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Soil Organic Carbon Storage of China estimation Based on the National 1:1,000,000 Soil Database

Soil organic carbon(SOC) storage and density were estimated by a method, in which SOC density and SOC storage can be expressed in space based on 1:1,000,000 soil database of China, which consists of 3 parts, 1:1,00,0000 digital soil map, soils profiles attribution database and soil reference system of China. The digital soil map contains more than 94,000 polygons and 926 soil mapping units including 690 soil families. 7,292 soil profiles were collected and their physical, chemical and morphological data are used as a source for the soil profile attribution database, which includes 81 descriptive fields. SOC density of soil profiles were calculated and linked to soil polygons of the digital soil map by a method referred to as "GIS linkage based on soil type", resulting in a vector map of 1:1,000,000 SOC density in China. The SOC storage of the country or of one soil can be estimated by summing all selected polygon's SOC storage, further the SOC density can be obtained by dividing the total storage by the area. After manipulation of the data base it was determined that the SOC storage and SOC density of the country are estimated to be approximately 89.14 Pg (1 Pg = 1015g) and 96.0 t C/ha., representing all soils with total area of 9,281,000 km^2, which may be considered as the closest values to the actual levels for China.

Parameters for SOC Dynamic Monitoring at a National Scale

Regionalized soil attribute parameters for SOC dynamic monitoring at national scale of China are generated based on 1:1,000,000 soil database of China, which was mentioned above. The regionalized soil attribute parameters include depth of soil profile, bulk density, particle composition (sand, silt and clay), pH, organic carbon, total nitrogen, field water capacity and wilting point etc, which are generated for different depths of soil profile, including, 0-10cm, 10-20cm, 20-30cm, 30-70cm and > 70cm. These regionalized soil attribute maps at different depth are output as grids with 10km×10km and 2km×2km resolutions for China. In order to need

the research of soil organic carbon dynamic for different territorial ecosystems, these regionalized soil attribute maps at different depth are generated into national scale soil attribute parameters for different land covers including crops, forest, pasture, etc.