**Japan Geoscience Union Meeting 2010**
(May 23-28 2010 at Makuhari, Chiba, Japan)


MIS006-P24 Room: Convention Hall Time: May 26 17:15-18:45

# EM Sounding Characterization of Soil Environment toward Effective Estimation of Potential Non-point Source Load

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A multi-frequency electro-magnetic (EM) sounding method was applied to the forest or agriculture field to investigate the characteristics of non-point pollution load. Longer EM wave can propagate into deeper profile, while shorter wave can not, therefore, if we applied multi-frequency EM soundings to the land, we could obtain vertical profile of the bio-chemical characteristics of the field. Soil environmental properties such as differences in land management were analyzed with electrical conductivity (EC) maps. In addition, vertical EC profiles obtained from EM soundings were compared with EC in drainage ditch or river water. As results, surface soil EC maps successfully extracted the differences in land management affected by fertilizer application, i.e, higher EC for tea farm while lower EC for bamboo field. Moreover, surface EC at the vertical profiles strongly related with drainage ditch or river EC, showing most of the EC in the drainage water was explained by surface EC maps at the EM sounding data. The proposed method has strength in obtaining EC data without sampling river water, therefore, we could know potential non-point pollution load a priori.

Keywords: EM sounding, Soil environment, Pollution load, Watershed