European Union
Thematic Strategy for Soil Protection

Possible links and synergies with the forestry sector

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COM(2002) 179 final

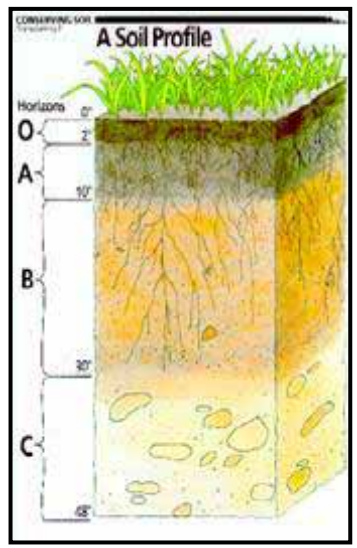
COMMUNICATION FROM THE COMMISSION TO THE COUNCIL, THE EUROPEAN PARLIAMENT, THE ECONOMIC AND SOCIAL COMMITTEE AND THE COMMITTEE OF THE REGIONS

Towards a Thematic Strategy for Soil Protection

http://europa.eu.int/comm/environment/agriculture/soil_protection.htm

Policy relevant features of soil

SOIL FEATURES	SOIL POLICY REQUIRES…
SOIL IS A VARIABLE MEDIUM	LOCAL PERSPECTIVE
SOIL IS A NON-RENEWABLE RESOURCE	PREVENTION AND PRECAUTION
SOIL IS A STORAGE/BUFFER MEDIUM	ANTICIPATION
SOIL IS A SOURCE OF BIODIVERSITY	PROTECTION
SOIL IS A SUBJECT OF PROPERTY	ENVIRONMENTAL LIABILITY



Main functions of soil

- **Food and other biomass production**
- **Storage, filtering, and transformation**
- **Habitat and gene pool**
- **Physical and cultural environment for mankind**
- **Source of raw materials**

Participatory approach

Soil mailbox: **env-soil@cec.eu.int**

Soil internet site:
`http://europa.eu.int/comm/environment/`

policies: Soil

Soil electronic library and discussion site: **CIRCA** *(june 03)*

Threats to soil as identified in COM(2002) 179

- Erosion
- Decline in organic matter
- Soil contamination
- Soil sealing
- Soil compaction
- Decline in soil biodiversity
- Salinisation
- Floods and landslides

Soil Policy Development
Organisational Set-up

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ISWG = Interservice Working Group
TWG = Technical Working Group

Stakeholders meetings

Chair DG ENV

Commission ISWG
Chair DG ENV

Advisory Forum
Chair DG ENV

Technical co-ordination group and secretariat
Chair DG ENV

TWG 1 Monitoring
Chair Germany/JRC
Co-chair UK

TWG 2 Erosion
Chair Spain/Belgium
Co-chair EEB

TWG 3 Organic matter
Chair France
Co-chair IUSS/FEAD

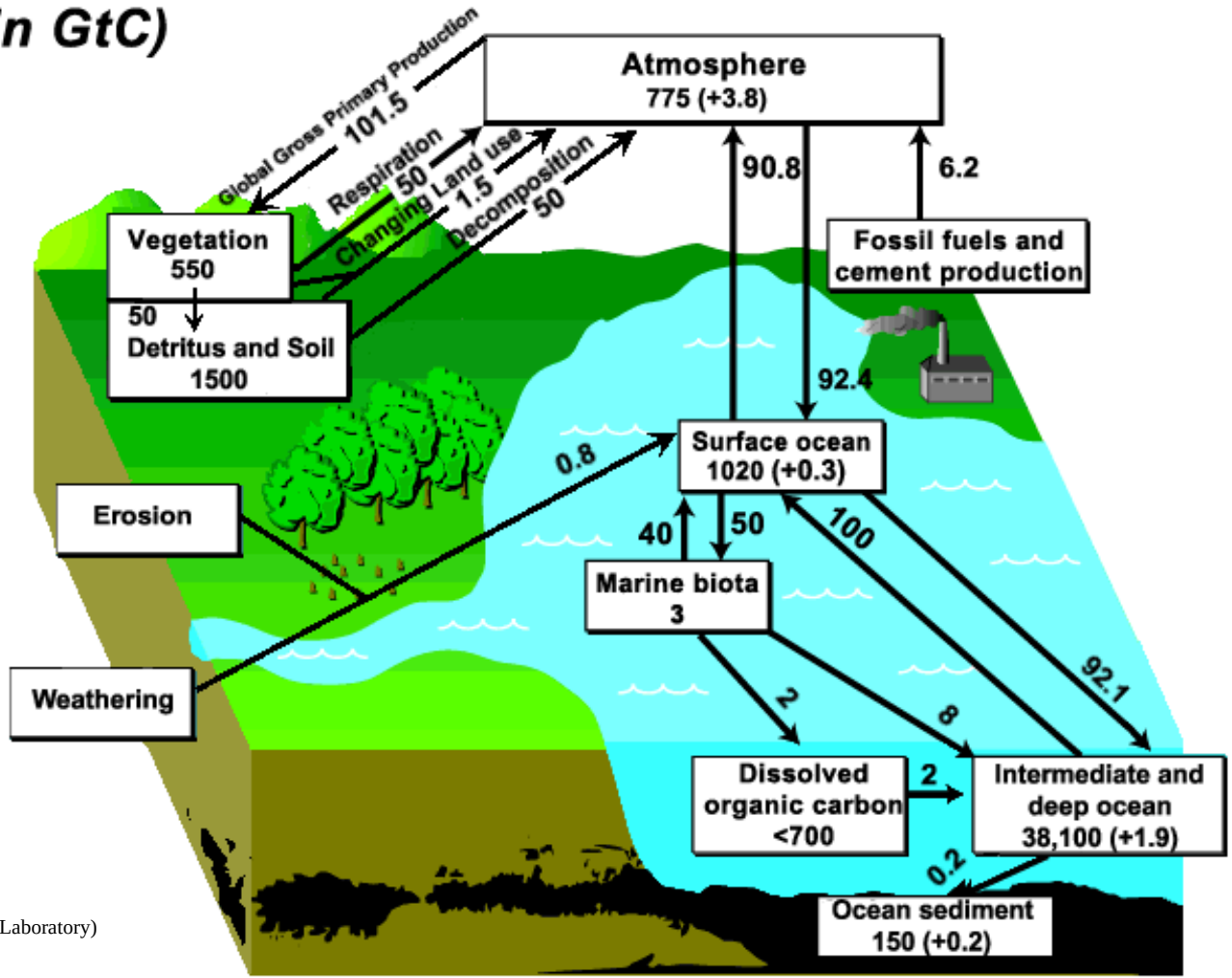
TWG 4 Contamination
Chair Austria/NL
Co-chair EEA

TWG5 Research
Chair W. Blum/ RTD
Co-chair ELO

Decline in organic matter

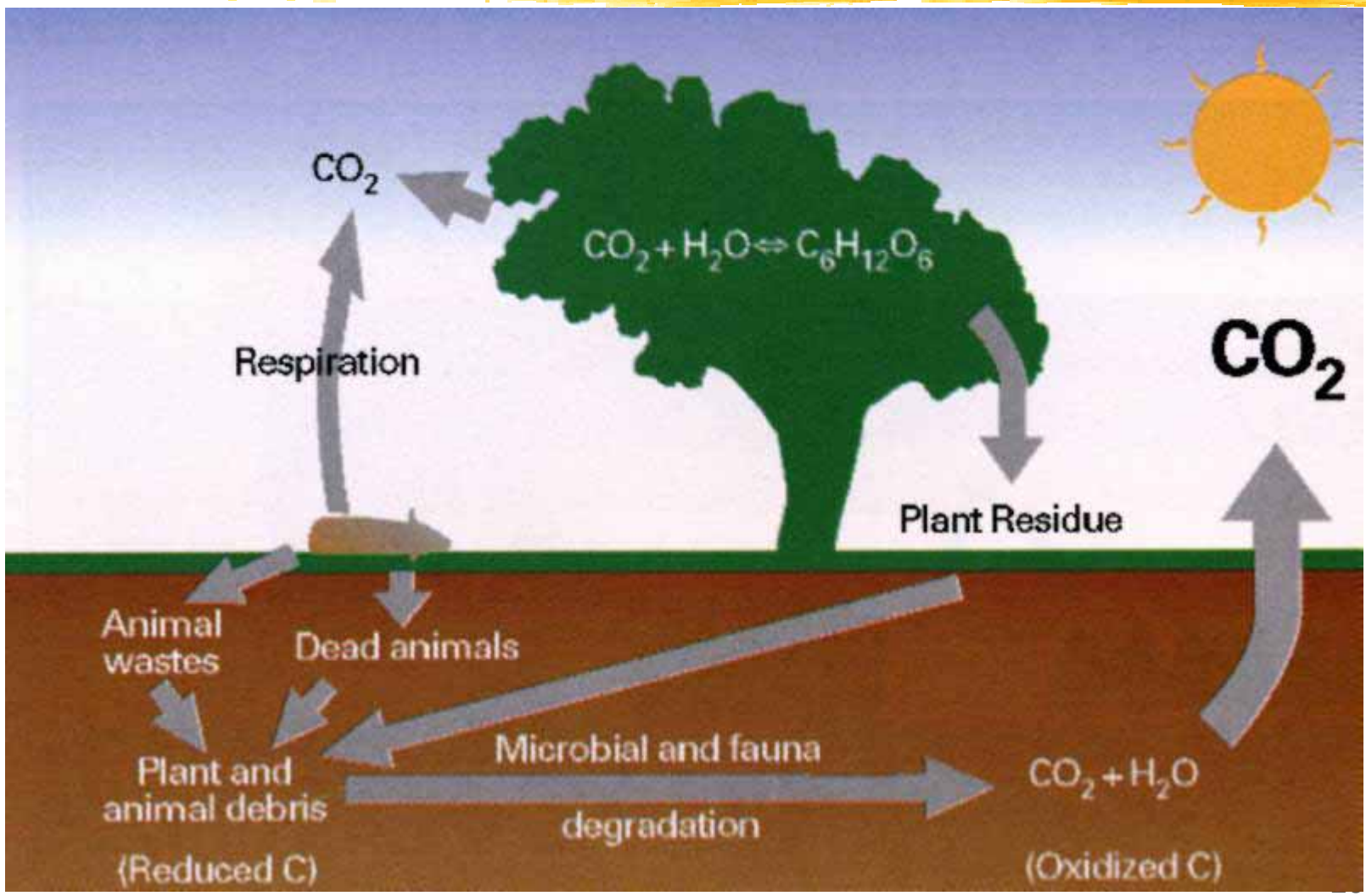
- UNFCCC
  - Major terrestrial carbon pool
- UNCBD
  - Major gene pool
- UNCCD
  - Major consequence of desertification

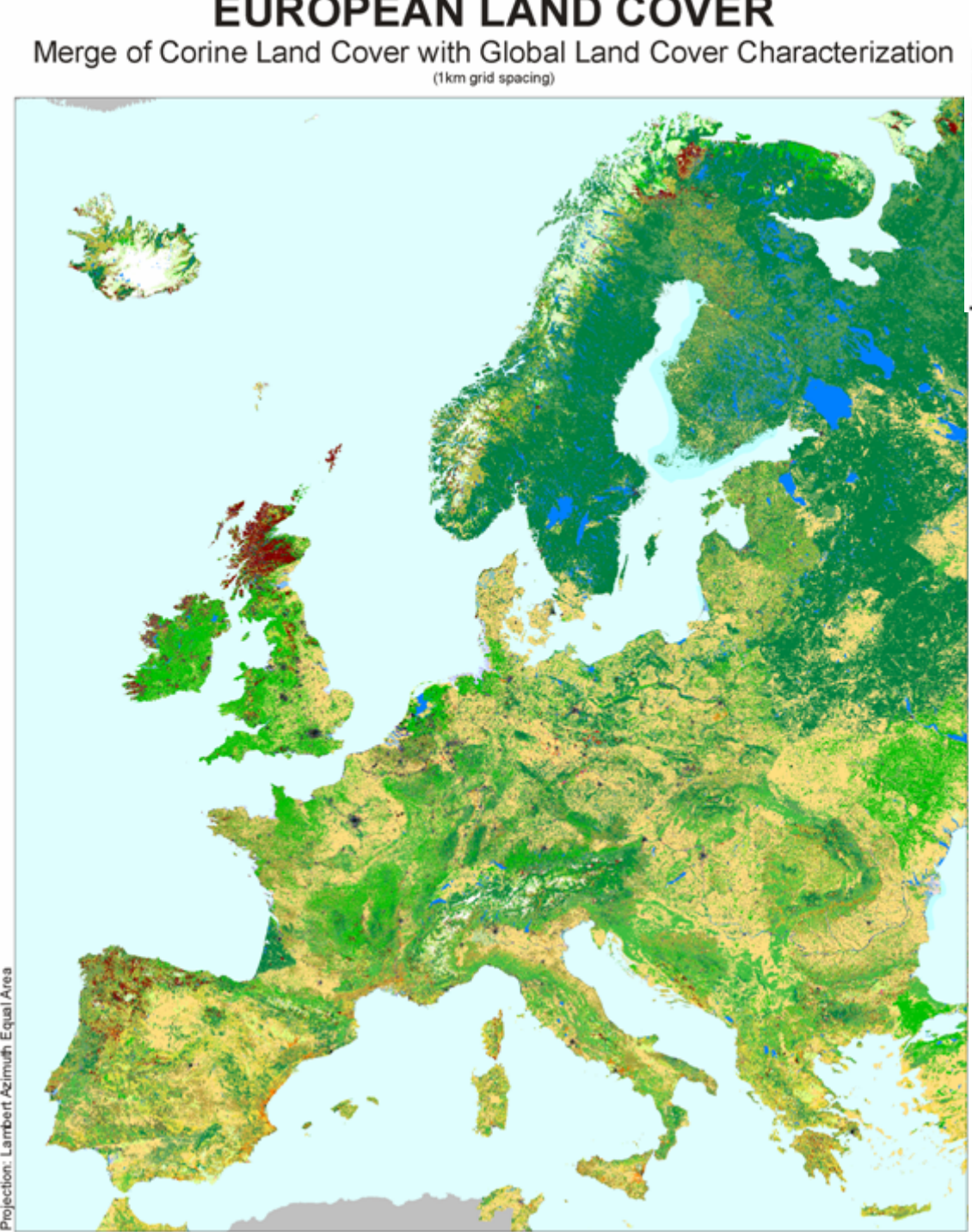
Global Carbon Cycle (1992-1997)
(in GtC)



Source: Mac Post (Oak Ridge National Laboratory)

Soils are a source and sink for atmospheric CO_2





Core data

European data set according to CORINE land cover classification

Extended data

CORINE supplemented with adapted USGS Eurasia land cover

European Soil Database: WRB classification

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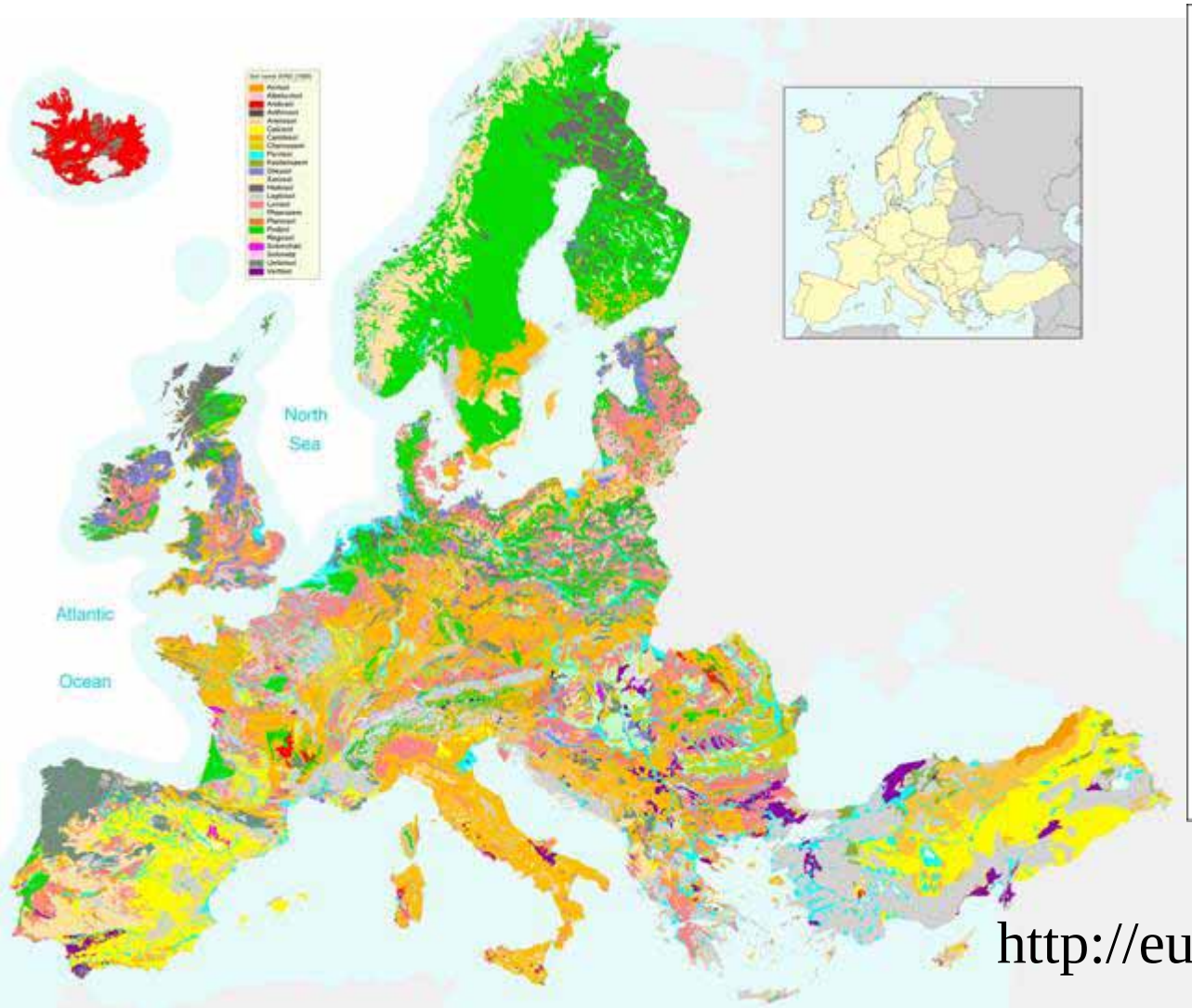

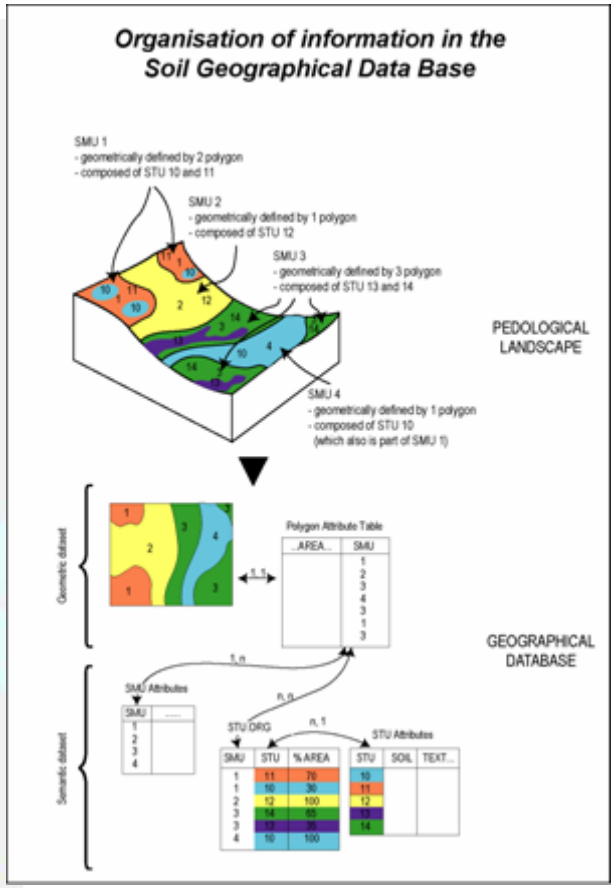

http://eu-geoportal.jrc.it/

Climate data

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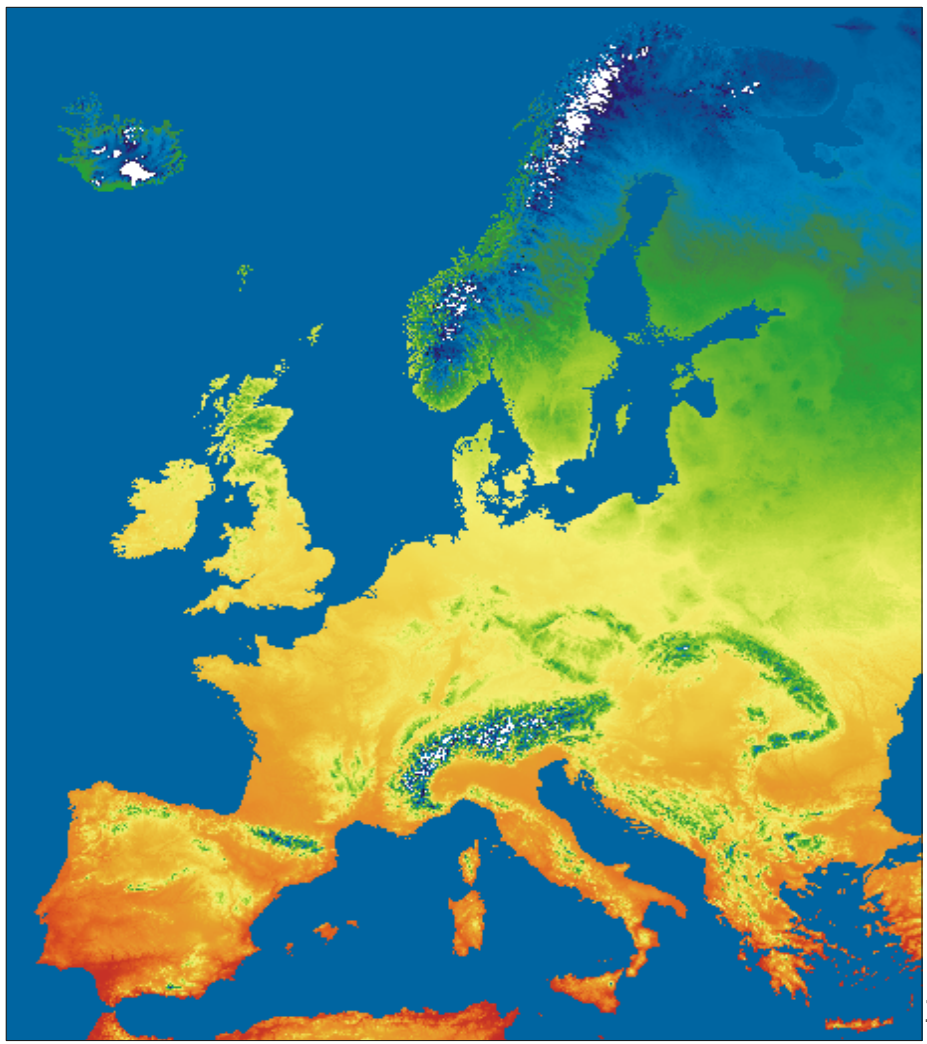
Global Historical Climatology Network (GHCN)

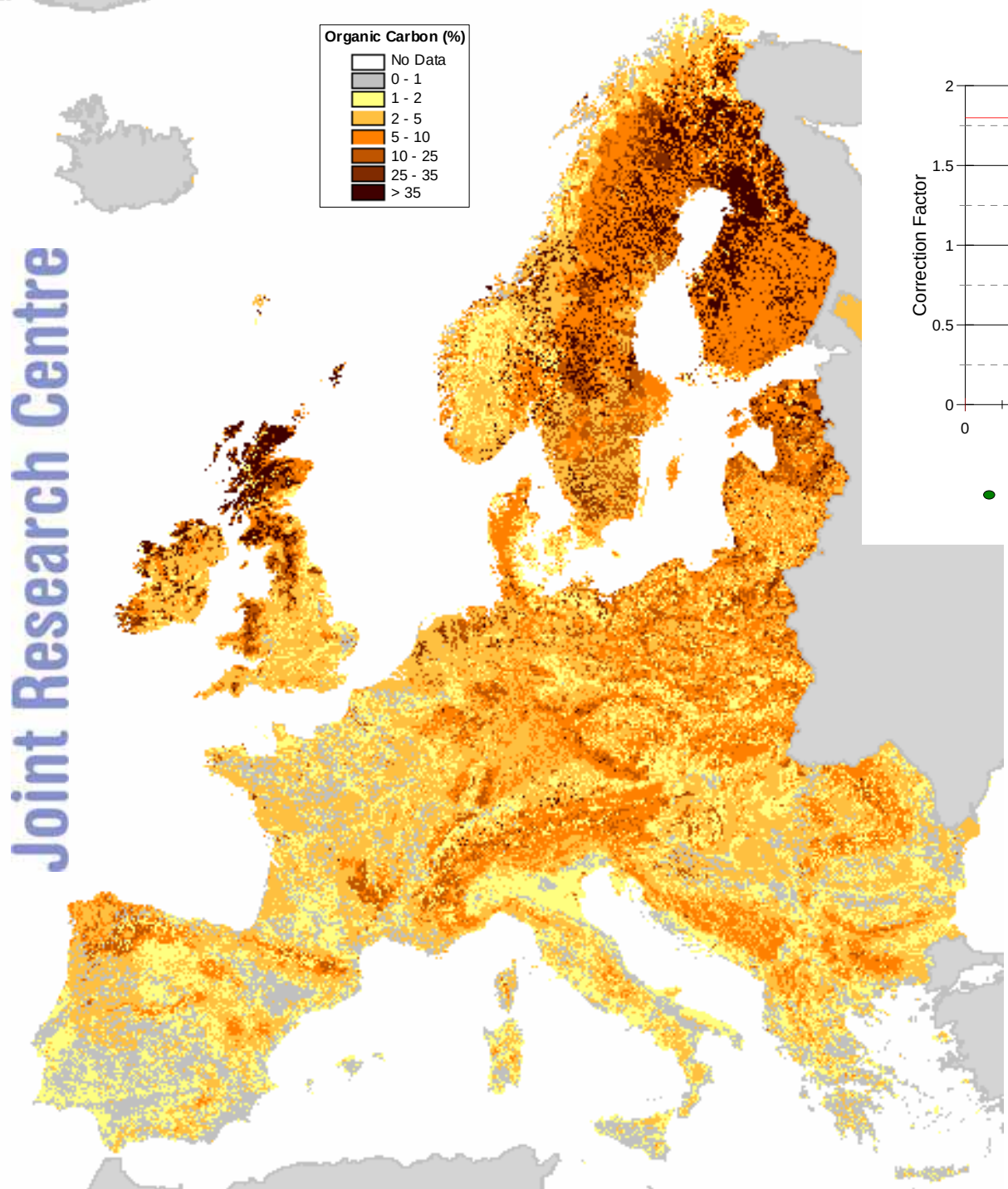
Data source:

Av annual accumulated temperature (AAAT) computed from GHCN temperature data

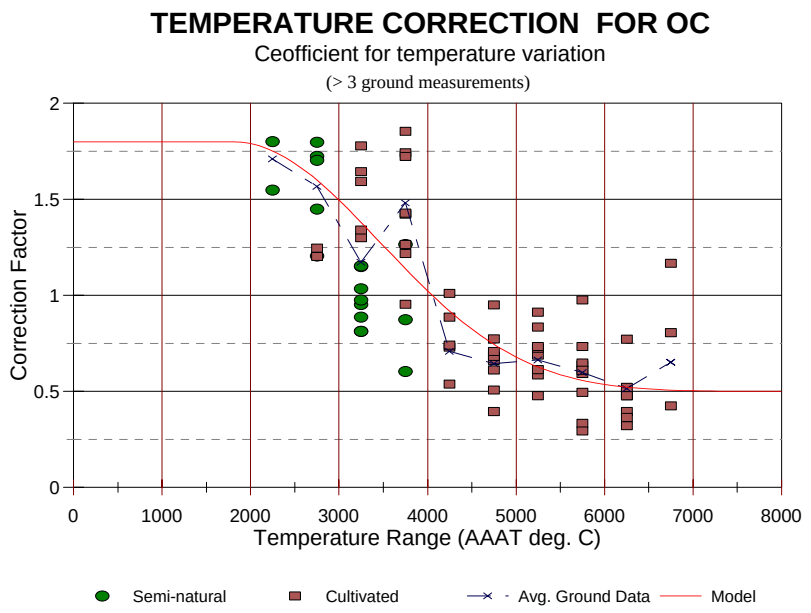
Rasterization:

Spatial layers derived by rasterization of a Triangulated Irregular Network (TIN) model with weighted distance interpolation, in applying the adabatic lapse rate of 6 deg C per 1000m rise





Joint Research Centre



$$TEMP_{cor} = f * \cos(t_{AAAT})^{n} + c$$

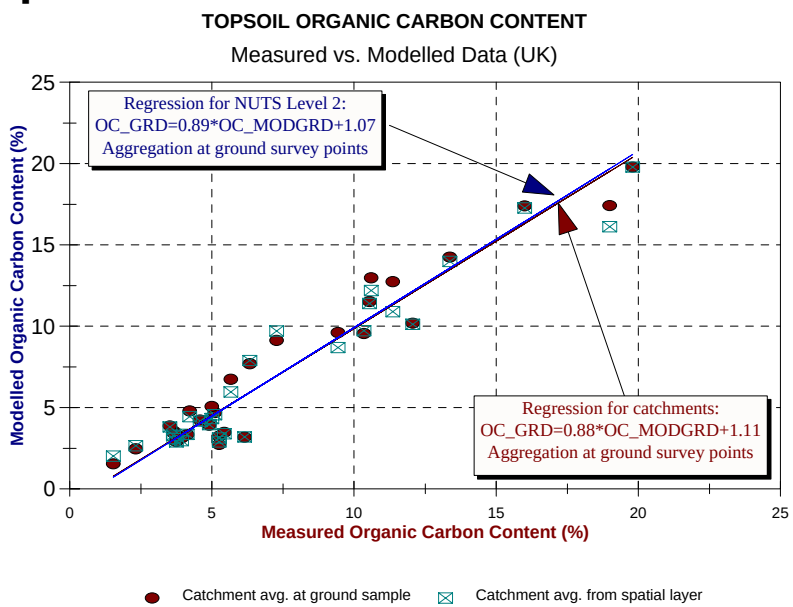
Within belts of uniform moisture conditions and comparable vegetation, the average total content of organic matter in soils increases by 2x to 3x for each 10 deg C fall in mean temperature.

Jones, Hiederer Rusco & Montanarella (2003)

Organic Carbon Content (0-30cm)

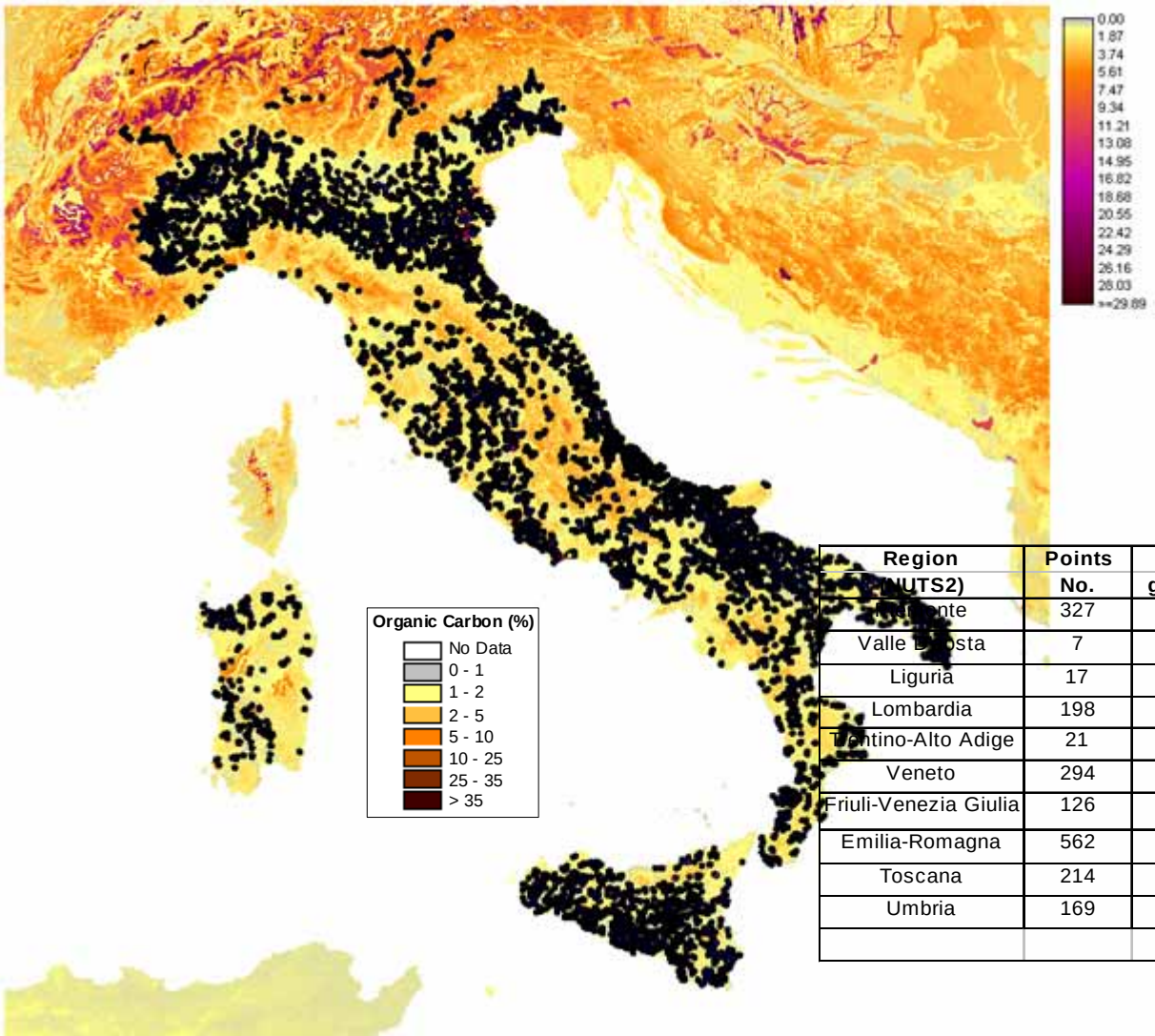
Validation: England and Wales

- Samples taken during National Soil Inventory (NSI) 1979-83 on a systematic 5km x 5km grid
- OC measurements from 5600 NSI points – under all land uses



Coeff. Determination = 95%

Validation



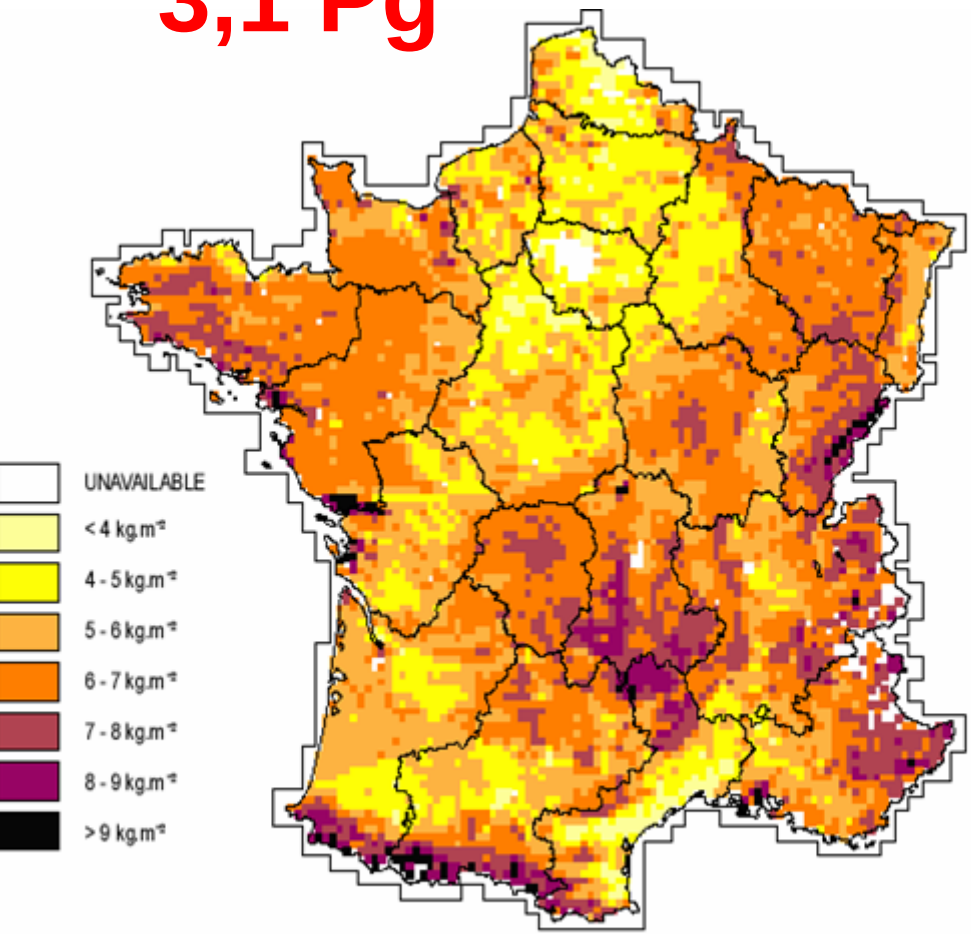
Italy:

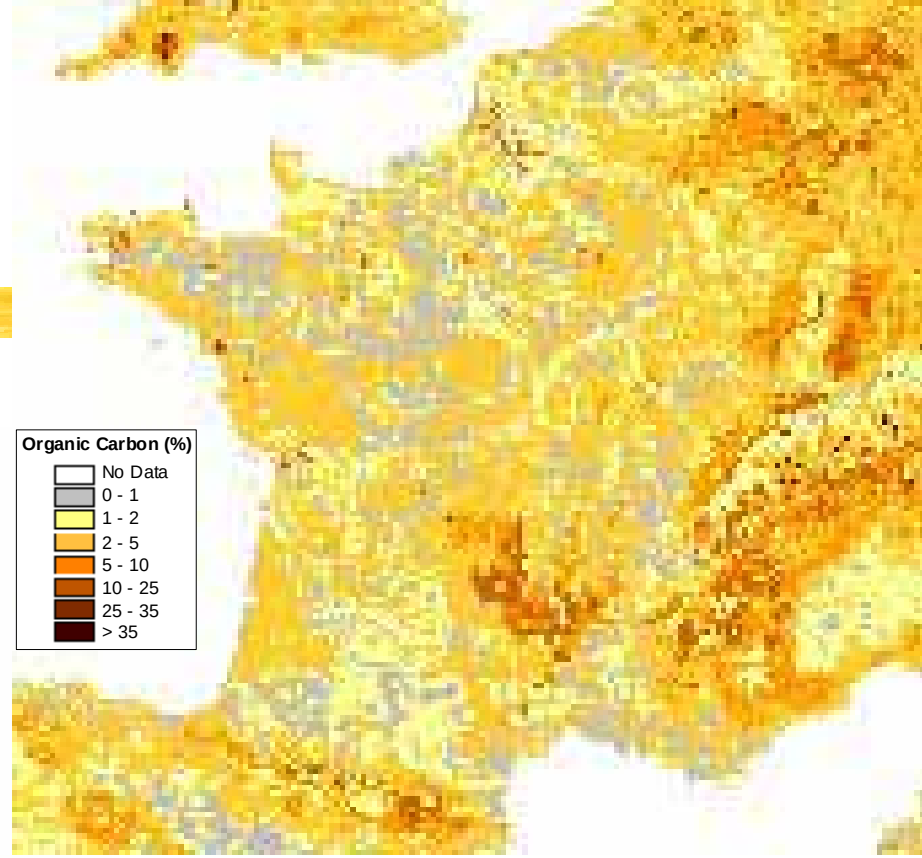
- Non systematic sampling scheme
- Samples mainly from agricultural areas
- Clustered sampling in some areas
- 6586 sampling points

Region (NUTS2)	Points No.	OC % ground	OC % estimate	Region (NUTS2)	Points No.	OC % ground	OC % estimate
[illegible]nte	327	**1.2**	1.4	Marche	145	**0.8**	0.9
Valle [illegible]osta	7	**2.3**	3	Lazio	295	**1.4**	1.3
Liguria	17	**1.1**	1.8	Abruzzo	185	**0.8**	1.1
Lombardia	198	**1.2**	1.4	Molise	117	**1.2**	1.4
Trentino-Alto Adige	21	**1.9**	2.9	Campania	157	**1.7**	1.3
Veneto	294	**1.4**	1.5	Puglia	546	**1.3**	1
Friuli-Venezia Giulia	126	**1.6**	1.2	Basilicata	210	**1**	1.1
Emilia-Romagna	562	**1.4**	1.6	Calabria	152	**0.9**	1
Toscana	214	**0.9**	1.2	Sicilia	594	**1.1**	0.8
Umbria	169	**1.3**	1.3	Sardegna	164	**1.1**	1
				Total / **Avg**	*4500*	**1.2**	1.2

Stocks of C in soils (0-0.3 m) in France - Arrouays et al. (2002)

3,1 Pg

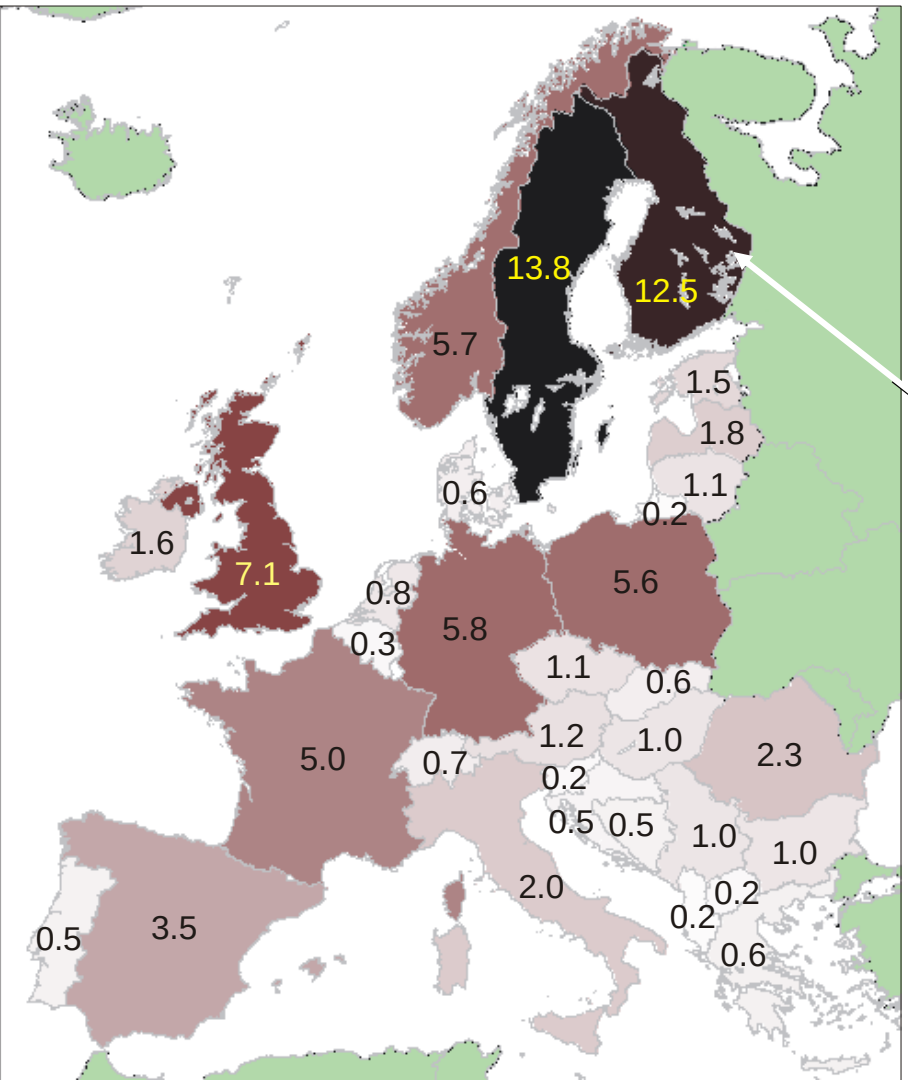


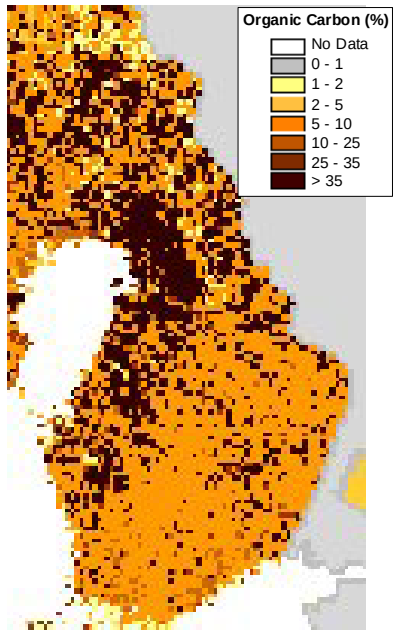


5,0 Pg

OC content in topsoils (0-0.3 m) in France - European Soil Database

Validation for Finland

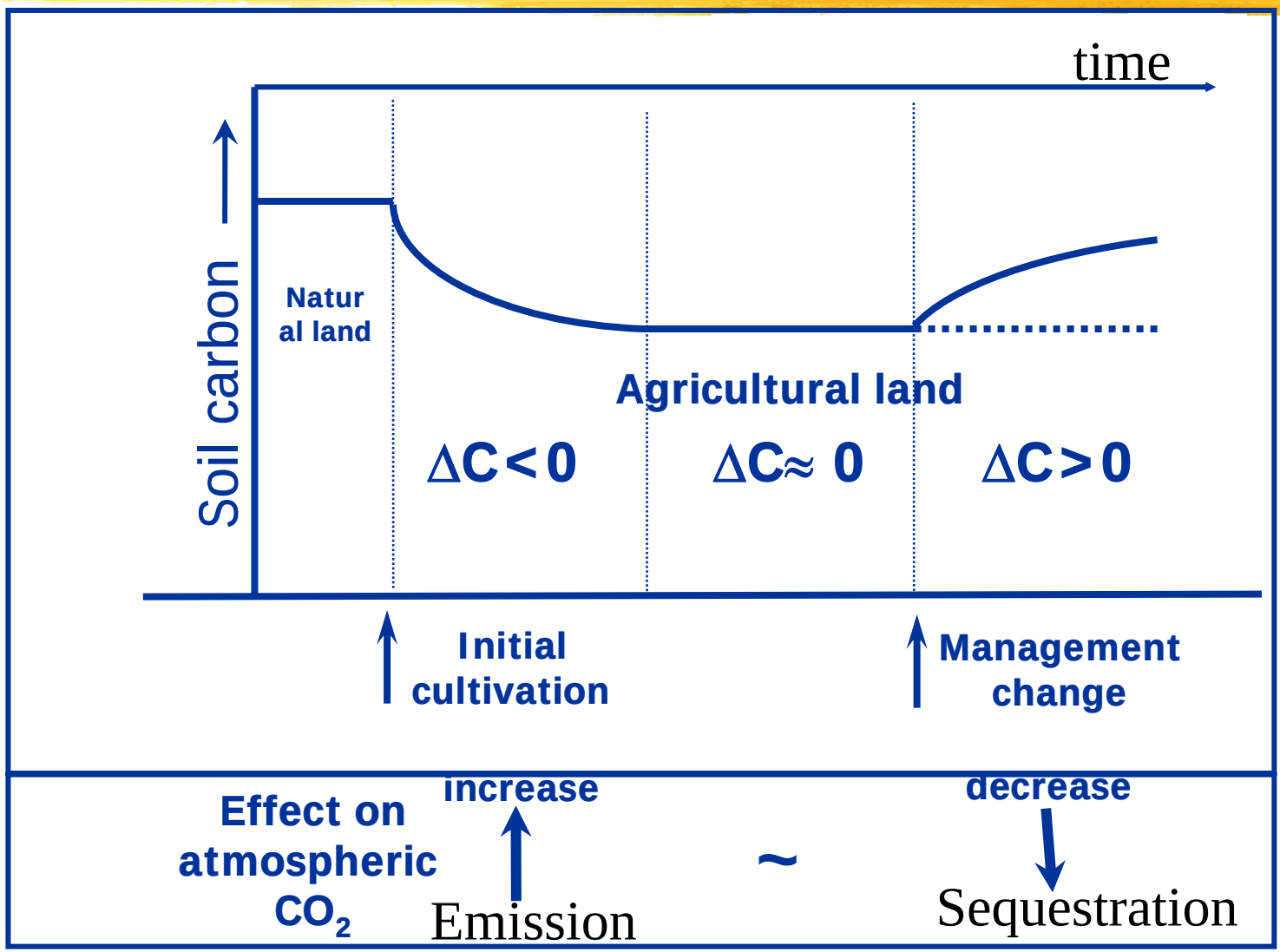




Finland (Yli Halla) :

- Calculated OC stock of 9-11 tera t
- Suggests that the European Soil Database may be overestimating OC in Finland
- Further ‘point’ checks will be made in future

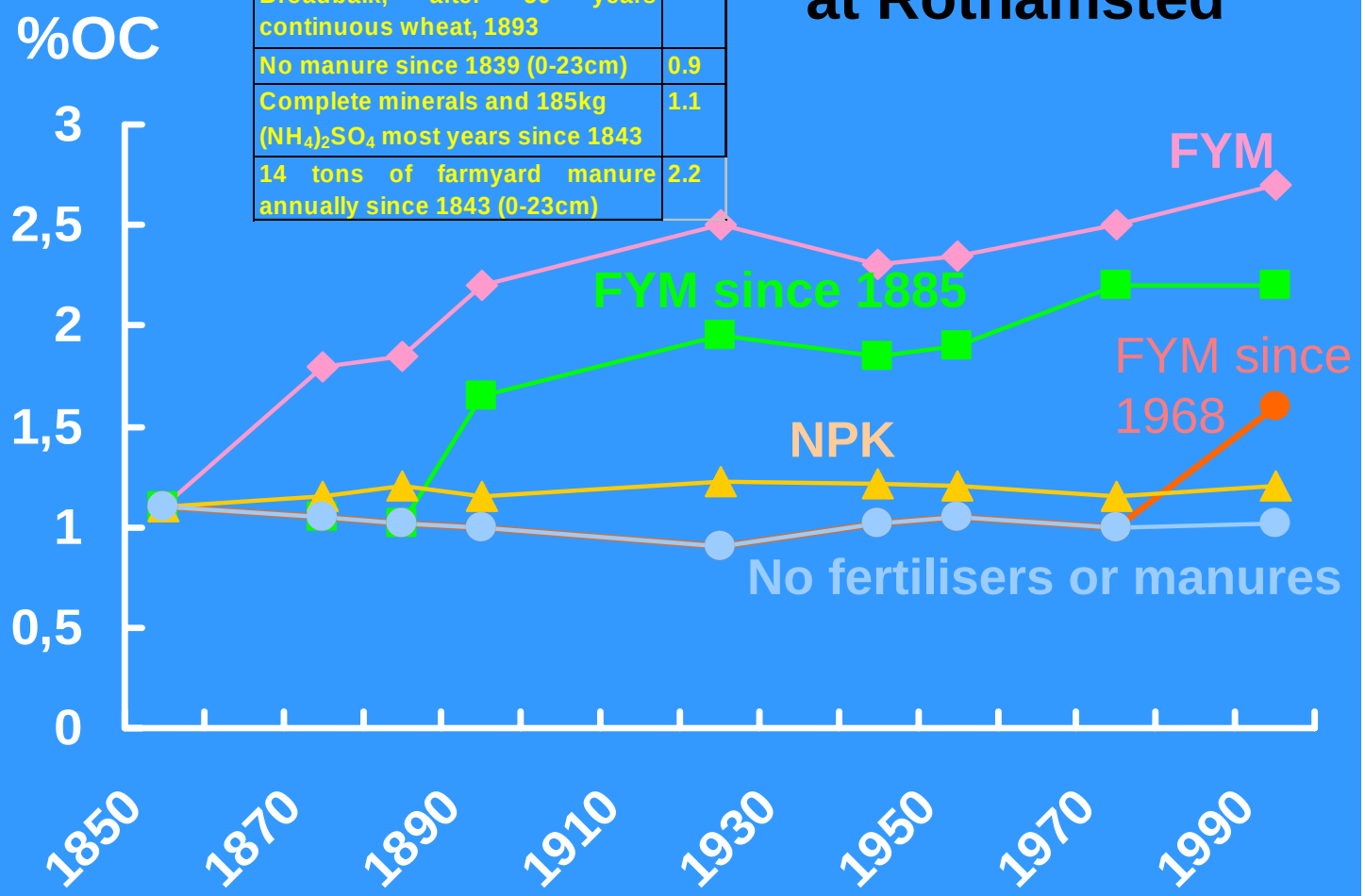
Soil C trajectories



Declining soil organic matter

Management/vegetation	% C
Old pasture (8-18cm)	1.5
Old woodland (13-18cm)	2.4
Broadbalk, after 50 years continuous wheat, 1893	
No manure since 1839 (0-23cm)	0.9
Complete minerals and 185kg $(NH_4)_2SO_4$ most years since 1843	1.1
14 tons of farmyard manure annually since 1843 (0-23cm)	2.2

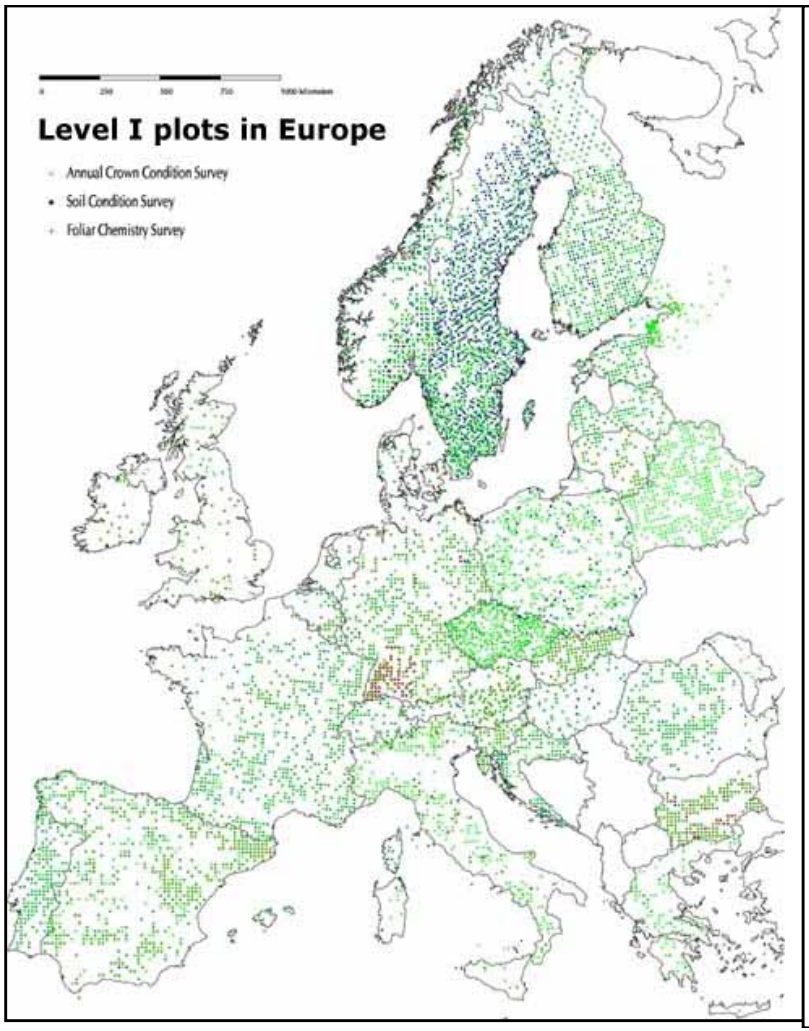
Monitoring SOM at Rothamsted

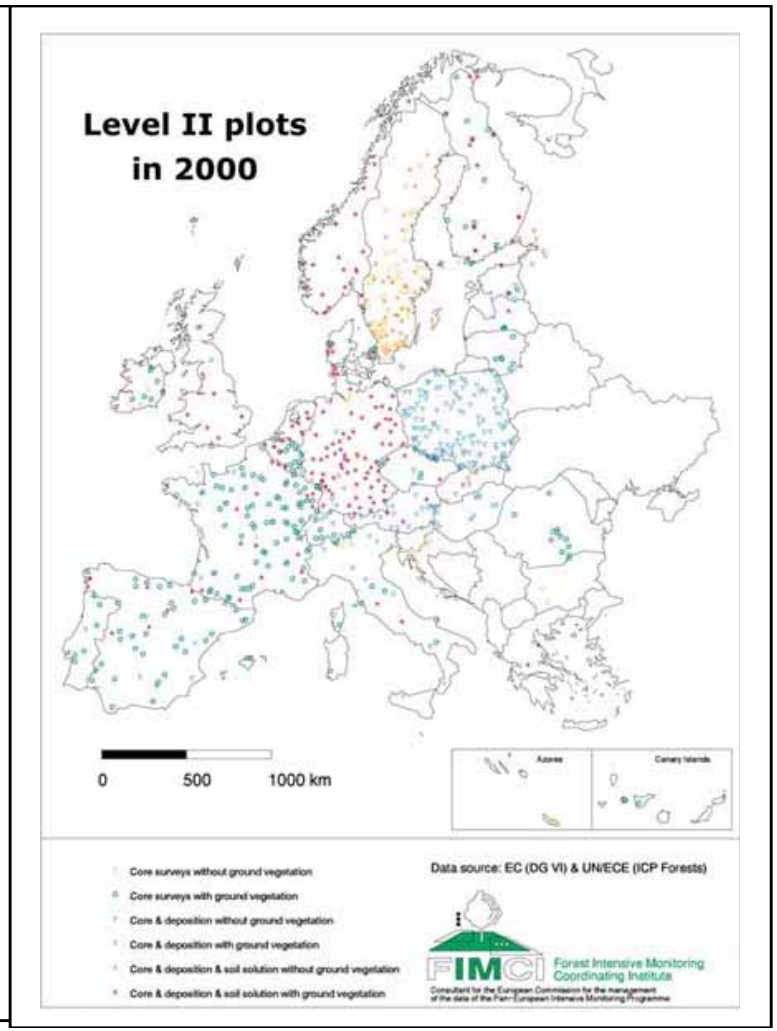


FYM applied at 35 t ha^{-1} yr^{-1}

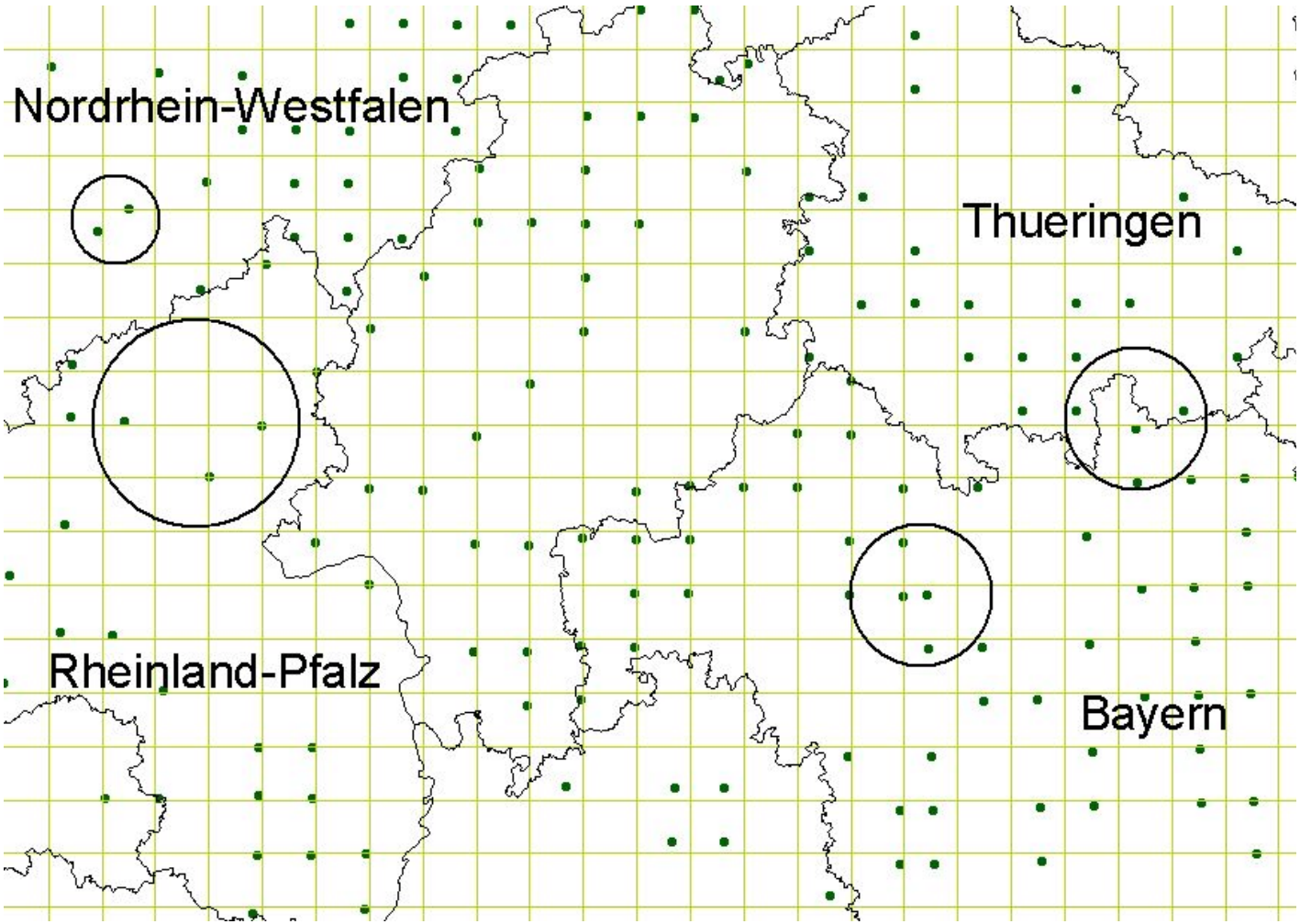
Goulding

ICP Forest
Soil Monitoring Network

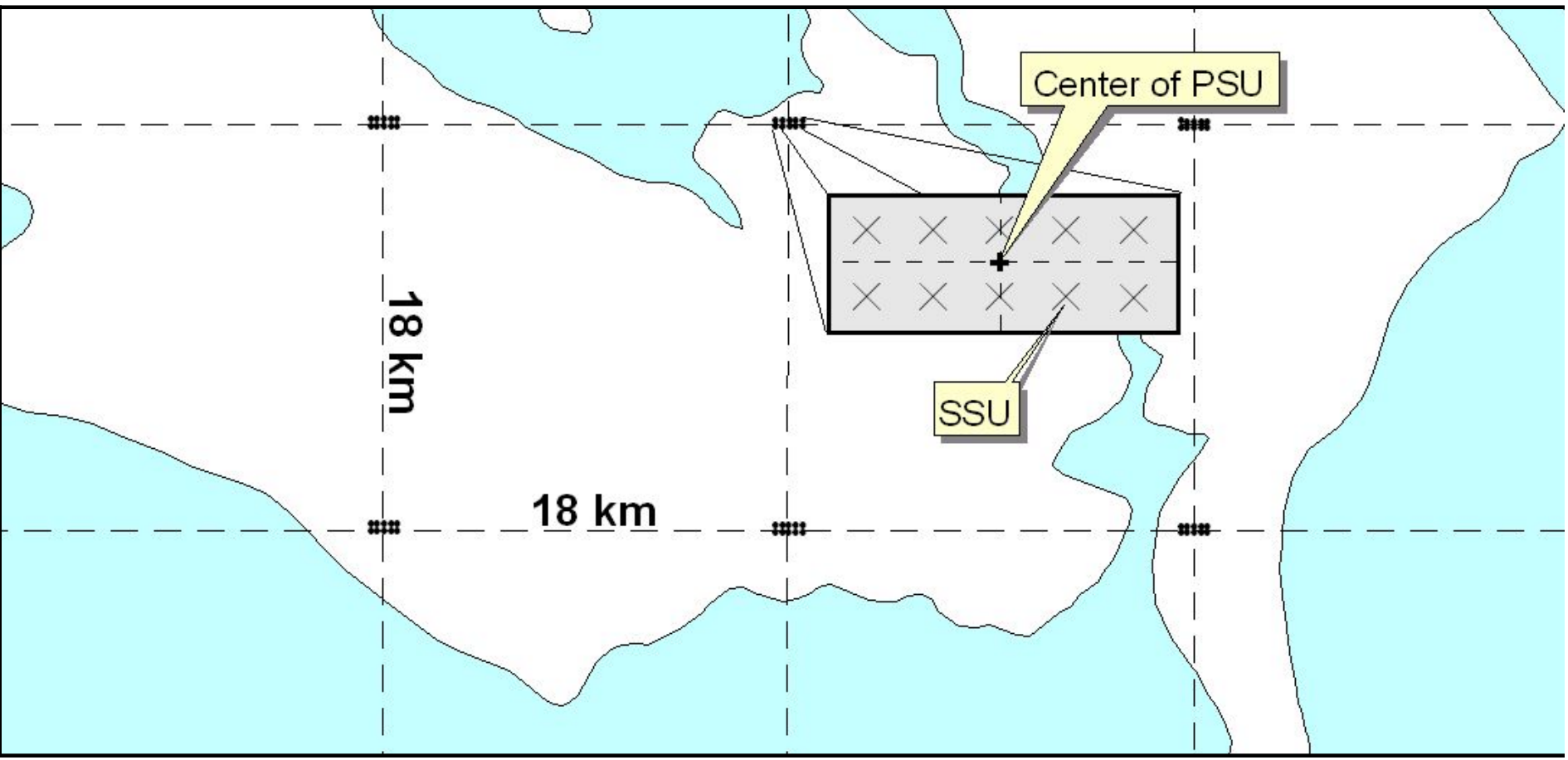




Approximate 16 x 16 km grid sampling

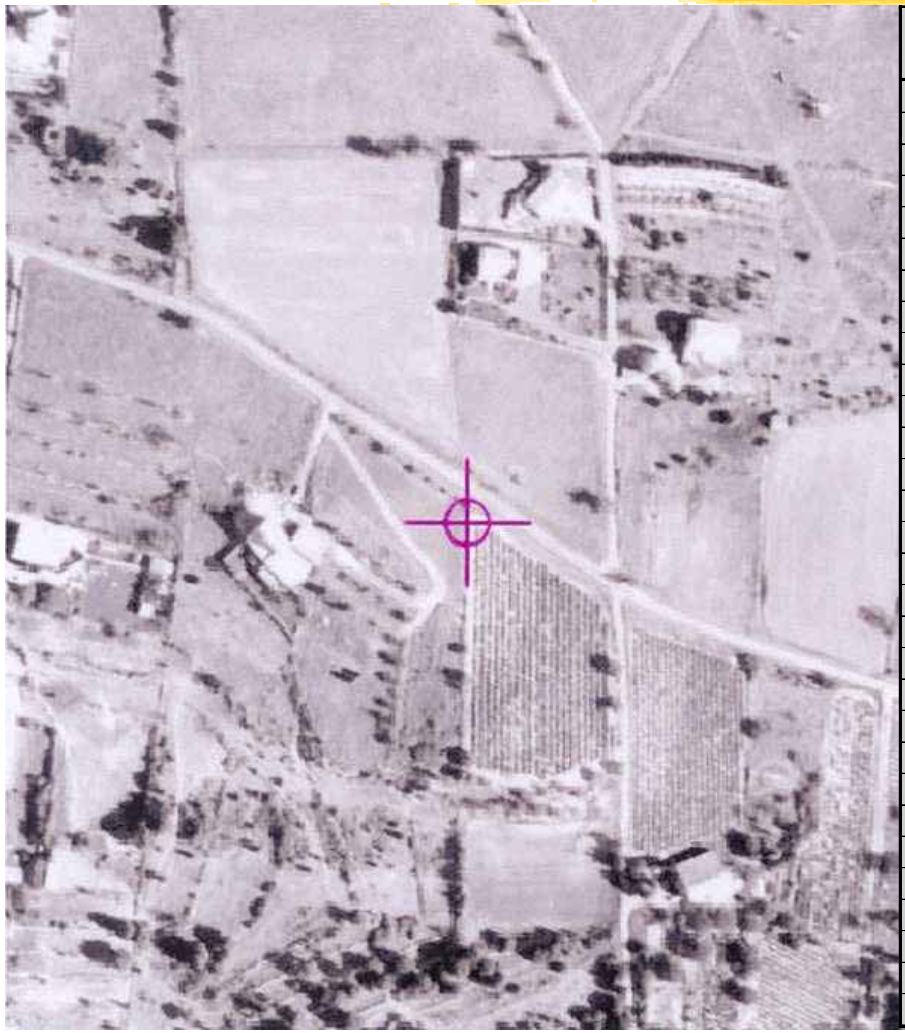


LUCAS
(Land Use and Cover Annual Survey)



LUCAS
(Land Use and Cover Annual Survey)

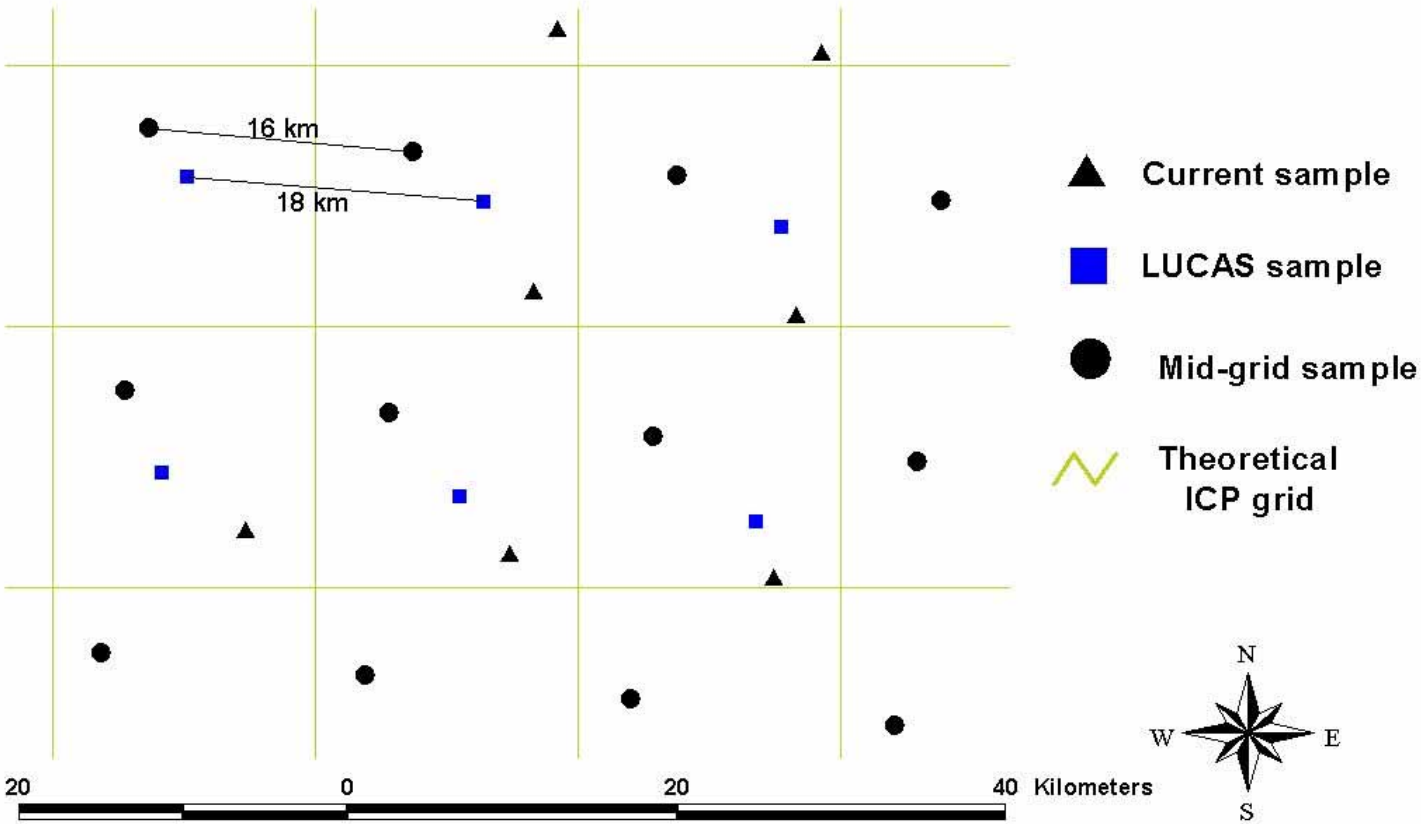
Institute for Environment and Sustainability

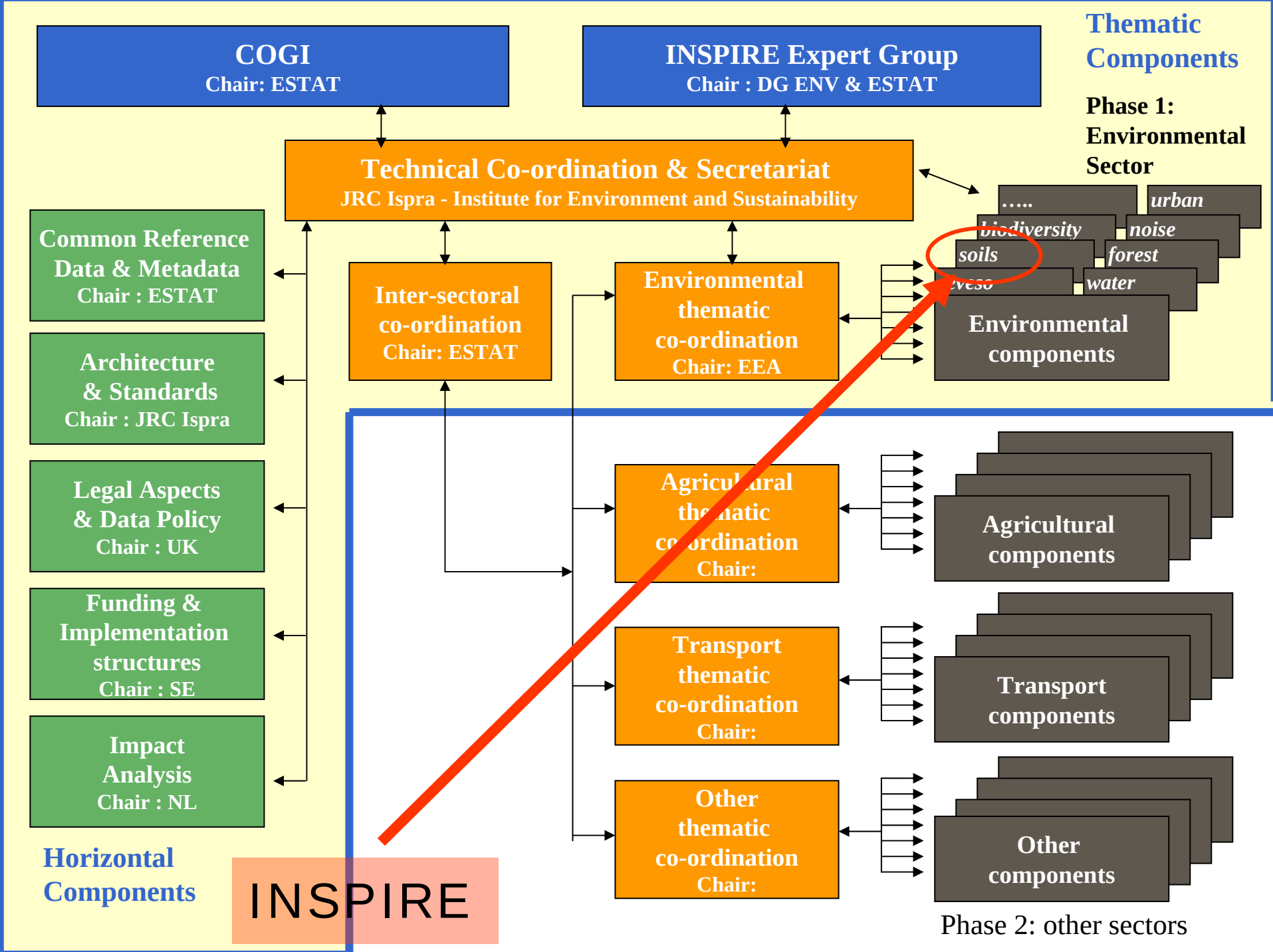


Field Name	Width (number of characters)	Required (Empty not allowed)	Type	Description
CNTRYCODE	2	**Yes**	C	Code of the Country
PSUROW	3	**Yes**	I	Number of the PSU row (country specific)
PSUCOL	3	**Yes**	I	Number of the PSU column (country specific)
SSU	2	**Yes**	I	Number of the SSU
SURVEYTYPE	1	**Yes**	I	Type of the survey
OBSSTAT	1	**Yes**	I	Status of the observation
OBSDIST	1	No	I	Class of distance of observation
OBSRADIUS	1	No	I	Radius of observation
OBSDIREC	1	No	I	Direction of observation
LCOVER1	3	No	C	Land Cover 1
LCOVER2	3	No	C	Land Cover 2
LUSE1	3	No	C	Land Use 1
LUSE2	3	No	C	Land Use 2
PHOTODIST	1	No	I	Class of distance of photo from the SSU
PHOTO_N	1	No	I	Status of Photo taken to the North
PHOTO_S	1	No	I	Status of Photo taken to the South
PHOTO_W	1	No	I	Status of Photo taken to the West
PHOTO_E	1	No	I	Status of Photo taken to the East
IRRIG	1	No	I	Irrigation
EROSSTAT	1	No	I	Status of erosion
EROSRILL	1	No	I	Number of Rills
EROSGULLY	1	No	I	Number of Gullies
EROSACCUM	1	No	I	Presence of Accumulation
ISOLATREE	1	No	I	Presence of isolated trees
NATHAZARD	1	No	I	Damage caused by Natural Hazards
FARMSTAT	1	No	I	Identification of the farmer
NOISESTAT	1	No	I	Status of noise
NOISETYPE	1	No	I	Type of noise
NOISESOUR	1	No	I	Source of noise
NOISELEVEL	1	No	I	Level of noise

Possible interaction between ICP Forest and LUCAS monitoring sites

Possible complementary samples




COGI
Chair: ESTAT
INSPIRE Expert Group
Chair : DG ENV & ESTAT
Thematic Components
Phase 1: Environmental Sector
Technical Co-ordination & Secretariat
JRC Ispra - Institute for Environment and Sustainability
Common Reference Data & Metadata
Chair : ESTAT
Architecture & Standards
Chair : JRC Ispra
Legal Aspects & Data Policy
Chair : UK
Funding & Implementation structures
Chair : SE
Impact Analysis
Chair : NL
Horizontal Components
Inter-sectoral co-ordination
Chair: ESTAT
Environmental thematic co-ordination
Chair: EEA
.....
urban
biodiversity
noise
soils
forest
water
Environmental components
Agricultural thematic co-ordination
Chair:
Agricultural components
Transport thematic co-ordination
Chair:
Transport components
Other thematic co-ordination
Chair:
Other components
INSPIRE
Phase 2: other sectors

Forest FOCUS

Regulation (EC) N° No 2152/2003

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- Scientific Coordination by JRC
  - Scientific Coordination Body (SCB).
- Planned activities for forest soils:
  - Development of a draft Manual of Procedures for Soil Monitoring (2004).
  - Testing of the procedures in selected pilot areas (2005).
  - Reporting of the results of these tests, including final recommendations concerning future soil monitoring (2006).