Prediction of carbon turnover in forest litter and soil using the FullCAM model. (S07-paul230553-Oral)

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Abstract:

Change in soil carbon under afforestation can be estimated using process-based models providing that they have been properly calibrated and verified. To meet this objective, the FullCAM model has been developed by the Australian Greenhouse Office for full carbon accounting in forests. It links the empirical CAMFor model to models of tree growth (3PG), litter decomposition (GENDEC), and soil carbon turnover (RothC). Unlike 3PG, the GENDEC and RothC models had not been calibrated for forest systems. We reviewed litter decomposition data in Australia for model calibration and validation. This was done for both the GENDEC and empirical algorithms in the CAMFor model. RothC was calibrated using data from two long-term experimental studies where comprehensive sets of stand and site data were available, and where the magnitude of carbon cycling in soil had been manipulated. Fractionation of soil sampled from these sites into labile and resistant pools provided additional data for model testing. The calibrations of litter and soil carbon decomposition greatly decreased the uncertainty in predictions of net change in storage of carbon within forest systems.

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