

Earth Syst. Dynam. Discuss., referee comment RC3  
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## **Comment on esd-2022-44**

Anonymous Referee #3

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Referee comment on "PInc-PanTher estimates of Arctic permafrost soil carbon under the GeoMIP G6solar and G6sulfur experiments" by Aobo Liu et al., Earth Syst. Dynam. Discuss., <https://doi.org/10.5194/esd-2022-44-RC3>, 2022

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This is a really interesting study. The authors have done a careful job and obtained some interesting results. I think that most of this is well done, but I am recommending some revisions.

My main issue is the econometrics section where you're computing socioeconomic benefits. I'm fine with what you've done, but I think you need to be more careful in your descriptions. There may be socioeconomic harms (or other unforeseen benefits) that you're not discussing because those are not captured in your model. Statements in your abstract like "averting about \$20 trillion in economic losses" does not communicate this uncertainty and conveys way too much confidence. There are other examples in the paper that need similar attention.

Relatedly, your 90% confidence intervals for economic benefits are approximately \$0-70 trillion. Does that mean there is no possibility of harm (negative values)? That requires justification.

Figures 1-3: It's hard to see differences between the top and bottom rows. Can you add a third row showing the differences?

Lines 360-361: Stating that Indigenous people should consider geoengineering "with urgency" when they're not the ones capable of deploying geoengineering smacks of colonialism.