



UNIVERSITY OF NOVI SAD
FACULTY OF TECHNICAL SCIENCES



Earth observation research activities

Geoinformatics Laboratory

PhD Miro Govedarica

PhD Dušan Jovanović

SCERIN 7 Capacity Building Workshop

WEB: <http://geoinformatika.uns.ac.rs>

Mail: geoinformatika@uns.ac.rs



Member of



Faculty of Technical Sciences

Founded on May 18th in 1960. as Faculty of Mechanical Engineering

On April 22nd in 1975. it was upgraded into a Faculty of Technical Sciences

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

44 chairs

13 departments

36 centers

14 administration offices

1,200 employees

14,000 students

90 study programs

Image Landsat / Copernicus

Google Earth



Geoinformatics Laboratory



16 PC Workstations

2 PC Servers

3D Projector

International Federation of Surveyors

Copernicus Academy

International Society for Photogrammetry
and Remote Sensing

Open Geospatial Consortium

United Nations Committee of Experts on
Global Geospatial Information Management



Geoinformatics Laboratory



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Geoinformatics Laboratory Equipment



Leica DNA03



Leica Sprinter 250M



Leica ScanStation P20



Trimble Total Station S5



Leica TCRP1201+



Leica Total Station TS06



GNSS Receiver
Trimble R8s



GNSS Receiver Leica
GS15



GNSS Receiver
Trimble 5800



Handheld Device
Leica Zeno 10



Handheld Device
Trimble GeoXT



Handheld Device
Trimble GeoXM



UAV
DJI MavicPro



Ground Penetrating
Radar GSSI 3000



Tiltmeter
Geokon 6160



Piezometer
Geokon 3400-2



Strain Gauge
BDO ST350



Accelerometer
ADXL203EB



Data Logger
Campbell Scientific CR1000



Moxa Nport 5650-8-
DT



Electromagnetic
Locator RD8000



Geoinformatics Laboratory



Member of





Geoinformatics Laboratory Staff Members



PhD Professors



M.Sc Teaching Assistants



M.Sc Junior Researchers



Lab Technician and Project Administrator



Geoinformatics Laboratory



Member of





Activities in the field of geoinformatics



Student education

Research and scientific projects

Development of software solutions

Development and system realization

Consulting and other services

Process reengineering

Engineering staff education, specialization and certification

Organization of expert and scientific meetings

Cooperation and realization of joint projects with companies



Geoinformatics Laboratory



Member of





Studies



Undergraduate
Academic Studies

- 4 years, 240 ECTS

Master Academic
Studies

- 1 year, 60 ECTS

Doctoral Academic
Studies

- 3 years, 180 ECTS



Geoinformatics Laboratory



Member of





Areas of expertise



Software Engineering in Geospatial Systems

Geoinformatics

Photogrammetry

Remote Sensing and Image Processing

Laser Scanning

GNSS and Location Based Services

Geosensor Networks



Geoportals and Geospatial Services

Spatial Data Visualization

Spatial Databases

Big GeoData

Detection of Objects of Underground Infrastructure

Spatial Data Infrastructure



Geoinformatics Laboratory



Member of





Scientific Projects



Geoinformation System of Serbian Republic Water Management Authority

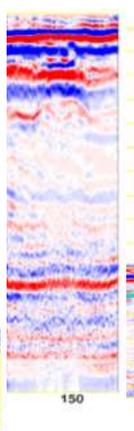
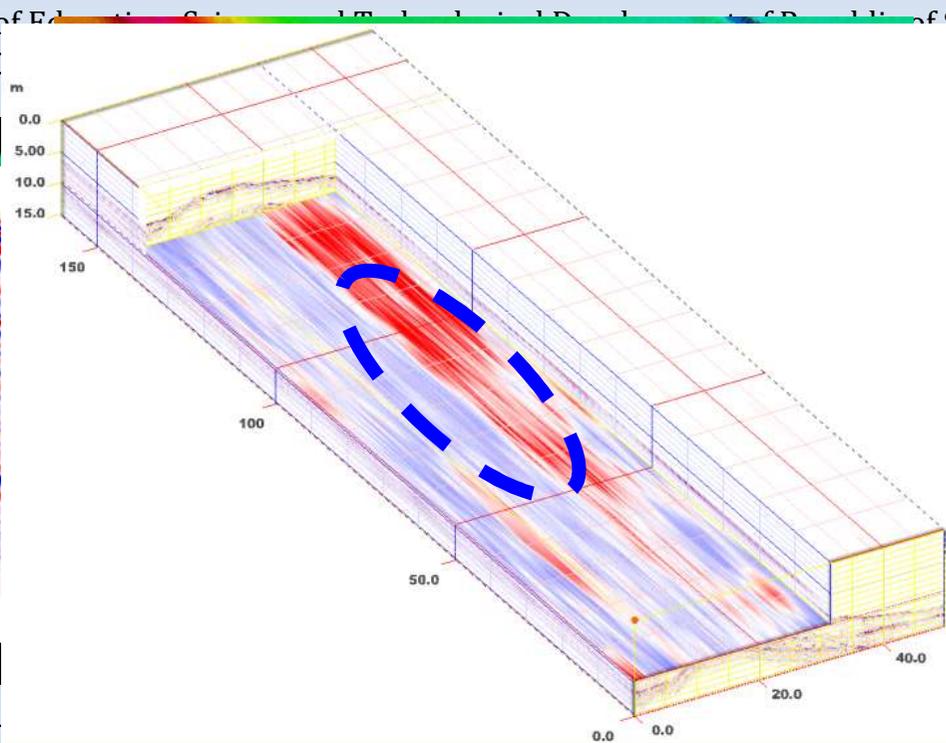
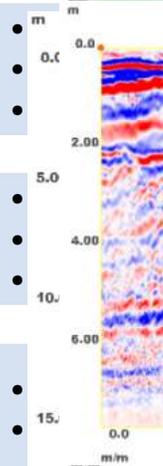
Flooding bank's structure modelling using geoinformation technologies and systems and ground penetrating radar

Modelling the state and the structure of slope processes using GNSS, laser scanning technology and ground penetrating radar

GEOWEB

BESTSDI

- Ministry of Education, Science and Technological Development of the Republic of Serbia
- 2004 - 2008
- Serbia



- Erasmus+
- 2016 - 2019



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Member of





Scientific Projects



TD1202 Mapping and the citizen sensor

TU1208 Civil engineering applications of ground penetrating radar

Network of the permanent GPS stations in AP Vojvodina and full infrastructure network of geodata and geoservices

Network of the permanent GPS stations in AP Vojvodina

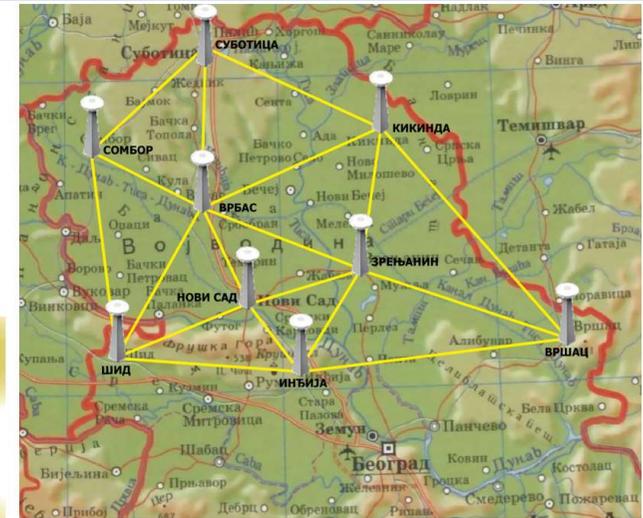
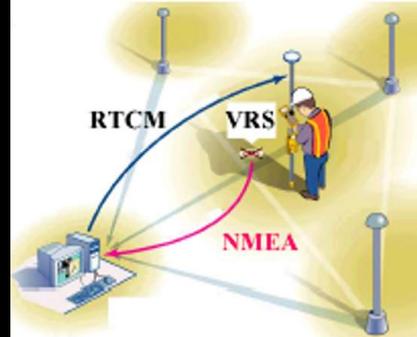
DGNSS Correction data for real time navigation and GNSS observation data for post-processing positioning

Oasis Innovation Hub for Catastrophe and Climate Extremes Risk Assessment

- ICT COST
- 2012-2016

Development started in year 2003.

- ▶ Network consists of 9 permanent stations and one control center on FTS
- Software GPSNet
- Implemented VRS concept



Academic GNSS Position Timing and Navigation System Novi Sad

- ICT COST
- 2012



International Cooperation Projects



EUPOS® Interregional Cooperation

- INTERREG IIIC
- 2005 - 2010
- Germany, Serbia, Hungary, Poland, Latvia, Lithuania, Bulgaria, Romania

SURVEY and INFORMATION SYSTEM of ADRIATIC roads - SISA

- INTERREG IIIC
- Italy, Serbia and Montenegro, Albania, BiH, Croatia
- 2005 – 2006



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International Cooperation Projects



TICAD-Tisa Catchment Area Development

- VATI Hungary, Urban and Spatial Planning Institute of Vojvodina, Serbia
- 2008 – 2012
- Serbia, Hungary
- Program: South East Europe, Transnational Cooperation Programme

DATOURWAY – Transnational Strategy for the Sustainable Territorial Development of the Danube Area with special regard to Tourism

- VATI Hungary, Urban and Spatial Planning Institute of Vojvodina, Serbia
- 2008 – 2012
- Serbia, Bulgaria, Hungary, Croatia
- Program: South East Europe, Transnational Cooperation Programme



Geoinformatics Laboratory



Member of





Commercial Projects



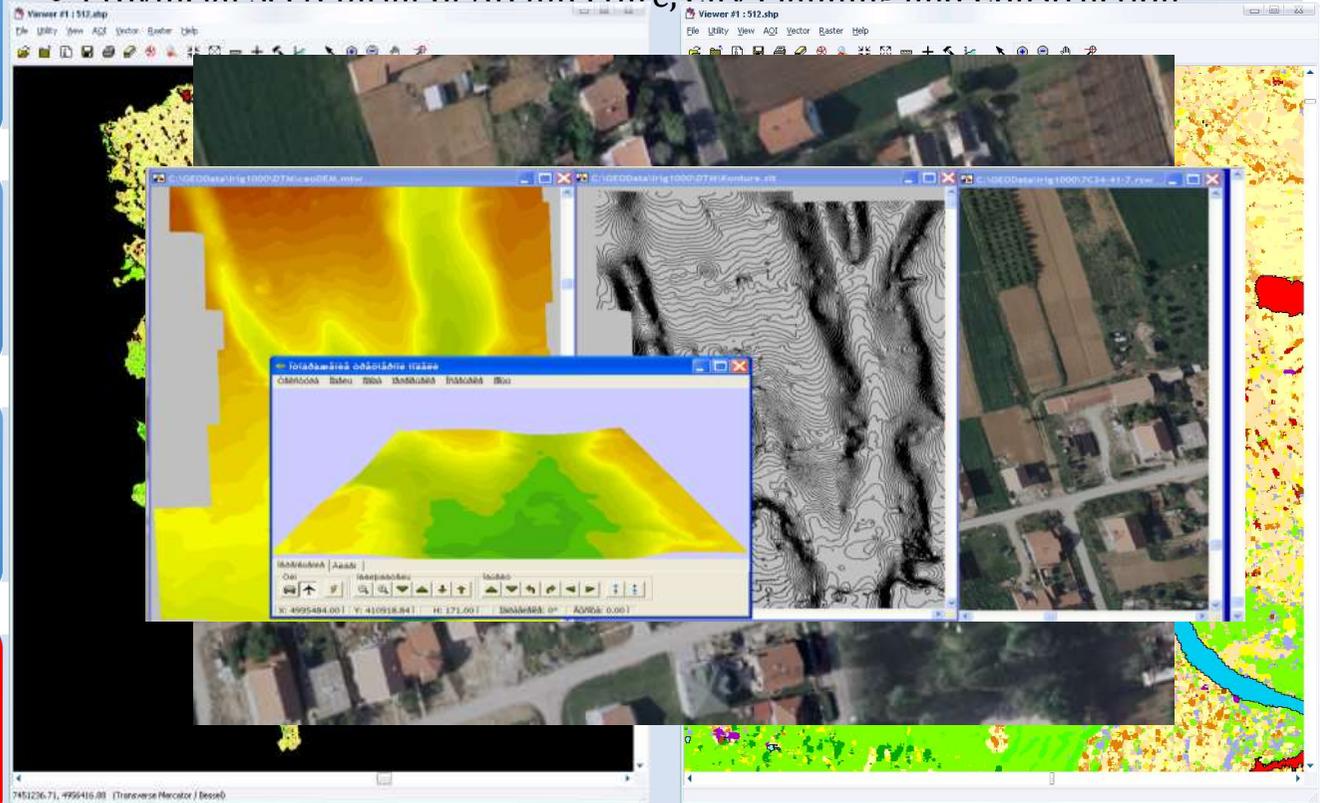
Technological Method for Developing Up-to-date Cartographic Base for Urbanism Based on Satellite and Airborne Remote Sensing

Geographic Information System for the Ministry of Environmental Protection

Digital Spatial Model of the Riverside of the Danube

Production of Digital Orotophoto and Digital Terrain Model for Irig 1: 1000

• Provincial Secretariat of Architecture, City Planning and Construction



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Commercial Projects

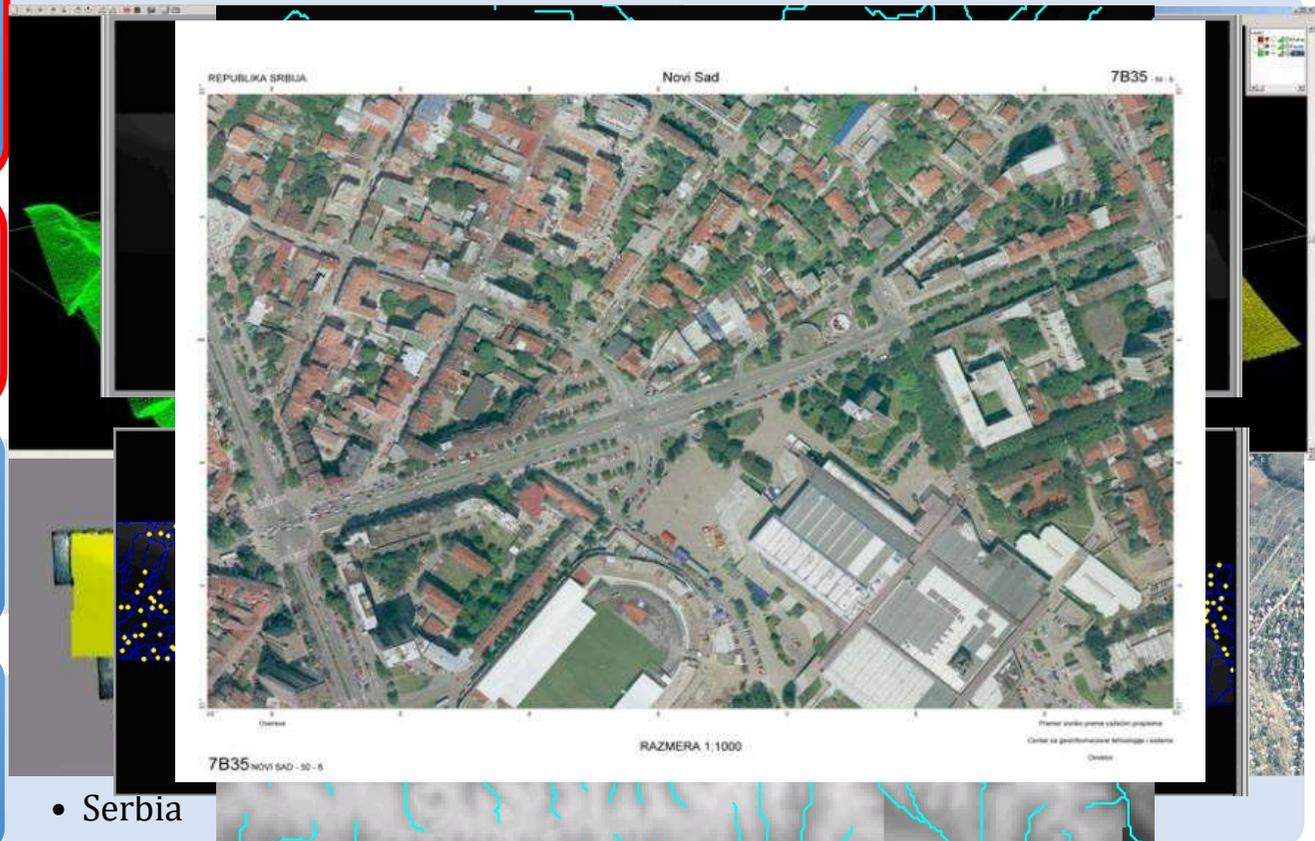


Production of Digital Ortofoto and Digital Terrain Model for mountain Fruška Gora 1:5000 (area 142 000 ha)

Production of Digital Ortofoto and Digital Terrain Model for Novi Sad 1:1000 and 1:5000 (area 70 000 ha)

Distribution and Application of Infrastructural Geospatial Data in Agricultural GIS of Autonomous Province of Vojvodina (APV)

New Technological Method for the Management of Agricultural Fields Purpose of AP Vojvodina – regulation of agricultural areas based on modern geoinformation technologies and systems



• Serbia



Geoinformatics Laboratory



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Commercial Projects



Development of GIS and Geoportal

- Republic Administration for Geodetic and Property Affairs
- 2007 - 2013
- Republic of Srpska

GIS for Local Authorities

- GTZ Montenegro
- 2006 - 2009

GIS for Land Administration in the Real Estate Cadastre and Land Registry

- Dept for Real Estate, Montenegro
- 2000 - 2005



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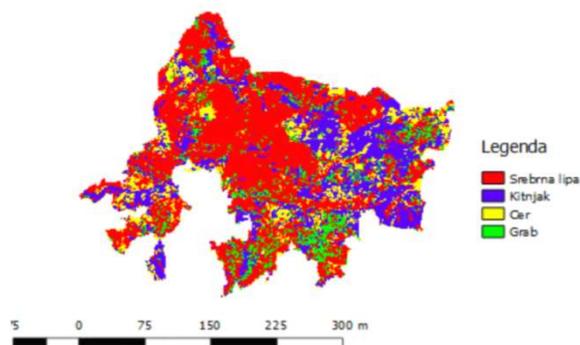
Commercial Projects



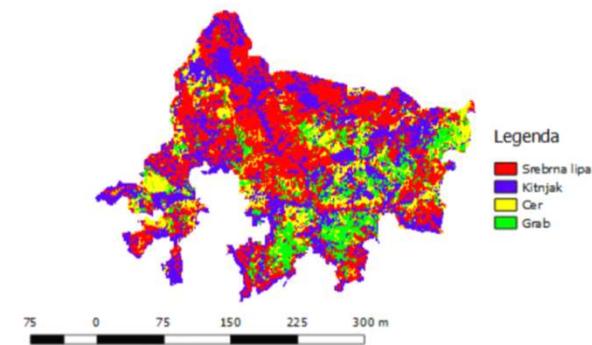
Remote Sensing in
Forestry

Remote Sensing in
Agriculture

Klasifikacija vrsta drveća metodom
Random Forest za snimak iz 2016 godine



Klasifikacija vrsta drveća metodom
Random Forest za snimak iz 2017 godine

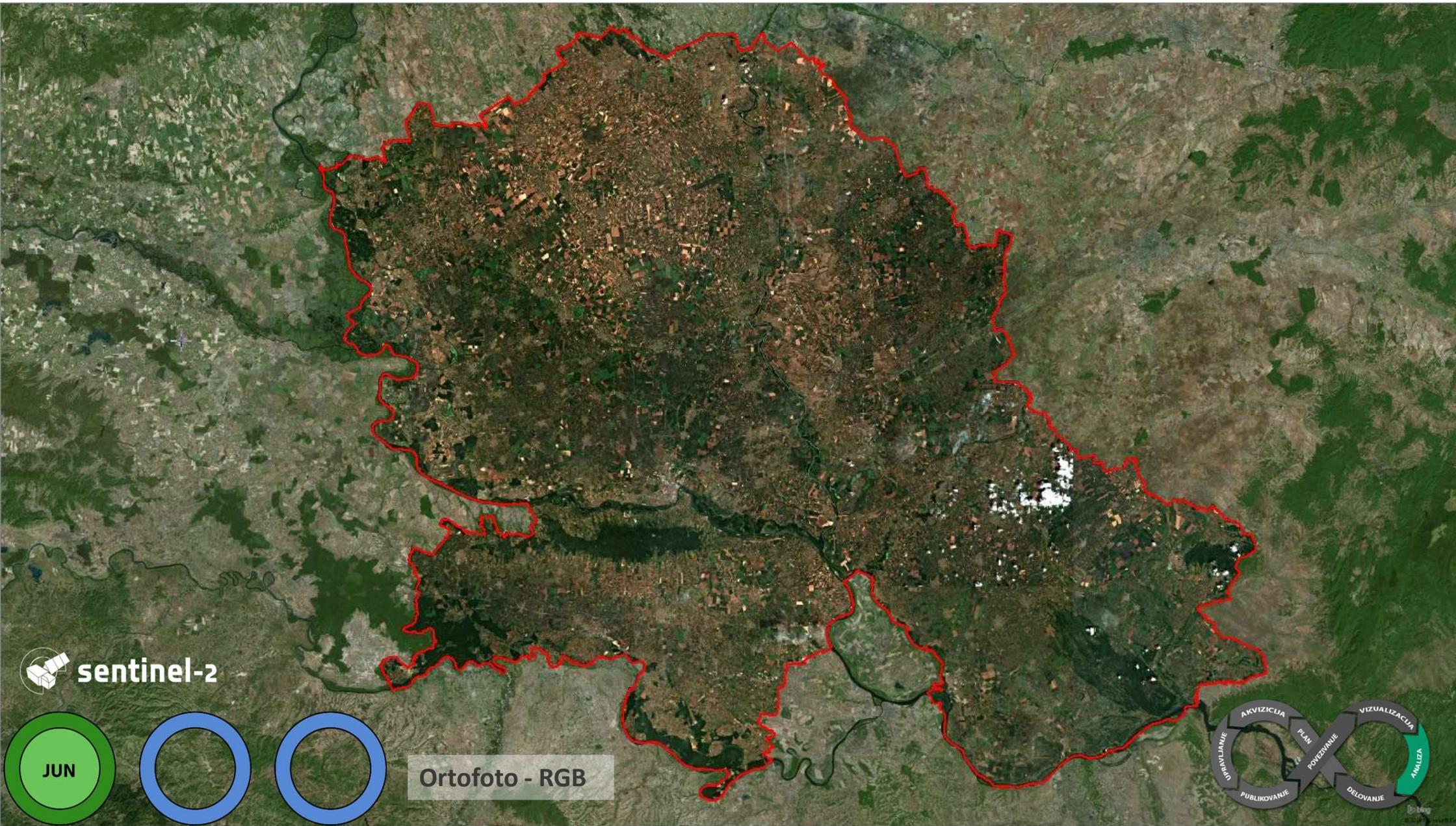


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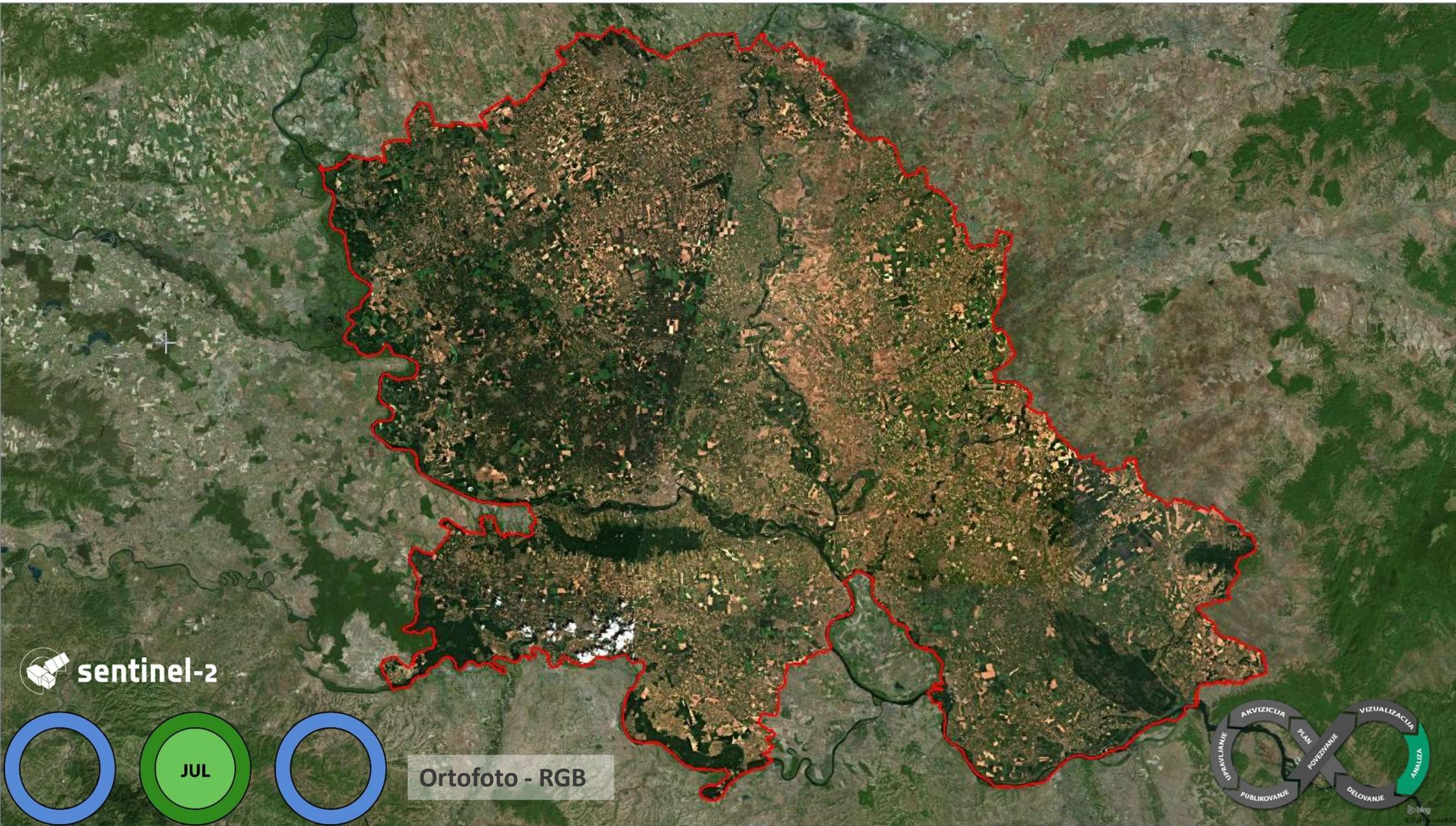


sentinel-2

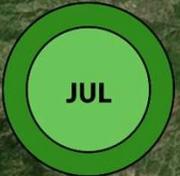
JUN

Ortofoto - RGB



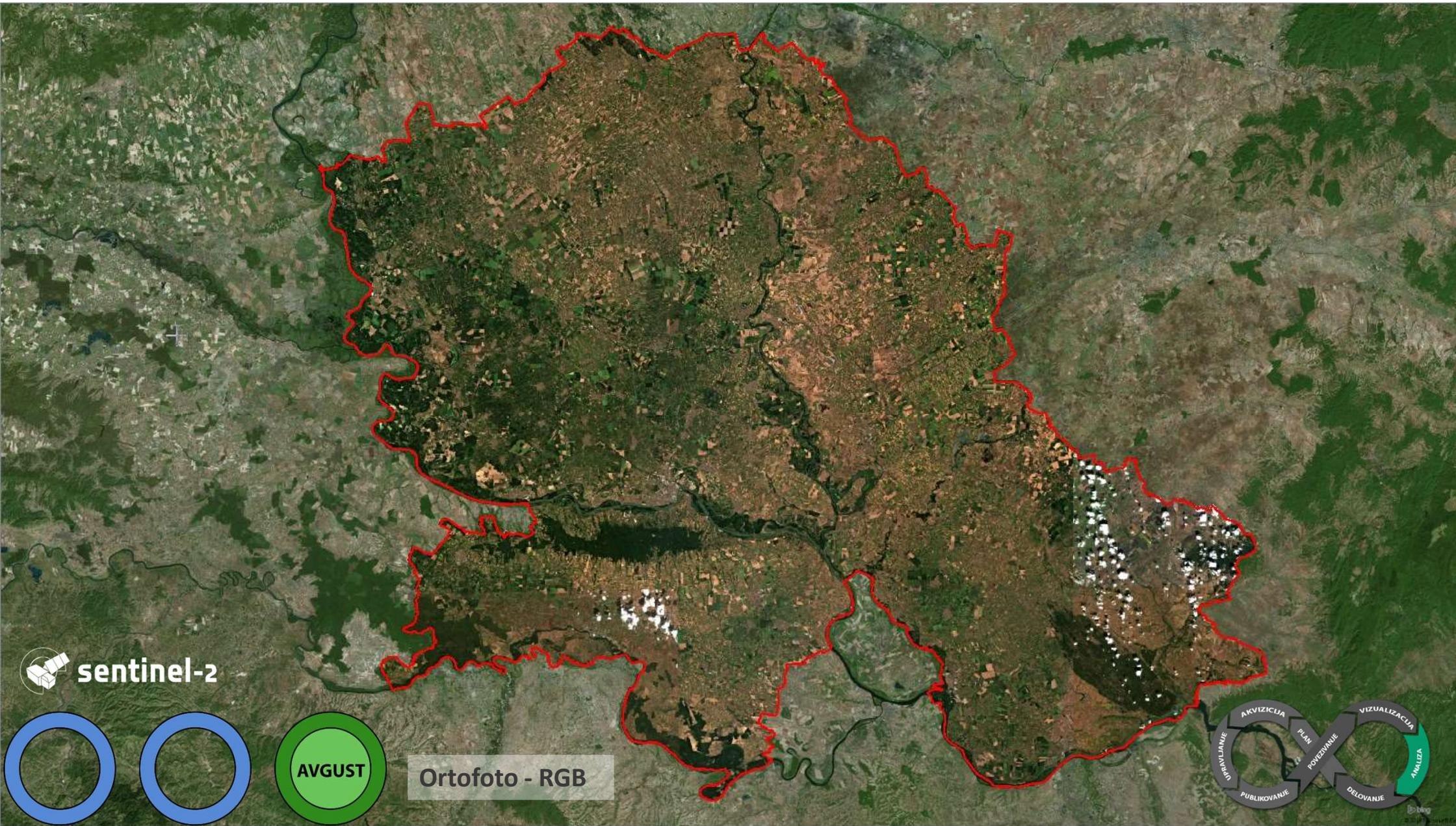


 sentinel-2



Ortofoto - RGB



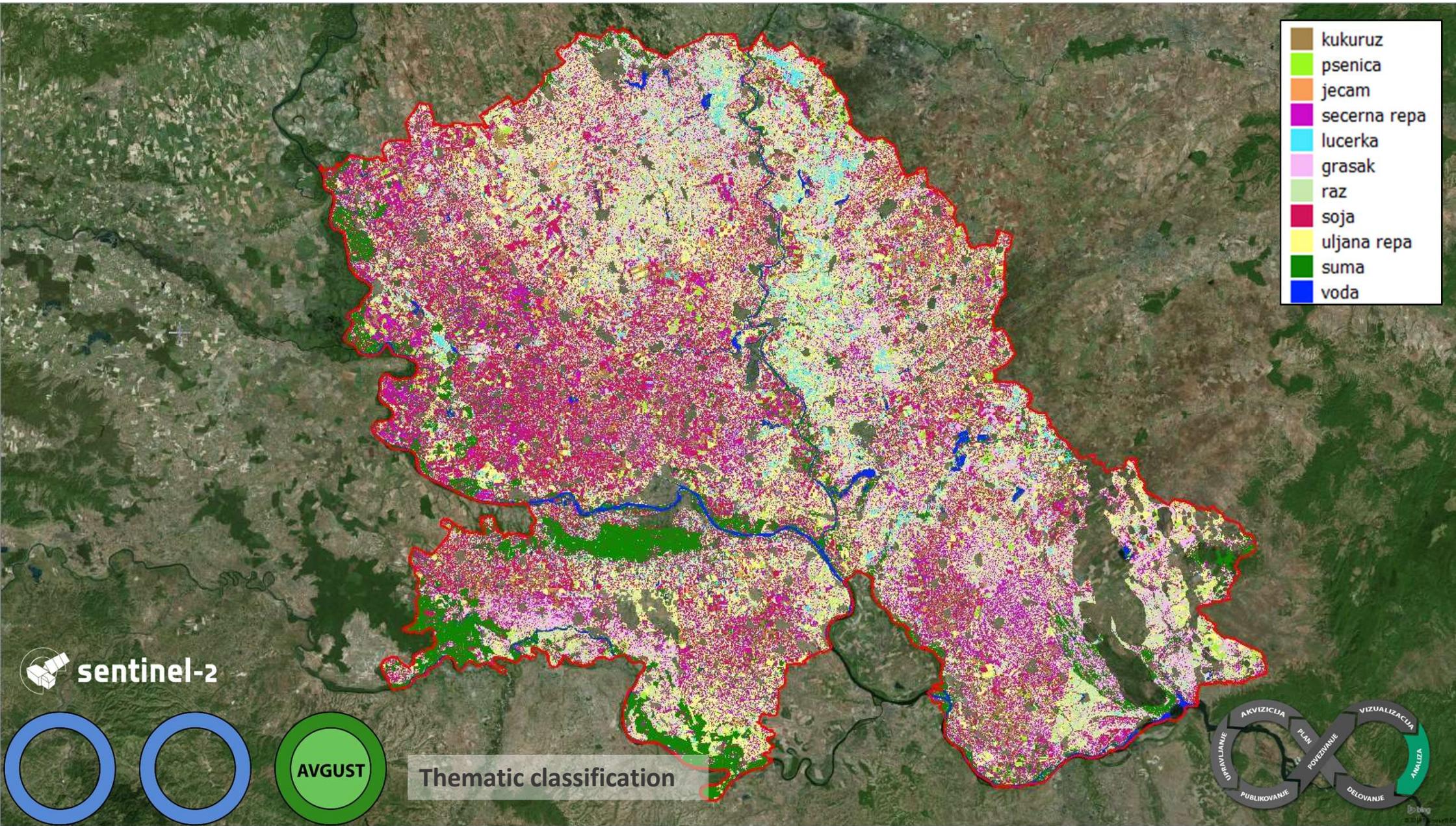


sentinel-2

AVGUST

Ortofoto - RGB





- kukuruz
- psenica
- jecam
- secerna repa
- lucerka
- grasak
- raz
- soja
- uljana repa
- suma
- voda

sentinel-2

AVGUST

Thematic classification



Planet, RapidEye



Čenta T 2



Čenta T 1



Besni Fok T 35



Besni Fok T 30



Vrbovski T 7



Padinska Skela T 2



Padinska Skela T 3



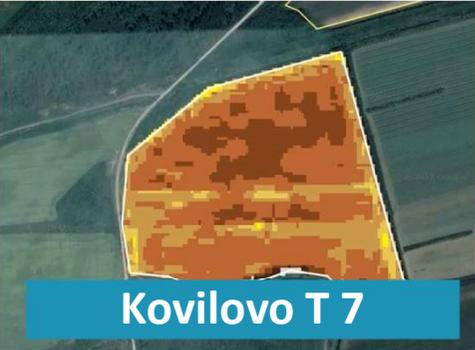
Padinska Skela T 12



Padinska Skela T 13



Kovilovo T 3



Kovilovo T 7



Kovilovo T 5

ANALYSIS

T126

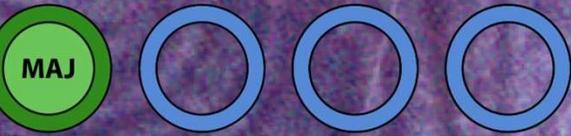
T133 Maiz

T127

Maiz

T134

planet.



ANALYSIS

T126

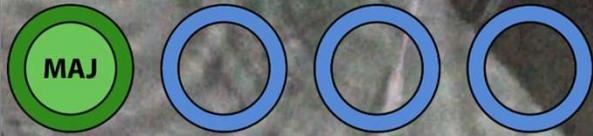
T133 Maiz

T127

Maiz

T134

planet.



ANALYSIS

T126

T133 Maiz

T127

Maiz

T134

planet.



ANALYSIS

T126

T133

Maiz

T127

Maiz

T134

planet.

JUL



ANALYSIS

T126

T133 Maiz

T127

Maiz

T134

planet.

JUL



ANALYSIS

T126

T133

Maiz

T127

Maiz

T134

planet.

JUL



ANALYSIS

T126

T133

Maiz

T127

Maiz

T134

planet.

AVGUST



ANALYSIS

T126

T133

Maiz

Potential problem?

T127

Maiz

T134

planet.

JUL



ANALYSIS

T126

T133

Maiz

Low NDVI value

T127

Maiz

T134

planet.

JUL

Vegetation indices



ANALYSIS

T133

Maiz



wingtra

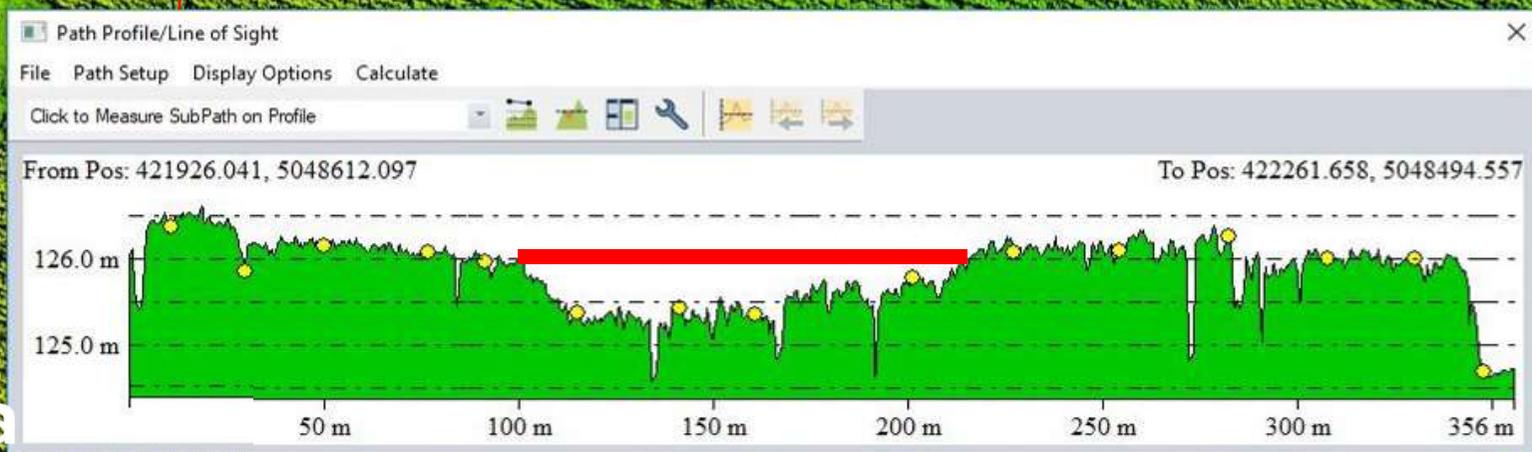
JUL

Ortofoto - RGB



ANALYSIS

Poor plant growth - Insufficient fertilizer?



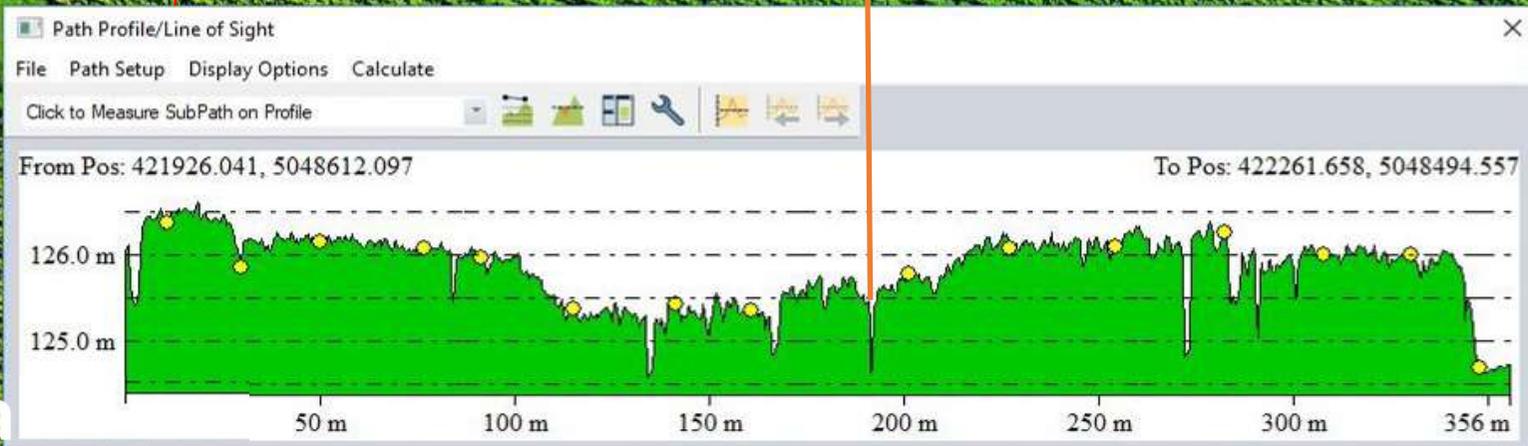
wingtra

JUL

Profile height of the plants



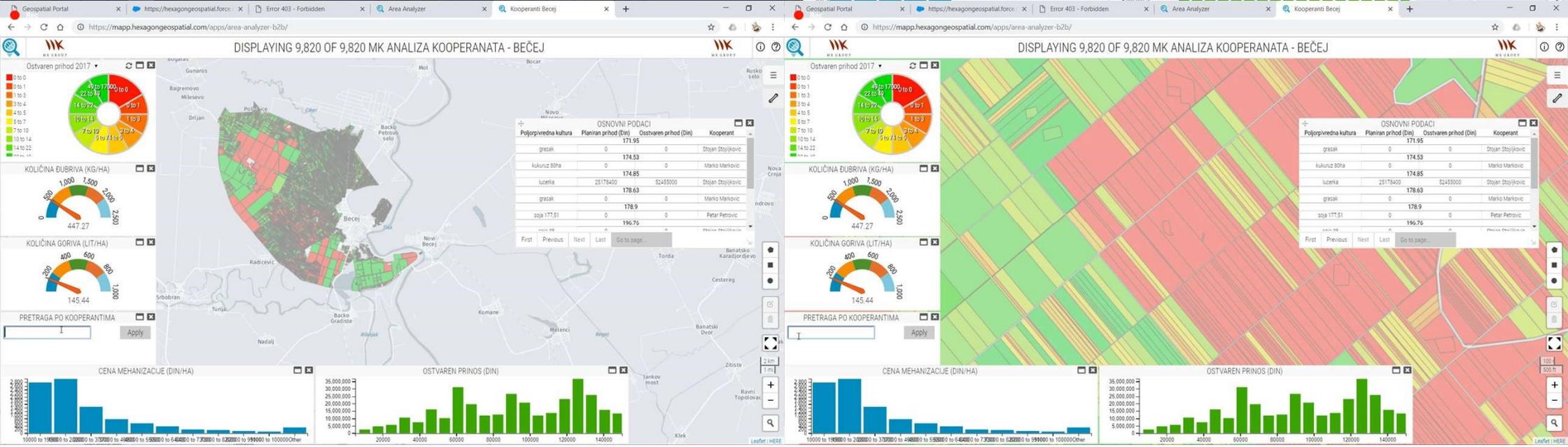
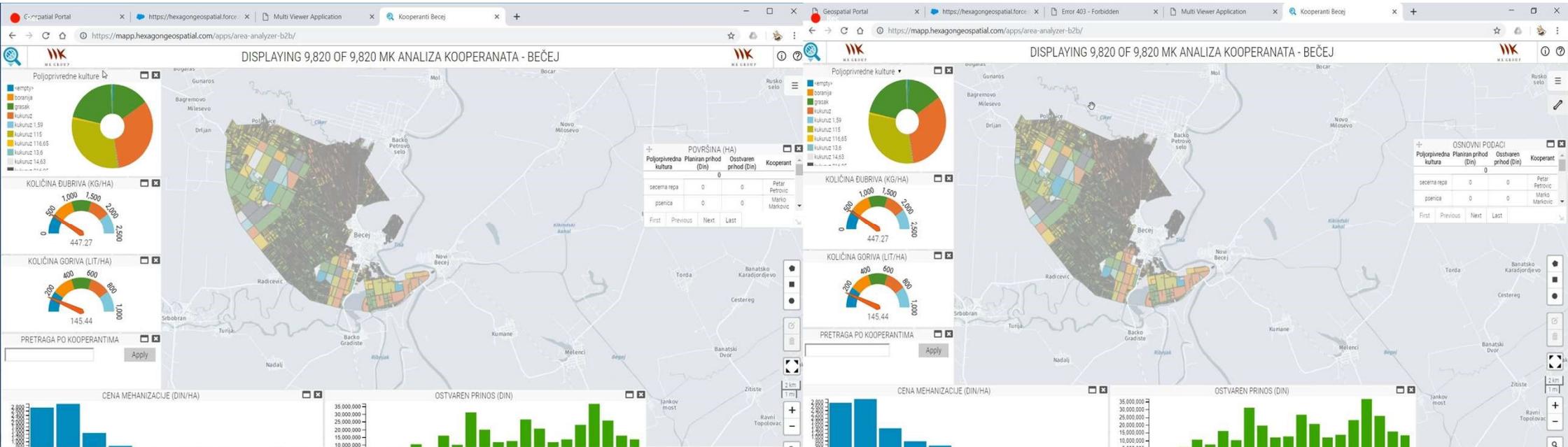
ANALIZA



JUL

Profil visina biljaka







Commercial Projects



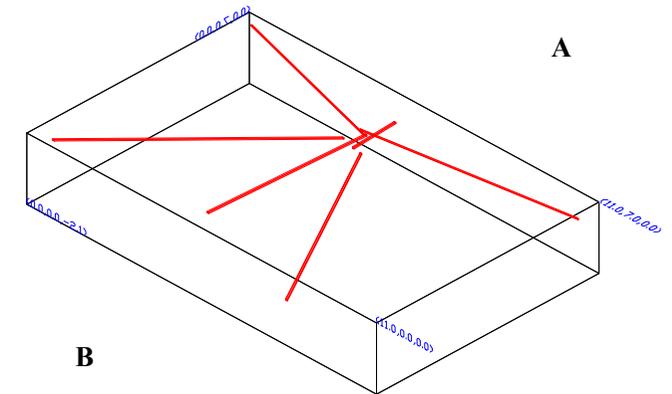
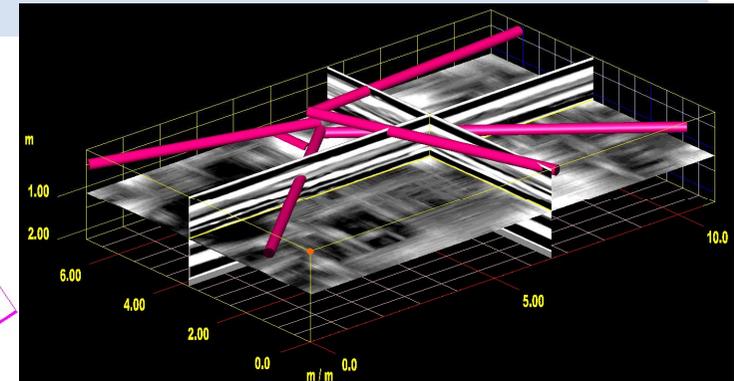
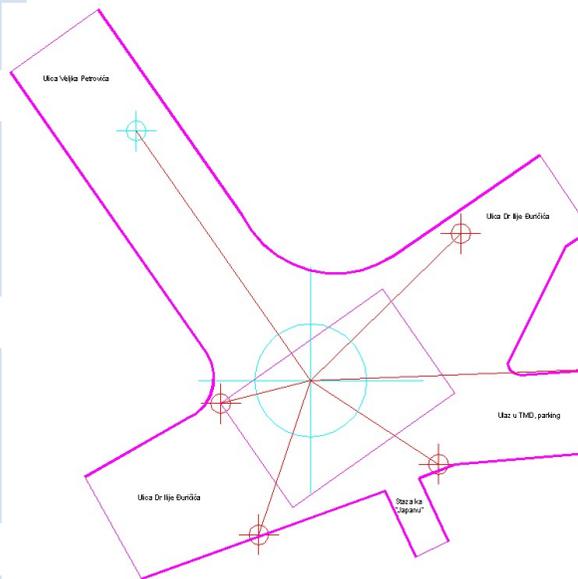
GPR Scanning and GPS Mapping of Underground Mid-pressure Gas line Network in Kikinda (44 km)

GPR Scanning and GPS Mapping of Underground Utilities in Carlsberg Brewery in Čelarevo

GPR Scanning and GPS Mapping of Underground Mid-pressure Gas line Network in Novi Sad

GPR Profile Scanning and GPS Mapping of Primary and Secondary Telecommunications Network in Čelopek, Bosnia and Herzegovina (43 km)

• Srbijagas, Novi Sad



• Bosnia and Herzegovina

Z axis

X axis



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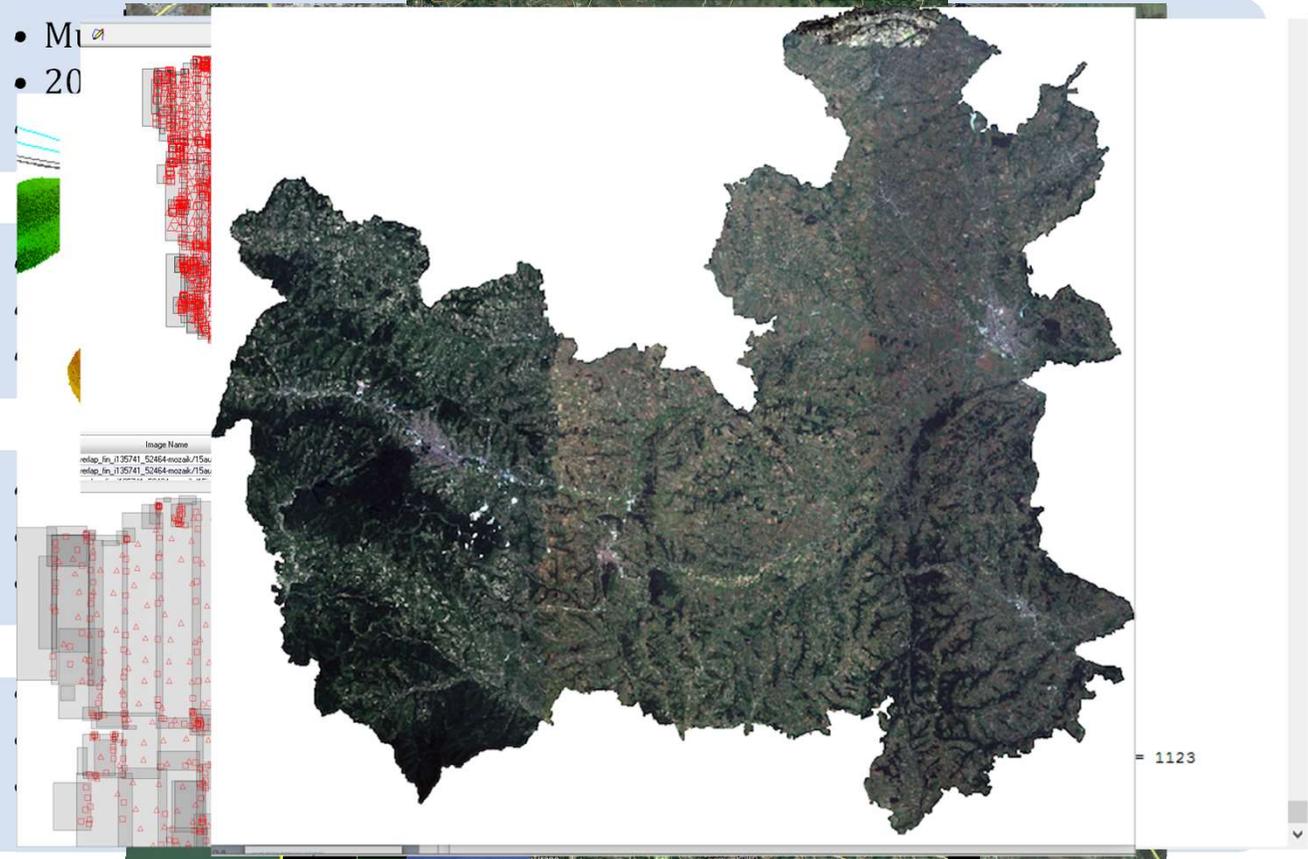


Ortophoto and DTM using LiDAR

Extraction of power lines and towers from the point cloud

Ortophoto and DTM using LiDAR

Orthophoto Serbia 2015-2016



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Spatial Data Visualization - Projects



3D Map Clients

Virtual Reality Framework

Augmented Reality



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Spatial Data Visualization - Projects

