



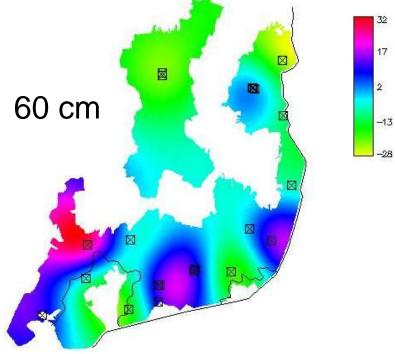


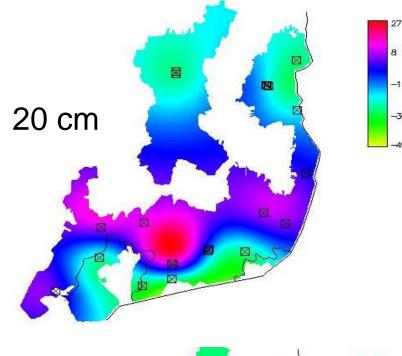
The use of satellite imagery in the assessment of the restoration of the floodplain Česma forest in the North-Western Croatia

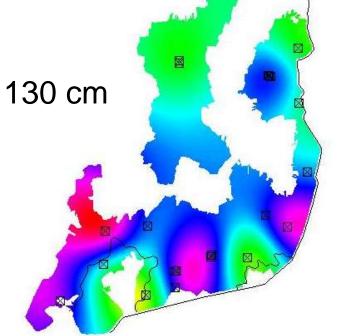
Luka Rumora⁽¹⁾, Mario Miler⁽¹⁾, Damir Medak⁽¹⁾, Ivan Medved⁽²⁾, Ivan Pilaš⁽²⁾ (1) University of Zagreb, Faculty of Geodesy (2) Croatian Forest Research Institute, Jastrebarsko

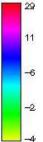
SCERIN-4 Capacity Building Workshop (CBW) Zvolen, Slovakia 19-22 July, 2016











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Difference between EVI_2007_2010 and EVI_2002_2007

Difference between EVI_2010_2015 and EVI_2007_2010



Long-term disturbance patterns in Romanian forests Mihai Daniel Niță¹, Cătălina Munteanu²

¹ Department of Forest Engineering, Faculty of Silviculture and Forest Engineering, Transilvania University of Brașov

² SILVIS Lab, Department of Forest and Wildlife Ecology, University of Wisconsin-Madison

Long-term disturbance patterns in Romanian forests



Mihai Daniel Niță¹, Cătălina Munteanu²

¹ Department of Forest Engineering, Faculty of Silviculture and Forest Engineering, Transilvania University of Braşov
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Introduction

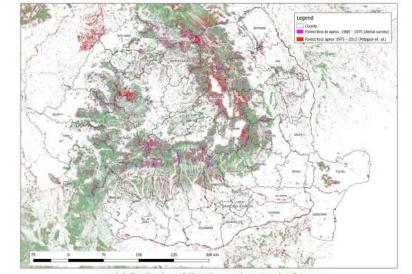
Forest disturbance and recovery are critical ecosystem processes and an improved monitoring of changes in forest structure is needed to quantify natural and human impact on forest systems. The influence of size, fragmentation of disturbances to the ecosystem is directly proportional to the covered area. Long-term changes, in particular, have major consequences for ecosystem functioning, carbon storage, climate regulation and biodiversity.

Our goal was to create a spatial database with the location, fragmentation and shape of forest disturbances in the last 60 years

Results

Following WWII, and especially after 1975, Soviet policies increased forest cover by establishing forest plantations outside the historical range of forests. We observed a peak in harvest around 1965, partly due to war reparations paid to Russia in oil and timber.

Disturbance peaked again in 1982–1985 when Romania was paying off Ioans to the International Monetary Fund. Following the collapse of the Soviet Union, disturbance rates were also high in Romania especially following major privatization laws in 1991, 2000, and 2005.



Spatial distribution of disturbances in Romanian forests

Methods

In this study, we created a spatial database by combining geographic data on forest disturbances maps extracted from different products and studies.

For the period 1960 – 1975, we digitized the forest disturbances using the second edition of Military Topographic map of Romania which was based on the first aerial survey which covered the entire teritory of Romania.

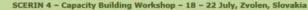
For the period 1975 – 2012, the forest disturbances were extracted from a previous study (Potapov et al, 2014) which is based on several Landsat historical and recent scenes collected from USGS archive.

Conclusions

The results revealed that fusing cartographic data and Landsat's temporal and spatial coverage, provides an unique opportunity for characterizing vegetation changes. On macro level, this kind of method offers a large view on forest disturbances which occur during a management cycle.

This database is an important starting point in identifying the valuable ecosystems and old-growth forests, by identifying islands of undisturbed forests in the context of forest ownership in Romania

An important finding of this study is highlights that rates of forest harvesting after 1990 were lower than pre-1990, a fact that is missed by most post-socialist studies.



Methodology



1975 – 2012 (Potapov et. al, 2014)

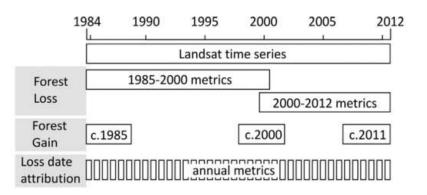
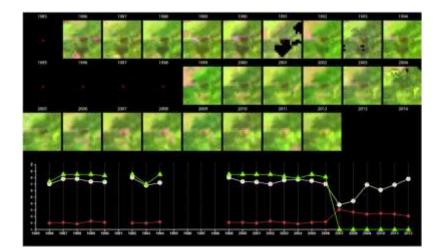
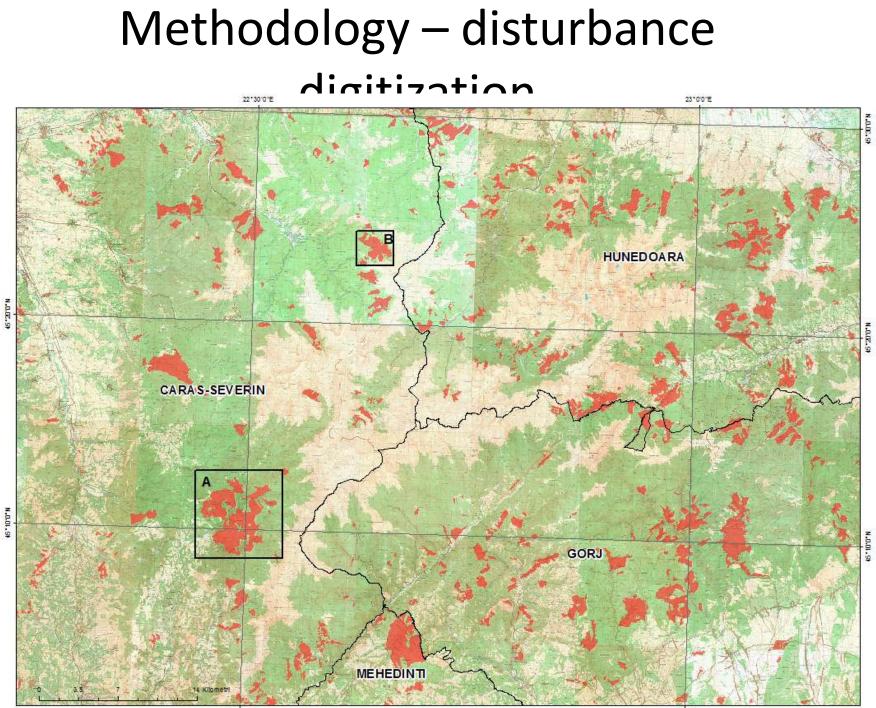


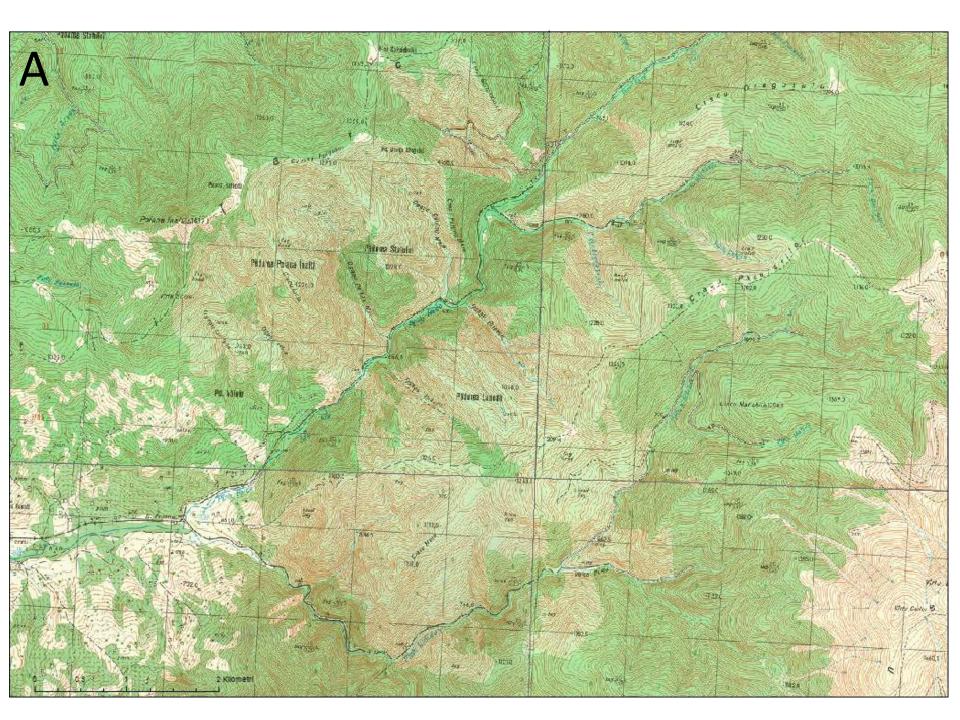
Fig. 1. Landsat time series and multi-temporal metric sets.

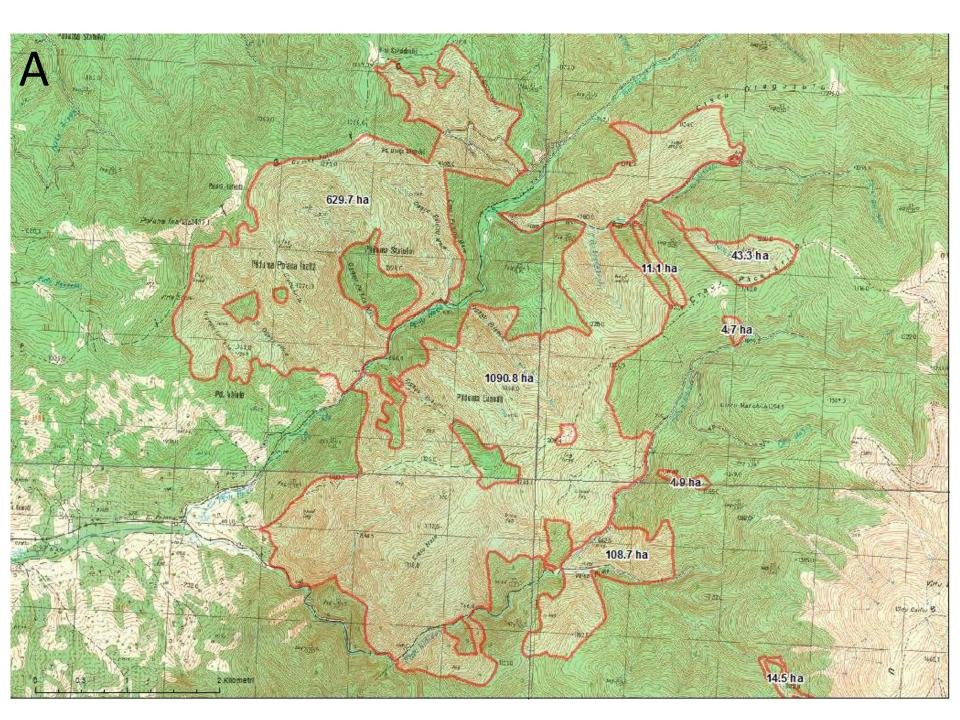




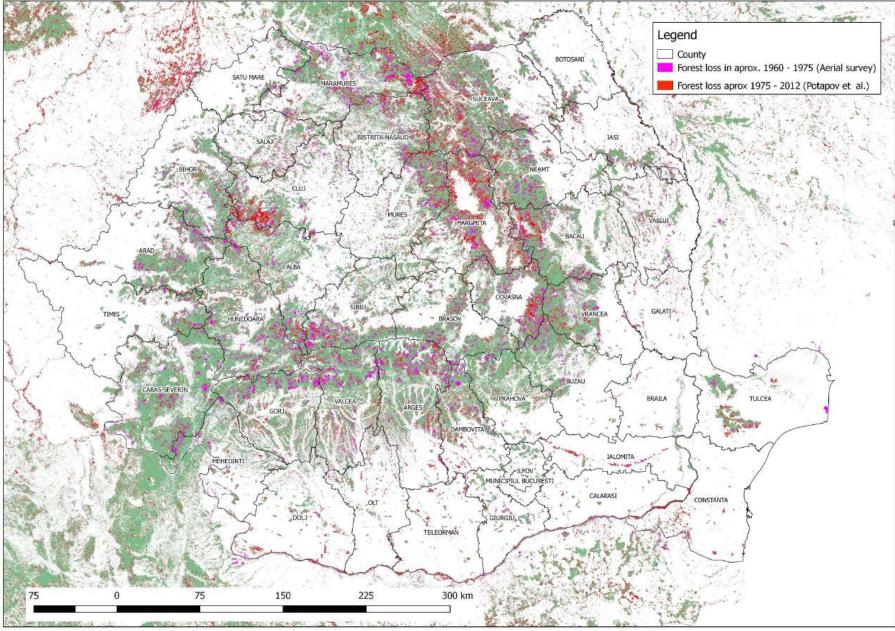
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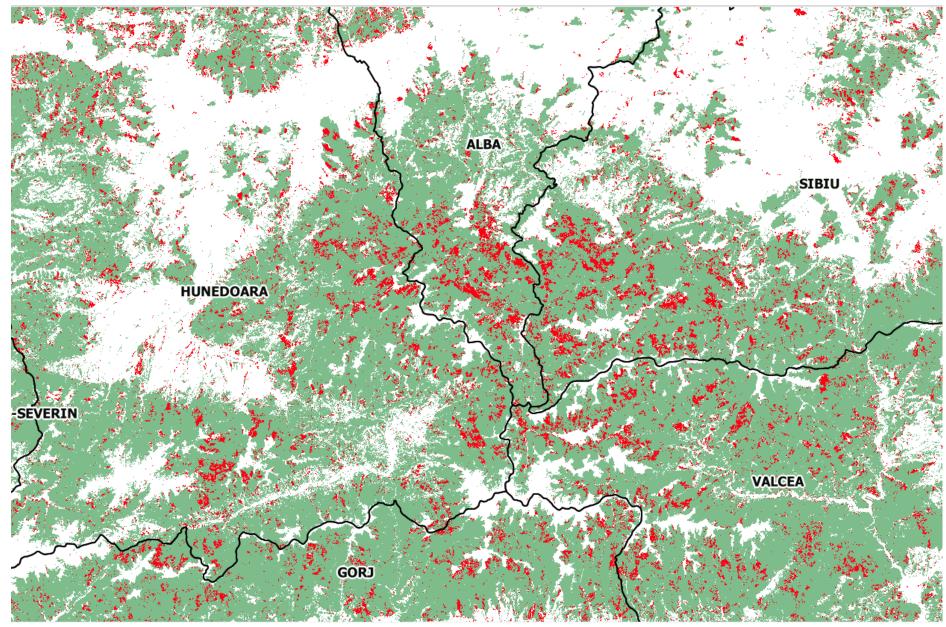


Results

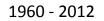


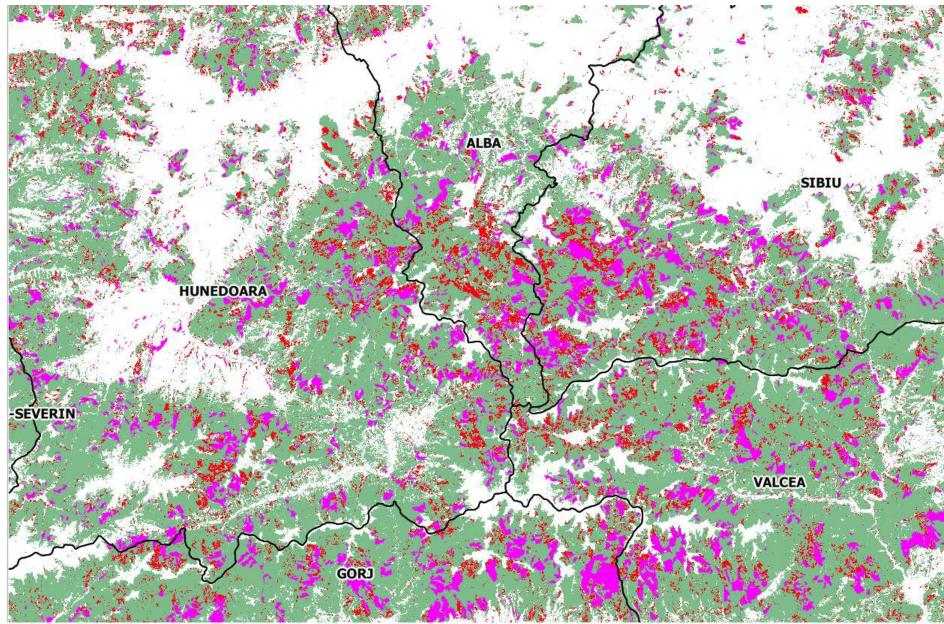
Results

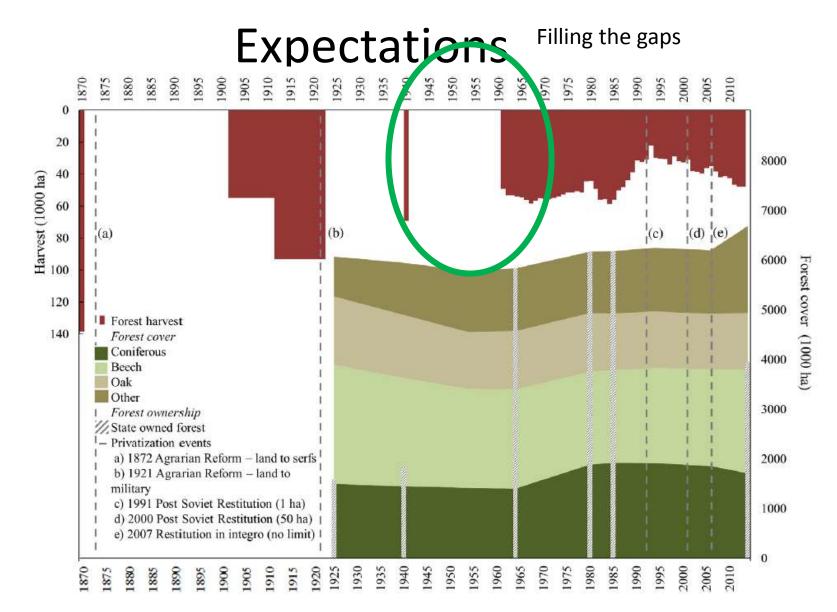
1980 - 2012



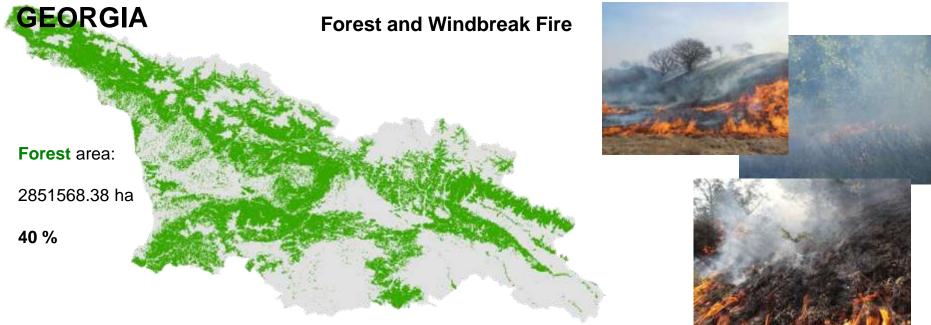
Results



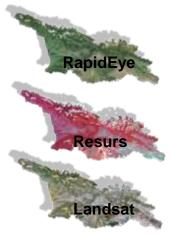




Overview of the evolution of forest cover, species composition, disturbance and ownership patterns in Romania between 1870s and 2010, in the context of major land tenure changes (Munteanu et al, 2016)



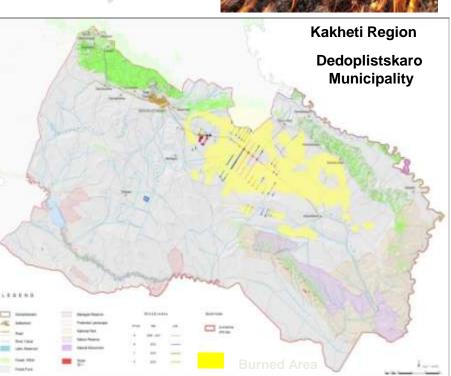
SATELLITE IMAGES



The MODIS burned area product was downloaded, free of charge, as Shapefiles from the server:

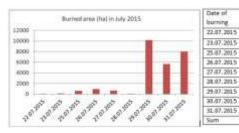
http://modis-fire.umd.edu/index.php



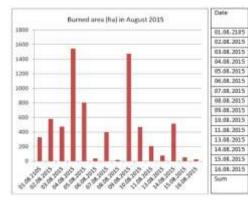


The MODIS burned area product Fire and Burned area

Burned area July 2015



Burned area August 2015



7021.09

Burned area

(ha)

53.98

71.97

35.93

89.83

35.94

107.82

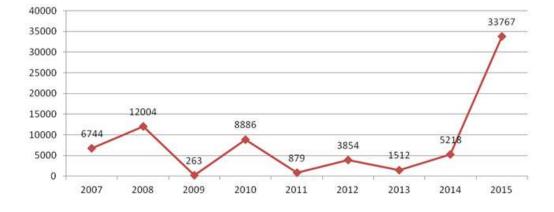
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Annually burned area in hectare

🛞 geographic

HUMAN IMPACT ON THE LAND COVER CHANGE IN UNIVERSITY FOREST ENTERPRISE IN ZVOLEN

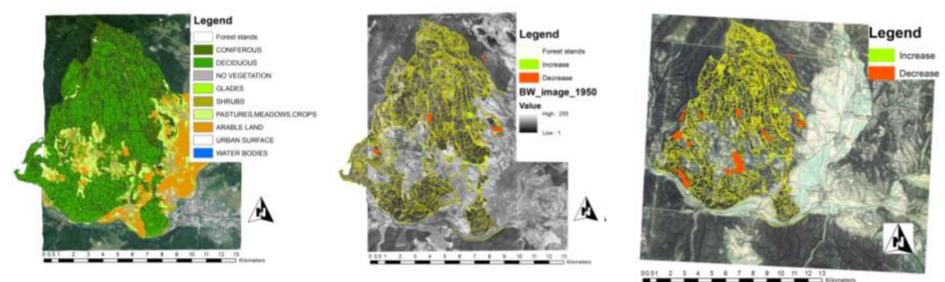
Sitko R. – Merganičová M. – Merganič J. – *Sitková Z. – Mistrík M. Technical University in Zvolen, *National Forest Center, Zvolen, SLOVAKIA

<u>Goal:</u>

Assessment of land cover change in the selected region (11 000 ha) surrounded by famous mining towns of the past

Methods:

Retrospective analysis of historical orthoimages and historical maps (supervised classification, method of image regression and visual interpretation)



2012 - LC classification (World View-2)

2012/1978 and 1978/1950 change detection

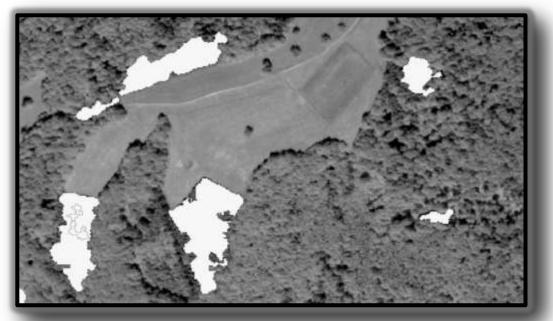
1950/1846 change identification

Preliminary results:

• At the end of 18th century, the deforested areas occurred mainly around villages (demand on wood for mining)



Forest expansion in second half of 20th century (abandonment of farmlands)





INLAND EXCESS WATER MAPPING USING RAPID EYE IMAGES

Mészáros Minucsér, Department of Geography, Tourism and Hotel Management Faculty of Sciences, University of Novi Sad







Inland excess water occurs due to:

- Iack of runoff in flat terrains
- insufficient evaporation
- Iow infiltration capacity of the soil
- upwelling of ground water

Typical problem in flat, lowlands causing:

- crop losses, damages, diseases
- soil and evironmental pollution
- damage to buildings and infrastructure

The scale and wider social implications of these problems are not fully recognized by the public or decision makers!

The solution requires:

- intensive monitoring (remote sensing)
- interdisciplinary research of spatio-temporal patterns
- integrated, cross border water management
- Iand use management

Monitoring of inland excess water:

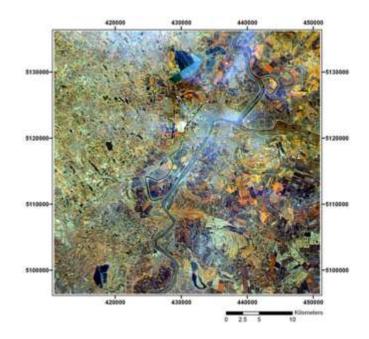
- inundated areas are inaccessible
- very limited ground measurement
- inundated areas change rapidly
- need for a quick and efficient assessment





Research area (northern Serbia, southern Hungary)







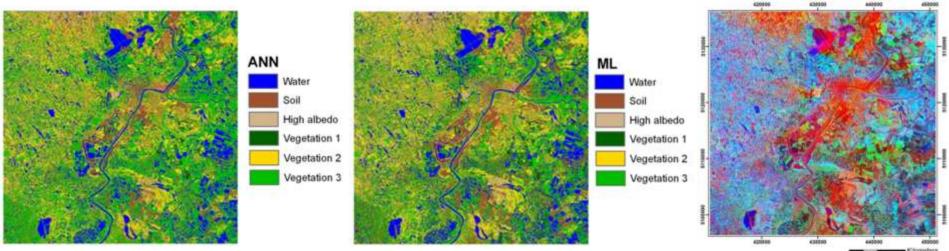
MEasurement, monitoring, management and RIsk assessment of inland EXcess WAter in South-East Hungary and North Serbia (Using remotely sensed data and spatial data infrastructure)



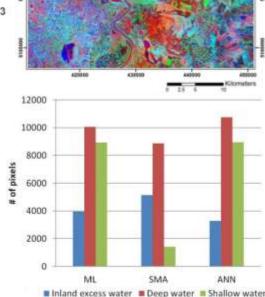


Methods of pixel classification used:

- maximum likelihood (ML)
- spectral mixture analysis (SMA)
- artificial neural network (ANN)



All three methods can be applied to classify inland excess water successfully and provide high quality maps of the inundations based on satellite data from a large area.



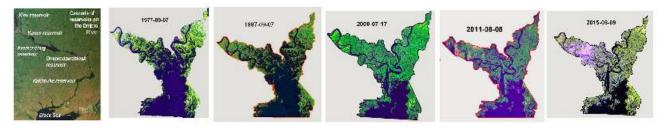
van Leeuwen et al. (2013) Inland excess water mapping using rapid eye images, Journal of Environmental Geography 6 (1–2), 1–8.

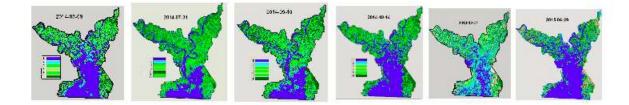
NEW LANDSCAPES FORMATION IN WATER RESERVOIRS: GLOBAL ASPECT

Starodubtsev V.M.

National University of Life and Environmental Sciences of Ukraine

1. Kiev reservoir in the Dnieper river basin: Perennial and seasonal dynamics of new landscapes







«SPATIAL HETEROGENEITY OF WATER REGIME OF SOIL. ITS ECOLOGICAL AND ECONOMIC SIGNIFICANCE»

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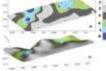
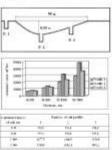


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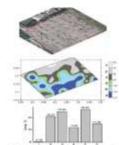
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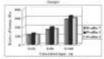


Fig. 91 Charges to tools of leases or do not al technologuements advanced for visual segment (and/or 1) committains (). Series of the Reprinted profile (). (Rep. 17 No. Reprinted)

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Fig.1. Contrast Register at an examiner with basis and particular problem spin in the problem permit (1. April 2016) both on the flag plot (1), where long term, agricultures (1. and agriculture with field, and an flag production field (2), and register(3) as the samelynesses (1). The coverts have "Telebroartende". Partonic durant Kier maint, Rold (84)



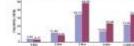
Fig. 3. Spatial Investigations of and increases to doe Ref. (NO, Spatial Webpendingels," genetrospins," does not a April 1, 2013.

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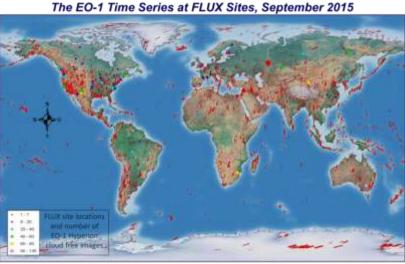
Fig. 7. Monocharmonic with L as Applic to reasons circleringging and decar of controllers

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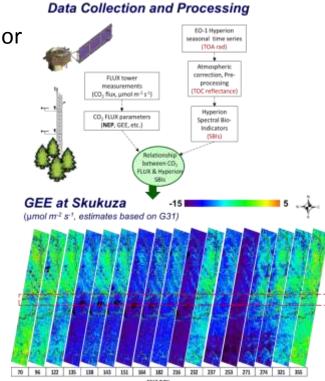
'Flexible' spectral time series for product validation and assessment of ecosystem productivity and bio-diversity

Summary of two posters, Campbell et al.

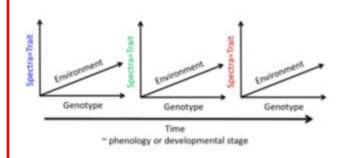
We use high spectral resolution images capturing the corresponding changes in multiple vegetation parameters or *traits*.



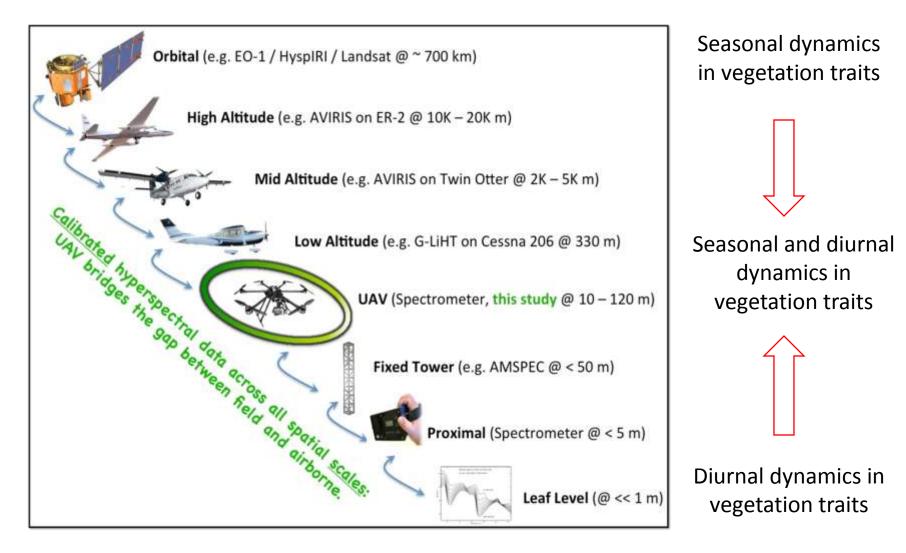
The Earth Observing One (EO-1) was launched in November 2000. As of September 2015 more than 85,000 Hyperion images have been collected. Hyperion has demonstrated the utility of satellite imaging spectroscopy for vegetation monitoring in applications relating to forestry, agriculture, land-use change, biodiversity, natural and anthropogenic hazards and disaster assessments. Numerous time series have been collected for select FLUX sites, which are freely available for download from USGS (http://earthecg/orer.usgs.gov/).



2012 DOY



Traits/spectra vary over the course of a day and/or a growing season



Spectral observations are required at all spatial scales, to bridge the gap and connect in situ with airborne and space observations and improve the monitoring of vegetation dynamics.

Additional Posters

• Ganna