We would like to thank the reviewer for reading our manuscript and making comments and suggestions, which helped to improve the manuscript. We have responded to all comments individually.

Dear authors,

I read with great interest your work on linking the Al, Fe, Mn and Si concentrations to organic carbon in chemically defined fractions. Although the produced dataset is impressive and definitely interesting, I've some major concerns regarding the presentation of the data. First of all, following the abstract and introduction, sites with Fe-rich / P-poor soils were selected. At the moment no data on phosphorus contents are given, Line 147 contradicts by stating that the samples are from "a wide range of Fe-concentrations" and this topic is not further developed. Secondly, most figures have grouped the data between top- and subsoil. At the moment there is no research question or hypothesis given that requires a differentiation between these two compartments. This is also my main concern with the current state of the manuscript, because what is exactly compared in this study? What I understood from your manuscript: 37 sites were selected with similar properties (i.e. P-poor?), but no differentiation or grouping was made (except Top- /Sub-soil, which was not further developed). Figure 1 suggests that there are differences in climatic conditions and/or land use between the samples and in Line 146 it is stated that there were different soil types, but this is at the moment not further developed in your manuscript. I encourage you to reexamine your dataset and create a clearer story line in which comparison between different categories are made.

Response: Thank you for this. We agree that no data on phosphorus content had been presented and we have revised the sentence and removed the P-poor soils from the statement.

We grouped the data into top- and subsoil and based on the hypothesis given in the study, we hypothesised that phase of mineral (e.g. poorly crystalline phase) of the metal(loid)s will contribute more to mineral associated organic matter (in the study soils rather than only the topsoil or subsoil) than other phase of minerals (e.g. crystalline phase). This differentiation was made in our study in the sense that if another phase of mineral is contributing to the topsoil and another phase of mineral is contributing to the subsoil, it would have been made known in the manuscript. However, similar phases contributed to both the top- and subsoils. Our focus of this manuscript was not the climatic conditions or land use. Irrespective of the soil types, we were mainly focused on the top and subsoil. However, we incorporated the different soil types in the generalized linear mixed model in Table 5 and 6.

Minor points for improvement:

L40: "the combined together in" -> "the combination of"

Response: Thank you. We have revised the words as suggested in the revised manuscript.

L117: "from temperate soils" -> likely meant "from temperate climates"

Response: We have already revised the words to read "from temperate regions" in the revised manuscript.

L153: "We further hypothesised that the concentration of Fe will be highest in soils and …" I assume there is a mistake here, as the whole study is on soils.

Response: Thank you for pointing this out and we have revised the sentence in Line 162 to read – "We further hypothesised that the concentration of Fe will be highest amongst the extracted metal(loid)s in soils…."

Table 2: Only displaying the Mean and SE will make the table clearer and would suit better for the main text. The range and median can be added as supplementary.

Response: Thank you for your suggestion, however, we would like to keep the Table 2 as it is because the data for some of the properties (e.g., total Fe in topsoils) are normally distributed and mean values don't clearly reflect the distribution of the data, thus it is better to present both mean and median in the studied soils.

Fig 2/3: "(cm)"in axis title is redundant

Response: Thank you. The "(cm)" has been removed in the revised manuscript.