

Interactive comment on “Seasonal and interannual dynamics of soil microbial biomass and available nitrogen in an alpine meadow in the eastern part of Qinghai-Tibet Plateau, China” by Bo Xu et al.

Anonymous Referee #1

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Overall, this is a largely descriptive project, but it is well presented and the overwinter data are valuable as those types of measurements are rare. The authors might work on describing which parts of their study are most novel to help the study be better found and cited within the literature. I have some suggestions below on which topics to emphasize. The data are also remarkably "clean" for soil nutrient data with less heterogeneity of variance between dates than usual and no unusual "hot spots" of activity. The authors might discuss whether quality control measurements may have eliminated such points and if not, why the numbers are so consistent, which is not always the case for these types of studies. $n = 15$ is a reasonably large sample size so I do recognize that that is part of it.

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Abstract is solid. No complaints.

INTRODUCTION I recommend the authors work to define their knowledge gaps better. There are several possible areas to discuss including location of study (including why it may or may not be different from other sites), the rarity of the overwinter measurements (there are probably just a handful of studies with this type of data), and finally, the microbial cultures are not often done in association with these types of seasonal nutrient measurements so that is worth mentioning too and describing which other studies if any have done this. The authors do mention these topics, but don't zero in on specifically what is not currently known and why it is important that we know that. I'm not saying this wasn't done at all—just that it can be done more and better.

L 15. I recommend removing these correction factors as it's widely understood that they are very ecosystem specific and hard to apply to sites in which they are not explicitly calibrated.

Three parts of the meadow were measured. Some discussion is warranted as to the spatial configuration of the sampling and why they were pooled for analysis as a single site ($n = 15$).

Figure 3, Fig. 7. Fig. 6B. These figures all show results that are already shown in the more detailed time courses. The authors can maybe report some of those values in the text if needed and eliminate these figures. If the authors feel this leaves the paper a little thin on figures, I would recommend exploring the relationships among the measured variables and environmental covariates using an approach such as a scatterplot matrix of correlations on a per-sample basis (ie one data point per sample, not averaged by date). Along these lines, providing the raw data as a supplement or as a link to an online repository would add value to the study.

I'm curious as to why the soil N numbers are so low-variance (particularly inorganic N). Were outliers eliminated before analysis? These types of measurements typically show substantial right skew and hot spots. Also TDN and MBN are often an order of

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magnitude higher than the inorganic constituents, but that is not the case here. These points warrant discussion.

The results section is serviceable but kind of boring with its descriptions of seasonal trends and what is "significant" or not sprinkled with uninsightful p-values. I'd like to see more of a narrative structure tied to some hypotheses (eg hypothesis that there will be a crash in N availability at beginning of season as seen in other studies, a hypothesis that would be supported).

This study would benefit from a photograph of the sampled sites.

The paper is completely readable and generally well written. Still, it could use a once-over by a native speaker to fix the most challenging issues for non-native speakers such as proper preposition choice, a few cases of singular/plural mismatch, etc.

Conclusion: keep it focused on the seasonal questions and trends. Climate change is not really addressed in any way in this study and so it's not worth mentioning here. The study's value is in its contribution to basic understanding of soil nutrient cycling seasonality.

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