

Thanks very much to the Editor for a last set of comments. Below are responses to each of these. We also found a few mistakes ourselves that we have corrected, which you will find at the end of this document.

Line 54: Delete "clearly" - **Fixed**

Paragraph from line 47: I agree with the reviewer that the diagrams would help a lot at this early stage, especially as Fig 1 doesn't include the tidal pumping mechanism. Please move fig 9 and fig 14 to this paragraph (they could be combined as two panels of one figure if you prefer). I understand your argument about the notation but it is easier to refer back to a diagram on the first or second page having already grasped the physical picture than forwards several pages.

- Done. The sketches are now in the Introduction section, in two separate figures to avoid too long figure caption.

Line 122 It might not affect the results, but what phase was the tide at the point of tracer release?

- We have now included this information in the manuscript (l. 124-125).

Fig 4 top right the label K1 has gone wrong. - **Fixed**

Equation 4 is incorrect, a font problem I think. Please check. - **Fixed**

The fit in Fig 10 is a bit unconvincing, especially on a log-log axis. But I don't think it necessarily damages your later argument.

- We were a bit unsure what we should implement from this comment. In the end, we kept the log-log presentation—to retain equal 'resolution' for values larger and smaller than 1—but downplayed the interpreted relationship in the corresponding text (l. 268-269).

Fig 13 needs a legend. Also "encricling"-> "encircling" in the caption. - **Fixed**

Line 420: Tidy. "Even though the latter term is not necessarily negligible, we will omit it in the following for simplicity..." - **Fixed**

Fig 15: If you haven't already, please check this colour scheme: <https://www.color-blindness.com/coblis-color-blindness-simulator/>

- Thank you for pointing this out. We have now changed the colormap in this figure.

Fig 17 needs a legend. - ***Fixed***

I hate to say it but "data available on request" is not enough, and not much help to a researcher in ten years time if you have a new job and don't answer your emails! Please consider uploading model results to a public archive server. If uploading the whole model run is impossible, you should at least make public the data necessary to reproduce the figures. See <https://www.ocean-science.net/submission.html#assets>

- The data set has now been uploaded and made public through a Norwegian national HPC storage service (NIRD):

(<https://archive.sigma2.no/pages/public/datasetDetail.jsf?id=10.11582/2021.00095>)

The information has been entered under "Data availability".

Data used for model boundary conditions must be included in Acknowledgements, using the data statement as provided with the data, as should the satellite images (people who fund satellites like to run searches to see their money is being well spent). And the bathymetry. Oh, and the tide stations in figure 5 - where is their data hosted please? - ***Fixed***

Additional corrections (spotted by ourselves and Dmitry Aleynik):

Fig. 9 and Fig.10 (prev. Fig 7 and 8) : description of streamlines is included in the caption.

Fig. 15: In caption, black contour lines are corrected to white contour lines for bottom topography.

Eq 10-11: $1/H$ is moved into the integral for consistency with Eq. 9 and 12.

L.231 : We included a sentence on neglecting the Coriolis acceleration in eqn. 3 (truncated momentum).

L. 277 : eastern (ebb) opening of Nordlandsflaget

L. 345: Changed use of Stokes theorem to use of Green's and Gauss' theorems.

L. 351-352: Added a sentence explaining why f_u is neglected in Eq.11

Eq. 14: Took out f from D/Dt since $D/Dt(f) = 0$ (makes it less messy).

Eq. 18: the left side should be divided by h^2 not just h (fixed)