Interactive comment on "Mineral element stocks in the Yedoma domain: a first assessment in ice-rich permafrost regions" *by* Arthur Monhonval et al.

Anonymous Referee #2

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I appreciate the efforts from the authors. I understand the authors created a valuable dataset for the mineral elements in the yedoma regions, and they also tried to calculated the storage of these elements. I have some comments for the authors to improve the quality of the manuscripts.

1. When the authors introduce the stocks or storage, it is necessary to clarify the depth or thickness of yedoma. At least, the authors should explain the characteristics of yedoma. This is important because the potential readers will be confused about the depth and height in the dataset.

2. It is difficult to follow in the sampling sites section. What is the more than 20 years of sampling? Does that mean the samples were collected during the past 20 years? The authors explained 22 locations (or areas), and total 1292 samples, but did not present

how many sites or profiles. How many soil profiles were measured? In the table 1, the authors introduced this, but is also necessary to explain the number of samples for each location and each yedoma profile. Just briefly introduce this.

3. I did not check the references listed in the Table 1. What did these references mean? These references were conducted in the location (or area), or include environmental conditions for these areas? I suggest the authors add some information about the landform in the table, and so the readers can understand why you select the number of profiles.

4. For the 3.1 and 4.1 sections, the authors claimed they analyzed 144 samples using ICP, what are the 144 samples? What locations, profiles, depths or heights?

5 Table 4, why the negative value for Si content?

6. In the discussion section, I would like to see the disadvantage of pXRF, so the future users can be careful use this dataset. I do not know if there were similar datasets from pXFR, but I know some soil scientists do not believe this method, the authors should also explain why this dataset are valuable for future studies.

7. I think it is necessary to compare the results with existing reports of the elements contents and stocks.

8. The authors calculated the stocks and storage of these elements based on the pXFR methods and the distribution data of yedema. The uncertainties in the yedema distribution itself should be clarified.

9. I encourage the authors dig deeper about the relationship among the elements. For example, compare their contents and distributions with other soils, especially with soils in permafrost regions. These will be more interesting that the implications of the elements release in the present version. For what I see, it is a little speculative.

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