

Interactive
Comment

Interactive comment on “Only small changes in soil organic carbon and charcoal concentrations found one year after experimental slash-and-burn in a temperate deciduous forest” by E. Eckmeier et al.

E. Eckmeier et al.

Received and published: 29 April 2007

The method we used to determine the charcoal carbon concentrations in our samples, MIR-PLS, is described and discussed in detail in a paper by Janik et al. (2007), which was published recently. The calibration data set consists of 177 soil samples that cover a wide range of Australian soil types of which 121 were used for char C calibration. Bulk samples (< 2 mm) were used in the calibration sample set, while the char C content was measured in $< 53 \mu\text{m}$ samples by UV-photo-oxidation and ^{13}C NMR (Skjemstad et al., 1996). The effects of using different soil fractions are small and were thoroughly discussed by Janik et al. (2007). The cross-validation for char C resulted in a standard

Full Screen / Esc

Printer-friendly Version

Interactive Discussion

Discussion Paper

error of cross-validation of 0.04 g C kg⁻¹ soil and an R² of 0.86 (PRESS analysis). Then 15 randomly selected samples were removed from the set, it was recalibrated and the 15 samples were read as unknowns. The prediction of the 15 samples gave an R² of measured against predicted of 0.78 and a standard error of 0.04 g C kg⁻¹ soil. Because the beta coefficient spectra for char prediction only shows features for char and not other soil features, the origin of samples is not relevant unless the char has a different chemistry to the char in the calibration set samples. Tests with seven soil samples from Kenya revealed that MIR-predicted char C concentrations and CPMAS ¹³C NMR-measured aryl-C concentrations gave an R² of 0.95. The same test was done for samples used in our study with 15 samples, resulting in an R² of 0.81.

Janik, L.J., Skjemstad, J.O., Shepherd, K.D. and Spouncer, L.R.: The prediction of soil carbon fractions using mid-infrared-partial least square analysis, *Australian Journal of Soil Research*, 45, 73-81, 2007. Skjemstad, J.O., Clarke, P., Taylor, J.A., Oades, J.M. and McClure, S.G.: The Chemistry and Nature of Protected Carbon in Soil, *Australian Journal of Soil Research*, 34, 251-271, 1996.

Interactive comment on *Biogeosciences Discuss.*, 4, 595, 2007.

BGD

4, S399–S400, 2007

Interactive
Comment

Full Screen / Esc

Printer-friendly Version

Interactive Discussion

Discussion Paper