

# **JOINT RESEARCH CENTRE - FP7 - WP2009**

## **Action n° 22004 - SOIL - Soil Data and Information Systems**

*(SOIL)*

*Institute for environment and sustainability*

*Policy Theme:* 2 - Solidarity and the responsible management of resources

*Agenda No & Title:* 2.2 - Natural resources

*Web site address (URL):* [eusoils.jrc.it](http://eusoils.jrc.it)

*Action Leader:* MONTANARELLA LUCA

*Customer/users (outside the European Commission):*

- African Union
- African Union Commission (AUC)
- Biofuels regulators of the Member States
- CEN
- CHINA-CAAS
- Consultative Group on International Agricultural Research (CGIAR)
- Convention on Bio-Diversity - CBD
- EEA (European Environment Agency)
- EFSA (European Food Safety Agency)
- Environment and Transport Ministries of Member States
- Environmental Agencies of Member states
- EU Member State competent authorities
- EuroGeoSurveys
- European Environment Agency
- European Parliament
- FAO
- FAO (Food and Agriculture Organisation of the United Nations)
- INSPIRE Legally Mandated National Organisations (e.g. Ministries of Environment, Regional Public Authorities, Mapping Agencies, Statistical Institutes, Environmental Protection Agencies, Cadastres, Geological Surveys)
- International Co-operative Programme on Assessment and Monitoring of Air Pollution Effects on Forests (ICP Forests)
- ISRIC - World Data Centre for Soils
- Ministries of Agriculture
- Ministries of Environment of Member States
- National/Regional Authorities and Environment Agencies
- Polytechnic of Milan

- Regional Authorities, in particular Lombardy Region
- Research Institutions and Universities
- Soil Conservation Service of Iceland
- TUBITAK
- UNEP
- United Nations Convention to Combat Desertification - UNCCD
- United Nations Food Agriculture Organization (UN-FAO)
- United Nations Framework on Climate Change (UNFCCC)
- USDA

***Customer DGs (inside the European Commission):***

- Agriculture and Rural Development - AGRI
- EuropAid - AIDCO
- Development - DEV
- Enterprise and Industry - ENTR
- Environment - ENV
- Eurostat - ESTAT
- Regional Policy - REGIO

***Keywords:***

Soil Data Centre, Soil Thematic Strategy, Soil Framework Directive, Desertification

***Rationale:***

Soil data and information are relevant for a number of EU policy areas: Agriculture, soil protection, water protection, nature protection, development policy, health and sustainable development. The EU Thematic Strategy for Soil Protection addresses these different policy areas in a coherent manner and proposes the way forward towards effective soil protection in Europe. Policy relevant soil data and information will therefore play a crucial role in the policy development and implementation process. In addition, a number of global multilateral agreements also ratified by the European Community demand an increasing amount of soil data and information: Climate change, biodiversity and desertification are global issues that are strongly related to soil degradation phenomena... This Action will provide, through the establishment of the European Soil Data Centre (ESDAC) a single focal point for soil data and information for the European Commission. It will therefore support the Commission's services in the negotiations of the Thematic Strategy for Soil Protection and the proposal for a Soil Framework Directive through the EU Institutions and their subsequent implementation in the Member States. The Action will also facilitate the reporting and assessment obligations by Member States.

### *Summary of the project:*

EU policy relevant soil information, from initial field data collection all the way to final reporting will be managed by this Action. This will be achieved by using the European Soil Data Centre (ESDAC) as the single soil information focal point. It will serve the Commission's needs in negotiating through the EU Institutions the new Thematic Strategy for Soil Protection (COM (2006)231) and the Soil Framework Directive (COM(2006)232) as proposed by the European Commission. Advanced modelling techniques and scenario analyses will be used to provide soil information to end users in relation to the major threats to soil as identified in the Thematic Strategy for Soil Protection (erosion, decline of organic matter, compaction, salinisation, landslides, sealing, contamination and loss of soil biodiversity). Strong scientific and technical support to United Nations Framework Convention for Climate Change (UNFCCC), the Convention for Biodiversity (CBD) and the United Nations Convention to Combat Desertification (UNCCD) will be provided by promoting the reform of the Committee of Science and Technology (CST) of the UNCCD (in close collaboration with action DESERT) by implementing the International Soil Biodiversity Initiative in support of CBD and by the development of an operational Global Soil Information System (GLOSIS) for the regular assessment of global soil degradation processes.

International Activities:

European Dimension:

More than 40 European countries and regional authorities collaborate in a well established network, the European Soil Bureau Network, managed by this action. A full list of members is available at [http://eusoils.jrc.it/esbn/esbn\\_members.html](http://eusoils.jrc.it/esbn/esbn_members.html)

As a new development within FP7, action SOIL has established the European Soil Data Centre (ESDAC), as an INSPIRE compliant fully nested system on soil data and information operated by a network of National and Regional (data centres).

Outside Europe:

This Action is one of the major global players in the development and operation of soil data and information systems. Within FP7 the following global and regional initiatives have been established:

Global activities:

A global network of soil science institutions and data providers has been established: GlobalSoilMap.net is a network including partners from all continents aiming to produce a new digital soil map of the world using established

and emerging state-of-the-art technologies for soil mapping and predicting soil properties at high spatial resolution.

Regional and Bilateral activities:

ROSOM - Regional Office for Sustainable Land and SOil Management in the Mediterranean (ROSOM) hosted by CIHEAM-IAMB (International Centre for Advanced Mediterranean Agronomic Studies) as the Mediterranean component of the European Soil Data Centre (ESDAC). It includes 36 partner countries covering the complete Mediterranean basin and aims at providing the policy relevant soil data and information for the ESDAC in this area, as specified in the relevant MoU between the participating organisations.

Northern Circumpolar Soil Atlas - As an initiative of the JRC's SOIL Action in support of the International Polar Year (IPY) the project aims at completing by 2008 the Northern Circumpolar Soil Atlas jointly in collaboration with Canada, USA, Greenland, Norway, Iceland, Denmark, Sweden, Finland, Russian federation. The atlas is intended to be delivered as final publication within the IPY 2008-2009 as a supportive contribution of the EC. Further details can be found at <http://eussoils.jrc.it/library/maps/Circumpolar/index.html>.

Soil Atlas of Africa - As a contribution of the JRC to the Africa and the Caribbean and Pacific Observatory, the Soil Atlas of Africa will be the reference for soil information in Africa. The project allows for full involvement of the local stakeholders in the design, data collection and final publication of this atlas, which is scheduled for 2009. Further reading is available at [http://eussoils.jrc.it/library/maps/africa\\_atlas/index.html](http://eussoils.jrc.it/library/maps/africa_atlas/index.html).

EU-China cooperation agreement in soil science: Following an exploratory mission coordinated by this Action, an extensive collaboration agreement has been signed with the Chinese Academy of Sciences and the Institute of Soil Science. The agreements include exchange of staff and joint activities aiming towards the development of joint soil information systems and soil degradation assessments.

Collaboration agreements with the Food and Agriculture Organisation (FAO), Consultative Group on International Agricultural Research (CGIAR), ISRIC - World Data Centre for Soils, Tamil Nadu University (INDIA), Krasnoyarsk University, Moscow University, Soil Conservation Service of Iceland. Further collaboration including other institutions world wide will follow, and allow the expansion of international collaboration within the action, with the ultimate goal of completing the new Global Soil Information System by end of the FP7.

This Action will provide a coherent approach to soil data collection and distribution for all different policy areas and initiatives relevant to the EU, while

assuring high scientific quality, policy relevance and technical support as needed. The Action will focus on the following overarching objectives:

1. The full execution of the implementation plan 2007-2009 for the European Soil Data Centre (ESDAC) as a single focal point for all soil data and information in Europe.
2. The development of procedures and methods for data collection, quality assessment and control, data management and storage and data distribution fully complying with INSPIRE principles for spatial data infrastructures.
3. Research and development of advanced modelling techniques, indicators and scenario analyses in relation to the major threats to soil (erosion, decline of organic matter, compaction, salinisation, landslides, sealing, contamination, and loss of soil biodiversity), as identified in the Thematic Strategy for Soil Protection.
4. Supporting the other Commission services with soil information and scientific data and advice as well as providing technical assistance in negotiating the Thematic Strategy for Soil Protection and the proposal for a Soil Framework Directive through the EU Institutions and their subsequent implementation at Community and Member State level.
5. Extension of the coverage of the European Soil Information System (EUSIS) towards a fully operational Global Soil Information System (GLOSIS), providing relevant soil information for the implementation of multilateral environmental agreements, like UN-FCCC, CBD and UN-CCD, and contributing to the ground segment of the Global Monitoring for Environment and Security (GMES/KOPERNICUS) as well as to the AU - EU Strategic Partnership.

***Objectives :***

- 01.00: To complete the implementation of the European Soil Data Centre (ESDAC) according to the "ESDAC Implementation Plan 2007-2009" as agreed with DG ENV and the EEA.
- 02.00: Development of new procedures and methods for data collection, quality assessment and control, data management, data storage and data distribution.
- 03.00: Research and development of advanced modelling techniques, indicators and scenario analyses.
- 04.00: Direct support to Commission services and agencies.
- 05.00: Development of the Global Soil information System (GLOSIS).

***Deliverables :***

- 2009-12-31 01.01: Progress Scientific and Technical report to DG Environment, European Environment Agency and EUROSTAT on the implementation of the enhanced operational ESDAC (31/12/2009) (Cat. 2)
- 2009-12-31 02.01: Scientific and Technical Report on metadata and specifications for soil data holdings in the MS and the creation of network services that allow the interchange and interoperability of soil data sets in support to the INSPIRE Directive. (Collaboration with Action INSPIRE) (31/12/2009) (Cat. 2)
- 2009-12-31 02.02: Scientific and Technical Report on developments at the ISO/TC190 (on soil quality) to set-up an international standard for soil data recording and exchange. (31/12/2009) (Cat. 2)
- 2009-12-31 02.03: Final report on the evaluation of the BIOSOIL results for soil monitoring in Europe. (31/12/2009) (in collaboration with Action FOREST) (Cat. 2)
- 2009-12-31 02.05: Critical review paper on forest-soil-climate change mitigation and adaptation issues: The political expectations, their scientific soundness, and the feasibility of implementation. [31/12/2009] (in collaboration with Actions AFOLU and FOREST)- Support to sub-Priority Area 'Climate Change' (Cat. 2)
- 2009-12-31 03.01: World maps of estimated soil organic carbon levels under different land uses. (31/12/2009). Support to JRC's Thematic Programme 'Biofuels'. Relevant to sub-Priority Area -'Climate Change' (Cat. 5)
- 2009-12-31 03.02: Progress Scientific and Technical Report of DIGISOIL: An integrated system of data collection technologies for mapping soil properties. (31/12/2009). Exploratory research (Cat. 2)
- 2009-12-31 03.03: Progress Scientific and Technical Report of iSOIL: Providing techniques and recommendations for high resolution, economically feasible, and target orientated soil mapping under conditions realistic for end-users (31/12/2009). Exploratory research (Cat. 2)
- 2009-12-31 03.04: Progress Scientific and Technical Report on the development of soil quality indicators and indices (31/12/2009) (Cat. 2)
- 2009-12-31 03.05: Scientific and Technical Report on guidelines for the delineation of priority risk areas. (31/12/2009) (in collaboration with Action FLOODS). Support to TF 'Natural Disasters' (Cat. 2)
- 2009-12-31 03.06: Progress Scientific and Technical Report on the use of Earth Observation-based indicators assessing regional and local soil erosion. (31/12/2009). Support to TF 'GMES' (Cat. 2)
- 2009-03-31 04.01: Sampling tools, methodologies and training courses delivered to field teams of the 2009 LUCAS survey (31/03/2009) (Cat. 8)
- 2009-12-31 04.02: First results of the analysis of collected soil samples of the LUCAS-Soil survey reported to EUROSTAT and DG ENV (31/12/2009) (Cat. 5)
- 2009-12-31 04.03: Spatially distributed input data for modelling activities of the European Food Safety Authority (EFSA) including temperature (in

collaboration with AGRI4CAST), soil organic matter content, dry bulk density and soil water content (31/12/2009) (Cat. 5)

- 2009-12-31 04.04: Soil Eco-regions map of Europe-integrating weather (in collaboration with AGRI4CAST), soil and soil biodiversity data (31/12/2009) (Cat. 5)
- 2009-12-31 04.05: Report with updated information and data on the status of European soils for incorporation in the State of the Environment Report 2010 of the EEA (31/12/2009). Support to EEA (Cat. 2)
- 2009-12-31 04.06: Progress Scientific and Technical Report on IRENA indicator nr.21 "Soil Erosion" (JRC lead) including maps, data and full assessment within the DPSIR (Driving Forces-Pressures-State-Impacts-Responses) framework (31/12/2009). Support to EUROSTAT/EEA (Cat. 2)
- 2009-12-31 04.07: Progress Scientific and Technical Report on IRENA indicator nr.26 "Soil Quality" (JRC lead) including maps, data and full assessment within the DPSIR framework (31/12/2009). Support to EUROSTAT/EEA (Cat. 2)
- 2009-12-31 04.08: Progress Report on the feasibility of Harmonised Risk Assessment Methodologies for Soil Contamination - to be delivered to DG ENVIRONMENT (in collaboration with the Action ENSURE (22005) of IES).
- 2009-12-31 05.01: Soil Atlas of Africa (31/12/2009) (in collaboration with Action DESERT) Support to JRC's Thematic Programme AU-EU Strategic Partnership (Cat. 2)
- 2009-12-31 05.02: Soil Data Portal (31/12/2009) (in collaboration with Action MONDE). Support to JRC's Thematic Programme AU-EU Strategic Partnership (Cat. 5)
- 2009-12-31 05.03: African Soil Bureau (network of African soil survey Offices) (31/12/2009) (in collaboration with action MONDE) Support to JRC's Thematic Programme AU-EU Strategic Partnership (Cat. 8)
- 2009-12-31 05.04: Progress Scientific and Technical Report on the collaboration with the Institute of Soil Science of the Chinese Academy of Sciences (31/12/2009) (Cat. 2)
- 2009-12-31 05.05: Progress Scientific and Technical Report on the collaboration with the Institute of Geographical Sciences and Natural Resources Research of the Chinese Academy of Sciences (31/12/2009) (Cat. 2)
- 2009-12-31 05.06: Final Scientific and Technical Report on the collaboration with the International Soil Reference and Information Centre (ISRIC) (11/12/2009) (Cat. 2)
- 2009-12-31 05.07: Progress Scientific and Technical Report on the collaboration with the Soil Conservation Service of Iceland (31/12/2009) (Cat. 2)
- 2009-12-31 05.08: Progress Scientific and Technical Report on the development of a Soil and Terrain (SOTER) data base for Europe and rule-based landform classification methods (31/12/2009). Support to GEOSS/and JRC's Task Force 'GMES' (Cat. 2)

- 2009-12-31 05.09:Progress Scientific and Technical Report on the development of a global digital soil properties map (31/12/2009) (Cat. 2)
- 2009-12-31 05.10:Scientific and Technical Report from the JRC Soil Biodiversity session at AAAS (31/03/2009) (Cat. 2)
- 2009-12-31 05.11:Progress Scientific and Technical Report on soil biodiversity research activities at JRC. (31/12/2009) (Cat. 2)

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