

Interactive comment on “Hydrological soil properties control tree regrowth after forest disturbance in the forest-steppe of central Mongolia” by Florian Schneider et al.

Anonymous Referee #2

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General comments

The authors assessed the relative importance of different soil properties on the forest regrowth success after disturbance in central Mongolia. The main problematic is the sustainability of wood resource in a semi-arid region, which, among other factors, depends on soil properties. This study is at the crossroad of soil science/climate change/human activities. As such, the questions addressed in this paper fall within the scope of SOIL.

The hypotheses are clearly stated and the authors neatly wrap everything up by evaluating the hypotheses in the conclusion.

C1

The methods are clearly described and can be reproduced. The methods and the statistical analyses used are adequate to test the hypotheses stated. The tools are not necessarily novel (basic soil analyses). The novelty resides in the studied ecosystems: forests and steppes in Mongolia. This is shown by a rapid bibliometric analysis (on the 1st of December) in a popular scientific search engine: “European forest” - 3410000 results, “German forest” - 2320000 results, “Mongolian forest” - 60900 results. The resulting database is thus original and valuable for the soil science in general as it gives basic pedologic information on a relatively less studied area of the world.

The soils are well described and the descriptions follow FAO guideline. The results are clearly represented, other than the figure 8 (see specific comment). Most of the discussion is relevant and supported by the results. However, key questions arise about the figure 8, which weaken the subsequent parts in the discussion based on the results presented in this figure.

Specific comment

My main concerns is about the figure 8, representing hydraulic conductivity and field capacity results. Important parts of the discussion and the conclusions are based on these results. However, the way these results are presented now do not clearly support the discussion/conclusion.

1) This is a site wise comparison without any statistical analysis, which makes difficult to draw any conclusion.

2) In Fig. 8c, the number of DWIR site is superior to DNOR sites: 10 and 6 sites for DWIR and DNOR, respectively. Then, in Fig. 8d, there are 5 sites for each situation. Is there any explanation of the different number of samples, within one analysis (hydraulic conductivity) and between analyses (more than 5 for hydraulic conductivity, 5 for field capacity)? How the sites for these analyses were chosen? Can the author assure that choice of the sites did not generate any bias? The authors should give information to clarify these points.

C2

3) In the way data are presented in Fig. 8c and 8d, it is not easy to analyse the difference between DWIR and DNOR. What you see in a first sight is just orange and red boxes on the left hand side of the dotted blue line and orange and red boxes on the right hand side of the dotted blue line. . . Then, you have to go back to the map in Fig. 1 to check which DWIR and DNOR sites are closed by so you can start making groups to ease the comparison, like 37+41 for DWIR to compare to 38+40, for hydraulic conductivity. When you compare these 2 groups, you can see that hydraulic conductivity tend to be higher in DWIR compared to DNOR. When you compare field capacity of 37 (DWIR) to 39+40 (DNOR), you can see that indeed field capacity tend to be higher in DWIR situation.

The authors should try to make statistical analysis and improve the presentation of the data (e.g. by group of sites as suggested above) to have results that better supports the conclusion reached.

Technical comment

The word “ecotone” is used several times. Following the Oxford Dictionary of Ecology, ecotone is “a narrow and fairly sharply defined transition zone between two or more different communities. Such edge communities”. It seems there is a misuse of the word ecotone in this article. The central Mongolian forest-steppe is a combination of ecosystems, a complex of ecosystems or a landscape, but not an ecotone. The authors should avoid the use of this word and replace it.

Details of the measurements of the field capacity should be given (no mention of it in the materials and methods part).

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