

## ***Interactive comment on “Satellite ice extent, sea surface temperature, and atmospheric methane trends in the Barents and Kara Seas” by Ira Leifer et al.***

### **Anonymous Referee #1**

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Re-review of "Satellite ice extent, sea surface temperature, and atmospheric methane trends in the Barents and Kara Seas" by Ira Leifer et al.

The resubmitted paper was reworked in many ways that improved it. Now, in my opinion, the paper is worth publishing.

The authors responded to all the points raised in the previous review, and made necessary corrections and alterations in their paper. The Introduction and Methods chapters were shortened and rearranged significantly. The figures were provided in higher quality that made them easier readable. Typos and inaccuracies found earlier were fixed. The authors also rewrote some parts of the paper to make it more understandable and

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to fill some gaps mentioned in the previous review.

There are only some small remarks.

Line 83: In Abstract, there is a phrase "... were analyzed for anomalies and trends relative to the Barents Sea". In line 83, we have "were analyzed for statistically significant trends in the Barents and Kara Seas relative to the Basin trends". What does "the Basin" mean in this context? It would be better to clarify that.

Line 269: A typo in "aare based".

Line 312–313: Is "a cooler period from 1875 to 1930" revealed from the Kola Section data or from (Skagseth et al., 2008)? The words "these data" at the beginning of the sentence makes one think that the period was revealed from the section data mentioned in the previous sentence, but observations along the Kola Section started in May 1900, so there are no data in this section before.

Line 316: There are no units in "from ~0.2 to ~0.12".

Line 318: A missed space in "MCand".

Line 342: A couple of typos happened in "to the west of the Grand Bank". The phrase is likely "to the south of the Great Bank" (according to Fig. 2b and 4a). The Persey Current position in Fig. 4a differs significantly from that in Fig. S2.

Line 535: As SST and CH<sub>4</sub> are mentioned here, a reference to Fig. 8 should be added as well.

Line 547: In July, the Kara Sea is partly ice free, not wholly.

Line 555–556: The statement that "the MC then flows along the east shores of Franz Josef Land" is inaccurate. The western side of the St. Anna Trough (right east of Franz Josef Land) is a site where modified Atlantic waters (100–300 m) enter the northeastern Barents Sea from the north. The transformed Atlantic waters leave the Barents Sea between Novaya Zemlya and Franz Josef Land flowing mainly along the southern

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and eastern sides of the St. Anna Trough.

Line 557: The Ob and Yenisei Rivers influence significantly the eastern and southeastern Kara Sea. Their impact on the northern Kara Sea, especially the northwestern part, is much weaker.

Line 561: July or June?

Line 564: Fig. 10c seems to be the right reference here.

Line 574: A typo in "In", the word needs lowercasing.

Line 583: A full stop was missed at the end of the sentence.

Line 686: A typo in "the Kara Straits", in the singular. It looks like a comma was missed after "coast".

Line 693: "north of the White Sea" is a bit inaccurate. Kolguyev Island is relatively far away from the White Sea northeastward. It is also northeast of the Kanin Peninsula.

Line 697–698: There is no flow of the Murman Current around Franz Josef Land, just Arctic waters and underlying modified Atlantic waters which are continuation of Atlantic waters īňCowing along the continental shelf break through the Fram Strait west of Spitsbergen, then rounding the northern tip of the archipelago and flowing east along the continental slope.

Line 714: The phrase "moving northwards from June–September" appears to be a bit ununderstandable.

Line 717–718: The northern Kara Sea is influenced by the Barents Sea and modified Atlantic waters (see the remark for lines 697–698) much stronger than by river outflow.

Line 722: What season is described here, when the mixed layer becomes shallower and, at the same time, cooling to the atmosphere takes place?

Line 774: There is a reference to Fig. 11 in the text, but there is no Fig. 11. It looks like

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Fig. 10.

Line 847–849: This sentence needs rewriting. What "trends" (the trends, mentioned trends, discovered trends)? "Sea" or"-s" need removing in "the Barents Sea and Kara Seas". The second "free" looks redundant.

Line 1199: Some captions in the list differ slightly from those under the figures in pages 34–43.

Line 1281: In Fig. 7 caption, "Box names on panel a" left from the previous version of the paper. Now, it should be "Box names on panels".

Line 1284: Perhaps, it would be better to write "methane anomalies" in the caption of Fig. 8, as the anomalies are exactly what are shown on the vertical axes of the figure.

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