

## ***Michael C. MacCracken***

January 6, 2016

### ***Present Positions and Affiliations***

Chief Scientist for Climate Change Programs (2003- ), and member, Board of Directors (2006- ), Climate Institute, Washington DC  
Member (2003- ), Advisory Committee, Environmental and Energy Study Institute, Washington DC  
Member (2008- ), US National Committee for the International Union of Geodesy and Geophysics of the National Academy of Sciences (liaison to IAMAS)  
Member (2010- ), Advisory Board, Climate Communication Shop  
Member (2010- ), Advisory Board, Climate Science Communication Network  
Member (2012- ), Union Commission on Climatic and Environmental Change (CCEC) of the International Union of Geodesy and Geophysics (IUGG)  
Member (2013- ), Advisory Council, National Center for Science Education, Oakland CA.  
Member (2013- ), Board of Advisors of Climate Accountability Institute (climateaccountability.org).  
Member (2014- ), American Meteorological Society Committee on Effective Communication of Weather and Climate Information (CECWCI)  
Member (2014- ), ASQ (American Standards for Quality) Technical Advisory Group ISO/TC 207 (TAG 207) on Environmental Management and the ASC Z1 Subcommittee on Environmental Management

### ***Previous Positions (selected)***

Atmospheric scientist (1968-2002) and Division Leader for Atmospheric and Geophysical Sciences (1987-1993), Lawrence Livermore National Laboratory, Livermore CA  
Senior Scientist for global change (1993-2002), Office of the US Global Change Research Program, on detail from LLNL with assignments serving as the first executive director of the Office of the USGCRP (1993-1997) and first executive director of the National Assessment Coordination Office (1997-2002).  
Member (2002-2004), Assessment Integration Team (AIT) of the Arctic Climate Impact Assessment (ACIA)  
President (2003-2007) and Past-President (2007-2011), International Association of Meteorology and Atmospheric Sciences (IAMAS)  
Member (2003-2011), Executive Committee of Scientific Committee on Oceanic Research (SCOR), representing the International Union of Geodesy and Geophysics  
Member (2004-2007), Scientific Expert Group (SEG) on Climate Change and Sustainable Development, in cooperation with Sigma Xi, The Scientific Research Society and the UN Foundation  
Review Editor (2005-2007), Fourth Assessment Report of the Intergovernmental Panel on Climate Change (IPCC), Working Group II, Chapter 14 on “North America”  
Chair, Scientific Organizing Committee (2009-2010), Asilomar International Conference on Climate Intervention Technologies: Minimizing the Potential Risk of Research to Counter-balance Climate Change and its Impacts, Asilomar CA, March 22-26, 2010.

### ***Long-term Research Interests***

Climate Change, Variations and Perturbations; Sea Level Rise; Global Environmental Change and its Consequences; Climate (Geo-)Engineering; Earth System Modeling; Paleoclimatic Change; Air Quality Modeling

### ***Education***

University of California, Davis/Livermore, Davis CA (1964-68)  
M.S. (1966) in Applied Science, School of Engineering  
Ph.D. (1968) in Applied Science, School of Engineering; Dissertation: “Ice Age Theory Analysis by Computer Model Simulation” (Advisor: Cecil “Chuck” Leith)  
Princeton University, Princeton NJ (1960-1964)  
B.S. Engineering (Aerospace and Mechanical Sciences); Honors at graduation: magna cum laude  
Tenafly High School, Tenafly NJ (1956-1960)

## ***Employment***

2002-2003: University Corporation for Atmospheric Research, climate change scientist (casual employee)

1968–2002: University of California, Lawrence Livermore National Laboratory (LLNL), Livermore CA  
Physicist/Atmospheric Scientist; Energy and Environmental Programs Directorate; participating guest  
scientist (2002-2007).

*Administrative Leadership Positions* [1974–1987: Deputy Division Leader, Atmospheric and Geophysical  
Sciences Division (Deputy Division Leader for Radiation, Chemistry, and Climate Change, March–  
September 1987); 1987–1993: Division Leader, Atmospheric and Geophysical Sciences Division;  
1993: Division Leader, Global Climate Research Division]

1964 (summer): Mechanical Engineer, Lawrence Livermore Laboratory, Livermore, CA

1963 (summer): Research Engineer, Singer Research Laboratory, Elizabeth, NJ

1960–61 (summers only): Engineering Assistant, Jet-Heet, Inc. (now CALMAC Mfg. Co.), Englewood, NJ

## ***Scientific Leadership Positions at Lawrence Livermore National Laboratory (LLNL) and for the Department of Energy as part of employment with LLNL***

1991–1993: Principal Investigator (PI), LLNL Earth System Modeling project (funded by DOE, EPA and  
LLNL)

1990–1993: Chief Scientist, Department of Energy (DOE) Computer Hardware, Advanced Mathematics,  
and Model Physics (CHAMMP) program

1988-1993: LLNL PI, University of California Institute for Collaborative Research (INCOR) project on  
Global Climate Modeling

1983–1988: LLNL Co-project leader, Study on the Environmental Consequences of Nuclear War

1979–1993: PI of Carbon Dioxide Effects Research project at LLNL funded by DOE

1979–1990: Scientific Director, Area Manager, and Principal Scientist (Climate), DOE Carbon Dioxide  
Research and Assessment Program

1976–1979: Project Director, DOE Multistate Atmospheric Power Production Pollution Study (MAP3S)

1973–1976: LLNL Principal Investigator, NSF Bay Area Air Quality Modeling Study also involving the  
NASA Ames Research Laboratory and the Bay Area Air Quality Management District

1972–1975: LLNL Principal Investigator, Department of Transportation (DOT) Climatic Impact Assessment  
Program (CIAP)

## ***Leadership Positions for Federal Government in Washington DC on assignment from LLNL***

2001 (October)-2002 (September): Senior Scientist, Office of the US Global Change Research Program  
(USGCRP), Washington DC (on assignment by LLNL with support from DOE)

1997 (September)-2001 (September): Executive Director, National Assessment Coordination Office of the  
USGCRP, Washington DC (on assignment by LLNL with support from DOE)

1993 (August)–1997 (September): Executive Director, Coordination Office of the USGCRP under an  
Intergovernmental Personnel Agreement to the National Science Foundation (through August, 1996)  
and an seconding agreement with the University Corporation for Atmospheric Research

1993 (February–July): Program Associate, Integrative and Predictive Modeling Working Group, USGCRP

## ***Professional Society Memberships and Offices***

Member, American Association for the Advancement of Science (fellow, 1998; chair-elect, chair, and  
retiring chair of Section W, Atmospheric and Hydrospheric Sciences, 1995-98; member-at-large,  
Section W, 1991-95)

Member, American Geophysical Union (also member, Focus Group on Global Environmental Change,  
2000-06; vice-chair 2002-2004)

Member, American Meteorological Society (past chair of the Committee on Climate Variations and past  
associate editor, *Journal of Climate*)

Member, International Commission on Climate (served as international president, 1995-2003) of the  
International Association of Meteorology and Atmospheric Sciences

Member (life), Oceanography Society

Member, Sigma Xi, The Scientific Research Society

## **Honors**

Fellow, International Union of Geodesy and Geophysics, awarded July 1, 2015 in Prague, Czech Republic  
American Meteorological Society (2013), Editor's reviewer award, *Weather, Climate and Society*,  
awarded January 6, 2013  
Diploma and medal lecturer, The Miguel Aleman Foundation of Mexico, Mexico City, Mexico, April 10,  
2013  
Harvard Project on International Climate Agreements paper competition (2008), honorable mention for  
paper: Moore, F. C., and M. C. MacCracken, 2009: Lifetime-leveraging: An approach to achieving  
international agreement and effective climate protection using mitigation of short-lived greenhouse  
gases.  
Nobel Peace Prize (2007), awarded jointly to Intergovernmental Panel on Climate Change (for which I  
served as contributing, author, reviewer, and delegation member) and Al Gore (for whom I served as a  
scientific adviser)  
Fellow, American Association for the Advancement of Science, elected September 1998  
Phi Kappa Phi (honor society), University of California Davis, 1966  
Fannie and John Hertz Foundation Fellowship, 1964–1968  
Phi Beta Kappa (honor society), Princeton University, 1964

## **Report and Proposal Reviews for:**

American National Standards Institute and the  
Leonardo Academy  
*American Water Works Association*  
*Atmospheric Environment*  
Bulletin of the American Meteorological Society  
Climate Change Science Program  
*Climatic Change*  
*Climate Dynamics*  
*Climate Science Forum*  
*Climate, Weather, and Society*  
Earthscan  
Electric Power Research Institute  
Environmental Protection Agency  
*Environmental Science & Technology*  
*EOS*  
*Geophysical Research Letters*  
*Global and Planetary Change*  
*Global Biogeochemical Cycles*  
Government Accountability Office  
Intergovernmental Panel on Climate Change  
International Development Bank  
Island Press  
*Journal of Atmospheric Sciences*  
*Journal of Applied Meteorology*  
*Journal of Climate*  
*Journal of Computational Physics*

National Aeronautics and Space Administration  
National Acid Precipitation Assessment Program  
National Institute for Global Environmental  
Change  
National Research Council  
National Science Foundation  
*Nature, Nature Climate Change*  
*Proceedings of the National Academy of  
Sciences*  
*Physics Today*  
*Risk Analysis*  
*Science*  
*Solutions*  
Swiss National Science Foundation  
*Tellus*  
UNICEF  
University of California University-wide Energy  
Research Group  
University of East Anglia  
US Department of Energy  
US Environmental Protection Agency  
US Global Change Research Program  
US National Assessment  
World Bank  
World Resources Institute  
(and others)

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## PUBLICATIONS

### **Books and Major Assessments**

- MacCracken, M. C. (editor), 2014: *Princeton 1964: Fifty Years Behind the Eight Ball*, Princeton University Class of 1964 50<sup>th</sup> Reunion Book, Reunion Technologies, Inc., 752 pp.
- Asilomar Scientific Organizing Committee [M. MacCracken (chair), S. Barrett, R. Barry, P. Crutzen, S. Hamburg, R. Lampitt, D. Liverman, T. Lovejoy, G. McBean, E. Parson, S. Seidel, J. Shepherd, R. Somerville, and T. M. L. Wigley], 2010: *The Asilomar Conference Recommendations on Principles for Research into Climate Engineering Technologies: Conference Report*, Climate Institute, Washington DC, 37 pp.
- MacCracken, M. C., F. Moore, and J. Topping, Jr., editors, 2008: *Sudden and Disruptive Climate Change: Exploring the Real Risks and How We Can Avoid Them*, Earthscan, London UK, 326 pp.
- Scientific Expert Group on Climate Change (SEG), 2007: *Confronting Climate Change: Avoiding the Unmanageable and Managing the Unavoidable*, Rosina M. Bierbaum, John P. Holdren, Michael C. MacCracken, Richard H. Moss, and Peter H. Raven (eds.), Report prepared for the United Nations Commission on Sustainable Development by Sigma Xi, Research Triangle Park, NC, and the United Nations Foundation, Washington, DC, 144 pp.
- Arctic Climate Impact Assessment (ACIA), 2004: *Impacts of a Warming Arctic: Arctic Climate Impact Assessment*, Cambridge University Press, 140 pp. [served as a co-author through participation on the Assessment Integration Team].
- MacCracken, M. C., and J. S. Perry (editors), 2002: *Encyclopedia of Global and Environmental Change, Volume 1: The Earth System: Physical and Chemical Dimensions of Global Environmental Change*, one of five volumes under chief editor T. Munn, John Wiley and Sons, London, 773 pp.
- National Assessment Synthesis Team (participating as additional lead author), 2001: *Climate Change Impacts on the United States: The Potential Consequences of Climate Variability and Change: Foundation Report*, U. S. Global Change Research Program, Cambridge University Press, Cambridge UK, 612 pp.
- National Assessment Synthesis Team (participating as additional lead author), 2000: *Climate Change Impacts on the United States: The Potential Consequences of Climate Variability and Change: Overview Report*, U. S. Global Change Research Program, Cambridge University Press, Cambridge UK, 154 pp.
- Helen McCracken Fulcher, edited by Michael MacCracken, 1995: *Mission to Shanghai: The Life of Medical Service of Josiah C. McCracken*, Tiffin Press, New London NH, 275 pp.
- MacCracken, M. C. (chairman), E. Aronson, D. Barns, S. Barr, C. Bloyd, D. Bruns, R. Cushman, R. Darwin, D. DeAngelis, M. Edenburn, J. Edmonds, W. Emanuel, D. Engi, M. Farrell, J. Hales, E. Hillsman, C. Hunsaker, A. King, A. Liebetrau, B. Manowitz, G. Marland, S. McDonald, J. Penner, S. Rayner, N. Rosenberg, M. Scott, M. Steinberg, W. Westman, D. Wuebbles, and G. Yohe, 1990: *Energy and Climate Change*. Report of the DOE Multi-Laboratory Climate Change Committee. (UCRL-102476, Rev. 1) Lewis Publishers, Boca Raton, FL, 161 pp.
- MacCracken, M. C., M. I. Budyko, A. D. Hecht, and Y. A. Izrael (Eds.), 1990: *Prospects for Future Climate: A Special US/USSR Report on Climate and Climate Change*. Lewis Publishers, Boca Raton, FL, 270 pp.
- Pittock, A. B., T. P. Ackerman, P. J. Crutzen, M. C. MacCracken, C. S. Shapiro, and R. P. Turco, 1989: *The Environmental Consequences of Nuclear War. Volume 1, Physical and Atmospheric Effects, Second Edition*, SCOPE Volume 28. UCRL-100560, published by John Wiley and Sons, Chichester, 359 pp.
- Pittock, A. B., T. Ackerman, P. Crutzen, M. MacCracken, C. Shapiro, and R. Turco, 1986: *The Environmental Consequences of Nuclear War: Volume 1. Physical and Atmospheric Effects*, SCOPE Volume 28, John Wiley and Sons, Chichester, 359 pp.
- MacCracken, M. C., and F. M. Luther (Eds.), 1985: *Projecting the Climatic Effects of Increasing Carbon Dioxide*, DOE/ER-0237, US Department of Energy, Washington, DC, 381 pp.
- MacCracken, M. C., and F. M. Luther (Eds.), 1985: *Detecting the Climatic Effects of Increasing Carbon Dioxide*. DOE/ER-0235, US Department of Energy, Washington, DC, 198 pp.

### **Journal Publications**

- Kravitz, B., A. Robock, S. Tilmes, O. Boucher, J. M. English, P. J. Irvine, A. Jones, M. G. Lawrence, M. MacCracken, H. Muri, J. C. Moore, U. Niemeier, S. J. Phipps, J. Sillmann, T. Storelvmo, H. Wang, and S. Watanabe, 2015: The Geoengineering Model Intercomparison Project Phase 6 (GeoMIP6): Simulation design and preliminary results, *Geosci. Model Dev. Disc.*, 8, 3379–3392, [www.geosci-model-dev.net/8/3379/2015/](http://www.geosci-model-dev.net/8/3379/2015/),

- doi:10.5194/gmd-8-3379-2015.
- Vose, R. S., S. Applequist, M. A. Bourassa, S. C. Pryor, R. J. Barthelmie, B. Blanton, P. D. Bromirski, H. E. Brooks, A. T. DeGaetano, R. M. Dole, D. R. Easterling, R.E. Jensen, T. R. Karl, R. W. Katz, K. Klink, M. C. Kruk, K. E. Kunkel, M. C. MacCracken, T. C. Peterson, K. Shein, B. R. Thomas, J. E. Walsh, X. L. Wang, M. F. Wehner, D. J. Wuebbles, and R. S. Young, 2014: Monitoring and understanding changes in extremes: Extratropical storms, winds, and waves, *Bulletin of the American Meteorological Society*, **95**(3), 377-386. doi: <http://dx.doi.org/10.1175/BAMS-D-12-00162.1>.
- MacCracken, M. C., H-J. Shin, K. Caldeira, and G. Ban-Weiss, 2013: Climate response to solar insolation reductions in high latitudes, *Earth Systems Dynamics*, **4**, 301-315, 2013; [www.earth-syst-dynam.net/4/301/2013/](http://www.earth-syst-dynam.net/4/301/2013/); doi:10.5194/esd-4-301-2013.
- MacCracken, M. C., 2009: On the possible use of geoengineering to moderate specific climate change impacts, *Environmental Research Letters*, **4** (October-December 2009) 045107 doi:10.1088/1748-9326/4/4/045107 [[http://www.iop.org/EJ/article/1748-9326/4/4/045107/erl9\\_4\\_045107.html](http://www.iop.org/EJ/article/1748-9326/4/4/045107/erl9_4_045107.html)].
- Moore, F. C., and M. C. MacCracken, 2009: Lifetime-leveraging: An approach to achieving international agreement and effective climate protection using mitigation of short-lived greenhouse gases, *International Journal of Climate Change Strategies and Management* **1**, 42-62. doi:10.1108/17568690910934390
- Edgerton, S. A., M. C. MacCracken, M. Z. Jacobson, A. Ayala, C. E. Whitman, and M. C. Trexler, 2008: Prospects for future climate change and the reasons for early action: Critical review discussion, *Journal of the Air and Waste Management Association*, **58**, 1386–1400, doi:10.3155/1047-3289.58.11.1386.
- MacCracken, M. C., 2008: Prospects for Future Climate Change and the Reasons for Early Action, *Journal of the Air and Waste Management Association*, **58**, 735-786. DOI: 10.3155/1047-3289.58.6.735
- Anthes, R. A., R. W. Corell, G. Holland, J. W. Hurrell, M. C. MacCracken and K. E. Trenberth, 2006: Hurricanes and global warming – Potential linkages and consequences, *Bulletin of the American Meteorological Society*, **87**, 623-628.
- MacCracken, M. C., 2006: Climate change discussions in Washington: A matter of contending perspectives, *Environmental Values*, **15**, 381-395.
- MacCracken, M. C., E. Barron, D. Easterling, B. Felzer, and T. Karl, 2003: Climate change scenarios for the U. S. National Assessment, *Bulletin of the American Meteorological Society*, **84**, 1711-1723.
- Parson, E. A., R. W. Corell, E. J. Barron, V. Burkett, A. Janetos, L. Joyce, T. R. Karl, M. C. MacCracken, J. Melillo, M. G. Morgan, D. S. Schimel, and T. Wilbanks, 2003: Understanding climatic impacts vulnerabilities, and adaptation in the United States: Building a capacity for assessment, *Climatic Change*, **57**, 9-42.
- MacCracken, M. C., 2002: Do the uncertainty ranges in the IPCC and US National Assessments adequately account for possibly overlooked climatic influences? *Climatic Change* **52**, 13-23.
- Dresler, P. V., M. C. MacCracken, J. M. Melillo, and A. Janetos, 1998: National assessment of the potential consequences of climate variability and change for the United States, *Water Resources Update*, Issue 112, Summer, 1998.
- Covey, C., S. L. Thompson, P. R. Weissman, and M. C. MacCracken, 1994. Global climatic effects of atmospheric dust from an asteroid or comet impact on Earth, *Global and Planetary Change* **9**, 263-273 (UCRL-JC-115314)
- Grotch, S. L., and M. C. MacCracken, 1991: The use of general circulation models to predict regional climatic change. *Journal of Climate*, **3**, 286–303.
- Frei, A., M. C. MacCracken, and M. I. Hoffert, 1988: Eustatic sea level and CO<sub>2</sub>, *Northeastern Environmental Science*, **7** (1), 91–96.
- Walton, J. J., M. C. MacCracken, and S. J. Ghan, 1988: A global-scale Lagrangian trace species model of transport, transformation, and removal processes. *Journal of Geophysical Research*, **93**, 8339–8354. Lawrence Livermore National Laboratory Report UCRL-95985.
- Ghan, S. J., M. C. MacCracken, and J. J. Walton, 1988: The climatic response to large atmospheric smoke injections: Sensitivity studies with a tropospheric general circulation model. *Journal of Geophysical Research*, **93**, 8315–8337. Lawrence Livermore National Laboratory Report UCRL-95984.
- Warner, N., A. B. Pittock, T. P. Ackerman, P. J. Crutzen, M. C. MacCracken, C. S. Shapiro, R. P. Turco, M. A. Harwell, T. C. Hutchinson, W. P. Cropper, C. C. Harwell, and H. D. Grover, 1987: Severe global-scale nuclear war effects reaffirmed. *Environment*, **29**, 4–5 & 45. Also *Disarmament X*, (2), 63–71.
- MacCracken, M. C., R. D. Cess, and G. L. Potter, 1986: The climatic effects of Arctic aerosols: An illustration of climate feedback mechanisms with one- and two-dimensional climate models. *J. Geophys. Res.*, **91**, 14445–14450.
- Ellsaesser, H. W., M. C. MacCracken, J. J. Walton, and S. L. Grotch, 1986: Global climatic trends as revealed by the recorded data. *Reviews of Geophysics and Space Physics*, **24**, 745–792.

- MacCracken, M. C., and F. M. Luther, 1984: Radiative and climatic effects of the El Chichón eruption. *Geofisica Internacional*, **23**, 385–401.
- Porch, W. M., and M. C. MacCracken, 1982: Parametric study of the effects of Arctic soot on solar radiation. *Atmos. Environ.*, **16**, 1365–1371.
- Potter, G. L., H. W. Ellsaesser, M. C. MacCracken, and C. S. Mitchell, 1981: Climate change and cloud feedback: The possible radiative effects of latitudinal redistribution. *J. Atmos. Sci.*, **38**, 489–493.
- Potter, G. L., H. W. Ellsaesser, M. C. MacCracken, and J. S. Ellis, 1981: Albedo changes by Man: Test of climatic effects. *Nature*, **291**, 47–49.
- MacCracken, M. C., 1978: MAP3S: An investigation of atmospheric, energy related pollutants in the northeastern United States. *Atmos. Environ.*, **12**, 649–659.
- MacCracken, M. C., D. Wuebbles, J. Walton, W. Duewer, and K. Grant, 1978: The Livermore regional air quality model: I. Concept and development. *J. Appl. Meteorol.*, **17**, 254–272. doi: 10.1175/1520-0450(1978)017<0254:TLRAQM>2.0.CO;2
- Duewer, W., M. C. MacCracken, and J. Walton, 1978: The Livermore regional air quality model: II. Verification and sample application in the San Francisco Bay Area. *J. Appl. Meteorol.*, **17**, 273–311. doi: 10.1175/1520-0450(1978)017<0273:TLRAQM>2.0.CO;2
- MacCracken, M. C., and R. D. Bornstein, 1977: On the treatment of advection in flux formulations for variable grid models, with application to two models of the atmosphere. *J. Comp. Phys.*, **23**, 135–149.
- Ellsaesser, H. W., M. C. MacCracken, G. L. Potter, and F. M. Luther, 1976: An additional model test of positive feedback from high desert albedo. *Quart. J. Royal Meteorol. Soc.*, **102**, 655–666.
- Potter, G. L., H. W. Ellsaesser, M. C. MacCracken, and F. M. Luther, 1975: Possible climatic impact of tropical deforestation. *Nature*, **258**, 697–698.

#### **Peer-Reviewed Reports, Book Chapters, Publications, and Contributions to Assessments**

- Moore, F. M., and M. C. MacCracken, 2011: Short-lived greenhouse gases and climate fairness, pp. 145-166 in chapter 7 in *China and Global Climate Change: Ethics, Responsibility and Environmental Policy*, edited by P. G. Harris, Policy Press, Bristol, UK, 256 pp.
- MacCracken, M.C., and L. J. Richardson, 2010: Challenges to Providing Quantitative Estimates of the Environmental and Societal Impacts of Global Climate Change, pp. 41-65 in *Assessing the Benefits of Avoided Climate Change: Cost Benefit Analysis and Beyond*, J. Gullede, L. J. Richardson, L. Adkins, and S. Seidel (eds.), Proceedings of Workshop on Assessing the Benefits of Avoided Climate Change, March 16–17, 2009, Pew Center on Global Climate Change, Arlington, VA. Available at: <http://www.pewclimate.org/events/2009/benefitsworkshop>.
- MacCracken M. C., E. E. Briones, D. Gilbert, G. Korotaev, W. Naqvi, G. Perillo, T. Rixen, E. Stanev, B. Sundby, H. Thomas, D. Unger, and E. Urban, 2009: Chapter 2: Vulnerability of Semi-Enclosed Marine Systems to Environmental Disturbances, pp. 9-29 in *Watersheds, Bays, and Bounded Seas: The Science and Management of Semi-Enclosed Marine Systems*, edited by E. R. Urban, Jr., B. Sundby, P. Malanotte-Rizzoli, and J. M. Melillo, SCOPE Publication 70, Island Press, Washington DC, 269 pp.
- MacCracken, M. C., 2008: Prospects for Future Climate Change and the Resources for Early Action: A Summary of the 2008 Critical Review, *em: The Magazine for Environmental Management* and [awma.org](http://awma.org) (Air and Waste Management Association), June 2008, 31-35.
- MacCracken, M. C., 2007: The Climatic Effects of Asteroid and Comet Impacts: Consequences for an Increasingly Interconnected Society, pp. 277-289 in *Comet/Asteroid Impacts and Human Society*, P. Bobrowsky and H. Rickman (eds.), Springer, Dordrecht, The Netherlands, 546 pp.
- MacCracken, M. C., 2002: Global Warming: A Science Overview, pp. 33-48 in *The Potential Impacts of Climate Change on Transportation*, Workshop summary and Discussion Papers (October 1-2, 2002), US Department of Transportation, Washington DC.
- MacCracken, M. C., 2002: Chapter 6: Impacts and adaptation, pp. 81-112 in *U. S. Climate Action Report—2002*, Third National Communication of the United States of America under the United Nations Framework Convention on Climate Change, U. S. Government Printing Office, Washington DC, 263 pp.
- MacCracken, M., E. Barron, D. Easterling, B. Felzer, and T. Karl, 2001: Chapter 1: Scenarios for Climate Variability and Change, pp. 13-71 in *Climate Change Impacts on the United States: The Potential Consequences of Climate Variability and Change*, Foundation, Cambridge University Press, Cambridge UK, 612 pp.
- Houser, S., V. Teller, M. MacCracken, R. Gough, and P. Spears, 2001: Chapter 12: Potential Consequences of Climate Variability and Change for Native Peoples and Homelands, pp. 351-377 in *Climate Change Impacts*

- on the United States: The Potential Consequences of Climate Variability and Change*, Foundation, Cambridge University Press, Cambridge UK, 612 pp.
- Mitchell, J. F. B., D. J. Karoly et al. (M. MacCracken, contributing author), 2001: Chapter 12: Detection of Climate Change and Attribution of Causes, pp. 695-738 in *Climate Change 2001: The Scientific Basis*, edited by J. T., Houghton et al., Cambridge University press, Cambridge, UK, 881 pp.
- Leemans, R., S. Agrawala, J. A. Edmonds, M. C. MacCracken, R. Moss, P.S. Ramakrishnan, 1995: Chapter 25. Mitigation: Cross-Sectoral and Other Issues, pp. 799-819 in *IPCC Working Group II Second Assessment Report*, Cambridge University Press, Cambridge.
- Santer, B. D., T. M. L. Wigley, T. P. Barnett, and E. Anyamba, 1995: contributor to Chapter 8. Detection of climate change and attribution of causes, pp. 407-443 in *IPCC Working Group I Second Assessment Report*, Cambridge University Press, Cambridge.
- Watson, R. T., et al., 1995: contributor to the Summary for Policymakers, Climate Change 1995: Impacts, Adaptations, and Mitigation, pp. 1-53 in *IPCC Working Group II Second Assessment Report*, Cambridge University Press, Cambridge.
- MacCracken, M. C., 1992: The challenge of identifying greenhouse-gas-induced climatic change. Chapter in the *Modeling of the Earth, Proceedings of the 1990 Global Change Institute on Earth System Modeling*, July 16–27, 1990, pp. 359–376 Snowmass, CO. Also Lawrence Livermore National Laboratory Report UCRL-JC-105967.
- MacCracken, M. C. (member, Effects Panel), 1991: *Policy Implications of Greenhouse Warming: Effects Panel Report*. National Academy Press, Washington, DC.
- Mitchell, J. F. B., S. Manabe, V. Meleshko, and T. Tokioka, (M. MacCracken among the contributors) 1990: Ch. 5: Equilibrium climate change—and its implications for the future. *Climate Change: The IPCC Assessment*, 131–164, Cambridge University Press, Cambridge, 365 pp.
- Wigley, T. M. L., and T. P. Barnett (M. MacCracken, among the contributors), 1990: Ch. 8: Detection of the greenhouse effect in the observations. *Climate Change: The IPCC Assessment*, pp. 239–255, Cambridge University Press, Cambridge, 365 pp.
- Golitsyn, G. S., and M. C. MacCracken, 1987: Atmospheric and Climatic Consequences of a Major Nuclear War: Results of Recent Research. World Climate Programme Report WC-142, World Meteorological Organization Report WMO/TD-No. 201, Geneva, December. Lawrence Livermore National Laboratory Report UCRL-96597.
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### **Legal Declarations**

MacCracken, M. C., 2016: Declaration in support of appeal by plaintiffs organized as Our Children's Trust in Case

- 6:15-cv-01517-TC before the UNITED STATES DISTRICT COURT, DISTRICT OF OREGON – EUGENE DIVISION (filed January 6, 2016). See <http://ourchildrenstrust.org/US/Federal-Lawsuit>
- MacCracken, M. C., 2015: Declaration in support of Respondents before the UNITED STATES COURT OF APPEALS FOR THE DISTRICT OF COLUMBIA CIRCUIT in Case No. 15-1363 and Consolidated Cases, STATE OF WEST VIRGINIA, et al., Petitioners v. UNITED STATES ENVIRONMENTAL PROTECTION AGENCY, et al., Respondents [prepared in cooperation with overall brief submitted by the Environmental Defense Fund and Natural Resources Defense Council].
- MacCracken, M. C., 2014: Declaration (Document 1-1) in Case No. 1:14-cv-01993; Complaint for Declaratory and Injunctive Relief: WESTERN ORGANIZATION OF RESOURCE COUNCILS, 220 South 27th Street, Billings, MT 59101 and FRIENDS OF THE EARTH, 1100 15th Street NW, 11th Floor, Washington, DC 20005, Plaintiffs, versus SALLY JEWELL, in her Capacity as Secretary of the Interior, Department of the Interior, and NEIL KORNZE, in his Capacity as Director, Bureau of Land Management, Bureau of Land Management, Defendants; filed 11/24/14 in the United States District Court for the District of Columbia.
- MacCracken, M. C., 2013: *Amici Curiae* brief in support of the plaintiffs ALEC L., et al., Plaintiffs – Appellants (represented by Our Children’s Trust), v. GINA McCARTHY, et al., Defendants – Appellees, THE NATIONAL ASSOCIATION OF MANUFACTURERS, et al., Intervenor for Defendants – Appellees, on Appeal from the United States District Court for the District of Columbia (No. 11-cv-02235 (RLW)) [USCA Case #13-5192, Document #1465851, Filed: 11/12/2013].
- MacCracken, M. C., 2013: Expert declaration in support of the petitioners (WildEarth Guardians and the Sierra Club) in Case 1:12-cv-00708 before the United States District Court for Wyoming: WildEarth Guardians and the Sierra Club, Plaintiffs, v. U.S. Bureau of Land Management, Defendant, in process. The case involves the proposed leasing of land in the Powder River Basin from which up to 1800 million tons of coal could be taken.
- MacCracken, M. C., 2012: Expert declaration (Document 38-4) in support of the petitioners (WildEarth Guardians, Defenders of Wildlife, and the Sierra Club) in Case 1:11-cv-01481-RJL before the United States District Court for the District of Columbia: WildEarth Guardians, Defenders of Wildlife, and the Sierra Club, Plaintiffs, v. U.S. Bureau of Land Management, Defendant, State of Wyoming, Alpha Wyoming Land Co., and Peabody Energy Corp., Intervenor-Defendants, filed December 13, 2012, 40 pp. The case involves the proposed leasing of land in the Powder River Basin from which up to 300 million tons of coal could be taken.
- MacCracken, M. C., 2011: Expert declaration in support of Environmental Petitioners (Sierra Club, Natural Resources Defense Council, Downwinders at Risk, Desert Citizens Against Pollution, Huron Environmental Activist League, Friends of Hudson, and Montanans Against Toxic Burning) in USCA Case #10-1376 regarding Case #10-1358 (and consolidated cases) Portland Cement Association, Petitioner, v. Environmental Protection Agency, et al., respondents concerning Petition for Review of Final Administrative Action of the United States Environmental Protection Agency, filed before the United States Court of Appeals for the District of Columbia Circuit [document #1308443, pages 189-218, filed 5/17/11].
- MacCracken, M. C., 2011: Expert declaration entered as Exhibit J [document 103-10 (filed 4/18/11)] in Case 1:11-cv-0041-CMH-TRJ before the United States District Court for the Eastern District of Virginia, Alexandria Division, Sierra Club and Southern Alliance for Clean Energy, plaintiffs, v. U. S. Defense Logistics Agency Energy, f/k/a U. S. Defense Energy Support Center; Kurt Kunkel, in his official capacity Commander of the U. S. Defense Logistics Agency Energy; U. S. Department of Defense; Robert Gates, in his official capacity as Secretary of the Department of Defense; U. S. Defense Logistics Agency; and Alan S. Thompson, in his official capacity as Director of the Defense Logistics Agency, defendants, and American Petroleum Institute, National Petrochemical and Refiners Association, and Chamber of Commerce of the United States of America, defendants-Intervenor.
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- MacCracken, M. C., 2007: Expert affidavit for the plaintiffs on the potential for new and useful analyses in Center for Biological Diversity, Greenpeace, and Friends of the Earth v. Dr. William Brennan, Acting Director of the U.S. Climate Change Science Program, and Dr. John Marburger, Director of the Office of Science and Technology Policy and Chairman of the Federal Coordinating Council on Science, Engineering. Case 06-cv-

07062-SBA in the United States District Court for the Northern District of California, Oakland Division. The lawsuit called for an updated US National Assessment as called for in the Global Change Research Act. Decision for plaintiffs, August 21, 2007.

MacCracken, M. C., 2004: Expert affidavit on the issue of expected impacts and standing of the plaintiffs in Commonwealth of Massachusetts et al., Petitioners, v. United States Environmental Protection Agency, Respondent, No. 03-1361, consolidated with Nos. 03-1362-1368, 18 pp. Filed with the United States Court of Appeals for the District of Columbia Circuit; argued before US Supreme Court, November 29, 2006. The case sought to require EPA to take action to limit greenhouse gas emissions. Decision for plaintiffs, April 2, 2007 (brief cited by Justice Stevens in majority opinion).

MacCracken, M. C., 2004: Expert affidavit on the issue of expected impacts and standing of the plaintiffs in Friends of the Earth, Inc., Greenpeace, Inc., City of Boulder, Colorado, City of Oakland, California, City of Arcata, California, and City of Santa Monica, California versus Peter Watson in his official capacity as President and Chief Executive Officer of the Overseas Private Investment Corporation, and Philip Merrill in his official capacity as President and Chairman of the Export-Import Bank of the United States, filed with the United States District Court, Northern District of California, San Francisco Division, Civ. No. C 02 4106 JSW (posted on Web at <http://www.climatelawsuit.org/>). The case sought to require the defendants to file environmental impact statements dealing with the climate change issue regarding their decisions to provide support for coal and oil production and processing facilities. Decision for the plaintiffs on standing and need for an EIS, March 30, 2007; still to be determined is the size of project(s) requiring an EIS.

***Participation in Assessments of the Intergovernmental Panel on Climate Change*** (which was awarded the Nobel Peace Prize in 2007 for its series of four international assessments)

First Assessment Report (1990)

Working Group I: contributor to Chapter 5 on “Equilibrium Climate Change—and its Implications for the Future;” contributor to Chapter 8 on “Detection of the Greenhouse Effect in the Observations;” reviewer.

Special Report: *Climate Change 1992: The Supplementary Report to The IPCC Scientific Assessment*, member of US delegation to the plenary in Guangzhou, China

Second Assessment Report (1995)

Working Group I: contributor to Chapter 8 on “Detection of Climate Change and Attribution of Causes;” reviewer; coordinated the US Government review; member of US delegation to the plenary in Madrid, Spain

Working Group II: lead author of Chapter 25 on “Mitigation: Cross-Sectoral and Other Issues;” reviewer; helped to coordinate the US Government review

Third Assessment Report (2001)

Working Group I: contributor to Chapter 12 on “Detection of Climate Change and Attribution of Causes;” reviewer; coordinated the US Government review; member of US delegation to the plenary in Shanghai, China

Working Group II: reviewer; helped to coordinate the US Government review

Fourth Assessment Report (2007)

Working Group I: contributing author (Chapter 1), reviewer

Working Group II: review editor for Chapter 14 on impacts on “North America;” reviewer

Fifth Assessment Report process (due 2013-14)

Special Report on Climate Extremes: reviewer (spring, 2011)

Expert Group Meeting on Geoengineering: participant (June 2011)

### ***Reports, Proceedings, Letters, and Other Publications and Posted Material***

MacCracken, M. C., 2015: Debunking Ridley and Peiser’s WSJ Climate Guide, posted December 8 at <https://medium.com/@mccracken/debunking-ridley-and-peiser-s-wsj-climate-guide-addecb625f#0no0byzbq>

MacCracken, M. C., H-J. Shin, K. Caldeira, and G. Ban-Weiss, 2012: Climate response to solar insolation reductions in high latitudes, *Earth Systems Dynamics Discussions*, 3, 715-757.

MacCracken, M. C., 2011: Potential Applications of Climate Engineering Technologies to Moderation of Critical Climate Change Impacts, IPCC Expert Meeting on Geoengineering, 20-22 June 2011, Lima, Peru, pages 55-56 in Meeting Report, edited by O. Edenhofer, R. Pichs-Madruga, Y. Sokona, C. Field, V. Barros, T. F. Stocker, Q. Dahe, J. Minx, K. Mach, G.-K. Plattner, S. Schlömer, G. Hansen, and M. Mastrandrea, Intergovernmental Panel on Climate Change, Geneva, Switzerland.

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- MacCracken, M. C., 2010: What We (also) Need to Know is How the Weather is Changing, poster presentation at the December 2010 AGU Winter Meeting, San Francisco CA.
- MacCracken, M. C., 2010: Opinion: Feds fall short in pricing climate disruption, Daily Climate blog posting (see <http://www.dailyclimate.org/idc-news/2010/12/carbon-cost-opinion>).
- MacCracken, M. C., 2010: The Achievable Path to Climate Protection, *World Best Practices, Asia-Pacific Edition*, Vol. 6 (No. 3), 48-51 (see [http://www.bestpracticesmagazine.org/2010\\_3.pdf](http://www.bestpracticesmagazine.org/2010_3.pdf)).
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- MacCracken, M. C., T. V. Crawford, K. R. Peterson, and J. B. Knox, 1972: Initial application of a multi-box air pollution model to the San Francisco Bay Area. *Proceedings of the Joint Automatic Control Conference*, Stanford, CA.
- MacCracken, M. C., T. V. Crawford, K. R. Peterson, and J. B. Knox, 1971: Development of a multi-box air pollution model and initial verification for the San Francisco Bay Area. 52nd Annual Meeting of the American Meteorological Society, New Orleans, LA (1972). Lawrence Livermore National Laboratory Report UCRL-73348.
- Groth, N. (editor-in-chief), M. Clark, J. M. Cleary, M. MacCracken, and J. Merenda (contributing editors), 1970: Air Pollution in the San Francisco Bay Area, Final report of the Stanford Workshop on Air Pollution, Ecology Center Press, San Francisco, CA, 380 pp.
- MacCracken, M. C., 1970: Tests of ice age theories using a zonal atmospheric model. Lawrence Livermore National Laboratory Report UCRL-72803.
- MacCracken, M. C., 1969: Ice age theory analysis by computer model simulation. Lawrence Livermore National Laboratory Report UCRL-71888.
- MacCracken, M. C., 1969: A zonal general circulation model. Lawrence Livermore National Laboratory Report UCRL-50594.
- MacCracken, M. C., 1969: The atmospheric conservation equations in flux divergence form. Lawrence Livermore National Laboratory Report UCRL-50593.
- MacCracken, M. C., 1968: Ice Age Theory Analysis by Computer Model Simulation. Ph.D. Dissertation.

### ***Congressional Testimony and Responses***

- MacCracken, M. C., 2007: Testimony before the Subcommittee on Energy and Environment of the Committee on Science and Technology hearing on “Reorienting the U.S. Global Change Research Program Toward a User-Driven Research Endeavor,” May 3, 2007, testimony available at <http://science.house.gov/publications/Testimony.aspx?TID=6362>
- Corell, R. W. (major role in preparing the written statement), 2006: “An Overview of Past and Projected Consequences for Marine and Terrestrial Systems,” prepared for the hearing of the Subcommittee on Global Climate Change of the Senate Commerce, Science, and Transportation Committee, Wednesday, April 26, 2006; posted at [http://commerce.senate.gov/hearings/testimony.cfm?id=1838&wit\\_id=3052](http://commerce.senate.gov/hearings/testimony.cfm?id=1838&wit_id=3052).
- MacCracken, M. C., 2006: Responses to questions posed by Senators Domenici and Bingaman of the Climate Change Conference, April 4 (posted at [http://energy.senate.gov/public/index.cfm?FuseAction=IssueItems.View&IssueItem\\_ID=38](http://energy.senate.gov/public/index.cfm?FuseAction=IssueItems.View&IssueItem_ID=38))
- MacCracken, M. C., 1996: Testimony before the Committee on Science of the House of Representatives Hearing on “U. S. Global Change Research Programs: Data Collection and Scientific Priorities,” on March 6, 1996. A significant portion of this testimony was included in an appendix to the book *The Heat is On* by Ross Gelbspan as part of a scientific critique of greenhouse skeptics. I also assisted in preparation of the written testimony for Dr. Robert Corell before a subcommittee of the House Committee on Science in November, 1995 and written responses to questions from Congressman Rohrabacher (two letters in December 1995 and January 1996) and Congressman Brown (in March-April 1996) published in the hearing record.

- MacCracken, M. C., 1992: Knowns and uncertainties from global climate modeling. Testimony before the Committee on Energy and Natural Resources U.S. Senate, May 6, 1992. Lawrence Livermore National Laboratory Report UASG-92-15.
- MacCracken, M. C., 1992: Issues to address at Global Climate Change Hearing. Lawrence Livermore National Laboratory Report UASG-92-18.
- MacCracken, M. C., 1992: Response to Senator Wallop's questions sent following the May 6 hearing of the Senate Committee on Energy and Natural Resources. Lawrence Livermore National Laboratory Report UASG-92-20.
- MacCracken, M. C., 1992: Response to Senator Domenici's question about budget priorities at the May 6 hearing of Senate Committee on Energy and Natural Resources. Lawrence Livermore National Laboratory Report UASG-92-21.
- MacCracken, M. C., 1988: Testimony to Energy and Power Subcommittee of the House Energy and Commerce Committee.
- Knox, J. B., and M. C. MacCracken, 1975: Concerning possible effects of air pollution on climate. Testimony before the Subcommittee on Environment and the Atmosphere of the Committee on Science and Technology, US House of Representatives.

### ***Video Clips***

- MacCracken, M. C., 1982: "Dr. Michael MacCracken - 1982 Climate Change Presentation (6 parts)," Sandia National Laboratory, Albuquerque NM, [http://www.youtube.com/watch?v=pYIk4cjsMb0&feature=results\\_main&playnext=1&list=PLAA46D9C718B545FD](http://www.youtube.com/watch?v=pYIk4cjsMb0&feature=results_main&playnext=1&list=PLAA46D9C718B545FD)
- MacCracken, M. C., 2004 : "Global Warming By Michael MacCracken PhD," <http://www.youtube.com/watch?v=DWyBthS23pE>
- MacCracken, M. C., interviewed by Joe Romm of Climate Progress, Feb. 4, 2010: "How We Know Humans Are Changing the Climate," [http://www.youtube.com/watch?v=ps6t\\_0Gih8w](http://www.youtube.com/watch?v=ps6t_0Gih8w)
- MacCracken, M. C., 2011: "Ethics and Issues Surrounding Geo-Engineering to Mitigate Climate Change," lecture at Osher Livelong Learning Institute, George Mason University organized by NOAA, Alexandria VA. Available at <http://www.climatewatch.noaa.gov/video/2012/climate-change-impacts-solutions-and-perceptions>.

### ***Abstracts for Formal Presentations (exclusive of reports for proceedings)***

- MacCracken, M. C., 2015: Is Nature Testing Climate Engineering for Us? Presented as a poster at the IUGG Congress in Prague, Czech Republic, July 1, 2015.
- MacCracken, M. C., 2012: Might Climate Engineering be Capable of Limiting Polar Warming? The International Polar Year (IPY) 2012 From Knowledge to Action Conference, Montreal, Canada, April 23-27.
- MacCracken, M. C., 2011: Application of Climate Engineering Technologies to Limit Polar Warming, American Geophysical Winter Meeting, San Francisco CA, December.
- MacCracken, M. C., H-J Shin, K. Caldeira, and G. A. Ban-Weiss, 2011: Moving Toward a Conceptual Design for Moderating Global Warming with Polar Shielding, WCRP Open Science Meeting, Denver CO, October.
- MacCracken, M. C., 2011: Moderating Critical Impacts by Climate Engineering, International Union of Geodesy and Geophysics (IUGG) General Assembly, Earth on the Edge: Science for a Sustainable Planet, 28 June - 7 July 2011, Melbourne, Australia.
- MacCracken, M. C., Ho-Jeong Shin, K. Caldeira, and G. A. Ban-Weiss, 2011: Engineering the Climate with Polar-only Solar Radiation Management, International Union of Geodesy and Geophysics (IUGG) General Assembly, Earth on the Edge: Science for a Sustainable Planet, 28 June - 7 July 2011, Melbourne, Australia.
- MacCracken, M. C., 2010: What We (also) Need to Know is How the Weather is Changing, American Geophysical Union fall meeting, December 13-17, San Francisco, CA.
- MacCracken, M. C., 2009: Impact Intervention: Regional Geoengineering as a Complementary Step to Aggressive Mitigation, Copenhagen Science Congress on Climate Change: Global Risks, Challenges and Decisions, March 10-12, Copenhagen, Denmark.
- MacCracken, M. C., and F. C. Moore, 2009: Achieving International Agreement and Effective Climate Protection by Coordinated Mitigation of Short- and Long-Lived Greenhouse Gases, Copenhagen Science Congress on Climate Change: Global Risks, Challenges and Decisions, March 10-12, Copenhagen, Denmark.
- Moore, F. C., and M. C. MacCracken, 2009: Lifetime-leveraging: An approach to achieving international agreement and effective climate protection using mitigation of short-lived greenhouse gases, Copenhagen Science Congress on Climate Change: Global Risks, Challenges and Decisions, March 10-12, Copenhagen, Denmark.

- MacCracken, M. C., 2007: Can Geoengineering Work? A Research and Development Program to Determine the Possibilities, Pontifical Academy of Sciences Symposium on Planetary Emergencies, The Vatican, December 20.
- MacCracken, M. C., 2005: Geoengineering the Climate: Approaches to Counterbalancing Global Warming. American Geophysical Union Fall Meeting, San Francisco CA, December 9.
- MacCracken, M. C., 2005: The Arctic Climate Impact Assessment: Taking the Next Steps, p. 16 in *Arctic Forum 2005*, The Arctic Research Consortium of the U.S. (ARCTUS), Fairbanks, AK, 82 pp.
- MacCracken, M. C., 2003: Nonlinearities, Thresholds And Surprises: Will The Future Surprise Us? IUGG Symposium on Challenges of Global Change in Forcing from Below and Above, Sapporo, Japan, July 10.
- MacCracken, M. C., 2002: Climate Change Science, and How Uncertainty Affects Perspectives on Policy Decisions, appearing in *Citizens Jury: Global Climate Change* (meeting 18-22 March 2002 in Baltimore MD), Jefferson Center, Minneapolis MN (<http://www.jefferson-center.org>)
- Joyce, L. A., and M. C. MacCracken, 2002: The National Assessment: A Grand Experiment in Integrated Assessments, in Workshop Summary: South Platte Integrated Assessment Workshop, September 29-October 1, Pingree Park, CO
- MacCracken, M. C., 2001: The Potential Consequences of Climate Change for the US—Results from the National Assessment, American Meteorological Society 30<sup>th</sup> Conference on Broadcast Meteorology, June 28, Minneapolis, MN (abstract).
- MacCracken, M. C., 2001: Projections of Climate Change and Its Potential Consequences, Clean Cities Conference, May 16, Philadelphia, PA (abstract).
- MacCracken, M. C., 2001: Projections of Climate Change and Its Potential Consequences, Haagen-Smit Memorial Symposium, California Air Resources Board, March 10, Lake Arrowhead, CA (abstract).
- MacCracken, M. C., 2001: Global Warming: A Science Overview, DOE Coal Utilization Conference, March 5, Clearwater, FL (abstract).
- MacCracken, M. C., 2001: The National Assessment of the Potential Consequences of Climate Variability and Change for the United States, and Reconstructions of Changes in the Climate of the Past 1000 Years, US-China Workshop on Global Climate Change, January 15-16, Shanghai, China (abstracts).
- MacCracken, M. C., 2000: Some Initial Thoughts on the Nature of Regional to National Assessments and on Lessons Learned from the First Phase of the US National Assessment on the Potential Consequences of Climate Variability and Change, Dialogue on Future Directions for National/Regional Assessments for the Impacts of Climate Change and Adaptation, October 25-27, Montreal, Canada (abstract).
- MacCracken, M. C., 1999: The Potential Consequences of Climate Variability and Change for the United States, American Nuclear Society, November 17, Washington DC (abstract).
- MacCracken, M. C., 1999: Assessment Of Uncertainties of Predicted Global Climate Change Modeling, Second International Dixy Lee Ray Memorial Symposium, September 1, Washington DC (abstract).
- MacCracken, M. C., 1999: Summarizing Global Change Science for Policymakers, NASA's Future Directions in Global Change Research: A Workshop for Journalists, June 24, Washington DC. (abstract)
- MacCracken, M. C., 1999: Global Warming: The Increasing Effects of Human Activities on Climate, and National Assessment of the Potential Consequences of Climate Variability and Change for the United States, National Agricultural Forum, Iowa State University, March 1, Ames IA (abstracts).
- MacCracken, M. C., 1999: The Basis for Believing Human Activities are Causing Climate Change, The Bruce Museum, February 21, Greenwich, NY (abstract).
- Melillo, J. M., A. Janetos, P. V. Dresler, and M. C. MacCracken, 1999: National Assessment of the Potential Consequences of Climate Variability and Change for the United States, Annual Meeting of the American Meteorological Society, January 12, Dallas TX (abstract).
- MacCracken, M. C., 1998: The Fundamentals of Climate Change Science, New York State Conference on Climate Change Impacts, November 19, Albany, NY (abstract).
- MacCracken, M. C., 1998: The U. S. National Assessment of the Consequences of Climate Change and Variability, AAAS Arctic Science Conference, October 26-28, Fairbanks AK (abstract).
- MacCracken, M. C., 1998, Global Warming: The Increasing Effects of Human Activities on Climate and the Environment, University of Illinois, Urbana-Champaign, May 19, Champaign, IL (abstract).
- MacCracken, M. C., 1998: Global Warming: The Increasing Effects of Human Activities on Climate, Hudson Valley Regional Workshop, April 23, Ramapo NJ (abstract).
- MacCracken, M. C., 1994: Organizing the U.S. Global Change Research Program to address critical questions, American Physical Society, Washington, DC, April 18–22, 1994 (abstract).
- MacCracken, M. C., 1994: United States Global Change Research: Looking toward 2000, Air and Waste Management Association, Phoenix, AZ, April 5–8, 1994 (abstract).

- MacCracken, M. C., 1993: The Computer Hardware, Advanced Mathematics, and Model Physics (CHAMMP) program. IAMAP/IAHS meeting in Yokohama, Japan, July 1993. (Lawrence Livermore National Laboratory UCRL-JC-115009 abstract).
- Gates, W. L. and M. C. MacCracken, 1993. Global data required for validation of climate models Joint International Meeting IAMAP/IAHS'93 Yokohama, Japan July 11-23, 1993 (Lawrence Livermore National Laboratory UCRL JC 112932 extended abstract).
- MacCracken, M. C., 1992: Global climatic change: An environmental and mathematical challenge. SIAM '92 Annual Meeting, Los Angeles, CA, July 20-24, 1992 (abstract).
- MacCracken, M. C., 1992: The DOE climate modeling program. Proceedings of the 27th International Geographical Congress, Washington, D.C., August 9-14, 1992, p. 163 (abstract).
- MacCracken, M. C., 1989: Global change: What's to be expected? 40th AIBS/ESA Symposium 'Ecological Consequences of Global Change,' August 6-10, Ontario, Canada, June. (Lawrence Livermore National Laboratory Report UCRL-101212 abstract).
- Taylor, K. E., H. W. Ellsaesser, and M. C. MacCracken, 1987: Climatic response to stratospheric volcanic injections. IAMAP Symposium on Aerosols and Climate, August 9-22, Vancouver, Canada, February (Lawrence Livermore National Laboratory UCRL-96170 abstract).
- MacCracken, M. C., S. J. Ghan, and J. J. Walton, 1987: The climatic response to large atmospheric smoke injections: Process sensitivities and regional responses. Global Effects Program Technical Meeting, DNA, Mission Research Corp. Santa Barbara, CA, March. (Lawrence Livermore National Laboratory UCRL-96270 abstract)
- MacCracken, M. C., 1987: Rising CO<sub>2</sub> and climate change. American Society of Plant Physiologists, St. Louis, MO, January (Lawrence Livermore National Laboratory UCRL-95936 abstract).
- MacCracken, M. C., 1986: Estimating and detecting contemporary climate change from the increasing CO<sub>2</sub> concentration. US Department of Energy State-of-the-Art Seminar, Dec. 3-4, 1986, in Washington, DC, November (Lawrence Livermore National Laboratory UCRL-95736 abstract).
- Taylor, K. E., and M. C. MacCracken, 1986: Some factors governing the climatic effects of volcanoes. Fourth Conference on Climate Variations: Climate Dynamics Update, March 9-13, 1987, Baltimore, MD, September (Lawrence Livermore National Laboratory UCRL-95455 abstract).
- MacCracken, M. C., 1986: Climatic effects of volcanic and arctic aerosols. US/USSR Meeting of Experts on the Causes of Recent Climatic Change, July 21-27, Leningrad, USSR, June (Lawrence Livermore National Laboratory UCRL-94732 abstract).
- Ghan, S. J., M. C. MacCracken, and J. J. Walton, 1986: The hydrological response to summertime injections of smoke into the atmosphere. Global Effects Program Technical Meeting, NASA Ames Research Center, February 25-27 (Lawrence Livermore National Laboratory UCRL-94006, abstract).
- Ghan, S. J., M. C. MacCracken, and J. J. Walton, 1986: The fate of smoke: Sensitivity studies with a global-scale atmospheric model. Global Effects Program Technical Meeting, NASA Ames Research Center, February 25-27 (Lawrence Livermore National Laboratory UCRL-94005, abstract).
- MacCracken, M. C., 1984: The challenge of understanding contemporary climate. *Extended Summaries Volume: Third AMS Conference on Climate Variations and Symposium on Contemporary Climate: 1850-2100*, American Meteorological Society, Los Angeles, CA, January 9, 1985 (Lawrence Livermore National Laboratory Report UCRL-91726 extended abstract).
- Ellsaesser, H. W., M. C. MacCracken, J. J. Walton, and S. L. Grotch, 1984: Previous analyses of the recorded data. *Extended Summaries Volume: Third AMS Conference on Climate Variations and Symposium on Contemporary Climate: 1850-2100*, American Meteorological Society, Los Angeles, CA, January 8-11, 1985 (Lawrence Livermore National Laboratory Report UCRL-91326 extended abstract).
- MacCracken, M. C., and J. J. Walton, 1984: The effects of interactive transport and scavenging of smoke on the calculated temperature change from large amounts of smoke. *Extended Summaries Volume: Third AMS Conf. on Climate Variations and Symposium on Contemporary Climate: 1850-2100*, American Meteorological Society, Los Angeles, CA, January 8, 1985 (Lawrence Livermore National Laboratory Report UCRL-91446 extended abstract).
- MacCracken, M. C., R. D. Cess, J. J. Walton, and F. M. Luther, 1983: Climatic effects of spreading smoke and dust. Presented at American Geophysical Union Fall Meeting, San Francisco, CA, December 5-10, 1983 (Lawrence Livermore National Laboratory Report UCRL-89798 abstract).
- MacCracken, M. C., 1983: Arctic aerosols: Climate model estimate of their influence on seasonal climate. Presented at the XVIII General Assembly of the International Union of Geodesy and Geophysics, Hamburg, FRG, August, 1983 (Lawrence Livermore National Laboratory UCRL-88838 abstract).

## PROFESSIONAL ACTIVITIES

- 1973–75  
Member, Climatic Impact Assessment Program, Panel on Monograph IV, *The Perturbed Troposphere* (chapter chairman)
- 1974  
Participant, National Academy of Sciences/National Research Council study on long-term worldwide effects of multiple nuclear weapons detonations
- 1975–80  
Member, Policy Task Force/Air Quality Maintenance Plan, Bay Area Technical Advisory Committee; ABAG Environmental Management Program, AQMP Advisory Committee; and Special Advisory Committee on Modeling
- 1976  
Participant, Workshop on EPA Regional Air Pollution Control Studies Programs
- 1977  
Participant, ERDA Workshop on Significant Environmental Concerns (Carbon Dioxide), Miami Beach
- 1977  
Member, Steering Committee, International Symposium on Sulfur in the Atmosphere, Dubrovnik, Yugoslavia
- 1978  
Member, NIEHS review team of “Six Cities Study,” Harvard School of Public Health, November 1–2, 1978
- 1979  
Participant, AAAS/DOE CO<sub>2</sub> Effects Research Meeting, Annapolis, MD, April 1979
- 1979  
Participant, National Academy of Sciences Climate Research Board review of US National Climate Plan, Woods Hole, July 1979
- 1979  
Member, WMO ad hoc study group on “Climate Effects of Increased Carbon Dioxide,” Boulder, CO, November 1979
- 1979–81  
Member, MAP3S/RAINE Advisory Committee
- 1980  
Co-organizer, DOE CO<sub>2</sub> Research Progress Meeting, panel rapporteur, Washington, DC, April 1981
- 1980–84, 88–89, 91–92  
Interviewer, Fannie and John Hertz Foundation scholarship program
- 1981  
Co-organizer: DOE Workshop on First Detection of Carbon Dioxide Effects, Harpers Ferry, WV, June 1981
- 1981  
Member, US Delegation to US/USSR Workshop on CO<sub>2</sub> and Climate, Leningrad, USSR, June 1981
- 1982  
Member, World Meteorological Organization panel of experts on Monitoring for Climate Change, Moscow, USSR, October
- 1982–83  
Member, National Academy of Sciences ad hoc panel on Monitoring for Climate Change
- 1982–86  
Member, American Meteorological Society Committee on Climate Variations; Chairman (1983–1985)
- 1983  
Co-organizer: DOE Workshop on the Interactions of Climate and Energy, Harpers Ferry, WV, June 1983 (co-editor of proceedings)
- 1983  
Invited Speaker, Third International Seminar on Nuclear War, Erice, Sicily, August 1983
- 1983  
Invited speaker: UNEP/WMO/ICSU Study Conference on The Sensitivity of Ecosystems and Society to Climate Change: Possible Impacts of CO<sub>2</sub> Increase in the Atmosphere, Villach, Austria, September 1983
- 1983

- Session co-chair, Fifth Conference on Atmospheric Radiation (prepared session review as input to “Recent Progress in Atmospheric Radiation,” *Bulletin of the Amer. Meteorol. Soc.*, **65**, 475–483, 1984)
- 1983–86  
Co-editor, State-of-the-Art Reports on Projecting and Detecting CO<sub>2</sub>-induced Climate Change for Carbon Dioxide Research Division, Department of Energy
- 1984  
Member, National Climate Program Office review team of the Scripps Institution of Oceanography Experimental Climate Forecast Center, March 1984
- 1984  
Drafting Committee, Interagency Research Report for Assessing Climatic Effects of Nuclear War, National Climate Program Office, NOAA (released February 5, 1985)
- 1984  
Invited speaker, Defense Science Board review of the global effects of a nuclear exchange, May 1985
- 1984  
Invited Speaker, Workshop on Biological and Ecological Research on the Effects of Global Thermonuclear War and Nuclear Winter, Stanford University, June 11–14, 1984
- 1984  
Invited Speaker, Fourth International Seminar on Nuclear War, Erice, Sicily, August 1984
- 1984–85  
Program Chair, Third Conference on Climate Variations and Symposium on Contemporary Climate 1850–2100, American Meteorological Society, Los Angeles, January 1985
- 1984–90  
US Co-chairman of Project 02.08–11 under Working Group VIII of the US/USSR Joint Committee on Cooperation in the Field of Environmental Protection. Meetings: January 1985 (Boston); November 1986 (Leningrad); November 1987 (Princeton/ Washington); November–December 1988 (Leningrad); October 1989 (Orlando)
- 1985  
Invited Participant, SCOPE/ENUWAR Workshops on the Environmental Consequences of Nuclear War, Hiroshima and Tokyo, Japan, February 1985; United Kingdom, June 1985; Bangkok, February 1987
- 1985  
Member, UCAR review panel for the NCAR Advanced Study Program, February 20–22, 1985
- 1985  
Invited speaker, National Academy of Sciences/National Academy of Engineering Symposium on Nuclear Winter: Current Assessment and Implications, March 26–27, 1985
- 1985  
Panelist, Sigma Xi CO<sub>2</sub> Teleconference, Washington, DC, September 1985
- 1985  
Participant, WMO/UNEP/ICSU Assessment of the Role of Carbon Dioxide and of Other Radiatively Active Constituents in Climate Variations and Associated Impacts, Villach, Austria, October 1985
- 1986  
Invited speaker, Nuclear Winter: Strategic and Diplomatic Implications, Virginia Polytechnic Institute and State University, March 1986
- 1986  
Invited lecturer, NATO Advanced Study Institute on Physically-Based Modeling and Simulation of Climate and Climatic Change, Erice, Sicily, May 1986
- 1986  
Leader, US delegation to US/USSR bilateral meeting of experts on the Causes of Recent Climate Change, Leningrad, July 1986
- 1986  
Convener, DOE Ocean-climate workshop, Washington, DC, August 1986
- 1986  
Invited participant, Commission of European Communities, invited presentation on detection of CO<sub>2</sub>-induced climatic change, Brussels, Belgium, November 1986
- 1986  
Invited speaker, Department of Energy Carbon Dioxide Research Division State-of-the-Art Seminar on Carbon Dioxide and Climate, National Academy of Sciences, Washington, DC, December 1986

- 1987  
Invited participant, National Academy of Sciences ad hoc panel to review the status of nuclear winter research, January 1987
- 1987  
Co-reviewer of nuclear winter research for Joint Scientific Committee of World Climate Research Programme, Castelvecchio, Italy, March 1987
- 1987  
Invited discussant, United Nations Department for Disarmament Affairs study of the potential effects of a nuclear war, New York, March 1987
- 1987  
Participant and speaker, EPA workshops on modeling of climate variability and on estimation of climate impacts, Boulder, CO, February and April 1987
- 1987  
Invited speaker, "The Reality of the Greenhouse Effect," World Petroleum Congress, Houston, April 1987
- 1987  
Chairman, panel convened by National Acid Precipitation Assessment Program to review the modeling element of NAPAP, Raleigh, NC, May 1987
- 1987  
Invited speaker, Rising CO<sub>2</sub> and Climate Change, American Society of Plant Physiologists, St. Louis, July 1987. Also at International Congress on Biometeorology, Purdue University, September 1987
- 1987  
Invited speaker, Intercomparison of Climate Model Simulations of Doubled Carbon Dioxide, and member of delegation, US/USSR Working Group VIII annual meeting, Princeton and Washington, DC, October 1987
- 1987–88  
Invited speaker and participant, UN ad hoc panel and SCOPE-ENUWAR Workshop on the Environmental Consequences of Nuclear War, Geneva, November 1987, and Moscow, March 1988
- 1987–2003  
International Commission on Climate (ICCL) of the International Association of Meteorology and Atmospheric Sciences (IAMAS); served as an ICCL member from 1987-1995 and as ICCL president from 1995--2003; organizer/co-organizer of international symposia at meetings held at Yokohama (1993), Boulder (1995), Melbourne (1997), Birmingham UK (1999), Innsbruck (2001) and Sapporo (2003). Continued participation at meetings in Beijing (2005), Perugia (2007), Montreal (2009), Melbourne (2011), Davos (2013), Prague (2015).
- 1988  
Invited speaker, American Physical Society short course: Nuclear Arms Race Technologies: The 1990s. April 1988
- 1988  
Witness, Climate Modeling, US House of Representatives Sub-committee on Energy, Washington, DC, July 1988
- 1988  
Member, US delegation, US–USSR Meeting on Past Climates, Madison, Wisconsin, September 1988
- 1988–89  
Member, LLNL Task Force on Performance Management
- 1988–89  
Member, Executive Committee planning U.C. Workshops on Global Change
- 1988–89  
Member, Climate Trends Panel of the National Climate Program Office
- 1988–92  
Member, Technical Advisory Panel on Global Climate Change, Office of Research and Development, Environmental Protection Agency
- 1988–93  
Chairman, Technical Advisory Panel on Acid Precipitation Field Program and Model Verification, US-Canada; National Acid Deposition Assessment Program/Electric Power Research Institute/Ontario Ministry of the Environment/ Canadian Atmospheric Environment Service
- 1988–93  
Member, Executive Committee, University of California Institute for Collaborative Research on Global Climate Modeling

1988–95  
Associate Editor, *Journal of Climate*

1989  
Member, EPA Science Advisory Board review panel on EPA Program on Global Climate Change, February 1989

1989  
Invited speaker and participant, National Academy of Sciences Symposium on Frontiers of Science, March 1989

1989  
Invited speaker and panel chairman, Workshop on Greenhouse-Gas-Induced Climatic Change: A Critical Appraisal of Simulations and Observations, Amherst, MA, May 1989

1989  
Invited speaker, Fourth International Conference of the Israel Society for Ecology and Environmental Quality Sciences, Jerusalem, Israel, June 1989

1989  
Climate Caucus Chairman, University of California Workshop on Climate Change in California, Davis, CA, July, 1989 (also speaker at U.C. workshop on Climate Change Impacts on the Pacific Rim, October 1989)

1989  
Invited speaker, AIBS/Ecological Society of America symposium “Ecological Consequences of Global Change,” Toronto, Canada, August 1989

1989  
Invited speaker, Lewis and Clark College Special Symposium on the Greenhouse Effect, Portland, OR, October 1989

1989  
Invited speaker, American Nuclear Society 1989 Winter Meeting, San Francisco, CA, November 1989

1989  
Member, Planning Committee, AGU Special Session on Sea Level Change, December 1989

1989–90  
University of California Advisory Panel on Global Change Research

1989–90  
Chairman, DOE Multi-laboratory Climate Change Committee

1989–91  
Member, National Academy of Sciences subpanel on climatic effects of the COSEPUP study on *Policy Implications of the Greenhouse Effect*

1990  
Invited speaker, Southeast Regional Climate Conference, Charleston, SC, February 1990

1990  
Invited speaker, California State University Fullerton, Special Symposium on the Greenhouse Effect, Fullerton, CA, April 1990

1990  
Invited speaker, California Energy Commission hearing on Greenhouse-induced Climate Change, July 1990

1990  
Invited lecturer, Workshop on Earth System Modeling, Office of Interdisciplinary Earth Studies/UCAR, Snowmass, CO, August 1990

1990  
Contributor and reviewer, *Climatic Change: The IPCC Scientific Assessment*, Inter-governmental Panel on Climate Change

1990–93  
Series co-editor, *Global Atmospheric Science*, Lewis Publishers

1990–93  
Member, Science Team, Climate System Modeling Program (CSMP), University Corporation for Atmospheric Research

1991  
Invited participant, NIGEC Workshop on the Engineering Response to Global Change, Palm Coast, FL, June

1991  
Program committee, Supercomputing ‘91 Conference, November 1991, Albuquerque, NM

1991

Member, Technical Committee, National Institute for Global Environmental Change

1991  
Invited panelist, AGU Union Session on Geoengineering the Climate, San Francisco, CA, December

1991–92  
Member, Research Advisory Board, University of Nevada, Las Vegas

1991–92  
Program Committee, Computing in the Atmospheric Sciences Workshop on Supercomputing and Climate Simulation, July 1992

1991–93  
Member, LLNL Department Head/Division Leader Diversity Advisory Committee

1991–1998  
American Association for the Advancement of Science, Section on Atmospheric and Hydrospheric Sciences (elected as member-at-large for 1991-1995; elected as chair-elect in 1995/96, chair for 1996/97, past chair in 1997/98); organizer of sessions at AAAS meetings 1993-1996.

1992  
Member, U.S. delegation to the meeting of Working Group I (Climate Change) of the Intergovernmental Panel on Climate Change, Guangzhou, PRC, January 1992

1992  
Witness, Uncertainties in Global Climate Change, Senate Energy and Natural Resources Committee, May 6

1992  
Member, ASHRAE (American Society of Heating, Refrigeration, and Air-Conditioning Engineers) Committee on Global Change (co-author of ASHRAE position statement)

1992–93  
Organizer, CHAMMP Science Team Meetings, Las Vegas, NV, March 1992 and Monterey, CA, March 1993

1992–93  
Member, Core planning group for DOE program on detection of climatic change

1992–93  
Member, Global Change Advisory Committee, Electric Power Research Institute

1993  
Invited speaker, 17th Workshop: The Collision of an Asteroid or Comet with the Earth, Ettore Majorana Centre for Scientific Culture, Erice, Sicily, Italy, April 28-May 3, 1993

1993  
Convenor, Symposium on Global Climate Models, IAMAP/IAHS Meeting, Yokohama, Japan, July 11-23.

1993  
Invited speaker (on prospects for changing the Earth's albedo to geoengineer the climate), JASONS summer study, La Jolla, CA July.

1993-96  
Member, Editorial Board for the *Encyclopedia of Climate and Weather*, published by Oxford University Press.

1993–97  
Chair, Oversight Panel for the Global Change Research Information Office (GCRIO)

1994  
Invited speaker (perspectives on global change), American Association of Petroleum Geologists, Denver, June 15, 1994

1994  
Co-organizer, USGCRP Earth System Modeling Workshop, Arlington, VA, May 2–4, 1994

1994  
Invited speaker (on Global Change), West Virginia Academy of Sciences, Fairmont WV, April 23, 1994

1994  
Coordinator, USGCRP Model Forum, Washington DC, October 12-13, 1994

1994-1997, 2000-2001  
Coordinator, USGCRP reviews of the draft IPCC Second and Third Assessment Reports and various special reports and technical papers

1994-97  
Member, Working Group on Climate Services, Office of the Federal Coordinator for Meteorology, National Oceanic and Atmospheric Administration, Washington DC.

1995

- Coordinator, U. S. Government review of the Second Assessment Reports for IPCC WG I (climate change) and WG II (consequences and adaptation)
- 1995  
Member, U.S. delegation to the plenary meeting of the Intergovernmental Panel on Climate Change Working Group I in Madrid, Spain, November 27-29, 1995
- 1996  
Testimony before the Committee on Science of the House of Representatives Hearing on “U. S. Global Change Research Programs: Data Collection and Scientific Priorities,” on March 6, 1996. A significant portion of this testimony was included in an appendix to the book *The Heat is On* by Ross Gelbspan as part of a scientific critique of greenhouse skeptics. I also assisted in preparation of the written testimony for Dr. Robert Corell before a subcommittee of the House Committee on Science in November, 1995 and written responses to questions from Congressman Rohrabacher (two letters in December 1995 and January 1996) and Congressman Brown (in March-April 1996) published in the hearing record.
- 1996  
Invited speaker on global warming, climate change and IPCC results at Tarant County College, Dallas, Texas (April 29), Climate Institute briefing (September 5), AAAS Congressional fellows briefing (September 11), Public Utilities Commission of Ohio national meeting (September 17), and Johns Hopkins University (October 9).
- 1996  
Invited speaker and participant, Aspen Global Change Institute 1996 summer session on expert opinion and uncertainty in assessments, Aspen CO, August 1-7.
- 1997-99  
Member, Advisory Committee, Oak Ridge National Laboratory, Environmental Sciences Division, Oak Ridge TN (reviews June 4-6, 1997 and June 15-17, 1999).
- 1997  
Co-organizer, Aspen Global Change Institute second session on Planning for a US National Assessment, July 29-August 7, Aspen CO. Also presented results of the meeting at the Energy Modeling Forum, August 7, Breckenridge CO.
- 1997  
Member, Planning Committee for the U. S. Climate Forum on the Consequences of Global Change for the Nation, November 12-13, Washington DC.
- 1997  
Invited speaker on global climate change and related issues at the U. S. Naval Academy Sigma XI induction (May 2, Annapolis MD), Johns Hopkins (June 23, Washington DC), Senate Environment Committee staff (July 15, Washington DC), Senate Commerce Committee staff (September 15, Washington DC), Johns Hopkins (September 23, Washington DC), First International Workshop on the Military Role in Climate Protection (November 7, Washington DC), Virginia Coal Council and State of Virginia joint legislative committee (November 17, Roanoke VA), President’s Council on Sustainable Development (November 19, Atlanta GA), Mutual Radio (December 4, Crystal City VA), National Research Council Committee on the Human Dimensions of Global Change (December 12, Washington DC), and for taping of Congresswoman Lynne Rivers (December 8, Washington DC).
- 1997-98  
Member, Steering Committee for the Gulf Coast Regional Workshop, February 25-27, Baton Rouge LA.
- 1997-2002  
Volume 1 co-editor, *Encyclopedia of Global Environmental Change*, John Wiley and Sons.
- 1998  
Invited participant, NOAA Strategic Planning workshop (February 11, 18)
- 1998  
Invited speaker on global climate change, the national assessment of consequences of climate change, and/or related issues at: American Meteorological Society (January 12, Phoenix AZ); Gulf Coast Regional Workshop (February 26, Baton Rouge, LA); California Regional workshop (March 9, Santa Barbara CA); Wesleyan University (April 15, Middletown CT at invitation of Senator Lieberman); Hudson Valley Regional Workshop (April 23, Ramapo NJ); Council of Scientific Society Presidents (May 4, Washington DC); Great Lakes Regional Workshop (May 5, Ann Arbor MI), The Business Council (May 8, Williamsburg VA), American Association of Petroleum Geologists (May 17, Salt Lake City UT); University of Illinois, Urbana-Champaign (May 19, Champaign, IL); GCIP Mississippi River Climate Conference (June 10, St. Louis); International Cooperative for Environmental Leadership (July 13, Pentagon City, VA); Caribbean/South Atlantic

- Workshop (July 22-23, Miami Beach, FL); Aspen Global Change Institute session on Climate Extremes (July 10-11, Aspen CO); International Polyurethane Symposium (September 18, Dallas, TX); North Atlantic Climate Impacts Workshop (23-26 September, Reykjavik, Iceland); AAAS Dialogue on Science and Religion (October 2, Washington DC); Kenan Institute of the University of North Carolina (October 2, Washington DC); National Weather Association (October 19, Oklahoma City OK); AAAS Arctic Science Conference (October 26-28, Fairbanks AK); New York State Conference on Climate Change Impacts (November 19, Albany, NY); Eno Transportation Foundation (December 8, Washington DC).
- 1998-99  
Member, organizing committee of 1999 US/Canada workshop on climate extremes
- 1998-2000  
Member, study committee on climate change of the U. S. Conference of Catholic Bishops (statement approved and published June 15, 2001)
- 1999  
Invited speaker on global climate change, the national assessment of consequences of climate change, and/or related issues at: American Meteorological Association (January 12, Dallas TX); American Association for the Advancement of Science (January 22, Long Beach CA); Bruce Museum (February 21, Greenwich CT); National Agricultural Forum (March 1, Iowa State Univ. in Ames IA); Battelle-Pacific Northwest Laboratory (March 18, Washington DC); Randolph-Macon University (April 22, Ashland VA); Middlebury College (April 28, Middlebury VT); Roundtable of Home Appliance Manufacturers (May 26, Washington DC); NASA Briefing on EOS for Science Writers (June 24, Washington DC); Union of Concerned Scientists (June 27, Washington DC); Darden Business School of the University of Virginia (June 27, Washington DC); Dixy Lee Ray Memorial Symposium (September 1, Washington DC); Committee on Atmospheric Chemistry of the National Research Council (September 8, Washington DC); Eno Transportation Foundation (September 14, Washington DC); Johns Hopkins University (November 10, Baltimore MD); American Nuclear Society (November 16, Long Beach CA); Northamerican Heating, Refrigeration, and Air-conditioning Wholesalers Association (December 6, Washington DC)
- 1999  
Co-organizer (with Warren Washington), AAAS Session on Climate of the Next Millennium, AAAS Annual Meeting, 21-26 January, Anaheim, CA.
- 2000  
Co-organizer (with Jerry Melillo, Tony Janetos, and Tom Karl), AAAS Session on the Potential Consequences of Climate Variability and Change for the US, AAAS Annual Meeting, 17-22 February, Washington DC.
- 2000  
Invited speaker, AAAS Session on Global Climate Change and Human Values, AAAS Annual Meeting, 17-22 February, Washington DC.
- 2000  
Co-organizer of special session at joint meeting of the American Nuclear Society/European Nuclear Society, on The Potential Consequences of Climate Variability and Change for the United States, November 14, Washington DC.
- 2000  
Invited briefings/talks: US Catholic Conference (February 29, Washington DC), University of Texas School of Public Affairs (March 7, Austin, Texas), Michigan State University (March 30, Ann Arbor, Michigan), Montgomery Blair High School science class (April 5, Silver Spring, Maryland), National Religious Partnership for the Environment (April 12, Washington, DC), Georgetown University (April 12, Washington, DC), Brookings Institution (June 14, Washington, DC), Office of the Federal Coordinating Committee on Meteorology (September 21, Silver Spring, MD), National Research Council Committee on Global Change Research (October 3, Washington DC), Canadian Conference on Assessment Practices (October 25, Montreal, Canada), Global Foundation (November 27, Ft. Lauderdale, Florida), Department of Commerce Science and Technology Fellows (December 6, Washington DC).
- 2000  
Chair for geosystems section (one of five), LLNL conference on "After Globalization: Future Security in a Technology Rich World," Livermore CA.
- 2000-2002  
Member, Department of Transportation Working Group on Impacts of Climate Change on Transportation
- 2000-2004

- Focus Group on Global Environmental Change of the American Geophysical Union; member (2000-2002), vice-chair (2002-2004)
- 2001  
Invited briefings/talks: National Research Council Transportation Research Board (January 8, Washington, DC), US-China Conference on Global Climate Change (January 15-16, Shanghai, China), Forum on Risk Management of Natural Hazards (February 5, Washington, DC), Toxicology Forum, (March 13, Washington, DC), DOE Coal Utilization Conference (March 5, Clearwater, FL), USAID Training Briefing (March 6, Washington, DC), Haagen-Smit Memorial Symposium (March 9-10, Lake Arrowhead, CA), Clean Cities Conference (May 16, Philadelphia, PA), Union of Concerned Scientists (June 24, Washington, DC), American Meteorological Society 30<sup>th</sup> Conference on Broadcast Meteorology (June 28, Minneapolis, MN)
- 2001  
Member, US delegation to the plenary meeting of the Intergovernmental Panel on Climate Change, Working Group I plenary, Shanghai, China (January 17-20).
- 2001  
Along with Robert Watson, Rosina Bierbaum, and Jeffrey Miotke, named in a private letter to the Council on Environmental Quality from ExxonMobil as one of four key members of the Clinton Administration's climate change team who should be removed by the incoming Administration of President George W. Bush because of their support for the IPCC and US National Assessments and their conclusions regarding the role of human activities in contributing to climate change and its impacts.
- 2001  
Member, Review Team, EPA Global Change Research Strategy, Washington, DC (February 15-16).
- 2001  
Invited participant, NOAA Strategic Planning workshop (April 19)
- 2001  
Co-organizer, Symposium on Modes of Current Climate Variability, International Association of Meteorology and Atmospheric Sciences (July 10-18, Innsbruck, Austria)
- 2001  
Member, Review Team, Environment Canada's Atmospheric Impacts Research Group, Toronto (Nov. 2)
- 2001-2002  
Lead author, chapter on Impacts and Adaptation, *U. S. Climate Action Report-2002*, submitted to Framework Convention on Climate Change; contributor to education and outreach chapter; reviewer of other chapters
- 2001-2002  
Steering committee, Department of Energy task force to develop a research program proposal on geoengineering for the National Climate Change Technology Initiative.
- 2002  
Invited briefings/talks: CLIC (Climate and Ice) planning meeting (January 11, Washington, DC); Jefferson Institute Citizens Jury on Climate Change (March 18-19, Baltimore, MD); Learning Retirement Institute of George Mason University (April 11, Fairfax, VA); Georgetown University Public Policy Institute (May 10, Washington, DC); "Coffeehouse," Montgomery County Public Television (September 3, Rockville, MD); World Bank Distance Learning Course (September 10, Washington, DC); Lawrence Livermore National Laboratory (September 17, Livermore, CA); Accuracy-in-Media Annual Meeting (October 5, Crystal City, VA); Livermore High School (October 17, Livermore, CA); National Research Council joint meeting of the Board on Atmospheric Sciences and the Climate Research Committee (October 23, Washington, DC).
- 2002  
Participant, Workshop on the US Climate Change Science Program (December 3-5, 2002), Washington DC.
- 2002  
Winner of the 2002 Lump-of-Coal award made by the *World Climate Report*, its editor Patrick Michaels, and its sponsor The Greening Earth Society for being the major force behind the U. S. National Assessment (former winners of the award include Vice-President Al Gore and Pew Center leader Eileen Claussen).
- 2002-2004  
Member of the ACIA Synthesis Team, which had responsibility for overseeing preparation of the *Arctic Climate Impact Assessment* (ACIA). Participated in meetings in Copenhagen, Denmark (November 20-22, 2002), Durham NH (March 24-28, 2003); Washington DC (May 15-16, 2003); London (October 14-17, 2003); Washington DC (January 29-31, 2004); Copenhagen, Denmark (March 22-24, 2004); Reykjavik, Iceland (November 9-11, 2004).
- 2002-  
Participating Guest, Lawrence Livermore National Laboratory, Livermore, CA.

- 2003  
Invited briefings/talks: National Association of Regulatory Utility Commissioners (February 26, Washington DC); National Energy Technology Laboratory Tutorial Seminar on Global Climate Change at the 28<sup>th</sup> International Technical Conference on Coal Utilization & Fuel Systems (Clearwater FL, March 10); Workshop for the EPA cooperative agreement project Use of Science in Gulf of Mexico Decision Making Involving Climate Change (Texas A&M, May 7); IAMAS symposium on Challenges of Global Change in Forcing from Below and Above (Sapporo, July 10); Neal Lane Symposium "Bridging the Gap between Science and Society: The Relationship between Policy and Research in National Laboratories, Universities, Government and Industry" (Rice University, November 1-2; available at <http://webcast.rice.edu/speeches/20031101lane.html>); University of Michigan (Ann Arbor, November 13-14)
- 2003  
Participant, North America regional consultation on how we can reduce hunger, improve rural livelihoods and stimulate environmentally sustainable economic growth over the coming decades through the generation, access and use of agricultural S&T (World Bank, April 28)
- 2003  
Participant, planning meeting for Arctic global change exhibit (Smithsonian Institutions National Museum of Natural History, May 1)
- 2003-2006  
Member, Advisory Council for Consortium for Atlantic Regional Assessment (CARA) (meetings in West Greenwich, RI, May 17, 2004)
- 2003-2007  
President, International Association of Meteorology and Atmospheric Sciences (IAMAS) of the International Union of Geodesy and Geophysics (IUGG); meetings in Sapporo (2003); Beijing (2005); Perugia (2007)
- 2003-2007  
Member, Executive Committee of International Union of Geodesy and Geophysics (IUGG); meetings in Sapporo (July, 2003), Boulder (August, 2004), Perugia (September, 2005), Perugia (July, 2007)
- 2003-2011  
Member, Executive Committee of Scientific Committee on Oceanic Research (SCOR); meetings in Moscow (September, 2003), Venice (September, 2004), Cairns (August, 2005), Concepcion, Chile (October, 2006), Bergen, Norway (August 2007); Woods Hole, MA (October 2008), Beijing, China (October 2009), Toulouse, France (September 2010), Helsinki (September 2011). Also liaison to various working groups.
- 2003-  
Member, Advisory Committee, Environmental and Energy Study Institute, Washington DC
- 2004  
Invited briefings/talks: Executive committee of the Transportation Research Board (Washington DC, January 14); Yale University, St. Thomas More Chapel and Center, Thomas E. Golden Jr. Fellowship in Faith and Science (New Haven CT, March 25); Climate Institute, Dartmouth interns (Washington DC, May 12); Climate Policy Center (May 14, Washington DC); EPA Science Forum (Washington, DC, June 3); NRC Panel of the Transportation Research Board's Conference on Integrating Sustainability into Transportation Research (June 12, Baltimore MD); Environmental and Energy Study Institute seminar series (September 15, Washington, DC); Department of Atmospheric Sciences, Nanjing University (October 11, Nanjing, China); Chinese Meteorological Administration (October 13, Beijing, China); State Key Laboratory of Numerical Modelling of the Atmosphere, Institute of Atmospheric Physics, Chinese Academy of Sciences (October 13, Beijing, China); National Press Club, press conference on the Arctic Climate Impact Assessment (November 8, Washington, DC); Symposium on Climate Change in the Arctic (November 11, Reykjavik, Iceland); Sierra Elementary School 6<sup>th</sup> Grade Class (November 23, Jamestown, CA); Workshop on the Impacts of Comets/Asteroids on Society (November 30, Tenerife, Canary Islands, Spain); Board of Directors, Environmental and Energy Study Institute (December 9, Washington, DC); also numerous media interviews
- 2004  
Participant, Workshop on Learning from the National Assessment (AAAS, Washington DC, April 29)
- 2004  
Member, Advisory Council of the Scientific Expert Group (SEG) on Climate Change and Sustainable Development being organized for the United Nations Commission on Sustainable Development, Sigma Xi, The Scientific Research Society (May 6-7, Research Triangle Park)
- 2004  
Participant, Workshop on START/SCOPE Rapid Assessment of Global Environmental Change in East Asia (October 6-8, Hangzhou, China)

2004-2005

Member, Core Advisory Group for the Workshop on Comet/Asteroid Impacts and Human Society, sponsored by the International Council of Scientific Unions (workshop held November 27 – December 2, 2004 in Santa Cruz de Tenerife, Canary Islands)

2004-2007

Member, Scientific Expert Group (SEG) on Climate Change and Sustainable Development, United Nations Commission on Sustainable Development, convened by Sigma Xi, The Scientific Research Society (December 3-4, 2004 in Research Triangle Park; March 29-31, 2005 in Trieste, Italy; February 17-18, 2006 in St. Louis, MO; August 17-19, 2006 in Washington DC)

2005

Invited briefings/talks: Whole Earth Systems: Integrating Environmental Science, Technology and Policy, Celebrating Stephen H. Schneider's professional contributions and 60th birthday (Palo Alto, January 12); National Catholic Rural Life Conference (Washington DC, February 19); Policy Discussions Online, on-line course on Federal Decision-making (Washington DC, March 4); Energy and Environment Program, Lawrence Livermore National Laboratory (Livermore, CA, March 21); Princeton Environmental Institute, Princeton University (Princeton, NJ, May 2); Global Climate Change and Catholic Responsibility, St. Rose Catholic Church, Gaithersburg, Maryland (Gaithersburg, MD, May 10); 17th annual meeting of the Arctic Research Consortium of the United States (ARCUS) and Arctic Forum (keynote address, May 19, Washington, DC); Charles G. Koch Summer Fellow Program, Institute for Humane Studies, George Mason University (Arlington VA, July 5); high school student groups in Beijing, China (Beijing, China, July 4 and 9); University of Missouri journalism class (via Internet video conference, October 19); State and Territorial Air Pollution Program Administrators and Association of Local Air Pollution Control Officials joint meeting (Arlington VA, October 26); Alternative Fueled Vehicles Conference "Road to Energy Independence: New York City's Alternative Transportation Future" (keynote address, Bronx Community College, Bronx, NY, October 28); American Geophysical Union (San Francisco, December 9); also numerous media interviews and interactions.

2005-2006

Member, National Advisory Panel, Aspen Climate Change Assessment (meeting: January 5-6; Aspen CO)

2005-2006

Member, Ad hoc Group to Identify High Priority Research Issues for the Arctic Region for the Decade Ahead, reporting to the Arctic Science Council and other groups

2005-2007

Review Editor, Fourth Assessment Report of the Intergovernmental Panel on Climate Change (IPCC), Working Group II, Chapter 14, North America (meetings: January 16-19, 2006 in Merida, Mexico and September 11-14, 2006 in Cape Town, South Africa)

2005-2006

Liaison on behalf of SCOR and IAMAS to the Joint Scientific Committee of the World Climate Research Programme (meetings in March 14-17, 2005 in Guayaquil, Ecuador; March 6-11, 2006 in Pune, India)

2006

Invited expert, EPA Workshop on Uncertainty in the US EPA Assessment of the Impact of Global Change on US Air Quality (Durham NC, November 1-2)

2006-08

Member, Board of Advisers, Scientists and Engineers for America

2006

Invited briefings and talks: New York chapter of the US Green Building Council (October 25, New York City); Workshop on the Challenge of Climate Change, Annual Social Ministry Meeting, United States Conference of Catholic Bishops (February 14, Washington DC); Washington chapter of the MIT Alumni Club (February 23, Washington DC); Climate Change Seminar (short course), Environmental Engineering Student Society, Michigan State University (March 22, Lansing MI; see <http://www.egr.msu.edu/~sanlleyc/EESS.htm>); Western Michigan chapter of the Air & Waste Management Association, (March 23, Grand Rapids, MI); Legislative Commission on Global Climate Change of the General Assembly of North Carolina (April 4, Raleigh NC); National and Governmental Advisory Committees to the U. S. Representative (Administrator of EPA) to the Commission for Environmental Cooperation (April 6, Washington DC); International Foundation for Democracy and Development (April 19-20, Santo Domingo, Dominican Republic); The 9th Annual Renewable Energy and Energy Efficiency Expo and Forum (June 20, Washington, DC); Yelping Hill Association (July 8, West Cornwall, CT); ICF International (August 8, Fairfax, VA); Climate Summit, Climate Institute (September 18-21, Washington,

- DC); Transatlantic Science Week 2006, Arctic Meltdown—Global Effects (October 2-3, Washington, DC); Conference on Climate Change Impacts, Transportation Research Board (October 12, Washington, DC); EPA SF<sub>6</sub> Meeting (November 28, San Antonio, TX); National Research Council Committee to Review the US Climate Change Science Program’s Synthesis and Assessment Product 5.2 “Best Practice Approaches for Characterizing, Communicating, and Incorporating Scientific Uncertainty in Climate Decision Making” (December 5, Washington, DC); Woodrow Wilson International Center for Scholars (December 11, Washington DC-panel on “Climate Change: Historical Perspectives and the Current Debate”); also numerous media interviews and interactions.
- 2007  
 Science Adviser to Al Gore’s speaker training sessions, organized by the Climate Project (January 2-3 and January 8-10; Nashville, TN); for a discussion of reactions to the movie, see <http://www.climatewatch.org/index.php/csw/details/maccracken-on-gore/>
- 2007  
 Invited participant, SCOPE-PACKMEDS workshop, Delmenhorst, German (April 2-6); lead author for one of the four crosscut chapters.
- 2007  
 Invited reviewer (three meetings) for the report “The Age of Consequences: The Potential Foreign Policy and National Security Implications of Global Climate Change,” Center for Strategic and International Studies (CSIS), Washington, DC (see [http://www.csis.org/component/option,com\\_csis\\_pubs/task/view/id,4154/type,1/](http://www.csis.org/component/option,com_csis_pubs/task/view/id,4154/type,1/))
- 2007  
 Author, speaker, and respondent, Case study on the U.S. National Assessment for the American Meteorological Society’s 2007 Summer Policy Colloquium, June 6 and 8.
- 2007  
 Main author of IAMAS and IUGG resolution recognizing the importance of human-induced climate change and recommending actions by governments, organizations, and scientists.
- 2007  
 Invited participant, Expert Panel on Climate Change re National Intelligence Estimate, Joint Global Change Research Institute, University of Maryland, July 17.
- 2007  
 Invited speaker (on geoengineering) and participant, 38<sup>th</sup> Session of the International Seminars on Planetary Emergencies, 19-23 August, Erice, Sicily, Italy
- 2007  
 Invited participant, Climate Engineering Workshop, organized by Harvard University and the University of Calgary, American Academy of Arts and Sciences, Cambridge MA, November 7-9
- 2007  
 Invited attendee (by former VP Al Gore) at the award ceremony for the Nobel Peace Prize to the Intergovernmental Panel on Climate Change and Al Gore in Oslo, Norway, December 9-11
- 2007  
 Invited talks and briefings: International Reporting Project, The Johns Hopkins School for Advanced International Studies (January 22, Washington, DC); Course on Sustainable Energy Technologies, The Johns Hopkins School for Advanced International Studies (February 1, Washington, DC); DC area graduates of Al Gore training session (February 3, Bethesda, MD); National Research Council fellows seminar (February 16, Washington, DC); Release of Confronting Climate Change briefings (February 27, New York, NY; February 28, Washington, DC); Dartmouth D.C. interns (March 22, Washington, DC); World Affairs Council of Washington DC (April 30, Washington, DC); Council of Science Society Presidents (May 7, Washington, DC); Adirondacks Research Consortium (May 22, Tupper Lake, NY); Ecology Club of Summerville High School (May 29, Sonora, CA); Tuolumne Unitarian Universalist Fellowship for the City of Sonora (May 29, Sonora, CA); Carnegie Institution of Washington, Department of Global Ecology (May 30, Stanford, CA); Capital Research and Management (June 5, Washington, DC); Future Forum (June 7, Cleveland, OH); International Union of Geodesy and Geophysics, Union lecture (July 2, Perugia, Italy, substituting for Robert Corell); International Association of Meteorology and Atmospheric Sciences special IPCC symposium (July 5, Perugia, Italy, substituting for Jean Palutikof); Fellow Seminar Series at Research Triangle Institute (Durham, NC, August 8); Exelon Corporation (Kennett Square, PA, August 14); Course on Climate and Energy Policy, The Johns Hopkins School for Advanced International Studies (September 17, Washington, DC); University of Pittsburgh, Department of Geology (Pittsburgh, PA, September 28); Rachel Carson Legacy Conference: Sustaining the Web of Life in Modern Society (Pittsburgh, PA, September 29);

President's Sustainability Symposium, University of Idaho (Moscow ID, October 1); MIT Alumni Club of Cape Cod (Chatham, MA, October 10—on Web at <http://alumweb.mit.edu/clubs/capecod/presentations.html>); Telecosm 2007, organized by George Gliner and Steve Forbes (Lake George NY, October 16); Conference of the Gulf Coast Association of Geological Societies (Corpus Christi TX, October 22); DC area graduates of Al Gore training session (November 17, Bethesda, MD); Pontifical Academy of Sciences symposium on planetary emergencies (The Vatican, December 19-20); also numerous media interviews and interactions, including NPR radio debate with Bjorn Lomborg (March 25); Nature Roundtable on Climate and Energy (October 26).

2007-2011

Past-President, International Association of Meteorology and Atmospheric Sciences

2008

Consultant and/or contract services to: ICFI (input for USDOT Environmental Impact Report); World Bank (for report on geoengineering); Impossible Films, Limited (for preparation of TV series)

2008

Attendee, Second Conference on The Oceans in a High CO<sub>2</sub> World, Monaco (October 6-9); SCOR 50<sup>th</sup> Anniversary Symposium, Woods Hole (October 20-21); AGU Meeting San Francisco (December 15-18)

2008

AAAS screening committee for radio journalism awards (Washington, DC, August 15)

2008

Consultant, World Bank (report on geoengineering in support of the *World Development Report-2009*)

2008

Member, informal Climate Intervention Research Planning Exercise (San Francisco, CA, December 15-17)

2008

Invited talks and briefings: Rotary Club of the District of Columbia (Washington, DC, January 9); National Council of Science and Education (Washington DC, January 16); Jet Propulsion Laboratory (Burbank CA, January 24); American Capital Group (Los Angeles CA, January 28); Televisa—Spanish language media company (Cozumel, Mexico, January 31); US-ASEAN briefing for ambassador from Singapore (Washington DC, March 6); District of Columbia Environmental Film Festival, premiere of film *Scarred Lands and Wounded Lives - the Environmental Footprint of War* (on panel as one of the interviewees featured in the film, Washington DC, March 11); DOE Sponsored Workshop on Next-Generation Terrestrial Climate Change Experiments (Crystal City, April 15); Hofstra University (Hempstead, NY, May 1) [see [http://www.hofstra.edu/Academics/educ8/educ8\\_gallery\\_climatechange\\_050108.html](http://www.hofstra.edu/Academics/educ8/educ8_gallery_climatechange_050108.html)]; Hertz Foundation Washington DC area meeting (NASA Goddard, May 4); Herricks High School (New Hyde Park, NY, May 14); Aldersgate Methodist Church (Alexandria, VA, May 20); Capital Research Management (Washington, DC, May 22); American Meteorological Society policy forum (Washington DC, June 1); Air and Waste Management Association (Portland OR, June 25); President's Climate Action Project, briefing (Washington DC, July 1); World Future Society (Washington DC, July 28); University of Michigan class (Ann Arbor, MI, September 8); World Congress of the Association of Energy Engineers (Washington DC, October 1); 16<sup>th</sup> Biennial AMS/AGU Joint Heads and Chairs Meeting (Boulder CO, October 16); University of Mexico Journalists Workshop on Climate Change (Mexico City, Mexico, November 13); USGS Meeting on Center for Climate and Wildlife, panelist (Landsdowne VA, December 3-4); and numerous interviews and discussions with media.

2008-2009

Member, Blue Ribbon Review Panel for the CCSP Unified Assessment Product “Global Climate Change Impacts in the United States”

2008-2011

Member, US National Committee for the International Union of Geodesy and Geophysics of the National Academy of Sciences (Irvine, CA, Nov. 4-5, 2007; Washington DC, May 21, 2008; Irvine, CA, Nov. 16-17, 2008; Washington DC, May 5, 2009; Irvine CA, Nov. 12-13, 2009; Washington DC, May 11, 2010; Irvine CA, Nov. 10-12, 2010; also meetings in 2011 and 2012; Washington DC, May 2-3, 2015).

2008-

Expert scientist for World Wildlife Fund's Climate Witness program (3 responses)

2009

- Chair and panelist, Geoengineering, MOCA-09 Joint Scientific Assembly of the International Association of Meteorology and Atmospheric Sciences/ International Association of the Physical Sciences of the Ocean/International Association of Cryospheric Sciences, Montreal, Canada, July 23, 2010
- 2009  
Invited speaker (on the importance of limiting emissions of non-CO<sub>2</sub> greenhouse gases) and participant, 42nd Session of the International Seminars on Planetary Emergencies, 19-24 August, Erice, Sicily, Italy
- 2009  
Invited talks and briefings: Georgetown University Law School, class on climate change (Washington, DC, January 15); Course on Sustainable Energy Technologies, The Johns Hopkins School for Advanced International Studies (Washington, DC, January 29); Environmental and Energy Study Institute (Washington DC, February 25) [see [http://www.eesi.org/022509\\_climate](http://www.eesi.org/022509_climate)]; International Scientific Congress on Climate Change (Copenhagen, two talks, March 11); Washington Area Model UN Conference (Washington DC, March 27); Clemson University (Clemson, SC, April 16); Stanford University/Carnegie Institution, May 20); AMS Summer Policy Colloquium (Washington, DC, June 4); Johns Hopkins University Applied Physics Laboratory (Laurel, MD, June 5); CIRCLE Project/Clean Air-Cool Planet/Clean Air Task Force (Washington DC, June 17); Laboratory Energy Research and Development Working Group (LERDWG), (Washington DC, June 24); DOT 'Perspectives on Climate Change' seminar series (Washington DC, August 6); Meridian International Center, foreign reporters and parliamentarians (Washington DC, September 17); UNEP press conference on release of *Climate Change Compendium 2009* (National Press Club, Washington DC, September 24); Mid-Maine Global Forum (Waterville ME, September 25); Colby College (Waterville ME, September 25); University of Michigan (Ann Arbor MI, September 28); Cornell University (Ithaca NY, September 30); Institute of Earth Environment (Xi'an China, October 13); Institute of Atmospheric Physics Chinese Academy of Sciences (Beijing China, October 16); Lawrence Livermore National Laboratory (Livermore CA, October 26); US-China Conference on Ecology and Biofuels (Oak Ridge National Laboratory, Oak Ridge TN, November 11); and numerous interviews and discussions with media.
- 2009-2010  
Chair, Scientific Organizing Committee, Asilomar International Conference on Climate Intervention Technologies: Minimizing the Potential Risk of Research to Counter-balance Climate Change and its Impacts, Asilomar CA, March 22-26, 2010.
- 2009-2010  
Member, Advisory Board for the Global Adaptation Atlas, Resources for the Future
- 2010  
Chair, External Review Panel for Assessing the State-of-the-Science for the Global Climate Change Domain within Research Triangle Institute International (RTI International), Research Triangle Institute, NC, June 28-29.
- 2010  
Participant, White House Adaptation Summit, Washington DC, May 25-27.
- 2010  
Member of mock Congress panel for Thomas Jefferson High School class; Woodrow Wilson Center for Scholars, October 19.
- 2010  
Participant, EPA-DOE Climate Damages Workshop (The Social Cost of Carbon), Washington DC, November 18-19.
- 2010  
Participant, US National Assessment Scenarios Workshop (Washington DC, Dec. 6-8) and US National Assessment Workshop on Climate Modeling (Dec. 9)
- 2010  
Invited talks and briefings: American Meteorological Society Monthly Forum (US Senate and House of Representatives, Washington DC, January 8); Center for a New American Security (Arlington VA, January 11); Center for American Progress (Washington DC, February 3); Princeton University IMAGINE Symposium (Princeton NJ, February 12); World Resources Institute (Washington DC, March 2); World Bank (Washington DC, March 3); Asilomar International Conference on Climate Intervention Technologies (Pacific Grove CA, March 22-26); Environmental group briefing (Washington DC, April 6); Energy Bar Association (Washington DC, April 7); Yale Black Carbon Mitigation Workshop (New Haven CT, March 9-10); American Association for the Advancement of Science (Washington DC, April 20); Laboratory Energy Research and Development Working Group (LERDWG), (Washington DC, April 21); Cosmos Club (Washington, DC, May 10); Center for Clean Air Policy (Washington DC, May 12); The Hill School

(Middleburg VA, May 20); International Association of Plant Biotechnology (St. Louis MO, June 7); Japan-US Science Forum 2010 (Washington DC, June 15); University of Albany, 50<sup>th</sup> Anniversary celebration of Atmospheric Sciences, October 4); University of Michigan (Ann Arbor, October 26); Greenpeace (Washington DC, December 1); American Geophysical Union fall meeting (San Francisco, Dec. 14); and numerous interviews and discussions with media.

2010-present

Member, Board of Advisers, Climate Science Communication Network

2010-present

Member, Board of Advisers, Climate Communication Shop

2011-2013

Member, Review Panel for EPA STAR fellowships (March 9-10, 2011, Springfield VA; March 6-7, 2012 Arlington VA; March 14-15, Chantilly VA)

2011

Member, Climate Change Panel, Global Alliance for Clean Stoves

2011

Participant, Keck Institute for Space Studies study team for monitoring of geo-engineering effects and their natural and anthropogenic analogues, Pasadena, CA, May 23-26, 2011 and November 15-18, 2011 (and also working group activities during the year).

2011

Participant, IPCC Expert Meeting on Geoengineering, Lima, Peru, June 20-22, 2011.

2011

Session chair and speaker, XXV Congress of the International Union on Geophysics and Geodesy (IUGG), symposia on geoengineering and on climate modeling, Melbourne, Australia, June 30-July 2, 2011.

2011

Participant, Stephen Schneider Memorial Symposium, Boulder, Colorado, August 24-27, 2011.

2011

Participant and poster presenter, WCRP Open Science Meeting, Denver CO, October 24-28, 2011.

2011

Participant and poster presenter, AGU Meeting, San Francisco CA, December 5-9, 2011.

2011

Invited talks and briefings: Environment and Energy Study Institute: Capitol Hill briefing (Washington DC, April 25); Osher Life Long Living (Alexandria VA, May 12); Keck Institute short course on climate physics and geoengineering (Pasadena CA, May 23); State of Victoria, Australia, Department of Economic Development (Melbourne, Australia, July 9); IEEE's Aerospace Electronics and Systems Society Wednesday Technical Series (Washington DC, July 13); CleanEnergy.org Webinar on "Tackling Black Carbon: Impacts and Solutions to Reducing this Short-Lived Climate Forcer and Public Health Threat" (Washington DC, July 14); Department of Homeland Security adaptation planning program (Washington DC, August 3); State Department visitors from Poland (Meridian Center, Washington DC, September 7); DOE Laboratory Energy Research and Development Working Group (Washington DC, September 21); Students of Dickinson College (Washington DC, October 20); University of Michigan geoengineering class (Ann Arbor MI, November 1); Board of Directors of the William and Flora Hewlett Foundation (Menlo Park CA, November 14); and numerous interviews and discussions with media (including Diane Rehm Show on NPR (August 2).

2012

Participant, Erb/UCS Workshop on Increasing Public Understanding of Climate Risks and Choices: What We Can Learn from Social Science Research and Practice, University of Michigan, Ann Arbor, January 19-21, 2012.

2012

Participant, UCS/Climate Accountability Project Workshop on Climate Accountability, Public Opinion, and Legal Strategies, La Jolla, CA, June 14-15.

2012

Invited talks and briefings: Department of State International Visitor Leadership Program, Arctic Development and Security in an Age of Climate Change, A Project for Canada (Meridian Institute, Washington DC, February 24); Discussant for "A Conversation on Climate Change with Brazilian Expert Luiz Gylvan Meira Filho" (Woodrow Wilson International Center for Scholars, Brazil Institute, Washington DC, March 28); Byrd Polar Research Center, Ohio State University (Columbus OH, April 18); State of Ohio Bar Association, Environmental Section (Newark OH, April 19); International Polar Year Knowledge to Action

- Science Conference (poster presentation, Montreal, Canada, April 22-27); University of Michigan geoengineering class (Ann Arbor MI, September 25); and other interviews and discussions with media.
- 2012-2014  
Science advisor, Al Gore Climate Speaker Training Session (San Francisco CA, August 21-23, 2012; Chicago, July 30-August 1, 2013; Melbourne, Australia, June 25-27, 2014)
- 2012-2013  
Group Facilitator for the Section 4 (Climate) Public Comment Working Group handling comments on the Proposed LEO-SCS-002 Standard; organized by the Leonardo Academy.
- 2012-13  
Organizer and expert reviewer, MIT Climate CoLab contest on geoengineering
- 2013  
Co-organizer, Symposium and workshop on “Enhancing Preparedness and Building Resilience in the Rapidly Changing Arctic: Developing an Action Plan,” workshop 12 at the National Council for Science and the Environment 13th National Conference on Science, Policy, and the Environment Disasters and Environment: Science, Preparedness, and Resilience, Washington DC, January 15-17, 2013.
- 2013  
Panelist for the workshop “Tackling Climate Change in the Arctic: An International Emergency,” organized by the 2013 Climate Leadership Conference sponsored by the American Climate Change Officers, the Center for Climate and Energy Solutions, the Climate Registry, and the US Environmental Protection Agency, Washington DC, February 27.
- 2013  
Participant, World Bank Expert Focus Group Discussion on Climate Change, Mexico City, April 9, 2013
- 2013  
Medal Lecturer, the Miguel Aleman Foundation, Mexico City, Mexico, April 10, 2013.
- 2013  
Planning committee for and participant in the special workshop on “White Arctic, Blue Arctic: Exploring Sea Ice Restoration,” The Earth Institute, Columbia University, April 24-25, 2013.
- 2013  
Session organizer and speaker, Joint Assembly of IAMAS/IACS, July 7-12, Davos, Switzerland. Co-author on resolutions of cooperation with Future Earth project of ICSU; and on geoengineering and aerosol/cloud uncertainties.
- 2013  
Participant, Union of Concerned Scientists Workshop: Industrial Carbon Producers & Climate Change Impacts, Chevy Chase MD, September 11, 2013.
- 2013  
Invited talks and briefings: to Tobias Gras, Danish Agriculture Council in Brussels (Washington DC, March 28); Miquel Aleman Foundation (Mexico City, Mexico, April 10); AGU Chapman Conference on Climate Communication (Granby CO, June 8-13); Rising Voice of Indigenous Peoples Gathering (Boulder CO, July 1-2); Society of Conservation Biology (Baltimore MD, July 22); US Postal Service Working Group on Climate Change (August 13, Washington DC); Carnegie Institution panel on “blocking the Sun: Will Solar geoengineering research Increase or Decrease the Risk of Climate Change?” (September 10, Washington DC); University of Michigan class (September 24, Ann Arbor, MI); Military Advisory Board (September 26, Alexandria VA); World Energy Engineers Conference (September 26, Washington DC); Johns Hopkins Geoengineering Panel (October 17, Washington DC); PIMAX-Insulation Manufacturers (October 29, Washington DC); Catholic University of America (November 20, Washington DC); Eastern Middle School video interview, award-winning student video (November 22, Silver Spring, MD); Syracuse University class (December 3, Washington DC); and other interviews and discussions with media.
- 2013-2014  
Adviser, World Bank planning committee for MOOC on climate change, and reviewer of draft reports “Turn Down the Heat”
- 2013-2014  
Lead organizer, AAAS Annual Meeting symposium “Santa’s Revenge: the Impacts of Arctic Warming on the Mid-Latitudes” (<http://aaas.confex.com/aaas/2014/webprogram/Session6975.html>); unable to attend due to now storm cancelling the flight.
- 2014  
Invited talks and briefings: National Council for Science and the Environment 13th National Conference (January 29, Washington DC); Energy Bar Association (February 12, Washington DC); World Bank MOOC

Hangout (February 18, Washington DC); Making a Living on a Living Planet: Toward a More Just and Sustainable Economy (March 11, Washington DC); US Technical Advisory Group (TAG) for American National Standards Institute (Orlando, FL, March 17); Princeton University Reunions (Princeton NJ, May 30); AGU Science Policy Conference panel (Washington DC, June 17); Commonwealth Scientific and Industrial Research Organization-CSIRO (Aspendale, Victoria, Australia, June 24); US Technical Advisory Group for Environmental Standards (Washington DC, August 4); US-Europe meeting on geoengineering (Washington DC, September 18); Security and Sustainability Forum webinar “The Case for New Climate Change Metrics” (from Bethesda MD, October 2); Dickinson College class on climate change (Washington, DC, October 21; Lehigh University lecture (Lehigh PA, October 24); Clarendon Methodist Church (Clarendon VA, November 13); World Science Summit on Climate Engineering (Washington DC, December 2-3); and other interviews and discussions with media.

2014

Invited participant, workshop on Communicating the Science and Impacts of Fundamental Earth System Change: A Focus on Ice-Snow-Water, November 12-14, Washington DC (also follow-up work on the workshop report)

2014

Participant and invited speaker, World Science Summit on Climate Engineering (Washington DC, December 2-3)

2014 (Sept)-2015 (March)

Member, Black Carbon Expert Panel, organized by The Gold Standard Foundation (frequent calls, and meeting in San Diego, December 6-7, 2014)

2014-

American Meteorological Society Committee on Effective Communication of Weather and Climate Information (CECWCI); numerous email exchanges and occasional conference calls

2014-

Member, IUGG Inter-Union Commission on Climate and Environmental Change (meetings: Beijing, China, April 11-12, 2014; Prague, Czech Republic, June 30, 2015)

2014-

Liaison from US National Committee to IUGG to the US SCOSTEP Coordinating Group

2014-

Member, ASQ (American Standards for Quality) Technical Advisory Group ISO/TC 207 (TAG 207) on Environmental Management and the ASC Z1 Subcommittee on Environmental Management (meetings in Orlando, March 2014; Washington DC, August 4; Orlando FL, March 2015; Washington DC, August 10)

2015

Invited talks and briefings: Georgetown University class on Catholic Social Teaching (Washington DC, January 13); visiting Iranian academics hosted by AAAS (Washington DC, March 18); visiting Kazakhstan officials hosted by the Meridian International Center (Washington DC, March 30); class at American University (Washington DC, April 1); panel on climate change at House of Representatives organized by Congressman Lieu (D-CA) (Washington DC, June 3); IUGG General Assembly (Prague, June 23-July 1); St. Raphael Catholic Church (Rockville MS, September 26); and other interviews (including with two students as input for a C-SPAN contest) and discussions with media.

### ***Family***

Wife; married in 1967 to Sandra Svets in Livermore, California

Children:

Chris (BA, Univ. of California Santa Cruz, 1992; MS Industrial Administration, Carnegie-Mellon, 1996); employed by ICF Consulting, Falls Church VA. Married and living in Mclean, VA.

Ron (BS, Univ. of California Santa Cruz, 1993; MS, Univ. of California Davis, 1997); employed by Centric Software, San Jose, CA. Married and living in San Jose, CA.

### ***Civic Activities***

Treasurer, Yelping Hill Association, West Cornwall CT; elected July 2015-

Editor, *Princeton Class of 1964 50<sup>th</sup> Reunion Book*, 2013-14, 752 pp.

Board of Directors, Livermore Area Recreation and Park District, Livermore California; publicly elected 1970; re-elected 1974; Chairman 1974, 1978; Second term completed November, 1978.

Livermore Youth Soccer Association, variously coach, referee, age-group coordinator in late 1970s/early 80s.

Board of Directors, University of California Livermore Employees Credit Union, Livermore, California; 1969–71.  
President, Livermore Tennis Club, 1968-69.