

Interactive comment on “Spatial variation of soil physical properties in adjacent alluvial and colluvial soils under Ustic moisture regime” by M. Sağlam et al.

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Referee 2

Thank you for your comments and suggestions on structure of our manuscript. We have modified the manuscript, accordingly.

General comments

The paper by Sağlam et al. entitled ‘Spatial variation of soil physical properties in adjacent alluvial and colluvial soils under Ustic moisture regime’ presents a local geo-

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statistical study of some soil properties. As such, it is a very limited interest to an international audience. At the end of the introduction section, the authors say (P.4263, L.27-28) that they ‘mainly work to figure out the effects of the topography on soil’ (sic). But they do not present any geostatistical analysis of slope, aspect, or any other topographical variable what so ever, that could serve a better understanding of the relationship between topography and soil. Clearly, if the authors had this aim in mind, they simply missed their scientific objective. However, later in the same introductory paragraph, they state (P.4264, L.1-2) that their ‘objectives (: : :) were to characterize spatial variation of soil physical properties’ (sic). If this were their single scientific objective, then one can say that the authors have completed it. But this is an objective of very limited interest to the reader of HESSD. Further, the paper has many errors in the data Table 1, with incompatibilities with Fig. 2 that cast doubt on the quality of the data themselves, the data analysis, and the data interpretation. In addition, considering the data as given, several interpretation errors can be found (see specific comments). In that sense, my opinion is that this paper does not meet the standards for scientific publication. The paper also suffers from a bad organisation of the Results and Discussion sections, with the Discussion section highly redundant with the Results section. Most of the data interpretation comes from the visual comparison of kriged maps of the soil properties. It is really surprising that the authors did not think to calculate statistical and geostatistical correlations between properties to support their speculative assessments. So my recommendation would be the release of the paper, with the suggestion of a strong revision in order to meet scientific standards, the use of correlation tools (e.g. cross-variograms) to support the interpretation of the data, and a submission to a local scientific journal.

Our response:

The objective of this paper was to evaluate spatial variations of some soil properties in alluvial and adjacent colluvial soils formed on two distinct slopes. In addition, soil management practices applied in these two sites are quite different that mostly irrigated

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agriculture is practices in alluvial site while rainfed (dryland) agriculture is applied in colluvial site As it is well known, soil formation factors are the main determinants of soils spatial variability on a landscape. In this paper, influence of these factors was evaluated in accordance with objectives. Effect of parent material (alluvial vs colluvial), management (irrigated vs. rainfed), and slope (0-2% vs. 2-6%) on spatial variations some physical and chemical properties of these soils formed under a ustic moisture regime was the main objective of this study. Studying topography related variables in more details would result in diversion from the main objective. Considering topography in more detail (i.e. steepness, aspect, and curvature of slope, local elevation, hill slope model, etc.) than other factors (i.e. crop ration, irrigation, soil tillage, type and stratification of parent material, etc.) would swell the manuscript and bury the main objective into details of topography. That is why we stayed at the current details to set a reasonable balance between the variables of soil spatial variations.

In geostatistical studies, correlation analysis gives the relation between two variables at $\bar{A}(h=0)$). However it does not give useful information on spatial relation between two variables. Also, the objective of this study was not compare spatial relationships of soil variables in alluvial and colluvial sites, but analyze differences between the same variables spatial variation in colluvial, alluvial, and whole (colluvial+alluvial) sites. In addition, a correlogram analysis of variables in the study sites would give a more quantitative means. But the correlogram analysis is generally used with transected data. Our data are irregularly gridded. That is why we preferred to conduct a semivariogram analysis and compare spatial pattern of the variables in kriging produced maps as this type of analysis is applied more widely. This method is widely used in comparing spatial pattern of variables. We disagree with the referee on that descriptive (verbal) analysis is weak and speculative; otherwise thousand of published papers would use a wrong method to evaluate and discuss their data.

Some of the statistics (min, max, skewness, and kurtosis) were not presented due the limited place of the Table 1 in the first submission. Now, all statistics are given in Table

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1. We have already calculated the cross–variograms but due to shortage of space we did not present them earlier. However all the correlation has been added to the text.

Specific comments:

Abstract P.4262, L.7. The depth of the samples should be given. P.4262, L.18-19. The error made when using a global instead of local variogram should be characterized quantitatively. P.4262, L.21-23. ‘water management’ is a very generic concept. Please specify what you exactly meant.

Our response:

âĀĀ P.4262, L.7, The depth of soil sampling was provided. âĀĀ P.4262, L.18-19, We have prepared two kinds of semivariograms: local (either colluvial or alluvial site) and global (alluvial and colluvial site together). The local semivariograms should be preferred over global semivariograms as some information is lost when semivariograms are combined. âĀĀ P.4262, L.21-23: The original statement has been changes as “. . .implications for irrigation water management. . . .” (we inserted the word “irrigation”)

Introduction

P.4262, L.26-P.4263, L.1. The text ‘differences in human activities’ is too vague. In its generic meaning, it is not even true, as different human activities do not necessarily imply differentiation of soil properties. P.4263., L.1. It is not true that heterogeneity typifies soil distribution in space: saying that the soil is heterogeneous does not inform us on its spatial distribution, only that it is not homogeneous (uniform distribution). P.4263, L.6-9. The sentence is unnecessary. P.4263, L.16-18. I did not catch the meaning of this sentence. P.4263, L.20-24. This long sentence has a problem of syntax. Revise it. Further, the results of Duffera et al. (2007) seem to be site-specific. Other studies should be referred to, in order to build a more general state of the art. P.4263, L.27. Did you mean ‘due to various factors’? P.4263, L.27-28. If you wanted to study the effects of the topography only, then you need the other factors to be set constant. Or you

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need to set up your experimental design in order to be able to distinguish between the various factors in an unambiguous way. Further, you did not even study topographical attributes such as slope or aspect in this paper. P.4263, L.29. ‘implications’ is a term too vague. Please be more specific. P.4264, L.4. The ‘source’ of the spatial variation of the soil properties was not demonstrated in the paper.

Our response:

âĀĀ P.4262, L.26- P.4263, L.1. I agree with you. The word of ‘differences in’ was deleted. âĀĀ P.4263, L.1: We revised the sentence. Please see the revised version of the manuscript âĀĀ P.4263, L.6-9: This sentence was removed. âĀĀ P.4263 L.16-18: In this sentence we meant that although determination of soil texture is easy soil texture maps are even produced at large scales to represent their spatial distribution. Instead of ‘soil maps’ ‘soil texture maps’ was written. âĀĀ P.4263, L.20-24: We revised the sentence. Please see the revised version of the manuscript. âĀĀ P.4263, L.27: Yes we meant and we modified the content as “Soil characteristics can highly change due to various factors” âĀĀ P.4263, L.27-28: In fact, we wanted to study geologic units (alluvial and colluvial) not the topography. We had to choose a criterion. If we chosen one the other would be suggested by someone else. According the information we have and our field observation the selected criteria is the one possible give the most valuable information. We believe, the others are important but difference in the field is not considerable. However other topographic attributes are involved somehow. âĀĀ P.4263, L.29: this sentence was corrected. âĀĀ P.4264, L4: We decided this sentence is not necessary over there. Therefore it is deleted.

2.Materials and Methods

2.1. Site description

P.4264, L.10. Elevation is certainly not homogeneous (500 m is an average?), otherwise there would be no topographical effects to be expected! Give more information about elevation within the studied site. P.4264, L.11-13. The site comprises several

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parent materials. How do these affect soil properties in regard to the effects of topography? P.4264, L.17-19. Information on slope should also concern the colluvial part of the site.

Our response:

â€” P.4264, L.10: Elevation of the farm office is 500m. However, the min and max elevation we worked is 427m and 471m, respectively. These figures were provided in the section of site description. â€” P.4264, L.11-13: Not several, the study area comprises of two distinct parent materials: Alluvial and colluvial. Parent material affects the soil properties deeply. Although the soil in alluvial field is transported and even distributed randomly it is easy to evaluate the impact of the parent material on soil properties. On the other hand colluvial site consist of the soil deposits of the hill behind and shadowed the effect of the parent material. We grouped all the variations and effects under two geomorphologic units separately. â€” P.4264, L.17-19: Of course, it does. The slope of the colluvial field is almost constant and between 2-6 % (2.1 Site description). There is no abrupt change throughout this site, except at the border of alluvial and colluvial areas. We considered this site as a whole for the point of slope. We revised the sentence. Please see the revised version of the manuscript.

2.2. Field history: Delineations of agricultural fields should be shown in Figure 1, as different agricultural managements can have potential effects on soil properties. P.4264, L.25-P.4265, L.2. Main crop rotation are biennial. Does this mean that vetch, corn, onions and sugar beet are minor crops? What are the proportion of the various crops at the field scale?

Our response:

â€” P.4264, L.25-P.4265, L. 2: Yes, different agricultural management affected on soil properties in the long run. This is clearly demonstrated from neighboring parcels. However, present paper is mainly focuses on description of spatial variations of some soil properties in two geological units. For another paper, we have collected soil manage-

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ment information (soil use, crop type, crop rotations, fertilizers used etc.) for past 5 years. These data statistically analyzed and compared the founding of present paper. We tried to combine everything in a single paper, but unfortunately it was not possible.

2.3 Sampling design and laboratory analysis

There is no description of any of the laboratory (or field?: e.g. bulk density?) analysis that have been used in this paper. You need to explain how you measured particle size distribution, organic matter content, bulk density, available water content and saturated hydraulic conductivity.

Our response:

â“ Methods of soil analysis and their references were provided at this section.

2.4.Exploratory data analysis

P.4265, L.16. No results on skewness or kurtosis are presented in the paper.

â“ P.4265, L.16: Skewness and kurtosis results were provided at Table 1.

2.5. Geostatistical Methods. P.4266, L.3. What types of transformation have been used, and on which properties? P.4266, L.5. Data should also have been checked for any spatial trend. Otherwise ordinary kriging would be unsuitable. P.4266, L.8-10. Generally, the maximum lag distance is controlled by the minimum number of data pairs for variogram calculation. Some also take half of the maximum distance between data points. By the way, what is the maximum distance between two data points. P.4267, L.1. What do you mean by 'each time'?

Our response:

â“ P.4266, L.3: No transformation have been used for clay, BD, and AWC. Yet square root transformation used for silt and sand, and logarithmic was for Ks and SOM. These were now presented in 2.5 Geostatistical Methods. â“ P.4266, L.5. The data were checked for anisotropy. Since the anisotropy ratio (maximum range/minimum range)

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was below 1.3 for all the properties we applied isotropy variograms. We included this statement in the manuscript – P.4266, L.8-10. We considered minimum 20 data pairs in calculation of variograms. We included this sentence in the manuscript. We also limited a maximum lag distance with shortest axis of the study area as we applied isotropic variograms. – P.4267, L.1: We meant by saying ‘each time’ is that ‘for each every calculation’ of any variable (clay, SOM, Ks, etc.). Now, it is substituted with ‘for the all variable’

3. Results

P.4267, L.9-27. All this part of the results presentation should be supported by statistical tests on the means, variances and distributions of the various soil properties. This would help focussing this presentation on those properties which are truly different between the alluvial and colluvial areas. P.4267, L.16. ‘unfavorable conditions’ of what?, and ‘unfavorable’ to what? P.4267, L.17. ‘addition’ by what or by who? P.4267, L.15-19. This is highly speculative, unless you bring data on these unfavourable conditions, and on available water, pore space, aeration capacity. P.4268, L.2. You need to define a criterion for saying what is an ‘abrupt’ rise of a variogram. P.4268, L.4-5. Sill for SOM is also an exception. P.4268, L.6. Explain why small sill and range indicate continuous deposition for colluvium, and large sill and range stable conditions for alluvium. P.4268, L.9-11. Wrong assessment.

Our response:

– P.4267, L.9-27: We revised the related content, accordingly. Please see the revised version of the manuscript. Some other statistics have been added to revised Table 1 (min, max, skewness and kurtosis). To avoid the repetition, these figures are not mention in the text. – P.4267, L.16: ‘Unfavorable condition’ here is drainage problem. We revised the content. Please see the revised version of the manuscript. – P.4267, L.17. It was addition of the manure. We revised the content. – P.4267, L. 15-19: This area suffers with high saline drainage water. Due to the wrong planning

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of the canals and high clay content. The excess of water is hardly drained out of the area. The necessary revision was made. $\hat{\text{A}}\hat{\text{C}}$ P.4268, L.2: This sentence is removed. $\hat{\text{A}}\hat{\text{C}}$ P.4268, L.4-5. Yes, sill of SOM in alluvial area is lower than that in colluvial area. It was corrected. $\hat{\text{A}}\hat{\text{C}}$ P.4268, L.6: We revised the statements. This sentence is removed. Please see the revised version of the manuscript $\hat{\text{A}}\hat{\text{C}}$ P.4268, L9-11. Yes our conclusion about BD is not true. This sentence is removed.

4. Discussion

P.4268, L.18- P.4271, L.19. This discussion section is highly redundant with the results section. Organisation of both sections is to be completely revised. P.4268, L.18-19. Skewness and kurtosis values should be shown in Table 1 or experimental distributions should be presented. P.4268, L.19. Perform normality tests to support your assertion. P.4268, L.23. You did not prove that texture differed between sites. P.4268, L.24. You cannot say that soil is compacted unless you can compare it to a situation where soil is not trafficked. Further, a bulk density of 1.3 kg.dm⁻³ does not seem compatible with compaction. P.4268, L.26. Show a map of silt content to support your assessment. P.4269, L.1-2. Do you have observation data on roots to support your assessment? P.4269, L.4-5. A high silt content is generally associated to high AWC. P.4269, L.8-9. How can you say that the characteristics of the spatial variation of sand content is related to slope if you did not analysed the spatial variation of slope? P.4269, L.11-13. You could calculate covariograms to support your assumption of a strong association between bulk density and texture. P.4269, L.15-17. Why don't you prove it? P.4269, L.17. What do you mean by 'land use'? All your study site is under agricultural use. P.4269, L.22. This is wrong: a smaller sill and range do not necessarily mean a more patchy distribution. P.4269, L.24 vs. P.4269, L.29. 'moderate' or 'high' nugget effect? P.4269, L.24-25. How can a 'moderate' nugget effect could result in a 'considerable amount of variation'?! P.4270, L.1. What do you mean by 'strong'? P.4270, L.4-6. Geometrical trends should show up in directional analysis. P.4270, L.6, and elsewhere. What do you mean by 'faint'? P.4270, L.4-8. Try cross-correlation between clay content

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and bulk density. P.4270, L.10-12. Idem. P.4270, L.8-9. Spatial patterns are not similar. P.4270, L.17. Evidence. P.4270, L.17-18. I seriously doubt that (see Fig. 3, 4). P.4270, L.20. You should locate the river on Fig.1. P.4270, L.22-23. Yes there is! See Fig.4. P.4270, L.26. What do you mean by 'rigorous'? If 'smaller', then why a higher OM return? (see P.4269, L.5-7). P.4270, L.27. Show cropping pattern in a Figure. P.4270, L.28. You should give information on tillage and cropping pattern in the Materials and Methods section. P.4271, L.1-2, L.10. Again show map of silt content. P.4271, L.2-3. Prove it by calculating a correlation coefficient. P.4271, L.3-5. The same. P.4271, L.6. Not supported by Fig.3. P.4271, L.7-8. Wrong assessment. P.4271, L.9. Again, wrong. P.4271, L.10-11. Contradictory with P.4269,L.4! P.4271, L.14-15. Is this sensitive to the class limits of the legend in Fig. 3 to 5? P.4271, L.17-19. What is the error made when using global variograms instead of local ones?

Our response:

âĀĀ P.4268, L. 18-19. The figure of minimum, maximum skewness and kurtosis were added to Table 1. âĀĀ P.4268, L.19: We don't need to perform a normality test since values of skewness can reflect the normality of data. We include the values of skewness in Table 1. âĀĀ P.4268, L.23: Of course we could prove that by a t-test, however, it would be too elaborate to conduct a statistical analysis to say something is different from another. Therefore, we did not conduct any classical statistical tests to comment on the event that was clearly proved by geostatistical parameters. I have added min and max value to Table 1. Although mean clay content is same, the very high clay values is generally detected in alluvial area. Since this soil formed from the deposits of the Āekerek Creek, locally sand accumulated areas decreased mean clay content. When looking at the revised Table 1, max. value of clay is larger in alluvial area than in the other. âĀĀ P.4268, L.24: Yes I agree with you. However, we have measured the depth of the easily penetrable soil in every sampling point. We determined very shallow depths in irrigated heavy clay soil. But due to the limitation we could not present map of the depth of easily penetrable soil. However we revised this section regarding

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your suggestion. P.4268, L.26. Silt map is prepared and presented in Figure 3, 4, and 5. P.4269, L.1-2, Yes, we have collected the disturbed soil surface from the depth of 0-20cm and a couple of disturbed samples from each every point. This gave us enough information about the plant roots. We revised this statement. P.4269, L.4-5. The silt content in both sites is low. This is one of the reasons for low AWC. We included the map of silt content. P.4269, L.8-9. We removed this sentence P.4269, L.11-13. The objective of this study was not analyze spatial relations among parameters in alluvial and adjacent colluvial sites, but show the differences of some soil variables between the two sites in regard with a likely site-specific application of water and nutrients. Therefore, we did not apply any multivariate geostatistical analysis since it would add noting to quality of the paper. P.4269, L.15-17 We revised the statement. Please see the revised version. P.4269, L.17: We wanted to express 'the effect of various land use on BD' in this sentence. We removed this sentence. P.4269, L.22. We removed this sentence. Please see the revised version of the manuscript. P.4269, L.24, P.4269, L.29 , P.4269, L.24-25. A moderate nugget effect means that a 25-50% of the sill comes from very short range variances. We simply considered it "considerable". P.4270.L.1. A semivariogram with a nugget ratio below 25% is simply deemed strongly spatially dependent. Please see Cambardella et al. (1994). P.4270, L.4-6 We conducted an analysis of anisotropy. We applied isotropic variograms since the anisotropy ratio was below 1.3. P.4270, L.6. We removed this sentence . P.4270, L.4-8. We don't need to conduct a cross correlation analysis as we explained its rationale above P.4270, L10-12 and P4270, L.8-9. We revised this content. Please see the revised version P.4270, L.17. We evidenced this. Please see the revised version. P.4270, L.17-18 We revised this content. Please see the revised version. P.4270, L.20. We located the river on the map. Please see the revised of Fig.1. P.4270, L.22-23. ? P.4270, L.26. 'We wanted to express 'vigorous plant growth' instead of 'rigorous '. However during revision this statement is changed P.4270, L.27. For another study we have collected cropping pattern data for the last 5 years to see the effect of soil management

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practices, crops etc. We applied statistics and produced a lot of maps. Results is little complex. Therefore, everything related to this issue is presented in another paper. To give a cropping pattern for, lets say, the last year is not so meaningful. [P.4270, L.28](#). A brief information was presented in [2.2. Field History](#). [P.4271, L.1-2](#) and [P.4271, L.10](#) Map of silt was added to [Figures P.4271, L.2-3](#) and [P.4271, L.3-5](#). We believe that the reader can see this association from comparing the surface maps of these variables. [P.4271, L.6](#). When looked at [Fig 3](#), it can be observed that BD and Ks are negatively associated in areas with the high soil BD except for a small area on the North. For example the place, in the center (a little North) shows high BD value, but on the contrary this area is shown low Ks. We revised this content. Please see the revised version [P.4271, L.7-8](#), you are right. The statement was revised. Please see the revised version. [P.4271, L.9](#). The statement was revised. Please see the revised version [P.4271, L.10-11](#). The mistake was corrected. Please see the revised version. [P.4271, L.14-15](#). The legend limits is same in [Fig.3, 4, and 5](#) for Ks and AWC except for BD. If you compare to [Fig 3 and 5](#), you can observe identical highlights, however this is not the case between the [Fig. 4 and 5](#) for the mention variables. There are some reasons for that: either model works better in alluvial site than in colluvial site or there are more samples collected in alluvial site dominating the results and less samples from colluvial site. However I can not prove either of them from the data we have. [P.4271, L.17-19](#). Of course using the variograms produced from the local data is more valuable, and some degree of error appears when producing the variograms from very large area. Some details in spatial trends were lost when global semivariograms were used instead of local ones. However we cannot say detailed how much is that?

5. Conclusion Why ? and What do you mean by ‘physiographic land unit’? Our response:

[P.4272, L.10-11](#): I meant by ‘physiographic land unit’ is that different geomorphologic units such as alluvial lands or colluvial lands. We revised the sentence.

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Table 1. Nugget ratio and Spatial class must be defined in the text. How was AWC calculated? Ks has generally a log-normal distribution: is it the case here? If yes, logKs values should be used. Our response:

â€œ Nugget ratio and spatial class was defined at the bottom of Table 1. â€œ The calculation of AWC was now added to 2.3. Sampling design and laboratory analysis. â€œ Ks had a log-normal distribution in our study too. Therefore, we used logKs values.

Fig. 2. The number of points appearing on each variogram is not consistent with the experimental design (see P.4265, L.9). There should be 9 points between 0 and 500 m lag. Also, the number of points varies among properties. Why so? Why not show the variograms for all properties? Any nested structure due to the dual sampling design (transect vs. grid)? Fig.3-5. Some maps indicate that data could be affected by outliers. Did you perform any analysis for the detection of outliers? Fig.5. Maps seem to be hardly affected by the choice between global and local variograms (compared to Fig. 3 and 4). Maps of prediction error should be checked to see if the maps of property values predicted either by local or global variograms are significantly different.

Our response:

â€œ Of course, the number of the points on each variogram, is not consistent. The number of points on each variogram among properties and among locations is normally different since the model produces them. Initially we covered the whole area by 500x500m grid. And randomly selected transects were settled (28) for all the directions and sampled specific (5, 15, 35, 65,105, 215, 295, 395m).

â€œ The model we used does not use outliers data. All the points within the range of any specific variables were used to produce map. The data out of the range do not affect the center. Therefore we did not employ any analysis for the detection of outliers.

Technical comments

Abstract P.4262, L.8. it was done. P.4263, L.17-21.

Introduction

P.4262, L.25. 'can' was deleted P.4263, L.2. The year for Junior et al. is supposed to be 2006. P.4263, L.2. 'becomes' was replaced by 'is' P.4263, L.4. It was corrected P.4263, L.11. Reference was corrected. P.4263, L.13. It was corrected P.4263, L.14. it is 1983, corrected P.4263, L.18-9 'would be extremely' was replaced by 'is' P.4263, L.19. 'the' was deleted.

Materials and methods

P. 4264, L.15. 'terrestrial' was replaced by 'ustic moisture regime' P.4265, L.5 'Fine' was deleted. P.4265, L.9. 'arranged as' was replaced by 'located as' P.4265, L.19. It was done. P.4266, L.7.'with' was replaced by 'at' P.4266, L.12. ' be' was replaced by ' provide' P.4266, L.19. ' by' was added. P.4266, L.22. It was corrected. P.4267, L.1. 'the ' was added. P.4267, L.2. 'procedure' was removed.

Results

P. 4267, L.9. This sentence was deleted. P. 4267, L.10. 'finer' was replaced by 'fine' P.4267, L10. Information on slope was moved to Materials and Methods. P. 4267, L.12. 'was' was deleted P. 4267, L. 14-19. This part was move to 'Discussion' P. 4267, L. 15. 'occurred' was replaced by 'accruing' P. 4267, L.21. 'generally' was replaced by 'globally' P. 4267, L. 23. 'determined' was replaced by 'found' P. 4267, L. 24 and 25. 'varied' was replaced by 'variable' P.4268, L1-2. This sentence was deleted. P. 4268, L. 5-7 'to' was deleted, 'in' was replaced by 'at' P.4268, L. 6. 'later' was replaced by ' former'

Discussion

P. 4268, L.18-21. This two sentences were moved to 3. Results P. 4268, L. 20. 'far' was deleted. P.4268, L.22 P. 4268, L.26. more' was added before 'silty' P. 4269, L.2. 'to' was deleted, 'content' was added after 'clay' P. 4269, L.4-7. I agree with you. This description was in wrong place. I have slightly changed and move it to end of the

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'Discussion' section where AWC was discussed. P. 4269, L.6. 'occurred' was deleted. P. 4269, L.8.'that' was replaced by 'the', 'colluvial' is corrected. P. 4269, L.9. 'steepness' was deleted. P. 4269, L.10. 'degree to' was deleted. P. 4269, L.20-23. Yes you are right. It was changed. Now, it is in a form of 'discussion' rather than giving result only. P. 4269, L.23, P4271, L26. They were corrected. P. 4269, L.26, It was corrected P. 4269, L.24. 'and' was added before 'indicated' P. 4270, L.2-3. The one in the 'Results' is just a result; however this sentence here expresses the possible reason. P. 4270, L.5. 'trend in' was replaced by 'trend with' P. 4270, L.17-18. It is singular now. 'clay' was moved to before 'distribution' P. 4270, L.18-19. Yes it is repetition. It was modified. P. 4270, L.10. 'dominated' was replaced by 'dominant' P. 4270, L.14-15. Yes legend class is different. Initially we have produced maps with the identical legends. Since the value of soil properties is different between the sites, some details are lost and sometimes there is only one or two class appeared in one site, when we used the identical legend class values.

5. Conclusion P. 4271, L.25. instead of 'comparable, 'compared' was written. P. 4272, L.1. Both corrections were done. P. 4272, L.2. 'resulted' and 'mostly' were replaced by 'resulting' and 'the', respectively. P. 4272, L.3. 'in' was replaced by 'at.

Table 1. Some of the CVs were miscalculated. I have checked all and corrected them. Sill values are correct. The Figure 2 could mislead you, since it does not reflect the exact values but model gave us these values.

Fig 1. New figure showing the creek was prepared. Fig.2. This figure compares the semivariograms of the soil properties for areas. Due to the large size of them and shortage of place some of the figures had to been cut. But all the necessary information was presented.

Interactive comment on Hydrol. Earth Syst. Sci. Discuss., 8, 4261, 2011.

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