SCERIN Summary of Activities

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2. Joint Center for Earth Systems Technology, University of Maryland Baltimore County, and NASA Goddard Space Flight Center, Greenbelt, Maryland, USA
Regional networks: Global reference validation database for accuracy assessment of land cover

Role in verifying classifications and classifying very high res. images
SCERIN
South/Central European Regional Information Network

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Geographic Domain

Central and South Eastern Europe, the Danube Watershed and Western Black Sea coast
Why SCERIN? REGIONAL SPECIFIC

- Extreme diversity in land forms and environmental conditions --- unique richness and diversity of species, both highly sensitive and vulnerable to the global climatic changes

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Why SCERIN? REGIONAL SPECIFICS
Most of the region has been under **extensive land use for a very long period** --- industrial, mining activities, urbanization

Many of the **natural processes of adaptation are dysfunctional**
SCERIN
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Why SCERIN? REGIONAL SPECIFICs
Why SCERIN? REGIONAL SPECIFICS

LCLUC, RS research

- *tradition of 20 years in Central EU*
- *Tradition of 10 years in South and Central Europe*
SCERIN region is densely populated, and has an important role in food production and industry.

The economical and social restructuring following the political transition has not reached a stable phase yet.

Mainstream research and the regional mitigation policy view the effects of land use and land cover changes in the SCERIN region as lower priority of marginal importance (as compared to socio-economical changes).
SCERIN region is undergoing *active land use change*, presenting a major source of uncertainty in global-scale estimates of land-cover, carbon storage and flux dynamics.

Climatic predictions for SCERIN region show higher uncertainties, and processes and trends that differ and/or oppose the forecasts for western or north European climatic conditions.

The decline of vitality/stability of the natural ecosystems in SCERIN region triggers extreme events (e.g., flooding, wild fires, droughts) which result in ecological degradation and a release of the carbon stored in the ecosystems, and/or urban destructions and devastation of settlements.

**UNIQUE**: Possibility/responsibility of applying planned, large-scale measures to support natural processes by human interference.

*all the above considerably complicates the socioeconomic consequences of land cover change*
IMPORTANCE OF the research in the SCERIN region

- **Model areas for research of impacts of human activities**

- **UNIQUE**: Possibility/responsibility of applying planned, large-scale measures to support natural processes by human interference
Goals:

1. To promote and coordinate the production and provision of Earth System observations, adapted and/or designed for the user communities in South, Central and Eastern Europe.

2. To focus on regional and local issues related to satellite data products, methodologies, and end users.

3. SCERIN contribution to GOFC-GOLD, linkages with regional networks, e.g. IGU LUCC workgroup.

Participants and Structure

- Informal network of scientists and other professionals based in the region or with scientific interests in the region.

- SCERIN’s participants work together with the regional forest and land management agencies to ensure continuous, high quality observations and information products for operational and management applications, to facilitate feasible and sustainable natural resources management practices.
Participants and Structure

FG1: Forest biomass production; decline, disturbance and driving forces

FG2: Land Cover Changes: climate change, agricultural land abandonment, urban expansion

New FG3: Validation/verification network for support of current and future satellite missions [e.g. NASA’s LDCM and Sustainable Land Imaging (SLI), and ESA’s GMES program]
SCERIN: Examples of Regional Projects

SOUTH EUROPE:
1. Romania: Issues in Remote Sensing Techniques for Forest Cover Change Monitoring (V. Gancz, Forest Research & Management Institute, Romania)
3. Use of Remote Sensing for Agricultural Applications in North West of Turkey (L. Genc, COMU, Turkey)
4. Use of Remote Sensing Data for LULC monitoring in Turkey (D. Maktav, Istanbul Technical University)

CENTRAL EUROPE:
1. Poland: Land Use & Land Cover Change Studies in the Northern Carpathians (J. Kozak, K. Ostapowicz, Jagiellonian University, Krakow)
2. Application of Hyperspectral Data and Artificial Neural Networks for Land Cover Mapping of Mountains Areas (B. Zagajewski, University of Warsaw, Poland)
4. LULCC Research in the Czech Republic (P. Stych, Prague, Czech Republic)
5. Monitoring of Forest Condition & Function (J. Albrechtova & L. Kupkova, Prague, Czech Republic)

EASTERN EUROPE:
Ukraine: Monitoring of New Wetlands Formation in Water Reservoirs and Deltas’ Degradation in the Black Sea Basin (V. Starodubtsev, National University of Life and Environmental Sciences, Ukraine)
Aims:
to provide a tool for systematic automatic forest cover change detection
to publish the results on Internet geoportal on a regular basis (annually / 6 months)

Based on medium resolution EO data (i.e. Landsat)

Illegal clear cutting

Natural spreading of forest vegetation on abandoned agriculture (orchards/vineyards)

Dr.ing. Vladimir Gancz
Application of this integrated interdisciplinary approach is a basis for multifunctional risk assessment at NIMH of Bulgaria.
Remote Sensing for Agricultural Applications

Genc et al. 2008
Earthquake Based Urban Transformation Project (Zeytinburnu Pilot Project)
Fatih Earthquake Based Transformation Project
Küçükçekmece Urban Renewal Project (Kentsel Yenileme Projesi)

- To protect and improve the cultural, historical, and natural heritage of the districts Fatih, Zeytinburnu, K.Çekmece.

- To provide durable, safe and livable urban spaces.

- To improve the social and economical status throughout the project timeline.

- To obtain LU maps: middle & HR sat. data were used: LANDSAT (30 m), IKONOS (1m).

- Duration: Sept 2005-Dec. 2010
Forest cover change, west – east gradients, 1930 – 2000; Kozak et al. 2007

Forest proportion

1930s – topographic maps; 1990s – satellite data (Landsat)
Land cover mapping of mountains areas

- grasslands
- wastelands
- coniferous forest
- mixed forest
- deciduous forest
- tree clumps
- orchards
- beet crops
- potato crops
- oat crops
- stubbles
- arable areas
- asphalt roads
- side roads
- built-up areas
- buildings

13 bands MNF 3x3

Reference map
Predictive land cover change modelling

Liberalization

Biodiversity

Andrej Halabuk, SAS, Slovakia

SCERIN: Examples of Regional Projects: CENTRAL
Project: **Driving forces of land use differentiation changes in the Czech Republic and neighbor countries. Perspectives after EU accession**

- **Unique long-term data sources** – cadastral records - LUCC database for years 1845, 1896, 1948, 1990, 2000, 2010 – 10 LUCC categories (about 9,000 units)

- **Well worked-out methodology for long-term changes evaluation** (index of change, typology of changes, coefficient of anthropogenic pressure, etc.)

- **Complex approach** – driving forces evaluation

**Changes of arable land 1845-1948**

**Main processes 1990 - 2000**

**Cross-border Case studies**

1839

- Košťálkov

2005

- Klein Taxen
HypSO - Assessment of Mining Related Impacts Based on Utilization of Airborne Hyperspectral Sensor

**Project goals**

- To assess the current extent of the area affected by mining activities (tailing pounds, acid and heavy metal polluted zones, irritated vegetation, and changes in protection zones of water).
- To find relationships between irritation originator and consequential environmental disturbances of vegetation.
INMON - Innovation of methods for monitoring of health status of Norway spruce stands in the Krusne hory Mts. with the use of hyperspectral data

- **Project goals**
  - Evaluation of current health status of selected Norway spruce stands in the Krusne hory Mts.
  - Linking foliage chemical composition and spectral properties with soil chemical properties (basic cations, heavy metals, pH, C/N, DOC, DON, etc.).
  - Adjustment of methodology for processing of hyperspectral data to allow comparison of health status of Norway spruce stands in the Krusne hory Mts. in the end of the 1990’s
  - Collaboration with Dr. Petya Campbell, NASA Goddard Space Flight Center

Campbell et al. 2004
New wetlands formation in the Kiev reservoir from 1985 till 2009 (Landsat-5)
Meetings and Activities:

2012:
SEERIN (now SCERIN) Formulation Workshop,
17 April, Sofia, Bulgaria

2013:
SCERIN-1 Meeting, Trip & Trans-Atlantic Training,
17-21 June, 2013 Prague, Czech Republic

2014
SCERIN-2 Meeting and Trans-Atlantic Training,
9-10 June, 2014 Krakow, Poland

1) Achieved a consensus if the regional network is needed
   • Regional experts discuss the recent research accomplishments in the LCLUC, GOFC-GOLD and GEOSS research areas
   • Define the regional/national research and application issues
2) Identified common goals, participants & outline a roadmap
   • Formulated the specific regional/national research & application objectives
3) Outlined next steps (outlined pilot projects and capacity building initiatives to be conducted by the network)
4) Formulated a capacity building workshop

• Under the auspices of the US GOFC-GOLD (Global Observation of Forest and Land Cover Dynamics) and START (global change SysTem for Analysis, Research & Training).
• 41 participants [Bulgaria, Czech Republic, Germany, Poland, Romania, Slovakia, Switzerland (ENVIROGRIDS), The Netherlands (GOFC-GOLD LCPO), TFYR Macedonia, Turkey, USA]
17 April 2012, Sofia

2012: SCERIN Formulation Workshop, Sofia, Bulgaria

Jana Albrechtova
Petya Campbell
Lucie Kupkova
Olga Krankina

17 April 2012, Sofia

3rd Symposium, Wageningen, April 2013
1. SCERIN-1 Meeting: 17-19 June 2013

“"Monitoring Land Cover Changes & Forest Condition"

2. Scientific Field Trip in coordination with IGU LUCC: 19 June 2013

„LCLUC in Sokolov Region in Northwestern Bohemia affected by mining activities“ (scientific trip)

3. Trans-Atlantic Training in collaboration with ESA: 20-21 June 2013 “Classification methods in Land-Use/Land-Cover Change”

4. IGU LUCC meeting: 20-22 June, 2013, Prague

„International Geographical Union LUCC workgroup meeting“

collaboration between the existing networks in the region
• **SCERIN** has linkages with the **IGU LUCC workgroup: joint meeting with SCERIN1 in Prague 2013**

**IGU LUCC**
http://luccprague.cz/

- Basic information about a special LUCC week in Prague (17th to 22nd June 2013).
- The seminar will be held on June 20th - 21st 2013 at the Faculty of Science, Charles University in Prague.
- On 22nd June you can join us for an excursion focused on the land use changes in Central and Northern Bohemia.
- This will be the 5th seminar dealing with these topics taking place in Prague and organised by geographers from the Faculty of Science (2001, 2007, 2009, 2010).

**We cordially invite you to the seminar held in Prague on the topic of**

**Land Use**

**Land Cover change research in European countries**
Capacity Building Goal Achieved

Trans-Atlantic Training in collaboration with NASA and ESA:

20-21 June 2013 “Classification methods in Land-Use/Land-Cover Change”

Premysl Stych stych@natur.cuni.cz
Department of Applied Geoinformatics and Cartography,
Faculty of Science
Charles University Prague

Francesco Sarti – ESA

Garik Gutman - NASA
Theme: Current LCLUC challenges in SCERIN: Assessing Ecosystem Function and Processes
9-10 June 2014, Krakow, Poland

The second meeting of GOFC-GOLD South Central and East European Regional Information Network (SCERIN-2) is planned for 9-10 June 2014.

It is hosted by Drs. K. Ostapowicz and J. Kozak, Institute of Geography and Spatial Management at the Jagiellonian University, Krakow, Poland (http://www.gis.geo.uj.edu.pl/ZGIS/eng/aboutus/contact.ht).
### AGENDA

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**Session 1: Plenary lectures, LCLUC and GOFC-GOLD priorities**

**Session 2: SCERIN Focus Groups Discussions**
- FG1: Land cover products/applications, ecosystem/landscape assessments using hyperspectral and LiDAR data
- FG2: Land Cover Changes: agricultural land abandonment, urban expansion
- FG3: Validation/verification network for support of current and future satellite NASA (HyspIRI, Landsat) and ESA missions (GMES program) New

**Session 3: Land Cover Observations in SCE – panel of experts**
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Current SCERIN remote sensing issues, needs, goals

✓ **Main processes in present:** forest deterioration, changes in forest ecosystem functions, suburbanization, afforestation,

✓ **Driving forces:** transitional processes, EU accession and open market, changes in land preservation and restitutions, private land ownership, nature preservation, changes in pollution

✓ **GOALS:**
  - Network of field validation sites (including land management data) at regional SCERIN scales
  - Developing archives of long-term RS, LCLUC data, meteorology and field observations
  - Developing techniques for up-scaling between sites, networks of sites for detecting and interpreting key indicators of land use and land cover change
  - Designing a system for a cost effective monitoring that enable frequent, repeated, regionally coordinated assessment of landscape and ecosystems: distribution, status and trends of change

✓ **Needs:** LCLUC regional modeling predictions, International cooperation for sharing of data and experience, and for comparative studies
SUPPORT US: GO TO KRAKOW June 9-10 2014

http://csebr.cz/scerin2014/

SCERIN-2 MEETING
Jagiellonian University in Kraków, Poland, Institute of Geography and Spatial Management

5-10 June 2014