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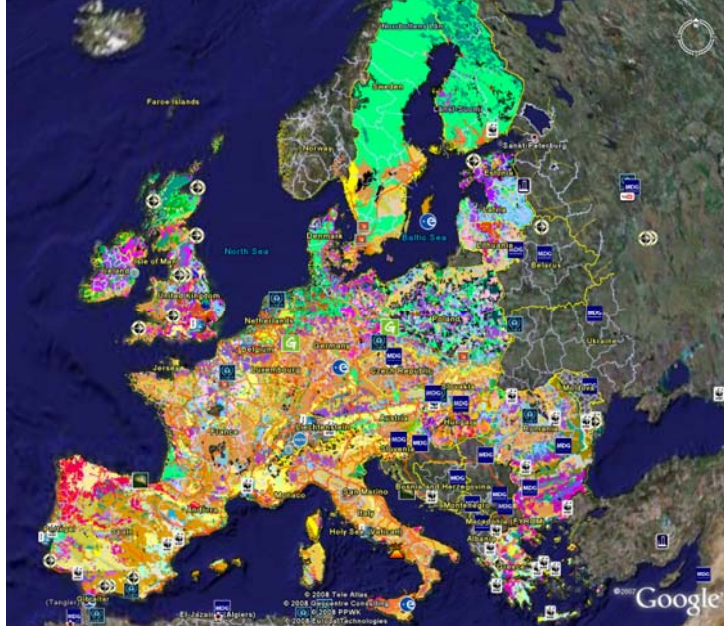
European Soil Database



Interest for Biodiversity

Panos Panagos
http://eusoils.jrc.ec.europa.eu
E-mail: panos.panagos@jrc.it

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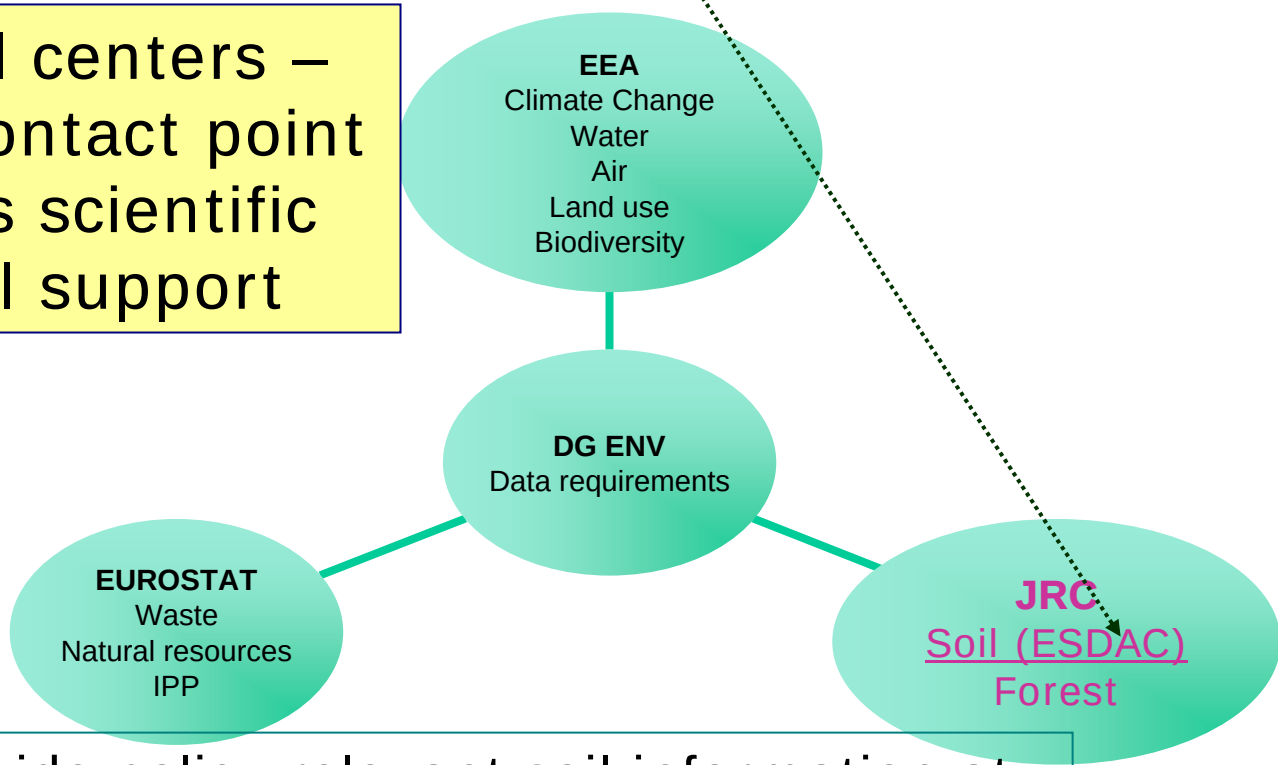
The new system of European Data Centers for the environment ("the group of four")

What is European Soil Data Center (ESDAC) and why it was established?

Environmental centers – primary data contact point for DG ENV as scientific and technical support



Data centers provide policy relevant soil information at different scales (European – National – Regional)

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Soil Portal: http://eusoils.jrc.it

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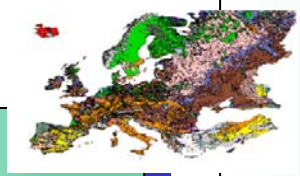
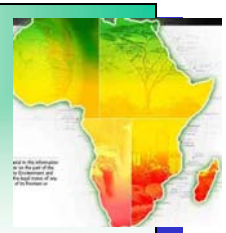


Data

Soil Bureau

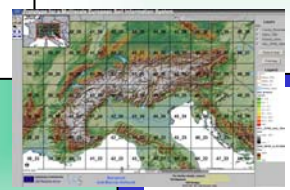
Maps



European Soil Portal

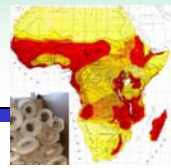
Documents

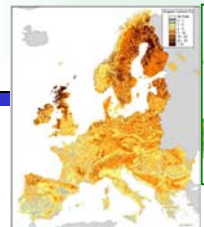
Applications



Projects

Themes





Biodiversity Workshop

ies
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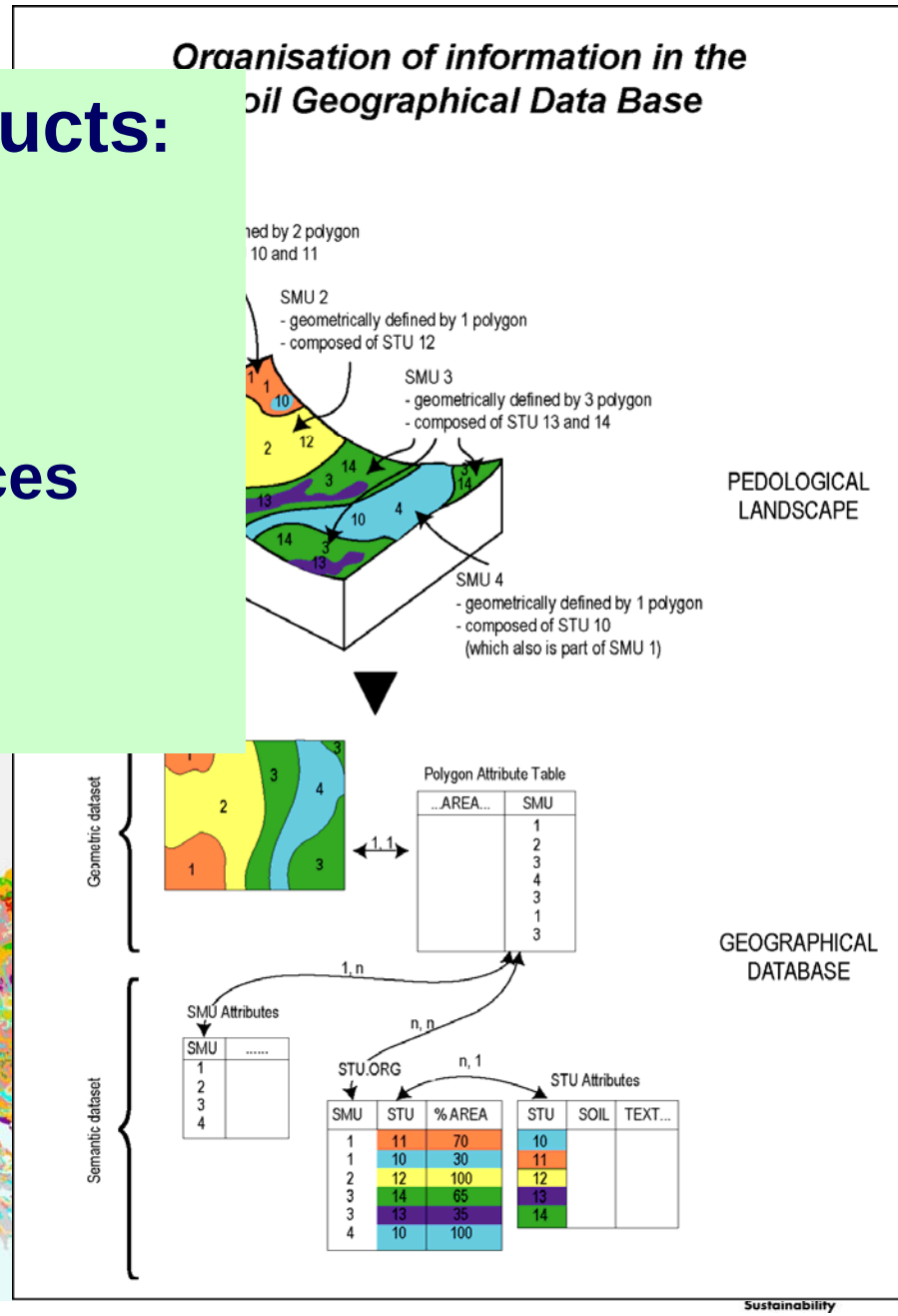
Soil Portal & European Soil Database

Value Added Products:

- Vector Data
- Raster Library
- Applications - Services
- Maps
- Research Reports

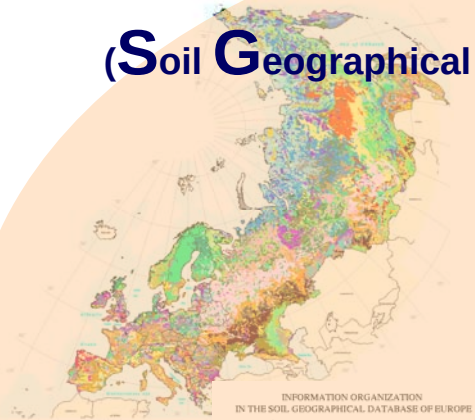


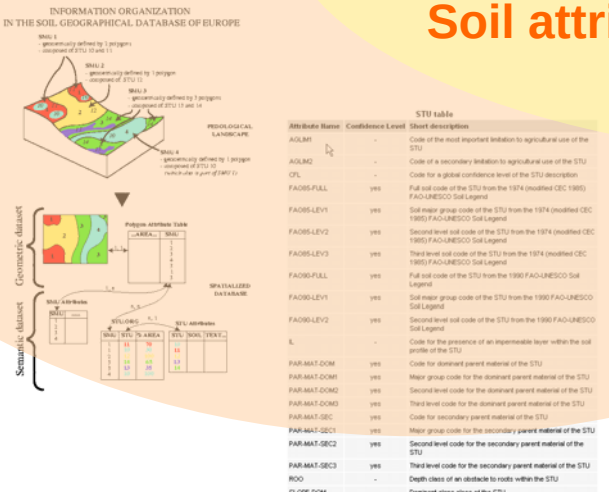
1:1M European Soil Database (ESDB): Components

http://eusoils.jrc.it

SGDBE 1M

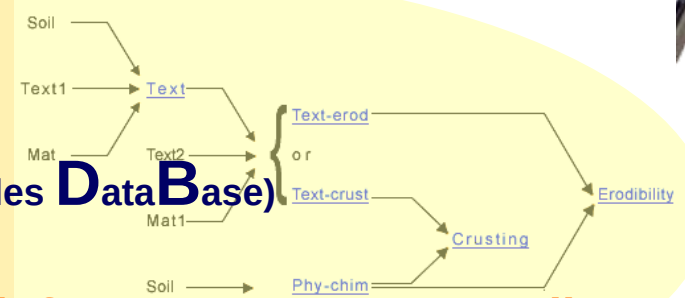
(Soil Geographical DataBase of Eurasia at scale 1:1,000,000)





PTRDB

(PedoTransfer Rules DataBase)



Soil attributes → inferences → output attributes

SPADBE

(Soil Profile Analytical DataBase)

HYPRES

(Hydraulic Properties)

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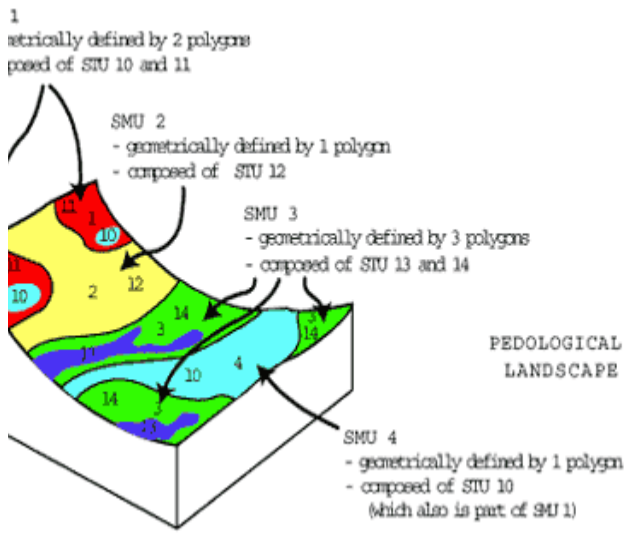
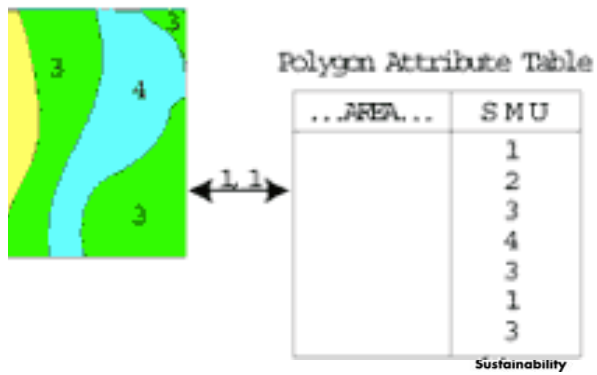
Joint Rest

Structure of the 1:1M European Soil Database

- ✓ The database contains a list of Soil Typological Units (**STU**).
- ✓ STUs are described by attributes specifying the nature/ properties of the soils: Texture, water regime, stoniness, etc
- ✓ Soil Database 1:1M: At this scale, it is not feasible to delineate STUs.

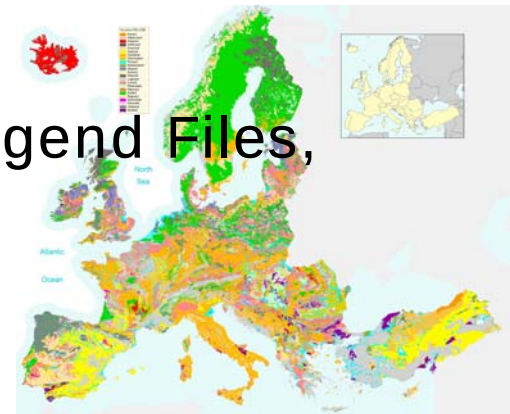


- ✓ Therefore, they are grouped into Soil Mapping Units (SMU) to form soil associations
- ✓ Each SMU corresponds to a part of the mapped territory and is represented by one or more polygons in a geometrical dataset.



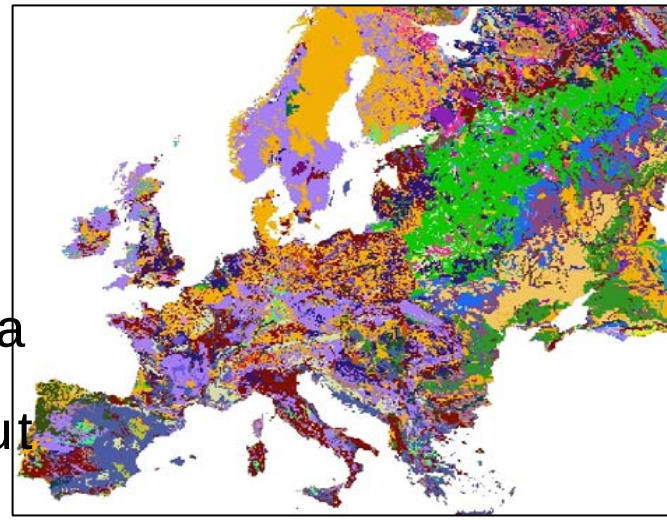
Data Distribution of Soil Database

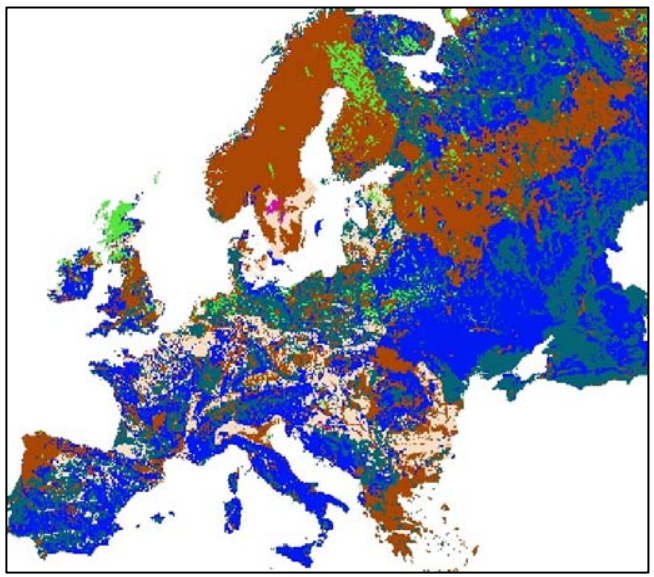
- The European Soil Database is the main source from which **Data**, **Information**, **Maps, Research Reports** and **Services** are derived.
- Data of the European Soil Database are available in the European Soil Data Center.
- Both to the needs of an expert user (advanced access to soil data) and to the expectations of a novice user.
- Full Database documentation is available in the Soil Portal: Metadata, Database Dictionaries, Attributes
- 73 Attributes available
- Technical Support: Google Earth Files, Legend Files, helpdesk, CD-ROM on line



Data: Raster Library of the ESDB

- ✓ Raster Library: 1km x 1km rasters, 10km x 10km rasters derived from the 1:1,000,000 ESDB data
- ✓ The degraded data respect ownership rights by giving access to degraded data
- ✓ Free public access to these degraded but usable data (expert users to use them for modelling purposes)





- ✓ Initial point for the development of a nested system for updating data according to INSPIRE objectives
- ✓ INSPIRE Reference Grid: Unique Grid Coding System

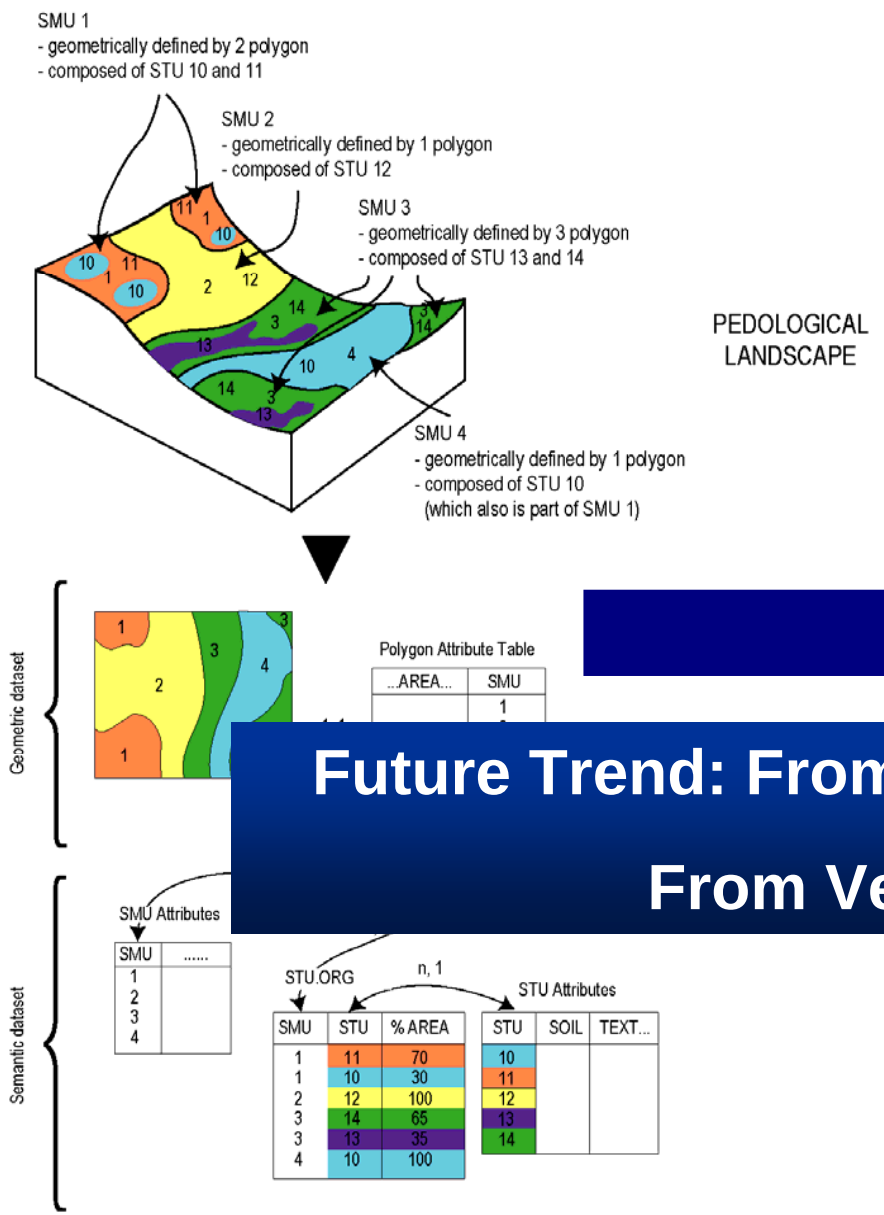
1:1M European Soil Database: present version

Benefits & Limitations

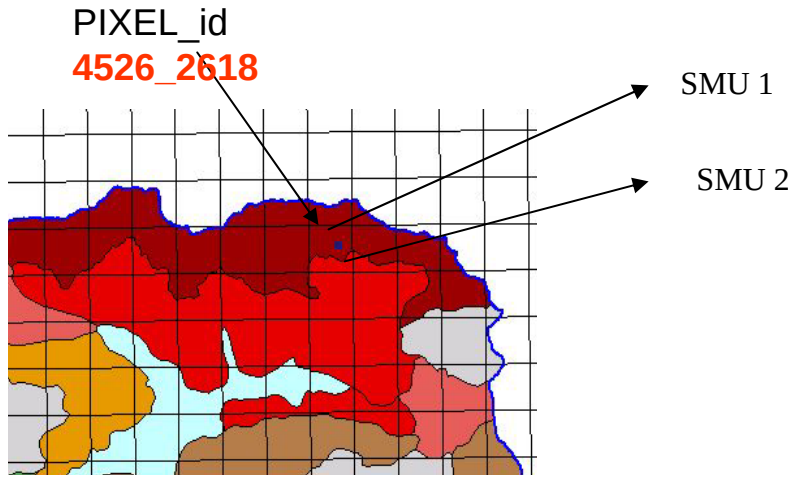
- Soil science community
- Whole Europe Cover
- Success story:
  - MARS
  - Soil Threats first assessment

- Geometric precision
- Harmonisation
- Updating Problems
- Integrating into more comprehensive programmes (e.g. INSPIRE)
- End user needs

Organisation of information in the Soil Geographical Data Base



Pixel Exchange Format (MEUSIS concept)



PIXEL_id	SMU	% PIX AREA	STU	% SMU AREA	Attributes
4526_2618	1	68	ZMB1	32	
4526_2618	1	68	SDP1	23	
		68	ORN1	14	
		68	CTA1	10	
4526_2618	1	68	CIA1	9	
4526_2618	2	32	ZMB1	18	
4526_2618	2	32	LCE1	13	

Future Trend: From Polygon to Pixel Format

From Vector to Raster

Pixel description based on:

- **dominant values of attributes** of the STUs in the SMUs and/or
- **weighted average** of some attributes of all STUs (e.g. topsoil Organic Carbon, tons)

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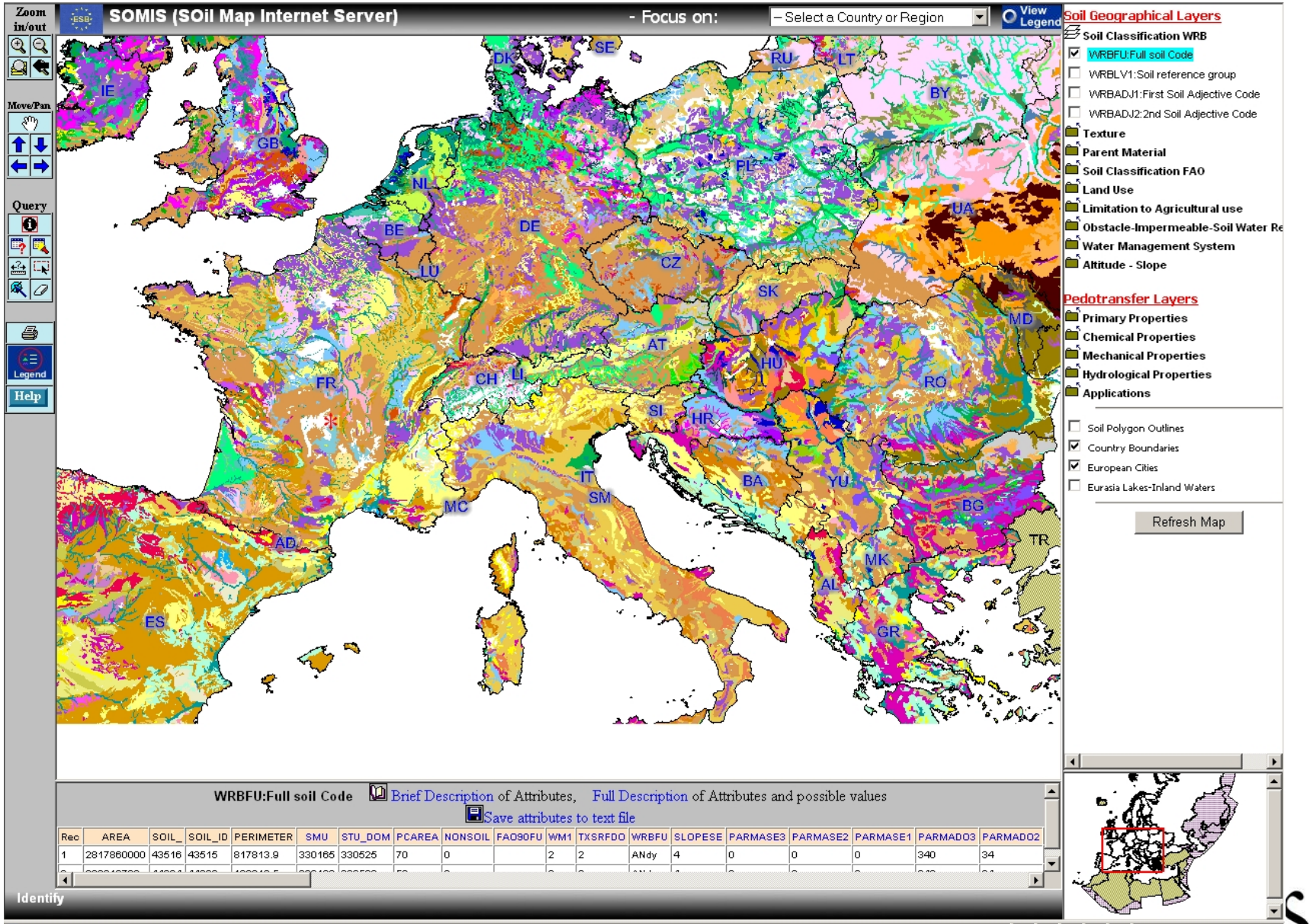
Applications - Services: Soil Mapping Internet Services (SOMIS)



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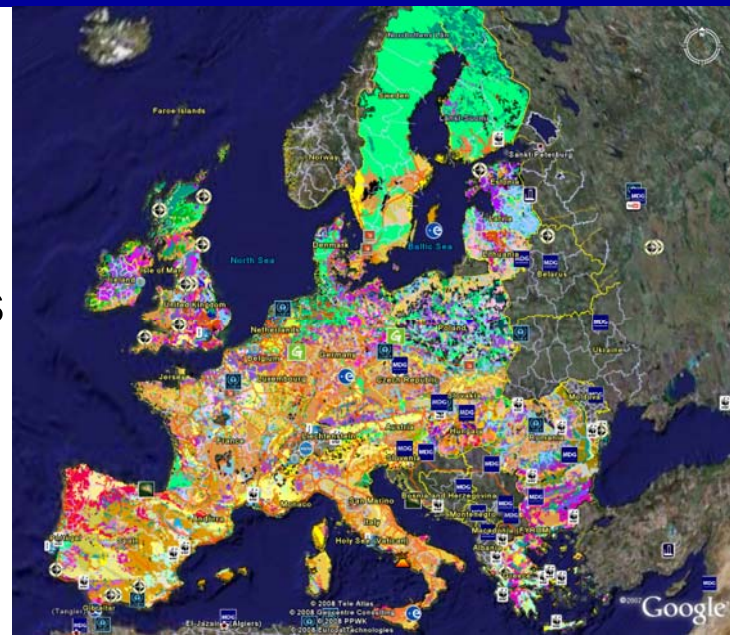
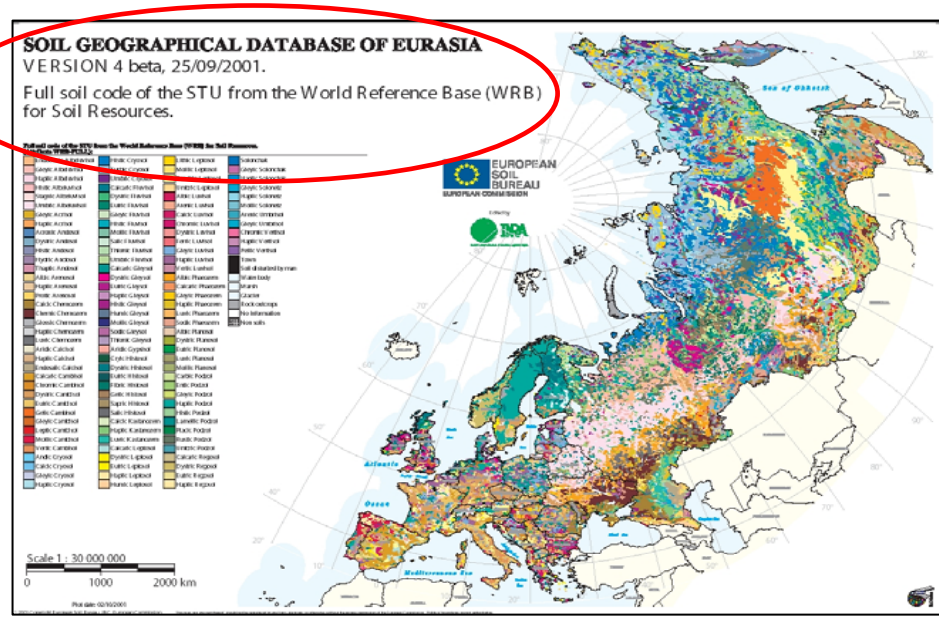
Maps: Archive derived from the ESDB

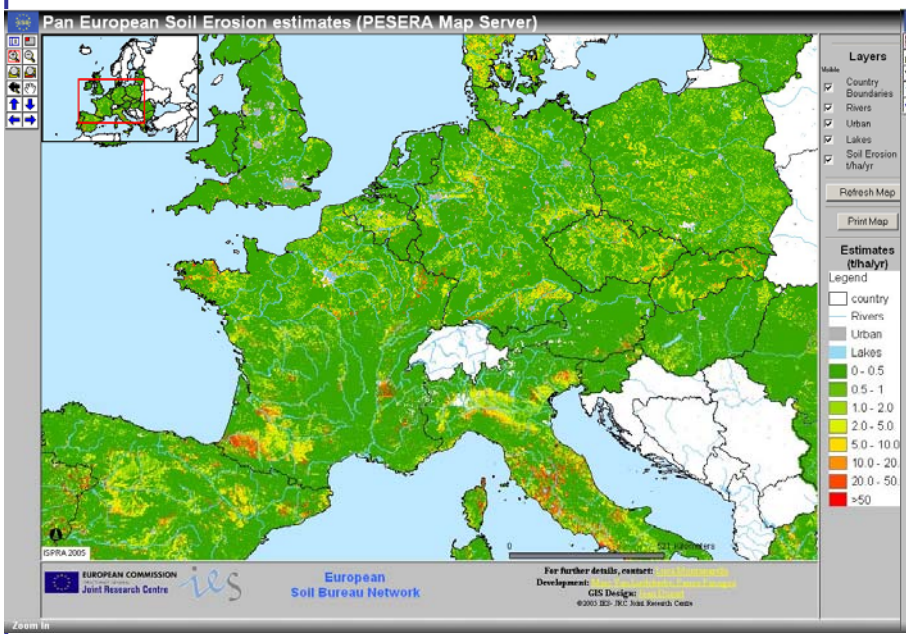
- ✓ Collection of maps representing 73 attributes of the Soil Database
- ✓ Based on the ESDB geometrical and attribute datasets, a number of maps have been created which allow the user to have an overview of the distribution of soil characteristics in a spatial way.
- ✓ Google Earth Files: Easy to use
- ✓ PDF format, Length A3, sizes between 1 and 2 MB

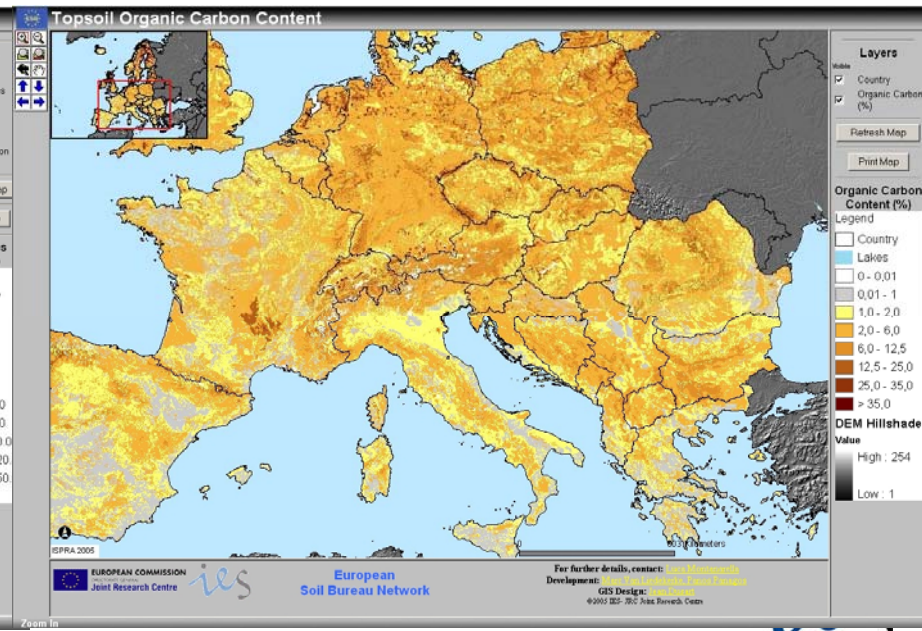




Threats to soil as identified in COM(2002) 179

- ✓ The Soil Portal and ESDAC respond to the needs for more data relative to the Soil Threats.
- ✓ Soil erosion estimates (t/ha/yr) by applying the PESERA GRID model at 1km x 1km
- ✓ Organic Carbon Content (%) on Topsoils 0-30cm
- ✓ Data are freely available upon request
- ✓ Maps, Applications, Services also Available.

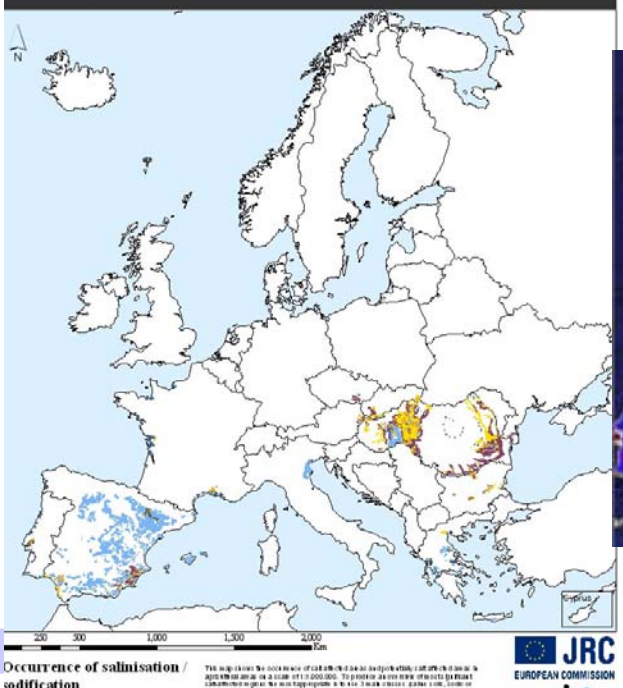


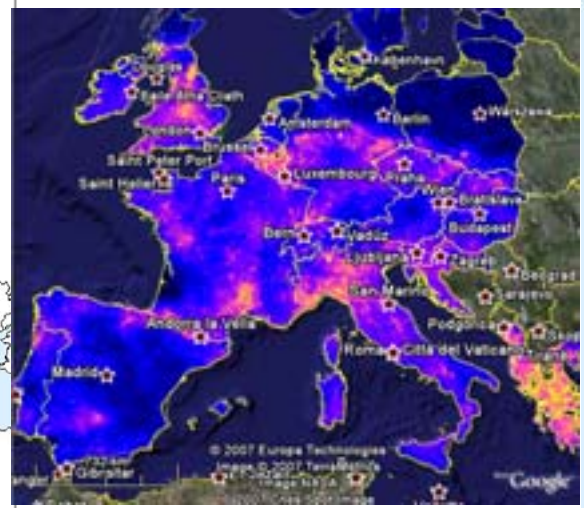


Threats to soil: New Developments in 2008

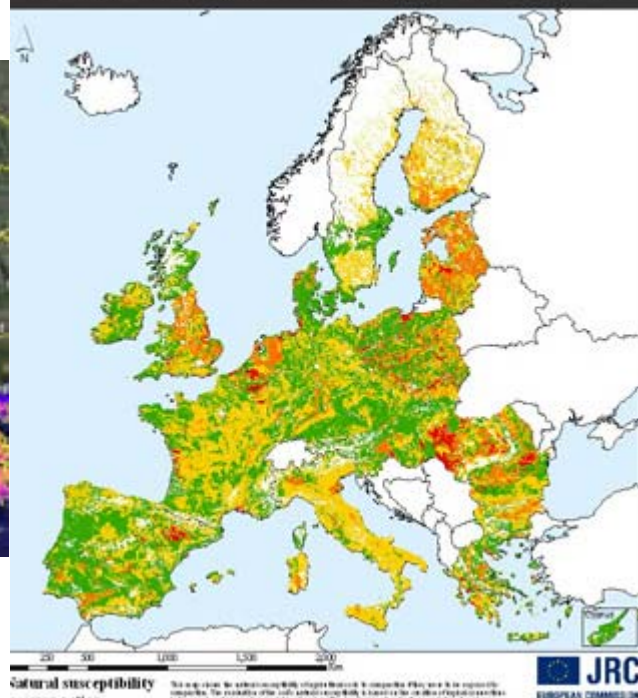
- ✓ Salinisation: Map of Saline and Sodic Soils
- ✓ Landslides: Working Group is established (10/2007)
- ✓ Sealing: Dataset at 100x100m (EEA – 1st half 2009)
- ✓ Contaminated Sites: Heavy Metals Data available
- ✓ Compaction: Soil Susceptibility to Compaction

Map of saline and sodic soils in Europe





The natural susceptibility of soils to compaction



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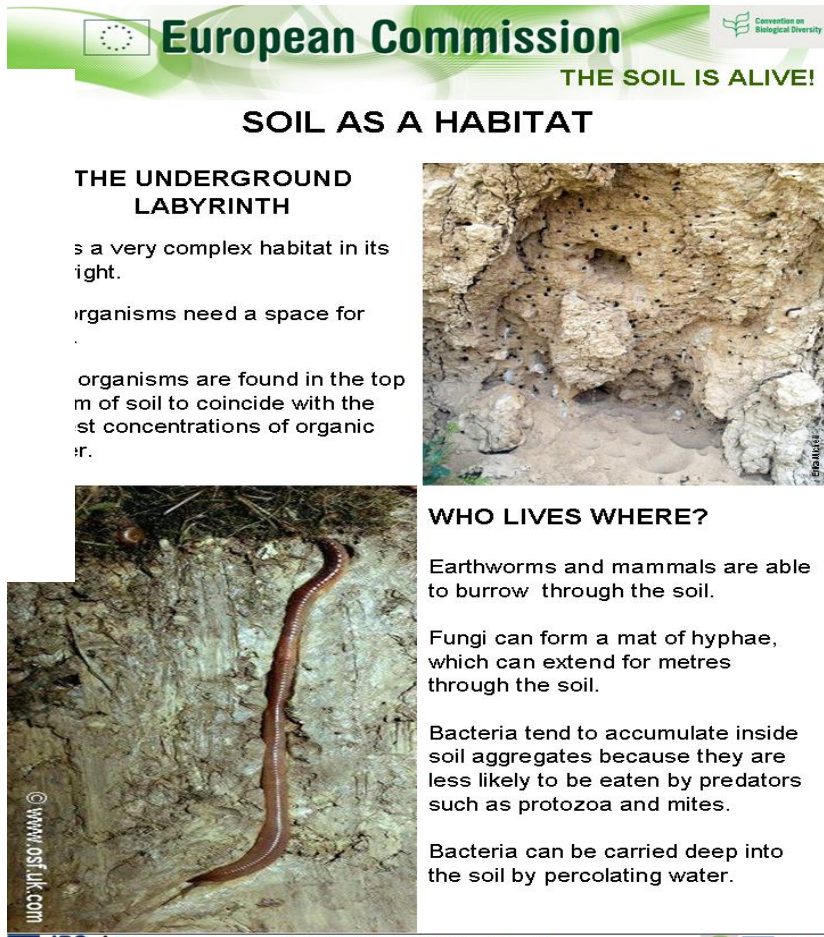
Threats to soil: Biodiversity

http://Eusoils.jrc.ec.europa.eu/library/themes/Biodiversity

Or

http://Eusoils.jrc.ec.europa.eu → Themes →Biodiversity

- ✓ General Information
- ✓ International Day for Biological Diversity (22 Posters)
- ✓ Current Meeting (Presentations, Etc)
- ✓ New Developments in order to keep aware the general public



Biodiversity Data

Database Request Data

- ✓ Soil typological unit (STU) (soil type)
- ✓ Clay(%), Sand(%), Silt(%) Content
- ✓ Organic Carbon
- ✓ PH
- ✓ Water Holding Capacity
- ✓ Organic Matter
- ✓ Nitrates
- ✓ Humus type

ESDB Data

- Soil typological unit (STU) (soil type)
- Soil Texture
- Soil Organic Carbon Content
- Under Development…..
- Topsoil available water capacity
- …….
- ……..
- ……..

Member States shall, in respect of each of those soil degradation processes, use at least the elements listed in Annex I and shall take into account the effects of those processes

ESDAC: Support to EU Policies

- ✓ Availability of **necessary Datasets** for Biodiversity
- ✓ **Data collection** should be organized in an efficient way
- ✓ Necessary **Quality Assurance**
- ✓ All relevant data are **accessible to Policy makers** and furthermore to European citizens
- ✓ **Technical Support** : Database issues, Metadata Standards, Web Development
- ✓ Experience in **Data Exchange Format**
- ✓ **Integration** with other Data sets and development of added-value products.