical Geodetický a kartografický obzor (Geodetic and Cartographic Review), in the yearbook Kartografické listy (Cartographic Sheets) and in the periodical Geomatika (Geomatics). All papers were unabridged displayed on a conference CD-ROM. A part of the conference program was a bi-national exhibition of maps and atlases, a technical exhibition, an exhibition of cartographic degree works from 7 Czech and Slovak universities. The exhibition of maps and atlases was open for primary and secondary school students and for the general public. In the conference took part 175 participants from the Czech and Slovak Republics and from Poland. The conference was combined with the 8th General Assembly of the Cartographic Society of the Czech Republic.



Fig.1 – 18th bi-national cartographic conference, Olomouc 2009
(from the left: Assoc.Prof.J.Kaňok, Assoc.Prof.J.Čižmár, Assoc.Prof.M.Mikšovský)

The next 19th bi-national cartographic conference will take place in Bratislava (Slovak Republic) from 8th to 9th September 2011. The motto of the conference will be „Cartography and Geoinformatics in the Today's Light“

b) Other conferences and workshops

The Institute of Geoinformatics of the Faculty of Natural Sciences of the Palacký University organizes in Olomouc from 2007 in cooperation with the CSCR and the Czech Geographic Society yearly by the end of February a workshop the „Cartographic Day“. The 1st Cartographic Day was organized on 23rd February 2007 and was focused on the modern conception of thematic mapping in the geosciences. The 2nd Cartographic Day was held on 29th February 2008 and was focused on modern conception of thematic mapping in census. The 3rd Cartographic Day was organized on 27th February 2009 and was addressed to

thematic mapping in territorial planning. The 4th Cartographic Day was held on 26th February 2010 and was focused on cartography in the school system. The 5th Cartographic Day was held on 25th February 2011 and was addressed to thematic mapping in the public transport. Usually 5 – 6 papers are presented on these workshops; all papers are displayed on CD-ROMs, which are sent to all participants (on average 50 – 60 participants)



Fig.2 – Assoc.Prof.J.Kaňok at the beginning of the 4th Cartographic Day, Olomouc 2010

The CSCR organized on 22nd October 2010 in Prague in cooperation with the Institute of Mapping and Cartography of the Faculty of Civil Engineering of the Czech Technical University and the Land Survey Office in Prague a very successful workshop on Digitalization of Map Collections and Archives. On the workshop 13 papers were presented; all presentations were displayed on the web site of the CSCR [http:// www.czechmaps.cz](http://www.czechmaps.cz). On the workshop took part more than 100 participants. The workshop was combined with an



Fig.3 - Assoc.Prof.M.Mikšovský and RNDr,M.Kronus at the beginning of the workshop on Digitalization of Map Collections and Archives

excursion to the State Archive of Land Surveying and Cadastre of the Land Survey Office in Prague.

c) Old Map Exhibitions

In 2008 was prepared at the Institute of Mapping and Cartography of the Faculty of Civil Engineering of the Czech Technical University in Prague a touring exhibition „Old Maps and Historical Memory of the Landscape“. The author of this exhibition was Prof.Ing.Bohuslav Veverka,DrSc. The exhibition was displayed in cooperation with the CSCR at the first time in April 2008 in the Cultural Centre Prague-Uhřetěves . In June 2008 moves the exhibition to the Information Centre in Prague-Kolovraty and in October 2008 to the State District Archive in Benešov. In January 2009 was the exhibition installed in Podblanické Ekocentrum in Vlašim and in 2010 took place in Sázava (both in Middle Bohemia).



Fig.4 - Prof.B.Veverka with the curator of the exhibition „Old Maps and Historical Memory of the Landscape“ in Prague-Uhřetěves

In October 2007 was festively opened the Moravian Cartographic Museum in the castle in Velké Opatovice. The main showpiece of the map exhibition is a relief map of Moravia and a part of Silesia consisting of 79 map sheets. The size of the whole relief model is about 100sqms. The maps originated in the 19th century as a result of the 3rd Military Mapping of the Austrian-Hungarian Monarchy. The particular altitude layers of these map sheets were cut out from plywood and concealed by printed maps. The map model served for military purposes; it was displayed the first time to the public in 1930 in Brno; after the 2nd World War it was in the property of the Czechoslovak Army, in 1989 it was handed to the Moravian Land Archive in Brno and in 2004 to the National Agricultural Museum in Prague. In October 2007 it was opened to the public in the new constructed Moravian Cartographic Museum. In addition to that shows the exhibition old maps of Bohemia, Moravia and Silesia, old measuring instruments and old historical photogrammetric and polygraphic devices.



Fig.5 - The relief map of Moravia and a part of Silesia in the main exhibition room of the Moravian Cartographic Museum in Velké Opatovice

d) National Competition „The Best Map of the Year“

The Cartographic Society of the Czech Republic organizes yearly a national competition of Czech cartographic publishing houses „The Map of the Year“. The competition is proceeded in 5 categories, i.e. A - Atlases, map collections and editions, B - Autonomous cartographic products, C - School maps and atlases, D - Cartographic results of student works and E - Digital cartographic products and their applications on the Internet. A special commission of the CSCR for evaluation of the registered cartographic works is lead by Prof.RNDr.Vít Voženílek,PhD. from the Palacký University in Olomouc.

In the 10th „Map of the Year“ national competition were registered 135 cartographic products. In the category A won the Edition of Cyclomaps of the Czech Republik 1:60 000 (edited by SHOCart Ltd., Zádveřice). In the category B won the Geological Map of the Czech Republic 1:500 000 (edited by the Czech Geological Survey, Prague). In the category C was no product awarded. In the category D won the student cartographic work „Florball groups of the Czech Republic (author Tomáš Pavelec, Palacký University in Olomouc). In the category E won the server „Prague and Czech Republic – Infomap 2007 – Home Edition“ prepared by the company PJ SOFT Prague. By special prices of the judge were awarded the „Satellite Atlas of Pyramids“ (edited by the publishing house DRYADA), the „Clima Atlas of the Czech Republic“ (elaborated by the Czech Hydrometeorological Institute Prague and the Palacký University in Olomouc); by the 10th anniversary of the competition was awarded the publishing house SHOCart Zádveřice, Ltd. for the highest number of appreciations in the competition during the years 1998 –2007. All prices were presented at a special meeting in the Literary Hall of the Prague International Bookfair on April 25, 2008.

In the 11th „Map of the Year“ national competition were registered 148 cartographic products. In the category A won the Edition of Tourist Maps 1:50 000 (edited by Kartografie Prague, Inc.). In the category B won the map „Protected Landscape Region of Broumov“ (edited by ROSY, Ltd., Mělník). In the category C was no product awarded. In the category D won the student cartographic work „Tourist Maps Compilation“ (author Tomáš Janata,Bc., Czech Technical University in Prague). In the category E won the server „Cycloatlas on-line“ prepared by SHOCart Zádveřice, Ltd. A special judge appreciation was given to Palacký

University in Olomouc for the „Atlas of Development of Microregion Hranice“. All prizes were presented at a special meeting in the Literary Hall of the Prague International Bookfair on May, 14, 2009



Fig.6 - The prizewinners of the competition „Map of the Year 2008“

In the 12th „Map of the Year“ national competition were registered 107 cartographic products. In the category A won the „Atlas of Olomouc region representatives election 2000-2008“. In the category B won the „Water Sports Map of the River Berounka“ (edited by Kartografie Prague, Inc.). In the category C and E were no products awarded. In the category D won the degree work „Security Map of Olomouc“ (author Mgr. Lucie Burianová, Palacký University in Olomouc). A special judge appreciation was given to the publishing house Stiefel Eurocart, Ltd. for a high quality production of school maps and to the publishing house TRASA, Ltd. for the production of tourist maps for the Czech Tourist Club. All prizes were presented at a special meeting in the Literary Hall of the Prague International Bookfair on May, 13, 2010.

In the 13th „Map of the Year“ national competition were registered 75 cartographic products from 28 publishing houses. In the category A won the „Landscape Atlas of the Czech Republic“ (edited by the Research Institute Silva Tarouca). In the category B won the tourist map „Giant and Jizera Mountains Border“ (edited by ROSY, Ltd.). In the category C was no product awarded. In the category D won the degree work „Analyse of City Olomouc Development with Use of Municipal Plans and Visualization“ (author Mgr. Zuzana Zapletalová, Palacký University in Olomouc). In the category E won the digital product „Historic Orthophotomap of the Czech Republic“ (developed by GEODIS Brno, Ltd.).

e) National Competition „Children Cartographic Drawings“

The national competition „Children Cartographic Drawings“ 2009 was evaluated in April 2009; in the competition took part 227 children works. Chosen winning drawings were sent to the ICA „International Children Cartographic Drawings Exhibition“ of Barbara Petchenik prize competition, which took place in Moscow during the 23rd ICA International Cartographic Conference.

The national competition „Children Cartographic Drawings“ 2011 was evaluated in April 2011; more than 200 children works took part in the competition. In the category less than 9 years won the work of Viktoria Karla Wojnarová (6 years) „Globalized World Deals with

Natural Disasters“ (Fig.7). In the category 9 – 12 years won the work of Barbora Mazánková (12 years) „We Are One World“ (Fig.8) and in the category 13 – 15 years won the work of Lucie Nováková (15 years) „Connected World“ (Fig.9).



Fig.7 – Wojnarová, V.K. : „Globalized World Deals with Natural Disasters“



Fig.8 – Mazánková, B.: „We Are One World“



Fig.9 – Nováková, L.: „Connected World“

The 2nd place in the category less than 9 years received the work of Viktorie Karla Wojnarová „Playful World Map“. The 2nd place in the category 9 – 12 years received the work of Josef Novotný (12 years) „Globe in Waste“ and the 3rd place the work of Marie Vanesa Wojnarová (10 years) „Planet of Horses“. The 2nd place in the category 13 – 15 years received the work of Marcela Kozlíková (15 years) „Journey Around the World“ and the 3rd place the work of Jan Vojta (15 years) „Globalization Is a Funny Game“. All these winning children works will be displayed at the ICA „International Children Cartographic Drawings Exhibition“ of Barbara Petchenik prize competition in Paris 2011.

1.2 International activities of the CSCR

The Czech Republic is an ICA regular member from 1995 and follows in the former membership of Czechoslovakia from 1968. The Czech Republic is in the ICA represented by the Cartographic Society of the Czech Republic (CSCR).

Mr Assoc.Prof Milan Konečný, RNDr., Ph.D. served to ICA in the period 2007 – 2011 as the ICA Past-President.

The members of CSCR worked in most of the ICA Commissions on the posts of Commission members or corresponding members.

The Czech Republic is a founding member of the European Cartographic Union, which was established in 1999 in Maastricht (The Netherlands). The CSCR was represented in the Executive Committee of the Union by its President.

The delegation of the Czech Republic, consisting mostly of CSCR members, visited the ICA International Cartographic Conferences in Moscow (2007) and Santiago de Chile (2009) and contributed to the conference's program with a lot of presentations.



Fig.8 – Participants of the ICA Conference in Santiago de Chile
From the left: Col.Assoc.Prof.V.Talhofer, chief of the Training Centre of the Geographic Service of Chilean Army, Assoc.Prof.M.Rybanský, Prof.M.Konečný

The CSCR arranged from the winning maps and atlases of the 8th and 9th competition „Map of the Year“ a national map exhibition for the ICA International Map Exhibition in Moscow (2007). The exhibited Czech maps gained from the international jury a silver medal for the „Cycloatlas of the Czech Republic“ (edited by SHOCart, Zádveřice, Ltd.) and two bronze medals for the „Base Map of the Czech Republic 1:25 000“ (edited by Land Survey Office, Prague) and for the „Beskydy – Relief Map 1:100 000“ (edited by Kartografie HP, Ltd., Jičín). The medals were festively presented to the representatives of the winning publishing houses on a special CSCR meeting on September 10th, 2007 at the Palacký University in Olomouc; the meeting was followed by a press conference.

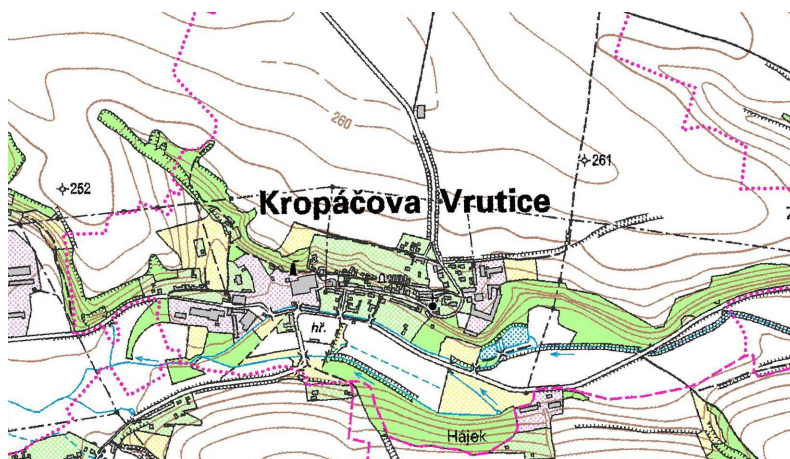


Fig.9 - A sample of the Base Map of the Czech Republic 1:25 000

From the winning maps and atlases of the 10th and the 11th national competition „Map of the Year“ arranged the CSCR a national map exhibition for the ICA International Map Exhibition in Santiago de Chile (2009); unfortunately these maps and atlases could not been displayed, because the sent packets were lost by the post.

In March 2011 was prepared a further Czech national map exhibition, which will be displayed at the ICA International Map Exhibition in Paris (July, 2011).

1.3 Other activities

The Cartographic Society of the Czech Republic (CSCR) is a collective member of the Czech Association for Geoinformatics. The Society cooperates closely with the Cartographic Society of the Slovak Republic, with the Society for Photogrammetry and Remote Sensing of the Czech Republic, with the Czech Union of Surveyors and Cartographers and with the Czech Geographic Society as well.

The CSCR issues a newsletter „Zpravodaj Kartografické společnosti České republiky“ (Digest of the CSCR) with information of activities of the society and of the ICA. The actually reports are published on the web sites of the society <http://www.czechmaps.cz>.

2. The state administration authority in the Czech Republic

The state administration authority is represented by the Czech Office for Surveying, Mapping and Cadastre (mail address: Pod sídlištěm 9/1800, CZ 182 11 Prague 8 – Kobylisy, Czech Republic, e-mail: cuzk@cuzk.cz, web site : <http://www.cuzk.cz>).

The subordnary organizations of the Czech Office are the Land Survey Office in Prague, the Research Institute of Geodesy, Topography and Cartography in Zdiby, the Survey and Cadastre Inspectorates (7) and Cadastre Offices (77).

The main tasks of the Czech Office for Surveying, Mapping and Cadastre are :

- f) the maintenance and modernization of horizontal, vertical and gravity control in the Czech Republic,
- g) the large-scale mapping (cadastral maps, the State Map 1:5000)
- h) the medium-scale mapping (the Basic Maps 1:10 000, 1:25 000, 1:50 000, 1:100 000, 1:200 000),
- i) the small-scale mapping of the Czech Republic at scales 1:500 000, 1:1 Mio, 1:2 Mio)
- j) the creation and updating of ZABAGED (Fundamental Base of Geographic Data) based on the Basic Maps 1:10 000 (in raster and vector form with attributes as well),
- k) the complete administration of the cadastre including legal relations to real estate property and digitalization of all cadastral maps
- l) the geodetic surveys and documentation of the state boundaries
- m) the development and maintenance of the Information System of Surveying, Mapping and Cadastre in the Czech Republic,
- n) standardization of geographical names and
- o) coordination of research works and of international cooperation in geodesy, cartography and cadastre.

3. The Geographic Service of the Czech Armed Force

In the latest years was finished the fundamental reorganization of the Czech Armed Forces Geographic Service (GS). Two previous institutions (the Military Geographic Institute and the Military Topographic Institute) were joined into one – the Military Geographic and Hydrometeorologic Institute (MGHMI) and completed by the Department of

Hydrometeorologic Support. The new organization took over all the production from both former institutes.

To guarantee full interoperability in the geographic support with other NATO armies the Czech Armed Forces have changed the previous geodetic reference system S-1942/83 with Gauss projection into the geodetic system WGS84 with UTM projection including MGRS since 1st January 2006. All digital databases were transformed into the new system; new topographic maps at the scales 1:25 000, 1:50 000 and 1:100 000 were created. In terms of this process which started five years ago, the geodetic reference system was changed, the basic database of DMU (Digital Feature Model) was completely up-dated and all features were improved according to their position. Nowadays the typical geometric accuracy is about 3 meters; main features have the resolution of 1 meter. Aerial photographs were used like basic information sources. They were orthogonalized and during this process the present digital elevation model was improved.

Except standard production many maps produced by Geocell of the KFOR Headquarter in Pristina (Kosovo) were printed in MGHMI.

A new international programme called Multinational Geospatial Co-production Program (MGCP) was started. The goal of MGCP is to cover selected parts of the world by very precise digital vector data with the geometric resolution of 10-20 meters. 28 participating countries started with the data collection. The Geographic Service used previous experience with VMap programme and committed to collect data from 12 tiles 100 per 100 km size.

To the basic topographic maps were added new versions of military thematic maps and charts, e.g. the Topographic Maps of the Czech Republic at scales 1:250 000 and 1:500 000, the Military Training Area Maps at scales 1:25 000 and 1:50 000, the Flying Charts – Tactical Flying Chart 1:250 000, Low Level Flying Chart 1:250 000, ICAO Chart 1:500 000 etc.

The system called IZGARD for access to digital data was created in 2007. The system was focused on military end-users and was accessible on the military net. The Web Mapping Service technology based on ArcIMS ground was used. The development of web maps service has been started by the help of ArcGIS Server in 2010. The new map portal MapsACR, which is accessible only on the military net including satellite connection, is created.

The GS has modernized its field units with a new deployable set of geographic support. The set is called SOUMOP and consists of four modules - data collection (MOSIN), data analyses (MOGAN), data and maps supply (MOZIN) and reprography (MOREP). All modules are in ISO containers, which can be transported by truck, airplane or ship. Modules have their own generator due to independency on external sources of electricity. ArcGIS and ERDAS Imagine are main GI technologies used in the SOUMOP.

The Geographic Service has a lot of partners in the Czech Republic and abroad, with whom it co-operates mainly in the data exchange. The most important local partner is the Czech Office for Surveying, Mapping and Cadastre. Foreign partners are especially geographic services of NATO armies.

4. Education in Cartography

The preparation of cartographers in the Czech Republic for civil purposes is provided on several universities and is included into geodetic, geographic or geoinformatic studying programmes. These programmes are provided at the Faculty of Natural Sciences of the Charles University in Prague, at the Masaryk University in Brno, at the Palacký University in Olomouc and the University of Ostrava, at the Faculty of Civil Engineering of the Czech Technical University in Prague, at the Technical University in Brno and at the Faculty of Applied Sciences of the West-Bohemian University in Plzeň.

In the last 4 years period the university courses were divided into Bachelor programmes (normally 6 terms, at the Czech Technical University 8 terms), Master of Science programmes (normally 4 terms after receiving of Bc. degree). After receiving of MSc. degree can the graduates continue in the post-graduate study at some chosen universities (the Charles University in Prague, the Masaryk University in Brno, the Czech Technical University in Prague and the Technical University in Brno). For more information see the Universities web sites.

The Bachelor studying programme is closed by state finals and by viva voce of the Bachelor dissertation. The Bc. graduates can continue in the Master of Science studying programme, sometimes without any further exams.

The Master of Science studying programme is closed by state finals and by viva voce of the Master of Science dissertation as well. Some of the MSc. graduates can continue in the post-graduate studies ; its duration is normally 3 – 5 years. This study is closed by a viva voce, the part of it is a presentation of a scientific work. After it presents the student his thesis; after their defence and their considering in the Scientific Council of the faculty receives the student the doctoral degree Ph.D.

In terms of reorganization of the military university education in the Army of the Czech Republic a new University of Defense (UoD) was founded in 2004. UoD consists of three faculties and three university institutes. Bachelor and Master of Science education in the geodesy and cartography was finished in 2006 and since this time a new branch of military geography and meteorology has started. A new Military Geography and Meteorology Department (MGMD) of the Military Technological Faculty was founded in September 2006. One half of the whole study programme is focused on cartography, photogrammetry, remote sensing and geoinformatic. This programme consists of two parts – Bachelor (6 terms) and Master of Science (4 terms). Study subjects correspond to Geographic Service and Hydrometeorologic Service requirements and after the graduation are students ready to serve in both services on basic positions.

The MGMD is responsible for geodesy and cartography post-graduate course finished by obtaining a Ph.D. degree. The duration of this course is 3 years in a present form or 5 years in a distance form. The study is organized according to the individual studying plans; a part of it are the doctoral thesis focused mainly on geographic support of armed forces problems. For more details see the university web site www.unob.cz.

5. Research activities

Research activities are provided in the frame of the state authorities (the Research Institute of Geodesy, Topography and Cartography in Zdíby, the Geographic Service of the Czech Armed Force) and at all universities as well.

The research topics in the period 2007-2011 were focused on following projects :

Project name : ***Cartometric and Semiotic Analysis and Visualization of Old Maps of Czech Lands from the Period 1518 – 1720***

Duration : 2007-2009

Applicant : Institute of Mapping and Cartography (Czech Technical University, Prague).

The goal of the project was the analysis of the oldest map works of the Czech history, which were examined from the view of the development of cartographic signs, cartometric and data analysis; the output of the research was a cartographic visualization (a map server).

Project name : ***Complex Study, Analysis and Accessibility of Müller's Map of Bohemia and Moravia Using GIS Technologies***

Duration : 2009-2011

Applicant: Institute of Mapping and Cartography (Czech Technical University, Prague).

The goal of the project was a complex analysis of two very important works of the Czech map history – the Müller's Map of Bohemia (1720) and Moravia (1716). The research was focused on analysing of cartometric quality of these maps, their deformations and a number of their further characteristics; these data were transformed and prepared for accessibility on the Internet .

Project name : ***Visual Health Project***

Duration: 2008-2009

Supported by Ministry of Education, No.2E08028

Applicant: Laboratory of Geoinformatics (Masaryk University Brno), Dpt.of Geoinformatics (West Bohemian University, Plzeň).

The project followed the output of interdisciplinary connection of natural and medical sciences. The main subjects of the research were available up-to-date data from the medical branch and the evaluation of their influence on the decision of individuals about their health. The outputs will serve as the inputs into the information systems of the universities for e-learning and blended-learning promotion.

Project name : ***SDI-EDU Project***

Duration: 2009-2011

Applicant: Dpt.of Geoinformatics (West Bohemian University, Plzeň).

The project was focused on the transmission of knowledges from the European research projects, connected with education in the area of space data infrastructure for the territorial planning creation. The solution is based on dislocation of the space data into the web surrounding and on using of the web services for building of the net of distributed geoportals.

Project name : ***E-Contentplus Project Plan4All***

Duration: 2009-2011

Applicant: Dpt.of Geoinformatics (West Bohemian University, Plzeň).

The solution was focused on the harmonization of territorial planning data in view of the INSPIRE instruction. The project was based on existing best practices in regions and

municipalities of the European Union and on evaluation of the results of current research projects solved in this area. The outputs will be asserted in the European Forum for Spatial Data Infrastructure.

Project name : ***Electronic Study Materials for Support of Digital Cartography Teaching***

Duration: 2009

Applicant: Institute of Mapping and Cartography (Czech Technical University, Prague).

The project was focused on the support of teaching of digital cartography in the software, which is mostly used in practice (ArcGIS, OCAD), especially from the view of the study materials for the exercises, input data and guidelines and processes for the software itself as well.

Project name : ***Telecommunications Advanced Networks for GMES Operations (TANGO)***

Duration: 2006-2009

Supported by European Commission, FP6

Applicant: EADS Astrium, France, cooperation: Dpt.of Applied Geoinformatics and Cartography, Faculty of Science, Charles University in Prague

The objectives of the project was to develop, integrate, demonstrate and promote new satellite telecom services dedicated to GMES (Global Monitoring for Environment & Security) requirements. 24 research and industrial institutions participated in the project. The Department of Applied Geoinformatics and Cartography contributed to design and implementation of GIS for evacuation scenario.

<http://www.teladnetgo.eu>

Project name: ***Demonstration of ESA Environments in Support to FLOod Risk Earth Observation Monitoring (FLOREO)***

Duration: 2008-2010

Supported by ESA

Applicant: Sprinx Systems, a.s., Czech Republic., cooperation: Dpt.of Applied Geoinformatics and Cartography, Faculty of Science, Charles University in Prague

The project was oriented on development and implementation of relevant EO-based services in the Czech Republic to support existing hydrological monitoring activities, especially snow melt and surface water runoff contributing to flooding events.

<http://www.floreo.cz>

Project name: ***Regional Differentiation and Possible Risks of Land Use as a Reflection of Functional Changes of Landscape in Czechia 1990 – 2010***

Duration: 2009-2012

Supported by Czech Science Foundation

Applicant: Dr. Ivan Bičík, Faculty of Science, Charles University in Prague

One of the project objectives is to define trends in development of the Czech and European landscape between years 1845, 1948, 1990, 2000 a 2010 based on different data sources (old maps, real estate registers, aerial images, satellite images, statistical data). Another objective is to evaluate and compare land use during the transformation period 1990-2010 in model areas of different type of landscape using remote sensing data, statistical data, methods of social metabolism and quantitative methods. The project contributes to the international research in Land Use Land Cover Change under the IGU LUCC commission.

Project name: ***Suburban Development, Suburbanization and Urban Sprawl in the Czech Republic: Tackling the Negative Impacts on the Environment***

Duration: 2007-2012

Supported by Ministry of Environment, Czech Republic

Applicant: Dr. Martin Ouředníček, Faculty of Science, Charles University in Prague

The project investigates the spatial extent and intensity of suburbanisation in the Czech Republic based on Earth observation and statistical data. It also identifies effects of suburbanisation on sustainable development of landscape and society. The aim is to find a system of indicators to evaluate extent and negative impacts of suburbanisation and to propose instruments to prevent and mitigate its negative consequences. Important purpose is to make the results of basic research accessible to professional community and to transfer the acquired knowledge in suitable form to area users.

Project name: ***GEO Network for Capacity Building (Geo-Net-Cab)***

Duration: 2009-2012

Supported by European Commission, FP7

Applicant: ITC, the Netherlands, cooperation: Dpt.of Applied Geoinformatics and Cartography, Faculty of Science, Charles University in Prague

The purpose of the project is to create the conditions for the improvement and increase of the GEO capacity building activities and framework, with special emphasis on developing countries, new EU member states (and EU neighbouring states) and climate monitoring and will serve the bigger goal of improved effectiveness and efficiency of GEO capacity building for application in the GEO societal benefit areas. Coinciding with this purpose, successful brokerage with (potential) clients for earth observation products and services will be facilitated.

Project name: ***Analysis of Accessibility Patterns in Czechia from 1921 to 2020***

Duration: 2010-2012

Sponsored by Czech Science Foundation

Applicant: Dr. Tomáš Hudeček, Faculty of Science, Charles University in Prague

The aim of the project is historical-geographic analysis of changes in accessibility in Czechia from the creation of Czechoslovakia in 1918 (census in 1921) till 2020, when expansion of motorways and railways is to be completed. We will take into account accessibility of most important settlement centres in Czechia as well as distance between borders. Three basic transport modes will be considered - road, rail and air transport. The change in accessibility is due to new travel infrastructure or introduction of new means of transport. Visualization of this relative reduction of space-time is partly enabled by GIS products, but there is no existing methodology for modelling various travel modes and incorporation of other accessibility-influencing conditions – deviatility, meteorological phenomena, individual factors. Deeper understanding of the interacting accessibility factors will lead to increasing precision of the models of accessibility. One of the aims is to elaborate the methodology of cartographic anamorphosis for GIS, the outcome of the project being a set of Shrinking maps.

The main research activities in the Geographic service were focused mainly on the basic spatial database development. Their precision was improved and added missing thematical properties of features. The original coding catalogue has been transformed into a new data dictionary DFDD (DIGWG Feature Data Dictionary).

The initial works of the Recognised Environmental Picture (REP) as a part of the Common Operational Picture have been started. The goal of REP is to increase the reliability of decision making process in areas of missions.

The new Digital Elevation Model with initial resolution of less then 0.5 metres has been launched in 2009 in co-operation of military and governmental organisations. The Laser Scanning technology is used. The territory of the Czech Republic will be covered in the beginning of 2012.

At the University of Defence - the Department of Military Geography and Meteorology two main research projects were provided in. The first one is Project of Defense Research of the MoD of the Czech Republic „*Geographic and Meteorological Factors on the Theatre*“, project code METEOR and second one is „*The Evaluation of Integrated Digital Spatial Data Reliability*“ founded by the Czech Science Foundation.

At the Masaryk University in Brno the main research project has been “*The Dynamic Cartographic Visualiziation in the Crises Management*” solved since 2004 which will be finished in 2011. The project was focused mainly on an adaptive cartography application in the frame of crises management where Web Mapping Service added by Context Service has been developed including all data and communication infrastructure creation necessary for pilot projects.



Fig. 10: Mobile application of Dynamic Cartographic Visualization in Crises Management (from Pilot project 2009)

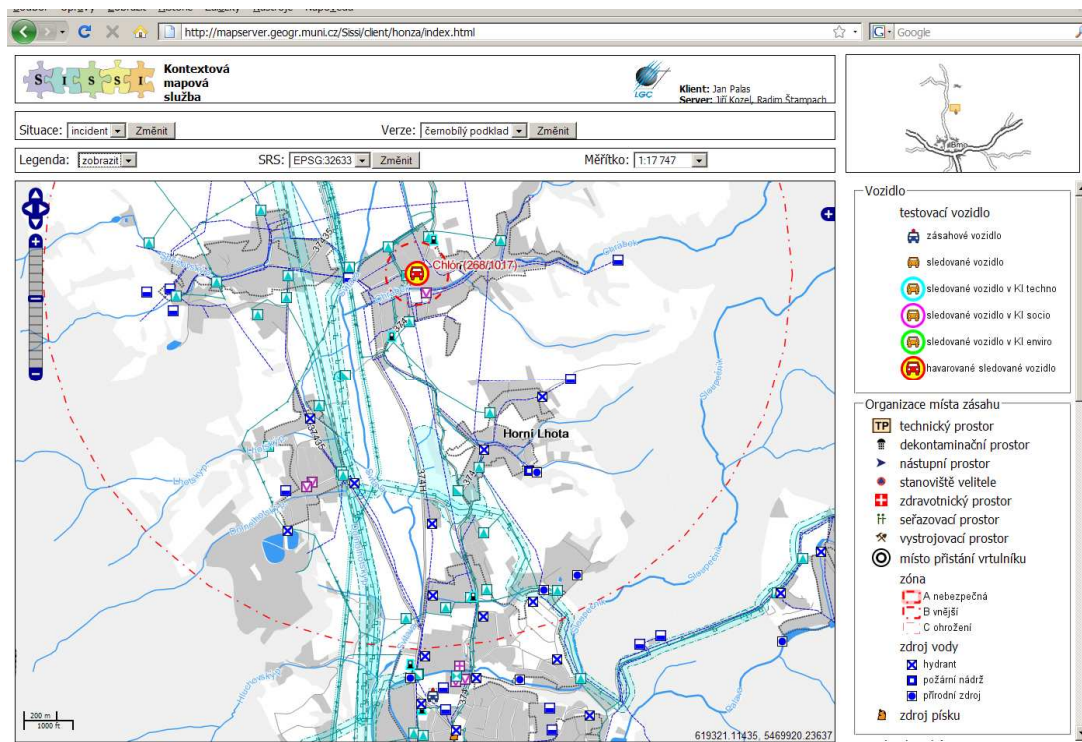


Fig. 11: Web Mapping Service and Context Service in the Dynamic Cartographic Visualization in Crises Management (from Pilot project 2009)

Some universities are very active in projecting and preparation of atlases and other new special cartographic products. E.g. the Institute of Geoinformatics of the Palacký University in Olomouc took part in preparation and production of *Climatic Atlas of Bohemia*, *Atlas of Hranice Region*, *Landscape Atlas of the Czech Republic* etc. To the other important projects of this Institute belongs e.g. the development of modern types of typhlomaps and multimedia tourist guides.

6. Cartographic publishing houses

In the Czech Republic exist at this time about 30 cartographic publishing houses. The most important of them are (in alphabetical order) :

Alpro CZ, Ltd., Valašské Meziříčí
maps, photomaps, map printing
<http://alpro.cz.com>

Geodézie ČS – Kartografické nakladatelství, Inc., Prague
map production to order, databases, vector and raster data, licences
<http://www.geodezie.cz>

GeoGalileo – Kartografie Brno, Ltd., Brno
map production, advertizing agency
<http://www.geogalileo.cz>

Kartografie Praha, Inc., Prague
geographical and school maps and atlases, road maps and atlases, tourist maps, city plans and other cartographic products, e-shop
<http://www.kartografie.cz>

KartografieHP, Ltd., Jičín
relief maps, lenticular maps, orientation charts, pictorial relief maps
<http://www.kartografiehp.cz>

P.F.art, Ltd., Brno
maps, advertising agency
<http://www.pfart.cz>

PLANstudio, Ltd., Prague
digital maps, interactive maps, Internet maps
<http://www.puamstudio.cz>

Prokart, Ltd., Doksy
city plans, orienteering maps, orientation charts
<http://www.repreob.hyperlink.cz/prokart>

SHOCart, Ltd., Zádveřice
tourist maps, map guides, cyclotourist maps and guides, maps for water sports, road maps and atlases, on-line maps, city plans
<http://www.shocart.cz/cs>

Stiefel Eurocart, Ltd., Vyškov
wall maps, political maps, road maps, satellite images
<http://www.mapy-stiefel.cz>

Topograf, Ltd., Prague
cartographic products, information technologies
<http://www.topograf.cz>

ZES Brno, Inc., Brno
wall maps, city atlases, map lamination, map distribution
<http://www.zesbrno.cz>

Žaket, Ltd., Prague
city plans, tourist maps, road maps and atlases, wall maps, DTP studio, map printing
<http://www.zaket.cz>