Analisi delle dinamiche di *land use*
Definizione del contesto nazionale

Gruppo di lavoro “Suoli e Pianificazione”

Bologna, 22.06.2010

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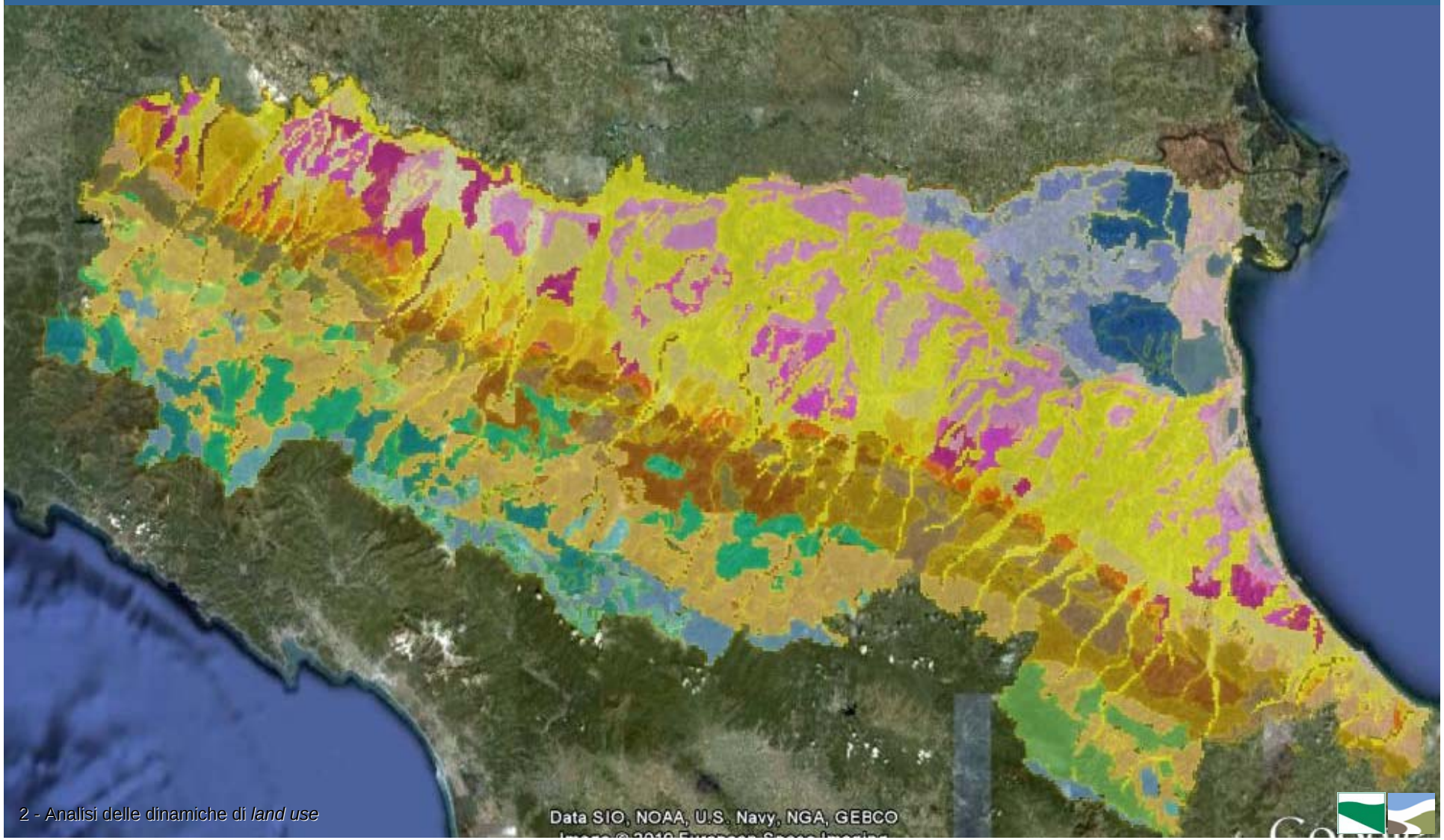
1. La definizione del contesto nazionale



Il contesto nazionale

L'interpretazione dei dati di land cover change relativi al territorio regionale dell'Emilia-Romagna può giovarsi di un raffronto con il contesto nazionale.

Viene pertanto di seguito proposta una sintesi dello studio condotto nell'ambito del gruppo "Suoli e pianificazione", finalizzato all'elaborazione dei dati del Corine Land Cover Change Italia 1990-2000.

L'approccio, negli aspetti basilari simile a quello adottato per l'Emilia Romagna, è finalizzato alla caratterizzazione delle dinamiche di land cover all'interno di contesti fisiografici omogenei a scala nazionale, allo scopo di evidenziare:

-La differenziazione delle dinamiche nei diversi contesti fisiografici

-La polarizzazione geografica dei cambiamenti, come risultato dell'effetto cumulato nel tempo di tali dinamiche differenziate.

La sintesi del lavoro svolto riportata di seguito è quella presentata al Convegno "Earth end man " tenutosi a Monaco nel giugno 2009 (pagine 8 e seguenti)

Land use dynamics and soil consumption in Italy

A. di Gennaro, B. Guandalini e F.P. Innamorato

Corine Land Cover Change is a very useful tool for understanding land cover dynamics that are changing the face of Europe (p. 10).

In recent years, data processing of the Corine Land Cover Change was mainly carried out with reference to administrative boundaries (especially regional and national boundaries). Otherwise, the goal of this work is to use the Corine Land Cover Change for analyzing the dynamics of land cover in Italy in relation to reference geographical systems, defined on a national scale.

The reference geographical systems were identified from the Eco-pedological Map of Italy, by aggregating the 92 Soil Sub-Regions in 13 reference geographical systems (pp 11-12)**.**

Analyzing land cover change is a rather challenging activity. As a conseguence, we define a simplified land cover legend by aggregating and re-classifying the Corine Land Cover classes (pp 13-14)**.**

Simplified legend comprehend only four reference land cover types:

- **forest areas**
- **grassland areas**
- **agricoltural areas**
- **urban areas**

The next step was to reclassify the Corine Land Cover Change map..

In this map are associated two information to each polygon: the class of land cover in which the polygon belonged to in 1990, and the class of land cover in which it belongs to in 2000 (p 15)**.**

The type of land cover dynamic concerned every polygon has been defined using a matrix of transition (p 16)**.**

Page 17 shows the map of the Corine land cover change, reclassified according to the different types of land cover dynamics affecting each polygon.

At this point we have overlayed the two map: the reclassified map of Corine land cover change and the map of Reference Geographical Systems (p 18)**.**

Flow chart in page 19 shows main land cover dynamics in Italy during the decade considered.

The graph in page 20 shows the net changes in the main land cover classes.

Pages 21-22 show the graphs of the flow chart of land cover in mountain systems, hilly and volcanic systems, and in the plains systems, and the graph of the net changes of land cover in the different systems.

Graphs in pages 23-26 show the contribution of the different reference geographical systems to the total net change of the four types of land cover considered in the study.

This study points out interesting considerations. We want to highlight the most important:

1. **64% of the new urbanization is in the plains systems, where two thirds of urban areas are already there, and where the rate of urbanization is more than double with respect to the national average (10% vs. 5%);**

2. **75% of new woods is in the mountains systems, where there are 81% of Italian woods;**

3. **the contribution of the Apennine to the forestation processes (59%) is more relevant than the one of Alps (16%): rural alpine landscapes seem much more stable than Appennine landscapes;**

4. **the loss of agricultural areas occurs in the mountains systems for 41%, in the plains systems for 40%;**

5. **hills systems are characterized by a more balanced mix of processes: the growth of the woods and the loss of agricultural areas is much smaller than in the mountains systems, while urban areas growth is lower than in the plains systems.**

The summary chart in page 32 shows the percentage incidence of different types of land cover dynamics in geographical reference systems.

The chart is very interesting because it shows how each geographical reference system moves along a trajectory of change, which is different from the trajectories of the other systems.

Without falling into deterministic simplifications, we can say that at the national scale, the interacting driving forces that control the land cover dynamics are strongly polarized with respect to physiographical, ecological and landscape aspects.

These study results should contribute to the development of differentiated strategies concerning the natural hazard prevenction, soil protection, landscape and biodiversity management, rural development, urban regeneration and control.

In conclusion, the results of the study confirm that the effort of the EU towards more territorialized policies in environmental, rural and cohesion sector, is going in the right way, moreover it is useful integrating in this process considerations about physiographical, ecological and landscape aspects.

earth AND man

Munich | Bavaria, Germany | June 9th - 12th 2009

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LAND USE DYNAMICS AND SOIL CONSUMPTION IN ITALY

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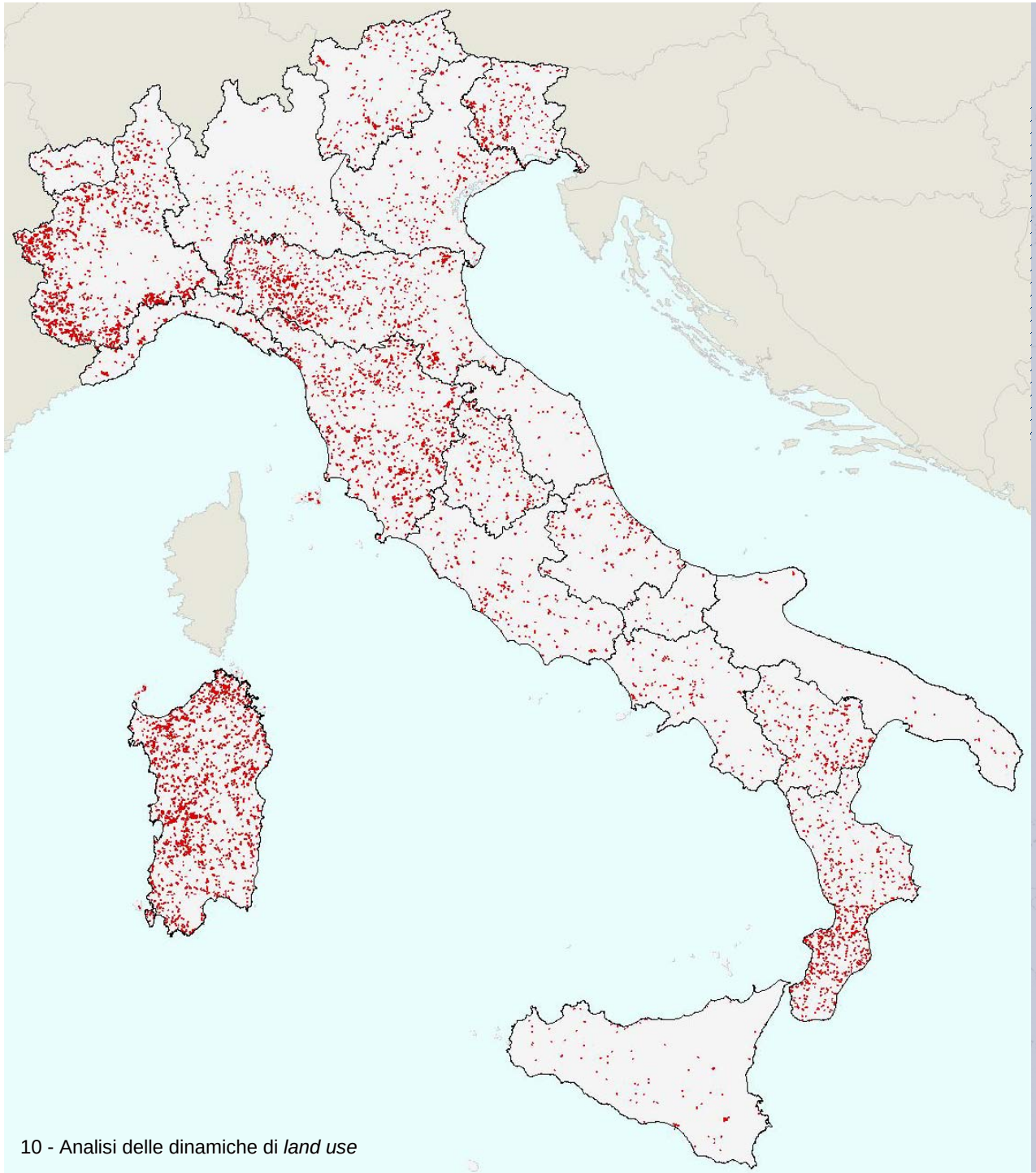
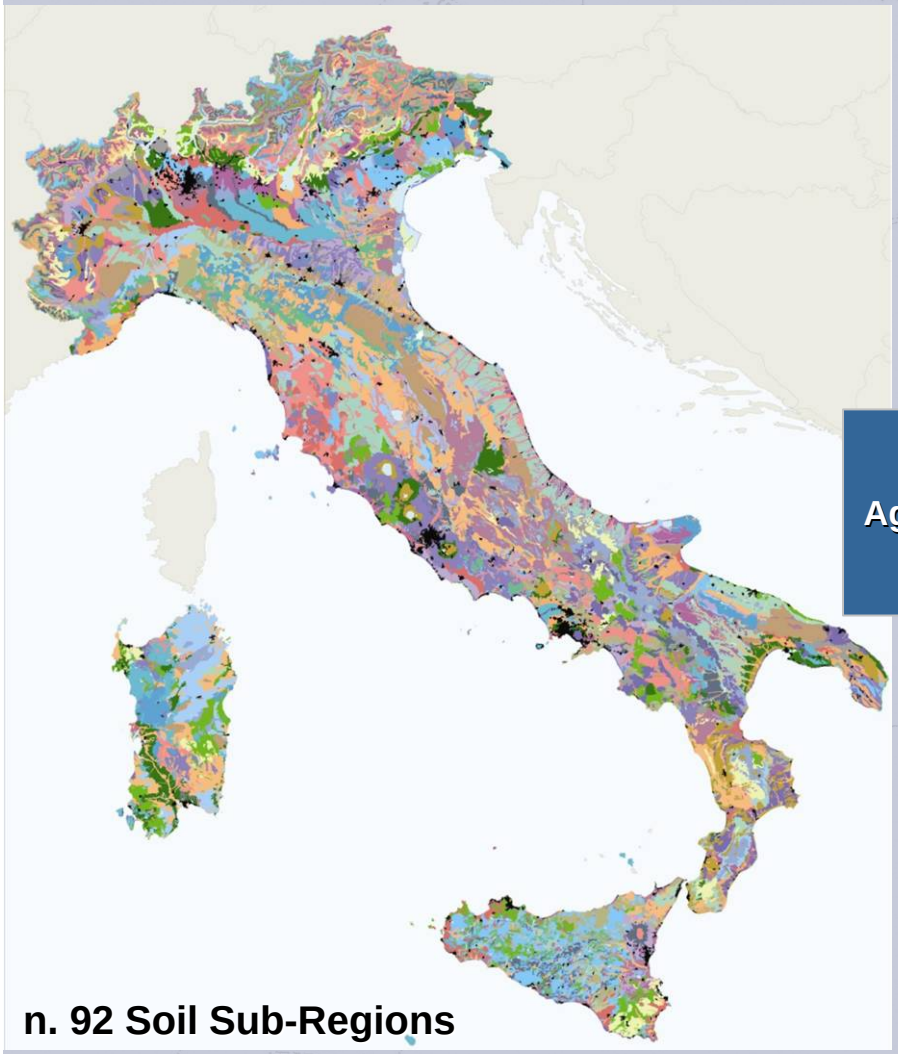


Corine Land Cover Change 1990 - 2000

Italy

Defining the reference geographical systems

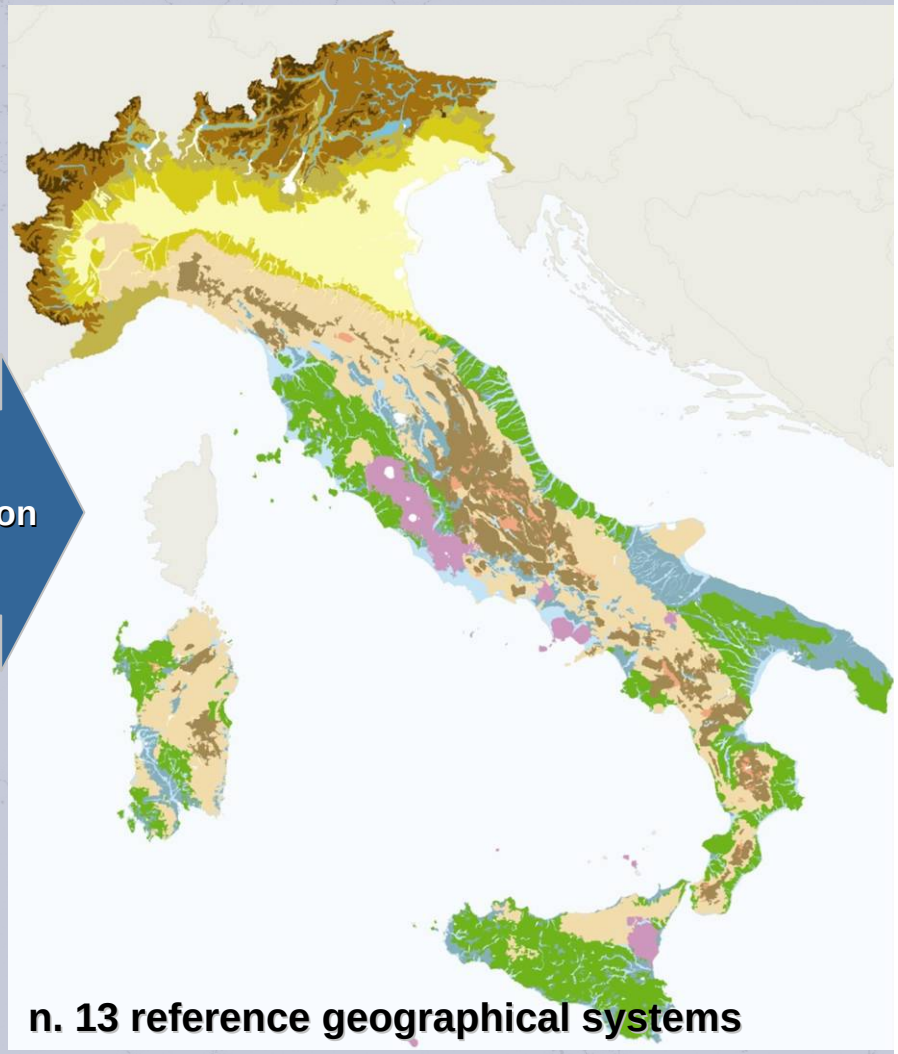
Eco-pedological Map of Italy (JRC, 2003)



n. 92 Soil Sub-Regions

Aggregation

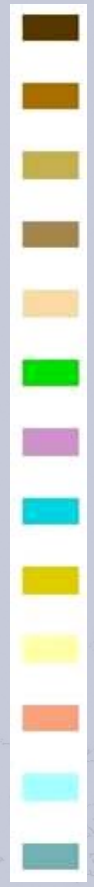
Reference geographical system



n. 13 reference geographical systems

Defining the reference geographical systems

Mountains	A - High mountain of the Alps
	B - Medium mountain of the Alps
	C - Low mountain and hills of the Pre-Alps
	D - Mountain of the Apennine and islands
	E - Low mountain and hills of the Apennine and islands
Hills and volcanic areas	F - Coastal hills of the Apennine and islands
	G - Hills, mountains and plateaux of volcanic land
Plains	H - Valley floors of the Alps
	I - Po River high plain
	L - Po River low plain
	M - Intra-mountain valleys of the Apennine
	N - Alluvial plains
	O - Terrace plains



Defining the reference land cover types

Aggregation

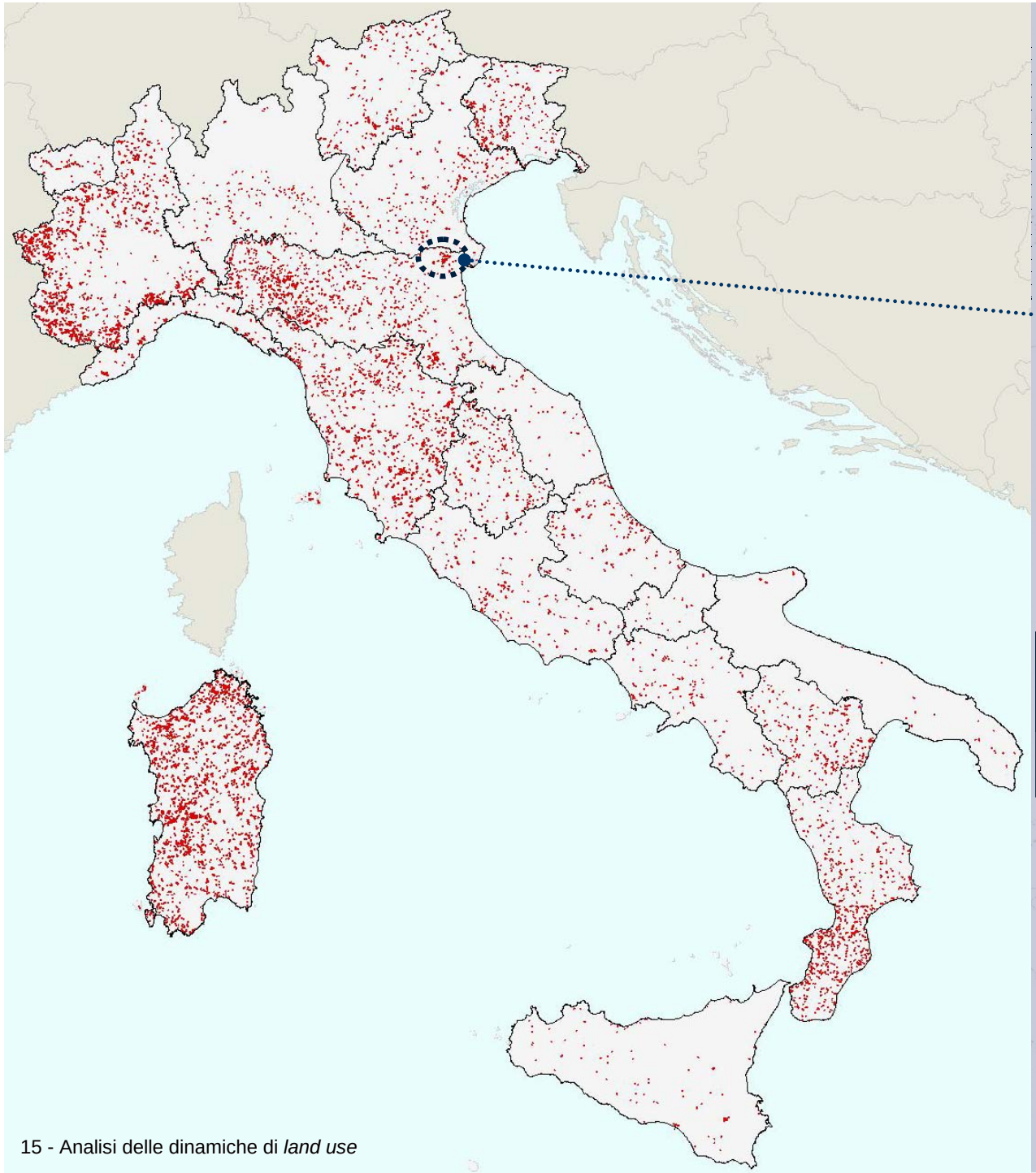
CORINE Land Cover:

5 classes at the primary level
15 classes on the second level
44 classes at the third level

n. 4 reference land cover types

Defining the reference land cover types

Reference land cover types	Aggregated CLC classes	CLC classes code
Forests areas	Forests and shrubs	3.1; 3.2 (class 3.2.1 excepted)
Grassland areas	Natural grassland*	3.2.1; 3.3; 4
Agricultural areas	Heterogeneous agricultural areas	2.4
	Arable land and pastures	2.1; 2.3
	Permanent crops	2.2
Urban areas	Artificial surfaces (continuous urban fabric excluded)	1.1.2; 1.2; 1.3; 1.4
	Continuous urban fabric	1.1.1



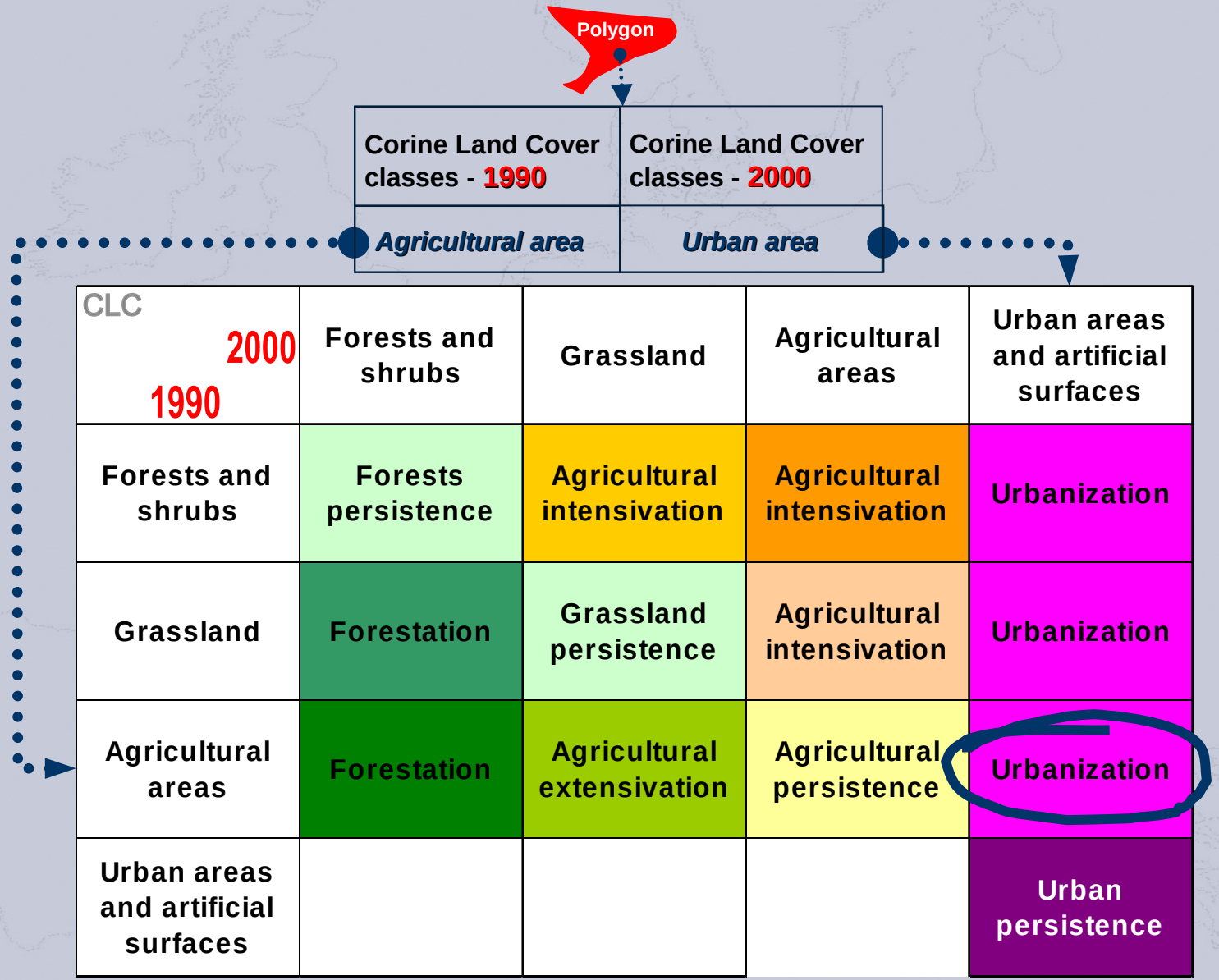
Re-classifying the Corine Land Cover Change 1990 - 2000

Polygon

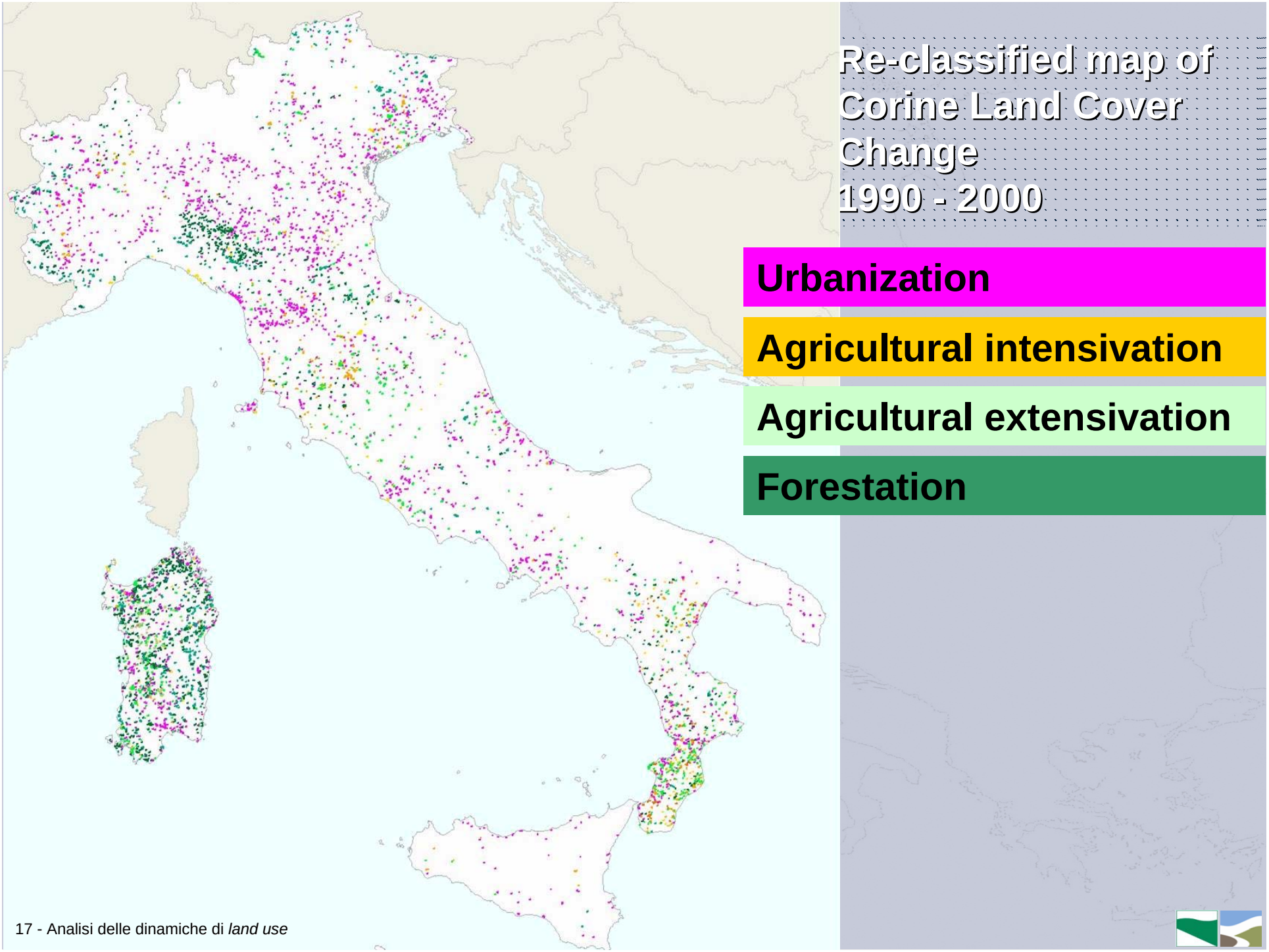
Geodatabase

Corine Land Cover classes - 1990	Corine Land Cover classes - 2000
Agricultural area	*Urban area*

Re-classifying the Corine Land Cover Change: the transition matrix



CLC 2000 / 1990	Forests and shrubs	Grassland	Agricultural areas	Urban areas and artificial surfaces
Forests and shrubs	Forests persistence	Agricultural intensivation	Agricultural intensivation	Urbanization
Grassland	Forestation	Grassland persistence	Agricultural intensivation	Urbanization
Agricultural areas	Forestation	Agricultural extensivation	Agricultural persistence	Urbanization
Urban areas and artificial surfaces				Urban persistence



Re-classified map of Corine Land Cover Change 1990 - 2000

Urbanization

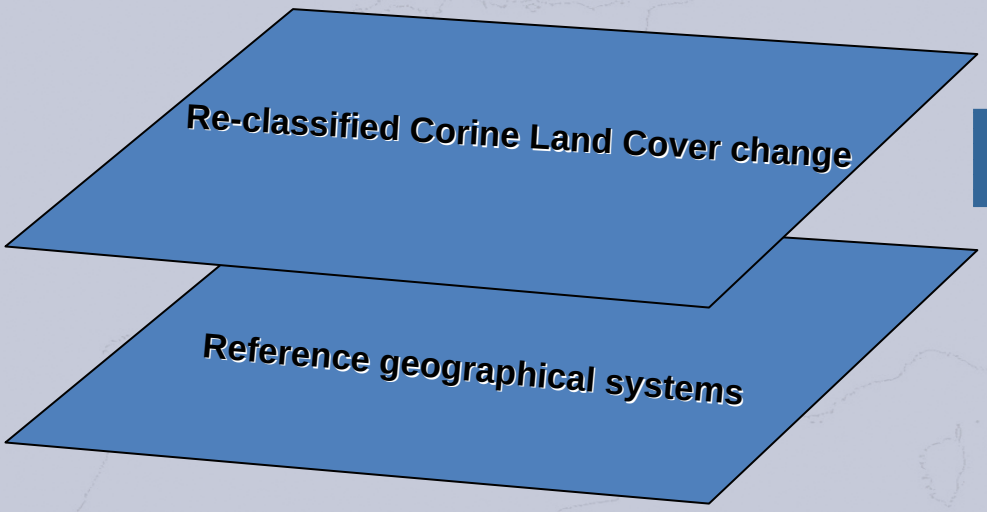
Agricultural intensivation

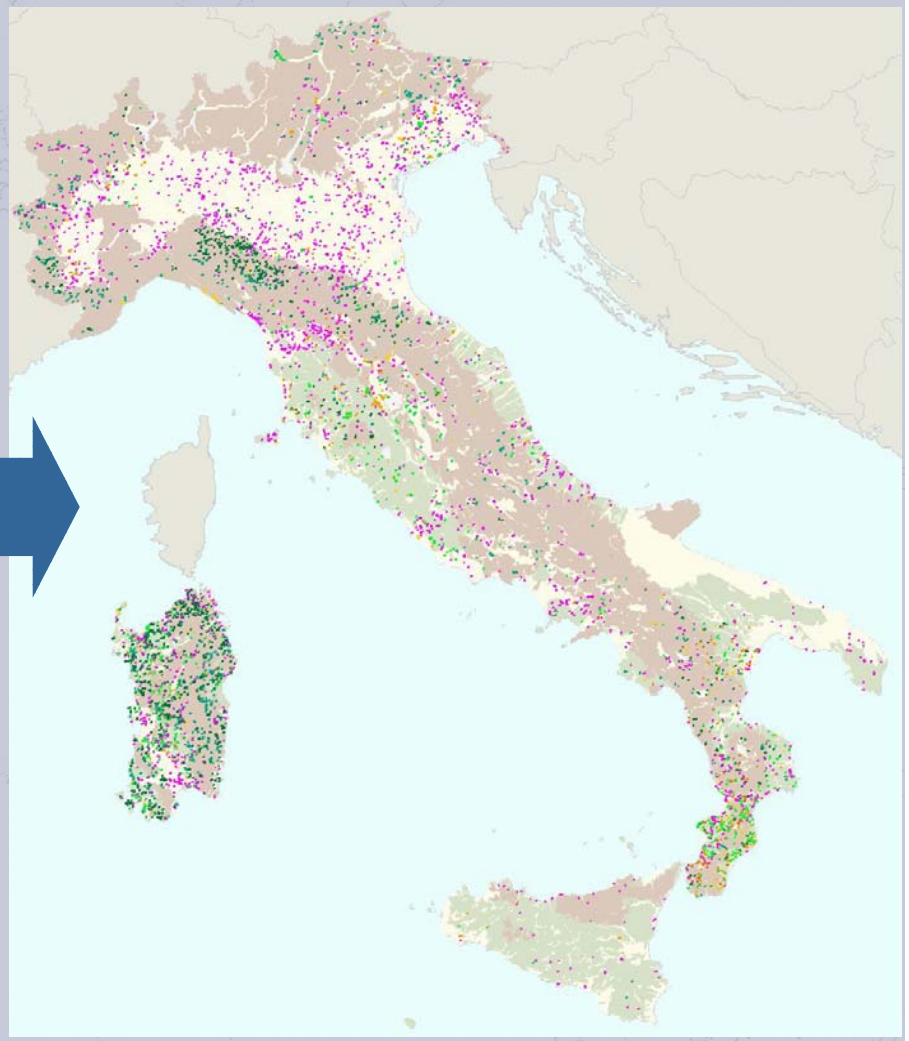
Agricultural extensivation

Forestation

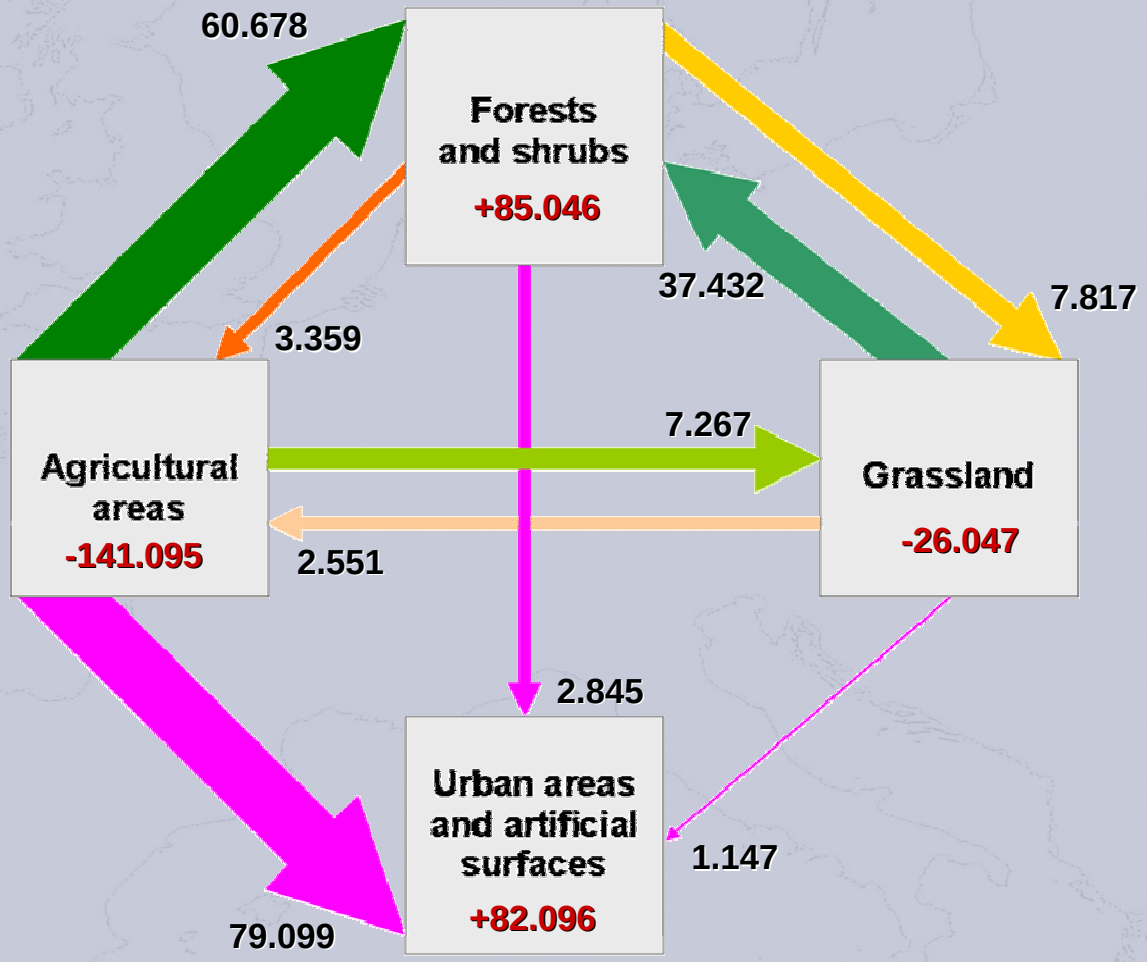
Analyzing land cover change in to the reference geographical systems

GIS overlay procedure

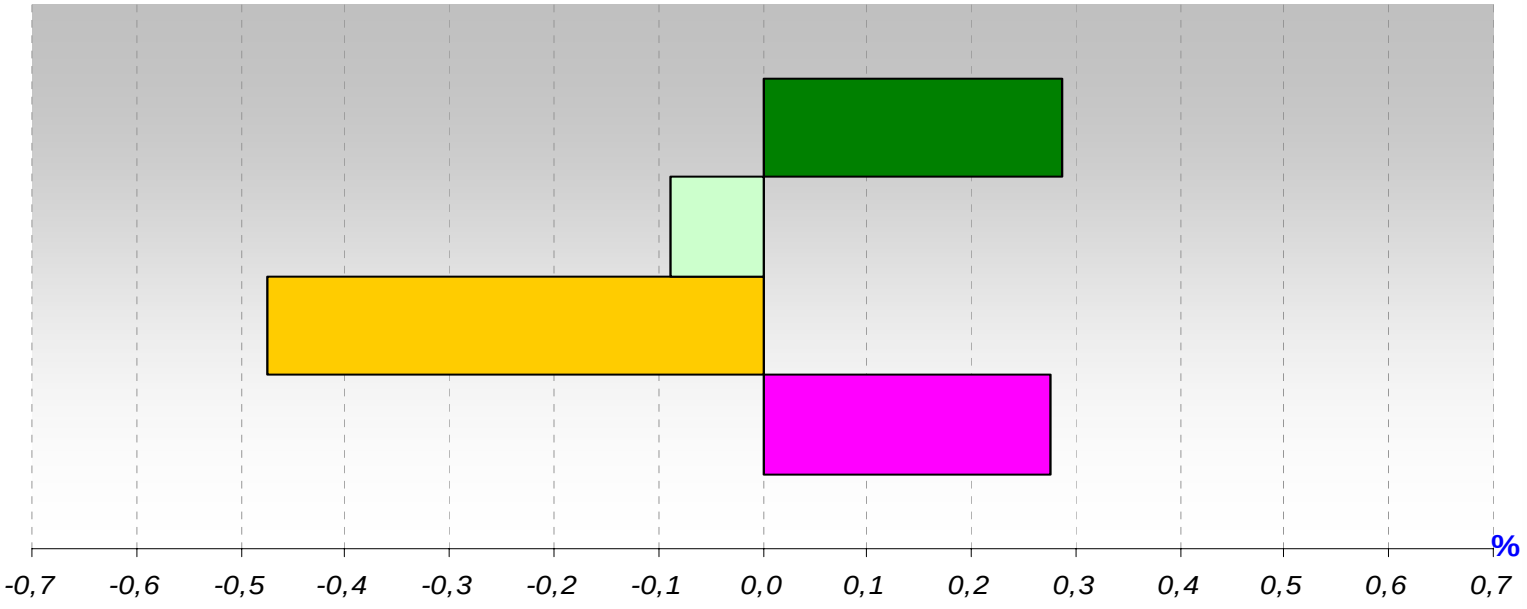




Flow chart of land cover in Italy 1990-2000 (hectars)



Net changes of land cover change in Italy 1990-2000 (% of total areas)



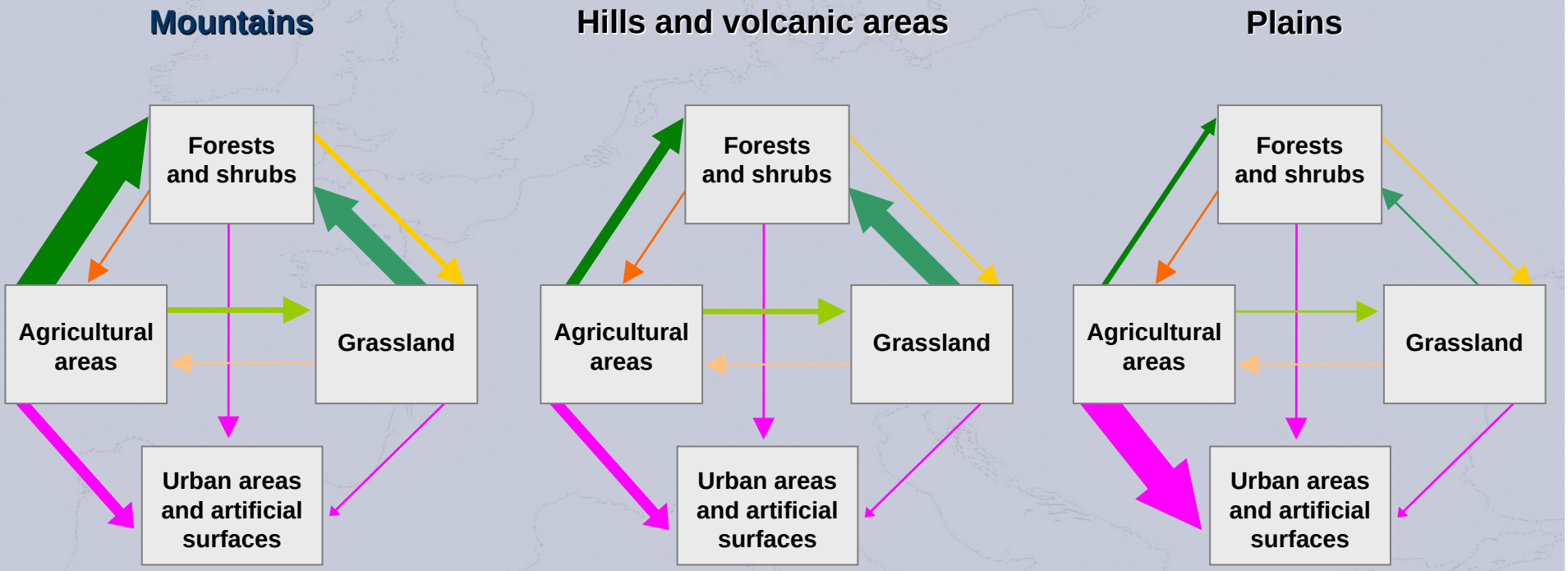
Forests and shrubs

Grassland

Agricultural areas

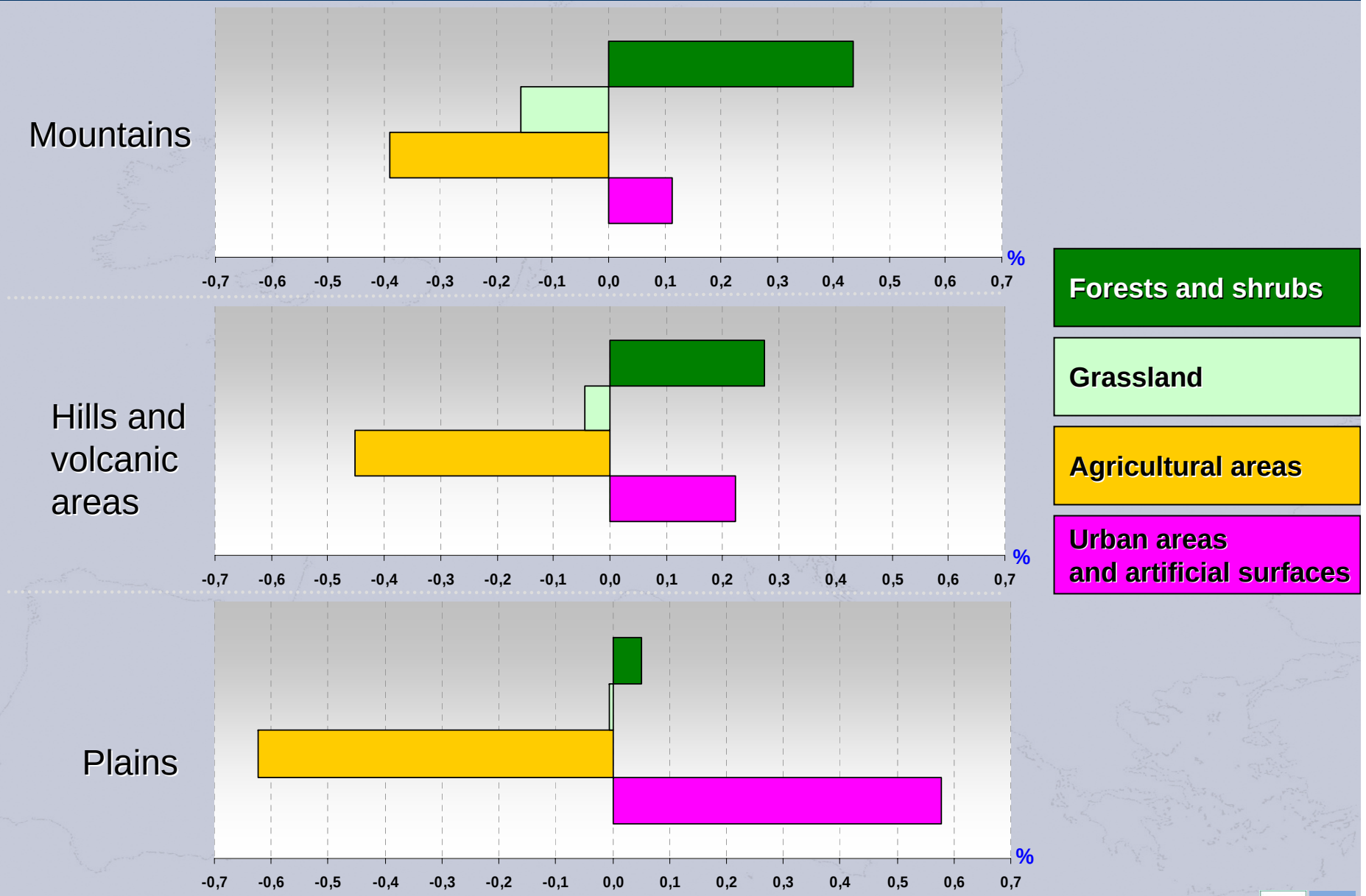
Urban areas and artificial surfaces

Flow charts of land cover in the reference geographical systems

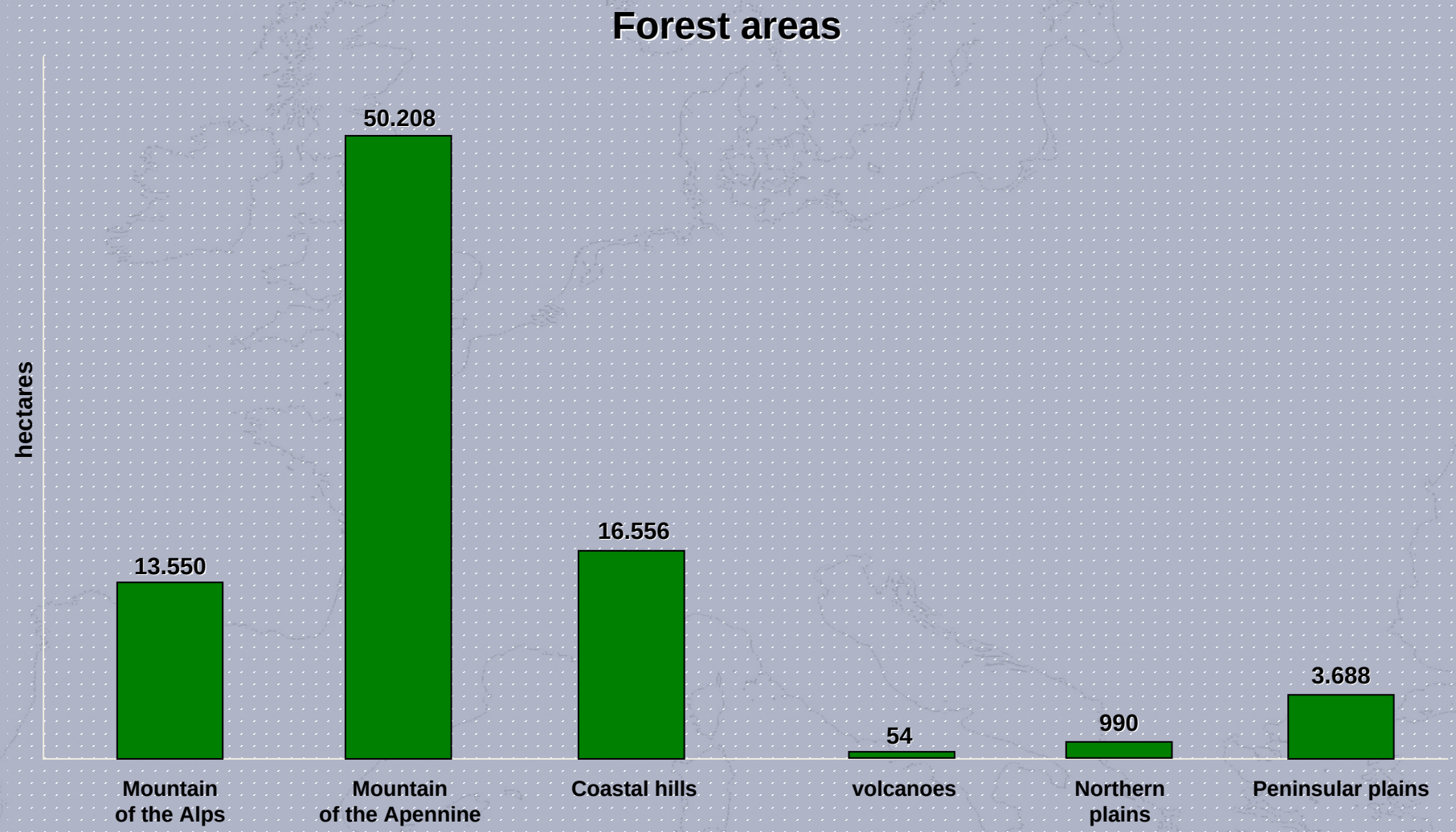


Net changes of land cover in the reference geographical systems

(% of the system's area)



Contribution of the reference geographical systems to the total net change of the four classes of land cover (hectars)



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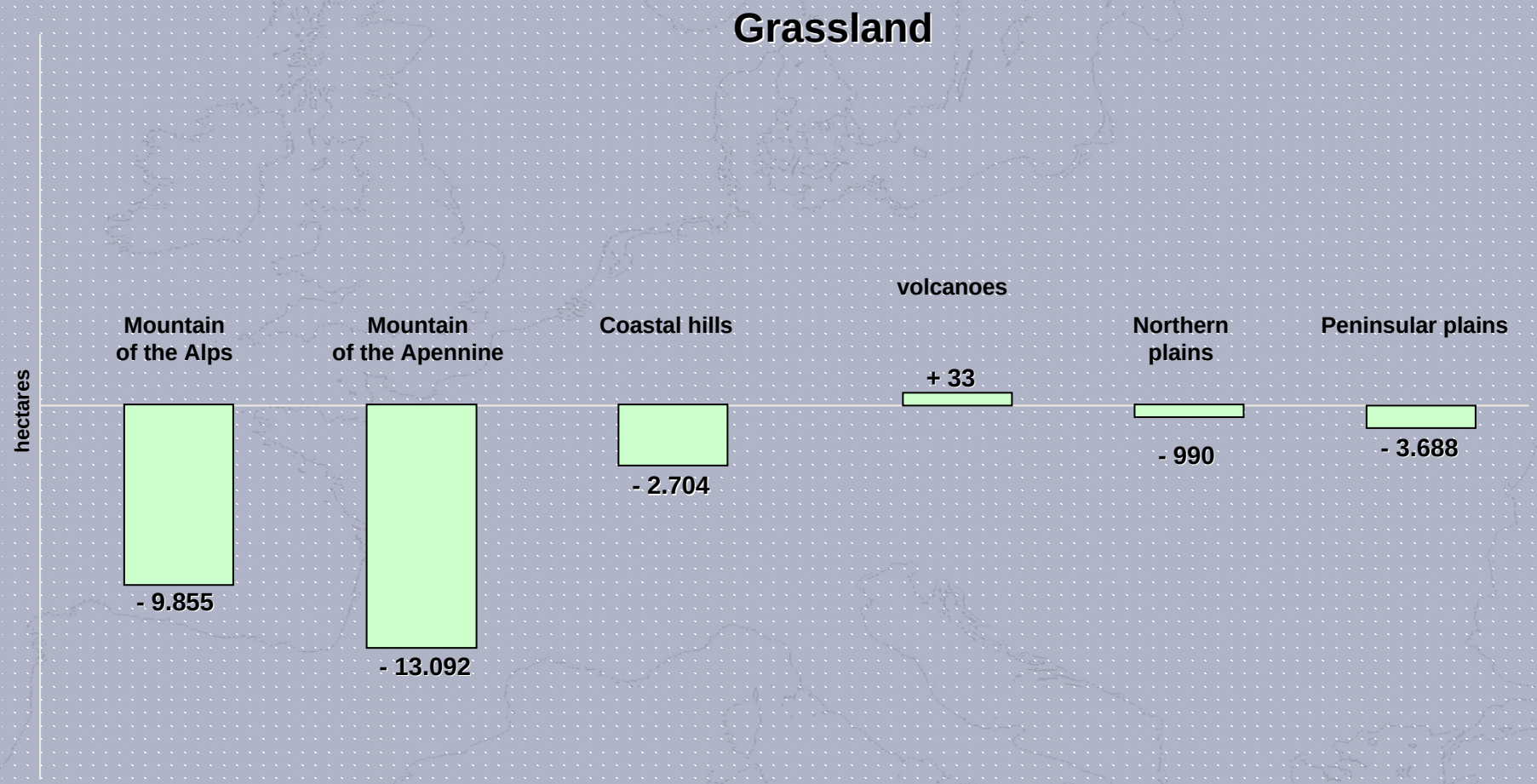

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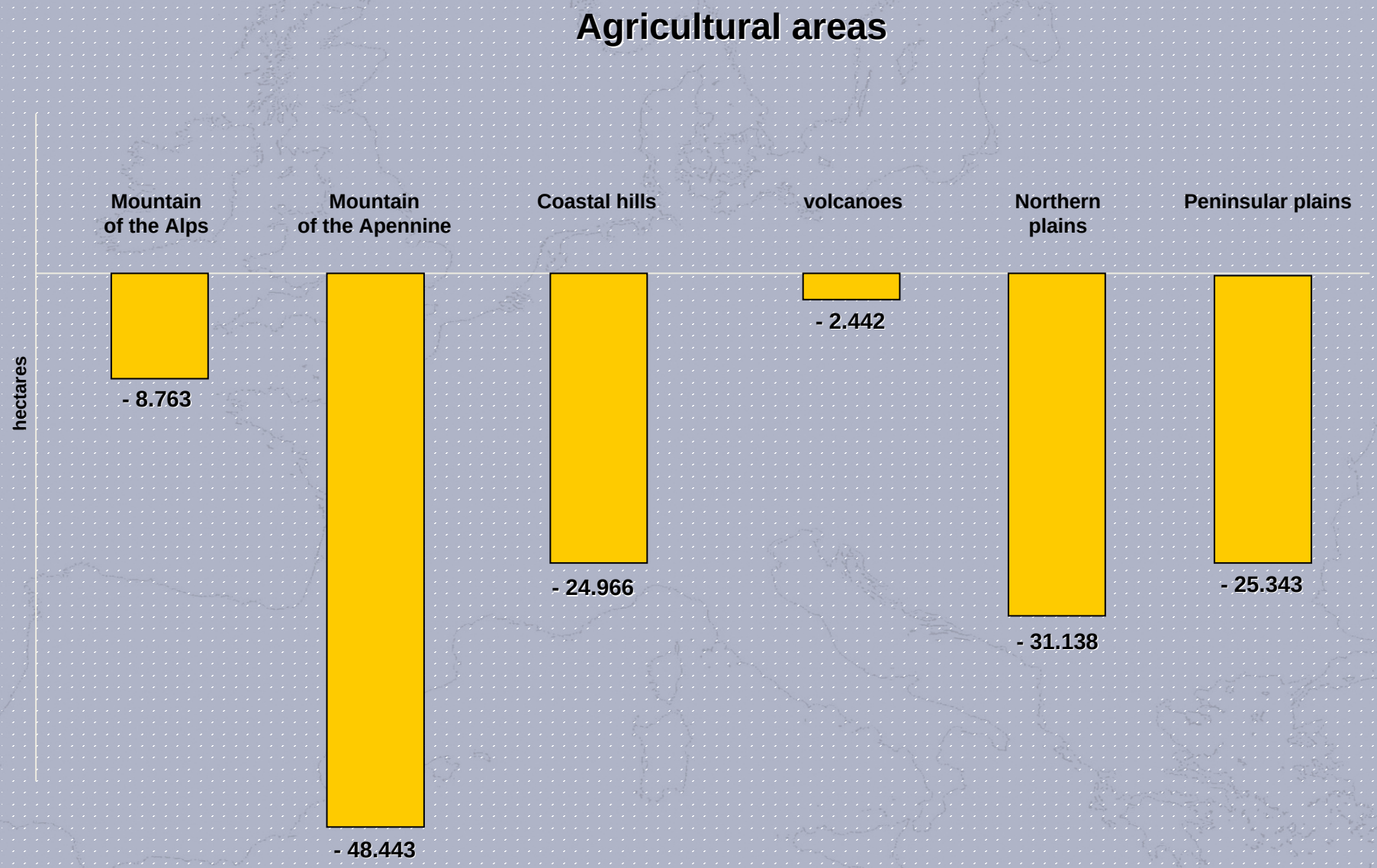

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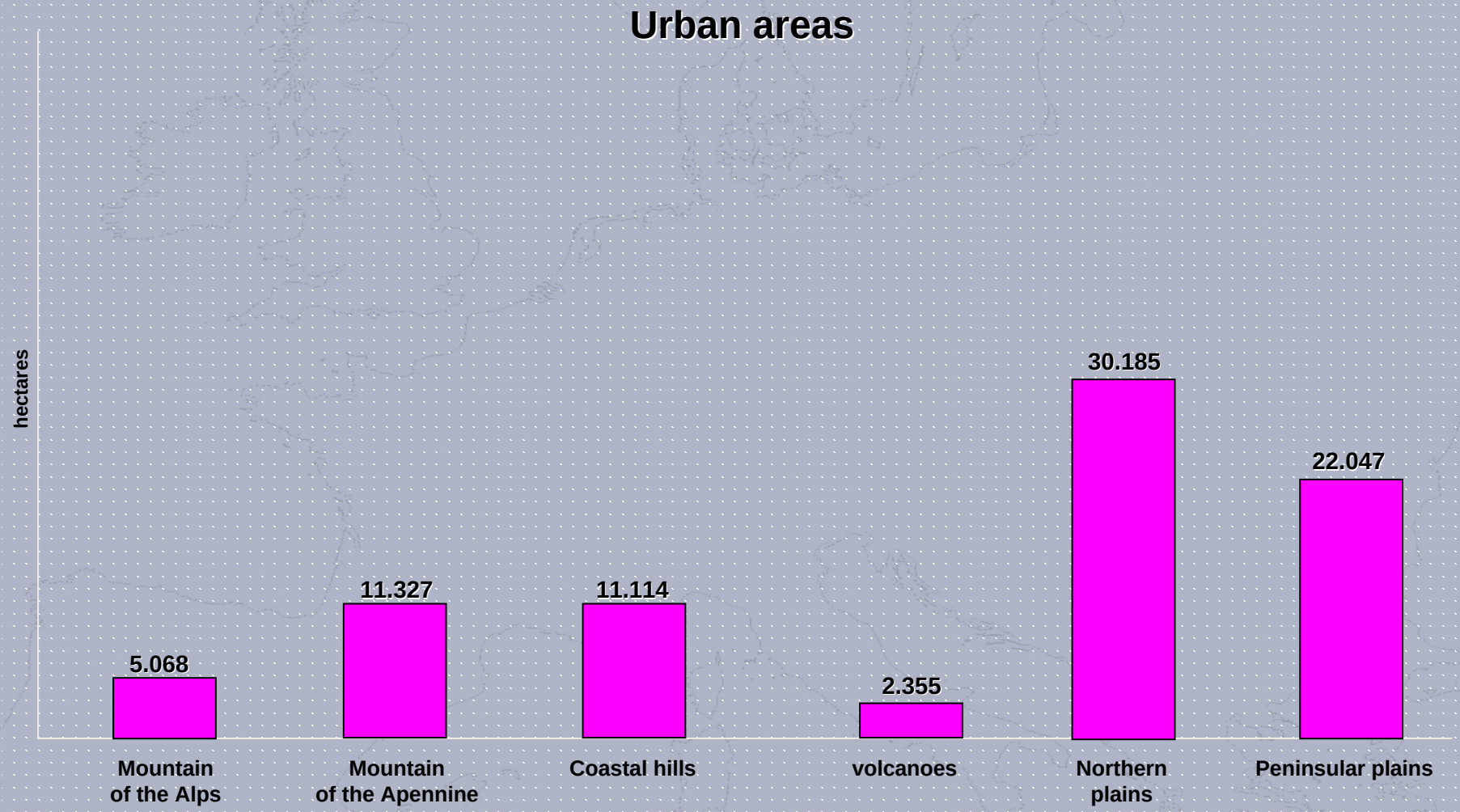
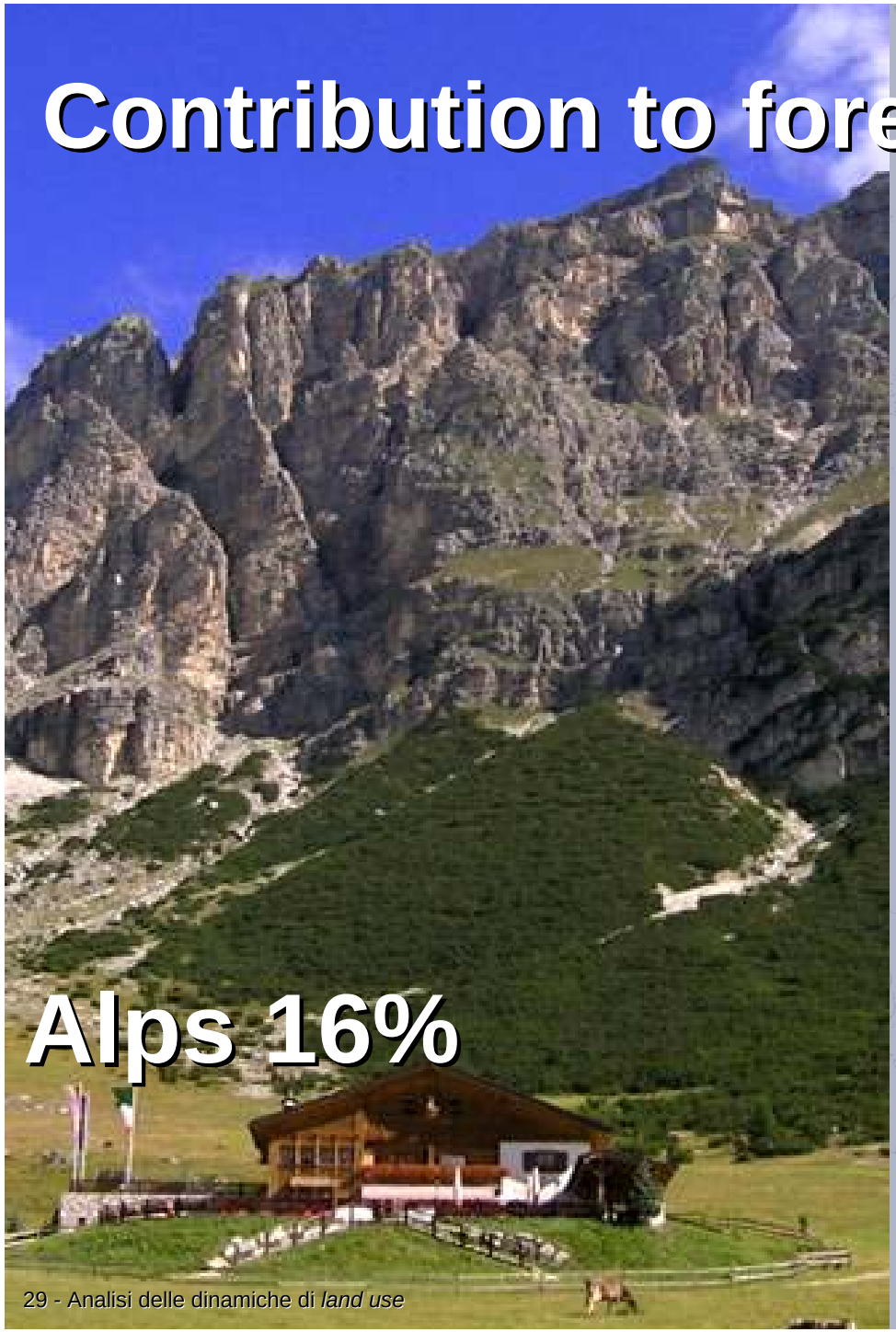


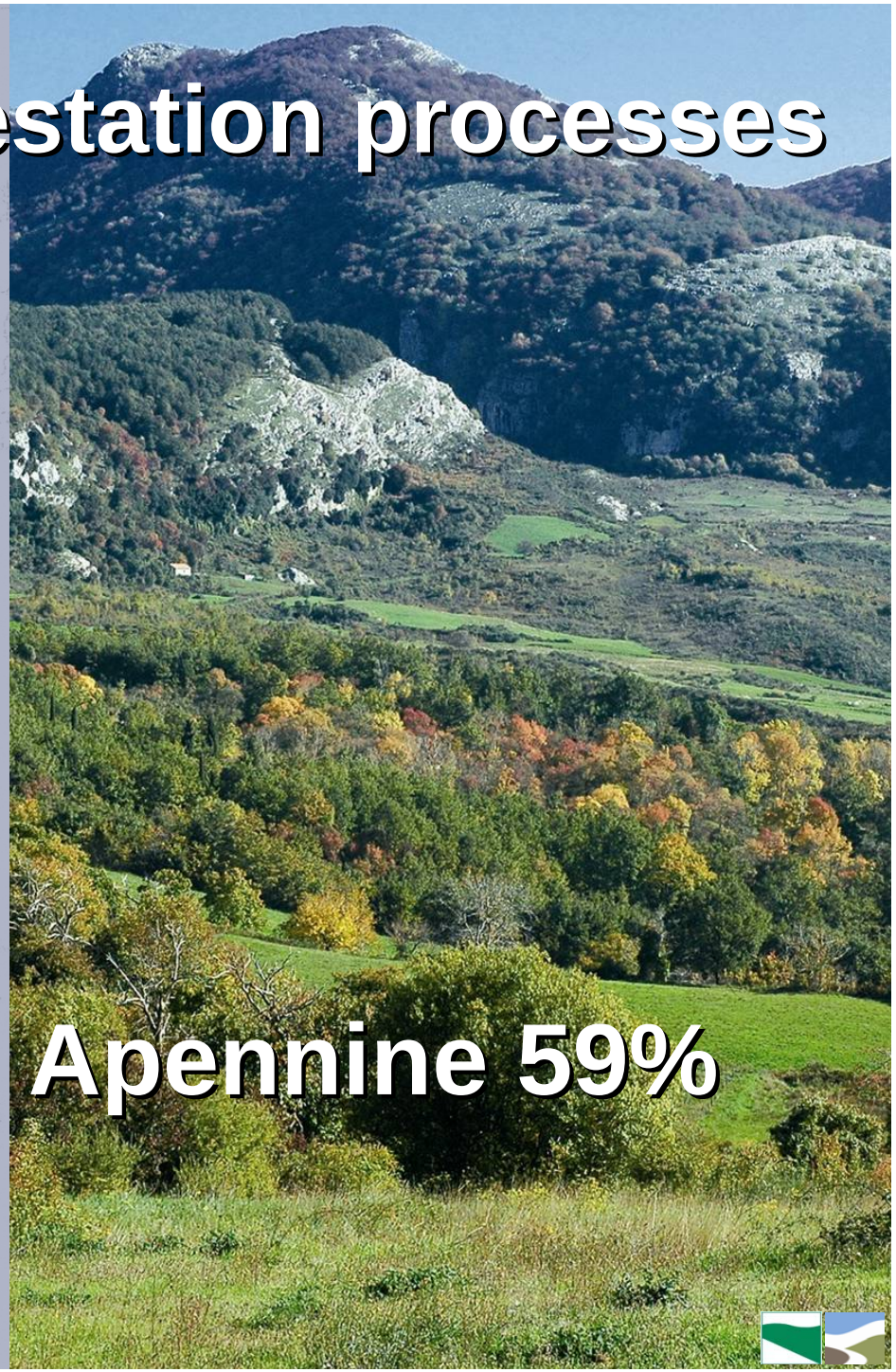

64% of the new urbanization
is in the plains systems


75% of new woods
is in the mountains systems

Contribution to forestation processes

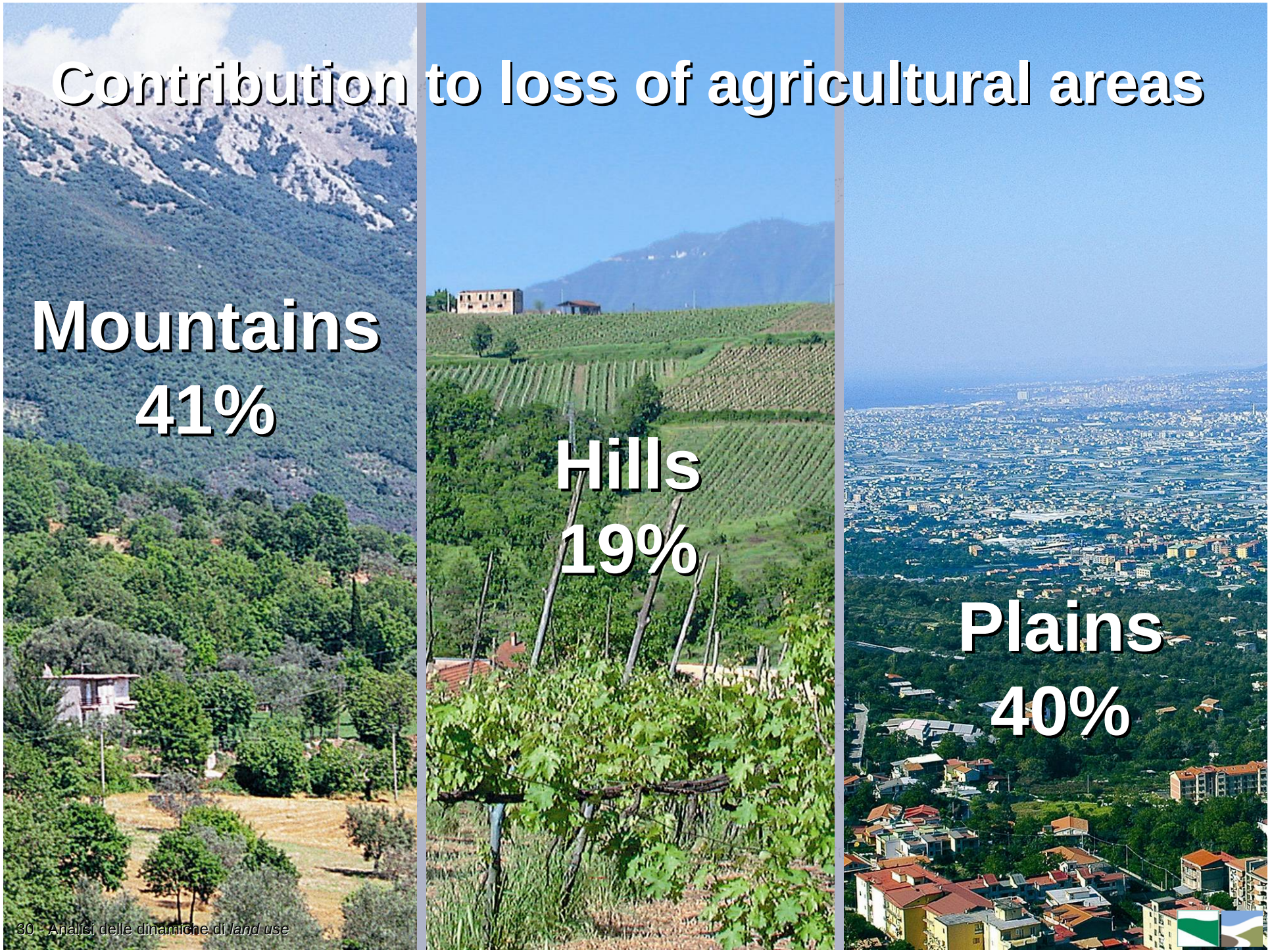


Alps 16%



Apennine 59%

Contribution to loss of agricultural areas




Hills systems are characterized
by a more balanced mix of processes

A general spectrum of land use dynamics in the reference geographical systems

(% of the systems area affected by land cover dynamics)