

Article: Confronting vicinity of the surface water and sea shore in a shallow glaciogenic aquifer in southern Finland by S. Luoma et al.

Reply to the comments received on 24 Jan 2015.

Thank you very much for your comments. We have made corrections in the updated manuscript based on the comments received. All modifications were written in **red colour** in the manuscript version 3Feb2015.

Editor Decision: Publish subject to minor revisions (24 Jan 2015) by Przemyslaw Wachniew

Comments to the Author:

The significance of your research for the scientific community is not evident. The abstract, introduction and conclusions place the study in the local context of the Finnish coastal aquifers. Meanwhile, rising sea levels and climatic and land use changes affect coastal areas worldwide. Answering several questions might help expose the importance of your findings.

How relevant are your results for coastal areas in Finland, Baltic Sea basin, worldwide?

Are there examples of studies similar in their aims, scope and methods and what distinguishes your study among them?

Is there any added value in the combination of the hydrogeological, hydrochemical, isotopic and statistical methods you applied?

An interesting notion is presented in the final paragraph of chapter 5.2.2 (page 17, lines 6-9) but not repeated in conclusions. Your results seem to have some importance in the context of groundwater vulnerability assessments. See:

Vulnerability of coastal aquifers to groundwater use and climate change Ferguson, G; Gleeson, T
NATURE CLIMATE CHANGE 2(5), 342-345. DOI: 10.1038/NCLIMATE1413

I have also several minor comments.

1. There is no explanation on how CO₂ and alkalinity were determined. It is only mentioned that CO₂ was measured by titration. Provide more details. Was it potentiometric or colorimetric titration?

Both CO₂ and alkalinity were determined by titration methods. CO₂ was measured immediately in the field using a colorimetric titration method. Alkalinity was measured by automatic potentiometric titration immediately upon arrival of the samples at the laboratory. The modification was made in the manuscript.

2. In chapter 3.3, page 8 line 33 – page 9 line you write that “the isotopic composition of the local mean annual precipitation closely follows that of local groundwater”. The opposite statement is more logical as local groundwater is almost entirely derived from precipitation.

The texts are revised in the manuscript.

3. I suggest removing Table 3. The range of variation in lake water isotopic composition can be seen in Fig. 5. Most wells revealed small variations and the exceptions are described in the text.

Done. Table 3 and also the relevant texts were removed from the manuscript.

4. Subchapters 5.2.1 and 5.2.2 could be merged into one and Table 4 removed. The correlations between variables are reflected in results of the PCA. Providing the Pearson correlation coefficients does not add anything to the discussion.

Done, Table 4 was removed and the modification was made in the manuscript.