Geophysical Research Abstracts
Vol. 20, EGU2018-10197, 2018
EGU General Assembly 2018

Impact of climate and management on organic carbon of cropland soils

Anna Kühnel (1), Martin Wiesmeier (1,2), Peter Spörlein (3), Bernd Schilling (3), Ingrid Kögel-Knabner (1,4)

(1) Soil Science, Technical University of Munich, Freising, Germany (anna.kuehnel@wzw.tum.de), (2) Bayerische Landesanstalt für Landwirtschaft, Freising, Germany, (3) Bayerisches Landesamt für Umwelt (LfU), Hof, Germany, (4) Institute for Advanced Study, Technical University of Munich, Garching, Germany

Soil organic carbon (SOC) content is mainly regulated by organic matter fluxes which are associated with the above- and belowground litter production and its decomposition into CO_2. The predicted rising temperatures and changing precipitation regimes might lead to an increased decomposition and release of soil carbon into the atmosphere. In cropland soils, however, management, i.e. the addition of fertilizer, crop rotation and tillage is known to have profound effects on SOC, which makes it difficult to detect the influence of climate. Using long term monitoring sites distributed over Bavaria, we have the unique opportunity to try to distinguish between climate and management effects of SOC change.

Here, we present an assessment of SOC in cropland soils of Bavaria over the last 30 years. We used conditional random forest analysis to detect the influence of site factors, different management practices and precipitation and temperature changes. Our dataset includes 94 sites, where SOC of the topsoil was measured regularly between 1986 and 2016. First results indicate that ploughing had the greatest effect on SOC change, with soils that are not being ploughed having less SOC loss than ploughed soils. This is however dependent on site factors like elevation and slope, and on the regional climate change.