

Robert C. Rhew

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EDUCATION

1992	B.A. Earth & Planetary Sciences (Atmospheres and Oceans) <i>Magna cum laude with highest honors</i>	Harvard University Cambridge, MA
1994	Graduate Diploma. Resource & Env't Management <i>Diploma with Distinction</i>	Australian National University Canberra, ACT
2001	Ph.D. Earth Sciences (Geochemistry) Thesis title: Production and Consumption of Methyl Bromide and Methyl Chloride by the Terrestrial Biosphere	Scripps Institution of Oceanography, UCSD La Jolla, CA

ACADEMIC EMPLOYMENT

2012 – present	Associate Professor, Dept. Env't. Science, Policy & Mgt.	University of California, Berkeley
2009 – present	Associate Professor, Department of Geography	University of California, Berkeley
2006 – present	Geological Scientist Faculty, Earth Sciences Division	Lawrence Berkeley National Labs, CA
2013 – 2014	Visiting Faculty Fellow, National Center for Atmospheric Research	NCAR, Boulder, CO
2013 – 2014	CIRES Visiting Fellow, NOAA/ CIRES	University of Colorado, Boulder
2003 – 2009	Assistant Professor, Department of Geography	University of California, Berkeley
2001 – 2003	Postdoctoral Researcher, Earth System Science <i>UCAR/NOAA Climate and Global Change Postdoctoral Fellowship, Host: Prof. Eric Saltzman</i>	University of California, Irvine

Other appointments: Affiliate faculty in Energy Resources Group (2010-present), Affiliate faculty in UCB Masters of Development Practice (2011-present); Adjunct Faculty in School of Agriculture Forest and Environmental Sciences, Clemson University (2014-present).

RESEARCH INTERESTS

- Trace gas biogeochemistry of halocarbons, hydrocarbons and reduced sulfur compounds
- Sources and sinks of environmentally important trace gases
- Biosphere-atmosphere flux measurements in natural and human-produced landscapes
- Ocean, climate and atmospheric sciences education

GRADUATE AND POST-DOCTORAL ADVISORS

Ph.D. Advisor: Dr. Ray Weiss (UCSD, Scripps Institution of Oceanography)

Post-doctoral advisor: Dr. Eric Saltzman (UC-Irvine, Earth System Science)

POST-DOCTORAL AND VISITING SCHOLARS ADVISED

Dr. Yit Arn Teh (2005-2007, now on faculty at University of Aberdeen, UK), Dr. Olivier Mazéas (2006-2008), Dr. Md. Anwar Khan (visiting scholar, 2009-2011), Dr. Julian Deventer (2015-present).

GRADUATE STUDENTS ADVISED (*=thesis chair)

Current PhD committees: *Yi Jiao (Geography); Jeffrey Benca (IB); Wenwen Kong (Geography).

Completed PhD Dissertations: *Daniel Schmidt (2008); Wendy Chou (2008); Daniela Cusack (2009); Wendy Yang (2010); Claudia Jones (2011); Jacob Hendrickson (Masters, 2011); Lei Hu (2012); Rachel O'Brien (2012); Rebecca Ryals (2012); Steven Hall (2013), *Mary Whelan (2013), Elissa Sato (2015), Jun-Jian Wang (2015).

Qualifying exam committee for 25 graduate students

Masters exam committee for 3 students (EPS).

Undergraduates: Research advisor for **57 undergraduates**, including 7 senior theses from *C. Pingatore (Env't. Sciences, 2007), *L. Ma (EPS 2008, winner of AWG outstanding woman student award), *C. Chen (Env't. Sciences, 2009), M. Cutty (Geography 2010 McNairs Scholar), *Y-T Chen (Env't. Sciences, 2011), *Julien Vollering (CNR, 2012), *R. Kim (Env't. Sciences, 2013).

PUBLICATIONS (advisees: [§]post-doctoral, ^{*}graduate student, ^{**}undergraduate student)

- *Whelan M.E. and **R.C. Rhew**, Reduced sulfur trace gas exchange between a seasonally dry grassland and the atmosphere, *Biogeochemistry*, doi: 10.1007/s10533-016-0207-7 (2016).
- Rhew, R.C.** and J. Happell, The atmospheric partial lifetime of carbon tetrachloride with respect to the global soil sink, *Geophysical Research Letters*, 43, doi:10.1002/2016GL067839 (2016).
- Wang, J.-J., *Y. Jiao, **R.C. Rhew** and A. T. Chow, Haloform formation in coastal wetlands along a salinity gradient at South Carolina, United States, *Environmental Chemistry*, doi: 10.1071/EN15145 (2016).
- *Whelan M.E. and **R.C. Rhew**, Carbonyl sulfide produced by abiotic thermal and photo-degradation of soil organic matter from wheat field substrate, *Journal of Geophysical Research Biogeosci.*, 120, doi: 10.1002/2014JG002661 (2015).
- Rhew, R.C.**, *Whelan M.E. and D.-H. Min, Large methyl halide emissions from south Texas salt marshes, *Biogeosciences*, 11, 6427-6434, doi: 10.5194/bg-11-6427-2014 (2014).
- [§]Khan, M.A.H., **R.C. Rhew**, K. Zhou^{**} and M.E. Whelan^{*}, Halogen biogeochemistry of invasive perennial pepperweed (*Lepidium latifolium*) in a peatland pasture, *Journal of Geophysical Research Biogeosci.* 118, 1–9, doi:10.1002/jgrg.20020 (2013).
- *Whelan M.E., D.-H. Min and **R.C. Rhew**, Salt marsh vegetation: a carbonyl sulfide (COS) source to the atmosphere, *Atmospheric Environment*, 73, p. 131-137, doi: 10.1016/j.atmosenv.2013.02.048 (2013).
- [§]Khan, M.A.H., M.E. Whelan^{*} and **R.C. Rhew**, Analysis of low concentration reduced sulfur compounds (RSCs) in air: storage issues and measurement by gas chromatography with sulfur chemiluminescence detection. *Talanta*, 88, p. 581-586, doi: 10.1016/j.talanta.2011.11.038 (2012).
- [§]Khan, M.A.H., M.E. Whelan^{*} and **R.C. Rhew**, Effects of temperature and soil moisture on methyl halide and chloroform fluxes from drained peatland pasture. *J. Environmental Monitoring*, 14, p. 241-249, doi:10.1039/c1em10639b (2012).
- Rhew, R.C.**, Sources and sinks of methyl bromide and methyl chloride in the tallgrass prairie: applying a stable isotope tracer technique over highly variable gross fluxes, *Journal of Geophysical Research Biogeosciences*, 116, G03026, doi:10.1029/2011JG001704 (2011).
- Montzka, S.A., S. Reimann, S. O'Doherty, A. Engel, A., K. Kruger, W.T. Sturges, D. Blake, M. Dorf, P. Fraser, L. Froidevaux, K. Jucks, K. Kreher, M. Kurylo, W. Mellouki, J. Miller, O.-J. Nielsen, V. Orkin, R. Prinn, **R. Rhew**, M. Santee, A. Stohl and D. Verdonik, Scientific Assessment of Ozone Depletion: 2010, Chapter 1. "Ozone-Depleting Substances (ODSs) and Related Chemicals", WMO Report No. 52 (2011).
- [§]Khan, M.A.H., **R.C. Rhew**, M.E. Whelan^{*}, K. Zhou^{**} & S. Deverel, Methyl halide and chloroform emissions from a subsiding Sacramento-San Joaquin Delta island recently converted to rice fields, *Atmospheric Environment*, 45, p. 977-985, doi:10.1016/j.atmosenv.2010.10.053 (2011).
- Rhew, R.C.** and O. Mazéas[§], Gross production exceeds gross consumption of methyl halides in northern California salt marshes, *Geophysical Research Letters*, 37, L18813, doi: 10.1029/2010GL044341 (2010).
- von Fischer, J., **R. C. Rhew**, G. Ames, B. K. Fossdick, and P. E. von Fischer, Vegetation height and other controls of spatial variability in methane emissions from the Arctic coastal tundra at Barrow, Alaska, *JGR Biogeosciences*, 115, G0003, doi: 10.1029/2009JG001283 (2010).
- Rhew, R.C.**, C. Chen^{**}, Y.A. Teh[§], and D. Baldocchi, Gross fluxes of methyl chloride and methyl bromide in a California oak-savanna ecosystem. *Atmospheric Environment*, 44, p. 2054-2061, doi: 10.1016/j.atmosenv.2009.12.014 (2010).
- [§]Mazéas, O., J.C. von Fischer and **R.C. Rhew**, Impact of terrestrial carbon input on methane emissions from an Alaskan Arctic lake, *Geophysical Research Letters*, 36, L18501, doi:10.1029/2009GL039861 (2009).
- [§]Teh, Y.A., O. Mazéas[§], A. Atwood^{**}, T. Abel^{*} and **R.C. Rhew**, Hydrologic regulation of methyl chloride and methyl bromide fluxes in Alaskan Arctic tundra. *Global Change Biology*, 15, p 330-345, doi:10.1111/j.1365-2486.2008.01749.x (2009).
- Rhew, R.C.**, Y.A. Teh[§], T. Abel^{*}, A. Atwood^{**} and O. Mazéas[§], Chloroform emissions from the Alaskan Arctic tundra, *Geophysical Research Letters*, 35, L21811, doi:10.1029/2008GL035762 (2008).
- Rhew, R.C.**, B.R. Miller, and R.F. Weiss, Chloroform, carbon tetrachloride and methyl chloroform fluxes in southern California ecosystems, *Atmospheric Environment*, 42, p. 7135-7140, doi: 10.1016/j.atmosenv.2008/05/038 (2008).

PUBLICATIONS (continued)

- [§]Teh, Y.A., R.C. Rhew, A.R. Atwood*, and T. Abel*, Water, temperature, and vegetation regulation of methyl chloride and methyl bromide fluxes from a shortgrass steppe ecosystem. *Global Change Biology* 14, p. 77-91, doi: 10.1111/j.1365-2486.2007.01480.x (2008).
- Rhew, R.C., Y. A. Teh[§], and T. Abel*, Methyl halide and methane fluxes in the northern Alaskan coastal tundra, *Journal of Geophysical Research (B)*, 112, G02009, doi:10.1029/2006JG000314 (2007).
- Rhew, R.C. and T. Abel*. Measuring simultaneous production and consumption fluxes of methyl chloride and methyl bromide in annual temperate grasslands. *Environmental Science & Technology*, 41, p. 7837-7843, doi: 10.1021/es0711011 (2007).
- Rhew, R.C., L. Østergaard, E.S. Saltzman, and M.F. Yanofsky, Genetic control of methyl halide production in *Arabidopsis*, *Current Biology*, 13, 1809-1813 (2003). (* contributed equally to this work)
- Rhew, R.C., M. Aydin, and E.S. Saltzman, Measuring terrestrial fluxes of methyl chloride and methyl bromide using a stable isotope tracer technique, *Geophysical Research Letters*, 30 (21), 2103, doi: 10.1029/2003GL018160 (2003).
- Bill, M., R.C. Rhew, R.F. Weiss, and A.H. Goldstein, Carbon isotopic ratios of methyl bromide and methyl chloride emitted from a coastal salt marsh, *Geophysical Research Letters*, 29, 10.1029/2001GL012946 (2002).
- Rhew, R.C., B.R. Miller, M. Bill, A.H. Goldstein, and R.F. Weiss, Environmental and biological controls on methyl halide emissions from southern California coastal salt marshes, *Biogeochemistry*, 60, p. 141-161 (2002).
- Rhew, R.C., B.R. Miller, M.K. Vollmer, and R.F. Weiss, Shrubland fluxes of methyl bromide and methyl chloride, *Journal of Geophysical Research – Atmospheres*, 106, p. 20,875-20,882 (2001).
- Rhew, R.C., B.R. Miller, and R.F. Weiss, Natural methyl bromide and methyl chloride emissions from coastal salt marshes, *Nature*, 403, p. 292-295 (2000).

SYNERGISTIC ACTIVITIES

- Peer reviewer:** 90+ manuscripts for journals incl. *Atmospheric Environment*, *BAMS*, *Biogeochemistry*, *Biogeosciences*, *Chemosphere*, *Environmental Chemistry*, *Environmental Science & Technology*, *Geophysical Research Letters*, *Geochimica et Cosmochimica Acta*, *Geology*, *Global Biogeochemical Cycles*, *Global Change Biology*, *Journal of Atmospheric Chemistry*, *Journal of Geophysical Research*, *Marine Chemistry*, *Nature*, *New Phytologist*, *Phytochemistry*, *Plant Biology*, *Plant Physiology* and *PNAS*.
- WMO Scientific Assessment of Ozone Depletion:** Contributor (2006). Co-author (Montzka *et al.*, Ch. 1, "Ozone-Depleting Substances (ODSs) and Related Chemicals", 2010). Reviewer (2014).
- Geosciences education development:**
 Scientific advisor for NSF-sponsored "Cumulative Learning using Embedded Assessment Results (CLEAR)", Graduate School of Education, 2011-present.
 Scientist Partner, Ocean Sciences Curriculum Sequence Grades 6-8: NOAA Environmental Literacy Project, Lawrence Hall of Science, UC Berkeley, 2010-2012.
- Outreach and conference organization:**
 Director, "Research Science Initiative at Tsinghua University", Beijing, China, July 12-July 31, 2015 (first half), six-week program for academically talented high school students in mathematics and science.
 Workshop facilitator for "On the Cutting Edge Workshop for Geoscience Faculty: Early career faculty workshop", College of William and Mary, Williamsburg, VA, June 9-15, 2012.
 Co-convenor of Fall 2011 AGU session: Biogeosciences B53A and B54A. Exchange Dynamics of Volatile Organic Compounds Between Plant Ecosystems and the Atmosphere, December, 2011.

TEACHING (Fall 2003-Spring 2015)*25 Undergraduate courses*

- GEOG 40: Introduction to Earth System Science (2003, 2004, 2005, 2006, 2008, 2010, 2011)
- GEOG/EPs/IB c82: Introduction to the Oceans (2008, 2009, 2010)
- GEOG 137: Top Ten Global Environmental Problems (new Fall 2011, 2012, Spr 2015)
- GEOG 143: Global Change Biogeochemistry (new 2005, 2006, 2009, Sp 2013, Fa2014).
- GEOG c146/EPSc100/IBc100: Communicating Ocean Science (w/ Lawrence Hall of Science) (Sp 2010, 2012)
- GEOG 147 (formerly 171): Communicating Climate Science (w/ Lawrence Hall of Science) (Fa2014, 2015).
- ESPM15 (formerly ES10): Introduction to Environmental Sciences (Sp 2012, 2013, Fa 2015)

10 Graduate courses

GEOG 245: Topics in Biogeochemistry (2004, 2005, 2006, 2007, 2008)

GEOG 248: Intro. to Lab & Field Methods in Earth System Science (2004, 2006)

GEOG 243: Advances in Environmental Change (w/ K. Cuffey and J. Chiang, Geography, 2005).

GEOG C302/ESPM C302: Effective Scientific Communication (w/ V. Resh and W. Yang ESPM, 2007, 2009).