

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
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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

2019

- Caldeira, K., & Brown, P.T. (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://doi.org/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>
- 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, S.J. (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>

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.

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.

2016

- Albright, R., Caldeira, L., Hoffelt, J., Kwiatkowski, L., Maclaren, J., Mason, B., ... 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., Hoffelt, 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. <https://doi.org/10.1002/2015GL063514>

2014

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.

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., ... 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., ... 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., ... 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>

2012

Ban-Weiss, G. A., Cao, L., Bala, G., & Caldeira, K. (2012). Dependence of climate forcing and response on the altitude of black carbon aerosols. *Climate Dynamics*, 38, 897–911.

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>

Kravitz, B., MacMartin, D. G., & Caldeira, K. (2012). Geoengineering: whiter skies? *Geophysical Research Letters*, 39, 11.

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.

Marvel, K., Kravitz, B., & Caldeira, K. (2012). Geophysical limits to global wind power. *Nature Climate Change*, 3, 118–121.

Myhrvold, N. P., & Caldeira, K. (2012). Greenhouse gases, climate change and the transition from coal to low-carbon electricity. *Environmental Research Letters*, 7, 014019.

Pongratz, J., & Caldeira, K. (2012). Attribution of atmospheric CO₂ and temperature increases to regions: importance of preindustrial land use change. *Environmental Research Letters*, 7, 034001.

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.

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.

Caldeira, K., & Davis, S. J. (2011). Accounting for carbon dioxide emissions: A matter of time. *Proceedings of the National Academy of Sciences*, 108, 8533–8534.

Cao, L., Bala, G., & Caldeira, K. (2011). Why is there a short-term increase in global precipitation in response to diminished CO₂ forcing? *Geophysical Research Letters*, 38.

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>

Pongratz, J., Reick, C. H., Raddatz, T., Caldeira, K., & Claussen, M. (2011). Past land use decisions have increased mitigation potential of reforestation. *Geophysical Research Letters*, 38.
<https://doi.org/10.1029/2011GL047848>

Rau, G. H., Knauss, K. G., & Caldeira, K. (2011). Capturing and Sequestering Flue-Gas CO₂ Using a Wet Limestone Scubber. *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>

2010

Anderson, R. G., Canadell, J. G., Randerson, J. T., Jackson, R. B., Hungate, B. A., Baldocchi, D. D., ... O'Halloran, T. L. (2010). Biophysical considerations in forestry for climate protection. *Frontiers in Ecology and the Environment*, 9, 174–182.

Bala, G., Caldeira, K., & Nemani, R. (2010). Fast versus slow response in climate change: implications for the global hydrological cycle. *Climate Dynamics*, 35, 423–434.

Ban-Weiss, G. A., & Caldeira, K. (2010). Geoengineering as an optimization problem. *Environmental Research Letters*, 5, 034009.

Caldeira, K., & Keith, D. W. (2010). The need for climate engineering research. *Issues in Science and*

Technology, 27, 57–62.

- Cao, L., Bala, G., Caldeira, K., Nemani, R., & Ban-Weiss, G. (2010). Importance of carbon dioxide physiological forcing to future climate change. *Proceedings of the National Academy of Sciences*, 107, 9513.
- Cao, L., & Caldeira, K. (2010a). Atmospheric carbon dioxide removal: long-term consequences and commitment. *Environmental Research Letters*, 5, 024011.
- Cao, L., & Caldeira, K. (2010b). Can ocean iron fertilization mitigate ocean acidification? *Climatic Change*, 99, 303–311.
- Davis, S. J., & Caldeira, K. (2010). Consumption-based accounting of CO₂ emissions. *Proceedings of the National Academy of Sciences*, 107, 5687–5692.
- Davis, S. J., Caldeira, K., & Matthews, H. D. (2010). Future CO₂ emissions and climate change from existing energy infrastructure. *Science*, 329, 1330–1333.
- Marker, M., Kline, D. I., Kirkwood, W. J., Headley, K., Brewer, P. G., Peltzer, E. T., ... Hoegh-Guldberg, O. (2010). The coral proto-free ocean carbon enrichment system (CP-FOCE): Engineering and development. *OCEANS*, 2010, 1–10.

2009

- Archer, C. L., & Caldeira, K. (2009). Global assessment of high-altitude wind power. *Energies*, 2, 307–319.
- Archer, D., Eby, M., Brovkin, V., Ridgwell, A., Cao, L., Mikolajewicz, U., ... Tokos, K. (2009). Atmospheric Lifetime of Fossil Fuel Carbon Dioxide. *Annual Review of Earth and Planetary Sciences*, 37(1), 117–134. <https://doi.org/10.1146/annurev.earth.031208.100206>
- Caldeira, K. (2009a). Geoengineering to Shade Earth. *Worldwatch Institute, State of the World*, 96–98.
- Caldeira, K. (2009b). Ocean acidification: Humanity and the environment in geologic time. *IOP Conference Series: Earth and Environmental Science*, 6(46200), 4.
- Cao, L., Bala, G., Caldeira, K., Nemani, R., & Ban-Weiss, G. (2009). Climate response to physiological forcing of carbon dioxide simulated by the coupled Community Atmosphere Model (CAM3. 1) and Community Land Model (CLM3. 0). *Geophysical Research Letters*, 36. <https://doi.org/10.3390/en20200307>
- Hoegh-Guldberg, O., Hughes, T., Anthony, K., Caldeira, K., Hatzitolos, M., & Kleypas, J. (2009). Coral reefs and rapid climate change: impacts, risks and implications for tropical societies. *IOP Conference Series: Earth and Environmental Science*, 6(30200), 4.
- Langer, W. H., Juan, C. A. S., Rau, G. H., & Caldeira, K. (2009). Accelerated weathering of limestone for CO₂ mitigation: Opportunities for the stone and cement industries. *Mining Engineering*, 61, 27.
- Orr, J., Caldeira, K., Fabry, V., Gattuso, J.-P., Haugen, P., Lehodey, P., ... Broadgate, W. (2009). Research Priorities for Understanding Ocean Acidification: Summary From the Second Symposium on the Ocean in a High-CO₂ World. *Oceanography*, 22(4), 182–189. <https://doi.org/10.5670/oceanog.2009.107>
- Pagani, M., Caldeira, K., Berner, R., & Beerling, D. J. (2009). The role of terrestrial plants in limiting atmospheric CO₂ decline over the past 24 million years. *Nature*, 460, 85–88.
- Silverman, J., Lazar, B., Cao, L., Caldeira, K., & Erez, J. (2009). Coral reefs may start dissolving when atmospheric CO₂ doubles. *Geophysical Research Letters*, 36.

2008

- Adams, E. E., & Caldeira, K. (2008). Ocean storage of CO₂. *Elements*, 4, 319–332.
- Archer, C. L., & Caldeira, K. (2008). Historical trends in the jet streams. *Geophysical Research Letters*, 35. <https://doi.org/10.1029/2008GL033614>
- Buesseler, K. O., Doney, S. C., Karl, D. M., Boyd, P. W., Caldeira, K., Chai, F., ... Watson, A. J. (2008). Ocean iron fertilization: Moving forward in a sea of uncertainty. *Science*, 319, 162.
- Caldeira, K., & Wood, L. (2008). Global and Arctic climate engineering: Numerical model studies. *Philosophical Transactions of the Royal Society A: Mathematical, Physical and Engineering Sciences*, 366, 4039–4056.
- Cao, L., Eby, M., Ridgwell, A., Caldeira, K., Archer, D., Ishida, A., ... Yool, A. (2008). The importance of ocean transport in the fate of anthropogenic CO₂. *Biogeosciences Discussions*, 5, 4521.
- Cao, Long, & Caldeira, K. (2008). Atmospheric CO₂ stabilization and ocean acidification. *Geophysical Research Letters*, 35(19).
- Griffith, E. M., Paytan, A., Caldeira, K., Bullen, T. D., & Thomas, E. (2008). A dynamic marine calcium cycle during the past 28 million years. *Science*, 322, 1671–1674.
- Hoegh-Guldberg, O., Mumby, P. J., Hooten, A. J., Steneck, R. S., Greenfield, P., Gomez, E., ... Hatzioios, M. E. (2008). Coral adaptation in the face of climate change: Response. *Science*, 320, 315–316.
- Jackson, R. B., Randerson, J. T., Canadell, J. G., Anderson, R. G., Avissar, R., Baldocchi, D. D., ... Pataki, D. (2008). Protecting climate with forests. *Environmental Research Letters*, 3, 044006.
- Matthews, H. D., & Caldeira, K. (2008). Stabilizing climate requires near-zero emissions. *Geophysical Research Letters*, 35(4). <https://doi.org/10.1029/2007GL032388>
- Schwartzman, D., Caldeira, K., & Pavlov, A. (2008). Cyanobacterial emergence at 2.8 Gya and greenhouse feedbacks. *Astrobiology*, 8, 187–203.
- Zeebe, R. E., & Caldeira, K. (2008). Close mass balance of long-term carbon fluxes from ice-core CO₂ and ocean chemistry records. *Nature Geoscience*, 1, 312–315.
- Zeebe, R. E., Zachos, J. C., Caldeira, K., & Tyrrell, T. (2008). Carbon emissions and acidification. *Science*, 321, 51.

2007

- Bala, G., Caldeira, K., Wickett, M., Phillips, T. J., Lobell, D. B., Delire, C., & Mirin, A. (2007). Combined climate and carbon-cycle effects of large-scale deforestation. *Proceedings of the National Academy of Sciences*, 104, 6550–6555.
- Caldeira, K. (2007a). Phanerozoic ocean chemistry and anthropogenic ocean acidification. *Goldschmidt*, 2007, 19–24.
- Caldeira, K. (2007b). The maximum entropy principle: a critical discussion. *Climatic Change*, 85, 267–269.
- Caldeira, K. (2007c). What Corals are Dying to Tell Us About CO₂. *Oceanography*, 20, 188.
- Caldeira, K., Archer, D., Barry, J. P., Bellerby, R., Brewer, P. G., Cao, L., ... Zeebe, R. E. (2007). Comment on “Modern-age buildup of CO₂ and its effects on seawater acidity and salinity” by Hugo A. Loáiciga. *Geophysical Research Letters*, 34(18). <https://doi.org/10.1029/2006GL027288>
- Cao, L., Caldeira, K., & Jain, A. K. (2007). Effects of carbon dioxide and climate change on ocean acidification and carbonate mineral saturation. *Geophysical Research Letters*, 34. <https://doi.org/10.1029/2006GL028605>
- Hoegh-Guldberg, O., Mumby, P. J., Hooten, A. J., Steneck, R. S., Greenfield, P., Gomez, E., ... Hatzioios, M. E. (2007). Coral reefs under rapid climate change and ocean acidification. *Science*, 318,

1737–1742.

- Lane, L., Caldeira, K., Chatfield, R., & Langhoff, S. (2007). *Workshop Report on Managing Solar Radiation*. NASA.
- Lutz, M. J., Caldeira, K., Dunbar, R. B., & Behrenfeld, M. J. (2007). Seasonal rhythms of net primary production and particulate organic carbon flux to depth describe the efficiency of biological pump in the global ocean. *Journal of Geophysical Research: Oceans* (, 112, 1978–2012.
- Matthews, H. D., & Caldeira, K. (2007). Transient climate-carbon simulations of planetary geoengineering. *Proceedings of the National Academy of Sciences*, 104, 9949–9954.
- Najjar, R. G., Jin, X., Louanchi, F., Aumont, O., Caldeira, K., Doney, S. C., ... Yool, A. (2007). Impact of circulation on export production, dissolved organic matter, and dissolved oxygen in the ocean: Results from Phase II of the Ocean Carbon-cycle Model Intercomparison Project (OCMIP-2). *Global Biogeochemical Cycles*, 21. <https://doi.org/10.1029/2006GB002857>
- Pagani, M., Caldeira, K., Archer, D., & Zachos, J. C. (2007). An ancient carbon mystery. *Science*, 314, 1556.
- Rau, G. H., & Caldeira, K. (2007). Coal's future: clearing the air. *Science*, 316, 691.
- Rau, G. H., Knauss, K. G., Langer, W. H., & Caldeira, K. (2007). Reducing energy-related CO₂ emissions using accelerated weathering of limestone. *Energy*, 32, 1471–1477.
- Roberts, B. W., Shepard, D. H., Caldeira, K., Cannon, M. E., Eccles, D. G., Grenier, A. J., & Freidin, J. F. (2007). Harnessing high-altitude wind power. *IEEE Transactions on Energy Conversion*, 22, 136–144.

2006

- Alendal, G., Haugan, P. M., Gangsto, R., Caldeira, K., Adams, E., Brewer, P., ... Chen, B. X. (2006). Comment on " Fate of rising CO₂ droplets in seawater". *Environmental Science and Technology*, 40, 3653–3654.
- Bala, G., Caldeira, K., Mirin, A., Wickett, M., Delire, C., & Phillips, T. J. (2006). Biogeophysical effects of CO₂ fertilization on global climate. *Tellus B*, 58, 620–627.
- Caldeira, K. (2006). Forests, climate, and silicate rock weathering. *Journal of Geochemical Exploration*, 88, 419–422.
- Caldeira, K., Akai, M., Brewer, P., Chen, B., Haugan, P., Iwama, T., ... Hansen, L. (2006). Ocean Storage. *IPCC Special Report on Carbon Dioxide Capture and Storage*, 277–317.
- Rau, G. H., Knauss, K. G., Caldeira, K., & Friedmann, J. (2006). Opportunities for Low-Cost CO₂ Mitigation in Electricity, Oil, and Cement Production. *Proc. Greenhouse Gas Control Technologies*. 8.

2005

- Bala, G., Caldeira, K., Mirin, A., Wickett, M., & Delire, C. (2005). Multicentury changes to the global climate and carbon cycle: Results from a coupled climate and carbon cycle model. *Journal of Climate*, 18, 4531–4544.
- Caldeira, K. (2005). Long-term consequences of continued carbon dioxide emission to the atmosphere. Ken Caldeira. *Department of Global Ecology, Carnegie Institution*, 25–30.
- Caldeira, K., & Wickett, M. E. (2005). Ocean model predictions of chemistry changes from carbon dioxide emissions to the atmosphere and ocean. *Journal of Geophysical Research*, 110. <https://doi.org/10.1029/2004JC002671>
- Gibbard, S., Caldeira, K., Bala, G., Phillips, T. J., & Wickett, M. (2005). Climate effects of global land cover

- change. *Geophysical Research Letters*, 32. <https://doi.org/10.1029/2005GL024550>
- Govindasamy, B., Thompson, S., Mirin, A., Wickett, M., Caldeira, K., & Delire, C. (2005). Increase of carbon cycle feedback with climate sensitivity: results from a coupled climate and carbon cycle model. *Tellus B*, 57(2), 153–163. <https://doi.org/10.1111/j.1600-0889.2005.00135.x>
- Orr, J. C., Aumont, O., Yool, A., Plattner, G.-K., Joos, F., Maier-Reimer, E., ... Sarmiento, J. L. (2005). Narrowing the uncertainty for deep-ocean injection efficiency. In E. S. Rubin, D. W. Keith, C. F. Gilboy, M. Wilson, T. Morris, J. Gale, & K. Thambimuthu (Eds.), *Greenhouse Gas Control Technologies 7* (pp. 1481–1485). <https://doi.org/10.1016/B978-008044704-9/50168-3>
- Rampino, M. R., & Caldeira, K. (2005). Major perturbation of ocean chemistry and a “Strangelove Ocean” after the end? *Ermian Mass Extinction*, 17, 554–559.
- Raven, J., Caldeira, K., Elderfield, H., Hoegh-Guldberg, O., Liss, P., Riebesell, U., ... Watson, A. (2005). *Ocean acidification due to increasing atmospheric carbon dioxide*. The Royal Society.

2004

- Caldeira, K. G., & Szaghmary, E. (2004). What Does History Teach Us about the Major Transitions and Role of Disturbances in the Evolution of Life and of the Earth System? *Earth System Analysis for Sustainability*, 29.
- Caldeira, K., Morgan, M. G., Baldocchi, D., Brewer, P. G., Chen, C., Nabuurs, G., ... Robertson, G. P. (2004). A Portfolio of Carbon Management. *The Global Carbon Cycle: Integrating Humans, Climate, and the Natural World*, 62, 103.
- Doney, S. C., Anderson, R., Bishop, J., Caldeira, K., Carlson, C., Carr, M. E., ... Weller, R. (2004). *Ocean carbon and climate change (OCCC): An implementation strategy for US ocean carbon research*. University Corporation for Atmospheric Research.
- Doney, S. C., Lindsay, K., Caldeira, K., Campin, J. M., Drange, H., Dutay, J. C., ... Yool, A. (2004). Evaluating global ocean carbon models: The importance of realistic physics. *Global Biogeochemical Cycles*, 18. <https://doi.org/10.1029/2003GB002150>
- Hoffert, M. I., & Caldeira, K. (2004). Climate Change and Energy, Overview. *Encyclopedia of Energy*, 1, 359–380.
- Lenton, T. M., Caldeira, K. G., Franck, S. A., Horneck, G., Jolly, A., Rabbow, E., ... Zimmermann-Timm, H. (2004). Long-term geosphere-biosphere coevolution and astrobiology. *Earth System Analysis for Sustainability*, 111–139.
- Matsumoto, K., Sarmiento, J. L., Key, R. M., Aumont, O., Bullister, J. L., Caldeira, K., ... Orr, J. C. (2004). Evaluation of ocean carbon cycle models with data-based metrics. *Geophysical Research Letters*, 31. <https://doi.org/10.1029/2003GL018970>
- Mueller, K., Cao, L., Caldeira, K., & Jain, A. (2004). Differing methods of accounting ocean carbon sequestration efficiency. *Journal of Geophysical Research*, 109. <https://doi.org/10.1029/2003JC002252>
- Thompson, S. L., Bala, G., Mirin, A., Caldeira, K., Delire, C., Milovich, J., ... Erickson, D. (2004). Quantifying the effects of CO₂-fertilized vegetation on future global climate and carbon dynamics. *Geophysical Research Letters*, 31. <https://doi.org/10.1029/2004GL021239>

2003

- Baba, Y., & Rakov, V. A. (2003). On the transmission line model for lightning return stroke representation.

- Geophysical Research Letters*, 30. <https://doi.org/10.1029/2003GL018407>
- Caldeira, K., Jain, A. K., & Hoffert, M. I. (2003). Climate sensitivity uncertainty and the need for energy without CO₂ emission. *Science*, 299, 2052–2054.
- Caldeira, K., & Wickett, M. E. (2003). Oceanography: anthropogenic carbon and ocean pH. *Nature*, 425, 365–365.
- Fallon, S. J., Guilderson, T. P., & Caldeira, K. (2003a). Carbon isotope constraints on vertical mixing and air-sea CO₂ exchange. *Geophysical Research Letters*, 30.
- Fallon, S. J., Guilderson, T. P., & Caldeira, K. (2003b). Oceans-OCE 9. *Carbon Isotope Constraints on Vertical Mixing and Air-Sea CO₂*, 2. <https://doi.org/10.1029/2003GL018049>
- Govindasamy, B., Caldeira, K., & Duffy, P. (2003). Geoengineering Earth's radiation balance to mitigate climate change from a quadrupling of CO₂. *Global and Planetary Change*, 37(1), 157–168.
- Hoffert, M., Caldeira, K., & Benford, G. (2003). Fourteen Grand Challenges. *Mechanical Engineering*, 125, 1–14.
- Holtvoeth, J., Wagner, T., & Schubert, C. J. (2003). Organic matter in river-influenced continental margin sediments: The land-ocean and climate linkage at the Late Quaternary Congo fan (ODP Site 1075). *Geochemistry, Geophysics, Geosystems*, 4(12).
- Johns, W. E. (2003). Observations of seasonal exchange through the Straits of Hormuz and the inferred heat and freshwater budgets of the Persian Gulf. *Journal of Geophysical Research*, 108(C12). <https://doi.org/10.1029/2003JC001881>
- Jones, I. S. F., & Caldeira, K. (2003). Long-term ocean carbon sequestration with macronutrient addition. In *Second Annual Conference on Carbon Sequestration*. Proc of this conference.
- Kerrick, D. M., Connolly, J., & Caldeira, K. (2003). Arc paleo-CO₂ degassing revisited. *EGS-AGU-EUG Joint Assembly*, 1, 14253.
- Orr, J. C., Aumont, O., Yool, A., Plattner, G. K., Joos, F., Maier-Reimer, E., ... Davison, J. (2003). The GOSAC project to predict the efficiency of ocean CO₂ sequestration using 3-D ocean models. *Greenhouse Gas Control Technologies*, 6. <https://doi.org/10.1016/B978-008044276-1/50277-4>
- Ridgwell, A. J., Kennedy, M. J., & Caldeira, K. (2003). Carbonate deposition, climate stability, and Neoproterozoic ice ages. *Science*, 302, 859–862.
- Wickett, M. E., Caldeira, K., & Duffy, P. B. (2003). Effect of horizontal grid resolution on simulations of oceanic CFC-11 uptake and direct injection of anthropogenic CO₂. *Journal of Geophysical Research: Oceans* (, 108, 1978–2012.
- Zeng, T., Wang, Y., Chance, K., Browell, E. V., Ridley, B. A., & Atlas, E. L. (2003). Widespread persistent near-surface ozone depletion at northern high latitudes in spring. *Geophysical Research Letters*, 30. <https://doi.org/10.1029/2003GL018587>

2002

- Caldeira, K. (2002a). Monitoring of ocean storage projects. *Proc. Workshop on Carbon Dioxide Capture and Storage*.
- Caldeira, K. (2002b). Simulating Ocean Fertilization: Effectiveness and Unintended Consequences. *Proceedings, Complements to Kyoto*, 23–24.
- Caldeira, K. (2002c). What has posterity done for us? *It's Not the Point*, 420, 605.
- Caldeira, K., Wickett, M. E., & Duffy, P. B. (2002). Depth, radiocarbon, and the effectiveness of direct CO₂

- injection as an ocean carbon sequestration strategy. *Geophysical Research Letters*, 29(13–1), 13–14.
- Duffy, P. B., Wickett, M. E., & Caldeira, K. (2002). Effect of horizontal grid resolution on the near-equilibrium solution of a global ocean-sea ice model. *Journal of Geophysical Research*, 107, 3075.
- Dutay, J. C., Bullister, J. L., Doney, S. C., Orr, J. C., Najjar, R., Caldeira, K., ... Yool, A. (2002). Evaluation of ocean model ventilation with CFC-11: Comparison of 13 global ocean models. *Ocean Modelling*, 4, 89–120.
- Govindasamy, B., Thompson, S., Duffy, P., Caldeira, K., & Delire, C. (2002). Impact of geoengineering schemes on the terrestrial biosphere. *Geophysical Research Letters*, 29(22), 18–1.
- Hoffert, M. I., Caldeira, K., Benford, G., Criswell, D. R., Green, C., Herzog, H., ... Wigley, T. (2002). Advanced technology paths to global climate stability: Energy for a greenhouse planet science. *Science*, 298, 981–987.
- Lutz, M., Dunbar, R., & Caldeira, K. (2002). Regional variability in the vertical flux of particulate organic carbon in the ocean interior. *Global Biogeochemical Cycles*, 16(11–1), 11–18.
- Pagani, M., Freeman, K. H., Ohkouchi, N., & Caldeira, K. (2002). Comparison of water column [CO₂aq] with sedimentary alkenone-based estimates: A test of the alkenone-CO₂ proxy. *Paleoceanography*, 17(4), 1069. <https://doi.org/10.1029/2002PA000756>
- Randerson, J. T., Enting, I. G., Schuur, E., Caldeira, K., & Fung, I. Y. (2002). Seasonal and latitudinal variability of troposphere $\Delta^{14}\text{CO}_2$: Post bomb contributions from fossil fuels, oceans, the stratosphere, and the terrestrial biosphere. *Global Biogeochemical Cycles*, 16, 1112.

2001

- Aumont, O., Orr, J., Yool, A., Plattner, K., Joos, F., Maier-Rainer, E., ... Matear, R. (2001). Efficiency of purposeful CO₂ injection in the deep ocean: Comparison of seven ocean models. *IGBP: Open Science Conference, 2001*.
- Caldeira, K., Herzog, H. J., & Wickett, M. E. (2001). Predicting and evaluating the effectiveness of ocean carbon sequestration by direct injection. *Proceedings of First National Conference on Carbon Sequestration, , DC*, 14–17.
- Govindasamy, B., Duffy, P., & Caldeira, K. (2001). Land use changes and Northern Hemisphere cooling. *Geophysical Research Letters*, 28(2), 291–294.
- Herzog, H., Caldeira, K., & Adams, E. (2001). Carbon sequestration via direct injection. *Encyclopedia of Ocean Sciences-*, 1, 408–414.
- Prentice, I. C., Farquhar, G. D., Fasham, M., Goulden, M. L., Heimann, M., Kheshi, H. S., ... Yool, A. (2001). *The carbon cycle and atmospheric carbon dioxide*. Cambridge.
- Rau, G. H., Caldeira, K., Knauss, K. G., Downs, B., & Sarv, H. (2001). Enhanced carbonate dissolution as a means of capturing and sequestering carbon dioxide. *First National Conference on Carbon Sequestration, Washington, DC*, 14–17.

2000

- Caldeira, K., & Duffy, P. B. (2000). The role of the Southern Ocean in uptake and storage of anthropogenic carbon dioxide. *Science*, 287, 620–622.
- Caldeira, K., Hoffert, M. I., & Jain, A. (2000). Simple ocean carbon cycle models. *The Carbon Cycle*,

199–211.

Caldeira, K., & Rau, G. H. (2000). Accelerating carbonate dissolution to sequester carbon dioxide in the ocean: Geochemical implications. *Geophysical Research Letters*, *27*, 225–228.

Govindasamy, B., & Caldeira, K. (2000). Geoengineering Earth's radiation balance to mitigate CO₂-induced climate change. *Geophysical Research Letters*, *27*(14), 2141–2144.

1999

Bickle, M. J., Caldeira, K., & Berner, R. A. (1999). The need for mass balance and feedback in the geochemical carbon cycle: Comment and Reply. *Geology*, *26*, 477–478.

Caldeira, K., & Berner, R. (1999). Seawater pH and atmospheric carbon dioxide. *Science*, *286*, 2043–2043.

Duffy, P. B., & Caldeira, K. G. (1999). Sensitivity of simulated salinities in a three-dimensional ocean general circulation model to vertical mixing of destabilizing surface fluxes. *Climate Dynamics*, *15*, 81–88.

Hoffert, M. I., Caldeira, K., Covey, C., Duffy, P. B., & Santer, B. D. (1999). Global warming: Solar variability and the Earth's climate. *Nature*, *401*, 764.

Hoffert, M. I., Nozette, S., & Caldeira, K. (1999). Evolutionary paths to “orbital power and light.” *IAF, International Astronautical Congress*, 50.

Kerrick, D. M., & Caldeira, K. (1999). Was the Himalayan orogen a climatically significant coupled source and sink for atmospheric CO₂ during the Cenozoic? *Earth and Planetary Science Letters*, *173*, 195–203.

Rau, G. H., & Caldeira, K. (1999). Enhanced carbonate dissolution: a means of sequestering waste CO₂ as ocean bicarbonate. *Energy Conversion and Management*, *40*, 1803–1813.

Teller, E., Caldeira, K., Canavan, G., Bala, G., Grossman, A., Hyde, R., ... Wood, L. (1999). Long-range weather prediction and prevention of climate catastrophes: A status report. *Publ. UCRL-JC*, *5414*(44), 13.

1998

Caldeira, K., & Berner, R. A. (1998). Reply-The need for mass balance and feedback in the geochemical carbon cycle. *Geology*, *26*, 477–478.

Caldeira, K., & Duffy, P. B. (1998). Sensitivity of simulated CFC-11 distributions in a global ocean model to the treatment of salt rejected during sea-ice formation. *Geophysical Research Letters*, *25*, 1003–1006.

Caldeira, K., Rau, G. H., & Duffy, P. B. (1998). Predicted net efflux of radiocarbon from the ocean and increase in atmospheric radiocarbon content. *Geophysical Research Letters*, *25*, 3811–3814.

Hoffert, M. I., Caldeira, K., Jain, A. K., Haites, E. F., Harvey, L., Potter, S. D., ... Wuebbles, D. J. (1998). Energy implications of future stabilization of atmospheric CO₂ content. *Nature*, *395*, 881–884.

Kerrick, D. M., & Caldeira, K. (1998). Metamorphic CO₂ degassing from orogenic belts. *Chemical Geology*, *145*(3), 213–232.

Longhurst, A., & Caldeira, K. (1998). Too intelligent for our own good. *Nature*, *395*, 9–9.

Stephens, B. B., Keeling, R. F., Heimann, M., Six, K. D., Murnane, R., & Caldeira, K. (1998). Testing global ocean carbon cycle models using measurements of atmospheric O₂ and CO₂ concentration. *Global Biogeochemical Cycles*, *12*, 213–230.

1997

- Berner, R. A., & Caldeira, K. (1997). The need for mass balance and feedback in the geochemical carbon cycle. *Geology*, *25*, 955–956.
- Duffy, P. B., & Caldeira, K. (1997). Sensitivity of simulated salinity in a three-dimensional ocean model to upper ocean transport of salt from sea-ice formation. *Geophysical Research Letters*, *24*(11), 1323–1326. <https://doi.org/10.1029/97GL01294>
- Duffy, P. B., Caldeira, K., Selvaggi, J., & Hoffert, M. I. (1997). Effects of subgrid-scale mixing parameterizations on simulated distributions of natural ¹⁴C, temperature, and salinity in a three-dimensional ocean general circulation model. *Journal of Physical Oceanography*, *27*, 498–523.

1996

- Caldeira, K. (1996). IPCC report, chapter and verse. *Nature*, *383*, 214.
- Martin, R. E., Vermeij, G. J., Dorritie, D., Caldeira, K., Rampino, M. R., Knoll, A. H., ... Twitchett, R. J. (1996). Late Permian Extinctions. *Science*, *274*(5292), 1549–1552. <https://doi.org/10.1126/science.274.5292.1549>
- Williams, D. M., Kasting, J. F., & Caldeira, K. (1996). Chaotic obliquity variations and planetary habitability. *Circumstellar Habitable Zones*, *1*, 43.

1995

- Caldeira, K. (1995). Long-term control of atmospheric carbon dioxide; low-temperature seafloor alteration or terrestrial silicate-rock weathering? *American Journal of Science*, *295*, 1077–1114.
- Duffy, P. B., & Caldeira, K. (1995). Three-dimensional model calculation of ocean uptake of bomb ¹⁴C and implications for the global budget of bomb ¹⁴C. *Global Biogeochemical Cycles*, *9*, 373–375.
- Duffy, P. B., Eltgroth, P., Bourgeois, A. J., & Caldeira, K. (1995). Effect of improved subgrid scale transport of tracers on uptake of bomb radiocarbon in the GFDL ocean general circulation model. *Geophysical Research Letters*, *22*, 1065–1068.
- Kerrick, D. M., McKibben, M. A., Seward, T. M., & Caldeira, K. (1995). Convective hydrothermal CO₂ emission from high heat flow regions. *Chemical Geology*, *121*, 285–293.

1994

- Caldeira, K., & Kasting, J. F. (1994). Insensitivity of global warming potentials to carbon dioxide emission scenarios. *Nature*, *366*, 251.
- Caldeira, K., & Rampino, M. R. (1994). Aftermath of the end-Cretaceous mass extinction: Possible biogeochemical stabilization of the carbon cycle and climate. *Paleoceanography*, *8*, 515–525.
- Kerrick, D., Caldeira, K., Selverstone, J., & Gutzler, D. S. (1994). Post-125 Ma carbon storage associated with continent-continent collision: Comment and Reply. *Geology*, *22*, 381–383.
- Kerrick, D. M., & Caldeira, K. (1994). Metamorphic CO₂ degassing and early Cenozoic paleoclimate. *GSA Today*, *4*, 62–65.
- Rampino, M. R., & Caldeira, K. (1994a). Major episodes of geologic change: correlations, time structure and possible causes. *Earth and Planetary Science Letters*, *114*, 215–227.
- Rampino, M. R., & Caldeira, K. (1994b). The Goldilocks problem: climatic evolution and long-term habitability of terrestrial planets. *Annual Review of Astronomy and Astrophysics*, *32*, 83–114.

1993

Kerrick, D. M., & Caldeira, K. (1993). Paleoatmospheric consequences of CO₂ released during early Cenozoic regional metamorphism in the Tethyan orogen. *Chemical Geology*, *108*(1–4), 201–230. [https://doi.org/10.1016/0009-2541\(93\)90325-D](https://doi.org/10.1016/0009-2541(93)90325-D)

1992

Caldeira, K., & Kasting, J. F. (1992a). Susceptibility of the early Earth to irreversible glaciation caused by carbon dioxide clouds. *Nature*, *359*, 226–228.

Caldeira, K., & Kasting, J. F. (1992b). The life span of the biosphere revisited. *Nature*, *360*, 721–723.

Caldeira, K., & Rampino, M. R. (1992). Mount Etna CO₂ may affect climate. *Nature*, *355*, 401–402.

Caldeira, Ken. (1992). Enhanced Cenozoic chemical weathering and the subduction of pelagic carbonate. *Nature*, *357*(6379), 578–581. <https://doi.org/10.1038/357578a0>

Rampino, M. R., & Caldeira, K. (1992a). Antipodal hotspot pairs on the Earth. *Geophysical Research Letters*, *19*, 2011–2014.

Rampino, M. R., & Caldeira, K. (1992b). Episodes of terrestrial geologic activity during the past 260 million years: A quantitative approach. In *Dynamics and Evolution of Minor Bodies with Galactic and Geological Implications*. https://doi.org/10.1007/978-94-011-2743-1_10

1991

Caldeira, K. (1991). Continental-pelagic carbonate partitioning and the global carbonate-silicate cycle. *Geology*, *19*, 204–206.

Caldeira, K., & Rampino, M. R. (1991). The Mid-Cretaceous Super Plume, carbon dioxide, and global warming. *Geophysical Research Letters*, *18*, 987–990.

1990

Caldeira, K., & Rampino, M. R. (1990). Carbon dioxide emissions from Deccan volcanism and a K/T boundary greenhouse effect. *Geophysical Research Letters*, *17*, 1299–1302.

Caldeira, K., Rampino, M. R., Volk, T., & Zachos, J. C. (1990). *Biogeochemical modeling at mass extinction boundaries: Atmospheric carbon dioxide and ocean alkalinity at the K/T boundary*. <https://doi.org/10.1007/BFb0011156>

1989

Caldeira, K. (1989). Evolutionary pressures on planktonic production of atmospheric sulphur. *Nature*, *337*(6209), 732–734. <https://doi.org/10.1038/337732a0>