Foreign Affairs Ministry of Italy

Agronomic Institute for Oversees

Professional MASTER

on

Geomatics and Natural Resources Evaluation

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What is IAO?

- IAO - Istituto Agronomico per l'Oltremare
- Created in 1904
- A branch of the Italian Ministry of Foreign Affairs
- Agriculture, Environment, International Development
  - technical assistance
  - research
  - training

Training activity at IAO

One of the principal purposes of IAO is:

TRAINING ACTIVITY...

...in different sectors as:

- **Agriculture and Urban Planning**
- **Irrigation**
- **Food security**
- **Remote Sensing and GIS**

Training activity at IAO

...the training section on Remote Sensing and GIS began in 1974.

The title of the Course is:

Professional MASTER:

on

"Geomatics and Natural Resources Evaluation"

A short history

1974: Aerofotogrammetria e Fotointerpretazione per la Gestione delle Risorse Territoriali

1987: Telerilevamento e Valutazione delle Risorse Naturali

1995: Remote Sensing and Natural Resources Evaluation

2001: Geomatics and Natural Resources Evaluation

A short history

- Since the first edition the theoretical part was followed by a practical stage

- With the 10-th edition we moved to a more ambicious project: ***common interdisciplinary work in which the whoule group can participate***

- With the 12-th edition, 1985, we have the first stage experience abroad – in Tunisia

- As a consequence, the course change its domination into ***"Remote Sensing and Natural Resources Evaluation".***

- With the 17-th edition, english become our official working language, in order to give a full opening to international participants

A short history

- In the meanwhile, IAO has been working to develop its own way of ***natural resources evaluation*** for rural development planning.

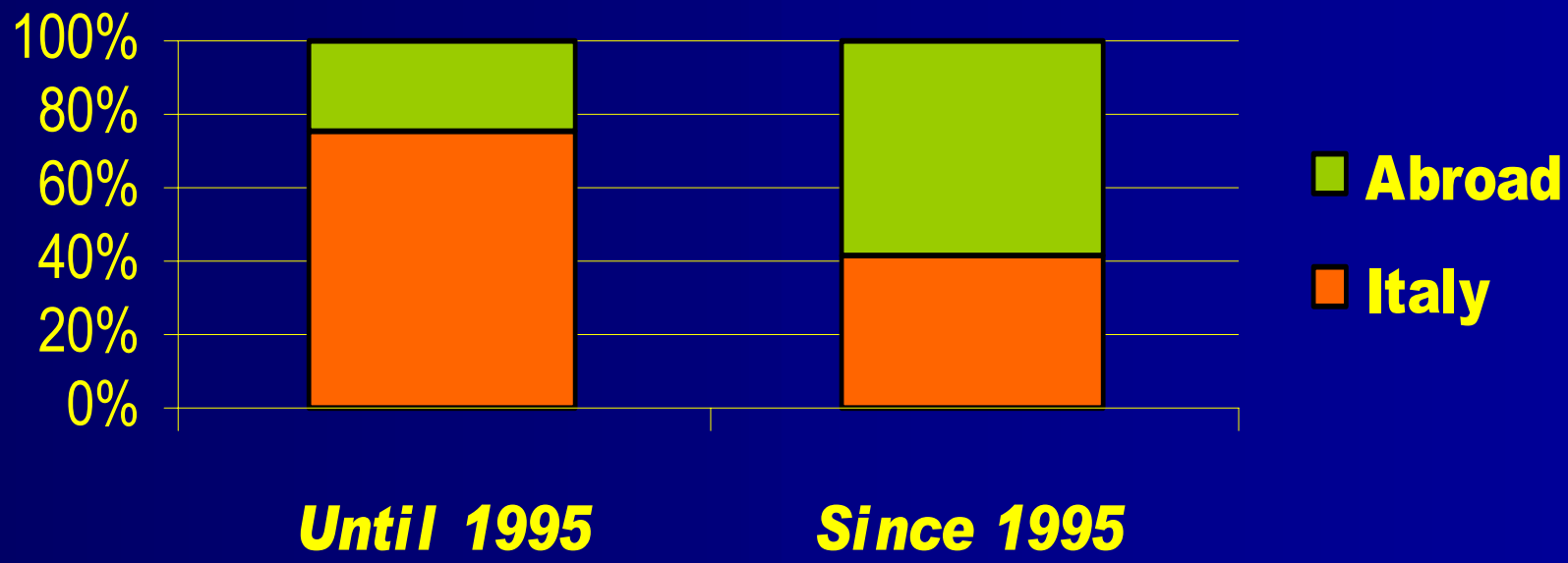
- More than a methodology, IAO's can be consider as a framework for holistic approach to ***land unit mapping***, similiar to those developed by FAO, ITC etc.

- IAO has utilize ***land unit mapping*** as a base for GIS in different development project.

- Moreover, we could state that the Course on ***Remote Sensing and GIS*** has been our experimental laboratory, profiting by the continuous transfer of expertise from our application work.

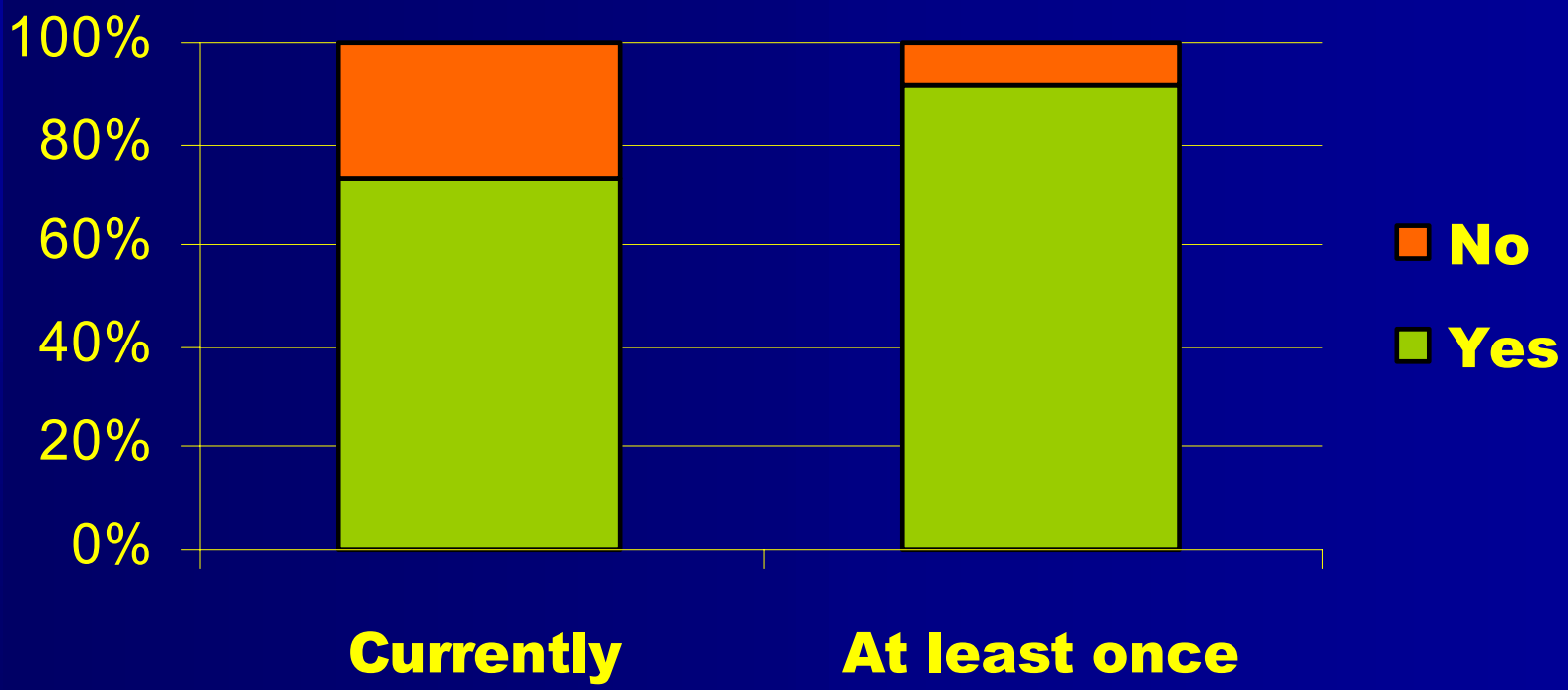
Students participation

- **Provenience**



Students participation

- **Job opportunities**



Geographical Distribution

	COUNTRY
AFRICA	Aleria
	Djibouti
	Egypt
	Eritrea
	Ethiopia
	Libya
	Marocco
	Nigeria
	Senegal
	Somalia
	Swaziland
	Tunisia
	Zaire
ASIA	China
	Iran
	Jordan
	Palestine
	Syria
	Turkey

	COUNTRY
CENTRAL / SOUTH AMERICA	Argentina
	Bolivia
	Brasil
	Chile
	Ecuador
	El Salvador
	Paraguay
	Uruguay
EUROPE	Albania
	Bosnia-Herz
	Bulgaria
	Greece
	Italy
	Spain
	Yugoslavia

The Course organization

- 16 participants
- University degree in Agriculture, Forestry, Geology or similar
- 32 weeks, 900 hours
- Two modules:
  - *1. Lessons and Exercises* – 3 months
  - *2. The Case Study* – 4 months

The First Module

- Methodological Aspects of Natural Resources Evaluation
- Introduction to Information Technology
- Cartography
- Photo,image-interpretation
- Principles of Remote Sensing
- Geographical Information Systems - GIS
- Digital Image Processing
- Microwave Remote Sensing
- Climatology
- Geology
- Geomorphology
- Agriculture and Land Use
- Rangelands
- Forests
- Soils
- IAO methodology

The First Module

- First module cover about 3 months (30h per week) and consisting in a series of lectures and laboratories that must give to the participants a common background on remote sensing data processing, GIS and photointerpretation in order to carry out natural resources inventories and management

The Second Module

- **Preliminary mapping**
  - Introduction to the study area
  - Project preparation
  - Analysis of existing information
- **Fieldwork (4 weeks)**
- **Final mapping**
  - GIS setup
  - Data processing
  - Reporting and presentation

IAO approach

- Simple technology, both hardware and software
- Interdisciplinary and participatory
- Non-academic, application oriented
- Complete project cycle

  - When you listen, you forget

  - When you look at, you understand

  - When you do, you learn

Team work

- Students work all together to the same project, throughout all phases
- Very intensive class and field work
- Intense coordination and continuous tutoring
- Weekly workshops
- Final document preparation
- Only one final product, in different version (CD, slide presentation, report, posters)

Course Methodology

IAO approach:

The environment can be studied only in an interdisciplinary way:

using:

A Holistic approach of:

"Land Unit Mapping"

Course Methodology

We adopt a ***Land Classification System***, using three different, scale-dependent, hierarchical levels: ***Site***, ***Facet*** and ***System***:

- The ***Land Site*** is the smallest – it is the truly **holistic** unit

- From a pragmatic point of view, a ***Land Facet*** should be defined as a management unit.

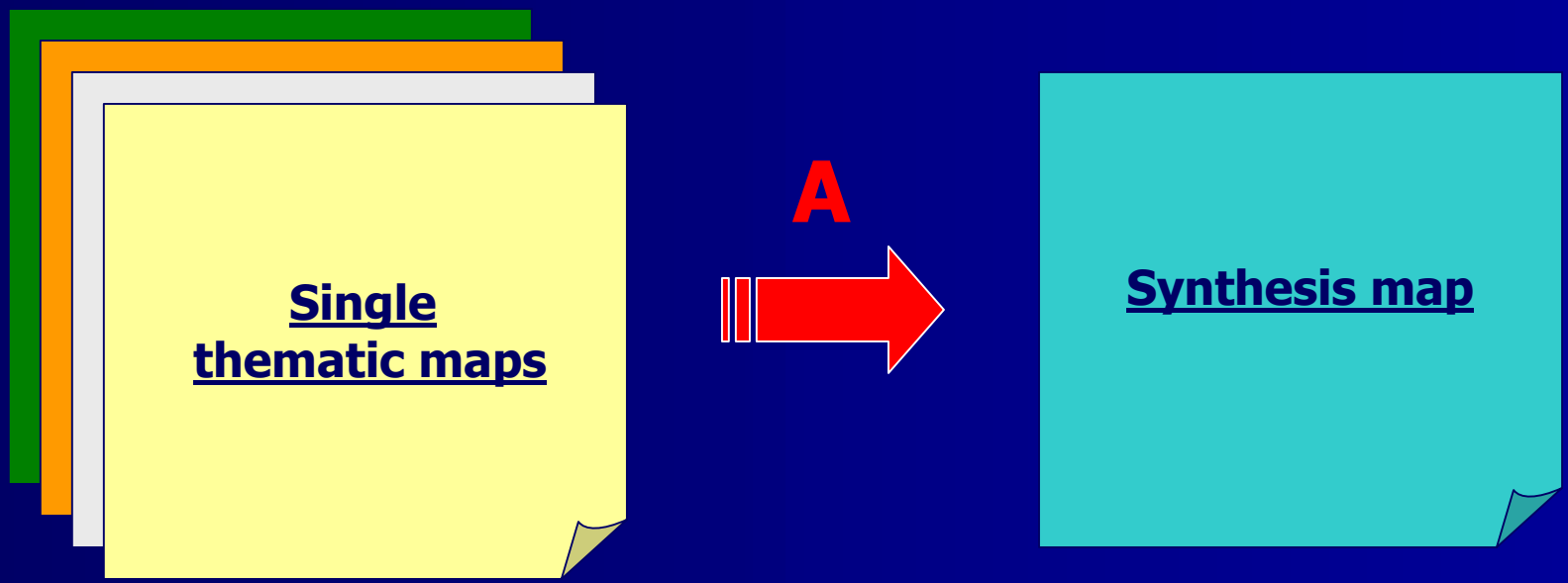
- The ***Land System*** is a combination of Land Facet together, forming one convenient mpping unit.

For all Land Definition the principal tools of evaluation are *Remote Sensing* and *GIS*

Course Methodology

- Holistic approach of "***Land Unit Mapping***"

Case A

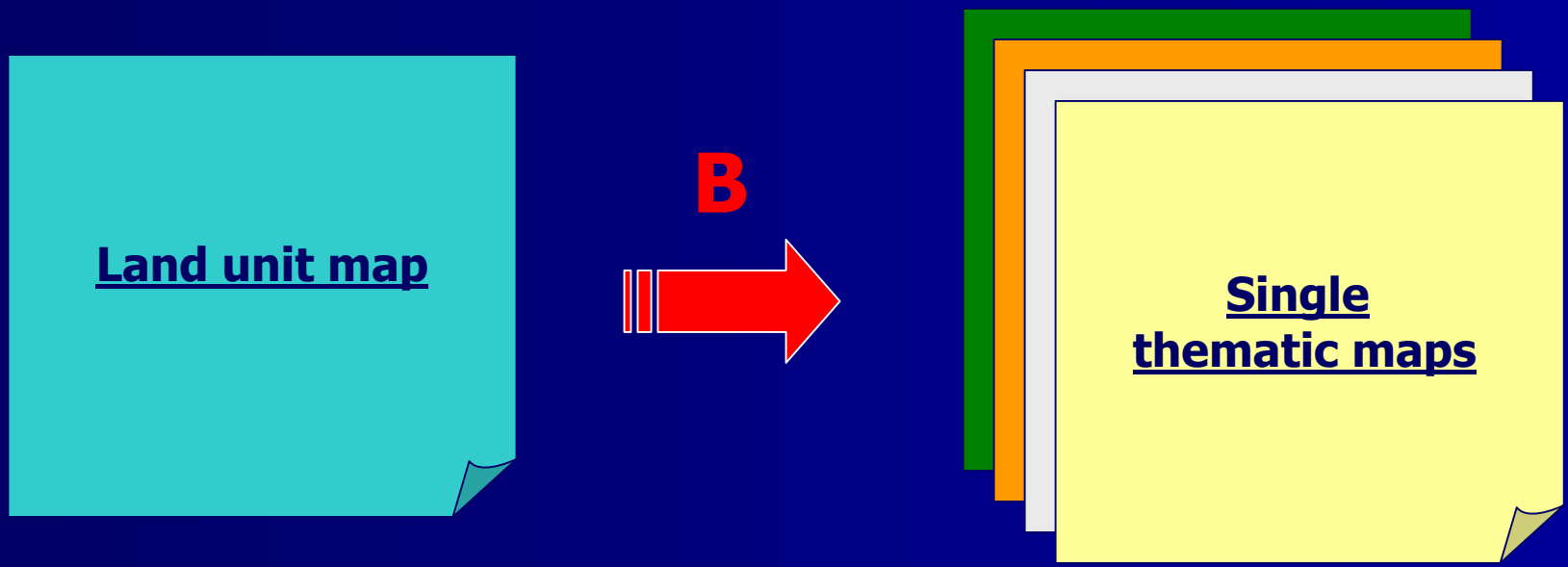


– Different themes are overlaid to produce a synthesis map

Course Methodology

- Holistic approach of "***Land Unit Mapping***"

Case B

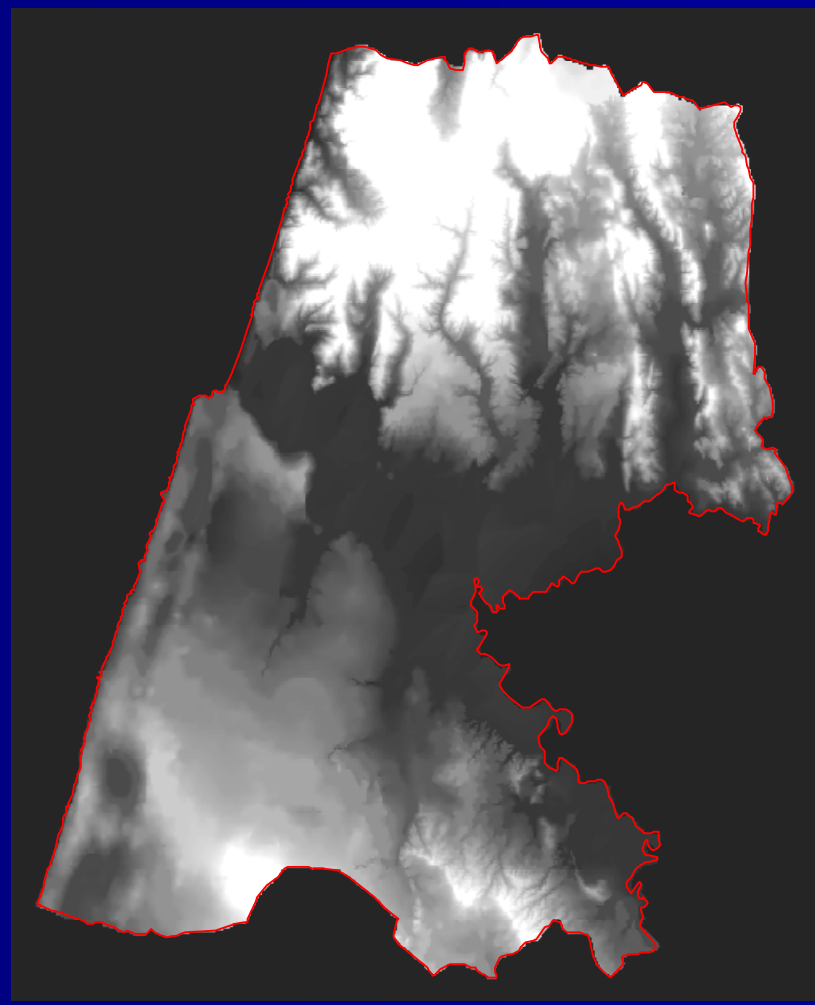


– Different themes are derived from the Land Unit Map

Example – Laranche, Marocco

- **The Land Unit Map of the Province of Larache, Northern Morocco (22nd Course)**
- **750 km², highly heterogeneous area**
- **Working scale 1:100.000**
- **Material used:**
  - *aerial photographs*
  - *Landsat 5 and 7*
  - *topographic maps*
  - *Other data*

The study area

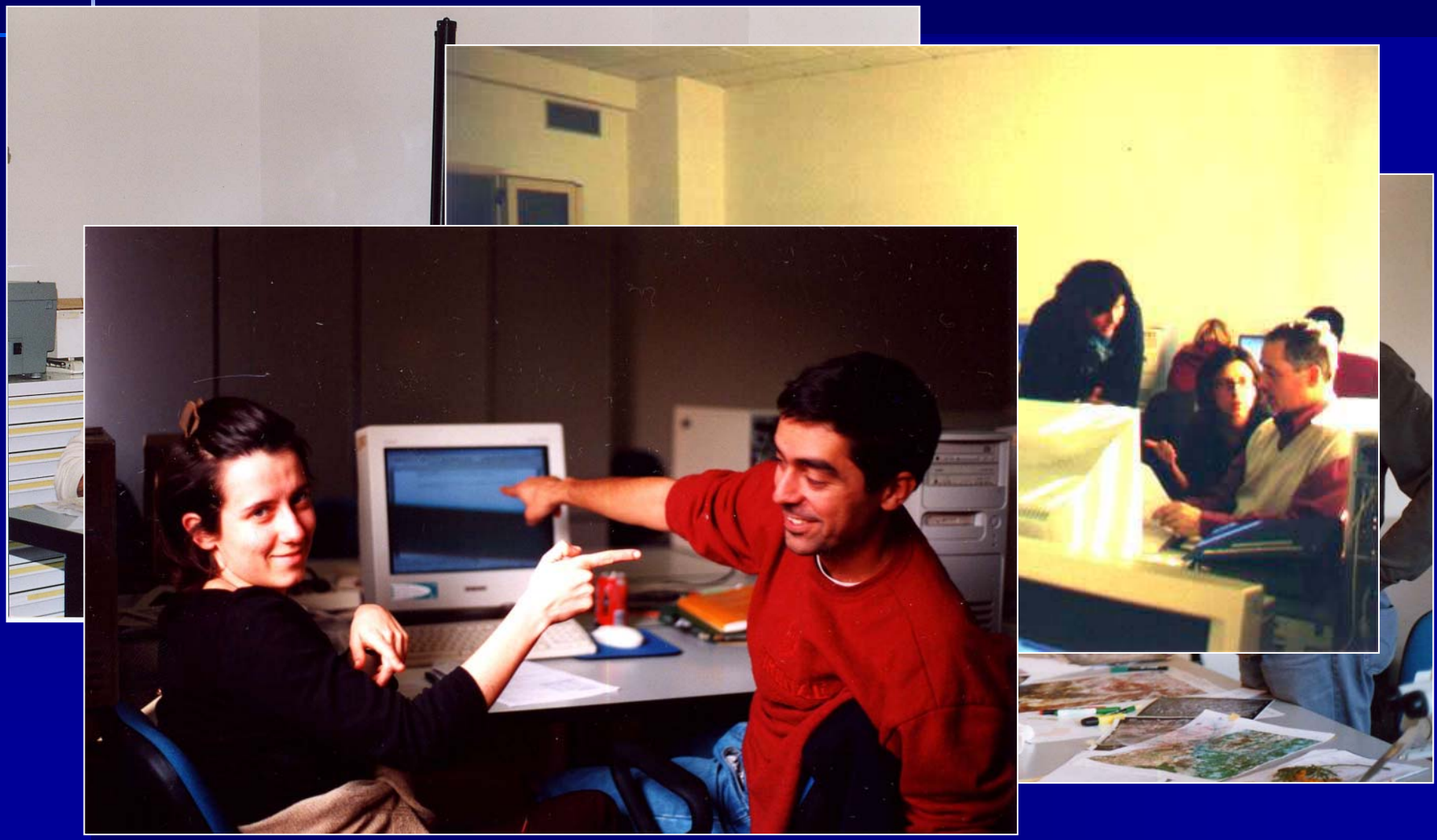


Satellite image processing

LandSat 7: 432 RGB of 08/2000

LandSat 7: 543 RGB

Preliminary mapping

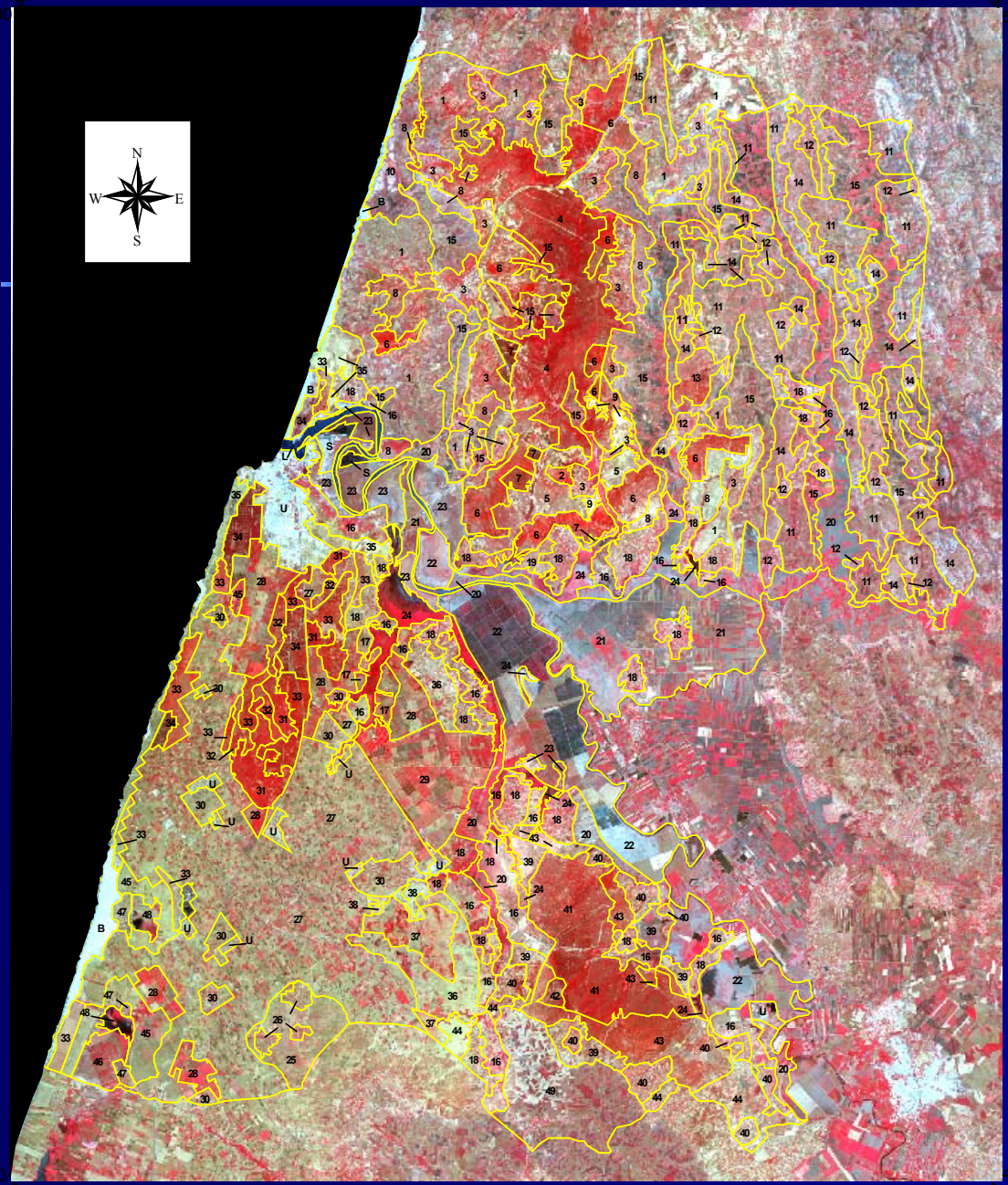


Fieldwork

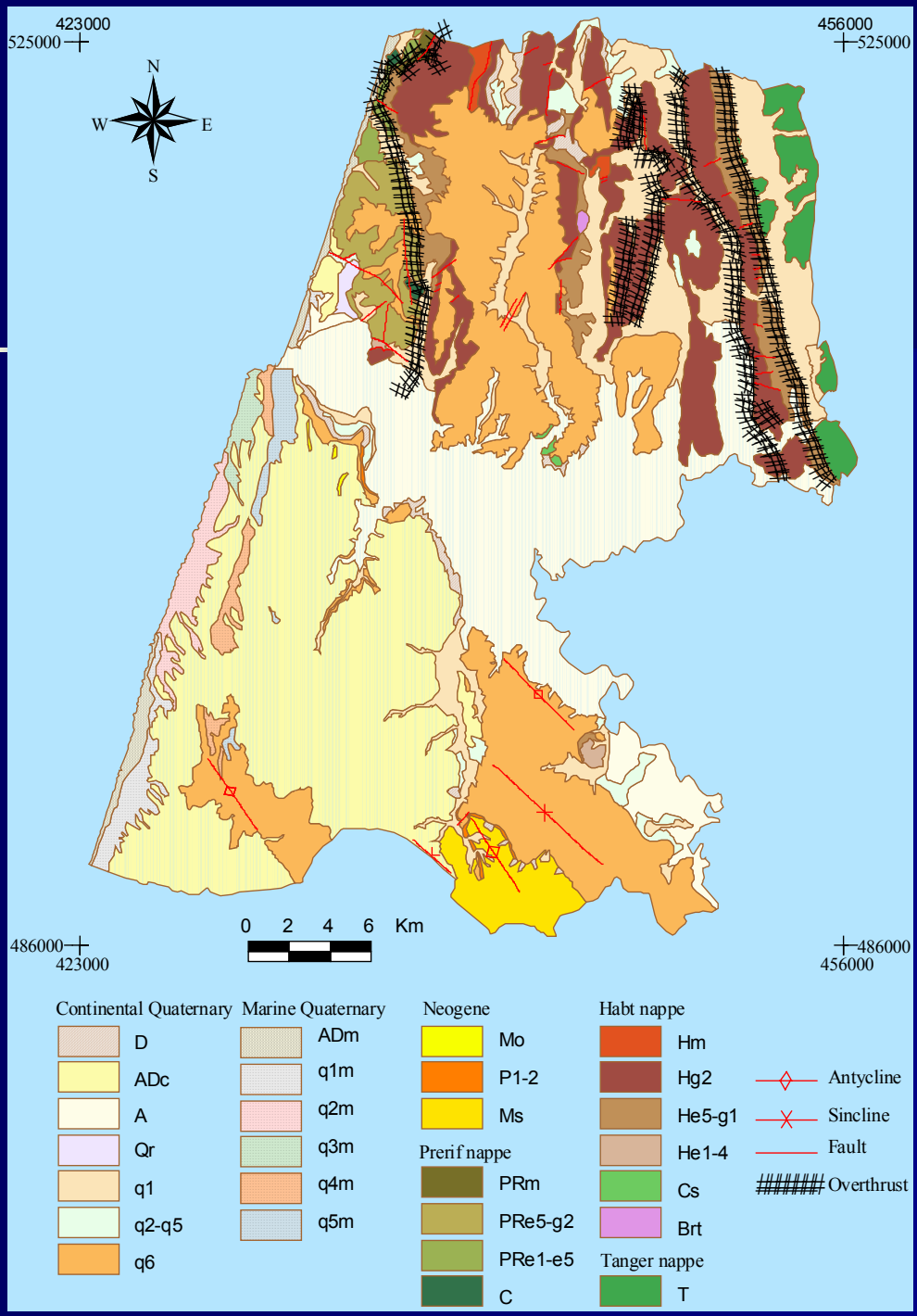
The final products

1. Land Unit Map
2. Geologic map
3. Final Land Use Map
4. Final Soil Map
5. Erosion Map
6. Traditional Capability Map
7. Wheat Map
8. Change Map

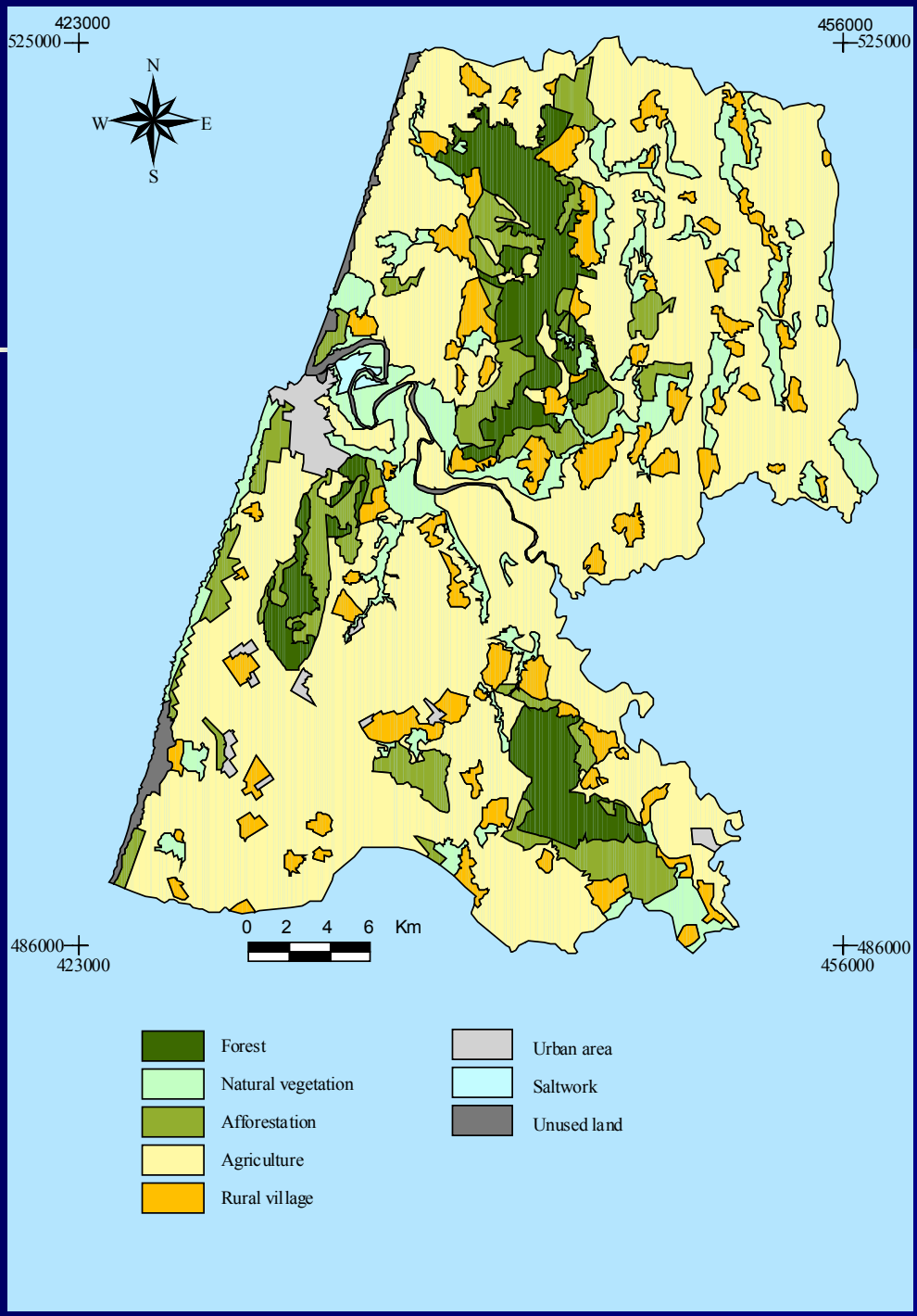
Land Unit Map



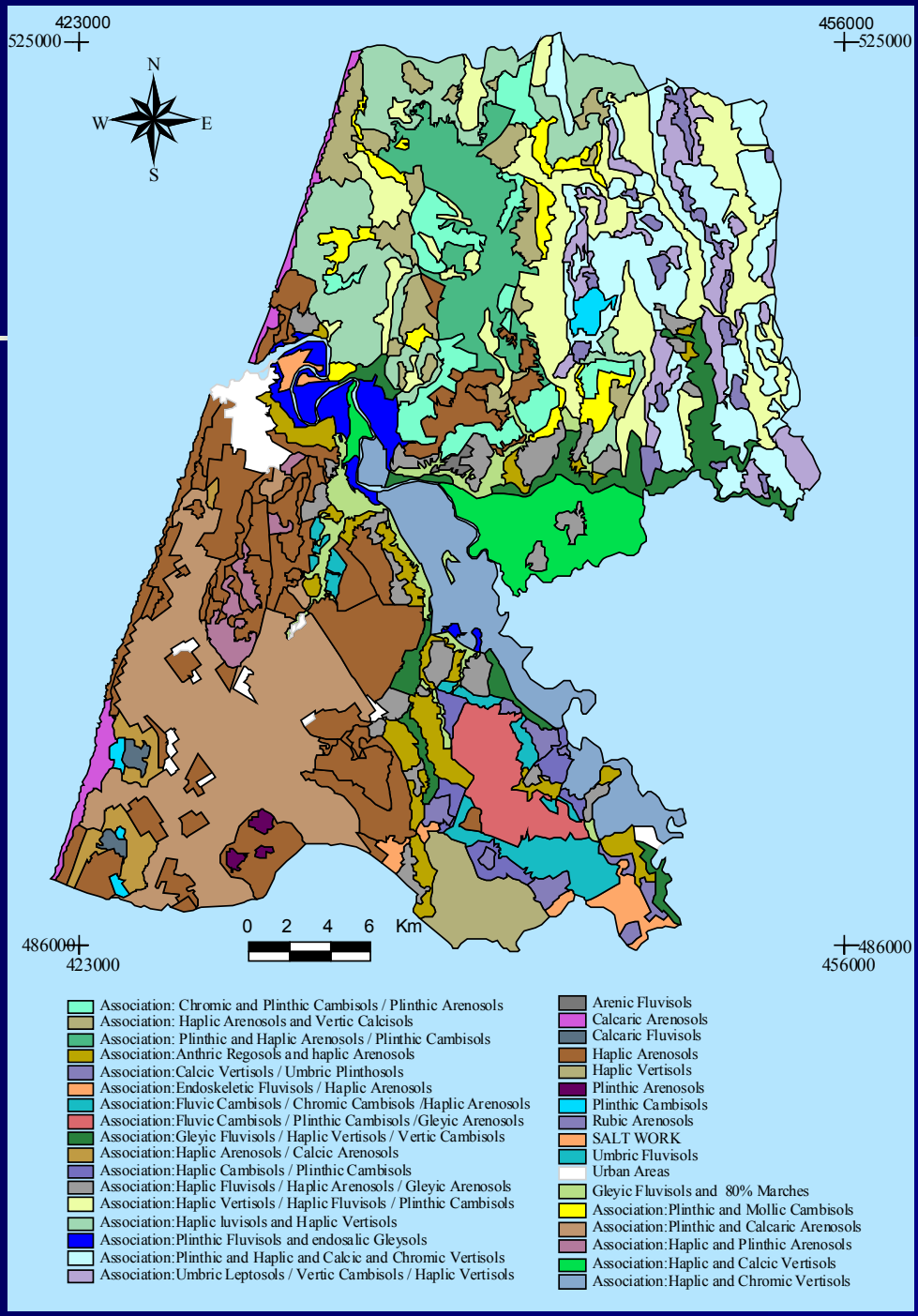
Geologic map



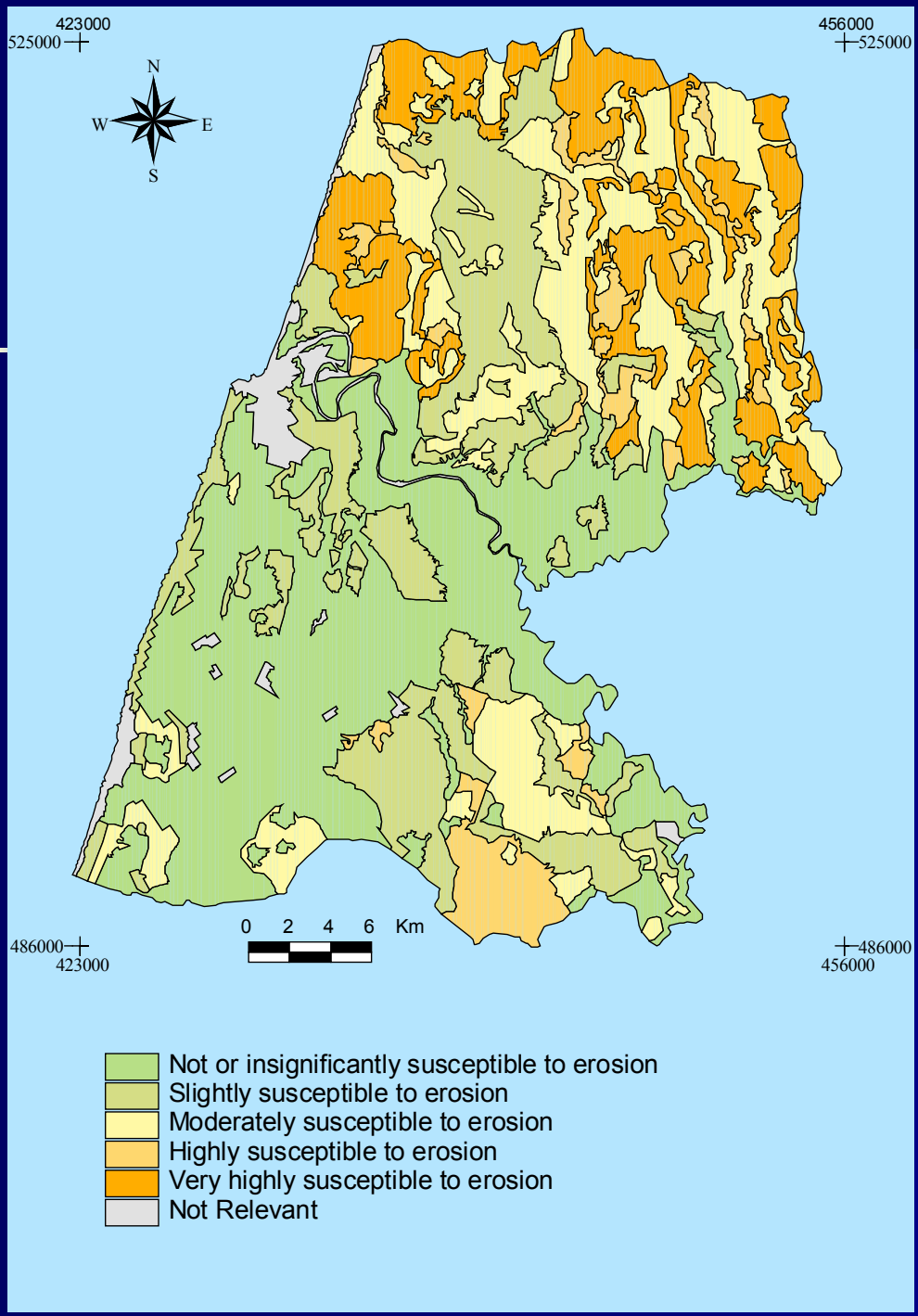
Final Land Use Map



Final Soil Map



Erosion Map


423000
525000
456000
525000
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W
E
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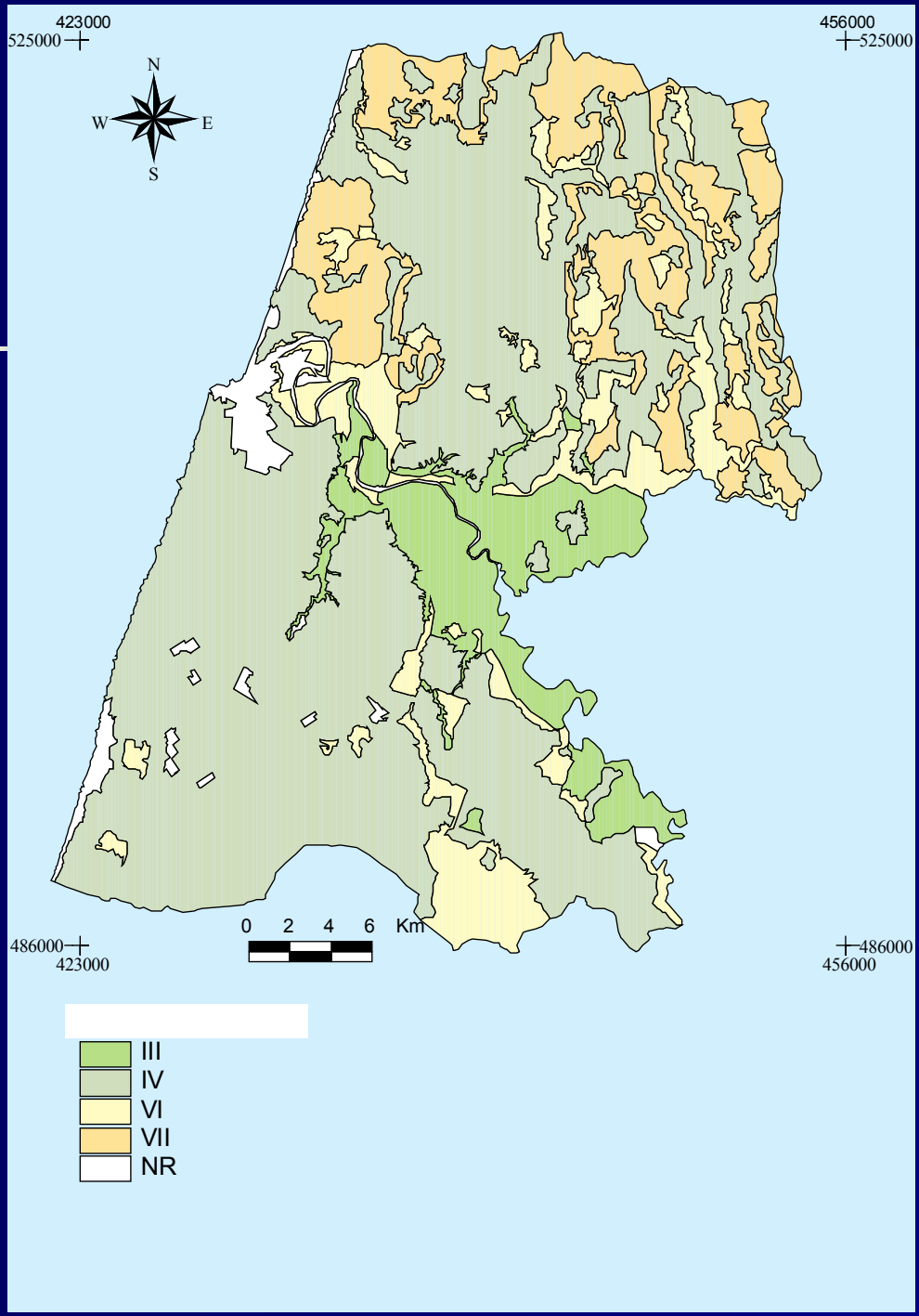
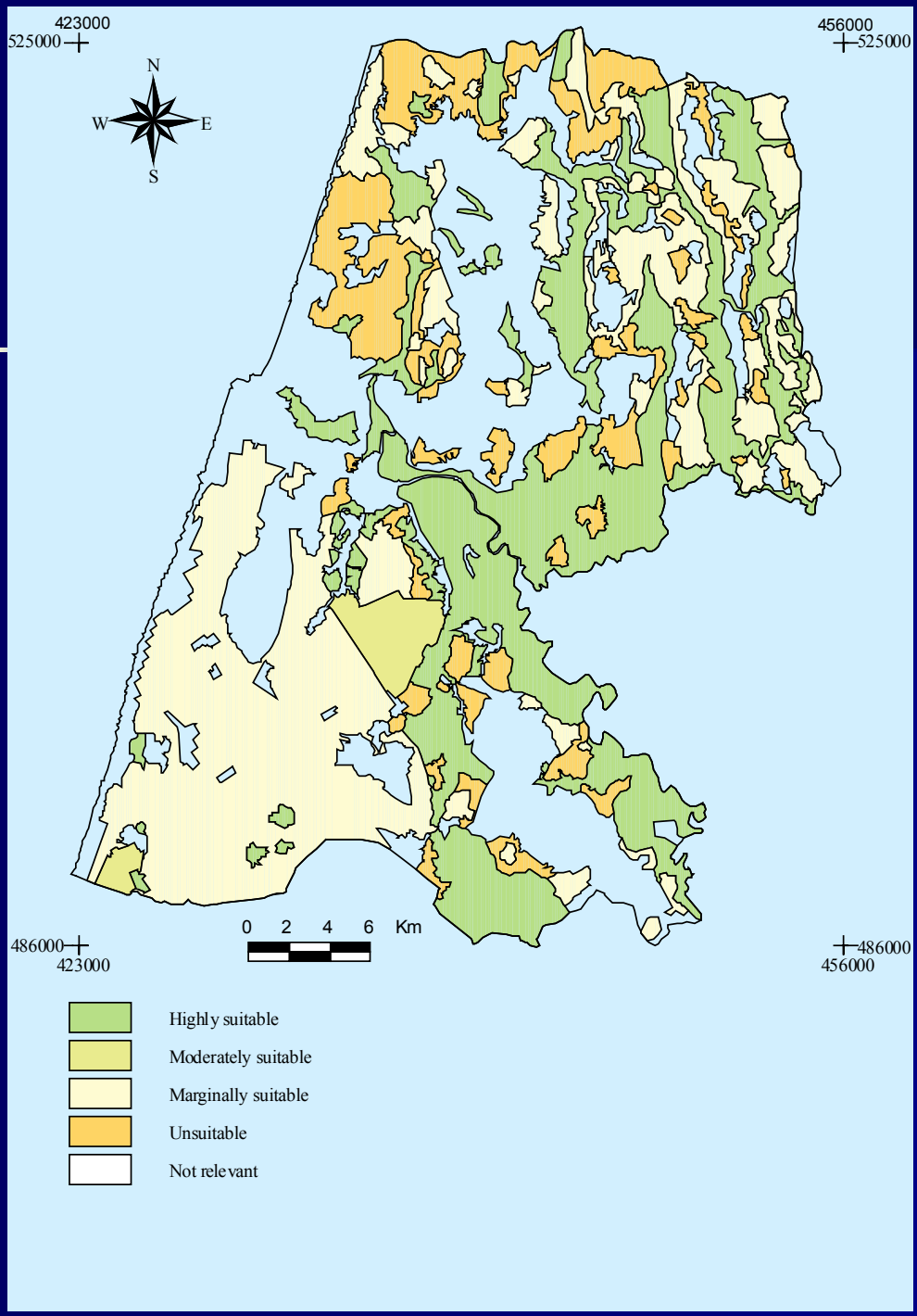
0 2 4 6 Km
486000
423000
486000
456000
Not or insignificantly susceptible to erosion
Slightly susceptible to erosion
Moderately susceptible to erosion
Highly susceptible to erosion
Very highly susceptible to erosion
Not Relevant

Traditional Capability Map



Wheat Map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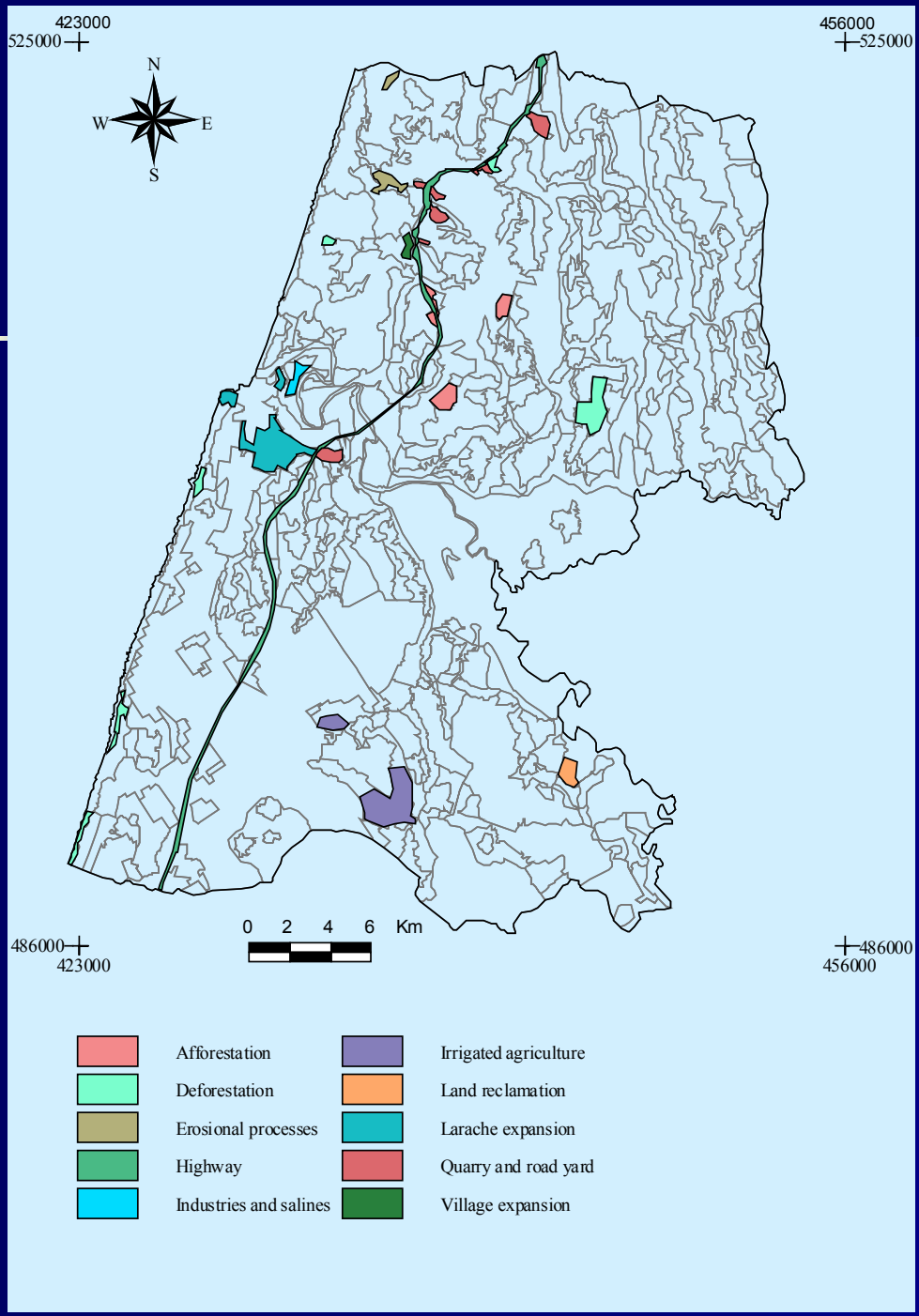
456000
Highly suitable
Moderately suitable
Marginally suitable
Unsuitable
Not relevant

Change Map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Afforestation
Deforestation
Erosional processes
Highway
Industries and salines
Irrigated agriculture
Land reclamation
Larache expansion
Quarry and road yard
Village expansion

COSTS

	EURO	USD
TOTAL COST	454,400.00	576,580.00
TOTAL COST / STUDENT	28,400.00	36,068.00
TOTAL COST/STUDENT/MONTH	3.550.00	4,508.50

Thank you for your attention

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