

## ***Interactive comment on “Effects of rodent-induced land degradation on ecosystem carbon fluxes in alpine meadow in the Qinghai–Tibet Plateau, China” by F. Peng et al.***

### **Anonymous Referee #3**

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#### Referee comment:

This manuscript tries to explain the influence of different soil and vegetation properties with CO<sub>2</sub> fluxes in an alpine meadow ecosystems. The topic is within the scope of the journal and the findings could deserve to be published, but the manuscript needs a deep improvement before being considered for publication.

The English needs to be thoroughly revised. There are a lot of sentences too long and wrongly built that in some cases make impossible to properly understand its sense. There are also a lot of spelling mistakes and wrongly placed words. In the following comments, I will only mention the more evident of these mistakes.

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The authors should correct the arbitrary use of acronyms and full names.

#### Abstract

P3004 L1-4: The first long sentence of the abstract, corresponding to the introduction, is wrongly built.

P3004 L6-8: In the material and method section only some of the analysed variables are introduced. The authors should mention all the considered variables and the main analyses they conducted. Moreover, there is an inconsistency when the authors mention that degradation aggravates from D1 to D6 and later, in the results, they say that D1 and D3 are the less degraded levels.

P3004 L8-16: The authors should complement the results with data.

#### Introduction:

P3005 L1-8: The introduction has too many unnecessary data about carbon stocks that make difficult to follow the story. The authors should simplify this section and remove some data so it is not necessary to read it several times to understand.

P3005 L12: In what county?

P3005 L15-16: There is a repetition: “reduction in soil C and nitrogen (N) concentration, (Wang et al., 2008b) and soil organic C pool”.

P3006 L19-21: This sentence has no sense.

P3006 L23: Not all the ecosystems loss nutrients or are imbalanced. It is more correct to say that rodent activity triggers these facts.

P 3007 L9: The second objective needs to be rewritten and spp. should be added after Kobresia.

#### Material and methods

P3007 L9-14: The authors have to provide an explanation on how they defined the

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levels of degradation. There is no clear trend from D1 to D6 in any variable of Table 1 and no information is given about how to allocate a plot in, for example, D1 or D2. In another words, how can I distinguish between D1, D2, D4 and D5? If a new plot were selected for the study, what is the rule to allocate it in any of the existing levels?

P3007 L 13: Why were the plots divided in two subplots?

P3007 L18: I guess that the PVC collars were connected to something.

P3008 L6: The brackets are not in the right position (see also P3008 L27).

P3009 1-5: As I said previously, I do not find justified the definition of six levels of degradation, since there is not any pattern to distinguish between levels on the same group. The ANOVA with the levels of degradation (D1-D6) should be removed and only the one with the groups of degradation (Group I and II) should be implemented. This would also contribute to make the analysis more robust (there would be more replicates within each level) and the result section clearer.

P3009 L9: Why the relation of SOC with Rs, Nee and ER is not analysed?

#### Results

P3009 18-20: This analysis is not mentioned in the material and methods section. Moreover, I guess that the analysis was done with the total average, and not with the monthly average.

P3009 19-21: There are five data for six degradation levels.

P3010 L6: This correlation is not significant ( $P > 0.05$ ).

P3010 L10-11: This is not true for all the levels.

P3010 L12: Only ER showed significant differences between levels.

P3010 L15: The p for ER is  $> 0.05$  in this analysis. The value is close to the significant limit and the authors could take it in consideration, but they cannot say that it is  $< 0.05$

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when actually it is not.

P3010 L18: It is the first time that the variables are grouped in biotic and abiotic factors. The authors should mention what they mean with this.

P3010 L19: The p-value of this regression is 0.1, so it is not significant.

P3010 L22: The p-value of this regression is 0.25, so it is not even close to be significant. In the material and methods section, it is mentioned that the significance level is 0.05. The authors should explain when and why they changed the criterion.

#### Discussion

P3011 L3: I am not sure if desertification should be used in this case. I would limit the discussion to land degradation.

P3011 L3: Density should be changed to concentration.

P3011 L3-6: This is not true and should be changed. The higher SOC content is in D2 so the results do not support the previous findings. Moreover, D6 is mentioned here with D1, D4 and D5, when it is in another degradation group. The authors have to be consistent through the manuscript and not interpret the results at convenience.

P3011 L15: ER was not significantly correlated with AGB (see also P3011 L20).

P3011 L24-28: This sentence needs to be rewritten.

P3012 L1: The relation between GEP and AGB was not analysed. It was NEE.

P3012 L12: What happens with D2?

#### Conclusions

This section should be rewritten grouping the conclusions in bullet points corresponding to the objectives of the study.

Tables:

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Table 1: levels needs to be changed to level.

Table 2: The meaning of the value after the  $\pm$  is not indicated, i.e. standard deviation, standard error. . .

Table 3: The result 0.02 of GEP in the group analysis should be in bold.

Figures:

Figure 1: The caption should be rewritten: Values of soil temperature in each degradation level (D1-D6) from June to September. The meaning of the error bars should be indicated.

Figure 2: The correspondence between properties and panels should be indicated in the figure caption (as the authors do in the Figure 3). The meaning of the error bars should be indicated.

Figure 3: SOC is mentioned in the caption and it does not appear in the figure.

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Interactive comment on Solid Earth Discuss., 6, 3003, 2014.