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Keywords

- geoengineering
- ocean acidification
- climate change

Index Terms

- Global Change: Earth system modeling
- Global Change: Global climate models
- Global Change: Impacts of global change
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Abstract

Sensitivity of ocean acidification to geoengineered climate stabilization

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Climate engineering has been proposed as a possible response to anthropogenic climate change. While climate engineering may be able to stabilize temperatures, it is generally assumed that this will not prevent continued ocean acidification. However, due to the strong coupling between climate and the carbon cycle, climate engineering could indirectly affect ocean chemistry. We used a global Earth-system model to investigate how climate engineering may affect surface ocean pH and the degree of aragonite saturation. Climate engineering could significantly re-distribute carbon emissions among atmosphere, land and ocean reservoirs. This could slow pH decreases somewhat relative to the non-engineered case, but would not affect the level of aragonite saturation due to opposing responses of pH and aragonite saturation to temperature change. However, these effects are dependent on enhanced carbon accumulation in the land biosphere; without this, climate engineering has little effect on pH, and leads to accelerated declines in aragonite saturation.

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