



## FROM THE BESTSDI NEWSLETTER TEAM



Dear colleagues

We present a new issue of the magazine "BESTSDI Newsletter". We are still gathered around the idea to disseminate project information and communicate results with a broad audience. This magazine provides information about our activities, events, results and activities tied to a project undertaken by project partners. It will be released within the frame of Dissemination and Exploitation Work Package and Task Group Communication prepared by the Editorial board.

The main event covered by this issue is the 10<sup>th</sup> BESTSDI Workshop in Novi Sad. With special attention, we also present the BESTSDI LLL Courses organized by our project partners.

From our great partners we got interesting presentations of their universities and faculties for our regular rubric "Partner Presentations". Presentations come from Tirana, Sarajevo, Belgrade and Novi Sad.

As before, in the section "Related Events and Conferences", we provide information about a lot of events that have disseminated more information about the BESTSDI project. Our colleagues presented this project on all important meetings related to Spatial Data Infrastructure, as well as in certain magazines, throughout partner countries.

We thank all authors for their excellent articles and, at the same time, we invite other colleagues to join us and be the part of the Newsletter in all subsequent issues.

The best regards!

*Slavko Vasiljević,*

*Faculty of Architecture, Civil Engineering and Geodesy,*

*University of Banja Luka*

*Editor-in-chief*



**BESTSDI Newsletter** is a quarterly e-newsletter by Erasmus+ KA2 Capacity Building in the field of Higher Education "Western Balkans Academic Education Evolution and Professional's Sustainable Training for Spatial Data Infrastructures" project (N° 574150-EPP-1-2016-1-HR-EPPKA2-CBHE-JP).

More information at: [www.beststdi.eu](http://www.beststdi.eu).



# Project Body Meetings

## 7<sup>th</sup> Project Management Board meeting in Novi Sad

As planned, the 7<sup>th</sup> Project Management Board has been held in the Novi Sad, during the Q10 BESTSDI workshop. Like workshop, the PMB meeting has been well attended by 14 out of 16 Board members. Beside regular Project coordinator reporting on Project status and financial management, Board meeting has been focused on quality assurance and coming activities which should ensure successful finalization of our Project.

Three reports relevant for quality assurance have been submitted, 2<sup>nd</sup> (internal) Evaluation Report for 2<sup>nd</sup> year of the Project lifetime (task head Andreas Wytzisk), 2<sup>nd</sup> (external) Evaluation Report delivered by Anders Östman (Novogit) also covering 2<sup>nd</sup> year of the project, and 6<sup>th</sup> Project Success Indicators Report for period M25-M27 (task head Joep Cormpvoets). The comments and suggestions delivered in those reports have been immediately addressed and decision that is made is to update Project SDI curriculum to version 1.1.

Further, status of ad-hoc tasks has been reported (task leader Anderas Wytzisk) and discussed aiming to ensure their finalization till Podgorica workshop in July.



In addition, several reports and event minutes have been adopted, and at the end set up for Final conference in Sarajevo discussed and adopted. Final result of this PMB meeting is a long list of actions which have to be undertaken till Podgorica workshop so we could be ready for Final conference and closing of the Project with all expected results achieved.

*Željko Bačić*

# Partner presentations

## Agricultural University of Tirana - Faculty of Forestry Sciences

The Agricultural University of Tirana (AUT) is established in 1951. It is the oldest university in Albania and the unique center in the country for undergraduate and graduate studies, scientific research, training and extension in the area of agriculture and food (Agronomy, Horticulture and Plant Protection, Agribusiness, Economy and Agrarian Policy, Forestry and Wood Engineering, Agro-environment and Ecology, Agro-food Technology, Animal Husbandry and Business, Aquaculture and Fishery Management, Veterinary Medicine, etc.).



Today, the AUT includes the following faculties:

- Faculty of Agriculture and Environment,
- Faculty of Economics and Agribusiness,
- Faculty of Forestry Sciences,
- Faculty of Veterinary Medicine and
- Faculty of Biotechnology and Food.

Actually there are about 8000 students studying in 72 Study Programs in total (B.Sc. 21; MP/M.Sc. 39 (20/19); PhD 12) offered by Agricultural University of Tirana.

Faculty of Forestry Sciences (FoFS) is the unique center of higher education for undergraduate and graduate studies, scientific research, training and extension in the forestry and wood technology in Albania. FoFS is established in October 19th, 1959 as one of the first three faculties of the Agricultural University of Tirana.

FoFS is the only HEI in Albania to graduate degree specialists able to provide sustainable governance for the forest and pastures resources, which make about 50 % of the country.

The mission of FoFS is to provide professional and scientific education to its students, in the highest level of quality possible, enabling them to successfully fulfill the requirements of the labor market and the challenges in the development of the Forestry and Wood Industry, through its advanced educational, research and training programs.

FoFS envisions at becoming a contemporary and modern center of graduate and postgraduate education, scientific research and training in the field of Forestry and Wood Sciences, as well as a reference point for sustainable development of forest resources, contributing directly to the development of the country.

FoFS is organized in 3 (three) Departments respectively : (i) Department of Forestry ; (ii) Department of Wood Industry ; (iii) Department of Physics and Applied Sciences and a Didactical and has also an Experimental Unit of Wood Technology.

The faculty has 52 faculty members, of which 35 academic member staff, organized in 6 Teaching and Research Groups. There are around 500 active students enrolled in 8 Study Programs, of which, two of the First Study Cycle (Bachelor), four of the Second Study Cycle (two Professional Master and two Master of Sciences) and two Doctoral Study Programs.

Forestry study programs prepare our students to manage forests in both rural and urban areas for economical, ecological, and recreational purposes, meanwhile the Wood Processing & Furniture and Interior Design study programs offer to the students a comprehensive understanding of wood sciences, business and advanced manufacturing operations, while developing transferable skills in problem solving, communication, leadership and teamwork.

The main fields of activity of FoFS include teaching and research in a wide range of topics related to Forest Management Wood Processing and Furniture and Interior Design.

In the last years the Faculty of Forestry Sciences is aiming to establish a faculty profile supported by a broad network of international partners. We have developed direct collaboration with several European research Institutions in the framework of EU-funded Programs and bilateral Governmental agreements with European Countries such as Italy, Germany, France, Greece, Slovenia etc. in all the traditional forestry and wood technology fields, several TEMPUS/ERASMUS+ projects etc..

Since 2016, together with the Agricultural University of Sweden and Sweden Forest Agency, the Faculty is supporting the National Environmental Agency, in implementing the process of National Forest and Pasture Inventory (NFPI).

Faculty professors are supporting the consortium, which is establishing the Albanian Forest Information System through the integration of the main forests datasets in the country (National Forest inventory data, Forest Management Plans data, Forest Cadaster data and Forest Monitoring data)

Faculty staff are involved in the albanian government activities, supported by World Bank, regarding the consolidation of decentralization processes in forestry. This activities aim at supporting the Ministry of Tourism and Environment in the implementation of the decentralization of cadaster management activities for forests and municipal pastures, including the update of cadaster, property and map information on about 343,000 hectares of forests and pastures distributed over the Albanian territory.

Starting from 2018 we are cooperating with Albanian General Directorate of Civil Emergencies in the framework of IPA DRAM Project "Disaster Risk Assessment and Mapping in the Western Balkans and Turkey".

All above mentioned activities are to be considered as very positive side-effects of our cooperation with partner universities in Western Balkan and EU in the framework of the BESTSDI project.

FoFS started in April 2019 the national accreditation procedures for the Master of Science Study Programme in "Forestry Engineering". In the framework of the BESTSDI project we updated and improved the contents of two modules, part of the M.Sc. programme curriculum, respectively (i) Forest Cadaster and GIS; and (ii) National Forest Inventories and Remote Sensing.



*Spiro Grazhdani*

## University of Sarajevo - Faculty of Agriculture and Food Science

The Faculty of Agriculture and Food Sciences in Sarajevo proudly bears the name of the oldest secular institution in the domain of higher education in Bosnia and Herzegovina (established in 1940). During the war 1992-1995 the Faculty suffered severe losses. Its building was burned down to the ground, together with equipment, library and personnel and student documentation. By getting and equipping of building in the ex-army barracks Maršal Tito, nowadays known as Sarajevo University Campus, the Faculty continued its work.

Two main tasks of the Faculty of Agriculture and Food Sciences are education and scientific and research work. Education or teaching process is organized through four Departments (Department of Plant Production, Department of Zootechnics, Department of Food Technology and Department of Agricultural Economics). Research and scientific activities are responsibility of eight Institutes (Institute of soil science, agro-chemistry and ameliorations; Institute of agronomy; Institute of fruit growing and viticulture; Institute of plant protection; Institute of agricultural machinery; Institute of food technology; Institute of animal husbandry; Institute of agricultural and food industry economics).



*Mission: Using our long-standing experience, a multicultural, inclusive and attractive environment, we create and enable the transfer of ideas, technologies and innovations in which everyone can express their creative and innovative potentials with the aim of modernizing and enhancing the competitiveness of agribusiness and rural areas, as well as enhancing sustainable development of Bosnia and Herzegovina.*

Teaching process is organized within three cycles in line with Bologna process: I Cycle – Undergraduate – B. Sc. – 6 semesters – 180 CPs; II cycle – Graduate – M.A.- 4 semesters- 120 CPs; III cycle – Doctoral- Dr. Sci. – 6 semesters – 180 CPs. Today, the Faculty offers postgraduate programmes in 12 different fields: Agriculture, Fruit Growing, Wine Growing, Plant protection-phytomedicine, Domestic Animals Nutrition, Agricultural and Food Industry Economics, Plant Products Technology, Animal Products Technology, Sustainable Management of Land and Rural Areas, Food and Drinks Quality Control, Growing of Vegetables in Protected Area and Production and use of flowers and ornamental plants. As of the academic year 2008/2009, the Faculty introduced Graduate (Master's) programmes, designed to conform to the standards of the Bologna process. So far, the Faculty has produced nearly 5000 graduate engineers of agriculture and food technologies, almost 250 MAs and nearly 200 PhDs.

The Faculty implemented number of projects, out of it CORINE projects, EU, FP6, FP7, TEMPUS, ERASMUS, FAO etc.

*Melisa Ljuša & Hamid Čustović*

## University of Belgrade - Faculty of Forestry

The University of Belgrade is the oldest and largest institution of higher education in the Republic of Serbia. The origin of the University can be traced back to 1808 when teaching began at the Great School founded by Dositej Obradović. The Great School was recognized as the forerunner of the University of Belgrade. In addition to the Department of Philosophy founded in Kragujevac, the School opened its Law Department in 1841, when it was moved to Belgrade, and then in 1853, the Department of Natural and Technical Sciences was established as its third department. These three departments were transformed into three faculties in 1863 – Faculty of Philosophy, Faculty of Law, and Faculty of Technical Sciences.



During more than two centuries of its existence, the University of Belgrade has formed a large number of faculties and institutes. Today, the University of Belgrade is made up of 31 faculties and 8 scientific research institutes. It also has a system of university libraries and information service centers. Its students and teachers have made an enormous positive contribution to the cultural, scientific, educational, political, and economic life in Serbia.

The faculties are classified according to scientific fields into four groups:

1. Faculties of Social Sciences in Humanities: Faculty of Economics, Faculty of Law, Faculty of Orthodox Theology, Teacher Education Faculty, Faculty of Special Education and Rehabilitation, Faculty of Political Science, Faculty of Sport and Physical Education, Faculty of Philosophy, and Faculty of Philology,
2. Faculties of Medical Sciences: Faculty of Medicine, Faculty of Dental Medicine, Faculty of Veterinary Medicine and Faculty of Pharmacy,
3. Faculties of Sciences and Mathematics: Faculty of Biology, Faculty of Geography, Faculty of Mathematics, Faculty of Physical Chemistry, Faculty of Physics and Faculty of Chemistry,
4. Faculties of Technology and Engineering Sciences: Faculty of Architecture, Faculty of Civil Engineering, Faculty of Electrical Engineering, Faculty of Mechanical Engineering, Faculty of Agriculture, Faculty of Mining and Geology, Faculty of Transport and Traffic Engineering, Technical Faculty in Bor, Faculty of Technology and Metallurgy, Faculty of Organizational Sciences, and Faculty of Forestry.

There are over 7,000 teaching staff at the University. About 90,000 students attend 320 undergraduate study programs and there are 1,700 postgraduate students. Since its establishment, the University has produced more than 346,000 graduates of various profiles, about 22,700 masters, about 28,000 specialists, and over 13,200 PhDs.

Universities in Skopje (1949), Novi Sad (1960), Niš (1965), Priština (1970), Kragujevac (1976) and present-day Podgorica (1974) were founded under the auspices of Belgrade University.

The University of Belgrade is a member of the European and International Association of Universities and is involved in The Faculty of Forestry of the University of Belgrade is the oldest and highest higher education and scientific institution in the fields of forestry, wood processing, landscape architecture and horticulture, and ecological engineering for soil and water resources protection in Serbia.



Универзитет у Београду  
Шумарски факултет



Studies in the field of forestry began on 5th December 1920 at the Department of Forestry of the Faculty of Agriculture in Belgrade. The Faculty of Forestry became an independent faculty on 5th February 1949, when it moved into a new building at 1, Kneza Višeslava Street in the autumn of 1954.

Teaching at the Faculty of Forestry is organized into four departments: Department of Forestry, Department of Landscape Architecture and Horticulture and Department of Ecological Engineering for Soil and Water Resources Protection.

Curriculum reforms at the Faculty of Forestry started in 2006 through the implementation of the Bologna Process, with the common structure of study: 4 + 1 + 3. Within its teaching activity, the Faculty carries out undergraduate and graduate academic studies, undergraduate vocational and specialist academic studies, as well as doctoral studies.

The first level of studies (Bachelor with honours) refers to undergraduate studies. These study programs of undergraduate studies last for 4 years, after which the students obtain 240 ECTS, and the professional title of a graduate engineer of forestry.

The second level (Master) refers to postgraduate or Master Academic Studies. The studies last for one year and the students obtain 60 ECTS. Having defended the master's thesis, the student obtains the following academic titles: Master engineer of forestry in the fields of Forestry, Technologies, management and design of furniture and wood products, Landscape architecture and horticulture, Ecological engineering for soil and water resources protection.

The third level of study (Ph.D.) represents doctoral studies. They last for three years and the students obtain 180 ECTS. They are an integral part of the Bologna Process.



The Faculty of Forestry has 20 chairs with associated laboratories and centers. The Center for Educational and Scientific Facilities integrates, organizes and manages the work of teaching bases "Majdanpečka domena" (2.08 thousand ha) and "Goč" (3.73 thousand ha). The purpose of the teaching bases is to implement the programs and curricula of the Faculty of Forestry and other members of the University. It includes:

- school practice, fieldwork, and production practice;
- practical work with students;
- scientific research activity of the Faculty;
- effective exemplary forest management based on the principles of modern forestry science.

The Faculty of Forestry Arboretum is a specific-purpose green area with exceptional botanical and landscape-architectural value. It was founded in the period from 1956 to 1959 on the faculty grounds for the purpose of conducting scientific research and education. The plant stock includes about 200 woody species, subspecies, hybrids, and cultivars, represented by about 1,500 specimens. The area of the Arboretum, together with the extension zone and the footpath system, is 6.70 ha.

The participation in the Erasmus + KA2 BESTSDI project has provided the Faculty of Forestry with the means to equip the Geodesy and GIS Laboratory. The available modern equipment which included 2 GPS receivers, 2 total stations, 1 photogrammetric workstation, 1 graphic station for satellite image processing was extended with 13 new computers, a drone, and a camera. The laboratory is now a complete unit that is used for teaching and scientific research purposes. Modern equipment for collecting, processing and presenting geospatial data accompanied by a modernized curriculum in the field of spatial data infrastructure (SDI), their affirmation and promotion represents a valuable contribution to the overall development and stresses the importance of the BESTSDI project for the future activities of the Faculty.

In 2020, the Faculty of Forestry will celebrate the grand jubilee – a hundred years long and rich tradition.

*Dragomir Grujović*



## University of Novi Sad - Faculty of Technical Sciences



University of Novi Sad is the second biggest University in Serbia and reputable educational and scientific institution, providing teaching and research. Having invested considerable efforts in intensifying international cooperation and participating in the process of university reforms in Europe, the UNS has come to be recognized as a reform-oriented university in the region. University is multidisciplinary, committed to excellence, and produces well-qualified and competent graduates, who find their place in the labour market. During 2013/2014 academic year all three levels of studies were attended by 50 358 students on 14 Faculties and on 359 study programs. In teaching process is enrolled around 4 000 teaching staff, domestic and foreign.

The Faculty of Technical Sciences was founded as the Faculty of Mechanical Engineering in Novi Sad on 18 May 1960. In 1974, when the Electrical and Civil Engineering Departments were established, the faculty changed its name into the Faculty of Technical Sciences. Faculty of Technical Sciences - FTS is the biggest faculty within the UNS according to the number of students (over 12 000) at all three levels of studies organized as a unique complex institution comprising smaller organizational units such as departments, chairs, research centers, registrar offices, etc. for appropriate scientific fields and laboratories. Faculty was founded in 1960 and till now it has developed 14 departments, 10 administrative services and 33 research centres. With more than 1 100 employees, covering the area of over 35 000 m<sup>2</sup> divided into 8 buildings, the Faculty ranks among the largest and most developed faculties in the region. The activities of the FTS have been divided in education, research and development and applied research in cooperation with Industry. The Faculty has been issued the certificates EN ISO 9001:2008, ISO 14001:2009 and OHSAS 18001:2007 and is accredited as a research and scientific institution. The Faculty, i.e. Departments, deal with organizing scientific and professional conferences. The success of these activities by the Faculty is evident in the realization of around fifteen international and domestic conferences every year.

The Faculty of Technical Sciences is strongly involved in the cooperation with a large number of scientific institutions worldwide, within the scope of its activities. The professors of the Faculty have been invited to give lectures at many universities in the most developed countries of the world, including Japan, the USA, and the European Union countries. Significant achievements have been made in the international cooperation, resulting into over 50 realized international projects. During the last several years, large international projects have started to be realized from the programmes TEMPUS (EU), CEEPUS (EU), WUS (Austria), CARDS (EU), FP7 (EU), EUREKA!, Cost and Erasmus+.

Study program Geodesy and geomatics is lead by two departments: Department of Computing and Control Engineering and Department of Civil Engineering and Geodesy.

Undergraduate academic studies - bachelor is 4 years study program with 240 ESPB and with title Bachelor with honors in Geodesy. Master academic studies is 1 year with 60 ESPB and title of Master in Geodesy, Specialized academic studies which last 1.5 year and with title Specialist in Geodesy, and finally Doctoral academic studies which last 3 years, with 180 ESPB and with title Doctor of Science – Geodesy





As a part of Faculty of Technical Sciences, Laboratory for Geoinformatics is in charge of education and support of teaching processes in the field of geoinformatics at the Faculty of Technical Sciences. The activities of the Laboratory for Geoinformatics are: education of students in the field of geoinformatics, realization of research and scientific projects in the field of geoinformatics, development of software products and specialized software solutions in the field of geoinformatics, development and realization of systems in the field of geomatics, geoinformatics and geoinformation technologies, consulting and other services in the field of geomatics, geoinformatics and geoinformation technologies, reengineering the work process in geoinformation systems, education, specialization and certification of engineering personnel, organization of professional and scientific meetings, cooperation and realization of joint projects with companies in the field of geomatics, geoinformatics and geoinformation technologies.

Laboratory for Geoinformatics also is member of : International Federation of Surveyors, Copernicus Academy, International Society for Photogrammetry and Remote Sensing, Open Geospatial Consortium and United Nations Committee of Experts on Global Geospatial Information Management.



*Dušan Jovanović*





# Project Events and Conferences

## 10<sup>th</sup> BESTSDI Project Workshop in Novi Sad



The 10<sup>th</sup> BESTSDI workshop was held at the Faculty of Technical Sciences in April 8<sup>th</sup>-10<sup>th</sup>, 2019. At this gathering, 50 teachers and experts from 16 academic institutions, project partners worked on the introduction of new content into university study programs in the area of spatial data infrastructure and achieving goals of broader project outcomes through the activities of ad-hoc task groups.

Workshop has also been focused on finalization of the Consortium Agreement – Memorandum of Understanding which has been prepared by the task group headed by University of Ss. Cyril and Methodius from Skopje. After the workshop, this document has been sent for final check to the partners legal units and after that to the partners rector offices for signing.

*Dušan Jovanović and Vesna Poslončec-Petrić*



# Related Events and Conferences

## Erasmus+ call 2019

In October 2019 new call for Erasmus+ projects have been released. This was anticipated by Project consortium and already at the workshop in Banja Luka (April 2019) announced with invitation to partners to propose new project ideas. This invitation resulted with five reply's, out of which two have been agreed to make project proposals out of them and apply on the call.

First project was named "Business driven problem-based learning for academic excellence in geoinformatics" – GEOBIZ. GEOBIZ project consortium built out of 15 academic and 3 business partners together with 5 affiliated partners is addressing partners needs regarding geoinformatics business and academic sector in five European countries: Albania, Bosnia and Herzegovina, Kosovo, Moldova and Montenegro. Geoinformatics ecosystem, as a link between technical and ICT subject and professionals, is part of digital industrial revolution characterized with fast technology driven changes and development of new knowledges and skills necessary for efficient use of this technology for satisfaction of user needs. Rapid change is creating situation in which academic sector faces problems. It can't cope with fast changes and lags in introduction of new content in educational process. This results in situation that new professionals finishing academic education do not master necessary knowledge and skills in field of geoinformatics and therefore are not well prepared for industry. Ultimately business sector suffers from such situation lacking new experts which can contribute in their development. Therefore, GEOBIZ project aims to design and establish new business-academia cooperation platform in field of geoinformatics in targeted countries which will bring together geoinformatics subjects, foster their cooperation and create situation in which all stakeholders will benefit. Based on this cooperation HEI's will improve quality of education of geoinformatics and related courses using business-driven problem-based cases which are prepared (designed) by geoinformatics companies for use in educational process and thus modernise their geoinformatics courses. This modernisation should result in raising attraction of geoinformatics studies for students,

deliver well educated and prepared professional, satisfy needs of business sector for expert work force and ultimately offer to society geoinformatics sector capable to answer on societal needs in efficient, timely and cost benefit manner. GEOBIZ project application has been successfully submitted on February 7th and we are hoping on positive result of evaluation and future execution of this project.

Second project was named "Modernization, standardization and innovation of GIS courses for risk and process management in the Western Balkans HEI's teaching process" – MOGISMA. The main aim of the NatRisk project is to educate experts for Natural Disasters Risk Management (NDRM) in WB partner countries through the development and implementation of new master curricula in the field of NDRM and development of educational trainings for the public sector and citizens. The project recognized the need for constantly strengthening of the personnel competencies, followed by technical innovations and equipment, infrastructure, information and technological systems.

Besides day-by-day visible outcomes (reports, analyses, surveys, study visits, action plans, etc.), more prominent outputs showing to what extent the project objectives are met were:

- Developed seven master curricula in WB partner HEIs in line with the highest EU standards, followed by accreditation
- Contemporary equipped laboratories for studies in the field of NDRM
- Enrolment of students to the new master curricula offering mobility options for them as well as for teaching staff
- Developed and conducted educational trainings for citizens and public sector in the field of NDRM.

Finally, since the background for the foreseen activities is in accordance with EU standards and the best practices it is expected that all partner universities will educate experts with adequate knowledge and competences, which will be able to employ in relevant institutions for NDRM. Behind this project consortium of 17 universities has come together and worked on project application. Unfortunately we did not manage to collect all necessary documents in time and therefore application has not been submitted. Nevertheless, project partners agreed to prepare project proposal for next Erasmus+ call (2020).

*Željko Bačić*

# Academia - Business Cooperation Requirements Towards Establishment Of Efficient SDI



This survey is joint effort of the BESTSDI and the European Spatial Data Research Association – EuroSDR conducted on pan-European level. The aim of this specific survey is to collect information on the:

- needs and expectations of academia and business stakeholders regarding the quality of present higher education in SDI,
- expectation of business sector on knowledge and skills provided by academic institutions supporting labour market,
- forms of cooperation between academic and business sector in educational and research process and
- expectations of academic and business sector in further development of SDI.

The results of the survey will be presented on regional level at the Final conference of BESTSDI project held on September 3<sup>rd</sup>–4<sup>th</sup>, 2019 in Sarajevo, Bosnia and Herzegovina, and European level on INSPIRE conference.

Therefore, we are kindly asking you to take 15 minutes of your time and participate in this survey. Links in for questionnaire prepared in several languages: Albanian, Croatian, English, Macedonian and Serbian.

*Joep Cromvoets; Željko Bačić and Vesna Poslončec-Petrić*

## BESTSDI Presented in “FTN Novine”



In the 57<sup>th</sup> issue (March-May 2019) of FTN Novine, the newsletter of the Faculty of Technical Sciences, University of Novi Sad, BESTSDI project and activities are presented in short article.

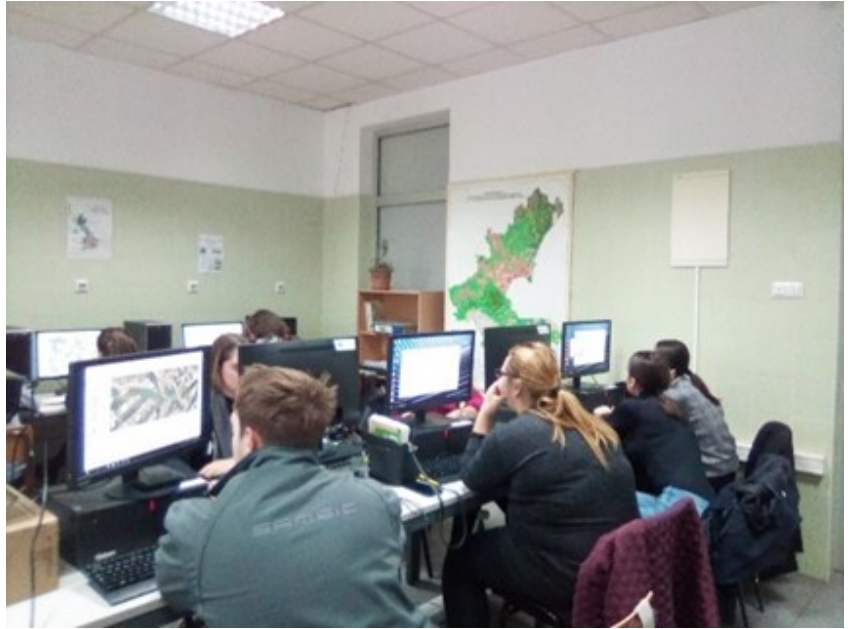
*Dušan Jovanović*



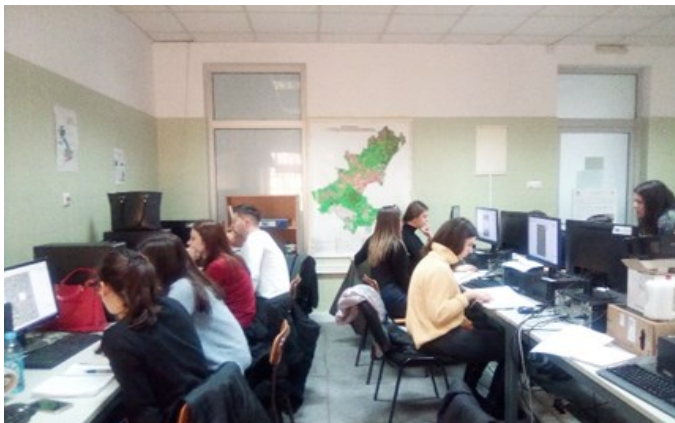
## Modern Equipped GIS Laboratory as the Basis for Further Work on Mainstreaming and Scaling Up of the Concept of SDI

Thanks to the BESTSDI project, the Faculty of Agriculture and Food Sciences of the Sarajevo University has renewed the GIS laboratory. The equipment procured (9 computers, 3 laptops, 1 server, 2 GPS, 1 projector) is worth 16,795 Eur. It has been successfully installed and networked thus ensuring the fulfillment of all prerequisites for the beginning of implementation of improved curricula as well as more efficient and more flexible approaches and analyzes in which SDI plays a key role, in this academic year.

Users of GIS laboratory are students of master study programs: Sustainable management of land and rural areas, Phytomedicine, Floristic and landscaping, and Agroindustry Economics, which will provide an assessment of the innovations in the existing curricula and suggestions that will help us improve our modules to the mutual benefit of teachers and students being the users of SDI.



*Melisa Ljuša & Hamid Čustović*



## Second Erasmus+ Staff Week for Programme and Partner Countries at the University of Zagreb

More than 40 participants from 6 European and 11 non-European countries were presented Erasmus+ BESTSDI and EO4GEO projects and exchanged experiences in preparation and realization of the project.

This interesting workshop was held within Erasmus + Staff WEEK organized by the Central Office for International Cooperation of the University of Zagreb. The aim of this event is to consider the existing cooperation and consider the possibility of its continuation and expansion to other types of projects and forms of cooperation. During Erasmus+ Staff Week, Prof. Željko Bačić held a lecture: Strategic Approach and Coherence in Preparation and Execution of CBHE projects.

Erasmus+ Staff Week has been included in the official program marking the 350 years of the founding of the University of Zagreb.

*Vesna Poslončec-Petrić & Željko Bačić*



## BESTSDI Presented on the 7<sup>th</sup> Conference on Contemporary Achievements in Civil Engineering

7<sup>th</sup> INTERNATIONAL CONFERENCE

Contemporary achievements in civil engineering 23-24. April 2019. Subotica, SERBIA

### BESTSDI CURRICULUM IMPLEMENTATION AT THE FACULTY OF CIVIL ENGINEERING IN SUBOTICA

Paper titled BESTSDI CURRICULUM IMPLEMENTATION AT THE FACULTY OF CIVIL ENGINEERING IN SUBOTICA by Danica Goleš, Jelena Gučević and Miroslav Bešević was presented at 7<sup>th</sup> Conference on Contemporary Achievements in Civil Engineering, April 23<sup>rd</sup>-24<sup>th</sup>, 2019. Subotica, Serbia.

*Danijel Kukaras*

# Public Lecture by Slobodanka Ključanin

On 31<sup>th</sup> January 2019, at the Center for Interdisciplinary Studies of the University of Sarajevo, Prof. Dr. Slobodanka Ključanin held public lectures (LLL) under the title: Importance of Spatial Data Infrastructure (IPP) for the development of society and economy.

Within the study, spatial databases are studied through several courses. The 24 candidates were enrolled. Equipment installed at the University of Tuzla; Erasmus+ stickers were applied on the equipment showing that the equipment has been purchased within the project supported by the EU.

The lecture covered the following topics:

1. Process of targeted data collection and the existing problem;
2. Interoperability of spatial data as a need for efficient IPP,
3. Definitions of IPPs,
4. The principles of the INSPIRE directive,
5. Topics INSPIRE directive,
6. Elements of spatial quality data,
7. Possibilities for exchanging spatial data,
8. Savings achieved by simple access to spatial data through the service,
9. National IPP,
10. Creating a business model of IPP,
11. Economic profit through IPP and the importance of forming new professions and improving existing professions.

Invitation for lectures is published on the following websites: <http://cis.unsa.ba/en/invitation-to-public-lecture-by-dr-slobodanka-kljucanin-titled-significance-of-spatial-data-infrastructure-sdi-on-the-development-of-society-and-economy/>

Attendance to lectures was satisfactory. Students and practitioners from various disciplines such as civil engineers, geographers, physicists, traffic engineers, etc. were present.

*Suada Džebo*



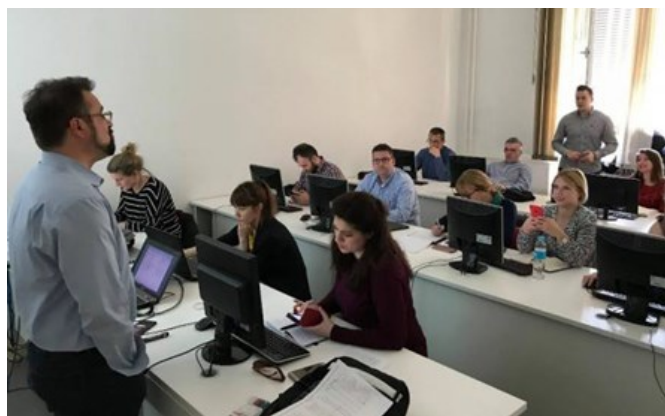
# Life-Long Learning Course at the Faculty of Geodesy in Zagreb: Setting up Web Services for Spatial Data (WMS, WFS, CSW)

A two-day (12 hrs) LLL workshop for professionals interested in setting up web services for spatial data (WMS, WFS, CSW) was held at Faculty of Geodesy, University of Zagreb from February 28<sup>th</sup> to March 1<sup>st</sup>, 2019. The aim of this workshop was to provide knowledge and skills for the creation of spatial data web services based on OGC standards, namely Catalog Service for the Web (CSW), Web Map Service (WMS) and Web Feature Service (WFS). It was aimed at those professionals who maintain or create new sets of spatial data and want to use SDI technology to maintain and publish spatial data. After attending the workshop participants were expected to have competences for establishing a software architecture for spatial web services (using the open source tools Geoserver and GeoNetwork) and for establishing and configuring functional WMS, WFS and CSW and to test the capabilities and features of these services.

The workshop was designed and led by Assist. Prof. Dražen Tutić from Faculty of Geodesy and Nikola Kranjčić, MSc, from Faculty of Geotechnical Engineering the University of Zagreb, with organizational help from Assist. Prof. Rinaldo Paar and Assist. Prof. Vesna Poslončec-Petrič from Commission for LLL programs of the Faculty of Geodesy. Croatian Chamber of Chartered Geodetic Engineers recognized the workshop by giving points to its members.

The workshop was attended by 11 participants, all from private companies who deal with spatial data and are involved in spatial data infrastructure. The workshop content and exercises were created from experiences gained through BESTSDI project, mainly from its Summer Schools, but also extended with some specific tasks identified by lecturers and participants.

*Dražen Tutić & Nikola Kranjčić*



# Life-Long Learning Workshops at the Faculty of Geology and Mining in Tirana

From April 26<sup>th</sup> to May 11<sup>th</sup>, 2019, within the project BESTSDI - Erasmus, Department of Mining Resource Engineering at the Faculty of Geology and Mining, Polytechnic University of Tirana, organised three Training Workshops with participation of Experts of Institutions and Private Companies. The workshops were attended by experts from the National Agency of Natural Resources; Immovable Property Registration Offices; Private companies in the field of geology and mining; National Authority of Geo-information - ASIG; GIS offices in the municipalities, etc.



The topics discussed in these seminars were: SDI, GIS, Mining Modelling, Micromine, Photogrammetry, Sensing Remote, Mechanic Rock, Mine Surveying, etc. At the end of the seminar cycle was organised the ceremony of Certificates distribution with the participation of Dean of the Faculty of Geology and Mines, Prof. Dr. Vasil Jorgji, Head of Department Prof. Assoc. Dr. Aida Bode, Project Coordinator BESTSDI at the Faculty of Geology and Mining Prof. Assoc. Dr. Edmond Hoxha, students and lecturers and other guests.

*Edmond Hoxha*





# SDI Courses at the Faculty of Civil Engineering in Subotica

During the winter semester of this school year within the framework of the BESTSDI project implemented on the Faculty of Civil Engineering Subotica, Computer room #302 was equipped with 16 new computers. Additionally, this Lab and the Classroom #103 each got new projectors. Over the course of current, summer, semester, this equipment was used for lectures and exercises of SDI related courses and also for other courses given at the Faculty.



SDI related courses that were adapted and upgraded through the BESTSDI project are: Geology and Petrology, Engineering Geology,

Irrigation and Drainage, Basics of Urban Planning, Building Heritage Protection and Revitalization, Basics of Building Design, Design of Multi-family Buildings, Traffic Infrastructure and Space and Complex Synthesis Project.

The SDI content of these courses consists of theoretical part and practical exercises. Theoretical part of the courses provide an answer the following questions: Why to learn SDI? Who builds standards? How to access the data list of SDI services in Europe and Serbia? Purpose of the practical exercises within the basic SDI courses is to upgrade theoretical knowledge of students and to teach them how to become a practical user of an SDI software.

Practical part of the courses is concentrated on students ability to get information about software used for data processing. Software that is available consist of: Educational Version of commercial software and Free and Open Source Software. For the fulfilment of the basic SDI course objective, professors who oversee these courses decided to use the QGIS software. After completion of the courses the students should be able to understand the concepts and components of SDI, list of SDI standards, services and best practices, the elements of the INSPIRE Directive on Data and Service Sharing, as some of the main course objectives.

One of the most important objective is for all students to understand that SDI represents a basis for spatial data discovery, evaluation, and application for users and providers within all levels of stakeholders, such as: government and public administration, the commercial sector, the non-profit sector, education and by citizens in general. The SDI should be recognized as a collection of technologies, policies and institutional arrangements that make easy access to spatial data.

*Danijel Kukaras*

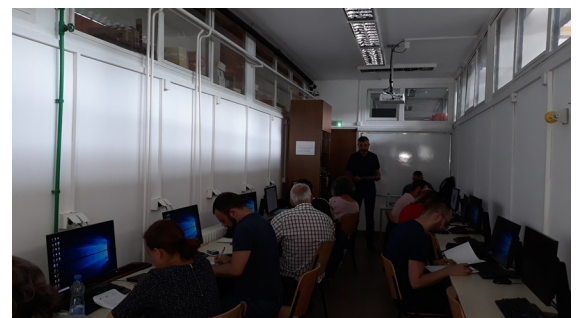


# SDI Courses at the Faculty of Technical Sciences in Novi Sad

In the winter semester two SDI related courses have been carried out at the Faculty of Technical Sciences, study program Geodesy and geoinformatics: Spatial Data Infrastructure and Geoportals and Geospatial Services for about 30 students each. These courses primarily cover the technical framework of the Spatial Data Infrastructures, but they also cover the legal framework and regulations in the European Union and the Republic of Serbia. The Spatial Data Infrastructure course first provides an overview of the basic concepts in the field of Spatial Data Infrastructures that are elaborated in detail later. After that, the elements of conceptual data modelling in the geospatial domain and the application of standards in the conceptual modelling of geospatial information are presented. SDI services are also presented including metadata and metadata catalogues as an important segment of each spatial data infrastructure in order to search, access and visualize geospatial resources. The course provides an overview of infrastructure for spatial information in the European Union regulated by the INSPIRE Directive. The transposition of the INSPIRE Directive into Serbian legislation and the development of the National Spatial Data Infrastructure (NIGP) is covered in detail. Geoportals and Geospatial Services course covers the topic of geoportal architecture and provides theoretical background of the three-tier architecture of geoportals, as well as a practical examples of the implementation of three - tier architecture using open source tools, through the example of the realization of all three tiers (data tier, service tier and client tier). It also covers the analysis of the relevant OGC standards, such as WMS, WFS, WCS, CSW, WPS, etc.

With regard to the technological trends and the growing application of technologies for the acquisition and processing of 3D geospatial information, the course provides an overview of development trends in the domain of the 3D spatial data infrastructures, 3D geoportals, as well as development trends in the field of 3D cadastre. It provides guidance for future development and research in these areas, and given the interest and growing user base, indications are that these areas will occupy a dominant position in the future. These two courses primary deal with SDI related content. However, other courses that are not primary focused to SDI related content, also include topics related to it, such as Spatial Databases in which students use ETL tools to import data into spatial database structured according to INSPIRE data themes.

*Dubravka Sladić and Aleksandra Radulović*



## Impressum

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