

Dear authors,

Many thanks for your revised manuscript. I would be happy to accept this subject to minor revisions. Below, please find a list of these. Once you have addressed them all, please submit the further revised version. I will then review this, and make a final decision on publication. I am optimistic this means we have a rapid route to acceptance.

We thank the Editor for their thoughtful feedback and encouraging response. We have addressed each point as indicated below.

1)

“Only policies that build on this perspective will contribute to a flourishing future for humanity. Here, we offer a few brief glimpses of this cosmic perspective, and call on our colleagues to acknowledge the powerful stories emanating from their work.” I suggest the language is changed to highlight the argument or perhaps advocacy you are developing. For example “Here we argue that these perspectives should inform policies that seek to build a flourishing future for humanity. To that end, we offer a few brief glimpses of this cosmic perspective, and call on our colleagues to acknowledge the powerful stories emanating from their work.”

We agree that this shift to highlight advocacy potential may be a more effective presentation for our target audience. We have changed these sentences to read: "Here we offer a few brief glimpses of this cosmic perspective, and argue that it should inform policies that seek to build a flourishing future for humanity. We call on our colleagues to acknowledge the powerful stories emanating from their work."

2)

It's a minor point, and probably a quibble, but “every niche that can support life—and even some that would seem inhospitable—is inhabited (Rothschild, 2001)”. Does it make sense to define a niche that is not inhabited? Does using the word niche here risk making the statement tautologous? I think the point you are making is that there is extraordinary diversity in life, that evolution has produce adaptations that have allowed life to survive and thrive in even surprising places (e.g. extremophiles).

We agree that technically an unoccupied niche may not qualify as a niche (though perhaps one could formulate the concept of a "potential niche"). We have rephrased the sentence to read, "Biology has covered the planet very thoroughly with an extraordinary diversity of life: from rock deep beneath the ocean floor to the high reaches of the atmosphere (and even on space probes!), every environment that can support life—including many that would seem inhospitable—is inhabited (Rothschild, 2001)."

3)

“Humans will not survive without a robust/ and resilient biosphere: it is our life support system.” Yes, but this makes me ask about scope. Is it human extinction that is the risk? Or is it the destruction of complex/industrialised societies? Or is it very large increases in morbidity and mortality? The first is expansive, the last perhaps more immediate? The reason I ask - and will expand later, is that technological-based solutions to such questions can sometimes emphasise

the former. For example, the central (only significant?) risk of longtermism is Homo sapiens extinction.

This is an important point. There is necessarily a selfish (human-centered) element to any discussion about mitigating the effects of the climate crisis. To use the metaphor of the introduction, if we (collectively or individually) did not mind burning to death in our own house, then there would be no reason to do anything. At the opposite end of the spectrum is the argument that humans are completely irrelevant. This leads either to arguments that we should not harm the environment (which is also our human habitat) for the sake of the environment itself, or that because the biosphere is resilient and humans are irrelevant, it does not matter if climate change destroys us and a significant proportion of the environments that are important to us. Our position implicitly rejects both extremes, the strictly human-centered and the strictly non-human-centered, because it places humans within the biosphere, rather than at some aloof position. We also implicitly reject the extreme interpretation of longtermism (or indeed moving the human species off-planet, see below) because neither is in fact a scientifically grounded or viable possibility. We therefore argue that both for the sake of biosphere and for the sake of human survival in the near future, we must accept and acknowledge the place of the latter inside the former. Ultimately, the argument is simple: disrupt the biosphere, disrupt human life. The scope of biosphere disruption will determine the scope of disruption to human life. We find it difficult to expand on this given the length limitations, however, we have appended, "[...] and the scale of disruption to the biosphere will determine the scale of disruption to human life."

4)

“Although we occupy a privileged and exciting moment in our understanding of the universe, we will not find another haven to escape our planetary and humanitarian crises. There is no planet B (Nicholson & Haywood, 2023).” I understand that argument. Perhaps it could be spelt out. Could you briefly outline just how outlandish arguments to produce permanent settlements on other planets are in the light of the current climate and ecological crisis?

We have clarified this point by adding: "Recent astronomical observations show that Earth-size, rocky planets are ubiquitous, but this does not mean any of them can support us. What makes Earth hospitable is its multi-billion-year relationship with its biosphere." We keep this explanation brief because of the length constraints. We refer the readers to Nicholson & Haywood 2023 for further details.

5)

“Engaging in advocacy does not diminish public trust in scientists (Kotcher et al., 2017); on the contrary, the public expects climate advocacy from us (Cologna et al., 2021). Scientists are the most trusted professionals alongside doctors (Ipsos, 2022)”. It’s not clear who you wish to aim this advocacy at. I think the argument you are making is addressed to planetary scientists and ask them to use their knowledge and perspectives to become more involved in public discourse and potentially policy making. If that is the case, then some specific examples on how they could do that? What should people do in response to reading your article?

Our target audience is research scientists across the disciplines we represent (we recognize that ESD readers are primarily planetary scientists). The main goal of this opinion piece is to highlight that there is a connection between the primary research in our fields and planetary

crises, and that the connection takes the form of the unique and powerful perspective these fields offer on the history of the Earth-biosphere system. Advocacy is one possible action that individuals may choose to take, though we are keen not to be prescriptive and have therefore avoided specific advocacy positions. The quoted sentence was primarily a pre-emptive response to a counter-argument we often encounter: that science isn't, or shouldn't be, political. Nonetheless, we appreciate that readers may expect some direction on this issue, and we have appended the following: "Advocacy begins with an acknowledgement that our research is relevant to interpreting planetary crises. We envision a near future in which the next generation of scientists recognizes and embraces their role in communicating knowledge in the political arena. This is a collective endeavour, but for an individual it could be as simple as discussions with colleagues, coursework, outreach, and educational initiatives, or as engaged as working directly with policymakers and politicians."

6)

Reviewer 2 made a number of comments referring to the technosphere. Given the central aim of your argument and its intended audience, I do not think it necessary for you to situate your manuscript within that literature. However, concepts and movements such as the technosphere, transhumanism, and longtermism are relevant to the topic. Given the constraints of this submission's format, I do not think you have sufficient scope to sufficiently address this. I would urge you to consider how your argument could be developed into another longer piece of work that could begin to substantively engage with these specific themes as I think it would be a very fruitful area to explore.

We agree that there are many additional topics to explore, and appreciate the Editor's encouragement. We would like to continue thinking and writing about these themes.