Sensitivity of the CENTURY Model for Estimating Sequestered Soil Carbon Due to the Adoption of No-Till Management in North Central Montana Using Coarse- and Fine- Scale Map Data Sources. (S05-bricklemyer214206-Oral)

Authors:

- R.S.Bricklemyer* - *Montana State University*
- P.R.Miller - *Montana State University*
- K.H.Paustian - *Colorado State University - NREL*
- T.J.Keck - *USDA - NRCS, Whitehall, MT*
- J.M.Antle - *Montana State University*
- G.A.Nielsen - *Montana State University*

Abstract:

Understanding the sensitivity of the CENTURY model to the effects of scale-related soil taxonomic variation in soil texture is critical to reliable soil carbon estimates. Using measured soil texture and organic carbon values from an intensively sampled field for comparison, CENTURY model predictions were initiated so that soil texture and related properties (ex. bulk density) were varied to encompass the range in reported clay content for that field. CENTURY soil organic carbon (SOC) estimates, corresponding to STATSGO (1:250,000 scale) and SSURGO (1:24,000 scale) data, ranged from 21.2 to 49.7 metric tons SOC per hectare (Mt SOC ha-1), and 29.8 to 33.4 Mt SOC ha-1, respectively. The measured clay content for the field was 47% with measured SOC content of 33.3 Mt SOC ha-1. Estimated SOC for the center tendency of the databases (43% clay) and measured SOC differed by 1.9 Mt SOC ha-1. SSURGO data results in a more narrow range of carbon estimates compared to the STATSGO database, however a 3% clay content difference translated to a 1.9 Mt SOC ha-1 difference in estimated SOC content. CENTURY model estimates of SOC were influenced by the scale of map data sources.

Corresponding Author Information:

Ross Bricklemyer phone: 406 - 994 - 5119

Montana State University e-mail: rsb@montana.edu
334 Leon Johnson Hall
Bozeman, MT 59717

Presentation Information:

Presentation Date: Tuesday, November 12, 2002
Presentation Time: 2:00 pm

Keywords:

carbon sequestration, Century Model, soil taxonomic variation, no-till management