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

MIS006-P09 会場:コンベンションホール 時間: 5月26日17:15-18:45

測定可能なプールで構築した土壌炭素動態モデル-日本で観測されたリター分解データを用いたパラメータ決定-

A compartment-measurable soil carbon model parameterized by litter decomposition data taken in Japan

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We are developing a new soil carbon model using litter decomposition datasets obtained in Japanese forest. The goal of this study is to develop a model which can reproduce field data obtained in Japanese forests and can be regionally applicable (e.g. national scale). The model is based on the Yasso model which was developed in Finland (Liski et al. 2005). The major assumptions of the model are as follows. (1) Litter consists of three different compounds (extractives, celluloses, lignin-like compounds) which are measurable, and these compounds have their own decomposability (e.g. decomposition constant). (2) The decomposability of each compound does not differ among litter types. (3) The litter types are foliage, branch, stem, fine root and coarse root. (4) The woody litters (branch, stem and coarse root) have physical protection before biological decomposition. (5) The mass of decomposition is given by multiplying the mass of the compounds by the decomposition constant (Olson 1963). (6) The decomposition constant is a function of air temperature and rainfall. We parameterized the model using litter bag decomposition data, and coarse woody debris data which were measured by chronosequence approach. We used the Bayesian calibration to estimate the best parameter sets and to evaluate the uncertainty of the model (Markov Chain Monte Carlo simulation). Further testing and developing a submodel for mineral soil are our next studies.

キーワード:土壌炭素,モデル,分解,リター,マルコフ連鎖モンテカルロ法

Keywords: soil carbon, model, decomposition, litter, Markov Chain Monte Carlo