



# Land cover mapping in Europe and Hungary 1990-2006



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# CORINE Land Cover (CLC)

Coordination of Information on the Environment



- The project was initiated by the EU in the 80ies
- Coordinated by the EEA (European Environmental Agency)
- Aims at covering the geographical Europe – started in 1998 with 28 countries and on 4.4 million km<sup>2</sup>



## ■ Objectives

- quantitative, reliable and comparable land cover map of Europe to
  - provide detailed information on land cover and its changes
  - help forming a harmonised European environmental policy

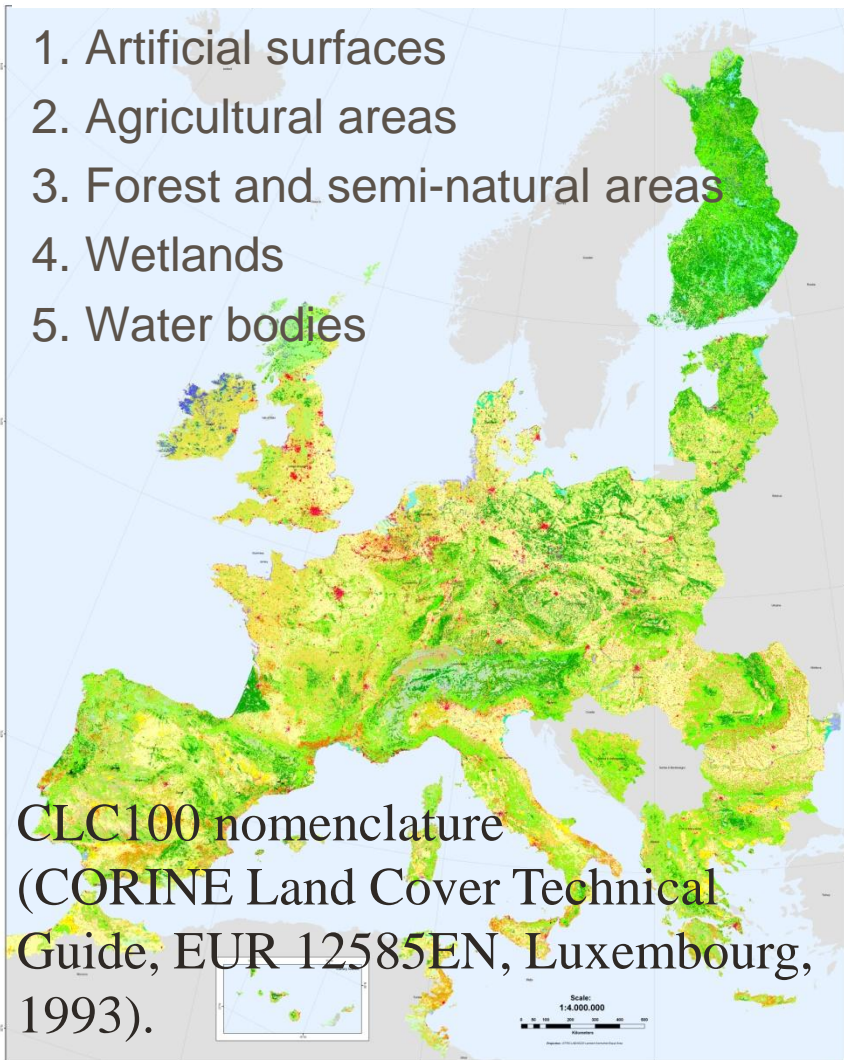
## ■ Applications

- modelling of environmental processes
- regional planning
- landscape management
- rural development

# CLC1990 – 3 levels

1. Artificial surfaces
2. Agricultural areas
3. Forest and semi-natural areas
4. Wetlands
5. Water bodies

CLC100 nomenclature  
(CORINE Land Cover Technical  
Guide, EUR 12585EN, Luxembourg,  
1993).



## Corine land cover classes



### 1. Artificial surfaces

#### 1.1 Urban fabric

- 1.1.1. Continuous urban fabric
- 1.1.2. Discontinuous urban fabric

#### 1.2 Industrial, commercial and transport units

- 1.2.1. Industrial or commercial units
- 1.2.2. Road and rail networks and associated land
- 1.2.3. Port areas
- 1.2.4. Airports

#### 1.3 Mine, dump and construction sites

- 1.3.1. Mineral extraction sites
- 1.3.2. Dump sites
- 1.3.3. Construction sites

#### 1.4 Artificial, non-agricultural vegetated areas

- 1.4.1. Green urban areas
- 1.4.2. Sport and leisure facilities

### 2. Agricultural areas

#### 2.1 Arable land

- 2.1.1. Non-irrigated arable land
- 2.1.2. Permanently irrigated land
- 2.1.3. Rice fields

#### 2.2 Permanent crops

- 2.2.1. Vineyards
- 2.2.2. Fruit trees and berry plantations
- 2.2.3. Olive groves

#### 2.3 Pastures

- 2.3.1. Pastures

#### 2.4 Heterogeneous agricultural areas

- 2.4.1. Annual crops associated with permanent crops
- 2.4.2. Complex cultivation patterns
- 2.4.3. Land principally occupied by agriculture
- 2.4.4. Agro-forestry areas

### 3. Forests and semi-natural area

#### 3.1 Forests

- 3.1.1. Broad-leaved forest
- 3.1.2. Coniferous forest
- 3.1.3. Mixed forest

#### 3.2 Shrub and/or herbaceous vegetation associations

- 3.2.1. Natural grassland
- 3.2.2. Moors and heathland
- 3.2.3. Sclerophyllous vegetation
- 3.2.4. Transitional woodland shrub

#### 3.3 Open spaces with little or no vegetation

- 3.3.1. Beaches, dunes, and sand plains
- 3.3.2. Bare rock
- 3.3.3. Sparsely vegetated areas
- 3.3.4. Burnt areas
- 3.3.5. Glaciers and perpetual snow

### 4. Wetlands

#### 4.1 Inland wetlands

- 4.1.1. Inland marshes
- 4.1.2. Peatbogs

#### 4.2 Coastal wetlands

- 4.2.1. Salt marshes
- 4.2.2. Salines
- 4.2.3. Intertidal flats

### 5. Water bodies

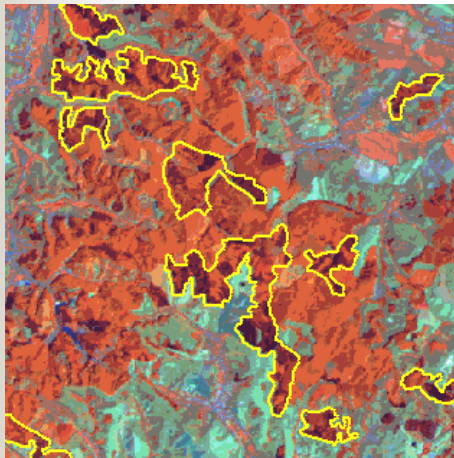
#### 5.1 Inland waters

- 5.1.1. Water courses
- 5.1.2. Water bodies

#### 5.2 Marine waters

- 5.2.1. Coastal lagoons
- 5.2.2. Estuaries
- 5.2.3. Sea and ocean

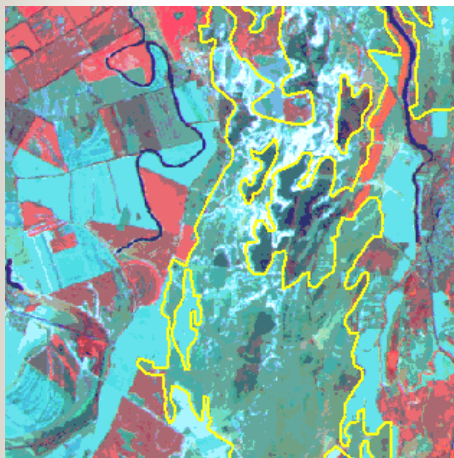
# CLC 100 - 3 hierarchical level European standard nomenclature



## ■ 3. Forest and semi-natural areas

### ■ 3.1. Forests

#### ■ 3.1.1. Broad-leaved forest

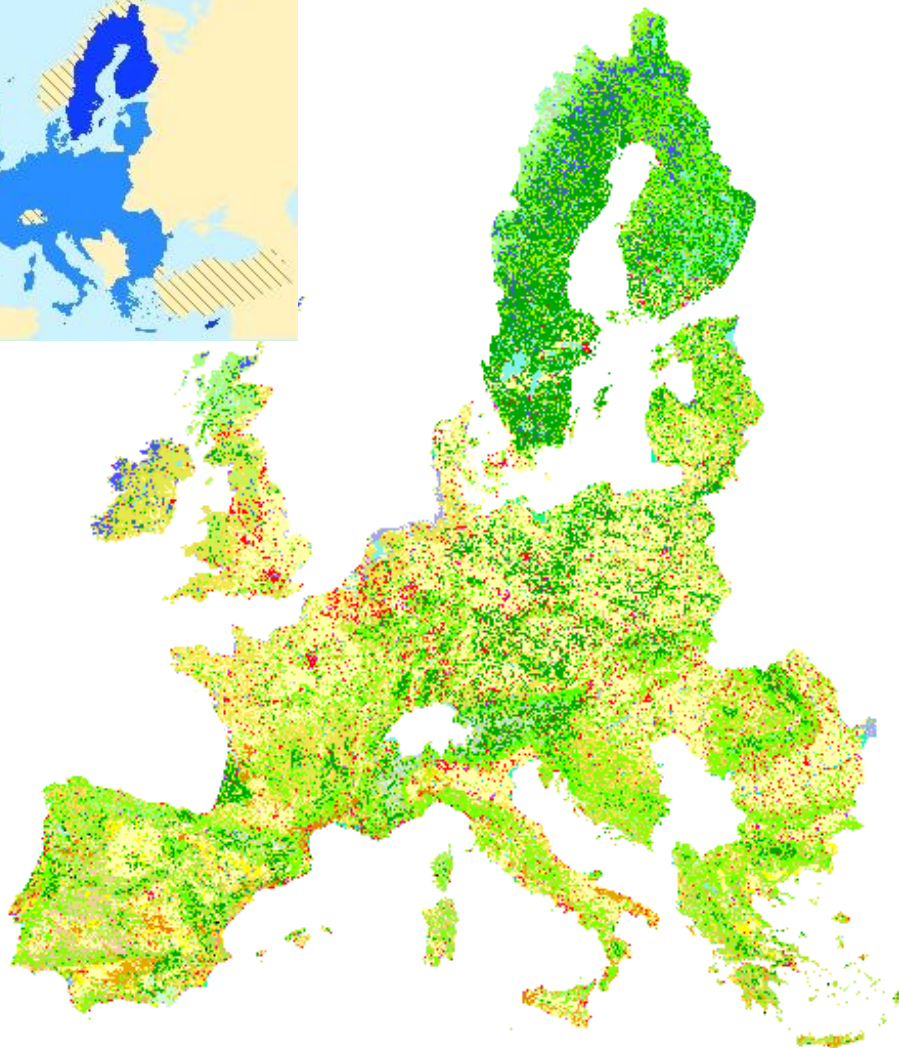


### ■ 3.2. Scrub and/or herbaceous vegetation associations

#### ■ 3.2.4. Transitional woodland-scrub

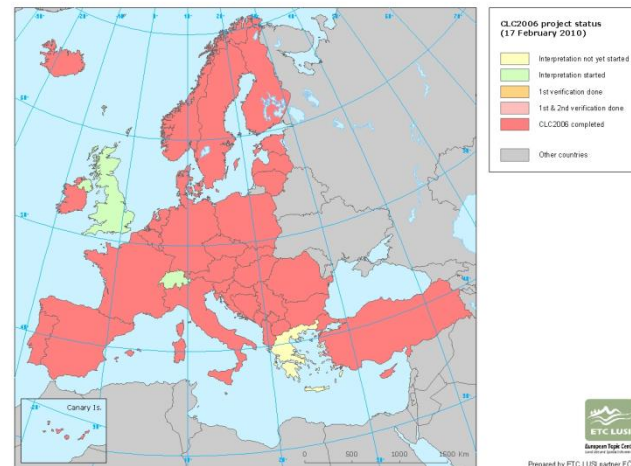
# CLC2000

## Change maps



# CLC2006

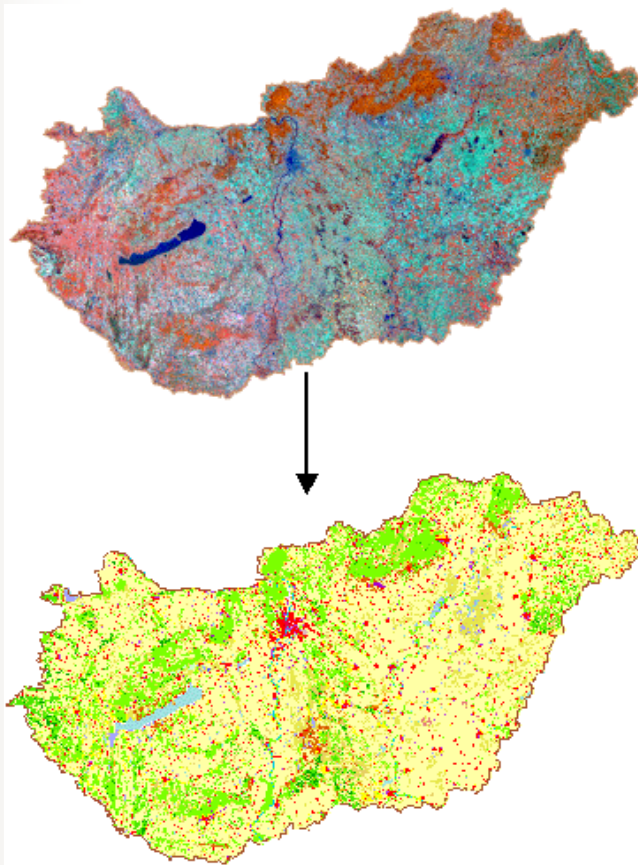
status 17/02/2010



Prepared by ETC LUSI partner FOM

# Hungarian land cover mapping

## 4/5 level CLC 50 – started in 1998

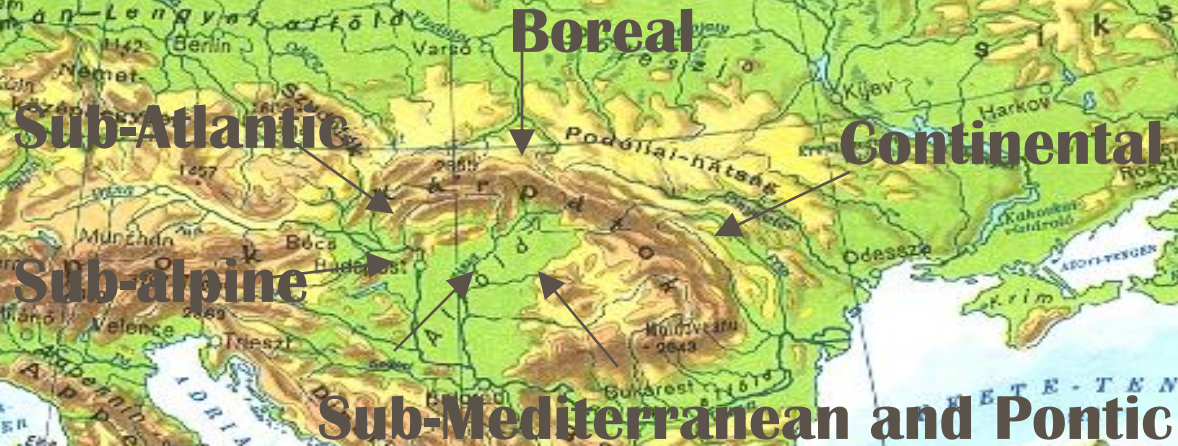


### Technical parameters:

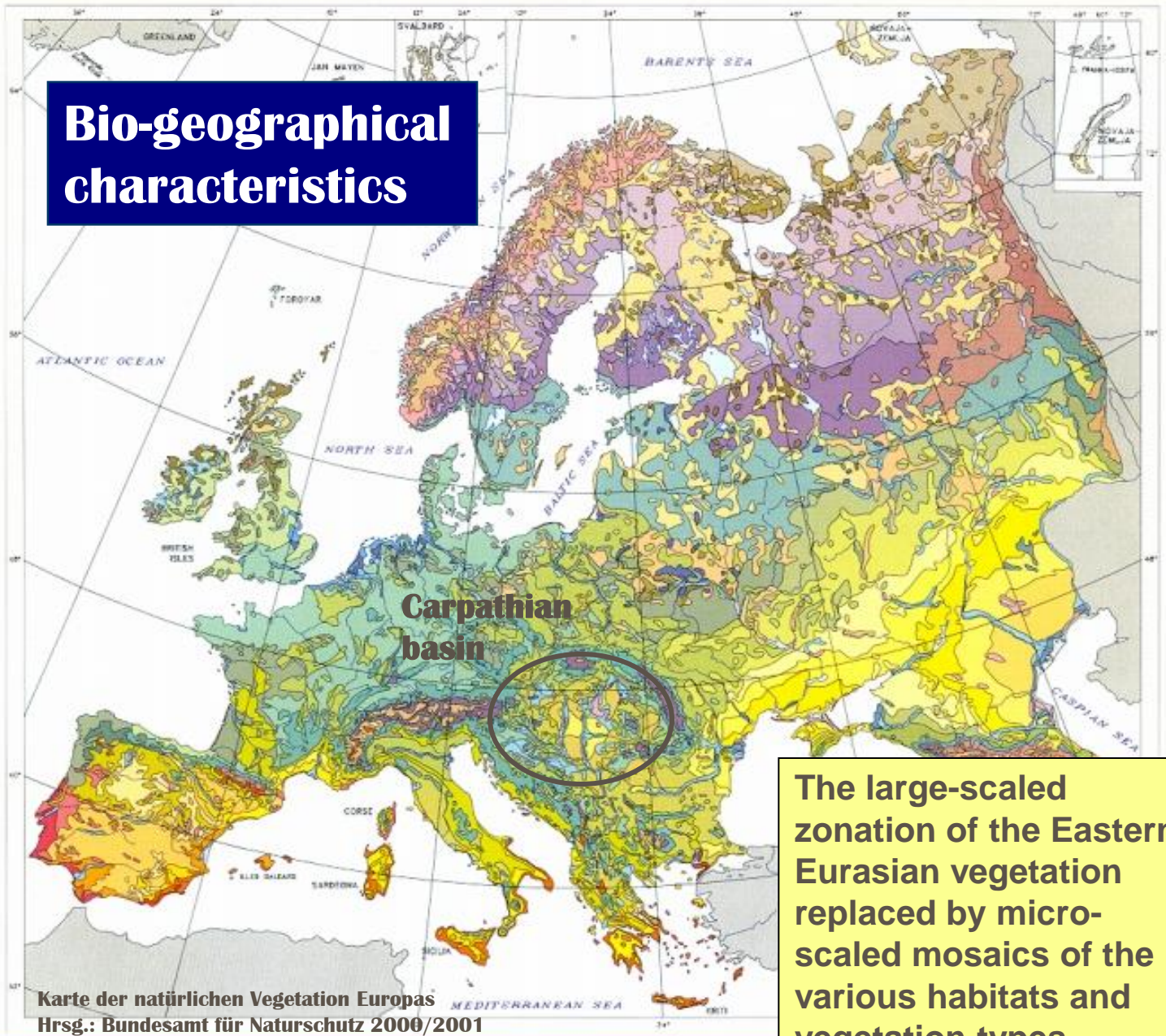
- Base data:  
Landsat TM imageries  
(1990-92)
- Visual  
photointerpretation
- Vector database

# Climatic effects and immigration of species

The Carpathian Basin is a unique meeting point and division zone of various climatic effects and bio-geographical areas.



## Bio-geographical characteristics





# CLC 100 – 50 parameters

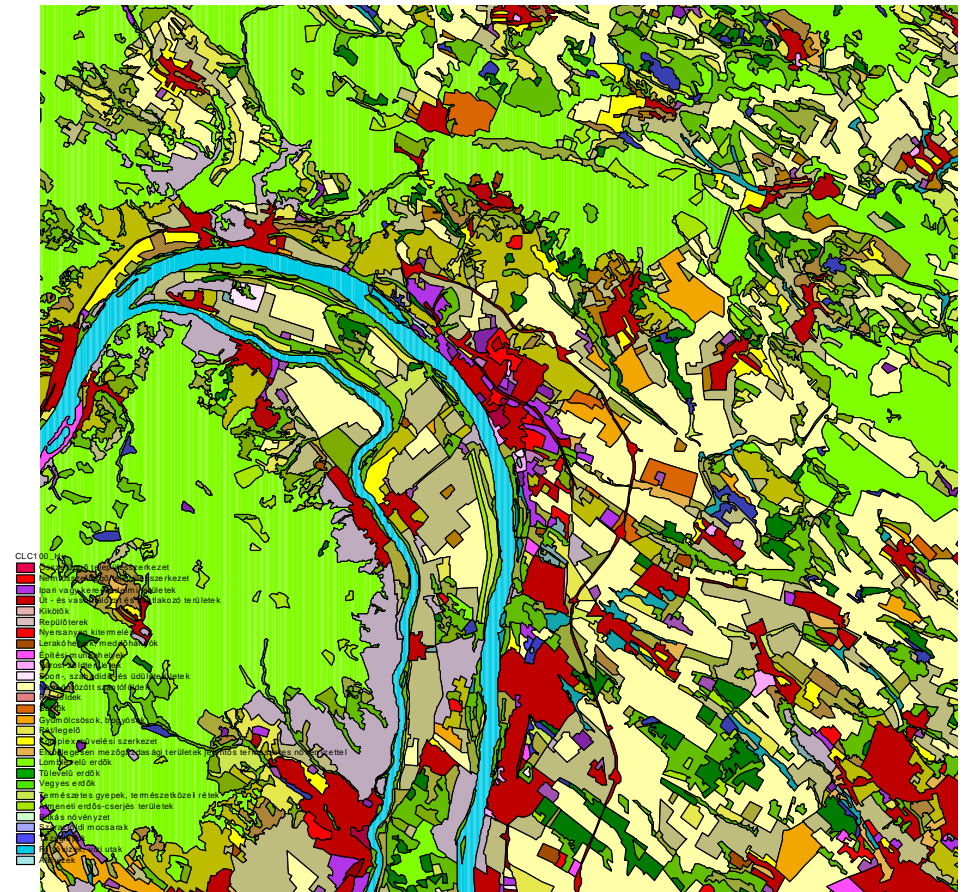
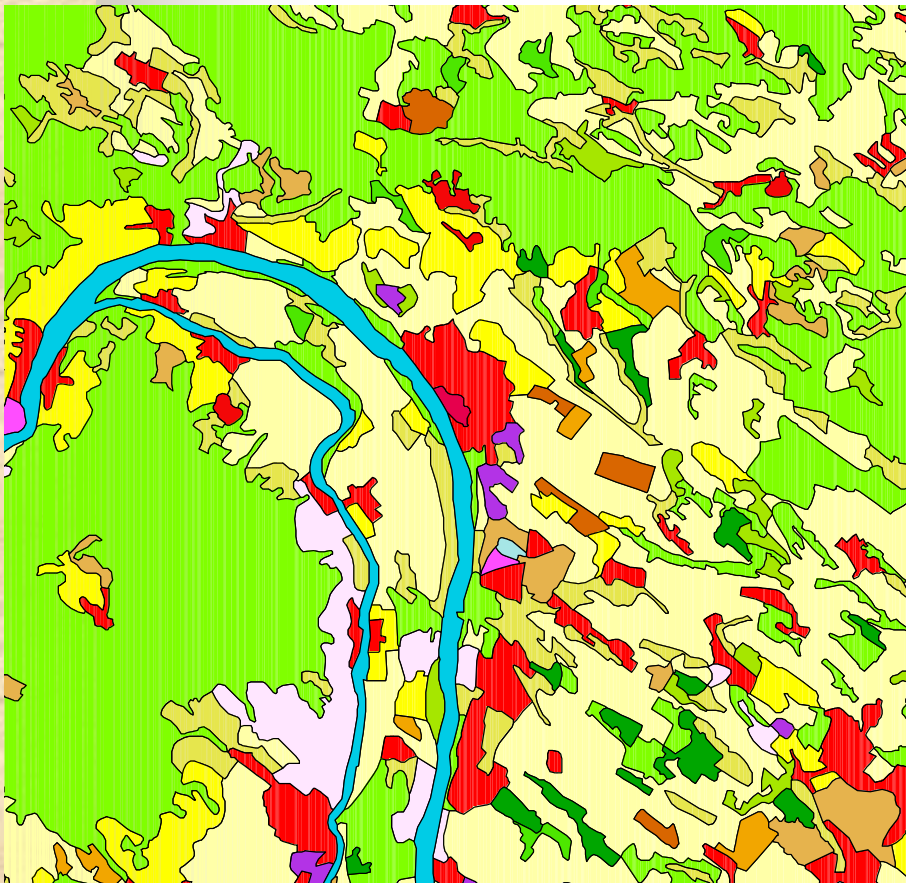
## CLC100

- 1 : 100 000
- Landsat TM
- 1990-92
- MMU: 25 ha
- Min. width: 100 m
- Polygon nr. 24.000
- EU nomenclature  
3. level  
44 categories EU – 28 Hu

## CLC50

- 1 : 50 000
- Spot-4
- 1998-99
- MMU: 4 ha
- Min. width: 50 m
- Polygon nr. Cc.150.000
- Hungarian nomenclature  
4/5. level  
79 categories

# Hungarian CLC 100 – CLC 50



# Hungarian CLC 50 nomenclature



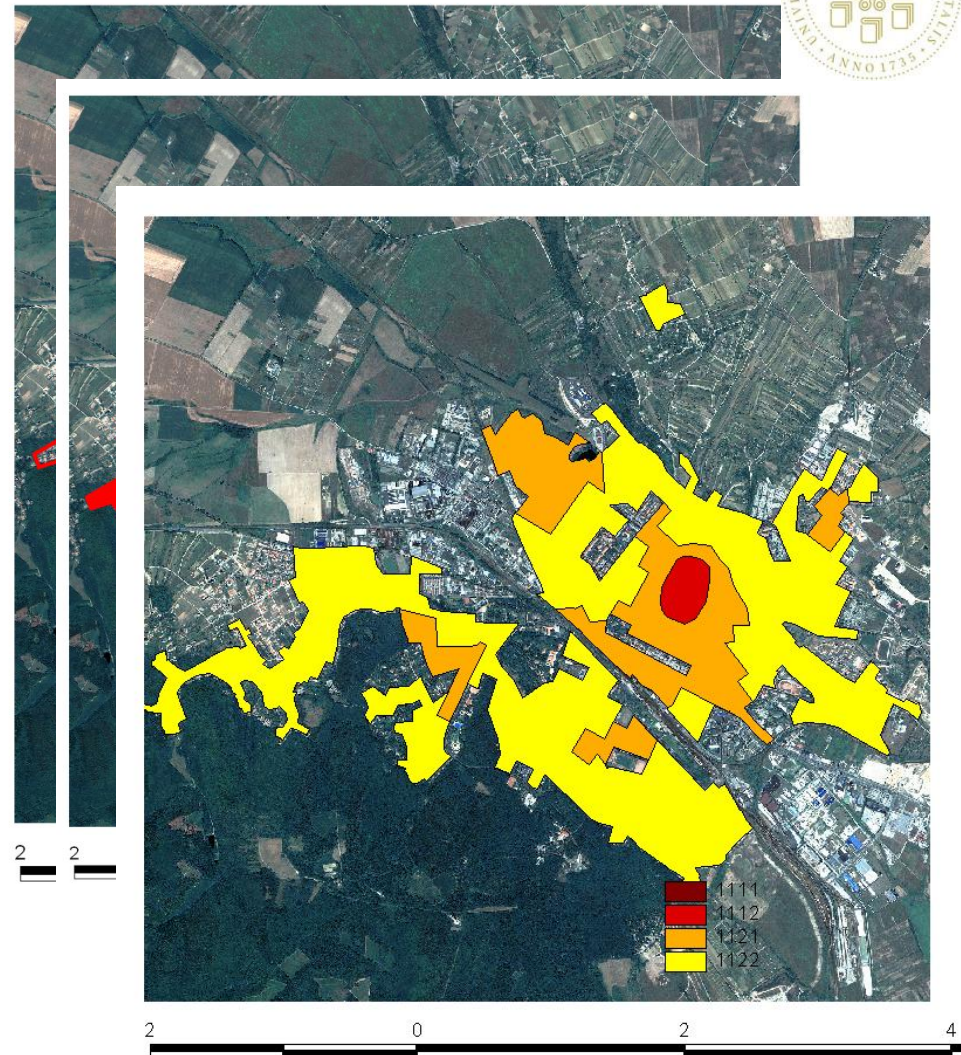
- The 4. level nomenclature is based on the European standard CORINE scale 1:100.000
- The standard European nomenclature has been adapted to the geographic conditions of Hungary by dr. A. Horánszky and F. Horváth at 1992.
- Significant expertise has been obtained in the application of the nomenclature during the implementation of CLC100 project in Hungary between 1994 and 1996 within the frames of the Phare Regional Environmental Programme.

# 1. ARTIFICIAL SURFACES



## 1.1. Urban fabric

- 1.1.1 Continuous urban fabric
  - 1.1.1.1. Areas of urban centers
  - 1.1.1.2. Areas of ancient cores
- 1.1.2 Discontinuous urban fabric
  - 1.1.2.1. Discontinuous built-up areas with multi-flat houses prevailing without gardens
  - 1.1.2.2. Discontinuous built-up areas with family houses with gardens



## 2. AGRICULTURAL AREAS

### 2.4. Heterogeneous agricultural areas



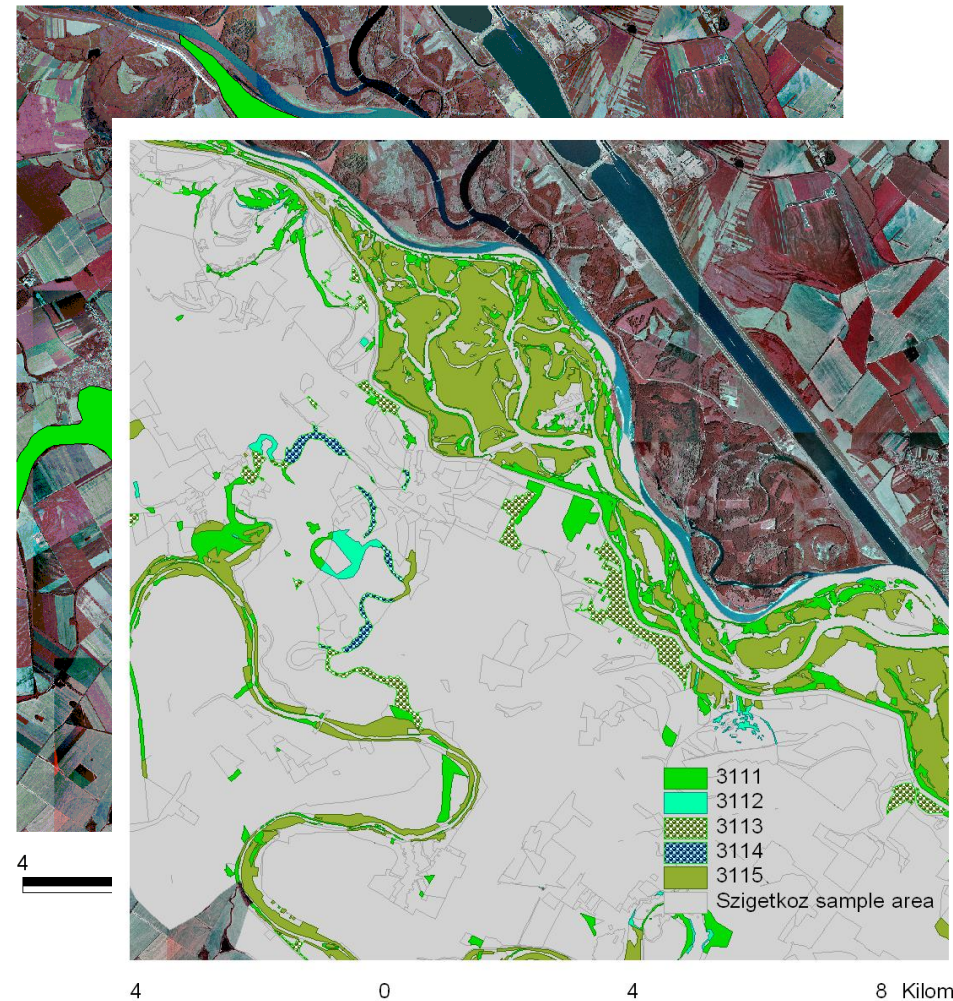
- **2.4.2. Complex cultivation patterns**
  - 2.4.2.1 Complex cultivation patterns **without scattered houses**
  - 2.4.2.2. Complex cultivation patterns **with scattered houses**
- **2.4.3. Land principally occupied by agriculture, with significant natural vegetation**
  - 2.4.3.2. Agricultural areas with significant share of natural vegetation and with prevalence of arable **grassland**

# 3. FOREST AND SEMI-NATURAL AREAS



## 3.1. Forests

- **3.1.1. Broad-leaved forest**
  - 3.1.1.1 Broad-leaved forest with continuous canopy in dry area
  - 3.1.1.2 Broad-leaved forest with continuous canopy in wet area
  - 3.1.1.3 Broad-leaved forest with discontinuous canopy in dry area
  - 3.1.1.4 Broad-leaved forest with discontinuous canopy in wet area
  - 3.1.1.5 Plantations of broad-leaved forests





# Thank you for your attention!

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