

Amonrat Sangthong 2009: Carbon Stock and Emission in Forest Soils. Master of Science (Environmental Science and Technology), Major Field: Environmental Science and Technology, Division of Science. Thesis Advisor: Ms. Kruamas Smakgahn, Ph.D. 77 pages.

The study aims to estimate carbon stock and loss from forest soils, included considers influencing parameters on carbon loss as carbon-dioxide and methane to atmosphere from forest soil. The experiments were investigated in natural forest (mixed deciduous forest) at the Siridhorn International Environmental Park (SIEP), Phetchaburi province and Eucalyptus forest at Kasetsart University at Kamphaeng Saen (KPS), Nakornpathom province. The study was undertaken in November 2008 to June 2009. Air and soil samples were collected every month. The dark static chamber method was used to collect air sample and to be analyzed for carbon loss by Gas Chromatography. Soil samples were collected and to be analyzed to achieved soil properties included soil carbon loss and stock.

Average carbon-dioxide emissions rate for 8 months from SIEP and KPS site was 40.65 and 29.33 g CO<sub>2</sub>/m<sup>2</sup>, respectively. Highest emission rate was found in June 2009 from both sites, which was 117.61 and 120.46 g CO<sub>2</sub>/m<sup>2</sup> from SIEP and KPS site, respectively. Lowest emission rate from SIEP site was found in March 2008 (12.58 g CO<sub>2</sub>/m<sup>2</sup>). While, lowest emission rate from KPS site was 21.97 g CO<sub>2</sub>/m<sup>2</sup>, which was found in December 2009. However, methane emission from both study area were not found. Soil carbon stock in SIEP and KPS site were 53.05 and 28.90 g/m<sup>2</sup>, respectively. The result showed seasonal plays importance role on carbon dioxide emission from both study sites. Carbon dioxide emission rate in rainy season was 67 and 47 % higher than the rate in dry season from SIEP and KPS site, respectively. The result can be concluded that amount of rainfed, soil moisture, soil organic carbon effect soil carbon loss in terms of CO<sub>2</sub> emission from both sites.

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Thesis Advisor's signature