

Communicating the value of soil: a JRC perspective

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Soil and society - Issues!

Despite vast body of scientific knowledge, the role of soil
Is not understood, not appreciated nor valued by
society at large.

Nor by many policy makers or other scientific domains.

Soil [science] (unfairly?) lacks a 'wow factor'!

WHY NOT? WHAT CAN BE DONE?

The problem?

- Increasing urbanisation of society
- Lack of prominence in education
- Lack of political weight?
- Soil science has been living in 'ivory tower'?
- Poor delivery of the message.
- So need to improve communication....



JRC is European Commission's in-house provider of scientific basis for EU policies.

Bridge between scientific disciplines and policy maker.

EU Soil Thematic Strategy Communications 2006-2012

“...little public awareness of the importance of soil protection. Measures to improve knowledge and exchange information and best practices are needed to fill this gap.”

Article 15: Member States shall take appropriate measures to raise awareness about the importance of soil for human and ecosystem survival, and promote the transfer of knowledge and experience for a sustainable use of soil.



To increase public awareness of the need to protect soil, the Commission will foster initiatives such as"

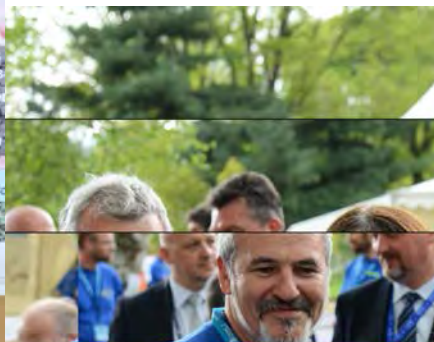
- **wide distribution of the Soil Atlas of Europe** (10,000 copies)
- **maintenance of the EUSOILS/ESDAC web site for open access to policy relevant soil information** (30,000 downloads for soil biodiversity atlas)
- **European Summer School on Soil Survey to provide specific training to young researchers** (4 schools run)
- initiatives such as EU Manifesto on Earth Heritage and Geodiversity,
- integration of soil protection aspects in Community-funded information and training events
- **initiatives within the UNCCD and other conventions** (soil as habitat in CBD)

Soil in EU Policy Areas

- 10 Common Agricultural Policy (CAP)
- 10 Climate Change Policy (Post-Kyoto debate, LULUCF)
- 10 Energy Policy (Renewable Energies Directive)
- 10 Biodiversity (Nature) Protection Policy (EU Biodiversity Strategy)
- 10 Water Protection Policy (WFD, Groundwater Directive)
- 10 Forest Protection Policy (Forest FOCUS, ICP Forest)
- 10 Regional Policies (Structural funds)
- 10 Food Safety (PPR Registration, EFSA)
- 10 Food Security (FAO)
- 10 Development Policy (ACP-Observatory, EU DEV DAYS)
- 10 Waste Policy (Biowaste Directive, Sewage Sludge Directive)
- 10 Nature conservation (NATURA 2000)

.....etc.

Reaching Policy



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J R C R E F E R E N C E R E P O R T S

The State of Soil in Europe

*A contribution of the JRC
to the European Environment Agency's
Environment State and Outlook Report—SOER 2010*

A. Jones, P. Panagos, S. Barcelo, F. Bouraoui, C. Bosco,
O. Dewitte, C. Gardi, M. Erhard, J. Hervás, R. Hiederer,
S. Jefferj, A. Likewille, L. Marmo, L. Montanarella,
C. Olazábal, J.-E. Petersen, V. Penizek, T. Strassburger,
G. Tóth, M. Van Den Eeckhaut, M. Van Liedekerke,
F. Verheijen, E. Viestova, Y. Yigini

2012

European Environment Agency

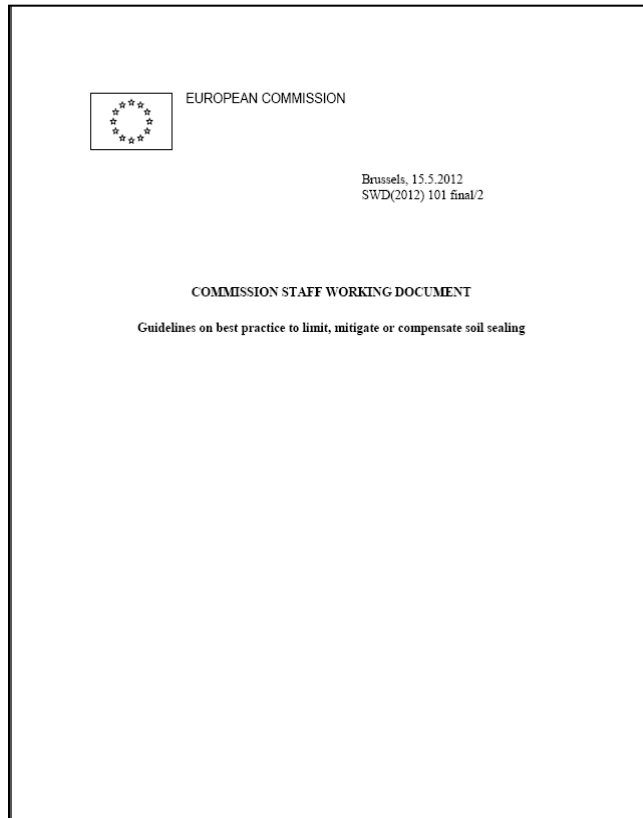
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Report EUR 25186 EN

Guidelines on best practice to limit, mitigate or compensate soil sealing

SWD(2012) 101 final/2, 15 May 2012

http://ec.europa.eu/environment/soil/sealing_guidelines.htm



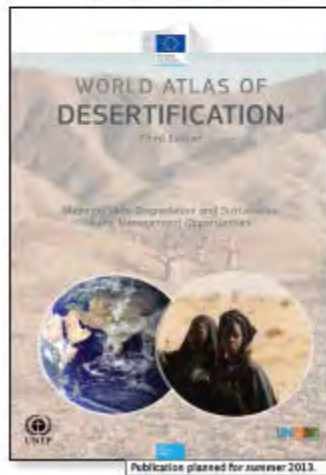
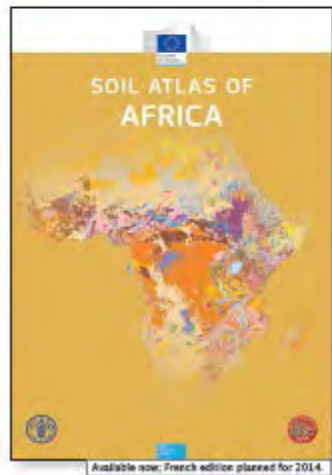
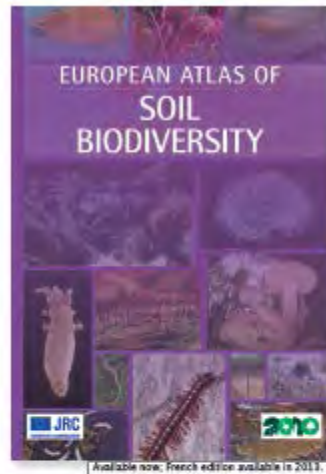
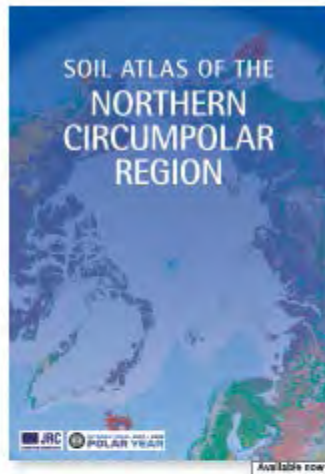
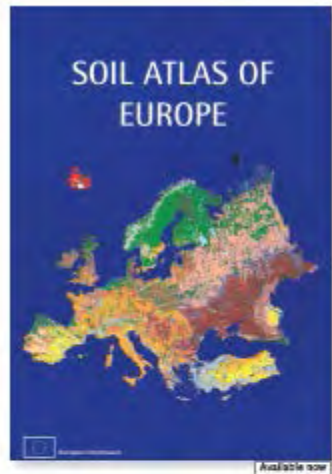
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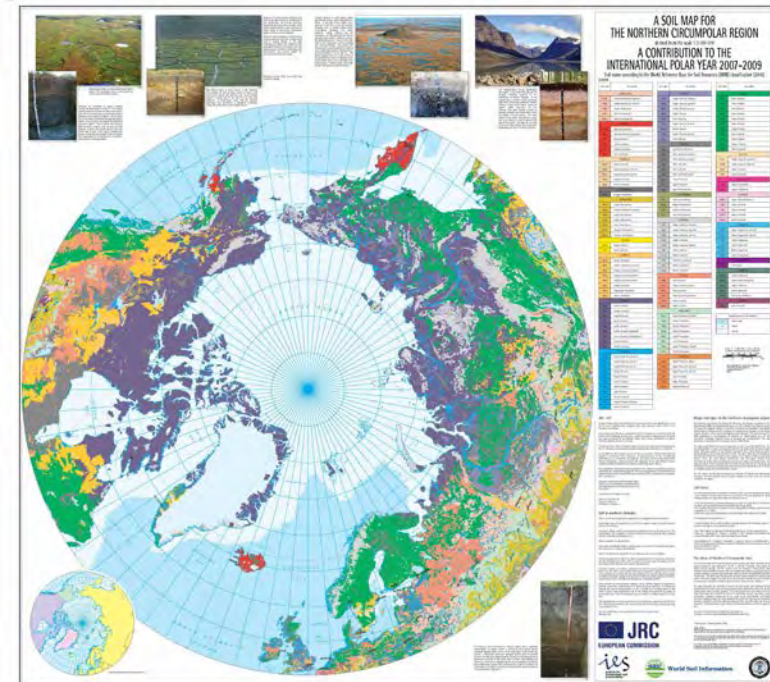


Simplifying soil!



High political, media, educational and societal impact

***EU PRESIDENCY
MONOLITH SERIES***



Free copies at SOIL CAFÉ!

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3. Filmmaking

But formation depends enormously on the climate, so temperature and moisture levels affect weathering processes, and biological activity.

With the equator passing through its middle, Africa has the largest tropical area of any continent and about 90% of the land area lies within the tropics. In southern parts of the equator, the areas are approximately three times as large as that in the north of the equator. The broad climatic pattern of Africa is driven by the position around the equator; the impact of coastal waters currents and the absence of a mountain barrier on the east coast. (Even the Nile is able to cross from the south to the north.)

[†]In the north and the south is a sub-fossil assemblage zone with animal material between 600 m and 1,200 m, covering 27% of the total area. The material is increasingly abundant in relation to distance from the

Shrub and sedge zone with an average rainfall equalling or less than 600 mm with falls in July is somewhat feasible, covers 5% of the total land area, shrub forest zone occupying nearly half of the above land area (47%). Arid zone is mostly with less than 500 mm precipitation. In some areas this is not. Dry and occasional extremes of temperatures are great with the average annual temperature greater than 30°C.

• An indicator of overall climate in the different parts and states with high temperatures in the southern and western states and western parts with a rainfall.

• In the highlands of eastern Africa, particularly in Kenya and Uganda, rainfall is well distributed throughout the year and high features are a sign of it.

• The high plateaus of southern Africa have a temperate climate.

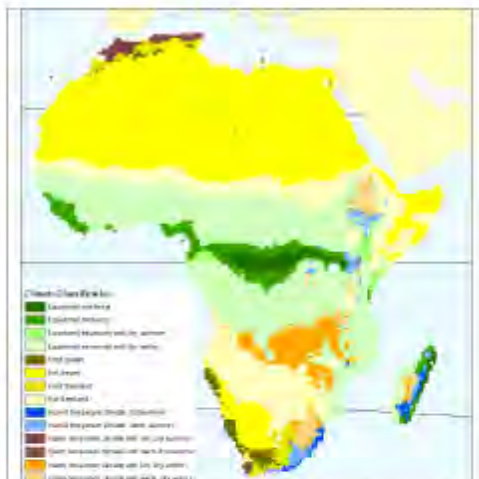
• On a few high mountain summits, a subarctic climate can be found even in the summer!

Small Temperature Range

Temperature and fluctuations in temperature have important bearings on seed germination processes. The map on the right shows the annual last position isophrase in range for Africa based on the difference between the monthly mean temperature of the warmest and coldest months. This change depends on the annual cycle of incoming solar radiation, which is non-dependent on the latitude, altitude and proximity of the coast.

[illegible]

The tropic marks the area on the Earth where the Sun is directly overhead at least once during the solar year. It is marked by the Tropic of Cancer, at approximately $23^{\circ}28'14''N$, and similarly by the Tropic of Capricorn at $23^{\circ}28'14''S$.



Mean of Africa has a mean in the plateau, but the heavily depressed, or so-called desert, consequently from west to east. Highest part of Africa has a square plateau not 150 ft. above level of sea-level. The remaining area represents actual contrast with water in the average state, which means an increase of rainfall which is not far from 100 in. Half of the surface is completely arid, or nearly so. Africa, more arid than any island, presents probably the most arid region on earth. Throughout the plateau, the climate can rarely exceed more periods of smaller or smaller. Climate change, especially including the prolonged drought in some of the most isolated regions, affecting the agriculture and the resources of the whole of the region are said to be. As has been shown several times in the last 30 years, extreme changes in climate can have a devastating effect on the children of people (Gibbs et al., 1998).



The steps in the right column are almost completely analogous to those in the left column, but the difference is that the velocity is measured at the end of each column and then the time is calculated.

International Certificate Zone

One of the main drivers of climate change is a feature known as the Interglacial Convergence zone (ITCZ). While originating from high pressure cells in the northern and southern hemispheres, these converge over the equator, where they are fed by the rain and driven upward. This rising movement creates the air forcing the moisture out, which forms a precipitation. The area this system has formed is a subtropical where it descends, producing arid climates at approximately 20 degrees north and south of the equator. In Africa, the ITCZ is located just north of the Sahara at about 15°N. Conditions in this position can result in drought conditions.

[illegible]

Soil provides the foundation upon which we construct our buildings, roads and other infrastructure.

In addition to providing the support for the vast majority of human infrastructure, soil provides a range of raw materials such as clay, sand, minerals and peat. Clay is used for making bricks for construction, pottery (such as e.g. earthenware) and as the best fertiliser (see also Table 1).

Dade is a building material that has been used for at least 5,000 years for making the walls of buildings. A recent batch of new-made slabs is finished with a shiny material usually made from wet soil, clay, sand, ochre, dung and straw. It is an important construction material in many parts of Africa and the technique is becoming popular again as a low impact sustainable building technique.

Mud bricks, made of a mixture of clay, silt, sand and water mixed with a binding material such as straw (or other), are a common building material in countries such as Niger and Mali. Dried in the sun for 25 days, they last a lifetime of some 30 years.

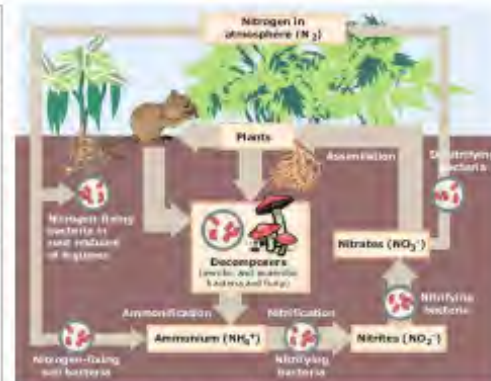
Due to its impermeable properties, clay is used as a barrier to stop water seeping away which is why many ponds, canals and landfill areas are lined with clay.

Sand and gravel deposits, laid down by rivers, are heavily used in the construction industry as aggregate in concrete making, while sand is the principal ingredient in glass making and used in sand blasting to clean buildings and in sandbags to stop flooding. Like sand, gravel has countless uses. For example, in Africa, many roads have gravel surfaces. It is concrete to make.

While *pond* can be added to soil by gardeners to improve structure and enhance soil moisture retention in some parts of Africa, *pond* is a source of fuel. Interestingly, people are becoming aware of the environmental impact of pond exploration and are looking for new, more ethical alternatives.



Shelton Many built out of wood shingles and nearly all are made of cedar. Most construction uses the built-up joist and ceiling and exterior cladding is usually all western red cedar. On



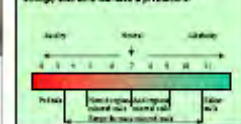
The code of will is the master's personal code.

George is being as serious as I am. I'm not kidding.

Soils are sometimes referred to as heavy or light. This refers to the mass with which they can be worked or lifted and depends on their texture (see box on page 72). Heavy soils contain greater proportions of clay or silt particles and retain more moisture than soils with larger particles, such as sand. Consequently, they are heavier to lift into and turn than light sandy soils.

100%

Stuffs are often described as being acid or alkaline or having a certain pH value. The pH value is a number which indicates the degree of acidity based on the concentration of hydrogen ions in a solution. The pH scale is usually measured by mixing a sample of soil with distilled water, KCl or CaCl_2 . While the pH scale is from 0 to 14, acids typically fall between pH 0 to pH 7, with a neutral soil having a pH of 7. Alkaline soils will range from pH 7 to pH 14 (generally alkaline soils associate acid soils with a soil buffer).



Source: *Journal of the American Statistical Association*, 1997, 92, 1037-1046.

Soil plays a crucial role in a number of the outstanding current biological and chemical cycles. Carbon, nitrogen and a range of essential nutrients are continuously recycled between the soil and plants, animals, the oceans, microclimate and the atmosphere.

The intensity of these longitudinal waves changes (fluctuates) from place to place and is regulated by cell characteristics, functions, and states.

The graphic below demonstrates that not cycling in the watershed. The hot, dry conditions on the forest floor allow for the rapid decomposition of dead plant material. This provides nutrients to the soil that are then easily absorbed by plant roots. However, as these nutrients are so high closest to the soil, the watershed's herbivores may not get enough in their diet to keep up. Therefore, more nutrients must be supplied. This rapid decomposition means that nutrients in the soil are concentrated near to the surface. If the forest vegetation is removed, the flow of nutrients from the vegetation to the soil is interrupted and the nutrients quickly leave the healthy, nutrient and moisture watershed ecosystem. The supply of chemical nutrients can only be used for a few days or weeks at

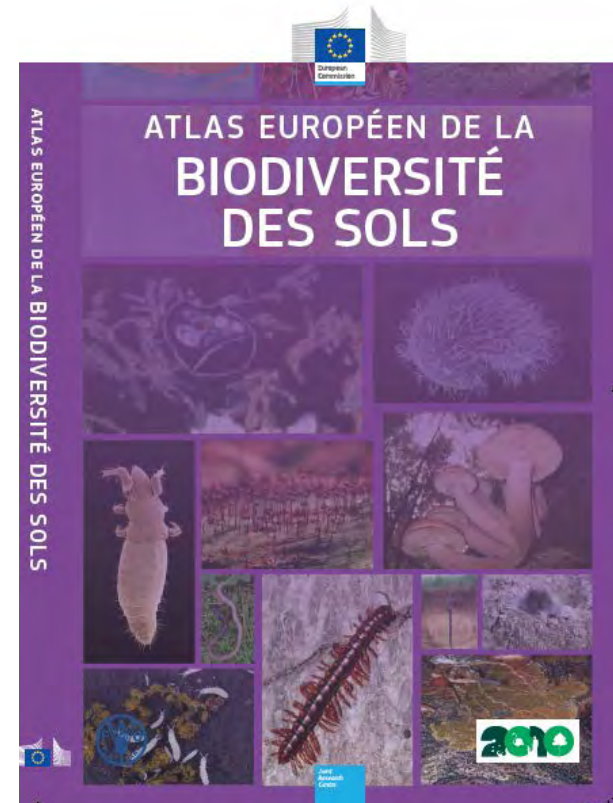


Planning

Soil structural role

The soil functions described on these pages are vital to the earth. However, not all soil types can carry these out to the same extent and some are far more capable to fulfil when stones are placed on them. It is our understanding of the functional capability and potential of different soil types in their role for planning and managing the sustainable development of African regions.

Language considerations



Public Engagements



2013 Open Day
10,000+ visitors
Soil exhibit = top attraction

Schools contact



European Soil Bureau Network Working Group Awareness Raising & Education

European Network Soil Awareness Conferences



GLOBAL SOIL
PARTNERSHIP

GSP - Pillar 2



Resource Efficiency Roadmap, COM(2011) 571:

*Milestone: By 2020, EU policies take into account their direct and indirect impact on land use in the EU and globally, and the rate of land take is on track with an aim to achieve no net **land take** by 2050; **soil erosion** is reduced and the **soil organic matter** increased, with remedial work on **contaminated sites** well underway.*

Rio+20:

*205. We [the Heads of State and Government and high-level representatives] recognize the economic and social significance of **good land management, including soil**, particularly its contribution to economic growth, biodiversity, sustainable agriculture and food security, eradicating poverty, the empowerment of women, addressing climate change and improving water availability.*



- ❖ Second **Global Soil Week** organised by the IASS on 28-31 October 2013 in Berlin
- ❖ FAO's proposal to the UN General Assembly to endorse the **World Soil Day** on 5 December
- ❖ **International Year of Soils** in 2015
- ❖ **World Expo, Milan 2015 – Food Security**
- ❖ **Global Soil Partnership**

Conclusions



- While scientific excellence is important, it's not enough. Need to proactively broadcast soil science and engage with sponsors, public and other scientific domains.
- Lots of activity but...
- Lacking impact and repeatability. Media critical.
- Needs target support. Role of EC?
- Dissemination of best practices.
- Need to involve communication experts.

Old view....

It sounded an excellent plan, no doubt, and very neatly and simply arranged; the only difficulty was, that Alice had not the smallest idea how to set about it.

Lewis Carroll

ENSA – the way forward.

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**Thank you very much
for your attention.**

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EU Soil Portal

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

