Solid Earth Discuss., 6, C9–C12, 2014
www.solid-earth-discuss.net/6/C9/2014/

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Interactive comment on "Variations of soil profile characteristics due to varying time spans since ice retreat in the inner Nordfjord, western Norway" *by* A. Navas et al.

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Received and published: 4 February 2014

General comments: The presented paper ÂńVariations of soil profile characteristics due to varying time spans since ice retreat in the inner Nordfjord, western NorwayÂż give very big and interesting information about soil composition in areas with different stages of deglaciation in Erdalen and Bødalen. It is really that glaciers retreat during last decades in Northern Europe. We see it also in close area at Spitsbergen (Mavlyudov at al., 2012). Authors used complex of methods for analysis and proving of difference of two kinds of soil (Leptosols and Regosols) that origin on moraine and colluvium and find many differences between them. Authors found that derived results

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indicate differences in soil development that are consistent with the age of ice retreat. It means that using of similar complex of methods is enough for distinguish of soil in areas at different stage of deglaciation. It opens big possibilities for study of areas that become free from ice, changing of soil during time and possibility of using of these areas for agricultural purposes.

1. The paper is really address relevant scientific questions within the scope of SE. 2. The paper present novel data about variations of soil profiles have been formed after deglaciation in the upper parts of Erdalen and Bødalen located in the inner Nordfjord in western Norway. 3. The paper ended by substantial conclusions that include finding of difference of soils in areas that have became ice free at different ages by using complex of methods. 4. Using in the paper scientific methods and assumptions valid and clearly outlined. 5. The results in the paper are sufficient to support the interpretations and conclusions. 6. The description of experiments and calculations is sufficiently complete and precise but it may be will not allow their reproduction by fellow scientists because authors not represent exact criteria of using places of samples taking in areas presented in the paper. Authors are not explaining why they use concrete places for sampling, why these places are better then others and why they believe that these places are representative. In any case it is better to say that results presented in the paper are preliminary. 7. The authors in the paper give proper credit to related work and clearly indicate their own original contribution to receiving new data. 8. The title is enough clearly reflect the contents of the paper. 9. The abstract provide a concise and complete summary. 10. The overall presentation is enough well structured and clear. 11. The language of paper is enough fluent and precise. 12. All mathematical symbols, abbreviations, and units in the paper are correctly defined and used. 13. Some changing is in Technical corrections. 14. The number and quality of references are enough appropriate (some recommendations are in Specific comments). 15. The amount and quality of supplementary material is enough appropriate.

Specific comments: It is not clear from the text what authors are doing with stones in

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the soil samples (page 95, lines 21-22). Are stones also "ground, homogenized and quartered" or not. If it is not so it is better to say about it and also better to say how big quantities of stones (weight percent and size) were in the each sample. It additionally will show difference between soil at moraine and in colluvium. There is no reference in the methodology of the analysis of the total elemental composition (page 96, line 13). Authors say: "Most of elements were directly correlated among them and correlations were stronger in the colluvium profiles (page 98, lines 19-20). But authors not say what it means. In this case it will be better to give any interpretation and add one or some references connected with this interpretation of data about elements correlation as for example (Wang and Chen, 1998 or Acosta et al., 2011).

Technical corrections: 1) In Conclusions it is need to add zero in 1000 to change it in 10000 (page 105, line 21). 2) As in Table 2 and in Table 3 not used "CV: Coefficient of variation" it is better to remove CV from under the tables. 3) As area in Fig. 2 is situated outside glaciers it will be better to remove square "Glacier" from Agenda. 4) I do not exactly know Journal politic but usually it is not good when used two times one word. In Norwegian "Dalen" means valley and in some places in the paper it is possible to find "Erdalen and Bødalen valleys" (page 92, line 26; page 93, line 22; page 94, line 21; page 105, line 1; page 113, Fig. 1) that means "valley Er and valley Bø valleys". I think that it is better to change. Similar in Norwegian "Breen" means glacier and it is not good to use "Jostedalsbreen ice cap" (page 94, line 4). It will be better to use "Jostedals ice cap" or "Jostedalsbreen".

References: Acosta, J.A., Martínez-Martínez, S., Faz, A., Arocena, J.: Accumulations of major and trace elements in particle size fractions of soils on eight different parent materials, Geoderma, 161, 30–42, 2011. Mavlyudov, B.R., Savatugin, L.M., Solovyanova, I.Yu.: Reaction of the Glaciers of Nordenskiold Land (Spitsbergen archipelago) on climate change, Problems of Arctic and Antarctic, 1 (91), AARI, Sankt-Petersburg, 67-77, 2012 (in Russian). Wang, X.J., Chen, J.S.: Trace element contents and correlation in surface soils in China's eastern alluvial plains, Environmen-

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Interactive comment on Solid Earth Discuss., 6, 91, 2014.