Geophysical Research Abstracts
Vol. 14, EGU2012-10870, 2012
EGU General Assembly 2012

Soil Organic Carbon dynamics in agricultural soils of Veneto Region

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One of the eight soil threats expressed in the European Commission's Thematic Strategy for Soil Protection (COM (2006)231 final) it's the decline in Soil Organic Matter (SOM). His preservation is recognized as with the objective to ensure that the soils of Europe remain healthy and capable of supporting human activities and ecosystems. One of the key goals of the strategy is to maintain and improve Soil Organic Carbon (SOC) levels. As climate change is identified as a common element in many of the soil threats, the European Commission (EC) intends to assess the actual contribution of the soil protection to climate change mitigation and the effects of climate change on the possible depletion of SOM. A substantial proportion of European land is occupied by agriculture, and consequently plays a crucial role in maintaining natural resources. Organic carbon preservation and sequestration in the EU's agricultural soils could have some potential to mitigate the effects of climate change, particularly linked to preventing certain land use changes and maintaining SOC stocks.
The objective of this study is to assess the SOC dynamics in agricultural soils (cropland and grassland) at regional scale, focusing on changes due to land use. A sub-objective would be the evaluation of the most used land management practices and their effect on SOC content.
This assessment aims to determine the geographical distribution of the potential GHG mitigation options, focusing on hot spots in the EU, where mitigation actions would be particularly efficient and is linked with the on-going work in the JRC SOIL Action.
The pilot area is Veneto Region. The data available are coming from different sources, timing and involve different variables as: soil texture, climate, soil disturbance, managements and nutrients. The first source of data is the LUCAS project (Land Use/Land Cover Area Frame statistical Survey). Started in 2001, the LUCAS project aims to monitor changes in land cover/use and management of the EU territory by field observations of geo-referenced points. In 2009, a topsoil (0-30 cm) module was included to the survey and a subset of around 21,000 sites was sampled in 23 Member States. The second source is a soil survey monitoring pilot campaign carried in Veneto Region last year. The pilot campaign has been organized with the collaboration between JRC, University of Padova and ARPAV Veneto. The scope was to apply the LUCAS methodology to an experimental soil survey of 40 samples. The selection of the points to survey has been done on the basis of the LUCAS project related to Veneto Region, pedo-climatic and management unit conditions and the database on soils belonging to ARPAV Soil Unit, collected ante 2000.
Data started to be investigated and permit to show changes in SOC content in a decade for different land use/cover and climatic areas. Through the bulk density data collected and the data already available from ARPAV library, it's possible to evaluate the Carbon stocks of Veneto region. Possible changes in Carbon can be related to land use changes and different strategies of management practices adopted over time.