Cartography in Croatia 2011-2015
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Dražen Tutić, Miljenko Lapaine, Marina Viličić
## Contents

1 Introduction 3

2 Official Cartography 4
  2.1 Hydrographic Institute of the Republic of Croatia (HHI) 4
  2.2 Croatian Geological Survey (HGI-CGS) 8
  2.3 National and University Library in Zagreb (NUL) 9
  2.4 Croatian State Archives (CSA) 11
  2.5 Miroslav Krleža Institute of Lexicography 20
  2.6 Institute for Migration and Ethnic Studies 21
  2.7 Ivo Pilar Institute of Social Science 22
  2.8 Emergency Management Office of the City of Zagreb 23

3 Academic Cartography 23
  3.1 University of Zagreb, Faculty of Geodesy 23
  3.2 University of Zagreb, Faculty of Sciences, Geography Department 26
  3.3 University of Zadar, Department of Geography 27
  3.4 University of Zagreb, Faculty of Agriculture, Department of Soil Science 29

4 Commercial Cartography 30
  4.1 Institute for Photogrammetry d.d., Zagreb 30
  4.2 Croatia Control d.o.o. (HKZP) 31
  4.3 VA-COPY multimedia d.o.o. 33
  4.4 STEF d.o.o., Zagreb 33
  4.5 Infokarta d.o.o., Split 34

5 Other Activities 34
  5.1 Croatian Cartographic Society 34

6 Acknowledgements 40

7 Bibliography 2011 – 2015 41


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 to general assemblies held every four years. The bearer of these activities in Croatia is the Croatian Cartographic Society.

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 in Ottawa in 1999 for the period 1995–1999, in Durban (Republic of South Africa) in 2003 for the period 1999–2003, in Moscow in 2007 for the period 2003–2007, and in Paris in 2011 for the period 2007–2011. This report, which covers the period 2011–2015, will be submitted at the General Assembly of the ICA in Rio de Janeiro in 2015. As a result of this work, Croatia has a comprehensive overview of cartographic activities in the past 20 years, i.e. since it became an independent state.

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

A report such as this will never include all the activities of the preceding period. This is because not all parties responded to the invitation to collaborate. Nevertheless, the most relevant institutions and companies are represented in the report. It is the result of individual contributions, and those people are listed in the Acknowledgments.

The list of references 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 Hydrographic Institute of the Republic of Croatia (HHI)

The Hydrographic Institute of the Republic of Croatia (HHI) carries out hydrographic activities of interest to the Republic of Croatia, which includes scientific and research work, as well as developmental and professional tasks relating to the safety of navigation in the Adriatic, hydrographic-geodetic surveys of the Adriatic, marine geodesy, construction and production of charts and nautical publications, oceanographic research, marine geology, development of information systems, and publishing and printing tasks.

The Institute is authorised to develop the safety of navigation service in the Adriatic, in compliance with the recommendations of the following organizations:

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

and in cooperation with the Ministry of Maritime Affairs, Transport and Infrastructure, the Croatian Navy, harbour masters’ offices, the ‘Plovput’ company, as well as the hydrographic offices and institutes of other maritime nations worldwide.

According to its annual work plans, between 2011 and 2015 the cartographic activity of the Hydrographic Institute comprised the production and publishing of charts and nautical publications, their continuous updating, the construction and production of graphic representations in nautical publications, studies, and projects, as well as other cartographic tasks.

Official paper navigational and thematic charts

1. First edition

Thematic chart No. 950 VTS – Croatian Vessel Traffic Service, 1:950 000 scale, December 2014

Navigational plan Luka Gaženica (incorporated in Chart No. 100-20), 1:10 000 scale, July 2014

Navigational plan Luka Šibenik (incorporated in Chart No. 533), 1:10 000 scale, April 2015

Navigational plan Uvala Mala Stinica (incorporated in Chart No. 22), 1:3 000 scale, November 2012

2. New edition

Navigational chart No. 100-15, Grado - Rovinj, 1:100 000 scale, July 2013

Navigational chart No. 533, Šibenski kanal, 1:25 000 scale, April 2015

Navigational plan Rijeka – Brajdica, container terminal, 1:5000 scale, as a component of Chart No. 15, July 2013

Navigational plan Luka Ždrelac, 1:7 500 scale, as a component of Chart No. 37, June 2013

Navigational plan Prolaz Mali Ždrelac, 1:2 500 scale, as a component of Chart No. 37, June 2013

Navigational plan Split – Gradska luka, 1:5 000 scale, as a component of Chart No. 47, September 2014

Navigational chart No. 15 Rijeka (in progress)
Navigational chart No. 47 Split - Kaštelanski zaljev (in progress)

3. Reprints and subsequent prints

All other navigational charts published by the HHI to ensure the safety of navigation in the Adriatic Sea were printed according to need and demand as reprints or subsequent prints with machine corrections.

Thematic chart No. 950 VTS – Croatian Vessel Traffic Service, 1:950 000 scale, December 2014

4. Continuous updating of official navigational charts

A large part of the cartographic work covers updating of official navigational charts, involving the following tasks:

- Defining corrections for previously published official charts, publishing these corrections in the monthly Notices to Mariners (Oglas za pomorce).
- Producing block corrections to be added to existing charts and publications to update their contents. Block corrections are parts of cartographic representations, i.e. extracts from charts or plans or graphic representations in publications. From 2011 to 2015, a total of 54 block corrections were produced and published in Notices to Mariners for the purpose of updating charts and publications.
- Updating the contents of previously printed official charts by means of offset printing machines or plotters.
- Reproducing some official computer-produced charts which are in lower demand using high-quality, large format plotters, according to a standard procedure.

5. Vectorizing the existing contents of official charts.

Some official charts not produced by computer were subject to vectorization and computer processing, so as to improve the quality and accuracy of cartographic representation and facilitate updating and reproduction. From 2011 to 2015, this process was applied to the production of official charts No. 100-15, 100-16, 100-17, 100-18, 100-19, 100-20, 100-22, 100-24 and 100-25, while the production of charts No. 100-21 and 100-26 is currently in progress.

6. Conversion to the WGS84 ellipsoid

All the official charts of the Hydrographic Institute were constructed on the Bessel ellipsoid. Due to production technology and compliance with the requirements for conversion to the WGS84 ellipsoid according to IHO standards, constructing all these charts on the WGS84 ellipsoid is an important task and a must for the Hydrographic Institute. Therefore, all new charts and new editions of charts are now constructed on the WGS84
ellipsoid. Until new editions are published, reprints continue to be constructed on the Bessel ellipsoid, indicating the correction for the WGS84 ellipsoid.

**Official electronic navigational charts (ENC)**

A large part of the basic cartographic activity covers updating already released ENC cells and the production of new ENC cells within the area of competence of the Hydrographic Institute of the Republic of Croatia.

1. Updating already released ENC cells, due to the structure of updates, is performed through reprints or new editions.

2. From 2011 to 2015, new ENC cells were produced and released for the following areas: Šibenski Kanal, Luka Ždrelac, Luka Gaženica and Uvala Mala Stinica. Production and quality control for the following ENC cells is currently in progress: Luka Šibenik, Kornat - Murter, Murterski Kanal and Starogradski Zaljev.

Altogether, 95 ENC cells have been released to date (April 2015) through the Primar distribution centre (Norway).

Navigational chart No. 533, Šibenski kanal, 1:25 000 scale, April 2015

**Nautical publications**

1. First edition

   • Adriatic Archipelago – Split sea area nautical guide, 2012

   53 graphic representations of the Split local waters (extracts from charts, harbour plans, sketches, and schemes with amended and updated contents) were produced.

2. New edition

   • Sailing Directions I (HI-N-20), official navigational handbook, 2012

   Altogether, 71 graphic representations and 81 schemes and plans of ports and harbours on the eastern coast of the Adriatic Sea were produced.

   • INT 1 Symbols and Abbreviations Used on Charts (HI-N-15), March 2013

   This publication was produced according to the Chart Specifications of the International Hydrographic Organization (IHO).

   • List of Lights and Fog Signals, Adriatic Sea – Ionian Sea – Maltese Islands, (HI-N-10), 2014

   Five graphic representations were produced, including updates to lights.

   • Catalogue of Charts and Nautical Publications (HI-N-18), 2013

   22 graphic representations were produced to present the entire editorial production of the Hydrographic Institute of the Republic of Croatia.
Cartographic work on other projects

1. Charts showing concessionary shellfish farms in Malostonski Zaljev. For the Ministry of Maritime Affairs, Transport and Infrastructure, three charts were produced at a scale of 1:10 000, and one chart at a scale of 1:25 000, showing all the shellfish farm concessions in the area of Mali Ston (Malo More, Kanal Mali Ston, Uvala Bistrina and Uvala Kuta).

2. Cartographic work for the arbitration procedure between Croatia and Slovenia. Nine thematic charts were produced for the purpose of defining the maritime border between Croatia and Slovenia.

3. Production of cartographic representations of VTS sectors. Sixteen cartographic representations of all sectors in the VTS Croatia area were produced to be annexed to the Ordinance published in the Official Gazette of the Republic of Croatia.

4. Cartographic work for an IPA project. Fourteen cartographic representations were produced for the booklet “IPA Cross-border Programme Croatia – Montenegro”.

5. Cartographic work for a study prepared for the Hrvatske vode (Croatian Waters) company. Four cartographic representations were produced on the topic: Sea flooding in coastal areas.

6. For the Study of the Development of Nautical Tourism in Split-Dalmatia County, 255 graphic representations were produced (extracts from charts and topographic maps with amended contents, and extracts from digital orthophoto maps and air-photo-graphs).

7. For the study Potentials for developing nautical tourism ports in Primorje-Gorski Kotar County, three cartographic representations were produced in A4 format, and 20 extracts from topographic maps with amended contents.

8. Cartographic work on training for the dKart chart production platform.

Within the CRONO HIP project, proficiency in dKart Editor, dKart Archive and dKart Catalogue modules has been developed, while familiarization with dKart Publisher and dKart FODB modules has started. From 2011 to 2015, the dKart Archive module was filled with hydrographic data from scanned fair charts not input in the previous period, and data from new hydrographic surveys. Data vectorization was done using Global Mapper software instead of Hydrocap. Four charts showing maritime concessions were produced in dKart Publisher for the Ministry of
Maritime Affairs, Transport and Infrastructure. During the test phase, charts Nos. 100-22 and 100-24 were produced, while the production of charts Nos. 100-19, 300-31, 300-32, 300-33 and 300-34 is currently in progress.

9. Improving the accuracy of coastline data.
The official coastline applied by the HHI is based on data obtained from official charts. In some areas, due to the small scale of the charts, coastline data are not appropriate for use in projects that require higher accuracy. Existing coastline data are currently being corrected using the data defined on fair charts, and by consulting new digital orthophoto data.

2.2 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 form the basis for resolving numerous projects in the national interest, such as the fresh water supply, water and soil protection, the construction of large infrastructure objects, city planning, defining reserves of mineral resources, and environmental protection. Research is done using the latest methods and information and computer technology. Maps are prepared within the scientific programme: Geological Maps of the Republic of Croatia, supported by the Ministry of Science, Education and Sport which covers eight fundamental scientific projects (in the period 2013-2015):

Basic Geological Map of the Republic of Croatia 1:50 000,
Basic Hydrogeological Map of the Republic of Croatia 1:100 000,
Basic Engineering-Geological Map of the Republic of Croatia 1:100 000,
Basic Geochemical Map of the Republic of Croatia,
Map of Mineral and Energetic Resources,
Geothermal Map of the Republic of Croatia.

Within the project for the Basic Geological Map of the Republic of Croatia 1:50 000, 4 standardized sheets of the geological map were published: Cres 2, Vis 3 & Biševo 1, Cres 4 and Vis 4. In addition, several more sheets have been prepared and will be published after a revision procedure in 2015.

Maps published 2011-2015


2.3 National and University Library in Zagreb (NUL)

http://www.nsk.hr/

The National and University Library (NUL) in Zagreb is one of the most significant cultural institutions in Croatia. Its Collection of Maps and Atlases is the biggest library collection of cartographic material in Croatia. It comprises about 44,000 sheets of maps and about 3000 atlases of all kinds, scales and geographic areas collected during the 70 years of its existence. Old maps and atlases produced from the mid-16th to the mid-19th century in woodcut and copper engraving, and a collection of manuscript maps form the special cultural, historical and scientific value of the collection. The collection has been catalogued completely according to international standards, and bibliographic records are available in the NUL online catalogue. The process of systematic digitisation of valuable cartographic material is also of special importance. The wider public can access the extensive cartographic and other finds of the Library via the Digitized Heritage of the National and University Library web page (http://www.nsk.hr/HeritageDetails.aspx?id=152). About 900 maps have been digitized, 490 in cooperation with The State Geodetic Administration while 1440 maps and 197 atlases were added to the Collection's fund during the period 2011-2015.

Thanks to a bequest by Dr. Drago Novak, a very valuable private collection of old maps of Croatia known as The Novak Collection - Mappae Croatiace was given to The Maps and Atlases Collection in 2012. The acquisition of 38 very valuable older cartographic material was also carried out: Maps:

2. Tuto el Cotado di Zara e Sebenicho / Mateo Pagano. Venetia : Mateo Pagano, [ca. 1530].
3. [Spalato] / Martinus Rotta. [Venetia : F. Camocio, ca 1558].
5. Istria sotto il dominio Veneto... / Donato Bertelli. Vinegia : [Ferrando Bertelli, 1570].
7. Tabula V. Europae / Laurentius Frisius ; Bilibaldo Pierckemyhero. Strasbourg : Johann Grüninger ; Johann Koberger, 1525.
8. Tavola nova di Schiavonia / [Girolamo Ruscelli ; Claudius Ptolemaeus]. [Venezia : s. n., 1561].
9. Tabula Europae Quinta / [Giovanni Magini ; Claudius Ptolemaeus ]. [Venezia : s. n., ca 1595].
11. [Isola di Curzola / Vicenzo Maria Corvenz]. [Venezia : s. n., 1689].
13. Il Territorio di Duare / [Vincenzo Maria Coronelli]. [Venezia : s. n., 1708].
14. Città e Canal di Curzola / [Vincenzo Maria Coronelli]. [Venezia : s. n., 1708].
23. Regnum Illyricum cum Illyrico à Romanis addito : Tom. III. Tab. II. / [cura et studio Ioannis Georgii Schwandtneri ; impensis Ioannis Pauli Kraus]. [Vindoboniae : impensis Ioannis Pauli Kraus bibliopolae Vindobonensis, 1748].
26. Descriptio geographica antiquorum et recentiorum episcopatum provinciae ac metropolis Salisitanae postea Spalatensis / [auctore Daniele Farlato ; Francesco Zucchi ; apud Sebastianum Coleti]. [Venetiis : apud Sebastianum Coleti, 1751].
27. Dalmatia Veneta sive Hodierna / [auctore Daniele Farlato ; Francesco Zucchi ; apud Sebastianum Coleti]. [Venetiis : apud Sebastianum Coleti, 1751].
28. Dalmatia sub Imperio Romanorum / [auctore Daniele Farlato ; Francesco Zucchi ; apud Sebastianum Coleti]. [Venetiis : apud Sebastianum Coleti, 1751].
32. Tabula Illyrici universalis et hodierni / Danielle Farlati ; Francesco Zucchi.
33. La parte Meridionale del Circolo dell'Austria / G. M. Cassini. Roma, 1796.

Atlases

1. Orbis antiqui tabulae geographicae secundum Cl. Ptolemaeum : cum indice philologico absolutissimo ... / [Gerardus Mercator] ; Cl. [Claudius] Ptolemaeus. Am-

Visitors were able to visit the entire Library and the Collection of Maps and Atlases during the Open Door Days of the National and University Library.

Mira Miletić Drder, PhD is the head of the Library’s Cartographic Collection, and a list of her published papers for the period 2011–2015 can be found in the Bibliography.

2.4 Croatian State Archives (CSA)

http://www.arhiv.hr/

The Croatian State Archives keeps records of central executive, legislative and administrative bodies and governmental bodies, structured in fonds/collections that mostly correspond to entities created by a single creator or institution (or multiple creators in the case of collections), active in the area of the Croatian countries in the historical context. Cartographic records are kept separately in individual collections, or as parts of funds (blueprints, plans or maps as enclosures to documents created by central executive, legislative or administrative bodies and governmental bodies in the area of the Croatian countries in the historical context, pertaining to various examples of technical work and construction. Finding aids for the fonds and collections are available to users in the Main Reading Room of the CSA, as well as via the ARHiNET archival informational-register system used for describing, processing and managing archives, which represents the online registry of archival fonds and collections (http://arhinet.arhiv.hr/). Analytically described cartographic archives whose analytically described data is available in the Main Reading Room of the CSA or via ARHiNET comprises the following collections/fonds:

Kartografska zbirka (reference number HR-HDA-902)

Kartografska zbirka (The Cartographic Collection) has been created by the regular transfer of records (a legal obligation), purchases, donations or extraction from individual archival fonds. The collection currently has 4600 processed and analytically described cartographic items. There are 50 atlases and 4550 maps and plans altogether. A cartographic item may comprise one or more pages when it comes to atlases. The maps in the collection are processed in accordance with the International Standard Biographic Description for Cartographic Materials – ISBD (CM) and are described according to the type of map: general, topographic, cadastral, maritime, bathymetric, forestry, plant-geographical, geological, geomorphological, seismological, pedological, hydrological, climatological, wartime, military-didactical, historical, archaeological, traffic, aeronautical, postal, kilometrical, demographical, ethnographical, lingual, economic, tourist, mountainous, or administrative, along with political maps, demarcation maps, settlements plans, property plans and other maps (astronomical, trigonometrical, medicinal). Users can access the databases on the computers in the CSA Main Reading Room.
Description and processing of maps/plans

All maps and plans are processed in accordance with the International Standard Biographic Description for Cartographic Materials – ISBD (CM) and are analytically described in the database according to the given parameters. In the period 2011 to 2015, a total of 269 cartographic map items, plans and atlases, that is, 616 pages of maps and plans were described.

Digitization of some of the most valuable maps

Digitization of some of the most valuable maps from Cartographical Collection was carried out (153 cartographic units) and their cartographical description in ARHINET is in progress. Subsequently, map descriptions and digital copies of the maps will be published online in ARHINET.

Acquiring new cartographic records

In the period 2011 to 2015, the CSA acquired 54 maps and 16 graphics (purchase), and 1 graphic (donation).

Zbirka građevinskih nacrta (reference number HR-HDA-905)

Zbirka građevinskih nacrta (The Building Designs Collection) comprises blueprints for public buildings, and rarely, private ones. The processed designs were created in the period 1770 to 1990. According to the building they depict, the Collection designs were divided into 36 groups (regulatory basis of settlements, conservation studies, regional designs and site diagrams of streets and squares; educational institutions; pedagogical and social institutions; scientific institutes; health facilities; medicinal institutes; judiciary; administration; cultural institutions; publishing; financial institutions; PTT; military facilities; police stations and guard-houses; penitentiaries; industrial facilities; mines and quarries; state farms; cooperative facilities; rural economic facilities; veterinary surgeries; other economic facilities; road building; railways; bridge building; inland waters regulation; harbours and seafronts; sewage, waterworks, water supply, wells; residential facilities; tourist and catering facilities; castles, fortresses, citadels; church facilities; cemeteries, tombs, monuments; builders’ examination tests; furniture designs; detail designs. The collection comprises 1165 cartographic items and is regularly amplified by new acquisitions – mostly by separating them from other archival fonds.

Description and processing of blueprints, plans and maps

In the period 2011 to 2015, a total of 95 pages of blueprints, plans and maps were analytically processed and described in accordance with the International Standard Biographic Description for Cartographic Materials – ISBD (CM). Users can access the finding aid in the CSA Main Reading Room and via ARHINET (http://arhinet.arhiv.hr/details.aspx?ItemId=2_542).

Zbirka planova (reference number HR-HDA-904)

Zbirka planova (The Plans Collection) comprises cartographic records from private, public and military facilities from 1600 to 1941. All the description items were grouped in accordance with local points of reference, and some in accordance with topical points of reference (for example, ecclesiastical buildings, belvederes, inns, border-guard houses, penitentiaries, mills, bridges, mortuaries, furnaces, guardhouses, stables and sheds, military buildings and dwellings), due to the existence of old list and card files, the former already being structured in that way.
and quoted by users. The collection comprises 536 cartographic items and does not grow. The cartographic records in the collection were processed in accordance with the International Standard Biographic Description for Cartographic Materials – ISBD (CM). Users can access the finding aid in the CSA Main Reading Room and via ARHiNET (http://arhinet.arhiv.hr/details.aspx?ItemID=2_541).

Zemaljska vlada, Odjel za unutarnje poslove (reference number HR-HDA-79)

Odjel za unutarnje poslove Zemaljske vlade (The Land Government’s Department for Internal Affairs) is a fonds that, along with books and documents, also keeps cartographic records created by the activities of the same creator (as enclosures to documents), mostly pertaining to public facilities and, rarely, private ones. The processed cartographic records pertain to the period 1869 to 1921. According to the facility they depict, the cartographic items are divided into 30 groups (regulatory bases, conservation studies, regional designs and site diagrams of streets and squares; educational institutions; pedagogical and social institutions; health facilities; medicinal institutes; administration; cultural institutions; PTT; military facilities; penitentiaries; industrial facilities; mines, quarries; state farms; smaller farms; commercial facilities; other economic facilities; road building; railways; bridge building; inland waters regulation, hydrographic facilities, land reclamation, vessels; sewage, waterworks, water supply, wells, cisterns, watering places; residential facilities; tourist and catering facilities; forests, forest farms; landed properties; various maps (demarcation maps, kilometric maps, cadastral maps, administrative maps); insignia, coats of arms, flags, symbols; examination tests; cemeteries, tombs, monuments.

Describing and processing cartographic records and creating the finding aids

Processing the associated cartographic records (designs, plans and maps), and creating a finding aid for the Collection is in progress. So far, 1198 cartographic units have been processed in accordance with the International Standard Biographic Description for Cartographic Materials – ISBD (CM). Users can access a temporary finding aid in Word format on the computers in the CSA Main Reading Room. In the period 2011 to 2015, a total of 179 designs, plans and maps were described and analytically processed. The plan is to finish the analytical processing of the designs, plans and maps in this fonds during 2015. Users will be able to access the finding aid (calendar with an index of places) in the CSA Main Reading Room and via ARHiNET.

Arhiv mapa za Hrvatsku i Slavoniju (reference number HR-HDA-1421)

Arhiv mapa za Hrvatsku i Slavoniju (The Maps Archive for Croatia and Slavonia) is a fonds that keeps cadastral records created in the period 1847 to 1963, mostly cadastral records created as a result of the First Systematic Cadastral Survey during the reign of Emperor Francis I (known as the ‘first stable cadastre’) and later reambulations. Digitization of the archives, according to the Guidelines for the selection of records for digitization (http://kultura.hr/hr/Sudjelujte/Preuzimanja-idokumenti/Smjernice-za-odabir-i-pripremu-grade-za-snimanje), is carried out for the purpose of:

- Protecting the originals
- Increasing availability and the potential better, wider use of the records
Creating or disseminating the services offered to users

Completing fonds and collections – the goal is to complete the fonds with digitized records from other organizations that may hold originals, copies or duplicates.

Related to this, the digitization of the cadastral plans and the plot register for the fonds is being carried out systematically, and will result in the protection of the originals, wider availability of the records, the creation of new services offered to users, and the completion of the fonds.

**Digitization of cadastral plans**

In the first phase, the digitization of the original cadastral plans was carried out, according to the cadastral counties that were part of Croatia and Slavonia at the time of the survey. Where the original cadastral plans had not survived, copies or plans with the drawn reambulation (original plans or copies of cadastral plans) were digitized. A total of 29,878 pages of cadastral plans for 2,661 cadastral counties were digitized. The plan is to digitize all the types of cadastral plans kept in this fonds. The publication of digitized images of the cadastral plans in ARHiNET is in the final phase. A total of 14,395 digitized images for 1,355 cadastral counties are currently available (http://arhinetmaster.arhiv.hr/_Generated/Pages/ArhivskeJedinice.ParentTree.aspx?RootItemIld=5308), while the publication of a further 12,786 digital copies for 1,306 cadastral counties in ARHiNET is in the final phase (transfer of the images has already been done), i.e. the transfer of 2,697 digitized images of other kinds of cadastral plans.

**Virtual merging of cadastral plans**

In order to merge virtually cadastral plans created during the First Systematic Cadastral Survey, but not kept in the CSA’s ‘Archives of maps for Croatia and Slavonia’, collecting digitized copies of the plans for the area of Međimurje and Eastern Slavonia has begun. Some cadastral records (plot registers, cadastral plans) for the area of Međimurje is kept in the Međimurje State Archives and digitized copies of cadastral plans will be virtually merged with the records of Međimurje (Zaledska County) in ARHiNET, because Međimurje was an integral part of the Kingdom of Croatia-Slavonia during the First Systematic Cadastral Survey. A total of 379 digitized copies (pages of cadastral plans) for 47 cadastral counties have been acquired. Some cadastral records (cadastral plans, indication sketches) for the area of Eastern Slavonia is kept in the Osijek State Archives and digitized copies of the cadastral plans will be virtually merged in ARHiNET with the records of Virovitica County and Baranja. Altogether, 1,121 digitized copies (pages of cadastral plans) for 57 cadastral counties and 28 forest grounds have been acquired. The specified digitized copies will be merged in the fonds ‘Archives of maps for Croatia and Slavonia’:

http://arhinetmaster.arhiv.hr/_Generated/Pages/ArhivskeJedinice.ParentTree.aspx?RootItemIld=5308

**Digitization of plot registers**

Digitization of plot registers comprises book materials directly connected to the cadastral plans of the individual cadastral counties. The digitization of plot registers for Varaždin County is currently in progress and will be completed in 2015. A total of 60,717 pages of plot registers for the cadastral counties that were part of Varaždin County during the cadastral survey were digitized. The plan is
to publish them in ARHiNET and to digitize the plot registers of other counties from the fonds ‘Archives of maps for Croatia and Slavonia’.

Georeferencing of cadastral plans

Georeferencing of cadastral plans from the period of the First Systematic Cadastral Survey is a CSA project realized in cooperation with Arcanum Adatbźis Kft, the results of which are georeferenced cadastral plans for the area of the Kingdom of Croatia-Slavonia. These are available online at [http://mapire.eu/en/map/collection/croatia/?zoom=8&lat=45.30208&lon=16.93141](http://mapire.eu/en/map/collection/croatia/?zoom=8&lat=45.30208&lon=16.93141).

This is a working version, updated on a daily basis with new, georeferenced, digitized copies of cadastral plans kept in the CSA, the Osijek State Archives and the Međimurje State Archives. The plan is to collect cadastral plans for the area of the Kingdom of Croatia-Slavonia in order to obtain complete georeferenced cadastral plans for this particular area, which are currently kept in different archives in the Republic of Croatia.

Republička geodetska uprava SR Hrvatske (1949-1969) (reference number HR-HDA-311)

The fonds ‘Republic Geodesic Administration of the Socialist Republic of Croatia’ keeps cadastral records (plans, books, documents) and thematic maps acquired from the State Geodesic Administration. These records are being listed and processed. So far, the following have been listed:

- 1799 maps of cadastral plans for 835 cadastral counties
- 1396 topographic maps (1:25 000)
- 66 topographic maps (1:50 000)
- 422 overview, topographic and basic state maps (1:5000, 1:25 000, 1:50 000)

Exhibitions

Croatia and Europe: Travelling through Historical Maps, CSA, 1 July 2013

Following an appeal from the Ministry of Culture of the Republic of Croatia to allow free entry to visitors to museums, galleries, archives and other cultural institutions with existing or specially prepared programs and events to mark Croatia's accession to the European Union on 1 July 2013, the CSA organized a temporary exhibition entitled ‘Croatia and Europe: Travelling through Historical Maps’. The aim of the exhibition was to present to the general public manuscript and printed cartographic heritage items relating to the general and historical maps of Europe and the Croatian countries, along with demarcation maps through different periods of time. Altogether, 38 maps kept in CSA’s Cartographic Collection (HR-HAD-902) were on display. The author of the exhibition was Mirjana Jurić.

Selection of maps from the Cartographic Collection of the Department of Geography of the Faculty of Science, Zagreb, 10 April 2015

Through collaboration between the Department of Geography of the Faculty of Science and the CSA, Mirjana Jurić created the permanent exhibition in the Department’s premises. The exhibition formed part of the Department’s Open Day event and also represented the Department’s participation in commemorating the International Year of Maps (2015-2016) proclaimed by the International Cartographic Association. The exhibition was designed to be a permanent display. A total of 52 maps and 1 atlas were on shown, and an appropriate leaflet was published for this occasion.

Loan of cartographic records for the exhibition “Herman Bollé – Builder of the Croatian Capi-
tal’, Museum of Arts and Crafts, 17 April – 23 August 2015

The CSA lent 14 cartographic units (16 pages of building blueprints) from the Collection of Building Blueprints (HR-HDA-905) for this exhibition.

Educational activities

Cartographic workshops

Since May 2014, the CSA has provided a new educational activity, a cartographic workshop entitled ‘Let's read maps!’ intended for children of various ages – from preschoolers (6 year-olds) to 4th graders in elementary school, and also for higher grades. The author of the workshop is Mirjana Jurić. The aim of holding workshop in preschool institutions is to introduce through additional activities ways of perceiving the world around us. It is coordinated with the national basic curriculum for preschool education and general compulsory and high school education. The aim of holding the workshop in elementary schools through after-school activities is to introduce the topics of nature and society/geography. It is also coordinated with the National basic curriculum for preschool education and general compulsory and high school education, and with the curriculum for teaching nature and society/geography. The workshop uses various educational materials created by using old maps and plans from the CSA’s Cartographic Collection, which is entered in the Register of Cultural Goods of the Ministry of Culture. The main goals of the workshop are to arouse interest in maps, stimulate the children’s artistic creativity by presenting space, promote cartography and improve children’s cartographic perception, so that they acquire new knowledge and experiences, develop new skills (orientation, orientation on a map, map-reading, recognizing map from different time periods), grasp spatial relations, encounter cartographic heritage and historical sources, and of course to develop basic cartographic literacy, through geography classes. Several thematic workshops were designed, depending on the age of the children, and adapted in terms of terminology to the level of their current knowledge (i.e. what they had already learned in ‘Nature and Society’ classes). New ones are being designed for higher grades using wider workshop terminology).

In the period 26 May 2014 to 1 May 2015, a total of 524 children (preschoolers, 3rd, 4th, 5th 7th graders (elementary school) and 1st-grade highschoolers) attended the workshop. In total, 24 cartographic workshops were held.

Student practice programme

The student practice programme, lasting 40 hours, has been taking place since 2013 for 3rd year university students of the Department of Geography of the Faculty of Science in Zagreb, and is mentored by Mirjana Jurić. During the programme, students are introduced to the Cartographic Collection and Archives of Maps for Croatia and Slavonia (content-related physiognomy, types of maps, map reproduction techniques, the artistic treatment of maps through history, cadastral sources, topographic and cadastral surveys, different map publishers), while during the practical part, topographic maps published in the late 19th and early 20 centuries are listed analytically. So far, 16 students in four groups have participated in the student practice programme.

Lectures on cartographic records for students of the University of Zagreb
Mirjana Jurić delivers lectures to students of history and geography, aimed at introducing them to the cartographic heritage kept in the CSA, with an emphasis on the Cartographic Collection and the Archives of Maps for Croatia and Slavonia. Students are given an insight into original maps and plans from the mid-16th to early 20th century, tracing the development of cartography through history. So far, 53 students have attended the lectures: 35 history students from the Catholic University and 18 geography students from the Faculty of Science in Zagreb.

**Cultural Thursday, 6 November 2014**

The CSA organizes ‘Cultural Thursday’, an hour of history and culture. On 6 November 2014, the lecture was given by Mirjana Jurić on the topic ‘Let’s read maps! – the cartographic workshop of the CSA’. The goal of the lecture was to present the new educational programme of the CSA, the purpose of which is to promote stored cartographic heritage and improve cartographic literacy in preschool and elementary school children.

**Commemorating special events**

**European Heritage Days, CSA, 11 September 2014**

European Heritage Days are a joint venture of the Council of Europe and European Commission that gathers various cultural events under the slogan ‘Europe, the joint heritage’. Special attention is paid to local skills and traditions, and to building and art heritage. The Ministry of Culture and many other cultural institutions across Croatia prepare a varied programme to commemorate this day. The CSA commemorated it on 11 September 2014 with activities that included a thematic cartographic workshop led by Mirjana Jurić, entitled ‘All the best of Europe on old and new maps’. Nine children participated in the workshop.

**Lifelong Learning Week, CSA, 1 October 2014**

Lifelong Learning Week is a UNESCO initiative started in 1999. Each year it is commemorated in many countries on all continents, in order to raise public awareness about lifelong learning, promote the culture of learning, and encourage personal motivation. The Agency for Vocational Education and Training and Adult Education, in cooperation with partners, is developing this project through events in all parts of Croatia, to introduce citizens to the opportunities in education and learning. The CSA participated in commemorating this week and a thematic cartographic workshop entitled ‘Let’s learn to read maps’ was one of the activities (led by Mirjana Jurić). The goal of the workshop was to introduce the participants to old symbols used on cadastral plans, since cadastral records are often used in the CSA Main Reading Room. Two retired people participated in the workshop.

**Night of Museums 2015, Vukovar State Archives, 30 January 2015**

On the occasion of the 10th Night of Museums, as the result of collaboration between the CSA and the Vukovar State Archives, a film projection and interactive workshop entitled ‘Old plans in a different guise’ were held in Vukovar City Museum, led by Mirjana Jurić. A presentation entitled ‘The cadastral heritage of Eastern Croatia in the digital environment’ was given, and a cartographic workshop entitled ‘Old plans in a different guise – developing a plan for a fictional settlement by using old symbols’ was held. Approximately 40 children participated in the workshop (preschool, lower school, 8th grade of elementary school and high school pupils).
Scientific conferences (presentations of papers)

SEEDI, Third Festival of Croatian Digitization Projects, Zagreb, 15-16 May 2014

SEEDI is an international initiative for the development of digitization of cultural and scientific heritage in the countries of Southeast Europe, with the goal of bringing together:

- Archive, library and museum workers responsible for preserving and ensuring permanent access to cultural and scientific heritage
- Researchers in information technology who develop projects for the digitization of cultural and scientific heritage
- Scholars from the fields of art, the social sciences, the humanities, history and computer science, students and all those interested in the digitization of cultural and scientific heritage.

Mirjana Jurić participated in the festival with a presentation entitled ‘Cadastral heritage in the digitized environment’.

45th Consultation of the Croatian Archival Society: Archival Service in the IT Environment, Umag, 19-21 October 2011

The 45th Consultation was organized by the Croatian Archival Society and Pazin State Archives. One of the participants was Mirjana Jurić, with a presentation entitled ‘Procedures in the digitization of cartographic cadastral records’.

6th International Workshop, The Hague, 7-8 April 2011

The Commission on Digital Technologies in Cartographic Heritage of the International Cartographic Association organized its 6th international workshop entitled ‘The digitized approach to cartographic heritage’ where Mirjana Jurić was one of the participants, with a presentation entitled ‘The digitization of cadastral maps in the Croatian State Archives – availability, use, problems’.

46th Consultation of the Croatian Archival Society: Specialized Archives and Collections of Records Outside Archives, Varaždin, 12 – 14 October 2012

The 46th consultation was organized by the Croatian Archival Society, Varaždin State Archives and Međimurje State Archives. One of the participants was Mirjana Jurić, with a presentation entitled ‘Dispersion of cadastral documentation, using the example of Međimurje and Croatian Zagorje’.

4th Congress of Croatian Archivists, Opatija, 22-25 October 2015

The 4th Congress of Croatian Archivists was organized by the Croatian Archival Society and Rijeka State Archives. One of the participants was Mirjana Jurić, with a presentation entitled ‘Maps in the formation of educational activities: Maps are to be read!’

Workshop ‘Cartography and cadastral maps. Visions from the past, for a vision of our future’, Pisa, 6-7 November 2013

This workshop was organized by Scuola Normale Superiore di Pisa, Budapest City Archives and the National Archives of Malta. One of the participants was Mirjana Jurić, with a presentation entitled ‘The present and future of the digital cadastral heritage in the Croatian State Archives’.

9th Conference with International Participation, Cartography and Geoinformation, for World GIS day, Zadar, 20-23 November 2013

The consultation was organized by the Croatian Cartographic Society, Geography De-
partment of the University of Zadar and the Croatian Geographical Society. One of the participants was Mirjana Jurić, with a presentation entitled 'The role of archives as a heritage institution in the education system, using the example of cartographical records'.

12 ICARUS Cadastral Maps Network, Marburg, 22 November 2011

The CSA is a member of ICARUS (International Centre for Archival Research) and participates in its work and different projects. One such project is the Cadastral Maps Network, whose goal is the digitization, georeferencing and online publication of cadastral plans from the period of the First Systematic Cadastral Survey made in the area of the Habsburg Monarchy. At the ICARUS MEETING held in Marburg on 22 November 2011 Mirjana Jurić completed the Cadastral Maps Questionnaire seeking information about the cadastral records kept in the CSA.

5th Croatian Congress on Cadastre with international participation, Zagreb, 8-9 May 2014

The 5th Congress was organized by the Croatian Geodetic Society. One of the participants was Mirjana Jurić, with a presentation 'The situation in cadastre along the Croatian-Slovenian border' (with Ilija Grgić and Davor Kršulović).


The seminar was organized by the Croatian Museum Association, Croatian Library Association, Croatian Archival Society, National and University Library in Zagreb, the CSA, Department of Information and Communication Sciences of the Faculty of Humanities and Social Sciences of the University of Zagreb, Department of Information of Faculty of Humanities and Social Sciences of the University of Osijek and Department of Information Sciences of the University of Zagreb. One of the participants was Mirjana Jurić, with a presentation entitled 'The cartographic workshop 'Let's read maps (globally and locally)'. She also held two thematic cartographic workshops; 'Cartographic symbols on a 19th century cadastral plan' and 'Making a plan of a fictional/real settlement by using old symbols'.

Professional conferences and courses (participation)

Participation in the 3rd Croatian NIPP and INSPIRE day and 7th Conference, Cartography and Geoinformation, Split, 14-15 September 2011

Participation in the workshop ‘Digitization and creating 3D objects’, Department of Information and Communication Sciences, Faculty of Humanities and Social Sciences, University of Zagreb, Zagreb, 11 April 2014

Workgroup at the Ministry of Foreign and European Affairs

At the invitation of the Ministry, the CSA appointed Mirjana Jurić as a member of the Workgroup to research, prepare and write a report for arbitration on the Croatian-Slovenian border dispute, and the Croatian Anti-Memorial of the Croatian government. The work consisted of researching archival fonds and collections that store cartographic and other archives.

Training for other Archives

The CSA (via Mirjana Jurić) participates in the professional specialization and training of employees of other Archives, by providing professional assistance in identifying and
20

describing cadastral records (cadastral plans and other cadastral archives) from the period of the First Systematic Cadastral Survey, kept in the Međimurje State Archives.

2.5 Miroslav Krleža Institute of Lexicography

http://www.lzmk.hr/

The entire cartography production of the Miroslav Krleža Institute of Lexicography takes place within the Cartographic Department of the Institute, and relates to geographic, topographic and thematic maps for most of the Institute’s editions in digital and printed forms. Maps are produced using the OCAD computer programme. The Cartographic Department continued to bear the entire cartographic production of the Institute during the period 2011–2015.

Its contribution is reflected in the production of a number of geographic, thematic and positional maps for the online edition of Croatian Encyclopaedia (the contents are supplemented and updated regularly) at www.encyklopedija.hr.

For the monograph Croatia: Land and People (produced in collaboration with the Ministry of Foreign and European Affairs of the Republic of Croatia, 2013) published to mark the accession of Croatia to the European Union, the Cartographic Department produced more than twenty thematic (traffic and historical charts) and positional maps.

Cartographic activities also included the technical editing of 15 sheets of TK 1:100 000 (total 55 sheets) for the needs of the Institute’s publications in the period 2011-13.

The Institute’s geographers, members of the lexicographical and cartographical editorial staff, have been working on the Dictionary of Foreign Geographical Names since 2013. The Dictionary is not a common project of the geographers and cartographers working in the Institute, but it is closely related to the problems they face every day when choosing and writing foreign geographical names. Having recognised the need to standardize the inconsistent way in which geographical names for geographical objects located outside the Croatian linguistic area (exonyms) are written, adapted or adopted and the need for its systematization, the Institute launched a project whose goal is to make recommendations for the more consistent rendition of foreign geographical names, thus enabling a wider circle to use them more easily. The purpose of the Dictionary is to lay the groundwork for standardising such geographical names. It would comply with the recommendations of the United Nations Group of Experts on Geographical Names (UNEGGN), the umbrella international association dealing with geographical names, on the need to systematize and standardize geographical names at national levels. The Dictionary relies on similar projects in other countries (e.g. in Slovenia, Poland). One of the results will be the publication (expected in 2015) of a book containing an alphabetical list of the names of countries, capitals and dependent territories. Other foreign geographical names, with recommendations on how to write them and other relevant details, will be covered in a book and online.

The problems associated with writing foreign geographical names were also brought to the fore during 2014-2015 through bilateral scientific cooperation between the Miroslav Krleža Institute of Lexicography and the Anton Melik Geographical Institute in
Ljubljana. The goal of the project entitled *A Comparative Analysis of Croatian and Slovenian Exonyms* is to explore influences on the processes of exonymization (adopting geographical names for foreign geographical objects) in both languages. In addition, a unique typology of exonyms has been created by the way they have been adopted in both languages, which could serve to categorize exonyms in other languages. The Croatian collaborators in the project are employees of the Miroslav Krleža Institute of Lexicography, the Institute of Croatian Language and Linguistics, and the Department of Geography of the Faculty of Science, University of Zagreb.

From 14-16 May 2015, the Institute hosted the 17th meeting of the UNGEGN Working Group on Exonyms, on the topic of criteria in the use of exonyms.

### 2.6 Institute for Migration and Ethnic Studies

http://www.imin.hr/

**Lectures**

2011-2012 Dubravka Mlinarić gave lectures on historical cartography, entitled ‘Cartographic Sources for the Croatian Lands: an Eco-Historical Approach’ for Postgraduate Studies in Croatian History, Centre for Comparative Historical and Intercultural Studies, History Department, Faculty of Humanities and Social Sciences, University of Zagreb (5 ECTS)

**Conference Papers**

29 June 2011, Petrinja Secondary School. Dubravka Mlinarić delivered a lecture to schoolteachers: ‘Cartographic visualisation of The Other – how to read maps without prejudice’, during a course entitled ‘Civic education: a module for developing identity and interculturality. It was organised by the Croatian Education and Teacher Training Agency and Institute for Migration and Ethnic Studies.

30 May - 2 June 2012, Juraj Dobrila University, Pula. Dubravka Mlinarić and Ivana Brković (Faculty of Humanities and Social Sciences, University of Zagreb) delivered a paper entitled ‘The Representation of Ragusa/Dubrovnik in 17th Century Literature and Cartography’ at the 15th Annual Congress of Mediterranean Studies, organized by Juraj Dobrila University and the Mediterranean Studies Association (Utah State University, the University of Massachusetts Dartmouth and the University of Kansas).

14-16 June 2012, University of Zadar. Dubravka Mlinarić presented a paper entitled ‘Images of The Other: the Cartographic Representation of Dalmatia in the Early Modern Period’ during the conference ‘Dalmatia in Space and Time: What Dalmatia is, and what it is not?’ organised by the University of Zadar.

2-6 July 2012, Ghent University, Belgium. Dubravka Mlinarić presented a paper entitled ‘Multiple Bordering and Multiple Interests in Early Modern Eastern Adriatic Navigation’ at the Sixth International Congress of Maritime History, organised by the International Maritime Economic History Association and Ghent University;

1-5 October 2012, Faculty of Humanities and Social Sciences in Zagreb. Dubravka Mlinarić presented a paper entitled ‘Changes to the Zadar hinterland environment in cartographic sources from the 16th and 17th centuries’ at the Fourth Congress of Croatian Historians - Liberty, organised by the Croatian National Committee for Historical Sci-
ences, Society for Croatian History and Faculty of Humanities and Social Sciences, University of Zagreb.

12 June 2013, Maritime and History Museum of the Croatian Littoral (PPMHP). Dubravka Mlinarić delivered a public lecture entitled ‘Piri Reis and Ottoman cartography in the age of great geographical discoveries’, in relation to the exhibition ‘Piri Reis – Suleiman the Magnificent’s cartographer’, organised by PPMHP and TINA.

10 October 2013, Technical Museum in Zagreb. Dubravka Mlinarić delivered a public lecture entitled ‘The Adriatic Coastline in the Cartography of Piri Reis’ in relation to the exhibition ‘Piri Reis – Suleiman the Magnificent’s cartographer’ organised by TINA.

20-21 November 2013, Geography Department, University of Zadar. Dubravka Mlinarić and Mithad Kozličić gave a lecture entitled ‘The Zadar Sea Region in Piri Reis’s 1526 Navigation Manual’ at the 9th Cartography and Geoinformation Symposium, organised by the University of Zadar and the Croatian Cartographic Society.

21 May 2014, Croatian Studies, Zagreb. Dubravka Mlinarić presented a paper entitled ‘Maps and mapping the Croatian historical area mentally: a history of intolerance and exclusion’ at the scientific meeting ‘Multiculturalism: the meaning and concept of Croatian culture’ organised by the Cassius Croatianology student society.

**Media, Public Lectures, Popularising Cartography**

25 October 2013, Croatian Radiotelevision, Channel 1, scientific programme: *Znanstveni krugovi*, Dubravka Mlinarić presented the activities and cartographic legacy of the 16th century Ottoman cartographer Piri Reis.

24 February 2015, National and University Library in Zagreb, public presentation celebrating International Map Year, popularizing cartography and presenting the Novak Map Collection, ‘Maps and Identities- Mapmakers from Croatian Lands in the Early Modern Period – a Selection from the Novak Collection’, delivered by Dubravka Mlinarić.

### 2.7 Ivo Pilar Institute of Social Science

http://www.pilar.hr/

**Projects**

Historical Towns Atlas: the Historical Identity and Modern Development of Towns in the Republic of Croatia. Project leader: Mirela Slukan Altić. The project was part of an international project in comparative studies of European towns, supported by the International Commission for the History of Towns. The project evaluated maps sources for the urban history of Croatian towns in the European historical context. To date, six volumes have been published.

**Teaching**

The following courses were held in the Department of History, Faculty of Humanities and Social Sciences, University of Zagreb:

- Introduction to the Reading of Historical Maps
- Cartographic Sources for Croatian History

Department of History, University of Juraj Dobrila in Pula:

- Historical cartography and historical geography
2.8 Emergency Management Office of the City of Zagreb

http://www.zagreb.hr

In order to improve the performance of operating forces in emergency situations in the area of the City of Zagreb, the Emergency Management Office has launched a series of activities to develop a Geographic Information System (GIS) for the operational activities of forces in emergency situations, especially potential disaster situations, such as a devastating earthquake in the City of Zagreb.

Guided by the idea of improving the quality of daily operational activities in emergency situations, the need has been observed for our own database within the GIS system, which would support operational activities in the event of major accidents or disasters. GIS allows improved operational forces in the field and selects the fastest, safest route to assist victims or protect property and the environment.

As part of reaffirming civil protection, the Emergency Management Office, in cooperation with the National Protection and Rescue Directorate, carried out training sessions for general purpose civil protection units by city districts. For this purpose, brochures were produced showing cartographic representations of evacuation corridors, evacuation areas and reception points in the event of an earthquake, for all seventeen districts of the City of Zagreb.

In addition, an analysis of cartographic representations interventions by the Fire Brigade and Volunteer Fire Departments in the Zagreb area was collated for the period of 1 January 2012 to 31 December 2014 (120x120 cm and in the scale of 1:55 000).

An enlarged master map (1:30 000, 240x240 cm) describes all operational forces for protection and rescue in the event of earthquakes, evacuation corridors, and reception and shelter areas.

During the reporting period, the Office participated in a number of conferences with studies on the use of GIS in crisis situations (Croatian National Platform for Disaster Risk Reduction, International Conference Crisis Management Days).

Scientific and technical cooperation between the Emergency Management Office and the Faculty of Geodesy, University of Zagreb continued. The Emergency Management Office provided three guest speakers, including the Head of the Office, Dr. Pavle Kalinić, who spoke to students and also held project practice through Risk Management, Practical Cartography and Spatial Development courses, in which students contributed to the development and updating of the GIS database used by the Office.

3 Academic Cartography

3.1 University of Zagreb, Faculty of Geodesy

http://www.geof.unizg.hr/

The Institute for Cartography and Photogrammetry (Head from 2010-2015, Dr. Ivka Kljajić; current Head Dr. Robert Župan) is one of three institutes at the Faculty of Geodesy. The Institute consists of three Departments: Cartography (Head of Depart-
ment, 2010-2015 Dr. Robert Župan, current Head Dr. Vesna Poslončec-Petric), Photogrammetry and Remote Sensing (Head Dr. Dubravko Gajski), and Geoinformation (Head Prof. Dr. Miljenko Lapaine). The departments form the basic structural units of all faculty activities.

In the period 2010-2015, courses have been held at undergraduate, graduate, postgraduate specialist and doctoral levels, adjusted to the Bologna Process.

The following doctoral dissertations were defended between 2010 and 2015:


During the period 2011–2015, the following projects associated with cartography were carried out at the Faculty of Geodesy of the University of Zagreb:

- Cartography of the Adriatic; led by Prof. Dr. M. Lapaine
- New user interface design in mobile navigation devices; led by Assist. Prof. Dr. R. Župan
- Multitudinous collection, analysis and cartographic visualisation of spatial data on mountain objects in the Republic of Croatia; led by Assist. Prof. Dr. R. Župan
- Three-dimensional geovisualisation of forest ecosystems based on interdisciplinary analyses of satellite images and terrestrial surveys; led by Assist. Prof. Dr. R. Župan
- Effect of GNSS and NSDI on use of spatial data and their synergistic effect on management processes in Croatia and the region – SYNERGY; led by Prof. Dr. Ž. Bačić

Individual employees of the Faculty of Geodesy collaborated in projects by other institutions:

1. INSPIRATION-Spatial Data Infrastructure in the Western Balkans (2011-2013)
2. Development strategy of official cartography of the Federation of Bosnia and Herzegovina (2014); led by Assist. Prof. Dr. Slobodanka Ključanin, Faculty of Civil Engineering, Sarajevo, Bosnia and Herzegovina.

Employees of the Faculty of Geodesy participated in the following conferences related to cartography and geoinformation:

XVIII meeting of Croatian Geodesists, Zaton, Croatia, 12 – 14 June 2015

Third Conference of the Croatian Platform for Catastrophe Risk Reduction, Zagreb, Croatia, 4 November 2011

IV International Conference “Crisis Management Days”, Velika Gorica, Croatia, 25-26 May 2011

International Multidisciplinary Scientific GeoConferences SGEM, Albena, Bulgaria, 17-26 June 2014

10th Annual International Conference on Tourism, Athens, Greece, 9-12 June 2014

7th International Scientific Conference, Crisis Management Days, Zagreb, Croatia, 22-23 May 2014
5th International Conference on Cartography & GIS, Riviera, Bulgaria, 15-21 June 2014

26th International Cartographic Conference, Dresden, Germany, 25-30 August 2013

Cartography and Art – cARTography, Zagreb, Croatia, 15 April 2013

2nd Japanese-Croatian Project Workshop, Monitoring and analyses for disaster mitigation of landslides, debris flow and floods, Rijeka, Croatia, 15-17 December, 2011

Employees of the Faculty of Geodesy also participated through workshops, exhibitions and presentations in the Festival of Science held at the Technical Museum in Zagreb.

2011

- 300th anniversary of the birth of Ruđer Josip Bošković, exhibition
- Josip Ruđer Bošković and cartography, presentation
- Light and shadow on maps, presentation
- Realistic 3D presentation of reality in virtual form, presentation

2012

- Loxodrome, presentation
- How maps are made, workshop

2013

- Mobility in cartography – yesterday, today and tomorrow, presentation
- Contemporary trends in cartographic visualisation, presentation

2014

- Use of PDA for navigation, presentation
- Spatial data and NSDI in Croatia, presentation

2015

- Dynamic map of noise in Zagreb produced within the i-Scope project, presentation

The following exhibitions were organized at the Faculty of Geodesy of the University of Zagreb:

The following exhibitions were organized at the Faculty of Geodesy of the University of Zagreb:

500th Anniversary of Gerhard Mercator / 500. obljetnica rođenja Gerarda Mercatora, exhibition, Gallery on the 1st floor, Faculty of Geodesy of the University of Zagreb, 5 March 2012 – 10 April 2013

10th Anniversary of the Croatian Cartographic Society and "Cartography and Geoinformation" journal, poster, Festival of Science, Technical Museum in Zagreb, 23–28 April 2012

Nautical Charts / Pomorske karte, exhibition of the Hydrographic Institute of the Republic of Croatia at the Department of Geography of the University of Zadar within the 9th Conference on Cartography and Geoinformation, Zadar, 20–21 November 2013

Cartographic Heritage in Archives and Libraries in Zadar / Kartografska baština u zadarskim arhivima i knjižnicama, exhibition in the State Archive in Zadar within the 9th Conference on Cartography and Geoinformation, Zadar, 21-28 November 2013

Geological Maps / Geološke karte, exhibition of the Croatian Geological Survey in the Miroslav Krleža Lexicographic Institute with-in the 10th Jubilee Conference on Cartography and Geoinformation, organized by the Croatian Cartographic Society, Zagreb, 10 October 2014

Waves / Valovi, exhibition of children’s work, Galery on the 1st floor, Faculty of Geodesy of
the University of Zagreb, 12 April 2014 – 23 February 2015

Tourist and trekking maps by the Croatian Mountain Rescue Service / Turističko-planinar-ski zemljovidi Hrvatske gorske službe spašava-nja, Gallery on the 1st floor, Faculty of Geodesy of the University of Zagreb, 25 February – 5 July 2015

Children’s drawings / Exhibition of children’s artwork in the National Home in Buzet. Eight best drawings were awarded, two of which were produced by kindergarten children, four by elementary school pupils and two by high school pupils. The exhibition was held within the 11th Conference on Cartography and Geo-information organized by the Croatian Cartographic Society, 8 May – 8 June 2015

Maps of Istria and Buzet / Karte Istre i Buzeta, exhibition in the Homeland Museum in Buzet. The exhibition featured 50 plans and maps, several books and atlases and several geodetic instruments. The exhibition was held within the 11th Conference on Cartography and Geo-information organized by the Croatian Cartographic Society, 8 May – 8 June 2015

The Islands of Iž and Rava on Old Maps / Otoci Iž i Rava na starim kartama, Gallery on the 1st floor, Faculty of Geodesy of the University of Zagreb, opened on 7 July 2015

The following maps were produced and published by the Faculty of Geodesy of the University of Zagreb:

• Plan of the City of Split, 2014
• Map of Istria, 2014
• Road map of Istria, 2014
• Tourist map of Mljet National Park, 2014
• Rovinj – City Plan on Digital Boards, 2014
• Split – City Plan, 2013.

The Islands of Iž and Rava on Old Maps / Otoci Iž i Rava na starim kartama, Gallery on the 1st floor, Faculty of Geodesy of the University of Zagreb, opened on 7 July 2015

The following maps were produced and published by the Faculty of Geodesy of the University of Zagreb:

• Map of Geomagnetic Field for Epoch 2009.5, Zagreb, 2013, authors: Brkić, M., Poslončec-Petrić, V.
• Northern Dalmatian Islands, 2012
• Dugi otok, Ugljan, Pašman, Silba, Olib, Ist, Molat, Sestrunj and Rivanj, 2012
• Split – City Plan, 2012
• Osijek – City Plan, 2012
• Faculties and Academies of the University of Zagreb and some useful locations in the City. University of Zagreb, 2012
• City Plan of Dubrovnik, 2011
• Plitvica Lakes National Park, 2011
• Position of High Schools, Universities and Other Institutions – 2011 Situation. Guide for Future Students, Academic Year 2011/12, University of Zagreb, 2011
• Bicycle Routes of Istra County – Umag, Road Tracks, Mountain Tracks, booklet, 2011
• Bicycle Routes of Istra County – Pula, Poreč, 2011
• Stepinac’s Path, Marija Bistrica, 2011
• Medulin, Beach, 2011
• Town of Sveti Ivan Zelina, 2011

3.2 University of Zagreb, Faculty of Sciences, Geography Department

http://www.pmf.unizg.hr/geog


The University of Zagreb, Faculty of Science, Department of Geography organized a map exhibition – a selection from its map collection which includes 9084 maps and atlases. The valuable cartographic heritage of the Department of Geography was represented
by 52 selected maps and one atlas – Claudius Ptolemy's *Geographia*, dating from 1562. The Department of Geography is using this exhibition, which will become a permanent display, to mark the International Map Year (2015-2016).

### 3.3 University of Zadar, Department of Geography

As in previous periods, the University of Zadar's Department of Geography and the Zadar branch of the Croatian Geographic Society were involved in various cartographic activities as part of their regular and extraordinary work during the period 2011-2015. Some of these activities were carried out independently, and others in cooperation with the university's Karst and Coastal Research Centre, Adriatic Onomastic Research Centre, and also with the Croatian Geographic Society, the Croatian Cartographic Society, the University of Zagreb's Faculty of Geodesy, the Zadar State Archives, the Scientific Library in Zadar, the Croatian Hydrographic Institute in Split, and others.

Much was done to develop and popularise cartography (teaching, scientific research into cartographic heritage, occasional popular-level scientific lectures, exhibitions, thematic map productions, etc.), but there is room for improvement, so in the coming period, new, significant steps forward will be attempted. Between 2011 and 2015, a great deal happened in terms of the professional development of the Department of Geography's staff, in the areas of cartography, GIS and remote research. Cartography and geoinformatics were important elements in the doctoral dissertations defended by Lena Mirošević (*Tvorbeni elementi prostornih identiteta u Dalmaciji (južnoj Hrvatskoj)* – Formative elements of spatial identity in Dalmatia (Southern Croatia), 2011, Ante Šiljeg (*Digitalni model reljefa u analizi geomorfometrijskih parametara – primjer PP Vransko jezero* – Digital relief models in analysing geomorphometric parameters – the example of Lake Vrana Nature Park, 2013) and Ante Blaće (*Razvoj i suvremena preobrazba krajoa i Ravni kotari* – The development and contemporary transformation of the Ravni Kotari landscape, 2015).

The cartographic activities of the University of Zadar's Department of Geography were continued in terms of teaching, science and expertise. Significant progress was made in teaching geoinformatics courses in higher education, through the acquisition and application of appropriate IT equipment, in particular, licensed computer programmes, while knowledge and skills in the GIS field were increasingly implemented in scientific and research work. As part of the syllabus for scientific single-subject and teaching-oriented double-subject undergraduate and graduate studies in geography, lectures in cartography and geoinformatics were delivered within the following courses: *Cartography I, Cartography II, Geoinformatics, Multimedia Geography, Digital Cartography, GIScience – the Science of Geospatial Information, Applying GIS in Spatial Planning, and Remote Research*. The Department's teaching staff (Josip Faričić, Ante Šiljeg, Lena Mirošević, Sanja Ložić, Branimir Vučosav, Ante Blaće, Denis Radoš and others) were no longer assisted by external associates in delivering these cartographic and geoinformatics courses, due to pressing financial circumstances, but also due to the strengthening of the Department's own staff. The involvement of geodesists and geographers from
other Croatian institutes of higher education would undoubtedly contribute to the quality of teaching, particularly in relation to interdisciplinarity. We are attempting to address this deficiency by cooperating in scientific research and organising various scientific and expert activities with geodesists, historians and others who study maps as means of expression and important sources of spatial information. In addition to what has already been achieved, and bearing real needs in mind, there is a new plan to improve the geography syllabus by strengthening the modules in cartography and GIS. The Chair in Cartography and GIS has been established and Josip Faričić has been its head since its inception in 2014.

A moderate amount has been accomplished in the scientific research of cartographic heritage and the production of thematic maps to accompany many scientific and expert geographic papers. The results of this research and other professional work have been published in Croatian and foreign journals (The Cartographic Journal, Geoadria, Kartografija i geoinformacije, Geodetski list, Annales, Naše more, Dela, etc.), scientific monographs (Toponimija otoka Paga, Toponimija Korunskog otoka, Otok Silba, Otok Šolta, Veli Rat etc.) and other publications (proceedings from symposia such as Čovjek i krš). A large number of thematic maps were published in university textbooks by Josip Faričić, Geografija sjevernodalmatinskih otoka (The Geography of the North Dalmatian Islands) (2012) and Damir Magaš, Geografija Hrvatske (The Geography of Croatia) (2013). Individual scientists from the University of Zadar’s Department of Geography contributed cartographic topics to the following national and international scientific gatherings:

- International Conference Mercator Revisited, Sint Nicolaas (Belgium), 2012.
- International scientific-expert meeting Čovjek i krš (Man and the Karst) Međugorje (BiH), 2012.
- Cartography and Art, Zagreb, 2013.
- 25th International Conference on the History of Cartography, Helsinki (Finland), 2013.
- 9th Consultation with International Participation on Cartography and Geoinformation, Zadar, 2013.

The latest results in studying the rich cartographic heritage of Croatia and the Adriatic were presented in these monographs and at many scientific meetings, in the context of observing the development of scientific knowledge of the Croatian coastal and island areas, and reconstructing their complex, shifting landscape on the basis of various cartographic sources. Some of these scientific achievements were made within the framework of scientific projects, such as Geografske osnove razvoja hrvatskih obalnih regija (Geographic bases for the development of the Croatian coastal regions), led by Prof. Dr. Damir Magaš, and financed by the Republic of Croatia’s Ministry of Science, Education and Sport, Hrvatski priobalni krški prostor – geomorfološke i ekološke značajke (The Croatian coastal karst area – geomorphological and ecological features), led by associate professor Dražen Perica, and financed by the Republic of Croatia’s Ministry of Science, Education and Sport) Kulturni krajolik kao izvor znanja o organizaciji prostora (The cultural landscape as a source of information on spatial organisation), led by
assistant professor Dr. Lena Mirošević, financed by the University of Zadar, and *Visual and Material Negotiations Around Borders – A Case Study of Sovereignty and Provincial Identity at the Edges of Imperial Rule*, led by Dr. Karen-edis Barzman, financed by the State University of New York in Binghamton.

As part of the 9th Consultation with International Participation on Cartography and Geoinformatics, held in Zadar in 2013, the University of Zadar’s Department of Geography and the Croatian Cartographic Society mounted an exhibition entitled *Cartographic Heritage in Zadar Libraries and Archives*, while the Department and the National Museum in Zadar mounted an exhibition on the *Anamarija*, a passenger ship, entitled *The Islands of Iž and Rava on Old Maps*, in 2014.

The Department, in cooperation with the Zadar branch of the Croatian Geographic Society, organised several popular-level scientific lectures and book displays. At these events, appropriate attention was drawn to cartography, particularly cartographic heritage. In particular, two commemorative academic events should be highlighted: the 300th anniversary of the birth of Ruđer Bošković, held at the University of Zadar on 25 May 2011, and the 500th anniversary of the birth of Gerard Mercator, held at the University of Zadar on 23 May 2012.

From all the above, it can be concluded that Zadar has been affirmed as one of the centres of Croatian academic cartography, primarily linked with the geographic aspects of carto-graphy.

### 3.4 University of Zagreb, Faculty of Agriculture, Department of Soil Science

http://www.agr.hr

Employees of the Department of Soil Science at the Faculty of Agriculture, University of Zagreb, continued with intense cartographic activities during the period 2011–2015, applying contemporary GIS technology. Several geoinformation projects were completed during this period and many thematic maps for various users were produced based on these projects.

One such project related to the production of an information system; ‘Regionalization of Fruit Production in the Bednja and Lepoglava Municipality’. By using this information system, created according to the criteria for producing pedological maps 1:25 000, it is possible to produce several thematic maps (maps of fruit species’ suitability), as a basis for planning fruit-growing development in the area.

A program for the irrigation of agricultural land has been running in the Republic of Croatia since 2005 at the national level. As part of it, the following maps were produced during the period 2011–2015:

- Map of Agricultural Land Irrigation Suitability for Bjelovar-Bilogora County at the scale of 1:100 000
- Map of Agricultural Land Irrigation Suitability of the Sisak-Moslavina County at the scale of 1:100 000
Map of Land Irrigation Suitability for the project area of the Dalj irrigation system at the scale of 1:10 000

Map of Soil Irrigation Suitability for the Pazinstina area at the scale of 1:25 000

The Soil Science Department coordinated the production of a very significant, major project (2012-2015) "Determination of areas with natural or other specific constraints in agriculture". As part of the project, the following thematic maps of Croatia were produced:

- low temperature map
- aridity/over arid conditions map
- limited soil drainage map
- unfavourable soil texture and stoniness map
- shallow rooting depth map
- soil acidity map
- soil salinity map
- slope inclination map
- strong wind areas map
- frequent occurrence of hail areas map
- wildfire danger areas map
- flood risk areas map
- integrated map of administrative municipalities / cities which are grouped in areas with natural and specific constraints

4 Commercial Cartography

4.1 Institute for Photogrammetry d.d., Zagreb

http://www.zzf.hr

The Institute for Photogrammetry has staff and equipment for all types of work in the field of geodesy, applying classical geodetic procedures, as well as aerial photogrammetry, terrestri photogrammetry and the 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 future challenges thanks to its constant monitoring of technological developments and scientific achievements, and its systematic training of young engineering staff.

The Institute for Photogrammetry produced a series of plans and maps between 2011 and 2015:

Updating topographic maps 1:25 000

Updating topographic maps at the scale of 1:25 000 (TK 25) and the fundamental topographic base (TTB) for the area of Istra County (2012–2013), 16 sheets

Updating topographic maps at the scale of 1:25 000 (TK 25) and the fundamental topographic base (TTB) for the area of Lika-Senj County (2012–2013), 5 sheets

Updating topographic maps at the scale of 1:25 000 (TK 25) and the fundamental topographic base (TTB) for the area of Šibenik-Knin County (2012–2013), 1 sheet
Updating topographic maps at the scale of 1:25 000 (TK 25) and the fundamental topographic base (TTB) for the area of Sisak-Moslavina County (2012–2013), 1 sheet

Updating topographic maps at the scale of 1:25 000 (TK 25) and the fundamental topographic base (TTB) for the area of Krapina-Zagorje County (2012–2013), 2 sheets

Updating topographic maps at the scale of 1:25 000 (TK 25) and the fundamental topographic base (TTB) for the area of the City of Zagreb (2012–2013), 2 sheets

Updating topographic maps at the scale of 1:25 000 (TK 25) and the fundamental topographic base (TTB) for the area of Međimurje County (2012–2013), 1 sheet

Updating topographic maps at the scale of 1:25 000 (TK 25) and the fundamental topographic base (TTB) for the area of Koprivnica-Križevci County (2012–2013), 5 sheets

Updating topographic maps at the scale of 1:25 000 (TK 25) and the fundamental topographic base (TTB) for the area of Bjelovar-Bilogora County (2012–2013), 9 sheets

Updating topographic maps at the scale of 1:25 000 (TK 25) and the fundamental topographic base (TTB) for the area of Zagreb County (2012–2013), 1 sheet

Updating topographic maps at the scale of 1:25 000 (TK 25) and the fundamental topographic base (TTB) for the area of Virovitica-Podravina County (2012–2013), 6 sheets

Updating topographic maps at the scale of 1:25 000 (TK 25) and the fundamental topographic base (TTB) for the area of Požega-Slavonia County (2012–2013), 6 sheets

**Digital Orthophoto 1:2000**

For the Cernik District area (2011)
For the Nova Kapela District area (2011)
For the Novigrad District area (2012)

For the Podstrana District area (2012)
For the Town of Pleternica area (2014)

**Thematic maps**

Tourist map for Orebić Tourist Association (2014)
Map of the Town of Križevci (2014)

**Data collection for GIS**

Maintaining a unique graphical database registry of spatial units in the GIS environment (for the entire Republic of Croatia) (2012)

Photogrammetric mapping and topological data processing of the Zagreb area (topographic base for a database of land usage in the City of Zagreb) (2012)

Vectorization of special features of the landscape (ARKOD system) for the Paying Agency in Agriculture, Fisheries and Rural Development (2013)


4.2 Croatia Control d.o.o. (HKZP)

Croatia Control is a state-owned, limited liability company that operates independently in the Republic of Croatia, pursuant to the relevant laws and company acts. In providing air navigation services to institutions in neighbouring countries, it adheres to the principles and procedures of ICAO (International Civil Aviation Organisation)

http://www.crocontrol.hr
The primary mission of Croatia Control is the provision of air navigation services, following the basic principle of achieving a high level of air traffic safety.

Croatia Control's Department of Air Navigation, Procedure Design and Cartography employs three cartographers.

The cartography service applies to the following activities of the company:

- provision of operational air navigation services – air traffic control, alerting services, provision of pre-flight and flight information services to enable safe, orderly and expeditious air traffic flows; processing and storage of flight data; forwarding of information significant to air traffic safety; management of air traffic flow and airspace use

- collection, processing and distributing aeronautical information, including the issue of specific publications

- identification of operational requirements for air traffic control systems, surveillance systems, equipment and infrastructure;

- planning airspace structure and flying procedures, taking into account the interests of civil and military users, as well as environmental requirements

- implementation and harmonization of operational, developmental and international tasks and duties with international organizations, especially ICAO (International Civil Aviation Organization) and EUROCONTROL (European Organisation for the Safety of Air Navigation);

Aeronautical information is collected, processed and disseminated in the form of text and charts. Data are published in the Aeronautical Information Publication and VFR Manual in regular, pre-determined cycles.

Various types of thematic maps are published for all airports in the Republic of Croatia, including the whole area of Croatia's Flight Information Region. These maps are created in different scales and are available in analogue and digital form.

Charts are adapted to the specific cartographic key for aeronautical charts.

Various types of charts made by Croatia Control published in the Aeronautical Information Publication and VFR Manual for the period 2011–2015 include:

- VFR Charts with recommended VFR routes, 1:500 000
- Aerodrome Charts – ICAO, 1:10 000 – 1:20 000
- Aircraft Parking/Docking Charts – ICAO
- Aerodrome Obstacle Charts Type A – ICAO, 1:10 000 – 1:20 000
- Precision Approach Terrain Charts – ICAO
- Instrument Approach Charts – ICAO, 1:100 000 – 1:500 000
- Visual Manoeuvring - Circling Charts (IFR)
- Standard Instrument Departure Charts (SID) – ICAO
- Standard Arrival Charts – Instrument (STAR) – ICAO
- Enroute Charts – ICAO, 1:1 000 000
- Visual Approach Charts, 1:100 000 – 1:250 000
- ATC Surveillance Minimum Altitude Charts

Many other types of thematic maps are created for the operational purposes of Croatia Control. These include an Anti-Hail Rock chart for Croatia and part of Bosnia and Herzegovina at a scale of 1:500 000, Charts of Aerial Sporting and Recreational Activities, Charts of Military Operations Areas, etc.
Charts are made and printed using digital methods.

Altogether, 110 charts were published, including amendments and reissues, during this period.

Charts are produced according to standards and recommendations contained in ICAO Annex 4 and are published whenever there is a safety-critical change in aeronautical data – whether once, or several times a year.

In addition to the production of various charts, we are also involved in ongoing projects aimed setting up geoinformation systems:

- establishing and updating the EAD database (European AIS database) within EUROCONTROL
- producing electronic Aeronautical Information Publication (eAIP) and electronic charts
- Aeronautical Information Database Modernization Project CroATM for the implementation of Commission implementing Regulation (EU) No 73/2010 and 1029/2014 and INSPIRE.

4.3 VA-COPY multimedia d.o.o.

http://www.cromaps.com/


The following wall maps were published: Road Map of Europe, Road Map of the Balkans, City Plan of Zagreb with District Borders, Map of the Republic of Croatia - Counties, Municipalities, Mayors, Prefects, Political Parties

Board maps (city light) include: Town Plan of Pregrada, the Pregrada Area, Kutina

Note: VA-COPY multimedia has gone into liquidation.

4.4 STEF d.o.o., Zagreb

http://www.stef.hr/

Zagreb, 2012
Infokarta produced a series of plans and maps between 2011 and 2015:

- Cycling Map of the Okrug District 1:20 000
- Plan of Okrug Gornji 1:8 000
- Cycling Map of the Island of Pašman 1:50 000
- Cycling Map of the Pakoštane District 1:25 000
- Cycling Map of the Town of Biograd na Moru 1:25 000
- Cycling Map of the Sv. Filip and Jakov District 1:25 000
- Cycling Map of the Sukošan District 1:25 000
- Cycling Map of the Seget District 1:25 000

2011

Regular sessions of the Presidency were held, as well as one regular Annual Assembly and one assembly on the occasion of the 10th anniversary of the Society. The *Cartography and Geoinformation* journal was published regularly and two issues were published in 2011, Nos. 15 and 16. CCS participated in the 25th International Cartographic Conference and the 15th General Assembly of the International Cartographic Society (ICA) in Paris in July 2011. In collaboration with the State Geodetic Administration, the CCS organized the 3rd Croatian NSDI and INSPIRE Day and the 7th Cartography and Geoinformation Conference in Split, 14–16 September 2011.

For their contributions to the successful organization of the 3rd Croatian NSDI and INSPIRE Day and the 7th Cartography and Geoinformation Conference, the Presidency proposed that CCS certificates of appreciation be awarded to Velimir Anić, Pejo Bročić, Drago Butorac, Stipe Jelinčić and Tea Duplančić Leder. Dragutin Bajilo was also acknowledged for donating maps to the Society's map collection.

2012

The 11th Annual Assembly of the Croatian Cartographic Society (CCS) took place in the Hall of the Faculty of Architecture, Geodesy and Civil Engineering, Kačićeva 26, Zagreb,
on 15 March 2013. Colonel Dr. Mladen Pahernik gave the keynote lecture, *Military Cartography at the Croatian Military Academy*.

Presidency meetings were held four times a year in accordance with the Statute. In 2012, two issues of *Cartography and Geoinformation*, Nos. 17 and 18, were published. The open source software Scribus began to be used to prepare the text layout and release. The appearance of the journal has been altered slightly in response to suggestions made by the graphic designer.

A scientific conference and an exhibition were organized on the occasion of the 500th anniversary of Gerard Mercator's birth on 5 March 2012. The day was also declared the First Day of European Geodesists and Geoinformation.

On 18 April 2012, the CCS organized the launch of the monograph *Topographic maps in the territory of Croatia* at the Croatian State Archive, in cooperation with the State Geodetic Administration (SGA).

On 23 May 2012, in the Ceremonial Hall of the University of Zadar, an event was held to commemorate the 500th anniversary of Gerard Mercator's birth. The organizers were the Geography and History Departments of the University of Zadar, the Croatian Cartographic Society and the Zadar Croatian Geographic Society. Four lectures were held, including one by M. Lapaine on Mercator's projection.

On 9 July 2012, the CCS organized a tour (Zagreb–Varaždin–Borl–Jeruzalem–Zagreb) on the occasion of the 250th anniversary of the Vienna meridian survey, and a visit to the oldest trigonometry point in Croatia. Twenty-five people participated in the tour. The tour was intended to be the first step in an attempt to mark, the final point of the Vienna meridian survey (Varaždin Cathedral tower) with a memorial or a monument.

In September 2012, the CCS and SAG organized a five-day conference in Zagreb, SDI Days. The first two days were devoted to the 2nd Regional INSPIRE Training, at which participation was by invitation only. On 27 September, the First Regional INSPIRATION Forum and 4th Croatian NSDI and INSPIRE Day took place, on 28 September, the 8th Cartography and Geoinformation Conference was held, and on 29 September, there was a tour to Hrvatsko Zagorje. The SDI Days also included these events:

- Launch of the INSPIRATION project's ideas competition
- Visit to an exhibition of Zagreb's special data infrastructure in the Zagreb Forum
- Visit to the Collection of Maps and Atlases in the National and University Library in Zagreb
- AGISEE General Assembly

200 participants from 15 countries took part in the SDI Days.

On 26 September 2012, the CCS featured at the Faculty of Geodesy Day, and was given a letter of thanks for successful cooperation with the Faculty of Geodesy of the University of Zagreb.

On 10 October 2012, the CCS celebrated its 11th birthday. On that occasion, at the Faculty of Geodesy, University of Zagreb, Prof. Dr. Marijan Herak from the Geophysics Department of the Faculty of Science, University of Zagreb held a lecture entitled *The Croatian Map of Earthquake Risk – how does it start and what happens next?*

On 16 October 2012 the CCS president, on behalf of the Faculty of Geodesy, was given a letter of thanks for successful cooperation with the Croatian Standards Institute on the
occasion of World Standards Day. This co-operation took the form of temperature, wind and snow maps.

On 14 November 2012, the CCS marked World GIS Day by organizing a conference, *Cartography and Eurocodes*, held in the Hall of the Faculty of Architecture, Civil Engineering and Geodesy, in Zagreb, Kačićeva 26. The co-organizers were the Faculty of Geodesy, University of Zagreb, Meteorological and Hydrological Service, Croatian Meteorological Society and Croatian Standards Institute. After the opening words and musical interlude, five lectures were held.

On 30 November 2012 the president was invited to participate in the Annual Assembly of the Association of Surveyors of Istra County in Novigrad. He held a two-hour lecture, *New Cartographic projection HTRS96/TM*. On behalf of the CCS, he greeted the Assembly participants at the ceremonial opening and the CCS was introduced in a special agenda item.

Prof. Dr. Mithad Kozličić, a CCS member, was elected a member of the Academy of Science and Arts of Bosnia and Herzegovina (an *ex officio* member, i.e. a citizen of Bosnia and Herzegovina residing abroad).

Assist. Prof. Dr. Ivka Kljajić received recognition from the CCS for many years of work successfully organizing and managing a children’s drawing competition for the Barbara Petchenik award that represented Croatia at international exhibitions. Ana Kuveždić Divjak, M.Eng was given a letter of thanks by the CCS for many years of effort and dedication to making and promoting its visual identity, and especially for her technical editing of the journal *Cartography and Geoinformation*.

**2013**

The 12th Annual Assembly of the CCS was held on 14 March 2014 in Zagreb. Prof. Dr. Igor Vlahović held a lecture entitled *How many dimensions does a geologic map represent, or who needs an unusual compass, and why?*

The Croatian Cartographic Society, the Faculty of Geodesy and the Academy of Fine Arts of the University of Zagreb, in collaboration with the Department of Geography of the University of Zadar organized a symposium entitled *Cartography and Art*. The symposium was held on 15 April 2013, the birthday of Leonardo da Vinci, a versatile scientist, artist and (though this fact is little known) cartographer. In addition to several lectures, including one by Prof. Dr. Georg Gartner, president of the ICA, the Croatian Cartographic Society organized:

- Exhibition of pictures by Vlado Martek entitled *kARTe mAReTk*, in the gallery on the first floor of the Faculty of Geodesy
- Exhibition of the sculpture *Atlas Globalization* by Marin Marinić, in the atrium of the Faculty
- Art workshop for elementary school pupils, in collaboration with the Academy of Fine Arts of the University of Zagreb
- Editing and printing a symposium program with abstracts and descriptions of accompanying events
- Publishing symposium, exhibition and workshop information in ICA News.

The largest Croatian science popularization project, the Festival of Science 2013, was held from 22 to 27 April 2013. It was organized by the University of Zagreb, British Council and Technical Museum, and sponsored by the Croatian Ministry of Science, Education and Sport. CCS members contributed lectures.
CCS honorary member Prof. Emeritus N. Frančula was given the Croatian Geodetic Society Lifetime Achievement Award at the 17th Meeting of Croatian Geodesists/Surveyors in Sveti Martin na Muri, held from 28 to 30 June 2013. The CCS president held a lecture on map projections.

The International Cartographic Conference was held in Dresden from 25 to 30 August 2013. The conference took place at the Congress Centre on the bank of the Laba. Croatia was represented by 8 people, 4 presentations and 2 posters. Croatia also contributed 5 maps to the map exhibition: Basic Geological Map of the Republic of Croatia scale 1:50000 – sheet Cres 2, Snow Area in Croatia, Basic Wind Speed Map in Croatia, Lowest Air Temperatures in Croatia and Highest Air Temperatures in Croatia. We also presented the three latest issues of our journal Cartography and Geoinformation at the Journal and Globe Exhibition. We had 6 entries at the Children’s Drawings Exhibition.

The CCS celebrated its birthday with a lecture by Dr. Dubravka Mlinarić on Piri Reis in the Technical Museum in Zagreb on 10 October 2013. UNESCO proclaimed 2013 the year of Piri Reis. Participants were able to see an exhibition about Piri Reis after the lecture.

The 9th Cartography and Geoinformation conference was held on the occasion of World GIS Day in Zadar, from 20 to 22 November 2013. Through organizing the conference in collaboration with the Department of Geography of the University of Zadar and the Croatian Geographic Society, the CCS strove to contribute to the development of geoinformatics, cartography, geography and associated fields, with a special emphasis on GIS and spatial data infrastructure. A wide range of topics and well known guest lecturers guaranteed an interesting programme and contemporary approach. About 80 participants attended the conference and its 30 lectures. The detailed conference program and abstracts of all lectures were printed in a special publication (ISBN 978-953-95815-3-2).

In addition to the lectures, participants could visit two exhibitions prepared for the conference. Catalogues of both exhibitions were also included in the afore-mentioned publication. The president expressed gratitude to his colleagues Pejo Bročić and Dejan Lovrinčević, who were responsible for the exhibition of charts of the Hydrographic Institute of the Republic of Croatia. Josip Faričić was responsible for the exhibition on the Zadar cartographic heritage, and provided exceptional help in organising the conference. Nos. 19 and 20 of Cartography and Geoinformation were published in 2013. A new interface enables past issues to be viewed, and texts to be submitted for publishing.
Prof. Dr. Josip Faričić was elected an honorary member of the Croatian Cartographic Society for his exceptional contribution to the development of contemporary Croatian cartography, his many years of productive collaboration with the Croatian Cartographic Society, and especially for co-organizing the 9th Cartography and Geoinformation conference in Zadar, 20-22 November 2013.

The CCS awarded a certificate of appreciation to Assoc. Prof. Dr. Vera Graovac-Matassi, head of the Department of Geography of the University of Zadar, for her contribution to the organization of the 9th Cartography and Geoinformation conference. The CCS also awarded a certificate of appreciation to Assoc. Prof. Dr. Lena Mirošević, president of the Croatian Geographic Society – Zadar for their contribution to the organization of the 9th conference Cartography and Geoinformation.

2014

Members of the CCS contributed several lectures and workshops to the 12th Festival of Science, held in April 2014. An exhibition of children’s artwork on the theme Waves was opened on that occasion at the Faculty of Geodesy of the University of Zagreb.

The CCS organised the 10th Jubilee Conference on Cartography and Geoinformation in Zagreb from 10-12 October 2014. The conference was sponsored by the Croatian Academy of Engineering, International Cartographic Association (ICA), International Federation of Surveyors (FIG) and the European Spatial Data Research Network (EuroSDR).

There were five guest lectures delivered by renowned experts: Prof. Georg Gartner, President of the ICA, Dr. Suchith Anand, President of the Commission on Open Source Geospatial Technologies of the ICA, Prof. Joep Crompvoets, Secretary General of EuroSDR, Assist. Prof. Dušan Petrović, member of the Commission on Mountain Cartography of the ICA and Prof. Yerach Doytsher, President of Commission 3 on Spatial Infor-
The conference lasted three days and included 20 lectures, an exhibition of geological maps, an orienteering competition, an awards ceremony for the best children's drawings, and a guided tour of Medvednica. The conference was followed by a seminar on the role of geodesy and geoinformatics in sustainable development, organised by the IT Section for students of the Faculty of Geodesy of the University of Zagreb. The seminar included lectures by Dr. Suchith Anand, Prof. Yerach Doytsher and Prof. Vladimir Tikunov, President of the Commission on Cartography and Sustainable Development of the ICA.

**2015**

The CCS Presidency assumed the role of the Commission for Celebrating International Map Year in Croatia and organised the following activities up to the end of the summer of 2015:

<table>
<thead>
<tr>
<th>Date</th>
<th>Event</th>
<th>Details</th>
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<tbody>
<tr>
<td>24 February 2015</td>
<td>Lecture at the National and University Library in Zagreb</td>
<td>Dubravka Mlinarić: Maps and Identities – cartographic &quot;guest workers&quot; from the Croatian lands in the Early Modern Period, A Selection from the Novak Collection</td>
</tr>
<tr>
<td>25 February – 5 July 2015</td>
<td>Exhibition in the Gallery of the Faculty of Geodesy, University of Zagreb</td>
<td>Tourist and Hiking Maps of the Croatian Mountain Rescue Service</td>
</tr>
<tr>
<td>13 March 2015</td>
<td>Book launch</td>
<td>Mirko Alilović: Herzegovina on Maps and Plans</td>
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<tr>
<td>13 March 2015</td>
<td>Assembly in Zagreb</td>
<td>Annual Assembly of the Croatian Cartographic Society</td>
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<tr>
<td>10 April 2015</td>
<td>Exhibition in Zagreb</td>
<td>Opening of the permanent exhibition &quot;Selection of Maps from the Map Collection of the Department of Geography of the Faculty of Science, University of Zagreb&quot;</td>
</tr>
<tr>
<td>25 April 2015</td>
<td>Festival of Science at the Technical Museum in Zagreb</td>
<td>Ivka Kljajić: Prizes and commendations in the competition for a children's map of the world, <em>My place in today's world</em> Miljenko Lapaine: International Map Year, lecture Robert Župan, Stanislav Frangeš, Krunoslav Šoštarić: 3D Campus of the University of Zagreb</td>
</tr>
<tr>
<td>8-10 May 2015</td>
<td>Conference in Buzet</td>
<td>11th Conference on Cartography and Geoinformation &quot;We Love Maps&quot;</td>
</tr>
<tr>
<td>8 May 2015</td>
<td>Exhibition in Buzet</td>
<td>Exhibition of children's drawings, <em>Narodni dom</em>, Buzet</td>
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<tr>
<td>9 May 2015</td>
<td>Exhibition in Buzet</td>
<td>Exhibition of maps of Istria and Buzet, <em>Zavičajni muzej</em>, Buzet</td>
</tr>
<tr>
<td>Date</td>
<td>Event</td>
<td>Description</td>
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<tr>
<td>17–21 May 2015</td>
<td>Map at the exhibition in Sofia, Bulgaria</td>
<td>Map of the World at the map exhibition, FIG Working Week 2015</td>
</tr>
<tr>
<td>12-14 June 2015</td>
<td>Lecture, Zaton near Zadar</td>
<td>M. Lapaine: HTRS96/TM – Distortions of lengths and areas, 18th meeting of Croatian surveyors organized by the Croatian Geodetic Society</td>
</tr>
<tr>
<td>7 July 7 – 31 October 2015</td>
<td>Exhibition in the Gallery of the Faculty of Geodesy, University of Zagreb</td>
<td>The Islands of I2 and Rava on Maps, exhibition author Josip Faričić</td>
</tr>
<tr>
<td>23-28 August 2015</td>
<td>ICC, Rio de Janeiro, Brazil</td>
<td>27th International Cartographic Conference, participation in the ICA General Assembly, several oral presentations, participation in the map exhibition and children's drawing exhibition, and chairmanship of the meeting of the ICA Commission on Map Projections</td>
</tr>
<tr>
<td>End of August 2015</td>
<td>Lecture at the Summer Seminar for geography teachers</td>
<td>Mladen Pahernik: Topographic Maps of the Republic of Croatia</td>
</tr>
<tr>
<td>14–20 September 2015</td>
<td>Exhibition at Marko Marulić City Library, Split</td>
<td>Tourist and Hiking Maps of the Croatian Mountain Rescue Service</td>
</tr>
</tbody>
</table>

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