Informaciaó de sòls à la Regió Emilia-Romagna: situciaó actual i perspectives

Nicola Filippi, D.G.Ambiente, Regione Emilia-Romagna
Barcelona, 4° June 2009
EL MAPA DE SÒLS DE CATALUNIA

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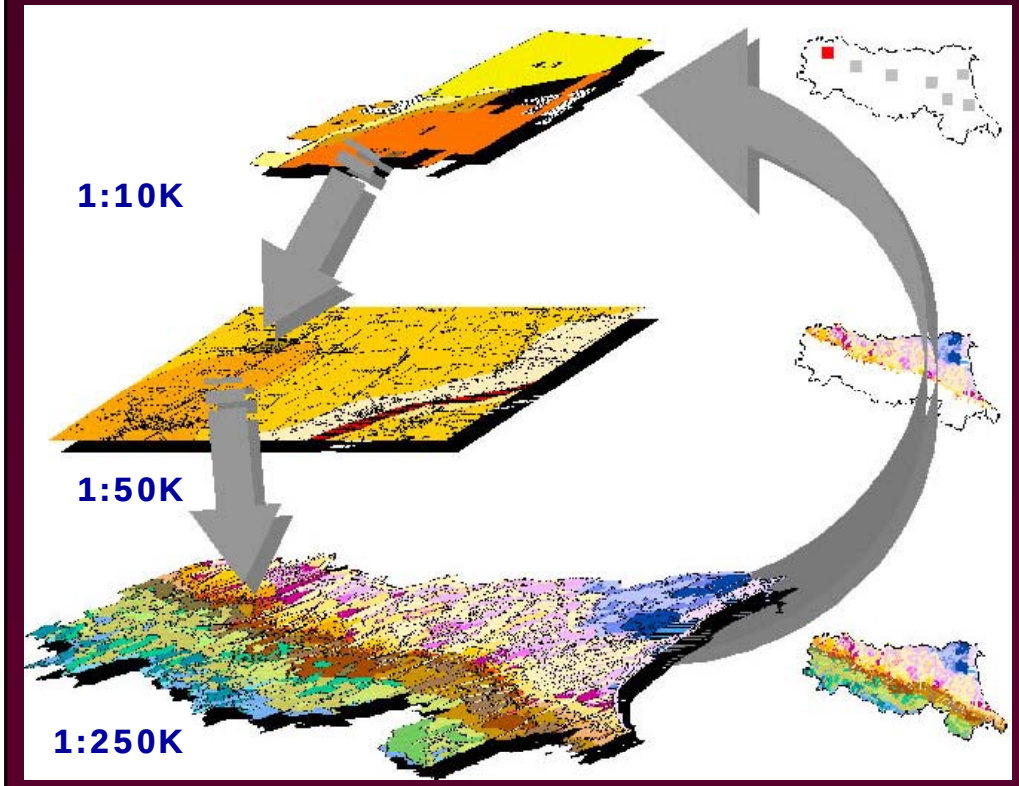
Informaciaó de sòls à la Regió Emilia-Romagna

Main activities:

- Soil survey & Soil information system
- Application of soil info
- Interregional co-operation/harmonization
- Dissemination of soil info

Soil survey & Soil information system

Soil info is analysed and described according to different levels of detail:



- **complementarily**
- **consistency**

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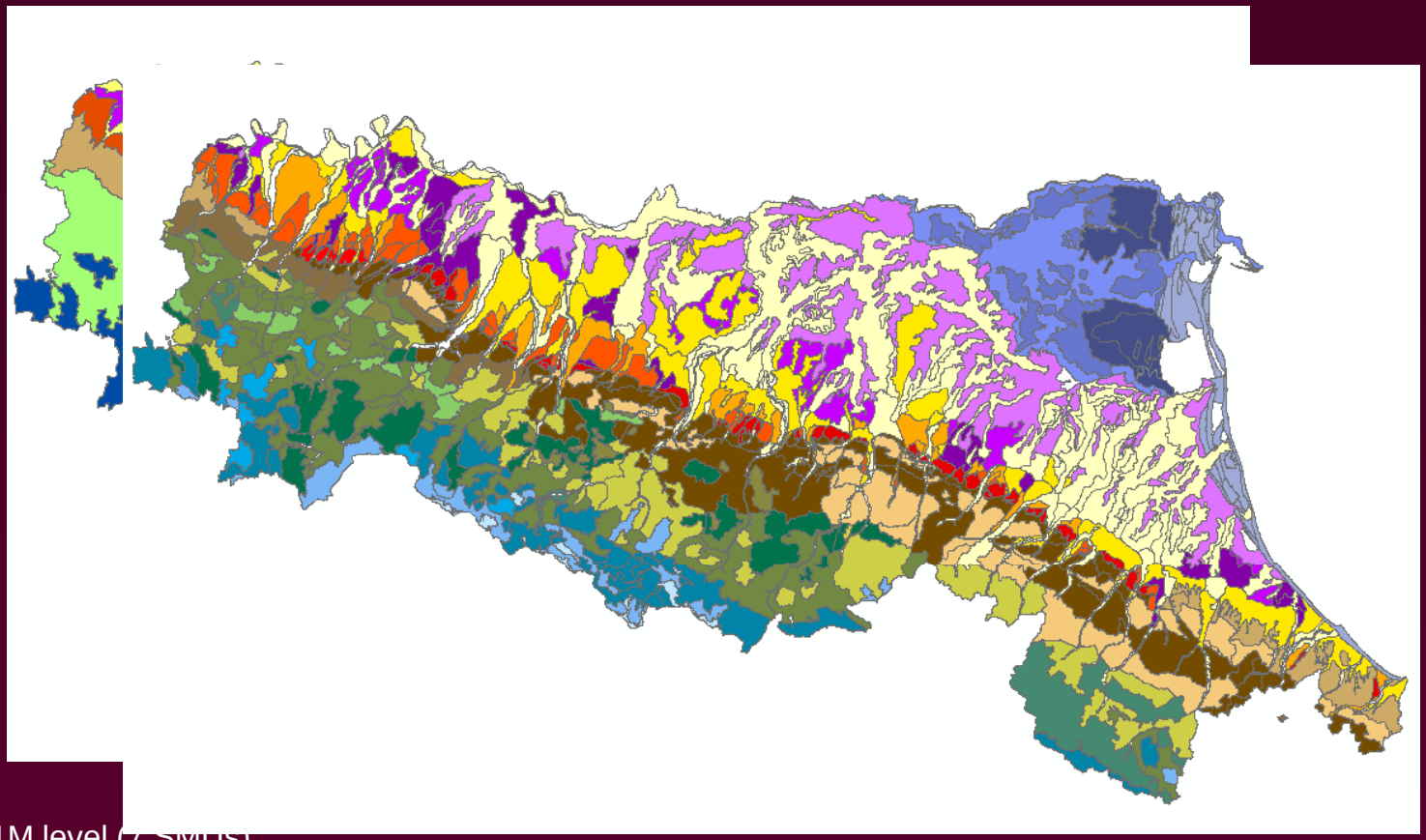
Towards a nested soil information system



-1:1M level (7 SMUs)
-1:500K level (29 SMUs);
-1:250K level (91 SMUs)

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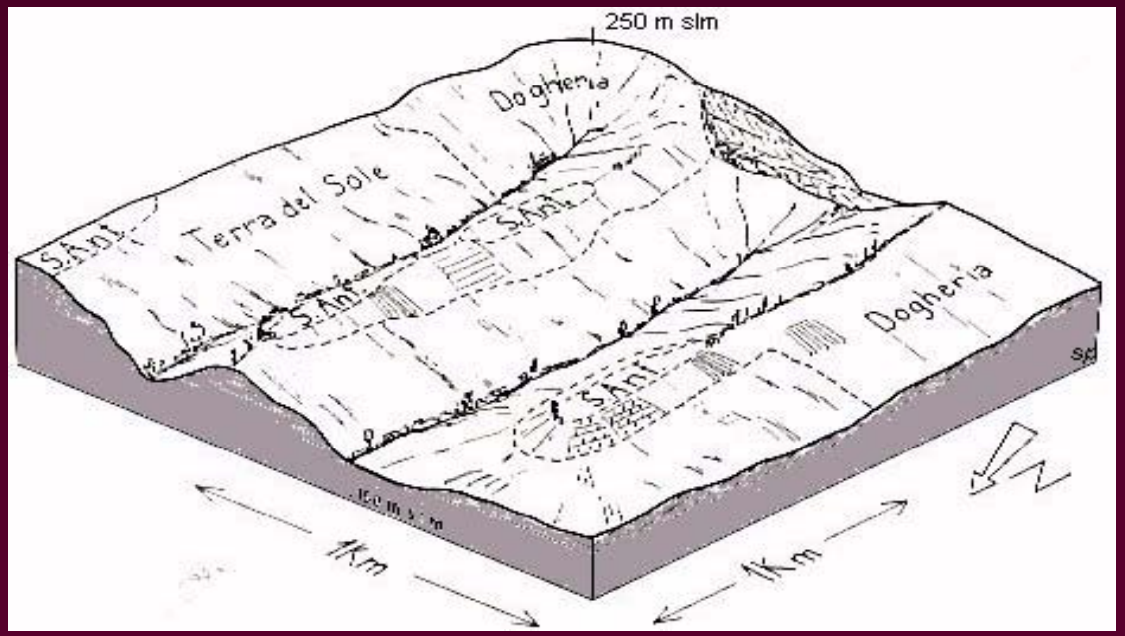
Soil survey approach

Basically:

- field soil survey
- definition of local "Soil-Landscape Models"



by relating
soil features
to any landscape
attributes
that can be
consistently
recognized

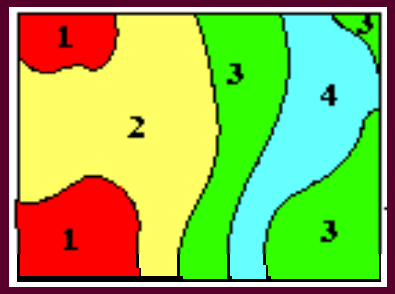
Soil survey approach

- Field soil survey
- Relief
- Geology
- Vegetation
- Land use
- Remote sensing
- New IT tools…

Interdisciplinary expertise

Local soil-landscape models

Soil info



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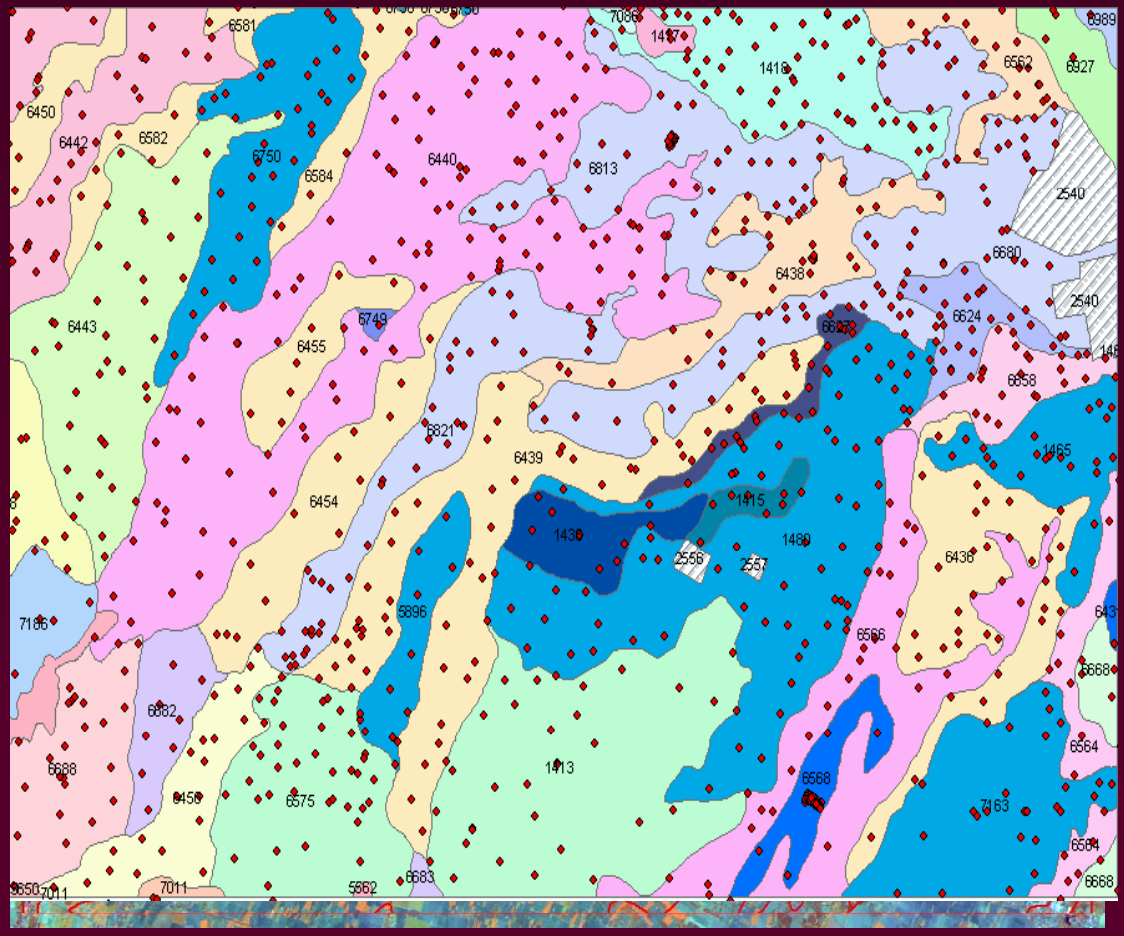
Updating 1:50K Soil Map

Iterative procedures of implementation



Geologic map (50k)

Historical Map (1828-1853)

Aereophotos (1996)

LANDSAT image (1993)

Geomorphologic Units

Field survey and soil mapping

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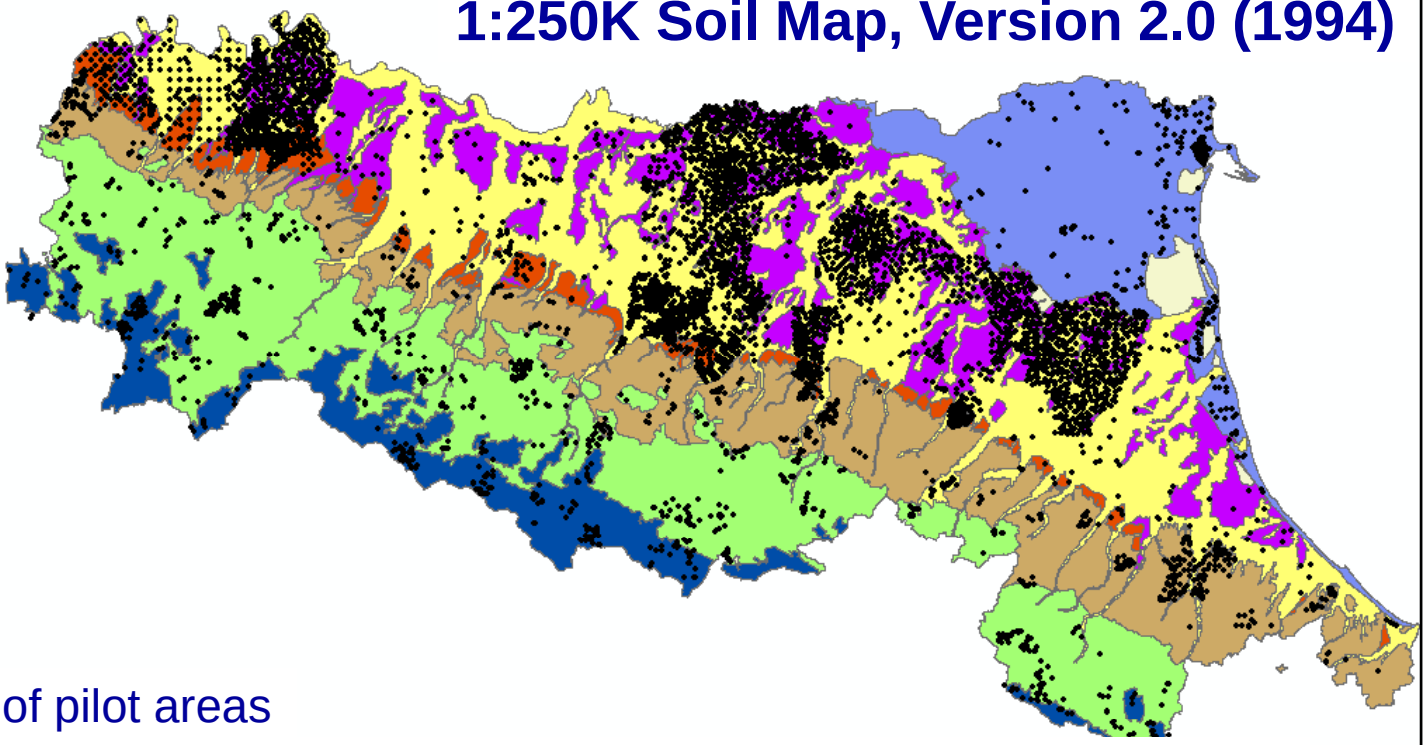
Soil survey

1:250K Soil Map, Version 2.0 (1994)



- Selection of pilot areas
- Within pilot areas: “erecting” STUs, delineating SMUs polygons, defining local soil-landscape models
- Extrapolation based on soil-landscape models

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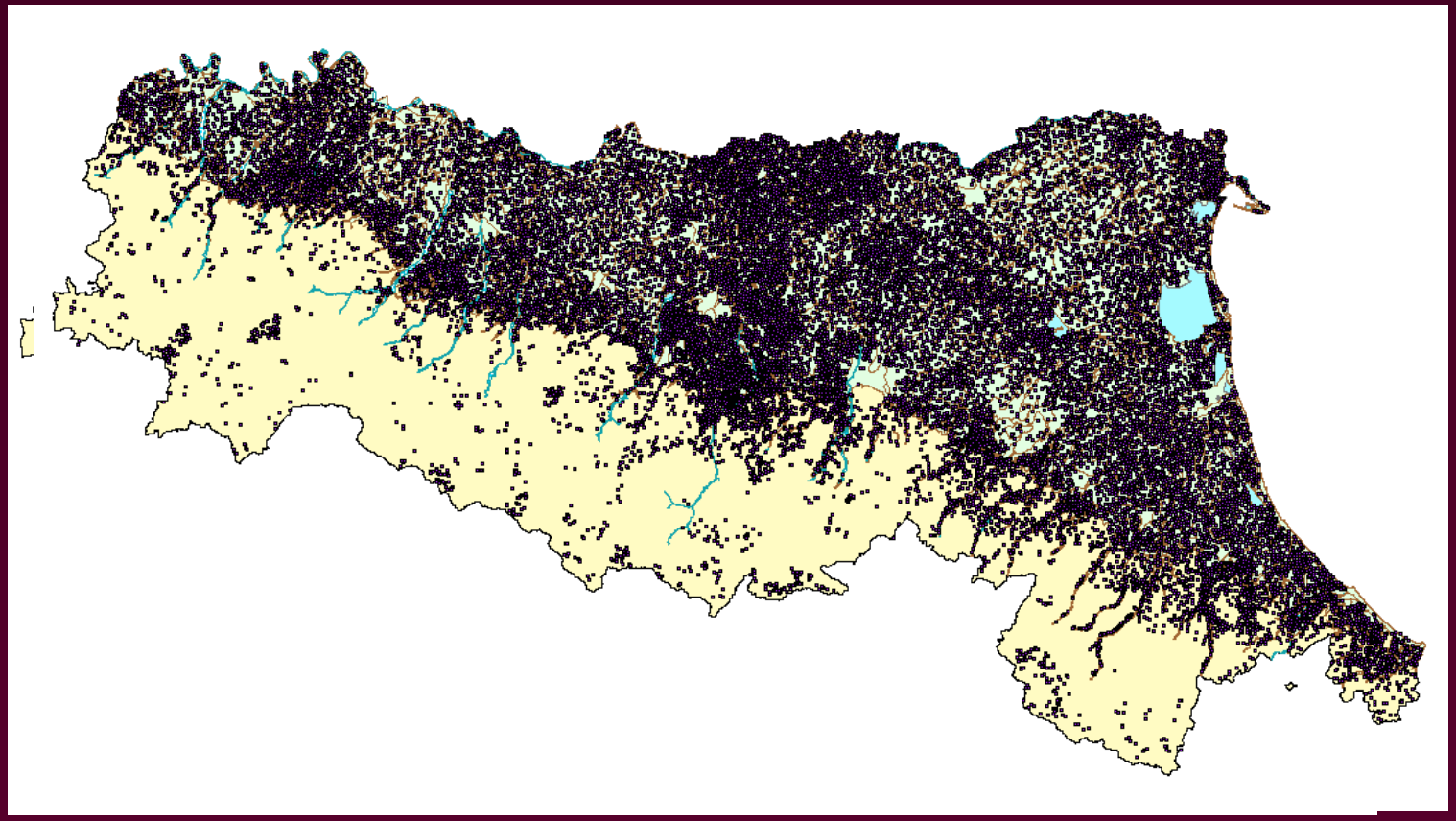
Soil survey



1:50K Soil Map: by subsequent approximations

Covering the whole Plain (about 50% of the region) and pilot areas in the Apennines

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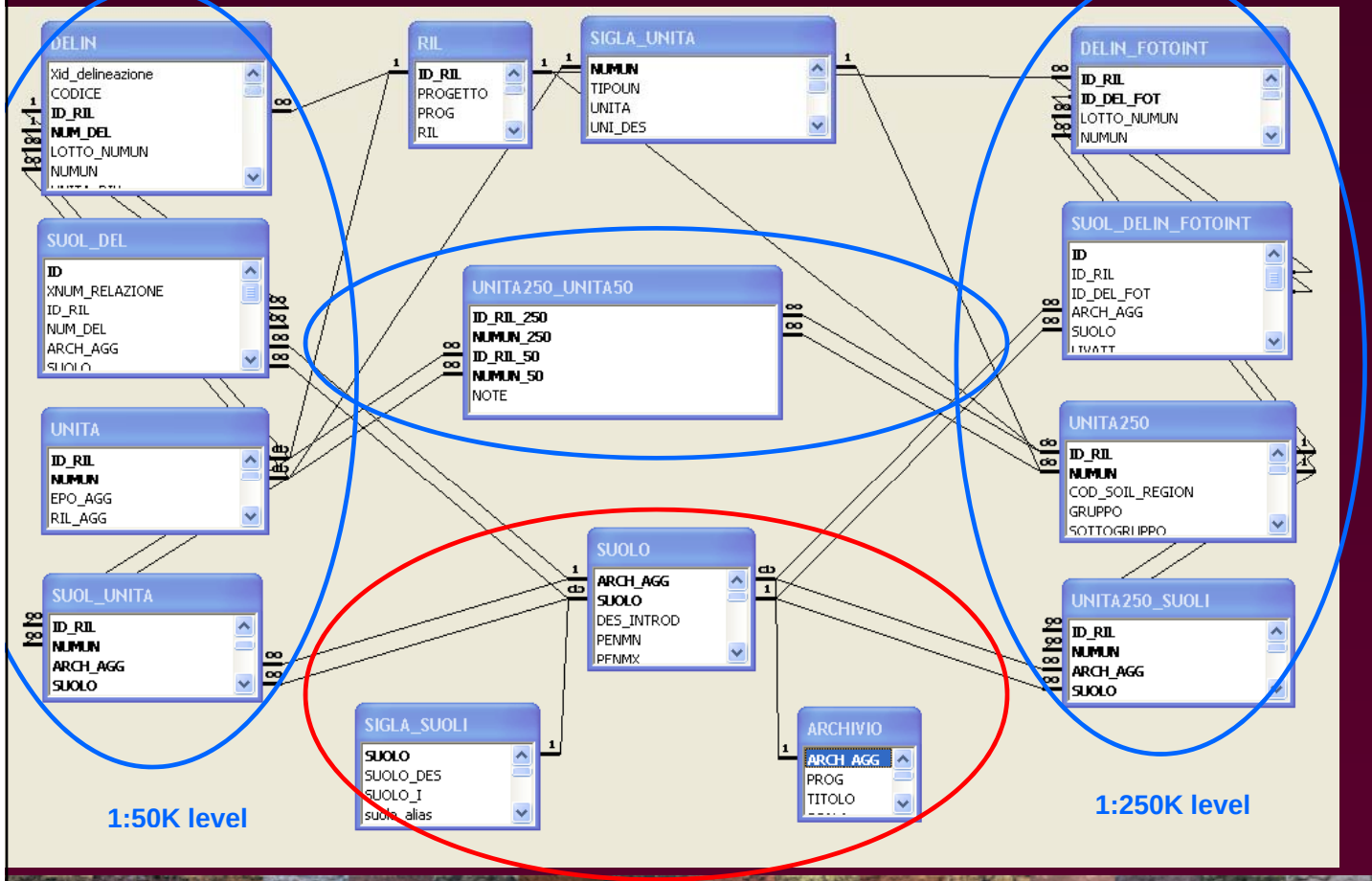
Towards a nested soil information system



The nested soil database enables:

1) to visualize single levels, when useful for specific purposes

2) to update components of single levels, when new info is available

3) to maintain integrity among the levels (e.g. STUs, soil polygons and SMUs are correlated)

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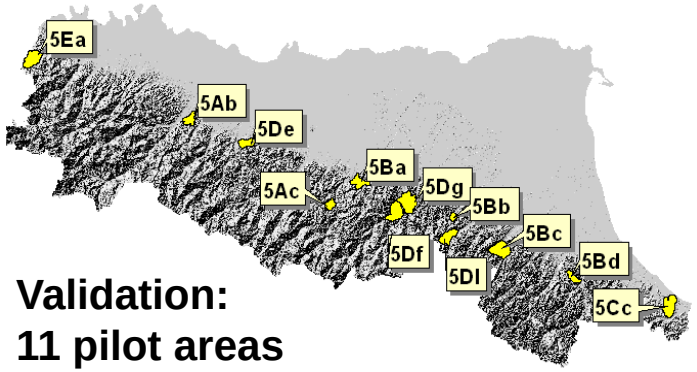
Application of soil information

E.g. Soil Erosion

Soil loss
by rill and inter-rill
water erosion

Model:
RUSLE (Renard ed al. 1997)
A = R * K * LS * C * P



Validation:
11 pilot areas

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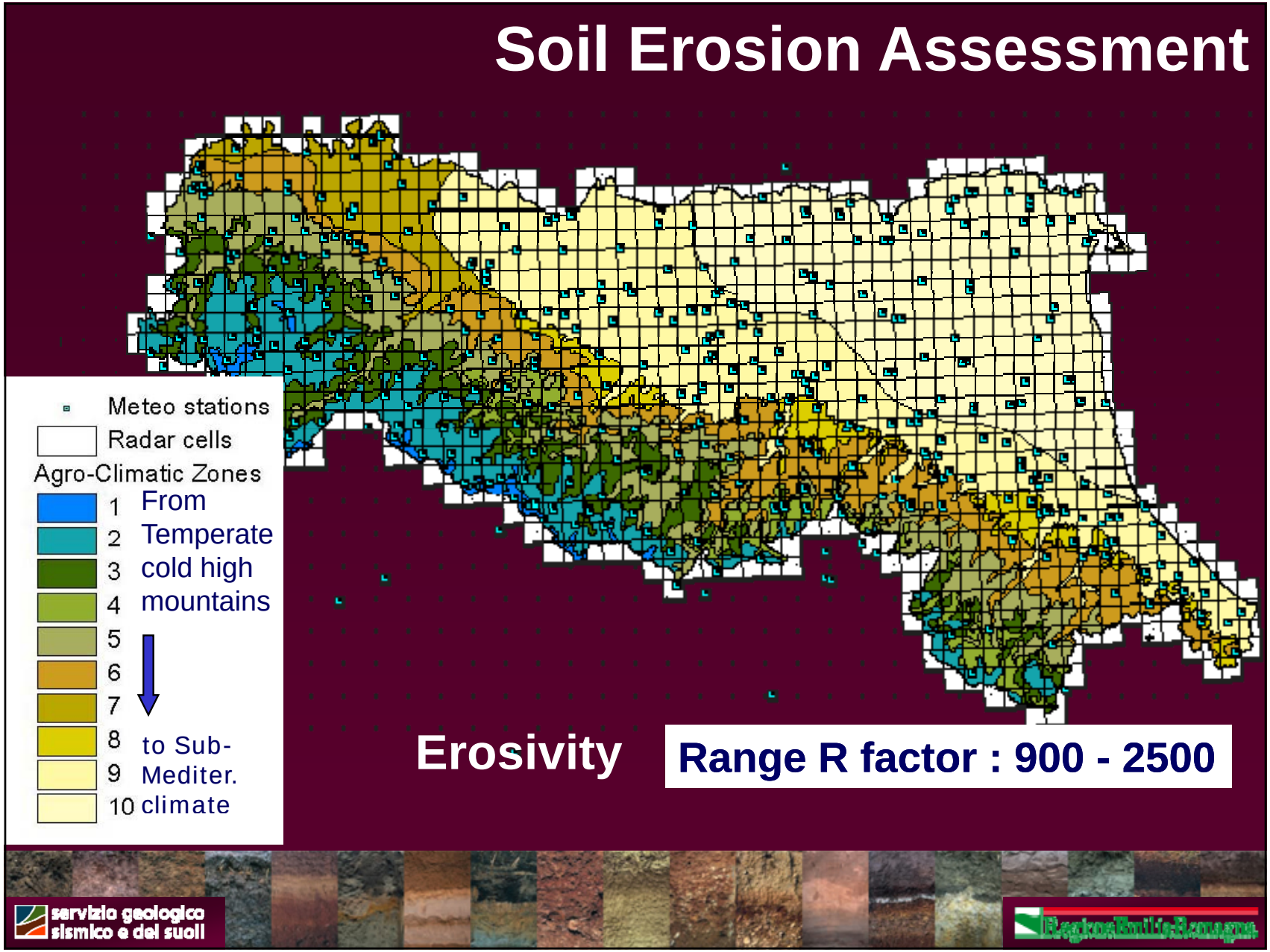
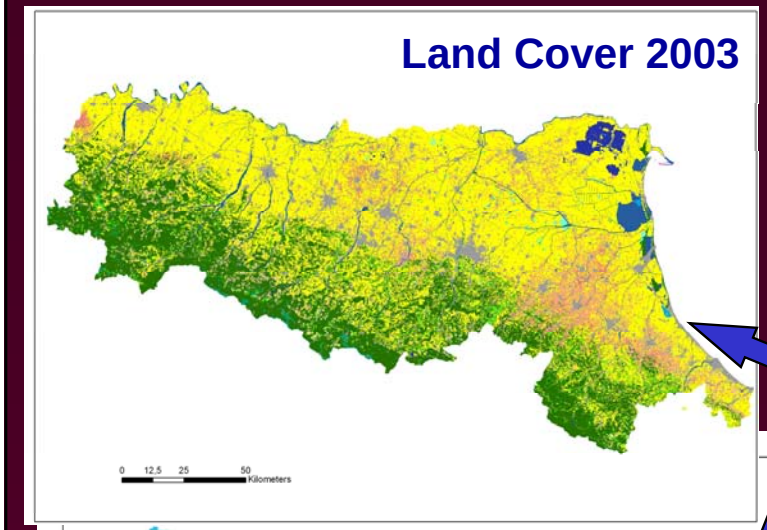
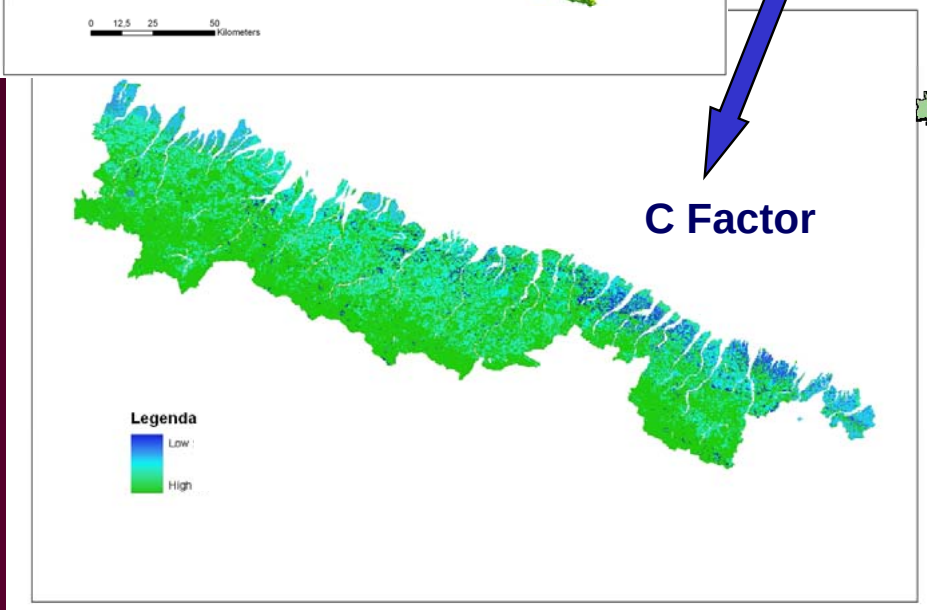
Soil Erosion Assessment



Soil Erosion Assessment



Cropping systems



Calendar of tillage and support practices

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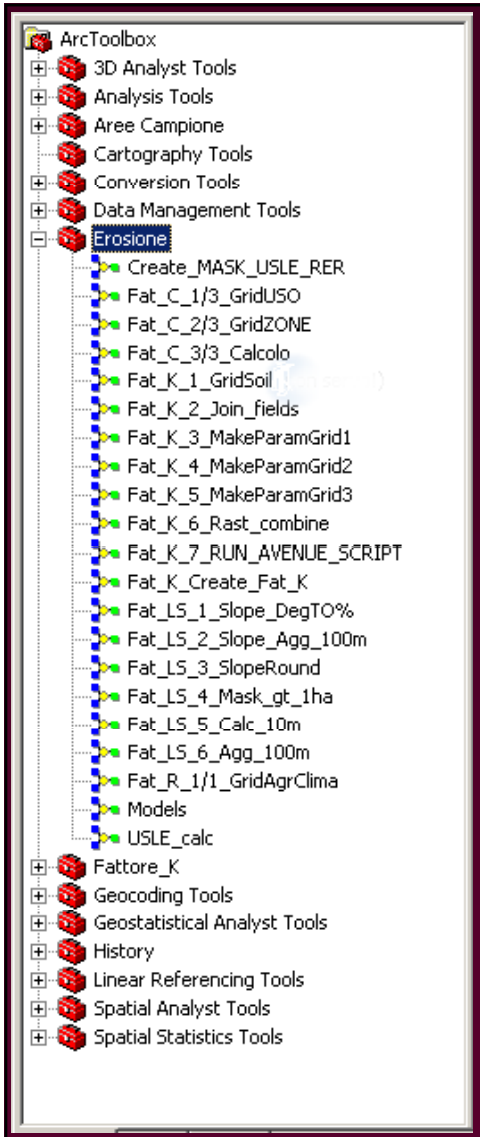
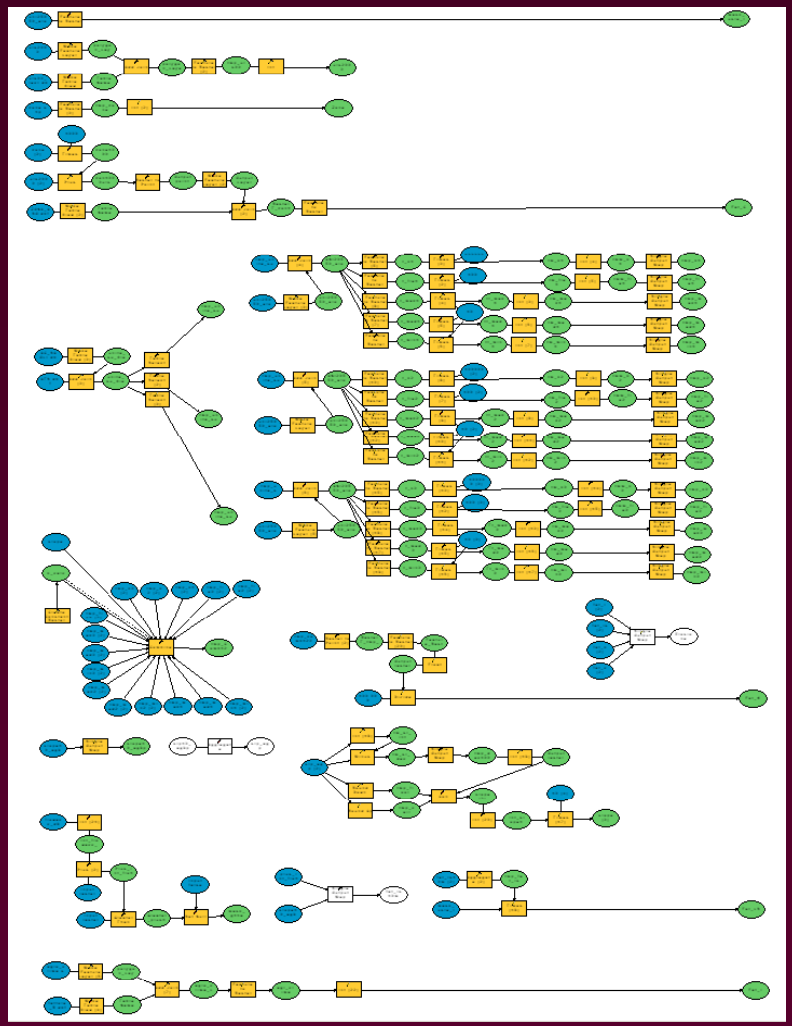
Soil Erosion Assessment





Geoprocessing:

the
“Model Builder”

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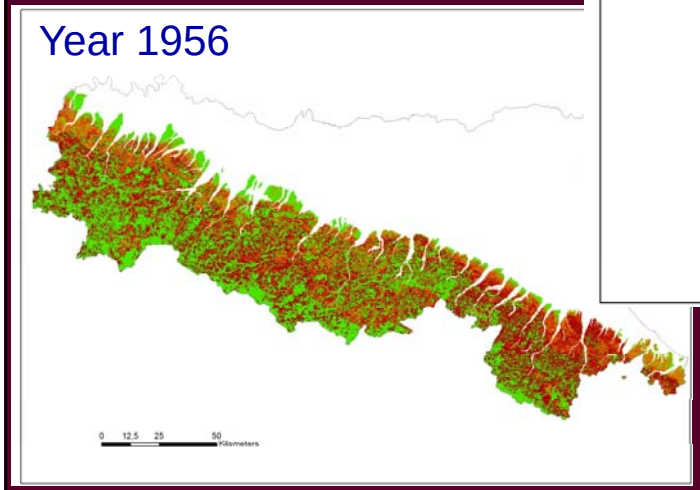
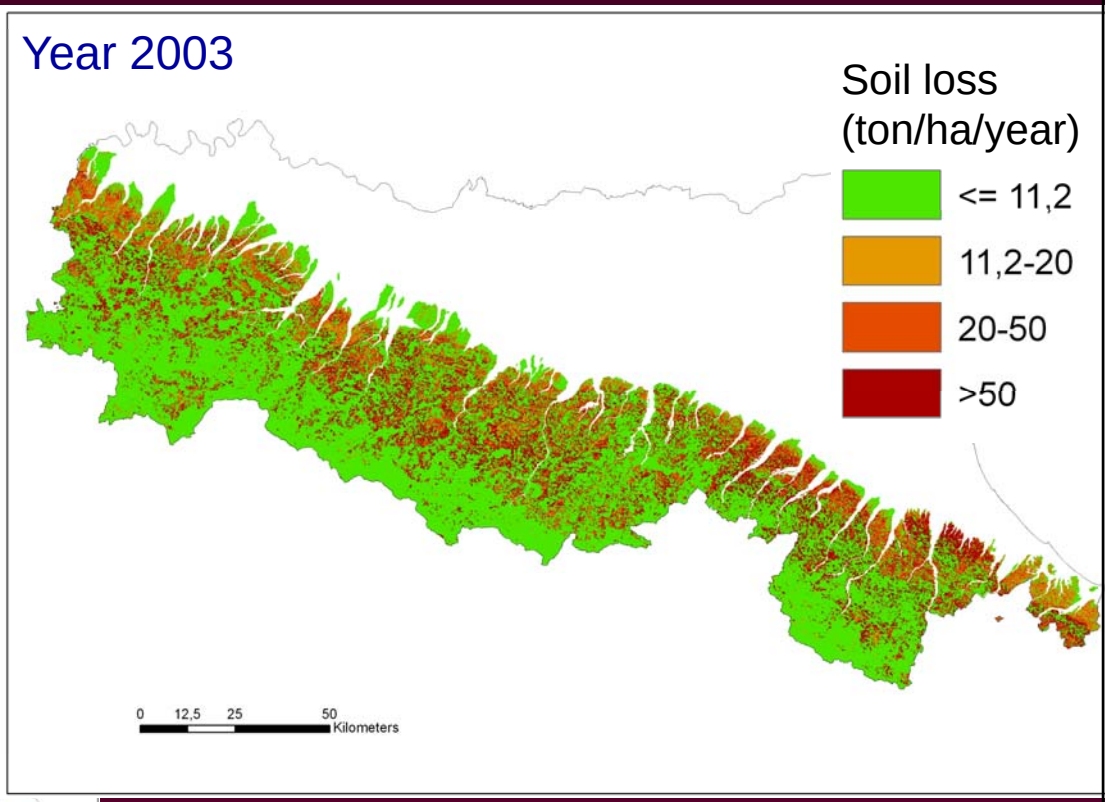
Soil Erosion Assessment

Policy relevant info

e.g. the Rural Development Plan





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Application of soil information

Quantity, variety and specificity of requested soil info

are increasing

e.g. areas of:

- regional and urban spatial planning,
- environment, nature and landscape, climate change,
- agriculture, rural development, forestry,
- transport,
- energy,
- raw material extraction,
- trade and industry,
- product policy,
- tourism

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Application of soil information

Integration

Directive 2001/42/EC

for plans and programmes

which are likely to have significant environmental effects

We should consistently carry out:

- environmental report
- statement summarising how environmental considerations have been integrated into the plan or programme
- environmental assessment
- statement summarising how environmental considerations have been integrated into the plan or programme
- monitoring the significant environmental effects of the implementation of plans and programmes

Application of soil info

- Field soil survey
- Relief
- Geology
- Vegetation
- Land use
- Remote sensing
- New IT tools…

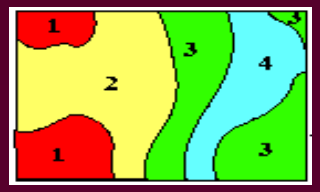
Interdisciplinary expertise

Local soil models

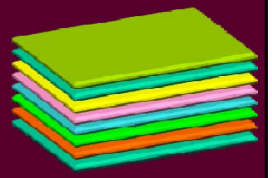
soil-landscape models

functional models

Soil info



Application of soil info by co-operating with users



Interregional harmonization of soil info

Ensuring **consistent and accurate soil:**

- **description:** e.g. soil profile description
- **classification:** e.g. allocating soil profiles to WRB and Soil Typological Unit classes
- **mapping:** application of local “soil landscapes models”
- **interpretation:** application of local “soil functional models”

It asks for a **perfect synchronization** of the activities of the different regional staff

Feasibility: in the long term

Interregional harmonization of soil info

- **Variety of approaches to soil protection** in the Regions of Europe
- **Distortion of competition in the internal market** (very different obligations on economic operators)

In the short run: harmonizing policy relevant soil info

To facilitate the **exchange of policy relevant information** a common European **Grid Reference System for Reporting** has been adopted

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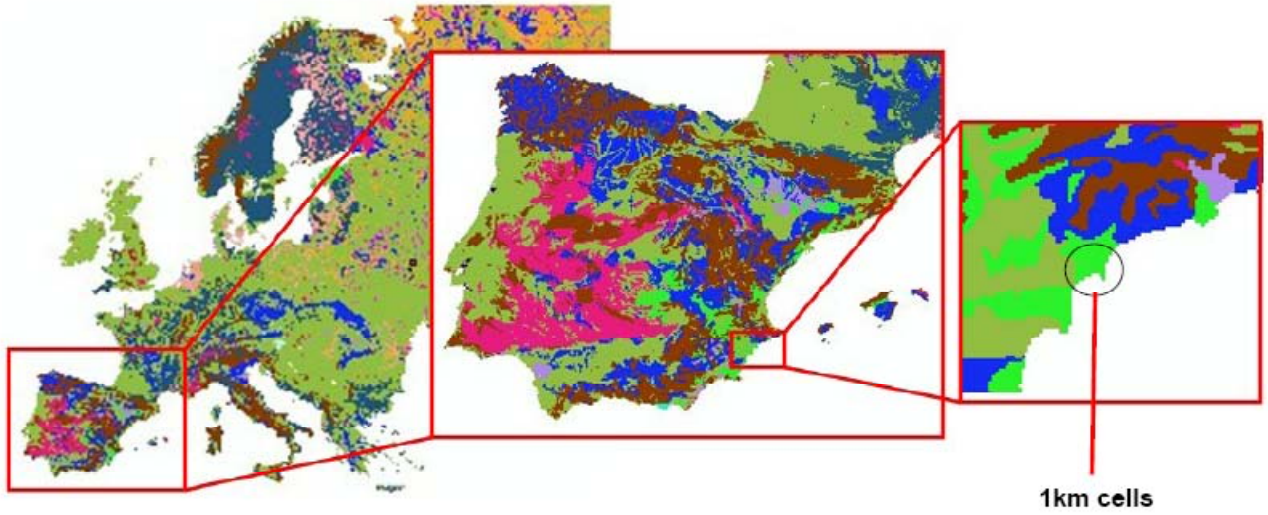
EUROPEAN COMMISSION
DIRECTORATE-GENERAL
Joint Research Centre

ESDAC and grids

Taking into consideration the recommendation to promote the wider use of such grids and in the context of dissemination of its soil data,

ESDAC offers European Soil Database also as a library of rasters, one for each soil property (soil name, soil texture, depth to roots, etc.)

Format which is easy-to-use (e.g for use in existing models, for overlay with other layers)



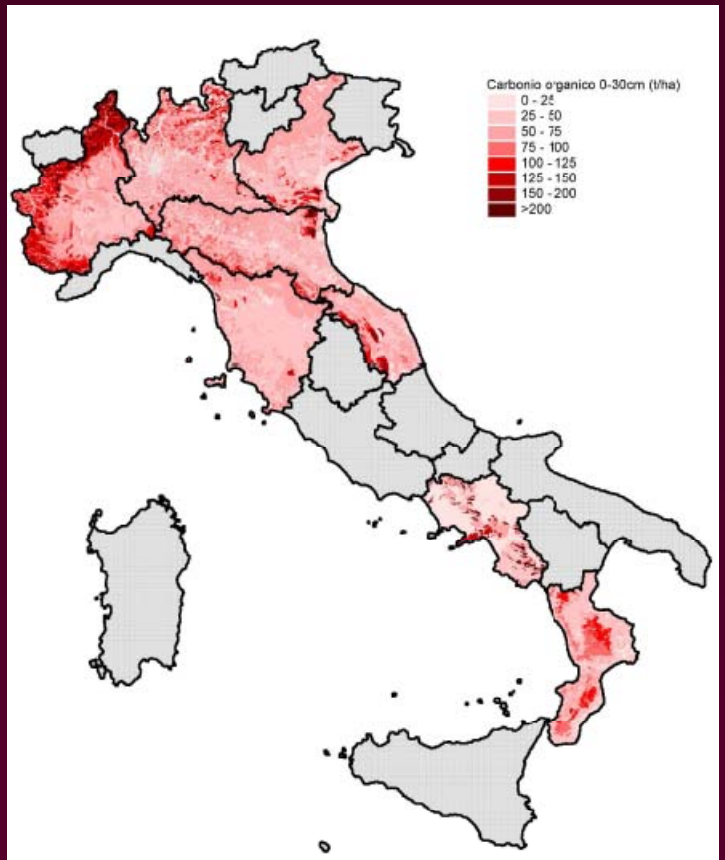
Joint Research Centre

Marc Van Liedekerke, Panos Panagos, *Barcelona 2008*
Opportunities offered by the Design and the Use of a Gridded Multi-Scale European Soil Information System in Support of European Soil Policy

ies Institute for Environment and Sustainability

Interregional harmonization of soil info

by exploiting local expertise



Topsoil organic carbon stock

Pilot Project promoted by the National Environmental Protection Agency involving all Italian regions and the European Soil Data Center

Further harmonization among regions will be necessary before merging all regional databases, in order to provide an effective and validated national tool.

From: I. Vinci et al. SIAS: a bottom-up approach for soil indicators, Bologna 2008.
http://www.regione.emilia-romagna.it/wcm/geologia_en/News/2009_01_congress_soil.htm

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Interregional harmonization of soil info

by exploiting local expertise

Example

Assessing the stock of topsoil organic carbon

A parametric simulation approach
conditional on soil map delineations
in the plain area of the region

resulted in lower standard errors, with improvement in accuracy
over the traditional delineation mean approach
(assessed on a subset of 2000 independent observations)

From: F.Ungaro et al.: Assessing topsoil organic carbon stock, Bologna 2008
http://www.regione.emilia-romagna.it/wcm/geologia_en/News/2009_01_congress_soil.htm

Dissemination of soil info

- http://www.regione.emilia-romagna.it/cartpedo/index.htm
- http://gias.regione.emilia-romagna.it/suoli.asp
- http://irrigation.altavia.eu/logincer.aspx

Dissemination by co-operating with users

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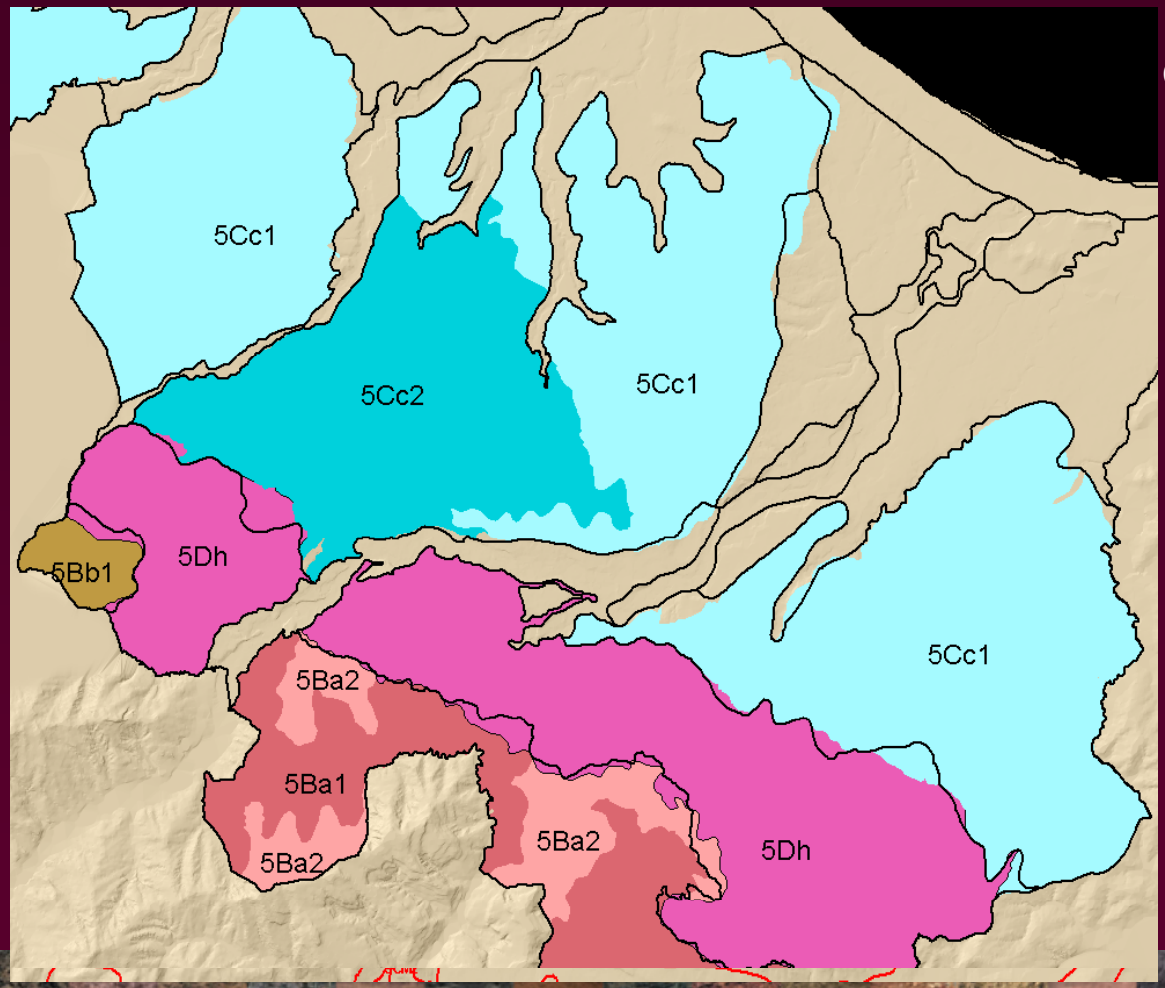
Updating 1:250K Soil Map/2

In areas without existing the new 1:50K soil map:

Pre-zoning based on available info + field soil survey



Old 250k soil map over DTM

Geologic map 10k (geologic units and Quaternary deposits)

Aereophotos (e.g.2008)

DTM processing, e.g.slope gradients

Active landslides

Land cover 25k (2003)

Field survey

50k soil map

The new 250K soil map

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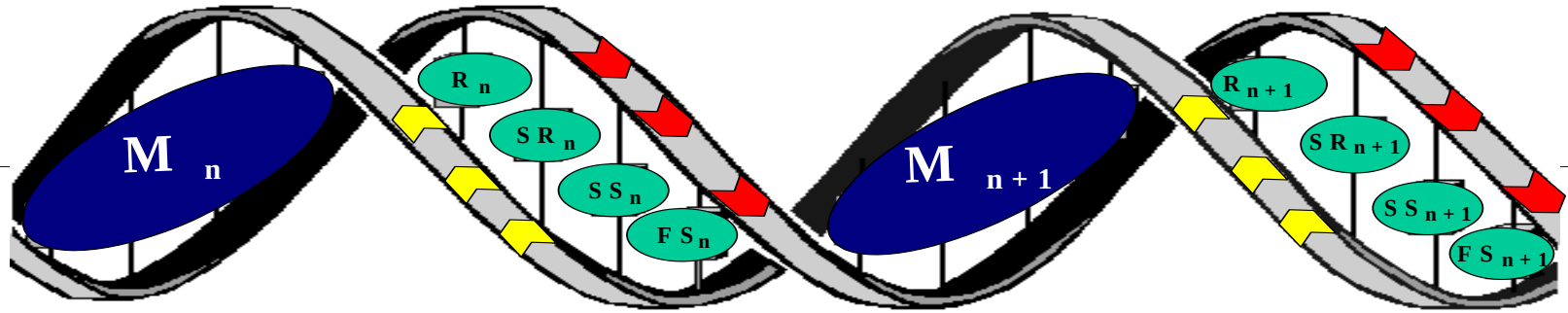
Soil survey approach

Consistency with the European Procedures Manual



R — Delineation of "Soil Regions" at 1:5,000,000 scale

SR — Delineation of "Soil Sub-Regions" at 1:1,000,000 scale

SS — Delineation of "soilscapes" at 1:250,000 scale

FS — Field soil survey in small reference areas

M — Definition of "soil-landscape" models

Work sequences according to the European Manual of Procedures:

- the "ascending" path
- the "descending" path

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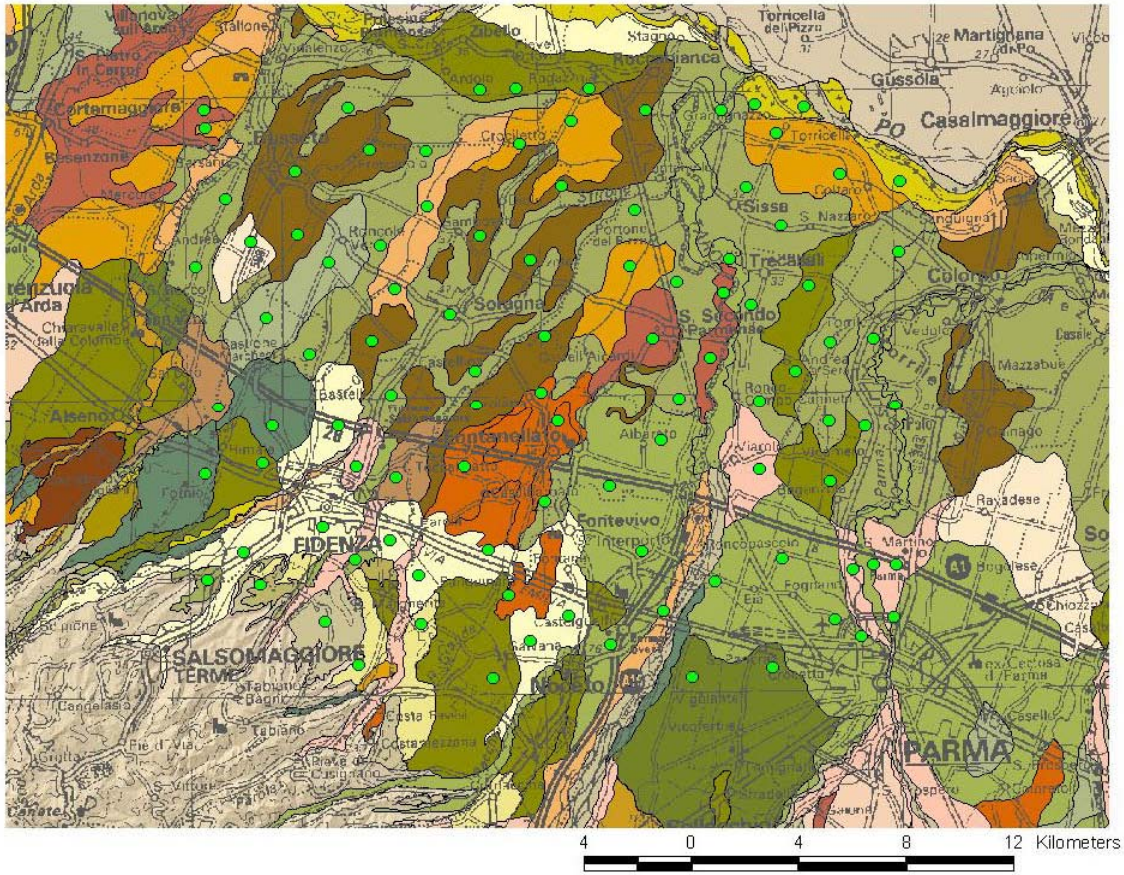
Soils

Pilot area about
480 Km^2



Aim of the work is, according the soil map and the geological map, check the natural background and the enrichment of Cd, Hg, Cr, Cu, Zn, As, Pb .

Sampling point: 100 top soil samples (30 cm depth) and the related sub soil samples (100 cm depth)

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envasso

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