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M.S., Astronomy and Astrophysics	University of Chicago, 1984
Ph.D., Astronomy and Astrophysics	University of Chicago, 1988

PROFESSIONAL EXPERIENCE:

1989 – 1990 Post-Graduate Research Associate, University of Chicago
1990 – 1992 Post-Graduate Research Associate, Scripps Institution of Oceanography
1992 – 1997 Assistant Research Physicist, Scripps Institution of Oceanography
1994 – 1994 Lecturer, Scripps Institution of Oceanography
1996 – 1997 Visiting Scientist, National Center for Atmospheric Research
1997 – 2001 Scientist II, National Center for Atmospheric Research
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2001 – 2007 Adjunct Professor, PAOS Program, University of Colorado
2006 – 2007 Deputy Section Head, National Center for Atmospheric Research
2007 – 2008 Senior Scientist, National Center for Atmospheric Research
2007 – 2015 Department Head, Lawrence Berkeley National Laboratory
2007 – present Senior Scientist, Lawrence Berkeley National Laboratory
2007 – present Professor in Residence, University of California, Berkeley
2013 – 2018 Director, Climate Readiness Institute
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PUBLICATIONS:**1 Dissertations**

B.A. Thesis: Thermodynamics of apparent horizons, 1981, Princeton University, 38 pp.

Ph.D. Thesis: The theory of magnetohydrodynamic wave generation by localized sources, 1988, University of Chicago, University of Michigan Microfilms No. T-30997.

2 Reviewed Publications

(Asterisks indicate publications based upon B.A. and Ph.D. theses.)

- 2.1. Collins, W.D., and M. Turner, 1984: Thermal production of superheavy magnetic monopoles in the new inflationary universe scenario. *Physical Review D*, **29**, 2158–2161.
- 2.2. Collins, W.D., 1989: The theory of magnetohydrodynamic wave generation by localized sources I. General asymptotic theory. *The Astrophysical Journal*, **337**, 548–567.
- 2.3. Collins, W.D., 1989: The theory of magnetohydrodynamic wave generation by localized sources II. Collisionless dissipation of wave packets. *The Astrophysical Journal*, **343**, 499–506.
- 2.4. Ramanathan, V., and W.D. Collins, 1991: Thermodynamic regulation of ocean warming by cirrus clouds deduced from observations of the 1987 El Niño. *Nature*, **351**, 27–32.
- 2.5. Collins, W.D., 1992: The theory of magnetohydrodynamic wave generation by localized sources III. Efficiency of plasma heating by dissipation of far-field waves. *The Astrophysical Journal*, **384**, 319–332.
- 2.6. Collins, W.D., 1992: Mechanics of apparent horizons. *Physical Review D*, **45**, 495–498.
- 2.7. Ramanathan, V., and W. Collins, 1992: Thermostat and global warming. *Nature*, **357**, 649.
- 2.8. Ramanathan, V., and W. Collins, 1993: A thermostat in the tropics. *Nature*, **361**, 410–411.
- 2.9. Weaver, C.P., W.D. Collins, and H. Grassl, 1994: The relationship between clear-sky atmospheric greenhouse effect and deep convection during the Central Equatorial Pacific Experiment (CEPEX): Model calculations and satellite observations. *J. Geophys. Res.*, **99**, 25891–25901.
- 2.10. Ramanathan, V., W.D. Collins, and B. Subasilar, 1994: Comment on the paper “An inquiry into the cirrus-cloud thermostat effect for tropical sea surface temperature” by K.M. Lau, C.H. Sui, M.D. Chou, and W.K. Tau. *Geophys. Res. Lett.*, **21**, 1185–1186.
- 2.11. Collins, W.D., and A.K. Inamdar, 1995: Validation of clear-sky fluxes for tropical oceans from the Earth Radiation Budget Experiment. *J. Climate*, **8**, 569–578.

- 2.12. Lohmann, U., E. Roeckner, W.D. Collins, A. Heymsfield, and G. McFarquhar, 1995: The role of water vapor and convection during the Central Equatorial Pacific Experiment (CEPEX) from observations and model simulations. *J. Geophys. Res.*, **100**, 26229–26245.
- 2.13. Collins, W.D., F.P.J. Valero, P. Flatau, H. Grassl, and P. Pilewskie, 1996: Radiative effects of convection in the tropical Pacific. *J. Geophys. Res.*, **101**, 14999–15012.
- 2.14. Waliser, D.E., W.D. Collins, and S.P. Anderson, 1995: An estimate of the surface shortwave cloud forcing over the western Pacific during TOGA COARE. *Geophys. Res. Lett.*, **23**, 519–522.
- 2.15. Valero, F.P.J., W.D. Collins, P. Pilewskie, P. Flatau, and A. Bucholtz, 1997: Direct radiometric observations of the water vapor super greenhouse effect over the equatorial Pacific ocean. *Science*, **275**, 1773–1776.
- 2.16. Collins, W.D., J. Wang, J.T. Kiehl, G.J. Zhang, D. Cooper, and W. Eichinger, 1997: Comparison of tropical ocean-atmosphere fluxes with the NCAR Community Climate Model CCM3. *J. Climate*, **10**, 3047–3058.
- 2.17. Valero, F.P.J., A. Bucholtz, B. Bush, S.K. Pope, W.D. Collins, P. Flatau, A. Strawa, and W.J.Y. Gore, 1997: The Atmospheric Radiation Measurement Enhanced Shortwave Experiment (ARESE): Experimental and data details. *J. Geophys. Res.*, **102**, 29929–29937.
- 2.18. Zender, C.S., S. Pope, B. Bush, W.D. Collins, J.T. Kiehl, F.P.J. Valero, and J. Vitko, 1997: Atmospheric absorption during ARESE. *J. Geophys. Res.*, **102**, 29901–29915.
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- 2.20. Jayaraman, A., D. Lubin, S. Ramachandran, V. Ramanathan, E. Woodbridge, W.D. Collins, and K.S. Zalpuri, 1998: Direct observations of aerosol radiative forcing over the tropical Indian Ocean during the Jan.–Feb. 1996 pre-INDOEX cruise. *J. Geophys. Res.*, **103**, 13827–13836.
- 2.21. Heymsfield, A.J., G.M. McFarquhar, W.D. Collins, J.A. Goldstein, F.P.J. Valero, J. Spinhirne, W. Hart, and P. Pilewskie, 1998: Cloud microphysical properties leading to highly reflective tropical cirrus. *J. Geophys. Res.*, **103**, 8805–8812.
- 2.22. Collins, W.D., 1998: A global signature of enhanced shortwave absorption by clouds. *J. Geophys. Res.*, **103**, 31669–31679.
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- 2.42. Meehl, G.A., W.M. Washington, W.D. Collins, J.M. Arblaster, A. Hu, L.E. Buja, W.G. Strand, and H. Teng, 2005: How much more global warming and sea level rise? *Science*, **307**, 1769–1772.
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- 2.46. Collins, W.D., C.M. Bitz, M.L. Blackmon, G.B. Bonan, C.S. Bretherton, J.A. Carton, P. Chang, S.C. Doney, J.J. Hack, T.B. Henderson, J.T. Kiehl, W.G. Large, D.S. McKenna, B.D. Santer, and R.D. Smith, 2006: The Community Climate System Model: CCSM3. *J. Climate*, vol 19, 2122–2143.
- 2.47. Kiehl, J.T., C.A. Shields, J.J. Hack, and W.D. Collins, 2006: The climate sensitivity of the Community Climate System Model: CCSM3. *J. Climate*, **19**, 2584–2596.
- 2.48. Collins W.D., V. Ramaswamy, M.D. Schwarzkopf, Y. Sun, R.W. Portmann, Q. Fu, S.E.B. Casanova, J.-L. Dufresne, D.W. Fillmore, P.M.D. Forster, V.Y. Galin, L.K. Gohar, W.J. Ingram, D.P. Kratz, M.-P. Lefebvre, J. Li, P. Marquet, V. Oinas, Y. Tsushima, T. Uchiyama and W.Y. Zhong, 2006: Radiative forcing by well-mixed greenhouse gases: Estimates from climate models in the IPCC AR4. *J. Geophys. Res.*, **111**, article D14317, doi:10.1029/2005JD006713.
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- 3.137. Kashinath, K., T.A. O'Brien, and W.D. Collins, 2016: A simple model for the clear-sky greenhouse effect: dynamics and thermodynamics. Revised manuscript submitted, *Geophysical Research Letters*.
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- 3.144. Prabhat, K. Kashinath, Y. Liu, E. Racah, M. Mudigonda, A. Mahesh, C. Beckham, T. Maharaj, S. Kahou, C. Pal, J. Biard, K. Kunkel, M. Wehner, T. O'Brien, and W. Collins, 2018: Deep Learning Recognizes Weather and Climate Patterns. Submitted to *EOS Transactions*.

- 3.145. Jones, A.D., K.V. Calvin, X. Shi, A.V. Di Vittorio, B. Bond-Lamberty, P.E. Thornton, W.D. Collins, 2018: Quantifying human-mediated carbon cycle feedbacks, Submitted to *Geographical Research Letters*.

4 Other External Refereed Publications

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55. Collins, W.D., D.R. Feldman, and C.A. Algieri, 2009: "Detecting Land Surface and Cloud Feedbacks using Shortwave CLARREO Spectra." *Eos Trans. AGU*, 90(52), Fall Meet. Suppl., Abstract GC51B-08. December 12–14, 2009.
56. Pressel, K.G., and W.D. Collins, 2009: "Satellite observations of atmospheric water vapor." 62nd Annual Meeting of the APS Division of Fluid Mechanics. Vol. 54(19), Abstract BAPS.2009.DFD.AS.3, Nov. 22–24, 2009, Minneapolis, Minnesota.
57. Feldman, D.R., and W.D. Collins, 2010: "Detecting Aerosols and Greenhouse Gases Forcings using Shortwave CLARREO Spectra." *Eos Trans. AGU*, 90(52), Fall Meet. Suppl., Abstract GC51B-07. December 12–14, 2009.
58. Rosa, D., and W. Collins, 2010: "Global Chemical Transport of Radon and Carbon Monoxide using the Colorado State University Multiscale Modeling Framework." Poster EGU2010-12880 (session AS1.10), European Geophysical Union Meeting, Vienna, May 3, 2010.
59. Collins, W.D., and C.A. Algieri, 2010: "The significance of shortwave methane forcing for climate change." Presentation EGU2010-12514 (session CL2.2), European Geophysical Union Meeting, Vienna, May 3, 2010.
60. Feldman, D.R., W.D. Collins, C. Algieri, J. Ong, and A. Young, 2010: "The Earth's reflected shortwave spectrum: Present and future." Talk 1.1, 13th Cloud Physics and Atmospheric Radiation Conference of the American Meteorological Society, Portland, Jun. 27–Jul 2, 2010.
61. Hsieh, W.-C., D. Rosa and W. Collins, 2010: "The effect of superparameterization on aerosol transport." Poster P1.46, 13th Cloud Physics and Atmospheric Radiation Conference of the American Meteorological Society, Portland, Jun. 27–Jul 2, 2010.

62. Kato, S., F.G. Rose, S. Sun-Mack, W.F. Miller, Y. Chen, B.A. Wielicki, D.M. Winker, G.L. Stephens, P. Minnis, N. Loeb, T.P. Charlock, P.W. Stackhouse, K.M. Xu, and W. Collins, 2010: "Computation of atmospheric heating rates and surface irradiances using CALIPSO, CloudSat and MODIS derived cloud and aerosol properties." Talk 8.4, 13th Cloud Physics and Atmospheric Radiation Conference of the American Meteorological Society, Portland, Jun. 27–Jul 2, 2010.
63. Pressel, K.G., W.D. Collins, and A.R. Desai, 2010: "Variance scaling in water vapor measurements from a tall tower." Poster P1.77, 13th Cloud Physics and Atmospheric Radiation Conference of the American Meteorological Society, Portland, Jun. 27–Jul 2, 2010.
64. Wielicki, B.A., and D.F. Young, J.G. Anderson, F. Best, K. Bowman, B. Cairns, W. Collins, J. Corliss, D.R. Doelling, J.A. Dykema, D.R. Feldman, R. Holz, Y. Huang, Z. Jin, K. Jucks, S. Kato, D.F. Keyes, D.B. Kirk-Davidoff, R. Knuteson, G. Kopp, D.P. Kratz, A.A. Lacis, S. Leroy, X. Liu, C. Lukashin, A.J. Mannucci, M.I. Mishchenko, M.G. Mlynczak, N. Phojanamongkolkij, P. Pilewskie, S. Platnick, V. Ramaswamy, H. Revercomb, C.M. Roithmayr, F.G. Rose, S. Sandford, E. Shirley, P. Speth, K.J. Thome, D. Tobin, and J. Xiong, 2010: "CLARREO: Decadal change accuracy for reflected and emitted Earth spectra." Talk 9.1, 13th Cloud Physics and Atmospheric Radiation Conference of the American Meteorological Society, Portland, Jun. 27–Jul 2, 2010.
65. Pressel, K. and W. Collins, 2010: Statistical scale invariance in satellite observations of water vapor mixing ratio from the Atmospheric Infrared Sounder. Abstract MG.00004, 63rd Annual Meeting of the APS Division of Fluid Dynamics, November 21–23, 2010; Long Beach, California.
66. Rubin, J.I., W. Collins, and A.F. Arellano, 2010: Uncertainty analysis in global aerosol size distribution and composition using ensemble based data assimilation. Abstract A11E-0093, 2010 Fall AGU Meeting, San Francisco, CA.
67. Gunn, L.N., and W. Collins, 2010: Long-wave radiative forcing due to mineral dust aerosol. Abstract A11E-0101, 2010 Fall AGU Meeting, San Francisco, CA.
68. Jones, A., M.S. Torn, W.J. Riley, and W. Collins, 2010: Factors Driving Biofuel Crops' Influence on Climate. Abstract B22D-07, 2010 Fall AGU Meeting, San Francisco, CA.
69. Murphy, L.N., W.J. Riley, M.S. Torn, and W. Collins, 2010: Expansion of woody biomass for bioenergy feedstock in the Southeastern US has local and remote climate impacts. Abstract B23D-0419, 2010 Fall AGU Meeting, San Francisco, CA.
70. Feldman, D., W. Collins, C. Algieri, and J. Ong, 2010: Spectral Forcing and Feedback Signals in IPCC Simulations: Simulations of Next-Generation Observing Systems. Abstract GC41B-0896, 2010 Fall AGU Meeting, San Francisco, CA.
71. Li, F., W. Collins, M.F. Wehner, D. Williamson, and J. Olson, 2010: Response of precipitation extremes to global warming in an aqua-planet climate model: Towards robust

- projection from regional to global scales. Abstract GC51K-01, 2010 Fall AGU Meeting, San Francisco, CA.
72. Pressel, K.G., and W. Collins, 2010: Structure Function Analysis of Scaling in Water Vapor Observations from AIRS. Abstract A52B-03, 2010 Fall AGU Meeting, San Francisco, CA.
 73. Collins, W., Feldman, D., C. Algieri, and J. Ong, 2010: Climate Change Time-to-Detection Simulations using IPCC Models for Shortwave Forcings and Feedbacks. Abstract GC53C-04, 2010 Fall AGU Meeting, San Francisco, CA.
 74. Collins, W.D, and D.R. Feldman, 2011: The future evolution of the Earth's reflected short-wave spectrum. Abstract 8.3, 23rd Conference on Climate Variability and Change, 91st American Meteorological Society Annual Meeting, Seattle, WA. William D. Collins, University of California, Berkeley, CA.
 75. Li, F., W. Collins, M.F. Wehner, D.L. Williamson, and J.G. Olson, 2011: Impact of horizontal resolution on simulation of precipitation extremes in an aqua-planet version of the Community Atmosphere Model. Abstract, PM10A.4, 23rd Conference on Climate Variability and Change, 91st American Meteorological Society Annual Meeting, Seattle, WA.
 76. Jones, A.D., M. Torn, W. Collins, and W.J. Riley, 2011: Characterizing the Climate Effects of Biofuel Cultivation. Abstract 11A.3, 23rd Conference on Climate Variability and Change, 91st American Meteorological Society Annual Meeting, Seattle, WA.
 77. Collins, W.D., F. Li, M. Wehner, D. Williamson, and J. Olson, 2011: Response of extremes to global warming in an aqua-planet climate model: Towards robust projection from regional to global scales. Abstract EGU2011-10451, Session NH1.2/AS4.7/HS12.6, European Geophysical Union General Assembly 2011, Vienna, Austria.
 78. Bhattacharyya, S., P.J. Cameron-Smith, D. Bergmann, M.T. Reagan, W.D. Collins, S.M. Elliott, and M.E. Maltrud, 2011: Atmospheric Impact of Large Methane Emission in the Arctic Region, Abstract GC41B-0803, presented at 2011 Fall Meeting, AGU, San Francisco, CA, 5–9 Dec.
 79. Collins, W., F. Li, D. Rosa, and M.F. Wehner, 2011: “Super-Parameterization”—A Better Way to Simulate Regional Extreme Precipitation?, Abstract GC13C-04, presented at 2011 Fall Meeting, AGU, San Francisco, CA, 5–9 Dec.
 80. Feldman, D., and W. Collins, 2011: Pan-Spectral Signatures of Climate Change and Prospects for Observational Constraints, Abstract GC11B-0910, presented at 2011 Fall Meeting, AGU, San Francisco, CA, 5–9 Dec.
 81. Gunn, L.N., and W. Collins, 2011: Long-wave radiative forcing due to desert dust, Abstract A51E-07, presented at 2011 Fall Meeting, AGU, San Francisco, CA, 5–9 Dec.

82. Hsieh, W., D. Rosa, and W. Collins, 2011: Global dust simulations in the multiscale modeling framework, Abstract A13H-01, presented at 2011 Fall Meeting, AGU, San Francisco, CA, 5–9 Dec.
83. Jones, A.D., L.P. Chini, W. Collins, A.C. Janetos, J. Mao, X. Shi, A.M. Thomson, and M.S. Torn, 2011: Regional-Scale Forcing and Feedbacks from Alternative Scenarios of Global-Scale Land Use Change, Abstract GC22C-06, presented at 2011 Fall Meeting, AGU, San Francisco, CA, 5–9 Dec.
84. Li, F., W. Collins, M.F. Wehner, D. Williamson, and J.G. Olson, 2011: Impact of Horizontal Resolution on the Simulation of Tropical Storms in an Idealized Climate Model, Abstract A23D-0203, presented at 2011 Fall Meeting, AGU, San Francisco, CA, 5–9 Dec.
85. Nolan, L., and W. Collins, 2011: The Effects of Cloud-Scale Physics Variability on Convection, Abstract A13B-0250, presented at 2011 Fall Meeting, AGU, San Francisco, CA, 5-9 Dec.
86. Prabhat, M., S. Byna, C. Paciorek, G. Weber, K. Wu, T. Yopes, M.F. Wehner, G. Ostrouchov, D. Pugmire, R. Strelitz, W. Collins, and W. Bethel, 2011: Pattern Detection and Extreme Value Analysis on Large Climate Data, Abstract IN41C-03, presented at 2011 Fall Meeting, AGU, San Francisco, CA, 5–9 Dec.
87. Pressel, K.G., W. Collins, and A.R. Desai, 2011: Scaling of water vapor in the meso-gamma (2-20km) and lower meso-beta (20-50km) scales from tall tower time series, Abstract A54A-01, presented at 2011 Fall Meeting, AGU, San Francisco, CA, 5–9 Dec.
88. Riley, W.J., L.N. Murphy, and W. Collins, 2011: Impact of afforestation with Loblolly Pines (*Pinus taeda* L.) in the Southeastern US on regional and global climate, Abstract GC23C-0971, presented at 2011 Fall Meeting, AGU, San Francisco, CA, 5–9 Dec.
89. Roberts, Y., P. Pilewskie, B.C. Kindel, D. Feldman, and W. Collins, 2011: Quantitative Comparison of the Variability of Simulated and Observed Hyperspectral Solar Radiance, Abstract GC23E-07, presented at 2011 Fall Meeting, AGU, San Francisco, CA, 5–9 Dec.
90. Rosa, D., W. Collins, and J. Lamarque, 2011: Global Transport of Radon and Methyl iodide in a Cloud-Resolving Global Climate Model, Abstract A13D-0358, presented at 2011 Fall Meeting, AGU, San Francisco, CA, 5–9 Dec.
91. Rubin, J.I., and W. Collins, 2011: Investigation of Aerosol Radiative Forcing with Multi-Wavelength Data Assimilation, Abstract A53C-0377, presented at 2011 Fall Meeting, AGU, San Francisco, CA, 5–9 Dec.
92. Subin, Z.M., F. Li, L.N. Murphy, C. Bonfils, W.J. Riley, S. Lee, S. Kang, and W. Collins, 2011: Atmospheric Responses to Changes in Boreal Lake Distribution and to Idealized Extratropical Terrestrial Surface Forcing Propagate to the Tropics and the Southern Hemisphere, Abstract H24E-08, presented at 2011 Fall Meeting, AGU, San Francisco, CA, 5-9 Dec.

93. Feldman, D. and W. Collins, 2012: Characteristics of Observing Systems that Differentiate Climate Models According by Their Low-Cloud Feedback Strengths, Abstract A21I-07, presented at 2012 Fall Meeting, AGU, San Francisco, CA.
94. Gunn, L.N. and W. Collins, 2012: Longwave radiative forcing due to dust aerosols: Observations and climatology comparisons, Abstract A13K-0334, presented at 2012 Fall Meeting, AGU, San Francisco, CA.
95. Jones, A.D. W. Collins, M.S. Torn and K.V. Calvin, 2012: Climate implications of including albedo effects in terrestrial carbon policy, Abstract GC11B-0982, presented at 2012 Fall Meeting, AGU, San Francisco, CA.
96. O'Brien, T.A. W. Collins, F. Li, S. Rauscher, T. Ringler, M.A. Taylor, S.M. Hagos, and L. Leung, 2012: Observational Constraints on Scale Awareness: Illumination of Scale Incognizance in CAM, Abstract A43G-0233, presented at 2012 Fall Meeting, AGU, San Francisco, CA.
97. Roberts, Y., P. Pilewskie, B.C. Kindel, D. Feldman, and W. Collins, 2012: Temporal Variability of Observed and Simulated Hyperspectral Earth Reflectance, Abstract A23E-0280, presented at 2012 Fall Meeting, AGU, San Francisco, CA.
98. Thornton, P.E., J.A. Edmonds, W. Collins, A.C. Janetos, G.C. Hurtt, X. Shi, J. Mao, A.M. Thomson, K.V. Calvin, B.P. Bond Lamberty, and L.P. Chini, 2012: Influence of human-climate system feedbacks on predicted 21st century land use/land cover trajectories, fossil fuel emissions, and climate change, Abstract GC11D-1037, presented at 2012 Fall Meeting, AGU, San Francisco, CA.
99. Du, E., A.V. Di Vittorio, and W. Collins, 2013: Performance evaluation and uncertainty analysis of hydrologic components of the CESM/iESM, Abstract H21C-1053 presented at 2013 Fall Meeting, AGU, San Francisco, CA, 9–13 December.
100. Feldman, D., W. Collins, and X. Liu, 2013: Shortwave and Longwave Hyperspectral Satellite Instrument Simulations Based on High and Low Sensitivity CMIP5 Models and Applications to Existing and Planned Measurement Systems, Abstract A43K-01 presented at 2013 Fall Meeting, AGU, San Francisco, CA, 9–13 December.
101. Holm, J.A., J.Q. Chambers, and W. Collins, 2013: Impacts of continual and periodic disturbances on a Central Amazonian forest: Lessons from a gap model for future model improvement, Abstract B51L-07 presented at 2013 Fall Meeting, AGU, San Francisco, CA, 9–13 December.
102. Jeon, S., M. Prabhat, S. Byna, W. Collins, and M.F. Wehner, 2013: Event Detection and Spatial Analysis for Characterizing Extreme Precipitation, Abstract H41J-1364 presented at 2013 Fall Meeting, AGU, San Francisco, CA, 9–13 December.

103. Jones, A.D., W. Collins, and M.S. Torn, 2013: Pattern scaling of land-use change climate response relationships, Abstract GC42A-07 presented at 2013 Fall Meeting, AGU, San Francisco, CA, 9–13 December.
104. O'Brien, T.A., W. Collins, S. Rauscher, and T. Ringler, 2013: Fractal behavior drives resolution dependent vertical velocity fields, Abstract NG41A-1659 presented at 2013 Fall Meeting, AGU, San Francisco, CA, 9–13 December.
105. Paige, J., D. Feldman, and W. Collins, 2013: An Assessment of Arctic Cloud-Albedo Feedbacks in the CMIP5 Archive and Prospects for Satellite Instrument Constraint, Abstract A21B-0032 presented at 2013 Fall Meeting, AGU, San Francisco, CA, 9–13 December.
106. Prabhat, M., S. Byna, V. Vishwanath, W. Bethel, W. Collins, and M.F. Wehner, 2013: TECA: Extreme Climate Analytics on Petascale Platforms, Abstract IN53B-1568 presented at 2013 Fall Meeting, AGU, San Francisco, CA, 9–13 December.
107. Roberts, Y., P.C. Taylor, C. Lukashin, D. Feldman, P. Pilewskie, and W. Collins, 2013: Climate Model Validation Using Spectrally Resolved Shortwave Radiation Measurements, Abstract A43K-07 presented at 2013 Fall Meeting, AGU, San Francisco, CA, 9–13 December.
108. Wang, H., W.J. Riley, and W. Collins, 2013: Evaluating terrestrial ecosystem model performance: An application of uncertainty in eddy covariance CO₂ flux measurements, Abstract B11E-0397 presented at 2013 Fall Meeting, AGU, San Francisco, CA, 9–13 December.
109. Wehner, M.F., C.J. Paciorek, M. Prabhat, H. Krishnan, W. Collins, and W. Bethel, 2013: Extreme value statistics of large climate modeled and observed datasets, Abstract IN24A-03 presented at 2013 Fall Meeting, AGU, San Francisco, CA, 9–13 December.
110. Williams, I.N., M.S. Torn, W.J. Riley, M.F. Wehner, and W. Collins, 2013: Climate extremes and ecosystem productivity in global warming simulations, Abstract B13M-03 presented at 2013 Fall Meeting, AGU, San Francisco, CA, 9–13 December.
111. Feldman, D.R., and W.D. Collins, 2014: Shortwave and Longwave Hyperspectral Satellite Instrument Simulations With Models of Varying Climate Sensitivity and Applications to Existing and Planned Measurement Systems. Abstract EGU2014-4586, presented at the 2014 EGU General Assembly, 27 April – 2 May, Vienna, Austria.
112. Holm, J., J.Q. Chambers, W.D. Collins, and N. Higuchi, 2014: Forest response to increased disturbance in the Central Amazon and comparison to Western Amazonian forests, Abstract B11G-0114 presented at the 2014 Fall Meeting, AGU, San Francisco, CA, 15-19 December.
113. Jones, A., K.V. Calvin, W.D. Collins, and J. Edmonds, 2014: Regionally Differentiated Scenarios of Future Albedo Forcing from Anthropogenic Land Cover Change, Abstract GC13J-0826 presented at the 2014 Fall Meeting, AGU, San Francisco, CA, 15-19 December.

114. Shi, X., J. Mao, P.E. Thornton, A.V. Di Vittorio, B.P. Bond-Lamberty, J.E. Truesdale, L.P. Chini, A.M. Thomson, W.D. Collins, J. Edmonds, and G.C. Hurtt, 2014: Investigating the biogeophysical impacts of land cover change on future climate, Abstract GC13J-0829 presented at the 2014 Fall Meeting, AGU, San Francisco, CA, 15-19 December.
115. Ferguson, J., C. Jablonowski, H. Johansen, R.E. English, P. McCorquodale, P. Colella, J.J. Benedict, W.D. Collins, J.N. Johnson, and P.A. Ullrich, 2014: Assessing Grid Refinement Strategies in the Chombo Adaptive Mesh Refinement Model, Abstract A13M-06 presented at the 2014 Fall Meeting, AGU, San Francisco, CA, 15-19 December.
116. Pincus, R., B.B. Stevens, P. Forster, W.D. Collins, and V. Ramaswamy, 2014: The Radiative Forcing Model Intercomparison Project (RFMIP): Assessment and characterization of forcing to enable feedback studies, Abstract A21H-3130 presented at the 2014 Fall Meeting, AGU, San Francisco, CA, 15-19 December.
117. Mao, J., X. Shi, A.V. Di Vittorio, P.E. Thornton, S. Piao, X. Yang, J.E. Truesdale, B.P. Bond-Lamberty, L.P. Chini, A.M. Thomson, G.C. Hurtt, W.D. Collins, and J. Edmonds, 2014: Dynamics of global vegetation biomass simulated by the integrated Earth System Model, Abstract B23C-0210 presented at the 2014 Fall Meeting, AGU, San Francisco, CA, 15-19 December.
118. Du, E., A.V. Di Vittorio, and W.D. Collins, 2014: Improvement of hydrologic simulations in CLM4 by modified soil properties, Abstract H33F-0907 presented at the 2014 Fall Meeting, AGU, San Francisco, CA, 15-19 December.
119. Martin, D., X. Asay-Davis, S.F. Price, S.L. Cornford, M.E. Maltrud, E.G. Ng, and W.D. Collins, 2014: Response of the Antarctic ice sheet to ocean forcing using the POPSICLES coupled ice sheet-ocean model, Abstract C33A-0376 presented at the 2014 Fall Meeting, AGU, San Francisco, CA, 15-19 December.
120. Ng, E., D.F. Martin, X. Asay-Davis, S.F. Price, and W.D. Collins, 2014: High-resolution coupled ice sheet-ocean modeling using the POPSICLES model, Abstract GC33A-0498 presented at the 2014 Fall Meeting, AGU, San Francisco, CA, 15-19 December.
121. O'Brien, T., K. Kashinath, and W.D. Collins, 2014: A New Framework for Systematically Characterizing and Improving Extreme Weather Phenomena in Climate Models, Abstract GC33A-0490 presented at the 2014 Fall Meeting, AGU, San Francisco, CA, 15-19 December.
122. Wehner, M.F., Mr. Prabhat, F. Li, C.J. Paciorek, and W.D. Collins, 2014: The effect of horizontal resolution of the simulation of precipitation extremes in the Community Atmospheric model version 5.1, Abstract GC33A-0488 presented at the 2014 Fall Meeting, AGU, San Francisco, CA, 15-19 December.
123. Pall, P., C.M. Patricola, M.F. Wehner, D.A. Stone, C.J. Paciorek, and W.D. Collins, 2014: Diagnosing Possible Anthropogenic Contributions to Heavy Colorado Rainfall in September

- 2013, Abstract GC33H-04 presented at the 2014 Fall Meeting, AGU, San Francisco, CA, 15-19 December.
124. Collins, W.D., D. Feldman, and D.D. Turner, 2014: Surface Forcing from CH₄ at the North Slope of Alaska and Southern Great Plains Sites, Abstract A34C-06 presented at the 2014 Fall Meeting, AGU, San Francisco, CA, 15-19 December.
 125. Asay-Davis, X., D.F. Martin, S.F. Price, M.E. Maltrud, and W.D. Collins, 2014: Present-day Circum-Antarctic Simulations using the POPSICLES Coupled Ice Sheet-Ocean Model, Abstract C34B-07 presented at the 2014 Fall Meeting, AGU, San Francisco, CA, 15-19 December.
 126. Di Vittorio, A., L.P. Chini, B.P. Bond-Lamberty, J. Mao, X. Shi, J.E. Truesdale, A. Craig, K.V. Calvin, A.D. Jones, W.D. Collins, J. Edmonds, G.C. Hurtt, P.E. Thornton, and A.M. Thomson, 2014: From Land Use to Land Cover: Restoring the Afforestation Signal in a Coupled Integrated Assessment - Earth System Model and the Implications for CMIP5 RCP Simulations, Abstract GC41F-0660 presented at the 2014 Fall Meeting, AGU, San Francisco, CA, 15-19 December.
 127. Jeon, S., C.J. Paciorek, Mr. Prabhat, S. Byna, W.D. Collins, and M.F. Wehner, 2014: Uncertainty Quantification for Characterizing Spatial Tail Dependence under Statistical Framework, Abstract GC41F-0644 presented at the 2014 Fall Meeting, AGU, San Francisco, CA, 15-19 December.
 128. Feldman, D., W.D. Collins, X. Huang, X. Chen, and Von Patrick Walden, 2014: Far-Infrared Surface Emissivity Impacts on Climate and the Potential for a Positive Feedback, Abstract A42E-08 presented at the 2014 Fall Meeting, AGU, San Francisco, CA, 15-19 December.
 129. Fildier, B., and W.D. Collins, 2014: The role of sunshine absorption on rainfall increase, Abstract A43F-3347 presented at the 2014 Fall Meeting, AGU, San Francisco, CA, 15-19 December.
 130. Benedict, J., M.S. Pritchard, and W.D. Collins, 2014: MJO Sensitivity to the Indian Ocean Dipole in the Superparameterized CAM, Abstract A51L04 presented at the 2014 Fall Meeting, AGU, San Francisco, CA, 15-19 December.
 131. Du, E., A.V. Di Vittorio, and W. Collins, 2014: Potentials of improving hydrologic simulations in CLM4.5 by adding interflow process and modified soil properties, presented at the 2014 Fall Meeting, AGU, San Francisco, CA, 15-19 December.
 132. Wehner, M.F., P. Pall, M. Duffy, D. Stone, C. Paciorek, W.D. Collins, 2015: Uncertainty quantification of daily precipitation extremes. Abstract 590, 95th AMS Annual Meeting, Phoenix, 4-8 January.
 133. O'Brien, T.A., and W.D. Collins, 2015: Analyzing and leveraging self-similarity for variable resolution atmospheric models. Abstract EGU2015-1572, European Geosciences Union General Assembly, Vienna, Austria, 12-17 April.

134. Di Vittorio, A., L. Chini, B. Bond-Lamberty, J. Mao, X. Shi, J. Truesdale, A. Craig, K. Calvin, A. Jones, W. Collins, J. Edmonds, G. Hurtt, P. Thornton, and A. Thomson, 2015: From land use to land cover: Restoring the afforestation signal in a coupled integrated assessment - earth system model and the implications for CMIP5 RCP simulations. Abstract EGU2015-4016, European Geosciences Union General Assembly, Vienna, Austria, 12-17 April.
135. Kashinath, K., T.A. O'Brien, and W.D. Collins, 2015: Changes in tropical climate due to bifurcations of radiative-convective equilibrium. Abstract EGU2015-4259, European Geosciences Union General Assembly, Vienna, Austria, 12-17 April.
136. Collins, W.D., H. Johansen, J. Benedict, D. Rosa, T.A. O'Brien, J. Johnson, E. Goodfriend, and N. Keen, 2015: Adaptive non-hydrostatic dynamics for exploring multiscale climate interactions. Abstract EGU2015-13505-3, European Geosciences Union General Assembly, Vienna, Austria, 12-17 April.
137. Pall, P., C. Patricola, M.F. Wehner, D. Stone, C. Paciorek, W.D. Collins, 2015: Diagnosing possible anthropogenic contributions to heavy Colorado rainfall in September 2013. Abstract EGU2015-12532, European Geosciences Union General Assembly, Vienna, Austria, 12-17 April.
138. Martin, D., X. Asay-Davis, S. Cornford, S. Price, E. Ng, and W.D. Collins, 2015: A Tale of Two Forcings: Present-Day Coupled Antarctic Ice-sheet/Southern Ocean dynamics using the POPSICLES model. Abstract EGU2015-7564, European Geosciences Union General Assembly, Vienna, Austria, 12-17 April.
139. Jones, A.L., D. Paynter, S. Freidenreich, D. Feldman, V. Ramaswamy, and W.D. Collins, 2016: Reducing the Spread in Modeled Aerosol Radiative Forcing with a Global, Scattering Line-by-Line Model as Part of RFMIP. Abstract A11I-0124, presented at 2016 Fall Meeting, AGU, San Francisco, Calif., 12-16 Dec.
140. Collins, W.D., D. Feldman, T. Daniels, and M.G. Mlynczak, 2016: Major Uncertainties in Shortwave Forcing by Methane: Sources and Implications for Climate Change. Abstract A11I-0128, presented at 2016 Fall Meeting, AGU, San Francisco, Calif., 12-16 Dec.
141. Feldman, D., T. Daniels, M.G. Mlynczak, M.J. Alvarado, E.J. Mlawer, and W.D. Collins, 2016: Methane longwave radiative forcing uncertainty and its thermodynamic dependence. Abstract A11I-0129, presented at 2016 Fall Meeting, AGU, San Francisco, Calif., 12-16 Dec.
142. Kratz, D.P., M.G. Mlynczak, E.J. Mlawer, T. Daniels, D. Feldman, W.D. Collins, M.J. Alvarado, J.E. Lawler, L.W. Anderson, D.W. Fahey, L.A. Hunt, and J.C. Mast 2016: The Spectroscopic Foundation of Radiative Forcing of Climate by Carbon Dioxide. Abstract A11I-0130, presented at 2016 Fall Meeting, AGU, San Francisco, Calif., 12-16 Dec.
143. Fildier, B., W.D. Collins, and H. Parishani, 2016: Contributions from Synoptic and Convective Motions to Changes in Tropical Precipitation Extremes. Abstract A11T-07, presented at 2016 Fall Meeting, AGU, San Francisco, Calif., 12-16 Dec.

144. Rhoades, A., P.A. Ullrich, H. Johansen, C.M. Zarzycki, Z. Xu, and W.D. Collins, 2016: Understanding California Mountain Wintertime Hydroclimate Trends using an Ensemble of High-Resolution Variable-Resolution CESM Simulations. Abstract A21F-0132, presented at 2016 Fall Meeting, AGU, San Francisco, Calif., 12-16 Dec.
145. Courtade, S., T.J. Immel, D. Feldman, S.R. Lorentz, L.P. Dyrud, and W.D. Collins, 2016: Measuring Earth's Radiation Imbalance using Cubesat Constellations. Abstract A41H-0160, presented at 2016 Fall Meeting, AGU, San Francisco, Calif., 12-16 Dec.
146. Leroy, S.S., W.D. Collins, D. Feldman, R.D. Field, Y. Ming, S. Pawson, B. Sanderson, and G.A. Schmidt, 2016: Toward a Climate OSSE for NASA Earth Sciences. Abstract GC12B-07, presented at 2016 Fall Meeting, AGU, San Francisco, Calif., 12-16 Dec.
147. Collins, W.D., Prabhat, E. Racah, Y. Liu, M.F. Wehner, J. Correa, A. Khowroshahi, D. Lavers, and K. Kunkel, 2017: Application of Neural Networks to Detect Extreme Weather in Climate Datasets, American Meteorological Society Annual Meeting, Abstract J3.1, Seattle, WA. Jan. 23-25, 2017.
148. Paynter, D., A. Jones, S. Freidenreich, D. Feldman, V. Ramaswamy, and W.D. Collins, 2017: Global Line-by-Line Calculations of Aerosol Radiative Forcing: A Demonstration of the RFMIP Aerosol-IRF Protocol., European Geophysical Union Congress, Vienna, Austria, Abstract EGU2017-10636, Session CL2.04, Apr. 23-27, 2017.

6.2 Conference Presentations and Talks

1. Collins, W.D., J.T. Kiehl, J. Wang, and G.J. Zhang, 1996: Validation of the NCAR community climate model with TOGA COARE observations. *Eighth Conference on Air-Sea Interaction*, 76th AMS Annual Meeting, Jan. 28–Feb. 2, 1996, Atlanta, Georgia (American Meteorological Society, Boston).
2. Zhang, G.J., J.T. Kiehl, W.D. Collins, and J. Wang, 1996: Sensitivity of surface evaporation in the tropical Pacific to treatment of convection in the NCAR climate model. *Eighth Conference on Air-Sea Interaction*, 76th AMS Annual Meeting, Jan. 28–Feb. 2, 1996, Atlanta, Georgia (American Meteorological Society, Boston).
3. Zender, C.S., S. Pope, B. Bush, W.D. Collins, J.T. Kiehl, F.P.J. Valero, and J. Vitko, 1997: Atmospheric absorption during ARESE. *Ninth Conference on Atmospheric Radiation*, 77th AMS Annual Meeting, Feb. 2–7, 1997, Long Beach, California (American Meteorological Society, Boston).
4. Collins, W.D., 1998: A global signature of enhanced shortwave absorption by clouds. Gordon Conference on Solar Radiation and Climate, Plymouth State College, Jun. 15–19, 1998, Plymouth, New Hampshire.

5. Collins, W.D., 1998: The atmospheric radiative heating rate during COARE: Estimation from observations and model simulations. *Proceedings of a conference on the TOGA Coupled Ocean-Atmosphere Response Experiment (COARE)* (World Climate Research Program, Geneva), WCRP-107, WMO/TD-No. 940, Jul. 7–14, 1998, Boulder, Colorado.
6. Collins, W.D., P.J. Rasch, and B.E. Eaton, 1999: Forecasting aerosols using a CTM with assimilation of satellite aerosol retrievals. Workshop on Mineral Dust, Jun. 9–11, 1999, Boulder, Colorado.
7. Collins, W.D., P.J. Rasch, and B.E. Eaton, 1999: A prototype global aerosol analysis using assimilation of satellite retrievals of aerosol optical thickness. NCAR ACD Workshop on Chemical Data Assimilation and Applications to Satellite Observations, Nov. 8–9, 1999, Boulder, Colorado.
8. Valero, F.P.J., S.K. Pope, and W.D. Collins, 2000: ScaRaB, GOES-8, aircraft and surface observations of the absorption of solar radiation by clouds. Gordon Conference on Solar Radiation and Climate, Connecticut College, Jun. 24–29, 2000, New London, Connecticut.
9. Collins, W.D., 2001: New treatments of radiative processes in the NCAR Community Climate Model. 8th Scientific Assembly of the International Association of Meteorology and Atmospheric Sciences, Jul. 10–18, 2001, Innsbruck, Austria.
10. Collins, W.D., 2001: Improved estimates of global atmospheric shortwave absorption by aerosols in clear and cloudy atmospheres. Chapman Conference on Atmospheric Absorption of Solar Radiation, Aug. 13–17, 2001, Estes Park, Colorado.
11. Fillmore, D.W., and W.D. Collins, 2001: Evidence for enhanced shortwave absorption over the tropical Pacific from collocated satellite and buoy observations. Chapman Conference on Atmospheric Absorption of Solar Radiation, Aug. 13–17, 2001, Estes Park, Colorado.
12. Collins, W.D. and D.W. Fillmore, 2002: Effects of clouds on direct radiative forcing by absorptive aerosols. *11th Conference on Atmospheric Radiation*, Jun. 3–7, 2002, Ogden, Utah (American Meteorological Society, Boston).
13. Collins, W.D., 2002: Overview of aerosol/climate interactions and radiative forcing: Parts I and II. NCAR ASP Summer Colloquium, “Interactions among Aerosols, Climate, and the Hydrological Cycle,” Jul. 8–19, 2002, Boulder, Colorado.
14. Collins, W.D., 2002: Techniques of aerosol assimilation. NCAR ASP Summer Colloquium, “Interactions among Aerosols, Climate, and the Hydrological Cycle,” Jul. 8–19, 2002, Boulder, Colorado.
15. Mlynczak, M., D. Johnson, K. Jucks, W. Traub, G. Bingham, P. Yang, C. Mertens, L. Gordley, B. Smith, W. Collins, C.R. Hyde, and S. Wellard, 2003: The Far-Infrared Spectroscopy of the Troposphere (FIRST) Project—A new instrument for AURA validation. AURA Validation Workshop, Mar. 18–21, 2003.

16. Mlynczak, M., D. Johnson, K. Jucks, W. Traub, G. Bingham, D. Kratz, P. Yang, C. Mertens, L. Gordley, B. Smith, W. Collins, J. Harries, R. Rizzi, C.R. Hyde, and S. Wellard, 2003: The Far-Infrared Spectroscopy of the Troposphere (FIRST) Project. Advanced Infrared Technology (AITA) Workshop, Sep. 2003, Pisa, Italy.
17. Collins, W.D., 2003: Effects of aerosols on regional and global climate. Workshop on Global Aerosol Measurements for Climate Studies: Present and Future, Sep. 17, 2003, Paris, France.
18. Collins, W.D., P.J. Rasch, A. Conley, and D. Fillmore, 2003: Regional and global effects of anthropogenic aerosols on the hydrological cycle. International Conference on Earth System Modeling, Sep. 19, 2003, Hamburg, Germany.
19. Collins, W.D., 2004: Cloud feedbacks in the NCAR Community Climate System Model CCSM3. Joint WGCM CFMIP/IPCC expert meeting on Climate Sensitivity and Feedbacks, Apr. 19–22, 2004, Exeter, UK.
20. Collins, W.D., 2004: Estimates of regional and global forcing: How good are our models? Aspen Global Change Institute symposium, “Aerosols and the Hydrological Cycle,” Jul. 11–17, 2004, Aspen, Colorado.
21. Collins, W.D., D.W. Fillmore, V. Ramaswamy, and M.D. Schwarzkopf, 2004: Comparison of radiative forcings from GCMs and line-by-line models. IPCC Workshop on Climate Sensitivity, Jul. 26–29, 2004, Paris, France.
22. Collins, W.D., 2004: Radiative transfer and forcing. IPCC Workshop on Climate Sensitivity, Jul. 26–29, 2004, Paris, France.
23. Charlock, T.P., F.G. Rose, D. Rutan, D.W. Fillmore, and W.D. Collins, 2004: All-sky aerosol direct forcing to SW and LW at TOA and surface using CERES Terra and the MATCH assimilation. International Radiation Symposium 2004, “Current Problems in Atmospheric Radiation,” Aug. 23–28, 2004, Busan, South Korea.
24. Lamarque, J.F., J. Kiehl, G. Brasseur, T. Butler, P. Cameron-Smith, W.D. Collins, W.J. Collins, C. Granier, D. Hauglustaine, P. Hess, E. Holland, L. Horowitz, M. Lawrence, D. McKenna, P. Merilees, L. Mickley, M. Prather, P. Rasch, D. Rotman, D. Shindell, and P. Thornton, 2004: Nitrogen deposition evolution in the 21st century under the A2-scenario: A multi-model multi-climate analysis. Eighth International Global Atmospheric Chemistry Conference, Sep. 4–9, 2004, Christchurch, New Zealand.
25. Holland, E.A., J.-F. Lamarque, J. Sulzman, G. Brasseur, T. Butler, P. Cameron-Smith, W.D. Collins, W.J. Collins, P. Hess, D. Hauglustain, J. Kiehl, D. McKenna, M. Lawrence, H. Levy, D. Shindell, 2004: Evaluation of nitrogen deposition in precipitation: A multi-model comparison with EMEP and NADP measurements. Eighth International Global Atmospheric Chemistry Conference, Sep. 4–9, 2004, Christchurch, New Zealand.

26. Collins W.D., G.A. Meehl, T.M.L. Wigley, and H. Teng, 2005: Simulations of committed climate change and sea-level rise through 2400 AD. US Climate Change Science Program (CCSP) Workshop “Climate Science in Support of Decision Making,” Nov. 14–16, 2005, Arlington, Virginia.
27. Collins, W.D., and A.J. Conley, 2006: New methods for representing transmission in radiative parameterizations. EGU General Assembly, Apr. 2–7, 2006, Vienna, Austria.
28. Sun, D.Z., T. Zhang, C. Covey, S. Klein, W. Collins, J.J. Hack, J. Kiehl, G.A. Meehl, I.M. Held, and M. Suarez, 2007: Atmospheric Feedbacks Over the Pacific Cold-Tongue: Results From Models and Observations. 3rd WGNE Workshop on Systematic Errors in Climate and NWP Models, Feb. 12–16, 2007, San Francisco, California.
29. Iacono, M., W. Collins, and P. Rasch, 2008: Evaluating the Impact of RRTMG/McICA in the NCAR CAM3.5 Climate Model, ARM Science Team Meeting, Mar. 10–14, 2008, Norfolk, Virginia.
30. Collins, W.D., 2009: “Climate modeling.” Carbon cycle 2.0 Retreat, Oct. 12–13, 2009, Chaminade Resort and Spa, Santa Cruz, CA.
31. Kiparsky, M., W. Collins, D. Groves, M. Hanemann, B. Joyce, D. Purkey, and C. Young, 2009: “Hydrology And Water Operations Modeling for Climate Change Risk Assessment in California’s Southern Central Valley“. AWRA 2009 Spring Specialty Conference: Managing Water Resources Development in a Changing Climate. May 4–6, 2009, Anchorage, Alaska.
32. Kato, S., S. Sun-Mack, W.F. Miller, F.G. Rose, B.A. Wielicki, D.M. Winker, G. Stephens, P. Minnis, N.G. Loeb, T.P. Charlock, P.W. Stackhouse, K.-M. Xu, and W.D. Collins, 2009: “CALIPSO, CloudSat, CERES, and MODIS merged product.” Earthcare Workshop, Kyoto, Japan, June 10–12, 2009.
33. Collins, W.D., 2010: “A future with(out) CC2.0.” Carbon Cycle 2.0 Symposium, Feb.1 2010, LBNL.
34. de Boer, G., W.D. Collins, S. Menon, E. Hunke, and E.W. Eloranta, 2010: “Quantifying seasonal influence of stratiform mixed-phase clouds on Arctic sea ice growth rates,” International Glaciological Society Symposium on Sea Ice in the Physical and Biogeochemical System, Tromso; Norway, May 30–June 4.
35. de Boer, G., W.D. Collins, S. Menon, E. Hunke, and E.W. Eloranta, 2010: “Quantifying seasonal influence of stratiform mixed-phase clouds on Arctic sea ice growth rates,” International Polar Year Science Conference, Oslo, Norway, June 8–June 12.
36. Feldman, D.R., C.A. Algieri, J. Ong, and W.D. Collins, 2010: “Observational System Simulation Experiments of CLARREO Shortwave Reflectance Spectra.” 11th International Meeting on Statistical Climatology, Edinburgh, Scotland, July 12–16, 2010.

37. Kato, S., F.G. Rose, S. Sun-Mack, W.F. Miller, Y. Chen, D.A. Rutan, B.A. Wielicki, D.M. Winker, G. Stephens, P. Minnis, N.G. Loeb, T.P. Charlock, P.W. Stackhouse, K.-M. Xu, and W. Collins, 2010: Computation of surface irradiances using CALIPSO, CloudSat and MODIS derived cloud and aerosol properties. NASA A-train Symposium, October 25–28, 2010, New Orleans, LA.
38. Collins, W.D., 2010: Quantifying Uncertainty in Climate and Integrated Assessments. National Climate Assessment Modeling and Scaling Workshop, Dec. 8, 2010, Washington, DC.
39. Nolan, L., and W. Collins, 2011: The Effects of Cloud-Scale Physics Uncertainty on Climate Prediction. WCRP Conference on Climate Research in Service to Society. 23–28 October 2011, Denver, Colorado.
40. Pressel, K., and W. Collins, 2011: Scaling of the First Order Structure Function of the AIRS Observed Water Vapor Field. WCRP Conference on Climate Research in Service to Society. 23–28 October 2011, Denver, Colorado.
41. Collins, W.D., K.G. Pressel, and A.R. Desai, 2012: A Comparison of the Scale Invariance of the Water Vapor Field Observed by the Atmospheric Infrared Sounder to the Scale Invariance of In Situ Observations from a Very Tall Tower. Poster EM-27, AGU Chapman Conference on Remote Sensing of the Terrestrial Water Cycle, 19–22 February 2012, Kona, Hawaii, USA.
42. Pressel, K.G., and W.D. Collins, 2012: Scale Invariance of the Water Vapor Field Observed by the Atmospheric Infrared Sounder, Poster EM-23, AGU Chapman Conference on Remote Sensing of the Terrestrial Water Cycle, 19–22 February 2012, Kona, Hawaii, USA.
43. Collins, W.D., and D.R. Feldman, 2012: The future evolution of the Earth’s reflected short-wave spectrum. Planet Under Pressure Conference, Abstract 3416, May 26–29, 2012, London, UK.
44. Collins, W.D., T.A. O’Brien, and F. Li, 2012: Observational constraints on scale-awareness: Scale-incognizant parameterizations in the Community Atmosphere Model. *Frontiers in Computational Physics: Modeling the Earth System*, Abstract 178, 16–20 December, Boulder, Colorado.
45. Feldman, D.R., and W.D. Collins, 2013: Pan-Spectral Signatures of Climate Change and Prospects for Observational Constraints, 25th Conference on Climate Variability and Change, Annual American Meteorological Society Meeting, 10 January, Austin, TX.
46. Jones, A.D., K.V. Calvin, W.D. Collins and J. Edmonds, 2013: Towards a more consistent treatment of land-use change within climate assessment. Presented at the Impacts World 2013, International Conference on Climate Change Effects, 27–30 May, Potsdam.

47. Collins, W.D., T.A. O'Brien, and F. Li, 2013: Do projections of rainfall extremes converge with increasing model resolution? Abstract 1097, Davos Atmosphere and Cryosphere Assembly DACA-13, 8–12 July, Davos, Switzerland.
48. Collins, W.D., and K.G. Pressel, 2014: Scaling Behavior of Atmospheric Moisture from Cloud System to Synoptic Scales. The Latsis Symposium 2014 on Atmospheric and Climate Dynamics, 18–21 June, Zurich, Switzerland.
49. O'Brien, T.A., W.D. Collins, S.A. Rauscher, and T.D. Ringler, 2014: Scale-dependent vertical mass flux and a possible deficiency in current parameterization suites. The Latsis Symposium 2014 on Atmospheric and Climate Dynamics, 18–21 June, Zurich, Switzerland.
50. Collins, W.D., D.R. Feldman, M.S. Torn, and P.J. Gero, 2014: Direct Measurements of Surface Forcing of Carbon Dioxide from 2000 to 2010. American Meteorological Society 14th Conference on Atmospheric Radiation, Abstract 2.4, Boston, Massachusetts, 7-11 July.
51. Feldman, D.R., W.D. Collins, and X. Huang, 2014: Far-Infrared Surface Emissivity: An Unconstrained Property that Impacts Atmospheric Radiation and Climate. American Meteorological Society 14th Conference on Atmospheric Radiation, Abstract 4.7, Boston, Massachusetts, 7-11 July.
52. Collins, W.D., 2014: The Spatial Scale Dependence of Water Vapor in Models, Satellite Data, and Tower Measurements. 7th International GEWEX conference, The Hague, the Netherlands, 14-17 July.
53. O'Brien, T.A., W.D. Collins, S.A. Rauscher, T.D. Ringler, M. Taylor, S.M. Hagos, and L.-R. Leung, 2014: Observed scaling in clouds and precipitation and scale incognizance in regional to global atmospheric models. 7th International GEWEX conference, The Hague, the Netherlands, 14-17 July.
54. Jones, A. D., W. D. Collins, M. S. Torn, K. V. Calvin, J. Edmonds, 2014: Land use scenarios to meet multiple needs for CMIP6, presented at Aspen Global Change Institute Workshop on Experimental Design for CMIP6: Aerosol, Land Use, and Future Scenarios, Aspen, CO, 5 Aug.
55. Jeon, S., Prabhat, S. Byna, W.D. Collins, and M.F. Wehner, 2014: Characterization of extreme precipitation under atmospheric river events. Joint Statistical Meeting, Boston, Massachusetts, 6 August.
56. Collins, W.D., H. Johansen, P. McCorquodale, P. Colella, and P. Ullrich, 2014: Nonhydrostatic adaptive mesh dynamics for multiscale climate models, Abstract SCI-PS243.01, World Weather Open Science Conference, Montreal, Canada, 16-21 August.
57. Martin, D.F., X. Asay-Davis, S.F. Price, S.L. Cornford, E.G. Ng, and W.D. Collins, 2014: Response of the Antarctic ice sheet to ocean forcing using the POPSICLES coupled ice sheet-ocean model. 21st Annual West Antarctic Ice Sheet (WAIS) Initiative Workshop, Julian, California, 24-27 September.

58. Feldman, D.R., R. Pincus, W.D. Collins, V. Ramaswamy, D. Paynter, E.J. Mlawer, P. Forster, 2014: Diagnostics from the Radiative Forcing Model Intercomparison Project, 13th AEROCOM Workshop, Steamboat Springs, CO, 30 Sep – 2 Oct.
59. Collins, W.D., and the ACME Science Team, 2014: ACME Climate Science. DOE Energy-Climate Workshop, Washington, DC, 28-30 October.
60. Edmonds, J., W.D. Collins, P.E. Thornton, A. Thomson, A.D. Jones, and K. Calvin, 2014: Improving Representations of Human-Earth System Interactions: The iESM Project, Integrated Assessment Modeling Consortium Seventh Annual Meeting, College Park, Maryland, 17-19 November.
61. Jones, A. D, K. V. Calvin, W. D. Collins, and J. A. Edmonds (2014), Accounting for radiative forcing from albedo change in future land-use scenarios, presented at the 7th Annual Meeting of the Integrated Assessment Modeling Consortium, University of Maryland, College Park, MD, 17-19 Nov.
62. Pall, P., M. Duffy, Wehner, M.F., D.A. Stone, C.J. Paciorek, H. Krishnan, W.D. Collins, 2015: Estimating the uncertainty in extreme precipitation due to sample size limitations. American Meteorological Society January.
63. Wehner, M.F., P. Pall, M. Duffy, D.A. Stone, C. Paciorek, W. D. Collins, 2015: Uncertainty quantification of daily precipitation extremes, American Meteorological Society Annual Meeting. Phoenix, AZ, January 8.
64. Collins, W.D., D.R. Feldman, J. Gero, M.S. Torn, E. Mlawer, and T. Shippert, 2015: Observational Determination of Surface Radiative Forcing by CO₂ and CH₄. Abstract BAPS.2015.MAR.D33.2, Session D33: The Physics of Climate II, APS March Meeting, San Antonio, 2-6 March.
65. Davis, A.B., F. Xu, W.D. Collins, 2015: Accounting for Sub-Pixel Variability of Clouds and/or Unresolved Spectral Variability, as Needed, with Generalized Radiative Transfer Theory. Abstract HT4B.3, Fourier Transform Spectroscopy (FTS) and Hyperspectral Imaging and Sounding of the Environment (HISE) Meetings, Lake Arrowhead, California, 1-4 March.
66. Feldman, D., and W.D. Collins, 2015: Simulating hyperspectral satellite instruments in pursuit of an observational constraint for low-cloud feedbacks. Cloud Forcing Model Intercomparison Project (CFMIP) Meeting on Cloud Processes and Cloud Feedbacks, Asilomar Conference Center, Pacific Grove, California, 8-11 June.
67. Kashinath, K., T.A. O'Brien, and W.D. Collins, 2015: Changes in tropical climate due to bifurcations of radiative-convective equilibria. Cloud Forcing Model Intercomparison Project (CFMIP) Meeting on Cloud Processes and Cloud Feedbacks, Asilomar Conference Center, Pacific Grove, California, 8-11 June.

68. Wehner, M. P. Pall, D. Stone, and W.D. Collins, 2015: Diagnosing Possible Anthropogenic Contributions to Heavy Colorado Rainfall in September 2013. Abstract IUGG-0115, Session JH1 Extreme Hydrological Events, 26th International Union of Geodesy and Geophysics (IUGG), Prague, Czech Republic, 22 June – 2 July.
69. Collins, W.D., D. Feldman, J. Gero, M. Torn, E. Mlawer, and T. Shippert, 2015: Observational Determination of Surface Radiative Forcing by the Major Anthropogenic Greenhouse Gases. Abstract IUGG-1830, Session M16 Radiation in the Climate System, 26th International Union of Geodesy and Geophysics (IUGG), Prague, Czech Republic, 22 June – 2 July.
70. Asay-Davis, X., D. Martin, S. Cornford, S. Price, and W.D. Collins, 2015: Coupled ice sheet-ocean simulations with the POPSICLES model. Abstract IUGG-2864, Session C06 Ice Sheet and Ocean Interactions on Multiple Scales, 26th International Union of Geodesy and Geophysics (IUGG), Prague, Czech Republic, 22 June – 2 July.
71. Feldman, D.R., Y.L. Roberts, J.L. Paige, Z.M. Subin, Y. Liu, G. Pau, W.D. Collins, 2015: Simulating Hyperspectral Satellite Instrument Measurements in Pursuit of an Observational Constraint for Low-Cloud Feedbacks, CFMIP Meeting, Monterey, California, 8–11 June.
72. Collins, W.D., H. Johansen, C. Jablonowski, and J. Ferguson, 2017: Demonstration of non-hydrostatic adaptive mesh dynamics for multiscale climate models, International Conference on Computational Science (ICCS), Zurich, Switzerland, Jun. 11-14, 2017.
73. Collins, W.D., B. Debusschere, S. Ghan, D. Lucas, P. Caldwell, L. Oliker, T. Ringler, and C. Woodward, 2016: Multiscale methods for accurate, efficient, and scale-aware models of the Earth System, SciDAC QUEST Institute Science Team Meeting, SNL Livermore, Livermore, CA., Jul. 7, 2016.
74. Rhoades, A, H. Johansen, P. Ullrich, Z. Xu, C. Zarzycki, and W.D. Collins, 2016: Understanding Western US Mountain Hydroclimatology Under Present and Future Conditions Using A Next-Generation Variable-Resolution Global Climate Model. MtnClim 2016, 7th Mountain Climate Conference on Mountains without Snow: What are the Consequences?, Sleeping Lady Resort, Leavenworth, Washington, Oct. 17-20, 2016.
75. Fildier, B., H. Parishani, and W.D. Collins, 2017: Simultaneous Characterization of the Dynamics of Tropical Precipitation Extremes on Mesoscales and Convective Scales. Presentation 5.5, AMS 21st Conference on Atmospheric and Oceanic Fluid Dynamics 19th Conference on Middle Atmosphere, Marriott Portland Downtown Waterfront, 26–30 June 2017 Portland, Oregon.
76. Langhans, W. and W.D. Collins, 2017: The influence of an Eddy-Diffusivity/Mass-Flux (EDMF) turbulence parameterization on convective self-aggregation. Poster 41, AMS 21st Conference on Atmospheric and Oceanic Fluid Dynamics 19th Conference on Middle Atmosphere, Marriott Portland Downtown Waterfront, 26–30 June 2017 Portland, Oregon.

77. Liu, Y., E. Racah, Prabhat, A. Khosrowshahi, D. Lavers, K. Kunkel, M. Wehner, W. Collins. 2016: Extreme Weather Pattern Detection Using Deep Convolutional Neural Network. Proceedings of the 6th International Workshop on Climate Informatics: CI 2016. NCAR Technical Note NCAR/TN-529+PROC, Sep 2016, 159 pp., doi: 10.5065/D6K072N6.
78. Liu, Y. E. Racah, Prabhat, J. Correa, A. Khosrowshahi, D. Lavers, K. Kunkel, M. Wehner, and W. Collins, 2016: Application of Deep Convolutional Neural Networks for Detecting Extreme Weather in Climate Datasets. International Conference on Advances in Big Data Analytics July 25-28, 2016, Las Vegas, Nevada.
79. OBrien, T.A., N.R. Cavanaugh, K. Kashinath, W.D. Collins, J.P. OBrien, A fast and objective multidimensional kernel density estimation method: fastKDE, 13th International Meeting on Statistical Climatology (IMSC), Canmore, Alberta, Canada, June 2016.
80. Pall, P., M. Duffy, M.F. Wehner, D.A. Stone, C.J. Paciorek, H. Krishnan, W.D. Collins, On the uncertainty of generalized extreme value estimates of daily precipitation return values, 13th International Meeting on Statistical Climatology (IMSC), Canmore, Alberta, Canada, June 2016.
81. Pall, P, C.M. Patricola, M.F. Wehner, D.A. Stone, C.J. Paciorek, and W.D. Collins, 2017: Diagnosing Conditional Anthropogenic Contributions to Heavy Colorado Rainfall in September 2013. International Detection and Attribution Group (IDAG) meeting. March 14-16, 2017.
82. Charn, A. B., and W. D. Collins, A31J-2311: Microphysical Sensitivity of Precipitation Extremes in the Continental US Using a Super-Parameterized Community Atmosphere Model (CAM), AGU Fall Meeting, New Orleans, LA, December, 2017.
83. Feldman, D., W. D. Collins, B. A. Wielicki, Y. Shea, M. G. Mlynczak, C. Kuo, and N. Nguyen, GC41F-05: How Continuous Observations of Shortwave Reflectance Spectra Can Narrow the Range of Shortwave Climate Feedbacks, AGU Fall Meeting, New Orleans, LA, December, 2017.
84. Ferguson, J. O., C. Jablonowski, H. Johansen, P. McCorquodale, P. A. Ullrich, W. Langhans, and W. D. Collins, A31J-2321: Capturing Multiscale Phenomena via Adaptive Mesh Refinement (AMR) in 2D and 3D Atmospheric Flows, AGU Fall Meeting, New Orleans, LA, December, 2017.
85. Fildier, B., and W. D. Collins, A43K-04: Predictive Power of Extreme Precipitation Scaling Formulas Across Spatial and Temporal Scales, AGU Fall Meeting, New Orleans, LA, December, 2017.
86. Jones, A. L., D. Feldman, S. Freidenreich, D. Paynter, V. Ramaswamy, and W. D. Collins, A53M-07: Characterizing Radiative Parameterization Uncertainty in Modeled Aerosol Instantaneous Radiative Effect as part of RFMIP, AGU Fall Meeting, New Orleans, LA, December, 2017.

87. Joseph, R., P. J. Gleckler, F. M. Hoffman, W. D. Collins, D. N. Williams, and G. L. Geernaert, TH23C: Coordinated Model Evaluation Capabilities (CMEC) for CMIP DECK and Historical simulations, AGU Fall Meeting, New Orleans, LA, December, 2017 (Conveners).
88. Mahesh, A., T. A. O'Brien, M. Prabhat, W. D. Collins, and Y. Liu, IN11E-06: Assessing Uncertainty in Deep Learning Techniques that Identify Atmospheric Rivers in Climate Simulations, AGU Fall Meeting, New Orleans, LA, December, 2017.
89. Thornton, P.E., K.V. Calvin, A.D. Jones, A.V. Di Vittorio, B.P. Bond-Lamberty, L.P. Chini, X. Shi, J. Mao, W.D. Collins, J. Edmonds, and G.C. Hurtt, B53J-06: Biospheric feedback effects in a synchronously coupled model of human and Earth systems, AGU Fall Meeting, New Orleans, LA, December, 2017.
90. Timmermans, B., W. D. Collins, T. A. O'Brien, and M. D. Risser, GC21E-0979: Parameter uncertainty in simulations of extreme precipitation and attribution studies, AGU Fall Meeting, New Orleans, LA, December, 2017.
91. Xu, Z., A. Rhoades, H. Johansen, P. A. Ullrich, and W. D. Collins, A24F-03: An intercomparison of GCM and RCM dynamical downscaling for characterizing the hydroclimatology of California and Nevada, AGU Fall Meeting, New Orleans, LA, December, 2017.
92. Prabhat, S. Byna, V. Vishwanath, E. Dart, M. Wehner, and W. D. Collins (2015), TECA: petascale pattern recognition for climate science, Computer Analysis of Images and Patterns. 16th International Conference, CAIP 2015. Proceedings: LNCS 9257, 426-436,
93. Mahesh, A., T. A. O'Brien, M. Prabhat, and W. Collins, 2018: 2.5 Assessing Uncertainty in Deep Learning Techniques that Identify Atmospheric Rivers in Climate Simulations, American Meteorological 97th Annual Meeting, Jan. 22–26, Seattle, WA.
94. O'Brien, T.A., K. Kashinath, H. Inda Diaz, and W. Collins, 2018: 552 Convective Aggregation and the Size Distribution of Updrafts, American Meteorological 97th Annual Meeting, Jan. 22–26, Seattle, WA.
95. Collins, W.D., D. Feldman, B. A. Wielicki, Y. L. Shea, M. G. Mlynczak, C. Kuo, N. Nguyen, and X. Liu, 2018: 6B.3A Shortwave Spectral Climate Change Signals of Earth Systems with Low, Medium, and High Climate Sensitivity, American Meteorological 97th Annual Meeting Seattle, WA, Jan. 22–26, 2018.
96. Collins, W.D., D. Feldman, C. Kuo, and N. Nguyen, 2018: Large Regional Shortwave Forcing by Anthropogenic Methane Enhanced by Clouds. Understanding and Modelling Atmospheric Process (UMAP), the 2nd pan-GASS conference sponsored by ARC Centre of Excellence for Climate System Science, Lorne, Victoria, Australia, Feb. 26 - Mar. 2, 2018.
97. Collins, W.D., D. Feldman, C. Kuo, and N. Nguyen, 2018: Large Regional Shortwave Forcing by Anthropogenic Methane Informed by Jovian Observations. Abstract H46.00005, March American Physical Society Meeting, Los Angeles, CA, March 5–9, 2018.

98. Collins, W.D, and the CASCADE team, 2018: Emergent Extremes in the Downwelling Radiation at the Earth's Surface. Abstract 11025, Session CL2.01, European Geophysical Union General Assembly, Vienna, Austria, April 8-13, 2018.
99. Jones, A., S. Freidenreich, D. Paynter, D. Feldman, V. Ramaswamy, and W. Collins, 2018: Benchmark Global Shortwave Absorption Calculations Constrain Intermodel Spread in Aerosol Radiative Forcing and Hydrological Cycle Intensification, Abstract 10169, Session CL2.01, European Geophysical Union General Assembly, Vienna, Austria, April 8-13, 2018.
100. Feldman, D., A. Jones, D. Paynter, S. Freidenreich, W. Collins, 2018: Native Error Diagnostics Reveal Sources of Aerosol Radiative Forcing Error in Earth System Models. Abstract Error in Earth System Models. Abstract, AOGS 15th Annual Meeting, , Hawaii Convention Centre, Honolulu, HI, June. 3-8, 2018.
101. O'Brien, T.A.; Inda-Diaz, Hector; Kashinath, K.; Collins, W.D. Convective Aggregation and the Intensity, Duration, Area and Frequency of Precipitation, 8th GEWEX Open Science Conference: Extremes and Water on the Edge, Canmore, Canada, May 7-11, 2018.
102. O'Brien, T.A.; O'Brien, J.P.; Risser, M.D.; Patricola, C.M.; Collins, W.D. A Weakening of Rainy Events in CA, International Detection and Attribution Group Workshop, Berkeley, CA, March 13-15, 2018.
103. Mahesh, A.; T.A. O'Brien; Prabhat; W.D. Collins; Y. Liu. Assessing Uncertainty in Deep Learning Techniques that Identify Atmospheric Rivers in Climate Simulations, 2nd ARTMIP Workshop, Gaithersburg, MD, April 23-24, 2018.
104. Mahesh, A.; T.A. O'Brien; Prabhat; W.D. Collins; Y. Liu. Assessing Uncertainty in Deep Learning Techniques that Identify Atmospheric Rivers in Climate Simulations, 2018 International Atmospheric Rivers Conference, La Jolla, CA, June 25-28, 2018.
105. Timmermans, B.; W.D. Collins; T.A. O'Brien; M.D. Risser Parametric uncertainty in simulations of extreme weather events Statistical and Applied Mathematical Sciences Institute, Research Triangle Park, NC, July, 2017.
106. Timmermans, B.; W.D. Collins; T.A. O'Brien; D. Stone; M.D. Risser Parameter uncertainty in simulations of extreme precipitation and attribution studies International Detection and Attribution Group Workshop, Berkeley, CA, March, 2018.
107. Alexandra Jones, Stuart Freidenreich, David Paynter, Daniel Feldman, William D. Collins , V. Ramaswamy, and Robert Pincus, 2018: Errors in Absorbed SW Radiation and the Hydrological Cycle. Tri-MIP-Athlon at the University of Reading, June 14, 2018.
108. David Paynter RFMIP talk, Tri-MIP-Athlon at the University of Reading, June 14, 2018.

109. Feldman, D.R., A. Jones, D. Paynter, S. Freidenreich, V. Ramaswamy, R. Pincus, and W.D. Collins, 2017: Rigorous and Comprehensive Greenhouse Gas and Aerosol Radiative Forcing Calculations for CMIP6, CFMIP Annual Meeting, September 25, 2017, Tokyo, Japan.
110. Feldman, D.R., W.D. Collins, B.A. Wielicki, Y.L. Shea, M. Mlynczak, C. Kuo, N. Nguyen, and X. Liu, 2018: Shortwave Spectral Climate Change Signals of Earth Systems with Low, Medium, and High Climate Sensitivity, AMS Annual Meeting, January 11, 2018, Austin, Texas.

6.3 Invited Presentations

6.3.1 Departmental seminars

1. Collins, W.D., 1995: The interaction of convection and the greenhouse effect in the tropical climate. University of North Carolina, Mar. 24, 1995, Raleigh, North Carolina.
2. Collins, W.D., 1997: A global signature of enhanced shortwave absorption by clouds. University of Colorado, May 2, 1997, Boulder, Colorado.
3. Collins, W.D., 1997: A global signature of enhanced shortwave absorption by clouds. University of Utrecht, Jun. 13, 1997, Utrecht, The Netherlands.
4. Collins, W.D., 1997: A global signature of enhanced shortwave absorption by clouds. Scripps Institution of Oceanography, Sep. 9, 1997, La Jolla, California.
5. Collins, W.D., 1997: A global signature of enhanced shortwave absorption by clouds. State University of New York, Oct. 22, 1997, Stony Brook, New York.
6. Collins, W.D., 1997: A global signature of enhanced shortwave absorption by clouds. Colorado State University, Nov. 20, 1997, Fort Collins, Colorado.
7. Collins, W.D., P.J. Rasch, and B.E. Eaton, 2000: Assimilation of atmospheric aerosol observations. University of Utrecht, Sep. 12, 2000, Utrecht, The Netherlands.
8. Collins, W.D., 2001: Modeling of aerosols with assimilation of satellite and surface aerosol observations. Geophysical Fluid Dynamics Laboratory, Princeton University, Apr. 5, 2001, Princeton, New Jersey.
9. Collins, W.D., 2002: Climate sensitivity to radiative effects of upper tropospheric water vapor. University of California, Los Angeles, May 8, 2002, Los Angeles, California.
10. Collins, W.D., 2002: Modeling aerosols with assimilation of observations. University of California, Los Angeles, May 10, 2002, Los Angeles, California.
11. Collins, W.D., 2002: Modeling aerosols with assimilation of observations. University of Miami, May 15, 2002, Miami, Florida.

12. Collins, W.D., 2002: Climate sensitivity to radiative effects of upper tropospheric water vapor. University of Miami, May 16, 2002, Miami, Florida.
13. Collins, W.D., 2002: Future prospects and challenges for global aerosol modeling. California Institute of Technology, Nov. 13, 2002, Pasadena, California.
14. Collins, W.D., 2002: Future prospects and challenges for global aerosol modeling. Stanford University, Nov. 19, 2002, Palo Alto, California.
15. Collins, W.D., 2003: Atmospheric response to natural and anthropogenic aerosols. Colorado State University, Mar. 27, 2003, Fort Collins, Colorado.
16. Collins W.D., A.J. Conley, and RTMIP coauthors, 2006: The range of climate forcing and response in global change projections: Problems and prospects for the next IPCC assessment. School of Earth and Environment, University of Leeds, Sep. 5, 2006, Leeds, UK.
17. Collins W.D., A.J. Conley, and RTMIP coauthors, 2006: The range of climate forcing and response in projections of global change: Problems and prospects for the next IPCC assessment. Sixth Atmospheric Sciences Symposium, Sep. 29, 2006, University of California, Berkeley, California.
18. Collins W.D., A.J. Conley, and RTMIP coauthors, 2006: Radiative Forcing by Greenhouse Gases and its Representation in Global Models. University of Wisconsin Department of Atmospheric and Oceanic Sciences, Nov. 6, 2006, Madison, Wisconsin.
19. Collins W.D., A.J. Conley, and RTMIP coauthors, 2006: Radiative Forcing by Greenhouse Gases and its Representation in Global Models. Oxford University Department of Physics, Nov. 13, 2006, Oxford, UK.
20. Collins W.D., A.J. Conley, and RTMIP coauthors, 2006: Radiative Forcing in Global Climate Models: Problems and Prospects. Harvard University, Nov. 16, 2006, Harvard, Massachusetts.
21. Collins, W.D., 2007: The roles of solar absorption in climate and climate change, Dept. of Earth and Planetary Science, University of California, Sep. 20, 2007, Berkeley, California.
22. Collins, W.D., 2007: The credibility of climate model predictions for future climate change, Dept. of Environmental Engineering, University of California, Sep. 28, 2007, Berkeley, California.
23. Collins, W.D., 2008: Constructive methods for climate forcing. Dept. of Mathematics, University of California, Feb. 6, 2008, Berkeley, California.
24. Collins, W.D., 2010: "On Climate Modeling." Physics Research Progress Meetings at LBNL, May 18, 2010, LBNL.

25. Collins, W.D., 2010: Computational Frontiers in Climate Change. Nov. 19, 2010, UC Berkeley Wireless Research Center, Berkeley, CA.
26. Feldman, D., W. Collins, C. Algieri, and J. Ong, 2011: Using Observing System Simulation Experiments to Guide the Next Generation of NASA Earth-Observing Satellite Instrumentation, April 19, 2011, College of Oceanic and Atmospheric Sciences, Oregon State University, Corvallis OR.
27. Collins, W.D., 2012. The Need for Scale Invariance in Climate Models. Math Department Seminar Series, 29 February, UC Berkeley, Berkeley, CA.
28. Collins, W.D., A. Thompson, J. Edmonds, T. Janetos, and P.E. Thornton, 2012: The Integrated Earth System Model (iESM): Development and Diagnostic Tests. Energy Modeling Forum, May 3, 2012, Stanford University, Stanford, CA.
29. Feldman, D.R., et al., 2012: Satellite Instrument Simulation for Mission Planning and Climate Model Evaluation, Physics Department Seminar Presentation, 7 November, Imperial College London,
30. O'Brien, T.A., L.C. Sloan, P.Y. Chuang, I.C. Faloona, and W.D. Collins, 2013: The Recent Decline of Coastal Fog and the Drying of the Coastal Boundary Layer. Oregon State University Physics of Oceans and Atmospheres Seminar Series, 29 January, Corvallis, Oregon.
31. Asay-Davis, X.S., M. Maltrud, S.F. Price, W. Lipscomb, D. Martin, S. Cornford, and W. Collins, 2013: Ice sheet-ocean interactions in the Community Earth System Model (CESM). CAOS Colloquium. Courant Institute for Mathematical Sciences, 23 October, New York University, New York, NY.
32. Feldman, D.R., W.D. Collins, S.C. Biraud, M.D. Risser, C.Kuo, J. Shortridge, D.D. Turner, P.J. Gero, S. Xie, E.J. Mlawer, M.J. Alvarado, T.R. Shippert, L.D. Riihimaki, D. Helmig, (2017) Measuring and Modeling the Radiative Forcing from Carbon Dioxide and Methane, Stanford, CA, 30 Jan. (Invited).
33. Feldman, D.R., Collins, W.D., C. Kuo, (2017) Measuring and Modeling the Radiative Forcing from Carbon Dioxide and Methane. Caltech GPS Seminar Series, Pasadena, CA, Jun. 20, 2017 (Invited).
34. Collins, W.D., D. Feldman, C. Kuo, and N. Nguyen, 2018: New Measurements and Modeling informed by Jovian Observations, Department of Geophysical Sciences, University of Chicago, April 13, 2018 (Invited).
35. Collins, W.D., D. Feldman, M. Mlynczak, and A. Jones, 2018: The Radiative Drivers of Climate Change: Known Knowns and Known Unknowns, University of California, Berkeley, ESPM Graduate Symposium, April 30, 2018. (Invited).

6.3.2 Colloquia

36. Collins, W.D., 1998: Statistics of Clouds. Conference on Statistics for Understanding the Atmosphere and Ocean, NCAR Geophysical Statistics Project, Jul. 18–24, 1998, Boulder, Colorado.
37. Collins, W.D., 1999: Unresolved issues in atmospheric solar absorption. Robert Cess Symposium, “Frontiers in the Science of Climate Modeling,” University of California, San Diego, Oct. 19–21, 1999, San Diego, California.
38. Collins, W.D., 2004: Climate models: Principles and applications. NCAR ASP Summer Colloquium, “Climate and Health,” Jul. 21–28, 2004, Boulder, Colorado.
39. Collins, W.D., 2006: An Introduction to CCSM. Art of Climate Modeling Advanced Study Program (ASP) workshop, Jun. 5, 2006, Boulder, Colorado.
40. Collins, W.D., 2006: An Introduction to Climate Modeling. Climate Change and Human Health Advanced Study Program (ASP) workshop, Jul. 17, 2006, Boulder, Colorado.
41. Collins, W.D., 2008: “What is a Climate Model? And what can it do?” Summer School on Climate, Mathematical Sciences Research Institute (MSRI), July 25, 2008, Berkeley, California.
42. Collins, W.D., 2009: “The Science of Climate Change.” Helios Solar Energy Research Center (SERC) Student Retreat, Aug. 10, 2009, Marconi Conference Center, Marshall, California.
43. Collins, W.D., 2011, Advancing Climate Science for a Sustainable Energy Future. Transatlantic Science Conference, 25–27 October 2011, David Brower Center, Berkeley, CA.
44. O’Brien, T.A., L.C. Sloan, P.Y. Chuang, I.C. Faloona, and W.D. Collins, 2012: Simulating the Recent Decline in Coastal Fog, Climate Change and California’s Water Supply conference, 15 May, University of California, Davis.
45. Collins, W.D., 2012, Understanding the interactions between Arctic ecosystems, microbial communities, and climate change: Prospects and Challenges, Peder Sather organizational meeting, October 24, University of California, Berkeley.
46. Collins, W.D., 2013: Water and climate – Projections of the IPCC AR5 Report. 2013. Philomathia Symposium on Water, Climate, and Society: Strategies in a Rapidly Changing World. 1 November, David Brower Center, Berkeley, California.
47. Feldman, D.R., W.D. Collins, X. Huang, X. Chen, V. Walden, 2015: The Potential for a Positive Feedback from Far-Infrared Surface Emissivity. February 10, Texas A&M University.
48. O’Brien, T. A., Collins, W. D., 2015: Analyzing and leveraging self-similarity in climate models, UC Davis Atmospheric Science Seminar, 8 April.

49. O'Brien, T. A., Collins, W. D., 2015: Analyzing and leveraging self-similarity in climate models, San Jose State University Climate and Meteorology Seminar, 28 April.
50. Collins, W.D., 2017: Going Down the Up Escalator of Climate Change, Cal Future Lab Forum, University of California, Berkeley, May 12, 2017.

6.3.3 Corporate or public meetings

51. Collins, W.D., 2005: Future climate change. Scripps Howard Institute on the Environment, May 19, 2005, Boulder, Colorado.
52. Collins, W.D., 2007: Our Changing World: A Scientific Assessment, St. Andrews Academy, March 29, 2007, Jackson, Mississippi.
53. Collins, W.D., 2007: Global warming: A scientific assessment of our changing world, ex-Ls luncheon, Aug. 16, 2007, Berkeley, California.
54. Collins, W.D., 2007: An overview of climate models: Applications to climate change, Chevron Fellows METamorphosis Conference, Oct. 17, 2007, League City, Texas.
55. Collins, W.D., 2007: Reducing our carbon footprint: Frontiers in climate forecasting, Berkeley Lab series Science at the Theater, Oct. 22, 2007, Berkeley Repertory Theatre, Berkeley, California.
56. Collins, W.D., 2008: Climate change: Past, present, and future, East Bay Municipal Utility District Headquarters, Feb. 27, 2007, Oakland, California.
57. Collins, W.D., 2008: Climate change: Past, present, and future, Association of California Water Agencies (ACWA) Region 5 Program Financial Impacts of Climate Change Apr. 7, 2008, San Francisco, California.
58. Collins, W.D., 2008: Reducing our carbon footprint: Frontiers in climate forecasting, St. Stephens Episcopal Church, Apr. 8, 2008, Orinda, California.
59. Collins, W.D., 2010: Advancing Climate Science for a Sustainable Energy Future. Berkeley International Symposium on Energy and Climate Science (Philomathia), Oct. 1, 2010, Berkeley Repertory Theater, Berkeley, CA.
60. Collins, W.D., 2011: The Dawn of the Anthropocene: A Grand Challenge for Science, Society, and Education. California Institute for Biodiversity, 24 September, Oakland, CA.
61. Collins, W.D., 2014: Water and Climate – Projections of the IPCC AR5 Report. Operation Sierra Storm TV-Meteorologist Conference, 8–11 January, South Lake Tahoe, CA.

6.3.4 Governmental organizations

62. Collins, W.D., 2000: Near-infrared/visible albedo ratio: Implications for climate. National Academy of Sciences Triana Review, Jan. 10, 2000, Washington, DC.
63. Collins, W.D., 2001: Aerosols, clouds, and the global environment: New techniques for modeling. National Science Foundation, May 11, 2001, Ballston, Maryland.
64. Collins, W.D., 2005: Simulations of global climate change commitment for the IPCC AR4. United Nations Framework Convention on Climate Change (UNFCCC) 22nd session of the subsidiary bodies, May 26, 2005, Bonn, Germany.
65. Collins, W.D., 2005: The Community Climate System Model. NRC Panel on Climate Variability and Change, Oct. 24–26, 2005, Washington, DC.
66. Collins, W.D., 2007: The Future Radiative Forcing of the Earth’s Climate System. DOE Scientific Discovery through Advanced Computing (SciDAC), Jun. 24–28, 2007, Boston, Massachusetts.
67. Collins, W.D., 2007: The future of California’s climate from a global perspective, Fourth CEC California Climate Change Conference, Sep. 11, 2007, Sacramento, California.
68. Collins, W.D., 2008: Radiation and clouds: Major challenges in forcings and feedbacks, Identifying Outstanding Grand Challenges in Climate Change Research: Guiding DOE’s Strategic Planning, Mar. 25–27, 2008, Arlington, Virginia.
69. Collins, W.D., 2008: Extreme climate change: Scaling laws and scale invariance, ASCR workshop on Mathematics for Analysis of Petascale Data (MAPD), Jun. 3–5, 2008, Rockville, Maryland.
70. Collins, W.D., 2008: “Current state of climate change modeling,” National Security and Climate Change Workshop, U.S. Climate Change Science Program Office, November 18, 2008, Washington, DC.
71. Collins, W.D., 2009: “Transformation of Climate Change Science: Challenges and Prospects.” DOE Climate Change Science Focus Group, July 27–28, 2009, Washington DC.
72. Collins, W.D., 2010: “Climate Change.” Visit of Environment Industry Study Group, Industrial College of the Armed Forces, National Defense University. April 7, 2010, LBNL.
73. Collins, W.D., 2010: “Abrupt climate change from methane hydrate destabilization.” Distinguished lecture series, NSF, May 10, 2010, Arlington, VA.
74. Collins, W.D., 2012: Action on Climate, Environment, and Society (ACES). Bay Area Joint Policy Committee workshop “Preparing the Bay Area for a Changing Climate,” 7 June, MTC/ABAG Metro Center, Oakland, CA.

75. Collins, W.D., 2014: Communicating Climate Science. DOE Office of Biological and Environmental Research (BER) Earth System Modeling (EaSM) Science Team Meeting, 27–29 January, USDA Conference and Training Center, Washington DC.
76. Collins, W.D., 2014: Projecting our Climate’s Future. DOE Office of Biological and Environmental Research (BER) Brownbag Seminar Series, 29 January, Germantown, MD.
77. Feldman, D.R., W.D. Collins, P.J. Gero, D.D. Turner, S. Biraud, E.J. Mlawer, M.S. Torn, 2015: Radiative Surface Forcing from CH₄ at the North Slope of Alaska and Southern Great Plains Sites, Atmospheric Systems Research (ASR) Annual Science Team Meeting, Vienna, Va, 16-19 Mar.

6.3.5 National/international research labs and centers

78. Collins, W.D., and V. Ramanathan, 1991: Thermodynamic regulation of ocean warming by cirrus clouds during the 1987 El Niño. NASA Langley Research Center, Apr. 26, 1991, Hampton, Virginia.
79. Collins, W.D., 1991: Analysis of satellite data for global climate studies. Los Alamos National Laboratory, Dec. 3, 1991, Los Alamos, New Mexico.
80. Collins, W.D., 1998: A global signature of enhanced shortwave absorption by clouds. Seventeenth CERES Science Team Meeting, NASA Langley Research Center, Apr. 21–23, 1998, Hampton, Virginia.
81. Collins, W.D., 1999: Effects of enhanced shortwave absorption on simulations of the tropical Pacific climate system. NASA Goddard Space Flight Center, May 25, 1999, Greenbelt, Maryland.
82. Collins, W.D., 2001: Aerosol assimilation in a GCM. Twenty-third CERES Science Team Meeting, NASA Langley Research Center, Jan. 23–25, 2001, Hampton, Virginia.
83. Collins, W.D., 2001: Modeling aerosols with assimilation of observations. NASA Goddard Space Flight Center, Nov. 28, 2001, Greenbelt, Maryland.
84. Collins, W.D., 2002: Water vapor, clouds, and the Earth radiant energy balance. Goddard Space Flight Center Graduate Student Summer Program, June 11, 2002, Greenbelt, Maryland.
85. Collins, W.D., 2004: The Community Climate System Model. U.S. GLOBEC SSC Meeting, Nov. 4–5, 2004, Boulder, Colorado.
86. Collins, W.D., 2006: Challenges and Prospects for Earth System Modeling. Lawrence Berkeley National Laboratory, Oct. 12, 2006, Berkeley, California.

87. Collins, W.D., 2007: Where do we go from here? Mathematical Science Research Institute Symposium on Climate Change: From Global Models to Local Action, Apr. 12–13, 2007, Berkeley, California.
88. Collins W.D., 2007: The computational frontiers of Earth system modeling. Town hall meeting, Department of Energy’s Simulation and Modeling at the Exascale for Energy, Ecological Sustainability, and Global Security (E3SGS), Apr. 17–18, 2007, Berkeley, California.
89. Collins, W.D., 2007: The Future of the Earth’s Climate: Frontiers in Forecasting. Lawrence Berkeley Laboratory Summer Lecture Series, July 11, 2007, Berkeley, California.
90. Collins, W.D., 2008: Earth system simulation for climate change: Challenges and prospects, NASA Ames Research Center GREEN Seminar, Apr. 17, 2007, Moffett Field, California.
91. Collins, W.D., A. Conley, D. Fillmore, and P. Rasch, 2009: “The role of solar absorption in climate and climate change,” Pacific Northwest National Laboratory, June 8, 2009, Richland, Washington.
92. Collins, W.D., 2009: “Radiative Processes.” Community Atmosphere Tutorial, July 29, 2009, NCAR, Boulder, Colorado.
93. Collins, W.D., D. Rosa, and Wei-Chun Hsieh, 2011: Chemical Transport in the Multi-scale Modeling Framework: Tests and Implications for Climate. Center for Multiscale Modeling of Atmospheric Processes Meeting, Jan. 11–13, 2011, UC Berkeley, Berkeley, CA.
94. Collins, W.D., D. Feldman, C. Algieri, J. Ong, Y. Roberts, and P. Pilewskie, 2011: The future evolution of the Earth’s reflected shortwave spectrum. May 4, 2011, Jet Propulsion Laboratory, Pasadena, CA.
95. Collins, W.D., 2011: Adding Integrated Assessments to the Community Earth System Model: Progress and prospects. Societal Dimensions of Earth System Modeling, May 25, 2011, NCAR, Boulder, CO.
96. Collins, W.D., 2011: A future with(out) climate mitigation. EPA-LBNL workshop on CO₂ Geological sequestration and water resources, June 1, Berkeley, CA.
97. Collins, W.D., etc. 2011: Quantifying Uncertainty in Climate and Integrated Assessments. CESM annual meeting, June 21–23, Breckenridge, Colorado.
98. Collins, W.D., 2011: Aerosol Particles: The Big Picture. International Cooperative in Aerosol Prediction Workshop on Aerosol Emission and Removal Processes and Satellite Data for Aerosol Prediction. ESA/ESRIN, Frascati, 14–17 May.
99. Collins, W.D., 2012: Cross-cutting Uncertainty Quantification Research towards Climate Science for a Sustainable Energy Future. First Annual CESM Uncertainty Quantification and Analysis Interest Group Meeting, 30–31 January 2012, National Center for Atmospheric Research, Boulder, CO.

100. Cameron-Smith, P.C.S., and W.D. Collins, 2012: Update on plans for global CESM methane simulations. Land Model Working Group meeting, 29 February 2012, National Center for Atmospheric Research, Boulder, CO.
101. Collins, W.D., 2012: Multiscale methods for enabling scale-aware capability in CESM. 17th Annual CESM Workshop, 18–12 June 2012, Breckenridge, CO.
102. Collins, W.D., 2012: Earth System Models and Uncertainty, IMAGE Topic of the Year (TOY) – Uncertainty in Climate Change Research: An Integrated Approach, August 13, NCAR, Boulder, Colorado.
103. O’Brien, T.A., L.C. Sloan, P.Y. Chuang, I.C. Faloona, and W.D. Collins, 2013: The Recent Decline of Coastal Fog and the Drying of the Coastal Boundary Layer. Pacific Northwest National Laboratory Climate Physics Seminar, 31 January, Richland, Washington.
104. O’Brien, T.A. W.D. Collins, F. Li, S.A. Rauscher, T.D. Ringler, M. Taylor, S.M. Hagos, and L.R. Leung, 2013: Observed Scaling in Clouds and Precipitation and Scale Incognizance in Regional to Global Atmospheric Models. Pacific Northwest National Laboratory Climate Physics Seminar, 1 February, Richland, Washington.
105. Feldman, D.R., et al., 2013: Developing Observational Constraints for Climate Models Using Hyperspectral Observing System Simulation Experiments, Lawrence Livermore National Laboratory Atmospheric Earth and Energy Division Atmospheric Seminar Series, Livermore, Calif., 26 February.
106. Feldman, D.R., et al., 2013: Using Hyperspectral Observing System Simulation Experiments to Identify Observational Constraints for Climate Models, Climate and Radiation Laboratory Seminar Series, NASA Goddard Space Flight Center, Greenbelt, MD, 19 April.
107. Collins, W.D., D.R. Feldman, C. Algieri, J. Ong, Y. Roberts, and P. Pilewskie, 2013: Early detection of critical climate feedbacks from hyperspectral observations, May 16, NASA GSFC, Greenbelt, MD.
108. Asay-Davis, X.S., M. Maltrud, S.F. Price, W. Lipscomb, D. Martin, S. Cornford, W. Collins 2013: Ice sheet-ocean interactions in the Community Earth System Model (CESM). British Antarctic Survey, 25 September, Cambridge, UK.
109. Prabhat, S. Byna, M.F. Wehner, E.W. Bethel, and W.D. Collins, 2013: Pattern Detection for Large Climate Datasets. RIST/JAMSTEC Conference, LBNL, Berkeley, CA.
110. Collins, W.D., 2014: Modeling the Changing Earth System: Prospects and Challenges. National Energy Research Supercomputing Center (NERSC) 2014 User Group, 40th Anniversary Workshop, 3–6 February, Berkeley, CA.
111. Collins, W.D., and D.R. Feldman, 2014: Trends in Climate Modeling. NASA Langley Research Center, 27–28 May, Hampton, VA.

112. Collins, W.D., D.R. Feldman, M.S. Torn, and J. Gero, 2014: Observational determination of climate forcing by carbon dioxide. Invited presentation, All-hands meeting of the Center for Gas Separation, Claremont Hotel, Berkeley, 4 December.
113. Feldman, D.R., W.D. Collins, S.C. Biraud, M.D. Risser, C.Kuo, J. Shortridge, D.D. Turner, P.J. Gero, S. Xie, E.J. Mlawer, M.J. Alvarado, T.R. Shippert, L.D. Riihimaki, D. Helmig, (2016) Measuring and Modeling the Radiative Forcing from Carbon Dioxide and Methane, Princeton, NJ, 26 Oct. (Invited).
114. Collins, W.D., D.R. Feldman, and C. Kuo, 2017: "Shortwave Methane Climate Forcing: Big Enough to Matter?", Geophysical Fluid Dynamics Laboratory (GFDL), Princeton, New Jersey, Mar. 1-3, 2017.
115. Collins, W.D., D. Feldman, M. Mlynczak, and A. Jones, 2018: The Radiative Drivers of Climate Change: Known Knowns and Known Unknowns, Stanford Linear Accelerator Center, Palo Alto, CA, April 4, 2018.
116. Langhans, W. , Mueller, J., and Collins, W.D.: Alternatives to the EDMF parameterization uncovered through parameter optimization, Naval Research Laboratory, Monterey, USA (invited), 2018.
117. Langhans, W. , Mueller, J., and Collins, W.D.: Alternatives to the EDMF parameterization uncovered through parameter optimization, California Institute of Technology, Pasadena, USA (invited), 2018.
118. Feldman, D.R., W.D. Collins, S. Freidenreich, P.J. Gero, D. Helmig, A. Jones, C. Kuo, E.J. Mlawer, N.H. Nguyen, D. Paynter, R. Pincus, M.D. Risser, M.S. Torn, D.D. Turner, and S. Xie, 2017: Using Observations and Comprehensive Calculations to Investigate Greenhouse Gas and Aerosol Radiative Forcing in Climate Models, Lawrence Livermore National Laboratory PCMDI Seminar, November 14, 2017 (Invited).
119. Feldman, D.R., W.D. Collins, S. Freidenreich, P.J. Gero, D. Helmig, A. Jones, C. Kuo, E.J. Mlawer, N.H. Nguyen, D. Paynter, R. Pincus, M.D. Risser, M.S. Torn, D.D. Turner, and S. Xie, 2018: Using Observations and Comprehensive Calculations to Investigate Greenhouse Gas and Aerosol Radiative Forcing in Climate Models, NASA Jet Propulsion Laboratory Climate Sciences Seminar, February 23, 2018 (Invited).

6.3.6 National/international society conferences

120. Collins, W.D., and P.J. Rasch, 2000: Assimilation of atmospheric aerosol observations. 2000 Spring Meeting, American Geophysical Union. *Eos. Trans. AGU*, **81** (no. 19), p. S98.
121. Collins, W.D., 2000: Sources of uncertainty in climate-change simulations from coupled climate models. 2000 Fall Meeting, American Geophysical Union. *Eos. Trans. AGU*, **81** (no. 48), p. F21.

122. Collins, W.D., 2003: Radiative balance of the Earth's atmosphere. AAAS Annual Meeting, Feb. 13–18, 2003, Denver, Colorado.
123. Collins, W.D., 2003: Effects of aerosols on regional and global climate. EGS-AGU-EUG General Assembly. *EGS Newsletter*, p. 526.
124. Collins W.D., A.J. Conley, D.W. Fillmore, and P.J. Rasch, 2004: Regional and global response of the climate to aerosol radiative forcing. International Radiation Symposium 2004, "Current Problems in Atmospheric Radiation," Aug. 23–28, 2004, Busan, South Korea.
125. Collins, W.D., W.M. Washington, and G.A. Meehl, 2004: Effects of aerosols on the climate and ecosystem of northern Eurasia: Results from global models. 2004 Fall Meeting, American Geophysical Union, *Eos Trans. AGU*, 85(47), Fall Meet. Suppl., abstract A24C-06.
126. Collins, W.D. V. Ramaswamy, Q. Fu, M.D. Schwarzkopf, and D.W. Fillmore, 2005: Radiative forcing by well-mixed greenhouse gases: Estimates from GCMs in the IPCC AR4. *Sixteenth Conference on Climate Variability and Change*, 85th Annual AMS Meeting, Jan. 10–13, 2005, San Diego, California (American Meteorological Society, Boston), abstract 6.4.
127. Collins, W.D., 2005: Prospects for an Earth system model to study global climate change. American Physical Society March Meeting, Mar. 21–25, 2005, Los Angeles, California.
128. Collins, W.D., 2005: Radiative Forcing by Well-Mixed Greenhouse Gases: Comparison of IPCC Models. International Association of Meteorology and Atmospheric Sciences (IAMAS) 2005 Conference, Aug. 8, 2005, Beijing, China.
129. Collins, W.D. and D.W. Fillmore, 2005: An aerosol analysis using NASA Aqua and Terra satellite observations. American Association for Aerosol Research (AAAR) 2005 annual conference, Oct. 17–21, 2005, Austin, Texas.
130. Collins, W.D., 2007: The role of climate benchmark records in climate-change attribution and projection, 2007 Fall Meeting, American Geophysical Union, *Eos Trans. AGU*, 88(52), Fall Meet. Suppl., abstract A54D-02.
131. Collins, W.D., 2007: The role of climate benchmark records in climate-change attribution and projection, 2007 Fall Meeting, American Geophysical Union, *Eos Trans. AGU*, 88(52), Fall Meet. Suppl., abstract A54D-02.
132. Collins, W.D., 2008: Scaling laws, scale invariance, and climate prediction, talk 1035-60-1976, SIAM Minisymposium, Joint Mathematics Meeting, Jan. 7, 2008, San Diego, California.
133. Collins, W.D., 2008: Computational Challenges for Dynamic Earth System Models, Symposium 180-071: Transforming Our Ability To Predict Climate Change and Its Effects, American Association for the Advancement of Science Annual Meeting, Feb. 16, 2008, Boston, Massachusetts.

134. Collins, W.D., V. Ramaswamy, A. Conley, and M. Iacono, 2008: “The significance of short-wave methane forcing for climate change,” Session GC13, “Regional-Scale Forcing of Climate,” *Eos Trans. AGU*, 89(53), Fall Meet. Suppl., Abstract GC23A-0740.
135. Mlynczak, M.G., D.F. Young, B.A. Wielicki, Y. Huang, S.S. Leroy, D. Feldman, and W. Collins, 2010: Evaluating Climate Models with CLARREO. Abstract A12B-01, 2010 Fall AGU Meeting, San Francisco, CA.
136. Collins, W., 2011: Uncertainty across the CMIP5 ensemble of climate projections: Connecting cause and effect, Abstract GC13D-01, presented at 2011 Fall Meeting, AGU, San Francisco, CA, 5–9 Dec.
137. Thornton, P.E., J. Mao, X. Shi, J. Edmonds, W. Collins, G.C. Hurtt, L.P. Chini, A.M. Thomson, and A.C. Janetos, 2011: Influence of prognostic land use on 21st century climate prediction, Abstract GC22C-02, presented at 2011 Fall Meeting, AGU, San Francisco, CA, 5–9 Dec.
138. Collins, W., M. Anitescu, D.C. Bader, B. Debusschere, J. Gattiker, P. Hovland, G. Johannesson, G. Lin, D. Lucas, H. Najm, Y. Qian, and L. Swiler, 2012: The Role of Uncertainty Quantification in Climate Science for a Sustainable Energy Future, Abstract GC32A-01, presented at 2012 Fall Meeting, AGU, San Francisco, CA.
139. Collins, W., J.A. Edmonds, P.E. Thornton, A. Craig, G.C. Hurtt, A.C. Janetos, A. Jones, C.D. Koven, W.J. Riley, and J. Truesdale, 2012: Prospects for projecting the impact of Earth system processes on Integrated Assessment, Abstract A54A-08, presented at 2012 Fall Meeting, AGU, San Francisco, CA.
140. Prabhat, M., M.F. Wehner, S. Byna, O. Ruebel, F. Li, W. Bethel, and W. Collins, 2012: 13TB, 80,000 cores and TECA: The search for extreme events in climate datasets, Abstract IN52A-02, presented at 2012 Fall Meeting, AGU, San Francisco, CA.
141. Thomson, A.M. J.A. Edmonds, W. Collins, P.E. Thornton, G.C. Hurtt, A.C. Janetos, A. Jones, J. Mao, L.P. Chini, K.V. Calvin, B.P. Bond Lamberty, and X. Shi, 2012: Advancing coupled human-Earth system models: The integrated Earth System Model Project, Abstract GC11D-1033, presented at 2012 Fall Meeting, AGU, San Francisco, CA.
142. Collins, W.D., 2012: Computing and climate: The Road Ahead. DOE Computing Townhall, Session TH38, AGU Fall 2012 Meeting, San Francisco, CA.
143. Collins, W.D., 2013: The integrated Earth System Model: A Next Generation Tool for Exploring Energy-Climate Interactions. DOE IA Townhall, 93rd AMS Annual Meeting, 6–10 January, Austin, Texas.
144. Collins, W.D., 2013: Multi-scale Behaviors of the Water Cycle, DOE Water Workshop Townhall, 93rd AMS Annual Meeting, 6–10 January, Austin, Texas.

145. Collins, W.D., 2013: Climate modeling from first principles: Feasibility and prospects. APS March Meeting, Abstract N4.00005, 20 March, Baltimore, Maryland.
146. Benedict, J.J., W. Collins, and H. Johansen, 2013: Organized Tropical Convection in a High-Order Finite-Volume GCM Dynamical Framework with Adaptive Mesh Refinement, Abstract A33B-0217 presented at 2013 Fall Meeting, AGU, San Francisco, CA, 9–13 December.
147. Collins, W., H. Johansen, P. McCorquodale, P. Colella, and P.A. Ullrich, 2013: Nonhydrostatic adaptive mesh dynamics for multiscale climate models, Abstract A31H-03 presented at 2013 Fall Meeting, AGU, San Francisco, CA, 9–13 December.
148. Collins, W., K. Chowdhary, B. Debusschere, and D. Lucas, 2013: The Central Role of Uncertainty Quantification in Multiscale Earth System Models, Abstract GC34C-02 presented at 2013 Fall Meeting, AGU, San Francisco, CA, 9–13 December.
149. O’Brien, T. A., W.D. Collins, M.F. Wehner, D.A. Stone, S.A. Rauscher, 2014: Calibrated and Systematic Characterization Attribution and Detection of Extremes: A Focus on Central America (invited). First Workshop on Climate Change, Variability and Modeling over Central America and Mexico. Ensenada, Mexico, November.
150. Collins, W., D. A Harder Rain is Going to Fall, 2014: Challenges for Actionable Projections of Extremes, Abstract GC32A-06 presented at the 2014 Fall Meeting, AGU, San Francisco, CA, 15-19 December.
151. Collins, W.D., 2015: Progress Towards Projecting Climate Change at Storm Scales. Invited talk, Session on "Imaging Earth," 181st AAAS Meeting, San Jose, 12-16 February.
152. Asay-Davis, X., D. Martin, S. Cornford, S. Price, and W.D., Collins, 2015: Coupled ice sheet-ocean simulations with the POPSICLES model. Invited talk, abstract IUGG-2864, Session C06 Ice Sheet and Ocean Interactions on Multiple Scales, 26th International Union of Geodesy and Geophysics (IUGG), Prague, Czech Republic, 22 June – 2 July.
153. Collins, W.D., D. Feldman, J. Gero, M. Torn, E. Mlawer, T. Shippert, 2015: Observational Determination of Surface Radiative Forcing by the Major Anthropogenic Greenhouse Gases. Invited talk, abstract IUGG-1830, Session M16 Radiation in the Climate System, 26th International Union of Geodesy and Geophysics (IUGG), Prague, Czech Republic, 22 June – 2 July.
154. O’Brien, T.A., W.D. Collins, S. Rauscher, K. Kashinath, O. Rübel, S. Byna, J. Gu, H. Krishnan, and P.A. Ullrich, 2016: Understanding the resolution dependence of precipitation statistical fidelity in hindcast simulations. Invited Abstract A14D-03, presented at 2016 Fall Meeting, AGU, San Francisco, Calif., 12-16 Dec.
155. O’Brien, T.A., W.D. Collins, S. Rauscher, K. Kashinath, O. Rubel, S. Byna, J. Gu, H. Krishnan, P.A. Ullrich, and L. Donner, 2016: A case for missing cloud physics in climate

- models. Invited Abstract A31M-01, presented at 2016 Fall Meeting, AGU, San Francisco, Calif., 12-16 Dec.
156. Prabhat, Mr., Y. Liu, E. Racah, K. Kunkel, D.A. Lavers, M.F. Wehner, and W.D. Collins, 2016: Classification and Localization of Extreme Weather Patterns with Deep Learning. Invited Abstract IN14A-01, presented at 2016 Fall Meeting, AGU, San Francisco, Calif., 12-16 Dec.
 157. Collins, W.D., D.R. Feldman, and C. Kuo, 2017: First Global Estimates of Anthropogenic Shortwave Forcing by Methane, European Geophysical Union Congress, Vienna, Austria, Invited abstract EGU2017-3948, Session CL2.04, Apr. 23-27, 2017.
 158. Wielicki, B.A., and the CLARREO Science Definition Team, 2016: CLARREO Pathfinder Mission to ISS: Demonstrating Greatly Increased Accuracy for Reflected Solar Space Based Observations: Calibration and Intercalibration. Invited Abstract, presented at 2016 Fall Meeting, AGU, San Francisco, Calif., 12-16 Dec.
 159. Collins, W.D., M. Wehner, Prabhat, T. Kurth, N. Satish, I. Mitliagkas, J. Zhang, E. Racah, M. Patwary, N. Sundaram, and P. Dubey, 2017: Deep Learning @ 15 Petaflops/second: Semi-supervised pattern detection for 15 Terabytes of climate data. Abstract NG42A-02, Fall 2017 Meeting of the American Geophysical Union, New Orleans, LA, Dec. 11-15, 2017.
 160. Collins, W.D., W. Collins, J. Baird, K. Kashinash, K. Kunke, Y. Liu, T. OBrien, C. Pal, Prabhat, E. Racah, and M. Wehner, 2018: Deep Learning for Detecting Extreme Weather and Climate Patterns. Abstract TJ17.1, American Meteorological 97th Annual Meeting, Seattle, WA, Jan. 22-26, 2018.
 161. Prabhat, E. Racah, J. Biard, Y. Liu, M. Mudigonda, K. Kashinath, C. Beckham, T. Maharaj, S. Kahou, C. Pal, T.A. O'Brien, M.F. Wehner, K. Kunkel, and W.D. Collins, IN11A-0022: Deep Learning for Extreme Weather Detection (Invited), AGU Fall Meeting, New Orleans, LA, December, 2017.
 162. Prabhat, J. Biard, S. Ganguly, S. Ames, K. Kashinath, S.K. Kim, S. Kahou, T. Maharaj, C. Beckham, T.A. O'Brien, M.F. Wehner, D.N. Williams, K. Kunkel, and W.D. Collins, IN13E-01: ClimateNet: A Machine Learning dataset for Climate Science Research (Invited), AGU Fall Meeting, New Orleans, LA, December, 2017.
 163. Mlynczak, M., T. Daniels, D. Kratz, D. Feldman, W. Collins, E. Mlawer, M. Alvarado, J. Lawler, L.W. Anderson, D. Fahey, L. Hunt, and J. Mast, 2018: The Spectroscopic Foundation of Radiative Forcing by Carbon Dioxide, Abstract F16.00001, March American Physical Society Meeting, Los Angeles, CA, March 5-9, 2018.
 164. Johansen, H. W. Collins, J. Ferguson, and C. Jablonowski, 2017: Implications of 3D refinement in non-hydrostatic atmospheric flows, in session MS11a - Emerging methods for scalable atmosphere and ocean modelling, SciCADE 2017, International Conference on Scientific Computation and Differential Equations 2017, Bath, UK, September 11-15, 2017.

6.3.7 National/international workshops

165. Collins, W.D., 1993: Satellite data for diagnostics and for validation of model simulations. *Proceedings of the EUCREX/NOCLIMP Workshop, 24–26 May, 1993* (Department of Meteorology Report, Stockholm University), pp. 19–28.
166. Collins, W.D., 1998: Effects of enhanced shortwave absorption on simulations of the tropical Pacific ocean/atmosphere system. *GCSS-WGNE Workshop on Cloud Processes and Cloud Feedbacks in Large-Scale Models* (World Climate Research Program, Geneva), WCRP-110, WMO/TD-No. 993, Nov. 9–13, 1998, ECMWF, Reading, England.
167. Collins, W.D., 2003: Aerosols: What are the links with climate and how well are we modeling them? *NCAR Chemistry-Climate Interactions Workshop*, Feb. 10–12, 2003, Sante Fe, New Mexico.
168. Collins, W.D., 2003: Understanding the role of aerosols in climate through synthesis of models and observations. *Gordon Conference on Solar Radiation and Climate*, Colby-Sawyer College, Jul. 13–18, 2003, New London, Connecticut.
169. Collins, W.D., 2003: The Community Climate System Model. Keynote address, *Computing in the Atmospheric Sciences Workshop 2003 (CAS2K3)*, Sep. 8, 2003, Annecy, France.
170. Collins, W.D., V. Ramaswamy, Q. Fu, M.D. Schwarzkopf, Y. Sun, R. Portmann, and D.W. Fillmore, 2005: Radiative forcing by well-mixed greenhouse gases: Estimates from GCMs in the IPCC AR4. *Atmospheric Radiation Measurement Meeting*, Mar. 15–16, 2005, Daytona Beach, Florida.
171. Collins, W.D., 2005: Issues of upscaling and downscaling research – A GCM perspective. *WRF-RCM Workshop*, Mar. 22–23, 2005, Boulder, Colorado.
172. Collins, W.D., 2005: Status of CCSM. *Computing in the Atmospheric Sciences Workshop 2005 (CAS2K5)*, Sep. 11–14, 2005, Annecy, France.
173. Bader, D.C., J. Hack, D. Randall, and W. Collins, 2005: Climate simulation for climate change studies. *Workshop on Frontiers of Extreme Computing*, Oct. 17, 2005, Santa Cruz, California.
174. Collins, W.D., 2006: Regional effects of aerosol emissions. *Conference on Climate Change and Urban Areas*. Apr. 3–4, 2006, University College London, London, United Kingdom.
175. Collins, W., and J. Wolfe, 2006: The Community Climate System Model CCSM3. *Geoscience Application Requirements for Petascale Architectures (GARPA) workshop*, Jun. 1–2, 2006, Arlington, Virginia.
176. Collins, W.D., 2006: Modeling the Changing Earth System: Prospects and Challenges. *IBM System Scientific Computing User Group meeting SCICOMP-12*, Jul. 17, 2006, Boulder, Colorado.

177. Collins W.D., A.J. Conley, and RTMIP coauthors, 2006: Radiative Forcing by Greenhouse Gases and its Representation in Global Models. 2006 Solar Radiation and Climate Experiment (SORCE) Science Meeting, Sep. 20–22, 2006, Eastsound, Washington.
178. Collins, W.D., 2007: Radiation errors in climate models. 3rd WGNE Workshop on Systematic Errors in Climate and NWP Models, Feb. 12–16, 2007, San Francisco, California.
179. Collins, W.D., 2007: CLARREO: A climate model prediction perspective, University of Maryland, Jul. 16, 2007, College Park, Maryland.
180. Collins, W.D., 2008: Collaboration in climate research: The age of assessments, Berkeley Conference on Climate Research Management, Apr. 24, 2008, Berkeley, California
181. Collins, W.D., 2008: “What is a climate model? And what can it do?” Amphibia Tree (ATree) Species Distribution Modeling Workshop, University of California, Berkeley, December 5, 2008, Berkeley, California.
182. Collins, W.D., 2008: Computational challenges for dynamic Earth system models, The International Supercomputing Conference, Jun. 18, 2008, Dresden, Germany.
183. Collins, W.D., 2008: “Abrupt and Extreme Climate Change: Implications for Water,” XVII International Conference on Computational Methods in Water Resources (CMWR 2008), July 6–10, 2008, San Francisco, California.
184. Collins, W.D., V. Ramaswamy, A. Conley, and M. Iacono, 2009: “The significance of short-wave methane forcing for climate change,” Joint IPCC-WCRP-IGBP Workshop: New Science Directions and Activities Relevant to the IPCC AR5, March 4, 2009, University of Hawaii, Honolulu, Hawaii.
185. Collins, W.D., and D. Bader, 2009: “Exascale applications in climate science,” 2009 U.S. / Japan Climate Change and Sustainability Workshop, March 17, 2009, Oak Ridge, Tennessee.
186. Collins, W.D., 2010: “Abrupt Climate Change from Methane Hydrate Destabilization,” Current Challenges in Computing 2010: Climate Modeling, Aug. 31, 2010, The Meritage Resort and Spa, Napa California.
187. Feldman, D., W. Collins, C. Algieri, J. Ong, Y. Roberts, and P. Pilewskie, 2011: MODTRAN 5.3 Simulations of Changes in Shortwave and Longwave Spectra from Climate Change in the 21st Century, June 14, 2011, 33rd Review of Atmospheric Transmission Models Meeting, National Heritage Museum, Lexington, MA.
188. Collins, W., J. Edmonds, A. Janetos, A. Jones, A. Thompson, and P. Thornton, 2012: Land use, water, and carbon in the integrated Earth System Model (iESM). Energy Modeling Forum, 23 July, Snow Mass, Colorado.
189. Collins, W., 2012: Aerosol Particles: The Big Picture. Energy Modeling Forum, 23 July, Snow Mass, Colorado.

190. Collins, W.D., 2012: Opportunities for Simulating Cloud-Aerosol-Radiation Interactions in the Era of Cloud-system-scale Modeling, Global Atmospheric System Studies (GASS) Meeting, 13 September, NCAR, Boulder, Colorado.
191. O'Brien, T.A., W.D. Collins, L.C. Sloan, P.Y. Chuang, and I.C. Faloon, 2012: Sea Surface Temperatures Drive Fog Variability but not the Long-term Trend. 59th Annual Eastern Pacific Ocean Conference – EPOC 2012, 19–22 September, Timberline Lodge, Mt. Hood, Oregon.
192. Gauss, M., W.D. Collins, and V. Aurora, 2012: The current state of methane modeling, AMAP Meeting September 28, Washington DC.
193. Collins, W.D., 2012: Linking IAMs to Earth System Models: Lessons from Historical Aerosols in CMIP5, Integrated Assessment Modeling Consortium (IAMC) meeting, November, Utrecht, the Netherlands.
194. Collins, W.D., 2013: “Long-Term (Decadal and Beyond) Climate Simulation and Projection,” CIMMS 2nd US-China Symposium on Meteorology, Qingdao, 25–27 June.
195. Collins, W.D., J. Edmonds, G. Hurtt, and the iESM Team, 2013: Interactions of IAMs, ESMs, and EMICs. Aspen Global Change Institute, 8–13 August, Aspen, CO.
196. Asay-Davis, X.S., M. Maltrud, S.F. Price, W. Lipscomb, D. Martin, S. Cornford, and W. Collins, 2013: Ice sheet-ocean interactions in the Community Earth System Model (CESM). In Ice sheet-Climate Coupling Workshop, Reading, UK, October 1, 2013.
197. Collins, W.D., J. Edmonds, P.E. Thornton, A. Thompson, and the iESM Team, 2013: The integrated Earth System Model (iESM). Fourth Annual Global Change Assessment Model (GCAM) Community Modeling Meeting, 2–4 October, College Park, MD.
198. Collins, W., P. Caldwell, B. Debusschere, S. Ghan, D. Lucas, L. Oliker, T. Ringler, and C. Woodward, 2013: Multiscale methods for enabling scale-aware capability in Earth System Models. Institute for High-Performance Computational Science with Structured Meshes and Particles (HPCS-SMP) Workshop, 14–16 October, University of Berkeley, Berkeley, CA.
199. Collins, W.D., 2014: Aerosol and radiation: CMIP6 model evaluation needs. Observations for Climate Model Intercomparisons (OBS4MIPs) workshop, 29 April to 1 May, NASA Headquarters, Washington DC.
200. O'Brien, T.A., and W.D. Collins, 2014: Frontiers in climate modeling at the watershed scale. Invited presentation, 13th IWA Special Conference on Watershed and River Basin Management, San Francisco, 9-12 September.
201. Collins, W.D., J. Edmonds, P. Thornton, G. Hurtt, and the iESM Team, 2014: The integrated Earth System Model (iESM). Invited presentation, Combined JGCRI Integrated Assessment Technical Workshop and GCAM Community Modeling Meeting, College Park, Maryland, 20-23 October.

202. Asay-Davis, X., D.F. Martin, S.F. Price, M.E. Maltrud, and W.D. Collins, 2014: Circum-Antarctic Simulations using the POPSICLES Ice Sheet-Ocean Model. Invited presentation, Workshop on Rising Coastal Seas on a Warming Earth, New York University Abu Dhabi, United Arab Emirates, 27-29 October.
203. Collins, W.D., P. McCorquodale, P. Colella, P. Ullrich, J. Ferguson, and C. Jablonowski, 2014: Advances in Climate Modeling at Extreme Scales. Invited presentation, International Workshop on Co-Design. Guangzhou, China, 6-8 November.
204. Collins, W.D., K. Evans, H. Johansen, C. Woodward, and P. Caldwell, 2015: Progress in Fast, Accurate Multi-scale Climate Simulations. Abstract 141, Keynote Presentation, Session on Numerical and computational developments to advance multi-scale Earth System Models (MSESM), International Conference on Computational Science, Reykjavik University, Reykjavik, Iceland, 1-3 June.
205. Collins, W.D., 2016: Climate Simulation at Impactful Scales: Charge for a New Physics Paradigm, AXICCS Conference, Rockville, MD. , Sept. 11-13, 2016.
206. Collins, W.D., K. Calvin, A.D. Jones, J. Edmonds, and the iESM Team, 2016: Coupling for ESM: The integrated Earth System Model (iESM), Energy Modeling Forum, Snowmass XXII Energy Modeling Forum Workshop, Snowmass, CO., July. 24-29, 2016.
207. Feldman, D.R., W.D. Collins, Y. Shea, N. Nguyen, X. Liu, B. Wielicki, (2016) Observing Climate Change With Both Shortwave and Longwave Hyperspectral Satellite Instrumentation, HISE Meeting, Leipzig, Germany, 14 Nov. (Invited).

AWARDS:**7 Academic Recognition**

- Contributor (lead author) for the Fourth Assessment Report by the Intergovernmental Panel on Climate Change, co-recipient of the 2007 Nobel Peace Prize.
- NASA Group Achievement Award to the CLARREO Mission Concept Team, 2012.
- Lawrence Award for best Earth science paper at NASA Langley for CLARREO mission paper in the Bulletin of the American Meteorological Society (BAMS), 2014.
- U.S. Department of Energy Secretary's Achievement Award, for launch of the ACME Project, awarded on May 7, 2015.
- NASA Langley Reid Award for best scientific or technical paper, 2015.
- Fellow of the American Association for the Advancement of Science (AAAS), 2015 – present.
- Fellow of the American Physical Society, 2017 – present.
- James and Katherine Lau Chair in Sustainability, University of California, Berkeley, 2018 – present

PROFESSIONAL ACTIVITIES, TEACHING, AND SERVICE:**8 Service Activities (last 10 years)****8.1 National and international assessment activities**

- Lead and collaborating author, IPCC Working Group I Fourth Assessment Report, 2004–2007.
- Expert reviewer, IPCC Working Group I Fourth Assessment Report, 2005–2006.
- Lead author, IPCC Working Group I Fifth Assessment Report, 2010–2013.
- Lead participant, discussion of IPCC Radiative Forcing Model Intercomparison Project (RFMIP), Max Planck Institute for Meteorology, Hamburg, Germany, September 3-5, 2014.
- Champion for IPCC WG1 Chapter 7 on Energy Budget, Radiative Forcing, and Climate Sensitivity for AR6 at request of WG1 Bureau.
- Participation in RFMIP contributing to the IPCC Coupled Model Intercomparison Project CMIP6.
- Development of partnership with the Aerosol Chemistry Model Intercomparison Project (AeroChemMIP) for CMIP6 at the Fall AEROCOM STM, Steamboat Springs, Colorado, October 2, 2014.

- Participation, IPCC 6th Assessment Scoping Meeting, UN ECA, Addis Ababa, Ethiopia, Apr. 28 – May 6, 2017.
- Coordinating Lead Author (CLA) for Chapter 6 on Short Lived Climate Forcers for the IPCC AR6 WGI report, 2018–2020.
- Presentation on "Chapter 6 of AR6 WGI: Intention at the scoping meeting and the outline," IPCC Expert Meeting on Short-Lived Climate Forcers, World Meteorological Organization, Geneva, Switzerland, May 28-31, 2018.
- Presentation on "Aerosol and radiation: CMIP6 model evaluation needs", IPCC Tri-MIP-Athlon, University of Reading, Reading, UK, June 11-15, 2018.
- Participation, First Lead Author Meeting, Working Group I of the 6th Assessment Report of the Intergovernmental Panel on Climate Change, Guangzhou, China, June 25-29, 2018.

8.2 Institutional advisory/committee activities

- Chair, NCAR CCSM Scientific Steering Committee, 2003 – 2005.
- Member, NCAR's Computational and Information Systems Laboratory Advisory Panel, 2005 – 2011.
- Member, CCSM Scientific Steering Committee, 2006 – 2013.
- Member, Search committee for NCAR Atmospheric Chemistry Division Director, 2006 – 2007.
- Member, Selection committee, NCAR Advanced Study Program Early Career Scientists, 2006 – 2007.
- Alternate Chancellor's faculty seat, Chancellor's Advisory Committee on Sustainability, 2008 – 2009.
- Member, NCAR Earth Observing Laboratory (EOL) Advisory Panel, 2009 – 2010.
- Member, Steering Committee, LBNL Carbon Cycle 2.0 Initiative, 2009 – 2013.
- Affiliated member, UC Berkeley Energy and Resources Group, 2009 – present.
- Member, LBNL Earth Sciences Division Council, LBNL, 2007 – present.
- Chair, UCB/LBNL search for joint climate faculty/scientist, 2010 – 2011.
- Member, LBNL search for Computational Research Division director, 2010 – 2011.
- Member, UCB VCR's search committee for BIE director, 2011 – 2012.
- Member, LBNL Earth Science Division Staff Committee, 2011 – present.
- LBNL Chair, UCD / LBNL faculty search committee, 2012 – present.
- Member, LBNL Earth Science Division Director Search Committee, 2012 – 2013.
- Member, Advisory Board, Peder Sather Center (UCB), 2012 – present.
- Member, Berkeley Global Change Biology (BiGCB) steering committee, 2012 – present.

- Briefing to UC Regents on UC DOE Lab Climate Research, Sacramento, May 15, 2013.
- Briefing to UC President Napolitano re LBNL climate research on 15 October 2013.
- Member, APS Panel On Public Affairs, 1st of 3 annual meetings, National Press Club, Washington, DC. Feb. 2-3, 2017.
- Member. APS Panel On Public Affairs, 2nd of 3 annual meetings, National Press Club, Washington, DC. Jun. 1-2, 2017.
- ACME Lab Management Advisory Committee, Bolger Center, Washington Grove, MD., Jun. 4-6, 2017.
- Member, Center for Robust Decisionmaking on Climate and Energy Policy (RDCEP) External Advisory Group, University of Chicago, Chicago, Illinois, Jan. 17-18, 2017.
- Member, US CLIVAR Process Study and Model Improvement (PSMI) panel, four-year term, 2017 - 2020.
- Chair, LBNL search committee for new Laboratory Director for Strategic Communications, 2017.
- Member, LBNL Diversity, Equity, and Inclusion Senior Leadership Council, 2017 - present
- Member, APS Panel on Public Affairs meeting, 3rd of 3 annual meetings, National Press Club, Washington, DC, Oct. 6, 2017.
- Member, APS Panel on Public Affairs meeting, 1st of 3 annual meetings, National Press Club, Washington, DC, Feb. 9, 2018.

8.3 External advisory/committee activities

- Contributing author, NASA Conference on Uncrewed Aerospace Vehicles, 1996.
- Panelist, NSF Globe Proposal Review Panel, 1998.
- Member, AMS Committee on Atmospheric Radiation, 1999 – 2006.
- Chair, AMS Committee on Atmospheric Radiation, 2002 – 2006.
- Panelist, United Nations Environmental Program panel on the Asian Brown Cloud, 2001.
- Panelist, NASA ESSP-3 Lidar Algorithms Peer Review, 2001.
- Chair, NASA Radiation and Climate Peer Review, 2002.
- Panelist, National Academy Climate Sensitivity Workshop, 2003.
- Invited participant, Joint WGCM CFMIP/IPCC expert meeting on Climate Sensitivity and Feedbacks, 2004.
- Member, NASA Earth-Sun System Subcommittee, 2005.
- Member, Joint ASCAC-BERAC subcommittee, Computational and Informational Technology Rate Limiters to Climate Change Science, 2007.
- Panelist, Review of NOAA's Climate Research and Modeling Program for NOAA Climate Working Group of the NOAA Scientific Advisory Board, 2008.

- Member at Large, AAAS Atmospheric Sciences Section, 2009 – 2010.
- Reviewer, U.S. Climate Change Science Program, 2009.
- Chair, NASA Goddard Global Modeling and Assimilation Office Review, 2009.
- Member, LANL Energy Security External Advisory Board, 2009 – 2011.
- Member, UK Met Office / Hadley Centre Science Review Group, 2009 – 2012.
- Member, PNNL Fundamental and Computational Sciences Board, 2009 – 2011.
- Invited participant, BERAC 20-year Climate Vision Workshop, 2010.
- Invited participant, BER Climate Research Roadmap Workshop, 2010.
- Panelist and reviewer, DOE Regional Modeling Climate Panel review, 2010.
- Steering Group, National Climate Assessment Modeling and Scaling Workshop, 2010.
- Member, ASCR Panel, ORNL Leadership Computing Facility (OLCF-3) Titan Application Readiness Review, 2010.
- Chair, DOE ASCR INCITE allocation panel for climate applications, 2010.
- Participant, NRC Workshop on Climate Modeling, 2011.
- Launch and co-chairmanship of Societal Dimensions Working Group, CESM Project.
- Advisory Board of the Center for Climate Sciences at JPL, 2012 – present.
- Invited participant and panelist, DOE Financial services workshop, AAAS, Washington DC, June 3–4, 2013.
- Member, Committee of Visitors for DOE’s Climate and Environmental Sciences Division, July 8–10, 2013.
- Invited member, Aspen Global Change Institute workshop on CMIP6 and IPCC AR6, 4–9 August 2013.
- Invited participant, Arctic Monitoring and Assessment Program, 2013 – 2014.
- Invited speaker and participant, APS special meeting on the APS statement on climate change, New York University, New York, New York, 8 January 2014.
- LBNL lead for development of DOE Big Idea’s whitepaper on climate, and participant in the DOE Big Ideas Summit, 30–31 January 2014, Crystal City, VA.
- Invited participant, breakout lead, and whitepaper author for DOE’s Water-Energy Tech Team (WETT) workshop, 5–6 May 2014, Washington, DC.
- Invited participant and speaker, workshop on ACME-Energy and BER’s research in human dimensions of climate change, Washington DC, October 28-30, 2015.
- Invited participant and speaker, BERAC meeting on urban Integrated Field Laboratories, Germantown, January 29-30, 2015.
- Invited participant, ASCR-BER summit on computing for climate, Germantown, January 23, 2015.

- Invited participant, US Global Change Research Group's (USGCRP's) Interagency Group on Integrative Modeling (IGIM) Climate Forum on US participation in CMIP6, NCEP, College Park, Maryland, February 11, 2015.
- Lead author role for report from the USGCRP IGIM Climate Forum, Spring, 2015.
- Steering Committee, Air Miners, Scripps Institution of Oceanography, Feb. 22, 2018.
- Invited member, Biological and Environmental Advisory Committee (BERAC) Subcommittee on User Research Facilities Working Meeting, Gaithersburg, MD, April 23-24, 2018.

8.4 Service to state and local agencies

- Testimony to California Assembly Budget Subcommittee on water crisis, Sacramento, April 7, 2015.
- Testimony to information hearing of the California Senate Environmental Quality Committee on the future of California's water supply, Oakland City Hall, May 29, 2015.
- Meeting with Governor Brown and Executive Secretary Christiana Figueres of the UN-FCCC (UN Framework Convention on Climate Change) regarding California's efforts in support of the 21st session of the Conference of the Parties (COP) starting November 30 in Paris, Natural History Museum of Los Angeles, June 15, 2015.
- Talk on climate modeling developments to California State Senator Stern, Lawrence Livermore National Laboratory, Sept. 28, 2017.
- Presentation on "Advances in Climate Modeling" to staffers from the California State Assembly, Building 90, Nov. 6, 2017.
- Invited Participant, California Collaborative for Climate Change Solutions (C4S), Sacramento, CA, April 4, 2018.
- Talk on climate modeling developments to California State Senator Stern, Building 59, Sep. 28, 2017.
- Presentation on "Advances in Climate Modeling" to staffers from the California State Assembly, Building 90, Nov. 6, 2017.
- Presentation on "Advances in Climate Modeling" to members of San Francisco British Embassy, Building 59, Nov. 7, 2017.

8.5 Editorial service

- Editor, *Journal of Climate*, 2007 – 2008.
- Associate Editor, *Reviews of Modern Physics*, 2017 – present.

8.6 Professional meeting organizer

- Organizer, ASP Summer Colloquium, "Interactions between Aerosols, Climate, and the Hydrological Cycle," Jul 2002, Boulder, Colorado.

- Co-chair, Aspen Global Change Institute, “Aerosols and the Hydrological Cycle,” Jul. 2004, Aspen, Colorado.
- Vice-chair, Gordon Research Conference on Solar Radiation and Climate, Jul. 2005, Waterville, Maine.
- Co-chair, Joint AMS Clouds and Radiation meeting, Jul. 2006, Madison, Wisconsin.
- Chair, Gordon Research Conference on Solar Radiation and Climate, Jul. 2007, New London, New Hampshire.
- Appointment, vice-chair for DOE’s Workshop on Community Modeling and Long-Term Predictions of the Integrated Water Cycle, Sep. 24–26, 2012.

8.7 Professional meeting session chair

- Session chair, Chapman Conference on “Atmospheric Absorption of Solar Radiation,” Aug. 13–17, 2001, Estes Park, Colorado.
- Session chair, 11th AMS Conference on Atmospheric Radiation, Jun. 2–7, 2002, Ogden, Utah.
- Member, Organizing Committee, IPCC Working Group I Workshop on Climate Sensitivity, Jul. 2004, Paris, France.
- Session chair, International Radiation Symposium 2004, Aug. 23–28, 2004, Busan, South Korea.
- Poster session chair, Fourth Gordon Conference on Radiation and Climate, Jul. 24–29, 2005, Waterville, Maine.
- Session chair, Annual American Association for Aerosol Research (AAAR) Conference, Oct. 17–21, 2005, Austin, Texas.
- Co-convener, AGU Fall meeting Union session, Dec. 5–9, 2005, San Francisco, California.
- Session chair, 12th AMS Conference on Atmospheric Radiation, Jul. 9–14, 2006, Madison, Wisconsin.
- Session chair, NASA Solar Radiation and Climate Experiment (SORCE) Meeting, Sep. 20–22, 2006, Eastsound, Washington.
- Co-convener and session chair, AGU Fall meeting session GC19, SI-Traceable Climate Measurements From Space, Dec. 15–19, 2008, San Francisco, California.
- Session Co-convener, AGU sessions GC12A and GC13A, Coastal and Near-Term Climates in a Changing World, 2010 Fall AGU Meeting, San Francisco, CA. December 13–17, 2010.
- Session chair, 23rd Conference on Climate Variability and Change, 91st American Meteorological Society Annual Meeting, Seattle, WA. January 27, 2011.
- Session chair, Gordon Research Conference on Radiation and Climate, July 2011, Colby Sawyer College.

- Session chair for GC31C, "Climatology and Trends of Extreme Events in Climate Models Capable of Resolving Regional-Scale Processes I," AGU Fall 2014 meeting.
- Session chair for GC33A, "Climatology and Trends of Extreme Events in Climate Models Capable of Resolving Regional-Scale Processes II Posters," AGU Fall 2014 meeting.
- Co-chair, Regional and Global Climate Model Analysis Science Team Meeting, Rockville, Maryland, Nov. 28 - Dec. 2, 2016.
- Co-Convener, with R. Joseph, P. J. Gleckler, F. M. Hoffman, D. N. Williams, and G. L. Geernaert, "TH23C: Coordinated Model Evaluation Capabilities (CMEC) for CMIP DECK and Historical simulations", AGU Fall Meeting, New Orleans, LA, December, 2017.

8.8 Courses taught

- University of California, San Diego (Scripps Institution of Oceanography), "Introduction to Atmospheric Radiation," Spring 1994.
- University of Colorado (Program in Atmospheric and Oceanic Sciences), ATOC 4710/5710, "Introduction to Atmospheric Physics," Spring 2002.
- University of California, Berkeley (Earth and Planetary and Geography), EPS C181 / GEOG C139, "Atmospheric Physics and Dynamics," CCN 19123, Fall 2008.
- University of California, Berkeley (Earth and Planetary and Geography), EPS C181 / GEOG C139, "Atmospheric Physics and Dynamics," CCN 19072, Fall 2010.
- University of California, Berkeley (Earth and Planetary and Geography), EPS 230, "Radiation and its Interactions with Climate," CCN 19251, Fall 2013.
- University of California, Berkeley (Earth and Planetary Sciences), EPS 230, "Radiation and its Interactions with Climate," Spring 2016.
- University of California, Berkeley (Earth and Planetary Sciences), EPS 230, "Radiation and its Interactions with Climate," Fall 2017.

8.9 Ph.D. committees

- Lansing Madry (Program in Atmospheric and Oceanic Sciences, University of Colorado, Boulder), Sea salt aerosols in global models, 2002 – 2007 [thesis committee].
- Nicole Schlegel (Department of Geography, University of California, Berkeley), 2007 – 2011. Thesis: "Determining Greenland Ice Sheet sensitivity to regional climate change: One-way coupling of a 3-D thermo-mechanical ice sheet model with a mesoscale climate model," UMI Dissertation #3469489, 2011. [thesis committee].
- Alexander Stine (Department of Earth and Planetary Science, University of California, Berkeley), 2007 – 2010. Thesis: "Climate Change at Annual Timescales," UMI Dissertation #3561357, 2010. [thesis committee].

- Frida Bender (Meteorological Institute, Stockholm University), 2008 – 2009. Thesis: “Earth’s Albedo in a Changing Climate.” [Ph.D. dissertation disputation opponent]
- Michael Kiparsky (Energy and Resources Group, University of California, Berkeley), 2008 – 2010. Thesis: “Risk Analysis for Water Resources Under Climate Change, Population Growth, and Land Use Change,” UMI Dissertation #3555762, 2010. [thesis committee].
- Abigail Swann, (Department of Earth and Planetary Science, University of California, Berkeley), 2008 – 2010. Thesis: “Ecoclimate: Variations, Interactions, and Teleconnections,” UMI Dissertation #3527296, 2010. [thesis committee].
- Andrew Rollins, (Department of Chemistry, University of California, Berkeley), 2010 – 2010. Thesis: “Formation mechanisms and quantification of organic nitrates in atmospheric aerosol,” UMI Dissertation #3413471, 2010. [thesis committee]
- Andrew Jones, (Energy and Resources Group, University of California, Berkeley), 2010 – 2012. Thesis: “Land Use Change is a Critical Influence on the Climate Effects of Climate Policies.” [thesis committee].
- Zack Subin, (Energy and Resources Group, University of California, Berkeley), 2010 – 2012. Thesis: “Interactions of Water and Energy Mediate Responses of High-Latitude Terrestrial Ecosystems to Climate Change,” UMI Dissertation #3594001, 2012. [thesis committee].
- Andrew Friedman, (Department of Geography, University of California, Berkeley), 2010 – 2014. Thesis: “The changing interhemispheric temperature difference: mechanisms and impacts.” [thesis committee].
- Nadir Jeevanjee, (Department of Earth and Planetary Science, University of California, Berkeley), 2012 – 2016. Thesis: “Cold Pools, Effective Buoyancy, and Atmospheric Convection,” UMI Dissertation #10150827 (ProQuest document #1847568025), 2016. [thesis committee].
- Jacob Edman, (Department of Earth and Planetary Science, University of California, Berkeley), Atmospheric convection and dynamics, 2013 – present [thesis committee].
- Zeke Hausfather (Energy and Resources Group, University of California, Berkeley), Integrated assessment and the carbon cycle, 2017 – present [thesis committee].

8.10 Ph.D. students

- Richard van Hees (University of Utrecht), 1995 – 2000. Thesis: “Detection of deep convection in the atmosphere using infrared satellite data.” [co-promoter].
- David Fillmore, (Program in Atmospheric and Oceanic Sciences, University of Colorado, Boulder), 2000 – 2005. Thesis: “Anthropogenic aerosols and the scattering and absorption of solar radiation – Estimates of the climatic impacts through a synthesis of models and satellite observations,” UMI Dissertation #3168276, 2005. [thesis adviser].

- Lindsey Nolan (Environmental Engineering, University of California, Berkeley), Climate-change prediction using perturbed physics, 2008 – 2011 [thesis adviser].
- Kyle Pressel (Environmental Engineering, University of California, Berkeley), 2008 – 2012. Thesis: “Water Vapor Variability Across Spatial Scales: Insights for Theory, Parameterization, and Model Assessment,” UMI Dissertation #3527150, 2012. [thesis adviser].
- Juli Rubin (Environmental Engineering, University of California, Berkeley), 2009 – 2012. Thesis: “Investigation of Aerosol Sources, Lifetime and Radiative Forcing through Multi-Instrument Data Assimilation,” UMI Dissertation #3555898, 2012. [thesis adviser].
- Daniele Rosa (Department of Earth and Planetary Science, University of California, Berkeley), 2008 – 2014. Thesis: “Multiscale global atmospheric transport and convective precipitation.” [thesis adviser].
- Mr. Prabhat (Department of Earth and Planetary Science, University of California, Berkeley), Detection and future of extreme climate, 2011 – present [thesis adviser].
- Ben Fildier (Department of Earth and Planetary Science, University of California, Berkeley), Physics of climate extremes, 2013 – present [thesis adviser].
- Alexander Charn (Department of Earth and Planetary Science, University of California, Berkeley), 2015 – present [thesis adviser].
- Jordan Mizerak (Department of Earth and Planetary Science, University of California, Berkeley), 2014 – 2015 [prospective thesis adviser].

8.11 Postdoctoral researchers

- Daniel Feldman (Department of Earth and Planetary Science, University of California, Berkeley), CLARREO (CLimate Absolute Radiance and Refractivity Observatory) Observing System Simulation Experiment, 2008 – 2011.
- Lara Gunn, (Department of Earth and Planetary Science, University of California, Berkeley), The Longwave Radiative Effects of Aerosols from Synthesis of A-train Observations, 2010 – 2012.
- Wei-Chun Hsieh, (Department of Earth and Planetary Science, University of California, Berkeley), Multiscale Modeling of Atmospheric Processes, 2009 – 2012.
- Fuyu Li, (Climate Sciences Department, Lawrence Berkeley National Laboratory), Exploring and Quantifying Predictive Skill for Climate and its Extremes, 2010 – 2012.
- Lisa Murphy, (Climate Sciences Department, Lawrence Berkeley National Laboratory), Improving the Representation of Human-Earth System Interactions, 2010 – 2012.
- Gijs de Boer (Environmental Energy Technologies Division, Lawrence Berkeley National Laboratory), Measurement of cloud radiative effects on Arctic climate, 2010 – 2012.
- Andrew Jones, (Climate Sciences Department, Lawrence Berkeley National Laboratory), Interactions of land use, land cover, and climate change, 2012 – 2013.

- Travis O'Brien, (Climate Sciences Department, Lawrence Berkeley National Laboratory), Multiscale atmospheric dynamics and climate extremes, 2011 – 2013.
- Hwei-Jin Wang, (Climate Sciences Department, Lawrence Berkeley National Laboratory), Measurement of carbon exchanges with terrestrial ecosystems, 2012 – 2014.
- James Benedict (Climate Sciences Department, Lawrence Berkeley National Laboratory), Multiscale interactions of Indian Ocean and Madden Julian Oscillations, 2012 – 2015.
- Enhao Du, (Climate Sciences Department, Lawrence Berkeley National Laboratory), Impacts of terrestrial hydrology on anthropogenic climate change, 2013 – 2015.
- Soyoung Jeon, (Climate Sciences Department, Lawrence Berkeley National Laboratory), Spatial statistics of climate extremes, 2012 – 2015.
- Jennifer Holm, (Climate Sciences Department, Lawrence Berkeley National Laboratory), Implications of forest ecosystem dynamics for the carbon cycle, 2012 – 2014.
- Mark Risser, (Climate Sciences Department, Lawrence Berkeley National Laboratory), Statistics of extreme climate change, 2015 – 2017.
- Wolfgang Langhans, (Climate Sciences Department, Lawrence Berkeley National Laboratory), Multiscale modeling of atmospheric dynamics, 2015 – 2017.
- Yinghui Lu, (Climate Sciences Department, Lawrence Berkeley National Laboratory), Global precipitation as a measure of climate model fidelity, 2015 – 2017.

8.12 Guest lectures (since 2007)

- “Changes in Climate Extremes: History and Projections for the 21st Century,” Boalt Law 272.3 (CCN 49711), Climate Change: Law and Policy, Sep. 4, 2007.
- “Global climate change: History and projections for the 21st century,” Molecular And Cell Biology (MCELLBI) 90, Freshman Seminar, Sep. 25, 2007.
- “The Health Implications of Climate Change,” Public Health 298.38 (CCN 76642), Global Environmental Change for Health Scientists, Feb. 22, 2008.
- “Global climate change: History and projections for the 21st century,” Molecular And Cell Biology (MCELLBI) 15.001 (CCN 57709), Current Topics in the Biological Sciences, Apr. 8, 2008.
- “Radiative Forcing by Greenhouse Gases and its Representation in Global Models,” Chemistry 122.001 (CCN 11450), Quantum Mechanics and Spectroscopy, Apr. 7, 2008.
- “Aerosols’ Role in Radiative Transfer,” Chemistry 122.001 (CCN 11450), Quantum Mechanics and Spectroscopy, Apr. 9, 2008.
- “What is a Climate Model (and what can it do?),” Environmental Science 10.001 (CCN 30403), Introduction to Environmental Sciences, Apr. 24, 2008.
- “The Global Greenhouse: Welcome to the Anthropocene,” Earth and Planetary Science 3.001 (CCN 19003), The Water Planet, May 5, 2008.

- “Climate extremes: The future impacts of strange weather,”
Earth and Planetary Science 3.001 (CCN 19003), The Water Planet, May 7, 2008.
- “Changes in Climate Extremes: History and Projections for the 21st Century,”
Boalt Law 272.3 (CCN 49688), Climate Change and the Law, Aug. 8, 2008.
- “Radiative processes in climate and climate models,”
Research in Earth Science, EPS 260, 11/10/08.
- “What is a Climate Model? (And what can it do?),”
Physical Science, L&S 70B, 2/24/09.
- “The global greenhouse: Welcome to the Anthropocene,”
“The Water Planet,” EPS 3, 4/29/09.
- “Climate extremes: The future impacts of strange weather,”
“The Water Planet,” EPS 3, 5/4/09.
- “Radiative processes.” Geog. 171 (CCN 36601), Jan. 28, 2010.
- “What is a climate model, and what can it do?”
ES (Environmental Sciences) 10 (CCN 30803), Feb. 12, 2010.
- “From climate change to climate action.” Invited presenter for the
Dept. of Earth and Planetary Science, Calday, April 17, 2010, UC Berkeley.
- “The global greenhouse: Welcome to the Anthropocene.”
EPS 3 (CCN 19003), April 26, 2010.
- “The Future of the Earth’s Climate: Frontiers in Forecasting,”
ERG C200 and Public Policy C284, “Energy and Society,” CCN 27425, Nov. 30, 2010.
- “What is a Climate Model? (And what can it do?),”
Geography 171, “Special Topics in Physical Geography,” CCN 36520, Mar. 3, 2011.
- “The Global Greenhouse: Welcome to the Anthropocene,”
EPS 3, “The Water Planet,” CCN 19003, Apr. 20, 2011.
- “What is a Climate Model? (And what can it do?),”
CE 195, “Chemical Engineering – Special Topics,” CCN 10491, Sep. 13, 2011.
- “What is a Climate Model? (And what can it do?),”
EPS 10, “Introduction to Environmental Science,” CCN 30803, Sep. 24, 2011.
- “The Trajectory of the Earth’s Climate,” ChE 84,
“The Science and Engineering of Sustainable Energy,” CCN 10308, Mar. 1, 2012.
- “The Global Greenhouse: Welcome to the Anthropocene,”
EPS 3, “The Water Planet,” CCN 19003, Apr. 23, 2012.
- “What is a Climate Model? (And what can it do?),”
ERG 290, “Seminar in Energy and Resources,” CCN 27430, Jan. 29, 2013.
- “The Global Greenhouse: Welcome to the Anthropocene,”
ESPM C10, “Environmental Issues,” CCN 28856, Jan. 31, 2013.

- “The Global Greenhouse: Welcome to the Anthropocene,” EPS 3, “The Water Planet,” CCN 19003, Apr. 29, 2013.
- “Water and Climate Change,” Political Science 179, “Undergraduate Colloquium in Political Science (Activism),” CCN 71877, 13 November 2013.
- “The Global Greenhouse: Welcome to the Anthropocene,” EPS 3, “The Water Planet,” CCN 19003, 18 April 2014.
- “Projections of Climate Change,” ER 290, “Climate Change Adaption and Mitigation,” CCN 27301, August 28, 2014.
- “Direct measurements of surface forcing of carbon dioxide from 2000 to 2010,” EPS 260, “Research Seminar,” CCN 19276, September 22, 2014.
- “The Global Greenhouse: Welcome to the Anthropocene,” EPS 3, “The Water Planet,” CCN 19003, April 29, 2015.
- “Climate Change Adaption and Mitigation” ER 290 (ERG) Seminar in Energy and Resources (CCN 27301), August 28, 2014.
- “Direct measurements of surface forcing of carbon dioxide from 2000 to 2010”, EPS 260 Research Seminar (CCN 19276), September 22, 2014.
- “Welcome to the Anthropocene,” EPS 3, “The Water Planet” (CCN 19003) on April 29, 2015.
- “Climate Change: How to Thrive in a Warmer World,” Business Administration 193B (class number 10736) / Letters and Science 126 (class number 44483), Energy and Civilization, Sept. 9, 2016.
- “Direct observations of the Earths Greenhouse Effect,” EPS 260 Research in Earth Science, Class #15021, Oct. 10, 2016.
- “The Global Greenhouse: Welcome to the Anthropocene,” EPS 3, “The Water Planet” (CCN 39532) on April 17, 2018.

8.13 Public dissemination of scientific information

- Invited lecturer, NCAR Geophysical Statistics Conference, Jul. 18–24, 1998.
- Invited presentation, Boulder County Clear-Air Consortium, Nov. 14, 2000.
- Invited lecturer, NASA Goddard Graduate Student Summer Program, Jun. 11, 2002.
- Invited lecturer, NCAR ASP Colloquium on “Climate and Health,” Jul. 21–28, 2004.
- Invited lecturer, Scripps Howard Institute on the Environment, 2005.
- Invited lecturer, NCAR ASP Colloquium on “The Art of Climate Modeling,” Jun. 5–16, 2006.
- Invited lecturer, NCAR ASP Colloquium on “Climate and Health,” Jul. 17, 2006.
- Interview subject, programs on climate change by the Discovery Channel, CNN and HBO, 2005–2006.

- Lead author, *Scientific American* article on IPCC WG 1 findings, 2007.
- Invited lecture, “Our Changing Planet: A Scientific Assessment,” Montgomery Bell Academy, October 30, 2008, Nashville.
- Invited panelist, “Humanity’s Greatest Challenges,” Singularity University, Jul. 9 2009, NASA Ames, Moffett Field, CA.
- Invited lecture, “Climate change: Surf’s up in the Arctic,” Nano High, Oct 19, 2009, University of California, Berkeley.
- Invited participant, Climategate panel discussion, Climate and Energy Policy Institute, Haas School of Business, UC Berkeley, Jan. 26, 2010.
- Invited panelist, “Berkeley Lab Goes Hollywood,” Science at the Theater, Feb. 3, 2010, Berkeley Repertory Theater.
- IPCC Forum on the Fifth Assessment, ESPM, UC Berkeley, Nov. 28, 2012.
- Speaker, LBNL Science at the Theater presentation on “How Hot Will it Get,” Berkeley Repertory Theater, California, April 22, 2013.
- Earth Day kickoff speaker on climate change, Lawrence Berkeley Laboratory, Berkeley, California, April 22, 2013.
- Co-organizer, Philomathia Symposium on Water, Climate, and Society: Strategies in a Rapidly Changing World. 1 Nov. 2013, David Brower Center, Berkeley, California.
- Chair, CRI kick-off summit, David Brower Center, 11 February 2014, Berkeley, California.
- Presentation on climate change to the Bentley Lab School on 25 February 2014.
- Lecture on “Water and Climate Change” on UC Berkeley Cal Day, 11 April 2014.
- Musical performance as a member of the Climate Music Project, Odd Fellows Building, 76 7th Street, San Francisco, September 27, 2014.
- Organizer, Climate Readiness Institute Workshop #1 with City of Berkeley and San Mateo County, Berkeley, California, December 9, 2014.
- Organizer, Climate Readiness Institute workshop on “Bay Area Water in a Changing Climate,” Berkeley, California, June 10, 2015.
- Invited lecture, Climate Change: How to Thrive in a Warmer World,” at Contra Costa College, San Pablo, CA., Sept. 9, 2016.
- Invited participant, University of California 1.5C Initiative Kick-off meeting, San Diego Supercomputer Center, UCSD, San Diego, CA., Oct. 19-21, 2016.
- Musical performance as a member of the Climate Music Project, San Jose Tech Museum, July 19, 2016.
- Musical performance as a member of the Climate Music Project, Chabot Space and Science Museum, Sep. 24 and Oct. 7, 2016.
- Invited Participant, University of California 1.5C Initiative Kick-off meeting, San Diego Supercomputer Center, UCSD, San Diego, CA., Oct. 19-21, 2016.

- Advisory Board, The San Jose Tech Museum Tech and the Environment, to design major new installation on climate change, 2017.
- Two musical performances as a member of the Climate Music Project, Noh Space, San Francisco, April 28, 2017.
- Invited Speaker, Chinese Environmental Scholars Forum, Sibley Auditorium, UC Berkeley, May 20-21, 2017.
- Presentation to Berkeley Area Policy Professionals Inaugural Event, LinkedIn Headquarters, San Francisco, May 25, 2017.
- Invited Speaker, University of California, Berkeley Alumni, Homecoming 2017, “Going Down the Up Escalator of Climate Change,” University of California, Berkeley, CA Oct. 21, 2017.
- Concert with the Climate Music Project, Swissnex, San Francisco, CA, Oct. 26, 2017.
- Presentation of climate change talk to World Conference of Science Journalists at invitation of Robert Sanders, Manager of Science Communications in UC Berkeley Media Relations, University of California, Berkeley, CA, Oct. 29, 2017.
- Panel with Climate Music Project showcase, Herbst Theatre, San Francisco, CA, Dec. 9, 2017.
- Scientific advisor, course at San Francisco Conservatory of Music taught by Taurin Barrera (TAC 311, Max/MSP 2) on sonifying climate data concluding with student concert, April 15, 2018.
- Invited participant, expert workshop on Future of Climate Action, hosted by World Bank Climate Investment Funds, Institute for the Future, Palo Alto, CA, May 10, 2018.
- Concert with the Climate Music Project for the World Bank Understanding Risk Forum, Mexico City, Mexico, May 16-18, 2018.
- Concert with the Climate Music Project, Noe Valley Ministry, San Francisco, CA, June 9, 2018.

RESEARCH GRANTS:**9 Previous Research Support**

1. Principal Investigator, “Improved Estimates of Clear-Sky Longwave Flux and Application to the Tropical Greenhouse Effect,” Earth Science and Applications Division, NASA (NAGW-4777/S10144-X), 1996 – 2000, \$127K.
2. Principal Investigator (with Guang J. Zhang, Scripps Institution of Oceanography), “Investigation of the Warm Pool Heat Budget and Validation of Atmospheric GCMs using TOGA COARE Data,” Atmospheric Sciences Division, NSF (ATM95-25800), 1996 – 1999, \$240K.
3. Principal Investigator, “Validation of the CERES Surface Radiation Budget Using Long-term Observations from the Indian Ocean Experiment (INDOEX),” Mission to Planet Earth Program Science Division, NASA (S-97889-F), 1997 – 2001, \$265K.
4. Principal Investigator (with Brian Soden, GFDL/Princeton), “Improved Clear-Sky Top-of-Atmosphere Fluxes for Studies of the Greenhouse Effect and Aerosol Radiative Forcing,” Office of Global Programs, NOAA (NA96GP0444), 1999 – 2003, \$317K.
5. Co-Principal Investigator (with Philip Rasch, NCAR), “Aerosol Forecasting and Modeling for ACE-Asia,” Climate Dynamics Program, NSF (NSF01 Special Funds), 2001 – 2002, \$190K.
6. Co-Investigator (with Andrew Vogelmann, Scripps Institution of Oceanography), “Parameterization of Cloud Water Variability from EOS Observations and its Impact on GCM Climate Simulations,” Office of Earth Science, NASA (GWEC-0000-0086), 2001 – 2004, unfunded collaboration.
7. Co-Investigator (with Martin Mlyneczek, NASA Langley Research Center), “Far Infrared Spectroscopy of the Troposphere (FIRST),” Instrument Incubator Program, Office of Earth Science, NASA, 2001 – 2004, unfunded collaboration.
8. Principal Investigator, “Global Aerosol Modeling for Climate Studies Using Assimilation of EOS Satellite Observations,” Atmospheric Chemistry Modeling and Analysis Project, Office of Earth Science, NASA (W-19942), 2001 – 2005, \$444K.
9. Principal Investigator (with Francisco Valero, Scripps Institution of Oceanography), “Development of Radiative Modeling Capabilities for the Triana Satellite Program,” Scripps Institution of Oceanography and Earth Science Enterprise, NASA (10189379), 2002 – 2004, \$366K.
10. Co-Investigator (with Bob Malone, LANL; and John Drake, ORNL), “Collaborative Design and Development of the CCSM for Terascale Computers,” DOE Scientific Discovery through Advanced Computing (SciDAC) program (DE-FG03-02ER63387), 2002 – 2007, \$2.412M.

11. Principal Investigator, “Engineering the Community Climate System Model for Improved Portability,” NSF (ATM-0404790 under Cooperative Agreement number ATM-0301213), 2003 – 2006, \$281.9K.
12. Co-Investigator (with Bruce Wielicki, NASA Langley Research Center), “CERES (Clouds and the Earth’s Radiative Energy System) Climate Data Records: Development, Maintenance, and Validation,” Office of Earth Science, NASA (NNL04AA54I), 2004 – 2006, \$230K.
13. Co-Investigator (with Cecelia Deluca, NCAR), “Common Modeling Infrastructure in Support of U.S. Climate Change Science,” NASA Earth Science Enterprise (NNG06GB74G), 2005 – 2008, \$405K.
14. Institutional Co-Principal Investigator (with lead PIs John Drake, ORNL; and Phil Jones, LLNL), “A Scalable and Extensible Earth System Model for Climate Change Research,” DOE Scientific Discovery through Advanced Computing (SciDAC) program, 2006 – 2008, \$4.085M.
15. Co-Investigator (with Scott Doney, WHOI), “Ocean Biological Feedbacks on Global Coupled Climate-Carbon Cycle Dynamics,” NASA Interdisciplinary Science program, 2007 – 2007, \$370.3K.
16. Co-Investigator (with David Randall, Colorado State University), “Center for Multi-scale Modeling of Atmospheric Processes,” NSF via sub-contract with Colorado State University (CSU-G-3045-16), 2007 – 2017, \$533K (LBNL funding).
17. Co-Investigator (with Kuan-man Xu, NASA Langley Research Center), “Aerosol Indirect Effect: Unscrambling Dynamics and Aerosol Effect,” NASA Interdisciplinary Science program (NNX07AU78G), 7/1/2007 – 6/30/2011, \$195,000.
18. Co-Investigator (with Ricky Rood, University of Michigan), “Process-Based and Object-Based Investigation of Bias in the Simulations of the Physical Climate,” NASA Earth System Science Research using Data and Products from the Terra, Aqua, and ACRIM-SAT Satellites (UM-03000913901), 11/1/2007 – 6/30/2011, \$57,237.
19. Principal Investigator, “Detection and Attribution of Spectral TOA Forcings and Feedbacks: a CLARREO Observing System Simulation Experiment,” NASA (NNX08AT80G and NNX10AK27G) and UCSC (NAS-2-03144,), 2008 – 2011, \$252,047.
20. Principal Investigator (with Irina Sokolik, Georgia Tech), “The Longwave Radiative Effects of Aerosols from Synthesis of A-train Observations,” NASA Atmospheric Chemistry, Modeling, and Analysis Program (NNX08AK56G), 1/1/2008 – 12/31/2011, \$359,819.
21. Laboratory Principal Investigator (with Rich Loft, NCAR), “Collaborative Research: PetaApps: New Coupling Strategies and Capabilities for Petascale Climate Modeling,” NSF (OCI0749190), 3/1/2008 – 2/28/2011, \$391,130.
22. Principal Investigator, (William Riley, LBNL; Margaret Torn, LBNL; Matt Reagan, LBNL; Philip Jones, LANL; William Lipscomb, LANL; Philip Cameron-Smith, LLNL;

- Robert Jacob, ANL; and Ruby Leung, PNNL), “Investigation of the Magnitudes and Probabilities of Abrupt Climate TransitionS (IMPACTS),” DOE, 7/1/2008 – 6/30/2013, \$3,661,000.
23. Laboratory Principal Investigator (with David Bader, ORNL; Philip Jones, LANL; and Kenneth Sperber, LLNL), “Exploring and Quantifying Predictive Skill for Climate and Its Extremes on Decadal and Regional Scales”, DOE BER, 6/1/2009 – 9/30/2009, \$318,500.
 24. Principal Investigator, “Continuous Evaluation of Fast Processes in Climate Models using ARM Measurements”, DOE BER, 6/1/2009 - 09/30/2013, \$150K/year.
 25. Laboratory Co-Principal Investigator (with Philip Jones, LANL; Philip Rasch, PNNL; Steve Klein, LLNL; and Surabi Menon, LBNL), “Improving the Characterization of Clouds, Aerosols, and Cryosphere in Climate Models,” DOE BER, 6/1/2009 – 5/1/2014, \$1,660,411.
 26. Laboratory Principal Investigator (with Jae Edmonds, PNNL and David Bader, ORNL), “Improving the Representations of Human-Earth System Interactions,” DOE BER, 6/1/2009 – 9/30/2014, \$3,275,056.
 27. Laboratory Co-Principal Investigator (with Esmond Ng, LBNL), “High Performance Adaptive Algorithms for Ice Sheet Modeling,” DOE ASCR, 9/1/2009 – 8/31/2013, \$1,920,000.
 28. Laboratory Principal Investigator (with David Bader, ORNL; Philip Jones, LANL; and Kenneth Sperber, LLNL), “Ultra High Resolution Global Climate Simulation to Explore and Quantify Predictive Skill for Climate Means, Variability and Extremes,” DOE BER, 12/1/2009 – 9/30/2013, \$2,949,324.
 29. Laboratory Principal Investigator (with Ruby Leung, PNNL), “Development of Frameworks for Robust Regional Climate Modeling,” DOE BER, 7/1/2010 – 6/30/2013, \$1,650,000.
 30. Laboratory Co-Principal Investigator (with Wes Bethel, LBNL), “Visual Data Exploration and Analysis of Ultra-large Climate,” DOE BER, 7/1/2010 – 6/30/2013, \$2,149,741.
 31. Laboratory Co-Principal Investigator (with William Riley, LBNL), “Quantification and reduction of critical uncertainties associated with carbon,” 7/1/2010 – 6/30/2013, \$1,200,000.
 32. Laboratory Principal Investigator (with John Weyant, Stanford University), “Integrated Assessment Model Development, Intercomparison and Diagnostics,” DOE BER, 7/1/2010 – 6/30/2013, \$375,000.
 33. Principal Investigator, “Shortwave and Pan-Spectral Observing System Simulation Experiments in Support of the CLARREO Science Definition Team,” NASA, 3/1/2011 – 3/1/2012, \$225,301.

34. Principal Investigator, “Shortwave and Pan-Spectral Observing System Simulation Experiments in Support of the CLARREO Science Definition Team,” National Aeronautics and Space Administration (NASA) NNX11AE65G, 3/07/2011 – 3/31/2015, \$972K.
35. Laboratory Principal Investigator (with David Bader, LLNL), “Climate Energy for a Sustainable Energy Future (CSSEF),” DOE BER, 6/30/2011 – 3/31/2014, \$625,000.
36. Laboratory Research Manager, “Climate and Earth System Modeling (CESM) Scientific Focus Area,” DOE BER, 10/1/2011 – 3/31/2014, \$9.7M.
37. Principal Investigator, “Towards Integrated Assessment of Energy/ Water/ Climate Interactions,” DOE BER, 6/1/2012 – 5/31/2015, \$1.152M.
38. Principal Investigator (multi-lab), “Multiscale: Multiscale Methods for Accurate, Efficient, and Scale-Aware Models of the Earth System,” DOE/BER, 7/1/2012 – 6/30/2017, \$5.742M (LBNL funding).
39. Laboratory Research Manager, “CASCADE: Calibrated and Systematic Characterization, Attribution, and Detection of Extremes Scientific Focus Area,” DOE BER, 10/1/2013 – 9/30/2016, \$6.6M.
40. Laboratory Principal Investigator (with PI George Hurtt, U. Maryland), “Collaborative: Quantification of Land-use/Land Cover Change as Driver of Earth System Dynamics,” DOE SC/BER (SciDAC DE-FOA-0001036), 9/1/2014 – 8/31/2017, \$197K (LBNL funding).
41. Laboratory Principal Investigator (with PI Joao Teixeira, UCLA and JPL), “An Integrative Parameterization of Boundary Layer and Convective Mixing: The Eddy-Diffusivity/Mass-Flux (EDMF) Approach,” DOE SC/BER (SciDAC DE-FOA-0001036), 10/1/2014 – 9/30/2017, \$225K (LBNL funding).
42. Laboratory Principal Investigator [Daniel R. Feldman, LBNL, co-PI] (with PI Robert Pincus, NOAA and CSU), “Centralized activities in support of the Radiative Forcing Model Intercomparison Project,” DOE SC/BER (SciDAC DE-FOA-0001036), 11/1/2014 – 10/31/2017, \$293K (LBNL funding).
43. Co-Investigator (with PI Andrew Jones, LBNL) , “Ultra High Resolution Climate Projections to Support Climate Readiness in the San Francisco Bay Area”, LBNL Laboratory Directed Research & Development (LDRD), 10/1/2015 – 9/30/2017, \$200K.
44. Co-Investigator (with PI Hans Johansen, LBNL) , “Modeling the Earth’s Hydrological Cycle from Watershed to Global Scales”, LBNL Laboratory Directed Research & Development (LDRD), 10/1/2015 – 9/30/2017, \$200K.

10 Current External Research Support

1. Laboratory Research Manager, “CASCADE: Calibrated and Systematic Characterization, Attribution, and Detection of Extremes Scientific Focus Area,” DOE BER,

10/1/2016 – 9/30/2019, \$8.1M.

2. Laboratory Principal Investigator (Lead Lab PI: Dave Bader, LLNL), “Energy Exascale Earth System Model Scientific Focus Area (E3SM, formerly The ACME project),” DOE BER, 6/1/2014 – 5/31/2019, \$7.6(M) (LBNL funding).
3. co-Investigator (with PI Paul Ullrich, UC Davis), “An Integrated Evaluation of the Simulated Hydroclimate System of the Continental US”, DOE (SC/BER) SC-FOA-0001531, 9/1/2016 – 8/31/2019, \$1.8M (total).
4. Laboratory Principal Investigator (with PI Xianglei Huang, U. Michigan), “Collaborative: More realistic representations of the longwave radiative interactions between surface and clouds in the Polar Regions in the global circulation model (GCM),” DOE SC/BER (SciDAC DE-FOA-0001036), 4/1/2015 – 3/31/2018, \$180K (LBNL funding).
5. Laboratory Principal Investigator [Travis A. O’Brien, LBNL, co-PI] (PI Alex Hall, UCLA), “Collaborative: Developing Metrics to Evaluate the Skill and Credibility of Downscaling,” DOE SC/BER (SciDAC DE-FOA-0001036), 8/1/2015 – 7/31/2018, \$149K (LBNL funding).
6. Laboratory Principal Investigator (with PI Ashok Gadgil, LBNL and UC Berkeley), “CERC for Water-Energy Solutions and Technologies (CERC WEST)”, DOE (SC/BER) DE-FOA-0001285, 11/1/2015 – 10/31/2020, \$625K (LBNL funding to Collins).
7. Principal Investigator, “Resources to Support Sea Level Rise Planning in California”, State of CA OPC (Ocean Protection Council) and CNRA (California Natural Resources Agency), DOE (SC/BER) DE-FOA-0001285 10/13/2016 – 12/31/2018, \$255K.

11 Pending External Research Support