

Interactive comment on “Response of plant community composition and productivity to warming and nitrogen deposition in a temperate meadow ecosystem” by T. Zhang et al.

Anonymous Referee #2

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The aim of this manuscript is to understand the effects of warming and N deposition on plant community composition and productivity in a temperate meadow ecosystem in China, however, it lacks novelty. I guess the study has a value as one of the evidence which should be accumulated for a better understanding about the effects of global climate change.

The MS has two critical defects as “poor novelty” and “inadequate consideration of the result”. In respect to the novelty, if the authors think that the novelty of the MS is the investigation at a specific ecosystem (i.e. temperate meadow ecosystem in China), the authors should clearly state the differences of the meteorological and soil conditions at the experimental site and the degree of the treatment from the previous study at any

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other ecosystem.

The obtained results of this study are very complicated by the presence of interactions. I have to wonder whether the authors have appreciated the results because of the lack of uniformity in the explanations. There are some inconsistent descriptions; i.e., the effect of warming on the evenness is stated as positive in summary and discussions sections but it stated as no effect in the result section; and the effect of warming on belowground productivity is stated as no effect in discussions section but it stated as positive. It seems that the authors concluded the effects of each treatment subjectively. The presence of interaction between years and treatments indicates that the presence and extent of the effects of the treatments vary among years. The authors should first consider the reason for the variance in the effect among years, such as the difference of meteorological condition and long term effects of the treatments.

Moreover, the interaction between warming and nitrogen addition treatment should be consider more closely. When the interaction is found, the authors should describe not only about the presence itself but also about the consideration whether it is synergetic or antagonistic, because the study aim to understand the simultaneous effect of warming and N addition. Note that the presence of interaction does not mean that the warming plus N addition treatment plots significantly differ from control plots. The main effects of each treatment should also be discussed taking into account the presence of the interaction.

Specific comments:

1. Page 6651, Line 11: “Rhizoma pharagmitis” is not listed in Table 1. In a related matter, Table 1 is not explained in the text.
2. Page 6652, Line 12: The time of sampling should be stated.
3. Page 6652, Line 20: Does “the proportion of species” mean “proportional abundance of species” ?

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4. Page 6653, the first paragraph: I wonder whether a good estimation of biomass can be made using only 'cover'. I suggest estimating using both cover and height, or state the regression equation and its coefficient of correlation or RMSE.
5. Page 6653, the 'Statistical analysis' section: Duncan's test has been criticized as being too liberal and seem to be unsuited for ecological research. It is preferable to test the results with more protective method against Type I error.
6. Page 6653, the 'Soil temperature and moisture content' section: The soil moisture content is the lowest in the W+N plots. The authors need to describe the reason and discuss the influence of phenomenon on the result of this study.
7. Page 6655, the 'Importance value' section: Do the importance value of gramineous and forbs mean the sum of the importance value of individual species categorized into each group?
8. Page 6668, Table 2: Please list the effect of blocks in the experimental design.

Minor comments:

1. Page 6653, Line 16: Replace "GLM following a Ducan test" with "GLM followed by a Ducan test".
2. Page 6655, Line 11: Replace "(Fig 4)" with "(Fig 3)".
3. Page 6658, Line 1-6: This sentence is not clear.
4. Page 6658, Line 7-8: Replace "2008 and 2009" with "2007 and 2008".

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