**Geoscientific**
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Discussions

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# *Interactive comment on* "Matching soil grid unit resolutions with polygon unit scales for DNDC modelling of regional SOC pool" *by* H. D. Zhang et al.

**Anonymous Referee #1**

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General comments:

Upscaling is a crucial issue for applying process-based models at regional scale. The major obstacle for the upscaling is related to construction of spatial databases which hold all the input data needed to run the model across the target domain. Among the input parameters, soil properties possess the highest uncertainty due to their spatial heterogeneity. The manuscript reports a study on converting a set of soil polygon maps that generated from a nationwide campaign in China into gridding systems. The utilized polygon maps were in six deferent scales (1 : 50 000, 1 : 200 000, 1 : 500 000, 1 : 1 000 000, 1 : 4 000 000 and 1 : 14 000 000). After the conversion, the authors obtained six gridding systems (0.2X0.2km, 0.7X0.7km, 1X1km, 2X2km, 8X8km and 17X17km),

respectively. The authors ran a biogeochemical model, DNDC, in conjunction with each of the 12 maps for a large domain "Taihu watershed". By comparison of the modeled soil organic carbon (SOC) density and storage based on the polygon- and grid-based databases, the authors concluded (1) there is a quantitative relationship between the results from the polygon and grid systems, and (2) the conversion of 1 : 4 000 000 produced the least biases.

The theme of the manuscript well fits to the goal of the journal. The methodology described in the paper is interesting and kind of unique. It should benefit a wide range of readers. I recommend the manuscript be accepted but with major revisions. The major weakness is the language.

There are too many grammatical errors to be listed here, and many sentences are far from fluent. I strongly suggest the authors reorganize the manuscript with help from native English speakers.

Interactive comment on Geosci. Model Dev. Discuss., 8, 2653, 2015.