SCERIN Programs Inventory Panel

1. Bulgaria
2. Croatia
3. Czech Republic
4. Greece
5. Hungary
6. FYR Macedonia
7. Moldova
8. Poland
9. Romania
10. Serbia
11. Slovakia
12. Slovenia
13. Ukraine
## SRTI-BAS, Bulgaria

<table>
<thead>
<tr>
<th>Project/Program</th>
<th>Sponsor</th>
<th>Duration</th>
<th>Support (approximate funding level)</th>
</tr>
</thead>
<tbody>
<tr>
<td>EEOBSS: Education in Earth observation for Bulgarian secondary schools</td>
<td>ESA-PECS</td>
<td>2016-2018 24 months</td>
<td>~50k Euro</td>
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<tr>
<td>Testing Sentinel-2 vegetation indices for the assessment of the state of winter crops in Bulgaria (TS2AgroBg)</td>
<td>ESA-PECS</td>
<td>2016-2018 24 months</td>
<td>~200k Euro</td>
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<tr>
<td>GEO-CRADLE: Coordinating and integrRating state-of-the-art Earth Observation Activities in the regions of North Africa, Middle East, and Balkans and Developing Links with GEO related initiatives towards GEOSS</td>
<td>European Commission Horizon 2020</td>
<td>30 months</td>
<td>1 of 19 partner organizations <a href="http://geocradle.eu/en/">http://geocradle.eu/en/</a></td>
</tr>
<tr>
<td>Project/Program</td>
<td>Sponsor</td>
<td>Duration</td>
<td>Support (approximate funding level)</td>
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<tr>
<td>FP7-PEOPLE-2009-IRSES (Grant No 247608) IGIT – &quot;Integrated geo-spatial information technology and its application to resource and environmental management towards the GEOSS&quot;</td>
<td>EU</td>
<td>2011-2015</td>
<td>410,400 €</td>
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<td>FP7-ENV-2010 Balkan GEO Network (Grant No 265176) BalkanGEONet – Towards Inclusion of Balkan Countries into Global Earth Observation Initiatives</td>
<td>EU</td>
<td>2010-2013</td>
<td>1,200,000 €</td>
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<td>COST ES1309 Innovative optical Tools for proximal sensing of ecophysiological processes (OPTIMISE)</td>
<td>EU</td>
<td>2015-2018</td>
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<td>COST TD1202 “Mapping and the citizen sensor”</td>
<td>EU</td>
<td>2013-2016</td>
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<tr>
<td>Mapping urban green spaces based on remote sensing data: Case studies in Bulgaria and Slovakia</td>
<td>Bulgarian Academy of Sciences &amp; Slovak Academy of Sciences</td>
<td>2015-2017</td>
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<tr>
<td>Change Detection of Land Use and Land Cover in Coastal Zones of China (Fujian) and Bulgaria Using Multitemporal and Multiscale Remote Sensing Data</td>
<td>Bilateral science-technical cooperation between Bulgaria and People Republic of China</td>
<td>2008-2011</td>
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</table>
Geospatial monitoring of green Infrastructure by means of terrestrial, airborne and satellite imagery.

Goals:
- analyze and evaluate impact of particular imagery source (satellite, airborne, terrestrial) for monitoring and detecting Green Infrastructure at different scales
- use airborne and terrestrial high resolution imagery to validate and interpolate satellite imagery for usage in other urban areas
- detecting different types of Green Infrastructure on different scales (different imagery source);
- compare spectral footprint of particular type on different scales
- detect changes in urban vegetation areas through time on different scales
- research possibilities in detecting critical urban zones, like heat islands

Duration: 4 years (17-20)

Supported by Croatian scientific foundation
# Relevant GR Projects

<table>
<thead>
<tr>
<th>Project</th>
<th>Sponsor</th>
<th>Duration</th>
<th>Support/fund</th>
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<tr>
<td>GEO-CRADLE - Coordinating and integrRating state-of-the-art Earth Observation Activities in the regions of North Africa, Middle East, and Balkans and Developing Links with GEO related initiatives towards GEOSS</td>
<td>European Union’s Horizon 2020 Research and Innovation Programme</td>
<td>2016-2018</td>
<td>2.910.800 Euros</td>
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<td>BEYOND - Building EGNSS capacity On EU &amp; Neighboring multimodal Domains</td>
<td>FP7-REGPOT-2012-2013-1</td>
<td>3 years (2013-2016)</td>
<td>2,305,650 €</td>
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</tbody>
</table>
Jana Albrechtová, Charles University, Faculty of Science (FSCU), Prague, Czech Republic

Collaboration with: Lucie Kupkova, Dept. Applied Geoinformatics and Cartography FSCU
Petr Lukes, Lucie Homolova, Czechglobe; Petya Campbell – NASA/GSFC, UMBC

<table>
<thead>
<tr>
<th>Project/Program</th>
<th>Sponsor</th>
<th>Duration</th>
<th>Support (funding level)</th>
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<tbody>
<tr>
<td>1. &quot;New spectral insight into biogeochemistry of small forested watersheds&quot;</td>
<td>(Czech Grant Agency GACR 17-05743S), 2017-2019, PI - Lucie Homolova</td>
<td></td>
<td>small-medium</td>
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<td></td>
<td>(CzechGlobe), co-PIs Zuzana Lhotakova (FSCU), Veronika Kopackova (Czech</td>
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<td></td>
<td>Geological Survey), small-medium</td>
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<tr>
<td>2. A) Characterization of leaf optical properties to anatomical structure of</td>
<td>photosynthetic apparatus in connection with effects of environmental</td>
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<td>medium</td>
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<tr>
<td>photosynthetic apparatus in connection with effects of environmental factors.</td>
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<tr>
<td>B) Use of leaf spectral properties for evaluation of tree physiological status.</td>
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<tr>
<td>(Ministry of Education, Youth and Sports, NPUI LO1417), 2015-2019, Co-Pi Jana</td>
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<tr>
<td>Albrechtova, medium</td>
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</table>
1) Goals, programs and current priorities /projects (*key programs, capabilities of the institution(s) you represent*) – see next slides

2) Benefit(s) and requirement(s) with regard to SCERIN (*outcomes and needs*)
   • joined activities, collaborations, other benefit(s) to your institution – establishment of collaboration between CzechGlobe and Scientific-Research Centre of Agriculture in Georgia, 2 research visits (Georgia – Brno)
   • contribution(s) to SCERIN – participation in manuscript preparation

3) Future objectives of your institution/program and the role of SCERIN (*how can SCERIN contribute to your activities better*) - Agriculture, Forestry, Urban ecosystems

4) Remark(s) – CG conference
Recent projects - Department of Remote sensing

- HYPER – HyPlant Processing Chain, ESA – FLEX
- Mapping biochemical and biophysical indicators with airborne hyperspectral and chlorophyll fluorescence sensors, Ministry of Education, Youth and Sports CR
- Red Edge Positioning Techniques for Earth Observation Optical Mission, ESA
- Prognosis, indication of risk and prevention of natural fires and in the context of the current state of knowledge and conditions of climate change, Ministry of Interior CR
- OptiAgro - Optimizing the utilization of the production potential of the soil by locally targeted agro-technology, Ministry of Agriculture CR
CzechGlobe remote sensing infrastructure

- VNIR: CASI-1500, SASI-600
- Thermal: TASI-600
- Laser scanning: Riegl LMS – Q780
2nd – 4th October 2017
In Velké Karlovice in the Beskid Mountains, Czech Republic

CONFERENCE PROFESSIONAL SECTIONS:
1/ GLOBAL CHANGE AND AGRICULTURE,
2/ GLOBAL CHANGE AND FORESTRY,
3/ HUMAN DIMENSION OF GLOBAL CHANGE IMPACTS

http://hydap.czechglobe.cz/

http://mapserver.czechglobe.cz/

brovkina.o@czechglobe.cz
zemek.f@czechglobe.cz
MACEDONIA: Ivica Milevski, Institute of Geography - State University in Skopje

- Institute of Geography in Skopje is 90 years old – one of the oldest in the country.
- Our Institute has 4 courses and one is GIS with RS with about 20-30 students yearly as well as master studies, while PhD studies will start next year.
- Unfortunately our staff is only 24 persons, 13 professors, 9 assistants and 2 of technical staff.
- There are only 2 researchers which work on Remote Sensing on the Institute (I.M. and S.G.), but fortunately few students finishing its graduation in RS and will continue with master degree (as young researches).
- In the State University there are 3 other faculties with researches in RS (Faculty of Forestry, Civil Engineering and Agriculture).
- We try to joint our efforts toward better cooperation and use of resources.
- Main topics of RS research in our Institute are natural hazards assessments (excess erosion, landslides, floods, forest fires), land cover changes, geomorphological and hydrological interpretation and modelling...
- We have several bilateral projects with Bulgaria (modelling of potential natural hazards with the help of RS) and we prepare with the same with Serbia.
- We have also the project with ATOMKI from Debrecen about glaciation reconstruction where RS will be used in huge extent.
- Proposals: about desertification on the south Balkan Peninsula, and abandoning of (arable) land...
- Land cover changes vs natural hazards frequency and severity (CORINE, MODIS, NDVI...).
1) Direction of investigations of the Institute:
   • Dynamics and evolution of natural ecosystems;
   • Integrated monitoring of environment and ecological restoration.

2) We are interested in using Landsat-8 and Sentinel-2 data, but also the knowledge of the processing methodology, in land use change monitoring. Contributions to SCERIN will be the extension of the study Land cover changes and natural hazards on the territory of the Republic of Moldova.

3) Future objectives of the Institute (in corroboration with the SCERIN program):
   • Studying of dynamics and emphasizing of tendencies of modifications of ecosystems components under natural and anthropogenic factors’ influence.
   • Evaluation of factors which can cause appearance of geoecological disasters.
   • Optimization of geosystems structure to ensure their stable functionality
   • Creation of informational database for land monitoring (CORINE LCLUC).
   • Training of scientific personnel of high qualification.
RS projects carried out now by Space Research Centre (CBK PAN), Poland

Main (most exciting 😊)!

• 1. AF3 - Advance Fire Fighting, EC FP7, 2014 - 2017, huge project (100%)

• 2. S2GLC Sentinel-2 classification for Global Land Cover, ESA, 2016-2017, middle size project (100%, CBK PAN)

• 3. Crop detection using multi-temporal SAR data, GUS (Statistical Office), 2015, 2016, 2017, middle size project (100%)

• 4. detection of poppy fields (in Poland and in Asian countries), ESA, 2016-2017, middle size (100%),
<table>
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<th>Duration</th>
<th>Support (funding level)</th>
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</thead>
<tbody>
<tr>
<td>BearConnect</td>
<td><a href="http://www.biodiversa.org/">http://www.biodiversa.org/</a></td>
<td>03-2017 to 02-2020</td>
<td>Total grant: € 1,397,615</td>
</tr>
<tr>
<td>Evaluating functional connectivity and factors influencing brown bear distribution, movements, and effective dispersal in current and future landscapes scenarios</td>
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<tr>
<td>Long-term forest degradation in Romania</td>
<td>Romanian Government</td>
<td>10-2017 to 10-2020</td>
<td>Total grant: € 100,00</td>
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Research topics:

- **Calibration and Validation of Earth Observation data:**
  - ESA Sentinel-1 Soil Moisture Product,
  - Land Products Validation and Characterization in support to Proba-V, Sentinel-2 & 3 missions

- **Agriculture / Drought:**
  - Yield forecasting, yield estimation in Europe
  - Drought detection, Autumn conditions for winter crops and Analysis of snow cover
  - Biomass and soil moisture assessment

- **Bioenergy and carbon balance:**
  - Carbon balance and its variation and trends analysis
  - Biomass potential and possibilities of energetic plants cultivation
  - Agriculture – water pollution

- **Forests:**
  - GlobBiomass project: characterize and to reduce uncertainties of forest aboveground biomass estimates
  - Mapping the actual forest extent and structure
  - Damage and windthrow assessment of mountainous (Tatra) forests
  - Impacts of winter warming events and air pollution on forest ecosystems

- **Land-cover:**
  - Verification and enhancement of the 5 high resolution layers (HRLs)

- **Others:**
  - Changes of cloudiness in Poland
  - Effect of climatic changes on grassland growth, its water conditions and biomass
  - Ground deformations, Fires, Floods

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National activities

International activities
Land Products Validation and Characterisation in support to Proba-V, Sentinel-2 and Sentinel-3 missions

The main aim is to support calibration and validation activities related to biophysical products derived from new ESA optical sensors.

Set of ground measurements includes:

- Spectral responses by the ASD FieldSpec 4 Hi-Res,
- Leaf Area Index (LAI) (with LAI 2200 Plant Canopy Analyser),
- APAR (with AccuPar instrument),
- Soil moisture (with TRIME Field Measurement Devices)
- Wet and dry biomass (in a laboratory, from samples collected at measurement plots from the area of 0.5 x 0.5 m)
- Height of vegetation
- Carbon balance (with chamber method and Eddy-Covariance method)
- Type of vegetation cover and its development stage.

http://www.igik.edu.pl
Test sites areas (LPVP)

Agriculture test site

Grasslands area at the wetlands

- The agriculture test site: at the western part of Poland, while the grasslands area at the wetlands at the eastern part of Poland.

- The choice of these locations has been done in regard to the knowledge about the test sites where other measurements have been done in the past. Also the agriculture plots are large and there is the variety of crop types.
Title  “ASAP – Advanced Sustainable Agricultural Production”

Aims  The proposed Agricultural Service is designed as a ‘One-stop-shop’ Service for Farmers and Owners of Agriculture Production Companies (and other various Users) providing information during the growing season in order to increase the efficiency of the management of the fields, and to obtain the highest potential yield with the optimal dosage of fertilizers.  

www.asap.farmer.pl
ASAP – EO data based Service for Agriculture

Map of frozen vegetation

Map of yield potential

Comparison of map of frozen vegetation delivered on the basis of aerial data (bottom) and satellite data (top). These maps were also compared with the in-situ observations from insurance company.

Model developed on the basis of correlation between the NDVI values in the end of the growing season and the map of yield derived from the computer installed in the farming vehicle.
1) Goals, programs and current priorities /projects

Goals
Increase the capacity of the University to integrate students in the economic sector by implementing

Key programs
COREHABS
BEARCONNECT
LONGFORO

Capabilities of the institution
Geomatics Laboratory
Capacity for field inventory
Capabilities of the institution

Site Validation
2) Benefit(s) and requirement(s) with regard to SCERIN (*outcomes and needs*)
   - joined activities, collaborations, other benefit(s) to your institution
     - Fulbright Visiting Professor
     - Joint proposal with Volker Radeloff
   - contribution(s) to SCERIN
3) Future objectives of your institution/program and the role of SCERIN
4) Remark(s)

1. Enhance the collaborations on projects and papers
2. Increase the visibility of our institutions through SCERIN
2) Benefit(s) and requirement(s) with regard to SCERIN *(outcomes and needs)*
✓ *creating a curriculum for 4 year B.Sc degree in geographic information science, joint program with some SCERIN member institutions, inputs on experiences, recommendations*
✓ *facilitate teaching staff and student mobility*
✓ *Information about research grants opportunities for students and professors*
✓ *joint projects and publications*

4) Remark(s)
*A scientific conference on LCLUC in Novi Sad 2019 ?*
Institute of Landscape Ecology  
Slovak Academy of Sciences

Research

Landscape ecology
- Landscape mapping and classification
- Landcover mapping and analysis
- Landscape changes, landscape processes
- Landscape modelling
- Landscape planning and management
- Landscape protection

Biodiversity research

Nature conservation

Long-term ecological research

Publication activities

Education

Networking and scientific events
Slovenia, Research Centre, Slovenian academy of Sciences, Arts & CO Space-SI, Tatjana Veljanovski, Krištof Oštir

1) Goals, programs and current priorities /projects (key programs, capabilities of the institution(s) you represent)
- Small but leading research group for remote sensing in Slovenia, with over 30 years of tradition.
- Active in national and European projects (EU FP projects, ESA PECS projects, INTERREG projects, not successful in EU H2020 projects)
- Active and enhanced cooperation with national institutions: forestry, agriculture, civil protection.

2) Benefit(s) and requirement(s) with regard to SCERIN (outcomes and needs)
• joined activities, collaborations, other benefit(s) to your institution
• contribution(s) to SCERIN
  - Interested in joined activities in regional monitoring, with potential and enhanced field/aerial data exchange for satellite products validation capabilities, knowledge exchange.
  - Interests in calibration fields development in the region (if any) and strengthening the joinment to calibration/validation networks.
  - Knowledge and practice exchange in regional monitoring and satellite data time series analysis, multitemporal classifications and similar.

3) Future objectives of your institution/program and the role of SCERIN (how can SCERIN contribute to your activities better)
- Slovenia would be happy to join the SCERIN network more intensively and benefit of University of Maryland and NASA networking and knowledge, as well as regional connections and knowledge.

4) Remark(s) (your 1-2 additional points of importance, if any)
Space Research Institute (Ukraine)

Mykola Lavreniuk, Mykola Meretskyi
Space Research Institute, Ukraine

<table>
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<tbody>
<tr>
<td>Sigma</td>
<td>Euro Commicion</td>
<td>2013-2017</td>
<td>K200$</td>
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<tr>
<td>Sen2Agri</td>
<td>ESA</td>
<td>2016-2017</td>
<td>K45€</td>
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</table>
Joint Experiment of Crop Assessment and Monitoring

**JECAM GOALS**
The overarching goal of JECAM is to reach a convergence of approaches, develop monitoring and reporting protocols and best practices for a variety of global agricultural systems.
## JECAM experiments

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<th>method</th>
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SPOT5 Take5 experiment

- SPOT5 as a simulator of the image time series for Sentinel-2 mission
  - new methods, services and products ready for operational use with Sentinel-2 data
- Coverage:
  - from April to September 2015;
  - over 150 sites (by ESA and CNES);
  - 1 site is covered by 1 scene – 60*60 km (preferable);
- Ukraine – international JECAM test site
Big Satellite Data – optical

RapidEye:
- Swath Width – 77 km
- Revisit time: Daily (off-nadir) / 5.5 days (at nadir)
- Cost – non free

Sentinel-2:
- Swath Width – 100 km
- Revisit time: 10 days
- Cost – free

Proba-V:
- Swath Width – 2250 km (full field of view)
- Cost – free

Sen2Agri: Sentinel-2 National level Demonstration
GEE Award, 2016

- **Google Earth Engine Research Award** 2016
  “Land cover mapping for big areas with use of optical and SAR data on the basis of Google Earth Engine (GEE) cloud platform” (Prof. A. Shelestov)
Thank you!