

The authors wish to extend their gratitude to the reviewer for their helpful feedback which we feel has substantially improved the manuscript.

Detailed list of revisions:

Abstract

- Lines 15 – 10: minor grammatical edits to be more concise.
- Line 20: Defined NEMO acronym before using it.
- Lines 20 – 34: minor grammatical edits to be more clear and concise.
- Lines 33-34: concluding, forward-looking sentence

Non-Technical Summary

- Lines 37-44 - revised for clarity, to make it easier for reader to understand overarching aim and findings of the paper.

1 – Introduction

- Lines 63, 67, 77, 80, 105 – minor grammar edits.
- Lines 91- 94 (“It is therefore one aim..”) - added clarity as to why we did not focus evaluation on Puget Sound, as the reviewer suggested.
- Lines 97,103-104 – grammar edits for clarity

2.1- Spatial-Temporal Configuration

- Lines 140-143 – edits for clarity, grammar
- Line 144 (“To ensure dynamics..”) – edit to address reviewer’s request to improve clarity that a main motivator is resolving the central and northern portion (Strait of Georgia). Emphasis on the importance of Juan de Fuca and Southern Gulf for resolving circulation, which we feel implies that PS and DI are not quite as important and hence why evaluation efforts were focused of JFS,SGS, SGN, SGI and not as much on PS.
- Lines 154,157, 173 – minor grammar edits

3. - Methods

- Lines 242 – 252 (“As such, HOTSSea v1 shares..”) - In the first paragraph, we previously mentioned that we used SalishSeaCast to compare with HOTSSea results. To address the reviewer’s suggestion to “focus on model design choices or NEMO idiosyncrasies” we explicitly mention several of these idiosyncrasies, followed by specifics of the previously reported performance of SSC.

3.1 - Methods

- Line 266 – (Near top of the first paragraph) - we previously mentioned that SalishSeaCast has already been evaluated. In response to the reviewer’s request,

we add some specifics about the model and we moved this to Section 3 to put it more front and center (see above).

3.2.1 – Vertical Profiles

- Line 312 (Table 4) – typo corrected.

4.4.2. – Strait of Georgia

- Line 755 – minor edit to split sentences

5 – Discussion and Conclusion

- Lines 774-779,780,785-788, 792 (first paragraph) – minor edits for flow, changes to grammar.
- Lines 796, 802 (second paragraph) – minor edits to be more concise.
- Lines 810-815 (third paragraph) – re-ordered sentences to emphasis a key contribution of the paper, trimmed some sentences, tried to be more concise
- Lines 825, 830-835 (third paragraph) – minor grammar edits
- Line 838 (fourth paragraph) – added reference to supplemental tables S1,S2 which have PS evaluation metrics
- Lines 843 (fourth paragraph) - added another reference to Figure 4 (as reviewer suggested).
- Line 847 (fourth paragraph) – minor grammar edit
- Lines 857-863 (fifth paragraph) – added reference to Fig S4, moved references to next sentence, minor edits to be more concise, clear
- Line 878, 881 (final paragraph) – grammar edit to be more concise

Code and Data Availability

- Lines 916 – 920 – Added explicit reference to Zenodo having the monthly processed outputs to be consistent. Updated line referring to ‘pacea’ project.

References

- Line 1016 - Addition of URL link to github of pacea repo
- Line 1214- Update to Zenodo version of data outputs (Oldford et al (a)).

Supplemental

- Tables S1 and S2 – padding and spacing fixes so they each fit on one page
- Tables S1 and S2 – changed from ‘A1’ and ‘A2’ to align with GMD guidelines

Other:

- Figure and Table reference style made consistent (e.g., ‘Tables’ instead of ‘Tabs.’)
- Abbreviation ‘Fig.’ and ‘Tab.’ used when in sentence (GMD guideline)

Feedback

I commend the authors in the amount of work they put into this new draft. My overarching feedback at this stage is that a manuscript should aim to be “easy” for a reader - state explicitly what you mean, explain what the takeaways from each figure should be, outline exactly how you came to major decisions, and important results or background may be worth repeating. All those areas have been improved upon significantly in this draft, my feedback focuses on a couple areas that I still think could be made easier. I think that with these two relatively small edits that the paper will be ready for publication.

Thank you for the feedback. We agree.

We made edits to make it clearer and more concise – overall, easier for the reader (e.g., Lines 15-35, 91-94, 140-147, 809-815).

Evaluations with SalishSeaCast

Some limitations of SalishSeaCast that may impact HOTSSea have been added, but focus on model design choices or NEMO idiosyncrasies, not on how those impact overall model accuracy. Your discussion of the salinity bias observed in figure 4 (line 675) is effective in outlining that a significant portion of the salinity bias is inherited as well (I would suggest referencing figure 4 again somewhere in lines 831-835, because that is where the inheritance is shown most clearly).

Thank you. Changes were made to address this (Lines 857-861).

I understand your hesitancy to perform or outline specific evaluations of SalishSeaCast, you are right in saying that it is not within the scope of this paper; however, stating explicitly in the methods section the specific (previously reported) aspects of SalishSeaCast that may impact the accuracy of HOTSSea would add credibility to your evaluations. Overall, this concern has been much improved upon.

Thank you. We have now revised to be more explicit, clear about the model idiosyncrasies and design choices associated with NEMO and shared with the particular the SSC model design - in Section 3 (Lines 242-256).

Puget Sound

In the introduction you discuss the ecosystem model focused on the Strait of Georgia being the motivation for HOTSSea, but in the same paragraph you explain that the spatial domain chosen to work effectively with this ecosystem model encompasses all the Salish Sea (including Puget Sound). As such, I don't think that this section in the introduction sufficiently explains to the reader why Puget Sound was left out of your analysis.

We think you are referring to Section 2.1, not the introduction (Section 1), since this is where the motivation and domain is described. Actually, PS was not entirely omitted from our analysis – we just did not have much data collated and wrangled. The results are reported in the Supplemental tables (S1-S2). We added two more references to these tables for the reader (Lines 843, 857-862)

As it currently stands, the reader would need to already have a keen understanding of Salish Sea circulation and to take the same logical steps that you did without explanation (ie. since the Strait of Georgia is the focus you need to get Juan de Fuca and the Gulf Islands right but Puget Sound is probably less important).

Earlier, on line 88-91 you state “It is therefore one aim of this study to develop a physical hindcast with a spatial-temporal resolution that enables a long hindcast while maintaining acceptable model skill for supporting marine ecological research and ecosystem management.” This line comes directly after you explain that previous hindcasts have been performed for Puget Sound. I think that said line might be an appropriate location to express that performing an accurate hindcast within Puget Sound was deemed less important than for the other regions. As there is quite a bit of data available in Puget Sound, just not collated for the purpose of this project, and since a comparison to SalishSeaCast results within Puget Sound would have been possible, I don’t think that data availability on its own is a reasonable explanation for the lack of Puget Sound evaluation. State explicitly how you decided that while Puget Sound had to be included in the model domain, that an evaluation of it was a lower priority and outside of the scope of this paper.

Thank you, yes. You have the ‘logical steps’ exactly correct and we agree it was not articulated well enough. We have edited the sentence formerly on line 88 – 91, as suggested (Lines 91-95). Changes at Lines 144 also aim to clarify.

Smaller comments

- “Hare” should be “Haro” in table 4 – fixed (Line 312).
- Your discussion of the differences between v0.12, v0.14, and v0.16 has been made much clearer. – thanks!
- Discussion of the spatial scales required to study salmon strengthen the motivation of the paper! – thanks!