

Curriculum Vitae for
Ken Caldeira

PRESENT POSITION

Senior Scientist
Department of Global Ecology
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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

Ocean acidification; climate/carbon-cycle interactions; numerical simulation of climate and biogeochemistry; marine biogeochemical cycles; global carbon cycle; long-term evolution of climate and geochemical cycles; intentional intervention in the climate system; energy technology and policy

ADVISORY PANELS / DISSERTATION COMMITTEES

National Academy of Sciences, America's Climate Choices panel member (2009)
UK Royal Society geoengineering report panel member (2009)
Global Carbon Project, steering committee member (2009)
European Project on Ocean Acidification (EPOCA), Advisory board member (2008-present)
Intergovernmental Oceanographic Commission, representative at International Maritime Union negotiations (2008, 2009)
UK Royal Society ocean acidification report panel member (2007)
IPCC Special Report on CO₂ Capture and Storage, Oceans Chapter, Coordinating Lead Author (2005)
US Delegation to climate-related negotiations leading up to G8 Summit, Technical Support (2005)
UNESCO International Oceanography Commission CO₂ Panel of Experts (2002-2004)
US Global Carbon Cycle Scientific Steering Group (2001-2004)
Dissertation Committees of students at Stanford, MIT, and University of Illinois

PRINCIPAL PUBLICATIONS

Pagani, M., K. Caldeira, R. Berner, and D. J. Beerling. 2009, *The role of terrestrial plants in limiting atmospheric CO₂ decline over the past 24 million years*, **Nature** 460, 85-U94.
Archer D, Eby M, Brovkin V, Ridgwell, A., Cao, L., Mikolajeciz, Caldeira, K., Matsumoto, K, Munhoven, G., Montenegro, A., and K. Tokos, 2009, *Atmospheric Lifetime of Fossil Fuel Carbon Dioxide*, **Annual Review of Earth and Planetary Sciences** 37,117-134.
Archer, C.L., and K.Caldeira., 2009. *Global Assessment of High-Altitude Wind Power*, **Energies**, 2(2), 307-319; doi:10.3390/en20200307.
Cao, L., G. Bala, K. Caldeira, R. Nemani, and G. Ban-Weiss, 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, L10402, doi:10.1029/2009GL037724.

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- Jackson RB, Randerson JT, Canadell JG, Anderson, RG, Avissar, R, Baldocchi, DD, Bonan, GB, Caldeira, K, Diffenbaugh, NS, Field, CB, Hungate, BA, Jobbágy, EG, Kueppers, LM, Nosetto, MD and DE Pataki, *Protecting climate with forests*, **Environmental Research Letters** 3, 044006, 008
- Matthews, D.L., L. Cao, and K. Caldeira. 2009. *Sensitivity of ocean acidification to geoengineered climate stabilization*. **Geophysical Research Letters**, 36, L10706, doi:10.1029/2009GL037488/
- Silverman, J., B. Lazar, L. Cao, K. Caldeira, and J. Erez, 2009. *Coral reefs may start dissolving when atmospheric CO₂ doubles*, **Geophysical Research Letters** 36, L05606, doi:10.1029/2008GL036282.
- Adams, EE, Caldeira, K, 2008. *Ocean Storage Of CO₂*, **Elements** 4 (5):319-324, DOI: 10.2113/gselements.4.5.319.
- Archer, CL; Caldeira, K, 2008. *Historical trends in the jet streams*, **Geophysical Research Letters** 35 (8), DOI: 10.1029/2008GL033614.
- Buesseler, K.O., S.C. Doney, D.M. Karl, P.W. Boyd, K. Caldeira, F. Chai, K.H. Coale, H.J.W. de Baar, P.G. Falkowski, K.S. Johnson, R.S. Lampitt, A.F. Michaels, S.W.A. Naqvi, V. Smetacek, S. Takeda, and A.J. Watson, *Environment - Ocean iron fertilization - Moving forward in a sea of uncertainty*, **Science** 319 (5860) 162-162, 2008.
- Caldeira, K, 2008. *Fixing climate - What past climate changes reveal about the current threat - and how to counter it*, **Science** 322 (5900):376-377, DOI: 10.1126/science.1164254.
- Caldeira, K, 2008. *Geoengineering: Perhaps palliative medicine*, **Geotimes** 53 (7):59-59.
- 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 (1882):4039-4056, DOI: 10.1098/rsta.2008.0132.
- Cao, L; Caldeira, K, 2008. *Atmospheric CO₂ stabilization and ocean acidification*, **Geophysical Research Letters** 35 (19), DOI: 10.1029/2008GL035072.
- Griffith, EM; Paytan, A; Caldeira, K; Bullen, TD; Thomas, E, 2008. *A Dynamic Marine Calcium Cycle During the Past 28 Million Years*, **Science** 322 (5908):1671-1674, DOI: 10.1126/science.1163614.
- Hoegh-Guldberg, O; Mumby, PJ; Hooten, AJ; Steneck, RS; Greenfield, P; Gomez, E; Harvell, DR; Sale, PF; Edwards, AJ; Caldeira, K; Knowlton, N; Eakin, CM; Iglesias-Prieto, R; Muthiga, N; Bradbury, RH; Dubi, A; Hatziolos, ME, 2008. *Coral adaptation in the face of climate change - Response*, **Science** 320 (5874):315-316.
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- Matthews, HD; Caldeira, K, 2008. *Stabilizing climate requires near-zero emissions*, **Geophysical Research Letters** 35 (4), DOI: 10.1029/2007GL032388
- Schwartzman, D; Caldeira, K; Pavlov, A, 2008. *Cyanobacterial emergence at 2.8 gya and greenhouse feedbacks*, **Astrobiology** 8 (1):187-203, DOI: 10.1089/ast.2006.0074
- Zeebe, RE; Caldeira, K, 2008. *Close mass balance of long-term carbon fluxes from ice-core CO₂ and ocean chemistry records*, **Nature Geoscience** 1 (5):312-315, DOI: 10.1038/ngeo185.
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- Caldeira, K, 2007. *Phanerozoic ocean chemistry and anthropogenic ocean acidification*, **Geochimica et Cosmochimica Acta** 71 (15):A140-A140.
- Caldeira, K, 2007. *What Corals are Dying to Tell Us About CO₂ and Ocean Acidification*, **Oceanography** 20 (2):188-195.
- Caldeira, K., *The maximum entropy principle: A critical discussion*, **Climatic Change** 85 (3-4): 267-269, 2007.
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