

ERIC G. KEELING

Bard College/Cary Institute of Ecosystem Studies
Cary Address: 2801 Sharon Turnpike; PO Box AB
Millbrook NY 12545-0129

Telephone at Bard College: (845) 752-2357
web: www.caryinstitute.org/people_sci_keeling.html
e-mail: keelinge@caryinstitute.org

EDUCATION

PhD. Organismal Biology and Ecology, University of Montana, 2009
Advisor: Dr. Anna Sala

M.M. Music Performance, San Diego State University

B.S. Conservation and Resource Studies, University of California, Berkeley

PROFESSIONAL ACADEMIC APPOINTMENTS

2011 – present Visiting Assistant Professor in Biology and in the Center for
Environmental Policy, Bard College, Annandale-on-Hudson, NY

2009 – present Post-doctoral Associate, Cary Institute of Ecosystem Studies,
Millbrook NY

2008 Lecturer in Organismal Biology and Ecology, University of Montana,
Biology, Missoula MT

2006- 2008 Graduate Teaching Assistant, Organismal Biology and Ecology,
University of Montana, Biology, Missoula MT

2003 - 2008 Graduate Research Assistant, Organismal Biology and Ecology,
University of Montana, Biology, Missoula MT

AWARDS AND DISTINCTIONS

University of Montana Graduate Assistant Teaching Award, 2008

Outstanding Graduate Teaching Assistant, UM Organismal Biology and Ecology, 2008

Jack E. Schmautz Graduate Scholarship, 2008

PEER-REVIEWED PUBLICATIONS

Keeling, E. G. and Sala, A. 2012. Changing growth response to wildfire in old-growth ponderosa pine trees in montane forests of north central Idaho. Global Change Biology, 18: 1117–1126.

Keeling, EG, Sala A. DeLuca, TH. 2011. Lack of fire has limited physiological impact on old-growth ponderosa pine in dry montane forests of north central Idaho, USA. Ecological Applications 21 (8) 3227 - 3237

Lloret F, **Keeling EG**, Sala A. 2011. Components of tree resilience: effects of successive low-growth episodes in old ponderosa pine forests. Oikos 120 (12) 1909-1920

Naficy CE, Sala A, **Keeling EG**, Graham, J, DeLuca TH. 2010. Interactive effects of historical logging and fire exclusion on ponderosa pine forest structure in the Northern Rockies. Ecological Applications, 20(7) 1851-1864

Keeling, EG, N. Bettez, C. Harris, M. Hersh, K. Notin, M.A. Previtali, E. Rosi-Marshall, D. Strayer, and R. Wildova. 2010. Book review of Dodds, W.K. 2009. Laws, Theories, and Patterns in Ecology. Ecoscience 17(2) 225-228.

Keeling, EG, Sala, A., DeLuca, TH. 2006. Effects of fire exclusion on forest structure and composition in unlogged ponderosa pine/Douglas-fir forests. Forest Ecology and Management 237:418-428,

In preparation:

Keeling EG, Sala A., Giuggiola, A. Do slow trees grow old? Age, height, basal area growth and longevity in old-growth ponderosa pine trees.

TEACHING & MENTORING EXPERIENCE

- 2011 – present Visiting Assistant Professor, Bard College, Annandale-on-Hudson, NY
For 2011-2012, teaching Forest Ecology and Global Change Biology in the Biology department and Climate Change Solutions (graduate level course) in the Bard Center for Environmental Policy. Serving on student moderation committees and advising student senior projects.
- 2009 – 2011 Professional Development Provider, Cary Institute of Ecosystem Studies
Organized and taught professional development workshops for high school and middle school teachers in topics of ecosystem literacy, carbon cycling, water, and biodiversity.
- 2010 – 2011 Instructor, REU Seminar, Cary Institute of Ecosystem Studies
Organized and led multi-session seminar “Research in Context: Science and Society” for visiting undergraduates participating in REU (Research Experiences for Undergraduates) program at the Cary Institute of Ecosystem Studies.
- 2009 Mentor, Training American Indians in Environmental Biology (TRAIN)
Mentored Native American undergraduate in summer research project investigating the effect of tree age and size on wind-blown mortality. TRAIN is an NSF-UMEB program.
- 2008 Instructor, Biological Sciences, University of Montana, MT
Taught Introductory Ecology, a 3-credit course for undergraduate non-biology majors.
- 2007 Mentor, Montana Integrated Learning Experience for Students (MILES)
Mentored undergraduate student in summer research project investigating the effect of growth rates on tree longevity in the Selway-Bitterroot Wilderness.
- 2006 – 2008 Teaching Assistantship, University of Montana, MT
Taught discussion sections and labs for Cell and Molecular Biology, Genetics and Evolution, Introductory Biology, and Plant Physiology to undergraduate students.
- 2004 – 2005 Montana Natural History Center, Missoula, MT
Taught basic ecological and natural history concepts to 3rd and 4th graders in both classroom and field settings.

RESEARCH EXPERIENCE

- 2009 – 2011 Post-doctoral Associate, Cary Institute of Ecosystem Studies
Developed methods to assess student thinking and learning about ecosystems and designed innovative teaching strategies and professional development programs for improving student and teacher environmental literacy, with particular focus on the global carbon cycle. Advisor: Dr. Alan Berkowitz
- 2004 – 2011 Scripps Institute of Oceanography, La Jolla, CA
Conducted annual air sampling at field locations in Montana and Alberta, Canada to measure the carbon isotopic ratio in respired carbon dioxide in forests.
- 2003 – 2009 Research Assistantship, University of Montana, MT
Conducted surveys and analysis of plant community, forest stand structure and soil; and used field and lab dendrochronology techniques and analysis to study forest growth and responses to fire. Organized and led research crew on multiday field trips into remote wilderness areas.
- 1998 – 2001 Vollmar Natural Lands Consulting, Berkeley, CA
Assisted in field surveys to assess wetland plant species distribution and abundance for resource management plans. Analyzed data, produced figures, and contributed to final written reports.
- 1997 University of Montana, Forest Stewardship Workshop
Conducted forest inventory, plant survey, and created management plan for 60-acre forest.

SERVICE AND OUTREACH ACTIVITIES

- Invited workshop participant, Framework for Assessing Environmental Literacy
July 13-14, 2011. Reviewed draft and participated in two-day review, critique and discussion of NSF-funded framework for assessing environmental literacy.
- Invited panelist, The Wilderness Society Governing Council, Wash. DC, June 10, 2011
Topic: Wilderness management in a time of climate change. Made formal presentation and was panelist in Q & A and discussion with Wilderness Society governing council members.
- Reviewer, National Science Foundation, Population & Community Ecology Program, 2011
- Reviewer for peer-reviewed journals: Ecosphere, 2010, Ecological Modeling, 2007
- Reviewer for textbook: Campbell's Biology, 9th edition, 2009
Reviewed chapters "Introduction to Ecology and the Biosphere" and "History of Life on Earth"
- Public Outreach Activities at the Cary Institute, 2009 - 2011
Led nature walks for public, demonstrated science learning activities in public events, judged science fair.
- Bitterroot BioBlitz, Lee Metcalf Wildlife Refuge, MT, 2009
Contributed as registered scientist to intensive plant inventory study and community outreach and citizen science activities over 2-day period.

INVITED PRESENTATIONS AND GUEST LECTURES

Invited Talk, Bard College, Department of Biology, March 3, 2011

Carbon & Climate: An Essential Focus of Environmental Literacy

Guest Lecturer, University of Wyoming, Jan. 18, 2011

Assessing student and teacher quantitative understanding of carbon cycle diagrams, data, and dynamics.

For course - Quantitative Reasoning and Mathematical Modeling in the Sciences, graduate level.

Guest Lecturer, Marist College, Nov. 10, 15, 17, 2010; Jan. 31 2011

Topics in energy and metabolism, decomposition, photosynthesis, respiration, global carbon cycle, climate change. For course – Environmental Issues – undergraduate, non-science majors.

Guest Lecturer, Towson University, July 8, 2010

Teaching about carbon in the Baltimore Ecosystem. For course: - Investigating Urban Ecosystems: Research and Teaching Applications, graduate level.

Guest Lecturer, Bard College, April 12, 2010

Effects of carbon dioxide levels on plant growth. For course - Seminar in Ecology, advanced undergraduate level.

SELECTED PROFESSIONAL PRESENTATIONS

Keeling, EG, Alan R. Berkowitz, Charles W. Anderson, Robert L. Mayes, Jonathon W. Schramm, Richard Foot. Teaching strategies for improving public understanding of the global carbon cycle. Ecological Society of America conference, Austin, TX, August 9, 2011.

Keeling, EG, Alan R. Berkowitz. Broadening the reach, closing the circle: Protected lands and environmental literacy in the 21st century. George Wright Society Conference on Parks, Protected Lands, and Cultural Sites. New Orleans, LA. March 14, 2011

Keeling EG, Charles W. Anderson, Alan R. Berkowitz. Carbon and Climate: An Essential Focus of Environmental Literacy. North American Association for Environmental Education (NAAEE) conference, Buffalo, NY, September 28, 2010

Keeling EG, Charles W. Anderson, Alan R. Berkowitz, Beth Covitt, Robert L. Mayes. Carbon and Climate: An Essential Focus of Environmental Literacy. Ecological Society of America conference, Pittsburgh, PA, August 2, 2010.

Keeling EG, A Sala. Changing growth response to wildfire linked to climate variables in old-growth ponderosa pine trees. Ecological Society of America conference, Albuquerque, NM, August 5, 2009

Keeling, EG, A Sala. Do Slow Trees Grow Old? Growth and Longevity in Old Growth Ponderosa Pine in the Inland Northwest. Ecological Society of America conference, Milwaukee WI, August 2008

Keeling, EG, A Sala. Do Slow Trees Grow Old? Growth and Longevity in Old Growth Ponderosa Pine in the Inland Northwest. Ameridendro Conference, Vancouver B.C., June 2008

Keeling, EG, A Sala, TH DeLuca. Tree growth and physiological responses to wildfire in unlogged ponderosa pine/Douglas-fir forests. 3rd International Fire Ecology and Management Congress in San Diego, November, 2006

Sala, A, DeLuca TH, **Keeling EG**, Community structure in unlogged ponderosa pine/Douglas-fir forests along a fire-frequency gradient. Poster Presentation, Ecological Society of America, Portland OR, August, 2004

WORKSHOPS AND PROFESSIONAL DEVELOPMENT

Linking Ecology and Ethics: Values, Philosophy & Action, May 10-12, 2011

Cary Conference XIV. Participated in 3 day collaboration between ecologists and philosophers to address research questions that link ecology and environmental ethics.

Media Training Workshop for Scientists, Cary Institute, April 11, 2011

Participated in 4 hour workshop in media training with journalist and author Chris Mooney focusing on framing of science messages, new media, and interview techniques.

Transforming Undergraduate Education in Biology, Washington DC, 2009

Invited participant in 3-day conference sponsored by the NSF and AAAS addressing innovation in biology education. Contributed to working group focusing on new approaches to assessing student learning.

Environmental Ethics Institute, Missoula, MT, 2009

Participated in 3-weeks of online study and a 6-day workshop addressing the environmental ethics of fire, restoration and wilderness in a time of climate change. Taught by Andrew Light and Christopher Preston.

Innovative Teaching and Active Learning, ESA Conference, 2008

Participated in all day workshop focusing on principles, practices and materials for engaging students in active learning. Taught by Diane Ebert-May.

Introduction TIEE (Teaching Issues and Experiments in Ecology), ESA Conference, 2008

Participated in workshop providing training in online teaching resource used to promote inquiry-based learning via experiments and data-analysis. Taught by Charlene D'Avanzo and Bruce Grant.

50th Anniversary of Global CO₂ Record Symposium, Kona HI, 2007

Attended 3-day conference that included scientific presentations and panel discussions addressing broad subject areas relevant to the global carbon dioxide record.

Dendroclimatology (Summer Course), Tucson, AZ, 2006

Received training in analytic techniques used for climate reconstruction from tree rings with instructors Malcom Hughes and Ramzi Toucan.

North American Dendroecological Fieldweek, Lubrecht Forest, MT, 2003

Received training in basic skills and research theory of dendrochronology (tree ring science). Completed project on stand dynamics of high-elevation whitebark pine.

SOCIETY MEMBERSHIPS

Active member of the Ecological Society of America since 2004

Member of North American Association for Environmental Education, 2010

Member of George Wright Society, 2011