To the editors and reviewers,

thank you for three constructive and careful reviews of our manuscript. In most cases, the reviews either agreed with or complemented each other, so that we feel that almost all criticisms are justified and have endeavoured to use them to improve the paper. A revised version of the paper is being prepared on the basis of these comments. Most changes have been adopted. Improved explanations, in particular of the methods, and better figures are in preparation.

The following changes have been made based on the reviewer's generals comments:
1. the section on carbon and nitrogen data has been removed and reserved for a later paper on geochemistry;
2. the paper has been edited by a native speaker to improve the English;
3. additional references have been added to the paper;
4. the paper has been somewhat re-organized, including a stricter separation between results and discussion;
5. figure captions have been expanded and made more precise in all instances.

We respond to all of the reviewer's specific comments in the attached responses (below).

Sincerely,
Irina Fedorova

Response to Referee #1

Fedorova et al. discuss hydrological and geochemical data of the Lena Delta. The data sets include own measurements from the years 2002 to 2012, as well as archived data from the Russian hydrological survey (Roshydromet). The paper makes a valuable contribution to research conducted in the Russian Arctic, in particular by presenting to the international science community the hydrological time-series data. The discussion of the data provides some interesting aspects and testified to the authors' excellent knowledge of the study area. I feel that the paper would be well worth publishing, but it requires more rigorous organization. I am, however, not qualified to comment on the quality of data and discussion of the hydrological part of the paper. Hence I focus with my detailed comments on the general presentation of the paper and the geochemical aspects.

General comments: A strong focus of the paper is on hydrology of the delta. However, the manuscript is submitted to a biogeochemical journal with a readership that might, on average, not be experts in hydrology. In order to account for this, the hydrological aspects of the paper should be explained in more detail. Alternatively, the authors might consider publishing these data in a more focused journal.

A great wealth of data is presented, but the authors fall short of discussing them extensively. It might be worthwhile to consider splitting up the data sets and discussing them separately in two publications, one focusing on the hydrology, the other on the geochemistry, and perhaps even a third on sedimentation/erosion processes. As is, the manuscript is already very long and very complex and diverse.

The paper needs to be re-organized. The results and discussion sections are often mixed, with some of the discussion already being presented in the results, and with some results only being discussed without being presented as measured evidence. Care should be taken to define clearly the locations referred to (e.g., "central delta" – which area exactly is meant by this term; "areas of sedimentation" – where exactly is this taking place) **–will be adopted in Figure 1 or in an additional Figure**

The description of the geochemical methods is too vague and lacks details (again, I cannot comment on the hydrological methods, but I suggest to ask a hydrologist to review this aspect in particular). Furthermore, some of the interpretations do not seem to be substantiated by data. This is particularly true for the in itself very interesting discussion of ice-jamming processes, which is presented very prominently at the beginning of the discussion section without the process itself having been described before and the evidence for it not being presented in the data section.

In general, all data discussed need to be made available to the readers. The authors' own data used in the paper are in part archived in the Pangaea data base and publicly accessible; the geochemical data are, however, missing in this compilation. The data from Roshydromet, however, are only presented in figures. It would be desirable to make these data also available for the scientific community by providing them in tables. **– this data is accessible in the public record albeit in Russian (see relevant references in the paper), in which form it differs significantly from available online reproductions of the data. In its original form, it is protected from re-publication. We would hesitate, in any case, to create another version of the data, separate from tis meta-data and descriptions of the methods used.**

A clear distinction between own new and (published) old data should be made throughout the paper. The manuscripts includes a large number of tables and figures, which are a bit under-used. More reference should be made to them at the appropriate places, i.e., where the data presented in the tables and figures are presented and discussed.

Furthermore, the manuscript would benefit from some language editing. This could be done by some of the co-authors that are either native English speakers or have very good English skills. Word repetitions (in fact, in many cases sentences seem to be composed rather sloppily leading to statements like "only a minor amount a relatively minor amount of sediments. . .(page 20203)) and some misleading word choices (e.g. "branch length measurements" which I suspect refer to hydrological measurements made along the entire length of one of the branches, or "mineralization" which would be better expressed as "mineral content" or "ion content" of the water) should be eliminated.

Specific comments:
In the following I list a number of issues that I noticed when reading the manuscript. The list is not complete, as I cannot do the re-organization and language editing that should be done by the authors

The Abstract is not very well organized. It includes vague statements like "many questions regarding processes that occur there" – which processes? This should be described more specifically.
– removed vague statements and have rewritten the abstract, also in response to the other 2 reviews
The sentence starting in line 4 ("comparing long-term hydrometric. . .") is rather long. **– modified**
Line 11: Ice events (plural). How is the role "identified"? Do you mean "quantified"? **- removed**
Line 13: "increase of water and sediment discharge" relative to which time period? On which time scales? **- added**
Line 14: . . .to a large extent due to an additional influx of water. . . **– clarified in the text**
Line 17: . . .major ion an element contents . . .in summer is presented, . . . "The conservative character of some dissolved substances. . .": reword this sentence. **- adopted**
- Page 20181, Line 1: "Russian Arctic coast. . ." is this a publication? Please cite accordingly; **- removed**
Line 10 and following: Reword this sentence. **- adopted**
- Page 20182, Line 2: Khabarova polar station – refer to figure 1 for the location; **- adopted**
Line 23: an increase in temperature in a river basin increases in runoff. . . **- adopted**
- Page 20183, Line 2: C9346 delete "in a discussion"; **- adopted**
Line 13: provide a source for this statement; **- done**
Line 13: I am not sure that "sediment runoff" is a proper term **- removed**
- Page 20184, Line 1: published in "Resources of surface waters"; **- removed**
Line 6: delete "have studied the hydrochemistry of the Lena River estuary"; sentence starting in
Line 13 is incomplete; **- repaired**
Lines 23 and 24: this is not clear – which functions of H and Q are used to calculate Q and R, respectively? Give details; **- reference is added**
- Page 20185, Line 5: delete "we selected"; **- adopted**
Line 8 and 9: What are the threshold values for "critical points" and "considerable change"? **- removed**

- Page 20186: Line 18: I don't understand what is meant here**; - clarified in the text and figure 5.**
Line 21: delete "expedition" **- adopted**
- Page 20187: Line 1: all measured cross sections. **- adopted**
- Page 20189: Line 7: delete "on" after "using"; **- adopted**
Line 8 and following: give units for the error; **- adopted**
Line 20: introduce acronym (AARI); **- adopted**
Line 26 and following: Which pore size did the filters have (also on page 20190, Line 1**). – adopted**

- Page 20190: Line 23 and following: Reword to read: The methods of sample preparation and laboratory analyses are described in detail by Wetterich et al., (2009). After this, a brief summary of the methods should be given. **- adopted**

- Page 20191: Section starting Line 1 needs to be more detailed; avoid expressions like "special apparatus" but instead describe the apparatus; **- removed**
Line 22: What is meant by "available data on suspended sediments"; **- removed**
Line 28: please provide the internet source used here **- removed**

- Page 20192: Line 1: provide details on the software**; - adopted**
Line 3: give example for such a landmark; **- deleted**
Line 12 and following: What is meant by "picture elements"? **- adopted**

- Page 20193: Line 3: I am surprised by the use of W for a volume – why not use V?; **- retained**
Line 18: I don't understand how "the average" can be below the average **– clarified in the text**
Line 24: refer to Figure 2 here. **- adopted**

- Page 20194, Line 3: these data need to be presented in a table **– February data added to Figure 5**
Line 6: define time period for which the increase is observed;
Line 7: define "critical point" (see comment above) **– text has been changed to clarify meaning**

- Page 20195, Line 19: replace "correspondingly" by "respectively"; **- adopted**
Line 25: where is "Lenskaya Truba"?; sentence starting in **- will be added to Figure 1**
Line 27 ("One should also note. . .") seems contradictory: how can something vary in the center and stay constant in the middle?; **- clarified**
Line 28 "edge rim" seems redundant, use either edge or rim. **- adopted**

- Page 20196, Line 1: . . .in the middle of the branch. . .; "edge rim" – see comment above; **- adopted**
Line 11: delete "and" after "indicating"; **- adopted**
Line 28: Delete "Sardakh Island is not susceptible to erosion. . .", this was stated above. **- adopted**

- Page 20197: Line 2, C9347delete "formula"; **- adopted**
Line 7: sentence starting "Perhaps. . ." should be moved to discussion, as this is already data interpretation; **- adopted**
Line 11 and following: reword sentence; **- adopted**

Section 3.3.1: “Mineralization” is a poor word choice – replace in entire section (see comment above); please re-define the “mineral classes” as given by Alekin (1970) for the non- russian speaking readers **– replaced “mineralization” with TDS or salinity (sum of concentration of major ions); “mineral classes” by Alekin have been cut in the text - that is not necessity for following interpretation of results.**

- Page 20198: Line 14 and following: re-word this sentence; **- done**
Line 22 and following: Data from laboratory analyses of water sampled during summer field campaigns and field measurements are presented in Tables 3 and 4, respectively; sentence starting in
Line 25 needs to be reworded; **- done**
Line 29: give concentration ranges for trace elements and nutrients. **- done**

- Page 20199: re-word sentence starting Line 3; **- moved to discussion**
Line 18 and following: no plural-s for nutrients; **- done**
Line 19: seem to be conservative. . .; paragraph starting **- done**
Line 10 and extending to page 20200 **- done**
Line 19 should be moved to discussion; data in section 3.3.2 should also be presented as tables; **- moved to discussion**

- Page 20201: Are the percentages given here TOC contents given in % dry weight?; sentence starting **– given in % dry wt; units added to text**
Line 22 is incomplete; sentence starting **- changed**
Line 26: Figure 3 shows discharge, here runoff is dis- cussed, which from my understanding are two different things. **- changed**

- Page 20202: Line 2: how is the significance determined?; **-deleted**
Line 9, insert space between 21st and century; **- changed wording**
Line 25 delete “a” after “only”; sentence starting **-adopted**
Line 23: what are these statements based on? What is the data evidence for Ice blocking? **– this statement is in reference to the cited literature (Izrael et al., 2012)**

- Page 20203: starting at top: The entire discussion on the ice-influence on river channel morphology comes a bit out of the blue. It would be preferable to first describe the features that need to be explained and then present the ice-jamming as one of the potential processes that could explain the observations. **– we have re-worded the paragraph so that it stands on its own – our main goal is to describe the observed phenomenon and demonstrate that its occurrence and consequences are poorly recorded and potentially important**
Line 28: reword sentence starting here, delete “only a minor amount” in Line 29. **-adopted**

- Page 20204:
Line 19: particulates that have been eroded. . .; **- removed**
Line 21: reword sentence starting “Unfortunately,. . .” **- adopted**

- Page 20205: Discussion starting Line 18: Here, explanations for the observed decrease in discharge from start to end of a channel alternative to simple branching of the channels are introduced, leading to the impression that the authors deem these likely scenarios. However, in the conclusions, branching of the channels is presented as the likely explanation. This is confusing. **– we have changed the wording to make clear that we are describing alternative hypotheses**

- Page 20206: Line 2/3: . . .Olenek and Anabar River basins**;** **– text has been changed to clarify meaning**
Line 11 and following: here, C9348 cycles are discussed, which are not evident for me from the Figure referred to. How is a "cycle" defined?; **- deleted**
Line 14: it is not clear to me what is meant by "fluvial processes" that are supposedly evident from Figure 13: Please be more specific. **- deleted**

- Page 20207: Section 4.3: Please show a figure illustrating runoff of selected ions paired with water discharge; **- there are not enough data of some ions for chemograph (hydrograph of ion runoff) building.**
Line 11: sentence after semicolon is not clear to me; **- deleted**
Line 28. . . insufficient hydrological studies. . . **– deleted "hydrological"**

- Page 20208:
Line 2: explain "river orders"; **- stream or Strahler order, we have adopted the term "stream order" throughout**
Line 9: again, what is meant by "branch order"; **- see above**
Line 12: be specific on "biotic constituents"; **- replaced**
Line 18: please define the "four regions with active sedimentation", perhaps also by using a figure. **– it will be shown on an additional figure**

- Page 20209, Line 12: . . .as well as a decrease of . . .; **- adopted**
Line 23: "the most valuable of these were branch length measurements": do you mean "along-branch hydrological measurements"? **– changed text**

- Page 20210: Line 1: please define "central delta"; **- additional Figure created**
conclusion 8: What about aggregation or flocculation as a potential process explaining high TOC? **- deleted**

- Page 20211: Line 2 . . .parts of the delta that confirm the ranges. . .; **- adopted**
Line 6: re-word "that is more mineralized" **- reworded**

- Table 2: Please indicate whether a change is an increase or a decrease (e.g., by adding +/- signs**)** **- done**

- Figure 8: Panel 2) is of very poor quality, hardly anything is visible, and the interpretations made based on this figure cannot be reconciled. **– will be improved.**

- Figure 13: caption: Please refer to "dashed" rather than "dotted" Lines**;** **- adopted**
I cannot see what criterion was used to distinguish between the three phases of different annual water volume. To me, the average volume seems to be rather constant with the exception of the years 1987 and 1988. What was different then? **Will be clarified in the text/figure**

Response to Referee #2

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.
We agree that the paper is poorly organized, and have used specific comments from all three reviews to improve the paper in terms of language, presentation and organisation. This has involved –re-editing the paper (done by a native speaker), deleting text and moving text (in particular from results to discussions) and by describing and referring more explicitly to the data presented.

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). **– deleted** 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. **– it will be adopted in the text (3.3.1.) and some turbidity data for streams from ice complex will be given in the table 4.**

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?). **– C/N analyses (3.3.2) will be deleted based on the recommendations of reviewers.**

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. **– adopted**

The presentation of data in the text and in the figure captions is often too vague, please add more detail, **- this is true, and we have made an attempt to catch and improve any omissions; however, many of the details which the reviewer missed are available in the text. We have kept description of the observations separate from the results, so that locations and times are generally to be found in the methods section, where data collection is described (for details, see below)**
for example: (p. 20201 line 25) "..increase by an average of 35 m3/s.."

Is this per year? Per decade? Per month? **– added per year**
Also, over what period are the changes listed in line 19-23 of p. 20202? **– which branches were measured when is described in detail in the methods section 2.2 "Field research"**
Furthermore, (p. 20198 line 7) "long-term": over what period is that? **– the duration of the long-term data sets, which vary depending on location, is described in detail in Section 2.1 "Long-term hydrological data"**
And (p. 20197 line 22) ".. major ion composition is practically unchanged". Is that dissolved or particulate or both? **– this is in section 3.3.1, which deals with dissolved solids. We have clarified in this and preceding sentences.**
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. **– we describe the location of the Angardam branch as being located at the mouth of the Olenskaya branch in the text; the number of locations used and their relative importance preclude their all being shown on the figure. We have made an attempt to include almost all names, and to describe derived locations based on these.**
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. **– the paper has been re-edited by a native speaker and terminology has been made more consistent throughout**
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. **– changed to "near surface permafrost deposits"**
Neither is it a "combination of minerals and ice" but rather a combination of organic matter (roots, animal remains), sediment, and ice. **– we have changed this to make reference to high ice contents**
On p. 20204 (line 17) it is claimed that "alases" are "unique central Yakutian grasslands", this is also simply incorrect. **– we have changed description of alas to "low-lying basins created on the Ice Complex by thermokarst processes"**

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. **– based on some of the comments made above, we suggest that this information is critical for understanding the results and their interpretation, and should be made available as part of the document; since we present available long-term data, this information is crucial for its use by others.**
- 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. **– turbidity measurements are described in detail in the methods section 2.2**
- P. 20193 line 18-19 "yet the average remains below the average". Not clear to me. **– will be adopted**
- 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). **– it will be clarified in the text and added to figure 5.**
- The authors talk about “mineralization” many times (e.g. in Table 3). What do they mean by this? **– has been replaced with total dissolved solids and salinity (sum of concentration of major ions) throughout**
- P. 20205 line 18: please use “infiltrate” instead of “filtrate”. **- adopted**
This paragraph is interesting but the support for the statements made (increased flow from river to talik) is, again, weak. **– alternate hypotheses for the process leading to the observed decrease in discharge are proposed, of which sub-bottom flow or infiltration is one; observational data with which these hypotheses can be ruled out are not yet available**

- P. 20206 line 6: here you write “Monthly” but this is not the case when one looks at Fig. 13. **–changed to that is average annual discharge**
- P. 20207: you write that magnesium is the only ion that does not follow the runoff trends. Any idea why? **– unfortunately, we have no idea, and have no relevant indications in the literature; without further supporting data, we chose not to speculate**
- P. 20208, line 16: “especially where the ice complex has thawed”. Please provide evidence for this. **– we have removed this phrase, which will have to be dealt with in a further paper**
And further in the paragraph you write “four regions with active sedimentation”. Where are those? This is interesting to report. **- additional figures of the delta parts with different sedimentation/erosion processes will be made.**

Figure and tables:
Table 3: Where in the delta are those samples taken? **- adopted, it will be explained in the methods chapter 2.2.** And which months of the year? **-adopted, has been added in the table 2 title.**
Table 4: Again, what is “mineralization”? Also, it is hard to follow all the abbreviations of the streams/channels in this table. **– see above: removed abbreviations**

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? **– we have made an effort to include all major names on this Figure; a better resolution version will be provided for publication**

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. - **The additional hydrograph for the Main channel will be added on Figure 2 for with low, high and average water level years.**

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. **Adopted – average annual discharge.**

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. **It will be clarified in the text (methods)**

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? **The figure will be improved.**

Figure 9: Can you explain which color is which parameter? **–adopted**

Figure 10: From when are these samples? Month/year? Can you include literature values from previous estimates in the figure? **Deleted.**

Response to Referee #3

General comments
This paper builds on a solid base of data. It takes advantage of existing knowledge to make an analysis addressing current issues within hydrochemistry, carbon cycling and a changing climate through hydrology and geochemical application. In a sense validating the continuation of monitoring. It has a descriptive character but tries to advance the field through comparing temporal changes, and in my opinion has the potential of greatly exemplifying mechanisms in the whole study area through local examples.

However, it contains a lot of data that is not sufficiently discussed, or discussion points that are started but not followed through, or are actually not based on the analysis of the data. My own hydrological expertise is limited, but the geochemical statements, are often not well grounded in the reported data. I suggest taking out the nutrient/element data – or move it to supplemental information. There are no conclusions drawn from these and they appear to be from only one year (?) compared to most of the other data that have a strong temporal depth.

I want to emphasize an effort that may be forgotten but is equally important for any scientific field – to make already existing data and knowledge available to the international arena. Both the use of monitoring data from decades back, but also the extensive use of citations from Russian scientific literature. 41 out of 77 references cited are in Russian. I believe that the combination of the Russian and the international literature can lift, reveal and authenticate/endorse the, to the large community, unavailable knowledge. I do think however this may, despite the effort also be the weaker link of the paper – and suggest additional strengthening of the paper through more international references.

The language is imprecise in many places and the structure is not well set up. I have own experience with and recognize how difficult it can be with the language barrier for the Russian scientific community, and I encourage this effort. Therefore I put some time into actual language revisions that I think interrupt the message and flow in this paper. With revisions however I believe this to be an interesting and good contribution, and I support publication in Biogeosciences after the suggested corrections below.

Specific comments
1. The paper could benefit through adding the strong temporal aspect to the title. **– changed**
2. The abstract needs to include a conclusion of the scientific findings. **– abstract has been substantially revised, to align with the revised conclusions**
3. The conclusions section should be down scaled to include fewer main conclusions. **- adopted**
Please carefully revise these and see through the manuscript that the remaining ones are supported by the data. Remove the others. **– adopted; there are now 4 conclusions instead of 10**
4. The words mineralization and turbidity are probably misused in several places. Please revise. **– we have replaced the word "mineralization" throughout, and provided a description of turbidity in the methods section**
5. "Minerals and ice" is an incorrect description of ice complexes, as is "surface permafrost". The description of "alases" is also misleading. Please revise. **–adopted (also in review 2)**
6. The manuscript needs a reference to a map for identifying the mentioned locations. Figure 1 is attempting this, but it would be useful if you could get a more high-resolution picture? Several locations that are stated in the text are missing a location reference –

and should be pointed out on this figure. **– we have made an attempt to describe derivative locations in the text with reference to larger features (e.g. Angardam branch at the mouth of the Olenskaya branch), in order to avoid representing features of different spatial scales on the same map; most features are named on Figure 1, which will be provided in a better resolution**

7. Section 1.2, 1.3 and 1.4 are regarding existing knowledge and data, but does not report any of this particular data or introduce thoughts or views in the field of these. I suggest instead a new header 1.2 "Current state of knowledge" or something similar, and to make three sub-sections 1.2.1, 1.2.2 and 1.2.3; and at the same time to move the one sentence conclusion in current section 1.3 (starting p.20182, R26) to the abstract. This sentence should also be followed up upon in the actual results and discussion. Interesting – but it disappears after this mentioning. **– we have adopted the changes to the headings as suggested; however, the conclusion sentence to refers at the end of section 1.3 refers not this paper, but to the paper Syvitski 2003, which is being discussed in this paragraph. We have made this more explicit.**

8. Mid section 3.3.1 (P20199 R03-05). It is unclear how the mentioned local factors could be drivers, and actually what you mean with "control of geochemical runoff formation". Would want to know both how this happens and to have a good example.
Please develop and describe **– explained in the text. – this has been moved to the discussion (based on another reviewer's comments), and expanded.**

9. End of current section 3.3.1 (P20200 R15-19). This interesting conclusion would gain a lot by a couple of more sentences. Can you elaborate on what you mean here? Higher degradation closer to the coast - how does this associate to fine particles and nutrients? **- Delete the ending paragraph of section 3.3.1. on page 20200 starting with "The analyses… ", because it repeats the previous one. All details are explained on page 20199. This page will be re-written.**

10. Section 4.1 (P20201). Be more precise. Which parameter (sediment?) and time frame does the 35 m3s-1 increase apply to? **– adopted (per year).**
Report the actual significance p<0.0XX of both the 35 figure and of the mentioned water discharge (P20202 R01-02). **P 20202 R1-2 ('From 2000 the…") – deleted.**

11. Section 4.2 (P20206 R13-15). Here you say that there is a low water and little fluvial deformation between 1977 to mid 1980's, and reference to figure 13. On fig. 13 the lowest water discharge recorded by the blue line occurs right after mid 1980's to up around 1988-1989 when it increases sharply. This seems to be the only deviation from an otherwise steady plot. How does this correspond to the green tint background? This needs clarification. Please include description of how data for the green tints and the blue line associate to each other, and how you then see the stated trends accordingly. **– according to referees comments this figure 13 will be changed. The integral storage curve of annual average water discharge will be added instead of discharge. The explanation for different periods will be added to the text.**

12. Figure 8 needs clarification. Panel 1 is from 1951, panel 2 is from 2000, and panel 3 is 1951 and 2009 according to figure caption. In the text you say //The braided sandbar area increased from 1951 to 2000, but by 2009 began to increase.//. It looks on Fig. 8 as a decrease of the sandy area from panel 1 to panel 2. Is the figure caption referencing the right panels/years? There is no comparison from 2000 to 2009 made in the figure. It would be more informative if you could add a third contour for 2009 on panel 3. Perhaps add years to the actual panels for parallel construction to Fig. 7?
Also – improve picture quality of panel 2? **- Figure 8 will be changed accordingly.**

13. Check through the text that all the figures are mentioned in appropriate places. Remove figures to supplemental that are not. Also check all figure captions to be more precise! General rule of thumb is that figure caption should stand alone as explanation

for content of figure. Please check. **– Figure captions have been expanded and improved.**

Technical corrections
There are plenty of places where the language could be changed for a better flow.
These are the corrections that I believe alter the actual meaning or abrupt the flow in the text too much and thus should be changed before publication.

P20180 R09-10. Unclear: three periods were chosen, but for what? **– clarified meaning**
P20180, R19-20. Sentence vague: make clear if you mean that the conservative character was something you found, or otherwise - how you analysed it. **– removed; the preceding sentence was made more clear**
Section 1.1. State over what interval the reported discharge data was averaged. (Unclear if data was reported 2007 by the organization, or if it was averaged over the year 2007.) **- changed**
P20183 R08-10. Incomplete sentence. **– added verb**
P20184 R03-07. Sentence structure: repetition of words. **- improved**
P20185 R05-06. Sentence structure: remove "we selected". **- adopted**
P20185 R10 //. . .discharges values. . .// and R12 remove "plotted" or "calculated". **- adopted**
P20186 R02-04. Wording too complicated, rephrase. **- rephrased**
P20186 R09. State which long-term period intended**. – refer in parentheses to preceding section on the station-by-station availability of data over the long-term**
P20186 R21-25. Too long, split into two sentences. Perhaps the what, and then the why. **– split into 2 sentences**
P20186 R27-P20187 R02. Sentence incomprehensible. Split into two sentences, and/or make clear what is illustrated in Fig.1 and what is presented in the database. **– split into 2 sentences and clarified**
P20193 Section 3.1 header is redundant. Remove. **– headers have been shortened and more focussed**
P20193 R16-19. Incomprehensible. Rephrase **- adopted**. Also, do you have a reference/figure to positive trend of sediment discharge? Otherwise remove from sentence. **– explanation and references of sediment discharge increase are in chapter 4.1.**
First paragraph of section 3.1.2 (P20194 R21-26) not a result - should be moved to methods section.
P20194 R27. Sentence structure: remove "last". **- adopted**
P20196 R11. Sentence structure: remove "and". **- adopted**
P20196 R23-24. Unclear which 10-year period you are talking about. Clarify. **– added years**
Also, unclear where the Trofim-Kumaga sands are located. Mark on Fig.8 both Sardakh island and Trofim-Kumaga sands. **–adopted**.
P20197 R10 Sentence structure: add "is" to //. . .an increase and is presented. . .// **- adopted**
P20197 R11 Sentence structure: remove "were" and "," (comma) after "2005". **- adopted**
P20198 R22 Sentence structure: remove "below 3 and 4" and add Table 3 in the existing brackets. **– changed**
P20198 R25 Sentence structure: remove "correspond" **– changed**
P20198 R26 Incorrect tense, replace "to publish" with "published". **– changed**
P20199 R13-14. End sentence after "deduced". New sentence start //The main dissolved. . .// and remove either "transferred along" or "transported through". **– changed**
P20201 R12. State which channel the "principal channel" is. **– changed**
P20201 R14-17. Unclear what second part of sentence explains. Clarify. **– clarified**
P20202 R15-18. Sentence is incomplete. Rephrase. **- rephrased.**
P20202 R25, remove "a". **– changed**
P20203 R25-27. Sentence structure. Rephrase, or remove "the delta channels"? **- rephrased**

P20203 R29. Sentence structure. Repetition. Remove “a minor amount”. **– changed**
P20204 R12 remove “develop”. **- adopted**
P20204 R19 replace “these” with “that”. **– changed wording**
P20204 R21-23. Sentence structure: Perhaps //. . .in modern permafrost hydrology it is only mentioned that additional influx. . .//. Suggest to also end sentence after //. . .et al., 2013). // And change to //No calculations of. . .// //. . .has yet been made. //. **– changed wording**
P20206 R01. Add “was” and “,” comma in //. . . Kyusyur station was noticed in Burdyikina (1951), . . .// **– changed wording**
P20206 R23-24. State what the 3rd period is. **- adopted**
P20208 R18. Refer to which four regions you mean. Would be great if you could perhaps indicate on a map where these are? **- an additional figure and explanation in the text will be created to clarify regions within the delta.**
P20209 R03 remove “of”. **- adopted**
P20209 R12 replace “and” with “was”. **- changed**
P20210 R01. Sentence unclear. Specify the time frame that you refer to. When? **- changed**
P20210 R05. Repetition. Replace second “through” with “of”. **- removed**
P20211 R02 remove “are”. **- adopted**