

## ***Interactive comment on “Effects of climate change and land management on soil organic carbon dynamics and carbon leaching in Northwestern Europe” by M. Stergiadi et al.***

### **Anonymous Referee #1**

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The study “Effects of climate change and land management on soil organic carbon dynamics and carbon leaching in Northwestern Europe” by Stergiadi et al., is interesting and could benefit the scientific knowledge. This type of study is important to understand future change beforehand. However, there are some concerns which should be addressed :

1. Information on a detailed model parameterization is needed regarding the plant growth, which is one of the main source of C input, influencing SOC, DOC etc.
2. The present study claimed in the conclusion that "The Century model proved to be a useful tool for modelling past, present, and future SOC contents and DOC concentra-

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tions...". The main opportunity of this study to make the future projection more reliable is to compare 'current' model results with present measurements for SOC and DOC. A details statistical analysis for model performance is expected. This aspect is weak in the present study. If the measured data or literature values of SOC and DOC from the study region is not available in the top 20 cm soil layer (as needed for model outputs), some depth distribution functions could be useful in model testing. But, still some basic model performance statistics for SOC and DOC are needed within the present time window ('current levels') to make future prediction more reliable.

3. Again, model could be adjusted on the basis of the 'current levels of SOC and DOC' to predict SOC and DOC under future climate and land management scenarios more accurately. This step is important for future projection and needs to be considered carefully.

4. Future climate change scenario is incomplete without addressing the issue of change in atmospheric CO<sub>2</sub> concentration and it's effect on plant growth, C input and SOC etc

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