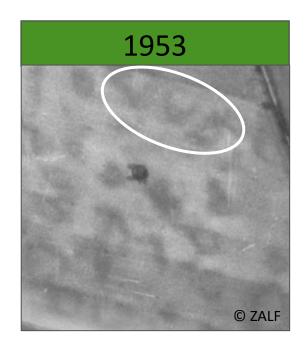
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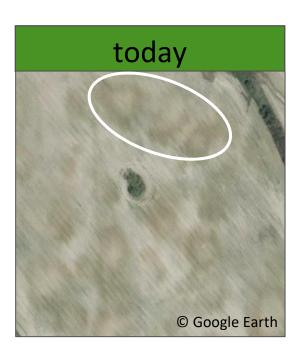
Soil organic and inorganic carbon stocks and dynamics in agro-ecosystems: mechanisms, measurements and modelling strategies



Tillage erosion as an important driver of soil organic carbon (SOC) dynamics long before agricultural mechanisation

Öttl, L. K., Wilken, F., Degg, M.-R., Wehrhan, M., Juřicová, A., Sommer, M., and Fiener, P.









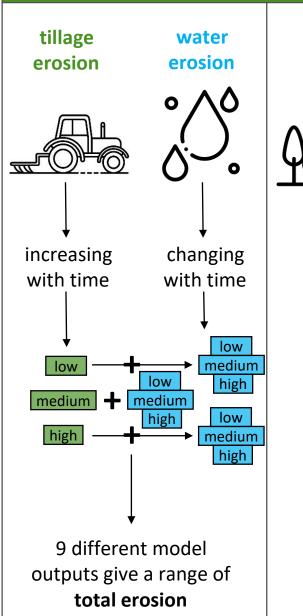
www.researchgate.net/profile/Lena Oettl

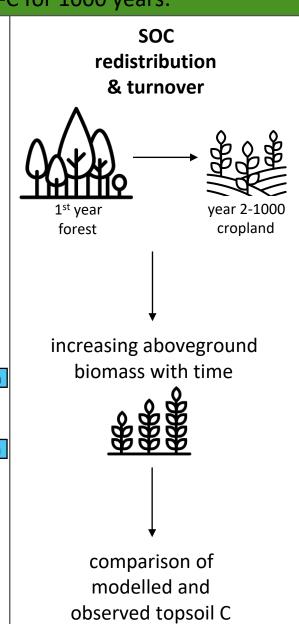
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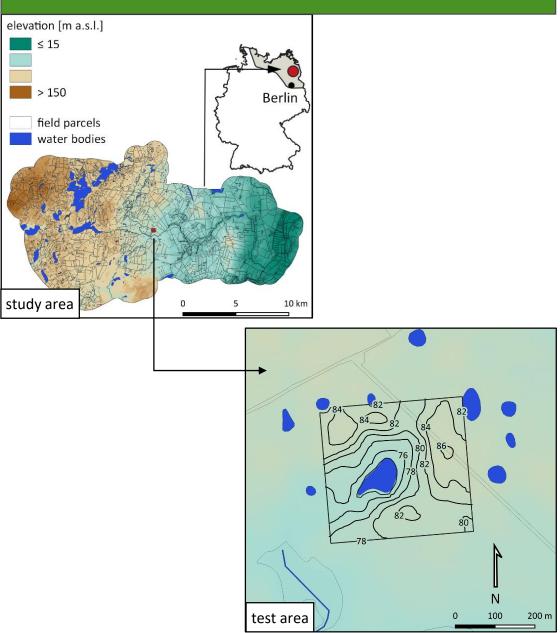


Soil & SOC redistribution modelled with SPEROS-C for 1000 years:





Study area ($\approx 200 \text{ km}^2$) & test area ($\approx 4.2 \text{ ha}$):

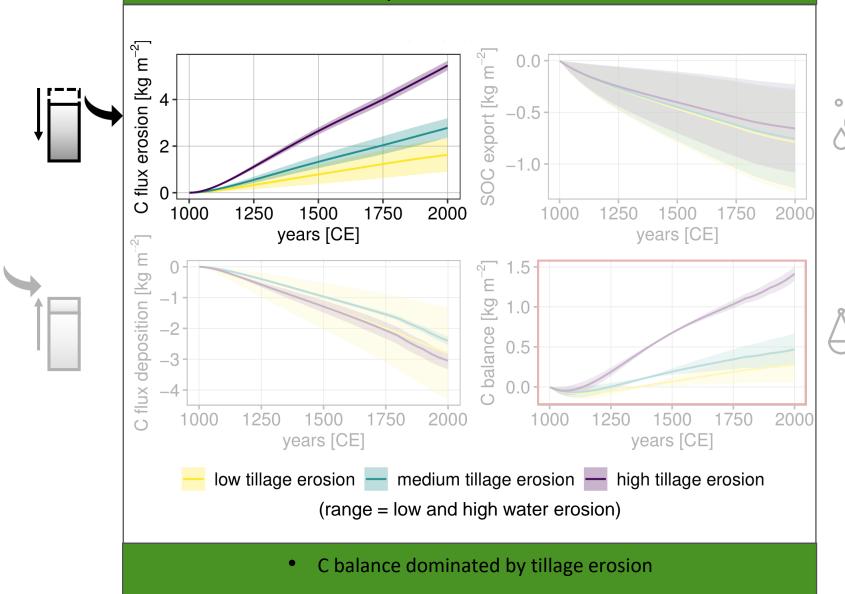


Spatial pattern of modelled (mean of the 9 realisations) & observed topsoil C: total erosion observed Topsoil C [kg m⁻³] ≤ 9.0 9.0 - 10.0 2 m contour lines DEM 10.0 - 11.0 kettle hole and Ν border of test area 11.0 - 12.0 100 200 m > 12.0 C depletion at hilltops can only be explained by tillage erosion

water erosion explains C depletion at steep slopes and in thalwegs

[2/3]

Modelled cumulative C fluxes & C balance over 1000 years for the 9 realisations:



tillage erosion-dominated soil redistribution leads to a C sink