Biogeosciences Discuss., 10, C9403–C9406, 2014
www.biogeosciences-discuss.net/10/C9403/2014/

Biogeosciences
Discussions
Open Access

Interactive comment on "Lena Delta hydrology and geochemistry" *by* I. Fedorova et al.

Anonymous Referee #2

Received and published: 3 April 2014

Fedorova and colleagues present an interesting manuscript where they combine historical data from Roshydromet and about 10 years of own field data. Although I think there are a lot of important insights to be gained from this seemingly large collection of data, the manuscript - in its current form – fails to do this. I found it difficult to read, chaotic, poorly organized, and often lacking detail (yet sometimes the opposite), or sufficient proof of presented statements.

There were several points made during the introduction and the abstract that triggered my interest. Unfortunately, however, often these topics were not followed up, e.g. "The conclusion that erosion and runoff of sediments is intensified in places where the ice cover of the catchment area is degraded is the important result of this work ..." (p.20183 line 1-2). I could not find any information about this later in the manuscript. Also the statement "...an increase of suspended and dissolved material released from the ice complex" (p.20180 line 15-16), was not given sufficient proof of

in the manuscript.

I feel that this manuscript tries to include too much; in its present state there are 13 Figures, which I initially was tempted to suggest to decrease, but while reading the manuscript I felt that there were many things said and claimed that were not shown or explained. In other words, probably even more figures would be needed to support all the things said. Splitting the manuscript into a hydrological and a geochemical part, as was also suggested by the other reviewer, would be a good idea. When doing that, the authors however should try to keep the intrinsic linkage between hydrology and geochemistry intact, which might be a challenge. That said, I found the geochemical part of the manuscript a bit overstated; the authors cite chemical element concentrations for longer periods (Table 5) but base the rest of their statements on a few C and N analyses from July and August (from one year only?). I also think that restructuring the manuscript is crucial: results and discussion can potentially be combined as this is now often repetitive and/or not in the right order. The headings should be more standardized and thought-through, now they are either unnecessarily long, or too similar or too general.

The presentation of data in the text and in the figure captions is often too vague, please add more detail, for example: (p. 20201 line 25) "..increase by an average of 35 m3/s.." Is this per year? Per decade? Per month? Also, over what period are the changes listed in line 19-23 of p. 20202? Furthermore, (p. 20198 line 7) "long-term": over what period is that? And (p. 20197 line 22) ".. major ion composition is practically unchanged". Is that dissolved or particulate or both? Also, where is the Angardam branch? This is mentioned several times but this is not in Figure 1. There are several more of these examples to make.

Language is certainly something that should be improved too. I understand most of the authors are no native speakers, but if the poor language limits the readability and also the interpretation, this should be improved. There are also a few incorrect statements, particularly regarding Ice Complexes: this is not "surface" permafrost (p. 20183 line 10)

but can extend up to 30-40 m depth. Neither is it a “combination of minerals and ice” but rather a combination of organic matter (roots, animal remains), sediment, and ice. On p. 20204 (line 17) it is claimed that “alases” are “unique central Yakutian grasslands”, this is also simply incorrect.

Based on the multiple issues that I have pointed out above (and you will find more below), I found that the evidence for the list of conclusions presented was too weak, too scattered, or lacking detail. I encourage the authors to substantially adjust the manuscript in order to make a stronger case.

Detailed comments: - I found large parts of sections 2.1 and 2.2 suitable for the supplementary information. - The authors talk about turbidity measurements (p. 20189 line 26) but I assume they mean SPM or TSS? The description of the geochemical methods and analyses is too short and should include more detail. - P. 20193 line 18-19 “yet the average remains below the average”. Not clear to me. - P. 20194 lines 1-5: here interesting data are presented on the relative increase of water for certain months. I would like to see better graphical support for this. In the next paragraph(s), on critical points, a number of interesting points are made too. However, I cannot find support in Figure 5 for this, the arrows do not seem to point towards the same points as are mentioned in the text? Also “a slight decrease of water volume during the low water period” (line 18), I cannot find in the figure (this is mentioned again at p. 20202 line 4-5). - The authors talk about “mineralization” many times (e.g. in Table 3). What do they mean by this? - P. 20205 line 18: please use “infiltrate” instead of “filtrate”. This paragraph is interesting but the support for the statements made (increased flow from river to talik) is, again, weak. - P. 20206 line 6: here you write “Monthly” but this is not the case when one looks at Fig. 13. - P. 20207: you write that magnesium is the only ion that does not follow the runoff trends. Any idea why? - P. 20208, line 16: “especially where the ice complex has thawed”. Please provide evidence for this. And further in the paragraph you write “four regions with active sedimentation”. Where are those? This is interesting to report.

Figure and tables: Table 3: Where in the delta are those samples taken? And which months of the year? Table 4: Again, what is “mineralization”? Also, it is hard to follow all the abbreviations of the streams/channels in this table. Figure 1: I think this figure can be improved; the resolution is pretty poor, the figure is hard to read when printed in black and white, and I think the delta deserves an even further close-up as there are many channels and parts of the delta that are specified in the text but that cannot be found in this figure. Can you not find a color, high-res image for this? Figure 2: I think a Figure of a typical (average over 10 years or so) hydrograph would be good to show in addition to (and prior to) what is presented now, so that the readers can identify themselves with the strong seasonal character of Arctic rivers, and see (graphically) that June is the high flow month and August has low(er) flow. In the current Figure 2, is this monthly or annual results you show? You write “annual” in the caption and “monthly” in the actual figure. Figure 3: I find this figure incomprehensible. You have provided some information on how you did this in the text, I believe, but it still is not clear to me. Figure 8: I think it is very interesting to show satellite imagery, but as it is presented now it is hard to look for patterns. Panel (2) is much too dark and lacks detail. Also, can you make the red lines in panel (3) slightly thicker? Figure 9: Can you explain which color is which parameter? Figure 10: From when are these samples? Month/year? Can you include literature values from previous estimates in the figure?

Interactive comment on Biogeosciences Discuss., 10, 20179, 2013.