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Carbon stocks in agriculturally used organic soils in Germany

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In Germany, the status quo of carbon stocks in agricultural soils is currently determined as part of the Agricultural Soil Inventory (BZE-LW). Based on an 8x8 km grid, agriculturally used soils were mapped according to the German Soil Mapping Guideline (KA5) and sampled following standardised protocols. All samples were analysed for soil organic carbon, bulk density and further soil properties. As organic soils differ from mineral soils in terms of major soil properties and functions, they were regarded separately. Up to now, 79 % of the sampling sites have been analysed and quality-checked. We extracted 144 sites that are to be classified as “organic soil” in a broader sense, but only 44 % of these could be mapped as a “typical” bog or fen peat soil or organic marsh soil according to the KA5. All other sites were even more disturbed by anthropogenic activity, e.g. by the application of mineral soil or mixing with mineral subsoil layers. Therefore, a new classification scheme was developed in order to categorize the profiles according to their current status more precisely. Stocks of soil organic carbon (0-100 cm) were determined for each class, including sand-mixed profiles for which literature data is scarce. The results show a high heterogeneity within each class and highlight the need for a) adapting the German soil classification system with regard to organic soils and b) a more diverse perspective on organic soils beyond typical bog or fen peat soils in terms of accounting soil organic carbon stocks and, in future, greenhouse gas emissions.