**Japan Geoscience Union Meeting 2012**
(May 20-25 2012 at Makuhari, Chiba, Japan)


MIS21-P03 Room:Convention Hall Time:May 23 17:15-18:30

# EM Sounding Characterization of Soil Environment toward Estimation of Potential Non-point Pollution Sources

MORI, Yasushi[1*], Madoka Kawahara[2], Ide Jun'ichiro[3], Somura Hiroaki[2], MIYAMOTO, Tamami[2]

[1]Okayama University, [2]Shimane University, [3]Finnish Forest Research Institute

Land management would affect water environment through infiltration of rainwater/irrigation water or surface water runoff at heavy rainfall event. Soil survey is, however, laborious and take long time for wide area research. In this research, we employed elcctro-magnetic (EM) sounding to conduct soil survey effectively and estimate potential environmental load, which would be discharged to water environment. A multi-frequency EM sounding was performed to measure electrical conductivity (EC) distribution at the soil surface. Soil sampling at 10,30 and 50cm depth, and stream water sampling was also conducted.

As results, EM sounding successfully measured land surface EC distribution, showing most of their properties was represented by land surface EC. EC showed the amount of soluble chemicals at the land, which was the result of fertilizer application, poor infiltration, and so on. Thus high EC was estimated as potential environmental load for water environment. EC decreased when the interval became longer at the combination use of paddy and upland field. EC was higher at non-thinning operation forest than that of well-managed forest. The forest floor had lower infiltration than well-managed one, moreover, floor weed was poor at those site. Thus forest with non-thinning operation would affect water environment through surface runoff at the storm event. When ion concentrations at stream water were compared with land EC, Na and Cl were inversely correlated with land EC. Because those two ions were affected by rainwater at Japan sea coast area, this means well-infiltration for low EC site and poor- infiltration for high EC site. In general through EM sounding survey, surface land EC distribution, land conductivity and ion concentration at stream water successfully connected each other. It would be beneficial when this technique is used for watershed management.

Keywords: Electromagnetic sounding, Soil Environment, Non-point sources