The following supplements accompany the article

Method for estimating soil carbon stock changes in Finnish mineral cropland and grassland soils

Taru Palosuo^{1,*}, Jaakko Heikkinen² and Kristiina Regina²

¹ Natural Resources Institute Finland (Luke), 01370 Vantaa, Finland;

² Natural Resources Institute Finland (Luke), 31600 Jokioinen, Finland

*Corresponding author. Email: taru.palosuo@luke.fi

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Figure S1

Figure S1 Literature review of 14 studies and 68 sites in Finland (references listed below) was conducted to estimate the share of SOC in soil layers below 15 cm. Sites were classified based on the soil type for clay (clay content >30%, n=30), fine (dominant particle size <0.06mm, n=22) and coarse soils (dominant particle size >0.06mm, n=16). Soil C concentration within the profile (black line) was modelled using linear mixed effect model, in which soil type, soil layer (in 10 cm interval) and their interaction were as fixed-effects and the site as a random effect. Soil C concentrations were log-transformed. SOC concentrations were taken as a proxy for SOC amounts by assuming constant bulk density over the depth profile. The estimated share of SOC below 15 cm were 63%, 57% and 59% for clay, fine and coarse soils, accordingly. Grey lines show the original measurements.

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Figure S2

Figure S2. Simulated dynamics of the SOC stock [Mg C ha⁻¹] for *Cropland remaining cropland* as the national mean (large cell) and separately for each regional ELY Centres (small cells). These simulations were done using mean climate data of the period 1961-2013 and annual litter and manure C inputs. The initialisation was done using the same mean climate data and litter input of 1990-1999 to run the model to steady state.

Figure S3

Figure S3. SOC stocks and stock changes of CRC for Southern and Northern Finland calculated based on ELY Centre level simulations (black line) and simulations done based on aggregated input for these subnational regions (grey lines).

Figure S4

Figure S4 Comparison of SOC stocks at ELY centres in 2009. The open black squares show the observed mean stocks to the depth of 15 cm with 95% confidence intervals based on the national soil monitoring network (Heikkinen et al. (2013)). The black boxes show the same observations scaled to the layer of 1 m depth with the help of SOC density functions in Fig. S1. The red and blue triangles mark the simulated SOC stocks to the depth of 1 m calculated using initialisation with agricultural litter input and initialisation with estimated SOC stock of forests for 1900 and pre-running the model for a period of 90 years with agricultural litter input, accordingly.