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Open Access Earth System Science Data Discussions

Interactive comment on "Generalized models to estimate carbon and nitrogen stocks of organic soil layers in Interior Alaska" *by* Kristen Manies et al.

Anonymous Referee #2

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The authors describe an 'aggregated' soil carbon and nitrogen dataset for boreal Alaska. Aggregation of the field measured data, for over soil 289 profiles and over 3000 samples (not provided here), is according to soil drainage, state of decomposition and time since last disturbance. This is a valuable contribution since, overall, organic horizons of boreal soils have seldom been adequately characterized (i.e. most studies focused on the mineral part). Soil laboratory methods are well documented, and the chemical methods and statistical methods well described; possible limitations of the data are appropriately discussed. For example, the study illustrates some of the issues that may arise when disparate data sets (i.e. different methods/standards) are used (e.g. line 248-255).

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Discussion paper

The description of the dataset itself in the manuscript is rather limited and this should be improved by adding an Appendix (see comments under data sets below).

Please find below some other comments:

Manuscript: line 19: Add some more town names to Figure 1. Add footnote that several profiles were sampled at a given site. Include more visible North arrow and scale bar (in SI units rather than miles).

line 20: Picture bottom right. Legend includes two drainage classes? How have such cases, when arising, been processed in the dataset itself?

line 35: change C/N to C and N dynamics to avoid possible confusion with C:N ratio.

line 37: There is no second or third, please rephrase this paragraph.

line 52: over 3000 thousand

line 77: Possibly present this as a table (new Table 1): code (X), name, description.

line 156: one progresses

line 157: express bulk density as g cm-3.

line 187 and 188: Both horizon and layer are used. Are they used as synonyms or were (thicker) horizons divided into separate layers for sampling? Please clarify this.

line: 190: than then → (change to) than the

line 202: Change Thickness to Horizon thickness.

line 222: I would suggest you move subsection 3.6 and 3.7 to a new Discussion section (4). This section could also include a comparison with results derived from other studies for boreal regions.

line 274-278: The authors should at least indicate that the units of measurement, respectively domains for observations, for the properties under consideration in the two

csv-files can be found in file Mega-AK metadata.xml. However, I would recommend this information is also summarised in an Appendix.

As indicated, it would be a 'plus' for this data paper if the underpinning 'raw' profiles could also be made available as supplemental information, as they are not presented in https://doi.org/10.5066/P960N1F9, rather than just pointing at several open file reports (pdf's) as is now the case. General: Abbreviations like weren't, wasn't etc do not belong in a manuscript. Please recheck the whole document for such instances.

Figure 3: What depth interval is considered in this figure? The unit of g/cm2 is rather confusing (a typo?).

Table 1: Bulk density given as g/cm2, this should be g/cm3.

Table 1 - 4: For legibility, and future typesetting by ESSD, it would be better to create three columns for each row (e.g. bulk density): n, mean, sd. The symbols for statistical significance would then also become more 'legible'.

Table 3: Bulk density, should be g/cm3. Is this a systematic typo or something else?

Datasets:

Under 'Data access' briefly describe the content of the zip file (csv and xml). Further, please provide an Appendix that describes the content of the csv files.

- Site_GPS_coordinates.csv:

There are 57 sites, yet the paper refers to over 289 profiles. It would be useful to know how many profiles were sampled at each site without readers having to digest this from file (Generalized_models_for_C&N_Alaska.csv). Further, the abbreviations for regions and sites should be provided, preferably in a look-up table (i.e. as a separate csv file). Please note that data in row 57 have 'shifted' to the right; this should be corrected.

- Generalized_models_for_C&N_Alaska.cvs

Specify units of measurement (depth (cm), bulk density (g/cm3), 13C etc.); explain all codes/abbreviations used in the file, as a 'look up' table (i.e. as a separate csv file). For example, add the descriptions from Fig. 2 for drainage.

Note: I realise this information is largely stored in file 'Mega-AK metadata.xml', but this is not really user friendly for the reader. Further, for some properties the measurement units are not specified (see e.g. LOI).

Supplemental information S2: Please add units for bd table.

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