Tag des Bodens 2011: „Peak Soil – Böden in der Krise“

Global Soil Partnership der FAO – Aktion für nachhaltiges Landmanagement

Luca Montanarella

6 Dezember 2011

GLOBAL SOIL PARTNERSHIP

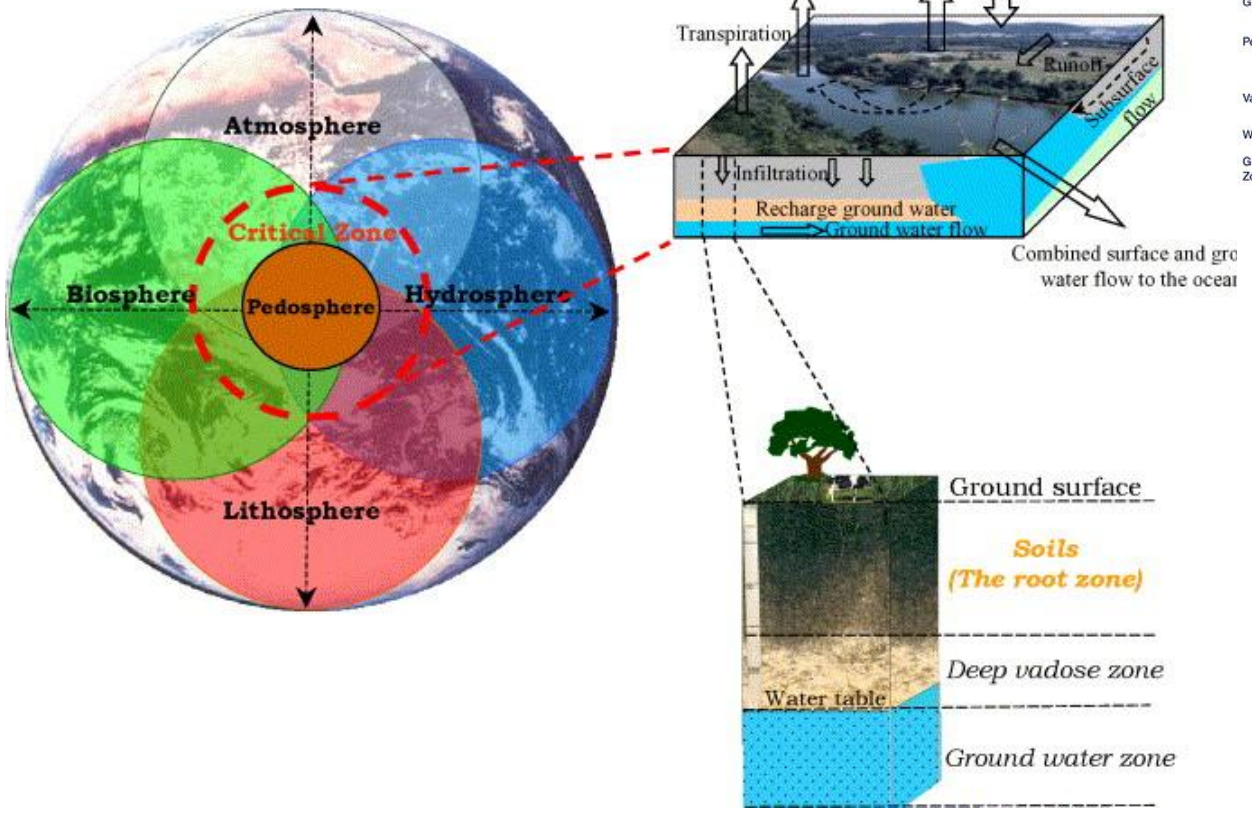
FAO FIAT PANIS

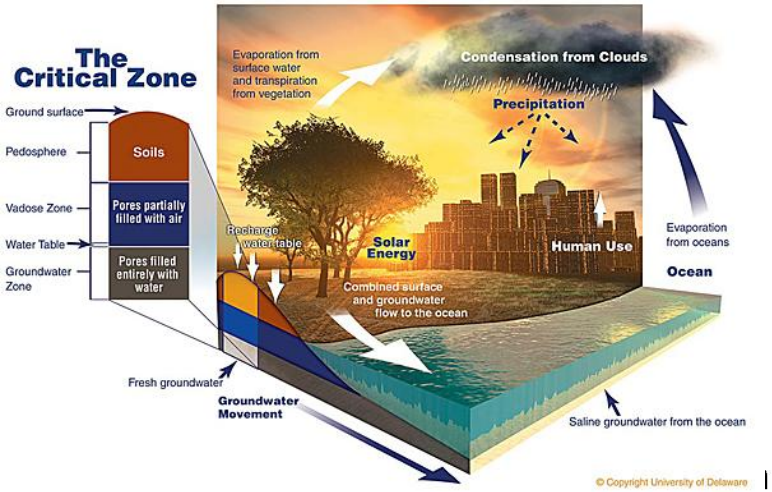
JRC EUROPEAN COMMISSION

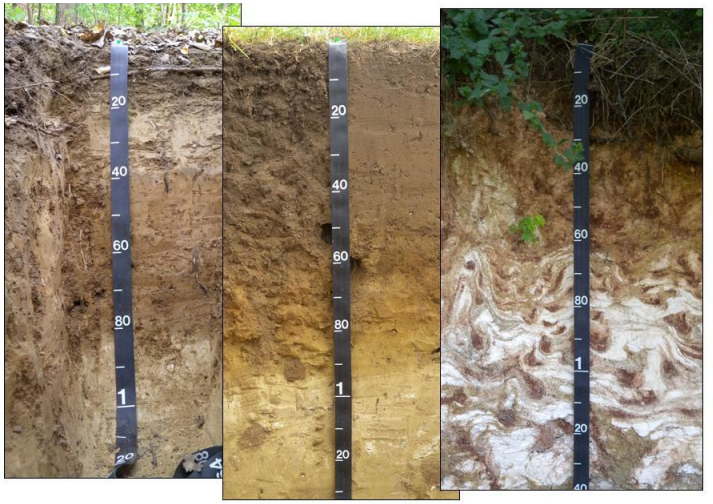
Soil, the skin of the earth

Soils at the interface between Atmosphere, Hydrosphere, Lithosphere and Biosphere

Soil defined as the top layer of the earth's crust situated between the bedrock and the surface.







source: L.P. Wilding & H. Lin, 2006

source: E. Micheli

Understanding and communicating to the general public and policy makers that soils are very diverse and require locally adapted protection strategies

JRC Soil Atlas Series

The European Commission Joint Research Centre is collaborating with soil scientists and researchers from all over the world to develop a series of soil-related atlases. To obtain a copy or for further information, please consult the Publications Office of the European Union (http://publications.europa.eu/) or the JRC SOIL Action's web site (http://eusoils.jrc.ec.europa.eu).

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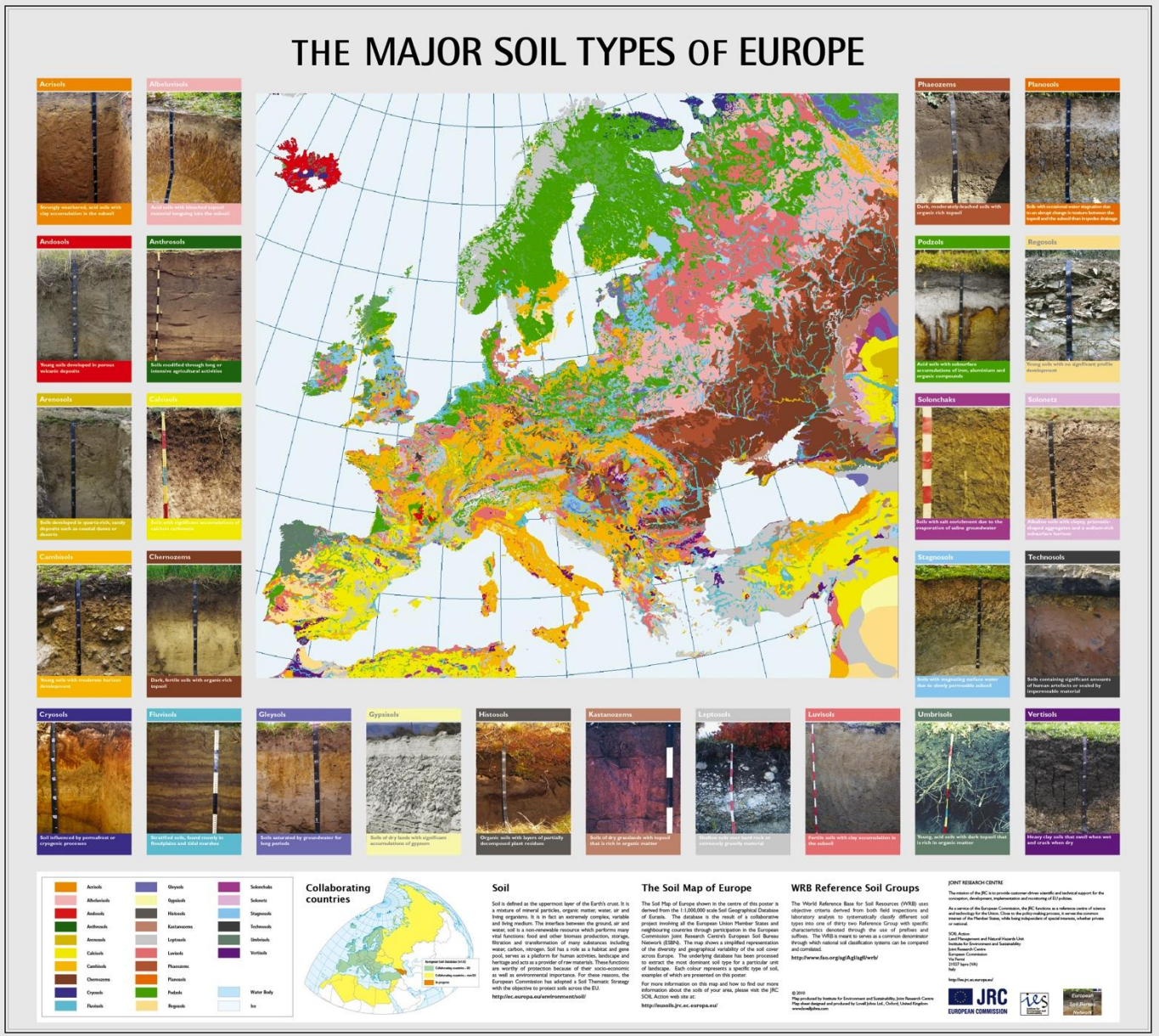
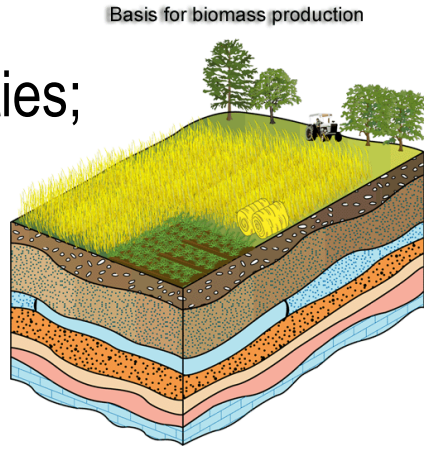
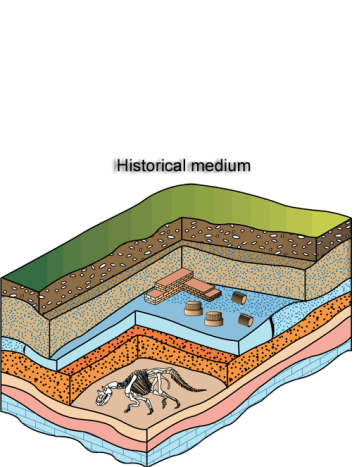


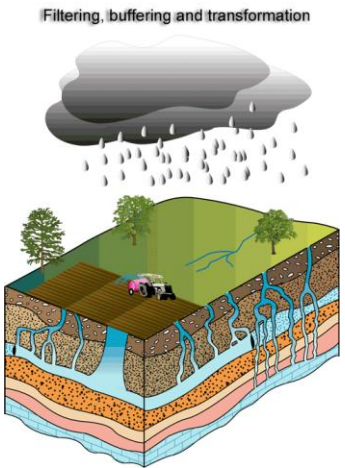
Soil defined as the top layer of the earth's crust situated between the bedrock and the surface, excluding groundwater.

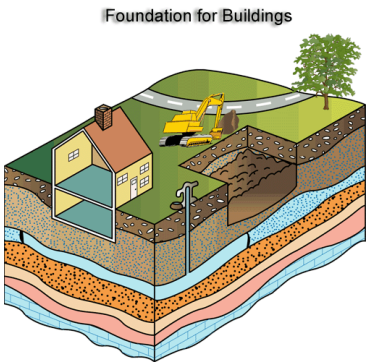
Soil functions to be protected:

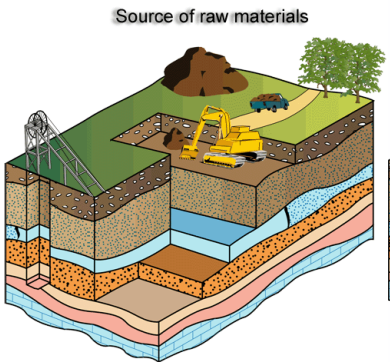
1. Biomass production, including in agriculture and forestry;
2. Storing, filtering and transforming nutrients, substances and water;
3. Biodiversity pool, such as habitats, species and genes;
4. Physical and cultural environment for humans and human activities;
5. Source of raw materials;
6. Acting as carbon pool;
7. Archive of geological and archeological heritage.

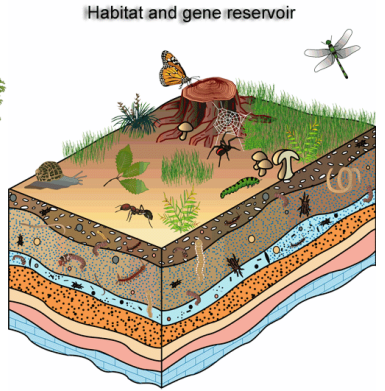








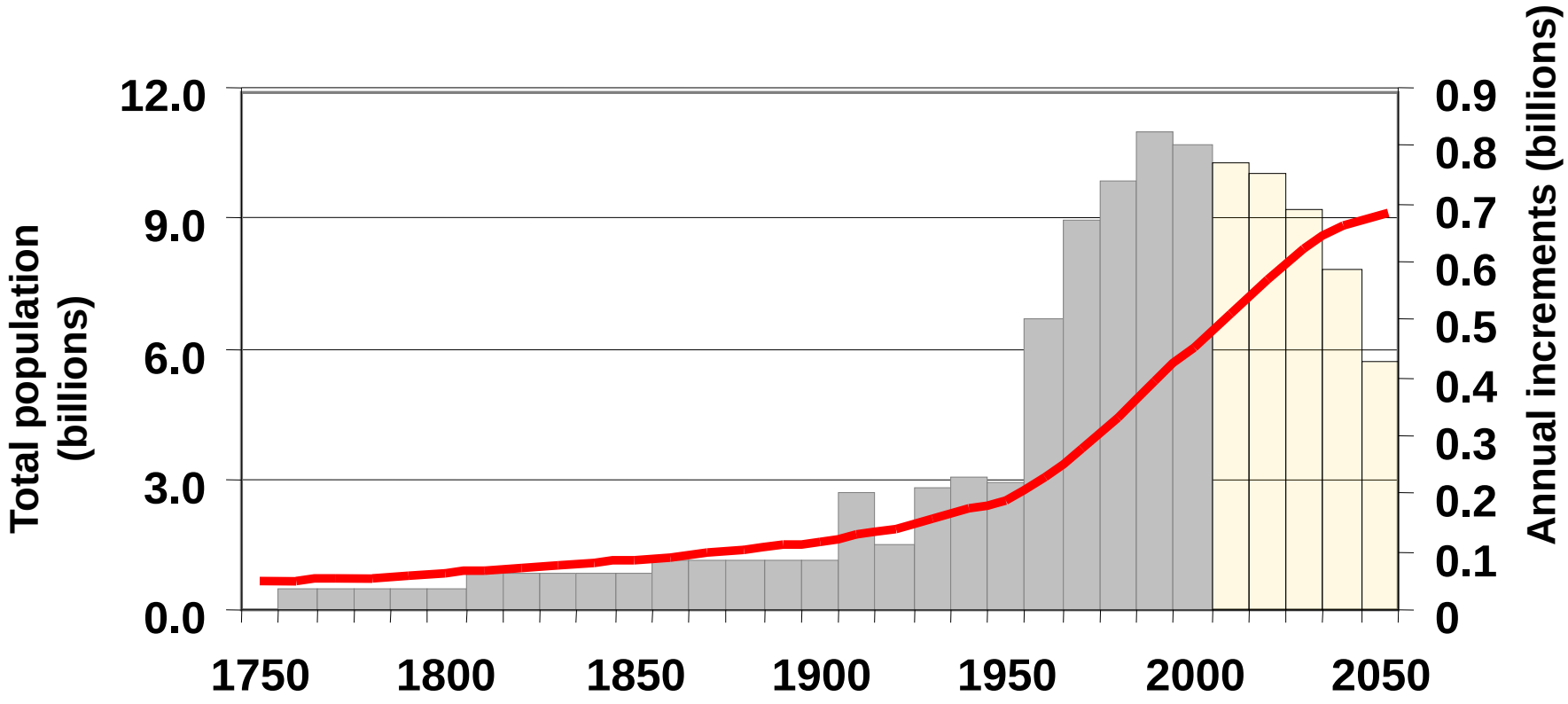




How much fertile soil is there on the planet to feed people? And where is it?

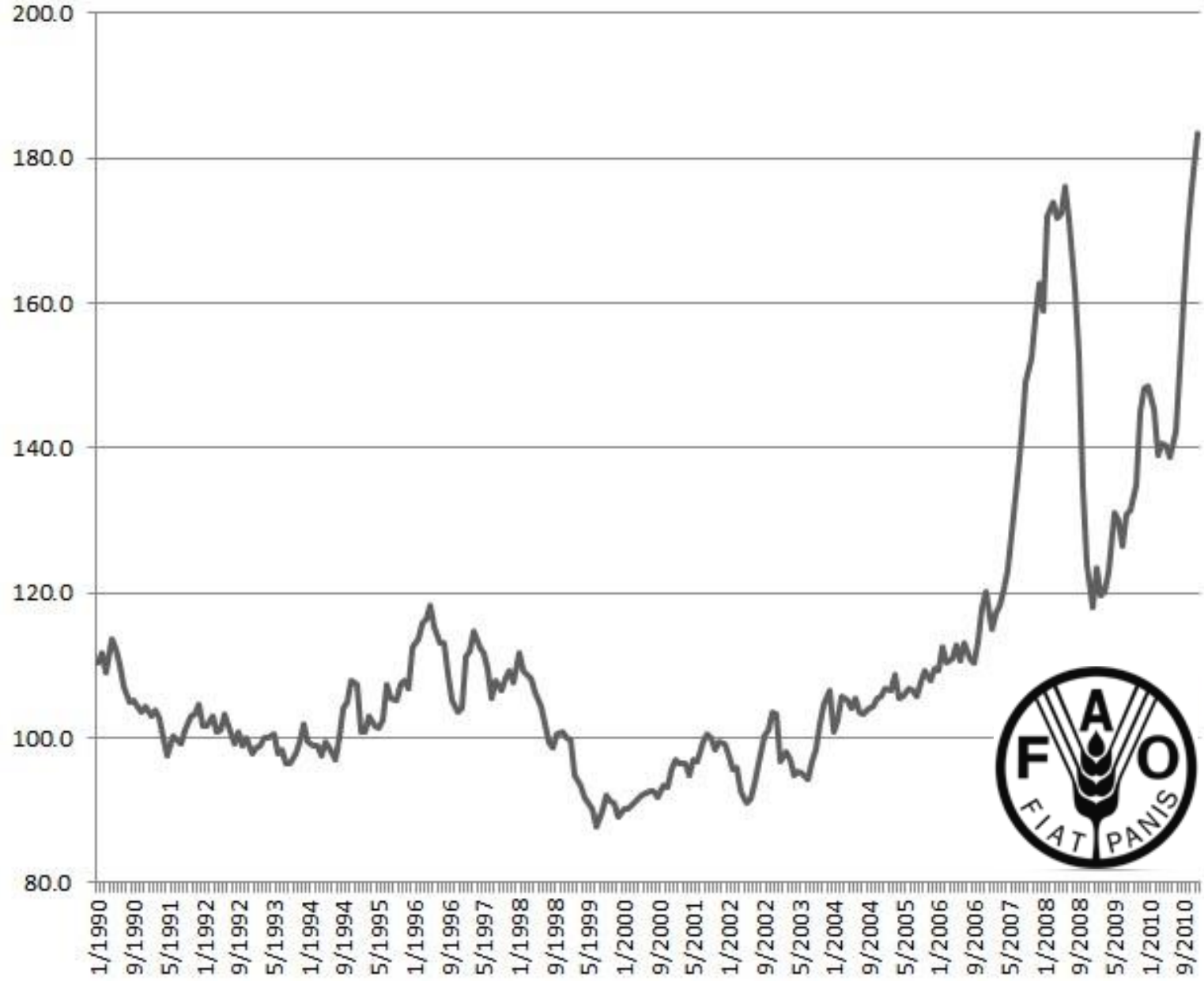
World population: 1750 – 2050

Further growth, but at drastically declining rates



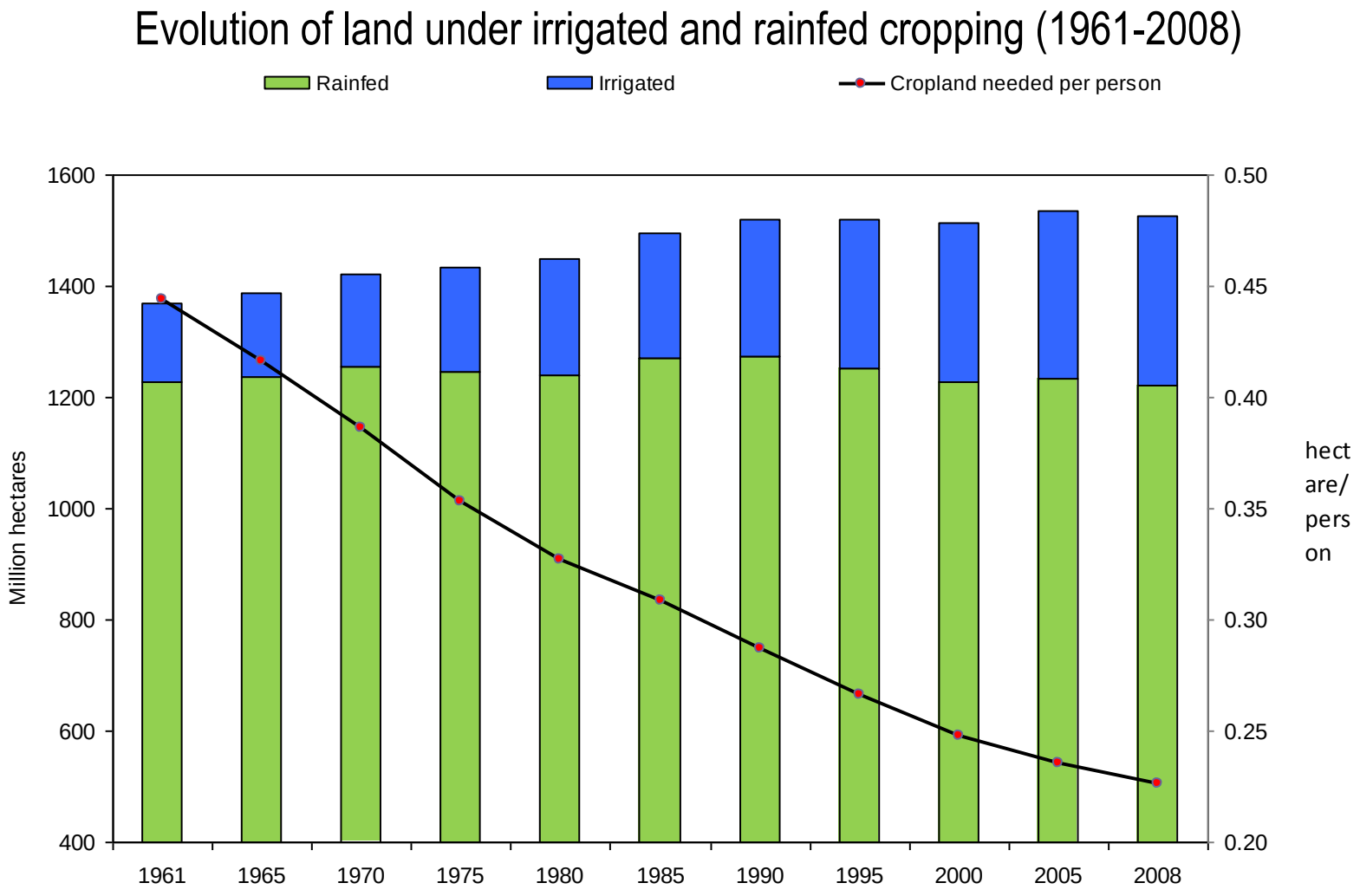
Source: UN, 2003

MONTHLY REAL FOOD PRICE INDEX (2002-2004=100)

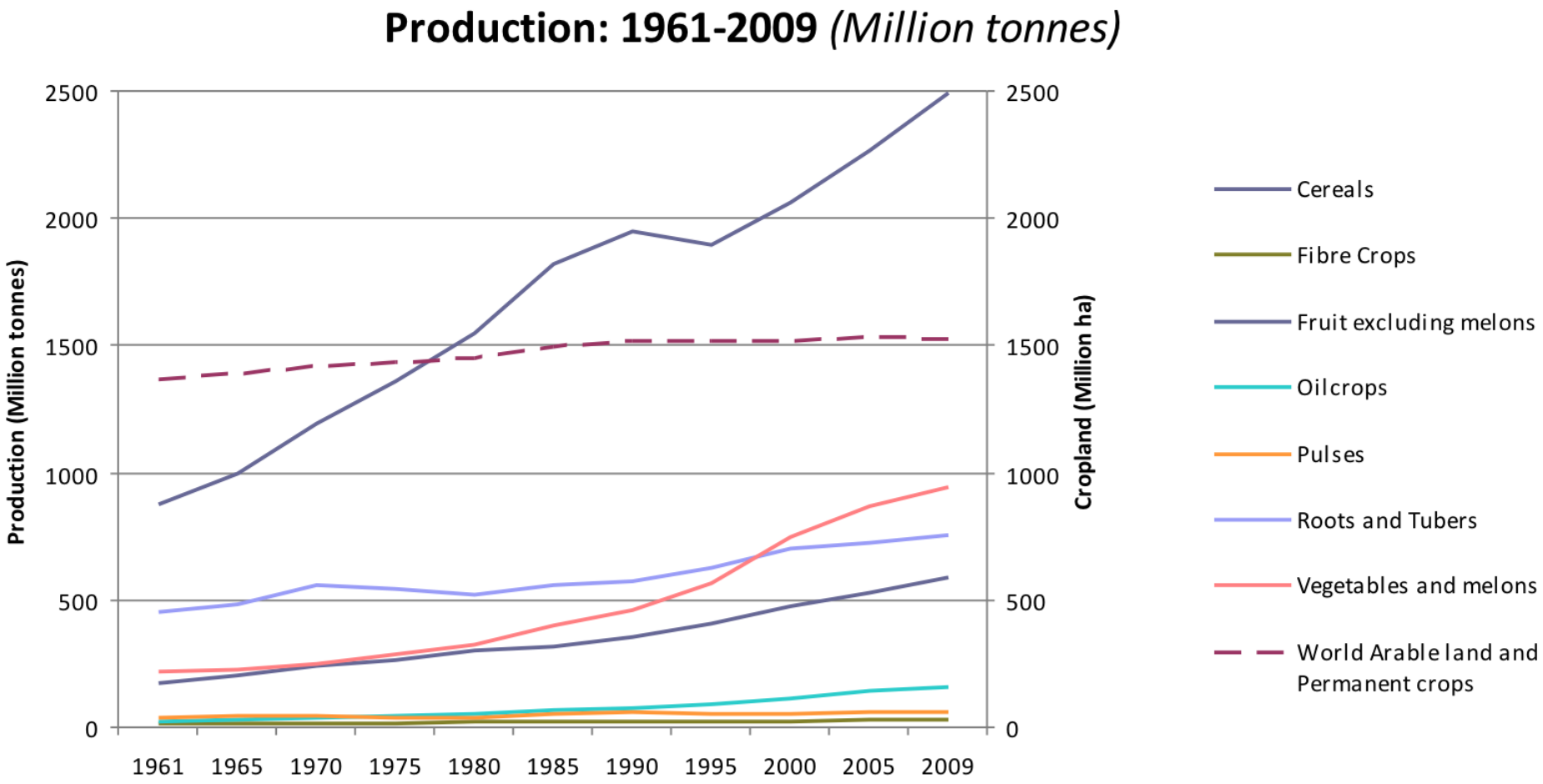


Source: FAO Food Price Index (www.fao.org)

Assuring that there will be enough fertile soils for feeding future generations



Intensification of agricultural production



Soil degradation processes

Sealing

Erosion

Organic matter decline

Compaction

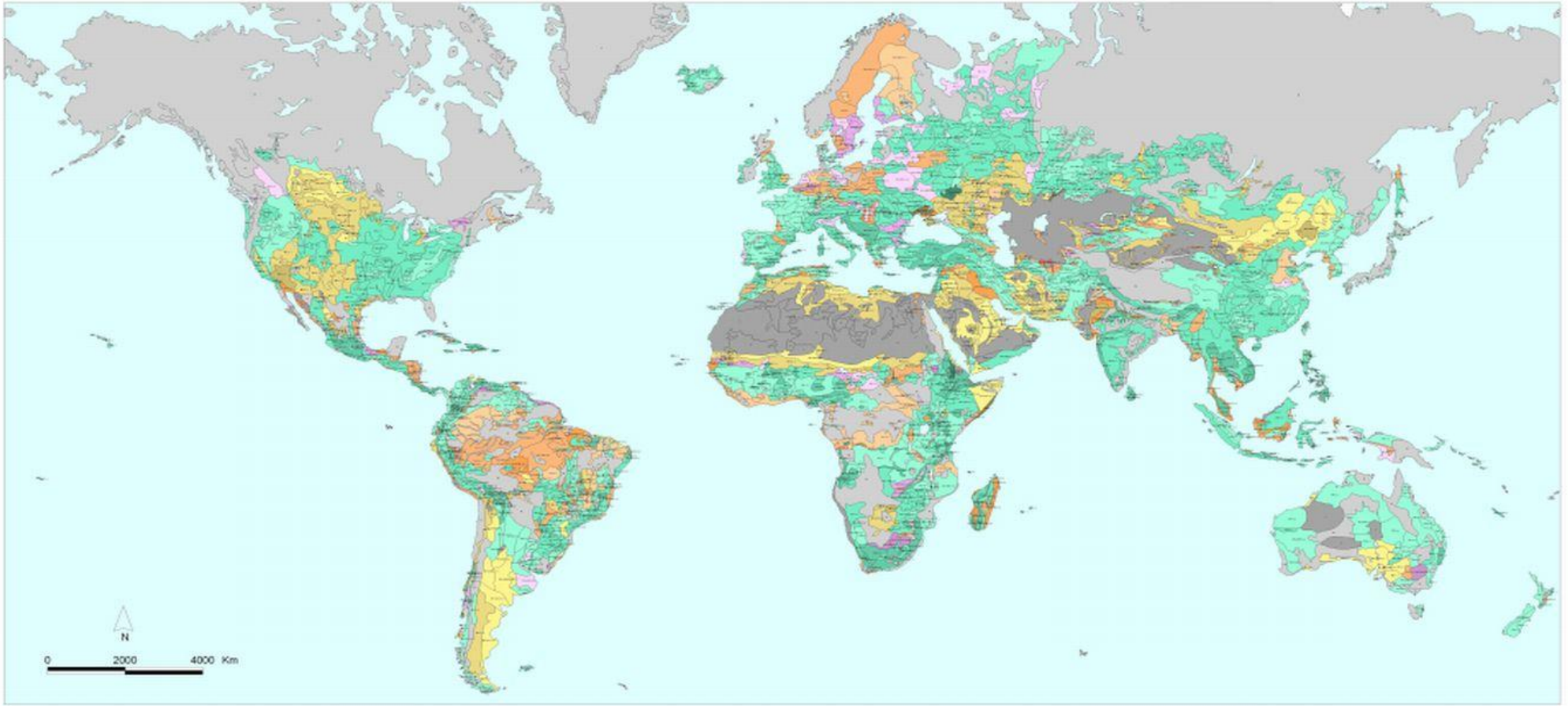
Salinisation
Acidification

Landslides

Contamination

ISRIC

GLOBAL ASSESSMENT OF THE STATUS OF HUMAN-INDUCED SOIL DEGRADATION (1990)



DEGRADATION SEVERITY (Extent + Degree)

Water erosion
- Loss of topsoil
- Terrain deformation/ mass movement

Low
Medium
High
Very high

Wind erosion
- Loss of topsoil
- Terrain deformation
- Overblowing

Low
Medium
High
Very high

Chemical deterioration
- Loss of nutrients/ organic matter
- Salinization/alkalinization
- Acidification
- Pollution

Low
Medium
High
Very high

Physical deterioration
- Compaction/crusting
- Waterlogging
- Subsidence of organic soils

Low
Medium
High
Very high

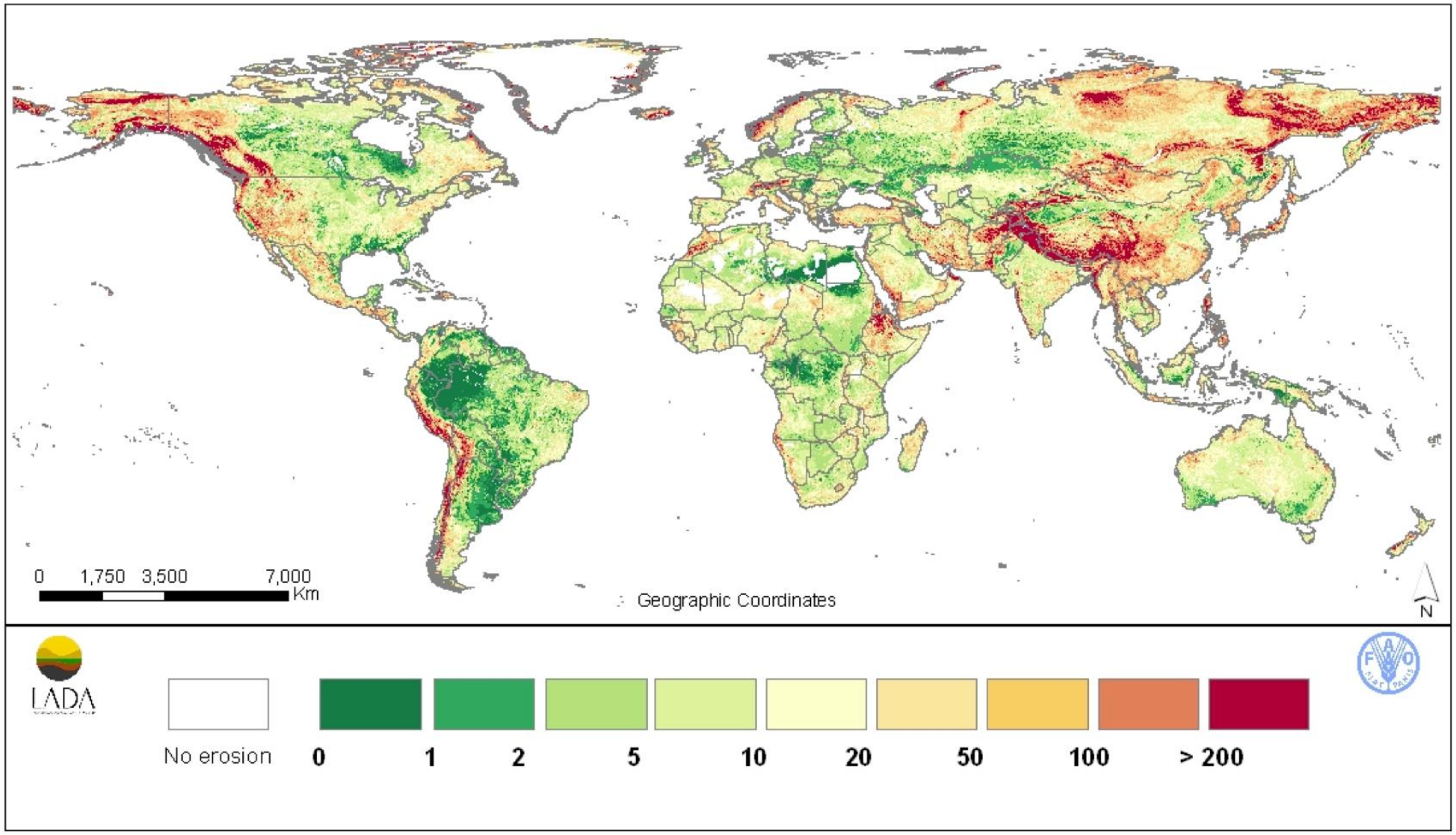
Stable terrain
- Stable under natural conditions
- Stable without vegetation
- Stabilized by human intervention

Stable

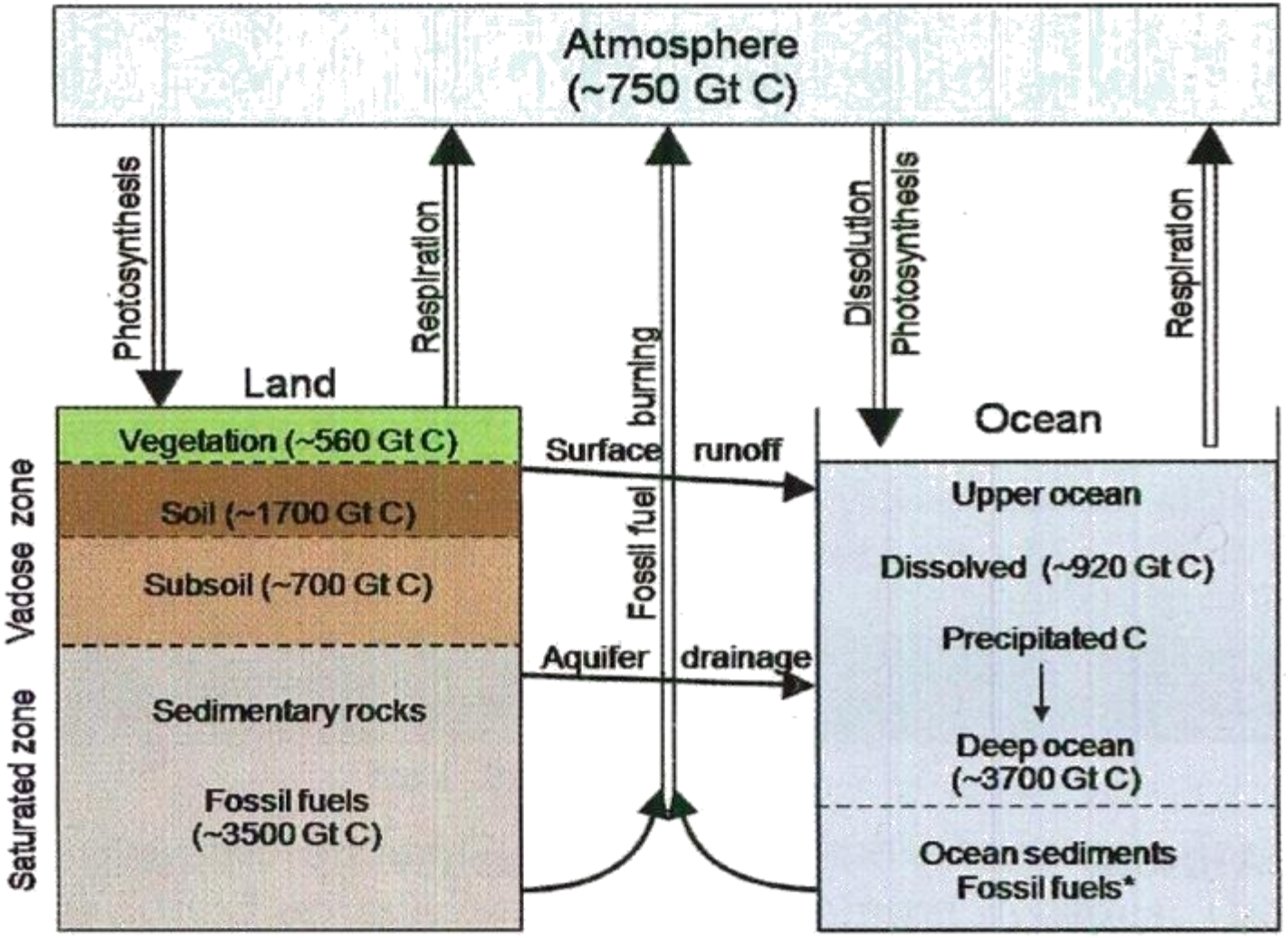
Other
Non used wasteland
Ocean, inland water

1/3 of agricultural soils are degraded of which 83% due to wind & water erosion

Predicted Soil loss in ton/ha/year (USLE equation)

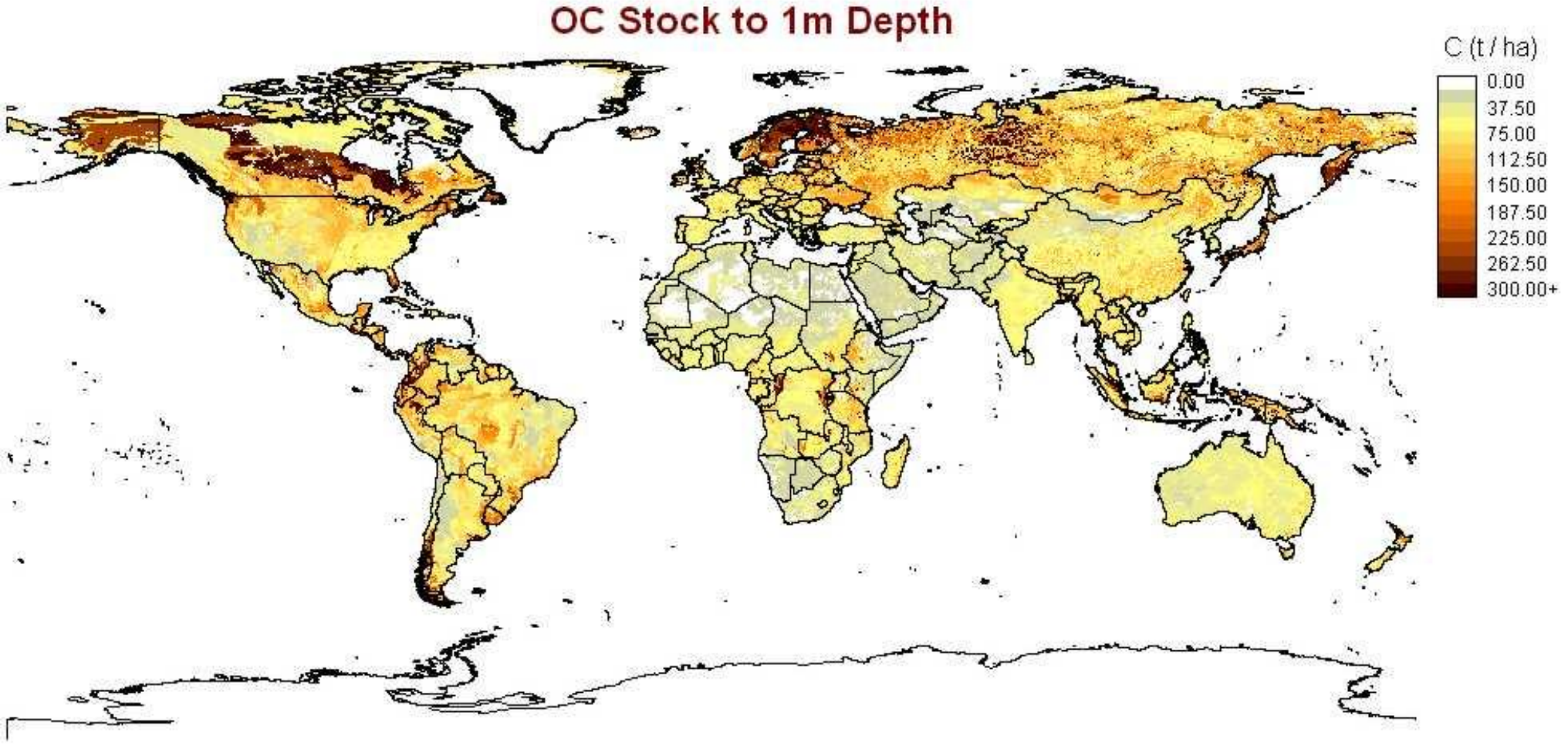


Global carbon pools

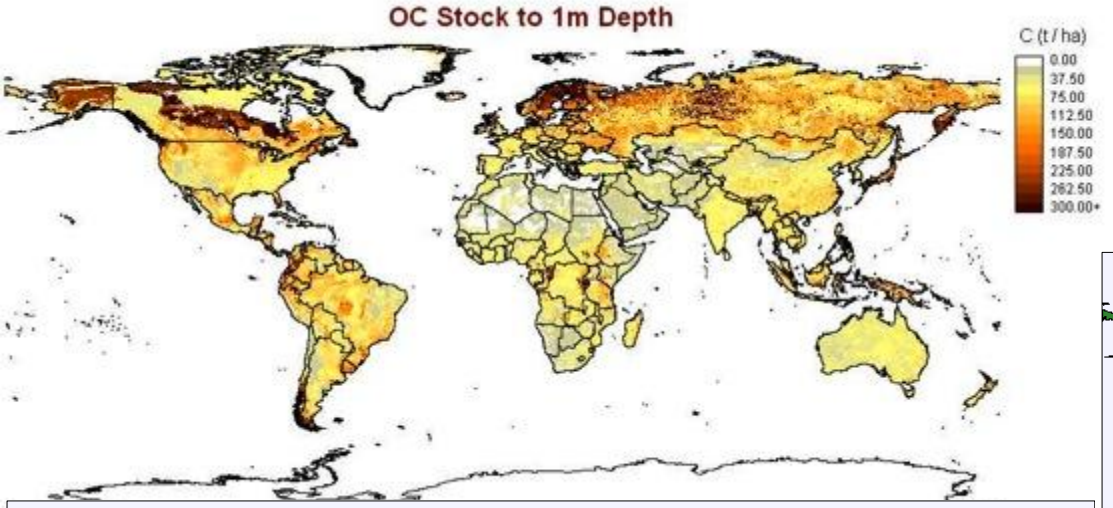


Hillel and Rosenzweig, 2009

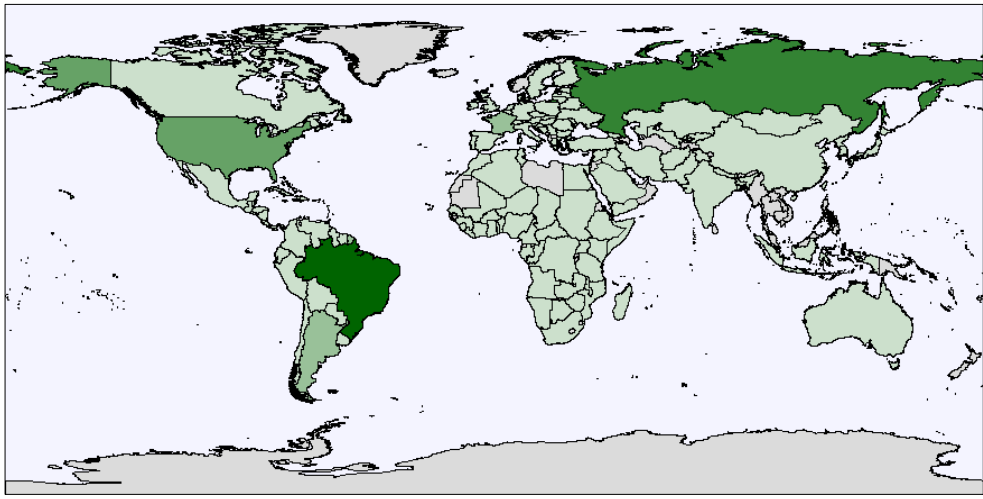
Soil Organic Carbon Stocks Assessment



Source: JRC-IES

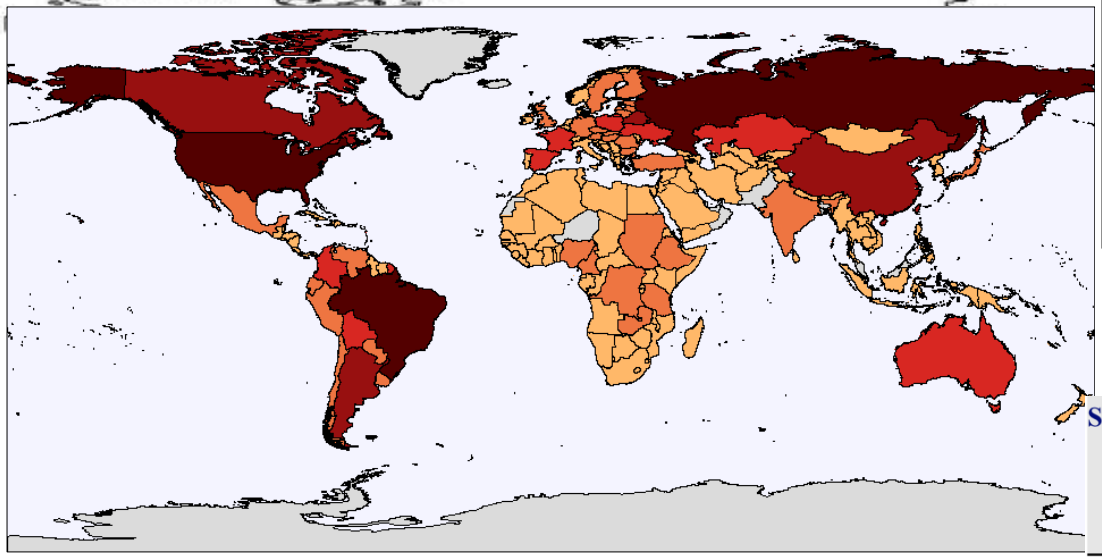


Indirect Land Use Change (ILUC) under various Biofuels policy scenarios



Change in Total Cropland Area by Country

Area Change [km²]: no data | < 100 | 100 - 250 | 250 - 500 | 500 - 1000 | > 1000



Soil Organic Carbon Stock Changes by Country

Changes in SOC [Mt C]: no data | < 0.01 | 0.01 - 0.05 | 0.05 - 0.1 | 0.1 - 0.5 | > 0.5

Scenario	New Cropland	Soil Organic Carbon Stock Changes			CO_2
			Relative		
	km²	*Mt C*	*Change (%)*	*t C ha⁻¹*	*Mt CO_2*
Business as Usual	8,209.0	-7.80	-0.0011	-9.5	28.6
Free Trade	9,758.9	-8.73	-0.0012	-8.9	32.0

Why do we need a new global governance for soils?

CURRENT SCENARIO

Increasing land degradation, impacts of climate change, drought and desertification resulting in lower productivity of arable lands and ecosystem services.

TRENDS

Population growth and diet change require increased demand for food, water, fiber, forage, bioenergy and further environmental services.

SOIL RESOURCE

Acknowledged for its key role in ensuring food security and ecosystems services. Yet fragile resource because of its nature (non renewable on human time frame).

RESPONSES BY MAIN STAKEHOLDERS

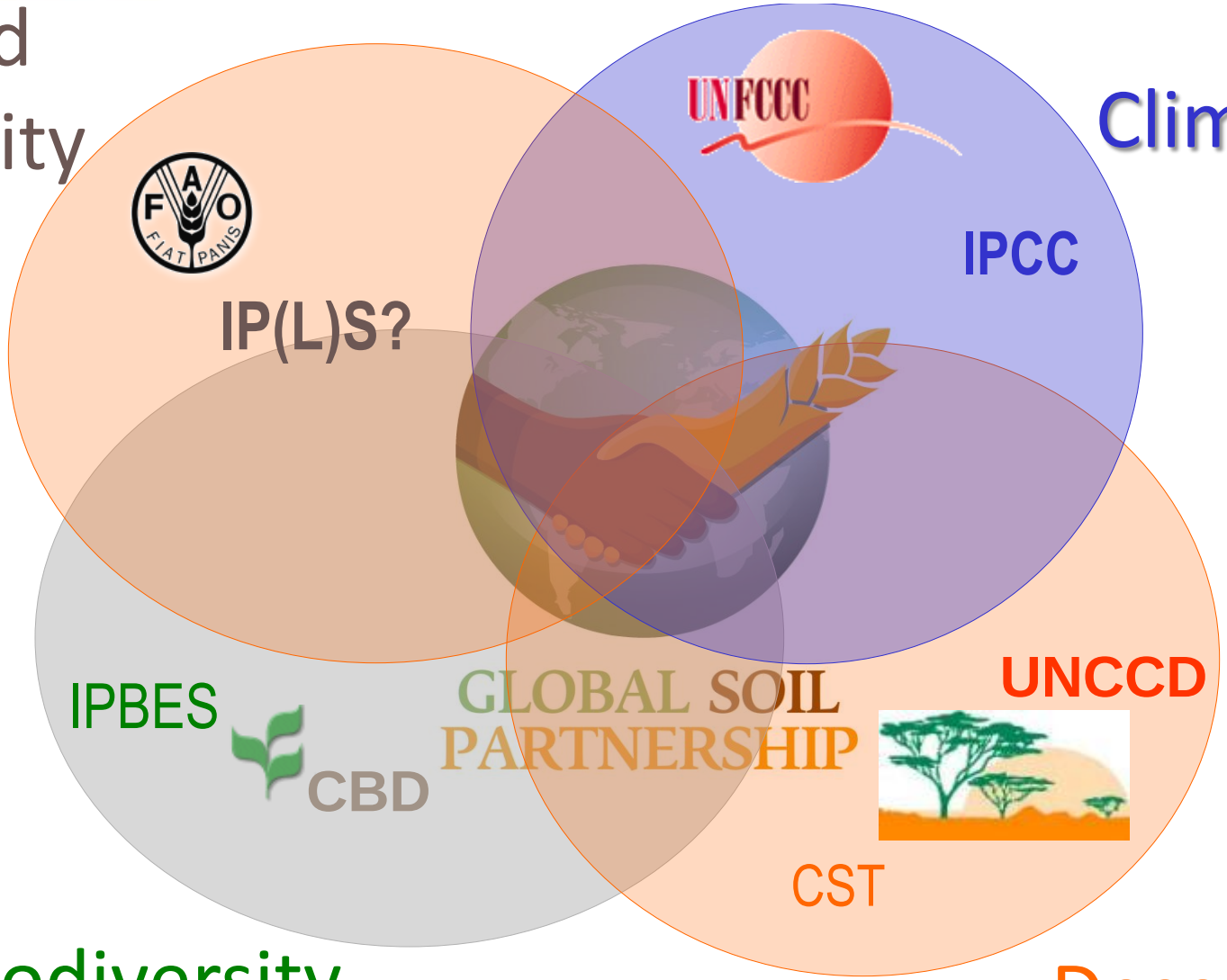
Many efforts addressing soil resource, but mainly: fragmented, uncoordinated, not addressing current challenges, not involving local communities and institutions.

TOWARDS A GLOBAL SOIL PARTNERSHIP

- A global Soil Partnership specifically addressing the linkages between food security, soil health and ecosystem services to promote innovative and sustainable solutions of low carbon emission agriculture and taking advantages of agro-ecological processes and outcomes.
- An enabling environment and specific expertise and fund raising capacity for sustainable improvements in soil and land management, allowing experience to be shared among farmers and scientists across countries and regions and promote win-win solutions.

GLOBAL SOIL PARTNERSHIP

Soils as a cross-cutting theme between food security, climate change, desertification and biodiversity



Why a Partnership?

A Global Soil Partnership (complementing the Global water partnership) can bring due recognition and concerted action with stakeholders at international, national and local levels to protect and sustain soil and water resources as the basis for sustainable agriculture and food security.

It will provide a platform for updating and sharing knowledge on soils, for developing capacities of land users and technical institutions and providing information and evidence for strengthened policies and programmes

GSP Vision and Mission

- **The Vision of the GSP** is for a healthy and productive soils for a food secure world.

- **The Mission of the GSP** is to
  - build capacities and exchange knowledge and technologies for sustainable management of soil resources at all levels to enhance food security in an era of climate change, and
  - propose national and international best practices, technical standards, guidelines and monitoring systems.

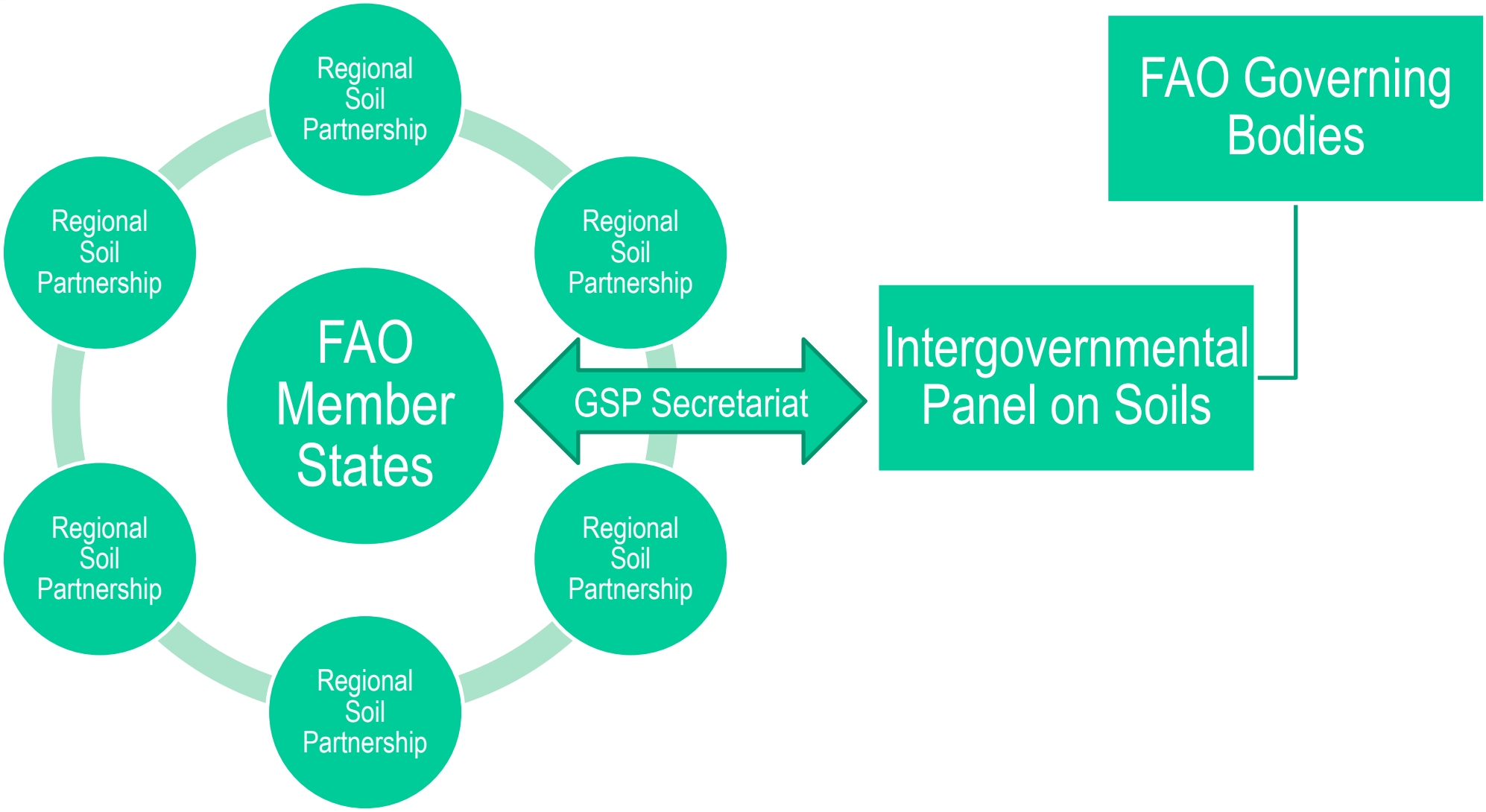
Our Proposal: three main elements of the GSP

- A **Partnership** open to governments and all relevant stakeholders and organizations;

- A **Secretariat** who will implement the vision and mission of the GSP through Regional Partnerships;

- **An Intergovernmental Technical Panel on Soils** of 25 high-level scientists providing scientific and technical advice to the Global Soil Partnership and FAO.

The Global Soil Partnership



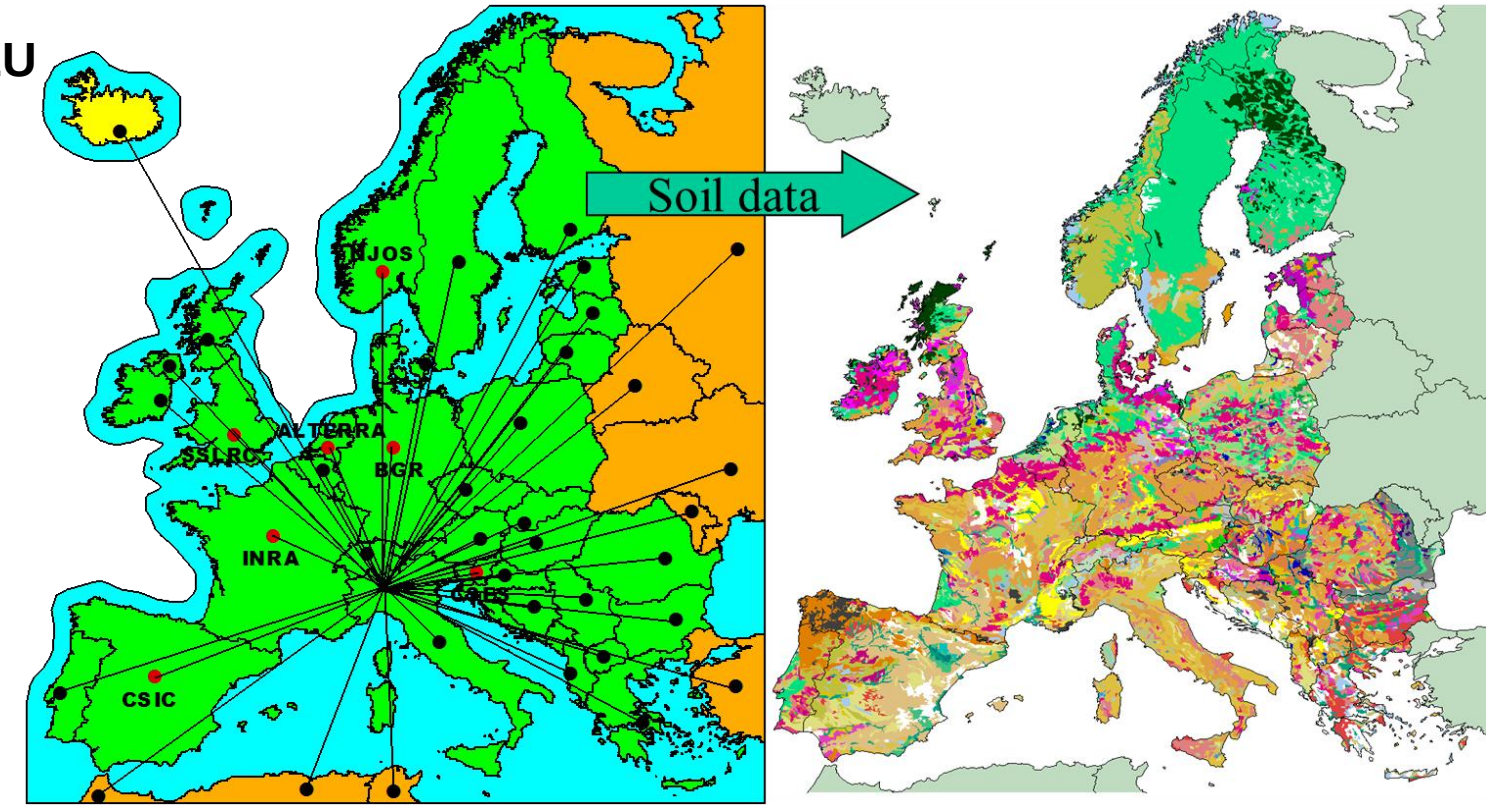
European Soil Bureau Network of experts

ESBN annual Plenary 2011 as SIDE EVENT of
Wageningen Conference on applied Soil Science
18 - 22 September 2011 Wageningen

- **Located in JRC**
- **1996s**
- **Soil EU infos**
- **Several different EU policy drivers**

DELIVERABLES

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



Source: JRC

European Commission
Joint Research Centre
Institute for Environment and Sustainability

European Soil Data Centre (ESDAC)

ESDAC

- Home
- About ESDAC
- Key Documents
- Other Data Centres
- Useful links

Applications

- Metadata Catalogue
- ESDAC Map Viewer

WELCOME TO THE EUROPEAN SOIL DATA CENTRE

The **European Soil Data Centre (ESDAC)** is the thematic centre for soil related data in Europe. It's ambition is to host and point to relevant soil data and information at European level. It consists of two main elements. A catalogue of soil resources and a map viewer into some of the soil data hosted at the ESDAC.

The catalogue of soil resources is a light-weight metadata system that describes and points to various soil resource types: datasets, services/applications, documents, events, projects and external links.

The ESDAC map viewer allows the user to navigate in key soil data for Europe. Main data come from the European Soil Database.

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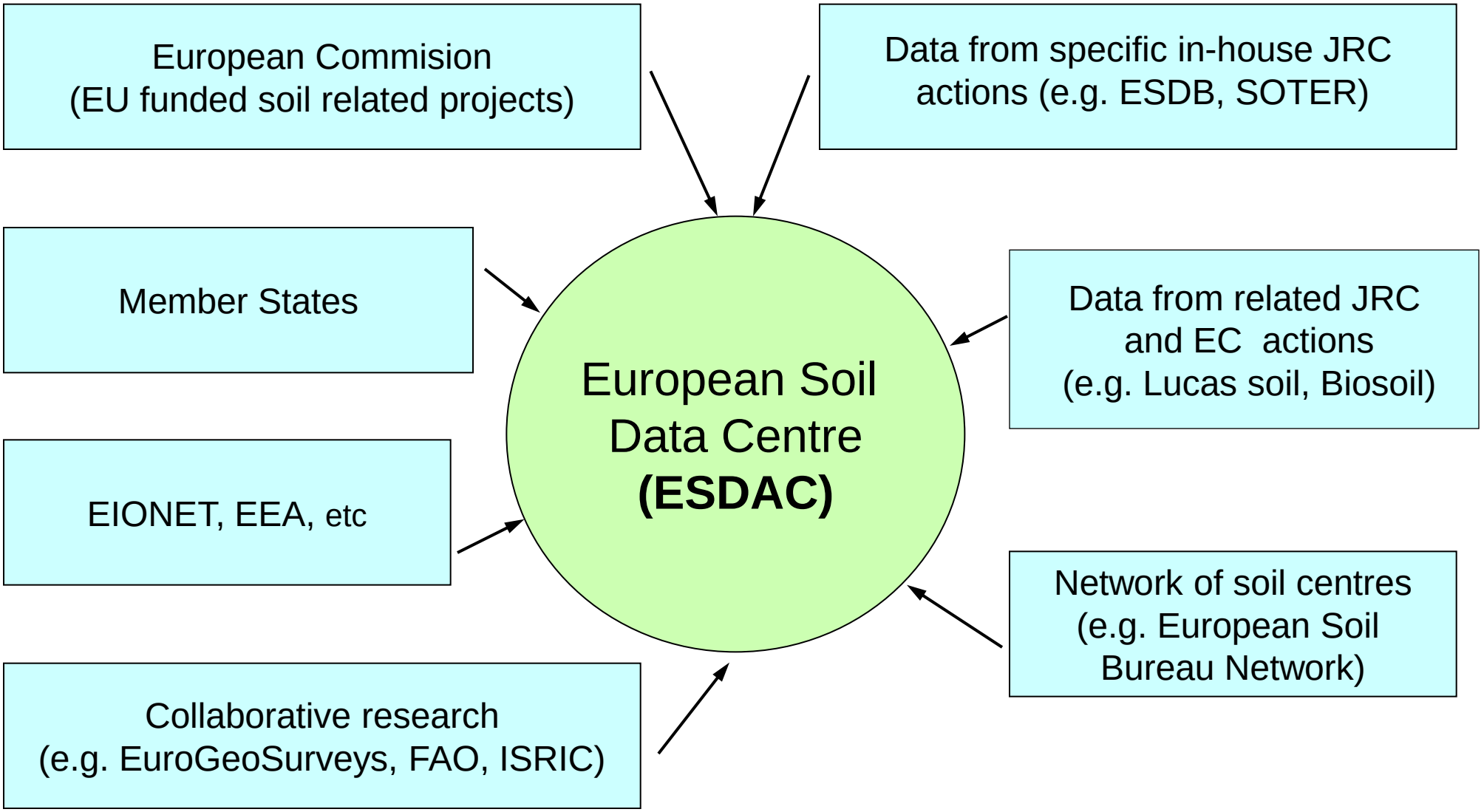
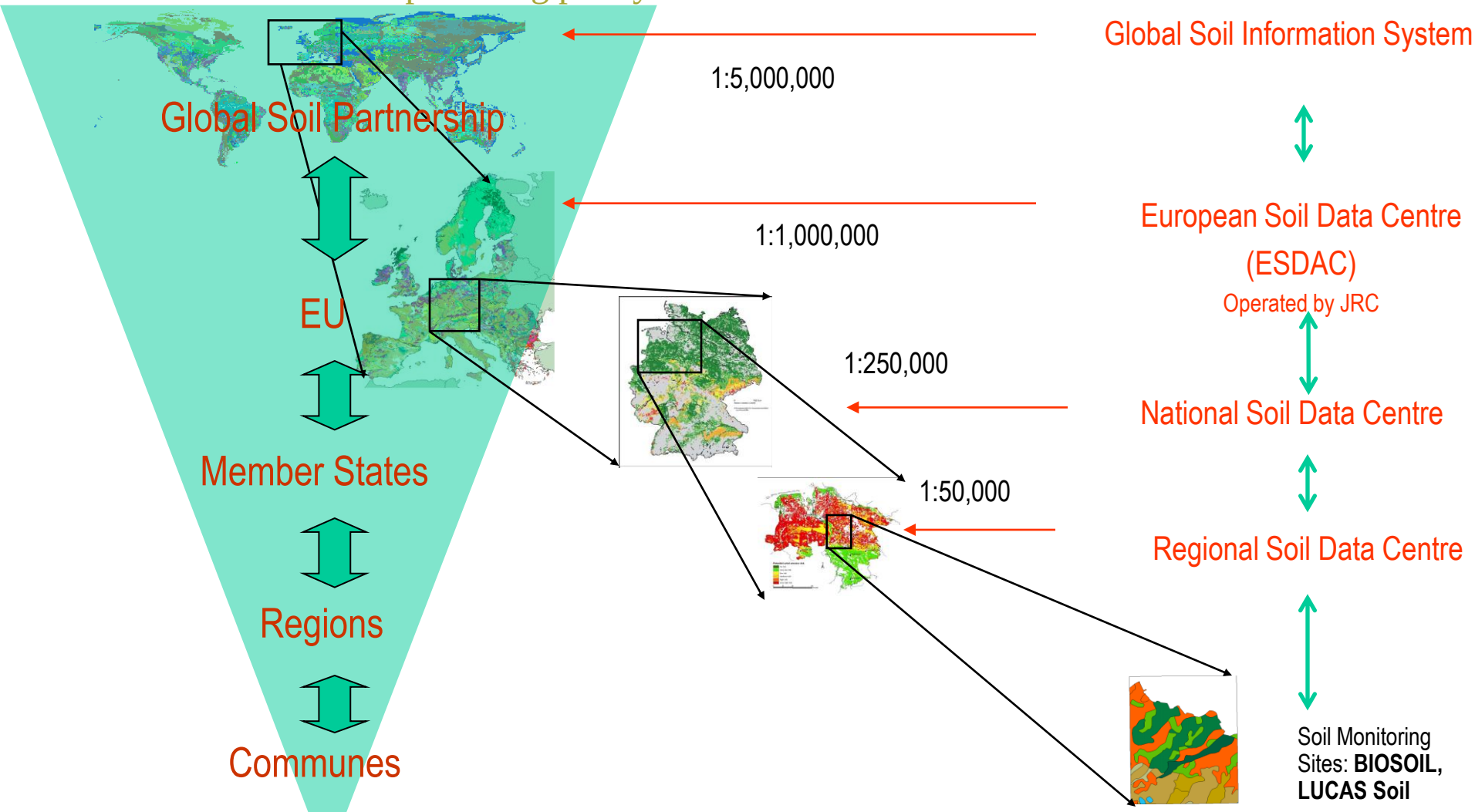
http://esdac.jrc.ec.europa.eu/

Source: JRC


European Commision
(EU funded soil related projects)
Data from specific in-house JRC actions (e.g. ESDB, SOTER)
Member States
Data from related JRC and EC actions
(e.g. Lucas soil, Biosoil)
European Soil Data Centre
(ESDAC)
EIONET, EEA, etc
Network of soil centres
(e.g. European Soil Bureau Network)
Collaborative research
(e.g. EuroGeoSurveys, FAO, ISRIC)

Source: JRC

Data centers providing policy relevant soil information at different scales



From local data and information to a global soil information system

Way Forward: Towards Rio+20

- Concept note distributed for discussion to Governments and stakeholders.
- Meeting in FAO HQ 7-9 of September 2011 for discussion and launch of the process towards the proposed GSP.
- Establishment of a Technical Working Group to draft the Terms of Reference for the GSP.
- Establishment of a formal Open-Ended Working Group by the FAO Governing bodies for finalizing the Terms of Reference of the GSP
- Submission of the Terms of Reference to FAO's Governing bodies for final endorsement of the GSP
- Formal establishment of the Global Soil Partnership

Thank you for your attention!

SOIL

Land Management & Natural Hazards Unit

GLOBAL SOIL PARTNERSHIP

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