Biogeosciences

Open Access

Discussions

EGU

Interactive comment on "Interactions between biogeochemical and management factors explain soil organic carbon in Pyrenean grasslands" *by* Antonio Rodríguez et al.

Anonymous Referee #2

Received and published: 15 June 2020

General comments The manuscript aims to understand how environmental and management factors affect SOC in mountain grasslands. And fitted a set of models with explicative purposes using data that comprise a wide range of environmental and management conditions to find the most important driver of grassland SOC. The authors are to be commended on the framing of an interesting study, the collection of a reasonable set of ancillary environment and management data and soil data in what appears to be good quality piece of research. The workload of this article is very huge. However, too many sections and repetitive statements in this article. Be better structured and more concise to attract readers. Deep discussion and comparison of your work is needed in an international context. In discussion section, some discussion on the

mechanism of environmental and management factors should be added. I suggest you add a conclusion section, a concise and clear conclusion will make your article more eye-catching and let readers understand the conclusion of this article more quickly and easily. As the manuscript contains some uncertainties in description of the methods, results, and English writing, I suggest a moderate revision necessary before it can be acceptable for publication in this journal.

Specific comments Line 75 "Soil organic carbon plays key roles in the terrestrial ecosystems." It sounds strange.

Line 179 At least one to two replicates of each patch type were sampled. What are the types of the patch?

Line 155 Not clear sampling design description. Showing a figure with sampling design would be helpful. Add a schematic of experimental design to make it clearer.

Line 192 The abbreviation for soil organic carbon had appeared in line 75, here only need to write SOC.

Line 193 There are 30 variables written in table S1, but here you have written 29 independent environmental variables. Are the two management variables belong to environmental variables? Please check these numbers.

Line 194 These variables were grouped into Regional, landscape, livestock management, soil nutrient stocks, and herbage variables? If so, replace ":" with ",".

Line 201 MTS?

Line 220 Here used livestock stocking rates which measured as livestock units ha-1 to determine grazing intensity. But the feed intake of different types of livestock is different. For example, the intake of cattle is higher than that of sheep. So, can't simply use the livestock units/ha-1 as livestock stocking rates, you need use standard livestock unit.

Line 314 Geophysical model based on geophysical predictors and grazing manage-

ment? There haven't grazing management in Figure S4.

Line 371 Authors need to better describe statistics of SOC.

Line 375 Generally, a part of the sample is used for modeling, and the other part is used for validation. Please describe clearly in here and in Line 279.

Line 379 Silt in here, loam in fig.2. Use consistent terminology of silt, loam, etc? Use one, Please!

Line 382 Why TSIS was the most relevant selected climate predictor? In figure 6s, Soil C/N has a higher relative importance.

Line 383 Please confirm this sentence and the quoted figure. I didn't find TSIS in figure S5 and S6.

In table s1, TSIS described as MST-MAT. In figure s8, MMT also described as MST-MAT Use consistent terminology of MMT, TSIS, etc? Use one, Please!

Line 381 Aboveground biomass and silt had a high relative contribution in the final BRT model obtained, why not selected them in the linear models?

Line 1121 Please add the fitting equation in figure 3 and 4. It is hard to distinguish which trend line belongs to which grazing species or grazing intensity. You can distinguish by color, or add the legend.

Line 25 in SUPPLEMENT Figure S1: points indicate sampling location, sampling location means the sample patches? Please add the legend of the points in this figure.

Line 39 in SUPPLEMENT There is no reference of Figure S3 in the text.

Interactive comment on Biogeosciences Discuss., https://doi.org/10.5194/bg-2020-63, 2020.