

Interactive comment on “Above- and below-ground response to soil moisture change on an alpine wetland ecosystem in the Qinghai-Tibetan Plateau, China” by G.-L. Wu et al.

Anonymous Referee #1

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The paper has the aim to investigate the effects the effects of soil moisture spatial heterogeneity on wetland community. In particular, authors used a sequence space-series variation of soil moisture to reflect potential time-series variation of soil moisture in alpine wetland community in order to assess the potential effect of climate change in their study area. The paper is within the scope of the journal and the topic is quite important in order to quantify the potential effects of climate change on grassland ecosystems in alpine areas. Even though the experimental approach sounds quite good, I have some major concerns. All the sites are meadows but no information on grazing (i.e. type of grazing [cows, sheep etc.], stocking rate, seasonality) are given in material and method section. Are the authors completely sure that the differences they found

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are not related to different grazing ? Please provide some evidence for that. Moreover, the experimental design is not completely clear to me. In fact, authors stated that they chose three block for each selected site and they established three 1 x 1 m quadrats in each block for detailed analysis. This means they have 9 quadrats for plot. Why then are they calculating standard error (table 1) on 12 quadrats ? Why did they decide to sample only five quadrat for above ground biomass ? Please clarify better your experimental design. In some part of the paper English has to be re-checked. Please also report citations according to journal style. I think the paper can be accepted for publication in Biogeosciences after the authors will answer the above questions and will solve the following detailed comments.

Page 1 line 7: please change all citation throughout the text according to journal stile. In this case Houghton et al., 2001 instead of “Houghton and others, 2001” Page 2 line 16: “terrestrial environments” instead of “terrestrial and environments” Page 2 line 6: I do not understand the sentence “which indicates an increase in local species richness”. Probably you have to delete it as you have already stated that warming increases species richness Page 2 line 6: “other studies” instead of “other study” (you are citing two studies at the end of the sentence) Page 2 line 22: please cite the studies you are referring to Page 3 line 2: “.” Instead of “.” Page 4 line 22: please check the English of the following sentence because I cannot understand its meaning: “The monthly mean temperature and precipitation, annual average precipitation and annual accumulated temperature of ≥ 0 °C from 1969 to 2005 in this protection area, which showed that annual accumulated temperature for decades is increasing and the regional climate become warmer in this area along the global climate change, which were reviewed in Wu et al. (2009).” Page 5 line 4: please complete the name of all the species you are reporting according to journal style.(i.e.” Kobresia tibetica Maxim.” instead of “Kobresia tibetica”) Page 5 line 7: please change the sentence as “A selection of 15 sampling sites with the same Humic alpine soil and similar historical wetland vegetation in alpine area of the Qinghai-Tibetan Plateau was studied in September 2009” Page 5 line 10-11. If I understood well, you sampled 9 quadrats in total for each plot (3 block x

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3 quadrat). If this is the case, why are you calculating standard error in table 1 using 12 quadrats ? Page 5 line 14-15: you previously stated that the three diagonal sampling quadrats per plot in both three blocks of each site were investigated and sampled, why did you sample only five quadrats for each site to estimate biomass ? Page 5 line 22: "from each quadrats" instead of "from each quadrats from every sampling quadrats" Page 5 line 22: what do you mean saying "in both five blocks in a simple random pattern, then fixed them" ? Please check the English Page 7 line 8: please complete species name (see my previous comment) Page 10 line 10: "Many" instead of "Mnay" Page 11 line 13: "- wetland species -" instead of " - wetland species" Table 2: please write that you are reporting standard error and report the size of your sample (n) Figure 1: it would be better to regress each variable with soil water content at each depth separately instead of plotting all together.

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