

## ***Interactive comment on “Lake and mire isolation data set for the estimation of post-glacial land uplift in Fennoscandia” by Jari Pohjola et al.***

**Anonymous Referee #2**

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The article ‘Lake and mire isolation dataset for the estimation of post-glacial land uplift in Fennoscandia’ of Pohjola et al. presents a collection of data, drawn from existing, both archaeological and palaeoenvironmental sources. It has been made available on the PANGAEA database. The data covers the complete Holocene and provides information about the ages of the earliest radiocarbon dates from mires and lakes, supposed to be representing their earliest stages after being isolated from the Gulf of Bothnia. Combined with spatial information (location and elevation), this is useful to build or validate and optimise land uplift models for Fennoscandia. Some potential pitfalls or deficiencies in the use of this data are pointed out. However, certain parts need some more critical discussion while others need clarification in order not to confuse or misguide readers and potential data users. Most of it concerns radiocarbon dating.

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Furthermore, the dataset uploaded to PANGAEA could benefit from certain additions, especially for the case that inconsistent results need to be evaluated critically. It would also get more interesting for disciplines apart from postglacial uplift modelling. The conclusion seems to devalue the dataset, as it suggests that it should not be published yet by saying that the search for additional (already existing) data is ongoing. All relevant studies that are already published should already be in the PANGAEA data of this manuscript. I suggest revision and a re-evaluation. Detailed comments can be found below.

Detailed comments:

Page 1

I. 20: Add more references if there are any or put an ‘e.g.’ before the two given citations or mention that these two are the most important (if so).

I. 21: Not a complete sentence (‘the most important source of information is that describing the shoreline displacement’). Please rephrase to make clear what was intended to be said.

Page 2

II. 5-7: This needs to be discussed in further detail. Consequently, ages that are from the first organic layers of ponds or mires are rather indicating the age of the ice retreat but cannot safely be used to infer uplift or isolation from marine influence.

I. 27: define the kind of laboratory analysis or rephrase. For example, simply to: ‘The isolation is defined by the transition from marine or brackish water algae to fresh-water algae.’

Page 3

II. 1-2: Bog and mire? Above, it was pond and mire. As a bog is also a mire, but a mire is not always a bog, please correct. See also page 2, I. 31.

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I. 4: Having information on the material that was sampled in both PANGAEA data files would be very good. It would allow the reader to assess the reliability of the radiocarbon age. Depending on the type of macrofossil or sediment dated, the discrepancies can be large.

Page 4

Figure 2: Why is the term height used, instead of elevation? The unit of Age is given in cal year instead of years BP, as in the text. Be consistent throughout manuscript and dataset.

II. 7-8: Do you mean older than expected? Something in this sentence is wrong: 'the radiocarbon dated burial remains seem to be younger than expected from the radiocarbon datings.' Expected from which datings? Did you want to say that the burial remains should be younger than the radiocarbon dating suggests?

I. 9: Do you mean 'from a time period stretching over thousands of years' or 'from thousands of years ago'? Consider revising to be more precise.

II. 10-12: What about an old wood effect of the dated material? Depending on what type of archaeological material was dated, the marine reservoir effect is unlikely to have altered the sample. What about the possibility that bones of humans were dated, which were eating a lot of fish or molluscs. And: also, freshwater lakes have varying reservoir effects (e.g. Philippsen 2013). Again, the type of material dated (bulk sediment, plant macrofossils, wood, bones, etc.) would be valuable to add directly to the data files provided on PANGAEA.

Page 5

II. 19-22: The term 14C age is normally used for uncalibrated radiocarbon ages (also concerns the 14C-error). In addition, the terminology is different in the .tab data files, where only Age and error are used. Furthermore, the ages given in the .tab file appear to be uncalibrated (for example Hel-146 in archaeological data). It is not only confusing

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but also dangerous if the data is used wrongly by users who believe to have calibrated ages at hand. This needs to be resolved by clear terminology in manuscript and both data files, and maybe with a comment for readers who are less experienced with radiocarbon dating. It needs to be clear if the age is calibrated or not. Right now, the text suggests that calibrated ages are provided, which is not the case in the data.

II. 21-22: Links/URLs to a database or report in lake/mire data file are not existing. Why not?

II. 25-26.: The Bronk Ramsey citation should be put behind 'Oxcal program' in I. 24. The IntCal 13 calibration curve should be cited properly with Reimer et al. (2013). The Reimer reference also appears on Figure 3, so it needs to be in the full references anyway.

II. 25ff.: Does this paragraph relate to the data handling to produce for example Figure 2? It comes a bit out of nowhere as long as the previous lines are saying, that the data is already calibrated. As the radiocarbon data in the data files is not calibrated, consider introducing this paragraph in a different way to put it more into the context of how to handle the data. Right now it says, that "the calibration was done using [...]", but where was it done then?

II. 30-31: 'certain areas' and deferring to Fig. 1 is a bit vague. This should have been at least briefly discussed earlier in the text. For example, it is said in the beginning, that the lake/mire isolation data is the most important for modelling, but the data points are concentrated mostly on the eastern coast of the Gulf of Bothnia.

Page 6

Figure 3.: In the example for a calibration, the scale is set to calBC, which is not mentioned before. See comment above concerning the consistent use of units.

Comments on the files uploaded to PANGAEA ('Fennoscandia\_lake\_mire\_isolation.tab' and 'Fennoscandia\_archaeological\_data.tab')

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- The archaeological data provides URLs to the original radiocarbon data. Unfortunately, this is not the case for the lake/mire isolation data. Why are no URLs or further information provided?

- Referring to the problem of using pond/mire data (page 2, ll. 5-7), how can the data user distinguish between lake radiocarbon data and pond/mire radiocarbon data?

- The whole dataset would greatly benefit from adding the material that was used for radiocarbon dating. By this, the reliability of the ages could be assessed better. Furthermore, disciplines aside from uplift modelling would get attracted to the data collection.

Technical comments:

Page 1

I. 3: its instead of it's

I.14: see previous comment

II. 16-17: Correct citation style '...can be found in Tikkanen and Oksanen (2002), Björck (1995), Punning (1987) and Ojala et al. (2013).

I. 22: 'Nowadays, land uplift...' or 'Ongoing land uplift...' or 'Today's land uplift.'

I. 24: citation style

I. 25: citation style ('Eronen et al. (2001) and Cato (1992) examined the isolation of several lakes...')

Page 2

I. 5: 'on top of'

I. 19: remove 'timing', put 'age' information

I. 28: 'In Finland, the main data. ...'

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II. 30-31: Citation style (brackets). Consider rephrasing: 'Mäkila et al. (2013) present a collection of ...'

Page 3

Figure 1: consider highlighting the Baltic Ice Lake better, as the contrast of the mild blue to the background is partly not high enough. Also think about the graphic being printed in black and white.

Page 5

I. 1: I would use British English (organisation), as you are also using 'archaeology' and not 'archeology'.

II. 20-21: Something is wrong with the structure and the brackets here: '...the name of the place, the reference (14C) Laboratory Identification, if available),...'

I. 32: citation style (see above)

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