National Report to the ICA
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1. Introduction

Croatia has been a member of the International Cartographic Association – ICA since 1995 and one of its obligations has been to submit national reports about its cartographic activities at general assemblies held every four years. The bearer of those activities in Croatia is the Croatian Cartographic Society. The State Geodetic Administration recognized the value and importance of those activities and has been financially supporting the work on national report for several years.

Croatia became a member of the ICA in Barcelona in 1995, where its first national report for the period 1991–1995 was submitted. Reports were also submitted for the period 1995–1999 in Ottawa in 1999, for the period 1999–2003 in Durban (The Republic of South Africa) in 2003, for the period 2003–2007 in Moscow in 2007. This report, which encompasses the period 2007–2011, is going to be submitted at the General Assembly of the ICA in Paris in 2011. As a result of the work, Croatia has a comprehensive overview of cartographic activities in the past 20 years, i.e. since it became independent state.

The report is divided into following sections: Official Cartography, Academic Cartography, Commercial Cartography and Other Activities. The report ends with Acknowledgments and Bibliography.

Such a report can never encompass all the activities for the previous period. This is because not all parties answered the call for collaboration. Nevertheless, the most relevant institutions and companies are represented in the report. It is a merit of individuals who contributed with their reports and those people are listed in the Acknowledgments chapter.

The list at the end of the report was based on data provided by collaborators on the report, searching the Croatian Scientific Bibliography database and other sources.
2. Official Cartography

2.1. State Geodetic Administration (SGA)
http://www.dgu.hr

The State Geodetic Administration (SGA) is a state administrative organization concerned with administrative and expert work from fields of geodesy, cartography, cadastre and photogrammetry. It also takes care of cadastre and geodetic-spatial system informatization, official state cartography (1:5000, 1:25 000, 1:50 000, 1:100 000, 1:200 000), geodetic documentation, statistical data about real estate cadastre, spatial units, network infrastructure, and state border geodetic-cadastral work.

The new State Survey and Real Estate Cadastre Law was adopted by a Decision of the President of the Republic of Croatia on January 26, 2007. The Law regulates state survey, real estate cadastre, spatial unit register, national spatial data infrastructure, geodetic work in local self-administration, geodetic work for special needs, authority of state survey and real estate cadastre work, structure and scope of SGA and the Croatian Geodetic Institute, data preservation and usage and control of state survey and real estate cadastre work.

State survey and real estate cadastre work are based on five-year and annual programs. Programs determine areas encompassed by basic geodetic work, topographic surveys and state map production, state border survey and marking, real estate cadastre production and program funding. Five-year programs are created by the Croatian Parliament and annual programs by the Government of the Republic of Croatia.

The SGA operates in the Central Office in Zagreb and 20 branch offices all over the Republic of Croatia. As an exception, the office of the City of Zagreb deals with administrative and expert work regulated by Law to be within the scope of the branch office.

Following internal administrative units were formed to do work of the Central Office in Zagreb:
1. Director's Office
2. Sector for Acquisition, Legal and Accounting Work
3. Sector for Topographic Survey and State Maps
4. Sector for Cadastral System
5. Sector for State Survey
6. Sector for Information System
7. Sector for National Spatial Data Infrastructure.

Sectors are managed by associate directors. They are further divided into departments, which are managed by heads and departments are divided into sections, which are managed by section leaders. The Sector for Topographic Survey and State Maps consists of two departments, each of which is divided into two sections: Department for Photogrammetry and Remote Sensing (Section for Photogrammetric Recording and Section for Photogrammetric Databases) and the Department for Topographic Survey and Cartography (Section for Topographic Survey and Section for Cartography).

The production of the topographic map 1:25 000 (TK25) was continued according to plan. All 594 sheets were put into official use. A new digital topographic map is being made at the same time the topographic data comprising the Fundamental Topographic Database are being topologically processed. Five hundred and thirty sheets of TK25 have been topologically processed so far, and topographic data for 309 of them are present in the topographic base.

Photogrammetric restitution of 560 sheets resulted in a digital relief model with a resolution of 25×25 m.

The production of the Croatian Base Map 1:5000 (Hrvatska osnovna karta – HOK) is almost over. Namely, these detailed maps currently cover approximately 99% of Croatia (9682 sheets out of 9802)
and maps of newer editions were produced digitally for areas of larger cities. Six hundred twenty three sheets of HOK have been made official and produced since 2007.

Within the CRONO GIP I project, the SGA collaborated with consultants from Norway in 2003 and developed and produced a program for vectorizing analogously produced sheets of the Croatian Base Map 1:5000. The TopoCap program has been used to vectorize 580 sheets of Croatian Base Map, separate layers for contour lines, situation and waters.

Digital orthophoto maps 1:5000 (DOF5) have been produced since 2001, thus 9772 sheets out of 9811 have been produced so far, with 9620 being in official use. DOF5 is one of basic sets of spatial data for establishing a system for identifying land parcels (LPIS project). Colour recording has resulted in 3926 sheets since 2006, while DOF5 for the rest of Croatia is going to be produced from the new colour recording within the LPIS project. Recording is done using a digital camera, with spatial resolution (GSD) being 40 cm or less. DOF5 is being produced in the new terrestrial reference system (HTRS96/TM), which requires the use of a new sheet division. In the new division, Croatia is covered with 10 981 sheets at the scale 1:5000, with one sheet having dimensions 3000 m on axis E and 2000 m on axis N. Sheet divisions are defined by Technical Specifications for Procedures of Calculation and Sheet Division of Official Maps and Detailed Sheets of Cadastral Plan in the Republic of Croatia – HTRS96/TM Map Projection, which have been officially used since July 30, 2009.

The project titled Croatian Map for Every Pupil was started in 2007, and the SGA has been providing each pupil of 3rd grade of elementary school with a sheet of the latest edition of TK25. The map sheet given to a pupil represents the area of his school and is in pocket format. In 2009, pupils of 3rd grade of elementary school in 19 counties were given 46 558 map sheets at the scale 1:25 000.

A project also worth mentioning is the Wall Map (kartozid), intended to promote cartography. The SGA produces a large topographic map for each county centre. Nine out of 21 wall maps have been put up in centres of counties of Dubrovnik-Neretva, Krapina-Zagorje, Bjelovar-Bilogora, Virovitica-Podravina, Medimurje, Koprivnica-Križevci, Slavonski brod-Posavljle, Sisak-Moslavina and the City of Hvar. The wall map of the Dubrovnik-Neretva County is listed in the Guinness Book of Records as the “world’s largest printed map”.

According to regulations of the State Survey and Real Estate Cadastre Law, new Topographic Survey and State Map Production Regulations were made in 2008.

The scientific-expert project Production of an Object-Oriented Conceptual Model of Topographic Database at the Scale 1:25 000 (TBP25) and Establishment of a Cartographic Base for the Scale 1:25 000 was conceived in 2008.

In the middle of 2009, a project was created with the title Implementation of CROTIS–GML Project Results into Existing document of CROTIS ver 1.1.

The project Production of Updating Specification of the Fundamental Topographic Database (TTB) and Production of Updated Sheets of TK25 was made. The project is going to define a system of national topographic data management.

Papers by employees of the SGA published between 2007 and 2011 can be found in the Bibliography chapter.
− Conducting developmental-research projects
− Controlling quality of collecting and processing spatial data and products of the SGA
− Providing professional help for establishing spatial databases of the SGA
− Establishing and records geographic names
− Working on standardizing geodetic work and procedures.

On July 23, 2010, the Government of the Republic of Croatia adopted the annexation of the Croatian Geodetic Institute to the State Geodetic Administration of the Republic of Croatia, with the Institute losing legal subjectivity.

Cartographic activities of the Institute between 2007 and 2011 can be summarized as:
− Quality control of topographic map at the scale 1:25 000 and vector topographic data. The final review of TK25 sheets was done for a total of 278 sheets:
  ▪ 2007 – 75 sheets
  ▪ 2008 – 167 sheets
  ▪ 2009 – 36 sheets
  ▪ 2010 – 127 sheets
− Quality control of digital orthophoto maps at the scale 1:5000. The final review of DOF5 sheets was done for a total of 6283 sheets:
  ▪ 2007 – 265 sheets
  ▪ 2008 – 2157 sheets
  ▪ 2009 – 3861 sheets
− Quality control of digital orthophoto maps at the scale 1:5000, and the LPIS establishment project:
  ▪ Quality control of 6859 sheets (priority areas P1–P5)
− Quality control of digital orthophoto plans at the scale 1:2000. The final review of DOF2 sheets was done for a total of 26 cadastral surveys (including sea property registration projects):
  ▪ 2007 – 4 surveys
  ▪ 2008 – 8 surveys
  ▪ 2009 – 14 surveys
  ▪ 2010 – 19 surveys
  ▪ 2011 – 17 surveys
− Proposal for updating the Croatian Base Map at the scale 1:5000 (October 2009)
− Homogenization of vector data for the topographic map at the scale 1:25 000 (November 2009)
− Transformation of maps of the SGA into the new official position datum and projection – data transformation procedures for needs of establishing the LPIS agricultural land parcel database (May 2009)
− Project of sheet division of official scales of maps from 1:250 000 to 1:500 in the HTRS96/TM projection reference system (submitted to the SGA in January 2009)
− Participation in the work of the Committee for Production of Topographic Survey and State Map Production Regulations (Regulations produced in December 2008 and published in Narodne novine 109/08),
− 24th International Cartographic Conference, Santiago, Chile, November 15–21, 2009. – presentation of the paper Detailed Quality Control of Topographic Map at the Scale 1:25 000 and the poster Proposal of Nomenclatures of the New Official Map Sheets of the Republic of Croatia
− The First National Conference on Geographic Names was held in Zadar in October 2009. Institute employees presented three papers at the conference. Establishment of a national committee for geographic names was initiated at the conference.
− Work in the Committee for Production of Specification for Updating the Fundamental Topographic Base.
− Participation in the Working Group for Producing Capacity of Establishing NSDI (Željko Hećimović), the Working Group for Technical Standards (Slavko Lemajić) and the Working Group for NSDI Business Model (Bojan Barišić)
Inclusion into EuroGeoNames – at the beginning of December of 2009, the Republic of Croatia was connected to the database system EuroGeoNames (EGN) for official geographic names of Europe. Croatia is currently among 12 countries in the EGN system. EGN was developed in the eContentPlus EU project and is now managed by EuroGraphics, although Bundesamt für Kartographie und Geodäsie (BKG) from Frankfurt, Germany is still operatively servicing the system. The central service is located in BKG, and after querying for geographic name, twelve national bases from various countries are searched. The Croatian database is located on CGI’s server. This was the first database networking at the EU level and was a predecessor to INSPIRE. The service is available at http://www.eurogeonames.com/refappl, and the Croatian interface is available by choosing the language (HRV) in the upper right corner of the main page.


2.3. Ministry of Defence of the Republic of Croatia (MORH)
http://www.morh.hr

The Department for Military Cartography is an organizational unit of the Ministry of Defence of the Republic of Croatia (MORH), the basic task of which is to supply the Armed Forces of the Republic of Croatia (Croatian Land Forces – HkoV, Croatian Air Force – HRZ and the Croatian Navy – HRM) with cartographic and other geospatial products, data and services for the territory of the Republic of Croatia, as well as for foreign areas where Croatian forces operate within NATO UN or EU in humanitarian or military actions of peace support.

The Department for Military Cartography does not have its own production capacities, thus all products, data and services are bought or traded. Activities in the previous period included:

- Collaboration with the State Geodetic Administration (SGA)
  - According to the Agreement About Collaboration in Official Cartography between MORH and SGA, the official data of civil fundamental topographic base (1:10 000) are used in production of military topographic and cartographic databases and corresponding military maps at scales 1:50 000 and 1:250 000. Newly created military databases, except certain specific military data are also used by SGA and they are used to produce civil maps. In order to execute the Agreement, the Coordination Committee was established with 3 representatives from each side meeting on a regular basis and creating annual reports about work results, issues and plans for the coming period and presenting them to minister of defence and the director of SGA.
- Establishment and creation of the Military Geoinformation System – VoGIS
  - VoGIS is a project started in 2006, which has the goal of establishing digital topographic and cartographic databases for the area of Croatia and making them available to armed forces, as well as using the database to produce a standard military tactical (1:50 000) and military operative map (1:250 000). Establishment of VoGIS is in the final stage, but the plans are slowed down and its completion was postponed for 2013. One hundred seventy four sheets of the military topographic map 1:50 000 and 14 sheets of the 1:250 000 map with corresponding topographic and cartographic databases are going to be produced for the area of Croatia.
- Standardization of products and data, as well as adoption of Croatian Military Standards (HRVN) in the field of geoinformation
  - All military spatial databases and corresponding maps are produced according to corresponding ISO and NATO standards. At the same time, own military standards are being worked on. During 2010, 8 Croatian military standards (HRVN) were adopted, and 12 more are being considered for adoption. HRVN committees consist of members of the military, representatives of civil administrative, scientific and vocational private sector.
Collaboration with military geoorganizations members of NATO and members of the Partnership for Peace

- Between 2007 and 2011, collaboration developed bilaterally with military agencies, institutes and similar military organisations in the USA, Great Britain, Germany, Italy, Hungary, Slovenia, Bulgaria, Greece, Macedonia and the Czech Republic, as well as multilaterally through participation in annual NATO geospatial conferences, participation in cartographic workshops, as well as international cartographic conferences. The Technical Agreement on Collaboration on Military Geospatial Information was signed with the Ministry of Defence of the Republic of Italy in 2008, and the Memorandum on the Compliance of Collaboration on Military Geospatial Information was signed with the Ministry of Defence of the United Kingdom of Great Britain and North Ireland.

Production of cartographic material

- Croatian Military Topographic Map (HVTK50), scale 1:50 000 – 75 sheets
- Map of the Republic of Croatia, scale 1:500 000 – 1 sheet (wall map)
- Digital orthophoto maps of military locations, 1:5000 and 1:2000 – 67 sheets
- Map of the Republic of Croatia 1:1 000 000 – 1 sheet
- Auto Map of the Republic of Croatia 1:1 000 000 – 1 sheet.

2.4. Hydrographic Institute of the Republic of Croatia (HHI)
http://www.hhi.hr

The Hydrographic Institute of the Republic of Croatia carries out research, developmental and expert work related to Adriatic navigation safety, hydrographic-geodetic survey of the Adriatic, maritime geodesy, design and production of maritime and other maps, as well as nautical publications and aids, oceanological research, sea bed geological research, information system development and publishing-printing work.

The Institute is authorized for developing Adriatic navigation safety service, according to recommendations of:

- International Hydrographic Organization (IHO)
- International Maritime Organization (IMO)
- International Association of Lighthouse Authorities (IALA),

and in collaboration with the Ministry of the Sea, Transport and Infrastructure, Croatian Navy, harbour captaincies, Institution for Maintenance of Maritime Fairways and hydrographic institutes of maritimes countries.

Between 2007 and 2011, cartographic activities in the Hydrographic Institute of the Republic of Croatia manifested in completed and published projects, as well as projects not completed yet:

1. First editions of charts:
   - Chart no. 50, Pakleni kanal, scale 1:18 000, with addition plans Hvar Harbour, scale 1: 5000 and Marina Palmižana, scale 1:2500, March 2008,
   - Chart no. 32, Sedmovraće – Prolaz Veli Ždrelac, scale 1:35 000, November 2009.

2. New editions of charts:
   - Chart no. 300-31, Venezia – Zadar, scale 1:300 000, July 2007,
   - Chart no. 300-32, Ancona – Šibenik, scale 1:300 000, July 2007,
   - Chart no. INT3410, Rijeka – Venezia, scale 1:250 000, July 2007,
   - Chart no. 50-4, Riječki zaljev, scale 1:55 000, July 2007,
   - Chart no. 47, Ploče, scale 1:8000, April 2008 and April 2011,
   - Coastal charts (small maps – 29 maps), eastern Adriatic coast, scale 1:100 000, January 2008.

3. All other charts the Institute is covering Adriatic navigation safety were printed as new editions or as added printing with mechanical correction.

4. In addition to designing and producing charts, all published charts are regularly maintained by updating every month in the Notice to Mariners (OZP). Chart correction using plotters was introduced during 2008, as well as printing some charts using plotters.
The Cartographic Department of the Institute has continued producing and controlling quality of ENC cells covering the Adriatic Sea. A total of 91 ENC cells were published through the Primar distribution centre (Norway) at the beginning of 2011. It is about 90% of all ENC cells being planned for publishing.


A total of 89 plans of more important harbours of the Adriatic were produced for the new maritime navigation publication Peljar – Jadransko more.

List of Lights and Fog Signals, Adriatic Sea, Ionian Sea, Maltese Islands (HI-N-10), new supplemented edition from 2009.

Within the CRONO HIP project, between 2007 and 2009, a high precision scanner (KartoScan FB V) was used to scan all hydrographic originals, harbour plans and sounding sheets produced analogously (a total of 698 hydrographic originals, 847 harbour plans, camouflage berths and underground military ports and 35 sounding sheets). All scanned data were processed using the Prime graphical program and georeferenced in the Georef graphical program, while 73 hydrographic originals were vectorized using the Hydrocap graphical program. In addition, chart production is underway using dKart software modules, which use database and the charts are going to be published with a graticule on the WGS84 ellipsoid. They are general charts no. 300-31, 300-32, 300-33, 300-34, as well as coastal charts no. 100-15, 100-19, 100-22, 100-24, 100-27 and 100-28, which are being planned for publishing in 2011/2012.

**Contemporary Maritime Cartography Project**

Contemporary Maritime Cartography was a project financed by the Ministry of Science, Education and Sport. It was started in 2007 and ended in 2010. Scientific research on the project was done within four themes:

1. The first theme considered height datums of the Republic of Croatia. The Government of the Republic of Croatia made a decision in 2004 (Narodne novine 110/2004) regulating the geodetic datum as the only height datum of the Republic of Croatia, defining it as “Surface of a geoid determined by the mean sea level shown by mareographs in Dubrovnik, Split, Bakar, Rovinj and Kopar in the 1971.5 epoch and determined with a reference surface for calculating heights in the Republic of Croatia” and called the “Croatian Height Reference System for the 1971.5 Epoch – abbreviated as HVRS71”. The decision did not define the relation between HVRS71 and the “standard datum according to Trieste”, and the SGA was responsible for gradual introduction of the datum into official use by January 1, 2010. Since the relation of heights in the new height datum and the “standard datum according to Trieste” (which is still in official use) is not determined, height values in the new height datum were related to heights in the “standard datum according to Trieste” for mareographs in Dubrovnik, Split, Bakar and Rovinj. Calculations were done with mean sea level data for every hour for the period of 18.6 years in the 1971.5 epoch. In addition, two new height datums of the Republic of Croatia were introduced in the geodetic reference system of the Republic of Croatia: a hydrographic datum and a coastline datum, established on the Hydrographic Activities Law (Narodne novine 68/98). A hydrographic datum is a reference surface from which depths on official charts and plans are calculated and mapped. Most countries define the coastline as the intersection of mean level of high waters with the coast. Therefore, the coastline was determined as invariable; it is drawn onto charts and plans and can be considered the height datum. It is important to distinguish the coastline from the line defined as a land belt periodically under the sea (physical and geographic definition). Taking into consideration relevant international and national scientific literature, concepts of hydrographic datum and coastline datum are defined and their heights for mareographs in Dubrovnik, Split, Bakar and Rovinj were calculated for the 1971.5 epoch.

2. Defining the procedure of producing electronic navigation charts (ENC) includes defining the entire procedure of producing a series of ENC cells (general, coastal, harbour and berthing) for the Croatian part of the Adriatic Sea. It is being planned to split the ENC production process into several subprocesses in order to monitor and optimize the process. Following subprocesses were proposed: defining user groups for the Croatian part of the Adriatic Sea, proposal of new classification of ENC cells and proposal of ENC scales for various user groups. Proposals of scale
classification according to user groups made by IC-ENC experts (in 2003) and the CHRIS Committee (in 2004) are not acceptable for the Adriatic Sea and do not match the traditional paper chart production at the Hydrographic Institute of the Republic of Croatia. The intention of the subproject was to propose a classification of ENC user cell scales according to recommendations of the International Hydrographic Organization, but to adjust them to the archipelago sea type such as the northeast Adriatic Sea. In addition, based on experiences in the world and the long tradition of producing paper charts, a proposal is being planned of dividing ENC cells according to individual user groups. The cell division is adjusted to new navigation techniques and new methods of presentation and use of navigation information. The optimal number of cells for the Croatian part of the Adriatic Sea and the optimal range for each ENC cell were researched. In addition, the ENC cell database needs to be updated once or twice a month and this single database will be used as a basis for producing paper charts. All subprocesses were tested on a test ENC with default conditions tested.

3. During the process of adjusting for ENC production, known ENC cell content generalization methods were tested in real time (on-line) and applied to ENC cells of the Hydrographic Institute of the Republic of Croatia. Relatively simple and efficient ENC cell content generalization methods in real time for the archipelago sea of the northeast part of the Adriatic Sea were proposed. A research was made about applying the recommended SCAMIN object coding method, the application of which is planned to generalize content in real time, according to the S-57 standard of the International Hydrographic Organization. A research was also made of some new content generalization methods. Special attention was paid to object representation for navigation aid, which was researched separately due to its great importance in navigation system security, as well as their importance for chart representation. In addition, adjustment was made of topographic, hydrographic and navigation objects regulated by the S-57 standard as specificities of the Adriatic Sea. Objects regulated by the S-57 standard have to be grouped according to their importance.

4. The last research theme was the definition of produced ENC distribution and updating processes. Distribution and updating are last processes which enable users’ access to ENC and thus offer them a contemporary and reliable navigation system which conforms to obligations according to the SOLAS convention, the Technical Resolution of the International Hydrographic Organization, providing services and the Hydrographic Activities Law.

A list of papers published in the scope of the project can be found in the Bibliography chapter.

2.5. Croatian Geological Survey (HGI-CGS)
http://www.hgi-cgs.hr

The Croatian Geological Survey is the largest research institute in the field of geosciences and geological engineering in the Republic of Croatia. Geological data are a basis for solving numerous projects of national interest, such as fresh water supply, water and soil protection, construction of large infrastructural objects, city planning, defining reserves of mineral resources and environmental protection. Research is done using latest methodologies, as well as information and computer technologies.

Scientific work was performed within the project Geological Maps of the Republic of Croatia of the Ministry of Science, Education and Sport which encompasses eight fundamental projects:
- Base Geological Map of the Republic of Croatia 1:50 000
- Base Hydrogeological Map of the Republic of Croatia 1:100 000
- Base Engineering-Geological Map of the Republic of Croatia 1:100 000
- Base Geochemical Map of the Republic of Croatia
- Structural-Geomorphological Map of the Republic of Croatia 1:100 000
- Tectonic Map of the Republic of Croatia 1:300 000
- Map of Mineral Resources
- Geothermal Map of the Republic of Croatia
Individual maps of various scales in digital form were produced within these scientific projects. Thus, the project Base Geological Maps resulted in geological maps on sheets Cres-2, Rovinj-2 and Zagreb-2 at the scale of 1:50 000. The project Base Hydrogeological Maps at the scale of 1:100 000 resulted in sheets Rijeka, Split and Omiš, Zagreb, Ivanić Grad, Rogatec, Sisak, Zadar, Imotski. Sheets Zagreb, Krapina, Ivanić Grad and Crikvenica of the Base Engineering-Geological Map were produced at the same scale. At the end of 2009, the project Base Geochemical Map of the Republic of Croatia resulted in the Geochemical Atlas of the Republic of Croatia, which represents the spatial distribution of 27 chemical elements in the surface layer of soil for the entire area of the Republic of Croatia.

Bilateral collaboration has been established with the Republic of Hungary on harmonizing geological maps alongside the state border within the project Base Geological Map of the Republic of Croatia. Production of the mutual geological map sheet Slatina (Sellye) at the scale of 1:100 000 was completed in 2009, and it was presented in digital form and GIS.

The Croatian Geological Survey published the monograph Geothermal and Mineral Waters of the Republic of Croatia in 2008. The monograph contains scientific analyses of all aspects of waters which are supplemented with 36 corresponding geological maps, as well as 65 drawings and sketches.

The Institute published the Geological Map of the Republic of Croatia at the scale of 1:300 000 in 2009. The map was produced on the basis of 74 sheets of the Base Geological Map covering the area of Croatia. It was published in digital and printed forms.

In addition to mentioned scientific projects and publications, the Institute also produced thematic maps during the previous period. They varied in scale and use and were presented in digital and printed forms. The most important of them are:

- Geological and Engineering-Geological Map of the Sub-Sljeme Zone, 1:5000
- Geological and Engineering-Geological Map Along the “Dalmatina” Highway, sections Šestanovac-Ploče and Doli-Dubrovnik, 1:5000
- Geological and Engineering-Geological Map along the Karlovac-Rijeka Railway, 1:10 000, location of tunnels Kapela I and Kapela II
- Geological Map at the Location of the "Sveti Ilija" Tunnel on Biokovo, 1:10 000
- Engineering-Geological Map Along the Zagreb-Sisak Highway, 1:5000
- Hydrogeological Maps 1:100 000 of following areas:
  - Western part of the Drava Basin (up to Ferdinandovac)
  - Međimurje County
  - Zagreb County
  - Istria
  - Lika
- Map of Mineral Resource Potentiality 1:100 000 of following counties:
  - Split-Dalmatia
  - Šibenik-Knin
  - Međimurje
  - Varaždin
  - Zagreb
  - Dubrovnik-Neretva
  - Požega-Slavonija
  - Virovitica-Podravina

2.6. State Institute for Statistics
http://www.dzs.hr

The State Institute for Statistics (DZS) is a state administrative organization, the central body, leader, disseminator and coordinator of official statistics system of the Republic of Croatia.
The Institute operates according to the Official Statistics Law (NN, no. 103/03 and 75/09), and regular statistical research are conducted according to the Program of Statistical Activities of the Republic of Croatia 2008–2012 (NN, no. 65/08), which includes other ministries and institutions which form the official statistics system.

Annual execution plans determine names, content, range, execution method, territorial characteristics, deadlines and harmonization of individual statistical research with national and international standards. Following structural units were established for carrying out the Institute’s activities:

Special structural unit:

1. Director’s Office

Individual departments:

2. Department for International Support
3. Department for Project Execution
4. Department for Internal Revision
5. Department for Strategic Development of Statistical System

Sectors:

6. Sector of Business Statistics
7. Sector of Agriculture, Forestry, Fishing and Environmental Protection
8. Sector of Social Statistics
9. Sector of Economic Statistics
10. Sector of Statistical Infrastructures
11. Sector of Information, Services and Publications
12. Sector of Information Technologies
14. Sector for Execution and Development of Statistical Research in counties

Maps in the State Institute for Statistics are indirectly produced by the Department for Publications within the Sector of Information, Services and Publications and directly by the Section of Spatial and Other Statistical Registers within the Sector of Statistical Infrastructures.

The Sector of Information, Services and Publications is divided into three departments: Department for Publications, Department of Information and Department for User Relations.

The Department for Publications organizes, harmonizes and executes publishing activities of the Institute on the basis of publication design recommendations and graphic standards. It coordinates obtaining material from expert departments for production of publications, forms and directions proofreading, translation, technical and graphical design, digital and offset printing and preparations for publishing on the Institute’s website according to deadlines. It plans and collaborates with expert departments to determine publishing deadlines and controls their execution. It also proposes visual appearances (cover and format) of new publications, conceives appearance of statistical tables and graphs, etc. and controls quality.

One of the most important publications of the State Institute for Statistics is the Statistical Yearbook. It is a fundamental and comprehensive publication intended for a wide range of users: economists, officers, scientists, media and other users, ensuring them a reliable source of statistical data. The publication contains tables and graphs with data about the Republic of Croatia and maps of the Republic of Croatia and individual counties. These maps are produced by the Institute for Photogrammetry Inc.

The Sector of Statistical Infrastructures comprises three departments: Department of Statistical Register, Department of Administrative Business Register, Spatial Statistical Register and Statistical Analysis and the Department of Classification, Sampling, Statistical Methods and Analyses. The Department of Administrative Business Register, Spatial and Other Statistical Register, Section of Spatial and Other Statistical Registers work on production of various cartographic representations by theme, as follows:
1. Maps by counties representing uninhabited settlements, those with 1–5 inhabitants and those with 5–10 inhabitants, April 2010
4. Maps by counties and district representing the number of people whose mother tongue is Slovenian – produced for the needs of the Ministry of Justice, April 2010
16. Maps by counties representing the number of people convicted for intellectual ownership infringement for every 100 000 inhabitants – “Measuring Intellectual Ownership Infringement, a Study for Improving Methodologies of Collecting Statistical Data”, Zagreb 2008
17. Maps by counties representing all perpetrators (of legal age and minors) – convicted/found guilty of drug use for every 100 000 inhabitants, study and analysis “Drug Use 1998–2007”, Zagreb, 2010

Considering the increased user interest in representing statistical data in such a way, production of maps by various themes is expected to increase in the future.

2.7. National and University Library in Zagreb (NSK)
http://www.nsk.hr

The National and University Library in Zagreb is a cultural institution which is home to the largest collection of cartographic material in Croatia. Officially named the Collection of Maps and Atlases, it has collected about 40 000 sheets of all kinds, dimensions and geographic spaces of maps during its long existence (since 1945). Most of its fund is formed by maps representing Croatia. In addition to maps, the collection also acquires, processes, preserves and makes available more than 1000 volumes of atlases. Old maps and atlases produced from the middle of the 16th to the middle of the 19th century in wood and copper engraving, as well as a collection of manuscript maps are of special cultural, historical and scientific value of the collection. The collection is completely catalogued according to international standards, and bibliographic records are available in the Library’s web catalogue. The process of systematic digitization of the cartographic collection’s valuable fund is also of special importance. Wider public can gain insight into the rich cartographic and other fund of the Library via the Digitized Heritage of the National and University Library web page (http://www.nsk.hr/HeritageDetails.aspx?id=152). About 700 maps are digitized.

1494 maps and 144 atlases were included into the Collection’s fund during 2008, 2009 and 2010. Acquisition of very valuable older cartographic material was realized, for example:
1. Tabula V. Europae / [Laurentius Frisius]. [Strassbourg : Johann Grueniger, 1522].
3. Ilirici seu Sclavoniae continentis Croatiae, Carni, Istriam, Bosni, eiusque contermina
   provincias, recens ac emendatus typus / auctore Augustino Hirsvogelio. [Antwerpen: Cornelius de
   Jode, 1578].
   1688].
5. Golfo di Venezia / descritto dal P. M. Coronelli. Venezia: [s. n.], 1688.
6. Ristretto dell'a Dalmazia divisa ne suoi contadi: isole dela Dalmatia diuise ne' suoi contadi parte
   orientale / dal P. Coronelli. Venezia: [s. n., ca 1690].
8. Iso del Dalmatia diuise ne suoi contadi parte occidentale / [Vincenzo Maria Coronelli]. [Venezia,
   ca 1690].
9. Corso del Danubio da Vienna sin a Nicopoli e paesi adiacenti / descriti, e dedicati dal P. M.
   Coronelli. [Venezia, 1696] u 6 listova
10. Regnorum Hungariae, Dalmatiae, Croatiae, Sclavoniae, Bosniae, Serviae, et Principatus
    Transylvaniae. Amstelodami, 1705.
11. Contado di Sebenico / [Vincenzo Maria Coronelli]. Venezia, 1708.
12. Carte de geographie des differents etats de la Republique de Venise, l'abrege de son
    gouvernement politique et ecclesiastique... / [Henry Abraham Chatelain]. Amsterdam, 1708.
13. Imperii orientalis et circumsiacientium regionum sub Constantino Porphyrogentio et ejus
    praecessoribus descriptio / auctore Guillelmo del'Isle ; Anselmo Banduri. Paris : chez Dezanche,
    [1711].
14. Orbis Romani descriptio seu divisio per themata sub Imperatoribus Constantinopolitanis post
    Heraclii tempora facta / auctore Guillelmo Del'Isle; quae prodit Studio Anselmi Badurii. Paris:
    Guillelmo Del'Isle, [ca 1715].
15. Theater des Oorlogs in Hongarve tussen de Keyserlyke en de Turken = Theatre de la guerre en
    Hongrie entre les imperiaux [&] les Turcs / [Gerrit van Schagen]. [Amsterdam, 1729].
16. Dalmatia et regiones adjacentes, Croatia, Bosna, Slavonia, Servia, Albania, accurate descrip
de / Pet[e]r Con[rad] Monath excudit. Norimbergae, [ca 1730].
17. Carte du Golfe de Venise ou sont les Bouches du Po et de l'Adige avec l'Istrie dont les Venitiens
    / desses par F. de Cantelli. A Amsterdam: chez R. [&] J. Ottens, [ca 1740].
18. Partie meridionale du cercle d'Autriche, qui comprend la basse partie du duche de Stirie, le duche
    de Carinthe... / par Robert de Vaugondy; grave par Delahaye L'aime. [Paris], 1752.
22. I paesi che sono fra il Danubio la Drava ed il mare Adriatico. Siena, 1788.
25. General Charte von Ungarn: mit seinen Nebenlaendern Croatien, Dalmatien, Slavonien und
    Guessefeld. Nuernberg, 1805.

Old maritime atls:

The Collection was visited by cardinal Josip Bozanić (in the scope of official visit to the Library);
president of the Republic of Latvia, Dr. Valdis Zatlers (in the scope of official visit to the Library);
directors of European national libraries in the scope of CENL, ambassador of the Kingdom of Sweden
in Croatia Fredrik Valquist, as well as numerous other individuals and groups.

Considerable collaboration was realized in exhibition preparations:
Visitors were able to visit the entire Library and the Collection of Maps and Atlases within the manifestation Days of Open Doors of the National and University Library.

Thematic units which are going to be presented on the Library’s web site were digitized: old plans of Zagreb; old plans of other cities in Croatia; manuscript collection of maps and plans of Tvrđa in Osijek; maps of Croatia from the 19th century and a valuable acceptance of old maps of Croatia.

Employees of the Collection participated in following international conferences:

- Digital Approaches to Cartographic Cultural Heritage in the Cartographic Institute of Catalonia in Barcelona on June 26 and 27
- 16th LIBER GdC Conference – Future of Cartographic Collection and Cartographic Librarian in Archive and the University Library in Amsterdam from June 30 to July 4, 2008 (Croatia’s National Report for the period 2006–2008 was presented)
- Participation in the AKM seminar in Poreč from November 26 to 28, 2008 (poster presentation titled Digitized Cartographic Collection Portal Interface Analysis)
- International Conference on the History of Cartography (ICHC) in the Royal Library in Copenhagen from July 12 to 17, 2009.

Mira Miletić Drder, MSc is the head of the Library’s Cartographic Collection, and a list of her published papers for the period 2007–2011 can be found in the Bibliography chapter.

2.8. Croatian State Archive (CSA)
http://www.arhiv.hr

The Croatian State Archives is central archival institution in Croatia and perform archival services relating to archival and current records created by state bodies, state and public institutions and enterprises, and by corporate bodies, families and individuals whose activity covers the whole or a greater part of the Croatian territory, or are of State interest. In order to make the memories of Croatian nation available to public as much as possible, Croatian State Archives provide access to its documents under equal conditions for all researchers.

CSA, as any other state archives:
- Carry out measures for the protection and security of archival material in its custody
- Arrange, publish and enable use of archival records
- Perform professional supervision over preservation and selection of records outside the Archives
- Perform close supervision over the work of the archives and other records-owners outside the state archives system
- Take over public and collect private archival records through acquisition, donations or deposit
- Perform security and preservation microfilming and restoration and conservation of archival material
- Provide information, extracts from documents and certified transcripts at the users’ request
• Create and publish finding aids for particular funds and collections etc.

Along with this, Croatian State Archives as central and national archives:
• Keep Register of archival fonds and collections in the Republic of Croatia
• Keep Register of owners and holders of private archival records and Register of owners of private archives in the Republic of Croatia
• Keep records concerning archives stored in foreign archival institutions being of importance for the Republic of Croatia, as well as concerning archives of Croatian emigrants
• Keep Register of archives proclaiming cultural goods
• Keep Register of all archives of the Republic of Croatia
• Offer its opinion to the Minister of culture about plans and programs of state archives
• Composes education plans and other forms of professional training of archival staff.

Cartographic material of the Croatian State Archive consists of several collections and funds, the descriptions of which can be found via the archival information-record system ARHiNET, which is used to describe, process and manage archival material and represents an online register of funds and collections (http://arhinet.arhiv.hr/).

**Cartographic Collection (sign. HR-HDA-902)**

The Cartographic Collection is formed from regular material handovers (legal obligation), repurchases, donations or extraction from particular archival funds. The Collection currently consists of 4332 cartographic units. There is a total of 49 atlases, 4283 maps and plans. A cartographic unit may comprise one or more sheets, i.e. several hundred sheets if it is an atlas. Maps in the collection are processed according to the International Standard Bibliographic Description for Cartographic Materials – ISBD (CM) and described according to map type: general, topographic, cadastral, maritime, batimeric, forestry, vegetation-geographic, geological, geomorphologic, seismological, pedological, hydrological, climatological, war, military-didactical, historical, archaeoalogical, transport, airline, mail, kilometic, demographic, ethnographic, linguistic, economical, tourist, mountaineering, administrative, political, borderline maps, settlement plans, property maps and other maps (astronomic, trigonometric, medicine). Users are able to access a database using computers in the Reading Room of the Croatian State Archive and a collection level description in ARHiNET (http://arhinet.arhiv.hr/). Digitization of cartographic material and publishing in ARHiNET are being planned.

During the period between 2007 and 2011, a total of 65 maps and one atlas with 49 topographic maps and 1 book of kilometic maps (legal obligation) were bought.

**Collection of Construction Drawings (sign. HR-HDA-905)**

The Collection of Construction Drawings consists of drawings of public and private (rarely) objects. These drawings were made between 1770 and 1990. The Collection comprises drawings of 1139 object and is regularly updated with new ones – mostly by extraction from other archival funds. Considering objects they represent, the drawings are divided into 36 groups (Regulation Bases of Settlements, Conservation Studies, Spatial Plans and Position Plans of Streets and Squares, Educational Institutions, Educational and Social Institutions, Scientific Institutes, Health Objects, Institutes of Medicine, Justice, Administration, Cultural Institutions, Publishing, Monetary Institutions, Post, Military Objects, Police Stations and Guardhouses, Correctional Facilities, Industrial Objects, Mines and Quarries, State Properties, Co-operative Objects, Country Economic Objects, Veterinary Stations, Other Economic Objects, Road Construction, Railway, Bridge Construction, Continental Water Regulation, Harbour and Coast Arrangement, Sewage, water supply, water pumps, wells, House Objects, Tourist Objects, Castles, Fortresses, Church Objects, Cemeteries, Tombs, Monuments, Civil engineering tests, Furniture Drawings, Detail Drawings. The cartographic material represented in the Collection is processed according to the International Standard Bibliographic Description for
Cartographic Materials – ISBD (CM). Users are able to access the inventory in the Archive’s Reading Room and a collection level description in ARHiNET (http://arhinet.arhiv.hr/).

**Collection of Plans (sign. HR-HDA-904)**

The Collection of Plans consists of cartographic material of private, public and military objects which was formed between 1600 and 1941. The Collection comprises 536 cartographic units. All description units are grouped according to the local unit entry, and some units are grouped according to theme (e.g. worship buildings, blockhouses, inns, border-crossing houses, correctional facilities, mills, bridges, morgues, ovens, guardhouses, stables and sheds, military buildings and apartments) due to existence of an old list and files, which had been structured that way and already cited by users. Cartographic material represented in the Collection is processed according to the International Standard Bibliographic Description for Cartographic Materials – ISBD (CM). Users are able to access the inventory in the Archive’s Reading Room and a collection level description in ARHiNET (http://arhinet.arhiv.hr/).

**Land Government. Department of Internal Affairs (HR-HDA-79)**

This is a fund which preserves cartographic material made by the Land Government, Department of Internal Affairs, and which is related to public objects, rarely private objects. Processed cartographic material is from the period between 1869 and 1921. Considering objects they represent, cartographic units are divided into 30 groups (Regulation Bases, Conservation Studies, Spatial Plans and Positional drawings of Cities, Streets and Squares, Educational Institutions, Educational and Social Institutions, Health Objects, Institutes of Medicine, Administration, Cultural Institutions, Post, Military Objects, Correctional Facilities, Industrial Objects, Mines, Quarries, State Property, Country Economic Objects, Smaller Economic Objects, Trade Objects, Other Economic Objects, Road Construction, Railway, Bridge Construction, Continental Water Regulation, Hydrographic Objects, Melioration, Vessels, Sewage, water supply, water pumps, wells, aqueducts, waterings, House Objects, Tourist Objects, Forests, Forest Properties, Land Properties, Various Maps (borderline maps, Kilometric Maps, Cadastral Maps, Administrative Maps), Signs, Coat of Arms, Banners, Symbols, Test Work, Cemeteries, Tombs, Monuments. Corresponding cartographic material (drawings, plans, maps) are being processed and the Collection of Construction Drawings of the Department of Internal Affairs of the Land Government is being created. A total of 1013 cartographic units have been processed so far according to the International Standard Bibliographic Description for Cartographic Materials – ISBD (CM). Users are able to access the temporary inventory in the form of a Word document on computers in the Archive’s Reading Room.

**Map Archive for Croatia and Slavonia (HR-HDA-1421)**

The Map Archive for Croatia and Slavonia is a fund preserving cadastral material produced between 1847 and 1963. It is mostly cadastral material which resulted from the Franz I cadastral survey (the so-called “first stable cadastre”) and later revisions.

In order to increase their availability, original cadastral plans started becoming digitized in 2009 (using a rotational scanner). Publishing of digital images of cadastral plans on ARHiNET is underway and there are 8099 digital images currently available for 803 cadastral districts (see: http://arhinet.arhiv.hr/_Generated/Pages/ArhivskeJedinice.PublicDetails.aspx?ItemId=5308).

Digital images of original cadastral plans for all cadastral districts with available original cadastral plans are being planned for publishing by the end of 2011 or beginning of 2012.

A total of 26 sheets of cadastral plans were bought between 2007 and 2011.
**Cadastre of Istria**

The Archive continues collecting and image recording cartographic material related to Croatian land and outside Croatian borders. A total of 97 digital images of cadastral districts of Istria (cadastral material related to the Francis I cadastre at the Istria area).

**Exhibition “Dalmatinska Zagora – Unknown Land”, September 4 – November 18, 2007, Gallery Klovićevi dvori, Zagreb**

The Archive participated in preparing exhibits for this exhibition, which was opened thanks to support of the Ministry of Culture of the Republic of Croatia. Thirty two maps and plans were prepared for the thematic unit Viennese and Turkish Age, nine out of which were from the Cartographic Collection of the Archive (other maps were borrowed from the Croatian Historical Museum, State Archive in Zadar and Scientific Library). Dr. Stjepan Ćosić (director of the Archive) wrote the article Zagora on Old Maps and Cadastral Plans, which is supplemented with the mentioned maps.

**Exhibition “Slavonia, Baranja, Srijem – Springs of European Civilization”, April 27 – August 2, 2009, Gallery Klovićevi dvori, Zagreb**

The Archive participated in preparing exhibits for this exhibition, as well as in the exhibition concept committee (member Dr. Stjepan Ćosić, director of the Archive) which was opened thanks to support of the Ministry of Culture of the Republic of Croatia. The Archive participated in preparation of exhibits for the thematic unit Archival Material, with subthemes and expert work in which cartographic material of the Archive was used along with borrowed maps and plans from the Croatian Historical Museum and the State Archive in Osijek: Ćosić, S.: History of Slavonia on Old Maps and Jurić, M.: Old Cadastres of Slavonia, Baranja and Srijem. The exhibition comprised a total of 30 maps (one borrowed from the Croatian Historical Museum) and 16 cadastral plans (three borrowed from the State Archive in Osijek).

A virtual web catalogue of the exhibition with all exhibits and thematic units has been available since May 2010. The catalogue contains cartographic exhibits preserved in the Archive that were prepared for the thematic unit Archival Material (http://www.bastina-slavonija.info/).

**“Land Ownership?!” June 9, 2010, International Archive Day, Croatian State Archive, Zagreb**

The Archive organized an exhibition on the occasion of the International Archive Day with the goal of introducing the general public to the cadastral material preserved in the Archive. Exhibition author M. Jurić prepared material from the Map Archive for Croatia and Slavonia fund. A total of 25 exhibits were prepared (cadastral plans, indication sketches and field drafts).

**Permanent Exhibition of the Croatian State Archive**

Five maps and plans from the Archive’s Cartographic Collection and one plan from the Map Archive for Croatia and Slavonia were prepared for the Archive’s permanent exhibition.

**Lending Cartographic Material for Exhibition**

The Archive lent two maps from the Cartographic Collection for the exhibition Blago Kotorške biskupije, Zagovori svetom Tripunu which was set in the Gallery Klovićevi dvori from December 14, 2009 to February 14, 2010.
2.9. Lexicographic Institute “Miroslav Krleža”
http://www.lzmk.hr

The Lexicographic Institute "Miroslav Krleža" is the central Croatian lexicographic institution. It was established on the initiative of writer and polymath Miroslav Krleža on October 5, 1950. Since then, editions of the Institute have been an important contribution to maintaining and raising the Croatian intellectual standard. Encyclopaedia, atlases, dictionaries, lexicons and bibliographies of the Institute have traditionally been reliable and explaining facts from Croatian heritage in a recognizable way.

On May 29, 2003, the Croatian Parliament adopted the Lexicographic Institute Law, which has regulated the Institute's legal status, activities and structure. According to the Law, the Institute is a public institution of special interest to the Republic of Croatia. The Republic of Croatia is the founder of the Institute, and its rights and duties are executed by the Ministry of Science, Education and Sport.

The Cartographic Department of the Lexicographic Institute "Miroslav Krleža" continued bearing the entire cartographic production of the Institute during the period 2007–2011. The Department produces geographic, topographic and thematic maps for most of the Institute’s editions. The Department employs five cartographers and four geographers-lexicographers. Maps are produced using the OCAD computer program.

The Cartographic Department of the Institute contributed to following editions during the period 2007–2011:

- *Croatian Encyclopaedia*, from 9 to 11, final volume (thematic black and white and colour maps, geographic maps of Croatia 1:300 000 and geographic maps of other countries)

2.10. Croatian Institute of History

http://www.isp.hr

Research of Historical Geography at the Croatian Institute of History is encompassed by the scientific-research project *Description of Lands of the Kingdom of Croatia on Military Maps from the 18th and 19th Century* as an integral part of activities of the Institute’s Department of New Age History. The project is led by Mirko Valentić and project collaborators are Ivana Jukić (up to 2010) and Ivana Horbec.

The basic project research guideline is the acquisition and publishing of archival material related to cartographic representations of Croatian lands produced during the 18th and the 19th centuries. Emphasis was put on researching Habsburg military cartography and engaging state institutions in mapping and describing those areas for military needs, especially activities of the Generalquartiermeisterstab and the Military-Geographic Institute in Vienna (Militärgeographisches Institut). Therefore, much of the research is conducted in the Vienna War Archive, where the cartographic collection contains numerous descriptions, maps, plans and sketches of Croatian lands.

In 1999, the Croatian Institute of History started publishing the book series *Croatia on Secret Maps of the 18th and 19th Centuries* intending to publish sections of the First (Joseph II) Survey of the Habsburg Monarchy for the areas of Civil Croatia, Slavonia and the Military Border with corresponding military descriptions. The survey was led by the Generalquartiermeisterstab from 1763 to 1787, and the area of Croatia was mapped in the following order: Banska krajina 1774–1775, Karlovački generalat 1775–1777, Slavonski generalat 1780–1781, Varaždinski generalat 1781–1782, Civil Slavonia 1781–1783 and Civil Croatia 1783–1784. Since the Joseph II Survey did not map areas of Istria and Dalmatia (then a part of the Viennese Republic), the area was to be represented by the Second (Francis) Topographic Survey of the Habsburg Monarchy conducted by the Generalquartiermeisterstab and the Military-Geographic Institute in Vienna from 1808 to 1869. Istria was mapped from 1825 to 1835 and Dalmatia was mapped from 1851 to 1854. Sections of the survey are also preserved in the Map Collection of the Vienna War Archive.
Each volume of the series contains material for one administrative area (pukovnija or županija) which encompasses: reproductions of sections of topographic survey of the area at the scale of 1:28 800 and a description corresponding to a particular section – transliterated from German gothic and translated to Croatian. Each volume also contains introductory text (M. Valentić, M. Slukan-Altić, R. Rill), as well as detailed toponymy and indexes. A total of 10 volumes were published by 2007.

The 11th and 12th volumes were published during the period 2007–2011. They encompass areas of the County of Zagreb. Most of the research and preparations are completed for publishing of the 13th volume, which is going to encompass the County of Severin, and preparations are underway for processing materials of the pukovnije of Bansa krajina and the Karlovački generalat. Further project work is going to depend heavily on financial capabilities.

2.11. Institute for Migrations and Nationalities
http://www.imin.hr

Dr. Dubravka Mlinarić works at the Institute for Migrations and Nationalities. Since the winter semester of the academic year 2008/09, she has been leading a seminar *Cartographic Sources of Croatian Lands: Ecohistorical Approach*, within the postgraduate doctoral study of the Croatian Early New Age at the Centre for Comparative Historical and Intercultural Studies of the Early New Age at the Faculty of Humanities and Social Sciences of the University of Zagreb. Several doctoral theses about the history of cartography are currently registered, with completed structure and doctoral workshops. Dr. Mlinarić is a mentor to those students and assists them in browsing available literature and sources and conceptualizing their dissertations.

She also maintains regular annual correspondence and coordination of regional activities in the international association International Map Collectors' Society (IMCoS) as the national representative of the Republic of Croatia.

Dr. Mlinarić has been a regular member of the Society for Croatian Economic History and Ecohistory since 2005, having participated in its establishment. She is also a member of the Editorial Board of the *Ekonomskai ekohistorija* journal, which is published by the Society and which contains papers from the field of historical cartography.

She has reviewed scientific papers from the field of history of cartography in journals such as *Cartography and Geoinformation*, the journal of the Croatian Cartographic Society and *Hrvatski geografski glasnik*.

Dr. Mlinarić participated in preparing an exhibition and selecting material from the field of history of medicine and history of cartography from the State Archive in Zadar and the Novak Cartographic Collection, as well as in the exhibition and its catalogue for the exhibition Dalmatinska Zagora – Unknown Land. The exhibition was organized in September of 2007 in the Gallery Klovićevi dvori in Zagreb.

A list of papers by Dr. Mlinarić can be found in the Bibliography chapter.

2.12. Institute of Social Sciences Ivo Pilar
http://www.pilar.hr

Assist. Prof. Dr. Mirela Slukan-Altić works at the Institute of Social Sciences Ivo Pilar. She has been the leader of the project *Historical Atlas of Cities – Historical Identity and Contemporary Development of Croatian Cities* (no. 194-1940657-0654) from January 2, 2007.

Dr. Slukan-Altić lectured:

− One-semester courses at the Department of History of the Faculty of Humanities and Social Sciences:
1. Introduction to Reading Old Maps

2. Cartographic Sources for Croatian History
   - One-semester course at the Department of History of the University of Pula:
     1. Historical Cartography/Historical Geography

A list of papers by Assist. Prof. Dr. Mirela Slukan-Altić can be found in the Bibliography chapter.

2.13. Office for Managing Emergency Situations of the City of Zagreb

http://www.zagreb.hr

During the academic year 2009/10, the Scientific-Expert Collaboration Agreement was signed between the Office for Managing Emergency Situations (Ured za upravljanje u hitnim situacijama Grada Zagreba – UHS) and the Faculty of Geodesy of the University of Zagreb. According to the agreement, the collaboration manifests in production of mutual studies and research within the Protection and Rescue Plan of the City of Zagreb, offering consultant services and helping introduce new methods in the Plan creation, as well as holding expert lectures within the course Risk Management of the University Graduate Study of Geodesy and Geoinformatics.

During the summer semester of the academic year 2009/10, the Head of the Office, Pavle Kalinić, MSc held two guest public lectures, Managing Emergency Situations in the City of Zagreb and Terrorism, which were attended extremely well, and students of the Faculty of Geodesy taking the course Risk Management worked on concrete tasks in producing the Protection and Rescue Plan of the City of Zagreb.

Students produced cartographic signs for various objects in the Plan. They used existing standardized symbols used in the world for producing cartographic representations related to protection and rescue. These are primarily signs used by the UN. Finally, the final version of the sign set to be used in the Protection and Rescue Plan was completed. The system Orchestra, which enables linking data at the international level, was also presented during the exercises.

The collaboration continued during the winter semester of the academic year 2009/10 with the course Spatial Development of the 3rd semester of graduate study. Exercises in that course included coordinate determination of atomic shelters in the City of Zagreb. The collaboration continued during the summer semester of the academic year 2010/11 with the course Risk Management, which has been held in English. Course exercises continue to contain coordinate determination of institutions in the City of Zagreb (for example schools, scientific institutions, state and city administrations, etc.). The end of the semester is going to feature a lecture and visit to the Office, and students were presented with new versions of GISCLOUD and the system Geotrag (vehicle following using a GIS application) by the Omnisdata company.
3. Academic Cartography

3.1. Centre for Geoinformation and Cartography of the Croatian Academy of Engineering
http://www.hatz.hr

The Croatian Academy of Engineering (HATZ) is an association of select distinguished scientists from fields of technical and biotechnical sciences which promotes those sciences by gathering and stimulating collaboration between scientists of various technical, biotechnical and other professions in order to support efficient scientific and economic development of Croatia without the intention of making profit.

Activities of the Academy are organized in departments, centres, permanent committees and other organization forms. Centres are scientific-research units of the Academy established for individual fields of science with the goal of promoting scientific research due to their direct application in economy and they were established by the Regulation about Organization and Activities of Centres of the Croatian Academy of Engineering. Members of a centre are organized according to projects.

The Centre for Geoinformation and Cartography is a scientific-research unit of the Academy established for the field of geoinformatics and cartography with the goal of promoting scientific research due to their direct application in society, administration and economy. The Centre was established at the 19th Assembly of the Academy on November 5, 2004. The head of the Centre is Prof. Dr. Miljenko Lapaine, who is also the vice-president of the Academy.

Within its program Creation of Croatian Expert Terminology, the National Foundation for Science, High Education and Technological Development of the Republic of Croatia financed the project Cartography and Geoinformation Dictionary, Phase 1, which the Centre for Geoinformation and Cartography worked on in 2009 and 2010. A systematic research approach to cartographic and geoinformatic terminology was ensured based on experience gained from working on the Geodesy and Geoinformation Dictionary. Terminological issues of the profession which arose during the research were solved in workshops organized with linguists. Considering the experience gained from working on the Geodesy and Geoinformation Dictionary, it was obvious that one year was not enough to produce and complete the entire Cartography and Geoinformation Dictionary. Therefore, the project proposal title includes “Phase 1”. The first phase consisted of following basic parts:
1. Introduction to terminological principles, terminological database and terminological manual (organization of the 1st workshop in Zagreb)
2. Production of alphabet list of entries
3. Analysis of selected subset of cartography and geoinformation terms
4. Analysis of treated material (organization of the 2nd workshop in Zadar)
5. Continued work on the dictionary
6. Final evaluation of project work (organization of the 3rd workshop in Zagreb)

The project was successfully completed and it was presented at the International Cartographic Conference held in Santiago (Chile) in November of 2009.

3.2. Faculty of Geodesy of the University of Zagreb
http://www.geof.unizg.hr

For years, the Institute for Cartography was one of five institutes of the Faculty of Geodesy of the University of Zagreb. It was established in 1965, but did not however have its fiftieth anniversary. At the end of 2005, two existing institutes (Institute for Cartography and Institute for Photogrammetry) were replaced with the new Institute for Cartography and Photogrammetry of the Faculty of Geodesy. According to the new organization, the Institute consists of three chairs: Chair for Cartography (head Assist. Prof. Dr. R. Župan), Chair for Geoinformation (head Prof. Dr. M. Lapaine) and Chair for Photogrammetry and Remote Sensing (head Assist. Prof. Dr. D. Gajski). The chairs are fundamental structural units of teaching, scientific, research and expert work at the Faculty.
Since the academic year 2005/06, teaching for the first three study years has been held according to the new undergraduate study program of Geodesy and Geoinformatics, which is adjusted to the Bologna Process. Teaching for a new graduate study has also been held since the academic year 2008/09. Teaching for the postgraduate specialist study of geodesy and geoinformatics was held for the first time in the academic year 2010/11. Cartography and geoinformation are represented in that study with courses GIS and Cartography, Web Map Production and Geospatial Data Generalization. In the doctoral study, students interested in cartography can choose the course Cartography of the Adriatic by Prof. Dr. M. Lapaine.

Following doctoral dissertations were defended from 2007:
- Ivana Racetin: STOKIS Dynamization, 2007, mentor Prof. Dr. M. Lapaine
- Robert Župan: Geovisualization Possibilities Using a PDA Device in Tourist Cartography, 2008, mentor Prof. Dr. S. Frangeš
- Dražen Tutić: Stereographic and Other Conformal Projections of Croatia, 2009, mentor Prof. Dr. M. Lapaine
- Vesna Poslončec-Petrič: Spatial Data Distribution for the Needs of Official Cartography of the Republic of Croatia, 2010, mentors Prof. Dr. S. Frangeš and Prof. Dr. Ž. Bačić

During the period 2007–2011, following projects related to cartography were worked on at the Faculty of Geodesy of the University of Zagreb:
- Cartography of the Adriatic, leader Prof. Dr. M. Lapaine
- Croatian Cartographers, leader Prof. Dr. M. Lapaine
- Oldest Geodetic Textbook, leader Prof. Dr. M. Lapaine
- Geodesy and Geoinformation Dictionary, leader Prof. Dr. M. Lapaine
- Translation of the geoinformation dictionary for use on other media and its supplement with new terms with special emphasis on the field of spatial data infrastructure, leader Prof. Dr. M. Lapaine

In addition, individual employees of the Faculty of Geodesy collaborated on projects of other institutions:
- Contemporary Maritime Cartography, leader Dr. N. Leder, Hydrographic Institute of the Republic of Croatia, Split
- Cartography and Geoinformation Dictionary, Phase 1, leader Prof. Dr. M. Lapaine, Croatian Academy of Engineering

Employees of the Faculty of Geodesy actively participated in following conferences related to cartography and geoinformation:
- Scientia Est Potentia – Knowledge is Power, FIG Commission 2 Symposium, Prague, June 7–9, 2007
- 23rd International Cartographic Conference, ICA, Moscow, August 4–10, 2007
- 2nd International Conference on Cartography and GIS, Borovets, January 21–14, 2008
- 13th International Conference on Geometry and Graphics, Dresden, August 4–10, 2008
1st ICA Symposium on Cartography for Central and Eastern Europe, Vienna, February 16–17, 2009
ICA 50th Anniversary, ICA, Swisstopo, Bern, June 9–10, 2009
27th International IMCoS Symposium, IMCoS, Oslo, September 6–9, 2009
Adriatic – Contemporary Geographic Issues, Department of Geography of the University of Zadar and the Croatian Geographic Society – Zadar, Zadar, September 10–12, 2009
2nd Symposium of Chartered Engineers of Geodesy, Croatian Chamber of Chartered Engineers of Geodesy, Opatija, October 23–25, 2009
1st Conference of the Croatian National Platform for Disaster Risk Reduction, Zagreb, November 9–10, 2009
24th International Cartographic Conference, ICA, Santiago Chile, November 15–21, 2009
 Croatian NSDI and INSPIRE Day and the Cartography and Geoinformation Conference, Varaždin, November 26–28, 2009
5th International Workshop on Digital Approaches in Cartographic Heritage, Vienna University of Technology, February 22–24, 2010
24th FIG International Congress, Sydney, April 11–16, 2010
3rd International Conference on Cartography and GIS, Nessebar, June 15–20, 2010
14th International Conference on Geometry and Graphics, Kyoto, August 5–9, 2010
itAIS 2010, VII Conference of the Italian Chapter of AIS, Information Technology and Innovation Trend in Organization, Naples, October 8–9, 2010
2nd Conference of the Croatian National Platform for Disaster Risk Reduction, Zagreb, October 14–15, 2010
3rd Symposium of Chartered Engineers of Geodesy, Opatija, October 22–23, 2010
2nd Croatian NSDI and INSPIRE Day and the 6th Cartography and Geoinformation Conference, Opatija, November 25–28, 2010

Employees of the Faculty of Geodesy also participated in the 8th Festival of Science held in the Technical Museum in Zagreb, April 19–25, 2010 with a lecture *GPS and PDA Devices and Their Application in Geodesy and Cartography*, the exhibition *Children’s Works from Croatia at Competitions of the International Cartographic Association* and the workshop *Children Draw the World*, and acknowledgments were awarded for the Croatian Cartographic Conference's competition for the best children's map.

Within the 9th Festival of Science, held in the Technical Museum in Zagreb, April 19–25, 2011, employees of the Faculty of Geodesy participated with lectures *Light and Shadow on Maps*, Josip Ruđer Bošković and Cartography, Bošković and the Earth’s Shape, workshop Light on Maps – Shaded Relief Representations and the contest Draw a Map.

Following exhibitions were organized at the Faculty of Geodesy of the University of Zagreb:
- Exhibition about student practice on the Island of Hvar, academic year 2009/10
- Exhibition of student works produced within the course Digital Cartography in the winter semester of the graduate study of geodesy and geoinformatics, January to April, 2011
- 300 anniversary of the birth of Ruder Bošković, exhibition at the gallery of the Faculty of Geodesy, April to June, 2011.

Following cartographic representations were produced and published at the Faculty of Geodesy of the University of Zagreb:
- Duga Resa City Plan
- Labin-Rabac Area Bicycle Track Map
- Gacka Region Tourist Map
- County of Zagreb Bicycle Routes Map
Cartography representations in Naša Djeća Tourist Guides
- Cartographic representations for the needs of the exhibition “Stećci” – Klovićevi dvori
- Imotski Area Map
- Trpanj District Map
- Split City Plan – New Edition 2010
- National Park Plitvička Jezera Tourist Map 2011
- Dubrovnik City Plan – New Edition 2011

Let us also point out following important books published by employees of the Faculty of Geodesy:
  The lexicon was awarded the Oton Kučera Award of Matica hrvatska for Science.

A list of published papers related to cartography and geoinformation by employees of the Faculty of Geodesy can be found in the Bibliography chapter.

3.3. Geographic Department of the Faculty of Sciences of the University of Zagreb
http://www.geog.pmf.hr

The Geographic Department is one of seven departments of the Faculty of Sciences of the University of Zagreb. According to new curricula of the Geographic Department which are a result of changes made according to the Bologna Process, there are considerably more cartographic and geoinformatic content within various courses of the undergraduate and graduate study of geography. This content is especially represented in the orientation Geographic Information Systems (profession: GIS analyst).

Following courses are compulsory for all orientations of undergraduate studies (Physical Geography with Geocology, Spatial Planning and Regional Development, Heritage and Tourism, Geographic Information Systems): Cartography, Geoinformatic. Students of graduate studies are offered following compulsory or elective courses (according to orientation) related to cartography and GIS: Analyses in GIS, Spatial Data Visualization in GIS, Digital Relief Analysis, GIS Analysis of Cultural Landscape, Application of Computers in Teaching Geography and Real Estate Cadastre and Remote Sensing, which are also taught by professors of the Faculty of Geodesy of the University of Zagreb.

The course GIS in Spatial Planning is lectured within the new postgraduate (doctoral) study of geography at the Geographic Department titled Geographic Bases of Spatial Planning and Design.

Scientific work was done within the following scientific projects:
- Geomorphologic and Geocologic Research of Karst of the Republic of Croatia (head Sanja Faivre)
- Environmental Changes and Cultural Landscape as a Developmental Resource (head Borna Fürst-Bjeliš)
- Geographic Evaluation of Spatial Resources of Rural and Karst Areas of Croatia (main researcher Dane Pejnović)
- Effect of Globalization and Transition on the Regional Development of Croatia (main researcher Zoran Stiperski)
- Spatial Characteristics of Demographic Resources of Croatia (main researcher Ivo Nejašmić)
- Geographic Research of Border Areas of Croatia (main researcher Ivan Crkvenčić)
- Space as a Resource of Tourist Development of Croatia (main researcher Zoran Ćurić)
- Effect of Climate Changes on Social-Geographic Elements in Croatia (main researcher Anita Filipčić)
- Urban Systems in the Spatial Development of Croatia (main researcher Dražen Njegač)
Geomorphologic Mapping of the Republic of Croatia (main researcher Andrija Bognar).

Within the scientific projects, numerous thematic maps were published in scientific papers with the goal of explaining relevant spatial structures and processes. Some of them were made in GIS as a result of spatial analyses. Geographic scientific papers were published in scientific journals in which GIS was applied in spatial analyses and production of thematic maps.

It is especially worth mentioning the collaboration established with geographers from Potsdam (Germany). Within the mutual project of producing the Demographical Atlas of Croatia (classic and web atlas), a database was formed in GIS and cartographic visualization in adequate software is underway. A workshop was held at the Geographic Section of the University of Potsdam (Demographic Atlas of Croatia – Workshop) with 15 participants from Potsdam and Zagreb. The work on the atlas resulted in participations in international conferences, such as the First ICA Symposium for Central and Eastern Europe 2009 which was held in Vienna in February of 2009, where there was a mutual presentation titled The Demographic Atlas of Croatia – A Web-Based Atlas Information System (authors Hartmut Asche, Aleksandar Toskić, Dubravka Spevec, Rita Engemaier) and the conference Applied Geography in Theory and Practice, which was held in November of 2010 and organized by the Geographic Department of the Faculty of Sciences of the University of Zagreb, where the section titled Applied GIS and Other Geo-Information Technologies contained a presentation titled Collaborative Development of the Web-Based Croatian Demographic Atlas Information System DACIS (authors Hartmut Asche, Aleksandar Toskić, Dubravka Spevec, Rita Engemaier). The conference also featured presentations titled Population Distribution Change in Istria County (authors Luka Valožić, Aleksandar Toskić, Dražen Njegać) and Forest at the End of the City: Deforestation and Urbanization in Medvednica Protected Area (authors Luka Valožić, Marin Cvitanović), and which included application of GIS and remote sensing.

Since 2008, active collaboration has been done with the Agency for Education, which organizes GIS workshops every year for elementary and high school geography teachers in order to promote lifelong learning and expert and pedagogical competences in the fields of cartography and GIS.

Collaboration has been established in 2009 on a project related to reducing mine suspicious areas in the Republic of Croatia and the Republic of Bosnia and Herzegovina by means of remote sensing (Luka Valožić actively participated in geocoding of collected material and data vectorization).

Several lectures organized by the Croatian Geographic Society were held at the Winter Seminar and the Summer Seminar, expert conferences for elementary and high school teachers of geography:

2007:
Aleksandar Toskić: GIS in School
Dubravka Spevec: GPS and its Application in Teaching Geography

2008:
Nenad Buzjak: Use of GPS Devices in Teaching Geography
Workshops (in groups): GPS in Practice (leaders: Dubravka Spevec, Nenad Buzjak)

2010:
Mladen Pahernik: Contemporary Topographic Maps within Geoinformatics

2011:
Mladen Pahernik: Geoinformation Technology Application Capabilities in Teaching Geography

In 2009, the Croatian Geographic Society published the book Demographic Resources of the Republic of Croatia: Synthetic Indicators for Counties, Cities and Districts (authors Nejašmić, I.; Toskić, A. and Mišetić, R.) with numerous thematic maps.
3.4. Department of Geography of the University of Zadar
http://www.unizd.hr

During the period between 2007 and 2011, the Department of Geography of the University of Zadar and the Croatian Geographic Society – Zadar carried out various cartographic activities within their regular and special activities. Some of those activities were realized independently, while others were realized in collaboration with the university Centre for Karst and Littoral Research and the Centre for Adriatic Onomastic Research, Croatian Geographic Society, Croatian Cartographic Society, Faculty of Geodesy of the University of Zagreb, State Archive in Zadar, Scientific Library in Zadar, Hydrographic Institute of the Republic of Croatia, etc.

Much was done (teaching, scientific research of cartographic heritage, popular-scientific lectures, exhibitions, production of thematic maps, etc.), although more could certainly have been achieved. Considering the expert staff is not numerous and the infrastructure is not adequate, digital cartography and its theory and application have not been developed enough. Nevertheless, compared to the period from 2003 to 2007, certain steps were made in that field, especially the organization of teaching of geoinformatic courses and implementation of GIS knowledge and skills in scientific-research work.

Cartographic activities of the Department of Geography of the University of Zadar were carried out at teaching, scientific and expert levels. Within the scientific and teacher undergraduate and graduate study of geography, cartography and geoinformation sciences were taught within following courses Cartography I, Cartography II, Geoinformatics, Multimedia Geography, Digital Cartography, GIScience – Geospatial Information Science and GIS Application in Spatial Planning. Teaching was realized by employees of the Department of Geography (J. Faričić, A. Šiljeg, B. Vukosav, A. Blače, etc.) and external collaborators Prof. Dr. M. Lapaine, Prof. Dr. M. Jurišić, Assist. Prof. Dr. M. Pahernik and Assist. Prof. Dr. I. Racetin. Engagement of geodesists, geographers and agronomists from other Croatian high education institutions contributed to the teaching, especially interdisciplinarity. Unfortunately, external collaboration was greatly reduced due to financial issues. Considering real needs, it was planned to further develop the remote sensing module which had been partially considered within the courses Cartography II and GIScience – Geospatial Information Science.

Relatively much was done on cartographic heritage research and production of thematic maps, which supplemented numerous scientific and expert geographic papers. Results of those research and other expert papers were published in Croatian and foreign journals (Geoadria, Cartography and Geoinformation, e-Perimetron, etc.) and scientific monographs (Toponymy of the Ugljan Island, Toponymy of the Vrgada Island, Toponymy of the Murter Island, The Island of Rava, Olib – Island, Village and People, Islands Ist and Škarda, etc.) and other publications (proceedings, etc.). Certain scientists from the Department of Geography of the University of Zadar participated with cartographic themes in international and national scientific conferences (in Santiago, Vienna, Nikšić, Kupres, Zagreb, Zadar, Varaždin, etc.).

The mentioned monographs and numerous scientific conferences presented latest results of studying the rich cartographic heritage of the Republic of Croatia and the Adriatic in the context of considering the development of scientific knowledge of the Croatian coastal and island space and reconstruction of complex landscape changes based on various cartographic sources. These scientific achievements were mostly accomplished within the scientific project Geographic Bases of Development of Croatian Coastal Regions (financed by the Ministry of Science, Education and Sport of the Republic of Croatia) led by the main researcher Damir Magaš.

In September of 2009, the Department of Geography of the University of Zadar and the Croatian Geographic Society – Zadar organized the international scientific conference Adriatic – Contemporary Geographic Issues. The motive was the 15th anniversary of the Department of Geography (at the time of establishing the Department for Geography of the Faculty of Philosophy in Zadar) and the 20th anniversary of the Croatian Geographic Society – Zadar. The conference featured numerous
geographic and cartographic themes, which were presented in interesting lectures by Miljenko Lapaine, Robert Lončarić, Lena Mirošević, etc.

In October of 2009, the University of Zadar and the Croatian Geographic Society organized the First National Scientific Conference on Geographic Names in Zadar and on the Island of Krpanj. Numerous scientists participated in the conference with lectures: from the University of Zadar, Geographic Department of the Faculty of Sciences of the University of Zagreb, the Croatian Geological Survey, Institute for Croatian Language and Linguistics and the Lexicographic Institute Miroslav Križa, and the conference’s work was actively followed by representatives of the Faculty of Geodesy of the University of Zagreb and the Croatian Cartographic Society. Following interesting lectures about various aspects of studying toponyms, there was a round table about the need of establishing a national body for geographic names, according to the recommendation of the Committee for Geographic Names of the United Nations. The conference was followed by preparations of a working version of the proposal of establishing a national committee for geographic names which is currently being worked on by representative of various scientific institutions.

In collaboration with the Croatian Geographic Society – Zadar, the Department of Geography of the University of Zadar organized several popular-scientific lectures and book presentations. These occasion paid adequate attention to cartography and especially cartographic heritage. Lectures *Historical Geography of the Krka River in Cartographic Sources* (Mirela Slukan Altić, 2009) and *Where is the Centre of the World?* (J. Faričić, 2010) are worth special mention.

In sum, Zadar is gradually becoming one of Croatian cartographic cores, related primarily to geographic aspects of cartography.

### 3.5. Department of History of the University of Zadar

http://www.unizd.hr

Prof. Dr. Mithad Kozličić works at the Department of History of the University of Zadar. He is the main researcher of the project *Development of Navigation and Geographic Knowledge in the Croatian Adriatic*, which has been realized with support of the Ministry of Science, Education and Sport of the Republic of Croatia since 2007. Prof. Dr. Kozličić is also the leader of the program *Eastern Adriatic: Population and Space*, which has also been realized with support from the Ministry of Science, Education and Sport of the Republic of Croatia and which has encompassed several projects since 2007.

Prof. Dr. Kozličić participated in following conferences:
- Cartography, Geoinformation and the Sea, Zadar, 2007
- Maritime Archaeology and the History of Middle and New Ages, Zadar, 2009
- Croatians and Illyrian Provinces, Zadar, 2009

A list of published papers by Prof. Dr. Mithad Kozličić can be found in the Bibliography chapter.

### 3.6. Institute for Pedology of the Faculty of Agriculture of the University of Zagreb

http://www.agr.hr

Employees of the Institute for Pedology of the Faculty of Agriculture of the University of Zagreb continued with intense cartographic activities during the period 2007–2011 and applying contemporary GIS technology. Several geoinformation projects were completed during this period and numerous thematic maps for various users were produced based on those projects. Several significant projects were conceived in the form of Land Information Systems.
The first project is related to the production of Geographic and Land Information System (GIZIS) of the Sopje District with maps produced according to criteria and standards of producing pedological maps 1:25 000. This information system is the first example of GIZIS production at the level of cities and districts in Croatia.

The second project concerns the creation of the information system Map of Agricultural Land Sensitivity and Potential Vulnerability of Subterranean Water to Pollution from the Surface of the Agricultural Land in the Republic of Croatia, which was created according to criteria of producing pedological maps 1:100 000.

The third project is also related to the production of the information system Regionalization of Fruit and Vine Production in the County of Zagreb. By using this information system created according to criteria of producing pedological maps 1:100 000, it is possible to produce numerous thematic maps (maps of fruit species suitability), thus they are a basis for planning fruit-growing development in the County of Zagreb.

One of the more important projects is the Agroecological Regionalization of Fruit-Growing in the Lika-Senj County, which resulted in an information system with the same name, according to criteria and standards of producing maps 1:100 000.

In addition, there were several projects with thematic and pedological maps at the scale of 1:100 000, in printed and digital form. We would like to emphasize following maps:
- Pedological Map of the Agricultural Land of the Split-Dalmatia County at the Scale 1:100 000
- Map of Agricultural Land Irrigation Suitability of the Split-Dalmatia County at the Scale of 1:100 000
- Map of Agricultural Land Irrigation Suitability of the Lika-Senj County at the Scale of 1:100 000
- Pedological Map of the Bujiština Area at the Scale of 1:25 000
- Map of Soil Irrigation Suitability of the Bujiština Area at the Scale of 1:25 000
- Pedological Map of the Labinština Area at the Scale of 1:25 000
- Map of Soil Irrigation Suitability of the Labinština Area at the Scale of 1:25 000

3.7. Centre for Adriatic Onomastic Research of the University of Zadar
http://www.unizd.hr

The Centre was established within the University of Zadar in 2003. Scientific-research activity of its employees is mostly related to the scientific project Onomastica Adriatica led by Prof. Dr. Vladimir Skračić and started January 2, 2007. The project researches contemporary and historical toponymy of North Dalmatian islands and is systematized and analysed in toponomastic monographs. At the beginning of 2008, the Centre published the Toponymy of the Island of Ugljan (392 pages), in 2009 the Toponymy of the Island of Vrgada (130 pages), and in 2010 the Toponymy of the Island of Murter (366 pages). Toponymy of the Island of Pag is being prepared for printing. Central to the published monographs are thematic onomastic maps produced in digital form based on topographic maps at the scale of 1:25 000. More about the production of those maps and cartographic presentation of toponyms can be found in those monographs’ chapters about methodologies. Centre’s employees and collaborators also research historical, topographic, ownership and cadastral maps representing the researched islands. Thus the Centre collaborates with the Department of Geography of the University of Zadar, whose employees actively participate in scientific analyses of North Dalmatian islands from the toponomastic-geographic perspective. More about the Centre’s toponomastic monographs and their content, the Centre itself and its employees can be found at the University of Zadar web site.
3.8. Chair for Urbanism of the Faculty of Architecture of the University of Zagreb  
http://www.arhitekt.hr

Prof. Dr. Nenad Lipovac works at the Chair for Urbanism of the Faculty of Architecture of the University of Zagreb. Books by Prof. Dr. Lipovac about Petrinja (German and English edition) were awarded the 3rd prize in the publication category at the 18th International Salon of Urban Planning held in Niš, Serbia from November 6 to 13, 2009. The Croatian edition titled *Petrinja – Spatial-Historical Development of the City* was published by the Faculty of Architecture of the University of Zagreb in 2010.

Prof. Dr. Lipovac lectured the elective course *American Cities until the End of the 19th Century – Reading the History of City Establishment through Various Mapping Forms* at the Chair in the academic year 2009/10. A list of his papers for the period 2007–2011 can be found in the Bibliography chapter.

3.9. Chair for Transportation and Geodesy of the Faculty of Civil Engineering of the J. J. Strossmayer University in Osijek  
http://www.gfos.hr

Prof. Dr. Brankica Malić works at the Chair for Transportation and Geodesy of the Faculty of Civil Engineering of the J. J. Strossmayer University in Osijek. A selection of her papers from the field of cartography published between 2007 and 2011 can be found in the Bibliography chapter.
4. Commercial Cartography

4.1. Geofoto Ltd., Zagreb
http://www.geofoto.hr

Geofoto was established in Zagreb on September 1, 1993 as a company registered for photogrammetry, geoinformatics, cartography and cadastre. During the last 17 years, it has grown into the Geofoto Group, which currently consists of 13 companies. The company’s basic activities are: aerial photogrammetric imaging, digital photogrammetry, cadastral survey, creation of topographic and cadastral databases, design and creation of geoinformation systems and solutions, and digital cartography. The Group’s members are present all over the world: Geofoto (Zagreb), Branch Office Geofoto Osijek, Infomax (Zagreb), Geofoto BiH (Orašje), Geofoto Zenit (Skopje), Geofoto London (London), Terramap Praha (Prague), Geofoto Scandinavia (Oslo), Geofoto Beograd (Belgrade), Geofoto Latinoamerica (La Paz), Geofoto Argentina (Buenos Aires), Terramap USA, International Geofoto Switzerland (Lugano), Geofoto Bulgaria (Sofia).

As one of the 10 leading companies in the world and the leading company in the field of geodesy and geoinformatics in Europe, the Geofoto Group currently employs 145 experts, whose knowledge is the basic strength and value of the company.

The Geofoto Group operates in the international market, with its main focus on Europe, Middle East and Latin America, Asia and Africa. Geofoto’s clients are governments (Sudan, Panama, Poland, Italy, Hungary…), state institutions (Albanian Aluizni, Bolivian SNA, Norwegian Statens Kartverk, Danish Agency for Cadastre and Spatial Data…), international institutions (MCA, EU – CARDS, Phare, World Bank…) and global companies (Boeing, USA Navy…). Main clients in Croatia include (State Geodetic Administration, Ministry of Defence, Ministry of Agriculture,…) and various agencies (HRC, PlinaCro, Janaf) and city administrations (Zagreb, Rijeka). The Group’s income over the last five years has grown at an average rate of 37%, and about 35% of total income comes from export. The company’s management expects an average growth of 25% with a significant increase of import in the coming years.

At the beginning of 2010, the European Bank for Reconstruction and Development became a minor shareholder of the Geofoto Group. By this partnership with an international financial institution present in 29 Central European and Asian countries, the Geofoto Group’s management gained additional support for important strategic decisions, as well as the further business model and production process development. In addition to its highly educated employees, the company’s basic strength is advance technology and advantage over competition by owning four airplanes with aerial photogrammetric imaging cameras (Cessna Citation II, two Cheyenne I airplanes, Turbo Piper Aztec with Vexcel UltraCam X and Vexcel UltraCam Xp cameras). In addition, in 2010 the company bought the LIDAR (Light Detecting and Ranging) system, which enables laser terrain imaging, i.e. aerial scanning of objects which enables a large quantity of important data, which are subsequently used to produce products such as digital relief model, vegetation database, objects, traffic routes, etc.

In 2006, Geofoto established the Geofoto Foundation to support talents and promote geodesy and geoinformatics through student scholarships and scientific research support.

The company worked on the following since 2007:

*Large-scale maps and plans:*

- Istarski 109
- Uredaj za pročišćavanje 5
- otpadnih voda grada Sisak PGP 69
- Zrakoplovna baza Zagreb 28
- Južna i sjeverna obala Općine Blato
- Bihać-Barani, Kamenic, Čeravci I, Repušine

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31
i Trg Maršala Tita 5 TP1000
Prometnica St. Peličeti-Pomer PGP 20 TP1000
Autocesta A1 dionica Doli-Osojnik 78 TP1000
Općina Punat PGP 31 TP2000
Općina Medulin PGP 42 TP1000
Otok Brač-zona Jerkovića PGP 5 TP1000
Grad Senj-Sv. Juraj, Bunica i Burnjak PGP 14 TP1000
Oton i Kozjak PGP 140 TP1000
Kompleks Galdovo-Kaptolsko i
Transportni kolektor IIIib PGP 19 TP1000
Petrinja-trasa kolektora PGP 5 TP1000
Poljanica Okička 1 TP1000
Tiquipaya VM 113 TP1000
Općina Lumbarda PGP 27 TP1000
Klizište Kostanjek-Podsused 9 TP1000
Bolnica Sv. Duh u Zagrebu 1 TP1000
Grad Sisak PGP 32 TP1000
GUP grada Zagreba i Sesveta 2007. 513 1:5000
VI policijska postaja – pano fotokarta 5 1:7500
GUP grada Zagreba 2009 441 1:5000
Pano GUP-a Zagreba 1 1:5000
GUP grada Zagreba i Sesveta 2010 513 1:5000
GUP grada Zagreba i Sesveta 2011 513 1:5000

Topographic maps TK25 and other topographic and thematic maps:
TK25 područja vojnog poligona Slunj 5 1:25 000
TK25 Ličko-Senjske županije 8 1:25 000
TK25-LOT4 (BiH) 2 1:25 000
VoGIS – VTK50 184 1:50 000
VoGIS – JOG-G 14 1:250 000
PPPP Medvednica 10 1:25 000
Karte župa u BiH 285 1:50 000
AERODROME OBSTACLE CHART – ICAO 2 1:10 000
Stari Grci u Hrvatskoj 19 S 1:10 000 – S 1:10 000 000

Height representation topological data and photogrammetric mapping data (according to TK25 sheets)
apalysis: about 1 222 000 hectares.

Digital Orthophoto (DOF)
Naftna polja okrug Slavonija In colour 241 DOF1
Albanija In colour 4214 DOF1
In colour 4439 DOF2
In colour 2661 DOF5
Plinovodi 2007 In colour 1405 DOF1
Sisak-gradevinska područja In colour 50 DOF2
INA Naftaplin - 8 polja In colour 382 DOF2
K.o. Vrbovec DOF1 In colour 52 DOF1
Zadar - GUP i PP In colour 91 DOF5
Zapadnohercegovačka županija DOF5 In colour 258 DOF5
Rijeka DOF1 In colour 162 True orthophoto 1
Nicaragua - Leon In colour 742 DOF1
Koridor Vc In colour 443 DOF1
Blato DOF1 In colour 46 DOF1
K.o. Krapina DOF2 In colour 17 DOF2
St. Peličeti-Pomer In colour 20 DOF1
4.2. Gisdata Ltd., Zagreb

http://www.gisdata.com

Gisdata Ltd. is a part of the international Gisdata Group formed by companies in Croatia, Slovenia, Bosnia and Herzegovina, Serbia, Macedonia and Hungary with branch offices in Kosovo and Great Britain. Gisdata Ltd. is a private company established in Zagreb in 1989 which has developed into the leading company for implementation of information systems, technologies and services in South East Europe.

The company’s primary activities include planning, development and maintenance of information systems, creation and maintenance of digital databases, working with GPS technology, remote sensing (satellite and aerial images), technical and business consulting, education and distribution for products of leading global suppliers.
Between 2007 and 2011, Gisdata Ltd. produced a series of plans and maps, some of which include:

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<td>Ministarstvo poljoprivrede, šumarstva i vodnog gospodarstva – Uprava za veterinarstvo</td>
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<td>Razmještaj općih, kliničkih i specijaliziranih bolnica, zavoda za javno zdravstvo i lječilišta za svaku od 5 regija</td>
<td>Ministarstvo zdravstva i socijalne skrbi</td>
<td>2007</td>
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<tr>
<td>Razmještaj domova zdravlja, poliklinika, privatnih ordinacija, ordinacija u zakupu i medicinsko-biokemijskih laboratorija za svaku od 5 regija</td>
<td>Ministarstvo zdravstva i socijalne skrbi</td>
<td>2007</td>
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<td>Razmještaj socijalnih ustanova za svaku od 5 regija</td>
<td>Ministarstvo zdravstva i socijalne skrbi</td>
<td>2007</td>
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<tr>
<td>Prosječna udaljenost subjekata koji proizvode opasni medicinski otpad po tipovima subjekata Količina i struktura godišnjeg otpada po regijama</td>
<td>Ministarstvo zdravstva i socijalne skrbi</td>
<td>2007</td>
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<td>Broj stanovnika regija i količina otpada po stanovniku godišnje</td>
<td>Ministarstvo zdravstva i socijalne skrbi</td>
<td>2007</td>
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<tr>
<td>Odlagališta otpada u radijusu od 50 km od regionalnih centara</td>
<td>Ministarstvo zdravstva i socijalne skrbi</td>
<td>2007</td>
</tr>
<tr>
<td>Prosječna udaljenost odlagališta otpada od regionalnih centara</td>
<td>Ministarstvo zdravstva i socijalne skrbi</td>
<td>2007</td>
</tr>
<tr>
<td>Karta Republike Hrvatske 1:480 000</td>
<td>Zagreb Montaža</td>
<td>2007</td>
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<td>Karta Europe 1:4 800 000</td>
<td>Zagreb Montaža</td>
<td>2007</td>
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<tr>
<td>Karta područja grada Zagreba 1:26 000</td>
<td>Zagreb Montaža</td>
<td>2007</td>
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<td>Karta svijeta 1:40 000</td>
<td>Zagreb Montaža</td>
<td>2007</td>
</tr>
<tr>
<td>Kartografski prikaz nuklearnih elektrana u srednjoj Europi 1:1 100 000</td>
<td>Državni zavod za nuklearnu sigurnost</td>
<td>2007</td>
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<td>Kartografski prikaz NE Krško i Pakš 1:1 230 000</td>
<td>Državni zavod za nuklearnu sigurnost</td>
<td>2007</td>
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<tr>
<td>Kartografski prikaz sektora i planske zone najveće ugroženosti NE Krško 1:45 000</td>
<td>Državni zavod za nuklearnu sigurnost</td>
<td>2007</td>
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<tr>
<td>Karta Republike Hrvatske za prikaz u tiskanom magazinu CREM 1:1 150 000</td>
<td>Oglasnik d.o.o.</td>
<td>2008</td>
</tr>
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Map title | Publisher | Year
--- | --- | ---
Atlas vinogradarstva Republike Hrvatske 1:570 000 | Business Media Croatia d.o.o. | 2008
Vinogradarske podregije | Business Media Croatia d.o.o. | 2008
Atlas logistike | Business Media Croatia d.o.o. | 2009
Karta odlagališta otpada 1:1 200 000 | Business Media Croatia d.o.o. | 2009
Karte alpskih skijališta | Znanje d.d. | 2009
Karta pokrivenosti VIPnet mrežom 1:550 000 | VIPnet d.o.o. | 2009
Turistička karta Medvednice 1:30 000 | JU Park prirode Medvednica | 2009

Digital maps

Interaktivni kartografski prikaz [www.njuskalo.hr](http://www.njuskalo.hr) | Njuškalo d.o.o. | 2007
Interaktivni kartografski servis [www.moh.hr](http://www.moh.hr) | Moderna hrvatska | 2009
Konzum lokator, Interaktivni kartografski servis | Konzum d.d. | 2009
Interaktivni kartografski prikaz [www.zastita-prirode.hr](http://www.zastita-prirode.hr) | Ministarstvo kulture | 2009
Interaktivni kartografski prikaz [www.zaba.hr](http://www.zaba.hr) | Zagrebačka banka d.d. | 2009

Digital atlases

Digitalni model reljefa Srbije 1:50 000 | Gisdata | 2007
Digitalni atlas Beograda, Niša, Kragujevca, Novog Sada | Gisdata | 2007
Digitalni model reljefa Beograda, Niša, Kragujevca, Novog Sada | Gisdata | 2007
Pokrov i upotreba zemljišta za Beograd, Niš, Kragujevac, Novi Sad | Gisdata | 2007
Digitalni atlas Crne Gore 1:50 000 | Gisdata | 2008
Digitalni atlasi gradova u Crnoj Gori 1:5000 | Gisdata | 2008
Pokrov i upotreba zemljišta gradova u Hrvatskoj | Gisdata | 2009
Digitalni model reljefa gradova u Hrvatskoj | Gisdata | 2009

4.3. Institute for Photogrammetry Inc., Zagreb
http://www.zzf.hr

The Institute for Photogrammetry Inc. has the staff and equipment for all work in the field of geodesy, applying classical geodetic procedures, as well as aerial photogrammetry, terrestrial photogrammetry and GPS technology of leading global manufacturers. Data are processed digitally, and plans and maps are produced applying highly automated processes. The Institute is prepared for upcoming challenges due to constantly following technological development and scientific achievements and systematically training young engineering staff.

The Institute for Photogrammetry Inc. Zagreb produced a series of plans and maps between 2007 and 2011:

Topographic Map 1:25 000

- Production of topographic maps at the scale of 1:25 000 (TK 25) for the area of the Šibenik-Knin County (2007–2008) – 21 sheets
- Production of topographic maps at the scale of 1:25 000 (TK 25) for the area of the Lika-Senj County (2008–2009) – 10 sheets
- Topological data processing of topographic maps at the scale of 1:25 000 (2009) – 30 sheets
- Updating topographic maps at the scale of 1:25 000 (TK 25) and the fundamental topographic base (TTB) for the area of City of Varaždin (2010) – 8 sheets
Digital Orthophoto 1:2000
- For the area of the City of Varaždin (2007–2008)
- True orthophoto of the centre of the City of Varaždin (2007)
- For the area of the Brckovljani District (2008)
- For the area of the City of Sveta Nedelja (2008)
- For the area of the City of Virovitica (2009)
- For the area of the City of Varaždinske Toplice (2009)

Topographic plan at the scale of 1:1000 for the area of the City of Varaždin (2008–2009)

Hydrographic atlas of the Drava River in Croatia between borders with Slovenia and Hungary (2008–2009)

GIS EuroGlobalMap – collecting and processing spatial data for EuroGlobalMap 1:1 000 000 (2007–2009)


3D digital model of the City of Varaždin centre with a representation on Google Earth (2009)


4.4. Geodetic Institute Inc., Split

http://www.geozavod-st.hr

The Geodetic Institute Inc. Split is a company with a long tradition of producing various geodetic and cartographic products. It was established at the end of 1946 with the name Regional Geodetic Institute of Dalmatia. In 1994, it became a corporation owned by employees and changed its name to Geodetic Institute Inc. Split. It should be mentioned that although it underwent numerous changes, the company has preserved its basic activities and is one of the oldest companies in Dalmatia.

The Geodetic Institute is a company with contemporary technology and staff. An ideal bond of youth and experience contributes to the quality of creating mostly state projects.

Activities of the Institute include projecting and geodetic work including basic geodetic work, geodetic documentation, real estate cadastre, land subdivision studies, thematic and topographic maps, digital relief models, digital orthophoto plans, monitoring construction objects, etc.

For a long time, the company has been collecting and processing spatial data for needs of producing analogous and digital maps and plans. Cartographic products resulting from the Geodetic Institute, Inc. Split are: topographic maps, Croatian Base Map, data for the CROTIS topographic base, digital orthophoto and various thematic maps.

During the previous period (2007–2011), the Geodetic Institute, Inc. Split participated in production of several cartographic products:

Topographic Map 1:25 000
1. The Zadar County: 8 sheets (Ondić, Mazin, Neteka, Doljani, Velika Popina, Osredci, Vrelo Zrmanje and Plavno) – 2008 and 2009
2. The Lika-Senj County: 5 sheets (Krbava, Udbina, Donji Lapac, Lovinac, Sveti Rok) – 2009
3. The Požega-Slavonija County and Osijek-Baranja County: 3 sheets (Savski Dol, Levanjska Varoš, Selci Đakovacki) – 2009

Topological data processing for the topographic map 1:25 000 was also done for those areas.

Digital Orthophoto Plans
   ……………………………………………………………………………30 sheets (2009)

4.5. Geodetic Institute Inc., Osijek
http://www.gzo.hr

Geodetic Institute Inc. Osijek is a company with a long tradition. It was established in 1947 with the
name Geopremjer. It changed names over the years until finally getting its current name Geodetic
Institute Inc. Osijek. It is one of Croatia’s leading companies in aerial imaging, cadastral studies,
topographic maps, thematic maps of various scale and content, GIS, 3D terrain models, etc.

During the last four years (2007–2011), the Geodetic Institute Inc. Osijek participated in production of
several cartographic products:

Cadastral surveys:
DL 1000 – 339 sheets
DL 2000 – 111 sheets
DOF2 – 236 sheets

TK25:
Brod-Posavina County – 15 sheets
Zadar County – 9 sheets
Osijek-Baranja County – 22 sheets

Atlas of the Drava River from 0.00 km to 70.00 km

Orthophoto city plans:
Osijek and Bjelovar

4.6. Geodetic Institute Inc., Rijeka
http://www.gzr.hr

The Geodetic Institute Inc. Rijeka is a modern company following all technological achievements and
trends in geodesy and informatics and has access to the latest equipment. It covers the whole range of
activities in geodesy related to photogrammetry, cadastral survey, engineering geodesy and lately
geoinformatics.

The Institute’s main activity is state survey, which includes terrain survey of entire cadastral districts
and production of digital orthophoto at the scale of 1:2000. The Department of cartography produces
official maps at the scales of 1:5000 and 1:25 000.

During the period 2007–2011, the Geodetic Institute Inc. Rijeka produced the following:

Topographic Map TK25
Šibenik 4 sheets
Plitvice 2 sheets
Kutjevo 1 sheet
Koprivnica-Križevci County 5 sheets
Lovinac 1 sheet
**Croatian Base Map 1:5000 (HOK)**

Trigonometric sections:

- **Bunić**: 7, 8 2 sheets
- **Korenica**: 37, 47, 48 3 sheets
- **Melinovac**: 22, 31, 32, 33, 41, 42, 43 7 sheets
- **Donji Lapac**: 6, 7, 8, 9, 16, 17, 18, 19, 20, 29, 30 11 sheets
- **Doljani**: 21 1 sheet
- **Plaški**: 12, 13, 14, 23, 24 5 sheets
- **Plitvice**: 17, 26, 27, 37, 38, 47, 48 7 sheets
- **Korenica**: 7, 17, 18, 27, 28, 38, 39, 40, 50 9 sheets

**Digital Orthophoto DOF (1:2000)**

- k.o. Ždrelac 11 units
- k.o. Omišalj 50 units
- k.o. Ražanaac 47 units
- section k.o. Bokanjac, dio k.o. Diklo, dio k.o. Crno 20 units
- section k.o. Kolan 17 units
- section k.o. Kostrena Barbara dio Urinj 10 units
- k.o. Radovin 49 units

4.7. Oikon Ltd., Zagreb
http://www.oikon.hr

Oikon Ltd. is an institute working in the field of applied ecology, its specialties being environmental protection, industrial ecology, environmental medicine, renewable energy sources, nature protection, natural resource management, ecological modelling, landscape ecology, remote sensing and geoinformatics. Oikon employs about forty people covering 13 expert fields (mathematics, informatics, physics, geology, biology-ecology, chemistry, environment management, economy, landscape architecture, forestry, architecture, construction, engineering), with an outspread network of two hundred external collaborators. Oikon does spatial analyses, cartographic processing and preparation of maps for its own needs and studies of environmental effects, natural resource management programs and nature protection studies and programs:

- Production of orthophoto from aerial images (1:5000/1:10 000) – various clients and for own needs
- Production of digital orthophoto from satellite images IRS, SPOT, Aster, Modis, NOAA, Spot vegetation (1:25 000/1:50 000) – various clients and for own needs
- Production of hunting ground areas for hunting economic bases (1:10 000/1:25 000) – various clients
- Production of maps for forest management programs (1:5000/1:25 000) – Forest Advisory Service of the Republic of Croatia, Croatian Forests Ltd.
- Production of maps for protected area (national parks and nature parks – 1:25 000) management plans – various clients
- Production of spatial noise distribution around various infrastructural and industrial objects – various clients
- Production of maps of landscape arrangement concept and main projects (1:500 – 1:5000)
- Production of maps of spread of gaseous and solid particles around industrial facilities and infrastructural objects – various clients
- Production of 3D visualization of various infrastructural and industrial objects – various clients
- Production of maps of potential and real erosion in areas of planning various infrastructural objects – various clients
- Production of bathymetric models of the sea bed (2D and 3D – 1: 5000, 1:25 000 and 1:100 000) – various clients
- Production of 3D visualizations of planned objects in space
- Analyses of visual sensitivity of landscape in landscape bases
- Telemetric and GPS animal tracking (wolf, lynx, brown bear), analysis of their movement and space/habitat use
- Ultrasound monitoring of bat movement and analysis of their use of space/habitat

Maps
Habitat Map of the Ornithological Reservation Krapje Dol and effect zones at the scale of 1:5000, client: Public Institution Nature Park Lonjsko polje
“Europe's Living Heart phase III: Project Coordinator” – mapping the habitat of the protected area Tajan, Bosnia and Herzegovina, training local experts in habitat mapping, client: WWF European Policy Programme
Vegetation Map of the Biokovo Nature Park (1:25 000) – JUPP Biokovo
Habitat Map of a Part of the Island of Pag (Zadar County) (1:25 000) – project UNDP – COAST
Habitat Map of the Krka River Estuary (1:25 000) – project UNDP – COAST
Habitat Map of the Cetina River Area (1:25 000) – project UNDP – COAST
Habitat Map of the Island of Vis and Surrounding Islands (1:25 000) – project UNDP – COAST
Habitat Map of the Island of Mljet (1:25 000) – project UNDP – COAST
Landscape Type and Pattern Map of the Island of Pag – project UNDP – COAST
Landscape Type and Pattern Map of the Krka River Estuary – project UNDP – COAST
Landscape Type and Pattern Map of the Island of Vis – project UNDP – COAST
Landscape Type and Pattern Map of the Island of Pelješac – project UNDP – COAST
Habitat Map of the Učka Nature Park (1:10 000)
Land Use Map of the Učka Nature Park (1:25 000)
Land Use Map According to the CORINE Methodology (1:100 000) – EEA (in collaboration with Gisdata)
Lonjsko Polje Nature Park Tourist Map (1:20 000)
Habitat Map of the Medvednica Nature Park (1:25 000), client: Public Institution “Medvednica Nature Park”
Hunting Ground Map, client: Ministry of Agriculture, Forestry and Water Management
Hunting Ground Map in Digital Form at the scale of 1:25 000 for all Mutual Hunting Grounds of the Karlovac County, client: Karlovac County

Spatial Analyses and Biophysical Modelling
Analysis of Capabilities of Using Space to Construct Solar Power Plants in the Area of the Primorsko-Goranska County, client PI “Institute for Spatial Planning of the Primorsko-Goranska County”
Landscape Typology and Classification in the Area of Zagreb, client: City of Zagreb, City Office for Strategic Planning and City Development
Production of bathymetric model of Croatian territorial waters of the Adriatic in a resolution of 300 × 300 m, based on available charts, client: D.I.I.V. Ltd.
Satellite Image analysis for Validating Spatial Data about Built and Unbuilt Areas in the Republic of Croatia According to the CORINE Standard, client: Croatian Environment Agency

Web GIS Applications and Spatial Databases
Environment Pollution Register, client: Croatian Environment Agency (AZO)
System for Vehicle Tracking Using Microsoft Visualization Solutions, client: Ecotech
Tool for Input and Conversion of Coordinates and Attributes from GIS Bases, client: Croatian Environment Agency (AZO)
Environment Protection Information System (ISZO), client: Croatian Environment Agency (AZO); Collaboration: Experts from the Agency, APO
Waste Disposal Site Base – ISZO Pilot Installation with Migrating GIS Bases and Selected Data about Waste Disposal Sites, client: Croatian Environment Agency (AZO); Biodiversity Base – Cadastre of Protected and Strictly Protected Species, client: Croatian Environment Agency (AZO);
Production of Database of Forest Ecosystem Damage and Installation of a Web GIS Interface for Displaying Databases; Database Model of Damage Developed According to the Standard (EU and UN Economic Commission for Europe) and Monitoring Defoliation, Discoloration and State of Forest Communities; client: Croatian Environment Agency (AZO)

A list of papers published by employees of Oikon Ltd. can be found in the Bibliography chapter.

4.8. Croatian Control Ltd. (HKZP)
http://www.crocontrol.hr

Croatian Control Ltd. (HKZP) is a corporation owned by the Republic of Croatia which operates according to laws and legal acts of HKZP. In carrying out its duties as a service provider in air navigation toward institutions of neighbouring countries, HKZP operates according to principles and procedures of ICAO (International Civil Aviation Organization) and EUROCONTROL (European Organization for the Safety of Air Navigation).

The basic task of HKZP is to offer services in air navigation, respecting the basic principle – high degree of air transport security. Three cartographers work in HKZP, Department of Air Navigation, Procedures and Cartography.

Activities of HKZP include services containing cartography:
- Execution of operative work of air navigation – air transport control, alerting, flight information and pre-flight information for a secure, regular and unhindered air transport, processing and storing data about flights, forwarding information important for air transport, air transport flow management and use
- Collecting, processing and publishing air information, including publishing special publications
- Determination of operative requirements for air transport control systems, serving and control systems, equipment and infrastructure
- Planning and caring of air space structure and flying procedures, taking into consideration interests of civilian and military users and environment protection
- Execution and adjustment of operative, developmental and international work and tasks in international organizations, especially ICAO and EUROCONTROL.

Collecting, processing and publishing air information are in form of textual and cartographic representations. Data are published in the Aeronautical Information Publication (AIP) and the Visual Flight Rules (VFR) regularly. Also published are various types of thematic maps for all airfields in the Republic of Croatia and the entire area of flight information of the Republic of Croatia. Maps are produced at various scales, in analogous and digital form. They are adjusted to a special cartographic key for aeronautical maps.

Map types produced in HKZP and published in the AIP and the VFR manual for the period between 2007 and 2011 include:
Various other type of thematic maps are produced for HKZP’s operative needs, such as the Square Grid Map for Defence Against Hail for the Area of Croatian and a Part of Bosnia and Herzegovina at the scale of 1:500,000, maps of sport air activity zones, military activity zone maps, etc. Maps are produced and printed digitally. A total of 111 maps were published during this period, some of which were modified and published several times. Maps are produced according to standards and recommendations of ICAO Annex 4 and are published as soon as data important for air security are changed (once a year or several times a year).

In addition to producing various types of maps, geoinformation system establishment projects are underway:
- European AIS Database (EAD) Establishment and Updating Project within EUROCONTROL
- Electronic Aeronautical Information Publication (e-AIP) and Electronic Map Production Project

### 4.9. Hrvatska školska kartografiya (HŠK)

Several titles were published during 2007. *Geographic Atlas for High Schools and Vocational Schools* with complete content produced using computer technique. The atlas was reviewed by Dr. Mirko Brazda, Dr. Mate Matas and Josipa Rodić, Prof., proofreader Milka Tica. Snježana Haiman is the editor in chief and author of individual maps, and cartographic editor Krunoslav Popović arranges content of all editions using computer technique. Maps were also produced by employees Maja Dožić, Barbara Mesner, Đurđica Šporiš and Miroslav Rapo. The atlas was published in collaboration with Školska knjiga.

Following titles were produced and printed using computer technique:
- Historical Atlas for Elementary School, independent edition and
- Geographic Atlas for Elementary School published in collaboration with Školska knjiga.

Following wall maps were printed using analogous technique:
- historical: *World War II*
- geographic: *Mountain Croatia* (1:130 000), *Croatia* (1:300 000), *Northeast Croatia* (1:130 000), *World* (1:20 000 000), *Eastern Croatia* (1:130 000), and the atlas *Croatian Historical Maps*, transparencies and regional map – *Rijeka and Broad Surroundings*.

Since in the school program needs for a didactical approach to teaching about space are becoming increasingly pronounced, students have to use aids other than maps and atlases. Therefore, transparencies were produced in collaboration with Školska knjiga.

Editions produced using computer technique are continued to be printed during 2008:
- Geographic Atlas for Elementary School
- Geographic Atlas for High Schools and Vocational Schools
And a new edition of the *Geographic Atlas for Elementary School and High School* with hard cover and 127 pages of maps for pupils in elementary and high schools. The atlas contains a terminology index to facilitate managing as well as basic data about each country (area, population, capital, GDI and flag). Editorial board is formed by: Snježana Haiman, Krunoslav Popović and Snježana Bakarić Palička, reviewers: Dr. Mirko brazda, Dr. Mate Matas and Josipa Rodić, Prof., and cartographic employees Miroslav Rapo, Maja Dožić, Barbara Mesner, Đurdica Sporiš. The atlas was published by HSК and Školska knjiga.

The geographic wall map of the *Mediterranean* was published in 2008 in analogous technique at the scale of 1:2 000 000 with size 220×145 cm, on four sheets. In addition to employees and editors from HSК, the map was worked on by reviewer Dr. Mate Maras and proofreader Milka Tica. The map’s content is adjusted to other regional wall maps, making it a great tool for teaching geography of Dalmatia, enabling pupils to imagine the Croatian coast and hilly hinterland.

Following wall maps were also printed in analogous technique:

- geographic: *Asia* (1:10 000 000)
- historical: *Migrations, Greece in the Old Age*

The edition includes reference maps, thus the new reference map of the *World* (1:60 000 000) for elementary and high school in computer technique was published in the same year. The map’s scale, content and projection are adjusted to needs of pupils of elementary and high school.

There were new editions of geographic reference maps of the *Republic of Croatia* for the 4th and 8th grade of elementary school.

All the editions were produced in collaboration with Školska knjiga.

Two new reference maps were produced and printed during 2009:

- *Europe* (1:12 500 000), reference map for high school,
- *The Republic of Croatia* (1:900 000), reference map for high school.

Both titles were produced using computer technique and in collaboration with Školska knjiga.

In addition to mentioned geographic and historical atlases, three wall maps produced using analogous techniques were printed in 2009:

- *South America, Europe and Bosnia and Herzegovina.*

Several significant titles produced using computer technique was printed in 2010. These are primarily digitally produced wall maps:

- *The Republic of Croatia* (1:500 000)
- *South Croatian Coast (Dalmatia)* (1:200 000)

The editorial board of the map of *The Republic of Croatia* in one sheet included Krunoslav Popović and Snježana Haiman, as well as employees: Maja Dožić, Barbara Mesner, Đurdica Sporiš and Miroslav Rapo. The map was reviewed by Nadia Vurnek, Prof. and proofread by Milka Tica. The map’s content and size make it suitable for small school spaces, as well as for business and other communication spaces.

The map of *South Croatian Coast (Dalmatia)* was worked on by mentioned employees of HSК and reviewer Dr. Mate Matas. The map’s content is adjusted to other regional wall maps, making it a great fit for teaching geography of Dalmatia, enabling pupils to imagine the Croatian coast and hilly hinterland.

Following school atlases were published in 2010:

- *Gea 1*, for the fifth grade of elementary school
- *Gea 2*, for the sixth grade of elementary school
- *Gea 3*, for the seventh grade of elementary school
- *Geography of Croatia*, geographic atlas for the eighth grade of elementary school

All four editions had editorial boards comprising Snježana Haiman, Krunoslav Popović and Snježana Bakarić Palička; reviewers MSc. Dragica Husanović Pejnović, Ivan Čužić, Prof., and proofreaders Milka Tica and Kata Zalović-Fišter. In addition to each edition’s cartographic part, they contain illustrations and texts by editor Prof. Predrag Kralj. The goal of the editions is to connect space and map with textual content and facilitate pupil’s memory. All these editions were produced in collaboration with Školska knjiga.
In addition, wall geographic maps were printed in analogous technique: North Croatian Coast (1:130 000) in two sheets and The Republic of Croatia (1:300 000) in four sheets. Gradually transitioning to computer technology, almost all mentioned atlas and reference editions were digitized. Editions of wall maps should also be gradually digitized. Regional maps for students in the third and fourth grades of elementary school are being produced.

4.10. Školska knjiga Inc. (ŠK)  
http://www.skolskaknjiga.hr

As in the last fifty years, Školska knjiga is raising generations by gathering the most reputable author teams from science, education and culture. Školska knjiga’s publishing program follows the latest global achievements in education and combining them to traditional values of national culture. The company has been the initiator and bearer of numerous national projects, from textbooks, expert, scientific, lexicographic and culturological books and manuals, to literature, children’s books, journals and other valuable editions. Aware of its responsibility to teachers, pupils and the entire cultural public, Školska knjiga developed a modern publishing program which responds to challenges of the third millennium.

Geographic and related textbook editions of Školska knjiga include:

<table>
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<th>3rd grade of elementary school</th>
<th>Nature and Society</th>
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<td>3.</td>
<td>Ivan De Zan, Ivo Nejašmić: Naš svijet 3: udžbenik prirode i društva za 3. razred osnovne škole</td>
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<td>Ivan De Zan, Ivo Nejašmić: Naš svijet 3: radna bilježnica s istraživanjima i igrama iz prirode i društva u 3. razredu osnovne škole</td>
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<td>Tomislav Kaniški: Moj prvi atlas: atlas za prirodu i društvo u 3. i 4. razredu osnovne škole</td>
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<td>Regijska karta: Središnja Hrvatska, presavijena, mj. 1:500 000</td>
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<td>Regijska karta: Istočna Hrvatska, presavijena, mj. 1:500 000</td>
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<td>10.</td>
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<td>17.</td>
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<td>18.</td>
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<td>Geografska karta Hrvatske za 8. razred osnovne škole; mj. 1:900 000</td>
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<td>25.</td>
<td>Slijepe karte – svijet za 5. razred osnovne škole</td>
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<td>Geography</td>
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<td>29.</td>
<td>Slijepe karte - Azija, Afrika, Sjeverna i južna Amerika, Australija s Oceanijom, Arktik i Antarktika za 6. razred osnovne škole</td>
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<td>Predrag Kralj: GEA 3: geografski atlas za 7. razred osnovne škole</td>
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<td>33.</td>
<td>Geografska karta Europe za srednju školu, presavijena, mj. 1:12 500 000</td>
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<td>34.</td>
<td>Slijepe karte Europe za 7. razred osnovne škole</td>
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<td>36.</td>
<td>Igor Tišma: Geografiya Hrvatske: radna bilježnica geografije za 8. razred osnovne škole</td>
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<td>Predrag Kralj: Geografija Hrvatske: geografski atlas za 8. razred osnovne škole</td>
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<td>Slijepe karte Hrvatske</td>
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<td>Geografska karta Hrvatske za 8. razred osnovne škole; mj. 1:900 000</td>
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<p>| Geography |
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| 1. | Hermenegildo Gall, Predrag Kralj, Robert Slunjski: Geografija 1: udžbenik geografije za 1. razred gimnazije |
| 2. | Hermenegildo Gall, Predrag Kralj, Robert Slunjski: Geografija 1: radna bilježnica iz geografije za 1. razred gimnazije |
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<td>14. Ružica Vuk, Suzana Nebeski Hostić: Geografija na državnoj maturi: priručnik za pripremu ispita državne matur iz geografije</td>
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<td>18. Geografska karta Europe za srednju školu: presavijena: mj. 1:12 500 000</td>
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<td>23. Ines Kozina: Geografija Hrvatske: udžbenik za 2. razred srednjih strukovnih škola</td>
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<td>27. Aleksandra Šmit, Karmen Boroša Kokić: Geografija 1: udžbenik geografije za 1. razred ekonomske škole</td>
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4.11. K.L.K. Ltd., Zagreb

Maps produced between 2007 and 2011:
3. Automap of the Republic of Croatia, Ministry of Defence of the Republic of Croatia, Zagreb 2009, 1:1 000 000
7. Primorsko-Goranska County, Public Institution Institute for Spatial Planning of the Primorsko-Goranska County, Rijeka 2010, 1:100 000
8. Primorsko-Goranska County, Public Institution Institute for Spatial Planning of the Primorsko-Goranska County, 2nd supplemented edition, Rijeka 2010, 1:150 000

4.12. Studio Bregant Ltd., Zagreb
http://www.studio-bregant.hr

Studio Bregant Ltd. is the first Croatian company in the field of transport, traffic and tourist informatics with a 50-year tradition of producing auto and tourist editions of maps, plans, atlases, guides, itineraries and wall maps.

2007
Auto Atlas of Slovenia and the City of Ljubljana; publisher: Cartographia Kft., Budapest; author: Studio Bregant Ltd., Zagreb; languages: Slovenian, English, German, Italian; atlas of Croatia
The company was established in 1994 by experts in informatics, design and marketing in order to consolidate these fields and develop application of new communication technologies in Croatia. New technologies and knowledge has been gained over the years, making the company among the best in Croatia.

VA-COPY Multimedia collects, processes, stores and uses spatial information and especially cartographic visualization. Digital maps are drawn in vector format, which enables excellent zooming quality and suitability for printing.

Flash interactive maps represent selected objects and result from VA-COPY Multimedia’s creativity and selection and are designed for use when spatial relations are of utmost importance. VA-COPY Multimedia cartographic products are mostly intended for including the cartographic dimension into the user’s information system, city plan on board, printing various brochures, etc.
Following maps were produced between 2007 and 2011:

**2007**
Vrbovec; Ivanić Grad, Kloštar Ivanić, Križ-Novoselec; Sveti Ivan Zelina; Durnevac and a map of the Koprivnica-Križevci County; Čakovec; Mursko Središče; Nedelišče; Zagreb – city quarter Črnomerec and Podsused-Vrapče; Zagreb – city quarter Stenjevec; Zagreb – city quarter Trešnjevka-North

**2008**
Novi Marof; Prelog; Ludbreg; Dugo Selo; Pirovac
Lika – Perušić District and Velebit – North Velebit tourist guide with maps, round trip plans and accomodation

**2009**
10 maps of the Lika-Senj County and a tourist map of Lika and surroundings, for the project 10 + 1 Reasons for Diverging from Highway and Getting Acquainted with the Region
The Island of Drvenik Veliki
Auto Map of the Republic of Croatia (printed by Glas Slavonije)
Zagreb – city quarter Maksimir; Varaždin; Zagreb – city quarter Centar – Medveščak; Sveti Ivan Zelina; reprint Zagreb – city quarter Stenjevec; Zaprešić; Zagreb – city quarter Trnje; Tourist Map of the Island of Korčula; reprint Čakovec

**2010**
Lučko; Oroslavje; reprint Tourist Map of the Island of Korčula; Koprivnica – reprint of the Koprivnica-Križevci County; Zlatař; reprint Samobor; reprint Zabok; reprint Sveta Nedjelja; Zagreb – city quarter Donja Dubrava

**2011**
Jastrebarsko City, Jastrebarsko Surroundings; event map of Jarun; Krapina; Island of Hvar Hvar; Stari Grad; Pregrada
Wall maps
Wall Map of the City of Zagreb 320 × 150 cm
Wall Auto Map of the Republic of Croatia, Bosnia and Herzegovina, Slovenia 150 × 135 cm
Wall Map of Serbia, Montenegro 135 × 150 cm
Wall Map of Europe – Geographical 150 × 110 cm
Auto Map of the Republic of Croatia RH 130 × 130 cm
Wall Map of the World 278 × 213 cm

**4.14. STEF Ltd., Zagreb**
http://www.stef.hr

The company STEF Ltd. was established in 1993. Its basic activities include publishing, cartography, graphic design and tourist promotion.

Following maps were produced between 2007 and 2011:

April 2007 – Petrova Gora, a panorama map, A1 format
February 2009 – 10 illustrations of jungle routes of Papua New Guinea, Bolivia and Guatemala for the book Jungle! by adventurer Davor Rastuhar, A4 in colour
December 2009 – Tribunj – panorama map of bicycle tracks, A2 format
February 2010 – Plitvička jezera and surroundings – a panorama map published by the Tourist Community of Korenica, A2 format
April 2010 – Zagreb – city panorama, B1 format
August 2010 – Krapina – vector plan of the city, A1 format
December 2010 – Rakovica – 8 vector maps of parts of the County of Rakovica with bicycle tracks, B1 format
February 2011 – National Parks of Croatia – 9 vector maps of national parks for illustrations for a series of articles in a journal, A5 format

4.15. Infokarta Ltd., Split

http://www.infokarta.hr

Infokarta Ltd. produced a series of plans and maps between 2009 and 2011:
1. Maps for the area of the Primošten District
   - Bicycle Map of the Primošten District (1:28 000)
   - Tourist Map of the Primošten District
   - Plan of Primošten (1:2000)
   - Photomap of Primošten (1:2000)
2. Maps for the area of the Rogožnica District
   - Bicycle Map of the Rogožnica District (1:30 000)
   - Plan of Rogožnica (1:3000)
3. Maps for the area of the Marina District
   - Bicycle Map of the Marina District (1:30 000)
   - Tourist Map of the Marina District
   - Plan of Marina (1:2000)
   - Plan of Vinišće (1:3000)
   - Plan of Sevid (1:3000)
   - Plan of Poljica (1:3000)
4. Digital orthophoto
   - Digital orthophoto of the City of Split (1:1000)
   - Digital orthophoto of the City of Solin (1:1000)
   - Digital orthophoto of the Primošten District (1:1000 and 1:2000)

4.16. Questor Ltd., Zagreb

Questor Ltd. published following maps between 2007 and 2011:
1. Wall Map of Europe, scale 1:5 500 000, size 140×100 cm, plasticized, 1st, 2nd and 3rd edition
   - On both sides, geographical and political
   - Political image
2. Wall Map of the World, scale 1:30 000 000, size 140×100 cm, plasticized, 1st edition
   - On both sides, geographical and political
   - Political image
3. Wall Map of the Republic of Croatia, territorial structure, scale 1:340 000, plasticized, size 145×140 cm, 1st and 2nd edition
4. Wall Map of the Republic of Croatia and Bosnia and Herzegovina, territorial structure, scale 1:340 000, size 160×140 cm, plasticized, 1st and 2nd edition
5. Road Distance Tables of the Republic of Croatia, 1st, 2nd and 3rd edition
6. Wall Map of Europe, scale 1:3 700 000, road map, size 100×140 cm, 1st edition
7. Solar System, 8-planets, 1st edition
8. Eclipse of the Sun, 1st edition
10. Image and Phases of the Moon, 1st edition
11. Map of Europe, table, on both sides plasticized, size 70×50 cm, 1st edition
12. Wall Map of the Bosnia and Herzegovina, territorial structure, scale 1:300 000, plasticized, size 140×135 cm, 1st edition

Questor Ltd. also produces globes and telluriums. Globe sizes range from 10 to 40 cm, and they vary in theme (high and low tide, astrological globe, etc.) and equipment type (money-boxes, gilded, etc.).
5. Other Activities

5.1. Croatian Cartographic Society

http://www.kartografija.hr

The Croatian Cartographic Society (CCS) is the association of cartographers and other individuals exceptionally interested in cartography. It was established on October 10, 2001. Activities of the CCS between 2007 and 2011 included:

23rd International Cartographic Conference

The 23rd International Cartographic Conference and the 14th ICA General Assembly were held in Moscow from August 4 to 10, 2007. The conference was organized by the International Cartographic Association (ICA), the Ministry of Transport of the Russian Federation, the Federal Geodetic and Cartographic Agency and the Russian Cartographic Committee. About 1000 participants from 62 countries were present at the conference and held 500 papers and presented 150 posters. Croatia was represented with five papers and one poster.

Papers and poster presentations were held at the same time in eight halls of the Kozmos hotel, and four exhibitions (International Cartographic Exhibition, International Children’s Works Exhibition, International Hydrographic Exhibition and the International Technical Exhibition) were organized in the All-Russia Exhibition Centre.

The International Cartographic Exhibition had participants from 28 countries members of ICA with various types of maps, satellite images, globes, atlases and expert literature. Croatia was represented with 22 exhibits. The International Children’s Drawings Exhibition featured 174 works from 36 countries. Croatia was represented with five drawings. The International Hydrographic Exhibition represented charts from 27 countries. The technical exhibition featured 34 presenters with latest achievements and innovations in technology, products, applications and services in cartography and geoinformation systems.

The 14th ICA General Assembly was held during the conference. In addition, each ICA committee had a working meeting in order to report on activities during the last four years and make plans for the following period, 2007–2011.

50th Anniversary of ICA

ICA celebrated its 50th birthday on June 9 and 10, 2009 in the place it was created on June 9, 1959. A special symposium organized on the occasion of the anniversary was organized in Swisstopo offices in Wabern near Bern (Switzerland), and guests arrived from countries founders of ICA, member countries in which ICA conferences were held, current member countries, as well as longstanding members, certain committee chairmen, representatives of friendly societies and the Imhof family (Eduard Imhof was the first president of ICA) and officials of the Swiss Cartographic Society, which enabled the celebration. M. Lapaine, vice-president of the Croatian Cartographic Society was present at the celebration.

24th International Cartographic Conference

The 24th International Cartographic Conference was held in Santiago, the capital of Chile, from November 15 to 21, 2009. The conference regularly assembles several hundred cartographers from all over the world. This time the conference was organized mutually by the International Cartographic Association (ICA), the Military-Geographic Institute of Chile (Instituto Geográfico Militar, IGM) and Fisa SA, the leading Chilean company for organizing large conferences. Most of the conference activities were organized in the Escuela Militar Bernardo O'Higgins military school.

Main activities of the conference titled The World's Geo-Spatial Solutions were plenary lectures and participants’ lectures divided into 31 themes, as well as poster sessions. With six plenary lectures, more than 400 participants’ papers and 90 poster presentations, there were also other important events. These were primarily the International Map Exhibition and the children’s drawings exhibition with the
theme *Living in a Globalized World*. The entire conference program was published in two editions, as a summary program and a full program in 64 pages.

The international exhibition presented latest achievements in cartography, primarily analogous and digital maps, atlases, journals and other cartographic publications. Out of 453 maps, atlases and cartographic publications, 14 of them were from Croatia and selected by the Croatian Cartographic Society out of numerous submitted cartographic works.

The children’s cartography exhibition, which refreshed the conference, featured six exhibits from Croatia. Valuable and interesting children’s works are a clear indicator of the interest of younger generations in cartography.

**Conference Cartography, Geoinformation and the Sea**

The conference *Cartography, Geoinformation and the Sea* was held at the Department of Geography of the University of Zadar on June 15 and 16, 2007. The conference was organized by the Croatian Cartographic Society, and co-organized by the Faculty of Geodesy of the University of Zagreb, and the Hydrographic Institute of the Republic of Croatia from Split. There were 250 participants. A booklet titled *Program* contains the conference program and proceedings. A CD was also published. The first day ended with the opening of the *Maritime Cartography* exhibition. The second conference day featured a trip to the Kornati National Park and the Telašćica Natura Park.

**Maritime Cartography Exhibition**

The exhibition *Maritime Cartography* was opened in the exhibition area of the State Archive in Zadar on June 15, 2007. The exhibition was accompanied by the catalogue *Pomorska kartografija / Maritime Cartography* with the landscape A4 format, glossy semi hard cover with a nice title page representing a section of a map from the edition *Carta di cabottaggio del Mare Adriatico*. The catalogue contains 110 pages with texts in two languages, Croatian in black on the left and English in bright blue on the right. The impressum contains the most important data about the catalogue and the exhibition: location Exhibition Space of the State Archive in Zadar, Rudera Boškovića bb, Zadar; duration from June 15 to 30, 2007; exhibition design by Vlado Zrnić, collaborator Zvonimir Ucović and lightning Ivo Nižić. Furthermore, editor in chief is Miljenko Lapaine, text author Josip Faričić, collaborator Ivka Kljajić, publisher Croatian Cartographic Society and co-publishers State Archive in Zadar, Scientific Library in Zadar, Hydrographic Institute of the Republic of Croatia, Split and Department of Geography of the University of Zadar. Scanning of originals and facsimile production was done by the Chair for Geoinformation of the Faculty of Geodesy of the University of Zagreb, and design and graphic preparation was done by Ana Kuveždić.

**1st Croatian NSDI and INSPIRE Day and the Cartography and Geoinformation Conference**

The *1st Croatian NSDI and INSPIRE Day and the Cartography and Geoinformation Conference* were held at the Faculty of Organization and Informatics in Varaždin from November 26 to 28, 2009. It was organized by the Croatian Cartographic Society and the State Geodetic Administration, and co-organized by the City of Varaždin, the Faculty of Organization and Informatics and the Faculty of Geotechnical Engineering in Varaždin and the Faculty of Geodesy of the University of Zagreb. The Croatian Academy of Engineering was a patron of the conference. More than 200 people participated. Promotions were held within the conference of the *Klimatski atlas Hrvatske / Croatian climate atlas 1961–1990* prepared by the Meteorological and Hydrological Service on the occasion of its 60th anniversary and the biographic lexicon *Croatian Cartographers* prepared by Miljenko Lapaine and Ivka Kljajić from the Faculty of Geodesy of the University of Zagreb and published by Golden marketing – Tehnička knjiga and the State Geodetic Administration. Varaždin sightseeing with an expert guide and a visit to the collection of geodetic instruments at the Faculty of Geotechnical Engineering and a tour to Međimurje were also organized.

**Cartography of Varaždin Exhibition**

The exhibition *Cartography of Varaždin* was organized within the Cartography and Geoinformation conference organized with the NSDI and INSPIRE Day by the Croatian Cartographic Society in
collaboration with the State Geodetic Administration. The exhibition was organized in the Varaždin City Museum in the Herczer Palace from November 24 to 28, 2009. There were about a hundred old and new maps and plans of Varaždin and its surroundings, including copies of old maps from the fund of the Cartographic Collection of the Varaždin City Museum, the fund of the Collection of Maps and Atlases of the National and University Library in Zagreb, sheets of official maps and plans of the State Geodetic Administration and examples of thematic maps by other publishers. The exhibition also featured several monographs related to cartography of Croatia and Varaždin. Chronologically, the exhibition encompassed a period of five centuries during which development of cartography and Varaždin can be followed.

Festival of Science
Universities of Zagreb, Split, Osijek and Rijeka, in collaboration with the Technical Museum and the British Council, sponsored by the Ministry of Science, Education and Sport organized the 8th Festival of Science, which was held from April 19 to 25, 2010. The Festival goal is to introduce activities and results in the field of science to public, improve public perception of scientists and motivate young people for research and gaining new knowledge. Earth was the central theme of the Festival. Within the Festival, the Croatian Cartographic Society organized a workshop with introductory lecture “Children Draw the World”. Goals of the workshop were to stimulate children's creativity in graphic form, improve their cartographic and environmental perception. The workshop was intended for preschool children, elementary school children and 1st grade high school children. In addition to the workshop, the Croatian Cartographic Society organized an exhibition of Croatian children’s works from contests of the International Cartographic Society.

2nd Croatian NSDI and INSPIRE Day and the 6th Cartography and Geoinformation Conference
The Croatian Cartographic Society and the State Geodetic Administration organized the 2nd Croatian NSDI and INSPIRE Day and the 6th Cartography and Geoinformation Conference in Opatija from November 25 to 28, 2010. The conference was co-organized by: Institute for Physical Planning of the Primorsko-Goranska County from Rijeka, Faculty of Geodesy of the University of Zagreb and the Faculty of Civil Engineering of the University of Rijeka. The conference patrons were the Croatian Academy of Engineering and the NSDI Committee of the Government of the Republic of Croatia. There were 170 participants, including guests from Albania, Austria, Bosnia and Herzegovina, Bulgaria, Montenegro, Kosovo, Macedonia, Germany, Serbia and Sweden. The conference featured 39 papers.

Opatija Riviera on Plans and Maps Exhibition
The exhibition Opatija Riviera on Plans and Maps was organized within the 2nd Croatian NSDI and INSPIRE Day and the 6th Cartography and Geoinformation Conference. The exhibition was organized by the Croatian Cartographic Society and co-organized by the Central Office and the Branch Office for Cadastre Rijeka of the State Geodetic Administration. The exhibition was organized in the Tamaris Congress Centre in Opatija on November 25 and 26, 2010. The exhibition featured about thirty maps and plans of Opatija and the Opatija Riviera – from cadastral plans produced in the second half of the 19th century to the latest maps. The exhibition catalogue is available at www.kartografija.hr.

Lectures organized by the Croatian Cartographic Society
Lapaine, M.: International Cartographic Conference in Moscow, lecture at the 6th CCS Annual Assembly held in the Hall of the Faculty of Architecture, Geodesy and Civil Engineering in Zagreb, March 3, 2008.
Salopek, Z.: Application of Remote Sensing in Evaluation of Soil Salinity of the Neretva River Valley, lecture held in the Hall of the Faculty of Architecture, Geodesy and Civil Engineering in Zagreb, December 4, 2008
Kuveždić, A., Lapaine, M.: Cartographic Conference GeoCart'2008 in New Zealand, lecture held in the Hall of the Faculty of Architecture, Geodesy and Civil Engineering in Zagreb, December 4, 2008

Bačić, Ž.: Society of the Future – Geo-Enabled Society, lecture held within the 7th CCS Annual Assembly in the Hall of the Faculty of Architecture, Geodesy and Civil Engineering in Zagreb, March 20, 2009

Tutić, D.: International Cartographic Conference in Chile, lecture within the 8th CCS Annual Assembly held in the Hall of the Faculty of Architecture, Geodesy and Civil Engineering in Zagreb, March 5, 2010

Železnjak, Ž.: Standardization of Military Geographic Data and Products in the Republic of Croatia, lecture organized by the Croatian Cartographic Society and the Faculty of Geodesy of the University of Zagreb, held in the Hall of the Faculty of Architecture, Geodesy and Civil Engineering in Zagreb, February 17, 2011

Tutić, D.: 14th International Conference on Geometry and Graphics, Kyoto, Japan, lecture within the 9th CCS Annual Assembly held in the Hall of the Faculty of Architecture, Geodesy and Civil Engineering in Zagreb, March 18, 2011

Cartography and Geoinformation Journal (KiG)
The Croatian Cartographic Society is the publisher of the Cartography and Geoinformation journal. The journal is published twice a year. Issues 7 and 8 were published in addition to a special issue in 2007, issues 9 and 10 were published in 2008, issues 11 and 12 were published in 2009 and issues 13 and 14 were published in 2010. The journal is cited in following databases: Bibliographia Cartographica, Scopus, DOAJ and Academic Search Complete and is available online at http://www.kartografija.hr/kig and http://hrcak.srce.hr/kig.

5.2. Association of Geodesists of the Istria County

The Association of Geodesists of the Istria County is an association of engineers and technicians of geodesy, scientific, administrative and other employees doing geodetic and cadastral work, in order to improve geodetic practice in the county. The association was established on November 6, 1993. Association headquarters are in Pazin. The association has 150 members, 100 of which are active.

Lectures about the state of geodesy in Croatia are organized by the Association. Members of the Association regularly participate at all lectures about classic geodesy and cartography. The Association’s activities contribute to the respectability and promotion of the geodetic practice in the county.

The Istarski geodet journal

Istarski geodet has been published since 1997. It features homeland themes from geodesy and cartography. Almost all issues published issues so far contained articles about old cartographic representations of the Istria County. The journal is sponsored by geodetic companies from Istria, printed in 499 copies and distributed free of charge to members of the Association, Offices for Cadastre in Croatia, geodetic associations in Croatia and Slovenia, as well as libraries.

Istarski geodet published following articles related to cartography from 2007 to 2011:
5.3. Croatian Geographic Society – Zadar

Activities of the Croatian Geographic Society – Zadar are closely related to activities of the Department of Geography of the University of Zadar. For more details, see section 3.4.

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