



JOINT RESEARCH CENTRE

European Soil Portal - Soil Data and Information Systems

European Commission > Joint Research Centre > Institute for Environment and Sustainability > Land Resource Management Unit

HOME
Soil Datasets
Soil at JRC
Documents - Publications
Soil Projects
Soil Themes
▶ Soil Erosion
▶ Soil Organic Carbon Content
▶▶ European Data
▶▶ EIONET Data Collection 2010
▶▶ Agricultural SOC Stocks
▶▶ Global Data - Other initiatives
▶ Soil Compaction
▶ Soil Salinization
▶ Landslides
▶ Soil Sealing
▶ Soil Contamination
▶ Soil Biodiversity
▶ Soil Sampling
European Soil Bureau (ESBN)
International Cooperation
Events - Presentations
Awareness Raising
What's new?
Utilities - Various
Team - Action SOIL
Links

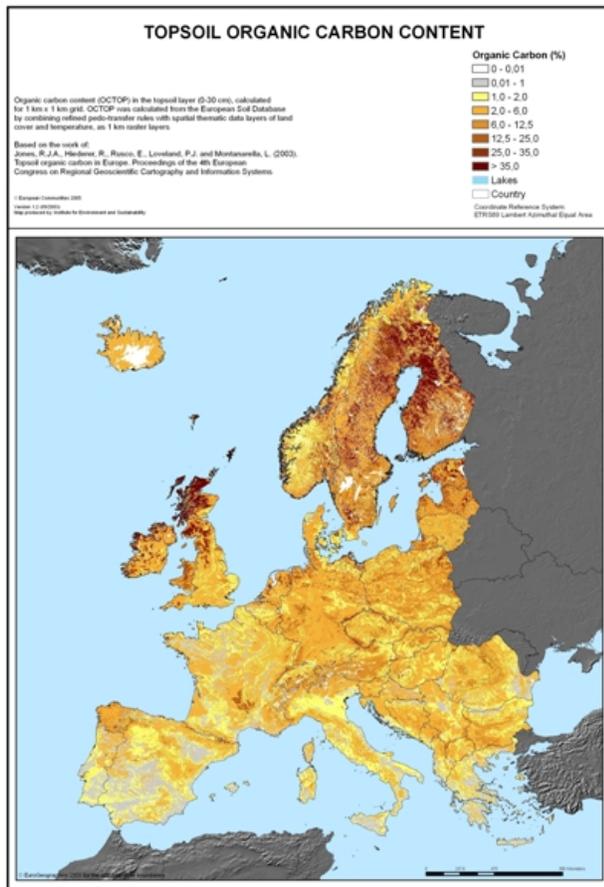
Soil Themes > Soil Organic Carbon Content

Soil organic carbon, the major component of soil organic matter, is extremely important in all soil processes. Organic material in the soil is essentially derived from residual plant and animal material, synthesised by microbes and decomposed under the influence of temperature, moisture and ambient soil conditions. The annual rate of loss of organic matter can vary greatly, depending on cultivation practices, the type of plant/crop cover, drainage status of the soil and weather conditions. There are two groups of factors that influence inherent organic matter content: natural factors (climate, soil parent material, land cover and/or vegetation and topography), and human-induced factors (land use, management and degradation).

European level

At the European level, there is a serious lack of geo-referenced, measured and harmonised data on soil organic carbon available from systematic sampling programmes. The European Soil Database, at a scale of 1:1,000,000, is the only comprehensive source of data on the soils of Europe harmonised according to a standard international classification (FAO). At the present time, the most homogeneous and comprehensive data on the organic carbon/matter content of European soils remain those that can be extracted and/or derived from the European Soil Database in combination with associated databases on land cover, climate and topography.

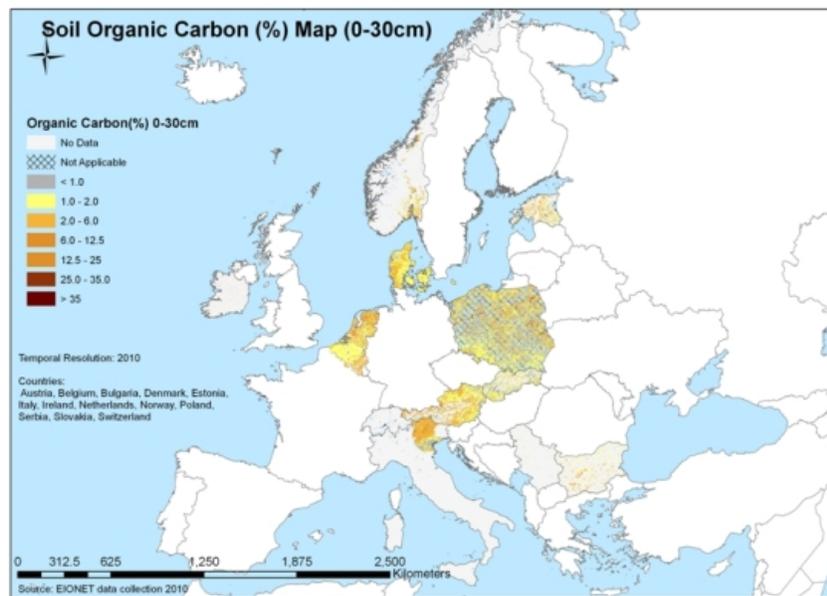
The Soil Portal makes available the Maps of Organic carbon content (%) in the surface horizon of soils in Europe. The [Data](#) are in ESRI GRID format and are available as an ASCII raster file or in native ESRI GRID format. In addition, an interactive application allows the user to navigate in the Organic Carbon data with OCTOP Map Server and print his own customized map.



Organic carbon content (%) in the surface horizon of soils in Europe (S.P.I.04.72)

EIONET Data collection

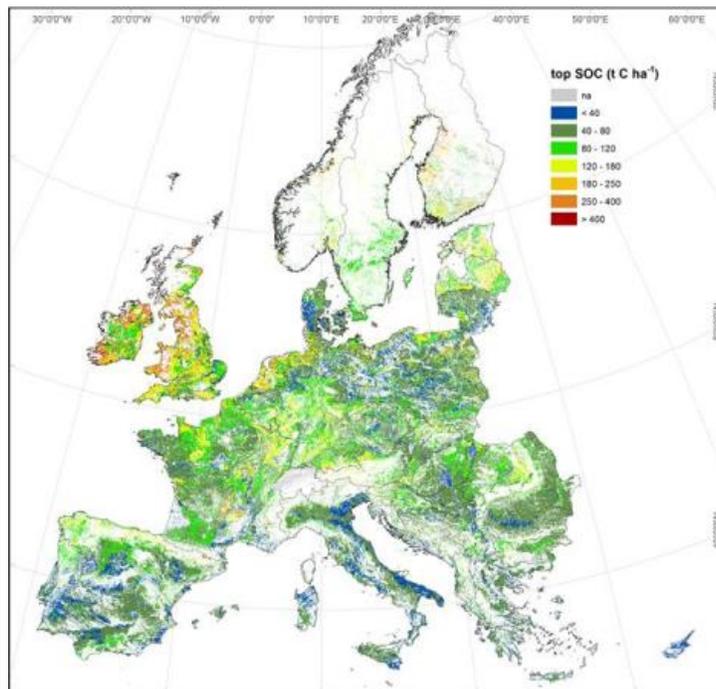
In 2010, the European Soil Data Centre(ESDAC) invited the Primary Contact Points (PCPs) of EIONET to contribute to a data collection campaign of EIONET-SOIL in order to develop the European datasets for soil erosion and Soil Organic Carbon(SOC). There was no legal obligation for the EIONET member countries to participate and PCPs and NRCs for soil contributed on a voluntary basis. Twenty(20) countries expressed their interest to participate in the project, of which eight(8) countries were interested to deliver data in the future. You can find more details on the [EIONET 2010 data collection](#).



The Soil Organic Carbon(%) Map (0-30 cm) based on EIONET data collection 2010.

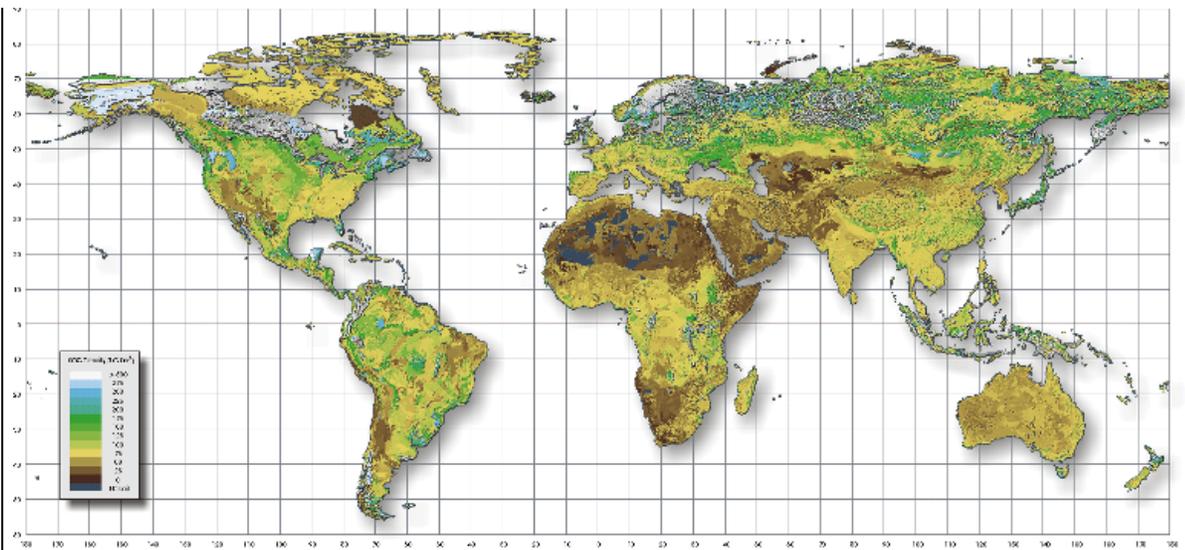
Pan-European Soil Organic Carbon (SOC) stock of agricultural soils

The future EU policy in agriculture will utilize SOC as indicator, both as a main parameter of soil quality and as a strategy to offset CO₂ emission by C sequestration. However a consistent picture of agricultural SOC stock is missing as well as tools to orient the future policymaker decisions. Get more information on how we estimated a [current top SOC stock](#) of 17.63 Gt in EU agricultural soils, by an unprecedented model application running about 164,000 combination of climate, soil and land use/management. A comprehensive model platform was established at a pan-European scale (EU + Serbia, Bosnia and Herzegovina, Croatia, Montenegro, Albania, Former Yugoslav Republic of Macedonia and Norway) using the agro-ecosystem SOC model CENTURY. The model was implemented with the main management practices (e.g. irrigation, mineral and organic fertilization, tillage, etc.) derived from official statistics. The model results were tested against inventories from the European Environment and Observation Network (EIONET) and approximately 20,000 soil samples from the 2009 LUCAS survey, a monitoring project aiming at producing the first coherent, comprehensive and harmonized top-soil dataset of the EU based on harmonized sampling and analytical methods. The [Data](#) are available as Shape Files.



Global level

Global estimates of soil organic carbon stocks have been produced in the past to support the calculation of potential emissions of CO₂ from the soil under scenarios of change land use/cover and climatic conditions (IPCC, 2006), but very few global estimates are presented as spatial data. For global spatial layers on soil parameters, the most recent and complete dataset is available as the Harmonized World Soil Database (HWSD). The HWSD represents a step forward towards a spatially more detailed and thematically more refined set of global soil data. The [Global Soil Organic Carbon estimates](#) are available in 2 different grid resolutions.



Estimates of Global Soil Organic Carbon Density from amended Harmonized World Soil Database ($t\ C\ ha^{-1}$)

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