

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



Volker C. Radeloff , Mutlu Ozdogan , Jennifer Alix-Garcia , Scott Gehlbach , Anna M. Pidgeon



Peter Potapov , Matt Hansen,
Kirsten de Beurs, Grigory Ioffe



Curtis E. Woodcock , Pontus Olofsson
Tobias Kuemmerle , Patrick Hostert



C. Alcantara, M. Baumann, E. Bragina, V. Butsic, M. Dubinin, P. Griffith, J. Knorn, T. Kuemmerle ,
M. Main, C. Munteanu, A. Prishchepov, A. Sieber, S. Walker, K. Wendland

D. Aksenov, L. Baskin, O. Chaskovskyy, V. Gancz, U. Gimmi, L. Halada, W. Keeton, R. Kennedy,
J. Kozak, I. Kruhlov, E. Ziolkowska, A. Lushchekina, D. Mueller, K. Ostapowicz,
K. Perzanowski, A. Rabe, F. Schierhorn, T. Sipko, ...



Land-Cover and Land-Use Change Program



April 3rd 2013













МАЯ

45
2012

Поднимай

Этим землям нет цены.
Больше год от года
Брать должны мы с целины
Хлеба для народа!

ЦЕЛИНУ!

Goal

Understand the effects
of socioeconomic shocks
on land use
and land cover change

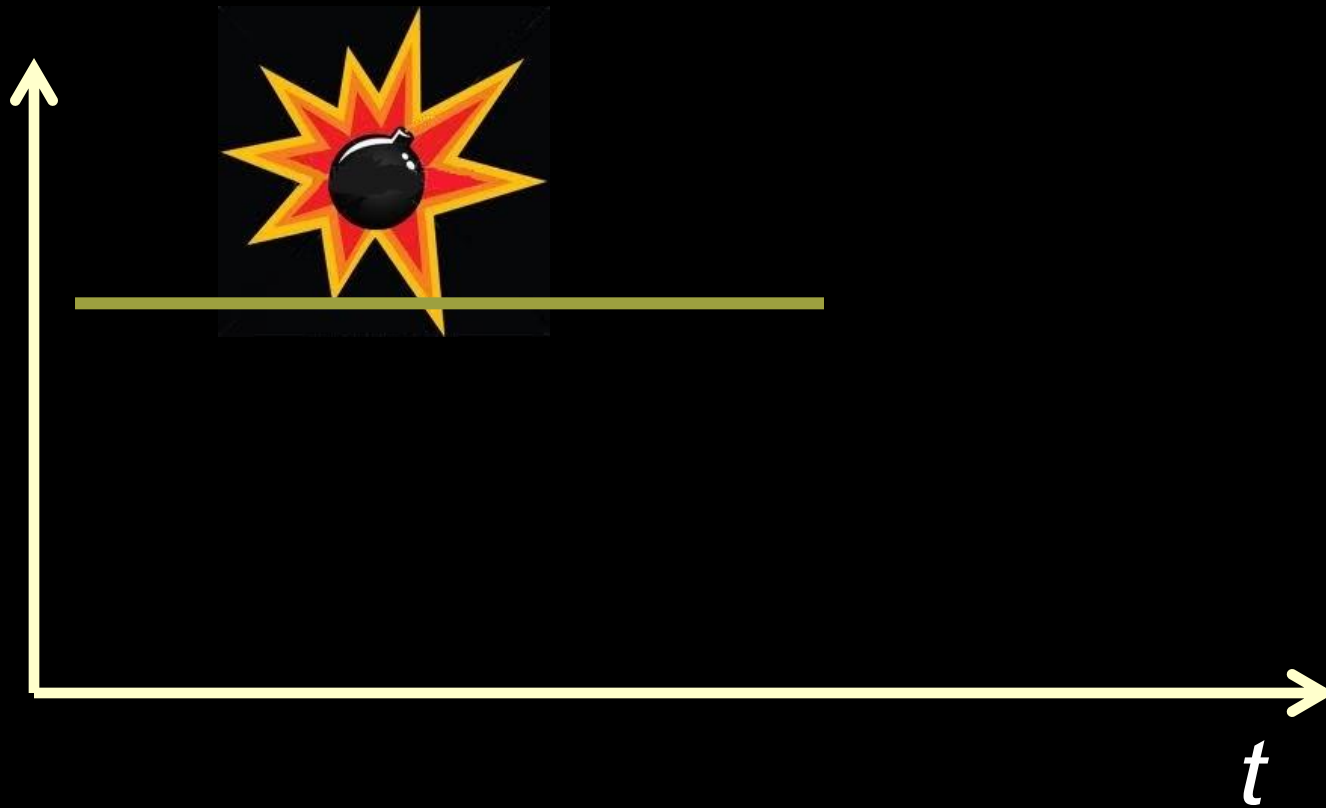
Effects of shocks



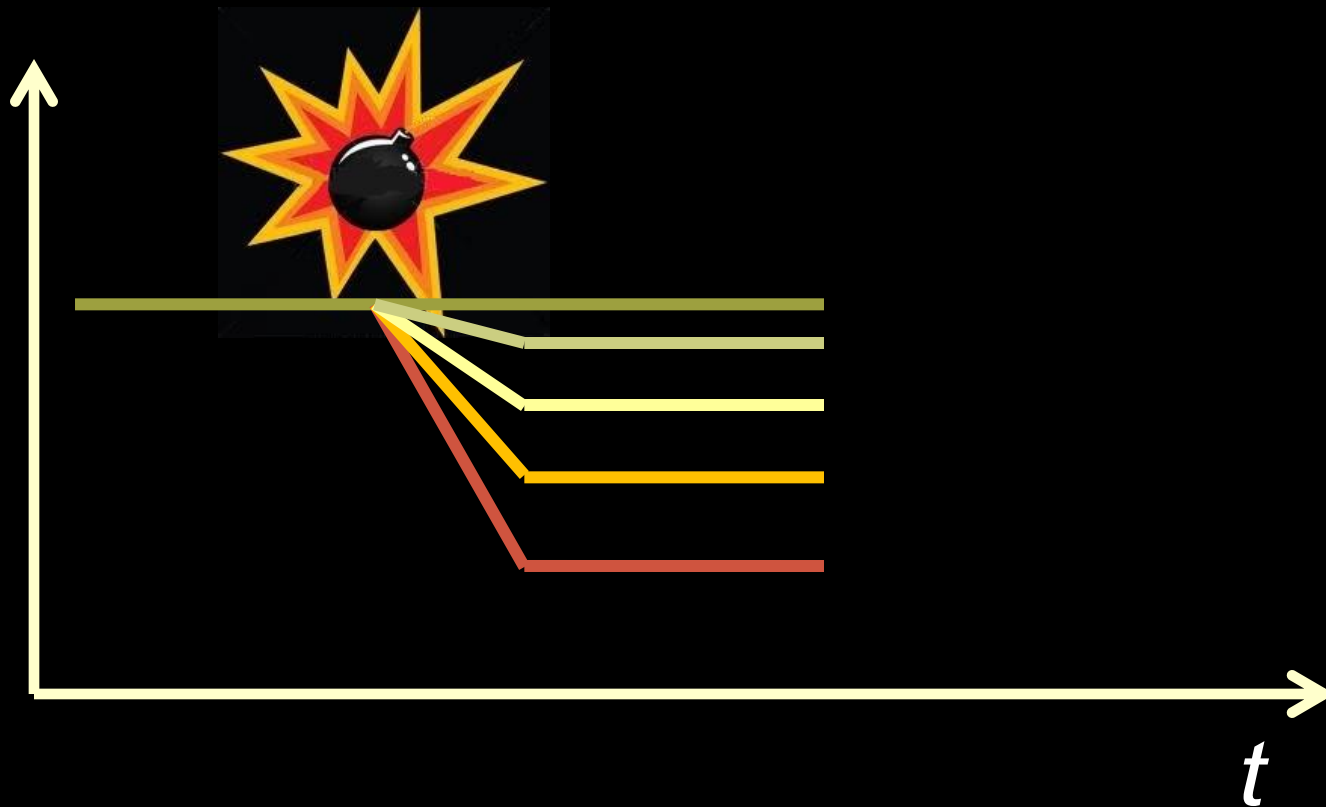
Effects of shocks



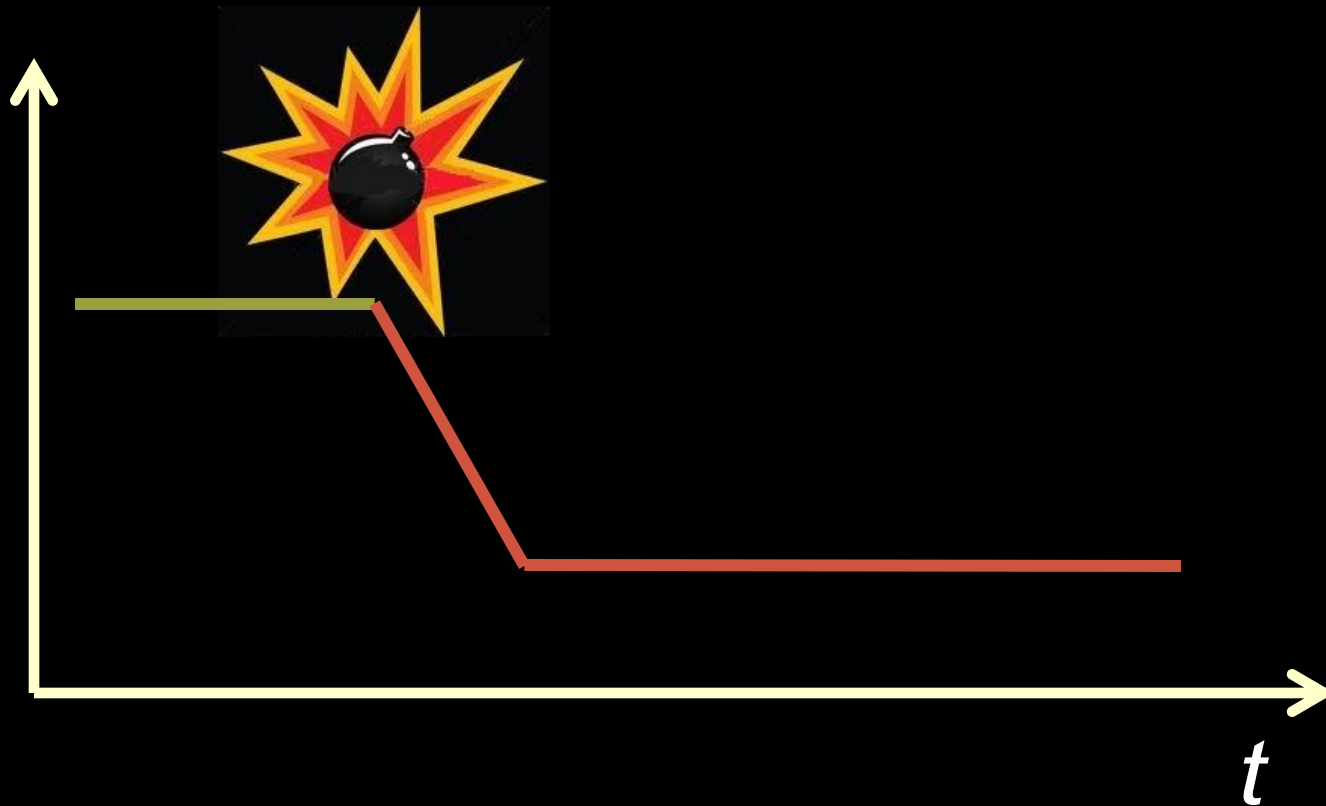
Effects of shocks



Effects of shocks

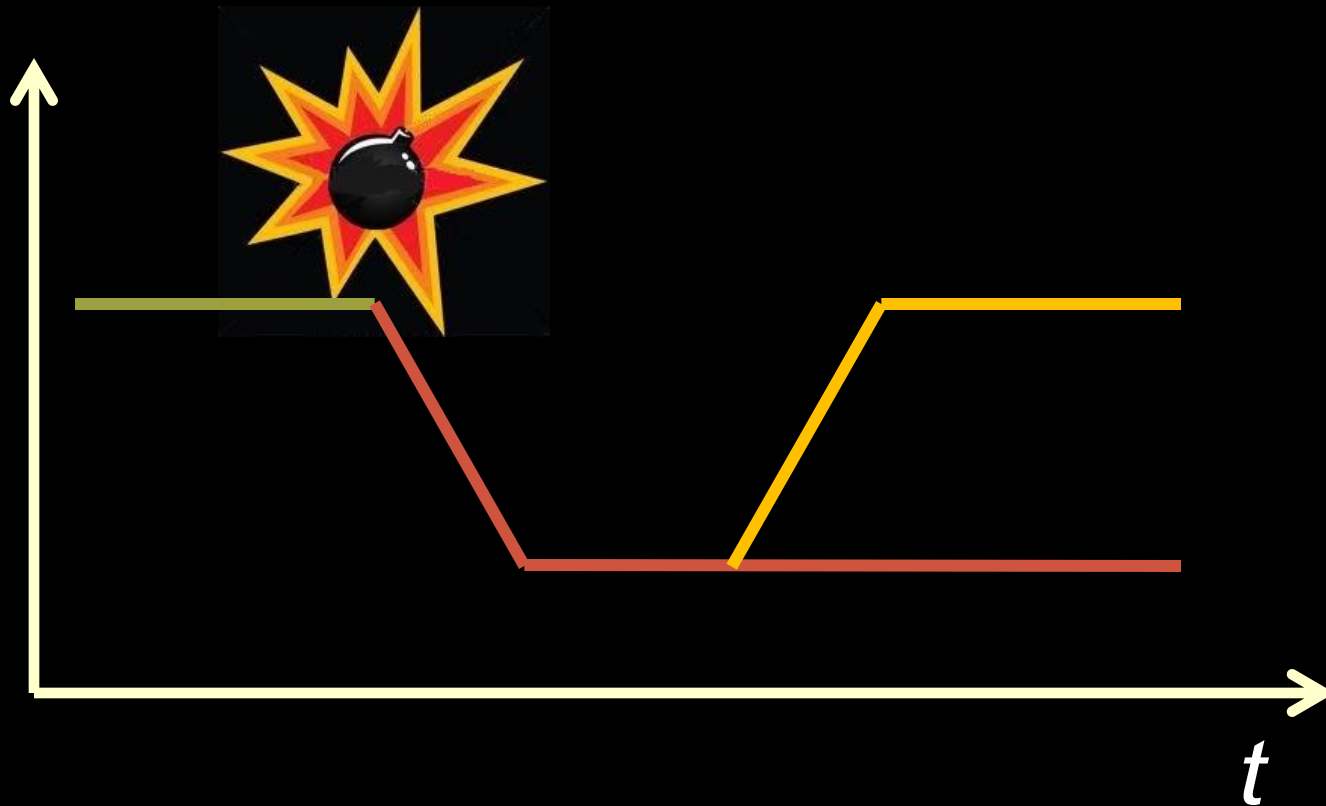


Effects of shocks



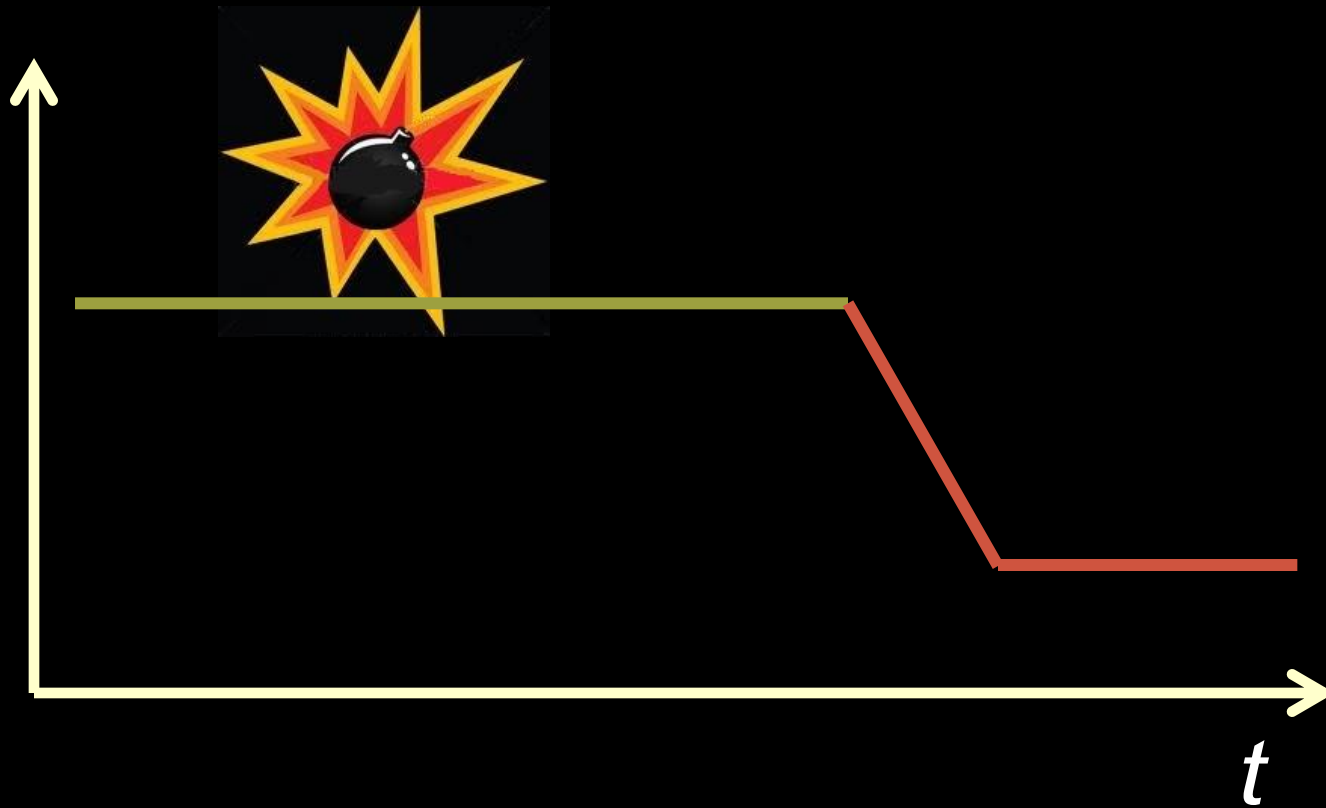
1. Multiple stable states?

Effects of shocks



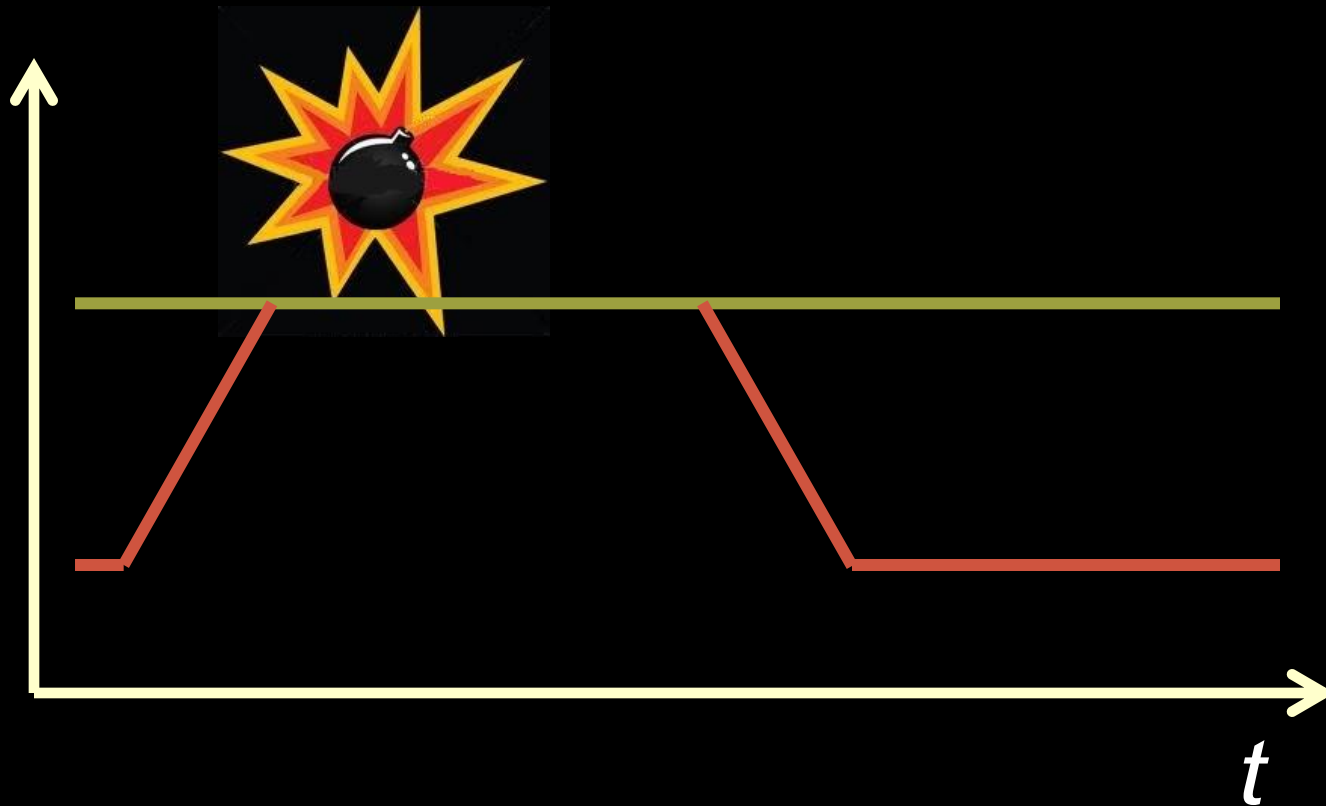
1. Multiple stable states?

Effects of shocks

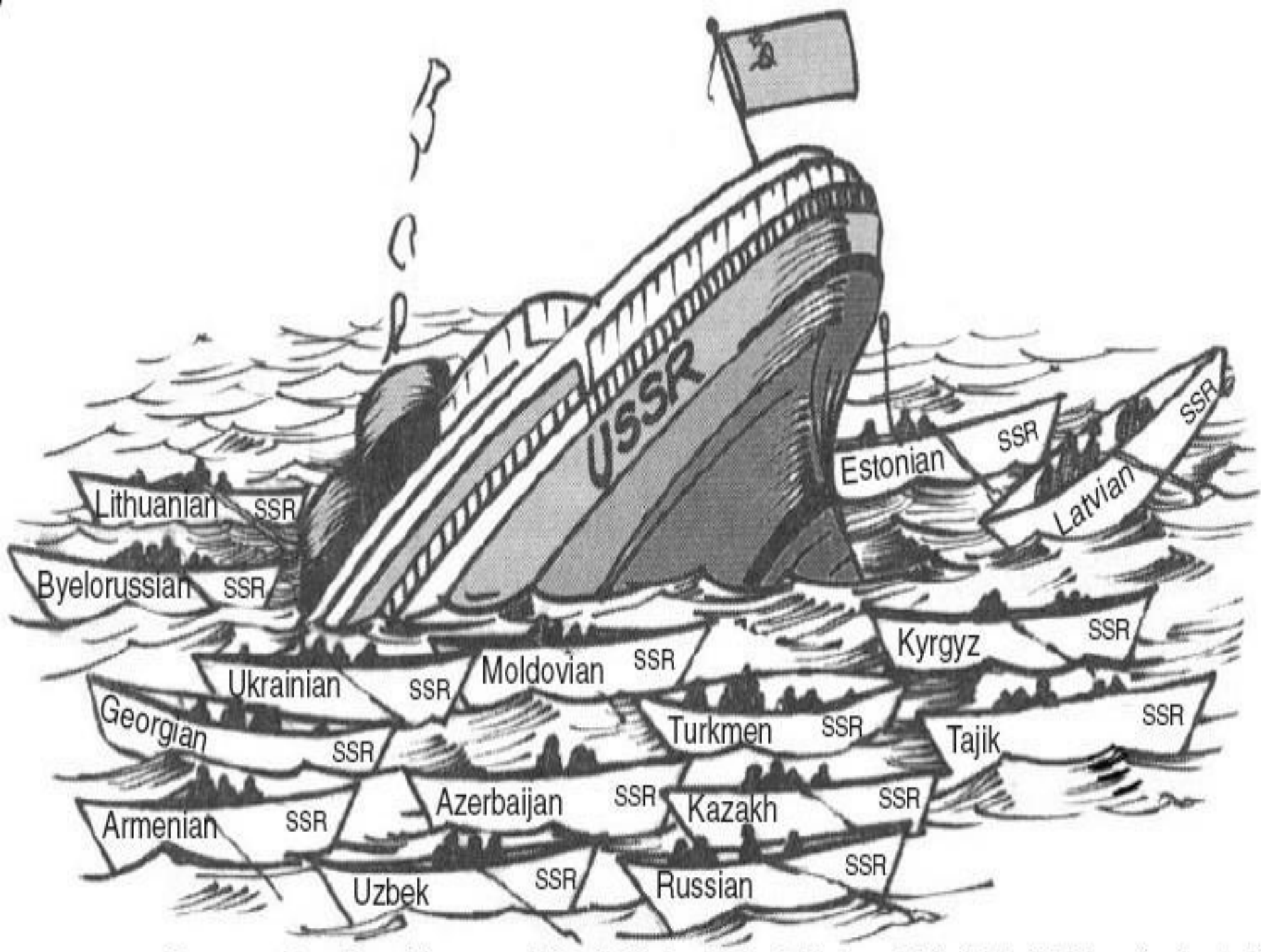


2. Lags?

Effects of shocks



3. Legacies?



USSR

Estonian

SSR

SSR

Latvian

Lithuanian

SSR

Byelorussian

SSR

Kyrgyz

SSR

Ukrainian

SSR

Moldovian

SSR

Georgian

SSR

Turkmen

SSR

Tajik

SSR

Armenian

SSR

Azerbaijan

SSR

Kazakh

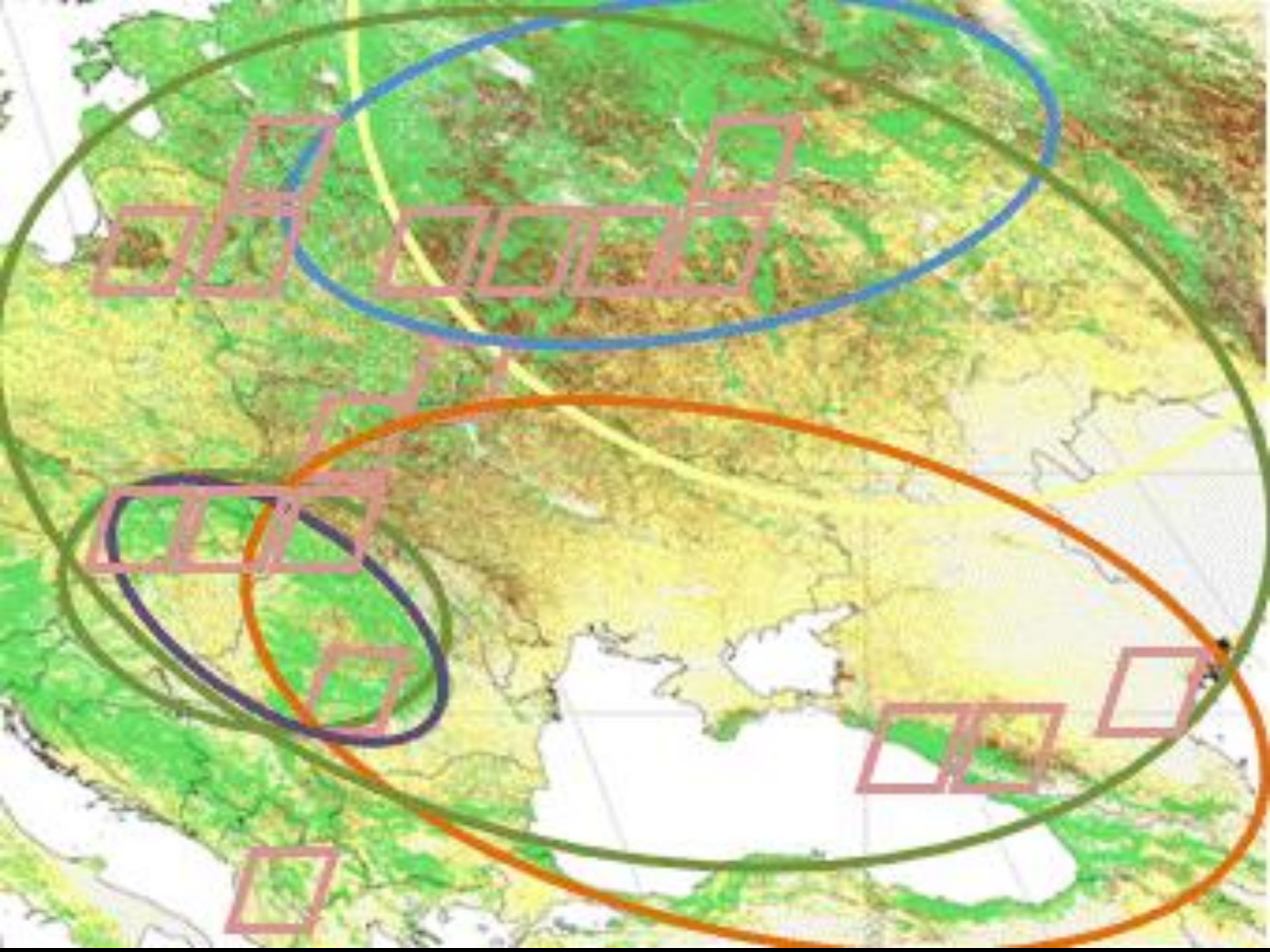
SSR

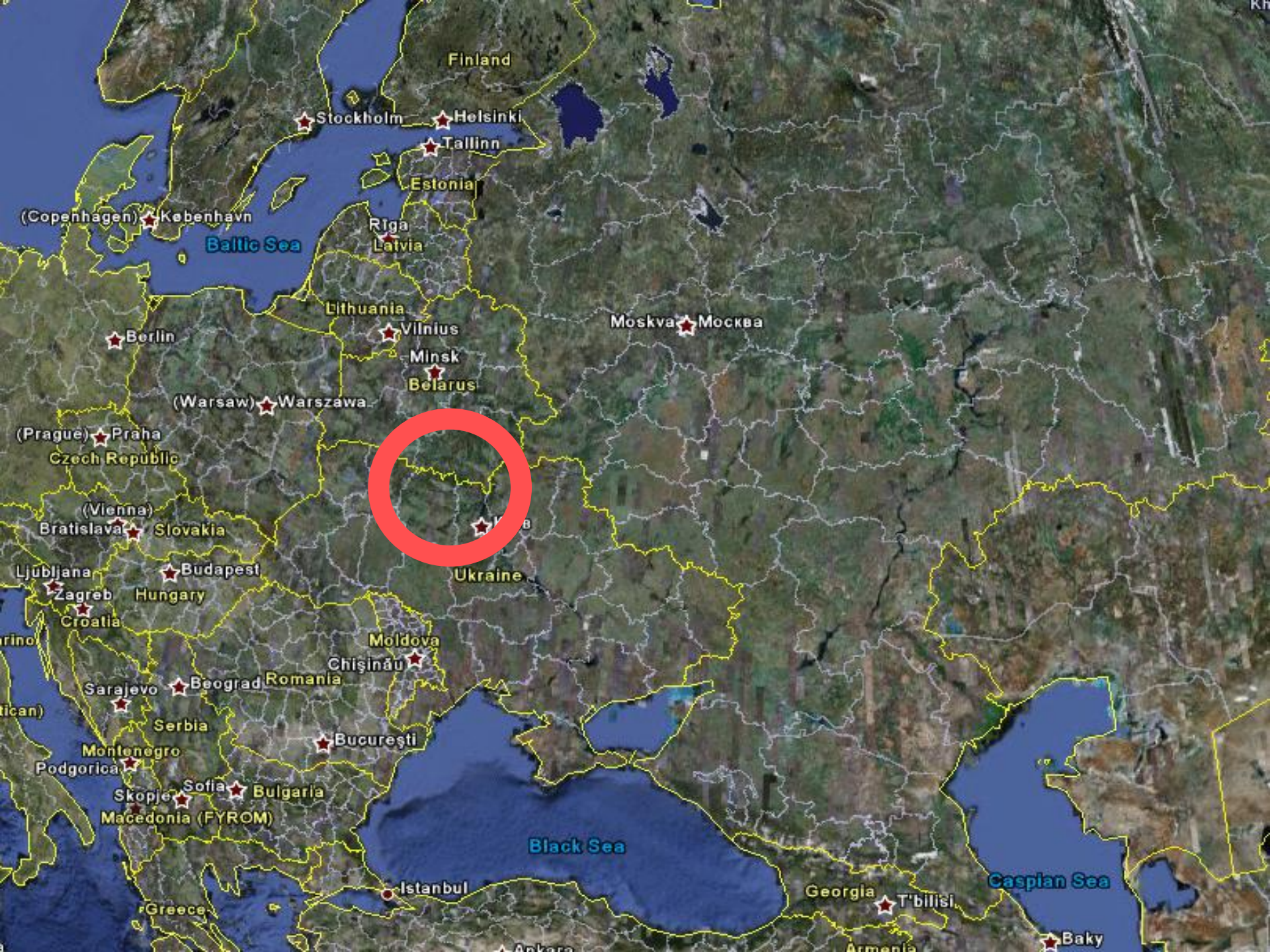
Uzbek

SSR

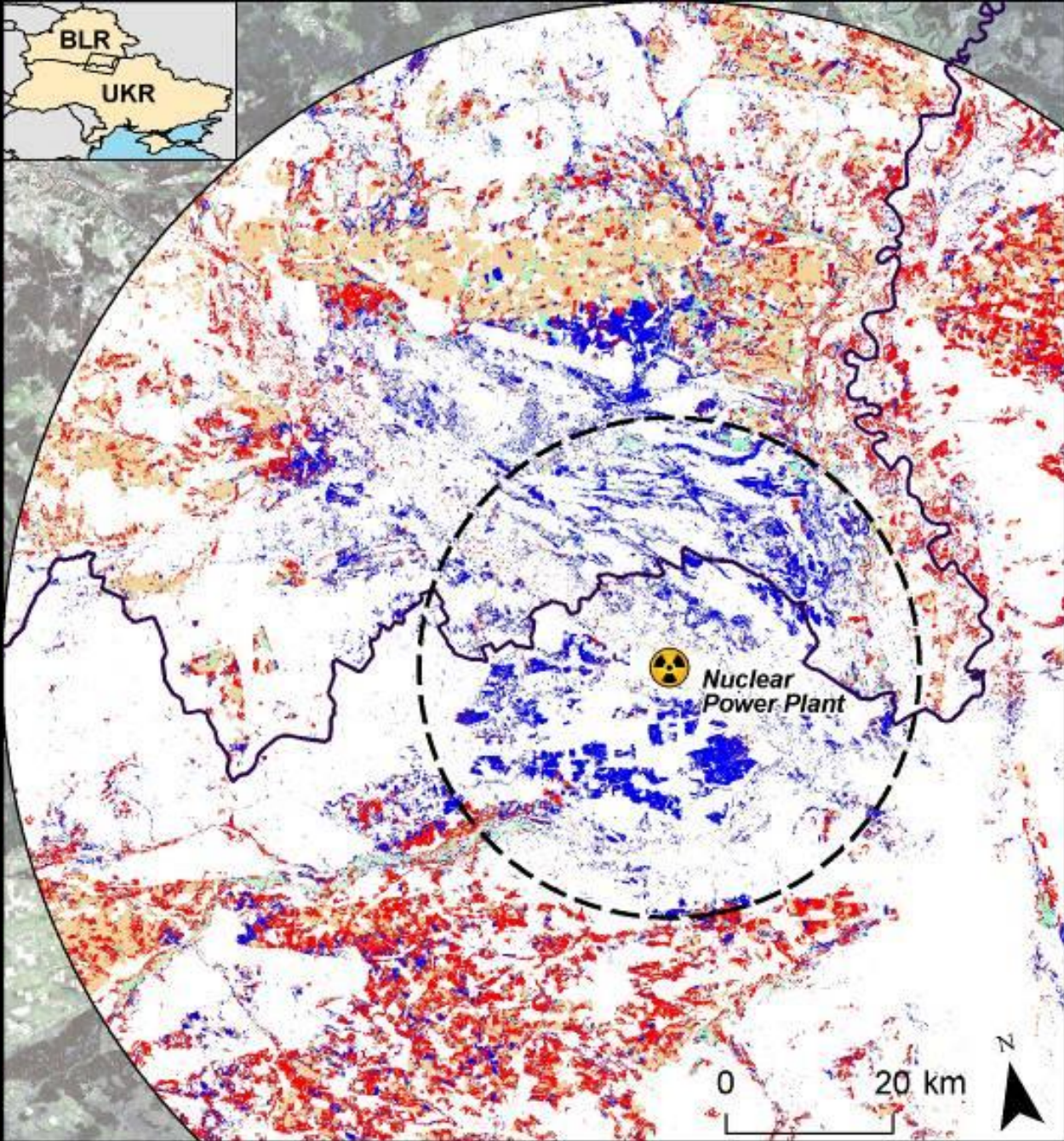
Russian

SSR

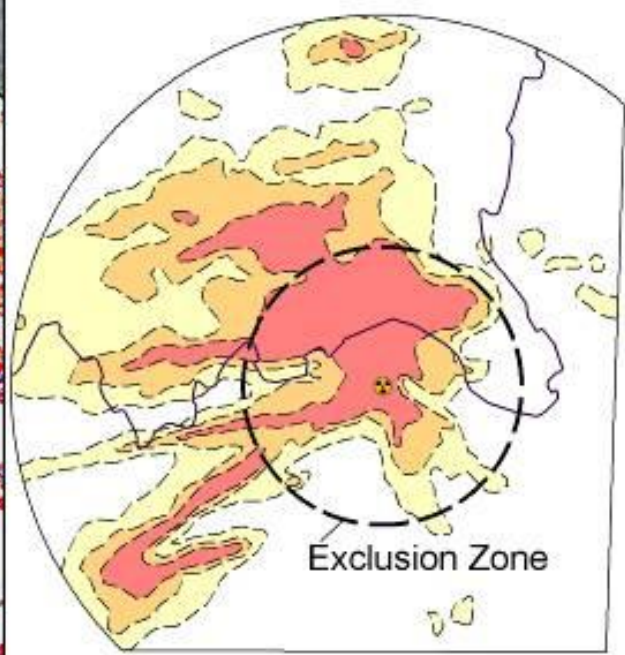


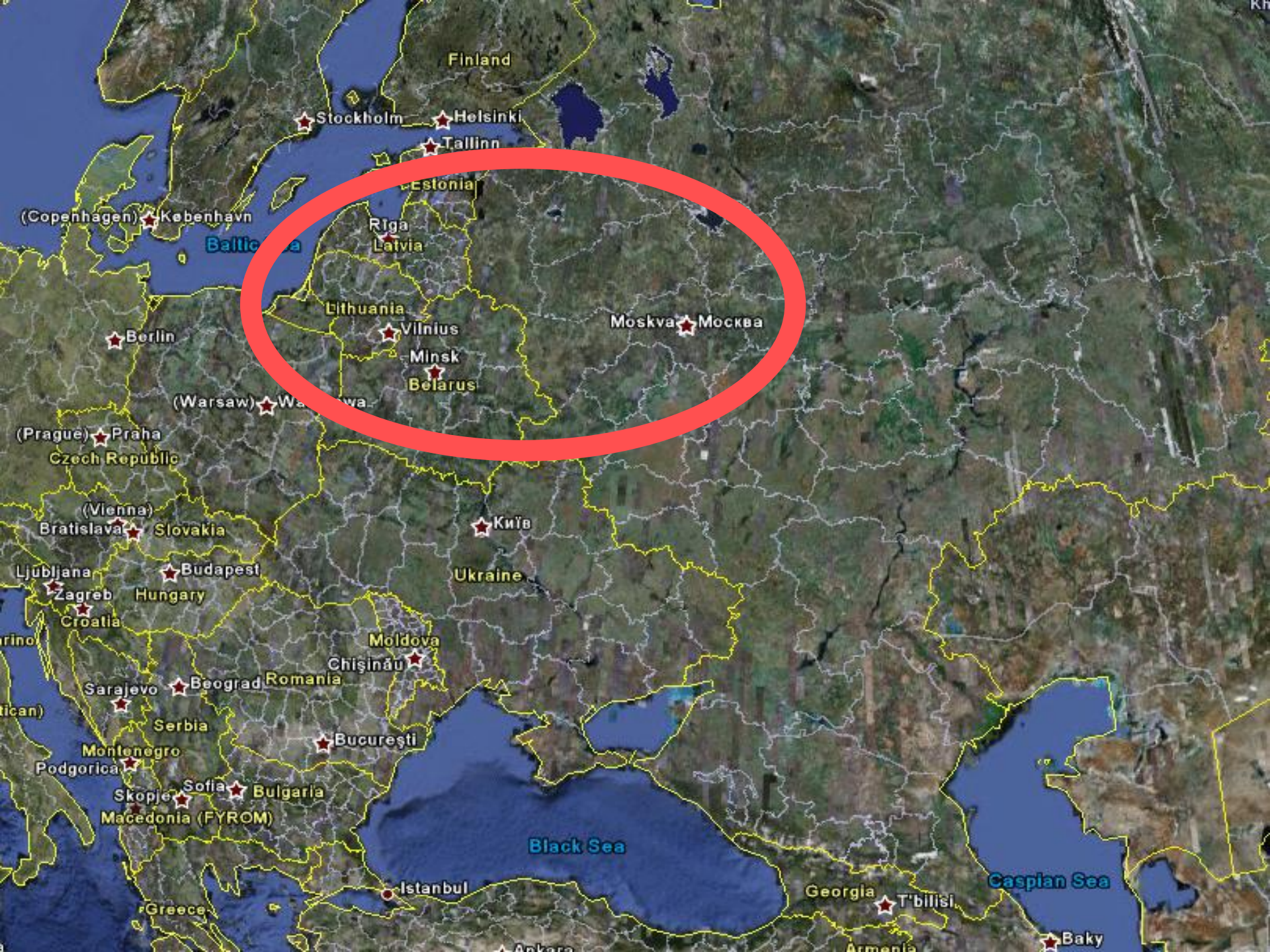






Contamination zones





Finland

Stockholm

Helsinki

Tallinn

Estonia

Riga

Latvia

Baltic Sea

(Copenhagen) København

Lithuania

Vilnius

Moskva

Москва

Minsk

Belarus

Berlin

(Warsaw) Warszawa

(Prague) Praha

Czech Republic

(Vienna)

Bratislava

Slovakia

Kyiv

Ukraine

Ljubljana

Budapest

Hungary

Zagreb

Croatia

Moldova

Chişinău

Beograd

Romania

Sarajevo

Serbia

Montenegro

Podgorica

Skopje

Macedonia (FYROM)

Sofia

Bulgaria

Bucureşti

Black Sea

Caspian Sea

Georgia

T'bilisi

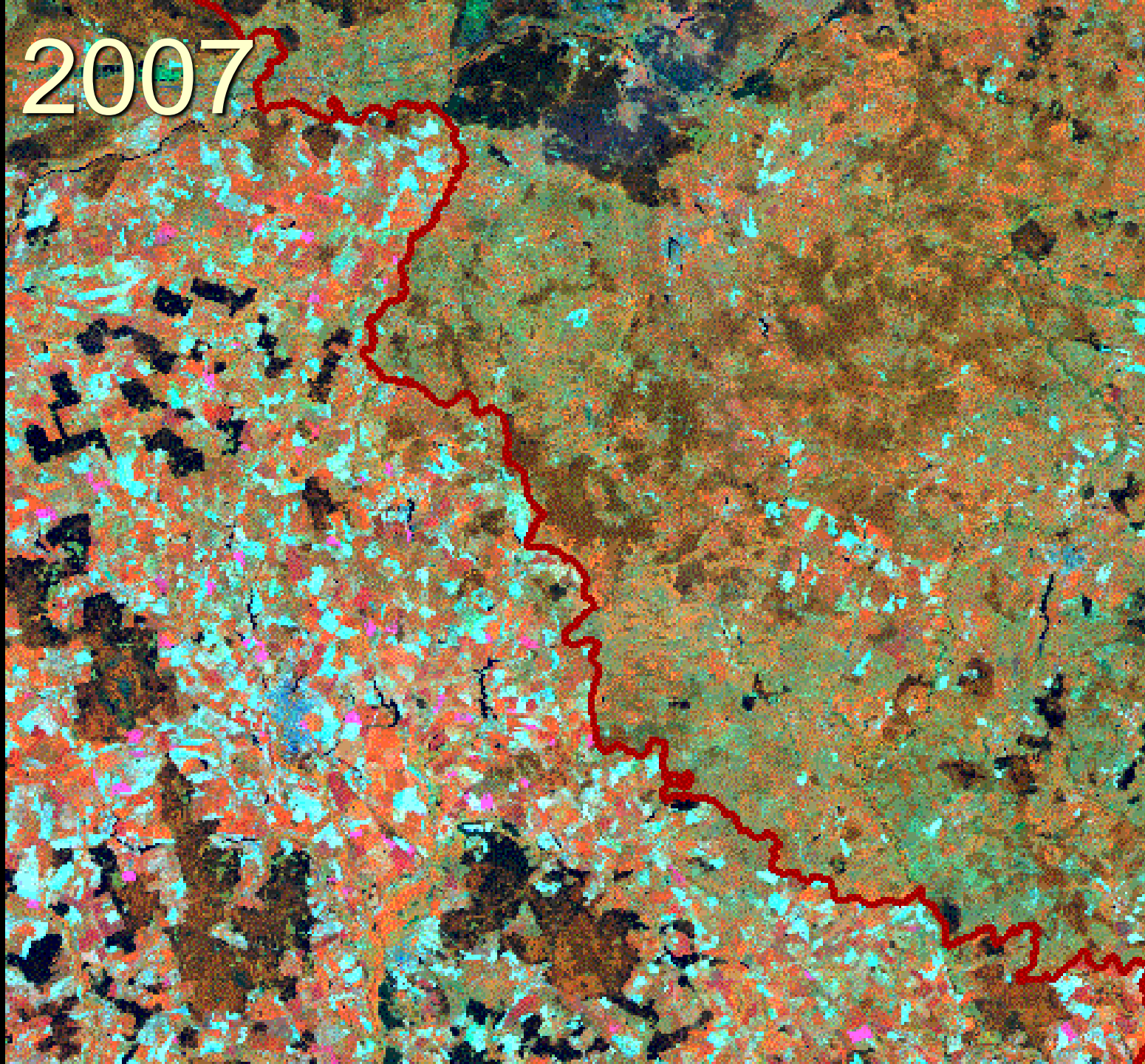
Greece

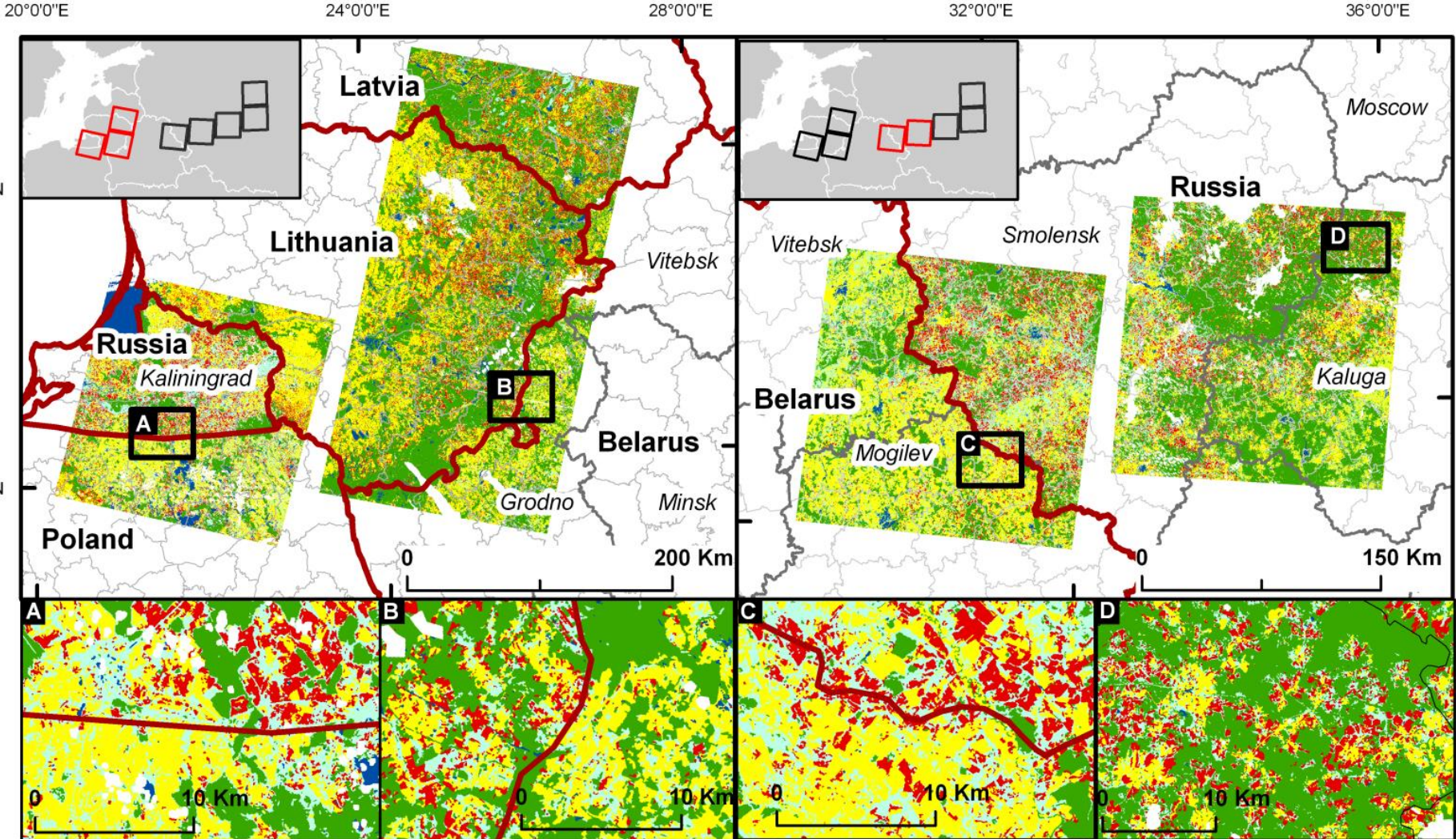
Ankara

Armenia

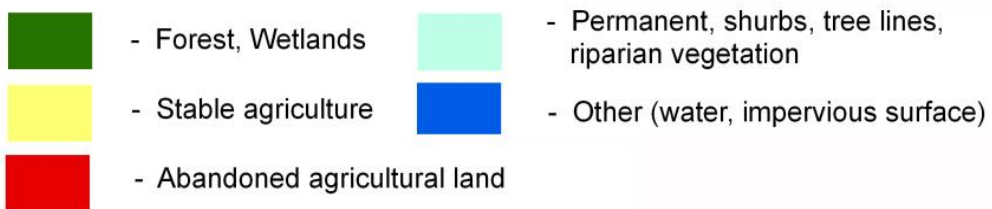
Baky

2007





Classes



- National Boundaries
- Regional Boundaries
- District Boundaries

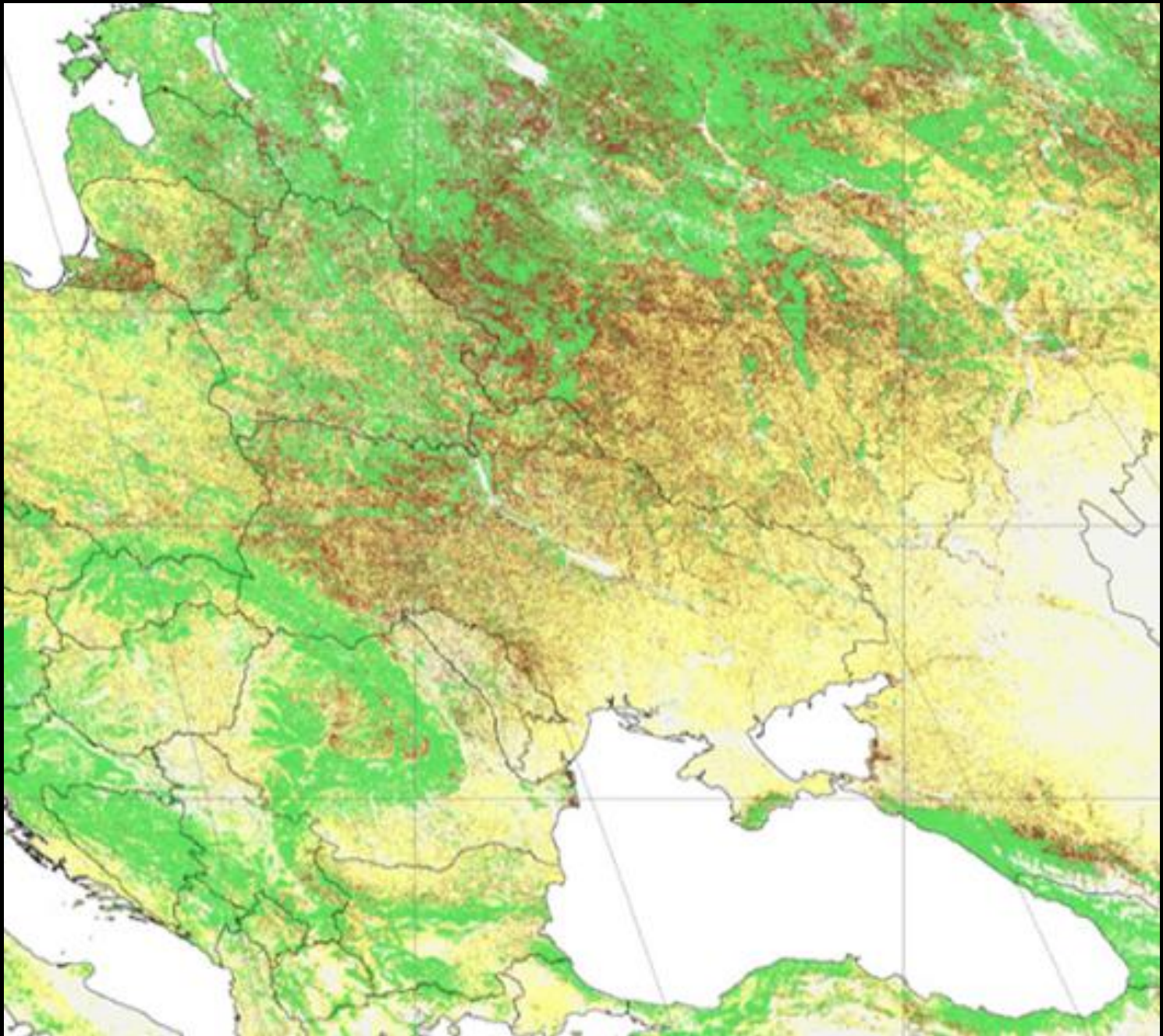
Belarus - Countries
Mogilev - Regions

Поднимай

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ЦЕЛИНУ!

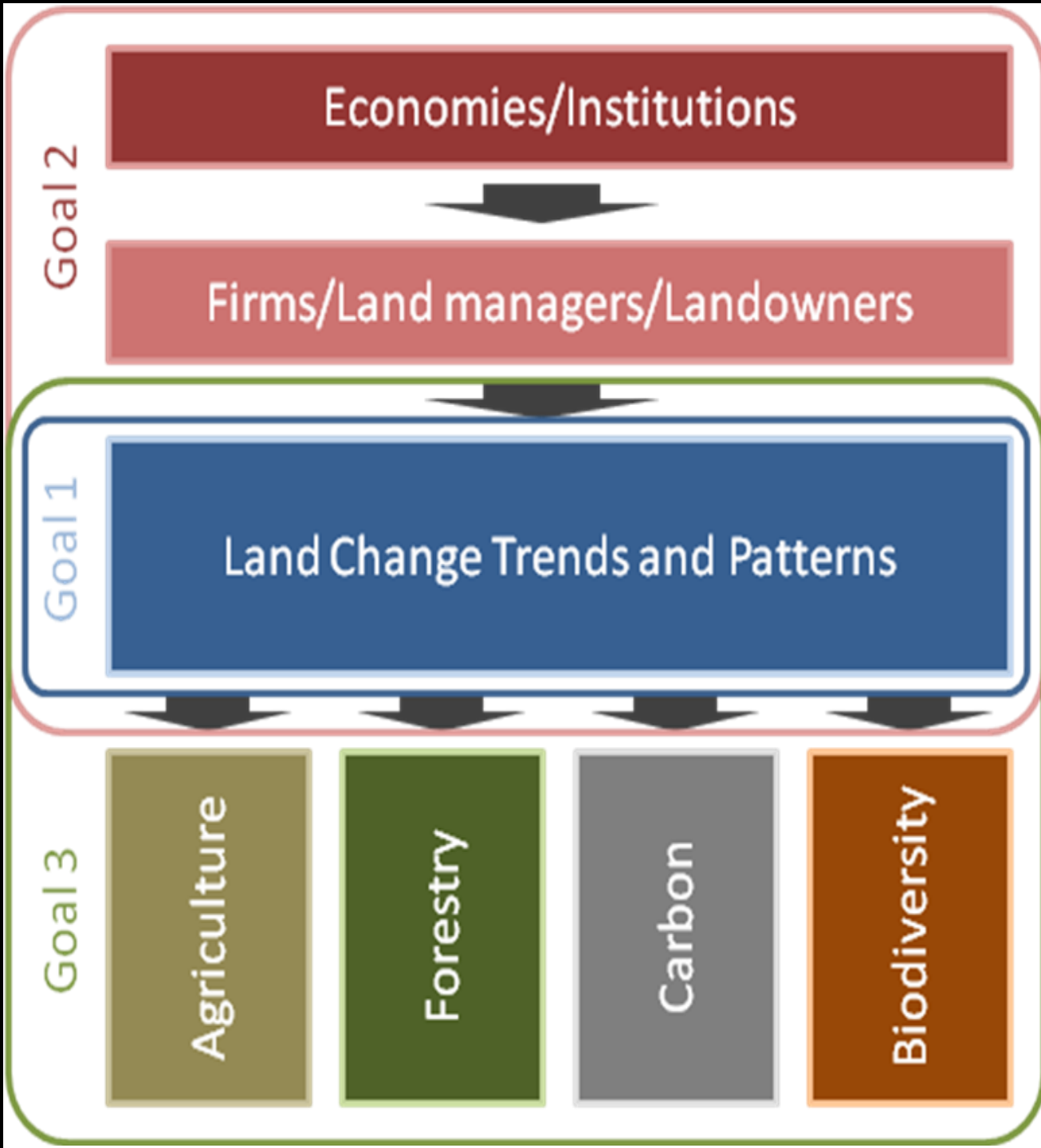




Alcantara, PhD Dissertation

Objectives

1. Map land change across Eastern Europe with Landsat data
2. Understand the economic, policy, and institutional drivers of land change
3. Assess the effects of land change on ecosystem services, and the environment



Goal 2

Economies/Institutions

Firms/Land managers/Landowners

Goal 1

Land Change Trends and Patterns

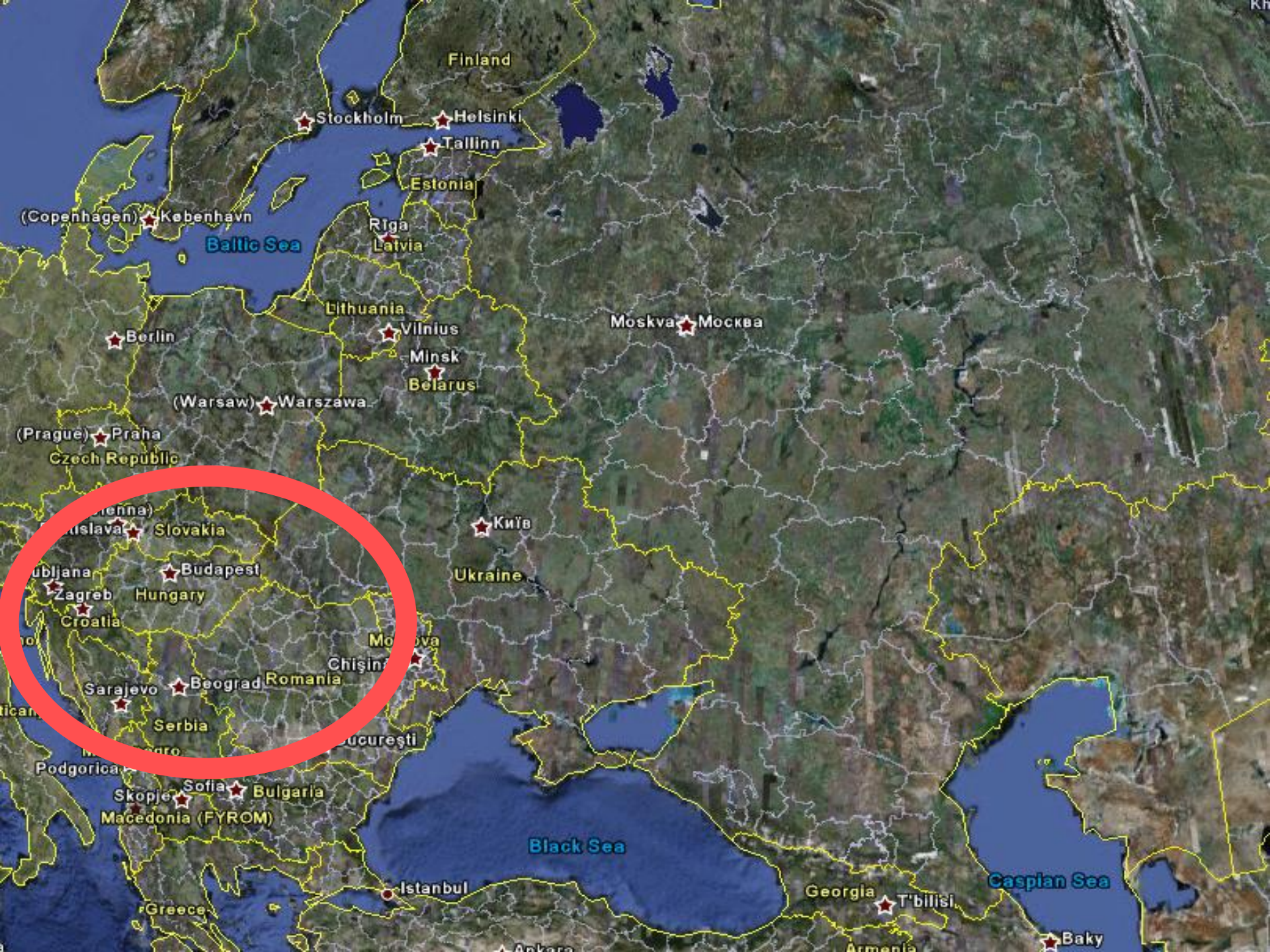
Goal 3

Agriculture

Forestry

Carbon

Biodiversity



Finland

Stockholm

Helsinki

Tallinn

Estonia

Riga

Latvia

(Copenhagen) København

Baltic Sea

Berlin

Lithuania

Vilnius

Moskva Москва

Minsk

Belarus

(Warsaw) Warszawa

(Prague) Praha

Czech Republic

Kyiv

Ukraine

(Vienna)

Slovenia

Ljubljana

Budapest

Zagreb

Hungary

Croatia

Moldova

Chişinău

Sarajevo

Beograd

Romania

Serbia

Bucureşti

Podgorica

Skopje

Sofia Bulgaria

Macedonia (FYROM)

Black Sea

Georgia

T'bilisi

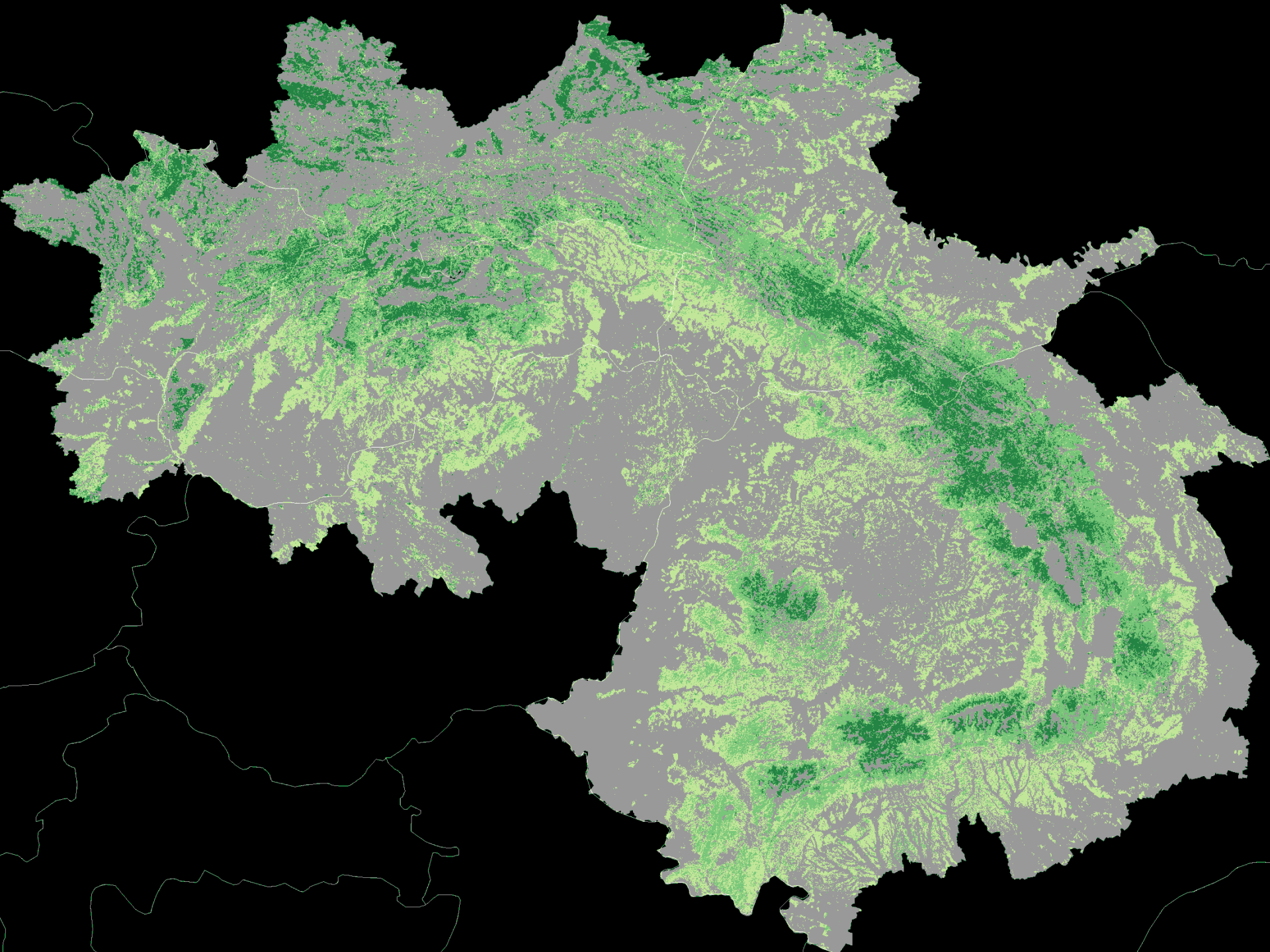
Caspian Sea

Baky

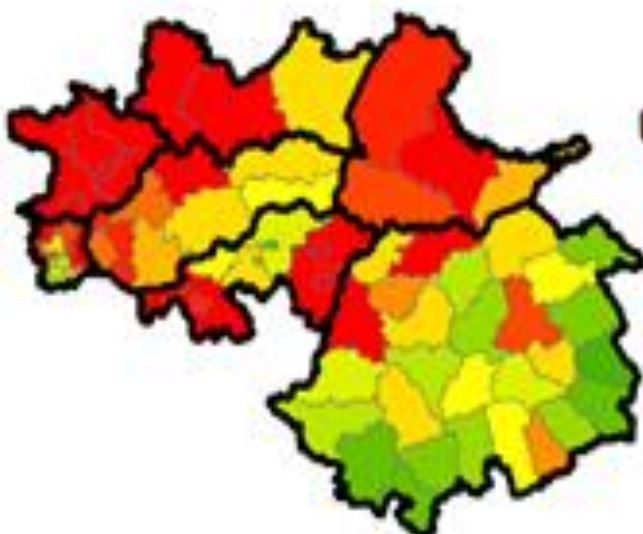
Greece

Ankara

Armenia



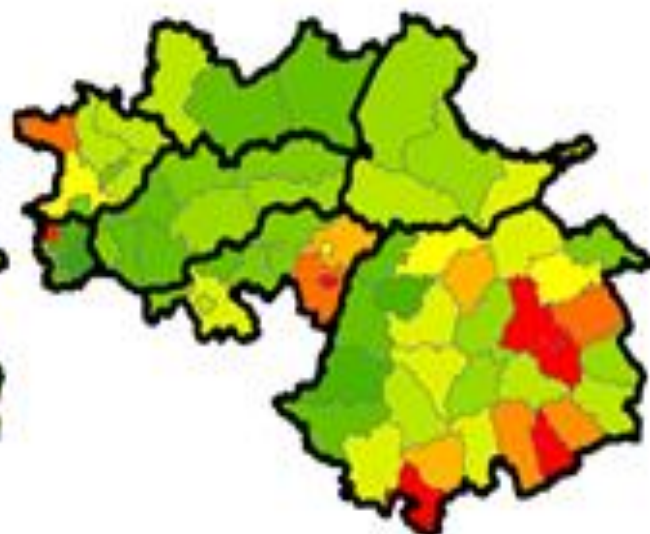
1985/1990



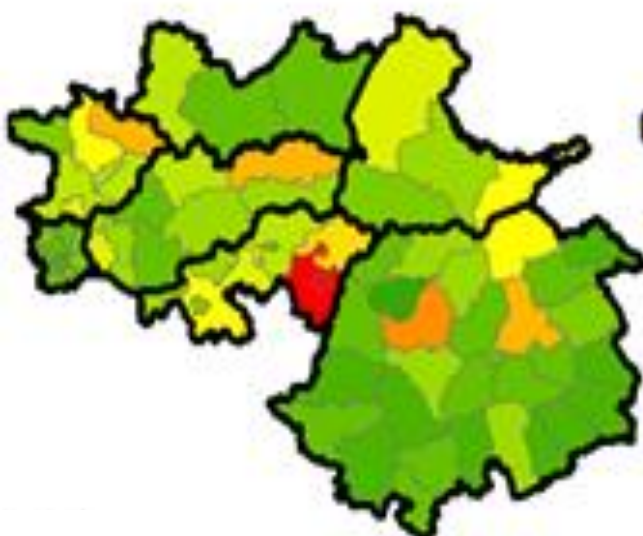
1990/1995



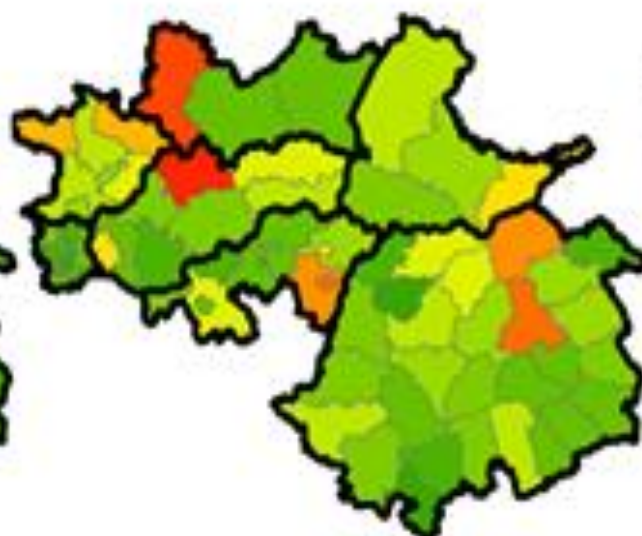
1995/2000




2000/2005



2005/2010

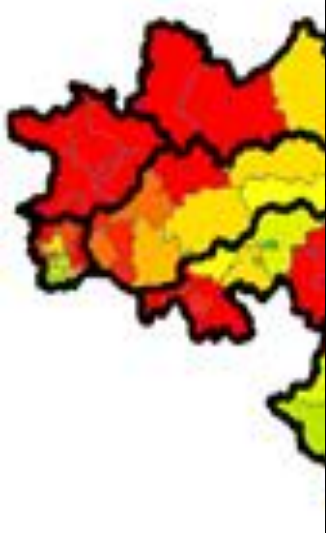


 Country boundaries

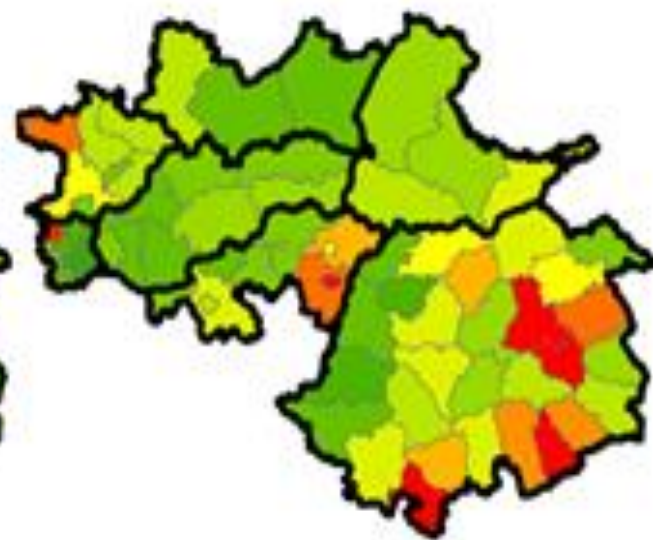
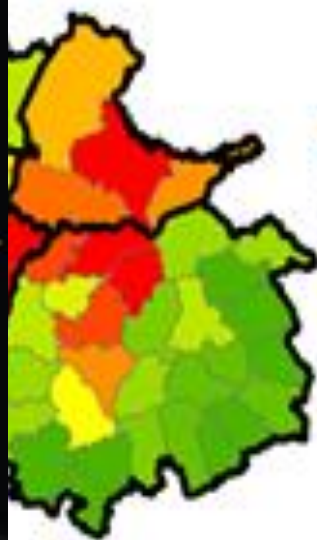
Annual disturbance rate [%]



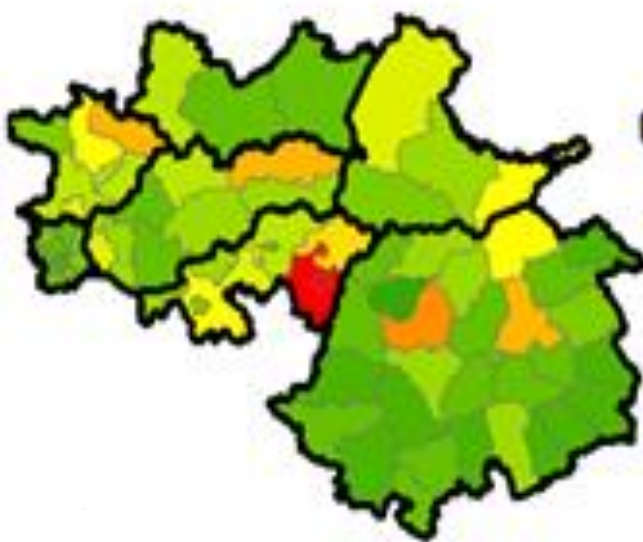
1985/1990



1995/2000



2000/2005



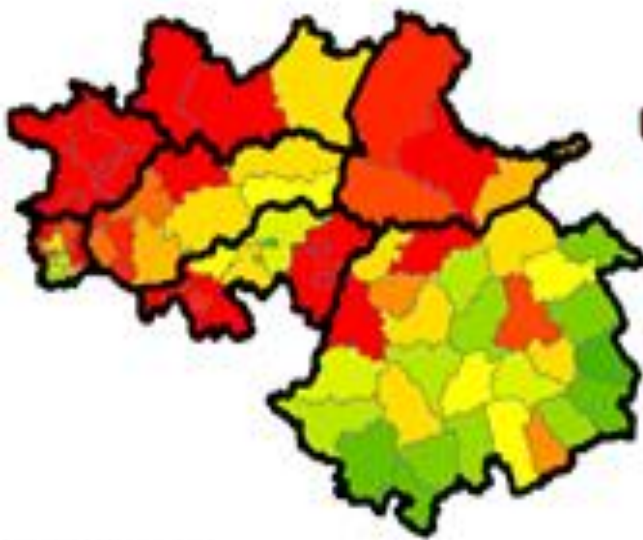
2005/2010



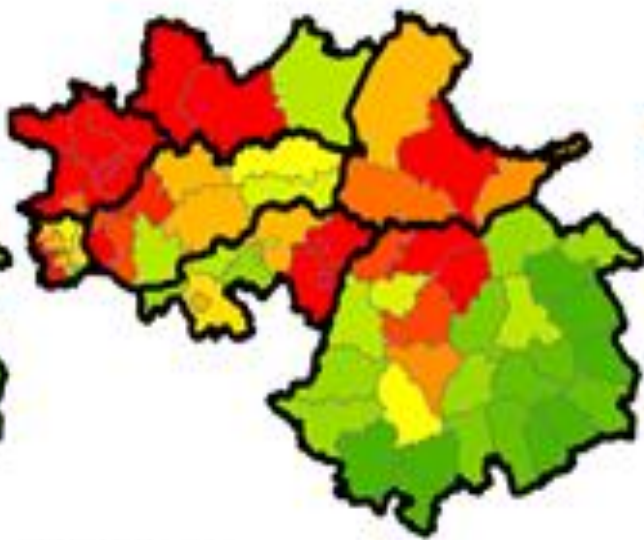
Country boundaries



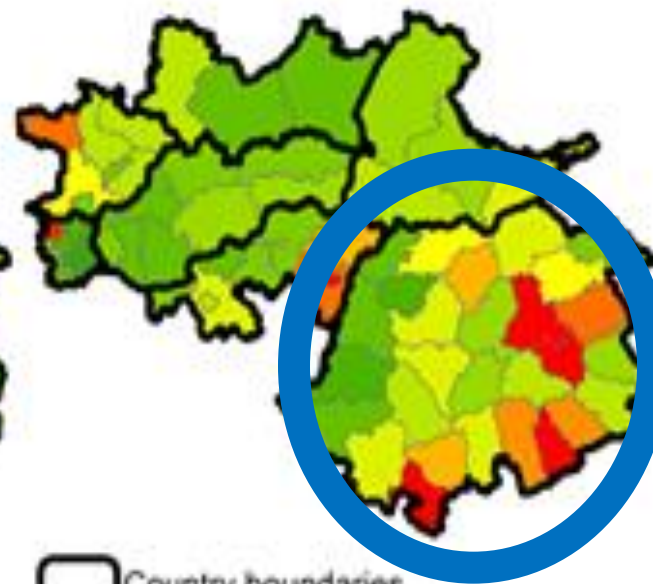
1985/1990



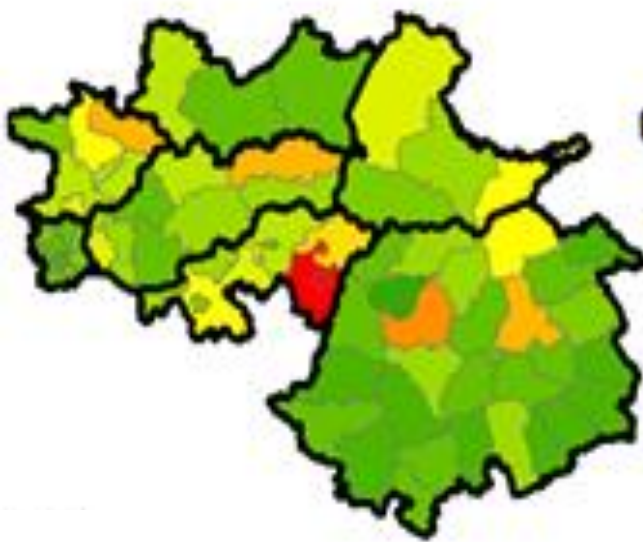
1990/1995



1995/2000



2000/2005



2005/2010



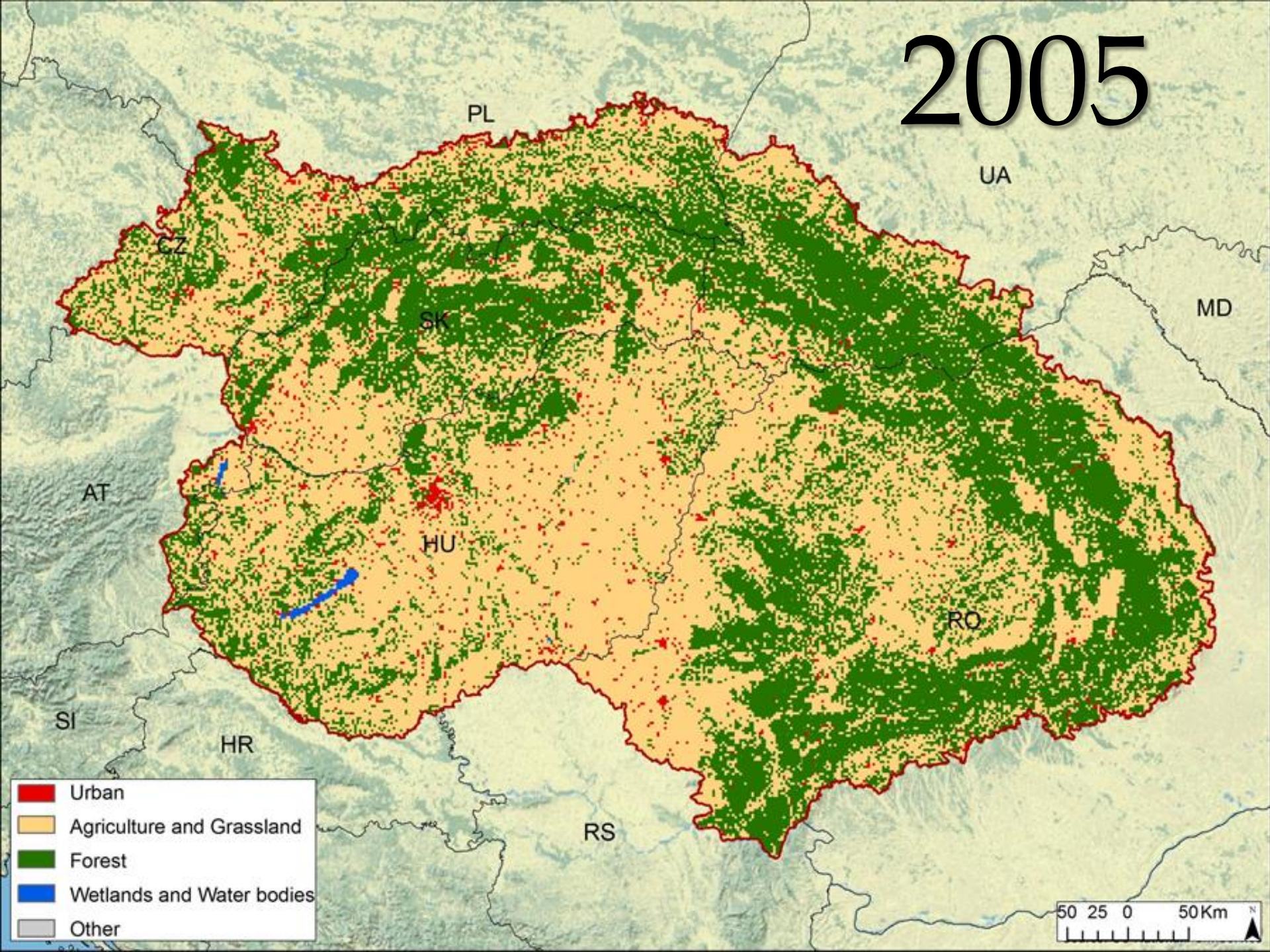
 Country boundaries

Annual disturbance rate [%]





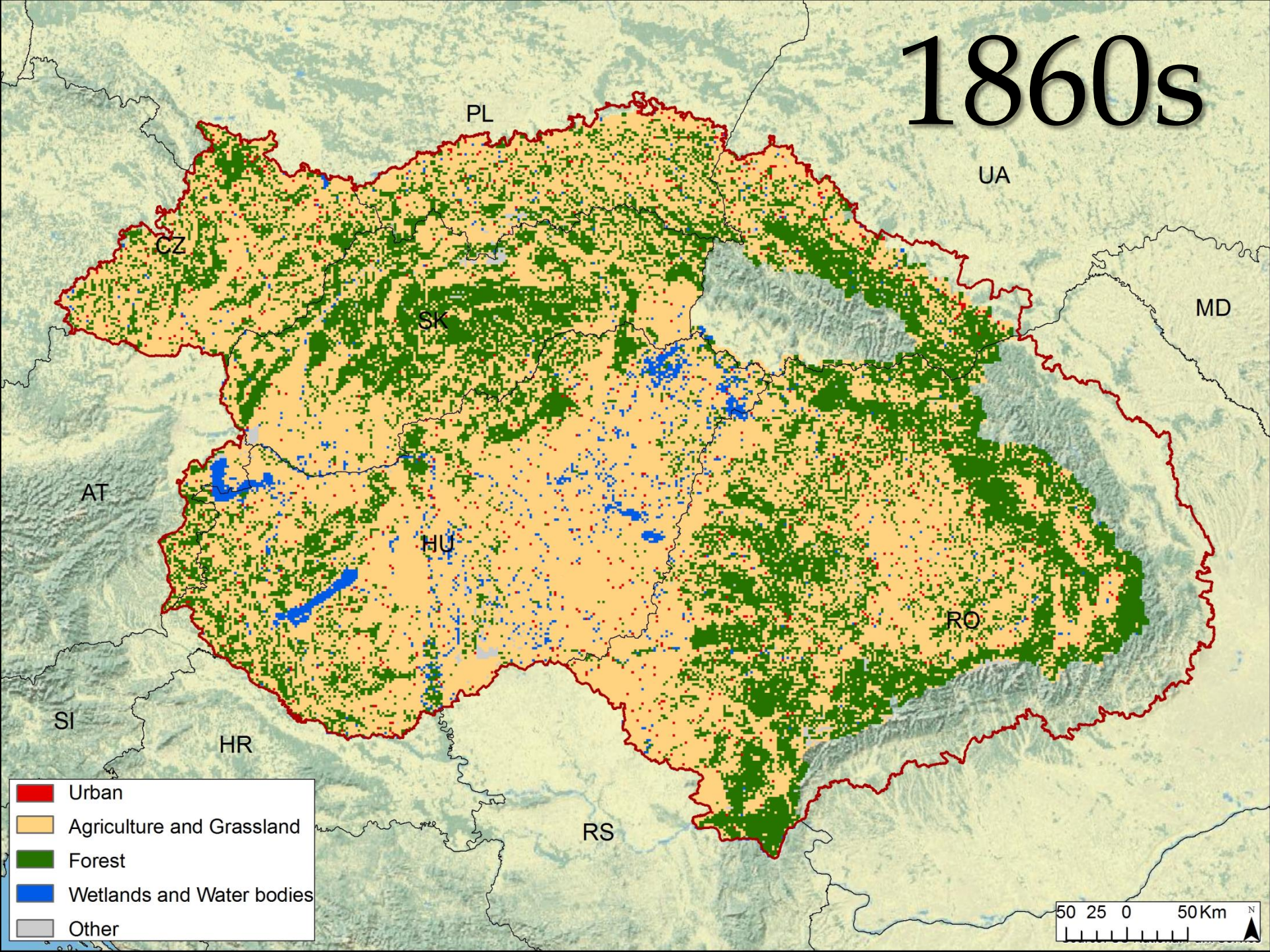
2005



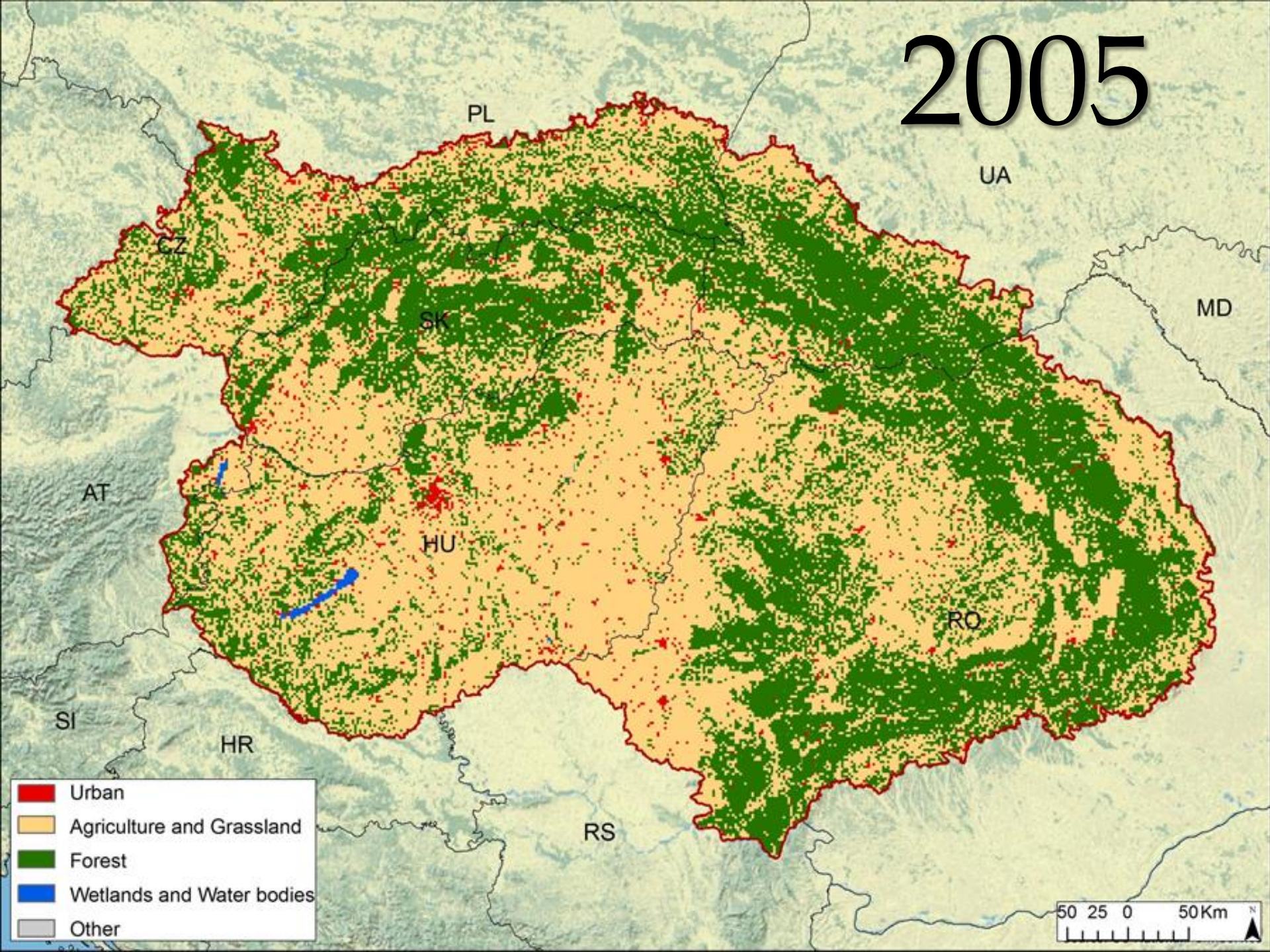
- Urban
- Agriculture and Grassland
- Forest
- Wetlands and Water bodies
- Other



1860s



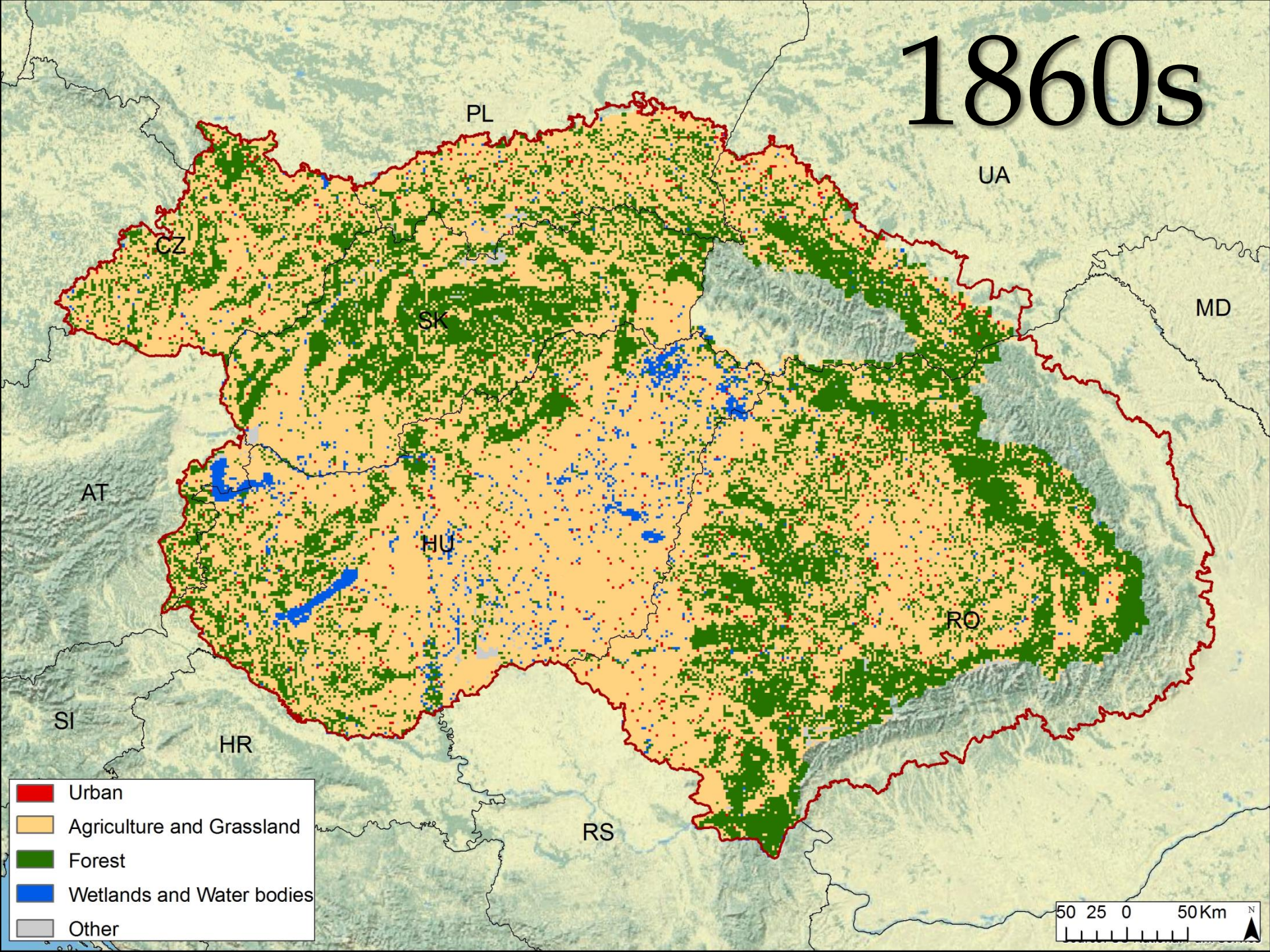
2005



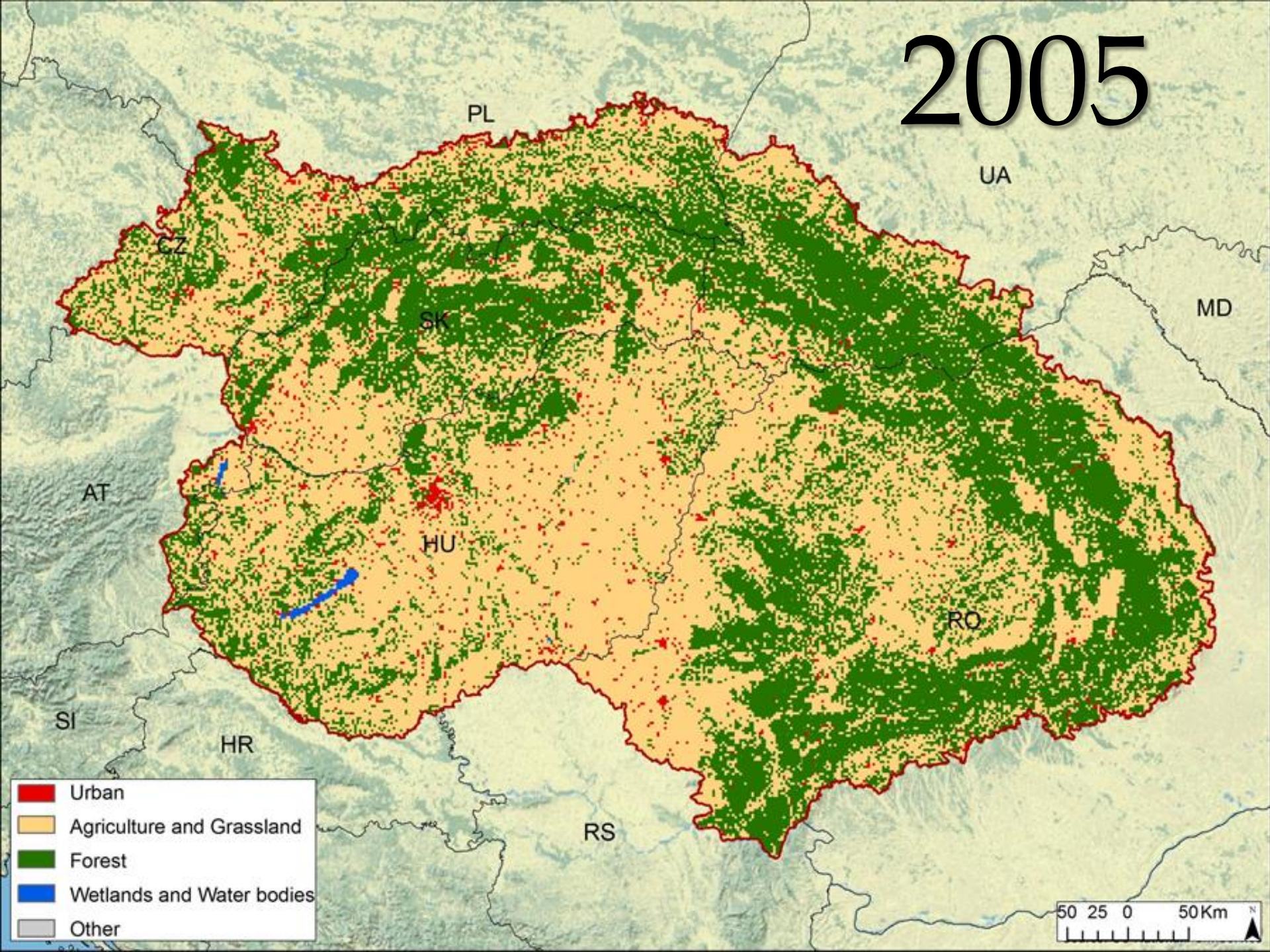
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1860s

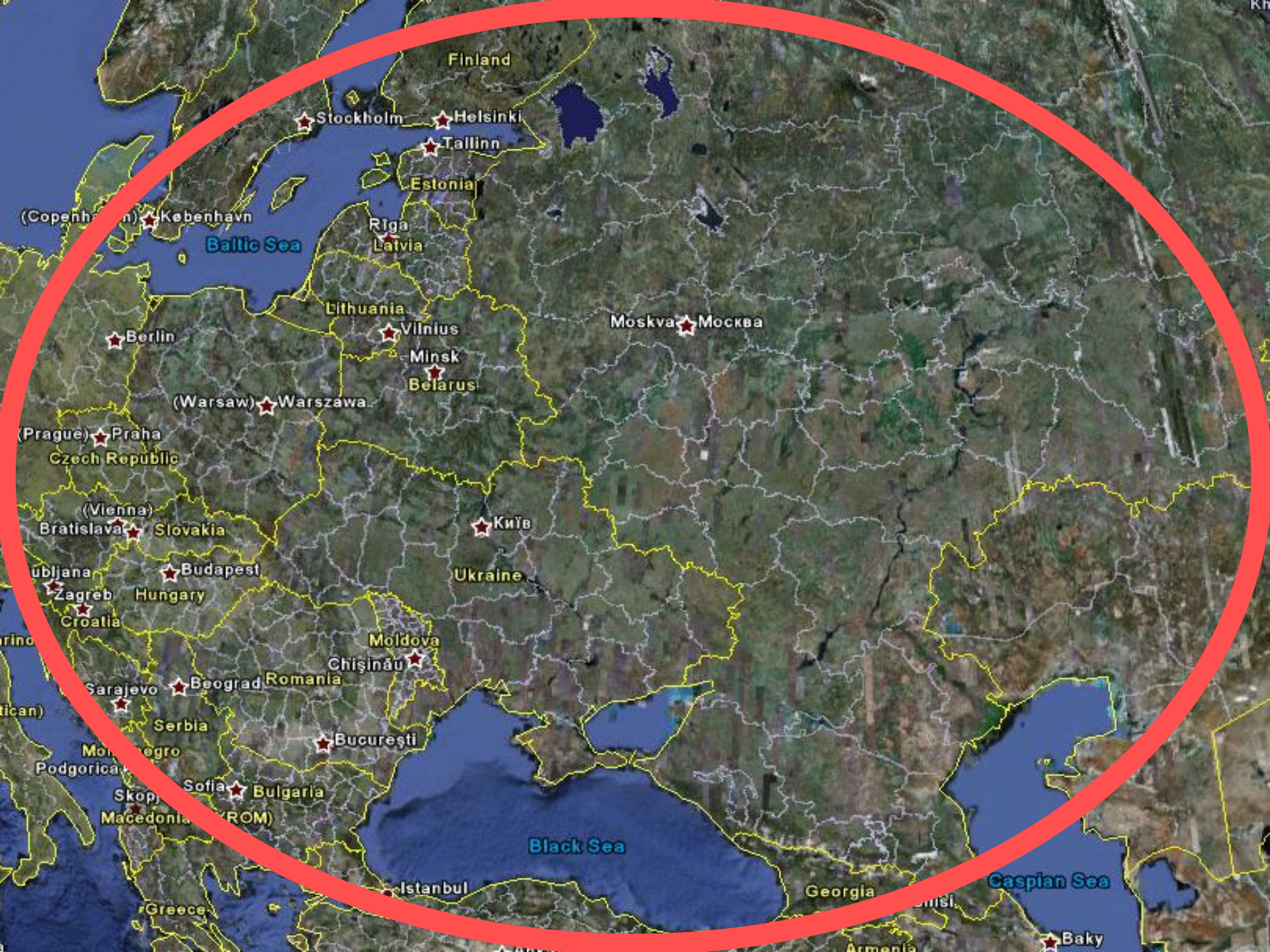


2005



- Urban
- Agriculture and Grassland
- Forest
- Wetlands and Water bodies
- Other





Finland

Stockholm

Helsinki

Tallinn

Estonia

Riga

Latvia

Baltic Sea

Lithuania

Vilnius

Moskva

Москва

Minsk

Belarus

(Warsaw) Warszawa

Berlin

(Prague) Praha

Czech Republic

(Vienna)

Bratislava

Slovakia

Київ

Ukraine

Budapest

Hungary

Ljubljana

Zagreb

Croatia

Moldova

Chişinău

Romania

Sarajevo

Beograd

Serbia

Bucureşti

Sofia

Bulgaria

Podgorica

Skopje

Macedonia (ROM)

Black Sea

Istanbul

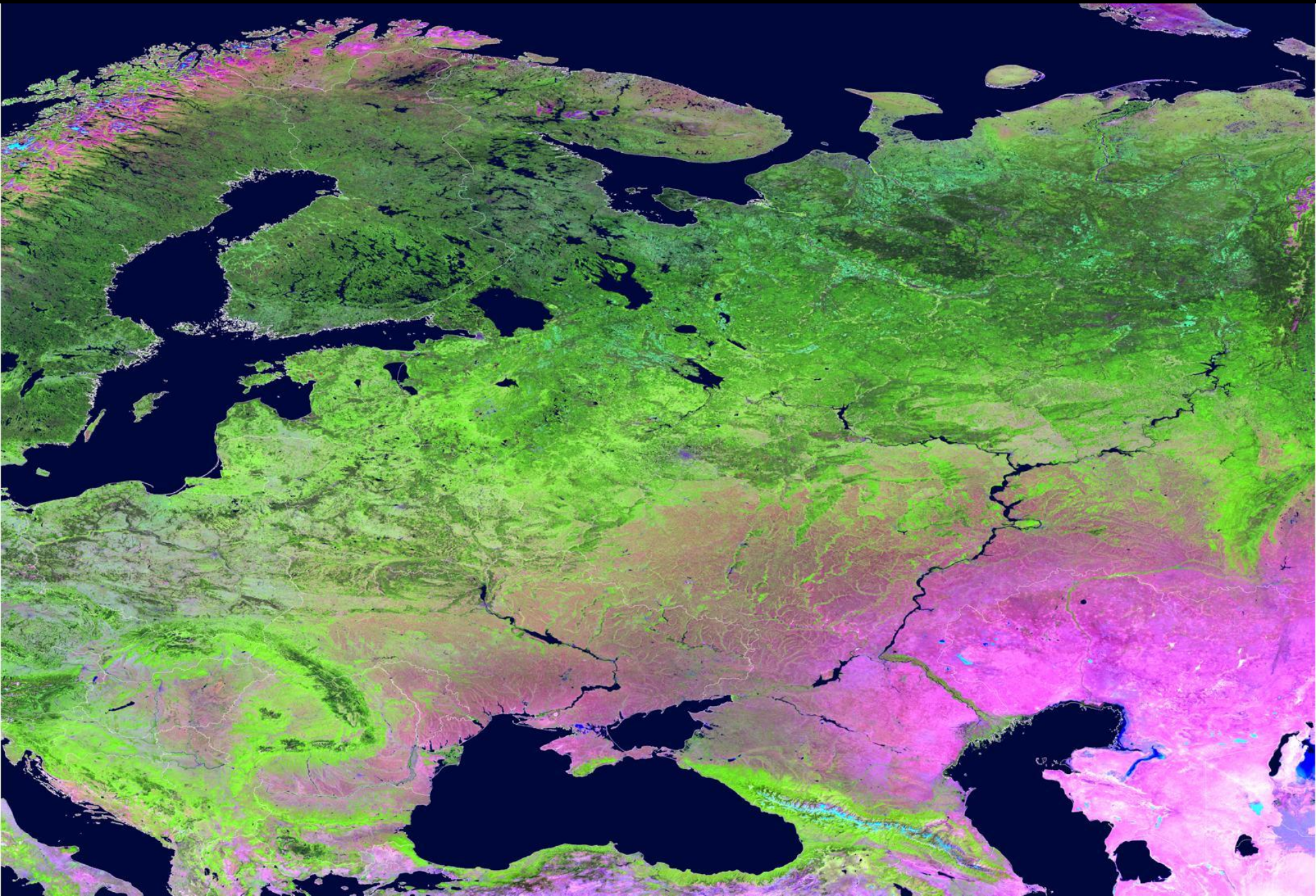
Georgia

Caspian Sea

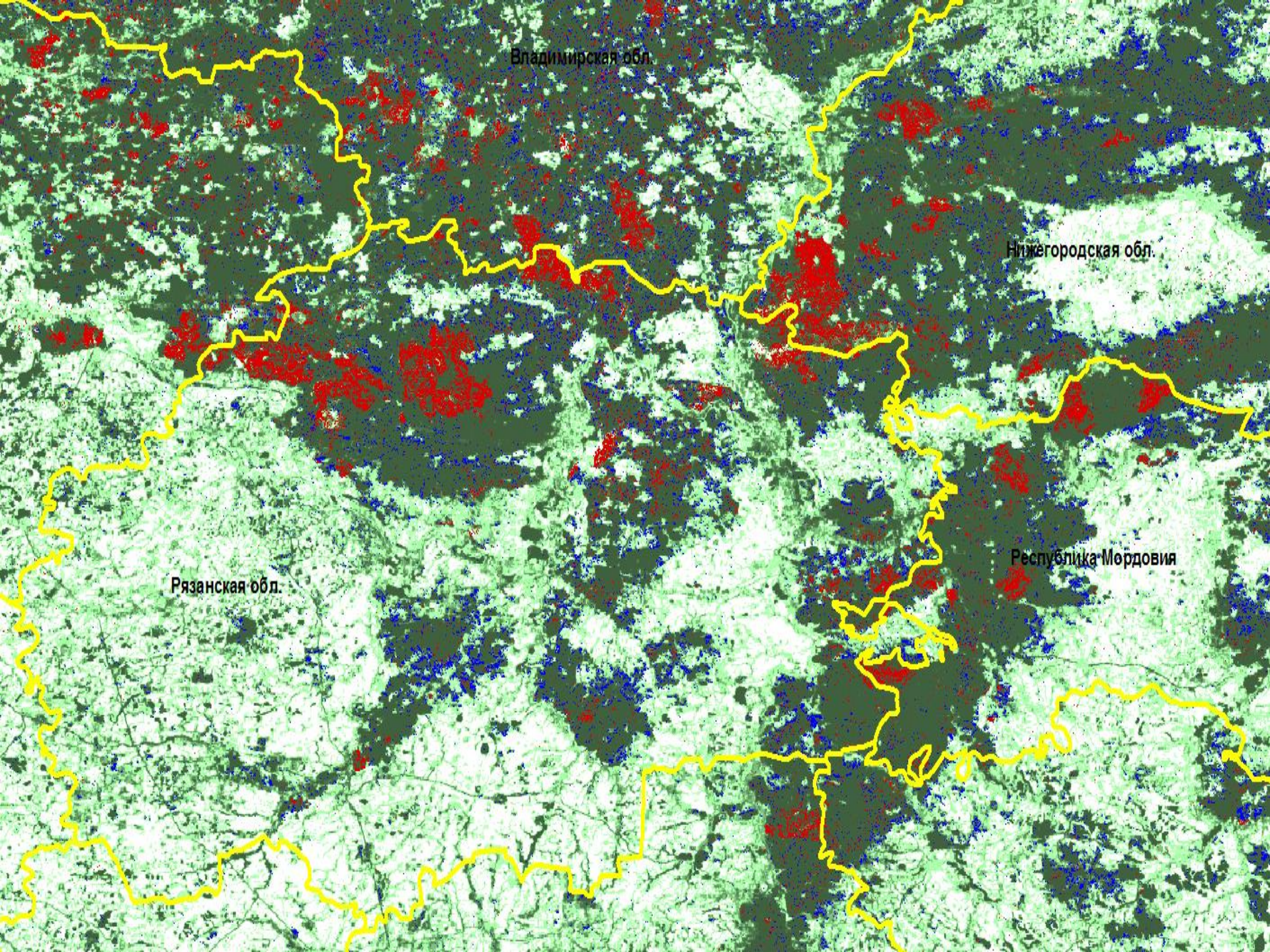
Greece

Armenia

Baky





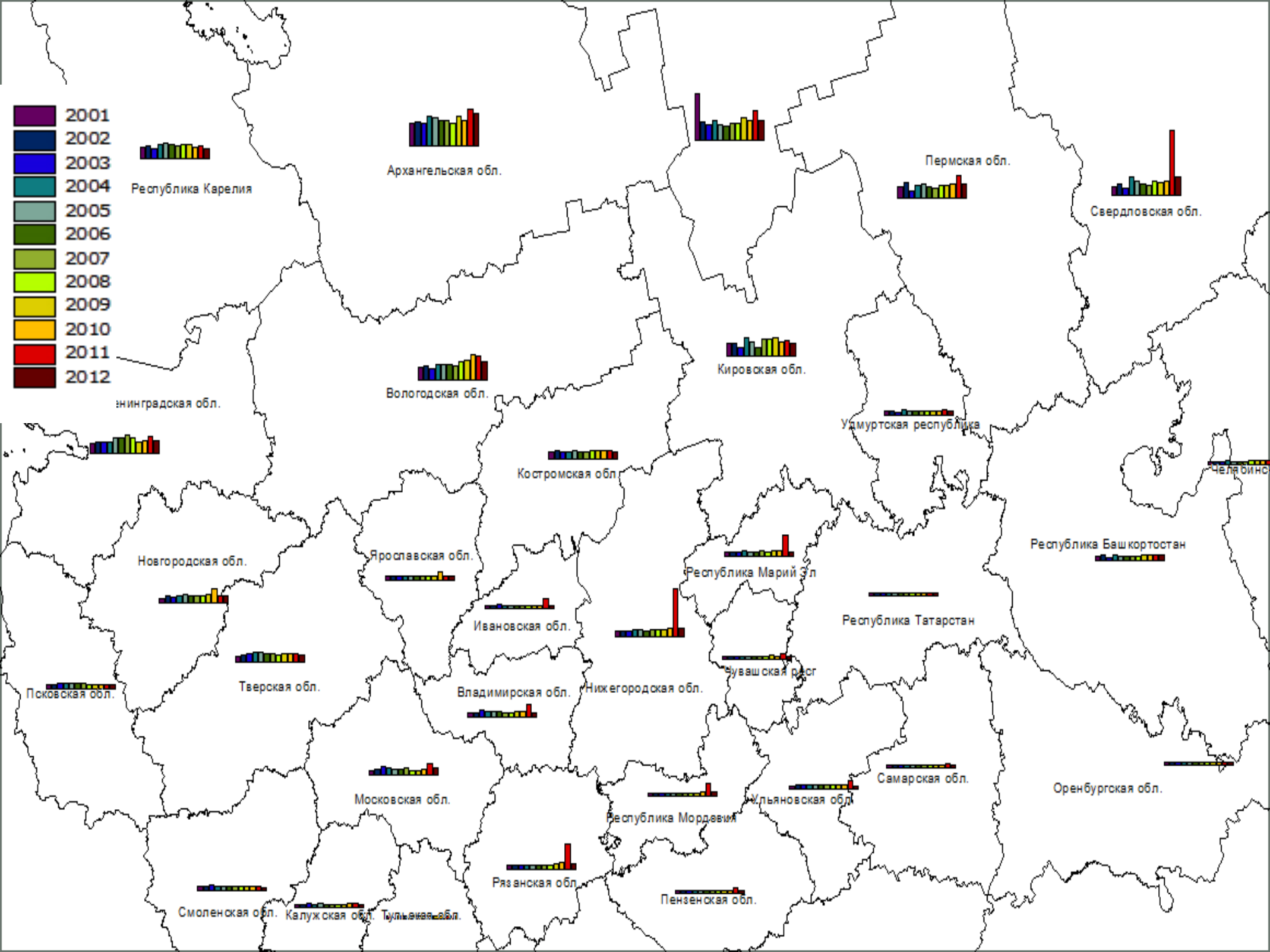


Владимирская обл.

Нижегородская обл.

Рязанская обл.

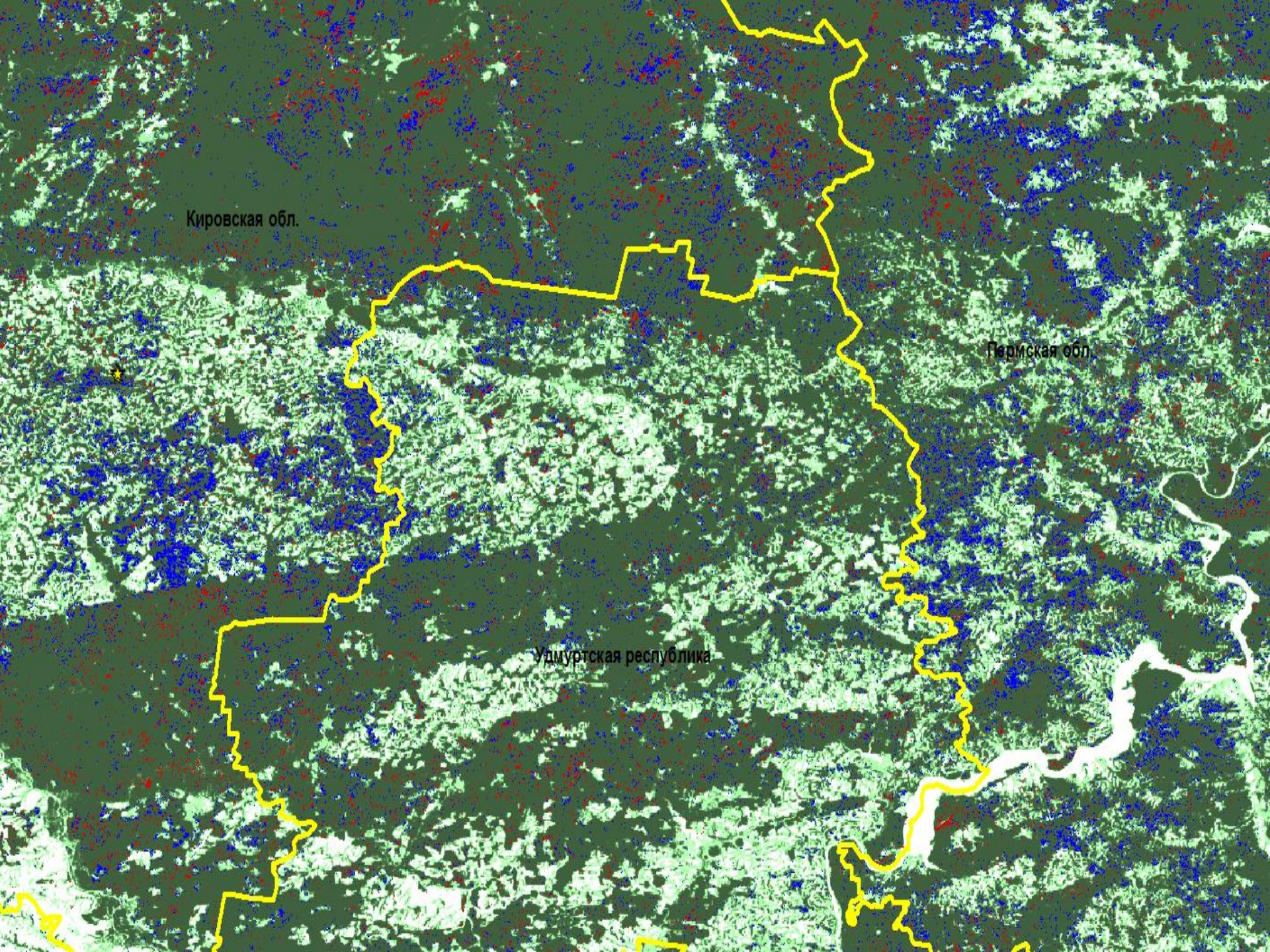
Республика Мордовия

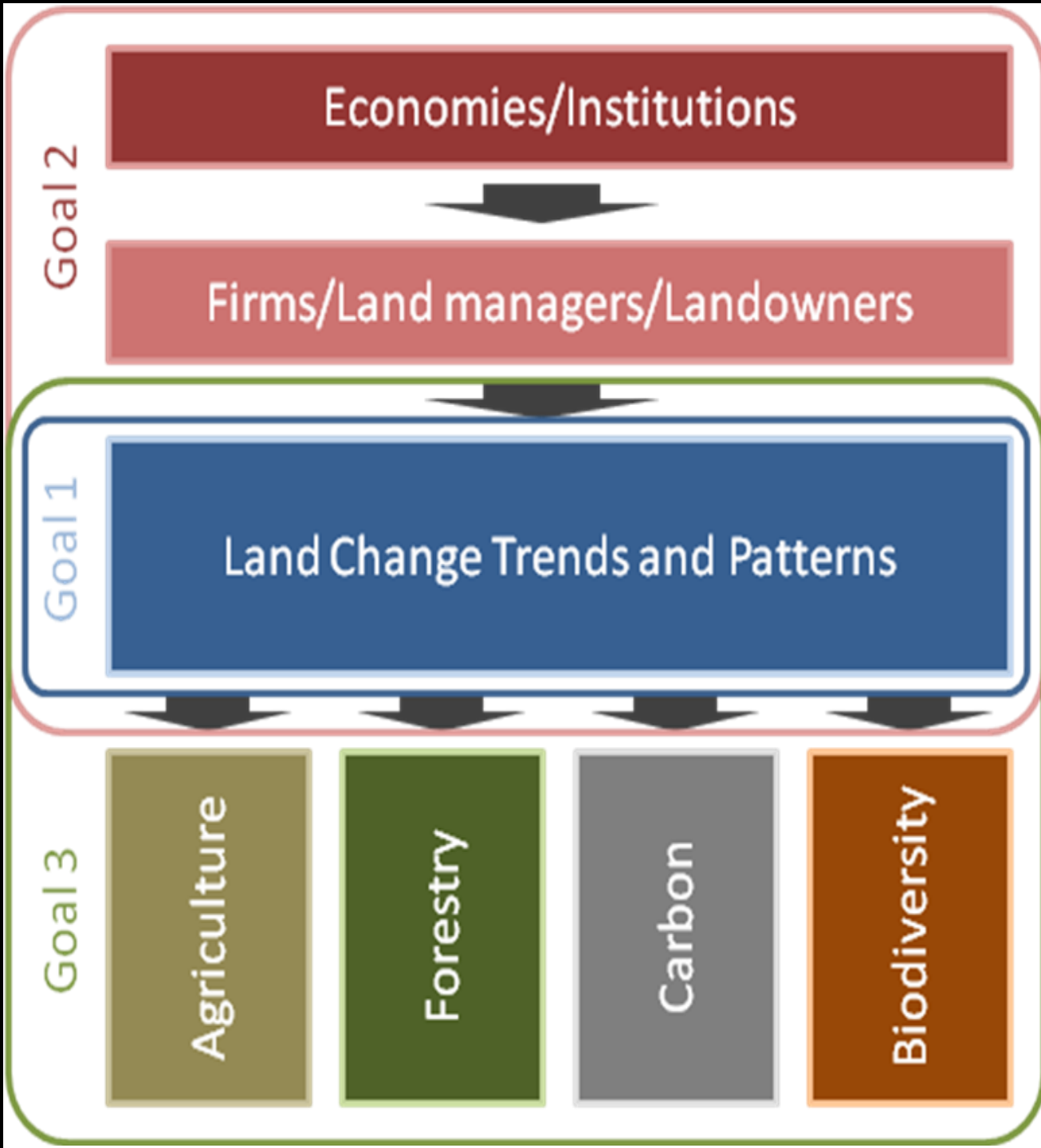


Кировская обл.

Пермская обл.

Удмуртская республика





Goal 2

Economies/Institutions

Firms/Land managers/Landowners

Goal 1

Land Change Trends and Patterns

Goal 3

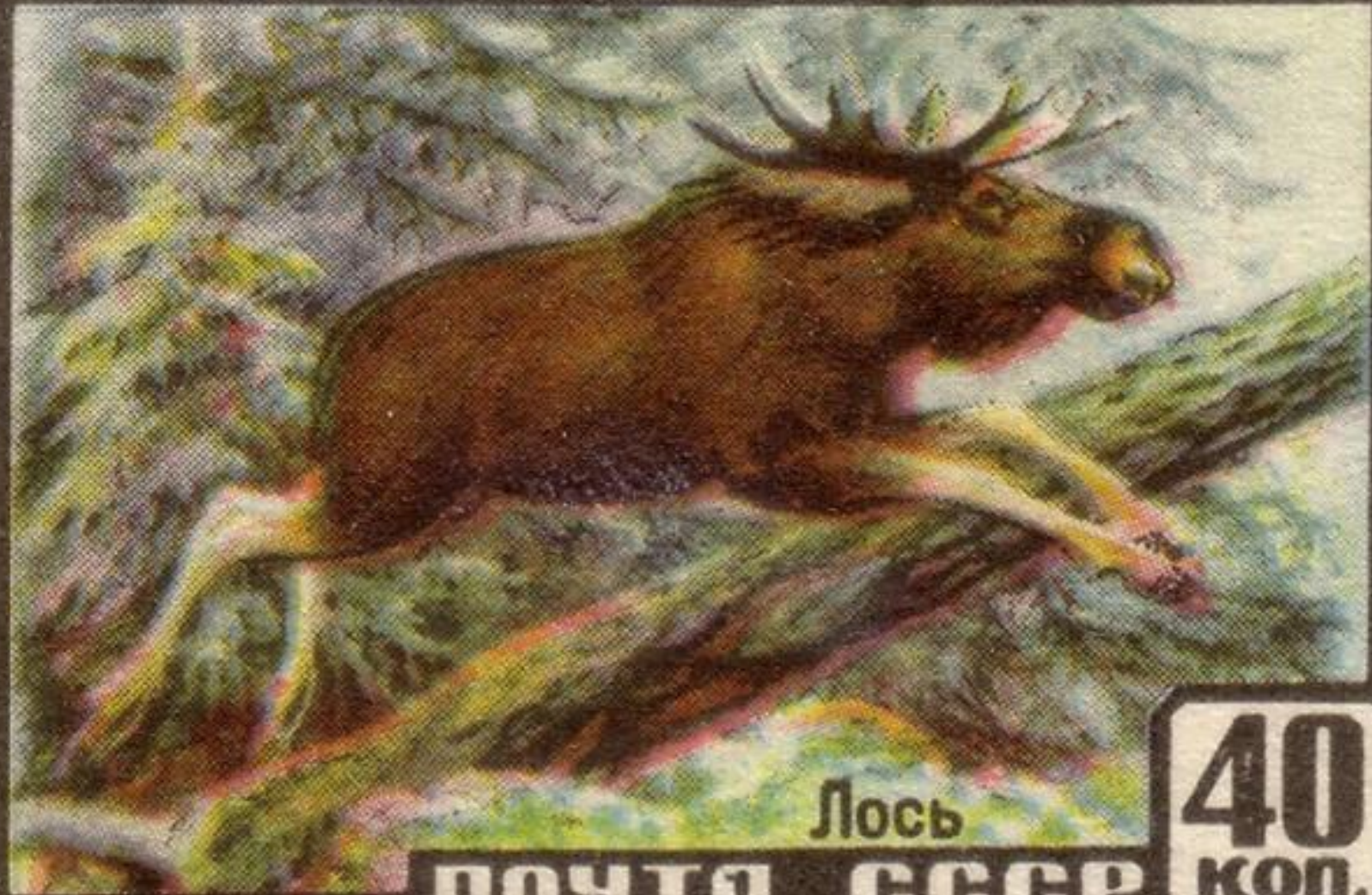
Agriculture

Forestry

Carbon

Biodiversity

ОХРАНЯЙТЕ ПОЛЕЗНЫХ ЖИВОТНЫХ



Лось

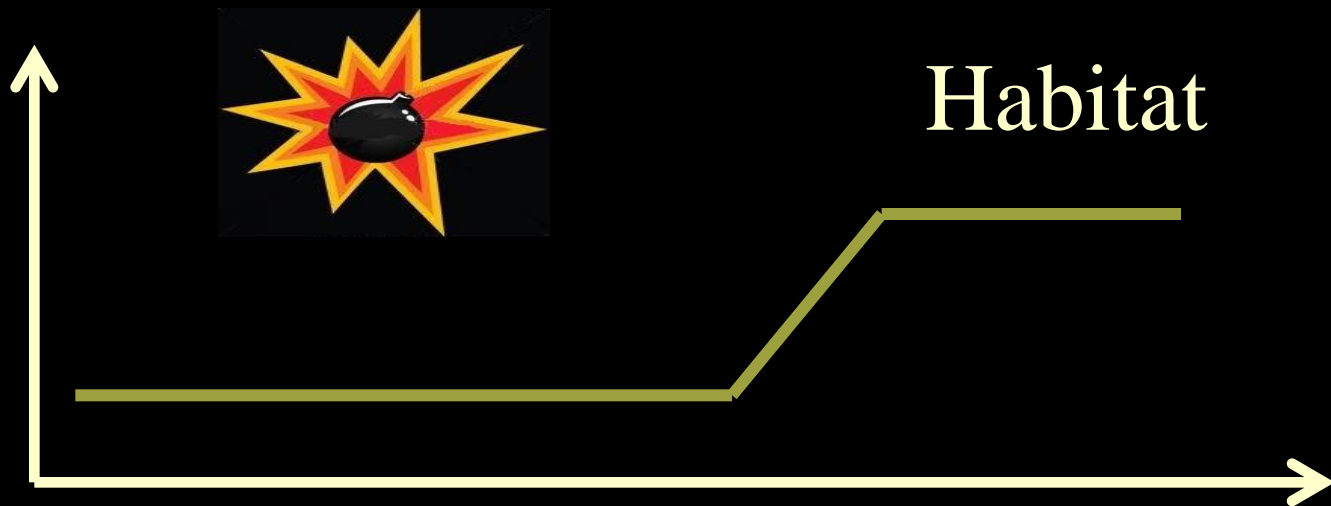
ПОЧТА СССР

40
КОП.

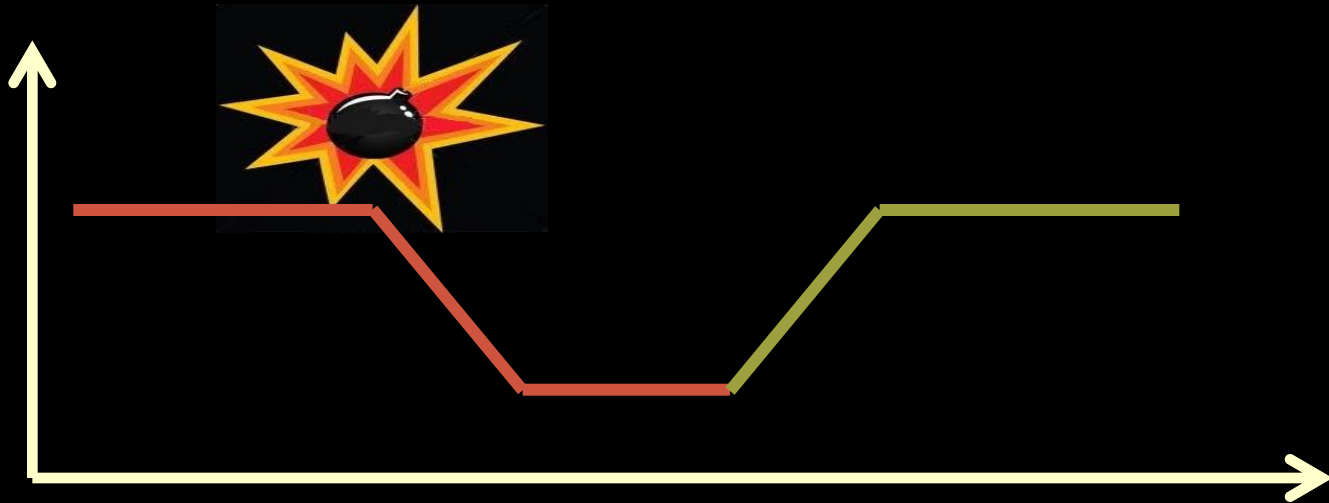
Shocks and large mammals

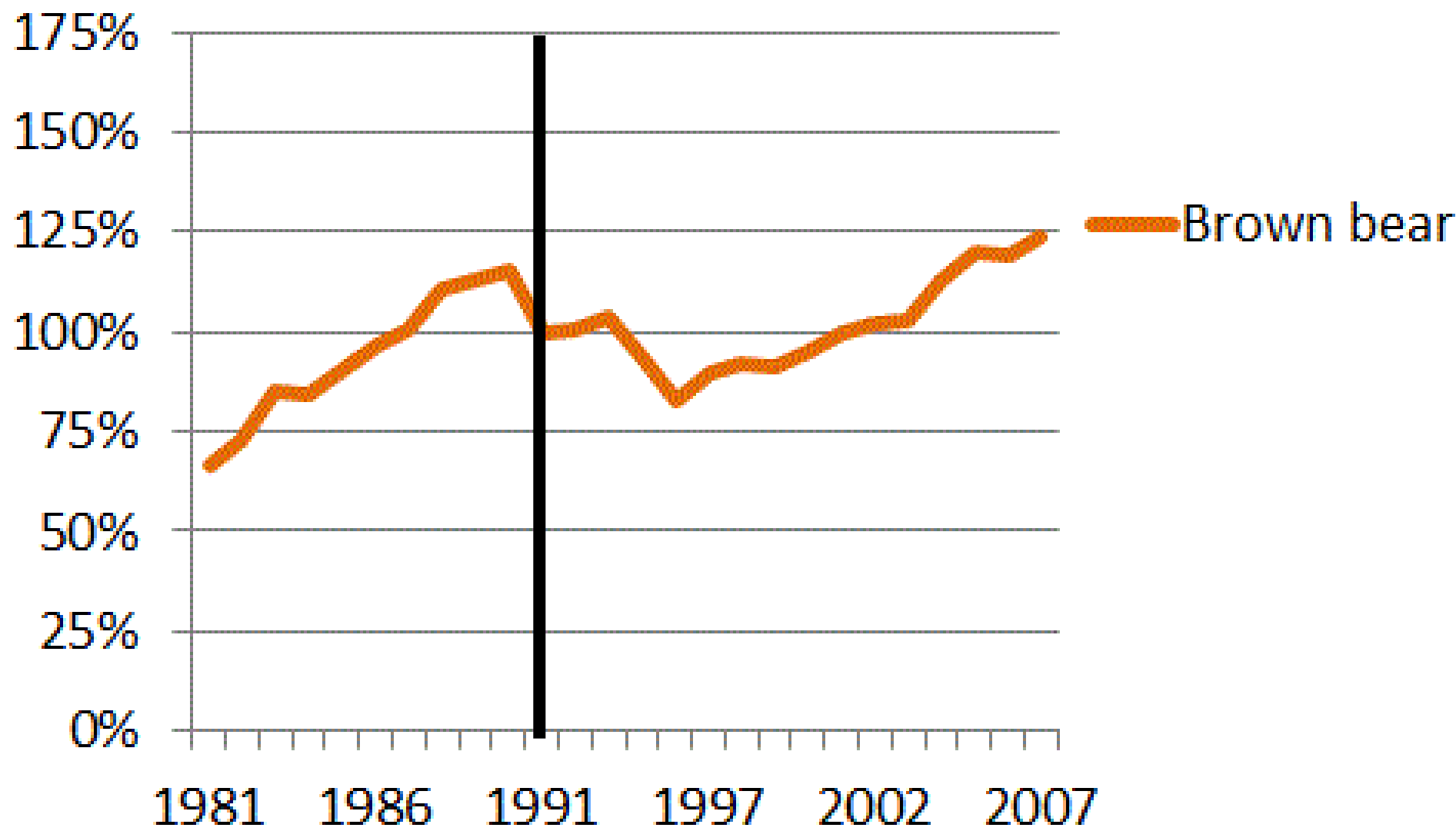


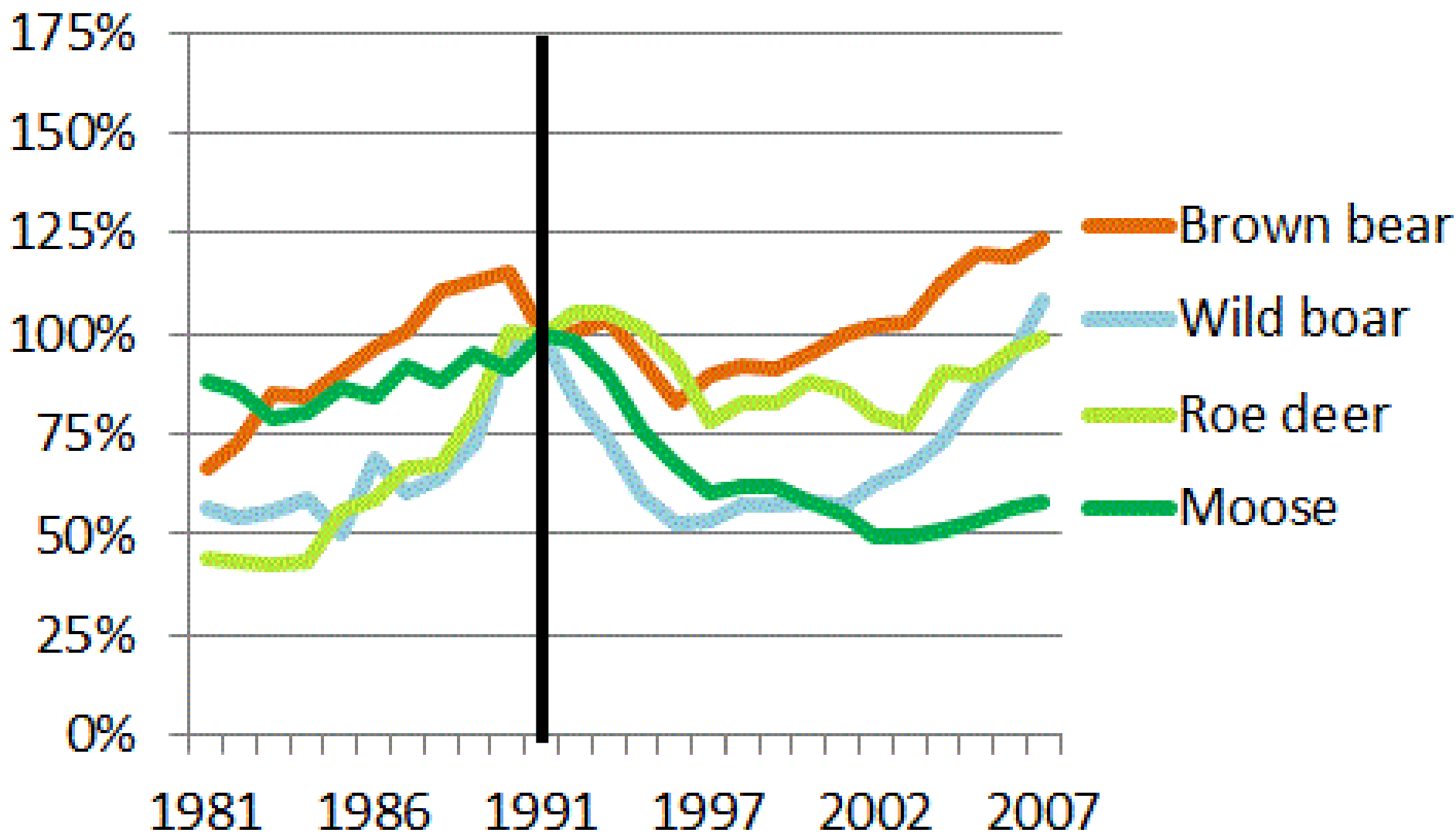
Shocks and large mammals

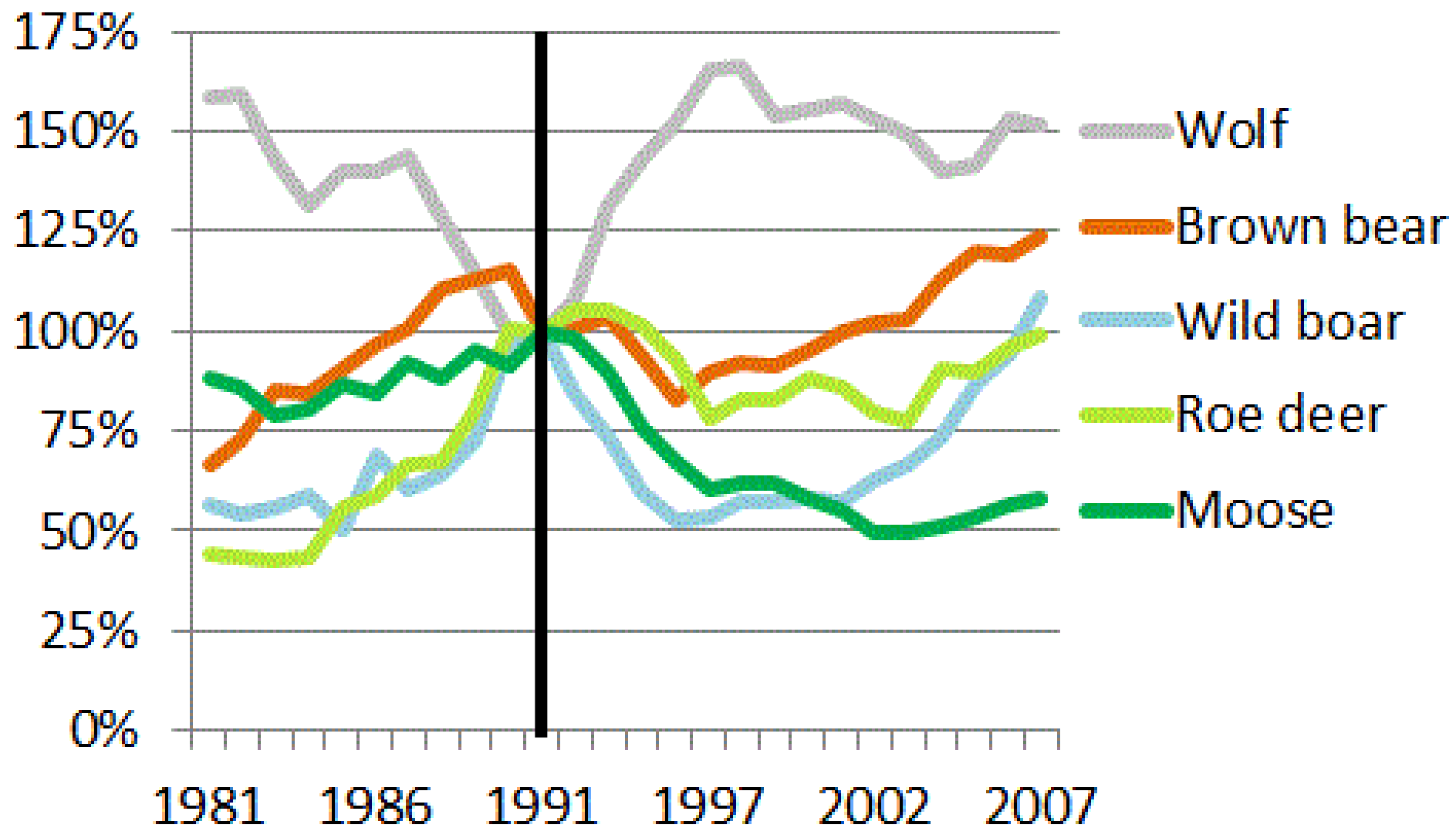


Shocks and large mammals




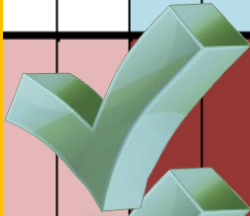









Summary

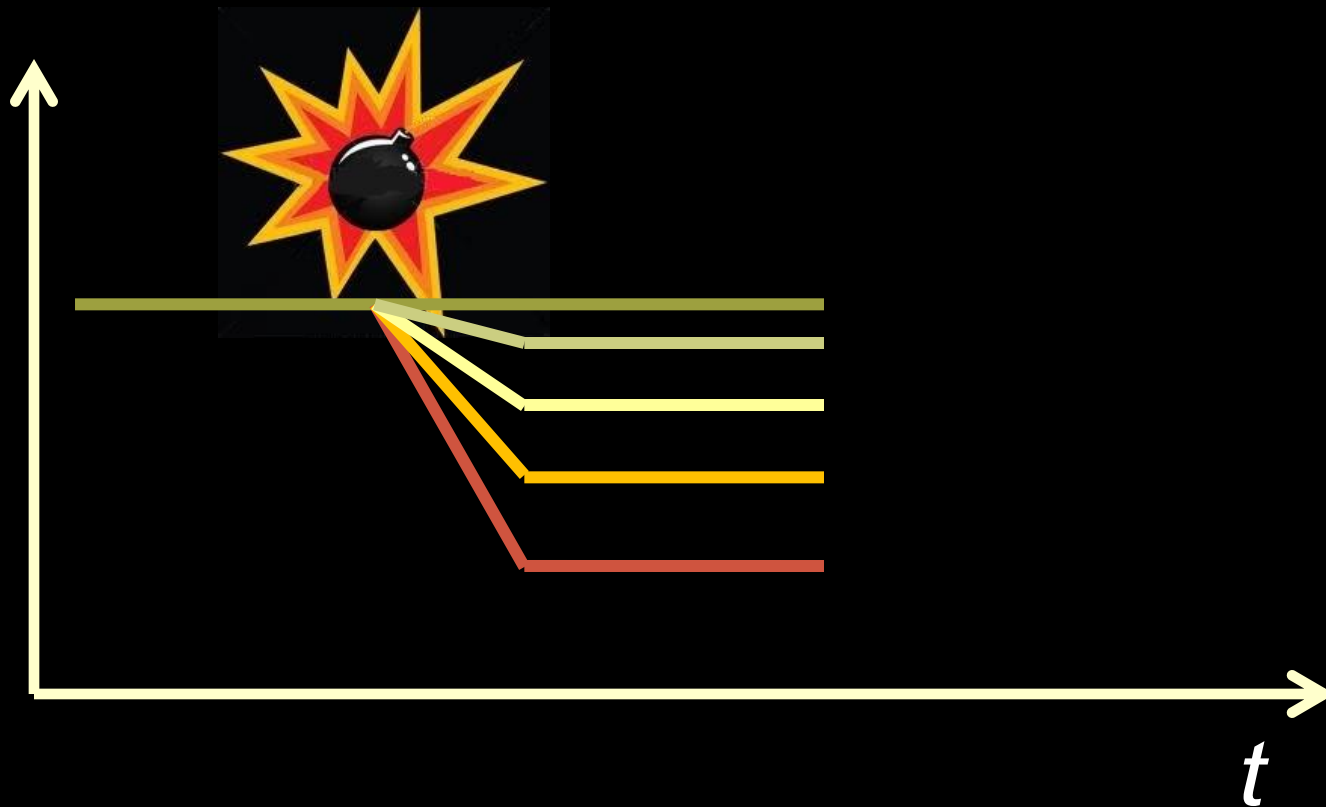
	Task	Lead Co-I(s)	Year 1				Year 2				Year 3			
Goal 1	Wall-to-wall Landsat mapping	Potapov												
	Dense Landsat time stacks	Radeloff, Aronson												
Goal 2	Economic and policy analyses	Alix-Garcia, PhD student												
	Institutional and legacies analyses	Gehlbach, PhD student												
Goal 3:	Carbon analysis	Woodcock, Oloffson												
	Agricultural analysis	Ozdogan, Culbert, Kuemmerle,												
	Forest analysis	Radeloff, Potapov												
	Biodiversity analyses	Pidgeon, Bragina, Kuemmerle												

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Goal 3:	Carbon analysis	Woodcock, Oloffson			
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	Forest analysis	Radeloff, Potapov			
	Biodiversity analyses	Pidgeon, Bragina, Kuemmerle			

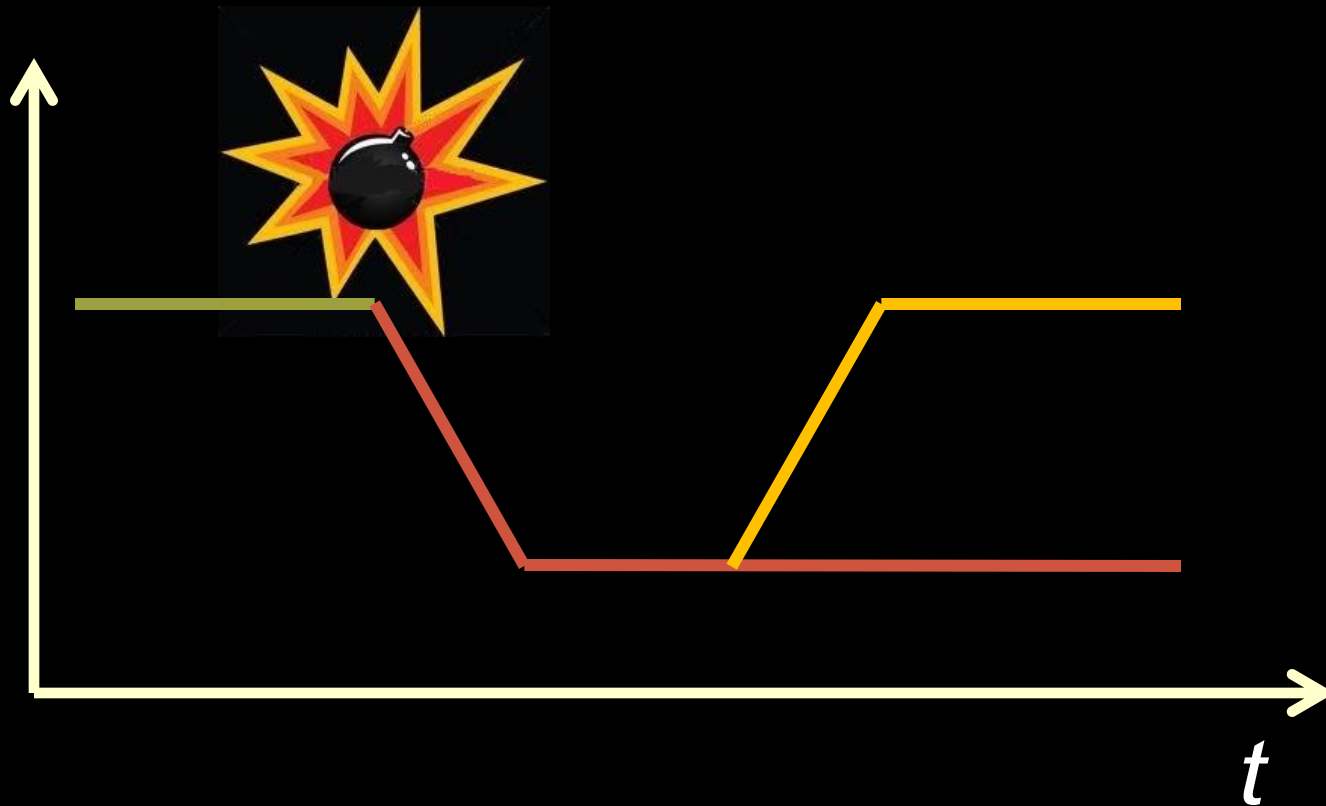


Questions or suggestions?

Effects of shocks

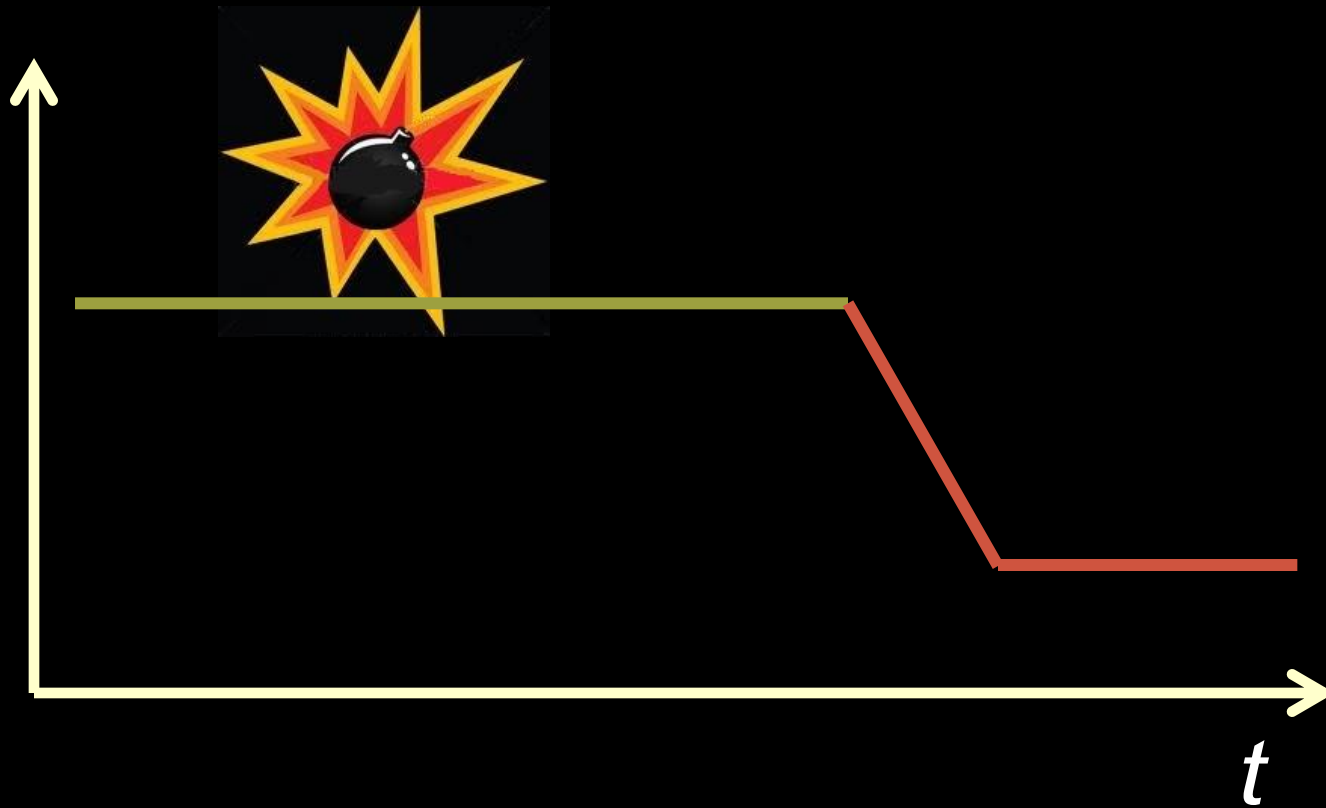


Effects of shocks



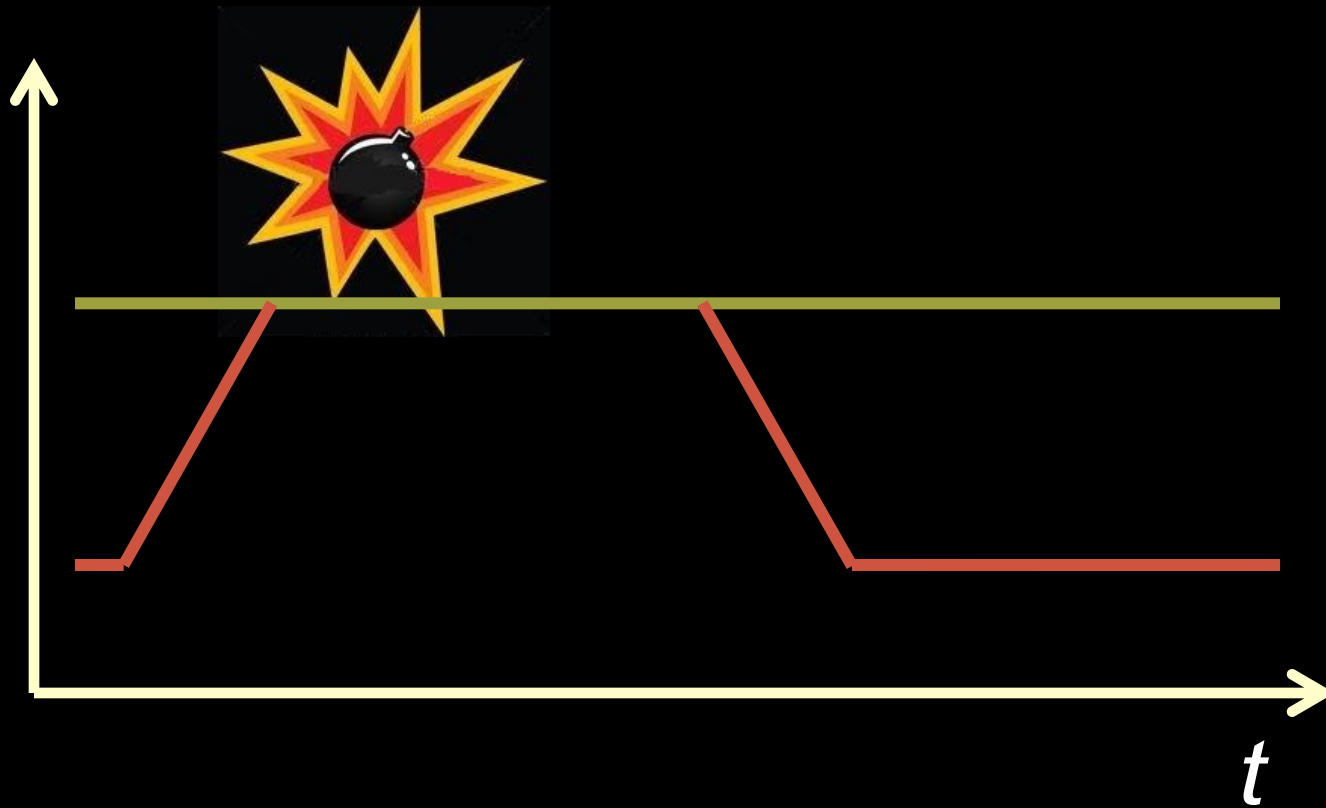
1. Multiple stable states

Effects of shocks



2. Lags

Effects of shocks



3. Legacies ?

Goal

Understand the effects
of socioeconomic shocks
on land use
and land cover change



Thank you!!!



