Response to reviewer's comments on "Monsoonal influence on floating marine litter pathways in the Bay of Bengal" by Harrison et al.

We thank the editor and reviewers for their further consideration of our manuscript and have made additional changes based on the comments on our revised manuscript. Our response to each point made by the reviewer is presented below in blue.

Reviewer #1 Comments

The manuscript has certainly improved in the revision process. The corrections and comments have been duly taken into account by the authors in the revised version of the manuscript. As a result, several methodological aspects that were not entirely clear in the original submission are now easier to follow. I still have a few minor comments that I feel need to be addressed before publication:

In the abstract :

L13. I suggest removing the reference to "novel approach", I don't think this is really novel, on the contrary it goes back to a basic principle of uniform and equidistant particle release justified by a lack of information on source estimates.

We have removed the word "novel."

L22. I would also suggest changing "Both simulations were validated" to "Both simulations were evaluated": the word validation does not seem appropriate given that only a few drifter trajectories were used for this phase.

This change has been made as you suggest.

L24-25. "This study will [...] volumes" : This sentence seems unclear. Does this study really provide information on the accuracy of the modeling approaches, given that there is no validation of the observed plastic distribution to say that one simulation or hypothesis is really better than others?

This is a valid point and we have altered the wording of this sentence to make sure the usefulness of the study is clearer, without referring to accuracy:

"This study will therefore crucially inform future research and policy in this region, providing advice on the benefits and suitability of selecting different modelling approaches independent of assumptions of the source locations or volumes."

L104-108. "Windage is implemented in the model by applying 1% of the wind velocity to the particles' trajectories. Following analysis of observations of the wind's effect on undrogued drifters by Pereiro et al. (2018), this should describe all but very buoyant items of litter." : Again, I understand that the 1% windage is important for this class of very buoyant items: but what percentage of the mass of plastic debris and particles at sea does this debris represent? My impression is that the percentage of debris with a significant emerged part remains small and that the majority of floating debris drifts to the subsurface due to processes of biofouling and degradation. I therefore suggest specifying in the abstract that the study focuses only on a class of highly buoyant debris with a relatively large size, which would represent about xx% of plastic debris at sea, if the literature provides information on these proportions.

This sentence stated that the choice of 1% windage applies to all **but** the most buoyant items of litter. The most buoyant items of litter are the only class of plastic items for which we expect a windage coefficient of 1% is **not** suitable, which as you note, is likely a small percentage of floating plastic litter. It is estimated that around 65% of plastics produced are lighter than seawater and would therefore float at the surface of the ocean (Pattiaratchi et al., 2022). Our approach of using a windage coefficient of 1% is consistent with other particle tracking studies simulating floating marine litter in this region (e.g. Irfan et al., 2024; van der Mheen et al., 2019).

To avoid misunderstandings about the types of buoyant plastic we are representing in our simulations, we have exchanged the word "but" for "except" in this sentence. This should make it clearer to readers that the particles in our model represent the majority of positively buoyant plastics entering the ocean:

"…this should describe all except very buoyant items of litter."

Fig. C1: (e) and (f): the particle clouds are identical between the two simulations, which does not correspond to the difference shown in the histogram bars in Fig. 2 (c) drifter D3.

Thank you for pointing this out, the CMEMS particle clouds had accidentally been added to both subplots. The ROMS particle clouds have now been included in Fig. C1 (f) and the differences between (e) and (f) now match up with Fig. 2 (c).

L145. "weightings could be applied as a post-process in the future": seems to be a little excessive given the limitations mentioned and the low numerical cost of running Lagrangian simulations and should be removed (as previously suggested by both reviewers).

We have previously removed all other references to this application of our results from the Abstract and Conclusions sections, based on previous reviews, to scale down the emphasis placed on the future importance of our results. However, we feel dropping this point altogether reduces the value of the manuscript. While computational costs to run these experiments are indeed relatively low these days, setting up and parameterising the scientific code is a time consuming and specialised task. We are providing an option to non-specialists (i.e. model users rather than just modellers) to scale our results in future to quickly and easily compute weighted source-to-sink estimates, making them available to wider audiences and avoiding the need for modelling expertise. Therefore, we have opted to retain this sentence in the manuscript.

L275. "though" → "through"

Thank you! This typo has been fixed.

References

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van der Mheen, M., Pattiaratchi, C., and van Sebille, E.: Role of Indian Ocean Dynamics on Accumulation of Buoyant Debris, Journal of Geophysical Research: Oceans, 124, 2571–2590, https://doi.org/10.1029/2018JC014806, 2019.

Pattiaratchi, C., van der Mheen, M., Schlundt, C., Narayanaswamy, B. E., Sura, A., Hajbane, S., White, R., Kumar, N., Fernandes, M., and Wijeratne, S.: Plastics in the Indian Ocean – sources,

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