Review of " Sensitivity of iceberg drift and deterioration simulations to input data from different ocean, sea ice and atmosphere models in the Barents Sea (Part II)"

General Comments

This paper investigates the sensitivity of iceberg drift and deterioration simulations to varying input data from different ocean, sea ice, and atmospheric models in the Barents Sea. It provides a detailed numerical experiment using four combinations of environmental forcing data (Topaz, Barents-2.5, ERA5, and CARRA). The study emphasizes that iceberg drift and deterioration are particularly sensitive to the choice of ocean and sea ice forcing data (Topaz or Barents-2.5). While the combination of statistical analysis and individual case studies, such as the trajectory of iceberg 2013-788, adds depth to the study, I find some critical gaps and ambiguities in the paper.

Firstly, the motivation for this study is unclear. While the authors explicitly demonstrate differences in iceberg deterioration under various forcing scenarios, the key takeaway remains vague. What actionable insights can we derive from these results? Which combination provides the most reliable or “best” estimate of iceberg drift? Without addressing these questions, the practical value of this study seems limited.

Secondly, the temporal scope of the analysis raises concerns. The authors focus on limited time windows (2010–2014, 2020–2021), and yet they find that atmospheric forcing has only minor effects. Why not extend the analysis to the longer overlapping period (2010–2022) available for Topaz, Barents-2.5, and ERA5? This would allow for a more robust assessment of iceberg occurrences and their trends over the full 12 years. The decision to restrict the study to only seven years until the end is not adequately justified.

Thirdly, the use of the nearest-neighbor scheme for environmental forcing is perplexing. The authors spend considerable text explaining the process, but why was this method chosen over more commonly used interpolation techniques such as linear or inverse distance weighting? How can the errors introduced by this nearest-neighbor approach, especially near coastlines, be quantified? This choice introduces uncertainty, which is not thoroughly analyzed.

Finally, Table 1 lacks clarity regarding the spatial resolution used in each test. In a sensitivity analysis, it is critical to change one parameter (e.g., spatial resolution, ocean/ice forcing, or atmospheric forcing) while keeping the others constant. The reference setting for the experiments remains unclear. And why keeps the original resolution instead of interpolating into different resolution?

In summary, the paper has potential but requires major revisions to address these concerns before it can be considered for publication.

Specific Comments:

1. Figures: Please review all figures to ensure the color legends are consistent and correctly labeled.
2. Line 59: I am not sure that I totally get the sentence, since you must list the rationale for selecting datasets (e.g., Topaz and CARRA) for specific variables like regional wind and their respective resolutions needs to be explicitly stated.
3. Line 99: Why were 2-hourly time steps chosen? Could hourly time steps provide a more precise representation of iceberg drift? Please clarify if 2-hourly intervals are sufficient.
4. Line 105-106: The reasoning for using the nearest-neighbor scheme is unclear. This method is known to be less accurate, especially near coastlines. Why was it chosen over more sophisticated interpolation methods? How do you quantify the associated errors?

5. Figure 7, The influence of bathymetry on Topaz+ERA5 and Topaz+CARRA combinations is intriguing. Could you elaborate on whether this arises from assimilation processes or the original resolution of the models? How can you ensure the observed differences are due to the coarse resolution of ERA5? Are these differences consistently observed in other trajectories over the same regions?
6. Line 433: I am not sure I can get the logics in the discussion on compensatory effects (e.g., similarities in iceberg pathways despite large differences in forcing). Did you compare products with the same forcing but at different resolutions? A clearer explanation is needed.
7. I am not sure if I am convined by just one case in Sec 3.6, did you find some common features based on all extreme case? Relying on a single case study is insufficient to draw broader conclusions. It would be better to incorporate additional deterioration processes into the model to better capture iceberg dynamics under extreme conditions.
8. Mechnism analysis: I would also love to see more mechanism anslysis about wave erosion, basal melt, and buoyant convection since it exactly shows how iceberg react to different forcings. This would clarify how icebergs respond to different forcing conditions. Additionally, could you explore ways to incorporate the uncertainties related to solar radiation, calving, and wave interactions, which are currently simplified in the model?