



**Project partners:**

Surveying and Mapping Authority of the Republic of Slovenia – Slovenia  
([www.gu.gov.si/en](http://www.gu.gov.si/en))

Ministry of the Environment and Spatial Planning – Slovenia ([www.mop.gov.si/en](http://www.mop.gov.si/en))

Statens kartverk – Norway ([www.kartverket.no/en](http://www.kartverket.no/en))

Landmælingar Íslands – Iceland ([www.lmi.is/en](http://www.lmi.is/en))

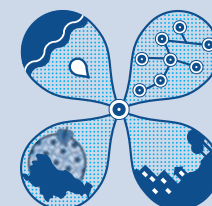
**EEA Financial Mechanism 2009-2014:**

EEA Grants, Iceland, Liechtenstein, Norway ([www.eeagrants.org](http://www.eeagrants.org))

EEA Financial Mechanism, Slovenia ([www.eeagrants.si](http://www.eeagrants.si))

[www.gurs-egp.si](http://www.gurs-egp.si)

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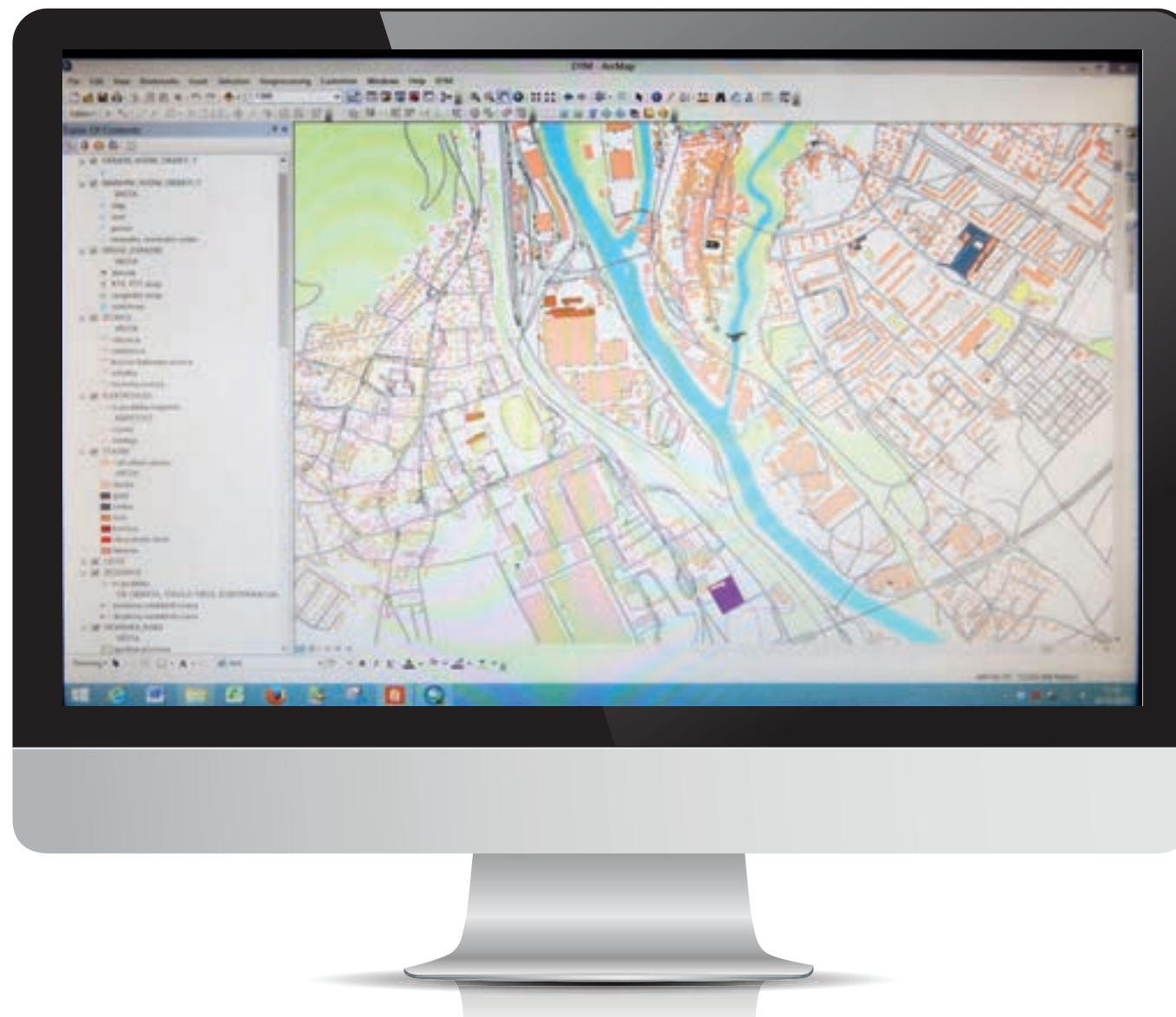
MODERNIZATION  
OF SPATIAL DATA  
INFRASTRUCTURE  
TO REDUCE RISKS  
AND IMPACTS  
OF FLOODS



# ANNUAL REPORT FOR THE YEAR 2015



# Table of contents



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EEA Financial Mechanism	3
Strengthening cooperation – exchanging ideas	4
Introductory words of the project manager	6
Project description	8
Subproject GEODETIC REFERENCE SYSTEM	12
Subproject TOPOGRAPHIC DATABASE	16
Subproject INSPIRE	20
Subproject HYDROGRAPHY	24
Unveiling of the zero order national geodetic network point - Priložje	28
Conferences, symposia, expert panels	32
International workshops and professional visits	42
Project's visibility, media coverage	46

# EEA Financial Mechanism

# Strengthening cooperation - exchanging ideas

Norway, Iceland and Liechtenstein are states involved with the Financial mechanism of the European Economic Area (EEA) and the Norwegian Financial mechanism (EEA Grants and Norwegian Grants). Both mechanisms contribute resources for the abolishment of economic and social disparities in the EEA as well as strengthening bilateral relations with eligible states. At this point there are 15 eligible states, Slovenia being one of them.

In the time period 2009 - 2014 Slovenia received almost 27 million EUR donations out of both financial mechanisms. These were used in different areas: climate change and the environment, civil society, human and social development, cultural heritage, research and studies, decent work opportunities and tripartite dialog.



Iceland, Liechtenstein and Norway are striving towards strengthened mutual relations through encouraging cooperation between Slovene subjects and donor state subjects on different projects. This collaboration has been increasing in the last few years. An excellent example of such partnership is the Surveying and Mapping Authority of the Republic of Slovenia (SMA). It has carried out a project with the help of donations in the former financial period 2004 – 2009 which was an important milestone for the Slovenian geodesy, establishing the horizontal component of the national coordinate system and establishing the national network of 15 permanent GNSS stations (Global Navigation Satellite System), named SIGNAL. The professional execution of this project and the excellent working relations between the SMA and donor states have led to a follow up project.

In the financial period 2009 – 2014, the Surveying and Mapping Authority of the RS has received donations for the execution of the project **»MODERNIZATION OF SPATIAL DATA INFRASTRUCTURE TO REDUCE RISKS AND IMPACTS OF FLOODS«**. The result of this project will be the establishment of the vertical component of the national coordinate system as well as data layers of basic topographic and hydrographic data, compliant with the INSPIRE Directive.



## INTRODUCTORY WORDS OF THE PROJECT MANAGER

Jurij Režek, MSc

We are successfully finishing two years of project implementation. All but a few planned activities are concluded and the project has gotten more attention as last year in expert circles as well as in the general public. Because of the national budget amendment for the year 2015 we had to perform a recalculation of resources for 2015 and 2016 and along with that corrections to the project's action plan for the year 2015. The finality of the project's end date (April 2016) meant that quite a lot of tasks were scheduled in this year, but we still managed to finish the majority of them in the set timeframe. If the delayed start of the project of almost a year and a half had the project team worried in 2014 regarding its successful conclusion in April 2016 we received some important news as we were preparing this annual activities report. The Financial Mechanism Office (FMO) in Brussels reached a decision to extend the project for 7 months. This means that the end date of the project has been moved to November 2016. This will ease the workload of the final tasks which would otherwise have to be done in just 4 months. Many of the key tasks – expert (calculations, workshops, system implementation) and promotional (publications, conferences) in nature are planned for the year 2016 and the quality of their execution will affect the overall evaluation of this project.

The project's visibility and recognition in the media and the professional public has been improved. This is due to activities transitioning from the planning stage to actual realization. The most prominent example is the construction of the zero order national geodetic network points, located at Prilozje, Kog, Areh, Šentvid pri Stični and Korada. These were referenced in many media publications. The project's importance and the importance of spatial, more accurately geodetic infrastructure, was presented at an expert gathering of urban and spatial planners. At that oc-

casion we emphasized the problematic of location data, especially the height component of geodetic and other data. The project was also presented at the Slovenian Land Surveying day with international participation, we organized the Slovenian INSPIRE conference from which participants departed with the shared desire for more similar gatherings. A positive side effect of activities in the field of topography was a broader debate regarding the need for a more systematic approach from state authorities regarding topographic data. In the field of hydrography an international workshop was carried out with participants from the Ministry of the Environment and Spatial Planning (MESP), Slovenian Environment Agency and from the field of hydrological-hydraulic modeling, together with our partners from Norway. Its share of media attention was also given to intervention activities due to floods, which were supported by tools developed and acquired in the scope of this project.

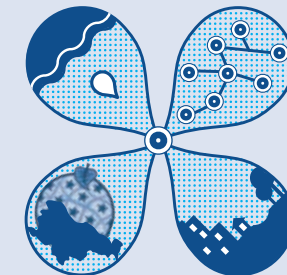
All the professional activities in the different subprojects were mostly carried out as they were laid out in the corrected action plan for the year 2015. The occurrence of some delays is due to the need for suitable weather conditions when performing geodetic field measurements. We have to emphasize the demanding nature of performing project activities alongside regular service duties of the entire team. Due to the project's nature it requires additional professional coordination and administration (special system of reporting, communication with the supervisory authority, separate financial management). But so far the project team has been successful on both fronts.



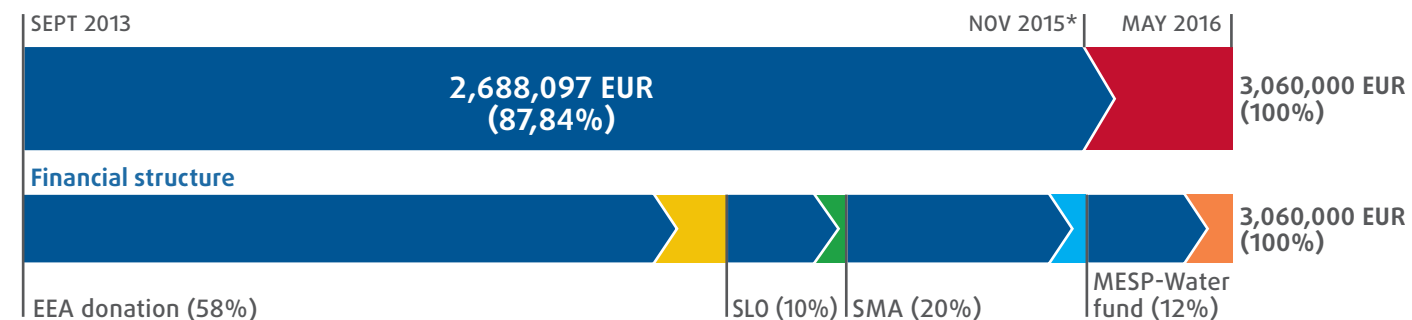


# PROJECT DESCRIPTION

## »MODERNIZATION OF SPATIAL DATA INFRASTRUCTURE TO REDUCE RISKS AND IMPACTS OF FLOODS«



### PROJECT BUDGET



\* Project's financial system data November 2015

### PROJECT OBJECTIVES



For successful flood management there is a need for different types of spatial data regarding objects and other phenomena in space, natural or artificial. For the accurate determination of potential flood risk areas and defining the impact of floods historical data are important alongside accurate topographic and hydrographic data. Currently these can be found in basic topographic maps or in topographic data sets. Amongst these data sets we have to emphasize data regarding the water network in Slovenia (hydrography), terrain model data, data on buildings and public infrastructure and all of them in conjunction with altitude data (available through the national reference system).

At this point we do not have appropriate spatial data, spatial data infrastructure or geodetic infrastructure for such purpose. What we have are watercourse topographic data, which do not meet current completeness and accuracy requirements. Less than 2/3 of Slovenia's territory is captured in 1:5000 scale, half of which is older than 10 years. Orthophoto is a good image of the surface, but does not have representation of heights.

The national geodetic horizontal and height system is the basis for defining and presenting spatial data coordinates. The height component does not provide reliable data and does not enable the use of satellite altitude measurement systems, which provide the necessary accuracy. The existing model of quasigeoid, which uses the Earth's gravity to produce a model



of Earth's shape and is used for identifying water overflow areas, is of an accuracy level less than 20 cm. The existing leveling network was recorded in the '70s and has an approximate accuracy of 15 cm. Such a height system is not sufficient in modern society and is not an appropriate platform for credible decision making, planning and construction of flood protection infrastructure.

For the availability and use of spatial data, managed by different public authorities, accompanying standardized discovery and download web services have to be produced for the users. The mentioned spatial data sets and web services are a required component of the national spatial data infrastructure, the establishment of which is mandated by the European Commission environmental Directive INSPIRE, along with its Slovenian legislative implementation. These also define data structure, data models and the establishment and use of a common European coordinate system. Slovenia does not have any of the mentioned components which means we have to establish a spatial data infrastructure to ensure the necessary data in a standardized data structures and reference system.

The present state is being improved in an organized and systematic manner with different activities and projects, one of the more important ones being **»Modernization of spatial data infrastructure to reduce risks and impacts of floods«**. Participants in this project are the Surveying and Mapping Authority



of the Republic of Slovenia (project management), the Ministry of the Environment and Spatial Planning and the Slovenian Environment Agency. The project is co-financed from donations out of the European Economic Area (EEA), so consequently the Government Office for Development and European Cohesion Policy (GODC) is also playing an important role. Of great importance to the project are the two international partners, the Norwegian and Icelandic surveying and mapping authorities. The resources coming from the donations from the EEA Financial Mechanism represent 58% of the funds in the financial structure of the project. The Republic of Slovenia directly contributes 10% of the project's funds through the GODC while the rest comes from budget appropriations from the Ministry of the Environment and Spatial Planning, Water Fund.

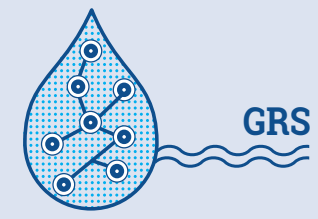
The project is divided into **four subprojects** in which different intertwined activities are carried out – firstly such activities within each subproject and later on between the subprojects. Every activity has a defined timeframe along with the necessary resources for implementation. In accordance with the guidelines of the financial mechanism the resources are structured regarding the financial types (services, equipment, land...), the budgetary items and we also have to fulfill the reporting demands. This makes for a very differentiated project plan (implementation, financial) which determines a complex project organization and real-time (sometimes even crisis) management along with the coordination of the entire project.

Besides the contextual part another important side of the project is the establishment of cooperation and increasing the operational performance of public administration. Participants from different public administration authorities have to participate in coordinated activities, which sadly is not an established practice today. Helping to improve this state is the fact that the GODC as well as the Financial Mechanism Office (FMO) in Brussels are responsible for the project's supervision which in itself strengthens the need for cooperation, responsibility division and motivation. With the project's organization, clearly defined objectives and the set timeframe for the conclusion of the subprojects and the entire project, the team strives to achieve the common goal: the establishment of the Slovene national geodetic reference system, especially the height component, which will be comparable with European standards, the foundation for a new topographic system which will be a redefinition of common practices of the previous century and at the



same time achieve at least a partial upgrade to the underlying data in the field of hydrography. All of this will also mean the partial implementation of activities demanded by the INSPIRE Directive. All of these activities are steps towards the realization of the core objective of the project - **modernization of spatial data infrastructure to reduce risks and impacts of floods**. The partial results of activities carried out till the end of 2015 which we are presenting in this activities report are a good indication for the successful conclusion of the project.





# SUBPROJECT GEODETIC REFERENCE SYSTEM (GRS)

Subproject manager: Klemen Medved, MSc

## SUBPROJECT OBJECTIVES



## ESTABLISHMENT OF A NATIONAL COMBINED GEODETIC NETWORK

The establishment of the national combined geodetic network or in other words the zero order geodetic network which will enable long term and high quality georeferencing in the Republic of Slovenia is coming to a close.

**The construction of five new points is concluded.** Besides the points Prilozje and Kog (established in the year 2014) three new were erected: Areh na Pohorju, Šentvid pri Stični and Korada. The additional reference point at Koper will be integrated into the combined geodetic network and is already functioning as a mareograph station and as one of 16 permanent stations of the Global Navigation Satellite System (GNSS) of the SIGNAL network.



Placement of the zero order geodetic network





The Minister of the Environment and Spatial Planning Irena Majcen at the opening of the first zero order point

The network points **Prilozje and Kog** are outfitted with all the necessary geodetic and other equipment. The point Prilozje is equipped with two GNSS stations, an inclinometer and meteorological station, the point Kog has one GNSS station and an inclinometer. All data are constantly transferred to the control center (Office for GNSS at the Geodetic Institute of Slovenia) where they are appropriately analyzed and stored.

In September 2015 the **zero order geodetic point Prilozje** was officially opened and as the first one given into operational use.

The point **Areh na Pohorju, Šentvid pri Stični and Korada** will be soon ready for operation. They are already outfitted with the necessary geodetic equipment and the establishment of telecommunication connections is in the last phases of completion. The necessary equipment for the point Koper is already procured and will shortly replace the outdated SIGNAL network equipment.



Geodetic measurements of the point Prilozje



For the operational management and data analysis of the network, **software** from the manufacturer Alberding GmbH and Bernese was purchased.

The zero order geodetic network points are the core component of the national spatial coordinate system. It connects its horizontal and vertical components. For the complete system integration of every point **geodetic measurements have to be done, comprised from classic, GNSS, gravimetric and levelling observations**. The first series of measurements were done on all zero order network points.

In order to monitor the local stability of points regular geodetic measurements have to be done inside each point's micro network. The physical stabilization of each point is very demanding as they are the most stable geodetic objects on the territory of Slovenia. Shifts of these points could also mean



Regional gravimetric measurement

the shifting of all other coordinate points in Slovenia due to geodynamic changes.

After the finalized establishment of the entire zero order network the next step is the **»EUREF campaign«**. Its agenda is to connect the existing realized coordinate system in Slovenia ETRS89 (European Terrestrial Reference System) with the zero order geodetic network. This will enable the long term assurance for a high quality Slovenian geodetic reference system.

## IMPLEMENTATION OF THE VERTICAL COMPONENT OF ESRS

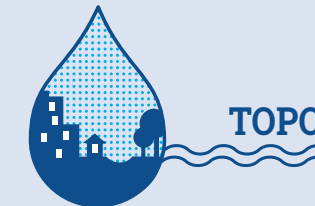
The measurement of **the new first order levelling lines** in Slovenia has continued in this year. More than 200 km of levelling lines were measured. By the end of 2015 all the necessary levelling line measurements will be completed and the gathered data will be ready for the final network adjustment in the system of geopotential numbers. Altogether, approximately 2000 benchmarks will be included in the network in a sum length of more than 1800 km of levelling lines.

On the basis of an analysis of existing detailed gravimetric data points, which stem mostly from the time period of former country Yugoslavia, the need for additional **detailed (regional) gravimetric measurements** became apparent. The main focus of these measurements are mostly the North-West, Central and South-East parts of Slovenia and will be carried out in the form of a grid system with cell size 4 km x 4 km, culminating in around 600 points.

## DEVELOPMENT OF THE GEOID MODEL FOR THE SLOVENIAN TERRITORY

All new gravimetric points are measured with a relative gravimeter in connection with the **basic gravimetric network**, the coordinates were determined with a GNSS receiver. The gravimetric measuring is concluded and after the data processing and calculation of the gathered data all of it will be used for **calculating the new Slovenian national (quasi) geoid**. Beside these measurements around 60 so called **»GNSS levelled«** points, which are evenly distributed across the territory of Slovenia, will be used to fit the new quasi geoid.





## SUBPROJECT TOPOGRAPHIC DATABASE (TOPO)

Subproject manager: Marjana Duhovnik

### SUBPROJECT OBJECTIVES

CHANGE OF THE EXISTING TOPOGRAPHIC DATA MODEL WITH REGARD TO INSPIRE DATA SPECIFICATIONS	100%
ESTABLISHMENT OF A PHYSICAL TOPOGRAPHIC DATABASE MODEL AND DEVELOPMENT OF APPLICATION FOR MANAGING DATA IN ACCORDANCE WITH THE NEW TOPOGRAPHIC DATABASE MODEL	100%
MIGRATION OF EXISTING TOPOGRAPHIC DATA INTO THE NEW DATA MODEL	100%
TOPOGRAPHIC DATA ACQUISITION IN ACCORDANCE WITH NEW INSTRUCTIONS	50%
DEVELOPMENT OF NEW METHODS AND PROCESSES FOR THE MAINTENANCE OF TOPOGRAPHIC DATA	40%
CREATION OF A NETWORK SERVICE FOR VIEWING TOPOGRAPHIC DATA	0%

### MIGRATION OF EXISTING TOPOGRAPHIC DATA INTO THE NEW TOPOGRAPHIC DATA MODEL

Data migration is the **transfer of existing data into a new data structure**, including quality control and the addition of new content. The Geodetic Institut of Sloveni in cooperation with the company Monolit performed the migration of existing topographic data into the **new national topographic data model**. The scope of data migration has been determined in the preceding project »The change of the existing topographic

model in regard to the INSPIRE data rules«.

- The following data sets were part of data migration:
- Topographic data: DTK 5 (building, high object, road, railroad, cableway, vegetation, special land use area)
  - Data of the Consolidated Cadaster for Public Infrastructure (ZK GJI): power line axis
  - Digital relief model: DMR 5
  - Data on geographical names: Register of Geographical Names (REZI)



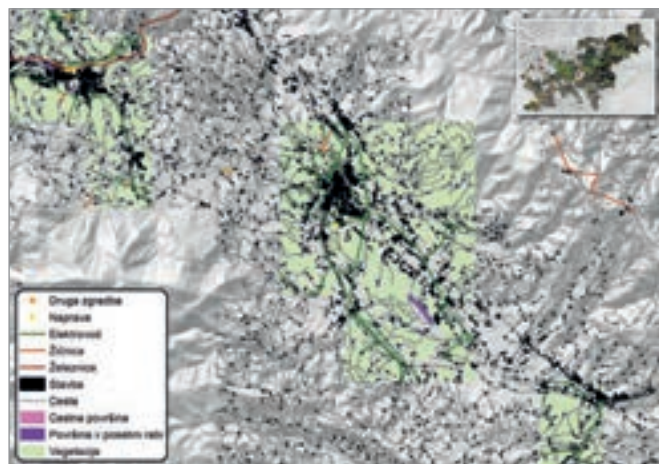
The **migration of topographic data** regarding hydrography is being done in the subproject Hydrography. The scope of the migration was test data gathered in 2013 out of aerial imagery data. This was done to test the database, because further down the line the database will hold such data for the entire territory of Slovenia gathered in 2015.

The migration was done in stages. The first stage was the defining of **migration rules** for every data set. The focus of the migration were existing data sets along with the production of additional attributes needed in the new data model. They could be acquired with the help of simple calculations or be uniformly defined for all objects in individual data sets. This phase also encompassed the verification of the proposed migration program from the previous project and consequently some additional project corrections were made to add or omit some content.

Objekt 1	grn	Objekt 1	Objekt 1	Objekt 1	Objekt 1	Objekt 1	Objekt 1	Objekt 1	Objekt 1
Objekt 2	grn	Objekt 2	Objekt 2	Objekt 2	Objekt 2	Objekt 2	Objekt 2	Objekt 2	Objekt 2
Objekt 3	grn	Objekt 3	Objekt 3	Objekt 3	Objekt 3	Objekt 3	Objekt 3	Objekt 3	Objekt 3
Objekt 4	grn	Objekt 4	Objekt 4	Objekt 4	Objekt 4	Objekt 4	Objekt 4	Objekt 4	Objekt 4
Objekt 5	grn	Objekt 5	Objekt 5	Objekt 5	Objekt 5	Objekt 5	Objekt 5	Objekt 5	Objekt 5
Objekt 6	grn	Objekt 6	Objekt 6	Objekt 6	Objekt 6	Objekt 6	Objekt 6	Objekt 6	Objekt 6

Example of data migration rules from the old into the new data model

Before the actual migration a test migration was done on a smaller scale.



Excerpt of topographic data which were meant for migration into the new topographic data model.

The second stage of the migration encompassed **an analysis of existing data**. This meant checking the accordance of existing attribute and geometric data with the old rules and regulations for data acquisition. This analysis revealed significant errors. Because of the number of errors and the complexity of their resolution (photogrammetric acquisition and individual examination of each case) some types of errors were resolved while others were well documented and submitted for latter correction.

In the third stage **migration files for each separate layer** were prepared. From a technical standpoint they were prepared in such data formats which were optimal for the technical part of the transfer (storing into the new data model database). The migration files were in their content and data format customized to files which present the data layers of the new data model. Different mechanisms were also produced (cross referencing tables and tables of dependent attributes) which enable automated processing of dependent attributes and enable additional options when overwriting attribute values during data maintenance.

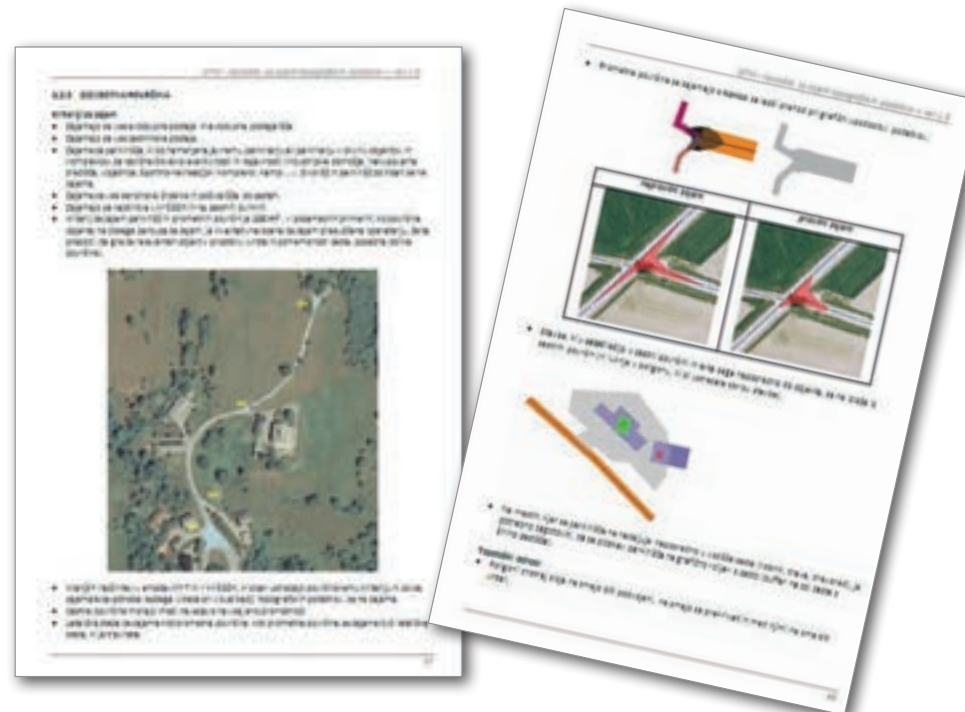
Objekt 1	grn	Objekt 1	Objekt 1	Objekt 1	Objekt 1	Objekt 1	Objekt 1	Objekt 1	Objekt 1
Objekt 2	grn	Objekt 2	Objekt 2	Objekt 2	Objekt 2	Objekt 2	Objekt 2	Objekt 2	Objekt 2
Objekt 3	grn	Objekt 3	Objekt 3	Objekt 3	Objekt 3	Objekt 3	Objekt 3	Objekt 3	Objekt 3
Objekt 4	grn	Objekt 4	Objekt 4	Objekt 4	Objekt 4	Objekt 4	Objekt 4	Objekt 4	Objekt 4
Objekt 5	grn	Objekt 5	Objekt 5	Objekt 5	Objekt 5	Objekt 5	Objekt 5	Objekt 5	Objekt 5
Objekt 6	grn	Objekt 6	Objekt 6	Objekt 6	Objekt 6	Objekt 6	Objekt 6	Objekt 6	Objekt 6

Example of interdependent attribute table

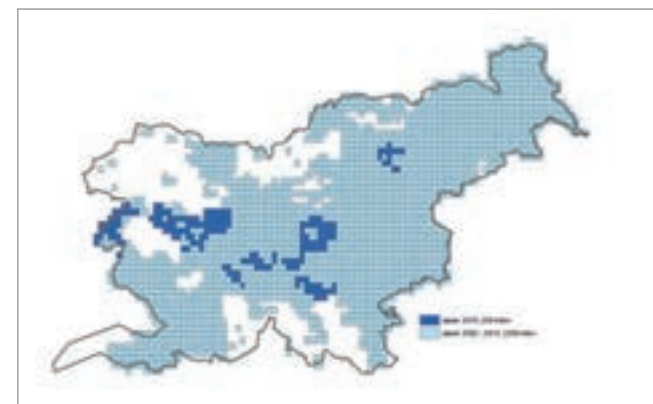
The final stage of the migration presented the **comprehensive control** (attribute values, object count, object location...) **between input data** (migration files) **and output data** (data layers in accordance with the new data model).

## TOPOGRAPHIC DATA ACQUISITION IN ACCORDANCE WITH THE NEW INSTRUCTIONS

The preparation of new instructions and guidelines for topographic data acquisition consisted of the preparation of **instructions for acquisition of all types of topographic data**, which were through different tasks of the subproject TOPO, determined for data migration into the new topographic data model and are supposed to be gathered/renewed in the scope of regular topographic data acquisition. These are data sets belonging to five INSPIRE themes: **Land cover, Land use, Buildings, Transport networks, Utility and governmental services and Hydrography**. The instructions consist of an **object catalog** with object



Instructions for acquisition of topographic data



Areas of gathered topographic data and the area of the test acquisition

type descriptions, their attributes and code lists as well as **rules for acquisition and attribution** of individual object types.

The topographic data acquisition is scheduled for 2015 and 2016. It encompasses the gathering of the following object types: **Buildings, Transport** and **Land use** for an area of 200 sheets of the new map division in 1 : 5000 scale. This task is being performed by the companies Geodetski Zavod Celje, Geodetska družba, Igea and DFG Consulting. The quality control of gathered data is done by the Geodetic Institute of Slovenia while the field control is carried out by the Surveying and Mapping Authority of the RS.

**The basic sources** for the identification and acquisition of geometrical spatial objects, including their features (content attributes) are stereopairs of cyclical aerial imagery of Slovenia and data from surface laser scanning of Slovenia. For the identification of objects, acquisition of additional features and special attributes, **supplementary sources** for acquisition are used (national topographic maps, ortophoto, Buildings Cadaster, Consolidated Cadaster of Public Infrastructure, Road Network Database).



# SUBPROJECT INSPIRE (INSPIRE)

Subproject manager: Tomaž Petek

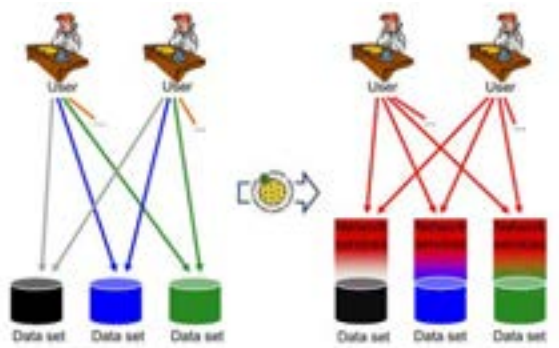
## SUBPROJECT OBJECTIVES

CREATION AND IMPLEMENTATION OF THE CAPACITY BUILDING PROGRAM AND THE PROMOTION OF THE INSPIRE DIRECTIVE	100%
PREPARATION OF INSTRUCTIONS FOR INTEROPERABILITY, THE COHERENCY OF SPATIAL DATA SETS AND THE UPDATE OF THE METADATA SYSTEM	100%
TRANSFORMATION OF SPATIAL DATA SETS IN THE DISTRIBUTION ENVIRONMENT OF THE SURVEYING AND MAPPING AUTHORITY OF THE REPUBLIC OF SLOVENIA IN ACCORDANCE WITH THE INSPIRE DIRECTIVE	100%
CREATION OF DISCOVERY, VIEW, DOWNLOAD AND TRANSFORMATION NETWORK SERVICES	100%
INTEGRATION OF THE NETWORK SERVICES AND METADATA INTO THE SLOVENE AND EUROPEAN GEOPORTAL	100%

In the year 2015 we carried out the establishment of network services and two smaller activities for management support of the subproject, support in the creation of strategic documents as well as organizational and promotional support.

## INSPIRE NETWORK SERVICES

In accordance with the INSPIRE Directive we established the **discovery network service** for all metadata and adjusted already existing discovery network services with the demands of the INSPIRE Directive. At this point the public has access to **view**



**network service** for buildings and orthophoto data, access to the Register of Spatial Units and some other spatial data sets. The development of **view and transformation services along with the connecting to other services** for topographic and hydrographic data is in the final development stages. The gathered experiences from the creation of network services were the basis for the prepared **instructions and guidelines** for the harmonization of spatial data network services, which at this moment are not covered by the INSPIRE Directive. With their inclusion we would further strengthen the ensurance of interoperability in the field of spatial data in Slovenia.

All the produced network services are part of the **Slovenian INSPIRE geoportal** (<http://www.geoportal.gov.si/eng/>) and will be also available trough the **European INSPIRE geoportal** (<http://inspire-geoportal.ec.europa.eu/>).

## MANAGEMENT SUPPORT OF THE SUBPROJECT AND CREATION OF STRATEGIC DOCUMENTS

In the scope of this task operational support for the subproject was provided. It encompassed assistance with the coordination and management of the subproject as well as administrative and technical support (support for the INSPIRE Project Group with the preparation and execution of activities, support to the National Contact Point, which acts as the link between the European Union and Slovenia regarding the implementation of the INSPIRE Directive).



Structure of the Subproject INSPIRE



User's manual

The **starting points for the connection of the subproject's results** within the field of spatial data were prepared. Their aim is to help with the simplification of data sharing and interoperability in public administration as well as outside users –eSpatial. The **recommendations for a coordinated and harmonized data policy** were supplemented in accordance with current global trends which strive toward »open data« and the use of open licenses which simplify the reuse of (spatial) data in accordance with the INSPIRE Directive and the Infrastructure for Spatial Information Act (ZIPI). For better access to information regarding the imple-

mentation of the INSPIRE Directive in Slovenia the **expert basis for ensuring access from European Union Institutions and Authorities as well as ensuring interoperability** were updated. Along with these activities another important aspect regarding the implementation of the Infrastructure for Spatial Information in Slovenia is international collaboration and the exchange of best practices and practical solutions for the implementation of the INSPIRE Directive.

For this purpose **a strategic document was designed regarding starting points for the inclusion of the Slovene infrastructure for spatial information into related regional and global initiatives**, such as: The United Nations initiative on Global Geospatial Information Management (UN-GGIM), European Commission initiative European Union Location Framework (EULF), the European Location Framework (ELF) project and the initiative for the establishment of a Danube region Data and Services Infrastructure (DRDSI).



Participants of the first Slovene INSPIRE day

## ORGANIZATION, PROMOTION AND TRAINING IN THE SUBPROJECT INSPIRE

In scope of activities regarding organization, promotion and training the first **Slovene INSPIRE day** was organized in 2015 and different promotional and informative materials were prepared for this occasion. The central topic of the event was **network services**. The participating lecturers presented best practices from different European countries as well as the state of play in Slovenia. The participants parted ways in a positive atmosphere and with the common hope for more similar gathering in the future.



Promotional and informational material



## SUBPROJECT HYDROGRAPHY (HIDRO)

Subproject manager: Boštjan Savšek



### SUBPROJECT OBJECTIVES

THE MIGRATION OF HYDROGRAPHIC DATA CAPTURED WITH A TEST ACQUISITION (320 SHEETS) INTO THE TOPOGRAPHIC DATABASE OF THE SURVEYING AND MAPPING AUTHORITY OF RS (SMA)	90%
UPDATE OF THE SPATIAL DATA INFRASTRUCTURE TO IMPROVE OPERATIONAL HYDROLOGICAL SYSTEMS	90%
UPDATE OF THE WATER INFRASTRUCTURE DATABASE TO IMPROVE THE PROCESS OF WATER MANAGEMENT AND MAINTENANCE	80%

The main purpose of the subproject is to **upgrade and improve the efficiency of water management services and hydrological forecasting** with the establishment of a **unified, central data structure for water management** and to incorporate new products and findings into the process of **hydrological forecasting** with the purpose for **more effective flood protection**. All newly created data sets will comply with the INSPIRE Directive regarding data access and use of spatial data sets.

The subproject HIDRO is in its last phase and is expect to come to a successful conclusion by the end of 2015. **The transfer of the test acquisition of hydrographic data**, gathered and equipped with attributes demanded by the INSPIRE Directive,

is basically finished. The hydrological forecasting has successfully incorporated data of laser surface scans into its model which resulted in improvements to the accuracy of the models. The first packets of processed satellite recordings data will be with the help of network services shortly available to analytics for hydrological forecasting. Field workers are updating water infrastructure registers and are recording new objects in test areas. A **plan for the maintenance of the hydrographic data base** is being prepared. A lot of momentum and fresh ideas have come from our young co-workers who participated in the spring workshop in Oslo regarding hydrological forecasting, organized in the frame of partner cooperation.



We are pleased that the subproject's products are not just target locked on goals defined in this subproject, but are as a small piece of a greater puzzle being incorporated in the broader scheme of water management processes, reducing flood risks and the renewal of spatial data registers. With the help of tools and software solutions developed in the subproject HIDRO and in combination with existing infrastructure for spatial information we were able to support an **action plan of intervention activities against floods** which enabled a practically real – time monitoring of the execution of intervention activities after the last year floods in Slovenia, which got a lot of media coverage..

Another resounding achievement was the **establishment of a free of charge distribution of LIDAR** (Light Detection And Ranging) **data** which was possible because of hardware components purchased in this subproject, our own expertise and the existing spatial infrastructure. It is still receiving a lot of praise from the professional public, business sector as well as from abroad.

Our hope is that this positive drive derived from actual results of our labor will lead us to the successful conclusion of the subproject.



*Atlas eVode which enables free of charge access to LIDAR data for the entire territory of Slovenia*

## ACTIVITIES IN 2015

### TRANSFER OF THE TEST ACQUISITION OF HYDROGRAPHIC DATA INTO THE TOPOGRAPHIC DATA SET AT SMA

We will determine the rules and procedures for **the migration of sample hydrographic data set compliant with INSPIRE data specifications into the new National Topographic Data Model**. The test migration of sample hydrographic data (320 sheets, about 10% of the territory of Slovenia) into the new topographic data model is being carried out.

### UPDATING OF THE SPATIAL DATA INFRASTRUCTURE IN ORDER TO IMPROVE THE OPERATIONAL HYDROLOGICAL SYSTEMS

#### Concept for a hydrographic data maintenance system

We will determine technical and administrative procedures for data updating and maintenance for each organization tasked with the managing of a hydrological data set. This determination will be based on different activities: analysis of all the stakeholders, analysis of their individual roles in the system and responsibilities for hydrologic data acquisition.

#### Inclusion of analyzed satellite recordings into hydrological forecasting

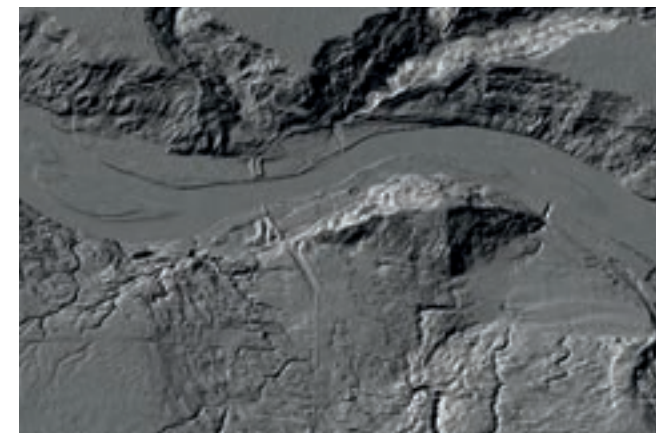
The application VodePRO will include products received from the Sentinel satellites. Areas of water bodies will be gathered from satellite pictures and with the help of WMS services incorporated into VodePRO. This will present a regular data source for water bodies to be used for different analysis in hydrological forecasting (data control, water overflow modeling...).

### UPDATING THE WATER INFRASTRUCTURE OF THE SPATIAL DATA INFRASTRUCTURE

In the start of 2015 we continued with the testing and debugging of the **network application for the entry and maintenance of water infrastructure objects**.



*Network application for the entry and maintenance of water infrastructure objects*



In the meantime instructions for test data acquisition of infrastructure were prepared, where priority areas for the test acquisition and the individual phases of the test acquisition were clearly defined. Because we do not have a working application for recording data since 2008 the first step was the review of all physical records (Phase I). This enabled the storing of data gathered with the review of physical records along with data out of the old application (Phase II) into the new application. On these foundations field data acquisition of water infrastructure is being carried out (Phase III) as well as review of the financial plan (Phase IV – capital assets). After the completion of all phases, verification of the gathered data is preformed and work in the test area is concluded.



# UNVEILING OF THE ZERO ORDER NATIONAL GEODETIC NETWORK POINT - PRILOZJE

Prilozje, September 11 2015

On Friday, September 11 2015, the first working zero order network point was solemnly unveiled and put into operational use with all the necessary geodetic and telecommunication equipment. It is situated near the recreational airfield in Prilozje, municipality of Metlika. The event was prepared by the Surveying and Mapping Authority of the RS in cooperation with the Geodetic Association of the Dolenjska region. Because this presents a special occasion in the modern land surveyor history an informational plaque has been placed there to communicate the purpose and importance of the network point to the broad public alongside with the significant role of the financial mechanisms in the construction of the basic geodetic infrastructure in Slovenia is also highlighted.



The event was attended by **the Minister of the Environment and Spatial Planning Irena Majcen**, who in her speech emphasized the importance of high quality data and the establishing of a geo-information infrastructure based on common, European guidelines and technologies to ensure international cooperation and economic, spatial, environmental and social development. And the core component of such infrastructure is the so called European Reference System, which has to be established by each EU member state.

The gathered public was greeted by the Director General of the **Surveying and Mapping Authority of the RS Anton Kupic** who highlighted the past 15 year transformation of the Slovene National Geodetic Reference System from traditional, historical, expert and technical foundations into a modern system on par with the rest of Europe.



**The Director of the Geodesy Office at SMA Jurij Režek, MSc**, emphasized the significance of a national geodetic reference basis which is one of the core tasks of the SMA. Besides giving a summary of activities of the past ten years and the ones planned for the near future he also emphasized the importance of the Norwegian financial mechanism and the EEA Financial Mechanism, which together with the Surveying and Mapping Authority of the RS cofinanced tasks relating to the National Geodetic Reference System.



The solemn unveiling of the point and the informational plaque

The solemn unveiling was followed by an **expert lecture from Klemen Medved, MSc**, the manager of the subproject GRS under which the new Slovenian Coordinate System is being established.

The event was attended by around 60 people, mostly co-workers from the Geodesy Office, which deserve the main credit for the establishment of the Slovene Georeferencing System,



Expert lecture



Colleagues from the Geodesy Office with the Minister and the Director General

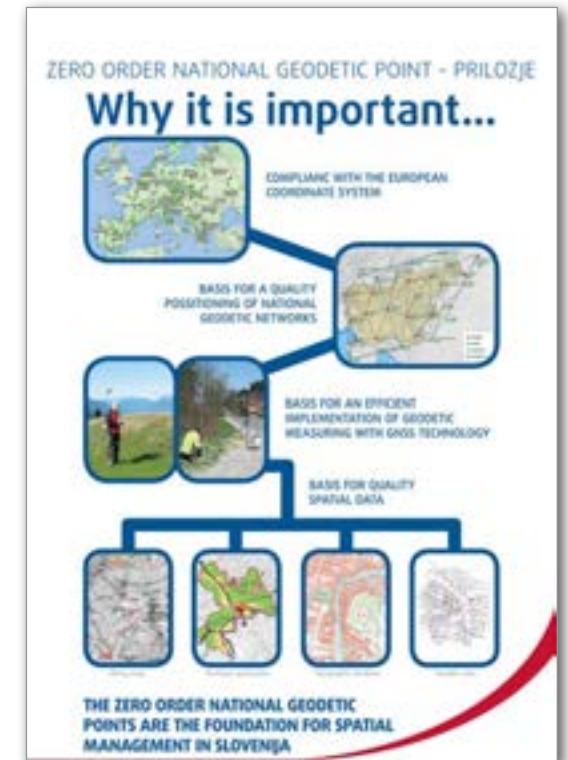
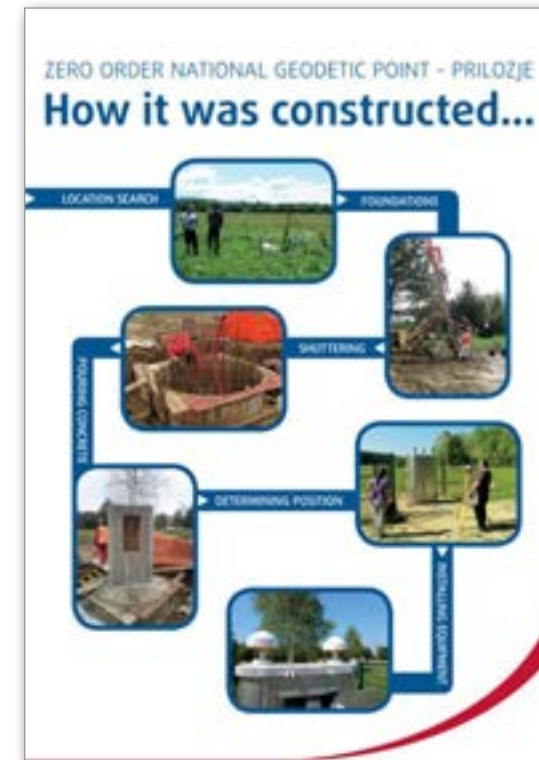
colleagues for the Department of Geodetic Engineering, Faculty of Civil and Geodetic Engineering, University of Ljubljana, representatives from the Geodetic Institute of Slovenia, which prepared the expert basis for its establishment, as well as colleagues from the Geodetic Association of the Dolenjska region, Regional offices of the SMA and others. The event also sparked attention in the press which reported on it in different media outlets.



Colleagues from the Geodesy Office with the Minister and the Director General

The visible (above ground) part of the point is a 2 m high column standing on a base plate, covered with dirt. Directly on its base plate four more points are located as well as a height reference point (benchmark) for levelling line measurements and the measurement of gravitational acceleration. These points are meant as anchors for surveying equipment when carrying out traditional terrestrial, levelling and gravimetric measurements. At the top of the column two GNSS antennas are mounted for satellite data reception. Located between the antennas on the columns axis lies the central reference point. Inside the column itself a box houses measurement equipment. All in all most of the construction and measurement equipment is hidden from the outside. It needs to be noted that the base plate is supported with three pylons which are placed under an 18° angle and are 22 m deep. The pylons, base plate and column form a unified reinforced concrete structure which gives the point the necessary stability while the installed equipment enables the receiving of satellite signals from the American GPS (Glo-

bal Positioning System), Russian GLONASS (Global Navigational Satellite System) and European Galileo (European Global Satellite System) systems. The two GNSS stations installed at this point transmit data without interruption to the control center in Ljubljana. There this data is used for continuous precise calculations of the reference point's location inside the European Coordinate System (ETRS89) within the accuracy of a few mm. The high accuracy of measurements at these network reference points enables the monitoring of geodynamic shifts (tectonics) and changes in the land mass distribution. The zero order points are also used to monitor the user network for the Satellite Positioning System Network (SIGNAL) which is used for the determination of all coordinates of geodetic and all other spatial data inside the European Coordinate System. This means that coordinates in Slovenia are based on the combined zero order geodetic network. Near the zero order network point at Prilozje a commemorative plaque was erected which is meant to inform visitors of the objects meaning.







## PRESENTATION OF THE NATIONAL COORDINATE SYSTEM AT THE EUROPEAN SPACE EXPO

Ljubljana, March 13 to 15 2015



Between the 6<sup>th</sup> and 15<sup>th</sup> of March 2015 Ljubljana, at the Congress Square, hosted the traveling interactive exhibition of the European Commission **European Space Expo**. It has been on the road since 2012 and has left its mark on 27 major European cities where it was visited by more than half a million people. Its purpose is to present key information regarding the European Space Program and bringing today's space technologies closer to the masses. The visitors were able to get information regarding the satellite navigation system Galileo and EGNOS (European Geostationary Navigation Overlay Service) and the Earth observation program Copernicus as well as try out different applications of

satellite technologies. The interactive nature enabled the visitors to learn about the practical application of satellite technologies for traffic optimization, higher efficiency in agriculture and fishing, environmental protection, monitoring of climate change, managing of emergency situations due to natural or industrial disasters, humanitarian aid and better security of EU citizens.

In the frame of the exhibition short popular science presentations were organized each day with which national experts, engineers and scientists presented Slovene activities and achievements in the field of space science and technologies.

The Surveying and Mapping Authority of the RS was also part of the Expo. On Friday, March 6, a special event took place organized by the EUROGI/CEKTRA titled **»Halo Zemlja, tukaj Vesolje, imamo rešitev«** (eng. trans. Hello Earth, Space calling, we have a solution). The contribution regarding the use of remote sensing in managing and maintaining geodetic data with the title **»Use of remote sensing at the Surveying and Mapping Authority of the RS«** was presented by Tomaž Petek. On Saturday, March 14, Klemen Medved, MSc, gave a presentation titled **»No satellites – no national coordinate system«**. He presented the meaning of a coordinate system and the activities carried out in this project for the establishment of its horizontal and vertical components.



*The Space Expo tent at Congress*



*Klemen Medved, MSc, during his presentation*

# 43<sup>rd</sup> LAND SURVEYING DAY – PRESENTING THE ACTIVITIES NEEDED TO ESTABLISH A MODERN GEODETIC REFERENCE SYSTEM IN SLOVENIA

Sežana, April 10 2015



Organized by the Slovenian Surveyor Association and the Surveyor Association of the Primorska region an expert gathering took place during the 43<sup>rd</sup> Surveyor Day at Kosovelov dom in Sežana titled **Land Surveying (r)evolution**. This traditional annual expert gathering of surveyors is an important educational event and provides an opportunity to share experiences, knowhow and ideas on a broader scale.

One of the high quality expert contributions from home and abroad was a presentation titled **»Activities for the establishment of a modern Geodetic Reference System in Slovenia«**, which was prepared as a collaboration between prof. Bojan Stopar, PhD, Assistant prof. Božo Kolar, PhD, Tilen Urbanč, Assistant prof. Miran Kuhar, PhD, Assistant prof. Polona Pavlovčič Prešeren, PhD, Oskar Sterle, MSc (UL FCGE); Jurij Režek, MSc, Klemen Medved, MSc, Žarko Komadina (SMA); Sandi Berk, Katja Bajec and Katja Oven, MSc (GIS). The presentation was given by prof. Bojan Stopar, PhD.



It covered the activities which were carried out in the frame of the subproject Geodetic Reference System of the project »Modernization of spatial data infrastructure to reduce risks and impacts of floods« from November 2013 till the end of 2014. Emphasis was given to the activities for the establishment of the horizontal and vertical components of the new National Coordinate System. For the horizontal component these included the analysis of the existing terrestrial reference system, analysis of different implementation possibilities for the realization of a new geodetic date and defining the role of the combined zero order geodetic network in the frame of the national spatial reference system.

The other tasks included work on the levelling and gravimetric networks, the execution of regional gravimetric measurements, quality control of existing geoid models in Slovenia, activities for the realization of the new vertical date and the future establishment of the Global Height System in Slovenia.



Solemn opening of the Land Surveying Day



Project promotion at the Land Surveying Day

# REPORTING ON THE PROJECT AT THE INSPIRE CONFERENCE IN LISBON

Lisbon, May 25 to 29 2015



From May 25 till 29 2015 the **INSPIRE conference** was taking place in Lisbon which was organized together with the **Geospatial World Forum – GWF**. The conference was attended by 1714 visitors and lecturers from 104 countries, who presented 374 reports divided into 11 parallel sections. Because of its size this conference is counted amongst the leading global events in the fields of geoinformatics, the ensuring and use of spatial data. All contributions and documentation is available

on the website of the conference <http://www.geospatialworldforum.org/>.

At the conference the INSPIRE subproject manager Tomaž Petek presented the intermediate results of the project **»Modernization of spatial data infrastructure to reduce risks and impacts of floods«** and its long term goals: managing of water sources and reducing the risk and impacts of floods as well as improve data harmonization and network services in accordance with the INSPIRE Directive.



Tomaž Petek presenting the Slovene contribution



Participants in the Spatial Data Infrastructure (SDI) section

## 25<sup>th</sup> EUREF SYMPOSIUM – PRESENTING OF THE NATIONAL REPORT REGARDING THE REALIZATION OF THE GEODETIC REFERENCE SYSTEM IN SLOVENIA FOR THE PERIOD 2014-2015

Leipzig, Jun 3 to 5 2015



From the 3<sup>rd</sup> till 5<sup>th</sup> Jun 2015 the jubilee **25<sup>th</sup> annual International Association of Geodesy Reference Frame Sub Commission for Europe (EUREF) symposium** was held in Leipzig, Germany. The EUREF symposia are of immense value to the geodetic profession as they are meant for expert contributions, debates and the informing of representatives from different European countries regarding the implementation and maintenance of the common European Reference System. The annual symposia also present an opportunity to convey national activities reports in this area as well as renew and strengthen relations with international colleagues. This year's symposium was attended by 110 representatives from national surveying authorities and other geodetic institutions

which look after the European Geodetic Reference System in 32 states, including Slovenia (picture below). In the scope of the three day gathering the participants could listen to 41 lectures and 24 national activities reports.

**The Slovene national activities report** was prepared in cooperation with the Surveying and Mapping Authority of the RS, the Geodetic Institute of Slovenia and the Faculty for Civil and Geodetic Engineering, University of Ljubljana. Klemen Medved, MSc, the GRS subproject manager, presented the report at the symposium.



## 26<sup>th</sup> SEDLAR MEETING

Ljubljana, Jun 12 2015

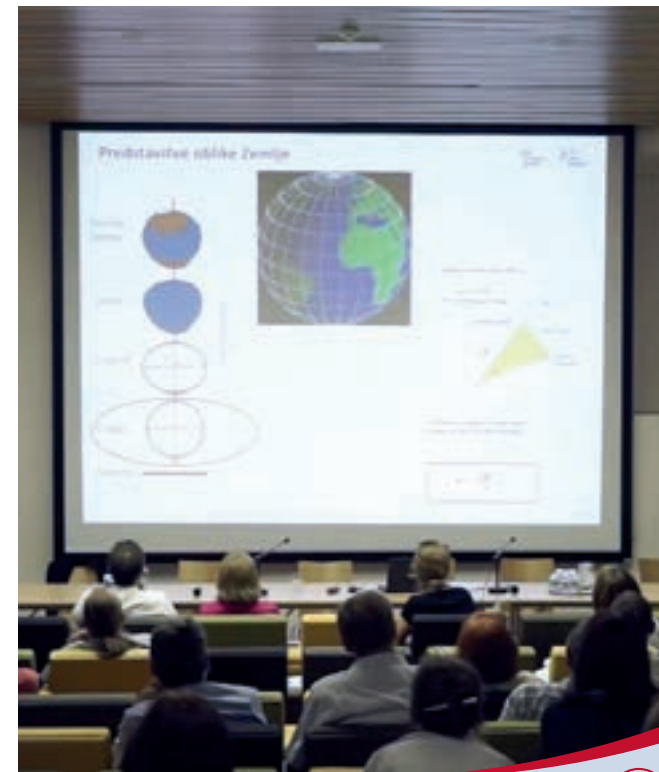


Organized by the Town and Spatial Planning Association of Slovenia (TSPAS) the **26<sup>th</sup> Sedlar meeting** took place on the 12<sup>th</sup> June at the Ljubljana City Museum. The meeting was aptly titled **Spatial Development Visions - Water Space Planning**.

The expert gathering was divided into three thematic sections. The first, introductory part the honorary speakers gave welcome speeches, the second part was dedicate to the work of prof. Maks Fabiani, PhD, and the third for expert presentations of contemporary solutions and projects. In the last section Jurij Režek, MSc, presented his contribution **»Can bad spatial data change the course of water?«**

Mr. Režek emphasized the importance of a georeference infrastructure which consists of the National Spatial Coordinate System along with some spatial data, important mostly for displaying the height component of space. He described the efforts of the land surveying profession along with the public and education sectors for a professional establishment of a geodetic and georeferenc data infrastructure in accordance with international standards. He mentioned activities which were and are still carried out through projects which are being financed from international financial mechanisms. He stressed the need for informing the professional public – experts from other professions who use spatial data– on the risks presented by a lack of knowledge of spatial and geodetic data specificities when they use it as input in their everyday work. This can lead to questionable solutions even thou they were prepared with the aid of best practice methods.

During his showing Mr. Režek also presented the importance and results of the project **»Modernization of spatial data infrastructure to reduce risks and impacts of floods«**.



# FIRST SLOVENE INSPIRE DAY

Ljubljana, September 21 2015



In the organization of the Surveying and Mapping Authority of the RS and in the scope of the subproject INSPIRE the **First Slovene INSPIRE conference** with international participation was held on September 21 2015. It had international participation. The main theme of the conference was **network services** while its purpose was to present experiences experts have gathered during the establishment of network services and spatial information abroad as well as present INSPIRE compliant network services, which are being implemented in Slovenia in the frame of the project »Modernization of spatial data infrastructure to reduce risks and impacts of floods«.

More than 70 people were attending the conference, both from the public and private sector, who over the course of the day listened to important lecturers and expert presentations and also used this opportunity to exchange and convey experiences with the implementation of the INSPIRE Directive.

The first part of the conference the honorary speakers welcomed the participants:



**Tanja Bogataj, MSc, State Secretary at the Ministry of the Environment and Spatial Planning**

She highlighted the importance of readily accessible and quality spatial data for sustainable development and efficient spatial and environmental management. »In human society everything happens 'somewhere' which makes knowledge regarding our environment of paramount importance for effective spatial and environmental policies. To gain this knowledge we rely on spatial and environmental data which convey information of real world phenomena into our virtual environment«.

**Erna Flogie Dolinar, MSc, Deputy Director of the Surveying and Mapping Authority of the RS**

In the name of the Director General of the Surveying and Mapping Authority of the RS, Anton Kupic, she welcomed all present parties and emphasized the importance of this project for land surveying in Slovenia. She briefly summed up the efforts of the Surveying and Mapping Authority for the successful implementation of the INSPIRE Directive and expressed her expectation for more such gatherings of spatial data producers and users in the future.



**Tomaž Petek, INSPIRE subproject manager**

He spoke a few introductory words on the meaning and overall theme of the Slovenian INSPIRE day and with his opening presentation INFRASTRUCTURE FOR SPATIAL INFORMATION IN SLOVENIA commenced the expert part of the conference.

## EXPERT LECTURES



**EXAMPLES OF BEST PRACTICE FROM DENMARK**

Ulla Kromborg MAZZOLLI, Danish Ministry of the Environment, Geodata Agency Denmark, Denmark



**EXAMPLES OF BEST PRACTICE FROM CROATIA**

Vlado CETL, PhD  
Faculty of Geodesy, University of Zagreb, Croatia



**EXAMPLES OF BEST PRACTICE FROM NORWAY**

Olaf ØSTENSEN, The Norwegian Mapping Authority, Norway (video presentation)



**EXAMPLES OF BEST PRACTICE FROM ICELAND**

Gunnar Haukur KRISTINSSON, National Land Survey of Iceland, Iceland



**EXAMPLES OF BEST PRACTICE FROM EEA**

Darja LIHTENEGER, European Environment Agency (EEA)



**NETWORK SERVICES IN THE FIELD OF WATERS AND THE ENVIRONMENT**

Primož KOGOVŠEK, Slovenian Environment Agency, and Tomaž GRILJ, Ministry of the Environment and Spatial Planning, Slovenia



**NETWORK SERVICES AND THE DISTRIBUTION ENVIRONMENT OF SMA**

Uroš MLADENVIČ, MSc, Surveying and Mapping Authority, Slovenia



**RESULTS OF THE INPSIRE PROJECT**

Martin PUHAR, MSc, IGEA d.o.o., Slovenia



**INTEGRATION OF GEOSPATIAL AND STATISTICAL DATA – the STAGE APPLICATION**

Igor KUZMA, Statistical Office, Slovenia



**SPATIAL INFORMATION SYSTEM – PIS AND NETWORK SERVICES**

Jurij MLINAR, Ministry of the Environment and Spatial Planning, Slovenia



**INTEROPERABILITY FRAMEWORK – NIO**

Danica ŠAPONJA, Ministry for Public Administration, Slovenia

All presentations are available on the project's web page <http://www.gurs-egp.si/podprojekti/inspire/dokumenti>



Everyone attending the conference received a document titled **ABC INSPIRE**, in which all the main tasks and responsibilities stemming from the INSPIRE Directive and the national Infrastructure for Spatial Information Act (ZIPI) are summarized for an initial overview for providers of spatial data sets. The participants parted ways with a clear message for more similar gatherings in the future and the hope for the Slovene INSPIRE day to become a traditional event.



## 8<sup>th</sup> SYMPOSIUM OF CHARTERED GEODETIC ENGINEERS OF CROATIA

Opatija, October 23 to 25 2015



The Croatian chamber of chartered geodetic engineers organized the **eight symposium of chartered geodetic engineers of Croatia** in October 2015 in Opatija titled **»Geodetic policy for the future«**.

This established gathering of Croatian land surveyors is the biggest professional event in the country which is attended by more than 700 chartered surveyors as well as representatives from the Croatian Surveying Authority and the Faculty for Geodesy, Zagreb. In the last few years the organizers have been striving to include more lecturers from abroad. This year's international participation was especially interesting as the event was attended by the Council of European Geodetic Surveyors - CLGE President Maurice Barbieri, IG PARLS President Clemens Kiepke, Dean of the Faculty for Geodesy in Munich, prof. Thomas A. Wuderlich, PhD, and the representative from the Surveying and Mapping Authority of the RS Jurij Režek, MSc. All the honored guests were partaking in a round table at the opening ceremony in which they discussed the current state of geodesy in modern society.

The symposium was divided into sections. In the one titled **»European experiences for Croatian land surveying«** the **»Modernization of spatial data infrastructure to reduce risks and impacts of floods«** Project manager Jurij Režek, MSc, presented his contribution titled **»Geodetic infrastructure – pointless cost or component of statehood?«**



Participants of the round table debate

The presentation displayed the results of both Slovene projects financed out of the Norwegian Financial Mechanism and the EEA Financial Mechanism. The presentation also showed global, regional and national geodetic infrastructure and encouraged appreciation of geodetic infrastructure as a component of statehood. In the closing of his presentation Mr. Režek concluded that the level of appreciation for geodetic infrastructure is definitely too low in the confines of the surveying profession, let alone policy makers and broad public which have a hard time understanding this demanding and expert topic and its importance in everyday life whilst ironically being highly dependent on it in their daily activities without their knowledge. The logical inference of this conclusion is the need for a more active communication and raising awareness about land surveying and what it actually means and encompasses and how its products and applications impact everyday activities of users.

## > INTERNATIONAL WORKSHOPS AND PROFESSIONAL VISITS

### INTERNATIONAL WORKSHOP IN LJUBLJANA

Workshop of the subproject TOPO

Ljubljana, February 18 2015

In the frame of the subproject TOPO an **international workshop** was organized in the offices of the Surveying and Mapping Authority of the RS on February 18 2015. Besides the employees of the Surveying and Mapping Authority of the RS it was attended by representatives from participating companies in the subprojects TOPO and INSPIRE as well as representatives from the partner organization – Norwegian Surveying Authority (Statens Kartverk). The first part of the workshop was dedicated to the presentation of **network services developed in the subproject INSPIRE**. Following were **presentations of individual tasks of the first stage of the subproject TOPO**, from the development of the INSPIRE compliant logical model, to its physical realization in the selected database. Additionally, a **practical solution for topographic data management** was presented along with the **envisioned data migration model** for the transfer of existing data into the new data model. During the workshop questions and dilemmas were exposed and addressed with the help of the representatives of the partner organization.



Workshop participants



## WORKING VISIT TO OSLO

### Workshop of the subproject HIDRO

Oslo, April 15 to 17 2015

In April 2015 representatives from the Ministry of the Environment and Spatial Planning and the Slovenian Environment Agency, both collaborating institutions in the subproject HIDRO, participated in a study visit to Oslo. The visit's theme was **hydrography** with the purpose to **acquire operational experiences on the workings of the Norwegian Water Resources and Energy Directorate** regarding data management on the Geoportal and the publication/distribution of LIDAR data in the domain of the Statens Kartverk - Norwegian Mapping Authority.

In the first part of the visit the **working processes of the Norwegian Water Resources and Energy Directorate relating to hydrometry** were presented (field measuring and analysis), flood and landslide forecasting, hydrologic modeling, determination of danger zones, avalanche warning systems and glacial monitoring. **The practical use of data and software solutions** (Geoportal layers) available to the broad public (application for collecting data on flood events, landslides, avalanches, snow weather conditions...) as well as software solutions, data and models meant for internal use (analysis and forecasting) were presented on actual cases. The workings of the before mentioned models were presented in connection with data sets of spatial elements and the entire procedure in the case of heightened risk levels.

The second part was the presentation of the **Geoportal** and the different **uses of available spatial data**. They also showed the structure and workings of the information infrastructure system in detail and gave useful advice regarding system optimization. Additionally, orthophoto recordings of Norway and test LIDAR scans were presented to the workgroup. During this visit it was concluded, that for the most part the presented solutions are in a similar way also applicable in projects being carried out in Slovenia.



Representatives of the study group

## WORKING VISIT IN HØNEFOSS

### Meeting of the project council and workshops of the subprojects TOPO and INSPIRE

Hønefoss, November 3 to 6 2015

In the Norwegian town of Hønefoss a meeting of the **»Modernization of spatial data infrastructure to reduce risks and impacts of floods«** Project Council took place in the beginning of November 2015. The meeting was attended by representatives from the Surveying and Mapping Authority of the RS, Slovenian Ministry of the Environment and Spatial Planning, Slovenian Environment Agency and representatives from the project partners Norway and Iceland. The purpose of this event was to overview all the executed tasks and report on the individual results of the subprojects, reporting on organizational and financial matters. **Two individual workshops** were also carried out for the two **subprojects TOPO and INSPIRE**. In the topographic workshop the modeling of height data, network modeling and the efficient management of a topographic database were addressed. In the INSPIRE workshop the Slovenian representatives presented the existing infrastructure of network services which are being developed by the Surveying and Mapping Authority of the RS for the purpose of INSPIRE and European Location Framework (ELF) projects.

The working visit continued with addressing different technical and contextual aspects of network services. Participants of all the three collaborating countries exchanged experiences with the introduction of standardization in the field of spatial data infrastructure and the establishment of compliant network services.

The attending representatives shared their experiences regarding the coordination and financing in the Norway Digital project and NODE as well as the working of the NSDI in Norway and Iceland. The debate also touched the standardization in the field of service metadata and the existence of a national data and metadata standard. At the conclusion of the visit the prospects for further cooperation (donation) in the upcoming financial perspective was discussed.



Group photograph of the Slovene representatives and outside project partners



Reporting on the project's results

## PROJECT'S VISIBILITY, MEDIA COVERAGE

Our wish for the project's recognition and understanding is to bring in to the professional as well as broad public on the national and local levels even though its subject matter is very expert focused. The project is related to geodesy, topography, hydrology and the INSPIRE Directive, which outlines the establishment of a European spatial and environmental data infrastructure in member states.

In the year 2015 we did an important step forward regarding the project's visibility as we improved in the field of reporting the project's achievements. This has especially helped increase awareness of the project's importance, stimulated interdepartmental cooperation and relayed the usefulness of the project's results for individuals as well as the community as a whole.

**Informing on the project** has been done with regular news publications, event announcements and the publication of related information on the project's website <http://www.gurs-egp.si/>, with posting information on the websites of the Surveying and Mapping Authority of the RS and the Ministry of the Environment and Spatial Planning, the publication of expert contributions in expert newsletters, presentations at expert and other events on the national and international level and with the help of media reports of individual events through printed or electronic media, radio and television.



### PUBLISHED EXPERT CONTRIBUTIONS

- **Activities for the establishment of a modern geodetic reference system in Slovenia.** Land Surveying (r)evolution, Proceedings of the 43<sup>rd</sup> Slovenian Surveying Day, 2015
- **Can bad spatial data change the course of water?.** Material of the 26<sup>th</sup> Sedlar meeting, 2015
- **Can bad spatial data change the course of water?.** Urbani izziv, Special Edition 2015, Issue 5
- **National report regarding the realization of the geodetic reference system in Slovenia for the period 2014-2015.** 25<sup>th</sup> EUREF symposium
- **Unveiling of the zero order national geodetic network point – Prilozje.** Geodetski vestnik, Volume 59, Issue 3
- **Geodetic infrastructure – pointless cost or component of statehood?.** Material of the 8<sup>th</sup> HKOIG symposium





# MEDIA COVERAGE AND OTHER PROMOTION OF THE PROJECT



- **Publications on the unveiling of the zero order national geodetic network point – Priložje**
  - SMA EEA project website; Project news 4/9/2015, Svečana otvoritev prve državne geodetske točke 0. reda - Priložje
  - SMA EEA project website; Project news 11/9/2015, Geodetska točka 0. reda - PRILOZJE je odprta
  - Delo, printed edition 12/9/2015; Konec prepirov za mejnike
  - Delo, web edition 8/9/2015; Geografska mreža za manj poplav
  - Delo, web edition 11/9/2015; Konec prepirov za mejnike
  - Dnevnik, printed edition 12/9/2015; Da bo vsak potok vrisan tam, kjer je
  - Dnevnik, web edition 12/9/2015; S posodobitvijo koordinatnega sistema nič več sporov zaradi nenatančnih geodetskih meritev
  - Dolenjski list, web edition 9/9/2015; Prva od šestih točk ničtega reda bo v Priložju
  - Dolenjski list, web edition 12/9/2015; V Priložju prva državna geodetska točka 0. reda
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- **European Space Expo, presentation on the national coordinate system at the European Space Expo titled »No satellites – no national coordinate system**
- **43<sup>rd</sup> Land Surveying Day – presentation on the activities needed to establish a modern geodetic reference system in Slovenia titled »Activities for the establishment of a modern geodetic reference system in Slovenia«**
- **INSPIRE conference in Lizbon, project presentation »Modernization of spatial data infrastructure to reduce risks and impacts of floods«**
- **26<sup>th</sup> Sedlar meeting, presentation of the georeferenc infrastructure and the project's results titled »Lahko slabi prostorski podatki spremenijo tok vode?« (eng. trans. »Can bad spatial data change the course of water?«)**
- **25<sup>th</sup> EUREF SYMPOSIUM – presentation of the national report regarding the realization of the geodetic reference system in Slovenia for the period 2014-2015**
- **Publications on the the INSPIRE conference:**
  - SMA EEA project website, Projektne news 7/9/2015, Prvi slovenski INSPIRE dan
  - SMA EEA project website, Projektne news 22/9/2015, Uspešno smo izvedli prvi slovenski INSPIRE dan
  - MESP, SMA, web publishement 22/9/2015, Prvi slovenski INSPIRE dan
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  - ZAPS (Chamber of Architecture and Spatial Planning of Slovenia), web publishement 7/9/2015, INSPIRE dan – Posodobitev prostorske podatkovne infrastrukture
  - Slovane INSPIRE geoportal, web publishement 7/9/2015, Invitation to the Slovane INSPIRE day
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- **8<sup>th</sup> symposium of chartered geodetic engineers of Croatia in Opatija, Croatia, presentation titled »Geodetska infrastruktura – besmisleni trošak ili komponenta državnosti?« (eng. Trans. »Geodetic infrastructure – pointless cost or component of statehood?«)**

