

Retraction Note: A constraint on historic growth in global photosynthesis due to increasing CO₂

<https://doi.org/10.1038/s41586-022-04869-w>

Published online: 30 May 2022

Retraction to: *Nature* <https://doi.org/10.1038/s41586-021-04096-9>

Published online 8 December 2021



Check for updates

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Since publication, it has come to our attention that the uncertainties associated with the results presented in Fig. 1 of our manuscript are underestimated. The underestimation stems from two issues that were overlooked in the analysis. The first relates to the application of variance normalization, as we normalized the model-based land sink estimates but did not normalize the observation-based estimates. The second owes to our treatment of land sink error estimates as random rather than systematic errors. Although correcting these issues by removing the variance normalization and using appropriate uncertainty values did not substantially change the central estimate of the effect of CO₂ on global photosynthesis, it led to a roughly threefold increase in uncertainties, significantly weakening the derived emergent constraint. Because of the larger uncertainties for the Fig. 1 results, the *Nature* editors suggested, and we agree, that a Retraction is the appropriate course of action.

We note that the issues we raise here do not affect the results presented in Figs. 2, 3 or 4, or the constraint provided by the convergence between the updated satellite-based estimates of the sensitivity of global photosynthesis to CO₂ and that derived from the ensemble of dynamic global vegetation models. Despite the revised uncertainties, we anticipate that our analysis will provide a valuable estimate of the effect of CO₂ on global photosynthesis. The revised paper, with these issues corrected and the associated uncertainties revised, will be submitted to another journal. The Retraction record will be updated to contain a link to the new publication, if and when it is published. We thank Pierre Friedlingstein and Catherine Morfopoulos for bringing these issues to our attention, and are grateful for their open and detailed feedback.

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