

Review #1

This manuscript is now much more streamlined, clear, and easy to follow. I appreciate the authors' responses to my comments and think they have done a nice job of restructuring the manuscript sections. I especially liked the identification of the 4 summary ideas at the end. This section really highlights the importance of the review and nicely synthesizes challenges and next steps regarding our knowledge of and interaction with Earth's biosphere. The updated introduction also did a good job of describing the importance of the synthesis up front, setting up a stronger structure for the reader to follow. I did notice that a number of grammatical/punctuation errors remained--it looks like this may have been the case where sentences were heavily edited and merged (also a missing reference at line 520). I would recommend a technical double check before the final publication, but I have no remaining substantial edits to suggest. This manuscript makes a nice contribution to advancing studies of the biosphere!

Thank you very much for your thoughtful and encouraging feedback. We are pleased to hear that the summary section effectively summarises the challenges and next steps in biosphere research. We have revised the manuscript to ensure that grammatical/punctuation errors are addressed before final publication.

Review #3

Thank you for your thoughtful and constructive feedback on our report. We greatly appreciate the time and effort you've invested in providing such detailed recommendations.

The title is broad and appropriate for the review's scope. However, it could be more specific to highlight key focus areas, such as climate change, biodiversity, and socio-economic interactions. This would better capture the central themes of the paper and attract more readers.

Good point: We update the title by giving a subtitle: "Reviews and syntheses: Current perspectives on biosphere research - 2024: 8 findings from ecology, sociology and economics."

To improve clarity and **reader engagement**, it might help to include a sentence **summarizing the eight selected themes in the abstract**.

Highlighting key actionable insights in the abstract would emphasize the review's contributions.

The abstract covers the scope effectively but could benefit from a more concise and impactful structure. A better approach might be to introduce the paper's aim as an interim report addressing the biosphere crisis for policymakers and stakeholders right at the outset. This quickly establishes the purpose. Again, introducing the eight themes briefly in the abstract would provide readers with a quick overview of the review's breadth.

We have revised the abstract to improve its structure by including actionable insights and using the same terminology as in the paper.

The introduction is somewhat long-winded and takes time to introduce the objectives and chosen methodology. Some suggestions for readability:

1. Begin with the document's objective as an interim report for policymakers and stakeholders.
2. Clearly outline the purpose of addressing challenges and bridging knowledge gaps between IPCC/IPBES reports.
3. Include a brief mention of the eight themes/topics here, with consistent references to these themes throughout the abstract, introduction, and conclusion. This consistency will improve the narrative flow and reader comprehension.

Thank you very much for these helpful comments:

- We have revised the introduction to make the aim of this (and subsequent papers in this series) clear in the first section.
- We have slightly shortened the introduction.
- The new text emphasises more strongly the bridging nature of this review.
- We have carefully revised the last section to make it consistent with all parts of the paper.

The background sections are informative and relevant but could be tightened for precision. Use more specific data (percentages, years, quantitative findings) to support the points. For example, in some areas, numbers are presented effectively, while others rely on broad statements.

In the backgrounds, avoid generic reiterations of the biosphere's importance. Instead, tie the relevance of background information directly to the specific topic of the sub-section. This will reduce redundancy and improve focus.

Thank you for your suggestions. We have selectively revised the background sections.

In section 3.2, we have added some figures to quantify the water flows

In section 3.3 we have also added some specific data to provide an overview of recent fires in different regions of the world.

In Section 3.5 we have added some data documenting the decline in biodiversity and the proportion of land under protection. We further have added the dependence of crops on pollinators as an example of the importance of biodiversity for human well-being.

In section 3.6 we have added here as well more specific data related to the specific topic.

The challenges are well-documented, but the implications need to be tied more explicitly to human lives, biodiversity, and socio-economic systems. For instance, "500 million people are projected to experience challenges within decades due to the likely loss and degradation of coral reefs" should specify what challenges people face and why they rely on coral reefs.

Adding such detail will make the stakes clearer and more impactful. This recurring issue in the manuscript should be addressed across all sections.

Thank you for your helpful feedback, we have added more explicit details about the impacts on human life, biodiversity and socio-economic systems in selected sections:

in Section 3.1. we added specifics regarding the how and why each statement was made in both the challenges and solutions sections as appropriate.

in Section 3.2. we add a short section about social economic loss due to droughts.

In Section 3.3. We explain in more detail the challenges for society, forestry and civil protection.

In Section 3.6. We added more data to show the linkages between human lives, biodiversity and economy.

The solutions are relevant but lack sufficient detail to make them practical. For example, "Better allowing space for stewardship practices by Indigenous and local communities can provide meaningful lessons..." is valid but vague. What specific actions, policies, or mechanisms should be implemented to allow for stewardship practices? Adding such specificity will help the paper achieve its intended impact.

- Similarly, it would help to add examples of successful implementations (e.g., case studies, projects) where relevant.
- There is an acknowledgement of biases, but the explanation is insufficient. For instance, biases toward tropical forests in the section on forest protection should be explicitly discussed. What is the basis for this focus? Are there overlooked ecosystems that also deserve attention? Addressing such caveats would strengthen the paper's credibility and transparency.

Thank you very much for your suggestions to improve solution sections:

For section 3.1, we have made more additional mention of local examples (e.g. "Bakhawan Mangrove Eco-Park" in the Philippines) and restructured to highlight benefits of solutions both locally and globally in relation to the challenges section.

For section 3.2, we note that other systems beyond the tropical forests were already discussed (savannahs, grasslands). Nevertheless, we reworded the last paragraph of the section to more explicitly include the need for spatially distributed observations.

In section 3.5 we have added a recent study showing that 20% natural habitat is important to maintain natural pollination.

In Section 3.8, we added a few lines and literature about Conservation Basic Income (CBI) initiatives that are currently taking place and about bottom up cohabitation with animals, specifically highlighting human-bear relations in Bulgaria.

The conclusion does a good job of summarizing findings, but it could more strongly articulate the report's overarching goal as a call to action. Emphasize:

- The collaborative methodology of bringing together experts across disciplines and geographies.
- The unique contribution of this review in providing timely, actionable insights as an interim measure between major IPCC/IPBES reports.
- The importance of addressing interconnected crises (climate, biodiversity, socio-economic systems) through interdisciplinary and inclusive approaches.

Thank you very much for your suggestions to strengthen the conclusion. We revised the conclusion and

- highlight the collaborative, interdisciplinary nature of our methodology and the importance of addressing the interconnected crises of the earth system.
- We also underscore the unique contribution of this review in bridging the gap between major IPCC/IPBES reports.

General Recommendations:

- o Reduce redundancy by removing sweeping, generic statements.
- o Ensure grammatical and formatting errors are corrected.
- o Break up longer paragraphs for better readability.
- o Provide specific, actionable recommendations in the solutions sections.
- o Focus on making the findings practically relevant for policymakers and stakeholders.
- o Reinforce the unique aim of this review: synthesizing diverse perspectives and expertise to address the Earth system crisis.
- o Use consistent terminology and thematic references throughout the document for better readability and coherence.

Thank you also for these recommendations. We worked on reducing redundancies, correcting grammatical and formatting errors, improving paragraph structure, using consistent terminology, revising some of the solution sections, and highlighting the diversity of disciplines contributing to this paper. Finally, we have checked for consistency of terminology and references. There will also be a homepage which presents the actional recommendations of the solution sections in a compact way.

Thank you again, your comments have contributed significantly to improving the quality of the paper. We're grateful for your expertise and the time you've dedicated to this review process.