



## **A bottom up approach to assess spatial distribution of Soil Organic Carbon (SOC) at the regional scale (Flanders; Belgium).**

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The global Soil Organic Carbon (SOC) stock is a very important element of the C-cycle. Regional scale estimates of the amount of SOC are important for better understanding the significance of this reservoir in global climate and environmental issues.

In this study an estimate of the total SOC amount in Flanders (Belgium) is presented. Over 6000 SOC measurements from the dataset 'Aardewerk' were combined with the digital land use map and digital soil map of Flanders. The spatial distribution of the SOC content is studied in relation to factors such as soil texture, soil moisture (drainage class), and land use. The resulting map consists of different classes that are combinations of these factors. It has a resolution of 15 metres.

SOC distributions are investigated at two depths: 1 meter and 30 centimetres. These depths were used, to enable comparisons with similar international estimates. The results reflect that the lowest amount of SOC is stocked under cropland. The highest amount is found under grassland for a depth of 1 meter. In the top soil, forested land stocks the highest amount of SOC.

Furthermore a significant correlation between the SOC stock and the ground water table depth was found. Sandy loam soils stock the lowest amount of SOC whereas clay soils retain the highest amounts. Based on above-mentioned relationships a multiple regression model was created, using the entire dataset.

To calculate a general SOC value of one particular class of the map the mean SOC value of the observations in that particular class can be taken. Alternatively our model based on all the observations, can also be used to predict a general SOC value of one

particular class of the map. The two methodologies are compared. A major advantage of our model is the production of more reliable class specific SOC values, even for small classes with only a few (or without) observations.