Katharine L. Ricke

Contact Information

Department of Global Ecology
Carnegie Institution for Science
260 Panama Street
Stanford, CA 94305 USA

(612) 382-8145
kricke@carnegiescience.edu
http://katericke.com

Education

Carnegie Mellon University, Pittsburgh, Pennsylvania USA

Ph.D., Engineering & Public Policy, August 2011

- Dissertation: "Characterizing Impacts and Implications of Proposals for Solar Radiation Management, a Form of Climate Engineering"
- Advisors: M. Granger Morgan and David W. Keith

Massachusetts Institute of Technology, Cambridge, Massachusetts USA

S.B., Earth, Atmospheric & Planetary Science (Subcourse: Physics of the Ocean and Atmosphere), May, 2004

- Thesis: "Analysis of Biomarker Candidates from Plant Lipid Inputs into Galapagos Lacustrine Sediments"
- Advisor: Julian Sachs
- Minor in Public Policy

Honors and Awards

- **Kavli Fellow, National Academy of Sciences Frontiers in Science**, 2012
- **Herb Toor Award for Outstanding Research Paper**, Carnegie Mellon, 2009
- **National Science Foundation Graduate Research Fellowship**, 2008-2011
- **ARCS Foundation Scholar**, 2007-2010
- **Christopher Goezte Prize for Undergraduate Research**, MIT, 2004
- **MIT Program on Human Rights and Justice Fellowship**, MIT, 2003

Academic Experience

Cornell University, Ithaca, New York USA USA

Research Associate, Sibley School of Mechanical and Aerospace Engineering **Jan 2016 - present**

Carnegie Institution for Science, Stanford, California USA

Visiting Investigator, Department of Global Ecology **Jan 2016 - present**
Fellow, Department of Global Ecology **Jan 2013 - Dec 2015**
Postdoctoral Researcher, Department of Global Ecology **Sept 2011 - Dec 2012**
Supervisor: Ken Caldeira

Carnegie Mellon University, Pittsburgh, Pennsylvania USA

Graduate Research Assistant, Climate Decision Making Center **Sept 2007 - Aug 2011**
Advisors: M. Granger Morgan and David W. Keith

University of Oxford, Oxford UK

Visiting Researcher, Climate Dynamics Group, Department of Physics **Jun - Aug 2008**
Host: Myles Allen

Massachusetts Institute of Technology, Cambridge, MA USA

Undergraduate Research Assistant, **Sept 2001 - May 2002**

Sachs Lab for Paleoclimatology and Organic Geochemistry **Sept 2003 - May 2004**
Advisor: Prof. Julian Sachs, Department of Earth, Atmospheric and Planetary Science

Summer Research Fellow, Akha Heritage Foundation, Chaing Rai, Thailand **Jun - Aug 2003**
Advisor: Dr. Susan Murcott, Department of Civil & Environmental Engineering

Undergraduate Research Assistant **Sept 2002 - Feb 2003**
Advisor: Prof. Jeffrey Ravel, Department of History

Undergraduate Research Assistant, San Francisco Libre, Nicaragua **Jun - Aug 2002**
Advisor: Dr. Susan Murcott, Department of Civil & Environmental Engineering

Professional Experience

Abt Associates, Cambridge, Massachusetts USA

Associate Analyst and Research Assistant **Sept 2004 - Jun 2007**
Performed environmental data analysis, program support and evaluation activities for the U.S. Environmental Protection Agency.

Publications

Ricke, K.L., J.B. Moreno-Cruz, J. Schewe, A. Levermann and K. Caldeira. 2016. Policy thresholds in mitigation. *Nature Geoscience*, 9:5-6.

Heutel, G., J.B. Moreno-Cruz and **K.L. Ricke**. Climate Engineering Economics. 2016. *Annual Review of Resource Economics*, in press.

Albright, R., J. Hosfelt, L. Kwiatkowski, J. K. Maclaren, B. M. Mason, Y. Nebuchina, A. Ninokawa, J. Pongratz, **K. L. Ricke**, T. Rivlin, K. Schneider, M. Sesoue, K. Shamberger, J. Silverman, K. Wolfe and K. Caldeira. 2016. Ocean acidification is already suppressing coral reef growth. *Nature*, in press.

Moreno-Cruz, J.B., **K.L. Ricke** and G. Wagner. 2015. "The Economics or Climate Engineering." *Geoengineering Our Climate* (eds. Blackstock, Miller and Rayner)

Kwiatkowski, L., **K.L Ricke.** and K. Caldeira. 2015. Atmospheric consequences of disruption of the ocean thermocline. *Environmental Research Letters*, 10:034016.

Ricke, K.L. and K. Caldeira. 2014. Timing and amount of maximum warming from a carbon dioxide emission. *Environmental Research Letters*, 9:124002.

Kravitz, B., D.G. MacMartin, A. Robock, P.J. Rasch, **K.L Ricke.**, J.N. Cole, C.L. Curry, P.J. Irvine, D. Ji, D.W. Keith, J.E. Kristjnsson, J.C. Moore, H. Muri, B. Singh, S. Tilmes, S. Watanabe, S. Yang and J.H. Yoon. 2014. A multi-model assessment of regional climate disparities caused by solar geoengineering. *Environmental Research Letters* 9:074013.

Ricke, K.L. and K. Caldeira. 2014. Natural Climate Variability and Future Climate Policy. *Nature Climate Change*, 4:333-338.

Caldeira, K. and **K.L Ricke.** 2013. Prudence on solar climate engineering. *Nature Climate Change* 3:941-941.

Ricke, K.L., J. Orr, K. Schneider and K. Caldeira. 2013. Risks to coral reefs from ocean carbonate chemistry changes in recent earth system model projections. *Environmental Research Letters*, 8:034003.

Victor, D.G., Morgan, M.G., Apt, J., Steinbruner, J. and **Ricke, K.** 2013. The truth about geoengineering. *Foreign Affairs*.

Ricke, K.L., J.B. Moreno-Cruz and K. Caldeira. 2013. Strategic incentives for climate geoengineering coalitions to exclude broad participation. *Environmental Research Letters*, 8:014021.

Ricke, K.L., D. J. Rowlands, W.J. Ingram, D.W. Keith, and M.G. Morgan. 2012. Effectiveness of stratospheric solar-radiation management as a function of climate sensitivity. *Nature Climate Change* 2:9296.

Moreno-Cruz, J.B., **K.L. Ricke** and D.W. Keith. 2011. A simple model to account for regional inequalities in the effectiveness of solar radiation management. *Climatic Change* 110(3-4):649-668.

Morgan, M.G. and **K.L. Ricke**. 2010. Cooling the Earth Through Solar Radiation Management: The need for research and an approach to its governance. An Opinion Piece for the International Risk Governance Council.

Ricke, K.L., M.R. Allen, and M.G. Morgan. 2010. Regional climate response to solar-radiation management. *Nature Geoscience* 3:537-541.

Victor, D.G., M.G. Morgan, J. Apt, J. Steinbruner, and **K. Ricke**. 2009. The Geoengineering Option: A Last Resort Against Global Warming?. *Foreign Affairs*, 88(2):64-76.

Teaching Experience

Stanford University, Stanford, California USA

Lecturer, Public Policy Program **Apr - Jun 2015**
PUBLPOL 353: "Science & Technology Policy"

Lecturer, Department of Environment and Earth Systems Science **Apr - Jun 2013**
EESS 37N: "Climate Change: Science & Society"

Carnegie Mellon University, Pittsburgh, Pennsylvania USA

Project Manager **Aug - Dec 2009**
19-452 EPP Project Course: "Reducing Obesity in Allegheny County."

Courses and Workshops

Bellagio Workshop on International Governance of Climate Engineering, Bellagio, Italy, October 2015.

Solar Geoengineering Research Residency, Cambridge, Massachusetts, May/June 2015.

Bipartisan Policy Center and Environmental Defense Fund Workshop on SRM Geoengineering Governance, San Francisco, California, April 2014.

Climate Engineering – Fourth Transdisciplinary Summer School, Cambridge, Massachusetts, August 2013.

DISsertations initiative for the advancement of Climate Change ReSearch Symposium, Colorado Springs, Colorado, October 2012.

NCAR Community Earth System Modeling Tutorial, Boulder, Colorado, August 2012.

Global Sustainability Summer School in *Risk, uncertainty and extreme events*, Potsdam, Germany, July 2012.

Climate Engineering – Second Transdisciplinary Summer School, Banff, Canada, August 2011.

Governing Climate Engineering – Transdisciplinary Summer School, Heidelberg, Germany, July 2010.

Workshop on Understanding and Governing the Risks of Planetary-scale Geoengineering, Lisbon, Portugal, April 2009.

Asilomar International Conference on Climate Intervention Technologies, Asilomar, California, March 2009.

Council on Foreign Relations Workshop on Unilateral Planetary Scale Geoengineering, Washington, D.C., May 2008.

Professional Training in: Risk Assessment & Life Cycle Assessment, Harvard University Extension School, Cambridge, Massachusetts, 2006.

Conference Presentations

Ricke, K. and K. Caldeira. Regional Heterogeneity in the Rates of Warming from CO2 Emissions. (Oral Presentation) AGU Fall Meeting. San Francisco, CA. December, 2015.

Ricke, K. and K. Caldeira. Maximum warming occurs about one decade after carbon dioxide emission. (Poster) AGU Fall Meeting. San Francisco, CA. December, 2014.

Ricke, K. and K. Caldeira. Temperature response to an emission of carbon dioxide today. (Poster) EGU General Assembly. Vienna, Austria. April, 2014.

Ricke, K. Solar Geoengineering: Questioning the Winners and Losers Paradigm. (Invited Oral Presentation) AGU Fall Meeting. San Francisco, CA. December, 2013.

Ricke, K. and K. Caldeira. Natural Climate Variability and Future Climate Policy. (Oral Presentation) AGU Fall Meeting. San Francisco, CA. December, 2013.

Ricke, K., D. J. Rowlands, W.J. Ingram, D.W. Keith, and M.G. Morgan. 2012. How does the sensitivity of climate affect stratospheric solar radiation management? (Poster) AGU Fall Meeting. San Francisco, CA. December, 2012.

Ricke, K., D. J. Rowlands, and D.W. Keith. Climate Responses to Stratospheric SRM:Resultsfroma Perturbed Physics Ensemble Modeling Experiment. (Oral Presentation) AGU Fall Meeting. San Francisco, CA. December, 2011.

Ricke, K., Allen, M.R., Ingram, W., Keith, D., Morgan, M.G. 2010. Global and Regional Climate Responses To Stratospheric Aerosol-Type Solar Radiation Management: Results from a climate*prediction*.net Geoengineering Experiment. (Poster) EGU General Assembly. Vienna, Austria. May, 2010.

Ricke, K. Regional Climate Responses To Planetary-Scale Geoengineering Activities, as Modeled Using climate*prediction*.net/HadCM3L. (Poster) AGU Fall Meeting. San Francisco, CA. December 16, 2009.

Ricke, K., Aina, T., Allen, M., Apt, J., Morgan, M. G., Steinbruner, J., Stier, P., Victor, D. 2008. International Collective Governance and the Need to Reduce Scientific Uncertainty about Geoengineering. (Oral Presentation) AGU Fall Meeting. San Francisco, CA. December 18, 2008.

Professional Service

- Reviewer for: *Nature Climate Change, Nature Geoscience, Nature Communications, Geophysical Research Letters, Earth System Dynamics, Environmental Research Letters, Ecology Letters, Journal of Geophysical Research - Atmospheres, Journal of Climate, The Anthropocene Review, Scientific Reports, Economics Research International*, National Science Foundation, National Academies of Science
- Session Co-chair, GC002: "Adapting to Rates of Climate Change: Natural and Human Dimensions" AGU Fall Meeting 2015
- Session Co-chair, GC028: "Integrating Natural and Social Science Research to Address Human Dimensions of Global Change" AGU Fall Meeting 2012
- Seminar Planning Committee, Department of Global Ecology, Carnegie Institution for Science, 2012-2013
- Graduate Student Liaison to CIT College Council, Carnegie Mellon University, 2010-2011

Skills

- Proficient with: Python (incl. NumPy, SciPy and CDAT), Mathematica, Community Earth System Model (CESM), Shell scripting
- Experience with: R, ncl, Stata, SimaPro, NetLogo, Matlab, Fortran 90
- Spanish (conversational)