

Curriculum Vitae

Long Cao

Present Position

Senior Research Associate
Department of Global Ecology
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Education

- University of Illinois at Urbana-Champaign
09/2000 to 05/2007 Ph.D. Atmospheric Science
- NanJing University, China, P.R.
09/1998 to 06/2000 Department of Atmospheric Science
- NanJing University, China, P.R.
09/1994 to 07/1998 B.S. Atmospheric Science

Professional Experience

- Senior Research Associate, Carnegie Institution, 01/2010 to present
- Postdoctoral Research Fellow, Carnegie Institution, 04/2007 to 12/2009

General Research Interest

Earth system modeling; atmosphere-land coupling; global carbon cycle; ocean acidification.

Professional Services

- **Editor**

Deputy associate editor, *Climatic Change*

- **Reviewer**

Nature Geoscience;
Geophysical Research Letters;
Global Biogeochemical Cycles;
Biogeosciences;
Environmental Research Letters;
Journal of Climate;
Geoscientific Model Development;
Carbon Management;
Climate Dynamics;
Mitigation and Adaptation of Strategies for Global Change;
American Journal of Science

Peer-reviewed publications

1. Ban-Weiss, George A., **L. Cao**, G. Bala, K. Caldeira, Dependence of climate forcing and response on the altitude of black carbon aerosols, *Climate Dynamics*, (2011), doi: 10.1007/s00382-011-1052-y
2. **Cao, L.**, , G. Bala, and K. Caldeira (2011), Why is there a short-term increase in global precipitation in response to diminished CO₂ forcing?, *Geophysical Research Letters* doi:10.1029/2011GL046713
3. **Cao, L.**, , G. Bala, K. Caldeira, R. Nemani, and G. Ban-Weiss (2010), Importance of carbon dioxide physiological forcing to future climate change, *Proceedings of the National Academy of Sciences*, doi 10.1073/pnas.0913000107
4. **Cao, L.**, and K. Caldeira (2010), Can ocean iron fertilization mitigate ocean acidification? *Climatic Change* doi: 10.1007/s10584-010-9799-4
5. **Cao, L.** and K. Caldeira (2010), Atmospheric carbon dioxide removal: long-term consequences and commitment, *Environmental Research Letter*, 5, doi:10.1088/1748-9326/5/2/024011.
6. Ray G. Anderson, Josep G. Canadell, James T. Randerson, Robert B. Jackson, Bruce A. Hungate, Dennis D. Baldocchi, George Ban-Weiss, **L. Cao**, Noah S. Diffenbaugh, Kevin R. Gurney, Beverly E. Law, Sebastiaan Luyssaert (2010), Biophysical

considerations in forestry for climate protection, *Frontiers in Ecology and the Environment*, doi:10.1890/090179.

7. Bala, G., K. Caldeira, R. Nemani, **L. Cao**, G. Ban-Weiss, and S. Ho-Jeong (2010), Albedo enhancement of marine clouds to counteract global warming: impacts on the hydrological cycle, *Climate Dynamics*, doi: 10.1007/s00382-010-0868-1
8. Kenneth R. N. Anthony, J. Maynard, G. Diaz-Pulido, P.J. Mumby, P.A. Marshall, **L. Cao**, and O. Hoegh-Guldberg (2010), Ocean acidification and warming will lower coral reef resilience, *Global Change Biology*, DOI: 10.1111/j.1365-2486.2010.02364.x
9. **Cao, L.**, G. Bala, R. Nemani, K. Caldeira 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.
10. **Cao, L.**, M. Eby, A. Ridgwell, K. Caldeira, D. Archer, A. Ishida, F. Joos, K. Matsumoto, U. Mikolajewicz, A. Mouchet, J. C. Orr, G.-K. Plattner, R. Schlitzer, K. Tokos, I. Totterdell, T. Tschumi, Y. Yamanaka, and A. Yool (2009), The role of ocean transport in the uptake of anthropogenic CO₂, *Biogeosciences*, 6, 375-390.
11. 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.
12. Matthews, D. **L. Cao** and K. Caldeira (2009), Sensitivity of ocean acidification to geoenvironmental climate stabilization, *Geophysical. Research Letters*, L10706, doi:10.1029/2009GL037488.
13. Archer D., M. Eby, V. Brovkin, A. Ridgwell, **L. Cao**, U Mikolajewicz, K. Caldeira, K. Matsumoto, G. Munhoven, A. Montenegro, and K. Tokos (2009), Atmospheric lifetime of fossil-fuel carbon dioxide, *Annual review of Earth and Planetary Sciences*, 37, 117-34.
14. **Cao L.** and K. Caldeira, Atmospheric CO₂ stabilization and ocean acidification, (2008), *Geophysical. Research Letters*, doi:10.1029/2008GL035072.
15. **Cao L.** and A. K. Jain, Learning about the ocean carbon cycle from observational constraints and model simulations of multiple tracers (2008), *Climatic change*, doi 10.1007/s10584-008-9421-1.
16. Caldeira K, D. Archer, J.P. Barry, R.G.J. Bellerby, P.G. Brewer, **L. Cao**, A.G. Dickson, S.C. Doney, H. Elderfield, V.J. Fabry, R.A. Feely, J-P Gattuso, P.M. Haugan, O. Hoegh-Guldberg, A.K. Jain, J.A. Kleypas, C. Langdon, J.C. Orr, A. Ridgwell, C.L. Sabine, B.A. Seibel, Y. Shirayama, C. Turley, A. J. Watson, R.E.

Zeebe (2007), Comment on “Modern-age buildup of CO₂ and its effects on seawater acidity and salinity”, *Geophysical Research Letters*, 34, L18608, doi:10.1029/2006GL027288.

17. **Cao L.**, K. Caldeira K., and A.K. Jain (2007), Effects of carbon dioxide and climate change on ocean acidification and carbonate mineral saturation, *Geophysical Research Letters*, 34, L05607, doi:10.1029/2006GL028605.
18. **Cao, L.**, and A. K. Jain (2005), An earth system model of intermediate complexity: simulation of the role of ocean mixing parameterizations and climate change in estimated uptake for natural and bomb radiocarbon and anthropogenic CO₂, *Journal of Geophysical Research (Oceans)*, 110, C09002, doi:10.1029/2005JC002919.
19. Jain, A. K., and **L. Cao** (2005), Assessing the effectiveness of direct injection for ocean carbon sequestration under the influence of climate change, *Geophysical Research Letters*, 32, L09609, doi:10.1029/2005GL022818.
20. Mueller K. **L. Cao**, K Caldeira, and A. K. Jain (2004), Differing methods of accounting ocean carbon sequestration efficiency, *Journal of Geophysical Research (Oceans)*, 109, C12018, doi: 10.1029/2003JC002252.

Conference proceedings:

1. **Cao L.**, G. Bala, K. Caldeira, R. Nemani, and G. Ban-Weiss, Global warming increased by the response of land plant to CO₂, *American Geophysical Union fall meeting*, San Francisco, CA. 2009.
2. Jain, A., M. Liang, R. Barman, M. Erickson, **L. Cao**, and G. Bala, Land-Use and Land-Cover Change and Associated Changes in Hydrological Cycle and Energy Exchange Processes in Monsoon Asian Region, *American Geophysical Union fall meeting*, San Francisco, CA. 2009.
3. Ban-Weiss, G., Caldeira, K., **L. Cao**, and G. Bala, Climate response to black carbon aerosols: Dependence on altitude, *American Geophysical Union fall meeting*, San Francisco, CA. 2009.
4. **Cao L.**, and K. Caldeira, Ocean fertilization and ocean acidification, *American Geophysical Union fall meeting*, San Francisco, CA. 2008.
5. Caldeira K. and **L., Cao**, Engineered carbon storage in the oceans, *American Geophysical Union fall meeting*, San Francisco, CA. 2008.
6. Caldeira K., S.J., Davis, and **L. Cao**, Will peak oil accelerate carbon emissions, *American Geophysical Union fall meeting*, San Francisco, CA. 2008.

7. **Cao L.**, and K. Caldeira, Ocean acidification, Coral reefs, and CO₂ stabilization, *Ocean Science meeting*, Orlando, FL. 2008.
8. **Cao L.**, and K. Caldeira, Ocean acidification consequences of stabilization of atmospheric carbon dioxide, *American Geophysical Union fall meeting*, San Francisco, CA. 2007.
9. Caldeira K., and **L. Cao**, Controls on the timescale of carbonate neutralization of carbon dioxide released to the atmosphere, *American Geophysical Union fall meeting*, San Francisco, CA. 2007.
10. **Cao L.**, and A. K. Jain, The sensitivity of ocean circulation and carbon uptake to the rate of CO₂ increase and resultant changes in climate and hydrological cycle, *American Geophysical Union fall meeting*, San Francisco, CA. 2003.
11. **Cao L.**, and A. K. Jain, Assessing the effectiveness of direct injection for ocean carbon sequestration, *American Geophysical Union fall meeting*, San Francisco, CA. 2002.
12. Jain, A. K., **Cao L.**, K. Caldeira, and H. Kheshgi, The simulated influence of anthropogenic climate warming on the oceanic carbon cycle, *American Geophysical Union fall meeting*, San Francisco, CA. 2001.