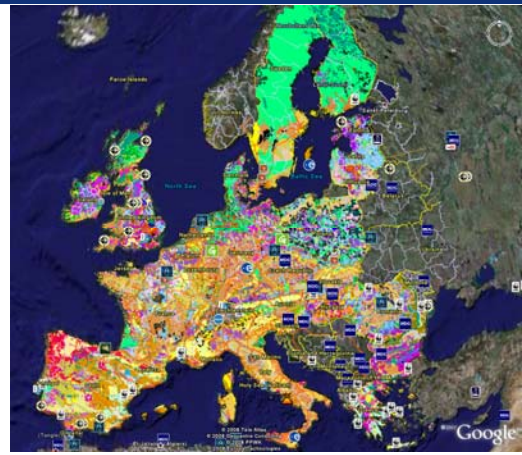
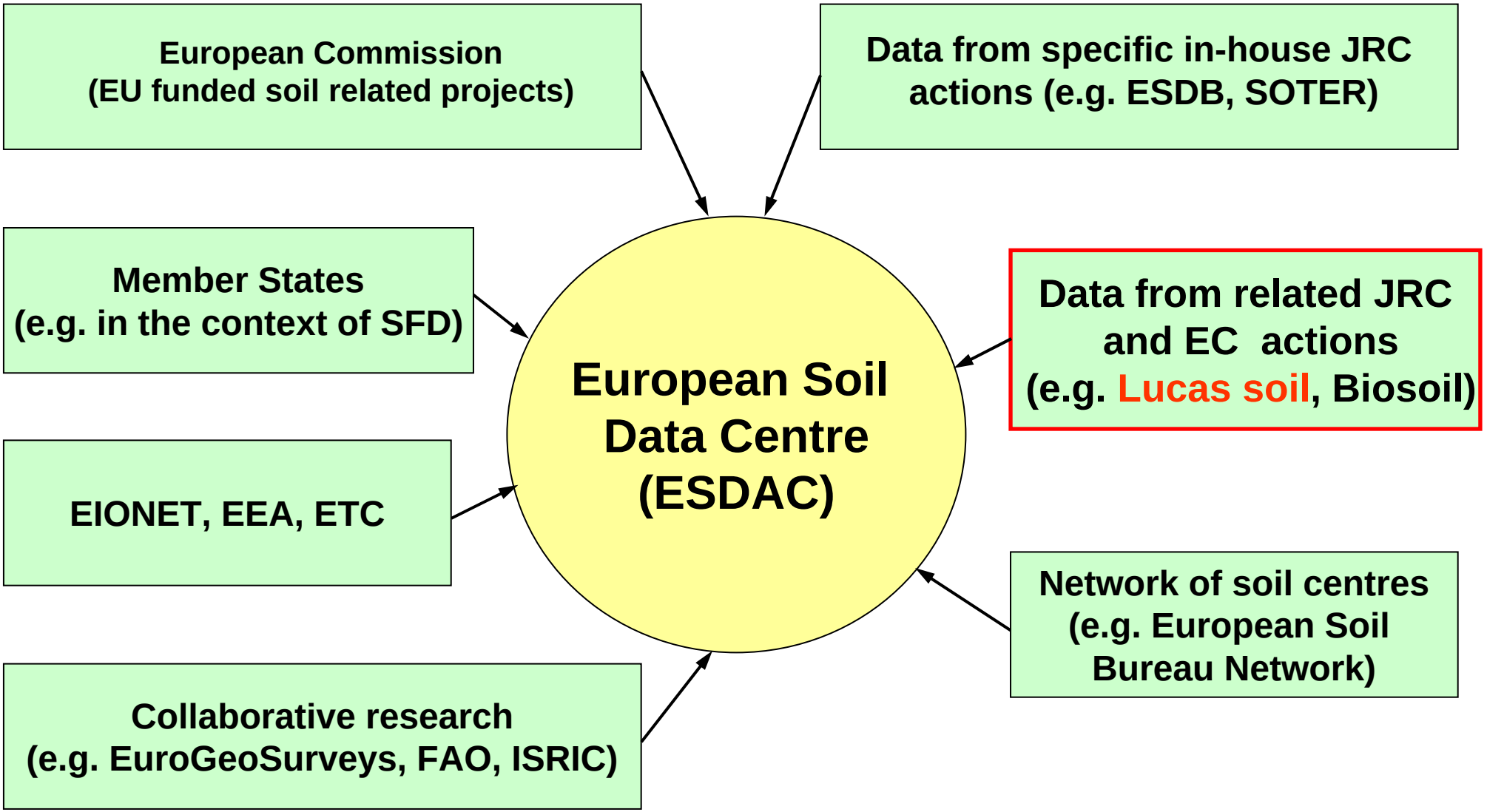


EIONET Data Collection
1km x 1km Raster

Panos Panagos, Marc Van Liedekerke
Institute for Environment and Sustainability
Joint Research Centre of the European Commission
E-mail: panos.panagos@jrc.ec.europa.eu

ESDAC Information Providers



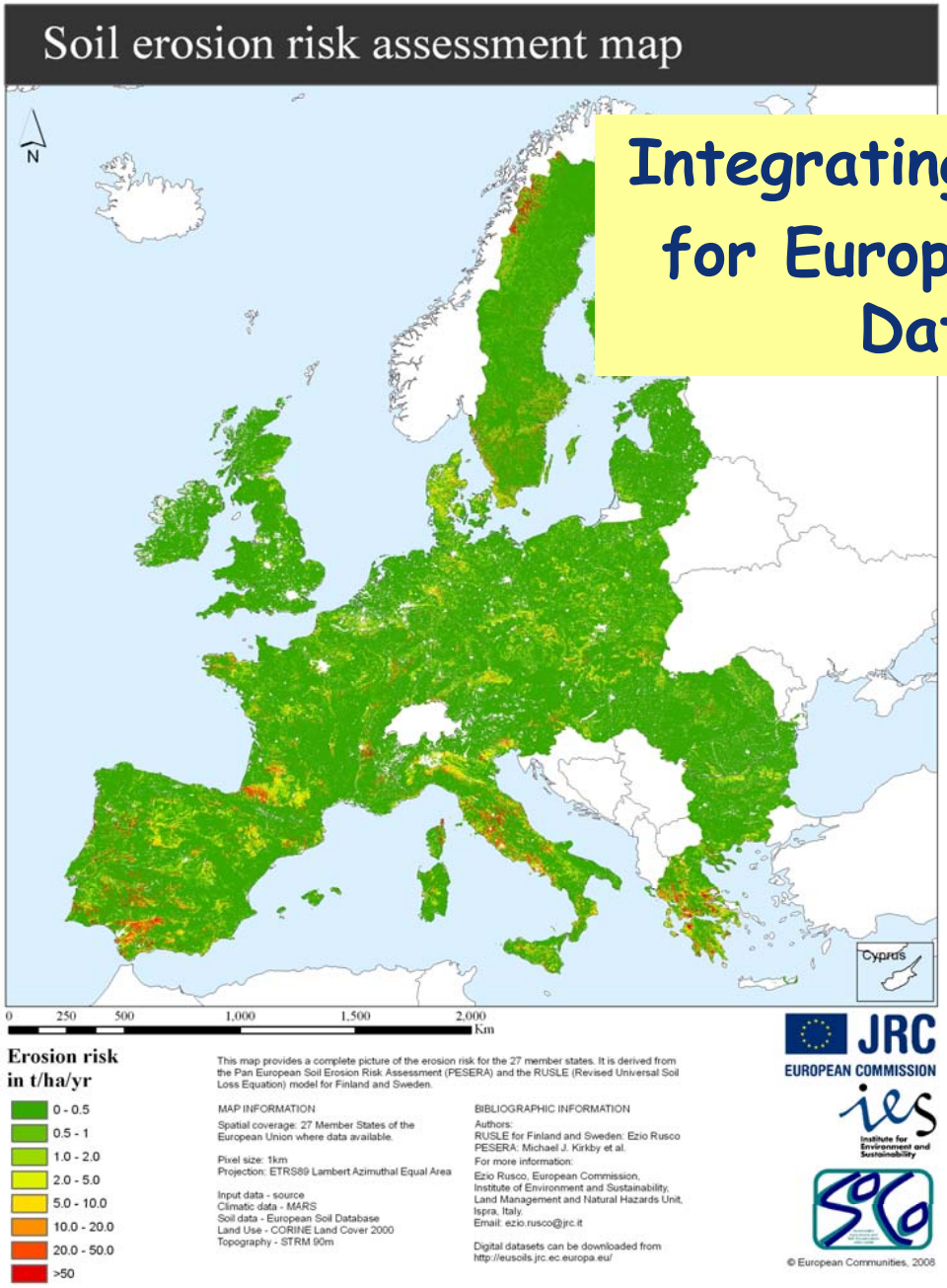
Data and information Sources

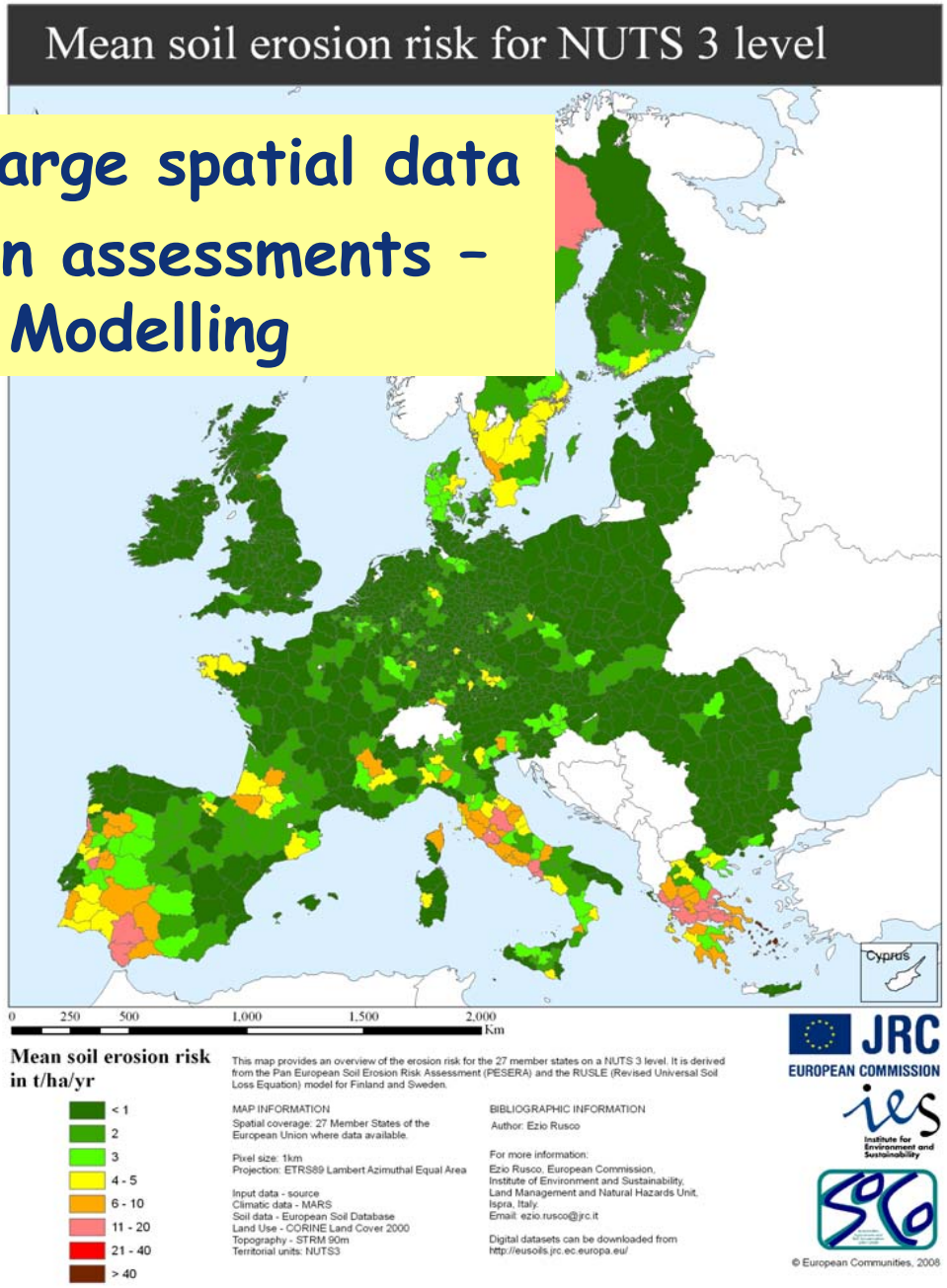
- Integrating large spatial datasets using data Models (PESERA, Organic Carbon, Compaction, ……..)

- LUCAS : Land Use/Land Cover Area Frame Survey

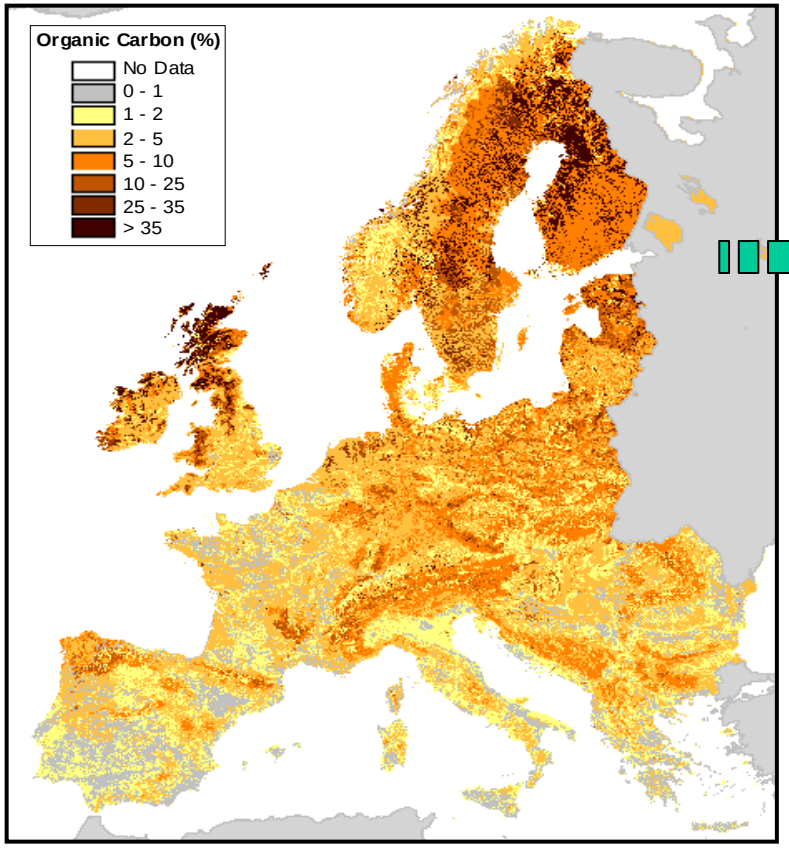
- Collaboration with the Member States and especially with our Networks:
  - European Soil Bureau Network (ESBN)
  - EIONET

Integrating large spatial data for European assessments – Data Modelling



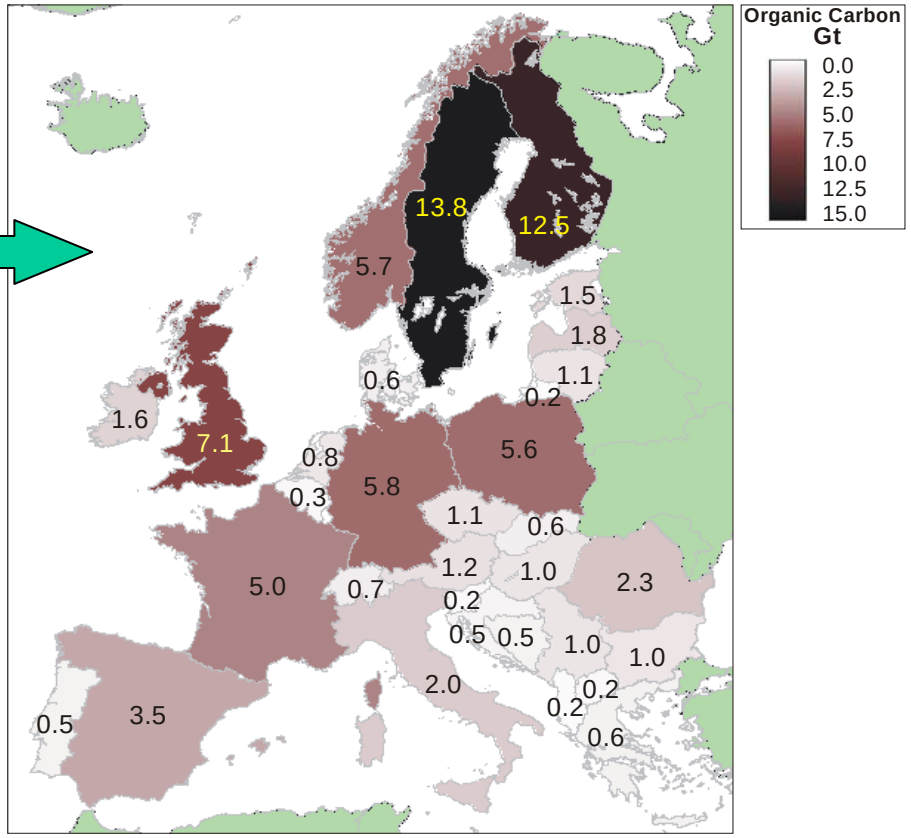


Model output

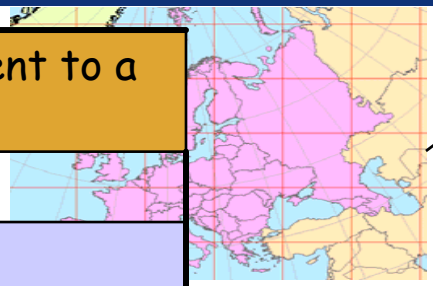


Organic carbon content (%) in the surface horizon (0-30 cm) of soils: total 71 GtC in EU

Aggregated results

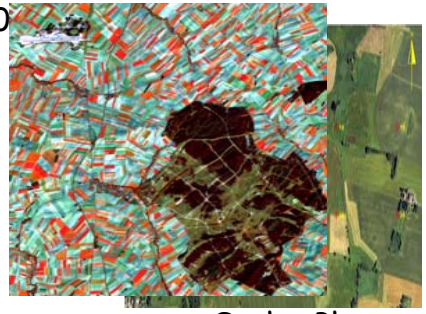


National Soil Organic Carbon stocks (0-30cm) in Gt.



1.000.000 Points

Image 2000



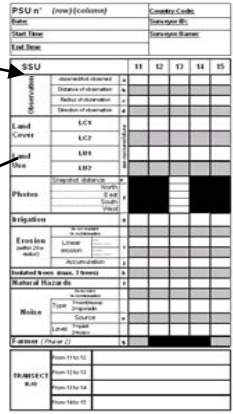
Ortho-Photos

Photo-Interpretation

Sampling

Stratum	Points
Arable	uuuuu
Water	xxxxxx
Artificial	yyyyyy
Woodland	zzzzz

250.000 Points



Compute **statistics**

The Samples have been sent to a Laboratory for analysis
Coarse fragments
Particle size distribution
Clay content
Silt Content
Sand Content
pH(CaCl2)
pH(H2O)
Organic carbon
Carbonate content
Phosphorus content
Total nitrogen content
Extractable potassium content
MULTISPECTRAL Properties (With diffuse reflectance measurements saturation)
Cation exchange capacity

- **44,000 Bags**
- **22,000 Samples**
- **500 Surveyors, Equipement**
- **25 Countries**
- **11 Tones**
- **European Soil Archive (JRC)**

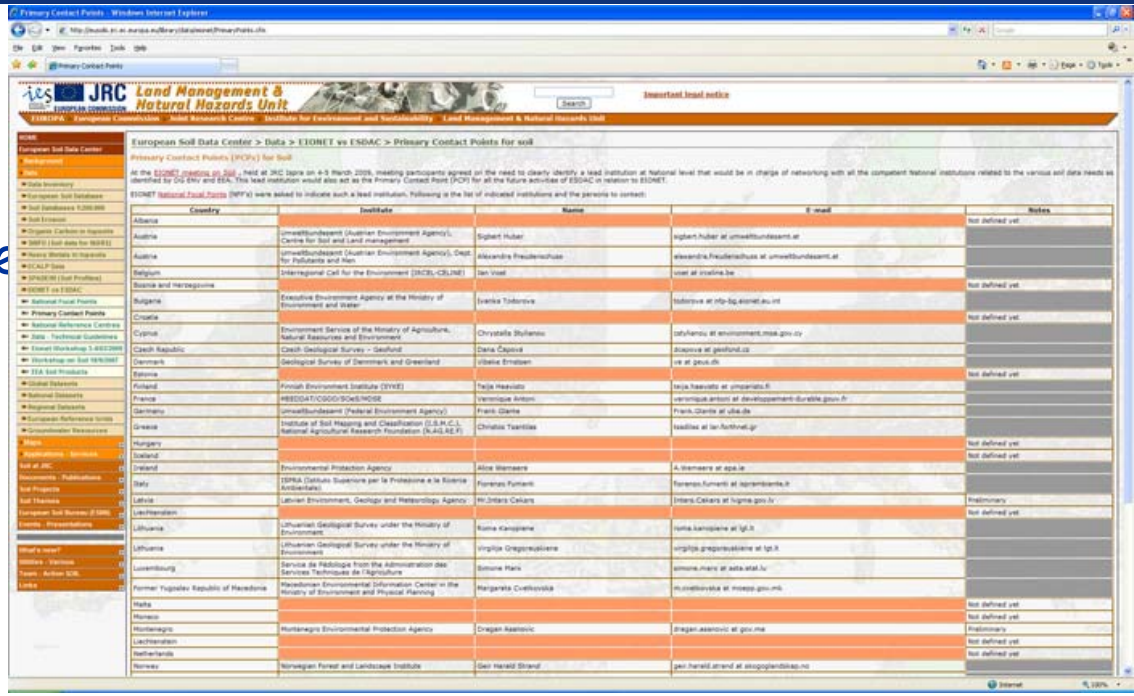
- Identify soil data requirements and reporting obligations
- Present the current and future implementation plan for the European Soil Data Centre
- Present the status and future requirements of the Infrastructure for Spatial Information in the European Community (INSPIRE).
- Present and discuss the views of EIONET members in relation to soil data reporting and INSPIRE
- Identify the way forward towards an operational European Soil Data Centre (beyond 2009)
- Identify the role of the National Reference Centers(NRCs), Primary Contact Points (PCPs), National Focal Points (NFPs) of EIONET in support of the ESDAC
- Establish a framework for the collaboration between EIONET members and ESDAC
- Define the roadmap and future deliverables in the framework of the collaboration between EIONET and ESDAC

Actions: Identify the Primary Contact Points

- Identify a Lead Institution at National level (in charge of networking with all the competent National institutions related to the various soil data needs as identified by DG ENV and EEA)

- The lead institution would also act as the Primary Contact Point (PCP) for all the future activities of ESDAC in relation to EIONET

- Information in the European Soil Portal in the section Data → EIONET vs ESDAC



Collection of Soil Organic Carbon and Erosion data(1)

- Two of the main soil threats in European soils are soil erosion and decline in soil organic matter.
- The EEA and the European Commission DG Environment have identified soil erosion and decline in soil organic matter as priorities in relation to the collection of policy relevant soil data at European scale.
- JRC organises through EIONET a data collection exercise with the objective of creating European-wide datasets for actual soil erosion and soil organic carbon (OC).
- An opportunity for the EIONET member countries to participate in updating these maps, considering that Member Countries frequently have more accurate and updated information

Collection of Soil Organic Carbon and Erosion data(2)

- Technical guidelines and grid files for the collection of soil OC and erosion data are distributed to EIONET members.
  - Data from EIONET member countries are collected according to a grid-based approach
  - 1km x 1km Grid Cells, Each cell carries a unique identifier , INSPIRE Compliant
  - Each country has assigned a number of grid-cells (covering the country territory)

- First phase: Proposal for a technical guideline for the EIONET data collection
  - Date: 22/7/2009 , Deadline for comments 30/9/2009
  - Review of the replies and Compilation of the Final Technical Guidelines

- Second phase (7/7/2010): Data Collection
  - Deadline 31/10/2010
  - Further Objective: Organise a Workshop at the beginning of 2011 based on the data collection exercise (Comparison with existing model outputs and the LUCAS results).

Data collection: Technical Assistance- User Interface

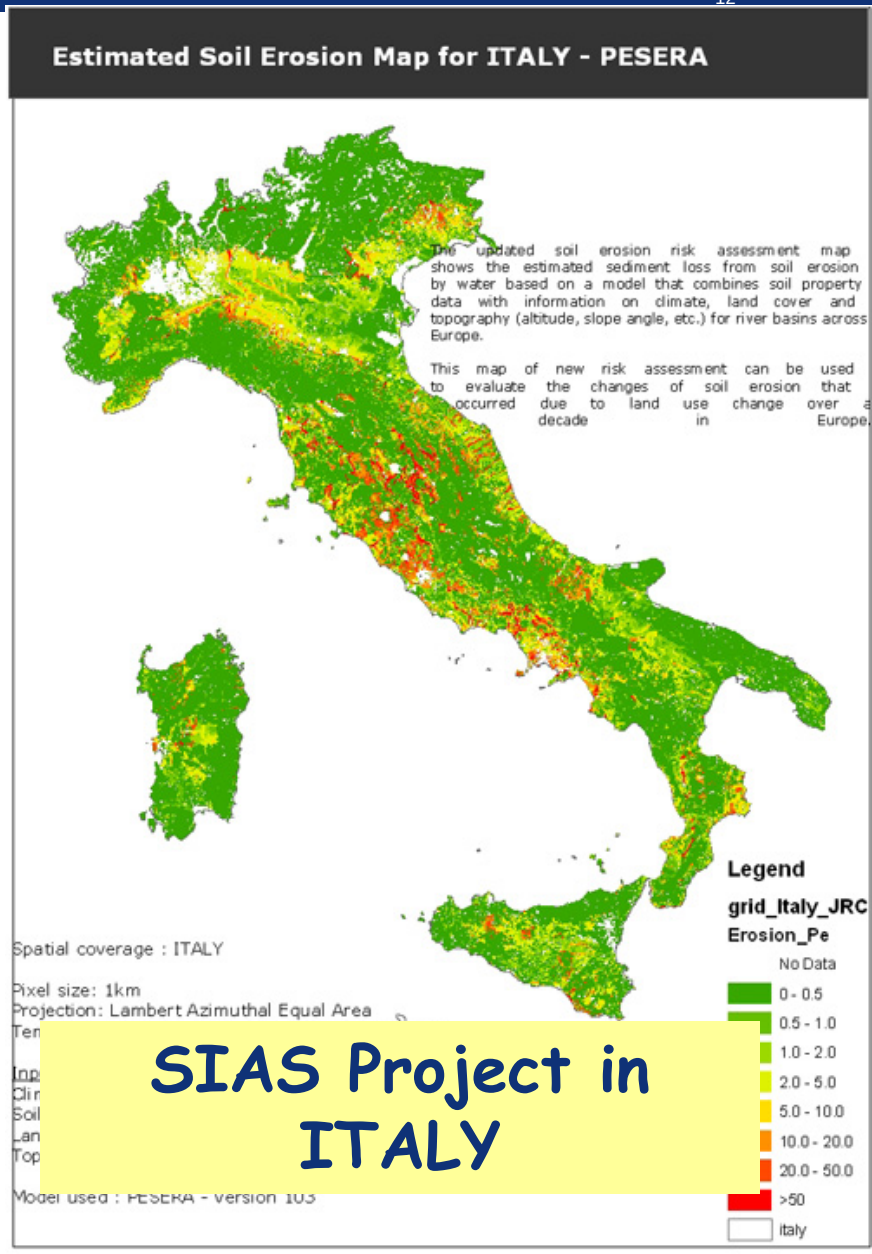
- EIONET members may download the Shape files from the European Soil Portal

- JRC also provided:
  - Country Boundaries,
  - Grid Files according to INSPIRE,
  - Metadata Templates,
  - Technical instructions

Data Collection: Fields

- Erosion: The (actual) soil water erosion are to be provided as quantitative data expressed in t/ha/yr
- If the data are the result of the use of models, details on the models used should be provided in the part on the metadata

- OC_30: soil organic carbon content (stock) for soil in the pixel (t/ha)
- OC_30_per: percentage of organic carbon content for soil in the pixel, 0-30 cm (%)
- OC (as stock and percentage) for the section 0-100cm
- Metadata for bulk density used to calculate OC stock as t/ha should be recorded together with information on sources and methods used to assess OC content.



Summary: The replies of the Member States

- A total of 20 of 38 countries replied (Austria, Belgium, Bulgaria, Czech Republic, Estonia, Finland, France, Germany, Greece, Ireland, Macedonia, Netherlands, Norway, Poland, Portugal, Serbia, Slovakia, Switzerland, Turkey and the United Kingdom).
  - Sixteen countries (AT, BG, CZ, DE, EE, FR, GR, IE, MK, NL, PL, PT, SE, SK, TR, UK) agree in general with the technicalities of the proposal and are ready to provide data, although many ask for clarifications or additional assessment.
  - Four (BE, CH, FI, NO) consider that the results may not make up for the workload

- The process of collaboration for data reporting between the ESDAC and the EIONET is developing in a satisfactory way. The ESDAC acknowledges both the high number of replies received and the quality of the comments. The suggestions have been considered

Data Availability (1)

Country	Erosion	Organic Carbon
Austria	Only erosion risk	No data 0-100 cm
Belgium	May not deliver Field data at parcel scale in chosen sites?	May not deliver Field data at parcel scale in chosen sites?
Bulgaria	Risk of soil erosion calculated by a model based on USLE	Two sources: - Statistical monitoring network (407 sites) - Specific soil survey (0-25, 0-50 and 0-100 cm)
Czech Republic	No info	No info
Estonia	Difficulties (e.g. No data on rate of erosion)	Only in agricultural areas. Not in deeper horizons
Finland	May not deliver Study plots in agricultural land Routine measurements of sediment load in basins	May not deliver -Monitoring of 700 sites in agricultural land Cluster sampling in forest land Not in deeper soils
France	Current erosion risk by MESALES (Soil data 1:1.000.000)	Contact of an expert
Germany	Model at 50 x 50 m	Real data To be checked with national expert
Ireland	PESERA	National Soil Data Base Research project: Soil Organic Carbon
Greece	No info	No data for mountain areas

Country	Erosion	Organic Carbon
Former Yugoslav Republic of Macedonia	Data in m^3 / km^2 / year	Scarce information for small areas
Netherlands	No info	No info
Norway	May not deliver Data available (most limiting data: soil type, at 1:1.000.000, except in some agricultural areas)	Only for cells where most of the soil is agricultural and soil is mapped
Poland	OK with model derived from USLE	OK for agricultural soils Forest soil data incomplete
Portugal	Not sure of delivering	Not sure of delivering
Serbia	Maybe not for the whole country	OK. No further info
Slovakia	OK, no info	Agricultural soils. Three sources of data: - Database from 1960s with 18.000 soil probes - Soil monitoring from 1993, 0-10 cm from 312 sites - Database of SOC stock (1970-2007) 0-20 cm at 10 x 10 km
Switzerland	May not deliver Data not available at nation-wide scale nor grid-based format There is map of soil erosion hazard potential (underlying soil map 1 : 200.000)	May not deliver Data not available at nation-wide scale nor grid-based format Data patchy and heterogeneous
Turkey	No info	No info
United Kingdom	No info	No info

Frequently Asked Questions (1):

- **Inconsistencies in the results**: Different outputs allowed by the different possible methodological approaches will lead to inconsistencies between countries (at boundaries) and/ or non-comparable data.
  - The ESDAC is fully aware of this fact. However, it is considered that by providing their data the countries are offering their current best estimate. This, even if not ideal, constitutes a good platform for future work.

- **Value for one cell**: What would be the value for one cell in case there is more than one measurement. The average? The median? .
  - It is up to the country to decide which value represents best the actual erosion and OC in a cell

- **1km x 1 km grid**. The 1 x 1 km grid might not be the better scale: it misses parcel data but is still too detailed (and entails a high workload)
  - The proposed 1 x 1 km grid is a resolution suitable for pan-European assessments; it is also one of the grids adopted by INSPIRE for the sake of reporting and display. Countries could upscale or downscale the data at national level in order to fit with the European grid

Frequently Asked Questions (2):

- **Practical improvements**: It was suggested to report the confidence intervals of the data and to add the time of data collection .
  - These elements should be included in the metadata

- **Missing data**. Many countries have data from a monitoring network of chosen sites. It is implicit that the up-scaling and extrapolation of this data has not been done.
  - ESDAC would like the countries to provide their available data in the proposed format. If, for any reason, it is not possible to bring the data in the requested format, ESDAC would appreciate if countries can send their erosion and OC data in the format they have available.

- **Assessment**. Some countries ask for help for calculating/ extrapolating/modeling
  - ESDAC will try to help these countries on an individual basis as much as it can in guiding them to perform such calculations. It will be glad to share its knowledge and promote the exchange of information among the participants.