Hydrol. Earth Syst. Sci. Discuss., 6, C2646–C2648, 2009
www.hydrol-earth-syst-sci-discuss.net/6/C2646/2009/

Hydrology and Earth System Sciences Discussions

Interactive comment on "Forest decline caused by high soil water conditions in a permafrost region" *by* H. Iwasaki et al.

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Received and published: 17 November 2009

Dear Dr. E. Covelo

We greatly appreciate your thoroughly reading the paper and providing comments and suggestions. We showed the soil profile in Fig. 1.

We determined organic matter content of the soil by the absorbance of extracts (Kumada et al., 1967). Air dried soil (2 g) was shaken for 30 min in 20 mL of 1:1 mixture of 0.25M sodium hydroxide and 0.05M sodium pyrophosphate. The filtrate filtered by filter paper (1 mL) was diluted with 11 mL of distilled water, the absorbance at 520 nm (Abs520nm) measured by spectrophotometer, and organic matter content was calcu-

lated from a standard curve (Eq. (1)) generated with soil samples of known organic matter content(OM). The relationship was described below.

OM = 8.708 (Abs520nm)^3 - 19.81 (Abs520nm)^2 + 18.63 (Abs520nm) + 0.9025 (1)

OM for S, LS and SL was 1.58 $\pm$ 0.512, 1.74 $\pm$ 0.551 and 2.20 $\pm$ 0.777 % (mean $\pm$ standard deviations), respectively. It was difficult to use this relationship (Eq. (1)) for the determination of OM of humus layer because Eq. (1) is limited to use for the soils which has low OM. Takakai et al. (2008) reported the value of 389 $\pm$ 5.45 g kg-1 (mean $\pm$ standard deviations) as the total carbon content of the surface soil (0 – 0.1 m) in this region. This total carbon content value converted to OM using the coefficient 1.724 proposed by Allison (1973) was 67.1 $\pm$ 0.940 % which indicated high OM compared to subsoil.

Reference

Allison, F.E.: Soil organic matter and its role in crop production. Elsevier, Amsterdam, 1973.

Kumada, K., Sato, O., Ohsumi, Y., Ohta, S.: Humus composition of mountain soils in central Japan with special reference to the distribution of P type humic acid. Soil Sci. Plant Nutr., 13, 151-158, 1967.

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Interactive comment on Hydrol. Earth Syst. Sci. Discuss., 6, 6087, 2009.

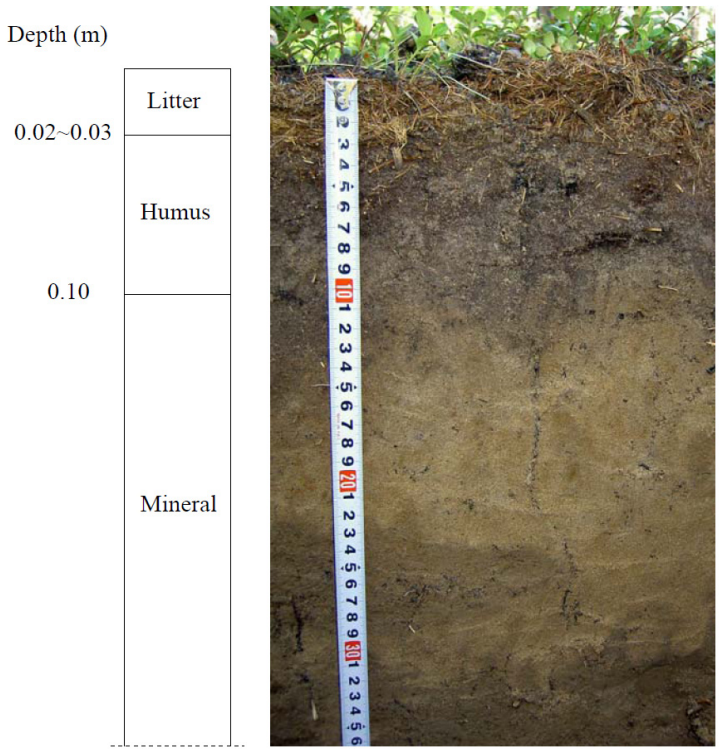

Fig. 1. Picture of soil profile in the study site