



What is the strength of ‘CO₂-calcification’ feedback on future fossil fuel CO₂ uptake?

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Understanding the strength of the ‘CO₂-calcification’ feedback; the enhancement of fossil fuel CO₂ uptake by the ocean due to a reduction in marine carbonate production, is critical if we are to accurately predict the future trajectory of atmospheric CO₂. To do this, computer models of the ocean carbon cycle have typically been informed by the *in vitro* response of the coccolithophorid *Emiliana huxleyi* to a decrease in ambient carbonate ion concentration. However, analysis of the experiments carried out to date across a range of calcifying plankton species leads us to suspect that the CO₂-calcification feedback could be much more important than previously assumed. Furthermore, analysis of the anthropogenic CO₂ impact on marine calcification has yet to include the effect of synchronous changes in climate. We address these issues and the uncertainties surrounding the strength of the CO₂-calcification feedback with the aid of an ensemble of instances of the GENIE-1 Earth system model. We find that an additional 60-90 GtC could be sequestered by the year 2300. Feedbacks between CO₂ and climate further amplify this response by around one third.