

Curriculum Vita: David Archer

PERSONAL

Date of Birth: 15 September 1960
Citizenship: US
Current Address: Department of the Geophysical Sciences
5734 South Ellis Avenue
University of Chicago
Chicago, Ill 60637

EDUCATION

B.S., 1983, Indiana University, Biochemistry
Ph.D., August, 1990, University of Washington, Oceanography
Dissertation: "Dissolution of Calcite in Deep Sea Sediments: an In Situ Microelectrode Study"

EMPLOYMENT

June 2001- present: Full Professor of Geophysical Sciences, University of Chicago
June 1997 – June 2001: Associate Professor of Geophysical Sciences, University of Chicago
September 1993 - May 1997: Assistant Professor of Geophysical Sciences, University of Chicago
August 1992 - September 1993: Postdoctoral Research Scientist at Lamont Doherty
September, 1990 - July 1992: Lamont Fellow Postdoctoral Fellowship at Lamont Doherty Earth
Observatory of Columbia University
1994 - present: Adjunct Professor, Lamont Doherty Earth Observatory
January 1996 - present: Adjunct Professor of Environmental Sciences, University of Chicago

RESEARCH INTEREST

The carbon cycle and its relation to global climate.

CLASSES TAUGHT

Global Biogeochemical Cycles, University of Chicago
Undergraduate level for majors, covering the global cycles of carbon, oxygen, nitrogen, etc.,
with emphasis on mechanisms of homeostasis.
Chemical Oceanography, University of Chicago
Undergraduate level for majors.
Global Warming: Understanding the Forecast.
Undergraduate non-scientist level, cross listed with PhySci distributional requirement
curriculum and with Environmental Studies.
Environmental Chemistry.
Undergraduate science major level, with lab, cross listed with Chemistry.
Aquatic Chemistry. Graduate seminar.

AWARDS

Lamont Postdoctoral Fellowship, 1990
Packard Foundation Fellowship in Science and Engineering, 1996

PUBLICATIONS

Archer, D. (in press) Global Warming: Understanding the Forecast. A textbook for non-science
major undergraduates, Blackwell Press, London.

- Archer, D. (submitted) Methane hydrates and anthropogenic climate change. *Rev. Geophys.*
- Barker, S., R. Rickaby, D. Archer, H. Elderfield, L. Booth, J. Henderiks (submitted) Globally increased pelagic carbonate production during the Mid-Brunhes dissolution interval and the CO₂ paradox of MIS 11. *Quat. Sci. Research.*
- Henning, C., D. Archer, and I. Fung (submitted) Argon as a tracer of cross-isopycnal mixing in the thermocline. *Journal of Physical Oceanography.*
- Archer, D. (2005) Fate of fossil fuel CO₂ in geologic time. *J. Geophys. Res.*
doi:10.1029/2004JC002625.
- Martin P., D. Archer, and D. Lea (2005) Evidence for the role of deep sea temperature in glacial climate and carbon cycles. *Paleoceanography*, 20, PA2015, doi:10.1029/2003PA000914.
- Zeebe R.E. and D. Archer (2005) Feasibility of ocean fertilization and its impact on future atmospheric CO₂ levels. *Geophys. Res. Letters* 32, L09703, doi:10.1029/2005GL022449
- Archer, D. and A. Ganapolski (2005), A movable trigger: Fossil fuel CO₂ and the onset of the next glaciation, *Geochem. Geophys. Geosyst.* 6, Q05003, doi:10.1029/2004GC000891
- Archer, D., and B. Buffett (2005) Time-dependent response of the global ocean clathrate reservoir to climatic and anthropogenic forcing. *Geophys., Geochem., Geosystems.* 6(3)
doi:10.1029/2004GC000854
- Buffett, B., and D. Archer (2004) Global inventory of methane clathrate: Sensitivity to changes in environmental conditions. *Earth and Planet. Sci. Letters.* 227: 185-199.
- Archer, D., P. Martin, B. Buffett, V. Brovkin, S. Rahmstorf, and A. Ganapolski (2004) The importance of the deep ocean temperature to global biogeochemistry. *Earth and Planet. Sci. Letters (Frontiers article)* 222: 333–348.
- Rahmstorf, S., D. Archer, O. Eugster, J. Jouzel, D. Maraun, U. Neu, G.A. Schmidt, J. Severinghaus, A.J. Weaver, and J. Zachos (2004) Cosmic rays, carbon dioxide, and climate. *EOS* 85(4), 38, 2004.
- Kheshgi, H., and D. Archer (2004) A nonlinear convolution model for the evasion of CO₂ injected into the deep ocean. *J. Geophys. Res.* 109: C02007, doi:10.1029/2002JC001489.
- Archer, D. (2003) Who threw that snowball? *Science* 302: 791-792 (unrefereed Perspectives piece).
- Archer, D. (2003) The Marine Geochemical Carbon Cycle, and Iron and Climate. in *Encyclopedia of Paleoclimatology and Ancient Environments*
- Archer, D. (2003) Biological fluxes in the ocean and atmospheric pCO₂, in *Treatise on Geochemistry, Volume 6, The Oceans and Marine Geochemistry*, edited by H. Elderfield.
- Archer, D.E., P. Martin, J. Milovich, V. Brovkin, K. Plattner, and C. Ashendel (2003) Model sensitivity in the effect of Antarctic sea ice and stratification on atmospheric pCO₂. *Paleoceanography.* 18, NO. 1, 1012, doi:10.1029/2002PA000760

- Bendtsen, J., C. Lundsgaard, M. Middelboe, and D. Archer (2002) Influence of bacterial uptake on deep-sea dissolved organic carbon. *Global Biogeochemical Cycles*. 16
doi:10.1029/2002GB001947
- Mekik, F., P. Loubere, and D. Archer (2002) Organic carbon flux and the organic carbon to calcite flux ratio recorded in the deep sea carbonate record: Demonstration and a new proxy. *Global Biogeochemical Cycles*. 16, 10.1029/2001GB001634.
- Klaas, C, and D. Archer (2002) Association of sinking organic matter with various types of mineral ballast in the deep sea: Implications for the rain ratio. *Global Biogeochemical Cycles* 16,
doi:10.1029/2001GB001765.
- Ridgwell, A., A. Watson, and D. Archer (2002) Modeling the response of the oceanic Si inventory to perturbation, and consequences for atmospheric CO₂. *Global Biogeochemical Cycles* 16:
doi:10.1029/2002GB001877.
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10.1029/2000GB001288.
- Anderson, D, and D. Archer (2002) Glacial ocean carbonate-ion saturation reconstructed from foraminifer preservation. *Nature* 416: 70-73.
- Archer, D.E. and Humayun, M (2002) Ocean Structure and Development, in *Encyclopedia of Global Change*, Ed. A.S. Goudie, Oxford University Press.
- Archer, D.E. and P. Martin (2001) Thin walls tell the tale. *Science* 294: 2108-2109 (unrefereed "Perspectives" piece).
- I.C. Prentice (Coordinating Lead Author), G. Farquhar, M. Fasham, M. Goulden, M. Heimann, V. Jaramillo, H. Kheshgi, C. Le Quéré, R. Scholes, D. Wallace (Lead Authors), D. Archer, O. Aumont, D. Baker, L. Bopp, W. Cramer, I. Enting, E.A. Holland, R.A. Houghton, J.I. House, A. Ishida, A. Jain, F. Joos, T. Kaminski, K. Kohlfeld, W. Knorr, R. Law, T. Lenton, K. Lindsay, E. Maier-Reimer, D. McGuire, R. Meyer, J.C. Orr, S. Piper, K. Plattner, P. Rayner, S. Sitch, S. Taguchi, M-F. Weirig, A. Yool (Contributing Authors). (2001) Chapter 3. The Carbon Cycle and Atmospheric CO₂, for Intergovernmental Panel on Climate Change Scientific Assessment, Cambridge University Press.
- Archer, D., G. Eshel, A. Winguth, W. Broecker, R. Pierrehumbert, M. Tobis, and R. Jacob (2000) Atmospheric pCO₂ sensitivity to the biological pump in the ocean. *Global Biogeochemical Cycles* 14: 1219-1230.
- Winguth, A.M.E, D. Archer, E. Maier-Reimer, and U. Mikolajewicz (2000) Paleonutrient data analysis of the glacial Atlantic using an adjoint ocean general circulation model, in *Inverse Methods in Global Biogeochemical Cycles*, AGU Geophysical Monograph Series, edited by P. Kasibhatla, M. Heimann, D. Hartley, N. Mahowald, R. Prinn, and P. Rayner. AGU, Washington D.C.
- Archer, D., and K. Johnson (2000) A model of the iron cycle in the ocean. *Global Biogeochemical Cycles* 14: 269-279.

- Archer, D., A. Winguth, D. Lea, and N. Mahowald (2000) What caused the glacial / interglacial atmospheric PCO_2 cycles? *Reviews of Geophysics* 38: 159-189.
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- Archer, D.E. (1999) Modeling CO_2 in the ocean: A review, in *Scaling of Trace Gas Fluxes between Terrestrial and Aquatic Ecosystems and the Atmosphere, Developments in Atmospheric Science Vol 24*, 169-184, edited by A.F. Bouwman. Elsevier Sciences, Amsterdam.
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- Catubig, N.R., D.E. Archer, R. Francois, P.B. deMenocal, W. Howard, and E.-F. Yu (1998) Global Deep-Sea Burial Rate of Calcium Carbonate during the Last Glacial Maximum. *Paleoceanography* 13: 298-310.
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- Archer, D.E. (1996) An atlas of the distribution of calcium carbonate in sediments of the deep sea. *Global Biogeochemical Cycles* 10, 159-174.
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