



Land-Cover and Land-Use Change Program



# The NASA LCLUC Program –SCERIN Interactions: An Update

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# GOFC-GOLD Networks

- **South/Central America**
  - Red LatinoAmericana de Teledetección e Incendios Forestales (RedLaTIF)
- **Africa**
  - South Africa Network (SAFNet)
  - Southeast Africa Network (Miombo)
  - West Africa Regional Network (WARN)
  - Central Africa (OSFAC)
- **Asia**
  - South East Asia (SEARRIN)
  - Central Asia Regional Information Network (CARIN) under resuscitation
- **Europe**
  - South Central and Eastern European Regional Information Network (SCERIN)
  - Balto-Arctic (BARIN)??
  - Caucasus – newly formed in Sep,2017
- NETWORKS SUMMIT held in Tbilisi, Georgia Sep, 2017
- Plans to have the next SUMMIT in 2019

# What Happened at the Summit

- Revisited the strategic points of GOFC-GOLD pertinent to regional networks: review and revise
- Exchanged ideas/experience from different regions
- Analyzed “lessons learned” during the two decades
- Discussed the dormant or unborn networks
- Shared networks’ achievements
- Brought Caucasus into GOFC-GOLD realm
- Celebrated the 20<sup>th</sup> anniversary!



Giorgi Ghambashidze,  
Scientific-Research Centre of Agriculture

# South/Central Eastern Europe Regional Information Network (SCERIN)



# SCERIN Victorious March



# Time Glimpse

- 100 Years ago: 1918, after World War I
  - Croatia was included in the unrecognized State of Slovenes, Croats and Serbs which seceded from **Austria-Hungary** and merged into the **Kingdom of Yugoslavia**
  - Independence of **Czechoslovakia, Poland, Hungary, ...**
- 50 years ago: Yugoslavia, 1968
  - June, Yugoslavia (Belgrade, Zagreb and Sarajevo): “Student Rebellion”
  - The first mass protest in Yugoslavia after the Second World War
  - Yugoslav university students launched strikes and demonstrations
  - Condemned police brutality and university conditions
  - Critiqued the apparent failure of self-managing socialism

# A Bigger Picture: 1968

- USA: Martin Luther King Jr. and Robert F. Kennedy assassinated
- Prague Spring, Czechoslovakia : Action Programme (Dubcek, individual liberties, political and economic reforms, changing the structure of the nation, limit the power of the secret police and formal abolishment of censorship)
- May, France: Students and Workers General Strike
- NASA launches Apollo 7 - the first manned Apollo mission
- Soviet Union: Garik finished his 8<sup>th</sup> grade - 1 year after his move to Siberia

This Month 40 Years ago: 1978

ВИЗА М  
№ 097645  
обыкновенная  
въездная

Гр. \_\_\_\_\_ член семьи

Фамилия Гутман

Имя, отчество (полно)  
(полно) Георгий Львович

Дата рождения 1953 пол МУЖ.

С. Фамилия \_\_\_\_\_  
до 16 лет \_\_\_\_\_

Цель поездки постоянное жительство

Из учреждения \_\_\_\_\_

В пункты Израиль

Действительна для выезда из СССР до 19 июля 78 г.  
и въезда в СССР до \_\_\_\_\_ г.  
через пограничные пункты \_\_\_\_\_  
открытие для пассажира \_\_\_\_\_

Переметьево-I  
Брест

Выдана 19 июня 78

К паспорту № \_\_\_\_\_

ОВИР ГУВД  
Мосгорисполкома

Подпись В.И.И.







- The oldest university in South East Europe
- Next year 350<sup>th</sup> anniversary!
  - 1669: King Leopold I granted the Jesuit Academy in Zagreb the status and privileges of a University

# Zagreb in Time



1910



1929

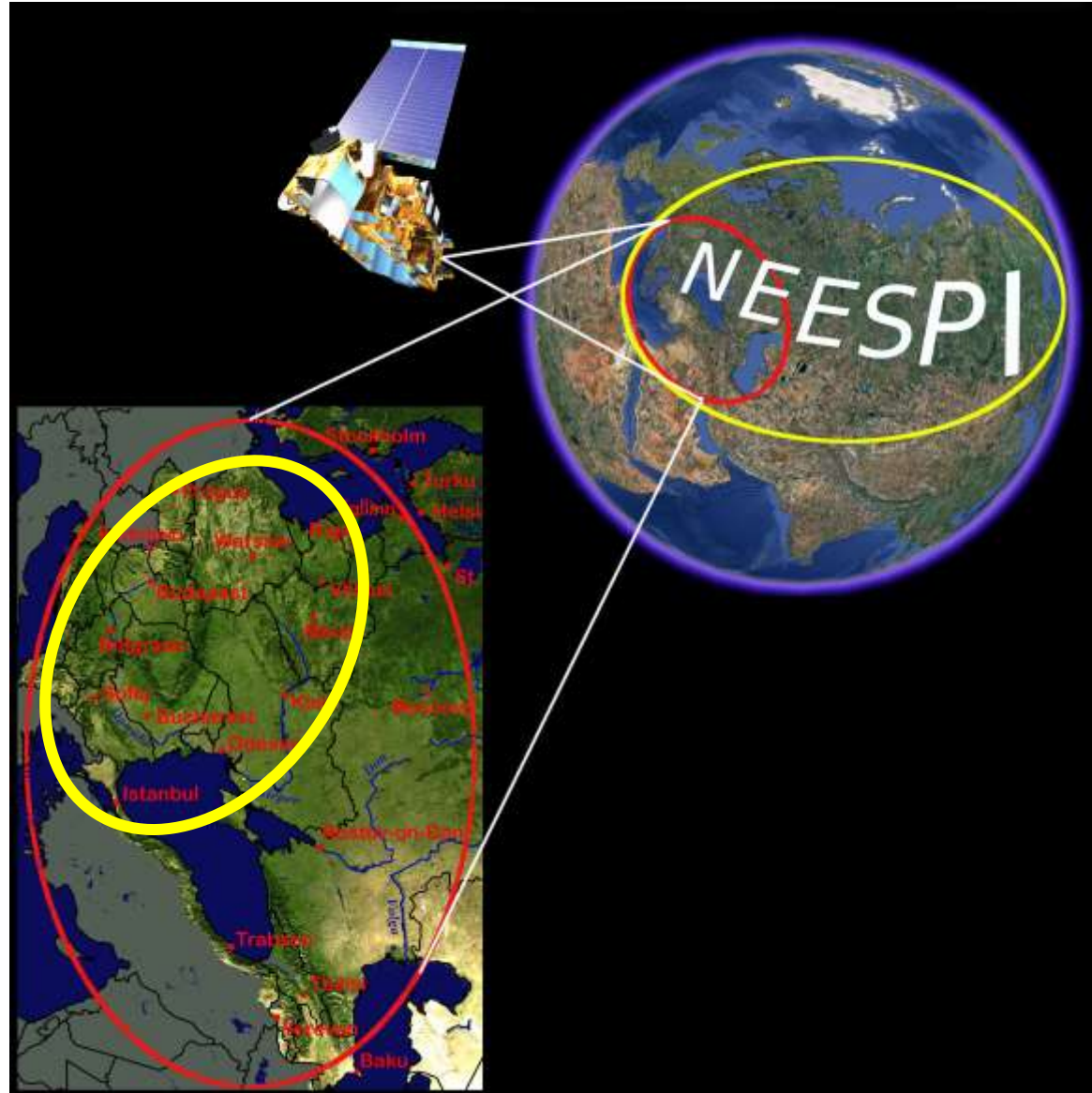


1968



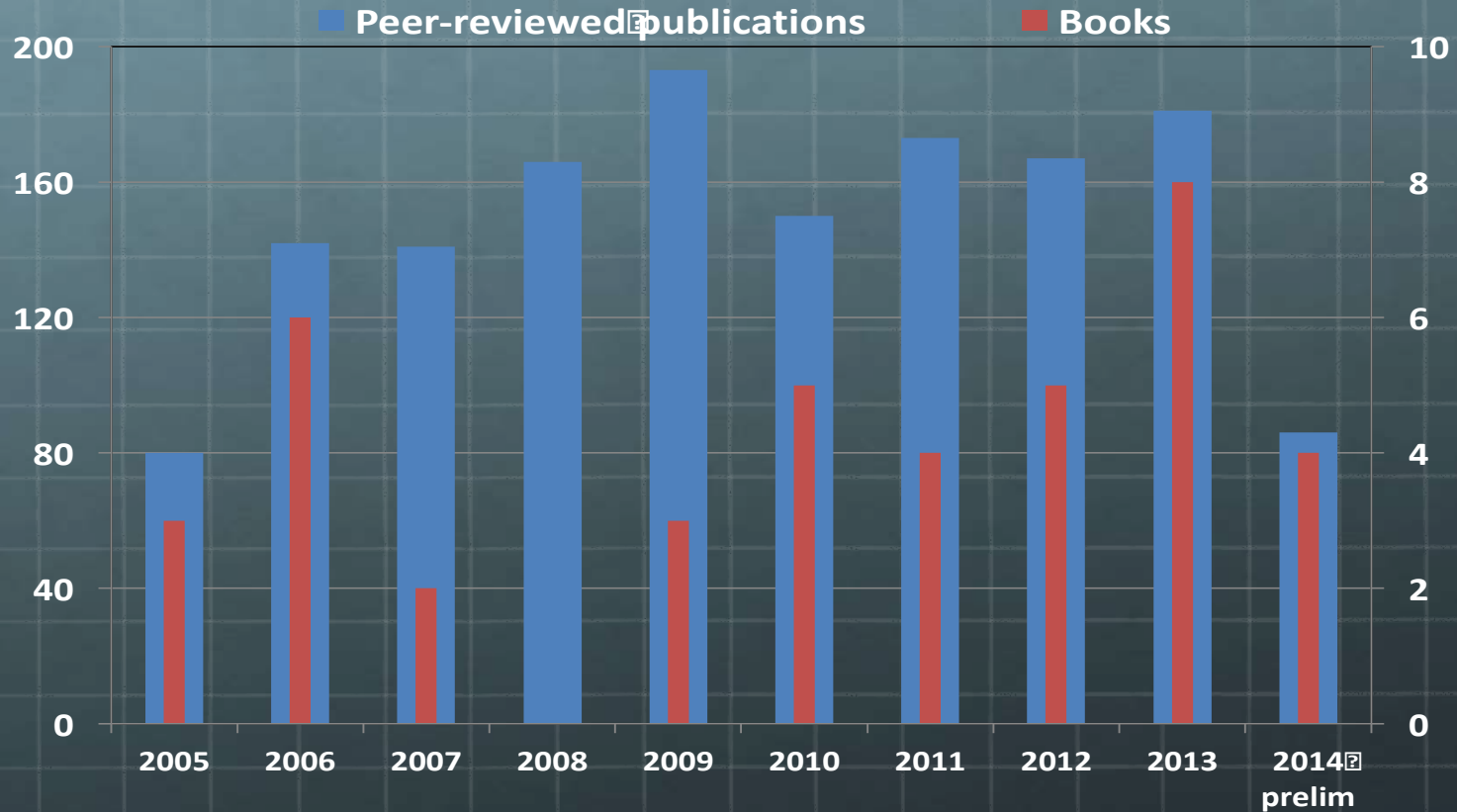
2015

# Northern Eurasia Earth System Partnership: NEESPI-Europe



# NEESPI Publications

## NEESPI Science Community



~1500 papers and 40 books published (or in press)

■ NASA ■ Other Agencies/Countries ■ Total

# NEESPI-LCLUC Books

Year	Chapter Downloads
2017	1,315
2016	1,588
2015	2,102
2014	2,304
2013	1,288
2012	602
2011	468
2010	113

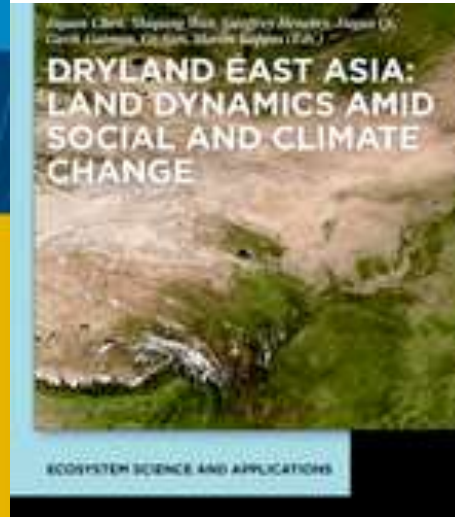


Springer 2010



Springer 2012

Year	Chapter Downloads
2017	527
2016	929
2015	908
2014	1,685
2013	1,539
2012	112



De Gruyter 2013

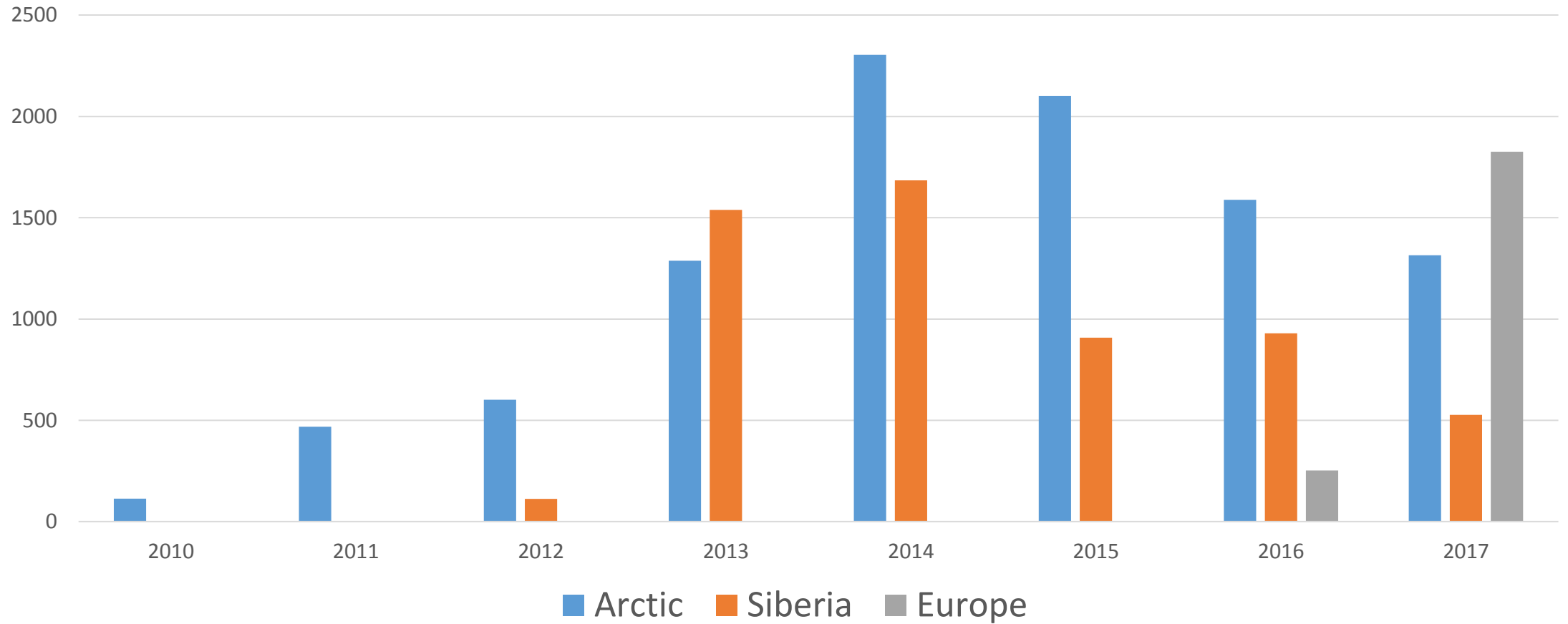
LCLUC on Drylands in Central Asia to be published in 2018



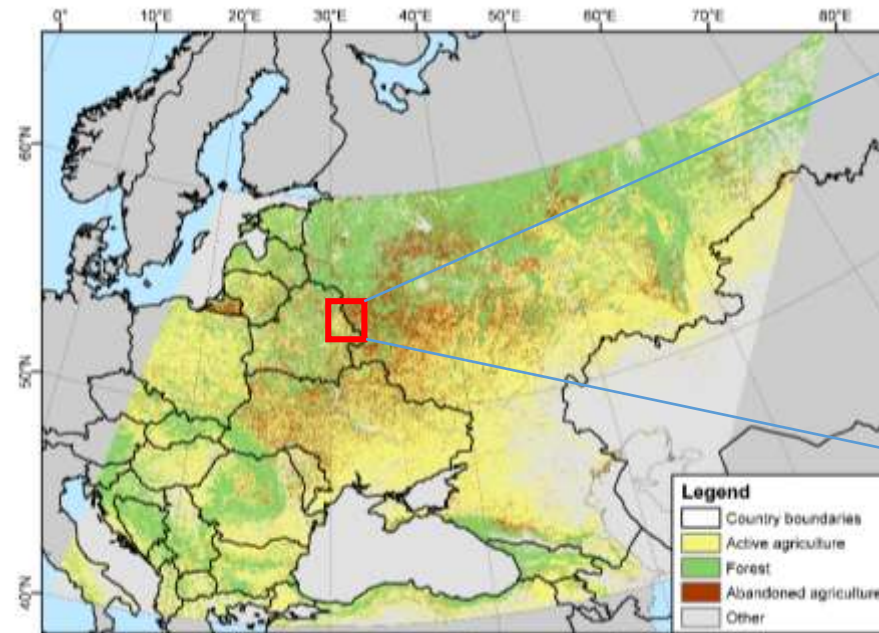
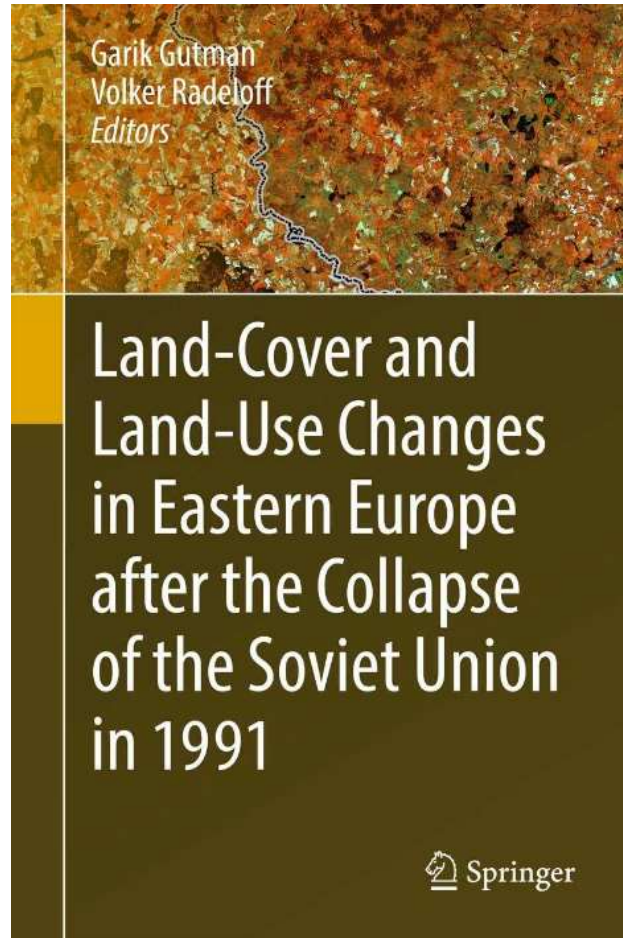
Springer 2016

Year	Chapter Downloads
2017	1,826
2016	253

# Chapter Download Statistics



# Land-Use Change After the Collapse of the USSR: Agricultural Abandonment



MODIS-derived abandoned agricultural areas in 2005  
35 to 50 million hectares of croplands and grasslands managed in 1990 were abandoned by 2010

- Widespread agricultural land abandonment after the collapse caused by the socioeconomic shock that the collapse of the USSR represented
- Strong differences in abandonment rates among neighboring countries were caused by differences in policies and institutions



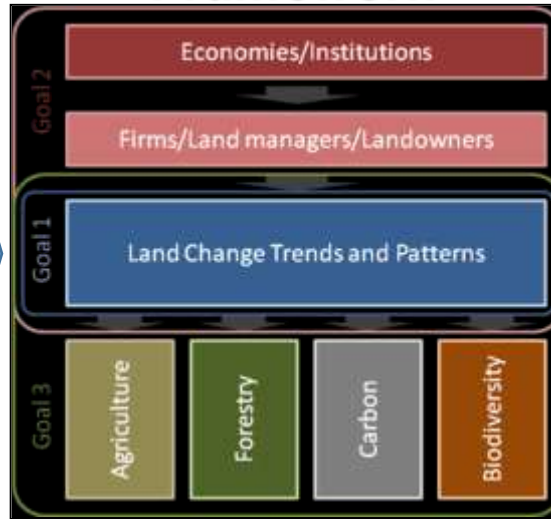
Notice the contrast on the two sides of the border between Russia (abandoned fields) and Belarus (managed fields)

# 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**

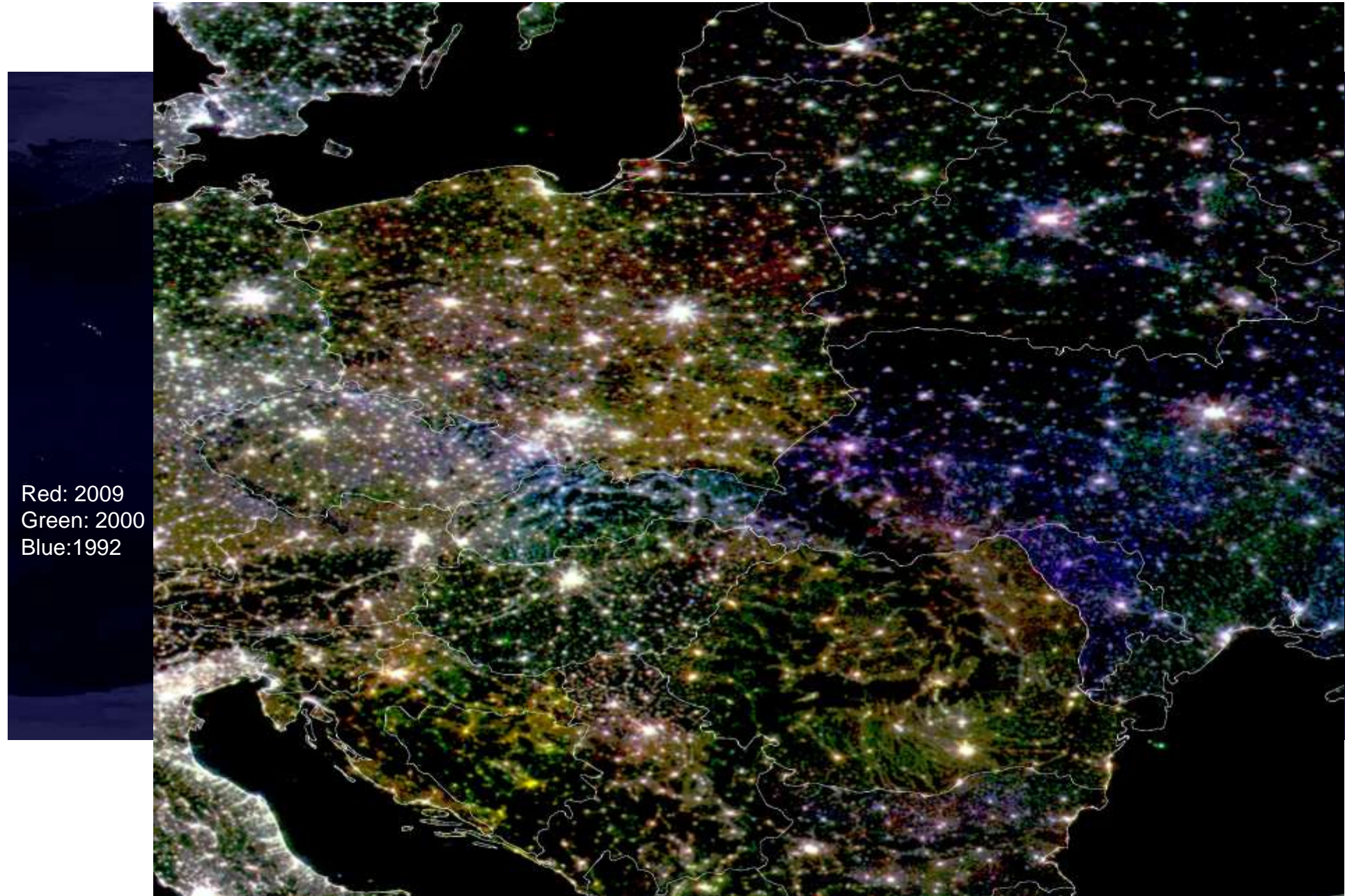




# Recent Addition to NEESPI (NEFI): Caucasus

- Kirsten de Beurs/University of Oklahoma Land Use Patterns and Political Instability as Predictors for the Re-Emergence of Malaria in the Caucasus
- Volker Radeloff/University of Wisconsin-Madison Long-Term Land Degradation in the Caucasus
- Pontus Olofsson/Boston University Comprehensive Analysis of Thirty Years of Land Change in Georgia: Patterns, Carbon Dynamics and Drivers

# Earth Night Lights Observed by DMSP/OLI



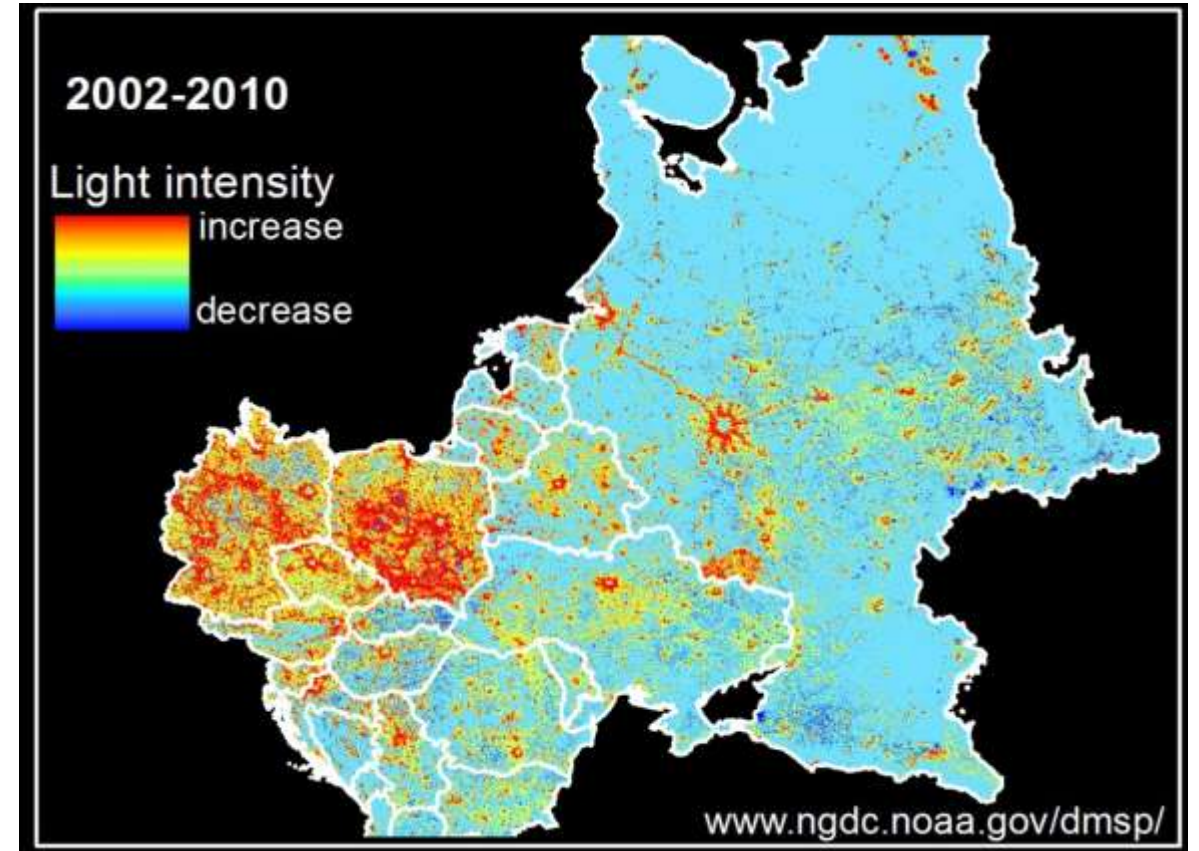
# DMSP Night Lights Reflecting Changes in Economy

## The Decade of Collapse



Deep Blue: Depressed Economies of Ukraine & Moldova  
Red: Positive Economy Development

## The Decade of Recovery



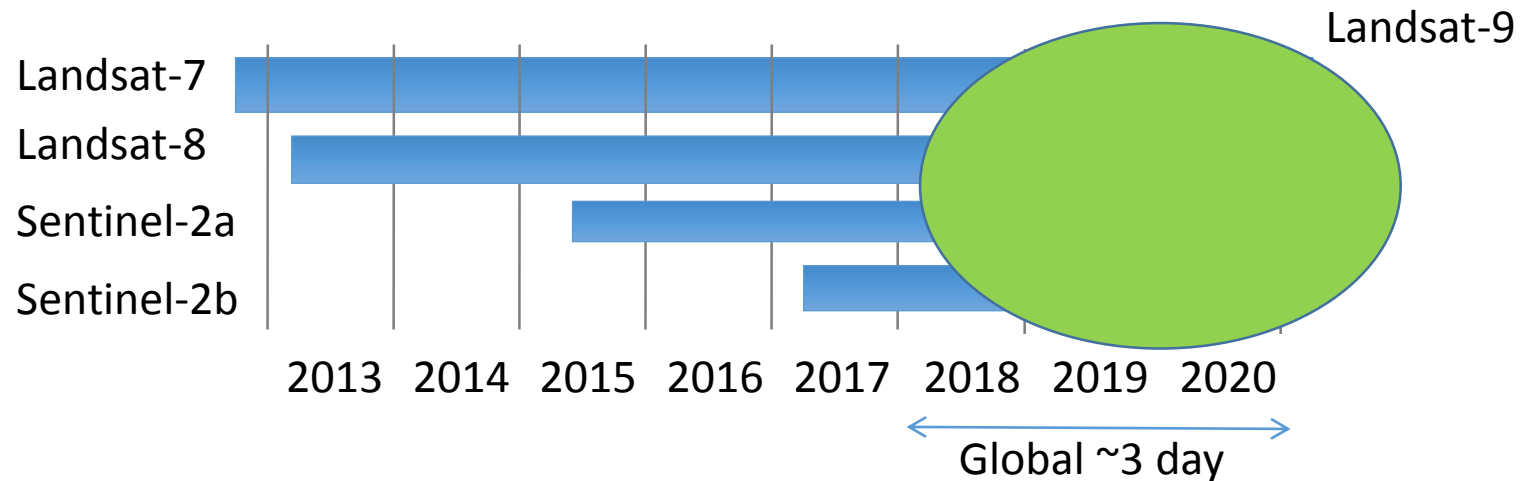
Light Blue: neutral (not much change)  
Red: Economy and urban expansion (e.g. Moscow)

# Current Prospects: Sentinel-2 - Landsat Fusion



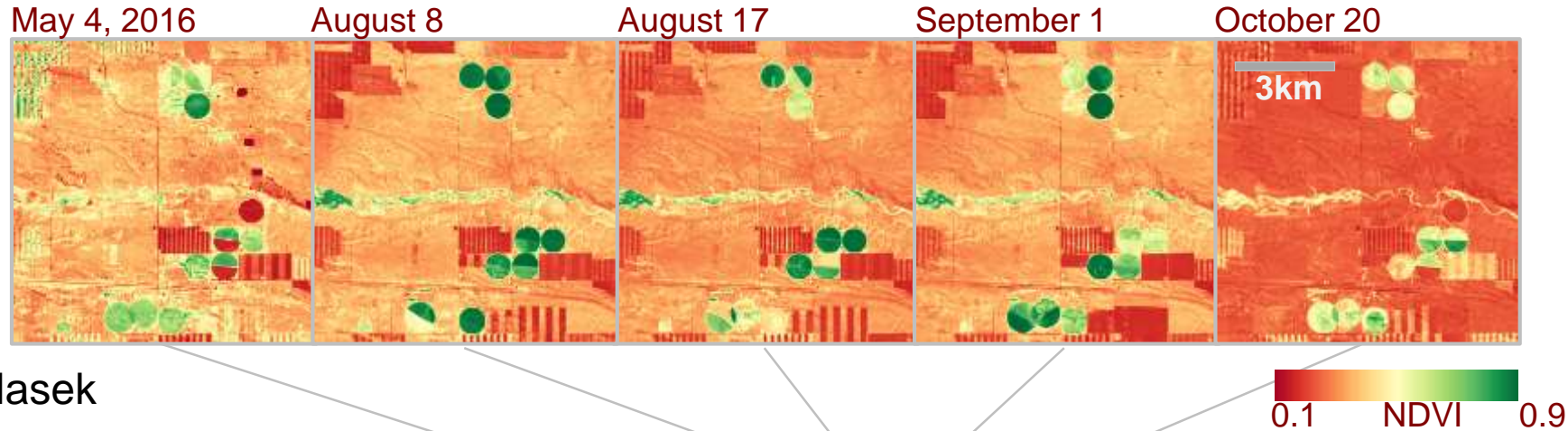
Agriculture monitoring needs  $\sim$  5-day coverage  
Both sensors have 10-30m coverage in VNIR-SWIR

- Satellite orbits are complementary
  - Landsat-7 & -8 8 days out of phase
  - Sentinel-2a & 2b 5 days out of phase
  - Landsat and Sentinel sun synch orbits precess relative to each other

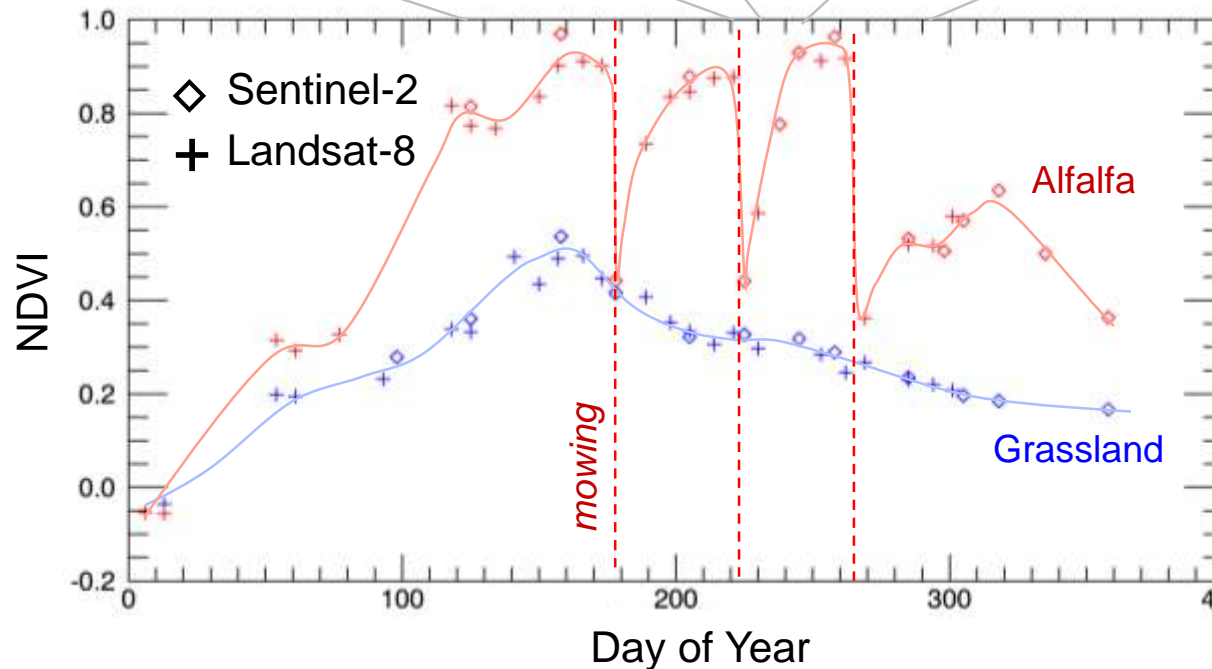


# Harmonized Landsat-8/Sentinel-2 (HLS) Products

## Laramie County, WY

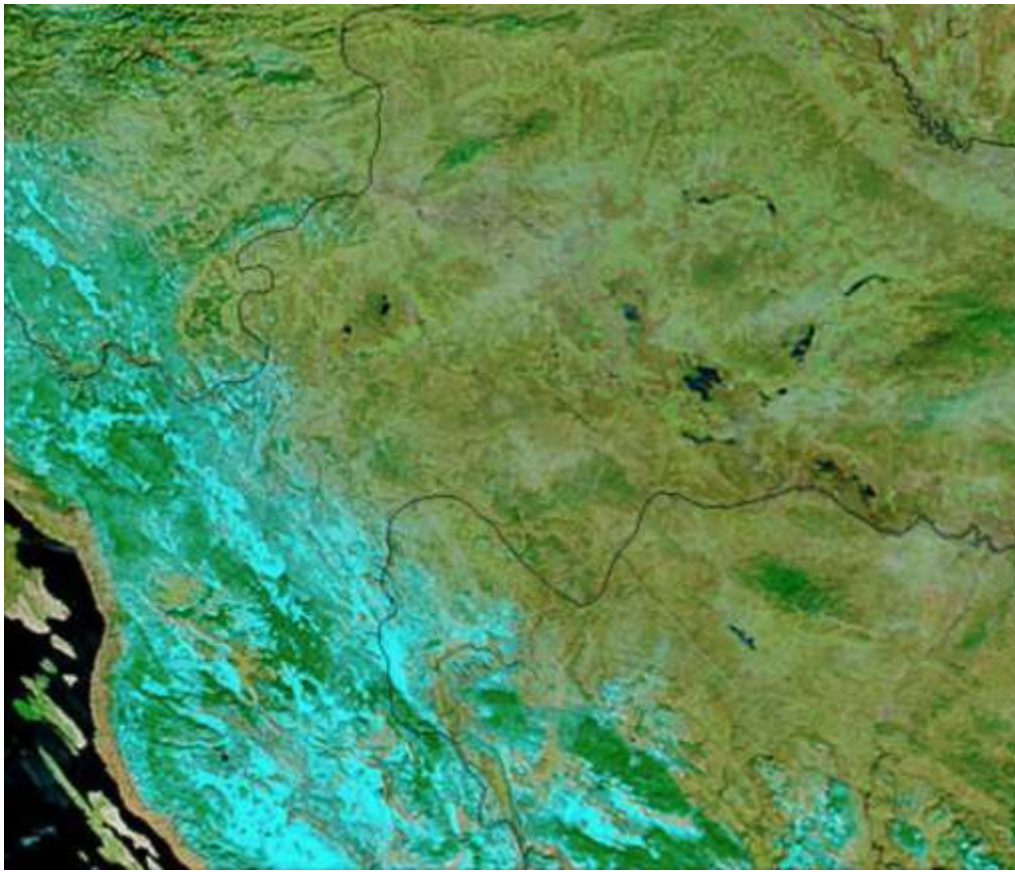


Courtesy: Jeff Masek  
NASA GSFC



Seasonal phenology (greening) for natural grassland (blue line) and irrigated alfalfa fields (red line) near Cheyenne Wyoming observed from Harmonized Landsat/Sentinel-2 data products. The high temporal density of observations allows individual mowing events to be detected within alfalfa fields. HLS Products available from <https://hls.gsfc.nasa.gov>

# Flooding of Sava River Observed by MODIS

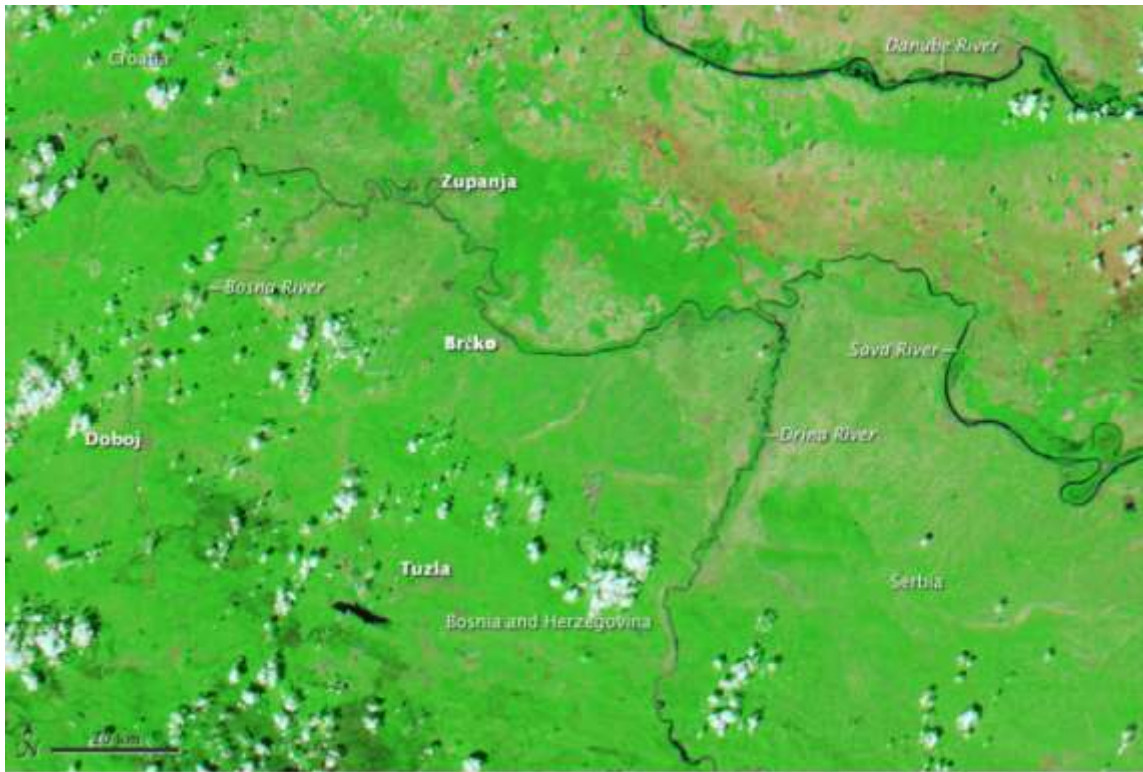


March 18, 2004



March 29, 2004

# Tamara's Rage Observed by MODIS



May 18, 2013



May 19, 2014

false color- a combination of infrared and visible light (MODIS bands 7-2-1)

# Flood of May 2014 as Observed by EO-1 ALI



May 23, 2014: The Advanced Land Imager (ALI) on NASA's Earth Observing-1 ([EO-1](#)) satellite



# Croatia from Landsat



Dec 11, 2013



Oct 27, 2014

# Fires as Observed by MODIS



July 17, 2017, natural-color image

# Capacity Building Component: Trans-Atlantic Training (TAT) in Conjunction with SCERIN



LCLUC Training in Latvia - 2010:  
Czech trainees

TAT's success resulted in a potential  
ESA-NASA Trans-Pacific training  
collaboration in Asia



Agreeing on the TAT: Prague, Dec 2011

NASA-ESA regular training sessions in Eastern Europe for students +3 years

June 2013 in Prague, Czech Rep.

June 2014 in Krakow, Poland

April 2015 in Prague, Czech Rep.

July 2016 in Zvolen, Slovakia

June 2017 in Pecs, Hungary

June 2018 in Zagreb, Croatia

June 2019 in Novy Sad, Serbia?

# Opportunities

- \* Postdoc: Land use/cover changes in a traditional agricultural landscape in Eastern Europe
  - **ORGANIZATION:** Bournemouth University
  - **DEADLINE:** Sunday, July 1, 2018
  - **START DATE:** Saturday, September 1, 2018
  - Dr Marin Cvitanovic
    - [mcvitanovic@bournemouth.ac.uk](mailto:mcvitanovic@bournemouth.ac.uk)
    - <http://orcid.org/0000-0002-3741-0332>
- \* PhD student positions in “Climate Change – Uncertainties, Thresholds and Coping Strategies” at the [University of Graz](#), Austria (looking for PhD students - project assistants without doctorate)
  - 20 positions to be filled as of September 3rd 2018
  - <https://dk-climate-change.uni-graz.at/de/dissertationsthemen/call-for-applications-2018/>
- \* The Copernicus Masters 2018 competition is open for submissions until 30 June 2018. Outstanding Earth Observation-based ideas and applications which tackle societal and commercial global challenges have the opportunity to win prizes
  - <http://www.copernicus.eu/news/copernicus-masters-competition-opportunity-boost-your-business>
  - **Land Monitoring Challenge:** €5,000 cash prize and a satellite data quota worth €5,000 for solutions that use Copernicus data for global, pan-European or local applications to create added value for industry and society
  - **Data Access Challenge:** €5,000 cash prize and a satellite data quota worth €5,000 for solutions that improve access to Copernicus data and services
  - **Sustainable Development Challenge:** €5,000 cash prize, invitation to a relevant European Commission event and satellite data quota worth €5,000 for solutions that use Copernicus to support sustainable development
  - **Government Challenge:** €5,000 cash prize and a satellite data quota worth €5,000 for solutions that use Copernicus to support public authorities.
  - **Emergency Management Challenge:** €5,000 cash prize and a satellite data quota worth €5,000 for solutions that use Copernicus to support the management of natural disasters, man-made emergency situations, and humanitarian crises.

Pecs → Zagreb



Hvala!

