

Soil Organic Carbon Stocks in Depositional Landscapes of Bavaria

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Erosion leads to redistribution and accumulation of soil organic matter (SOM) within agricultural landscapes. These fluvic and colluvic deposits are characterized by a highly diverse vertical structure and can contain high amounts of soil organic carbon (SOC) over the whole soil profile. Depositional landscapes are therefore not only productive sites for agricultural use but also influence carbon dynamics which is of great interest with regard on the recent climate change debate. The aim of our study is to elucidate the spatial distribution of organic carbon stocks, as well as its depth function and the role of these landscapes as a reservoir for SOM. Therefore we compare two representative depositional landscapes in Bavaria composed of different parent materials (carbonate vs. granitic). We hypothesize that the soils associated with different depositional processes (fluvial vs. colluvial) differ in SOC contents and stocks, also because of different hydromorphic regimes in fluvic versus colluvic soil profiles. Sampling sites are located in the Alpine Foreland (quaternary moraines with carbonatic parent material) and the foothills of the Bavarian Forest (Granite with Loess) with the main soil types Fluvisols, Gleysols and Luvisols. At both sites we sampled twelve soil profiles up to 150 cm depth, six in the floodplain and six along a vertical slope transect. We took undisturbed soil samples from each horizon and analyzed them for bulk density, total Carbon (OC and IC) and total Nitrogen (N) concentrations. This approach allows to calculate total OC contents and OC stocks and to investigate vertical and horizontal distribution of OC stocks. It will also reveal differences in OC stocks due to the location of the soil profile in fluvic or colluvic deposition scenarios.