The 2026 Starfish barometer is the first update of a synthesis of ocean-related developments. This barometer is extremely useful and I strongly support the effort put in place. In particular, its inter-disciplinary nature provides an overview of the role of the ocean in the earth system and its two-way interactions with society that is unique. The paper is interesting and full of insights.

We thank the reviewer for this very positive and encouraging assessment of our work. We are particularly grateful for the recognition of the interdisciplinary nature of the Starfish Barometer and its role in highlighting Ocean–society interactions. We note that the Barometer may be interpreted as a "synthesis" of Ocean-related developments. While it does provide an integrated overview, its primary objective is closer to a structured "curation" of robust, evidence-based signals rather than a comprehensive synthesis or integrated assessment. We have clarified this positioning in the revised manuscript to avoid potential ambiguity.

I have two main issues with the manuscript that need clarification.

First, because this is the first update, there is a mix of time-scales that is very difficult to follow. Throughout the manuscript there seems to be little distinction between what is a trend over the last (and sometimes multiple) decade and what took place in 2025 or the last year of available data. Most numbers are presented as if they were trends, when many clearly are not (e.g. the doubling of damages from tropical storms). In some cases, numbers are presented without context to place the size of the changes presented (e.g. the section on ocean observations) so that it is quite difficult to get an idea of scale. I suggest that a separation is made, particularly in the abstract but also in each section, that identifies clearly the continued trends (which should build on previous versions of the barometers) from the developments that took place in the past year or two. Careful language is also needed around wording on attribution, especially regarding the changes over the past year or two (see specific details below).

We agree that clarifying the distinction between long-term trends and recent developments is important for readability and interpretability. We have carefully addressed this throughout the manuscript, particularly in the abstract and individual sections, using your suggestions to improve clarity. Specific responses to your detailed points are provided below, addressed point-by-point.

Second, I recognise that a comprehensive analysis is not the intention of the paper, but there needs to be some rationale for what is included and what is excluded beyond the selection of the group of authors. It seems to me that the barometer intends to capture the co-evolution of society and environmental changes in the ocean domain, but it appears biased because of its lack of formalism. For example, the presentation of migrant fatalities (as tragic as they are) seems disconnected from other issues. Likewise, a lot is made of Arctic ice retreat, but the parallel developments of Arctic shipping routes is not mentioned. I suggest that the rationale for choices is better articulated, and that a number of issues are kept permanently in subsequent updates for continuity.

We agree that providing a clear rationale for the selection of topics and maintaining continuity across updates is essential. With the help of Reviewer 1's comments and our subsequent revisions, we have addressed these issues, including better articulation of inclusion/exclusion criteria and improved framing of topics.

Finally, some visual elements or summary tables would greatly facilitate the understanding of trends and highlights.

We agree that visual elements and summary tables can aid interpretation. However, the Barometer synthesizes information from multiple publications, all of which are fully referenced, and creating additional figures here would go beyond the scope of the Barometer. By referring readers to the original sources, we ensure both accuracy and completeness while keeping the Barometer concise.

Specific comments follow.

Page 2, lines 11-12: this statement is not really illustrating human pressure, but the longer term trend is. The 2023-2024 change simply shows there is a lot of variability in the number of tropical storms.

We agree that our initial formulation introduced an ambiguity between short-term variability and longer-term trends. In particular, the year-to-year change in economic losses reflects strong variability in extreme events, rather than a direct signal of increasing societal harms. We have therefore revised this point throughout the manuscript, including in the abstract and in the main text, to clearly distinguish between short-term fluctuations and longer-term trends

Abstract, initial formulation changed to : "*Economic losses from tropical storms and floods were particularly high in 2024, illustrating how human pressures are translating into material costs for societies*"

Results, initial formulation changed to: "*High economic losses from tropical storms and floods in 2024. Economic losses from tropical storms and floods can vary greatly from one year to another. … Over the long term, related economic losses have increased decade by decade since the early 1980s, with an acceleration during the past two decades (WMO, 2021). In 2024, damage costs due to tropical storms and flood surges were nearly twice as high as in 2023, reaching … This high level is largely explained by two strong hurricanes*."

Page 2, line 6: "In 2026", should be either in 2025 or in the 2026 barometer.

Agreed, this has been modified

Page 2, line 17: Please clarify "ocean-focused impact investing".

We have replaced with "*Ocean-focused environmentally beneficial investments*"

Page 2, line 60-61: See general comment above about the need for formalism and for continuity. As this is the first barometer update, the authors need to introduce a method for decision-making on what goes into updates beyond the choices of the authors.

The process guiding updates between editions is described in Section 2.4 "Selection of items". In particular, the manuscript explains that items are updated from one edition to the next when new information becomes available (i.e. when a new report is

published), and that new items are introduced when no such update exists. We acknowledge that this may not have been sufficiently explicit and have therefore reaffirmed that this paragraph 2.4 included the decision-making method: "*Together, these principles define how continuity and renewal are balanced across editions*."

Page 2, line 63: Consider refining the sentence to focus on international developments. I think this is what the manuscript attempts to do. There are many more ocean-based developments than those captured here.

We have completed the sentence to capture this: "*Rather than systematically updating a fixed set of indicators, the Barometer offers a curated, narrative-based synthesis aimed at capturing a selection of policy-relevant Ocean signals of the year at the global scale, without seeking to provide an exhaustive account of Ocean-related developments. This curation relies on collective expert judgement within the scientific committee, guided by the availability of new evidence"*

Page 5: Consider reformulating to remove "news", as the paper covers developments that are broader than news, or at least the reference to news seems out of context.

We agree that the term "news" may not be appropriate in this context. We have revised the manuscript to replace it with more neutral terminology (e.g., "items" or "developments"), to better reflect the nature of the content presented.: "*Key information is presented as concise, evidence-based summaries of key developments, highlighted through clear and accessible headlines. In the following, we refer to these as items*".

Page 6, line 126: This section would particularly benefit from careful language around decadal trends and evolution over the past year. Given there is data, this section can be more comprehensive and cover both the decadal trends and last year. The title in bold does not refer to 2025. I also challenge the use of "acceleration" which at the minimum needs to be presented with a time frame, but gets in place used interchangeably with "intensification". The latter is when things get worse, while acceleration should be used only when the second derivative is positive and above natural variability. A figure could be provided to illustrate the comment.

We agree that the initial formulation did not sufficiently distinguish between long-term trends and recent-year variability. We have revised this section to clearly separate decadal-scale changes from observations in the most recent year. In addition, we have ensured that the term "acceleration" is used more carefully and in a clearly defined temporal context.

"*Global mean sea-level rise and Ocean warming are accelerating. Global mean sea-level rise is a consequence of Ocean warming and land ice melt (Wang et al., 2024; Dangendorf et al., 2024; Mu et al., 2025). While global mean sea level rise was estimated at 2.6±0.3 mm/y over the period 1993 to 2011 (WMO, 2026), this rate has increased to 4.2±0.3 mm/y over the period 2012–2025 (Leclercq et al., 2026), consistent with an acceleration in sea-level rise over the last 30 years. Global mean Ocean warming is also accelerating since 1960 (Minière et al., 2023; Storto and Yang, 2024), and reached record values in 2025 (Pan et al., 2026; WMO, 2026). In addition to these long-term trends, recent years have been consecutively marked by particularly high values*."

Page 7, line 138: New research published in January 2026 suggests observations of polar bears shows they are fattening. Consider including this here.

We thank the reviewer for drawing our attention to this recent study, which we had not previously considered. We agree that such findings provide interesting insights into species-specific responses to environmental change. We have carefully considered this example. However, the inclusion of items in the Starfish Barometer is guided by criteria of global relevance and robustness across systems. In this context, results that are regionally constrained and species-specific may not be representative of broader Ocean trends, as different species can respond in contrasting ways to environmental change. For this reason, we have not included this example, but we appreciate the reviewer's suggestion.

Shrinking arctic ice opens new ship routes which seems highly relevant to this barometer. Consider exploring this aspect here.

We thank the reviewer for this suggestion. We have added one sentence and one reference to account for it: "*Declining sea ice is increasing the accessibility of trans-arctic shipping routes (PAME, 2026).*"

Page 7, line 146: in 2025? "Level of threat" seems vague.

We have replaced with "*deterioration in conservations status*", which is then explained in the paragraph

Page 7, line 150: Have you also reviewed any positive trends in this area?

Positive trends in the Antarctic are restricted currently to some specific regions, but the overall trend on average is negative since 2015 (before it was slightly positive, or no trend), which is mentioned in the text.

Page 7, line 163: the element around the 26.4% loss seems to deserve a separate sentence.

We have reformulated the sentence: "*All wetland ecosystems are losing surface area since 1970, coral reefs (-26.4%) but also mangroves (-11.8%), salt marshes (-14%), kelp forests (-48.1%), and seagrass (-16.3%) (ramsar_2025).»*

Page 7, line 167: Is this between 2024 and 2025? Specify time frame. And likewise line 169, "since 2024", specifies between 2024 and 2025.

Thank you for spotting this, it is corrected now.

Page 8, line 181: from which treaty is the 30x30?

We have replaced with: "*the Kunming-Montreal Global Biodiversity Framework target to conserve 30% of marine and coastal areas by 2030*"

Page 8, line 183: What period corresponds to "in recent times"?

We have replaced with: "*over the past two decades"*

Page 8, line 184: Deep sea biomass may be least understood but it is also very small in terms of living biomass. This could be acknowledged here.

The importance of deep-sea ecosystems lies in their remarkable diversity of life forms adapted to extreme conditions, rather than in there biomass. This has been added in the text.

Page 8, line 190-191: But are we seeing "unrestrained industrial mining" seems to contradict previous statements that contracts were issued by the ISA. Please clarify.

We agree that the initial formulation could be interpreted as referring to current activities. Our intention was to highlight potential future risks associated with large-scale industrial mining. We have revised the sentence to clarify that these impacts refer to scenarios where mining would be scaled up without effective environmental safeguards: "*If scaled up to industrial levels without effective environmental safeguards, deep-sea mining could have severe long-term impacts on deep-Ocean ecosystems due to their slow recovery rates*"

Page 8, line 195: is this more than in 2024?

We do not have information of the current trend in the number of contracts. This might become available in subsequent years. Our intention is to highlight the current scale of exploration activities and their potential implications. We have reformulated the sentence: *"31 exploration contracts are currently active"*

Page 9, line 205: The statement about doubling impacts is misleading as it refers to 2 years only. This is clearly natural variability. A reference to the longer trends is required, this example by itself cannot be used to demonstrate growing impacts.

We agree and the paragraph has been reformulated to better acknowledge inter-annual variability (see our previous answer to your comment page 2 line 10-11)

Page 9, line 227: Economic and political insecurity is not just caused by resource grabbing, and the linkages to climate events is weak at this stage. Please review.

We agree that the initial formulation may have suggested overly simplified causal relationships, particularly regarding the role of environmental factors on migrant fatalities at sea. More fundamentally, we would like to clarify that the objective of the Starfish Barometer is not to establish strict causal relationships between Ocean changes and societal outcomes, but to document significant and policy-relevant developments related to the Ocean (see our additions to the method section in response to reviewer 1). In this context, migrant fatalities at sea are included as they reflect the Ocean as a space of human activity, mobility, and risk. This signal is considered relevant independently of the underlying drivers. We have revised the paragraph to be more caution on causality and to clarify the rationale for its inclusion:

"This reflects the Ocean as a space of transit, risk, and human activity, where significant humanitarian challenges persist. The drivers of migration are complex and multifaceted.

Economic and political insecurity due to resource grabbing and severe climatic conditions, including extreme weather events, sea-level rise, desertification, and water scarcity, are among the factors that push people to leave their countries (Maattouk et al. 2025,Yang et al., 2025).”

Page 9: Key drivers "of climate-induced displacements" include … (as here the paper does not refer to the key drivers of all migrations). Please specify.

See above

Page 10, lines 239-248: this section needs to provide numbers to quantify changes in observations somewhere.

We are aware of this lack of numbers. Nevertheless, due to its importance, we have added this topic in the 2026 Barometer; specific studies are under way and not yet published which will provide numbers next year (Karina von Schuckmann, pers. comm.). We have added two references (Tanhua et al., 2024, von Jackowski, 2025) to strengthen the item.

Page 11, line 277: I think animal food is still food. Please specify that the primary non-food application refers to human consumption.

Indeed, we replaced with : “*which are primarily used in animal feed*”

Page 12, 318-319: Acceleration is wrong in this sentence, most elements refer to intensification.

We have replaced with : “Intensification is the dominant signal, with indications of acceleration in some cases”