



Delimiting areas with natural handicaps in the European Union: Common soil criteria and policy implications

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The Less Favoured Areas (LFA) scheme of the European Union (Council Regulation (EC) 1257/1999)

*Article 18: **Mountain Areas** are characterised as those areas handicapped by a short growing season because of a high altitude, or by steep slopes at a lower altitude, or by a combination of the two. Areas north of the 62nd parallel are also delimited as Mountains.*

*Article 19: '**Intermediate' Less Favoured Areas** are those areas in danger of abandonment of agricultural land-use and where the conservation of the countryside is necessary. They exhibit all of the following handicaps:*

land of poor productivity;

production which results from low productivity of the natural environment;

and a low or dwindling population predominantly dependent on agricultural activity.

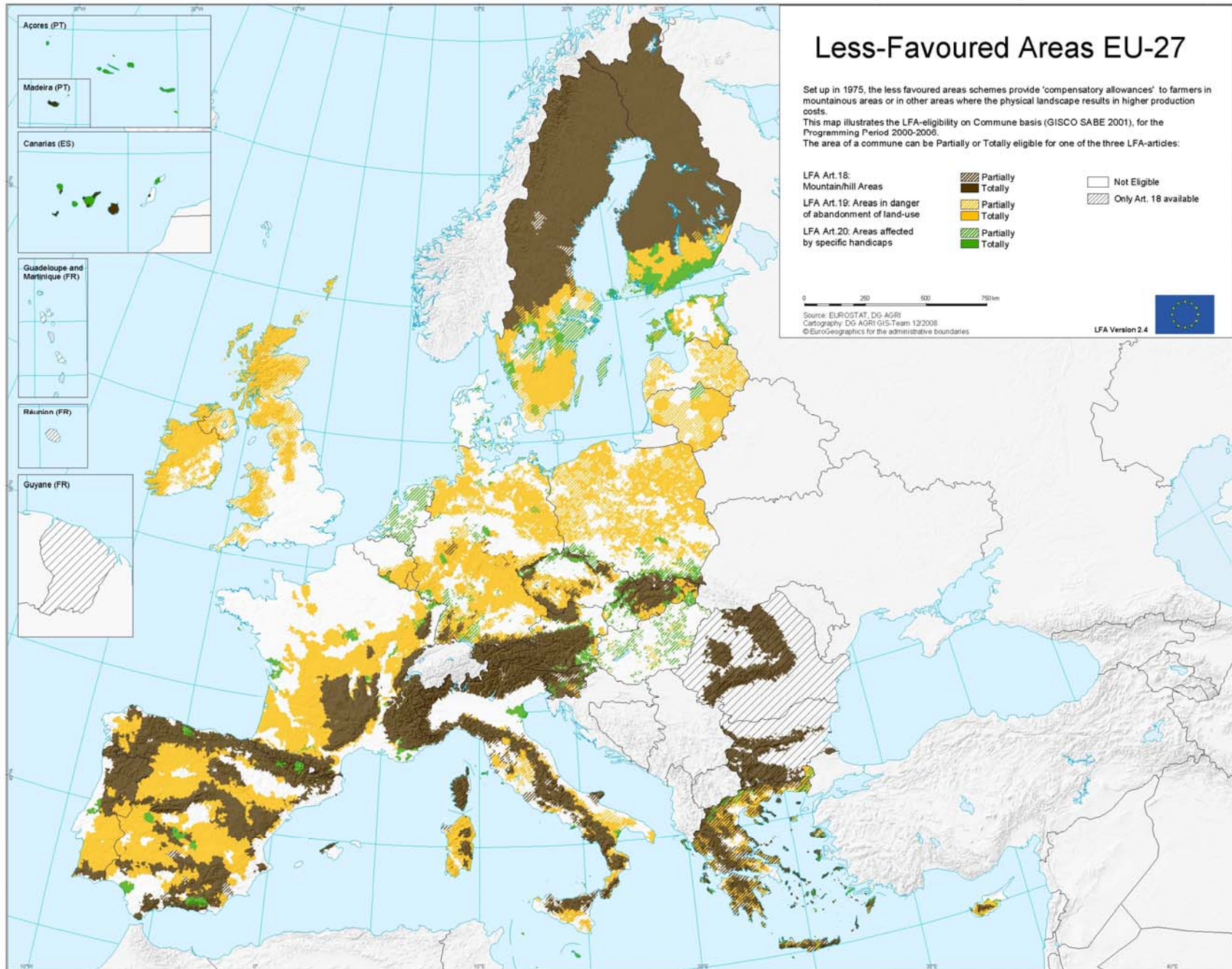
*Article 20: **Areas Affected by Specific Handicaps** are areas where farming should be continued in order to:*

conserve or improve the environment;

maintain the countryside;

preserve the tourist potential of the areas;

protect the coastline.



Indicator used		Member States that apply the indicator
<i>A) "Physical indicators"</i>		
1	Altitude	2 (BE, AT)
2	Number of days without frost	1 (BE)
3	Unfavourable drainage	1 (LU)
<i>B) "Farm structure indicators"</i>		
4	Comparative arable yield against national average	7 (BE, EL, ES, FR, IT, LT, SK)
5	% of grassland in the UAA	4 (BE, FI, SK, UK)
6	Proportion of forage in the UAA	3 (FR, LU, SE)
7	% of rough grazing in the UAA	2 (EL, IT)
8	% of arable land in the UAA	1 (ES)
9	Livestock density	1(LU)
10	% of irrigated land in arable areas	1 (ES)
11	% of land fallow in arable areas	1 (ES)
12	Ploughed area	1 (IE)
13	% of UAA with serious handicap	1 (PT)
<i>C) "Index methodologies"</i>		
14	Poor soil/climate productivity index (4 different methodologies)	4 (HU, LV, SK, SE)
15	Agricultural comparability index – BZ	1 (AT)
16	Agricultural comparability index – LVZ	1 (DE)

17	Bonitate system index	1 (EE)
18	Land index system - BPEJ	1 (CZ)
19	Index of Nikula	1 (FI)
20	Land quality index - LQI	1 (PL)
21	Land suitability map index	1 (CY)
22	Productivity index 'L. Turc'	1 (ES)
23	Soil quality index	1 (SI)

Indicator used		Number of Member States that apply the indicator
1	Population density limits per Km ²	25
2	Working population engaged in agriculture	18
3	Annual depopulation rate exceeds	10
4	Annual Ag works depopulation exceeds	2

Indicator used		Number of Member States that apply the indicator
1	Income per labour unit not exceeding % of National average amount	5
2	Index systems with economic indicators embedded	4
3	Amount of Income tax paid not exceeding threshold of National average level	2
4	Gross production not exceeding % of National average	2
5	Livestock gross margin compared to National average	1
6	Farm rents compared to the National average	1
7	Land tax not above % of national average	1
8	Whole farm income compared to National average	1
9	Cost of production	1
10	Total farm incomes lower than National average as related to livestock density	1
11	Income tax paid not exceeding threshold	1
12	Net value added at factor cost per Ag worker not exceeding % of European Community average	1
13	Standard Gross Margin of worker of worker does not exceed % of National average	1
14	Agricultural income of Administrative Area not above a threshold	1



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EUROPEAN COURT OF AUDITORS

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IS AGRI-ENVIRONMENT SUPPORT WELL DESIGNED AND MANAGED?



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FIGURE 3

CHARACTERISTICS OF THE AREA

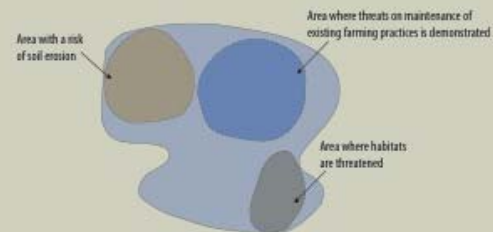


FIGURE 4

DISTRIBUTION OF FUNDS WITHOUT GEOGRAPHICAL TARGETING

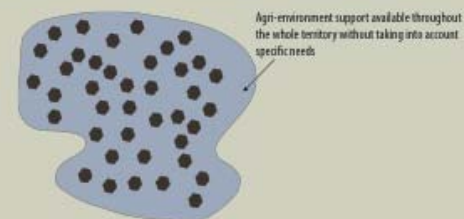
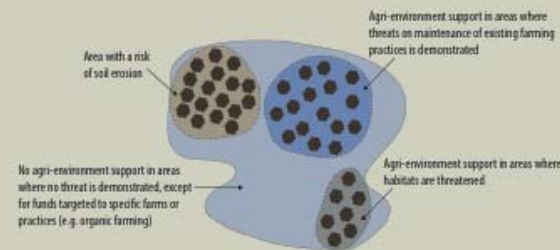


FIGURE 5

DISTRIBUTION OF FUNDS WITH GEOGRAPHICAL TARGETING



Source: Adapted from the work of Dr Pierre Dupraz, INRA, France, in particular 'Specific targeted research project n°SSPE-CT-2003-S02070 Integrated Tools to design and implement Agro Environmental Schemes'.



COMMISSION OF THE EUROPEAN COMMUNITIES

Brussels, 21.4.2009
COM(2009) 161 final

COMMUNICATION FROM THE COMMISSION TO THE EUROPEAN
PARLIAMENT, THE COUNCIL, THE EUROPEAN ECONOMIC AND SOCIAL
COMMITTEE AND THE COMMITTEE OF THE REGIONS

Towards a better targeting of the aid to farmers in areas with natural handicaps

{SEC(2009) 449}
{SEC(2009) 450}
{SEC(2009) 451}

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CRITERION	DEFINITION	THRESHOLD
CLIMATE		
Low Temperature	Length of Growing Period (number of days) defined by number of days with daily average temperature > 5°C (LGP ₅) OR	≤ 180 days
	Thermal-time sum (degree-days) for Growing Period defined by accumulated daily average temperature > 5°C.	≤ 1500 degree-days
Dryness	Ratio of the annual precipitation (P) to the annual potential evapotranspiration (PET)	P/PET \geq 0.5
CLIMATE AND SOIL		
Excess Soil Moisture	Number of days at or above Field capacity	\geq 30 days
SOIL		
Limited Soil Drainage	Areas which are water logged for significant duration of the year	Wet within 80cm from the surface for over 6 months, or wet within 40cm for over 11 months OR
		Poorly or very poorly drained soil OR Gleyic colour pattern within 40cm from the surface
Unfavourable Texture and Stoniness	Relative abundance of clay, silt, sand, organic matter (weight %) and coarse material (volumetric %) fractions	\geq 5% of topsoil volume is coarse material, including rock outcrop, boulder OR
		Topsoil texture class of sand, loamy sand defined as: silt% + (2 x clay%) \geq 70% OR
		Topsoil texture class is heavy clay (\geq 60% clay) OR
		Organic soil (organic matter \geq 10%) of at least 40cm OR
		Topsoil texture class of clay, silty clay, sandy clay and vertic properties within 100cm of the soil surface
Shallow Rooting Depth	Depth (cm) from soil surface to coherent hard rock or hard pan.	\geq 30cm
Poor Chemical Properties	Presence in topsoil of salts, exchangeable sodium, excessive acidity	Salinity: \geq 4 deci-Siemens per meter (dS/m) OR
		Sodicity: \geq 15 Exchangeable Sodium Percentage (ESP) OR
		Soil Acidity: pH \leq 4.5 (in water)
TERRAIN		
Steep Slope	Change of elevation with respect to planimetric distance (%).	\geq 5%

European Soil Bureau Network of experts



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ESBN Annual Plenary 2012 as SIDE EVENT of



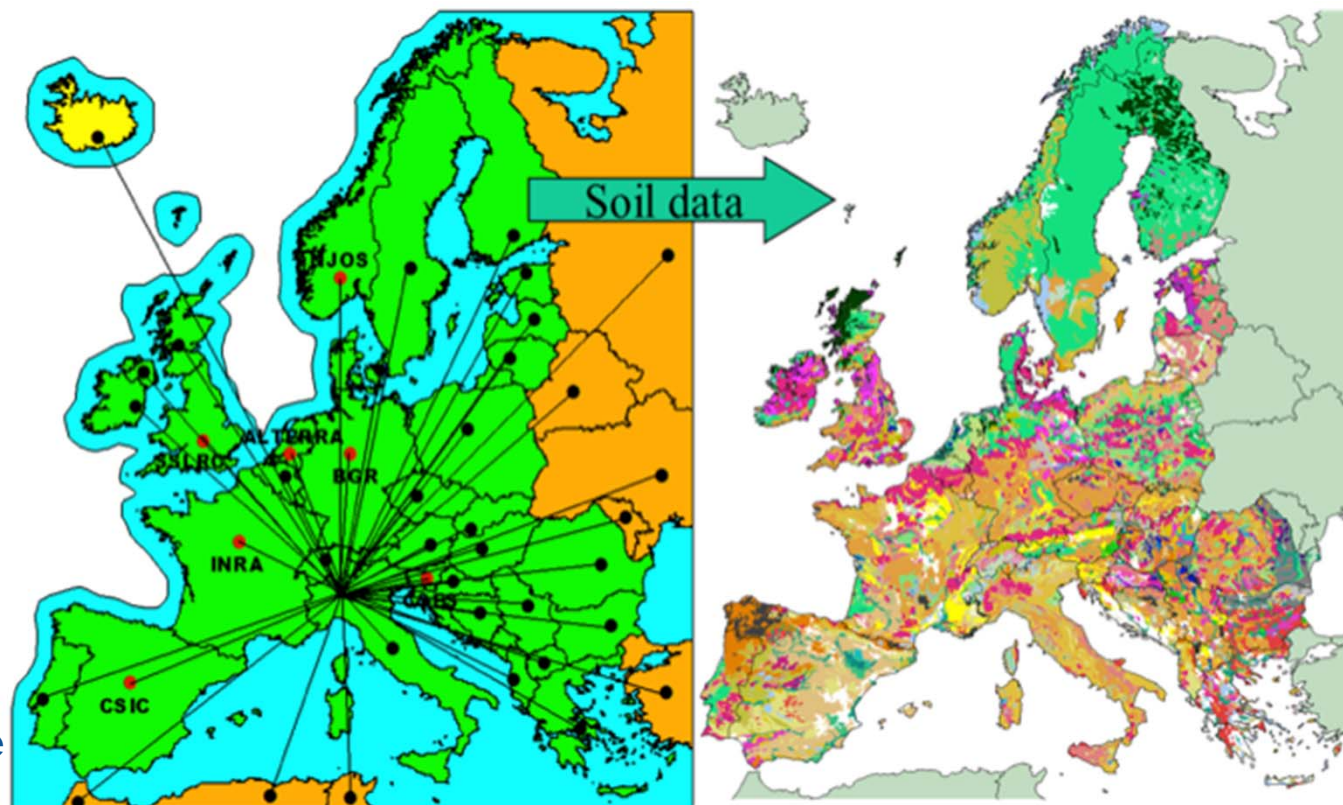
ESBN

- Located in JRC
- Since 1986s
- Soil EU info
- Several different EU policy drivers

DELIVERABLES

European Soil Data and Information

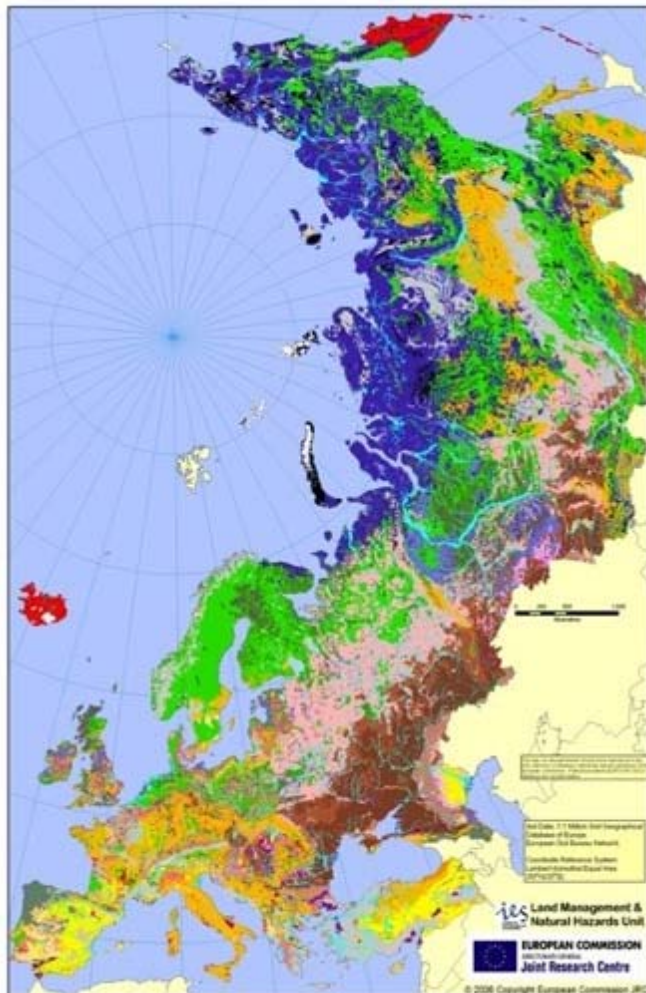
- Cartographic output from the EUSIS
- Working Groups
- Raising awareness
- 1:250.000 Soil database for Europe



EUROPEAN SOIL DATA BASE

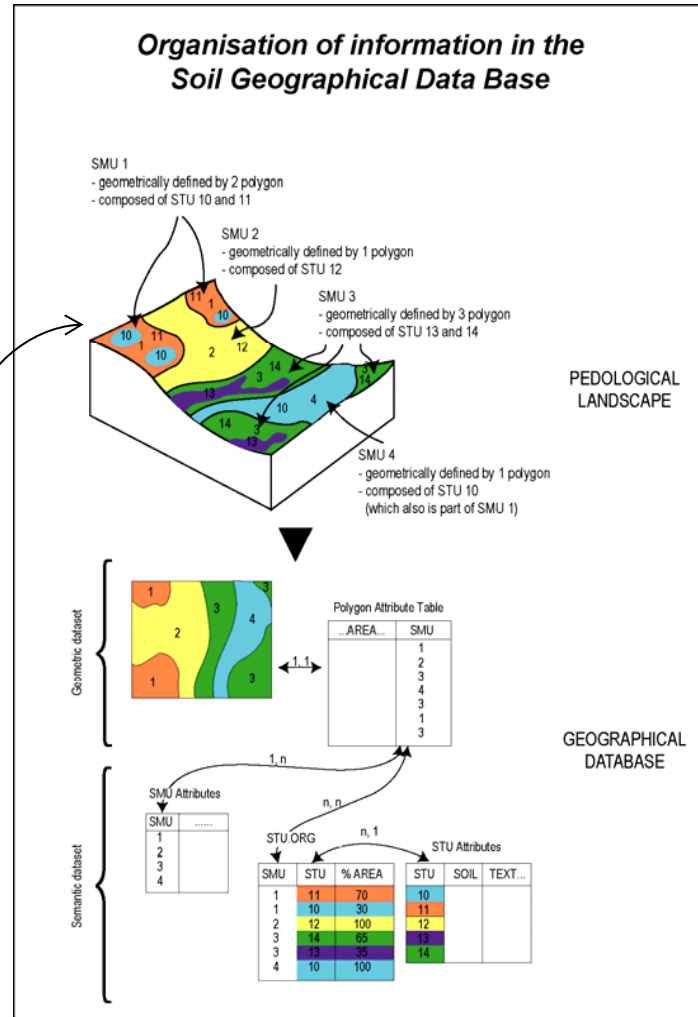


The Soils of Eurasia



Main source from which most DATA, INFORMATION, DOCUMENTS and SERVICES are derived
1:1.000.000

Vector (geometric) dataset:
 > 50.000 polygons
 9 ha minimum area
 > 2.000.000 vertices (x,y)
 73 parameters



Full database documentation is available in the Soil Portal <http://eusoils.jrc.ec.europa.eu>



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SOIL GEOGRAPHICAL DATABASE OF EURASIA

VERSION 4 beta, 25/09/2001.

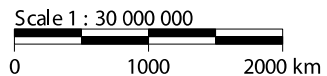
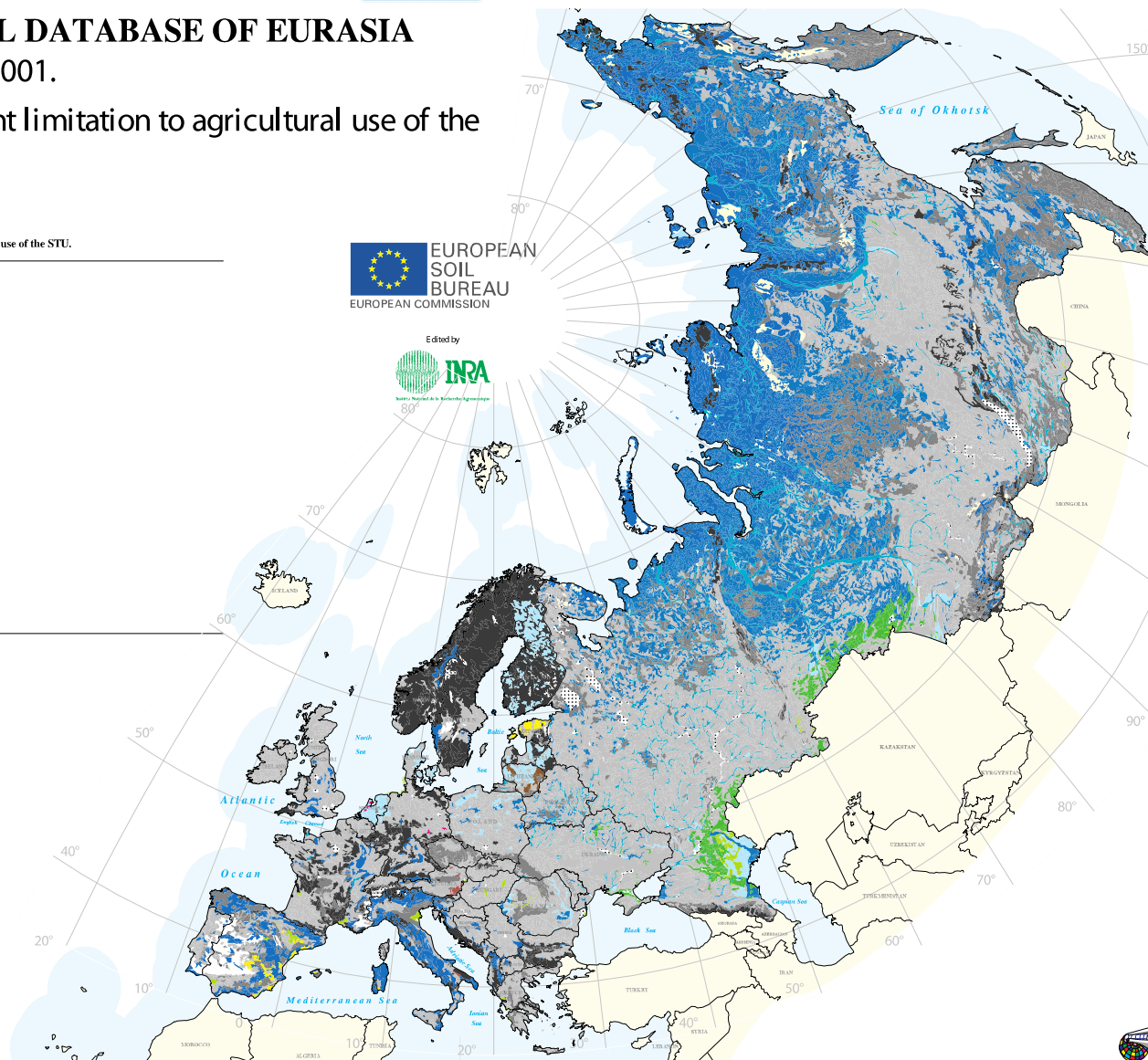
Code of the most important limitation to agricultural use of the STU.

% OF MAP: Code of the most important limitation to agricultural use of the STU. (Attribute AGLIM1):

2 %	No information
42 %	No limitation to agricultural use
13 %	Gravelly (over 35% gravel diameter < 7.5 cm)
8 %	Stony (presence of stones diameter > 7.5 cm, impracticable mechanisation)
11 %	Lithic (coherent and hard rock within 50 cm)
0 %	Concretionary (over 35% concretions diameter < 7.5 cm near the surface)
0 %	Petrocalcic (cemented or indurated calcic horizon within 100 cm)
0 %	Saline (electric conductivity > 4 mS.cm ⁻¹ within 100 cm)
1 %	Sodic (Na/T > 6% within 100 cm)
0 %	Glaciers and snow caps
0 %	Soils disturbed by man (i.e. landfills, paved surfaces, mine spoils)
0 %	Fragipans
2 %	Excessively drained
4 %	Almost always flooded
0 %	Eroded phase, erosion
17 %	Phreatic phase (shallow water table)
0 %	Duripan (silica and iron cemented subsoil horizon)
0 %	Petroferic horizon
1 %	Permafrost
	Non soils

EUROPEAN SOIL BUREAU
EUROPEAN COMMISSION

Edited by
INRA
Institut National de la Recherche Agronomique



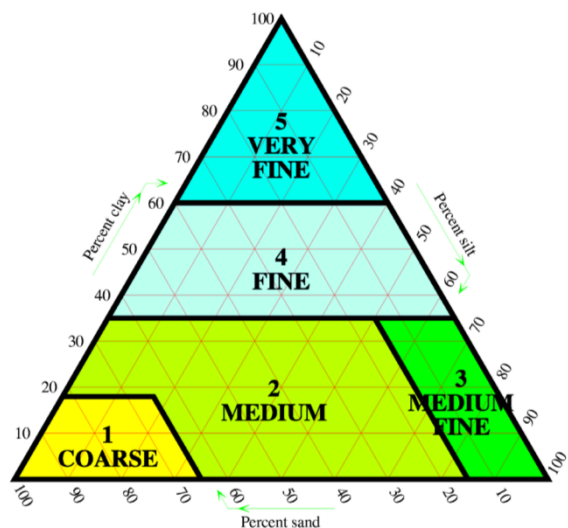
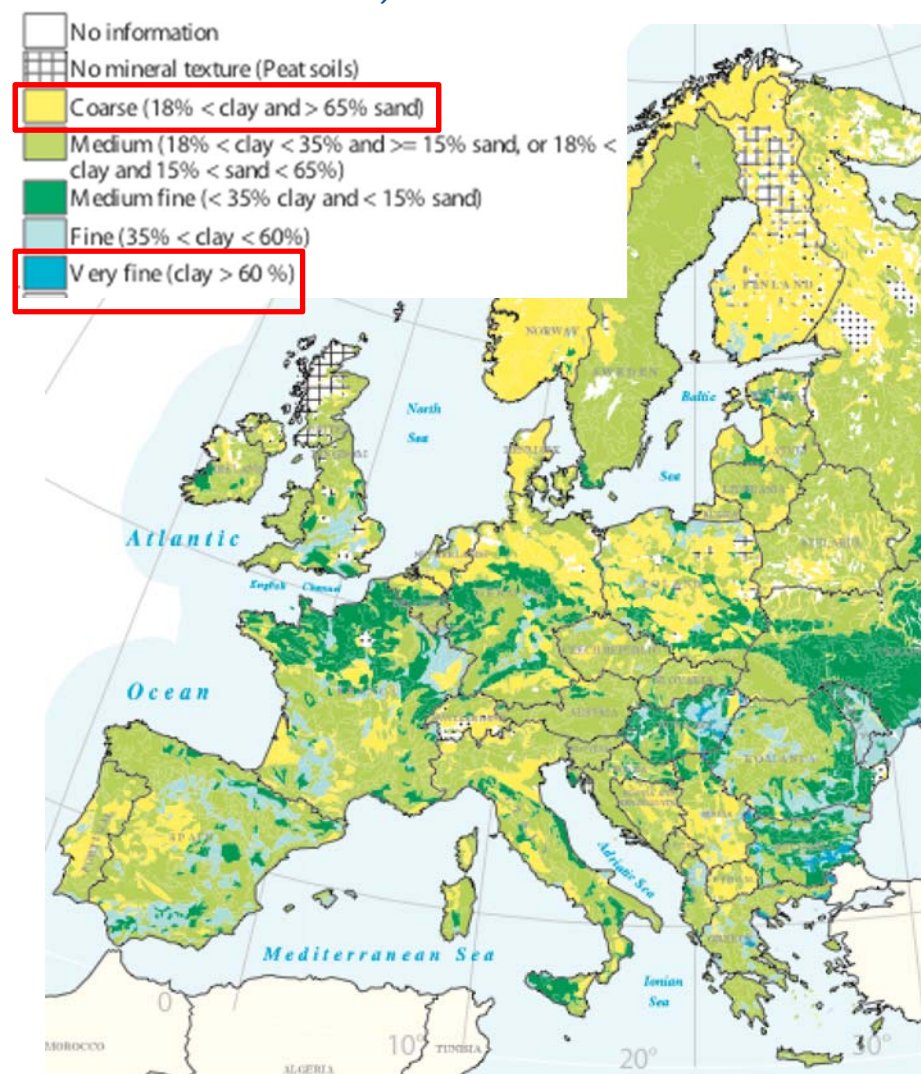
Plot date: 02/10/2001



New criteria for texture and stoniness proposed:

Soil texture is said to be severely limiting if any of the following conditions are present:

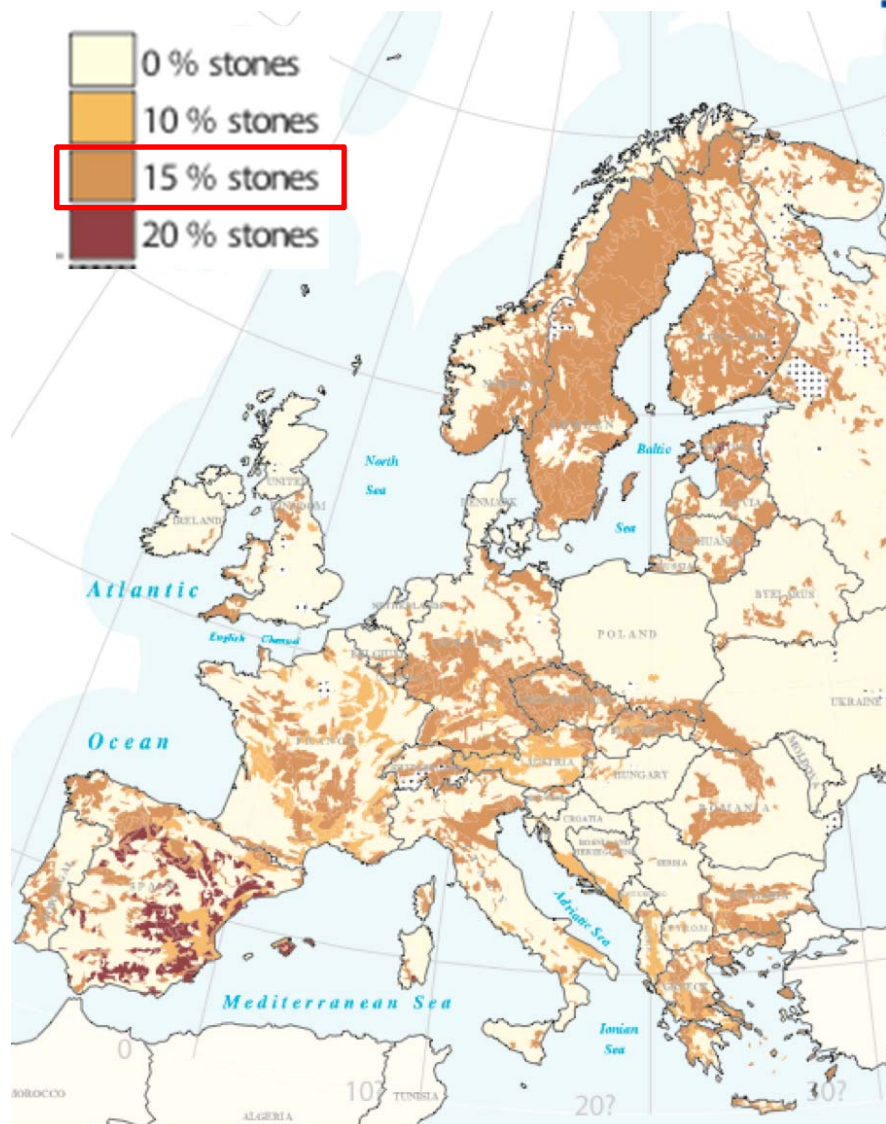
- (i) more than 15 % volume of coarse fragments (> 2 mm) of any kind in topsoil or
- (ii) average texture class of rooting zone is
 - (a) unsorted, coarse or medium sand, loamy coarse sand or
 - (b) heavy clay (> 60% clay) or
- (iii) organic soil as defined with organic matter (>30%) of more than 40 cm either extending down from the surface or taken cumulatively within the upper 80 cm of the soil or
- (iv) texture class of clay, silty clay, or sandy clay with vertic properties or;
- (v) any proportion of rock outcrops, boulders (largest dimension above or equal to 60 cm) within 15 cm of the surface.





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Presence of stones reported in 4 classes (European Soil Database ver. 2.0)



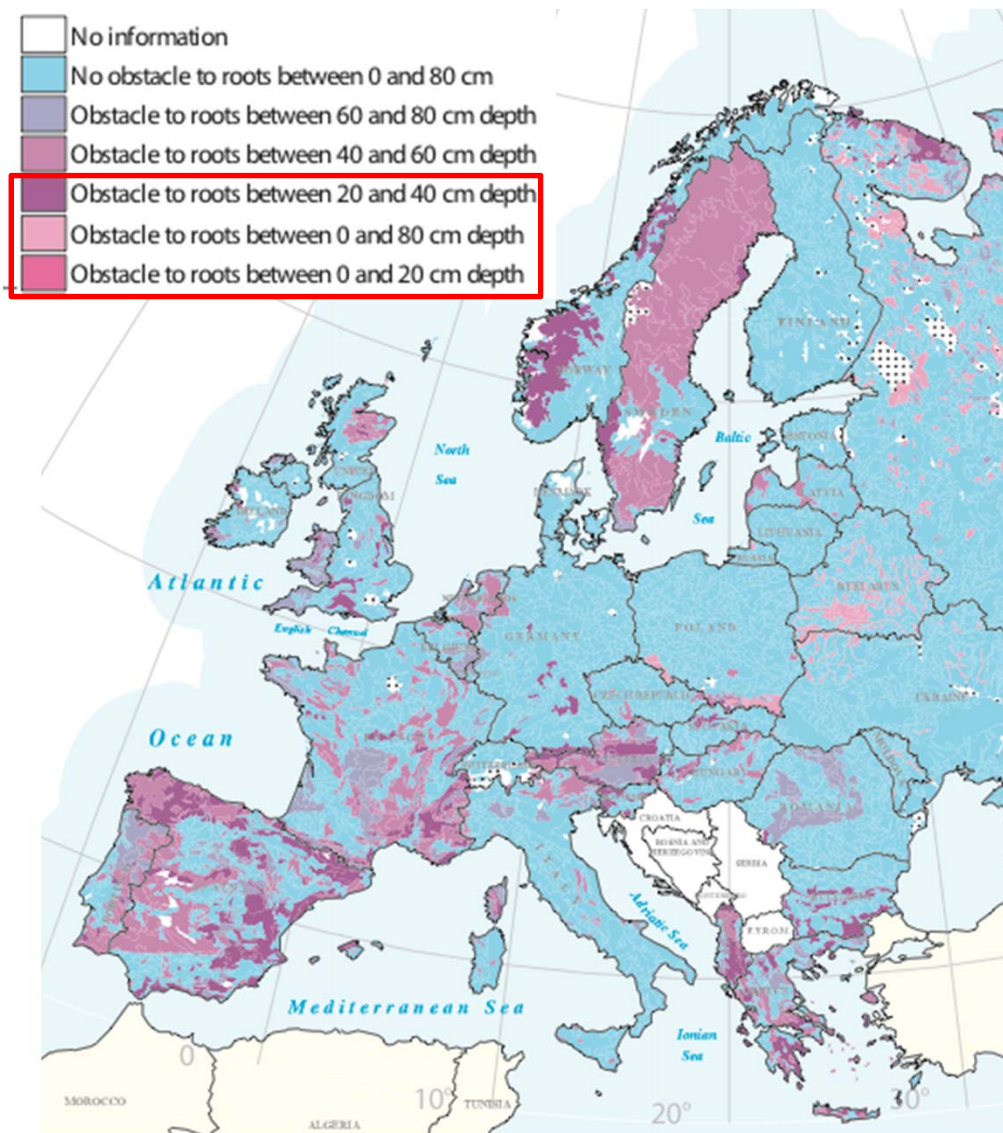
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- (v) any proportion of rock outcrops, boulders (largest dimension above or equal to 60 cm) within 15 cm of the surface.



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Rooting Depth

Severe physical rooting depth: < 30 cm



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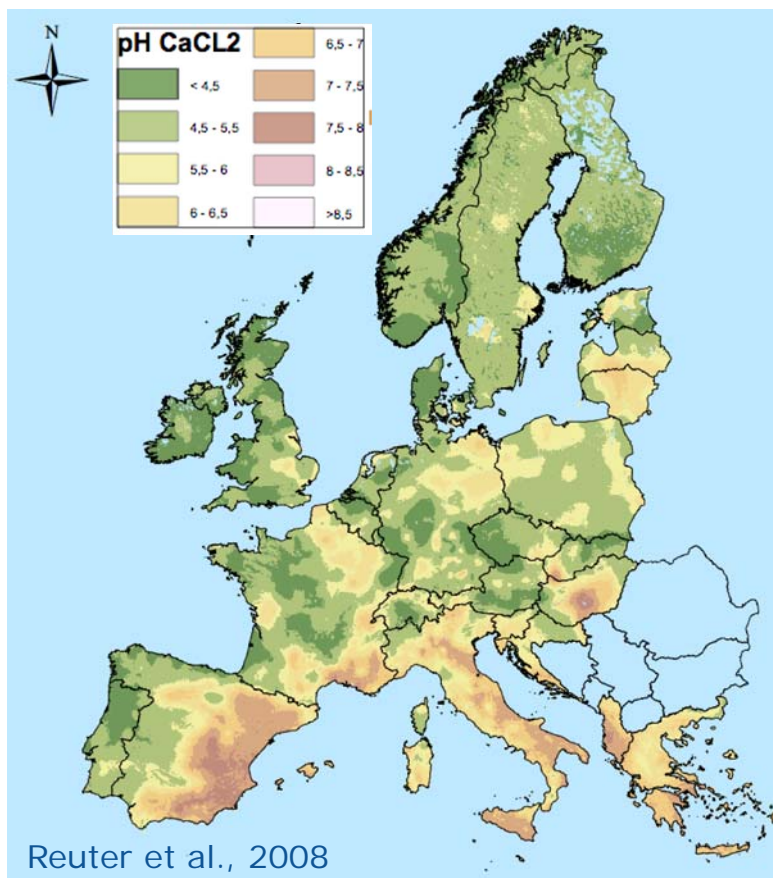
Saline and sodic soils in Europe (European Soil Database ver. 2.0)

Poor Chemical Properties

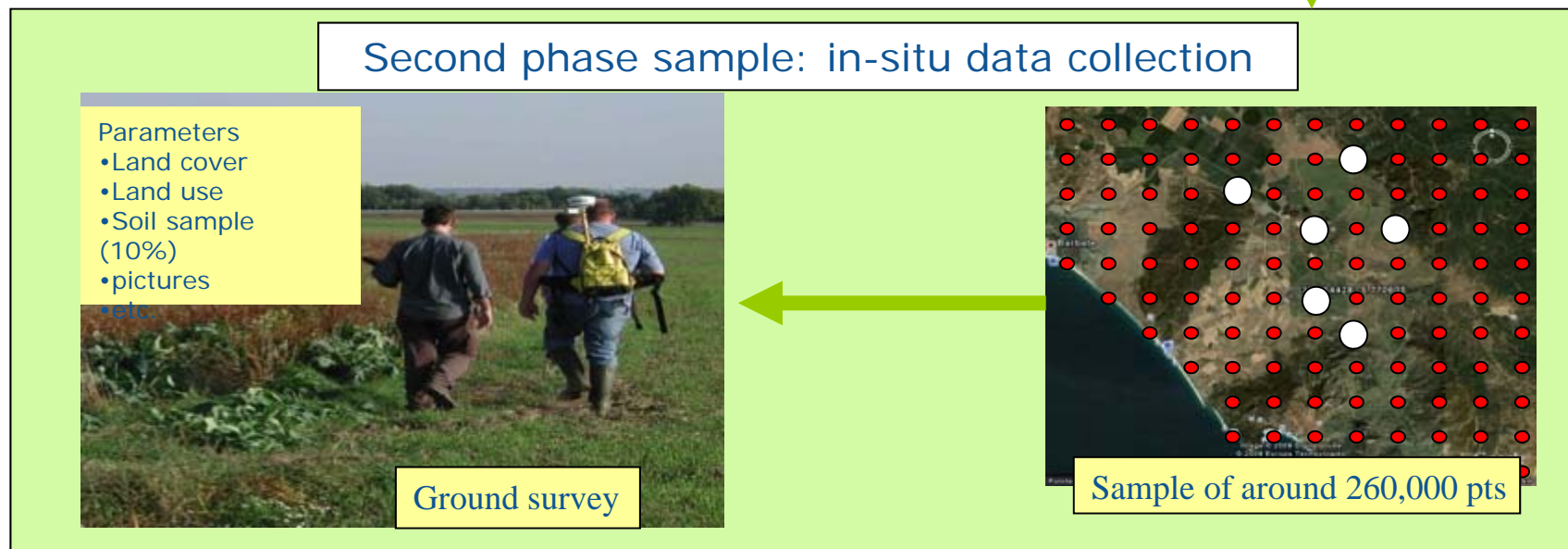
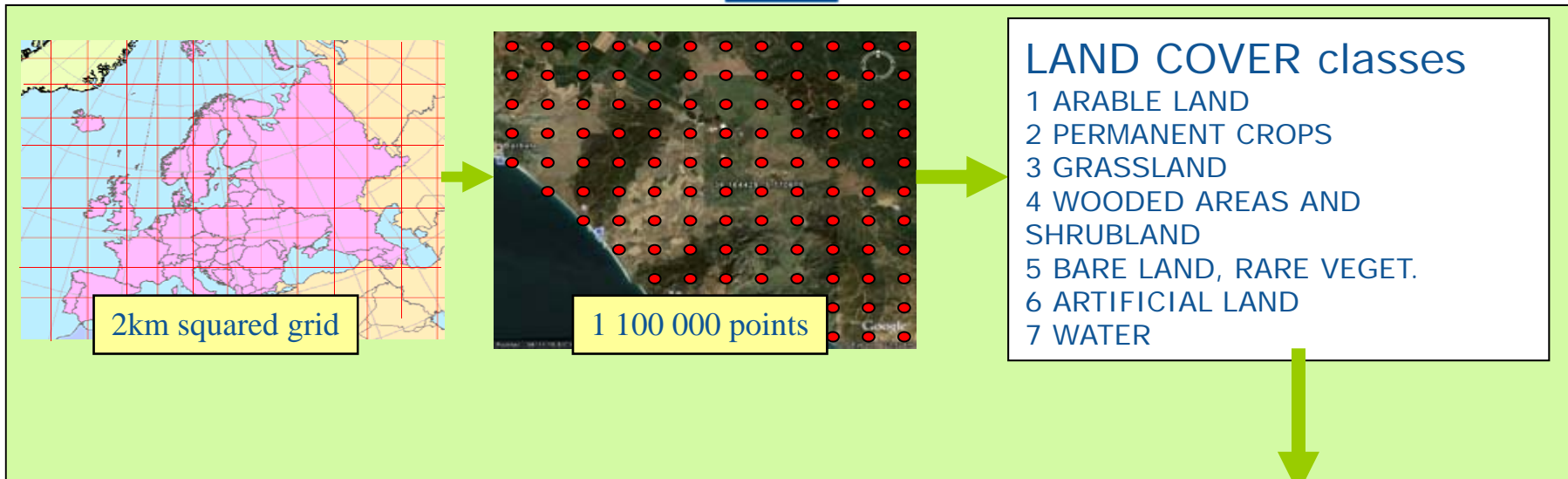
Presence in topsoil of salts, exchangeable sodium, excessive acidity

Salinity: >4 deci-Siemens per meter (dS/m) OR
Sodicity: >6 Exchangeable Sodium Percentage (ESP)
OR

Soil Acidity: pH <5 (in water)



LUCAS: EUROPEAN LAND USE / COVER AREA FRAME STATISTICAL SURVEY



LUCAS Soil sampling campaign 2009



Selection of point, based on Lucas master grid (2 x 2 km), as a function of:

- country
- land use
- physiography (slope, aspect, elevation, slope curvature, etc)

21,993 sampling points (triplets) have been selected

- Laboratory analysis is centralized
- Data are stored in ESDAC
- Processing of new soil information has started and will be reported by end 2012

SOIL PARAMETERS ANALYSED

Parameter	Unit	Decimals
Coarse fragments	%	0
Particle size distribution (FAO, 1990a)	-	-
Clay content	%	0
Silt Content	%	0
Sand Content	%	0
pH(CaCl ₂)	-	1
pH(H ₂ O)	-	2
Organic carbon	g/kg	1
Carbonate content	g/kg	0
Phosphorus content	mg/kg	1
Total nitrogen content	g/kg	0
Extractable potassium content	mg/kg	1
MULTISPECTRAL Properties (With diffuse reflectance measurements saturation)		
Cation exchange capacity	cmol(+)/kg	1

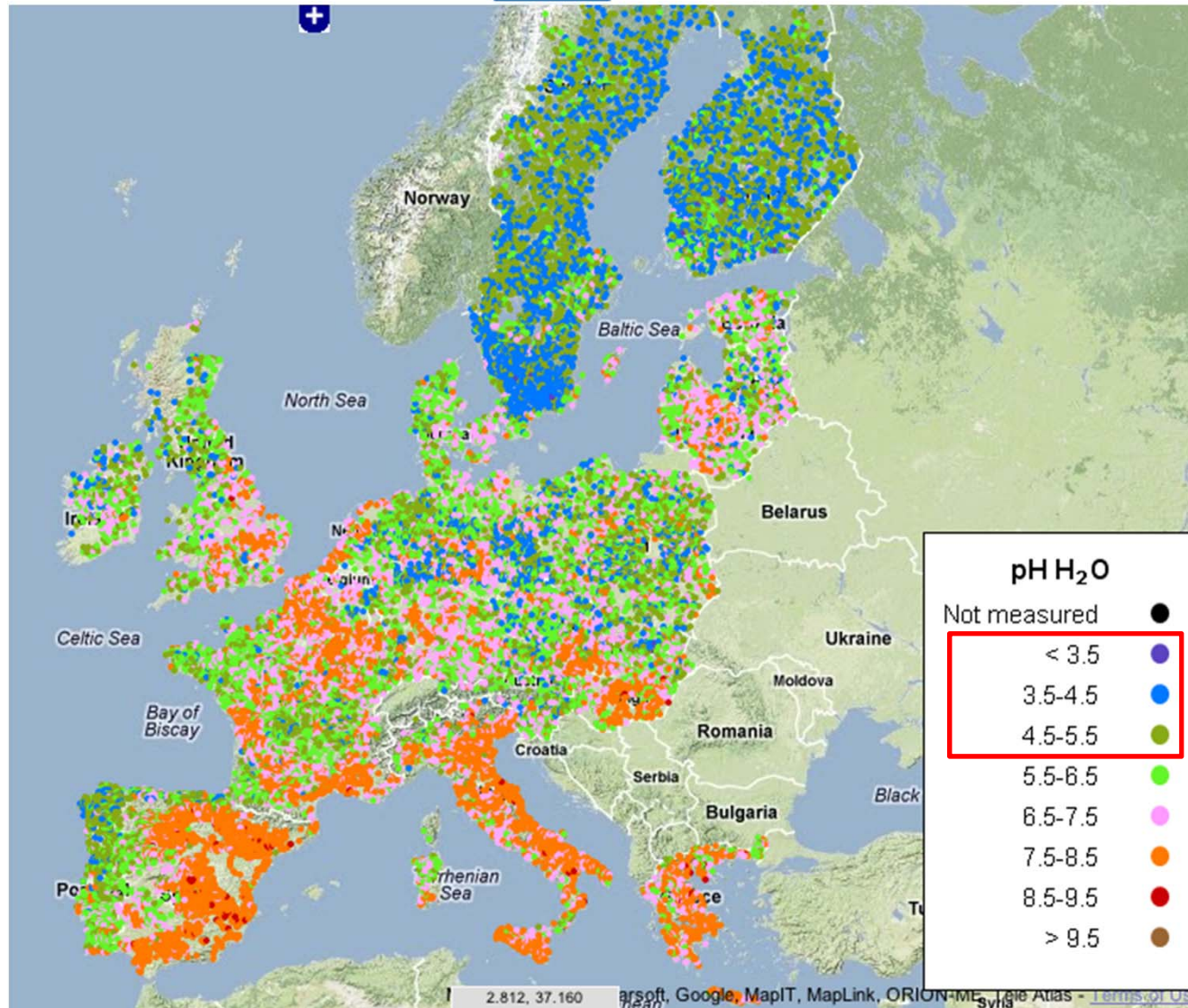
Soil parameters analyzed

Parameter	Unit	Decimals	Unit of measurement	Precision (in decimals)
Coarse fragments			%	0
Particle size distribution (FAO, 1990a)			-	-
Clay content			%	0
Silt Content			%	0
Sand Content			%	0
pH(CaCl ₂)			-	1
pH(H ₂ O)			-	2
Organic carbon			g/kg	1
Carbonate content			g/kg	0
Phosphorus content			mg/kg	1
Total nitrogen content			g/kg	0
Extractable potassium content			mg/kg	1
MULTISPECTRAL Properties (with diffuse reflectance measurements saturation)			-	-
Cation exchange capacity			cmol(+)/	-



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Soil Acidity: pH <5 (in water)



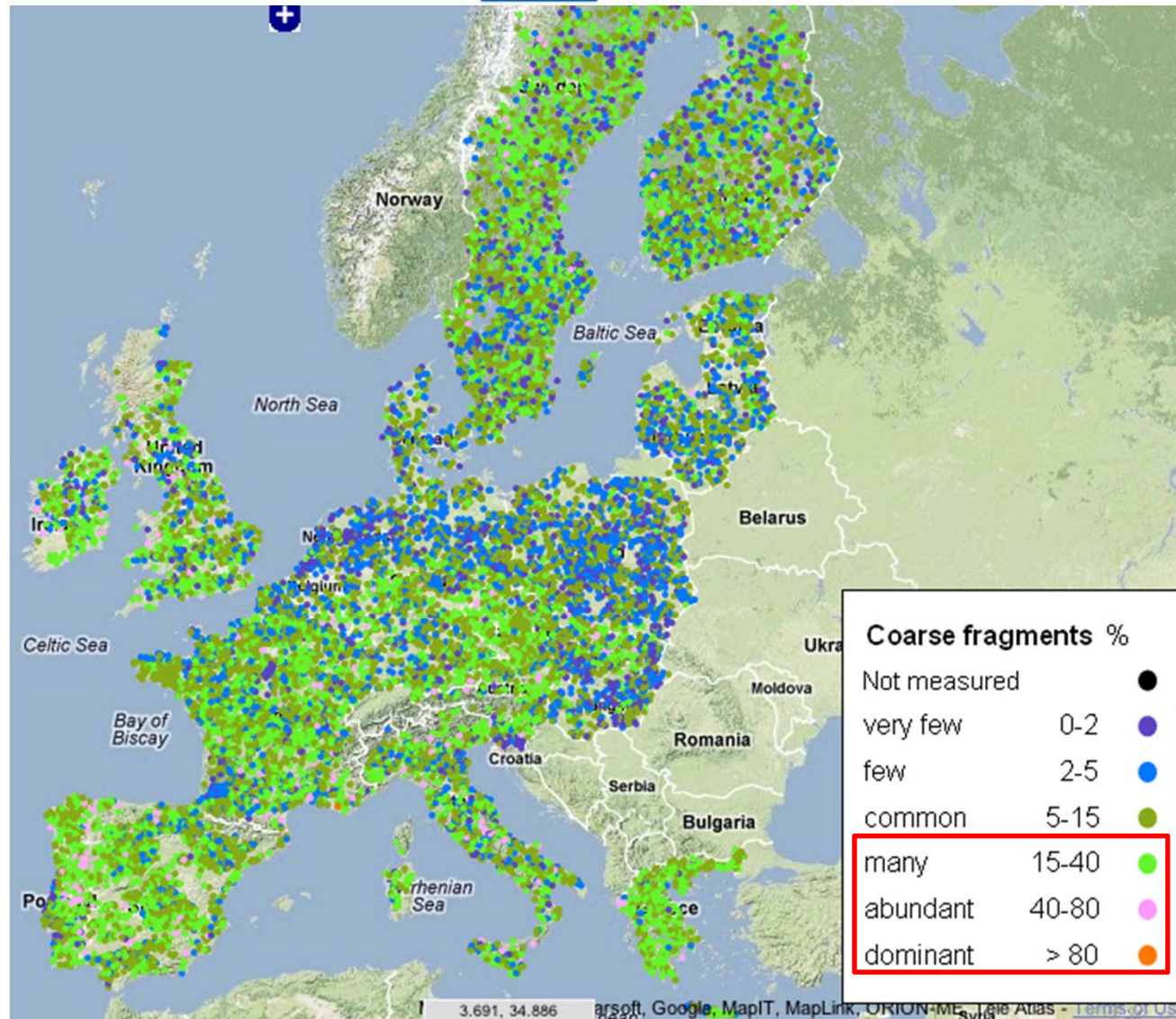
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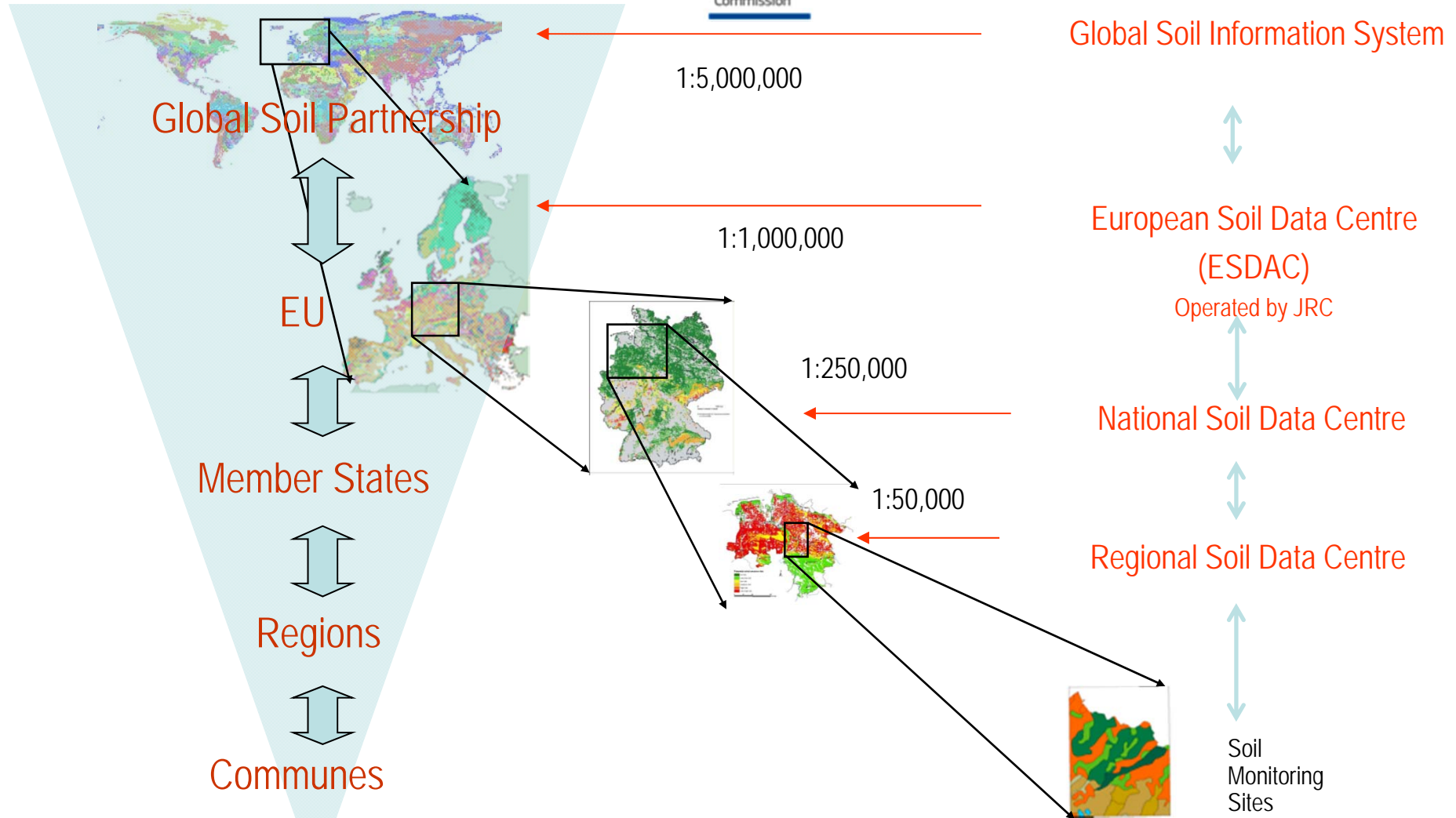


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more than 15 % volume of coarse fragments (> 2 mm) of any kind in topsoil



Data centers providing policy relevant soil information at different scales



Coherent data on soils at different scales: A nested system of policy relevant soil information





Conclusions

Delineating areas with natural handicaps requires detailed and updated soil data and information

Existing data at European scale are only of limited use for such an exercise

A coherent system of policy relevant soil data and information is needed at the various relevant scales: from the local to the global level

Responsibility for final delineation of relevant areas with natural handicaps remains fully within the Member States



Thank you for your interest!



<http://eusoils.jrc.ec.europa.eu/>

