

Dear Referee #2,

We sincerely appreciate your comments on our manuscript, "*Assessing and optimizing the role of wind forcing and upper-ocean dynamics in marine pollution transport simulations using surface drifters in the Canary Current System.*" Your feedback is highly valuable and has helped us identify areas for improvement. Below, we address each of the points raised in detail:

1. Lack of novelty and substantial conclusions

- We agree that many of the results confirm what is already known from previous studies. However, our goal was to conduct this sensitivity study specifically in the Canary region, setting a precedent for applying these types of tools in emergency situations in the area. We understand the point raised by the reviewer, and we will take it into account in future work to achieve a greater degree of innovation.
- Nevertheless, we present our results in the context of emergency response exercises in Macaronesia, which we consider a novel application for this region.

2. Diffusivity coefficients and lack of discussion

- The diffusivity values presented were chosen based on similar studies, such as Jalon-Rojas et al. (2019), and we attempted to discuss them in the context of the presence of nonlinear phenomena. However, we understand the comment by the reviewer regarding the lack of discussion on why the Skill Score should increase and the need for better justification of the chosen values.

3. Differences between numerical schemes and time step

- We agree with this comment, and we have not considered it, but we greatly appreciate it. It could indeed be interesting to take this into account for future work, especially when using different time steps or an adaptive time step.

4. Figure 2 presentation

- We understand the difficulties presented by Figure 2 due to its dependence on Table 3. We have not found a way to correct this without creating a visual overload. Any suggestions on how to improve this are welcome, and we would be open to hearing them to enhance future work. Thank you very much.

Conclusion

Thank you again for your detailed review. We appreciate your feedback and will take it into account in future work.