



*The GOFC-GOLD South Central and Eastern
European Network (SCERIN)*



SCERIN Overview

SCERIN-4 Goals and Workshop Agenda

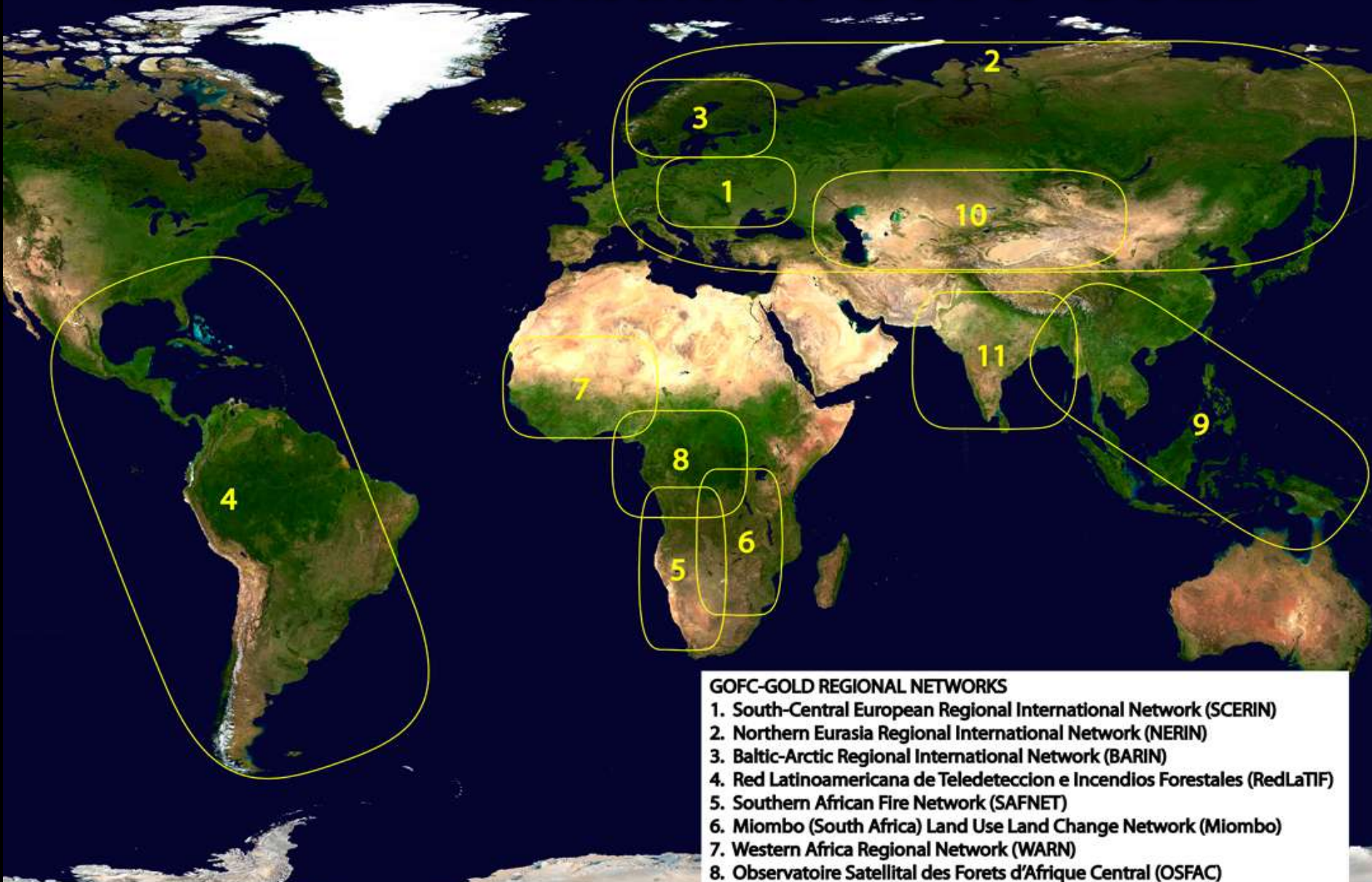
*Petya Campbell¹, Jana Albrechtová²
and Lucie Kupková²*

¹Joint Center for Earth Systems Technology, University of Maryland Baltimore County,
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²Charles University in Prague, Faculty of Science, Prague, Czech Republic



SCERIN Contributes to GOFC-GOLD



GOFC-GOLD REGIONAL NETWORKS

1. South-Central European Regional International Network (SCERIN)
2. Northern Eurasia Regional International Network (NERIN)
3. Baltic-Arctic Regional International Network (BARIN)
4. Red Latinoamericana de Teledeteccion e Incendios Forestales (RedLaTIF)
5. Southern African Fire Network (SAFNET)
6. Miombo (South Africa) Land Use Land Change Network (Miombo)
7. Western Africa Regional Network (WARN)
8. Observatoire Satellital des Forets d'Afrique Central (OSFAC)
9. Southeast Asia Regional Research and Information Network (SEARRIN)
10. Central Asia Regional Information Network (CARIN)
11. South Asia Regional Information Network (SARIN)

SCERIN Geographic Domain

SCERIN includes: Central & South Eastern Europe, the Danube Watershed & Western Black Sea coast



Network Goals

- To provide a platform for collaboration among remote sensing experts in SCEE, through joint projects activities
- To facilitate the progress and consistent implementation of remote sensing and LCLUC methodology in the region
- To foster regional collaboration for monitoring the dynamics, stability, and vulnerability of the major ecosystems
- To promote effective sustainable management and preservation, on the local, regional and pan-European level

Participants and Structure

- Network of scientists and other professionals based in the region or with scientific interests in the region.
- SCERIN contributes to GOFC-GOLD and has strong linkages with the NEESPI and LCLUC
- Thematic focus of SCERIN:
 - LCLUC and implications to climate & society
 - Forest function, disturbances, fires
 - Ecosystem carbon storage and flux dynamics



FG1: Forest changes: disturbances, biomass production, forest LCLUC driving forces

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

FG3: Validation/verification: satellite product validation/support of current and future missions [e.g. NASA's LDCM and HypIRI, and ESA's GMES program – Sentinel 1 and now 2]

SCERIN Coordination



Network Coordinator in U.S.:

Petya Campbell petya.campbell@nasa.gov

Joint Center for Earth Systems Technology (JCET), University of Maryland Baltimore County
NASA Goddard Space Flight Center, Greenbelt, Maryland, USA



Regional Contacts in Europe, Czech Republic:

Jana Albrechtova albrecht@natur.cuni.cz

Department of Experimental Plant Biology, Faculty of Science,
Charles University Prague



Lucie Kupkova lucie.kupova@gmail.com

Department of Applied Geoinformatics and Cartography, Faculty
of Science, Charles University Prague

Web pages: <http://www.fao.org/gtos/gofc-gold/net-SEERIN.html>
<http://csebr.cz/scerin/index.html>



- SCERIN and its activities offer a functional platform for developing professional collaborations and advancing regional remote sensing and LCLUC science.
- With the advances in global remote sensing, the need for regional networks, such as SCERIN, will only increase, for regional validation of global remote sensing products and providing feedback to the satellite agencies and information providers.



Regional Background

- Diversity of land forms and environmental conditions has produced a unique richness of species - highly sensitive and vulnerable to climate change.
- SCEE has undergone extensive land-use, which have rendered many of the natural processes of adaptation un-sustainable.
 - Rich archive of long-term LULC data
 - Archive of methodology for field observations
 - LUCC research established
 - Availability of regional data
 - from individual institutions or projects
 - not always uniformly organized and consistent



Identified Priority Topics

- Collaboration for: sharing of data, experience, and comparative studies
- Facilitation of LCLUC and regional modeling predictions and forecasts
- Establish network of field validation sites at regional SCERIN scales, for detecting/interpreting key indicators of land use and land cover change
- Promote techniques for cost effective monitoring to facilitate frequent, repeated, regionally coordinated assessment

Current Specifics

- ✓ **Main processes in the present:** suburbanization, land abandonment, afforestation, loss of agricultural and especially arable land and *dynamics in population density with migration*
- ✓ **Driving forces:**
 - ✓ Change in climate and extreme weather events (e.g. floods and fires)
 - ✓ EU accession and open market bringing changes in land preservation and land ownership)
 - ✓ Forest management and protection of natural environment
 - ✓ Transitional processes in population dynamics:
 - ✓ *unstable population dynamics due to the political situation in proximity to SCERIN*
 - ✓ *EU transitional state to providing solutions, and*
 - ✓ *relations to EU, US, UN and others...*

Transition from Land Cover Change to Land Cover Dynamics (from LCC to LCD)

Land cover dynamics

- characterized by seasonal and inter-seasonal variability of vegetation greenness
- reflected in dynamic change of SI signal

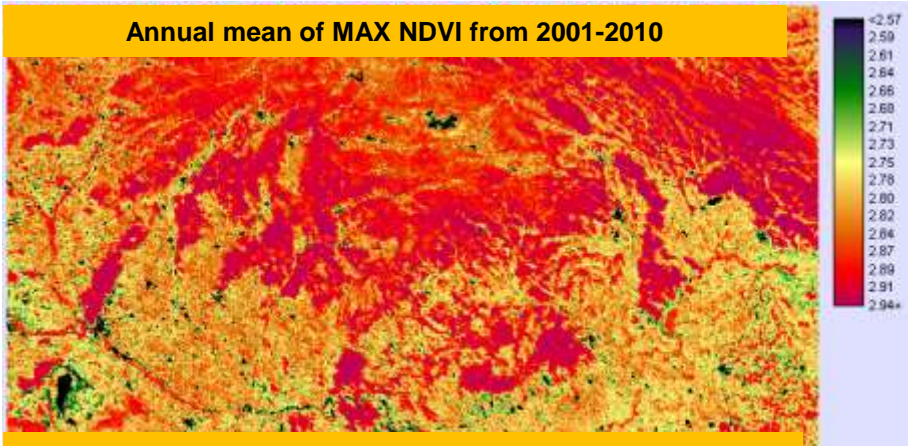
- Response to increasing availability of SI
- Increasing temporal resolution (LDCM, Sentinel2,...)

Result:

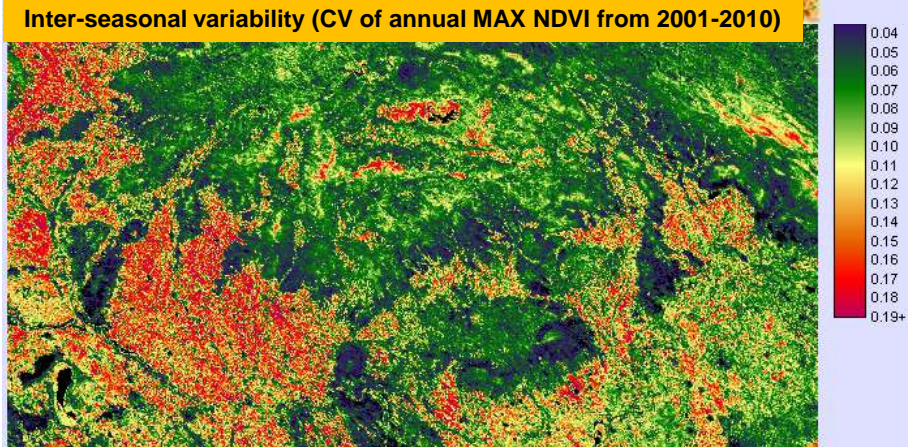
- multitemporal and time series based land cover classification and land cover dynamics analysis
- time series analysis of vegetation greenness (NDVI)

Andrej Halabuk, SAS, Slovakia

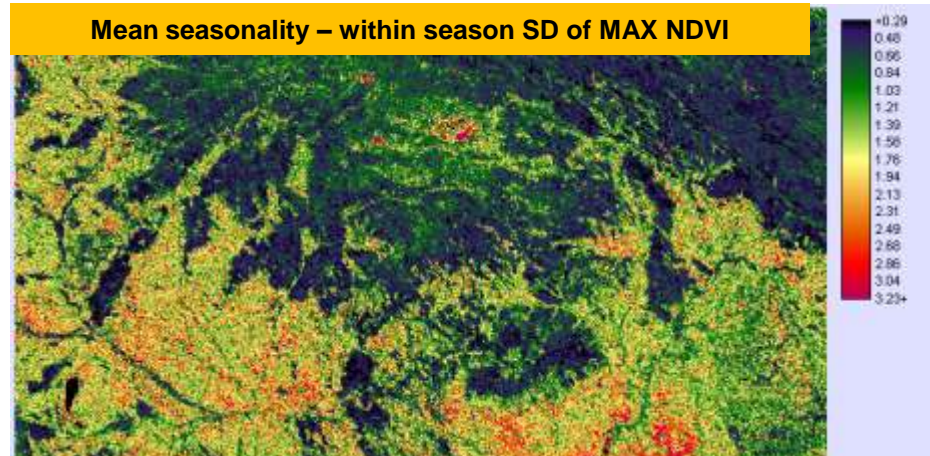
Annual mean of MAX NDVI from 2001-2010



Inter-seasonal variability (CV of annual MAX NDVI from 2001-2010)



Mean seasonality – within season SD of MAX NDVI

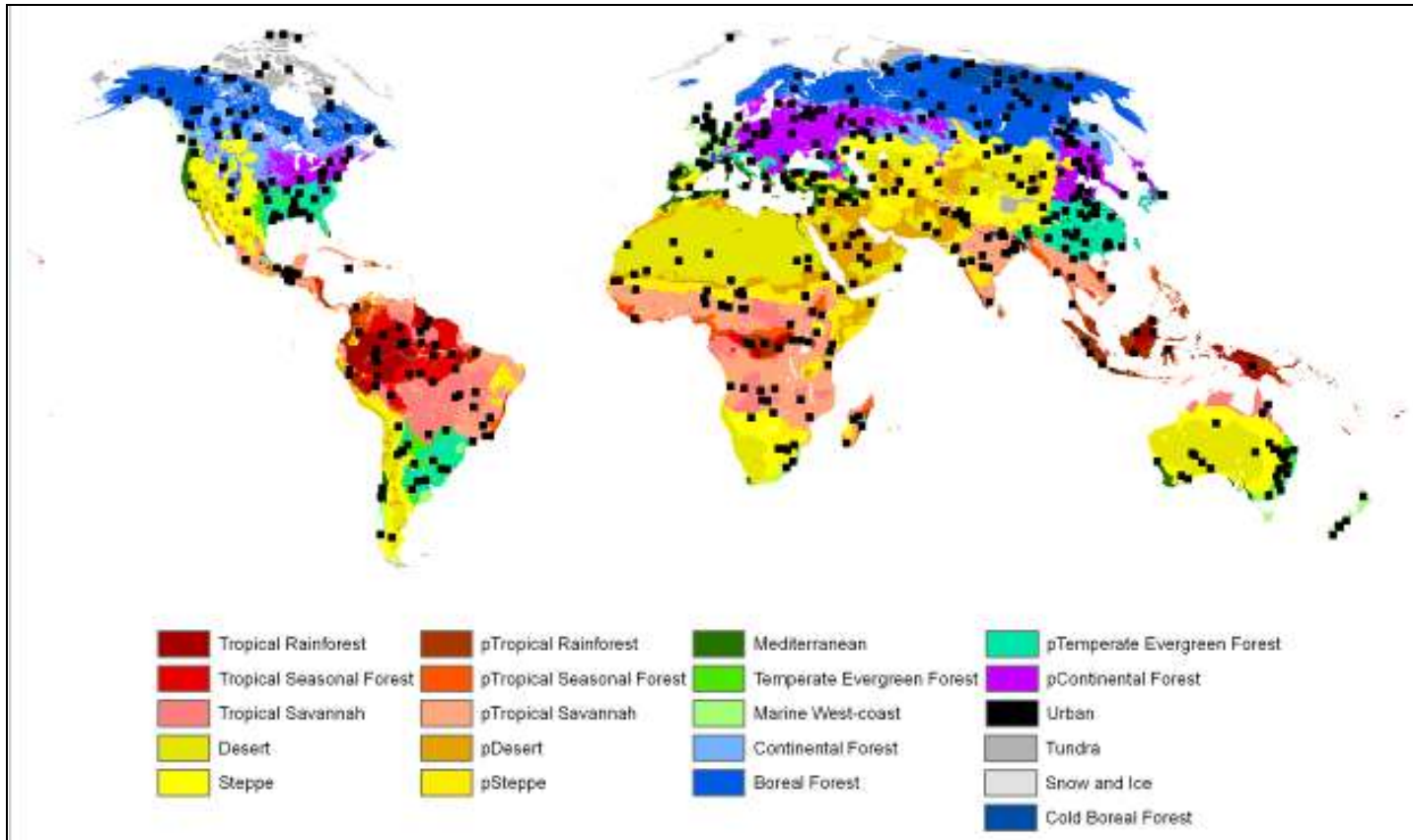


SCERIN Activities in Progress

- SCERIN joint projects for peer review papers (leads Ioannis, Greg and Premek)
 - Global land cover products validation
 - Inventory of land use and land cover change and driving forces
- Started discussion of SCERIN stable reference sites (examples in following slides)
- Identified the need of SCERIN field verification GIS database (sample points, pictures, etc. in ARC/GIS online)
 - Lead: Vladimir Ganz, start providing test data to Vladimir - GIS@SCERIN
- Steps Toward sustainable SCERIN – will work on at SCERIN-4 (lead Jana)
- Improve SCERIN web site web pages (START support requested)
 - Links for each country with list of active projects and data collections
 - * identify at SCERIN-4 responsible person per country
 - Jana - computer support, update and maintenance
- Social media: SCERIN Linked inn group page and Facebook presence - need suggestions

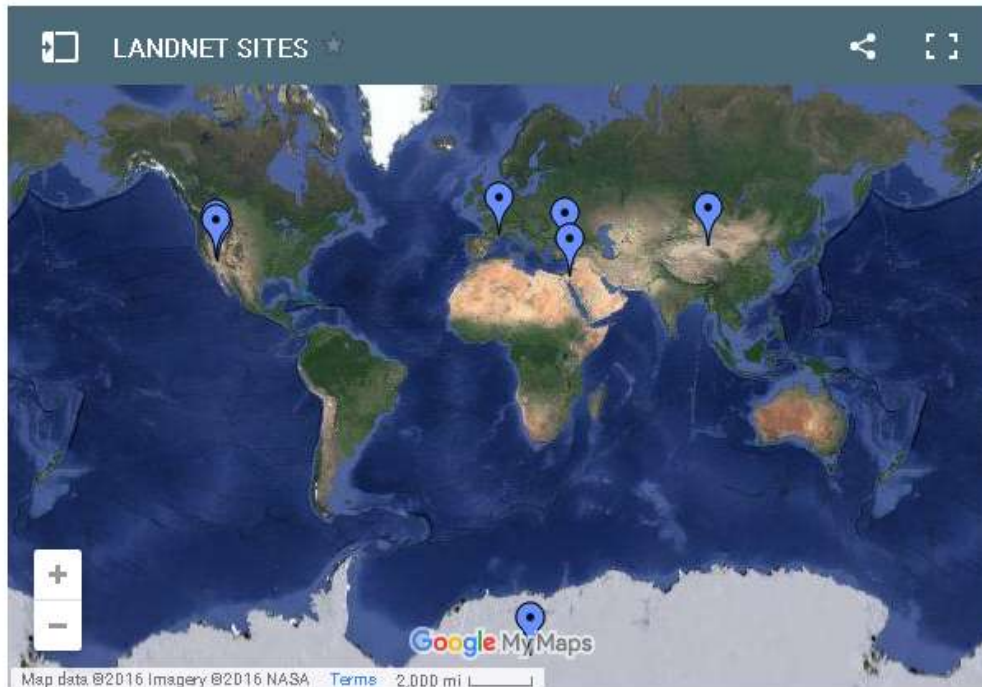
Global Reference Validation Database for Accuracy Assessment of Land Cover

Role of GOFC-GOLD and the regional networks in verifying classifications and classifying high resolution images



LANDNET SITES (CEOS Reference Sites)

Name	Longitude	Latitude	Affiliation	E-Mail
<u>Tuz Golu</u>	33.33	38.83	TUBITAK UZAY	hilal.ozen@uzay.tubitak.gov.tr
<u>Railroad Valley Playa</u>	-115.69	38.5	NASA/GSFC	kurtis.thome@nasa.gov
<u>Negev</u>	35.01	30.11	Ben Gurion University	karnieli@bgu.ac.il
<u>La Crau</u>	4.86	43.56	CNES	patrice.henry@cnes.fr
<u>Ivanpah Playa</u>	-115.40	35.57	NASA/GSFC	kurtis.thome@nasa.gov
<u>Frenchman Flat</u>	-115.93	36.81	NASA/JPL	carol.i.bruegge@jpl.nasa.gov
<u>Dunhuang</u>	94.34	40.13	NSMC/CMA	huxq@cma.gov.cn
<u>DOME-C</u>	123	-74.5	University of Washington	sqw@atmos.washington.edu



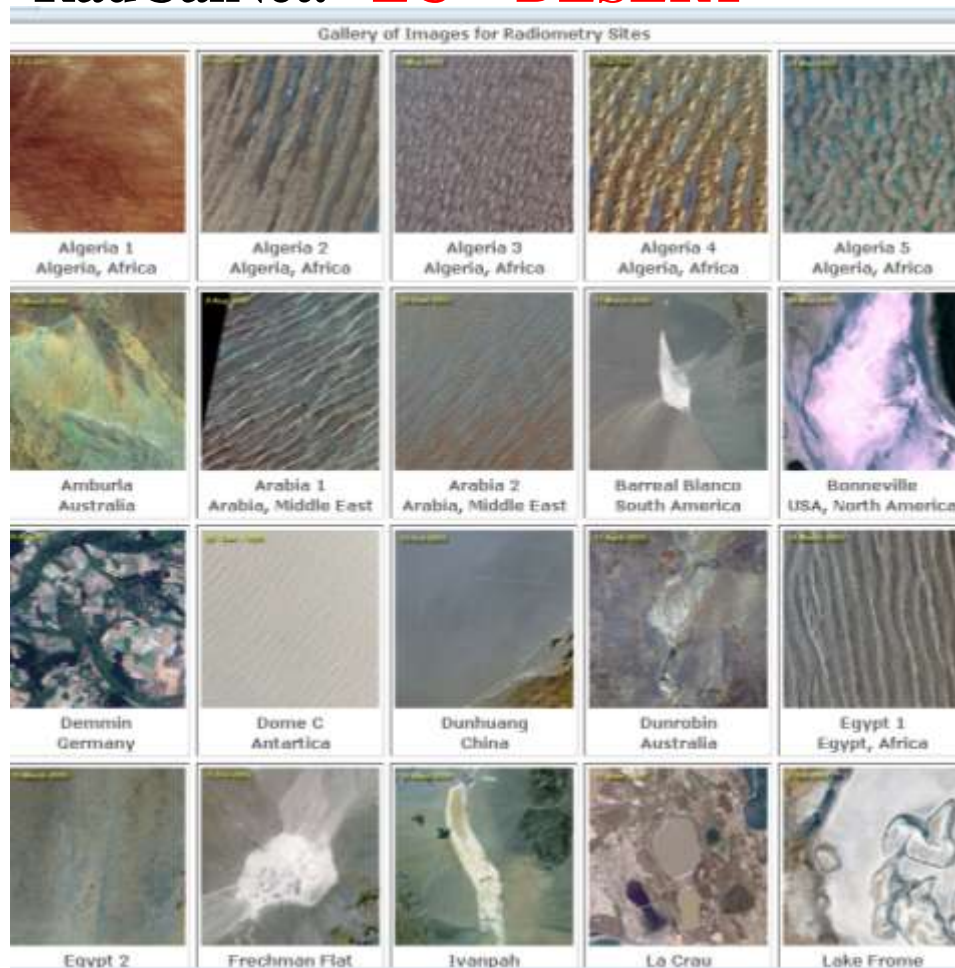
- CEOS Reference Sites
- Radiometry Test Sites
- Geometric sites

<http://calvalportal.ceos.org/ceos-landnet-sites>

Radiometry Test Sites

Operational network of sites with automated instruments for the radiometric calibration of high spatial resolution optical sensors:

RadCalNet. **LC = DESERT**



? **SCERIN stable LC sites for product cal/val**
(after Demmin, Germany)

Geometric Test Sites

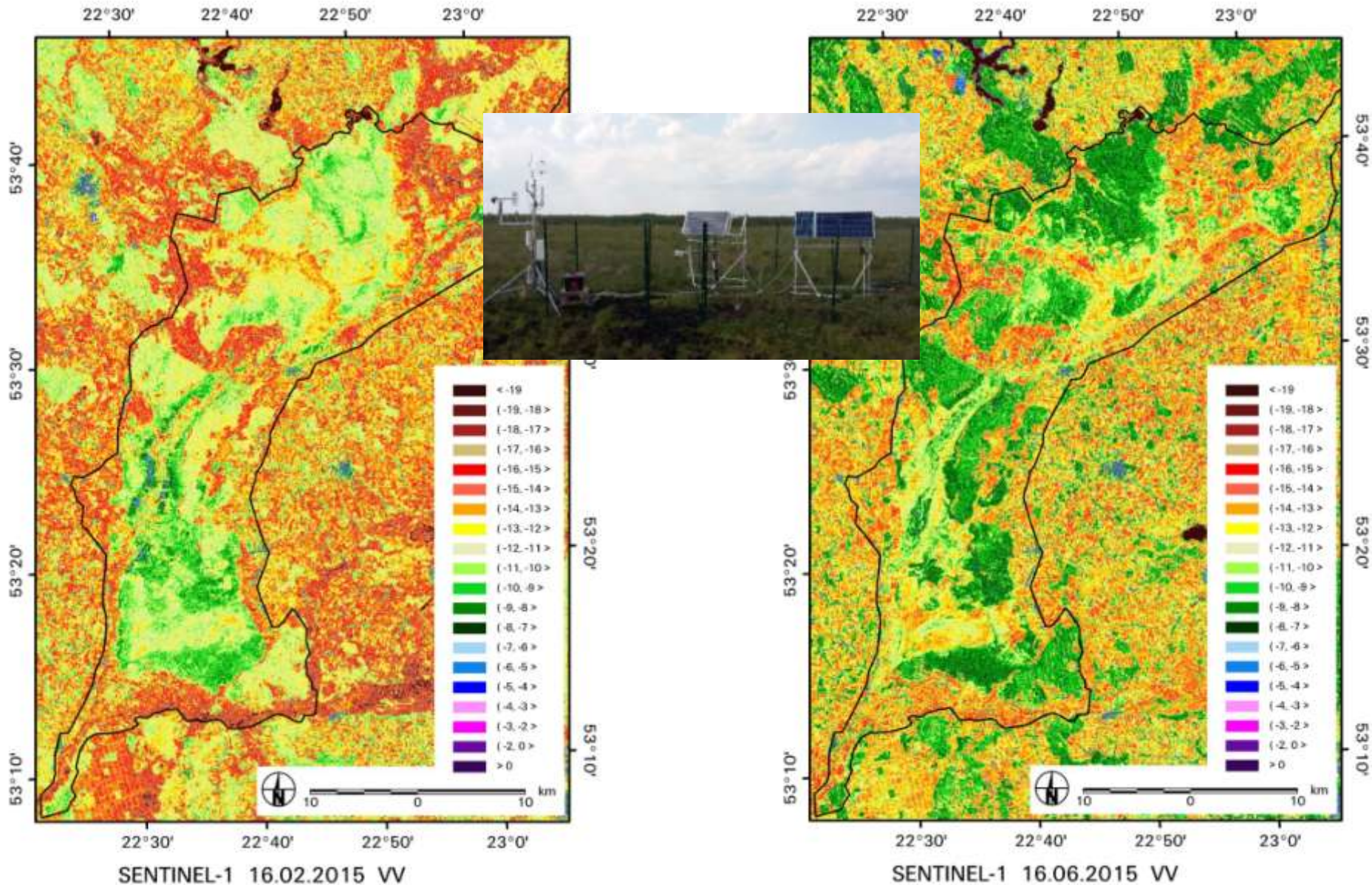


Rolla Range Design

- Goal - evaluating geodetic accuracy of sensors.
- Well-surveyed, photo-identifiable targets
- Identify SCERIN Geometric Test Sites ?

Location (City, State, Country):	Rolla, Missouri, USA
Altitude above sea level Min/Max/Mean (meters):	TBD
Center Latitude,Longitude (Degrees):	37.942740, -91.762601
UTM Zone:	15 N
Owner:	TBD
Points of Contact:	Aparajithan Sampath Brian Fiehler
Purpose:	The Rolla National Test Range (NTR) has been designed to evaluate aerial orthophotos as well as high resolution satellite images. The test range has been designed and built in partnership with the City of Rolla.
Range Layout:	TBD
Description:	The Rolla NTR for aerial and high resolution remote sensing images is located in the state of Missouri, USA and covers part of the city of Rolla, within Phelps County. The test range has been designed to accommodate most of the aerial sensors that are currently in use. It is planned to ask the DPs to generate an orthophotos over an area equivalent to 2 x 2 times the swath of the sensor, at a GSD of 6 inches. The USGS will provide control points and a Digital Elevation Model (DEM) for the area, and carry out an evaluation of the ortho product, based on several check points.
Orthophoto Procurement and Accuracy Assessment:	TBD

Sentinel – 1 Supersite



SCERIN-4 Goals

Theme: **Climate Change and Anthropogenic Impacts on SCERIN Ecosystems**

Objectives:

- 1) provide a forum for networking, collaboration, and capacity building
- 2) discuss and advance the work on SCERIN joint projects and papers
- 3) address SCEE priority topics, focusing on remote sensing in forest management, monitoring of ecosystem dynamics, and assessment of environmental disturbance
- 4) inform participants about ongoing scientific efforts and projects, with possible contributions and follow-up activities for SCERIN participants
- 5) identify the **current priorities** of land-cover and land-use change R&A in SCERIN
- 6) discuss availability of satellite data, products, and approaches for regional land-cover monitoring
- 7) outline the activities to be completed by SCERIN within the following year

The SCERIN-4 CBW is coordinated with the TAT training for graduate students and early career professionals.

Day	Mon	Tue	Wed	Thu	Fri*	Sat	Sun	Mon	Tue	Wed
Date	18-Jul	19-Jul	20-Jul	21-Jul	22-Jul	23-Jul	24-Jul	25-Jul	26-Jul	27-Jul
Event	Arrival	SCERIN-4 CBW			LCC Trip	TAT	TAT	TAT	TAT	TAT

Time	7/19/2016 Tuesday	
	SCERIN-4 Day 1	Presenters Name
8:30	<i>Registration & Logistics</i>	
	Plenary Session (Session Chair: Andrej Halabuk, Records: Ivan Sačkov)	
9:00	Opening	Andrej Halabuk, Ivan Sačkov, Róbert Smreček
9:05	Host Introduction: NFC	Tomáš Bucha, Director of NFC
9:15	Host Introduction: TUZVO	Jaroslav Šálka, Pro-rector of TUZVO
9:25	Host Introduction: SAS	Ľuboš Halada, Deputy Director of SAS
9:35	Key note: Multi-Source Land Imaging in relation to SCERIN activities under GOFC-GOLD program	TBD
10:00	<i>Coffee Break & Picture</i>	
	SCERIN Update (Session Chair: Jana Albrechtova, Records: Petya Campbell)	
10:30	SCERIN Overview, SCERIN-4 Workshop Goals and Agenda	Petya Campbell
10:50	Overview/potential for new networking activities and scientific projects with joined contribution from the SCERIN	Jana Albrechtova and Lucie Kupkova
11:10	Intro. Paper 1: Global land cover products validation and inter-comparison in the SCERIN area	Ioannis Manakos
11:30	Intro. Paper 2: Inventory of land use and land cover change and driving forces in SCERIN countries	Gregory Taff & Přemysl Štych
12:00	<i>Lunch & Visit of University Scientific Centre</i>	

Time	7/19/2016 Tuesday	
	SCERIN-4 Day 1 - Afternoon	Presenters Name
12:00	<i>Lunch & Visit of University Scientific Centre</i>	
	Research highlights Slovakia (Session Chair: Andrej Halabuk, Records: Géza Király)	
13:30	Analyses of land-cover change: spatial determinants and driving forces, Slovakia	Juraj Lieskovský, Andrej Halabuk
13:45	Using RS and GIS for forest mapping, monitoring and mensuration in Slovakia	Ivan Sačkov, Ivan Barka
14:00	Remote Sensing Applications in Mapping of Forest cover in Slovakia	Robert Krajčovič
14:15	Recommended practices for land cover/forest cover change validation, <i>GOFC-GOLD</i>	Brice Mora
14:30	<i>Coffee Break & Posters</i>	
	Research highlights SCERIN (Session Chair: Jana Albrechtova, Records: Petya Campbell)	
14:30	Posters FG1(2 min each)	* 2 min/each
14:50	Posters FG2 and FG3(2 min each)	! provide slides
15:10	<i>Questions & Discussion/ Coffee Break & Posters</i>	
15:30	<i>Adjourn, Walk in the nearby Dendrarium</i>	
19:00	<i>SCERIN Networking Diner Event</i> (location - Hotel Polana, Zvolen)	

14:30-15:30 Research highlights SCERIN: Posters by FG

(2 minutes each, provide slide(s) in advance to Jana or Petya !)

	First Name	Last Name	Focus Group (FG/Topic)	Title(s)
1	Ivan	Pilas	FG1: Forest monitoring	Responses to recent climate changes in the common beech (<i>Fagus sylvatica</i> L.) ecosystems in Croatia
2	Ivan	Barton	FG1: Forest monitoring	Monitoring system for natural forest dynamic in the fragments of virgin forest of Carpathian region
3	Luka	Rumora	FG1: Forest monitoring	The use of satellite imagery in the assessment of the restoration of the Česma forest in North-Western Croatia
4	Mihai Daniel	Nita	FG1: Forest monitoring	Long-term disturbance patterns in Romanian forests
5	Sophiko	Kenkebashvili	FG1: Forest monitoring	Forest Fires in Georgia monitoring with MODIS
1	Giorgi	Ghambashidze	FG2: Land Cover Changes	Fire monitoring on agricultural lands and prediction of possible effects on soil
2	Gregory	Taff	FG2: Land Cover Changes	Strategies to Study Invasive Weed Management
3	Roman	Sitko	FG2: Land Cover Changes	Human impact on the land cover change in University forest enterprise in Zvolen
4	Minucsér	Mészáros	FG2: Land Cover Changes	Inland excess water mapping using RapidEye images
5 6	Volodymyr	Starodubtsev	FG2: Land Cover Changes	1. New land resources formation in large water reservoirs (in Ukraine and global) 2. New landscapes formation in water reservoirs
1	Ganna	Zagorodnia	FG3: Validation/verification network	Validation of land cover maps using the regular and pseudo-random sampling
2 3	Petya	Campbell	FG3: Validation/verification network	Towards 'flexible' spectral time series and measurements for assessment of ecosystem productivity and bio-diversity
15 Posters, 30 minutes; Questions & Answers 30 minutes				

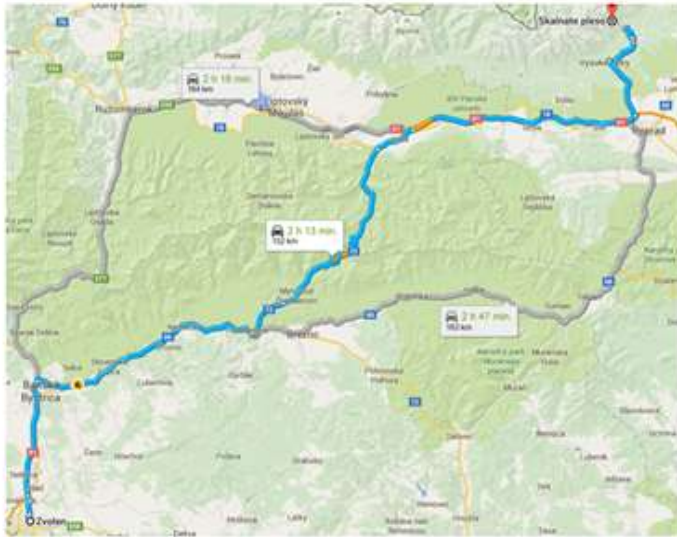
Time	7/20/2016 Wednesday	
	SCERIN-4 Day 2	Presenters Name
8:30	<i>Registration & Logistics</i>	
9:00	SCERIN Programmatic Panel (Bulgaria, Romania, Poland, Czech Republic, Slovakia, Hungary, Croatia, Ukraine, Greece, Turkey)	<i>(Chair: Gregory Taff, Records: Petya Campbell)</i>
10:00	<i>Questions & Discussion</i>	
10:30	<i>Coffee Break & Posters</i>	
11:00	Parallel working sessions on the overview papers 1 and 2	
	Paper 1: Global land cover products validation and inter-comparison in the SCERIN area	<i>Lead: Ioannis Manakos</i>
	Paper 2: Inventory of land use and land cover change and driving forces in SCERIN countries	<i>Leads: Gregory Taff and Přemysl Štych</i>
12:30	<i>Lunch</i>	
	Research highlights SCERIN (Chair: Levente Ronczyk , Records: Gregory Taff)	
13:30	Hyperspectral datasets for monitoring spruce health in Czechia	Jana Albrechtova
13:40	Multi-scale forest monitoring	Géza Király
13:50	Long-term forest cover changes in Czechia - trends, drivers and consequences	Přemysl Štych
14:00	Mapping forest cover change in two Bulgarian test sites using SPOT and Landsat data	Ilina Kamenova
14:10	Deep learning technique for land cover changes detection	Mykola Lavreniuk
14:20	SAR data application for hydrological issues	Levente Ronczyk
14:30	New land resources formation in large water reservoirs - in Ukraine and global	Volodymyr Starodubtsev
14:40	<i>Questions & Discussion</i>	
15:00	<i>Coffee Break & Posters</i>	

Time	7/20/2016 Wednesday	
	SCERIN-4 Day 2	Presenters Name
15:00	<i>Coffee Break & Posters</i>	
15:10	Urban Sprawl Impacts on Surface Temperature Using Landsat Imageries: Case Study of South Marmara, Turkey	<u>Levent Genc</u>
15:20	Impact of urban ecosystem structure on thermal properties of town	Olga <u>Brovkina</u> and Frantisek <u>Zamek</u>
15:30	Urban-rural contrasts in Central-Eastern European cities using MODIS 4 μ m time series	Monika Tomaszewska
15:40	<i>Questions & Discussion</i>	
16:00	<i>Discussion: New networking activities and scientific projects with joined contribution from SCERIN</i>	<i>Lead: Albrechtova, Records: Campbell</i>
17:00	<i>ADDITIONAL Parallel working sessions on papers 1 and 2</i>	<i>Leads: Manakos, Taff & Stych</i>
18:00	<i>Adjourn</i>	
19:00	<i>Diner (convenient location by host suggestion)</i>	

Time	7/21/2016 Thursday
	SCERIN-4 Day 3
9:00	Observers Programmatic Panel: Georgia and Norway (<i>Chair/Records: Petya Campbell</i>) <i>Questions & Discussion</i>
9:30	Improving future ecosystem benefits through earth observations in the SCERIN: the ECOPOTENTIAL approach (Ioannis Manakos)
9:45	Practical applications of accuracy assessment in large area land cover and land cover change monitoring with satellite data (Mutlu Ozdogan)
10:00	<i>Coffee Break</i>
10:30	SCERIN papers status, action items and deadlines (Report from the working sessions , 30 minutes each)
11:30	Future SCERIN networking activities and scientific projects: deadlines, joined contribution, actions (Outcome from discussions , review of action items, Lead: Jana Albrechtova, Records: Petya Campbell)
12:00	<i>Questions & Discussion</i>
12:30	<i>Lunch</i>
13:30	SCERIN-4 Workshop outcome, activities/actions and deadlines (Petya Campbell)
14:30	<i>Questions & Discussion</i>
15:30	<i>Coffee Break</i>
16:00	SCERIN Future plans, activities and potential venues (Jana Albrechtova)
16:30	Presentation and discussion of proposals for SCERIN venue(s) in 2017 (location, facility, hosts)
17:00	<i>Questions & Discussion</i>
17:30	Host Concluding Remarks
18:00	<i>Adjourn</i>
19:00	<i>Dinner in a convenient location by host suggestion</i>

Field Visit: *Regional Examples of LCLUC*

The field trip will focus on forest disturbance research in High Tatras that was accelerated after the severe windstorm in 2004. A presentation about the post-calamite research in High Tatras will be given by the staff of the Research Station of the State Forests of Tatra National Park. This will be followed by excursion to the research plots, where impacts of different forest management on forest regeneration are studied.



Goals:

- inform on regional LCLUC examples
- provide time and opportunities for discussions

Instructions for the field trip:

We are going to leave by bus from the parking place of Hotel Polana at around 7:30 am.

The return will be around 18:30.

The average traveling time to the High Tatras will be 2 hours. There will be only short stops upon request.

Lunch: The lunch break will be at around 12:00 in a reserved restaurant in High Tatras.

The menu will be pre-selected during the workshop in order to guarantee no delay at the place.

How to dress: in a sport wear, walking shoes

Information on the field trip is available also at:

<http://www.csebr.cz/scerin2016/trip.html>

The South Central and Eastern European Regional Information Network

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Garik Gutman, NASA Headquarters, ggutman@nasa.gov

Introduction

The South Central and Eastern European Regional Information Network (SCERIN) is an established network of the Global Observation of Forest and Land Cover Dynamics (GOFC-GOLD) project of the Global Terrestrial Observation System (GTOS). The regional networks perform an essential cross-cutting role in the implementation and integration of GOFC-GOLD's objectives and provide a link between the national/regional agencies and the global user/producer community. The SCERIN network has strong linkages with the Northern Eurasia Earth Science Partnership Initiative (NEESPI), and is well positioned to contribute to the emerging Northern Eurasia's Future Initiative (NEFI) under the auspices of the Future Earth program. The need to establish SCERIN was identified

the SCERIN region has produced a unique richness and diversity of species that are highly sensitive and vulnerable to climate change. Currently, mainstream research and the established European mitigation policies view the effects of land-use and land-cover changes in parts of the region as low priority and of marginal importance. However, climatic predictions for the SCEE region show higher uncertainties and processes and trends that differ significantly from climatic forecasts for Western or Northern Europe. The decline of vitality and stability of the ecosystems, especially forests, in the SCEE region may trigger extreme events (e.g., droughts, flooding, wildfires) and result in ecological degradation such as soil erosion and aridification, constraints and pressure on sustainable ecological diversity, and extinction of endangered species. Ecosystem degradation