

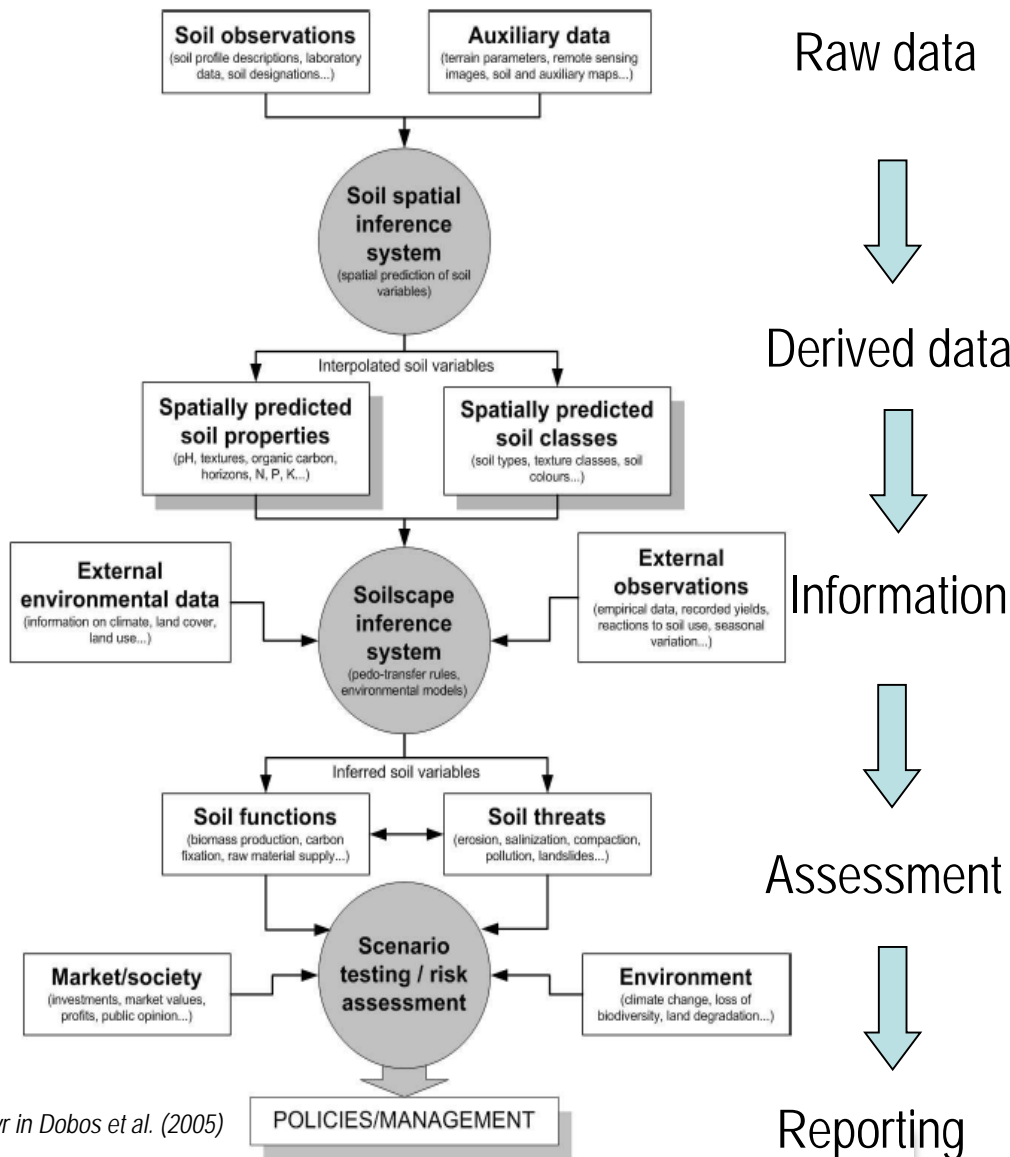
Stato dei suoli in Europa e in Italia

Luca Montanarella

Senior Expert

European Commission - JRC, Land Resource Unit, Ispra (VA), Italy
(luca.montanarella@ec.europa.eu)

From raw data to policy relevant information



European Commission
(EU funded soil related projects)

Data from specific in-house JRC
actions (e.g. ESDB, SOTER)

Member States

EIONET, EEA, etc

European Soil
Data Centre
(ESDAC)

Data from related JRC
and EC actions
(e.g. LUCAS, BIOSOIL)

Network of soil centres
(e.g. ESNB)

Collaborative research
(e.g. EuroGeoSurveys, FAO, ISRIC)

The Soil
of Europe

The Soils of Eurasia

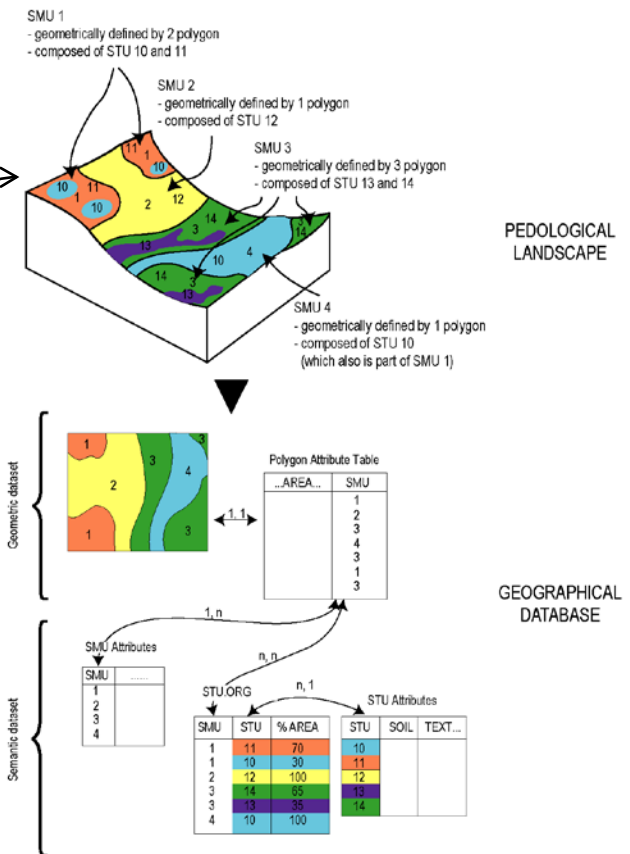


Main source from which most DATA, INFORMATION, DOCUMENTS and SERVICES are derived
1:1.000.000

Vector (geometric) dataset:

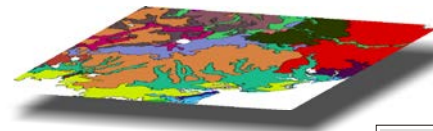
> 50.000 polygons
9 ha minimum area
> 2.000.000 vertices (x,y)
73 parameters

Organisation of information in the Soil Geographical Data Base



Mapping vs. Monitoring

- **Mapping**
symbolically represent
the geographic
distribution of an object
on the Earth surface.
- **Monitoring**
sample information on
an object
systematically and on a
regular basis.

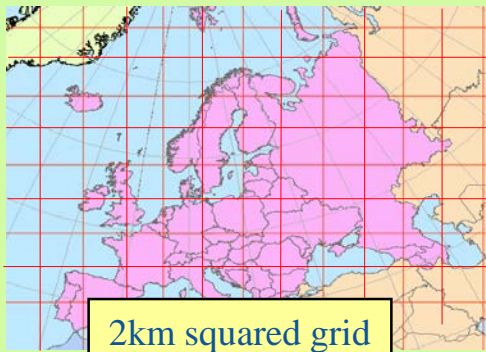


STU	NB_POLYS	NB_SMU	AREA	WRBFU
4401665	8	1	178.43	HSdy
4401666	8	1	68.63	CMdy
4401668	2	1	44.63	CMeu
4401669	2	1	44.63	CMgl
4401670	2	1	22.31	GLeu
4401671	1	1	142.01	CMeu
4401672	1	1	142.01	CMeu
4401673	1	1	94.67	CMdy
...

GIS Layer and Attribute



Field Survey



2km squared grid



1 100 000 points

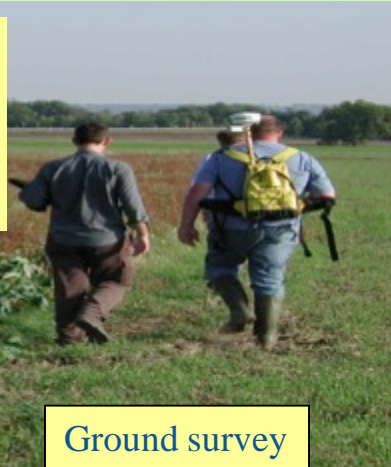
LAND COVER classes

- 1 ARABLE LAND
- 2 PERMANENT CROPS
- 3 GRASSLAND
- 4 WOODED AREAS AND SHRUBLAND
- 5 BARE LAND, RARE VEGET.
- 6 ARTIFICIAL LAND
- 7 WATER

Second phase sample: in-situ data collection

Parameters

- Land cover
- Land use
- Soil sample (10%)
- pictures
- etc.

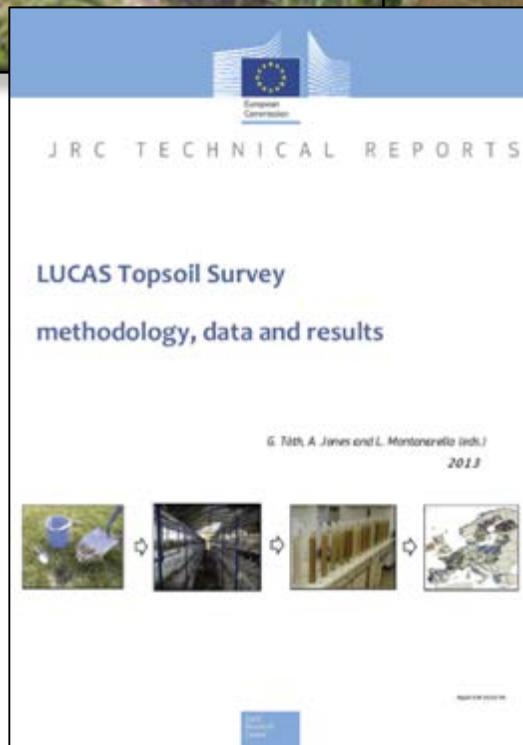
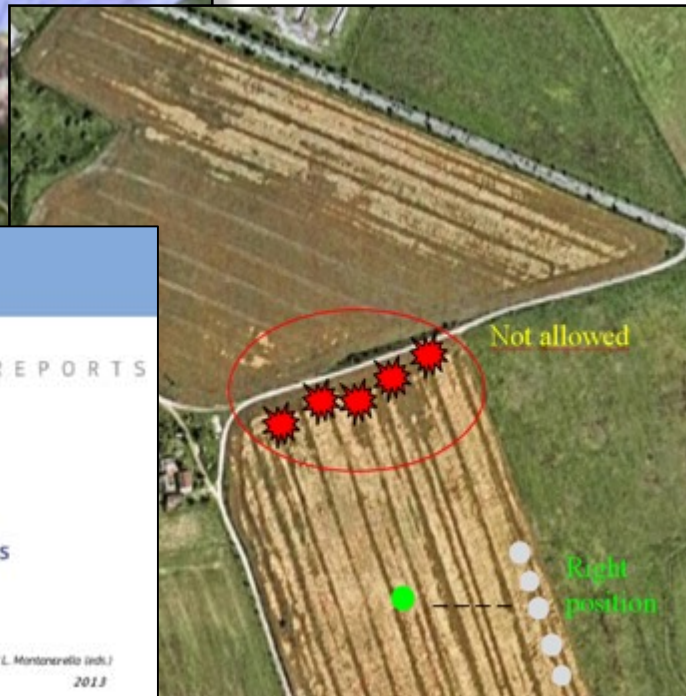
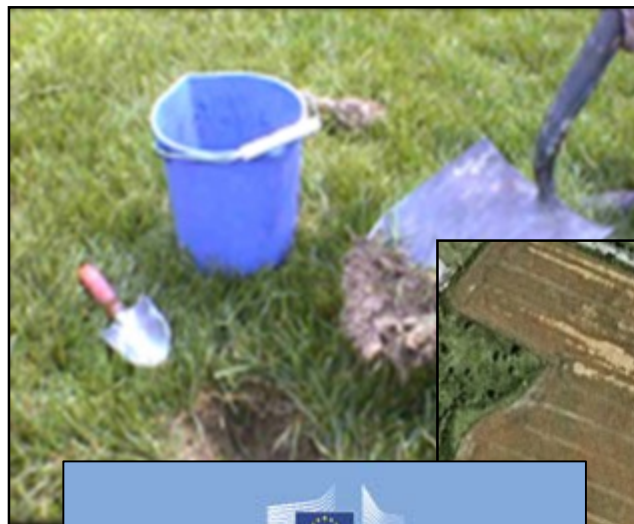


Ground survey



Sample of around 260,000 pts

LUCAS SOIL: TRAINING, SUPPORT MATERIAL, DATA AND RESULTS



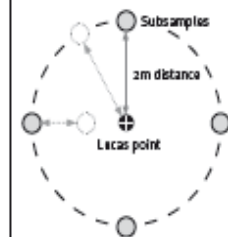
LUCAS Soil sampling Field guide



A Equipment for soil sampling

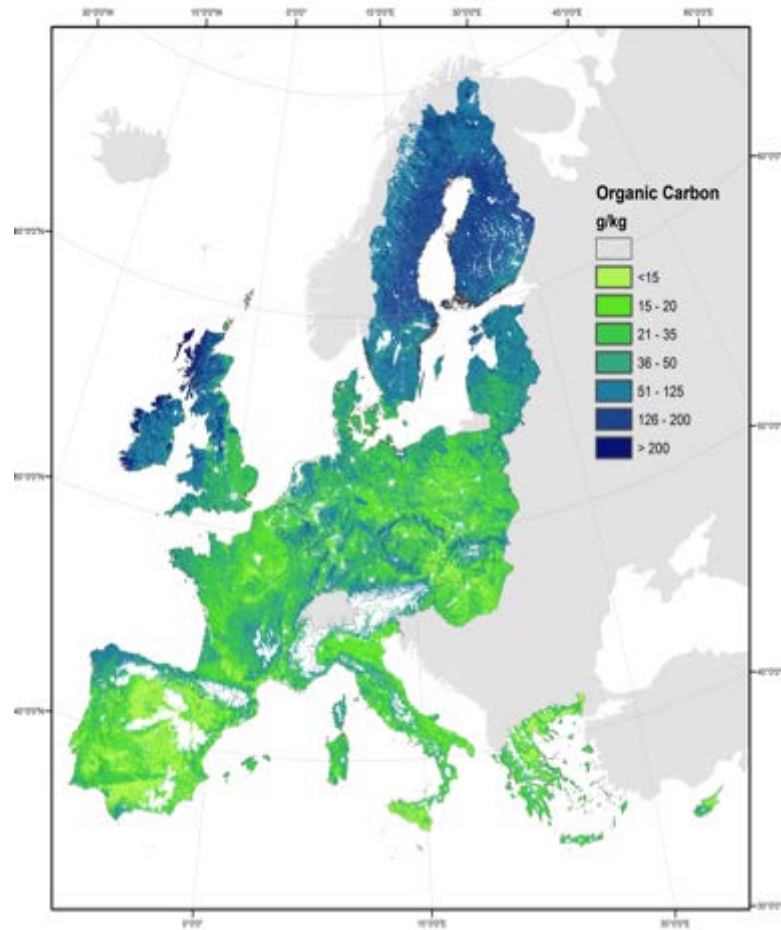
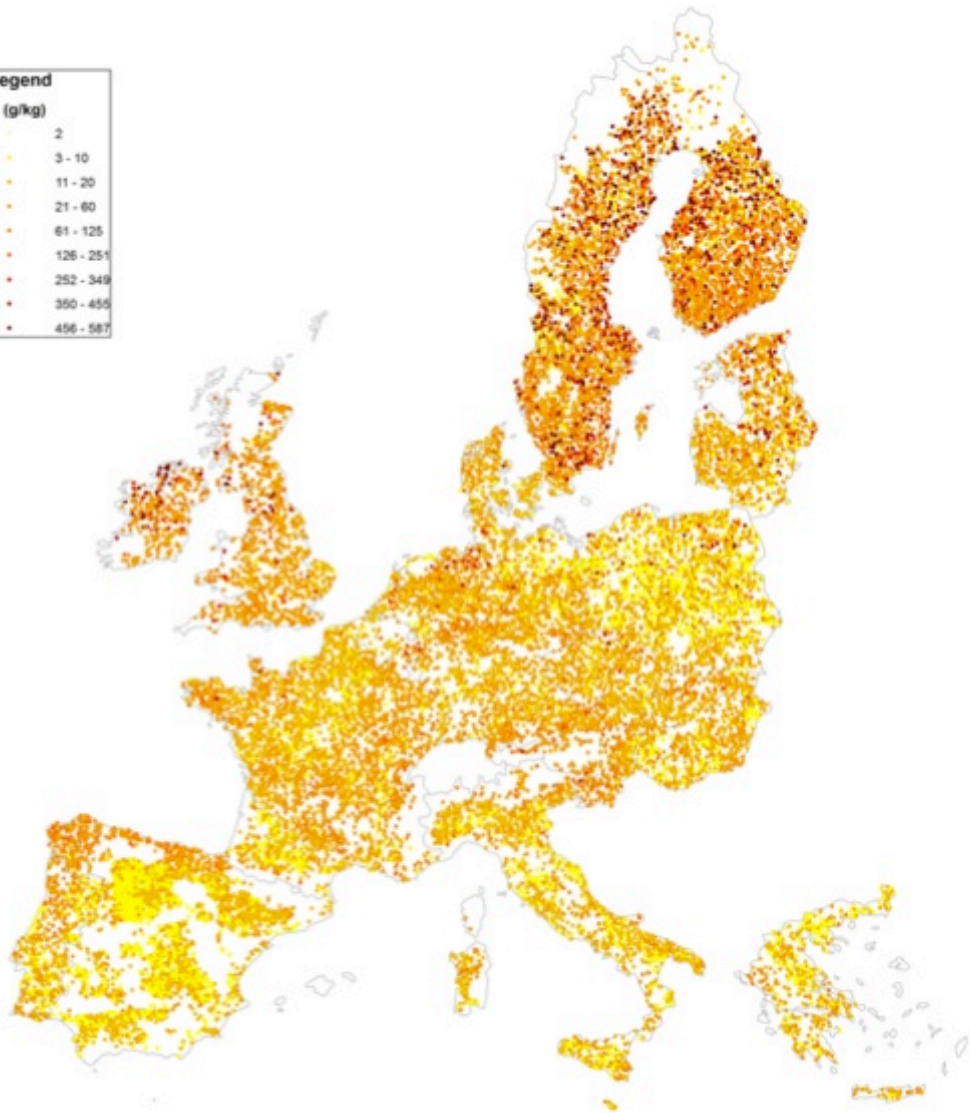
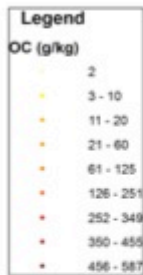
- 1) a spade;
- 2) a trowel (small spade);
- 3) a bucket;
- 4) 2 bags per sample (25x40cm and 40x60cm);
- 5) 2 printed plastic labels per sample (with code of the point);
- 6) 2 ties per sample (to close the bags);
- 7) a big box to store and transport samples;
- 8) mark the samples.

B Sampling locations



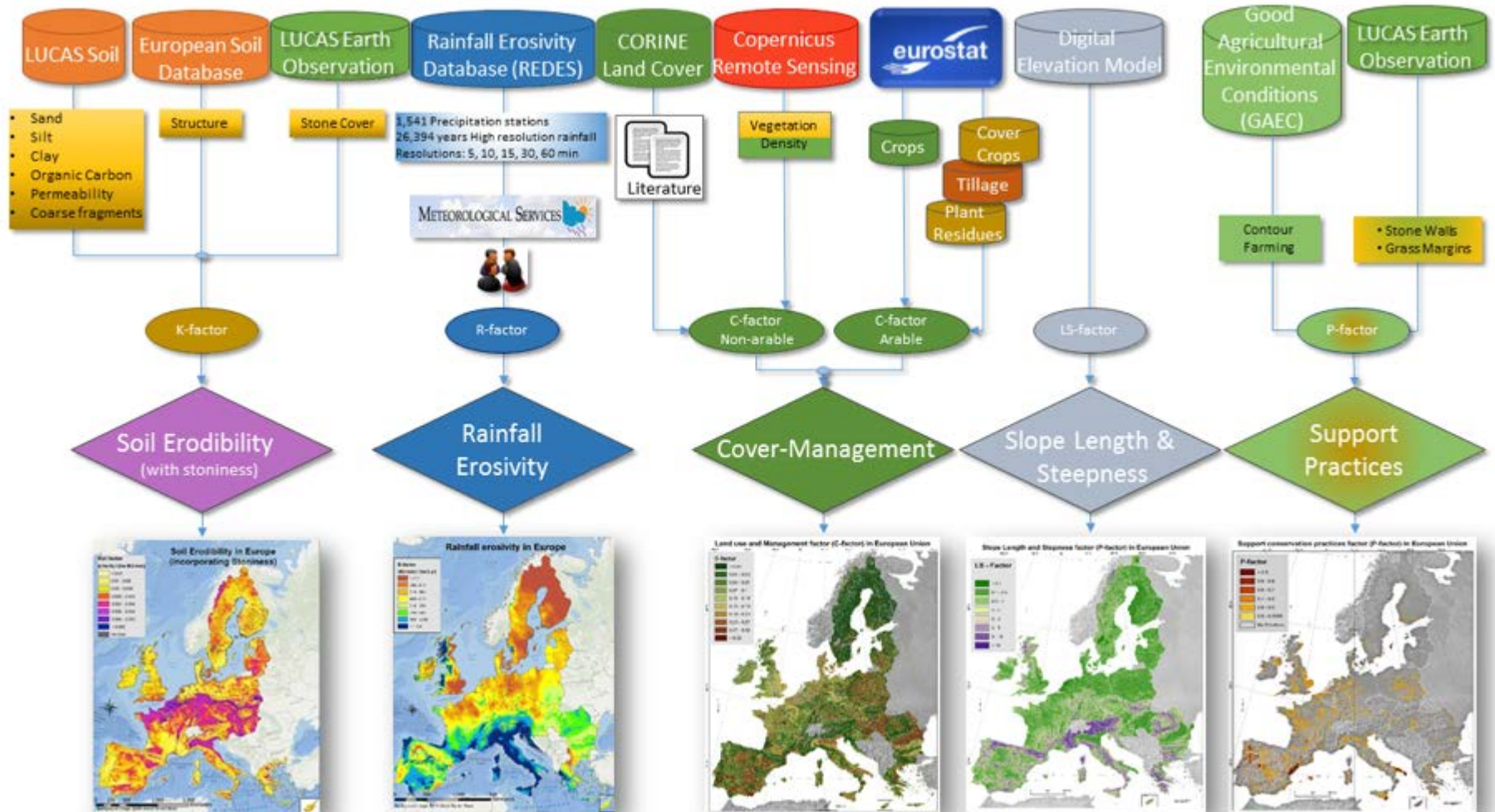
C Sampling

1. Walk to the LUCAS point.
2. Remove vegetation, grass and litter.
3. Dig a V-shaped hole with the spade.
4. Slice off a 3 cm thick layer - remove vegetation, grass and litter.
5. Turn the sides of this layer, leaving 3 cm in the middle.
6. Put the soil in the bucket.
7. Clean access soil from the spade.
8. Take a photo of the LUCAS point (with the hole visible).
9. Repeat steps 3-7 for the North - West - South and East points.
10. Take 5 samples with the trowel.
11. Take 50g (5 or 6 heaped trowels) and put it in the plastic bag.
12. The soil needs to cover at most 30 cm (lengthwise).
13. Put one label inside this bag, close the bag with a tie.
14. Put a second plastic bag over this bag, put a label between the 2 bags. Close the bag.
15. Throw away any excess soil.
16. At the end of the day, open the bags so the soil sample can air dry.
17. Put at least 20 samples (= 10kg of soil) in the box.
18. Seal box and tape edges.
19. Take to collection point of call.



Distribution of 19,879 LUCAS land areas/points and their level of organic carbon (OC) content in the topsoil layer (0-30 cm).

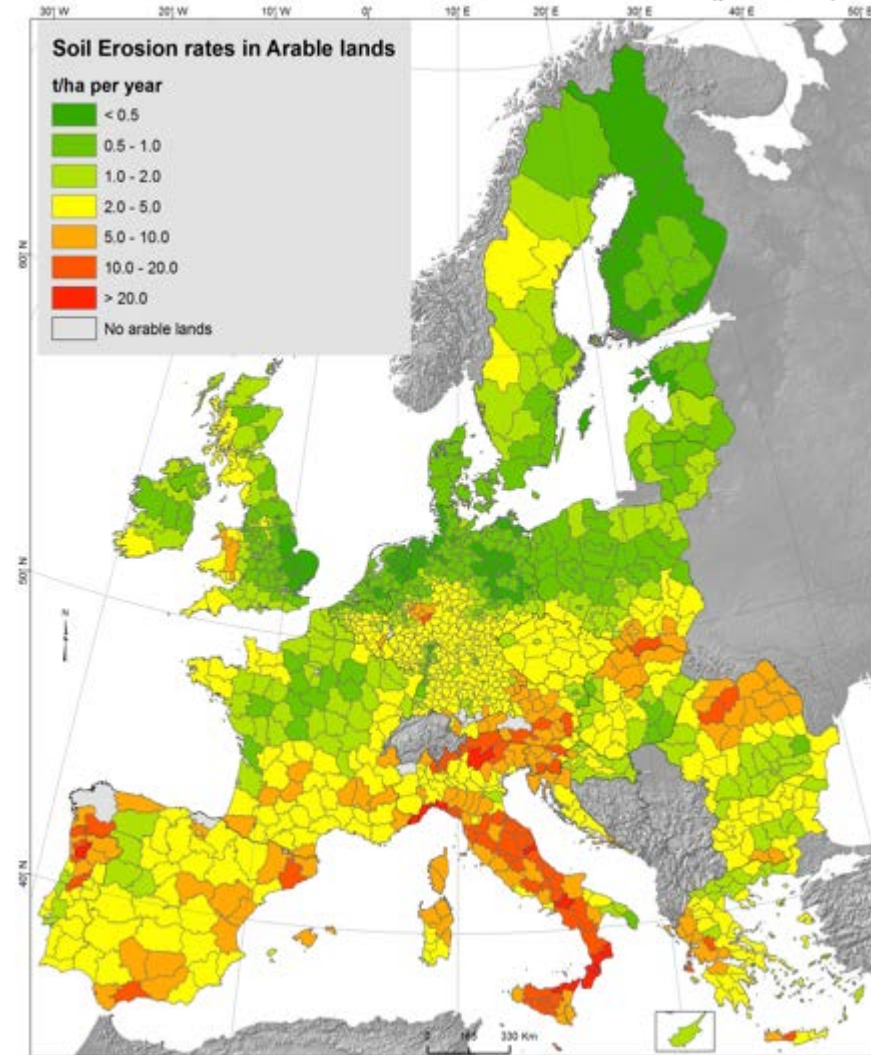
Soil erosion assessment in Europe



Soil Erosion in the European Union



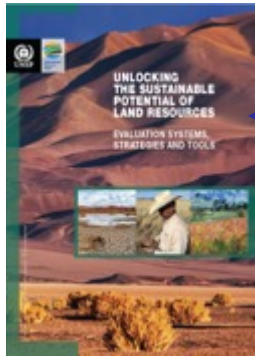
Mean annual soil erosion rates in arable lands at NUTS3 (provinces)



Soil erosion indicators & policy support



European Parliament - Greens



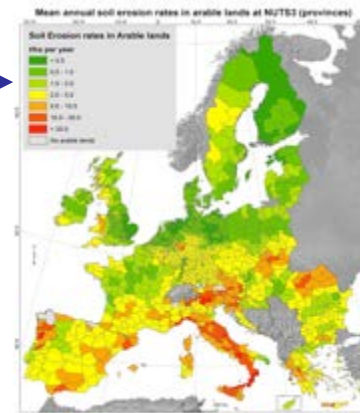
UNEP

ENV-ESTAT: EUROPE 2020



EEA

ESTAT: Agro-Environmental



DG AGRI

ESTAT: Regional stats





Food and Agriculture Organization
of the United Nations

Status of the World's Soil Resources

Main Report



itps
INTERNATIONAL
TECHNICAL PARTNERSHIP
FOR SOILS



2015
International
Year of Soils



Food and Agriculture Organization
of the United Nations

Status of the World's Soil Resources

Main Report

Chapter 11
Regional assessment
of soil changes in
Europe and Eurasia










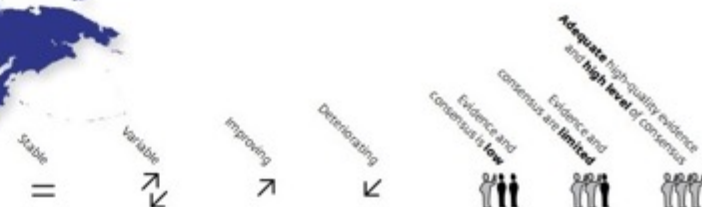
itps
INTERNATIONAL
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FOR SOILS



2015
International
Year of Soils

Summary of Status and Trends of Soil Threats by region

Region	Soil erosion	Organic carbon change	Nutrient imbalance	Salinization	Soil sealing	Loss of biodiversity	Soil pollution	Acidification	Compaction	Water-logging
 Sub-Saharan Africa	Poor ↘	Poor ↘	Poor ↘	Fair ↺	Good =	Fair ↘	Good ↘	Poor ↺	Good =	Good =
 Asia	Poor ↘	Poor ↺	Poor ↘	Poor ↺	Poor ↘	Fair ↺	Poor ↘	Poor ↘	Poor ↘	Fair ↘
 Europe and Eurasia	Fair ↗	Poor ↺	Poor ↺	Poor ↘	Poor ↘	Fair ↘	Poor ↗	Poor ↺	Fair ↺	Fair ↺
 Latin America and the Caribbean	Poor ↘	Poor ↘	Poor ↘	Poor ↘	Fair ↺	Poor ↘	Fair ↺	Fair ↺	Poor ↘	Fair =
 Near East and North Africa	Very Poor ↘	Poor ↘	Good ↺	Fair ↘	Very Poor ↘	Poor ↘	Very Poor ↘	Good ↺	Poor ↘	Good ↺
 North America	Fair ↗	Fair ↗	Poor ↘	Good ↗	Fair ↘	Good ↺	Good ↗	Poor ↘	Fair ↺	Good ↺
 Southwest Pacific	Fair ↗	Fair ↺	Fair ↘	Good ↺	Good ↘	Good ↺	Good ↗	Fair ↘	Fair ↺	Good ↺



Threat to soil function	Summary	Condition and Trend					Confidence	
		Very poor	Poor	Fair	Good	Very good	In condition	In trend
Soil sealing and land take	In densely populated Western Europe soil sealing is one of the most threatening phenomena.		↘					
Salinization and sodification	Salinization is a widespread threat in Central Asia, and it is challenging in some areas in Spain, Hungary, Turkey, and Russia.		↘					
Contamination	Soil contamination is a widespread problem in Europe. The most frequent contaminants are heavy metals and mineral oil. The situation is improving in most regions.		↗					
Organic carbon change	The loss of organic carbon is evident in most agricultural soils. Peatland drainage in northern countries also leads to rapid organic carbon loss. In Russia, extensive areas of agricultural lands were abandoned that resulted in quick organic matter accumulation; however, some of these areas are now again used for agriculture.		↗ ↘					
Nutrient imbalance	In the western part of the region the loss of nutrients is compensated by application of high doses of fertilizers. In the eastern part the use of fertilizers is insufficient, and in most soils nutrient mining results in intensive mineral weathering.		↗ ↘					
Soil erosion	Water erosion is active in all the cultivated mountainous and rolling areas; the worst situation is observed in Turkey, Tajikistan and Kyrgyzstan. Due to the attention paid to this threat it is controlled in most areas, especially in the EU.			↗				
Loss of soil biodiversity	Loss of biodiversity is expected in the most urbanized and contaminated areas of the region. However, there are almost no qualitative estimations of the biodiversity loss in soils.			↘				
Soil acidification	Acidification due to acid rain was a challenge in Northern and Western Europe. The situation is now improving, though several decades will be needed for complete soil recovery.			↗				
Waterlogging	Waterlogging is mostly associated with irrigation in Central Asian countries. Most cultivated irrigated soils there are waterlogged. This phenomena in Central Asia is commonly associated with salinization.			↗ ↘				
Compaction	The use of heavy machinery and overgrazing are threatening in almost all the agricultural areas.			↗ ↘				

Soil

SYNTHESIS
REPORTGLOBAL
MEGATRENDSTHE EUROPEAN ENVIRONMENT
STATE AND OUTLOOK 2015European Environment Agency 

- The ability of soil to deliver ecosystem services — in terms of food production, as biodiversity pools and as a regulator of gasses, water and nutrients — is under increasing pressure.
- Observed rates of soil sealing, erosion, contamination and decline in organic matter all reduce soil capability.
- Organic carbon stocks in agricultural soil may have been overestimated by 25 %.
- A coherent soil policy at EU level would provide the framework to coordinate efforts to survey soil status adequately.

Related content

Land use and
soil functionsIndustrial
pollution to air,
soil and waterUrban systems
and grey
infrastructure

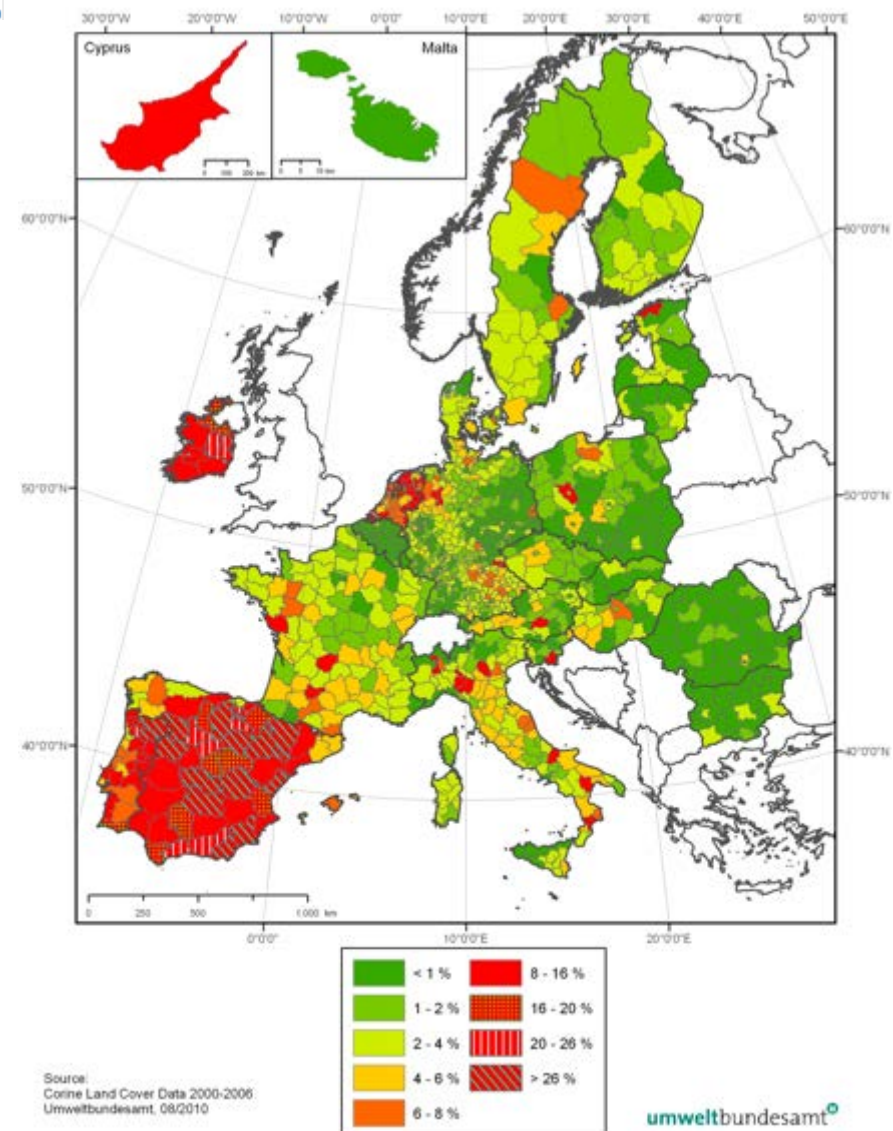
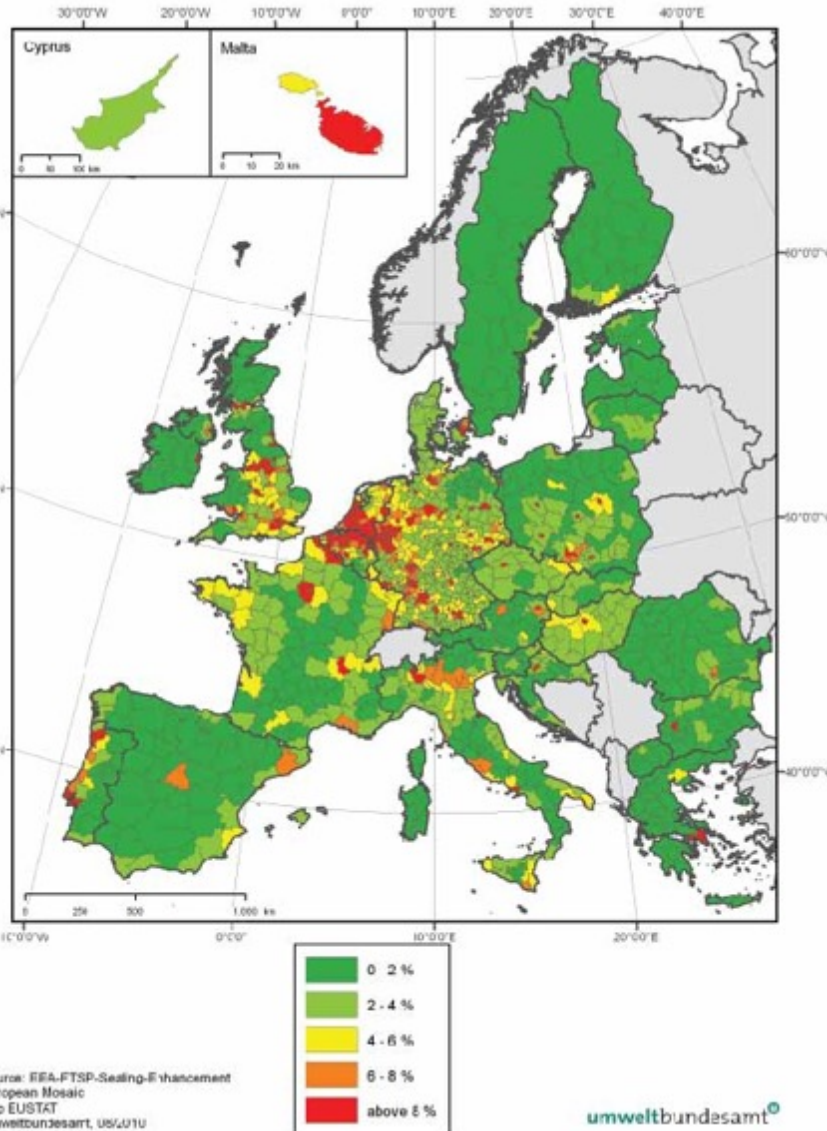
European Environment Agency



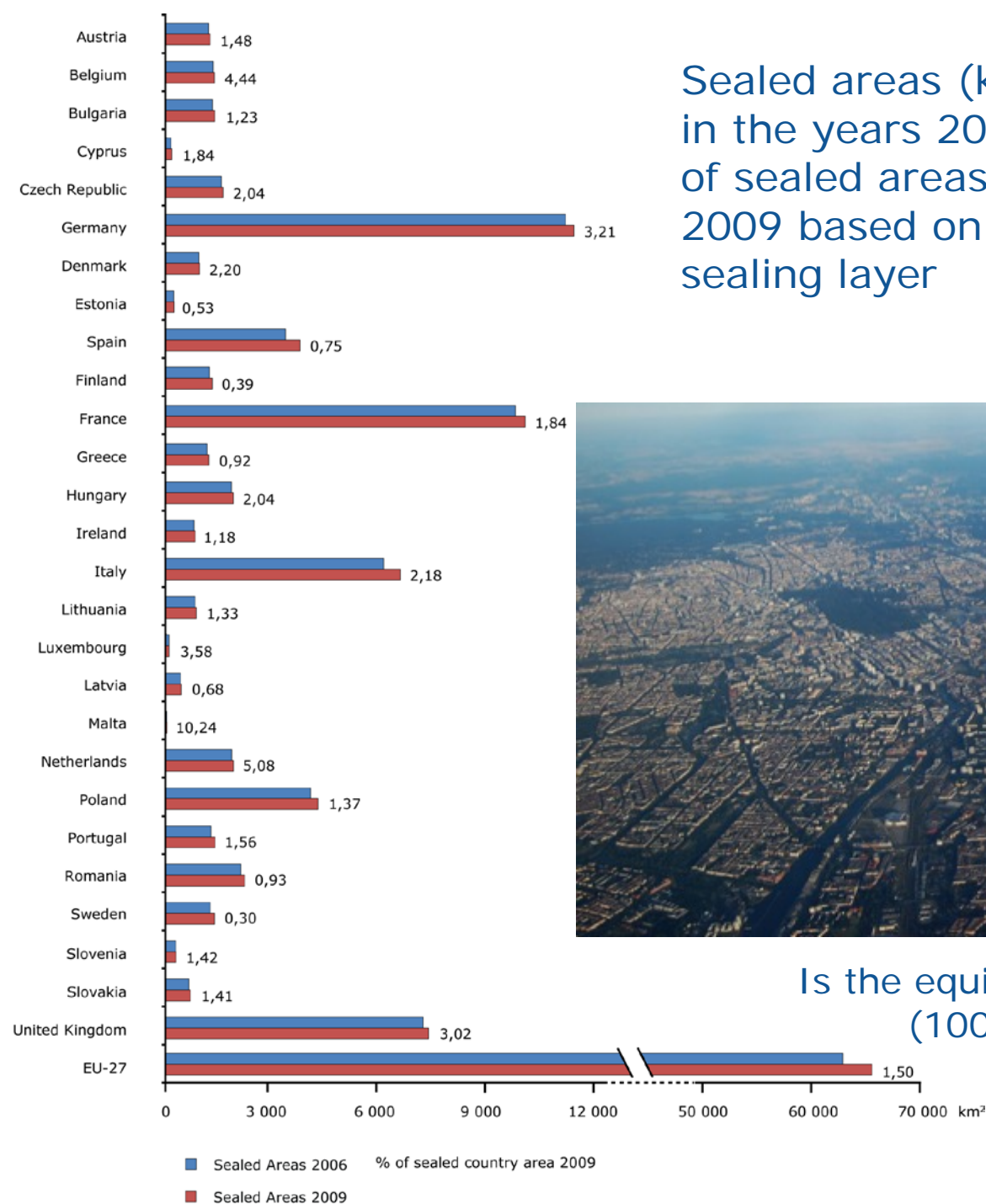
Soil sealing in 2006



Land take in the period 2000-2006

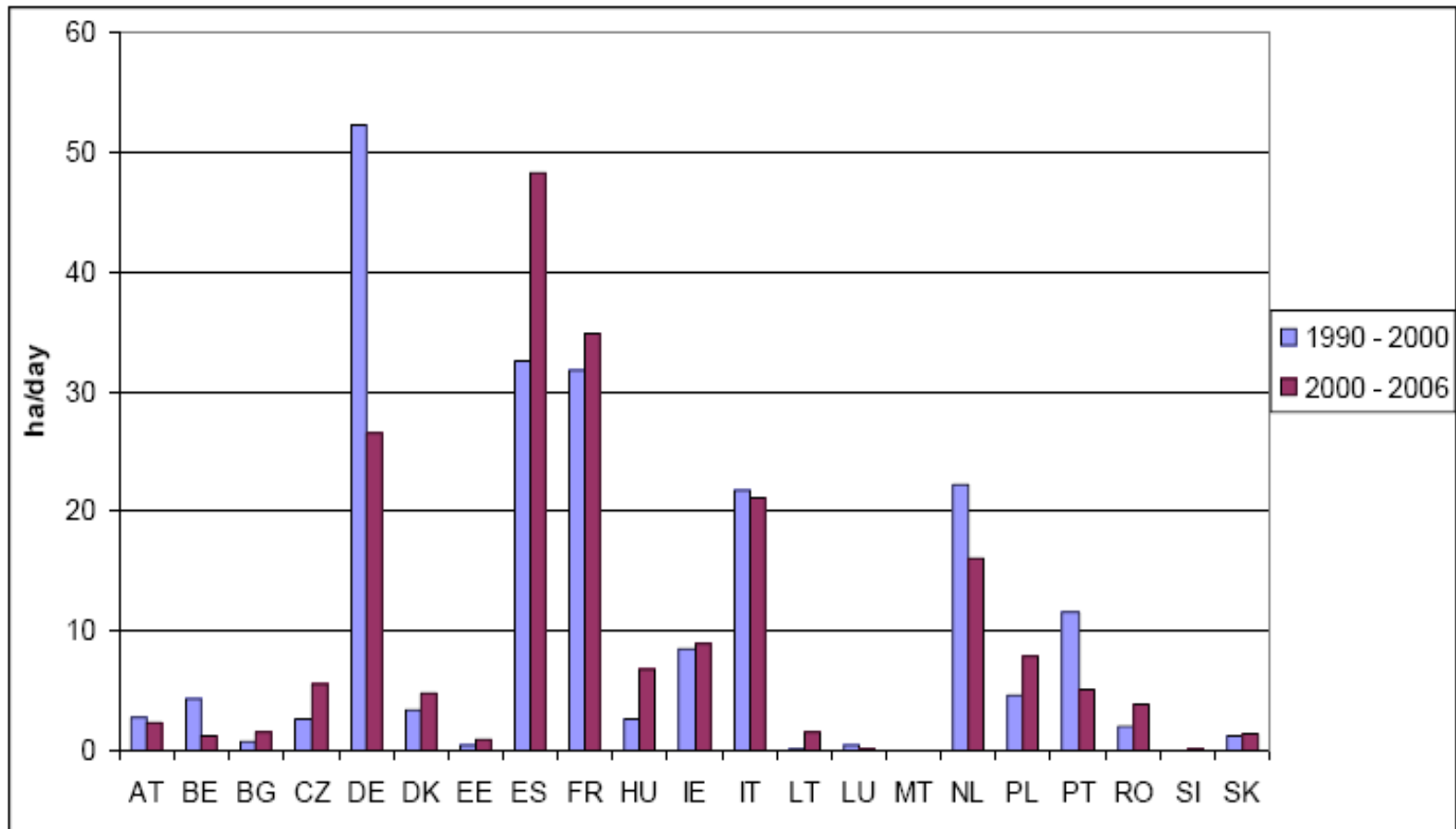


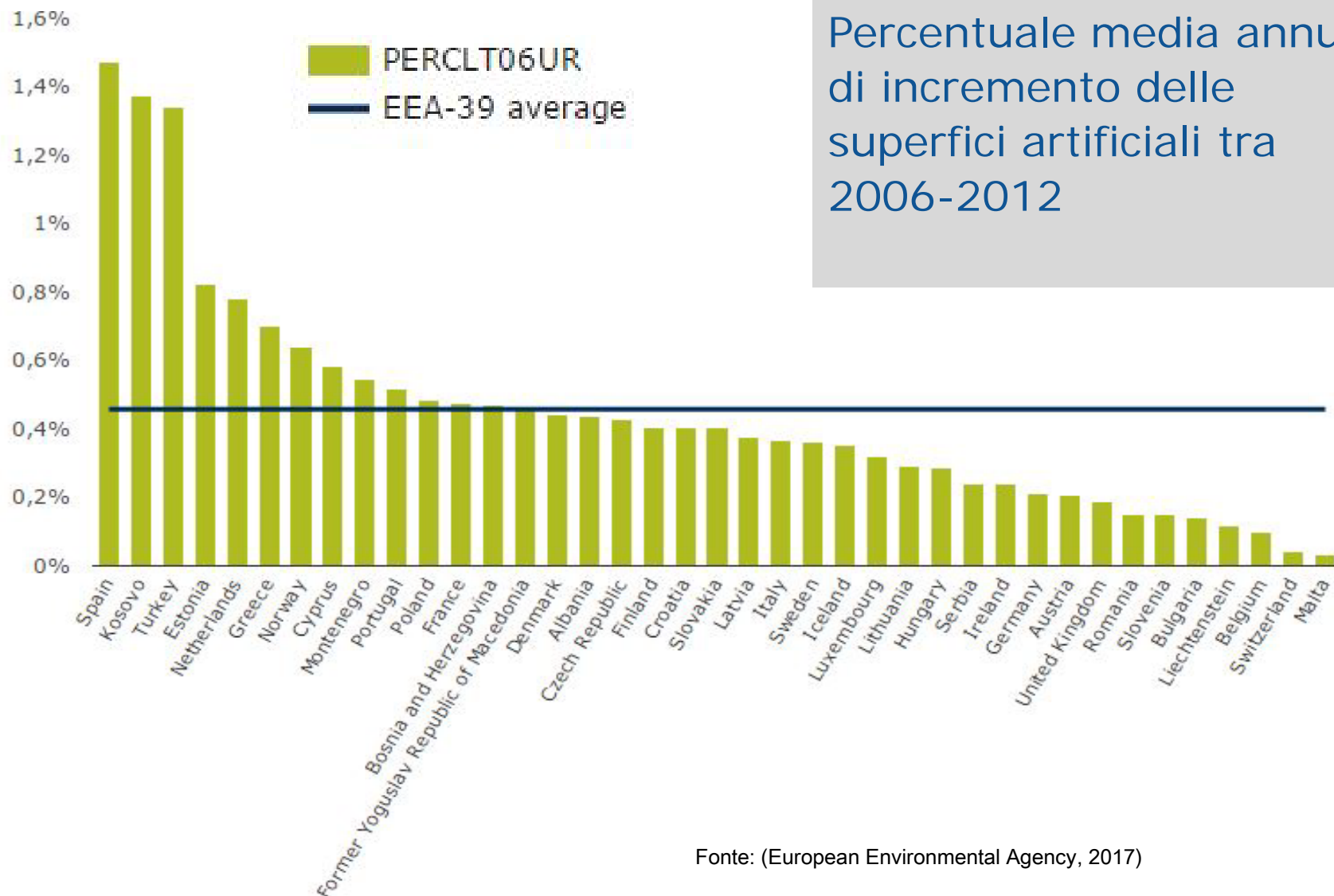
Sealed areas (km²) per country and EU-27 in the years 2006 and 2009 and percentage of sealed areas per country and EU-27 in 2009 based on 1km x 1km aggregated soil sealing layer



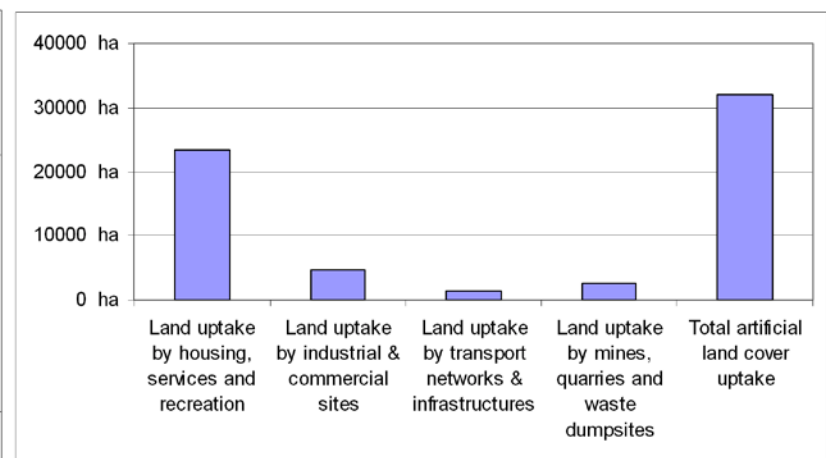
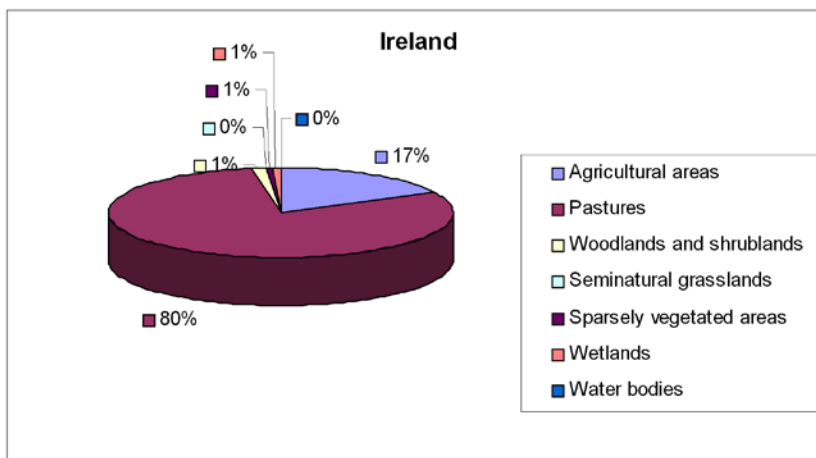
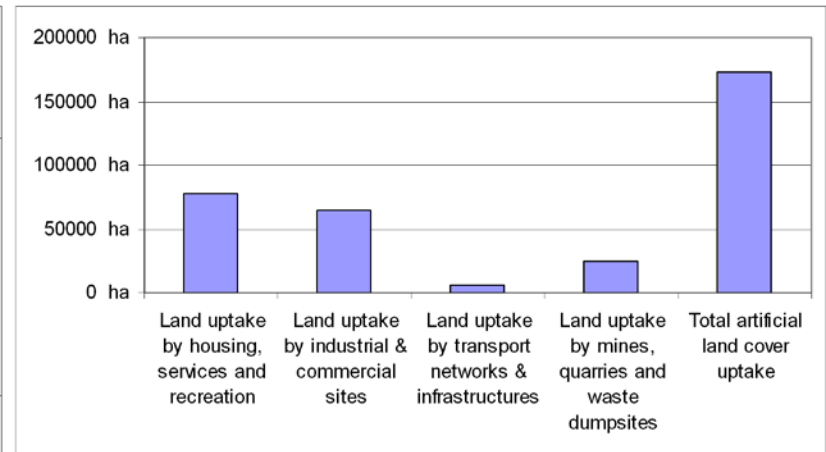
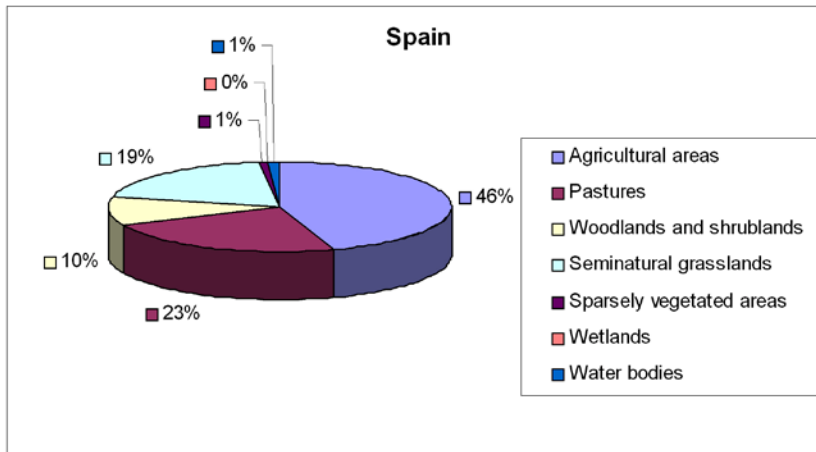
Is the equivalent of the area of Berlin (100,000 ha) every year!

How much land we are loosing every day

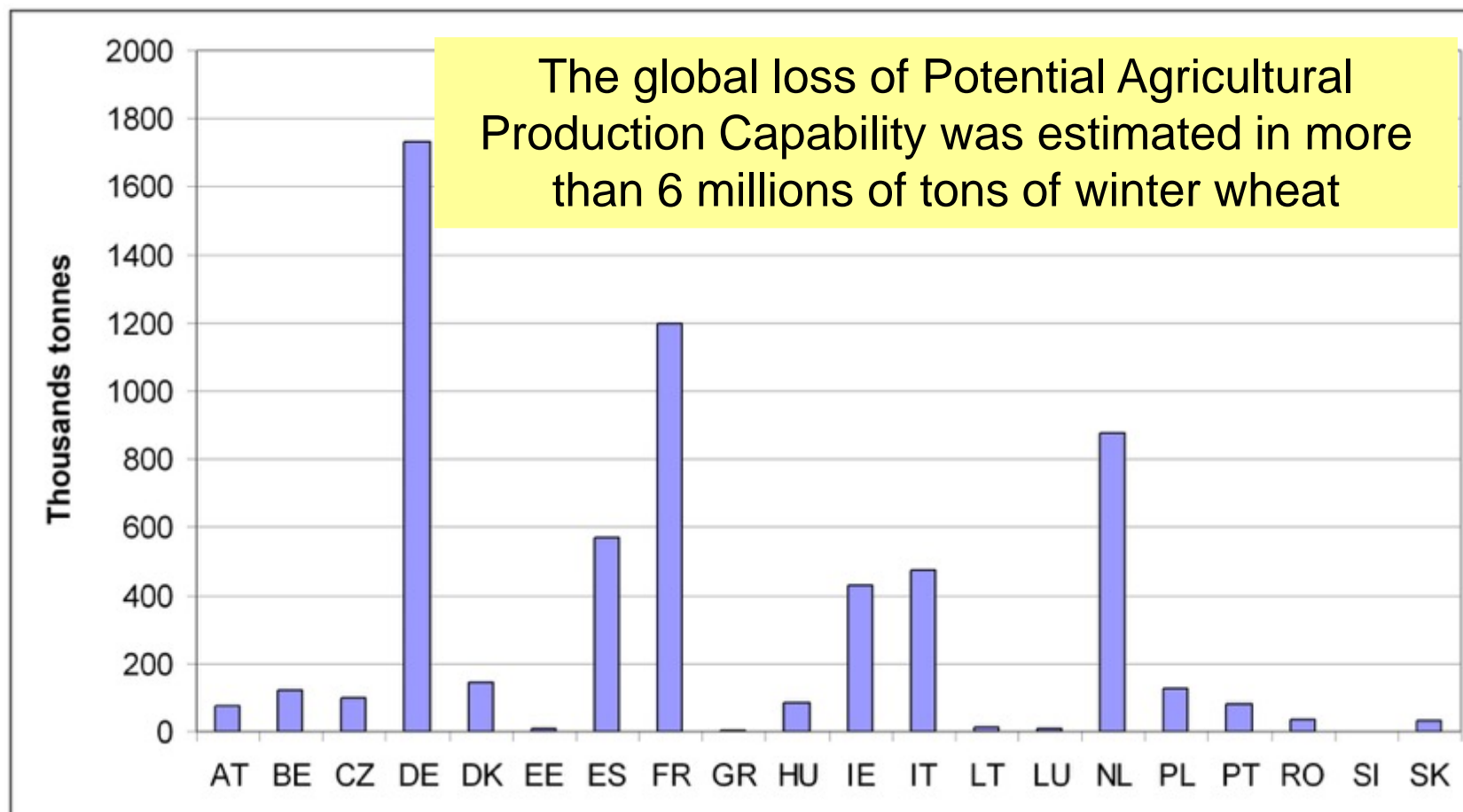




And which type of land we are loosing ?



The impact on the agricultural sector





SUSTAINABLE DEVELOPMENT GOALS:

1 UNIVERSAL AGENDA, 17 GOALS





United Nations
Convention to Combat
Desertification



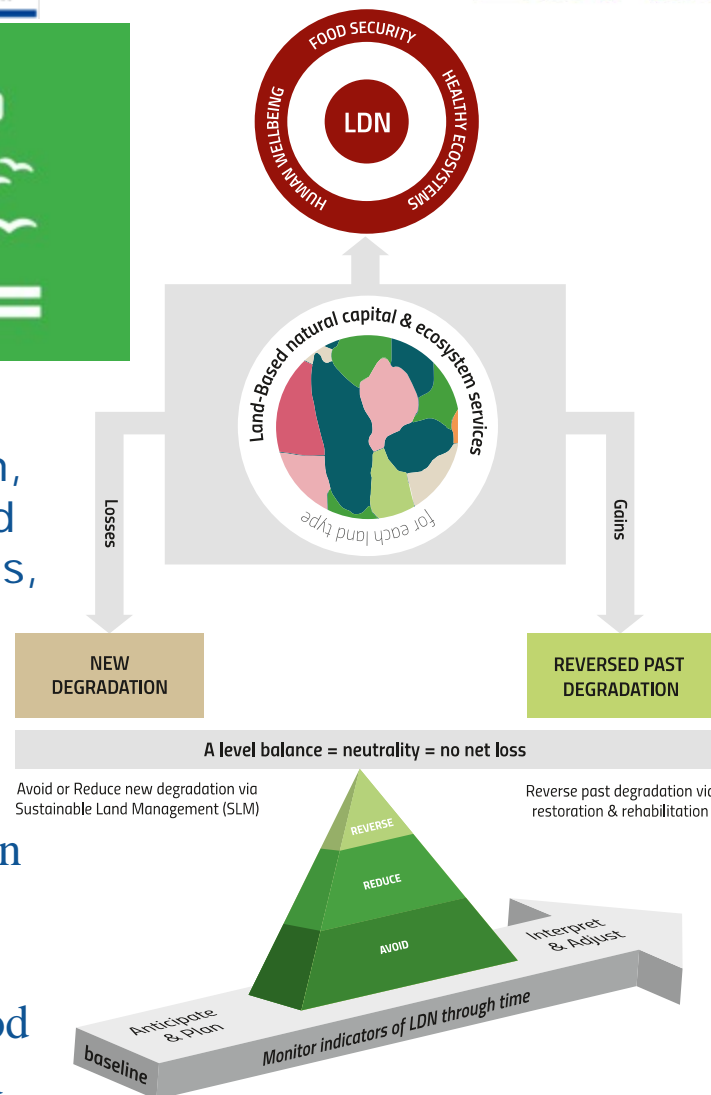
LDN ADOPTED AT UNCCD COP.13

UNCCD **SPI** Science - Policy
Interface

**SUSTAINABLE
DEVELOPMENT
GOALS**



Target 15.3 By 2030, combat desertification, restore degraded land and soil, including land affected by desertification, drought and floods, and strive to achieve a land-degradation-neutral world



The United Nations Convention to Combat Desertification (UNCCD) defines land degradation neutrality (LDN) as “a state whereby the amount and quality of land resources necessary to support ecosystem functions and services and enhance food security remain stable or increase within specified temporal and spatial scales and ecosystems”.

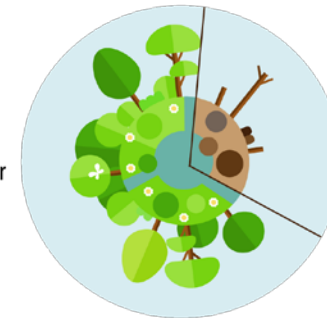
Framework for Monitoring and Reporting on SDG Target 15.3

Towards achieving Land Degradation Neutrality: turning the concept into practice

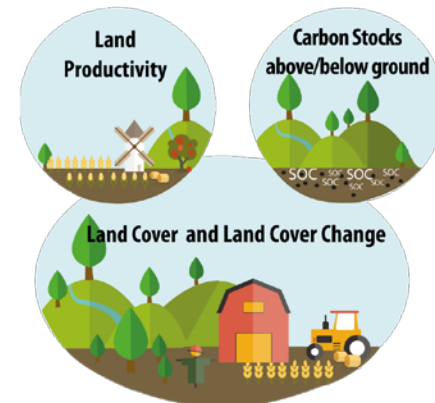


This report summarizes the key outcomes of the national efforts carried out in 2014 and 2015 towards putting in practice the land degradation neutrality concept. The LDN project, which was sponsored by the Republic of Korea, was carried out with the support of the UNCCD Secretariat and implemented in partnership with the Joint Research Center of the European Commission and CAP 2100 International.

Indicator 15.3.1
Proportion of land
that is degraded over
total land area

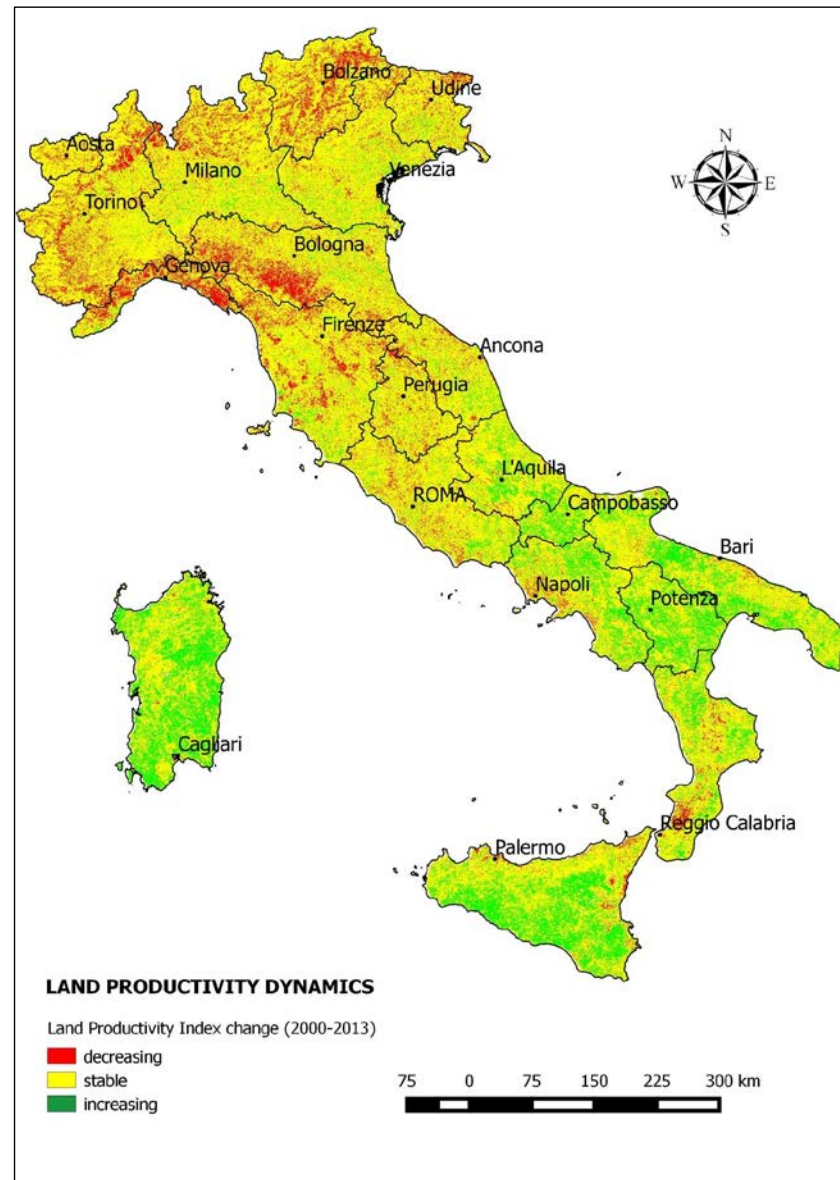
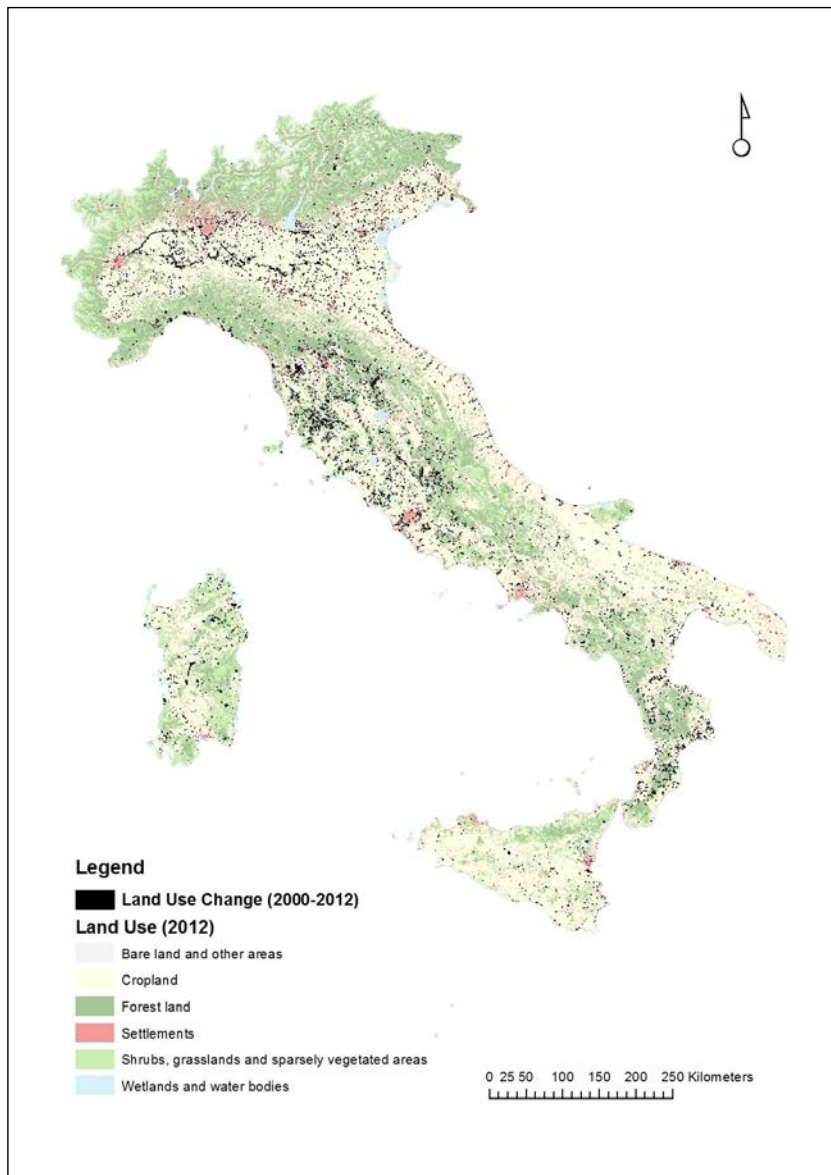


Sub-Indicators
UNCCD (CBD, UNFCCC)
Reporting Mechanisms



**Data from
multiple sources**
FAO, GEF and other
Reporting Mechanisms



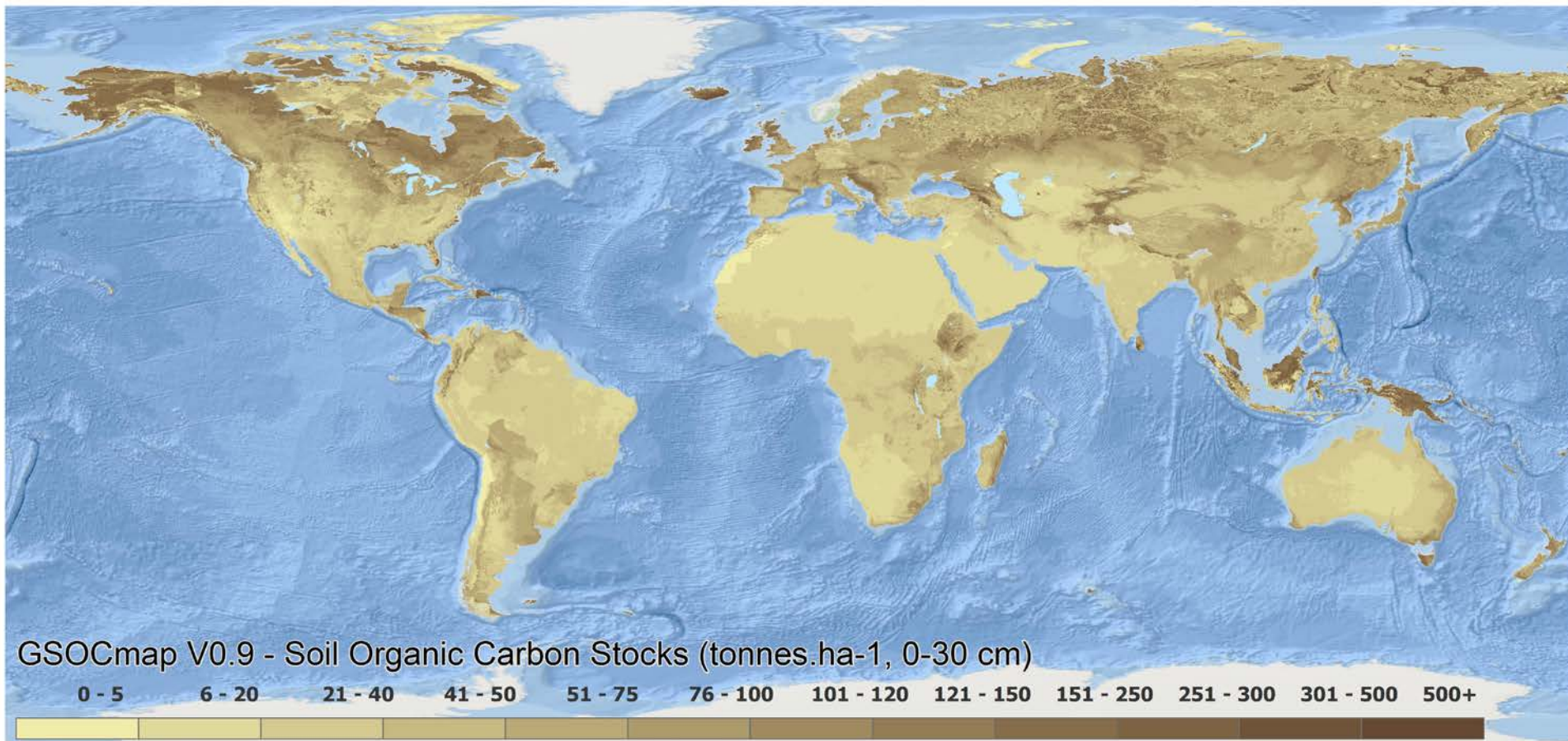




Food and Agriculture Organization
of the United Nations



itps
INTERGOVERNMENTAL TECHNICAL
PANEL ON SOILS



Global Soil Organic Carbon Stocks down to 30 cm

Number of Points/ Soil Samples:

~900 Pg

~950.000

Thank you for your interest!



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