The NASA LCLUC Program: Focus on Central-South Eastern Europe

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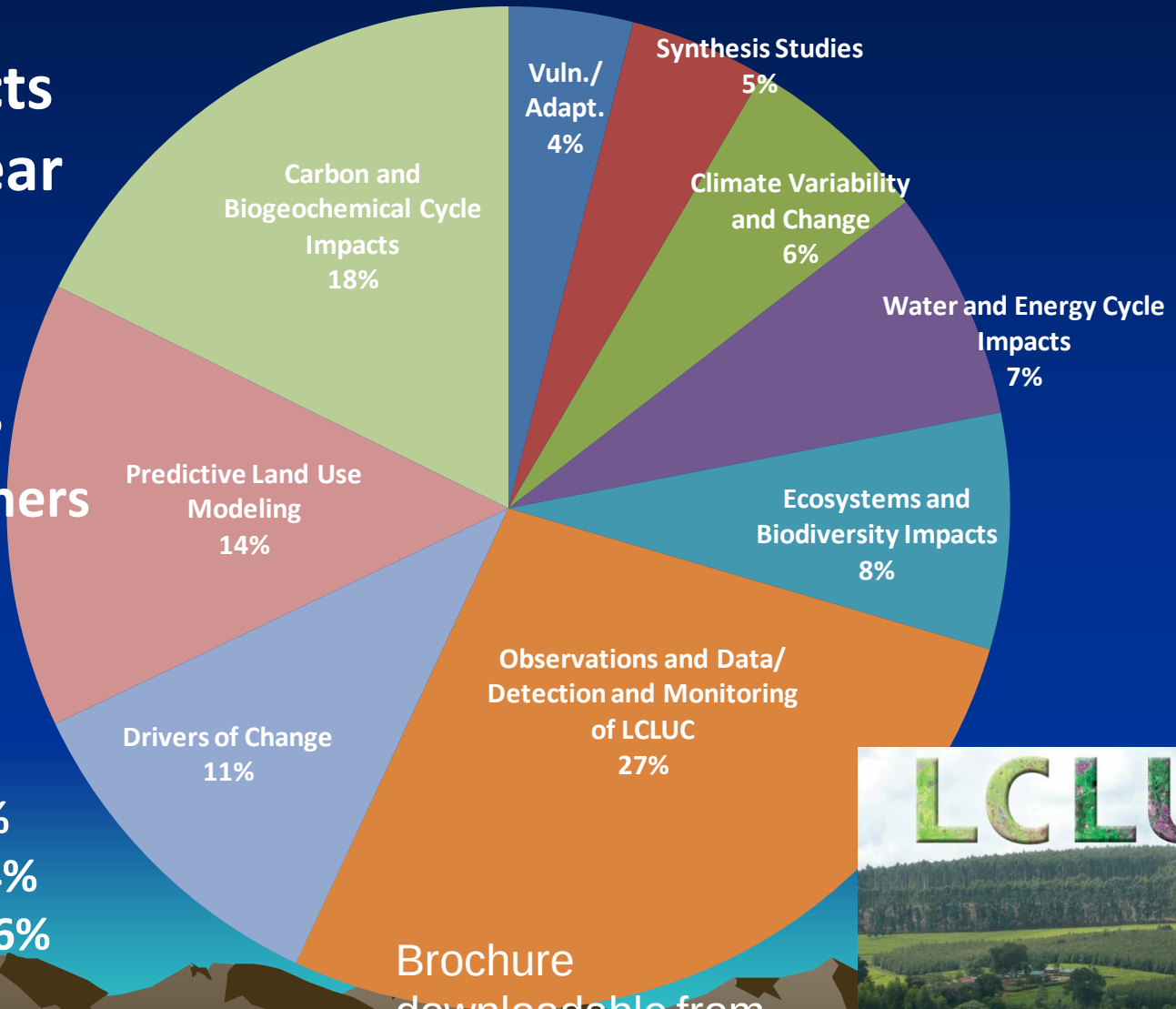
Land-Cover/Land-Use Change Program

- LCLUC is an interdisciplinary scientific theme within NASA's Earth Science program. The ultimate vision of this program is ***to develop the capability for periodic global inventories of land use and land cover from space*, *to develop the scientific understanding and models necessary to simulate the processes taking place, and to evaluate the consequences of observed and predicted changes***
- http://lcluc.hq.nasa.gov/

LCLUC Program Content

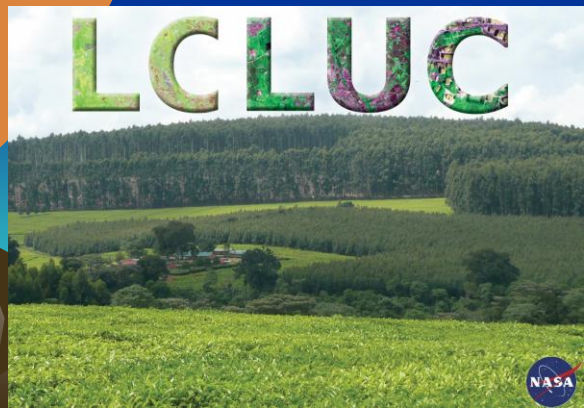
~ 200 projects during 15 year

Per year
~40 projects
~200 researchers



Impacts - 33%
Drivers – 11%
Monitoring – 27%
LU Modeling – 14%
LU <-> Climate - 6%
Synthesis – 5%
Vulnerability/Adaptation – 4%

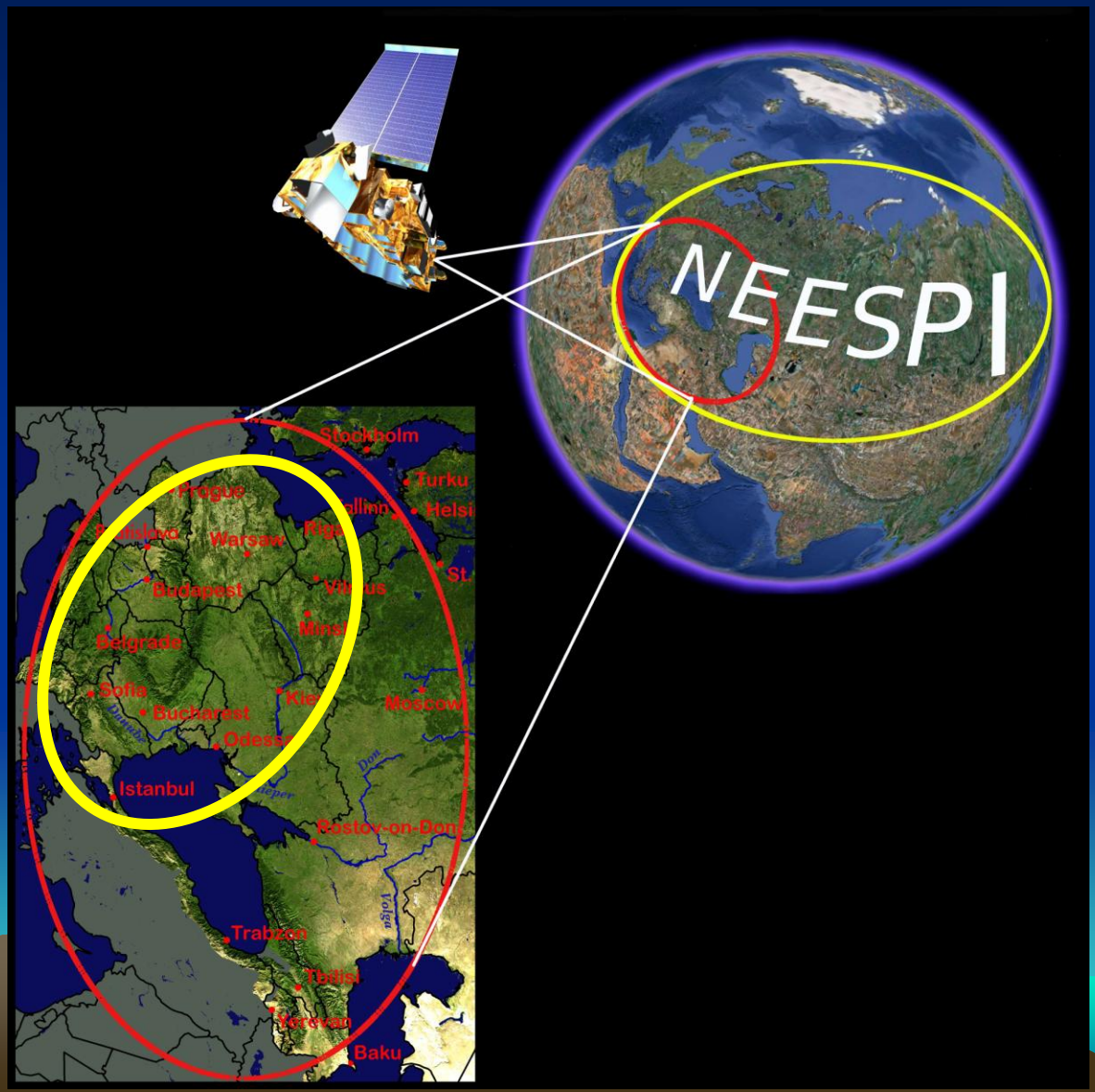
Brochure downloadable from http://lcluc.hq.nasa.gov

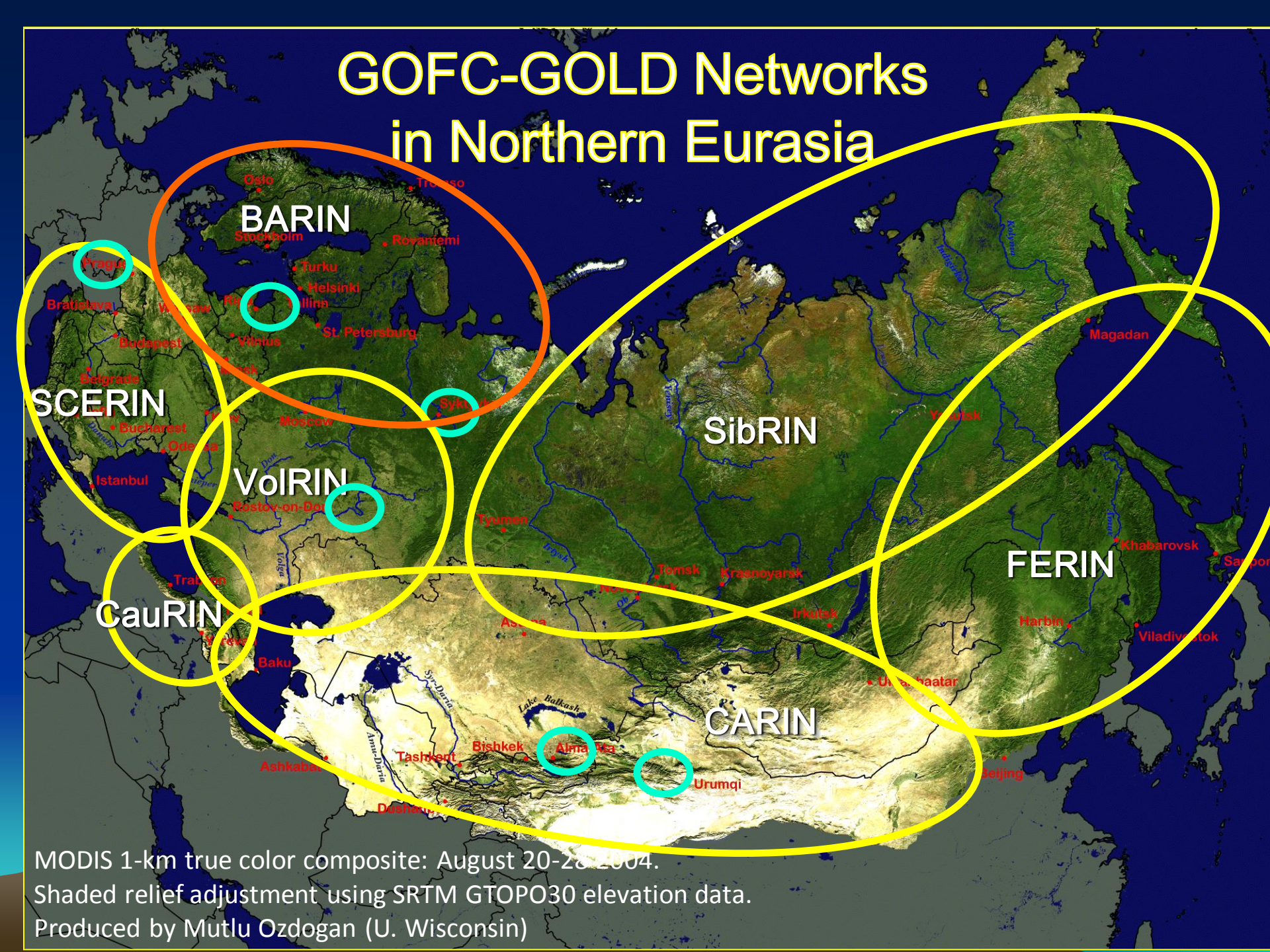


NASA LCLUC Program Support of Regional Initiatives

- LBA: Regional Field Campaign in Amazon
- CARPE: Central African Regional Project
- NEESPI Northern Eurasia Initiative
- MAIRS: Monsoon Area program
- *SARI: South Asia Regional Initiative*

NEESPI-Europe



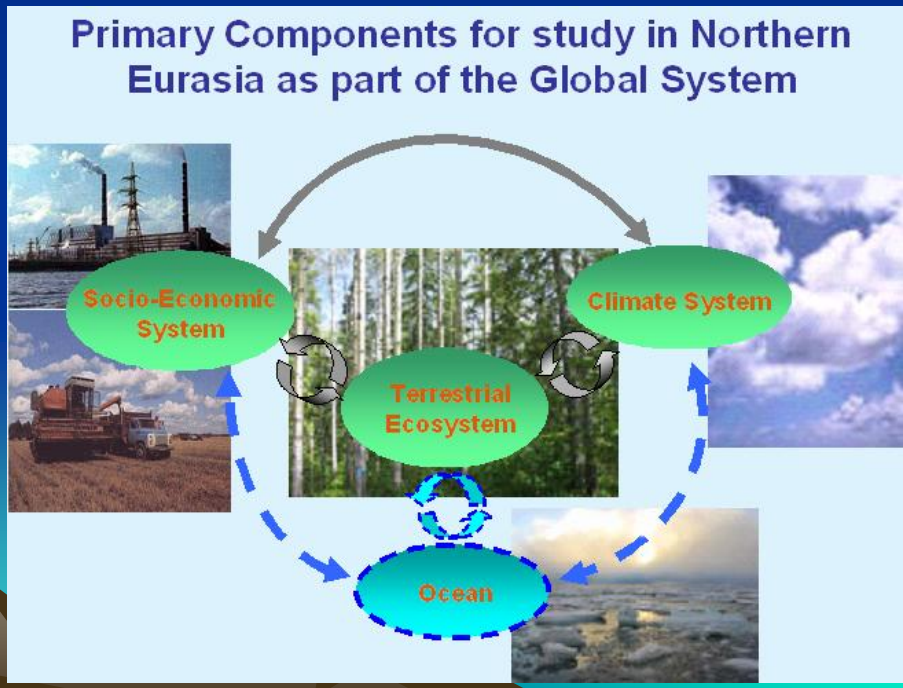

GOFC-GOLD Networks
in Northern Eurasia
BARIN
SCERIN
VolRIN
CauRIN
SibRIN
FERIN
CARIN
Oslo
Stockholm
Rovaniemi
Turku
Helsinki
St. Petersburg
Prague
Bratislava
Budapest
Belgrade
Bucharest
Istanbul
Moscow
Rostov-on-Don
Baku
Tyumen
Tomsk
Krasnoyarsk
Irkutsk
Yakutsk
Magadan
Khabarovsk
Harbin
Vladivostok
Ashkabat
Tashkent
Bishkek
Almaty
Urumqi
Beijing
Lake Balkash
Syr-Daria
Amu-Daria
MODIS 1-km true color composite: August 20-28, 2004.
Shaded relief adjustment using SRTM GTOPO30 elevation data.
Produced by Mutlu Ozdogan (U. Wisconsin)

Northern Eurasia Earth Science Partnership Initiative (NEESPI)

Focus on climate-ecosystem interactions and societal impacts in boreal and non-boreal zones of Northern Eurasia

Goals:

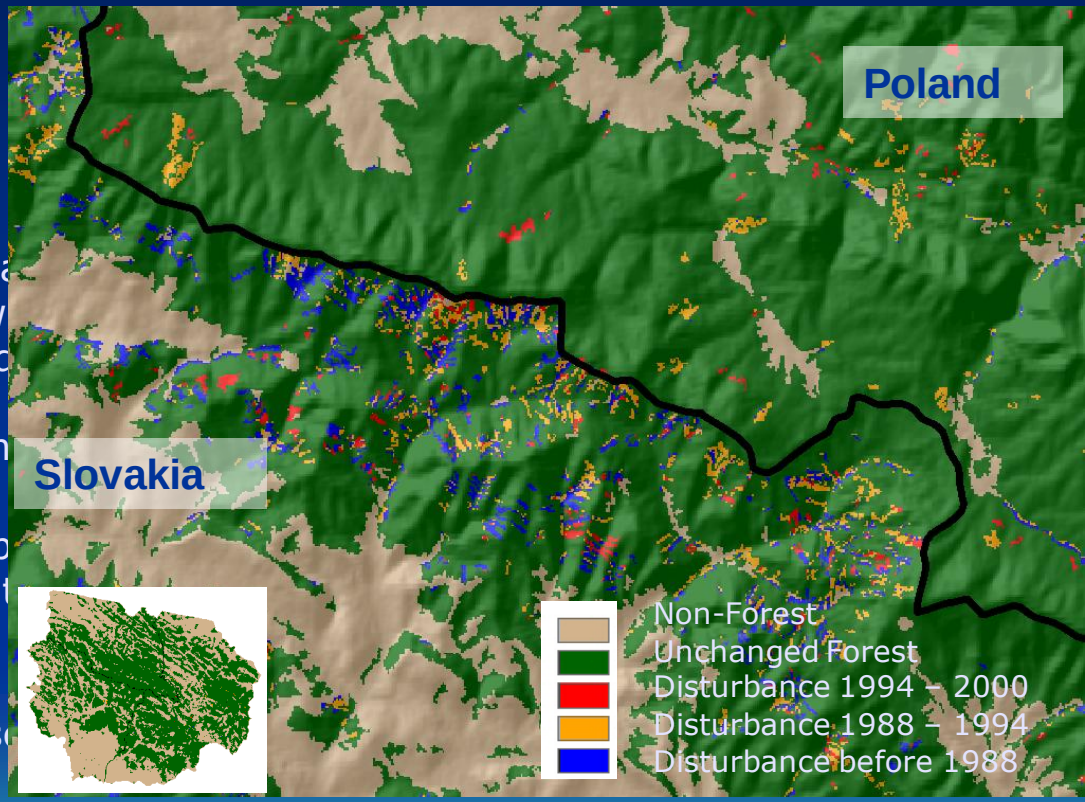
- To evaluate the role of anthropogenic impacts on the regional ecosystems and climate and how it may affect the global climate
- To evaluate the consequences of global changes for regional environment, the economy and the quality of life in the region



- Field abandonment rates differ strongly among countries
- Strength of institutions matters most

Land-Cover Changes in Eastern Europe in Post-Soviet Era

- Marked differences in forest cover, dominant forest species, and agricultural fragmentation.
- These differences can largely be explained by socialist forest management.
- Post-socialist land-cover change wa greatest in Ukraine, where there w high agricultural fragmentation and widespread early-successional shrublands indicating extensive lan abandonment.
- The abundance and pattern of arab land and grassland was attributed t land tenure in socialist times and economic transition since 1990.
- These results suggest that broad-s socioeconomic and political factors of major significance for land-cover patterns in Eastern Europe.



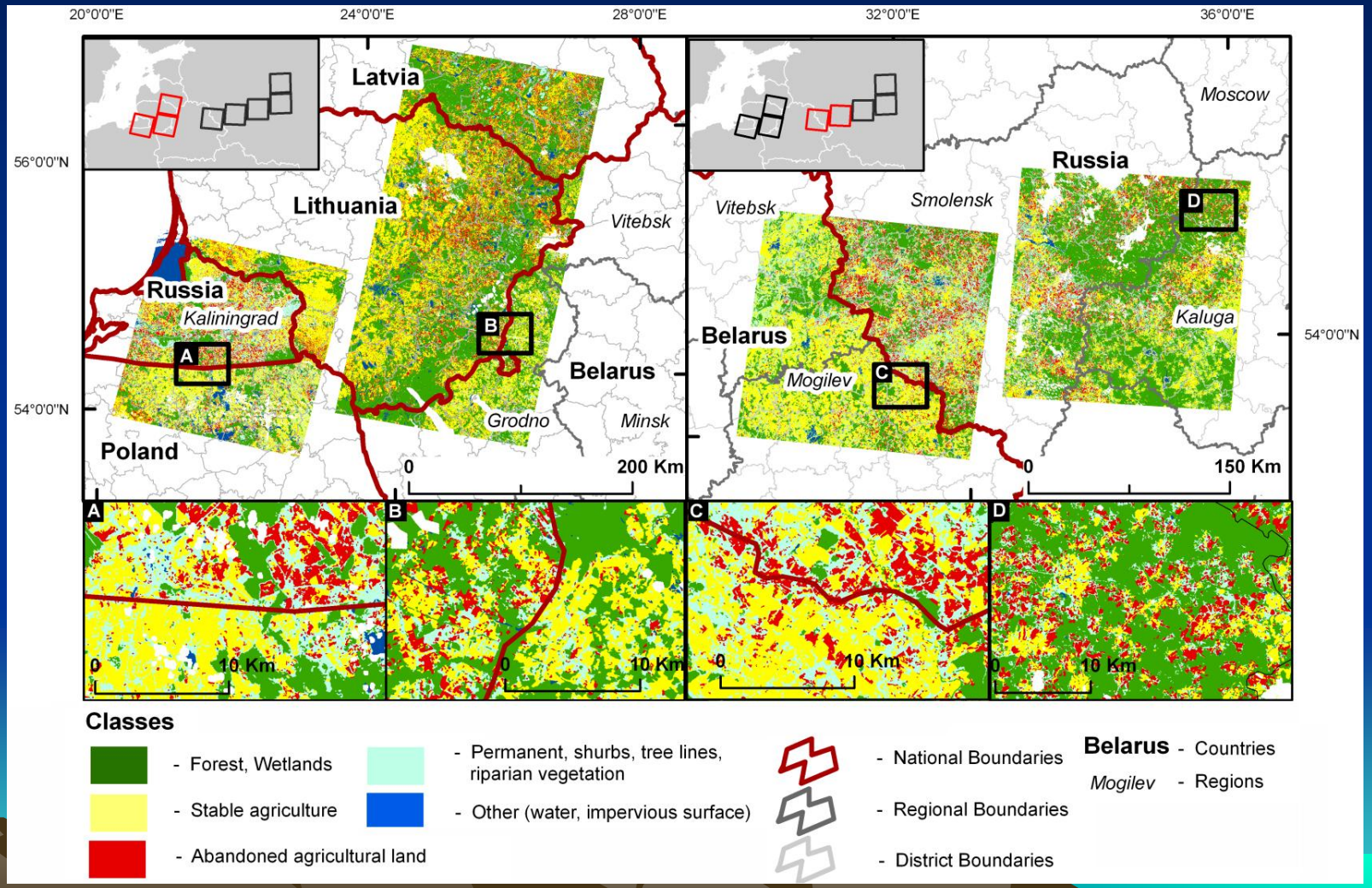
A comparison of land cover in the Polish, Slovak, and Ukrainian Carpathian Mountains in 2000 from Landsat images

Tobias Kuemmerle, Patrick Hostert,Volker C. Radeloff, Sebastian van derLinden, Kajetan Perzanowski, and Ivan Kruhlov, 2008: Cross-border Comparison of PostsocialistFarmland Abandonment in the Carpathians Ecosystems, DOI: 10.1007/s10021-008-9146-z

IMPACTS IN MID-LATITUDES

Fields abandonment in mid-latitudes affect surface processes
=>Carbon Cycle, Radiation Budget, Hydrology =>Climate

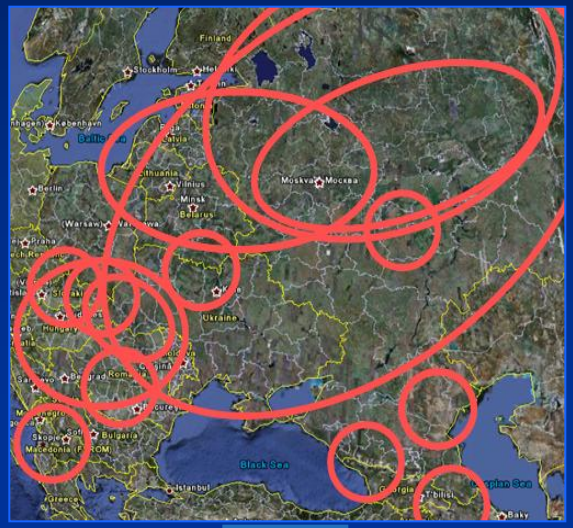
Field abandonment



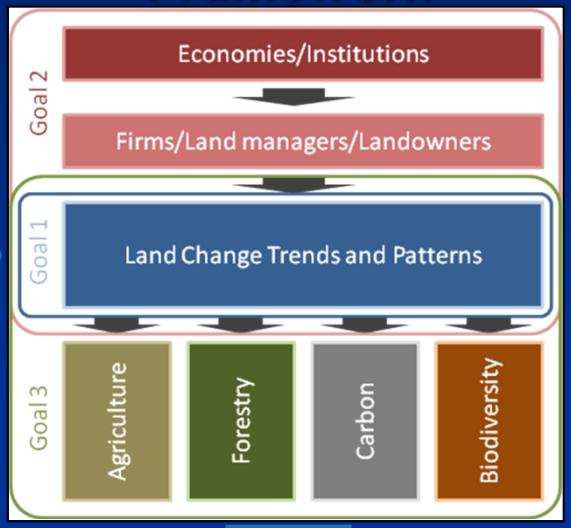
Prishchepov et al., Remote Sensing of Environment Journal, 2012

Synthesis of studies on institutional change and LCLUC effects on carbon, biodiversity, and agriculture after the collapse of the Soviet Union

Case Studies



Theoretical Framework



Comprehensive Assessments

A general theory of the effects of socioeconomic shocks on land use and land cover change

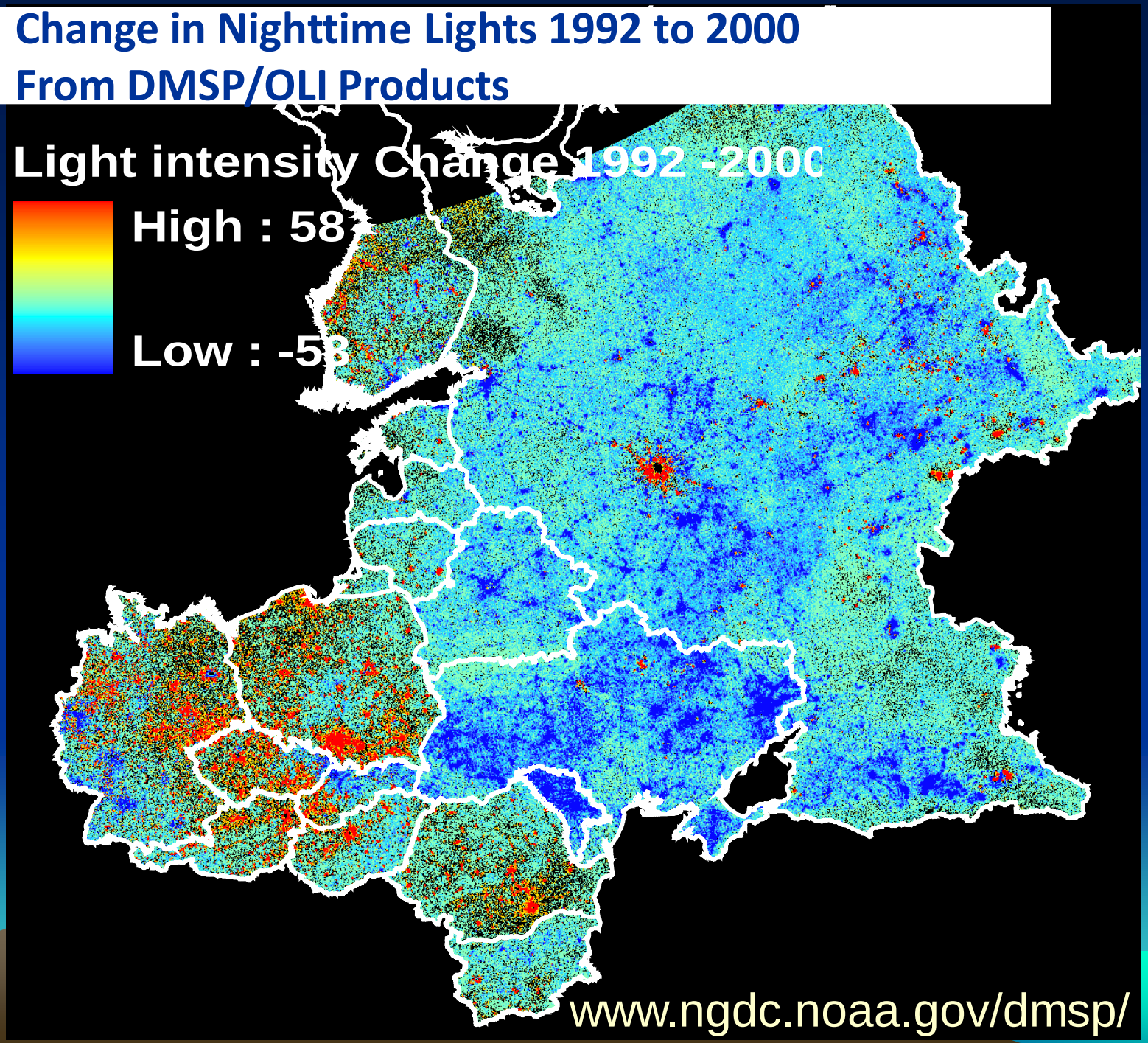
PI: V.C. Radeloff
radeloff@wisc.edu

Earth Night Lights Observed by DMSP/OLI

Red: 2009
Green: 2000
Blue:1992

Courtesy: Chris Elvidge, NOAA

Change in Nighttime Lights 1992 to 2000
From DMSP/OLI Products



Proceedings of NEESPI Workshop on Eastern Europe

NATO Science for Peace and Security Series C: Environmental Security 2009

Regional Aspects of Climate-Terrestrial-Hydrologic Interactions in Non-boreal Eastern Europe

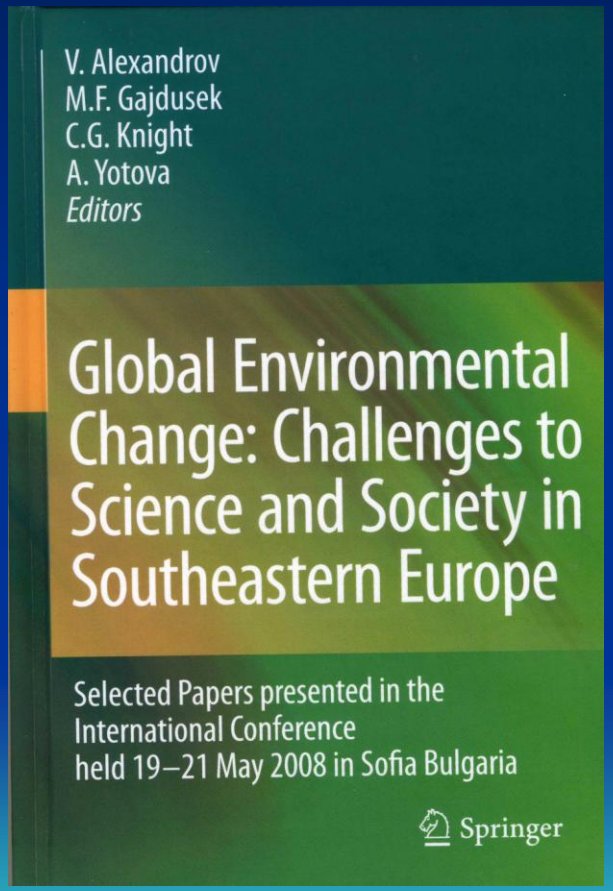
Editors: Pavel Ya. Groisman, Sergiy V. Ivanov

- Observations Issues in the Non-boreal Eastern Europe
- Regional Climate Changes in the Non-boreal Eastern Europe
- Air Pollution in Eastern Europe
- **Land Cover and Land Use Changes in the Non-boreal Eastern Europe**
- Changes in The Black Sea and Its Coastal Zone

http://link.springer.com/book/10.1007/978-90-481-2283-7

Proceedings of the International Conference in Sofia in May 2008

- Springer 2010
- Editors: Alexandrov, Gajdusek, Knight, Yotova
- "Global Environmental Change: Challenges for Science and Society in South-Eastern Europe" begins with and Introduction and four keynote chapters giving a more general perspective of the conference topics. The chapters encompass results from studies on climate change, land use change, changes in the carbon and water cycles, air quality, etc. Beyond the work of scientists and actions of governments, civil society has a major stake in dealing with environmental changes including actions to address, resulting impacts and to exploit new opportunities.



http://www.springer.com/environment/global+change+-+climate+change/book/978-90-481-8694-5

Future Steps in Enhancing the Education Component for LCLUC

- Enhance interdisciplinary nature of the program: Social Science + Physical Science + Remote Sensing
- Post-doc exchanges – fellowships are available through START program
- Training is an integral part for each LCLUC Science Team meeting

Czechs in Latvia

The NASA-ESA Trans-Atlantic Training (TAT) Initiative in Europe

- Regular summer schools for students and early career scientists
- The first TAT session – here this week
- Focus on new ESA partner states in Eastern Europe and their capacity building
- Aligned with GOFC-GOLD goals to develop regional networks in the area, i.e. SCERIN and BARIN (Boreal-Arctic)

Děkuje, Thank You

Good LCLuck with the SCERIN-1 and enjoy Prague