

Interactive comment on “Tiling soil textures for terrestrial ecosystem modelling via clustering analysis: a case study with CLASS-CTEM (version 2.1)” by Joe R. Melton et al.

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Received and published: 4 March 2017

This paper represents valuable efforts of incorporating sub-grid soil heterogeneity in a coupled land surface–ecosystem model, CLASS-CTEM. Instead of a mean value in each large CLASS-CTEM grid cell, several soil texture tiles are identified from a fine-resolution soil texture dataset using a clustering algorithm. The effects of tiling soil texture on modeled soil moisture, net ecosystem exchange, respiration, and carbon storage were examined. Although the authors state that "soil textures appear to be reasonably represented for global scale simulations using a simple grid-mean value," the results could still benefit the modeling community.

The paper is well-written and clearly aligned with the goals of the Geoscientific Model
C1

Development Journal. I recommend its publication with a major revision.

General comments:

1. I am willing to see the modeling results when minPts is set to 1%. The purpose of using soil tiles is to represent spatial heterogeneity. However, by setting minPts to 5%, the most heterogeneous regions (e.g. U.S. and China in Figure 6b) turn out to be the regions with the least numbers of soil tiles (Figure 6a). As a result, I don't think 5% is a reasonable threshold. On the other hand, in your ideal case, there is strong assumption that the fine-scale soil texture distribution is symmetrical. This assumption may not hold in the reality when the soil is heterogeneous.

Some specific comments:

1. P4L4, NCEP = National Centers for Environmental Prediction.
2. P7, L16 and L18. What is "pore content"? Air?

Interactive comment on Geosci. Model Dev. Discuss., doi:10.5194/gmd-2017-3, 2017.