

Curriculum Vitae for¶

Ken Caldeira¶



PRESENT POSITION¶

Senior Scientist→

Department of Global Ecology→

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Professor (by courtesy)¶

Department of Earth System Sciences¶

Stanford University¶

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EDUCATION¶

Ph.D.,1991, New York University, Atmospheric Sciences, Department of Applied Science¶

M.S.,1988, New York University, Atmospheric Sciences, Department of Applied Science¶

B.A.,1978, Rutgers College, Philosophy¶



PRIOR RESEARCH EXPERIENCE¶

Physicist/Environmental Scientist (Lawrence Livermore National Laboratory, 1995 to 2005)

Research ocean carbon cycle, atmospheric CO₂, ocean/sea-ice physics, climate, and energy systems¶

Post-Doctoral Researcher (Lawrence Livermore National Laboratory; 1993 to 1995) Research

the ocean carbon cycle, atmospheric CO₂ and climate¶

NSF Earth Sciences Postdoctoral Fellow (Earth Systems Science Center & Dept. of Geosciences,

The Pennsylvania State University; 1991 to 1993) Role of the carbonate-silicate cycle in long-term atmospheric CO₂ content and climate¶



GENERAL RESEARCH INTERESTS AND STRATEGY¶

Primary research strategy¶

- Work on whatever problems seems most likely to provide the highest return on invested time and resources, where that return is measured in terms of social utility and intellectual interest. ¶
- Suggest important and tractable problems to postdocs and students through conversations and questions. ¶
- Attempt to facilitate their success in attacking these problems.¶

Primary research areas ¶

- Energy and economic modeling and analysis¶
- Earth system modeling and analysis¶
- Coastal oceanographic experimentation and observation¶

PRINCIPAL PUBLICATIONS¶

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2020¶

- Brown, PT., Caldeira, K. (2020) Empirical prediction of short-term annual global temperature variability. *Earth and Space Open Archive*. <https://doi.org/10.1002/essoar.10502250.1>
- Foo, SA., Koweek, DA., Munari, M., Gambi, MC., Byrne, M., Caldeira, K. (2020) Responses of sea urchin larvae to field and laboratory acidification. *Science of the Total Environment* 723;138003. <https://doi.org/10.1016/j.scitotenv.2020.138003>
- Foo, S.A., Liddell, L., Grossman, A., & Caldeira, K. (2020) Photo-movement in the sea anemone *Aiptasia* influenced by light quality and symbiotic association. *Coral Reefs*. 39(47-54) [doi:10.1007/s00338-019-01866-w](https://doi.org/10.1007/s00338-019-01866-w)
- Koweek, DA, Garcia-Sanchez, C., Brodrick, PG, Gassett, P, and Caldeira, K. (2020) Evaluating hypoxia alleviation through induced downwelling. *Science of the Total Environment* 719;137334. <https://doi.org/10.1016/j.scitotenv.2020.137334>
- Krishnamohan KS., Bala G., Cao L., Duan L., & Caldeira, K. (2020) The climate effects of hygroscopic growth of sulfate aerosols in the atmosphere. *AGU100 Earth's Future* <https://doi.org/10.1029/2019EF001326>
- Zheng, Y., Davis, SJ., Persad, GG., Caldeira, K. (2020) Climate effects of aerosols reduce economic inequality (2020) *Nature Climate Change* 10; 220–224. <https://doi.org/10.1038/s41558-020-0699-y>

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2019¶

- Caldeira, K., & Brown, PT. (2019) [Reduced emissions through climate damage to the economy](#). *Proceedings of the National Academy of Sciences* 116(3): 714-716¶
- Casey, G., Shayegh, S., Moreno-Cruz, J., Bunzl, M., Galor, O., & Caldeira, K. (2019) The impact of climate change on fertility. *Environmental Research Letters*, 14(5), 054007. <https://doi.org/10.1088/1748-9326/ab0843>
- Duan, L., Cao, L., Bala, G., & Caldeira, K. (2019) Climate Response to Pulse Versus Sustained Stratospheric Aerosol Forcing. *Geophysical Research Letters* <https://agupubs.onlinelibrary.wiley.com/doi/abs/10.1029/2019GL083701>
- Duan, L., Cao, L., & Caldeira, K. (2019). Estimating Contributions of Sea Ice and Land Snow to Climate Feedback. *Journal of Geophysical Research: Atmospheres*, 124(1), 199–208. <https://doi.org/10.1029/2018JD029093>
- Koweek, D. A., Forden, A., Albright, R., Takeshita, Y., Mucciarone, D. A., Ninokawa, A., & Caldeira, K. (2019). Carbon Isotopic Fractionation in Organic Matter Production Consistent with Benthic Community Composition Across a Coral Reef Flat. *Frontiers in Marine Science*, 5, 520. <https://doi.org/10.3389/fmars.2018.00520>
- Kline, DI., Teneva, L., Odamoto, DK, Schneider, K., Caldeira, K., Miard, T., Chai, A., Marker, M., Dunbar, RB., Mitchell, BG., Dove, S., and Hoegh-Guldberg, O. (2019) Living coral tissue slows skeletal dissolution related to ocean acidification. *Nature Ecology and Evolution* 3;1438-1444. <https://doi.org/10.1038/s41559-019-0988-x>

- Krishnamohan KS., Bala G., Cao L., Duan L., & Caldeira, K. (2019) Climate system response to stratospheric sulfate aerosols: sensitivity to altitude of aerosol layer. *Earth Syst. Dynam.*, 10, 885–900, 2019. <https://www.earth-syst-dynam.net/10/885/2019/>
- Hoegh-Guldberg O., Caldeira K., Chopin T., Gaines S., Haugan P., Hemer M., Howard J., Manaswita K., Krause-Jensen D., Lindstad E., Lovelock CE., Michelin M., Gunnar Nielsen F., Northrop E., Parker R., Joyashree R., Smith T., Shreya S., & Tyedmers P. (2019) ‘The Ocean as a Solution to Climate Change: Five Opportunities for Action.’ Report. Washington, DC: World Resources Institute. Available online at <http://www.oceanpanel.org/climate>
- Romano de Orte, MR., Clowez, S., & Caldeira, K., (2019) Response of bleached and symbiotic sea anemones to plastic microfiber exposure. *Environmental Pollution*, 249, 512-517. <https://doi.org/10.1016/j.envpol.2019.02.100>
- Tong, D., Zhang, Q., Zheng, Y., Caldeira, K., Shearer, C., Hong, C., Qin, Y., & Davis, SJ. (2019) Committed emissions from existing energy infrastructure jeopardize 1.5° C climate target. *Nature*. 1476-4687. <https://doi.org/10.1038/s41586-019-1364-3>
- Wang, R., Saunders, H., Moreno-Cruz, J., & Caldeira, K. Induced Energy-Saving Efficiency Improvements Amplify Effectiveness of Climate Change Mitigation. (2019), *Joule* 3, 1-17, <https://doi.org/10.1016/j.joule.2019.07.024>
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2018¶
- Albright, R., Takeshita, Y., Koweek, D. A., Ninokawa, A., Wolfe, K., Rivlin, T., Caldeira, K. (2018). Carbon dioxide addition to coral reef waters suppresses net community calcification. *Nature*, 555, 516–519.¶
- Cyronak, T., Andersson AJ. Langdon, C., Albright, R., Bates, N. R., Caldeira, K., Carlton, R., ... Yamamoto, S. (2018). Taking the metabolic pulse of the world’s coral reefs. *PLoS ONE*, 13, 1.¶
- Davis, S. J., Lewis, N. S., Shaner, M., Aggarwal, S., Arent, D., Azevedo, I. L., ... Caldeira, K. (2018). Net-zero emissions energy systems. *Science*, 360, 6396.¶
- Koweek, D., Zimmerman, R. C., Hewett, K. M., Gaylord, B., Siddings, S. N., Nickols, K. J., ... Caldeira, K. (2018). Expected limits on the ocean acidification buffering potential of a temperate seagrass meadow. *Ecological Applications*, 28(7), 1694–1714.¶
- Li, C., Fang, Y., Caldeira, K., Zhang, X., Diffenbaugh, N. S., & Michalak, A. (2018). Widespread persistent changes to temperature extremes occurred earlier than predicted. *Scientific Reports*, 8, 1007
- Modak, A., G. Bala, G., Caldeira, K., & Cao, L. (2018). Does shortwave absorption by methane influence its effectiveness? *Clim Dyn*, 51(9–10), 3653–3672.¶
- Persad, G., & Caldeira, K. (2018). Divergent global-scale temperature effects from identical aerosols emitted in different regions. *Nature Communications*, 9, 3289.¶

- Possner, A., Wang, H., Wood, R., Caldeira, K., & TP, A. (2018). The efficacy of aerosol-cloud radiative perturbations from near-surface emissions in deep open-cell stratocumuli. *Atmospheric Chemistry and Physics*, *18*(23), 17475–17488.¶
- Praetorius, S., Rugenstein, M., Persad, G., & Caldeira, K. (2018). Global and Arctic climate sensitivity enhanced by changes in North Pacific heat flux. *Nature Communications*, *9*, 3124.¶
- Rampino, M., & Caldeira, K. (2018). Comparison of the ages of large-body impacts, flood-basalt eruptions, ocean-anoxic events and extinctions over the last 26 million years: a statistical study. *International Journal of Earth Sciences*, *107*(2), 601–606.¶
- Ricke, K., Drouet, L., Caldeira, K., & Tanoni, M. (2018). Country-level social cost of carbon. *Nature Climate Change*, *8*(10), 895–900.¶
- Shaner, M. R., Davis, S. J., Lewis, N. S., & Caldeira, K. (2018). Geophysical constraints on the reliability of solar and wind power in the United States. *Energy and Environmental Science*, *11*, 914–925.¶

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2017¶

- Ahbe, E., & Caldeira, K. (2017). Spatial Distribution of Generation of Lorenz's Available Potential Energy in a Global Climate Model. *J. Climate*, *30*, 2089–2101.¶
- Brown, P., & Caldeira, K. (2017). Greater future global warming inferred from Earth's recent energy budget. *Nature*, *552*, 45–50.¶
- Cao, L., Duan, L., Bala, G., & Caldeira, K. (2017). Simultaneous stabilization of global temperature and precipitation through cocktail geoengineering. *Geophysical Research Letters*, *44*, 7429–7437.¶
- Clack, C. T. M., Qvist, S. A., Apt, J., Bazilian, M., Brandt, A. R., Caldeira, K., ... Whitacre, J. F. (2017). Evaluation of a proposal for reliable low-cost grid power with 100% wind, water, and solar. *Proceedings of the National Academy of Sciences*, *114*(26), 6722–6727. <https://doi.org/10.1073/pnas.1610381114>¶
- Possner, A., & Caldeira, K. (2017). Geophysical potential for wind energy over the open oceans. *PNAS*, *114*(43), 11338–11343.¶
- Rampino, M. R., & Caldeira, K. (2017). Correlation of the largest craters, stratigraphic impact signatures, and extinction events over the past 250 Myr. *Geoscience Frontiers*, *8*(6), 1241–1245.¶
- Shayegh, S., Sanchez, D. L., & Caldeira, K. (2017). Evaluating relative benefits of different types of R&D for clean energy technologies. *Energy Policy*, *107*, 532–538.¶
- Wang, R., Moreno-Cruz, J., & Caldeira, K. (2017). Will the use of a carbon tax for revenue generation produce an incentive to continue carbon emissions? *Environmental Research Letters*, *12*, 6.¶

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2016¶

- Albright, R., Caldeira, L., Hosfelt, J., Kwiatkowski, L., Maclaren, J., Mason, B., Nebuchina, Y., Ninokawa, A., Pongratz, J., Ricke, K.L., Rivlin, T., Schneider, K., Sesbotié, M., Shamberger, K., Silverman, J., Wolfe, K., Zhu, & K., Caldeira, K. (2016). Reversal of ocean acidification enhances net coral reef calcification. *Nature.*, *531*, 362–365.¶
- Cao, L., Duan, L., Bala, G., & Caldeira, K. (2016). Simulated long-term climate response to idealized solar geoengineering: Effect of Long-term solar Geoengineering. *Geophysical Research Letters*, *43*(5), 2209–2217.¶
- Devaraju, N., Bala, G., Caldeira, K., & Nemani, R. (2016). A model based investigation of the relative importance of CO₂-fertilization, climate warming, nitrogen deposition and land use change on the global terrestrial carbon uptake in the historical period. *Climate Dynamics*, *47*, 173–190.¶
- Kwiatkowski, L., Gaylord, B., Hill, T., Hosfelt, J., Kroeker, K. J., Nebuchina, Y., ... Caldeira, K. (2016). Nighttime dissolution in a temperate coastal ocean ecosystem increases under acidification. *Scientific Reports*, *6*, 22984.¶
- Modak, A., Bala, G., Cao, L., & Caldeira, K. (2016). Why must a solar forcing be larger than a CO₂ forcing to cause the same global mean surface temperature change? *Environmental Research Letters*, *11*, 044013.¶
- Zhang, X., Myhrvold, N. P., Hausfather, Z., & Caldeira, K. (2016). Climate benefits of natural gas as a bridge fuel and potential delay of near-zero energy systems. *Applied Energy*, *167*, 317–322.¶



2015¶

- Albright, R., Benthuyssen, J., Cantin, N., Caldeira, K., & Anthony, K. (2015). Coral reef metabolism and carbon chemistry dynamics of a coral reef flat. *Geophysical Research Letters*, *42*(10), 3980–3988.¶
- Cvijanovic, I., & Caldeira, K. (2015). Atmospheric impacts of sea ice decline in CO₂ induced global warming. *Climate Dynamics*, *44*, 1173.¶
- Cvijanovic, I., Caldeira, K., & MacMartin, D. G. (2015). Impacts of ocean albedo alteration on Arctic sea ice restoration and Northern Hemisphere climate. *Environmental Research Letters*, *10*, 044020.¶
- Kline, D. I., Teneva, L., Hauri, C., Schneider, K., Miard, T., Chai, A., ... Hoegh-Guldberg, O. (2015). Six Month In Situ High-Resolution Carbonate Chemistry and Temperature Study on a Coral Reef Flat Reveals Asynchronous pH and Temperature Anomalies. *PLOS ONE*, *10*, 6.¶
- Kwiatkowski, L., Ricke, K. L., & Caldeira, K. (2015). Atmospheric consequences of disruption of the ocean thermocline. *Environmental Research Letters*, *10*, 034016.¶

- Mathesius, S., Hofmann, M., Caldeira, K., & Schellnhuber, H. J. (2015). Long-term response of oceans to CO₂ removal from the atmosphere. *Nature Climate Change*, *5*, 1107–1113.¶
- Petri, Y., & Caldeira, K. (2015). Impacts of global warming on residential heating and cooling degree-days in the United States. *Scientific Reports*, *5*.
<https://doi.org/10.1038/srep12427>¶
- Ricke, K. L., Moreno-Cruz, J. B., Schewe, J., Levermann, A., & Caldeira, K. (2015). Policy thresholds in mitigation. *Nature Geoscience*, *9*, 5–6.¶
- Winkelmann, R., Levermann, A., Ridgwell, A., & Caldeira, K. (2015). Combustion of available fossil fuel resources sufficient to eliminate the Antarctic Ice Sheet. *Science Advances*, *1*, 8.¶
- Zhang, X., & Caldeira, K. (2015). Time scales and ratios of climate forcing due to thermal versus carbon dioxide emissions from fossil fuels. *Geophysical Research Letters*, *2015*.
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- Caldeira, K., & Cvijanovic, I. (2014). Estimating the Contribution of Sea Ice Response to Climate Sensitivity in a Climate Model. *Journal of Climate*, *27*, 8597–8607.¶
- Caro, D., Davis, S. J., Bastianoni, S., & Caldeira, K. (2014). Global and regional trends in greenhouse gas emissions from livestock. *Climatic Change*, *126*, 203–216.¶
- Caro, D., LoPresti, A., Davis, S. J., Bastianoni, S., & Caldeira, K. (2014). CH₄ and N₂O emissions embodied in international trade of meat. *Environmental Research Letters*, *9*(11400), 5.¶
- Davis, S. J., Burney, J. A., Pongratz, J., & Caldeira, K. (2014). Methods for attributing land-use emissions to products. *Carbon Management*, *5*, 233–245.¶
- IPCC. (2014a). Carbon and Other Biogeochemical Cycles. In *Climate Change 2013 - The Physical Science Basis* (Vol. 9781, pp. 465–570). Cambridge: Cambridge University Press.¶
- IPCC. (2014b). Clouds and Aerosols. In *Climate Change 2013 - The Physical Science Basis* (Vol. 9781, pp. 571–658). Cambridge: Cambridge University Press.¶
- Kalidindi, S., Bala, G., Modak, A., & Caldeira, K. (2014). Modeling of solar radiation management: a comparison of simulations using reduced solar constant and stratospheric sulphate aerosols. *Climate Dynamics*, *44*(9–10), 1–17. ¶
- MacMartin, D. G., Caldeira, K., & Keith, D. W. (2014). Solar geoengineering to limit the rate of temperature change. *Philosophical Transactions of the Royal Society A*, *372*(20140), 134.¶
- Ricke, K., & Caldeira, K. (2014). Maximum warming occurs about one decade after a carbon dioxide emission. *Environmental Research Letters*, *9*(12400), 2. ¶
- Ricke, K. L., & Caldeira, K. (2014). Natural climate variability and future climate policy. *Nature Climate Change*, *4*, 333–338.¶

Silverman, J., Schneider, K., Kline, D. I., Rivlin, T., Rivlin, A., Hamylton, S., ... Caldeira, K. (2014). Community calcification in Lizard Island, Great Barrier Reef: A 33year perspective. *Geochimica et Cosmochimica Acta*, *144*, 72–81.

<https://doi.org/10.1016/j.gca.2014.09.011>

Zhang, X., Myhrvold, N. P., & Caldeira, K. (2014). Key factors for assessing climate benefits of natural gas versus coal electricity generation. *Environmental Research Letters*, *9*(11402), 2.

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2013

Bala, G., Devaraju, N., Chaturvedi, R. K., Caldeira, K., & Nemani, R. (2013). Nitrogen deposition: how important is it for global terrestrial carbon uptake? *Biogeosciences Discussions*, *10*, 11077–11109.

Bala, G., Krishna, S., Narayanappa, D., Cao, L., Caldeira, K., & Nemani, R. (2013). An estimate of equilibrium sensitivity of global terrestrial carbon cycle using NCAR CCSM4. *Climate Dynamics*, *40*(7–8), 1671–1686. <https://doi.org/10.1007/s00382-012-1495-9>

Caldeira, K. (2013). Coral Bleaching: Coral “refugia” amid heating seas. *Nature Climate Change*, *3*, 444–445.

Caldeira, K., Bala, G., & Cao, L. (2013). The science of geoengineering. *Annual Review of Earth and Planetary Sciences*, *41*. <https://doi.org/10.1146/annurev-earth-042711-105548>

Caldeira, K., & Myhrvold, N. P. (2013). Projections of the pace of warming following an abrupt increase in atmospheric carbon dioxide concentration. *Environmental Research Letters*, *8*, 3.

Caldeira, K., & Ricke, K. L. (2013). Prudence on solar climate engineering. *Nature Climate Change*, *3*(11), 941–941.

Ciais, P., Gasser, T., Paris, J.D., Caldeira, K., Raupach, M.R., Canadell, J.G., Patwardhan, A., Friedlingstein, P., Piao, S.L., and Gitz, V. (2013). Attributing the increase in atmospheric CO₂ to emitters and absorbers. *Nature Climate Change*, *3*, 926.

Davis, S. J., Cao, L., Caldeira, K., & Hoffert, M. I. (2013). Rethinking wedges. *Environmental Research Letters*, *8*, 1.

Hsieh, W. C., Collins, W. D., Liu, Y., Chiang, J., Shie, C. L., Caldeira, K., & Cao, L. (2013). Climate response due to carbonaceous aerosols and aerosol-induced SST effects in NCAR community atmospheric model CAM3.5. *Atmospheric Chemistry and Physics Discussions*, *13*, 7349–7396.

Kravitz, B., Caldeira, K., Boucher, O., Robock, A., Rasch, P.J., Alterskjær, K., Bou Karam, D., Jason, N.S., Curry, C.L., Haywood J.M., Irvine, P.J., Duoyhing, J., Jones, A., Kristjansson, J.E., Lunt, D.J., Moore, J.C., Niemeier U., Schmidt, H., Schulz, M. Singh, B., Tilmes, S., Watanabe, S., Yang, S., Yoon, J.-H. (2013). Climate model response from the Geoengineering Model Intercomparison Project (GeoMIP). *Journal of Geophysical Research: Atmospheres*, *118*(15), 8320–8332. <https://doi.org/10.1002/jgrd.50646>

- Mackey, K. R. M., Paytan, A., Caldeira, K., Grossman, A. R., Moran, D., McIlvin, M., & Saito, M. A. (2013). Effect of temperature of photosynthesis and growth in marine synechococcus spp. *Plant Physiology*, *163*(2), 815–829.¶
- Ricke, K. L., Moreno-Cruz, J. B., & Caldeira, K. (2013). Strategic incentives for climate geoengineering coalitions to exclude broad participation. *Environmental Research Letters*, *8*, 014021.¶
- Ricke, K. L., Orr, J. C., Schneider, K., & Caldeira, K. (2013). Risks to coral reefs from ocean carbonate chemistry changes in recent earth system model projections. *Environmental Research Letters*, *8*, 034003.¶
- Schneider, K., Silverman, J., Kravitz, B., Rivlin, T., Schneider-Mor, A., Barbosa, S., Byrne, M., and Caldeira, K. (2013). Inorganic carbon turnover caused by digestion of carbonate sands and metabolic activity of holothurians. *Estuarine, Coastal and Shelf Science*, *133*, 217–223. <https://doi.org/10.1016/j.ecss.2013.08.029>¶

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- Caldeira, K. (2012a). Avoiding mangrove destruction by avoiding carbon dioxide emissions. *Proceedings of the National Academy of Sciences*, *109*, 14287–14288.¶
- Caldeira, K. (2012b). The Great Climate Experiment. *Scientific American*, *307*, 78–83.¶
- Caldeira, K., & Myhrvold, N. P. (2012). Temperature change vs. cumulative radiative forcing as metrics for evaluating climate consequences of energy system choices. *Proceedings of the National Academy of Science*, *109*. <https://doi.org/10.1073/pnas.1206019109>¶
- Cao, L., Bala, G., & Caldeira, K. (2012). Climate response to changes in atmospheric carbon dioxide and solar irradiance on the time scale of days to weeks. *Environmental Research Letters*, *7*, 034015. ¶
- Kline, D. I., Teneva, L., Schneider, K., Miard, T., Chai, A., Marker, M., ... Hoegh-Guldberg, O. (2012). A short-term in situ CO₂ enrichment experiment on Heron Island (GBR). *Scientific Reports*, *2*. <https://doi.org/10.1038/srep00413>¶
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- MacMartin, D. G., Keith, D. W., Kravitz, B., & Caldeira, K. (2012). Management of trade-offs in geoengineering through optimal choice of non-uniform radiative forcing. *Nature Climate Change*, *3*, 365.¶
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- Myhrvold, N. P., & Caldeira, K. (2012). Greenhouse gases, climate change and the transition from coal to low-carbon electricity. *Environmental Research Letters*, 7, 014019.¶
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- Pongratz, J., Caldeira, K., Reick, C. H., & Claussen, M. (2012). Coupled climate-carbon simulations indicate minor global effects of wars and epidemics on atmospheric CO₂ between AD 800 and 1850. *The Holocene*, 21, 843–851.¶
- Pongratz, J., Lobell, D. B., Cao, L., & Caldeira, K. (2012). Crop yields in a geoengineered climate. *Nature Climate Change*, 2, 101–105.¶
- Russell, L. M., Rasch, P. J., Mace, G. M., Jackson, R. B., Shepherd, J., Liss, P., ... Morgan, M. G. (2012). Ecosystem impacts of geoengineering: a review for developing a science plan. *Ambio*, 41, 350–369.¶
- Silverman, J., Kline, D. I., Johnson, L., Rivlin, T., Schneider, K., Erez, J., ... Caldeira, K. (2012). Carbon turnover rates in the One Tree Island reef: A 40-year perspective. *Journal of Geophysical Research: Biogeosciences* (, 117, 2005–2012.¶
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- 2011¶**
- Bala, G., Caldeira, K., Nemani, R., Cao, L., Ban-Weiss, G., & Shin, H. J. (2011). Albedo enhancement of marine clouds to counteract global warming: impacts on the hydrological cycle. *Climate Dynamics*, 37, 915–931.¶
- Ban-Weiss, G. A., Bala, L. C., Pongratz, J., & Caldeira, K. (2011). Climate forcing and response to idealized changes in surface latent and sensible heat. *Environmental Research Letters*, 6, 034032.¶
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- Davis, S. J., Peters, G. P., & Caldeira, K. (2011). The supply chain of CO₂ emissions. *Proceedings of the National Academy of Sciences*, 108, 18554–18559. ¶
- Devaraju, N., Cao, L., Bala, G., Caldeira, K., & Nemani, R. (2011). A model investigation of vegetation atmosphere interactions on a millennial timescale. *Biogeosciences Discussions*, 8, 8761.¶
- MacMynowski, D. G., Keith, D. W., Caldeira, K., & Shin, H. J. (2011). Can we test geoengineering? *Energy & Environmental Science*, 4, 5044–5052.¶
- MacMynowski, D. G., Shin, H. J., & Caldeira, K. (2011). The frequency response of temperature and precipitation in a climate model. *Geophysical Research Letters*, 38. <https://doi.org/10.1029/2011GL048623>¶

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- Rau, G. H., Knauss, K. G., & Caldeira, K. (2011). Capturing and Sequestering Flue-Gas CO₂ Using a Wet Limestone Scrubber. *Capturing Capture and Storage*, 2. <https://www.netl.doe.gov/publications/proceedings/03/carbon-seq/PDFs/167.pdf>
- Schneider, K., Silverman, J., Woolsey, E., Eriksson, H., Byrne, M., & Caldeira, K. (2011). Potential influence of sea cucumbers on coral reef CaCO₃ budget: A case study at One Tree Reef. *Journal of Geophysical Research: Biogeosciences*, 116. <https://doi.org/10.1029/2011JG001755>

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2010

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