

CURRICULUM VITAE

William Ewart Easterling, III
Dean
College of Earth and Mineral Sciences
116 Deike Building
The Pennsylvania State University
University Park, PA 16802

email: billeasterling@psu.edu
phone: (814) 865-6546
fax: (814) 863-7708

PERSONAL:

Born October 2, 1953, Chapel Hill, North Carolina.
Married, four daughters

EDUCATION:

Ph.D. Geography-Climatology, University of North Carolina at Chapel Hill, December 1984
M.A. Geography-Industrial Location Economics, University of North Carolina at Chapel Hill, 1980
B.A. Geography and History, University of North Carolina at Chapel Hill, 1976
Diploma Christchurch School, Christchurch, Virginia, 1972

POSITIONS:

2007-date **Dean, College of Earth and Mineral Sciences, The Pennsylvania State University.** Dr. Easterling is the Chief Academic Officer of the College. He is responsible for all curricular, research, and outreach programs in a college that consists of 5 academic departments: Energy and Mineral Engineering, Geography, Geosciences, Material Sciences and Engineering, and Meteorology; and 3 standing institutes: John A. Dutton e-Education Institute, Earth and Environmental Systems Institute, and the EMS Energy Institute. He led the faculty through the development of the College's 2009-2014 Strategic Plan, which currently guides new thrusts in international earth and energy science education, traditional and high-risk research in clean carbon energy, natural gas technology, cryospheric science, and the science of weather risk. He oversees the hiring, promotion and tenure procedures for 136 standing faculty members and 120 fixed-term faculty members. He presides over a faculty that has averaged \$75 million a year in research expenditures for the past 5 years, which is the highest expenditure per FTE among all colleges at Penn State. More about his duties and the College can be learned at http://www.ems.psu.edu/about_ems.

- 1999-date **Professor** of Geography and Earth System Science, **Faculty Affiliate**, Earth and Environmental Systems Institute, and **Member** of the Graduate School, **Courtesy Professor** of Agronomy, The Pennsylvania State University.
- 2001-2007 **Director**, Penn State Institutes of Energy and the Environment (PSIEE), The Pennsylvania State University. Dr. Easterling was the founding director of the PSIEE during a period in which Penn State rose from 25th to 10th in federal environmental research expenditures according to NSF. He directed the coordination of interdisciplinary environmental and energy research, teaching and outreach across 8 Colleges of the University. He facilitated the allocation of 30 new faculty lines in targeted environmental priority areas including: air quality, biodiversity and ecosystems, environmental health, renewable energy, global environmental change, green engineering and industrial ecology, and water resources. Expansion of the PSIE to include all energy sciences, engineering, and policy was accomplished in November 2006 by vote of the Board of Trustees. Under Dr. Easterling's leadership, the University augmented the resources of the PSIEE to add 24 new faculty lines and associated program funds for energy. Dr. Easterling was advised by a Coordinating Council consisting of faculty representatives from each of the 8 member Colleges and was responsible to an Executive Committee consisting of College Deans and the Senior Vice-President for Research.
- 1997-1998 **Associate Professor** of Geography and Earth System Science, **Faculty Affiliate**, Environment Institute, and **Member** of the Graduate School, The Pennsylvania State University.
- 1996-1998 **Interim Director**, National Institute for Global Environmental Change (NIGEC)–U.S. Department of Energy (located at the University of California at Davis). Dr. Easterling directed all operations of the NIGEC—a consortium of six university-based regional research centers—including strategic planning of research programs, oversight of budgets and operations, and reporting of progress to the Department of Energy and NIGEC Board of Trustees. Made numerous presentations concerning NIGEC programs (to NIGEC Board of Trustees, to NIGEC Regional Center Annual Workshops, to member universities, to Department of Energy Program Managers, to other federal agencies, and to the broader scientific community and public).
- 1993-1997 **Associate Professor** of Agricultural Meteorology, **Graduate Faculty Fellow**, University of Nebraska-Lincoln, and **Adjunct Associate Professor** of Geography, University of Illinois--Champaign-Urbana.
- 1992-1997 **Director**, Great Plains Regional Center for Global Environmental Change (located at the University of Nebraska-Lincoln) Sponsored by the U. S. Department of Energy (DOE), Dr. Easterling directed all operations of the Center, including management of staff and budget, conduct of grant competitions and recruitment of potential investigators, oversight of funded research projects, integration and planning of research programs, reporting of research progress and results to DOE, publication of reports and outreach to researchers and the public.
- 1991-1993 **Assistant Professor** of Agricultural Meteorology, University of Nebraska-Lincoln and **Adjunct Assistant Professor** of Geography, University of Illinois--Champaign-Urbana.

- 1987-1991 **Fellow**, Climate Resources Program, Resources for the Future (RFF), **Adjunct Assistant Professor** of Geography, University of Illinois--Champaign-Urbana and **Adjunct Assistant Professor** of Agricultural Meteorology, University of Nebraska-Lincoln.
- 1987 **Professional Scientist**, Climate and Meteorology Section, Illinois State Water Survey, Champaign, IL and **Adjunct Assistant Professor** of Geography, University of Illinois-Champaign-Urbana.
- 1984-1986 **Associate Professional Scientist**, Climate and Meteorology Section, Illinois State Water Survey, Champaign, IL and **Adjunct Assistant Professor** of Geography, University of Illinois-Champaign-Urbana.
- 1983-1984 **Mellon Foundation Fellow-in-Residence**, Board on Atmospheric Sciences and Climate, National Academy of Sciences/National Research Council, Washington, DC.
- 1983-1984 **Staff Officer**, Planning for the International Geosphere-Biosphere Program, National Academy of Sciences/National Research Council.
- 1980-1983 **Academic Advisor**, Evening College, University of North Carolina at Chapel Hill.
- 1980 **Research Assistant**, Institute for Research in the Social Sciences, University of North Carolina at Chapel Hill (Summer).
- 1977-1982 **Graduate Research Assistantships and Teaching Fellowships**.
- 1975-1977 **Student Assistant**, Library Accounting Department, Wilson Graduate Library, University of North Carolina at Chapel Hill.

HONORS, AWARDS, AND SPECIAL RECOGNITION:

- Smith Fund Competitive Travel Award**, for travel to the Regional Science Association Meetings in Washington, D. C. University of North Carolina at Chapel Hill, 1981.
- Andrew Mellon Foundation Resident Fellowship**, Board on Atmospheric Sciences and Climate, National Academy of Sciences--National Research Council, Washington, D.C., 1983-84.
- W. R. Boggess Award for the Most Outstanding Paper** published in *The Water Resources Bulletin* in 1989, American Water Resources Association. Received January 1991.
- Fellow**, Center for Great Plains Studies, University of Nebraska-Lincoln, 1993-present.
- Associate**, Center for Grassland Studies, University of Nebraska-Lincoln, Institute of Agriculture and Natural Resources, 1994-1997.
- Graduate Faculty Fellow**, University of Nebraska-Lincoln, 1993-1997.
- Faculty Associate**, Global Environmental Assessment Project, Belfer Center for Science and International Affairs, John F. Kennedy School of Government, Harvard University, Cambridge, MA, 1997-1999.
- Honorary Director**, National Institute for Global Environmental Change (by unanimous vote of the Institute's Board of Trustees at conclusion of term as Interim Director). 1997.
- Graduate Faculty Member**, The Pennsylvania State University, 1997-present.

- Faculty Affiliate**, Energy Institute, College of Earth and Mineral Sciences, The Pennsylvania State University, 1999-present.
- Faculty Affiliate**, Department of Agronomy, College of Agricultural Sciences, The Pennsylvania State University, 2000-present.
- Wilson Award for Excellence in Research**, College of Earth and Mineral Sciences, The Pennsylvania State University, 2003.
- Coordinating Lead Author**, Intergovernmental Panel on Climate Change, Working Group II, Third Assessment Report (Chapter 5, Ecosystems and Their Services), 1999-2001. (Nominated by the White House Office of Science and Technology Policy)
- Coordinating Lead Author**, Intergovernmental Panel on Climate Change, Working Group II, Fourth Assessment Report (Chapter 5, Food, Fibre, Forestry), 2005-2007. (Nominated by the White House Office of Science and Technology Policy) The IPCC, its Chairpersons, and Lead Authors were co-awarded the 2007 Nobel Peace Prize with former Vice President Al Gore.
- Nominator**, John D. and Catherine T. MacArthur Foundation Fellows Program, 2009-present.
- Fellow**, American Association for the Advancement of Science, elected 2010 for contributions to climate change science.

NAMED AND OTHER SIGNIFICANT LECTURES, CONGRESSIONAL AND EXECUTIVE OFFICE PRESENTATIONS

- Easterling, W. E. 1997. Climate Change and Hunger. Walter Orr Roberts Memorial Lecture, Aspen Global Change Institute, Aspen, CO.
- Easterling, W. E. 1997. How Climate and Climate Change Impact People and the Way They Live. **Invited presentation** to the Joint White House-National Oceanic and Atmospheric Administration Briefing to Broadcast Weathercasters, Washington D. C. (followed by panel discussion with President Bill Clinton and Vice President Al Gore in preparation for Kyoto Protocol meetings)
- Easterling, William E. 2000. Scales of Climate Variability and Agricultural Production: Can Ever the Twain They Meet? **Invited presentation** in the Brown Memorial Lecture Series on Scale in Geography in Commemoration of the 75th Anniversary of the Founding of the Department of Geography, University of Minnesota, Minneapolis.
- Easterling, W. 2003. The Impacts of Climate Change on U.S. Agriculture; What Can Farmers Do About It? **Invited presenter and panelist**. Briefing to the Agriculture Committee of the United States Senate, Organized by the Harvard School of Public Health. Washington, DC.
- Easterling, W. E. 2006. Recent Climate Variability and Future Climate Change: What They Mean for the Nation's Farming. **Invited Presentation**. Senate Briefing sponsored by the AAAS Center for Science, Technology and Congress. 2006.
- Easterling, W. E. 2007. Food and Climate Change: Summary of the 2007 IPCC Report, **Invited Testimony** before the Committee on Science, U. S. House of Representatives.
- Easterling, W. E. 2007. Agricultural Adaptation to Climate Change: What We Know and What We Need to Know. **Invited Briefing** to the Committee on Energy and Natural Resources, U. S. Senate and briefing to the Committee on Science, U. S. House of Representatives.
- Easterling, W. E. 2007. Climate Change Effects on Food, Fibre, and Forestry, **Invited Presentation** at Symposium on Results of the Working Group II Fourth Assessment Report of the Intergovernmental Panel on Climate Change, Royal Society, London.

- Easterling, W. 2008. Adaptation to Climate Change. **Keynote presentation** to Peruvian Society of Mining, Metallurgy, and Exploration. Lima.
- Easterling, W. E. 2009. **Invited Guest and Panelist** for a joint National Science Foundation Television Network—*Discover Magazine* live webcast and follow-up magazine article on climate change science. San Francisco Exploratorium..
- Easterling, W. E. 2009. Can the World's Farmers Feed Ten Billion People as the Climate Changes? **Keynote Presentation** to the FEBS 2009 Congress on Adaptation Potential in Plants, Gregor Mendel Institute of Molecular Plant Biology, Vienna.
- Easterling, W. E. 2011. The Future of Global Food Security. **Keynote Presentation** to the Princess of Thailand on the occasion of the dedication of Thailand's new Agricultural Research and Development Building. Bangkok.
- Easterling, W. E. 2011. **Invited Panelist** for Indonesia and Pakistan segments of *24 Hours of Reality*, YouTube special on climate change, sponsored by Former Vice President Al Gore, New York.

RESEARCH, CREATIVE ACCOMPLISHMENTS, AND SCHOLARSHIP

Research and/or scholarly publications

1. Articles published in refereed journals

1. Robinson, P. J. and W. E. Easterling. 1982. Solar Energy Climatology of North Carolina. *Journal of Applied Meteorology*, 21(11):1730-1738.
2. Easterling, William E. 1985. Review of: R. S. Chen, E. R. Boulding, and S. H. Schneider (eds.). 1984. *Social Science Research and Climate Change*. In *Bulletin of the American Meteorological Society*, 66(7).
3. Easterling, W. E. 1986. NOAA Monthly and Seasonal Weather Outlook Subscribers. *Bulletin of the American Meteorological Society*, 67(9):402-410.
4. Easterling, W. E. and J. W. Mjelde. 1987. The Importance of Seasonal Climate Prediction Lead Time in Agricultural Decision Making. *Agricultural and Forest Meteorology*, 40:37-50.
5. Easterling, W. E. and S. A. Changnon, Jr. 1987. Climatology of Precipitation Droughts in Illinois Based on Water Supply Problems. *Physical Geography* 8(4).
6. Easterling, W. E. and D. A. Wilhite. 1987. Improving Drought Policy: A Plan of Action. *Journal of Land Use Planning Policy*, 4 (4): 444-448.
7. Easterling, W. E., S. A. Isard, P. Warren, P. Guinan, and M. Shafer. 1988. Improving the Detection of Agricultural Drought: The Case of Illinois Corn Production. *Agricultural and Forest Meteorology*, 43:37-47.
8. Richman, M. B. and W. E. Easterling. 1988. Procrustes Target Analysis: A Multivariate Tool for Identification of Climatic Fluctuations. *Journal of Geophysical Research*, 93:10,989-11,033.
9. Changnon, Jr., S. A. and W. E. Easterling. 1989. Measuring Drought Impacts: The Illinois Case. *Water Resources Bulletin*, 25(1):27-42.
10. Isard, S. A. and W. E. Easterling. 1989. Predicting Large-Area Corn Yield with a Weighted Palmer Z-Index. *Journal of Climate*, 2(3):248-252.

11. Wilhite, D. A. and W. E. Easterling. 1989. Drought Policy: Toward a Plan of Action. *EOS*, 70(7):106-108.
12. Easterling, William E. 1992. Review of: Maunder, J. 1989. *The Human Impacts of Climate Uncertainty: Weather Information, Economic Planning and Business Management*. In *Agricultural and Forest Meteorology*, 52:326-328.
13. Easterling, W. E., N. J. Rosenberg, M. S. McKenney and C. A. Jones. 1992. An Introduction to the Methodology, the Region of the Study, and a Historical Analog of Climate Change. Special Issue: Methodology for Assessing Regional Agricultural Consequences of Climate Change. *Agricultural and Forest Meteorology*, 59(1-2):3-15.
14. Easterling, W. E., N. J. Rosenberg, M. S. McKenney, C. A. Jones, P. T. Dyke and J. R. Williams. 1992. Preparing the Erosion Productivity Impact Calculator (EPIC) Model to Simulate Crop Response to Climate Change and the Direct Effects of CO₂. Special Issue: Methodology for Assessing Regional Agricultural Consequences of Climate Change. *Agricultural and Forest Meteorology*, 59(1-2):17-34.
15. Rosenberg, N. J., M. S. McKenney, W. E. Easterling and K. M. Lemon. 1992. Validation of EPIC Model Simulations of Crop Responses to Current Climate and CO₂ Conditions: Comparisons with Census, Expert Judgment and Experimental Plot Data. Special Issue: Methodology for Assessing Regional Agricultural Consequences of Climate Change. *Agricultural and Forest Meteorology*, 59(1-2):35-51.
16. Easterling, W. E., M. S. McKenney, N. J. Rosenberg, and K. M. Lemon. 1992. Simulations of Crop Response to Climate Change: Effects with Present Technology and No Adjustments (the 'dumb farmer' scenario). Special Issue: Methodology for Assessing Regional Agricultural Consequences of Climate Change. *Agricultural and Forest Meteorology*, 59(1-2):53-73.
17. Easterling, W. E., N. J. Rosenberg, K. M. Lemon and M. S. McKenney. 1992. Simulations of Crop Responses to Climate Change: Effects with Present Technology and Currently Available Adjustments (the 'smart farmer' scenario). Special Issue: Methodology for Assessing Regional Agricultural Consequences of Climate Change. *Agricultural and Forest Meteorology*, 59(1-2):75-102.
18. McKenney, M. S., W. E. Easterling and N. J. Rosenberg. 1992. Simulation of Crop Productivity and Responses to Climate Change in the Year 2030: The Role of Future Technologies, Adjustments and Adaptations. Special Issue: Methodology for Assessing Regional Agricultural Consequences of Climate Change. *Agricultural and Forest Meteorology*, 59(1-2):103-127.
19. Easterling, W. E., III, P. R. Crosson, N. J. Rosenberg, M. S. McKenney, L. A. Katz and K. M. Lemon. 1993. Agricultural Impacts of and Responses to Climate Change in the Missouri-Iowa-Nebraska-Kansas (MINK) Region. *Climatic Change*, 24(1-2):23-62.
20. Rosenberg, N. J., P. R. Crosson, K. D. Frederick, W. E. Easterling, III, M. S. McKenney, M. D. Bowes, R. A. Sedjo, J. Darmstadter, L. A. Katz and K. Lemon. 1993. The MINK Methodology: Background and Baseline. *Climatic Change*, 24(1-2):7-22.
21. Angel, J. R., W. E. Easterling, III and S. W. Kirsch. 1993. Towards Defining Appropriate Averaging Periods for Climate Normals. *Climatological Bulletin*, 27(2):29-44.
22. Easterling, W. E. and R. W. Kates. 1995. Leading Climate Indicators of Impacts. *Climatic Change*, 34 (2,3,4): 623-648.
23. Easterling, W. E. 1995. Long-Term Climate Monitoring by the Global Climate Observing System (GCOS). *Climatic Change*, 34 (2,3,4):181-184.
24. Easterling, III, W. E. 1996. Adapting North American Agriculture to Climate Change. Editorial in Easterling, W. E., guest editor, special issue of *Agricultural and Forest Meteorology*, 80(1):ix-xi.

25. Easterling, III, W. E. 1996. Adapting North American Agriculture to Climate Change in Review. In Easterling, W. E., guest editor, special issue of *Agricultural and Forest Meteorology*, 80(1):1-53.
26. Easterling, W. E., X. Chen, C. J. Hays, J. R. Brandle and H. Zhang. 1996. Improving the Validation of Model-Simulated Crop Yield Response to Climate Change: An Application to the EPIC Model. *Climate Research*, 6:263-273.
27. Guertin, D. S., W. E. Easterling and J. R. Brandle. 1996. Global Change and Biological Diversity in the Great Plains: A Review of Methods and Assessment of Prospects. *Bioscience*, Vol. 47, 5:287-296.
28. Easterling, W. E., C. J. Hays, M. McKenney Easterling and J. R. Brandle. 1997. The Role of Trees in the Adaptation of Great Plains Agroecosystems to Climate Change: A Sensitivity Analysis of Shelterbelts. *Agriculture, Ecosystems and the Environment*, Vol. 61, No. 2/3, pp. 163-175.
29. Easterling, W. E. 1997. Why Regional Studies are Needed in Support of Full-Scale Integrated Assessment Modeling of Global Change Processes. *Global Environmental Change*, Vol. 7, No. 4, pp 337-356.
30. Easterling, W. E., A. Weiss, C. Hays and L. Mearns. 1998. Spatial Scales of Climate Information for Simulating Wheat and Maize Productivity: The Case of the U. S. Great Plains. *Agricultural and Forest Meteorology*, 90:51-63.
31. Easterling, W. E., C. Polsky, S. Aryeetey-Attoh, D. Goodin, M. Mayfield, and B. Yarnal. 1998. Changing Places, Changing Emissions: the Cross-Scale Reliability of Greenhouse Gas Emission Inventories in the U. S. *Local Environment*, 3(3): 247-262.
32. Mearns, L. O., T. Mavromatis, E. Tsvetsinskaya, C. Hays, and W. Easterling. 1999. Comparative Response of EPIC and CERES Crop Models to High and Low Resolution Climate Change Scenarios. *Journal of Geophysical Research* Vol. 104 , No. D6 , p. 6623-6646.
33. Brown, Robert, N. J. Rosenberg, C. J. Hays, W. E. Easterling, and L. O. Mearns. 2000. Potential Production and Environmental Effects of Switchgrass and Traditional Crops Under Current and Greenhouse-Altered Climate in the Central United States: A Simulation Study, *Agriculture, Ecosystems and the Environment*, 78:31-47.
34. Schneider, S. H., William E. Easterling, and Linda O. Mearns. 2000. Adaptation: Sensitivity to Natural Variability, Agent Assumptions, and Dynamic Climate Changes. *Climatic Change*. 45 (1):203-221.
35. Easterling, W. E., J. R. Brandle, C. J. Hays, Q. Guo, and D. S. Guertin. 2001. Simulating the impact of human land use change on forest composition in Great Plains agroecosystems with the *Seedscape* model. *Ecological Modeling*, 140: 163-176.
36. Mearns, L. O., W. Easterling, C. Hays, and D. Marx. 2001. Comparison of agricultural impacts of climate change calculated from high and low resolution climate change scenarios: part I. The uncertainty due to spatial scale. *Climatic Change*, 51: 131-172.
37. Easterling, W. E., L. O. Mearns, C. J. Hays, and D. Marx. 2001. Comparison of agricultural impacts of climate change calculated from high and low resolution climate change scenarios: part II. Accounting for adaptation and CO₂ direct effects, *Climatic Change*, 51:173-197.
38. Polsky, Colin and W. Easterling. 2001. Adaptation to climate variability and change in the U. S. Great Plains: A multi-scale analysis of Ricardian climate sensitivities, *Agriculture, Ecosystems, and the Environment*, 83:133-144.
39. Weiss, A., Cynthia J. Hays, Qi Hu, and William E. Easterling. 2001. Incorporating bias error in calculating solar irradiance: Implications for crop yield simulations, *Agronomy Journal*, 93: 1321-1326.

39. Tsvetsinskaya E., L.O. Mearns, and W.E. Easterling. 2001. Investigating the Effect of Seasonal Plant Growth and Development in 3-Dimensional Atmospheric Simulations. Part I: Simulation of Surface Fluxes Over the Growing Season. *Journal of Climate*, 14: 692-709.
40. Tsvetsinskaya E., L.O. Mearns, and W.E. Easterling. 2001. Investigating the Effect of Seasonal Plant Growth and Development in 3-Dimensional Atmospheric Simulations. Part II: Atmospheric Response to Crop Growth and Development. *Journal of Climate*, 14:711-729.
41. Polsky, Colin and William E. Easterling. 2001. A Methodology for a Multi-Scale Analysis of Land Use with an Application to the U. S. Great Plains. *Agriculture, Ecosystems and the Environment*, 85: 133-144.
42. Easterling, William E. and Kasper Kok. 2002. Emergent Properties of Scale in Global Environmental Modeling: Are There Any? *Integrated Assessment*, 2-3:233-246.
43. Easterling, W. E., N. Chhetri, and X. Niu. 2003. Improving the realism of modeling agronomic adaptation to climate change: simulating technological substitution, *Climatic Change*, 60:149-173.
44. Easterling W, Apps M. 2005. Assessing the consequences of climate change for food and forest resources: A view from the IPCC, *Climatic Change* 70 (1-2): 165-189.
45. Tubiello, F., J. Amthor, W. Easterling, R. Gifford, M. Howden, G. Fischer, M. Donatelli, J. Reilly, and C. Rosenzweig 2007. Crop response to elevated CO₂ and world food supply - A comment on "Food for Thought..." by Long et al., *Science* 312 : 1918-1921, 2006, *European Journal of Agronomy*, 26(3): 215-223.
46. William E. Easterling (Guest Ed.) 2007. *Climate Change and Food Security Special Feature: Climate change and the adequacy of food and timber in the 21st century*, *Proceedings of the National Academy of Sciences*, 104:19679; published online before print December 6, 2007.

Papers in the collection:

- John F. Morton 2007. *Climate Change and Food Security Special Feature: The impact of climate change on smallholder and subsistence agriculture*, *PNAS*, 104:19680-19685; published online before print December 6, 2007.
- Tubiello, F. N., Jean-François Soussana, and S. Mark Howden 2007. *Climate Change and Food Security Special Feature: Crop and pasture response to climate change*, *PNAS* 104:19686-19690; published online before print December 6, 2007.
- Howden, S. Mark, Jean-François Soussana, Francesco N. Tubiello, Netra Chhetri, Michael Dunlop, and Holger Meinke 2007. *Climate Change and Food Security Special Feature: Adapting agriculture to climate change*, *PNAS*, 104:19691-19696; published online before print December 6, 2007.
- Kirilenko, Andrei and Roger A. Sedjo 2007. *Climate Change and Food Security Special Feature: Climate change impacts on forestry*, *PNAS*, 104:19697-19702; published online before print December 6, 2007.
- Schmidhuber, Josef and Francesco N. Tubiello 2007. *Climate Change and Food Security Special Feature: Global food security under climate change*,

PNAS 104:19703-19708; published online before print December 6, 2007.

Brander, Keith M. 2007. *Climate Change and Food Security Special Feature: Global fish production and climate change*, PNAS, 104:19709-19714; published online before print December 6, 2007.

47. Chhetri, N. and W.E. Easterling, 2008. Climate change and food security in dryland regions of the world, *Annals of Arid Zone*, 47: 1-12.
48. Niu, X., W. E. Easterling, C. Hays, A. Jacobs, and L. Mearns 2008. Reliability and input-data induced uncertainty of the EPIC model to estimate climate change impact on sorghum yields in the US Great Plains, *Agriculture, Ecosystems, and the Environment*, 129(1-3): 268-276.
49. Currit, Nathan and W. Easterling. 2009. Globalization and population drivers of rural-urban land-use change in Chihuahua, Mexico. *Land Use Policy*, 26(3): 535-544.
50. Podesta, G., F. Bert, R. Rajagopalan, S. Appipattanavis, C. Laciana, E. Weber, W. Easterling, R. Katz, D. Letson, and A. Menendez. 2009. Decadal climate variability in the Argentine Pampas: regional impacts of plausible climate scenarios on agricultural systems, *Climate Research*, 40(2-3):199-210.
51. Chhetri, N., W. Easterling, A. Terando, and L. Mearns. 2010. Modeling path dependence in agricultural adaptation to climate variability and change, *Annals of the Association of American Geographers*, 100(4): 894-907.
52. Baum, S. and W. Easterling. 2010. Space-time discounting in climate change adaptation. *Mitigation and Adaptation Strategies for Global Change*, 15(6): 591-609.
53. Chhetri, N. and W.E. Easterling (2010) Adapting to climate change: retrospective analysis of climate technology interaction in rice based farming systems of Nepal. *Annals of the Association of American Geographers*. 100 (5): 1156-1176.
54. Terando, A., K. Keller, and W. Easterling. 2012. Probabilistic projections of agro-climate indices in North America. *Journal of Climate*, 25 (2): 473-490.

2. Books and Monographs

1. Wilhite, D. A. and W. E. Easterling (eds.). 1987. *Planning for Drought: Towards A Reduction of Societal Vulnerability*. Westview Press, Boulder, CO. 597 pp.
2. Rosenberg, N. J., W. E. Easterling, P. Crosson and J. Darmstadter (eds.). 1989. *Greenhouse Warming: Abatement and Adaptation*. Resources for the Future Press. 182 pp.
3. Stern, Paul and William E. Easterling (eds.). 1999. *Making Climate Forecasts Matter*. National Research Council/National Academy of Sciences, Washington, National Academy Press. (peer reviewed)
4. Easterling, William E., Brian Hurd, and Joel Smith. 2004. *Coping with Global Climate Change: The Role of Adaptation in the United States*, Pew Center on Global Climate Change, Washington, DC.

3. Parts of books

1. Easterling, W. E. and W. E. Riebsame. 1987. Assessing Drought Impacts and Adjustments in Agriculture and Water Resource Systems (pp. 189-214). In: D. A. Wilhite and W. E. Easterling (eds.), *Planning for Drought: Towards A Reduction of Societal Vulnerability*. Westview Press, Boulder, CO. 597 pp.

2. Easterling, W. E. and D. A. Wilhite. 1989. Improving Response to Drought (pp. 321-332). In: *Climate and Food Security*. American Association for the Advancement of Science and International Rice Research Institute, Manila. 602 pp.
3. Easterling, W. E. and S. T. Sonka. 1989. Economic Adjustments to Climatic Vari-ation (pp. 389-404). In: *Climate and Food Security*. American Association for the Advancement of Science and International Rice Research Institute, Manila. 602 pp.
4. Easterling, W. E. 1989. Farm-Level Adjustments by Illinois Corn Producers to Climatic Change. In: J. Smith and D. Tirpak (eds.), *The Potential Effects of Global Climate Change on the United States*. Office of Planning and Policy Evaluation, U.S. Environmental Protection Agency, Appendix C, Volume 2, pp. 10/1-10/36.
5. Easterling, W. E., M. L. Parry and P. Crosson. 1989. Adapting Agriculture to Changes in Climate (pp. 91-104). In: N. J. Rosenberg, W. E. Easterling, P. Crosson, and J. Darmstadter (eds.), *Greenhouse Warming: Abatement and Adaptation*. Resources for the Future Press, Washington, DC. 182 pp.
6. Easterling, W. E. 1990. Climate Trends and Prospects (pp. 32-55). In: N. Sampson and D. Hare (eds.), *Natural Resources for the 21st Century*. Island Press, Washington, DC. 349 pp.
7. Rosenberg, N. J., P. Crosson, W. Easterling, K. Frederick and R. Sedjo. 1989. Policy Options for Adaptation to Climate Change (Chapter 5). In: J. Jaeger (ed.), *The Full Range of Responses to Anticipated Climate Change*. A report by the Beijer Institute for the Governing Board of the United Nations Environmental Programme, 182 pp.
8. Easterling, W. E., P. R. Crosson, N. J. Rosenberg, M. S. McKenney and K. D. Frederick. 1992. Methodology for Assessing Regional Impacts of and Responses to Climate Change: The MINK Study (pp. 168-199). In: J. M. Reilly and M. Anderson (eds.), *Economic Issues in Global Climate Change*. Westview Press, Boulder, CO. 460 pp.
9. Rosenberg, N. J., P. R. Crosson, W. E. Easterling, III, M. S. McKenney, K. D. Frederick and M. Bowes. 1992. A Methodology for Assessing Regional Economic Impacts of and Responses to Climate Change: The MINK Study (pp. 132-153). In: J. Schmandt and J. Clarkson (eds.), *The Regions and Global Warming*. Oxford Univ. Press, Oxford. 337 pp.
10. Easterling, W. E. 1993. Assessing the Regional Consequences of Drought: Putting the MINK Methodology to Work on Today's Problems (pp. 49-64). In: D. A. Wilhite (ed.), *Drought Assessment, Management and Planning: Theory and Case Studies*. Kluwer Academic Publishers, Dordrecht, The Netherlands. 293 pp.
11. Easterling, William E. and R.W. Kates. 1995. Leading Climate Indicators of Impacts (pp.493-518). In Karl, T.R. (ed.) *Long-term climate monitoring in the Global Climate Observing System (GCOS)*. Kluwer Academic Publishers. 561 pp. (peer reviewed)
12. Easterling, William E. 1995. Long-Term Climate Monitoring by the Global Climate Observing System (GCOS): Climate Impacts (pp. 51-54). In: Karl, T.R. (ed.) *Long-Term Climate Monitoring by the Global Climate Observing System (GCOS)*. Kluwer Academic Publishers. 561 pp. (peer reviewed)
13. Easterling, William E. and Robert Mendelsohn. 2000. Estimating the Economic Impacts of Drought on Agriculture. in Wilhite, Donald A. (ed.) *Drought: A Global Assessment, Volume 1*. London: Routledge, pp 256-268.
14. Easterling, William E. 2000. Lessons from the Papers for Applying the "End-to-End" Model to CLIMAG," in Sivakumar, M. V. K. (ed.). *Climate Prediction and Agriculture, Proceedings of an International Workshop*, International START Secretariat and World Meteorological Organization, Washington, D. C., 181-186.
15. Convening Lead Authors: Gitay, Habiba, Sandra Brown, William Easterling, and Bubu Jallow (with J. Antle, M. Apps, R. Beamish, T. Chapin, W. Cramer, J. Frangi, J. Laine, Lin Erda, J. Magnuson, I. Noble, J. Price, T. Prowse, O. Sirotenko, T. Root, E. Schulze, B.

- Sohngen, J. Soussana). 2001. Chapter 5. Ecosystems and Their Goods and Services. in McCarthy *et al.* (eds.) *CLIMATE CHANGE 2000—Impacts, Adaptations and Mitigation of Climate Change: Scientific-Technical Analyses*. Contribution of Working Group II to the Third Assessment Report of the Intergovernmental Panel on Climate Change, United Nations Environment Programme-World Meteorological Organization, Cambridge University Press. pp. 235-342. (*peer reviewed*)
16. National Research Council. 2003. *Fair Weather—Effective Partnerships in Weather and Climate Services*, Report of the Committee on Partnerships in Weather and Climate Services, Committee on Geophysical and Environmental Data, National Academy Press, 238 pp. (Easterling contributed substantial portions of Chapter 2—The U. S. Weather and Climate Enterprise.) (*peer reviewed*)
 17. Easterling, W. E., N. Chhetri, and X. Niu. 2003. Improving the realism of modeling agronomic adaptation to climate change: simulating technological substitution, in Mearns, L. O. (ed.), *Issues in the Impacts of Climate Variability and Change on Agriculture—Applications to the southeastern United States*, Kluwer Academic Publishers, Dordrecht, pp. 149-173. (*peer reviewed*)
 18. Wilbanks, T. J., R. W. Kates, D. P. Angel, S. L. Cutter, W. E. Easterling, and M. W. Mayfield. 2003. The Research Strategy: Linking the Local to the Global, in Association of American Geographers Global Change and Local Places Research Team (ed.), *Global Change and Local Places—Estimating, Understanding, and Reducing Greenhouse Gases*, Cambridge University Press, Cambridge, pp 143-157.
 19. Easterling, W. E., C. Polsky, D. Goodin, M. W. Mayfield, W. A. Muraco, and B. Yarnal. 2003. Changing Places, Changing Emissions: Comparing Local, State, and United States Emissions, in Association of American Geographers Global Change and Local Places Research Team (ed.), *Global Change and Local Places—Estimating, Understanding, and Reducing Greenhouse Gases*, Cambridge University Press, Cambridge, pp 27-56.
 20. Easterling, W. E. (2005). Chapter 11: Assessing the Consequences of Climate Change for Food Security: A View from the Intergovernmental Panel on Climate Change, in R. Lal (Ed.), *Climate Change and Global Food Security*, Routledge, Boca Raton, 778 pp.
 21. Easterling, W. E. 2007. Multiple Stresses and Climate Variability: What If the Next Katrina Is a Drought? In *Understanding Multiple Environmental Stresses: Report of a Workshop*, Board on Atmospheric Sciences and Climate, National Research Council, National Academies Press, p. 85-88.
 22. Easterling, W. E. 2007. Climate Change, Multiple Stresses, and Agriculture: When All Else is Not Equal. In *Understanding Multiple Environmental Stresses: Report of a Workshop*, Board on Atmospheric Sciences and Climate, National Research Council, National Academies Press, p. 123-126.
 23. Easterling, W. E. 2010. Guidelines for adapting agriculture to climate change, in Hillel, D. and C. Rosenzweig (eds), *Handbook of Climate Change and Agroecosystems: Impacts, Adaptation, and Mitigation*, ICP Series in Climate Change Impacts, Adaptation, and Mitigation – Vol. 1, Agronomy Society of America, Imperial College Press., 450 pp.

5. Articles in non-refereed journals and in-house organs

1. Stout, G. E. and W. E. Easterling. 1987. A Review of a Drought Prediction, Assessment, Response Symposium. *Proceedings of the International Conference on Water Resources Needs and Planning in Drought-Prone Areas*, Khartoum. United Nations Development Programme. pp. 632-640.

2. Easterling, W. E. 1987. Drought as Hazard: Can We Plan for It? Guest editorial to the *Natural Hazards Observer*, vol. 11, no. 4. pp. 1-2.
3. Richman, M. B. and W. E. Easterling. 1987. The Identification of Recent Interannual Climate Fluctuations for Agricultural Impacts Assessment: The Case of Midwestern Corn Production. *Preprints of the 5th American Meteorological Society (AMS) Conference on Applied Climatology*, Baltimore, MD. pp. 92-101.
4. Easterling, W. E. 1990. The Question of Climate as a Natural Resource. *Resources* (Newsletter of Resources for the Future, Inc.), No. 100. pp. 13-16.
5. Easterling, W. E. 1990. Coping with Drought Hazard: Recent Progress and New Research Directions. *Proceedings of the International Workshop on Natural Disasters in European and Mediterranean Countries*. Italian National University, Perugia. pp.231-270.
6. Easterling, W. E. 1990. Influence of Climate Change on Agriculture and Related Resources. *Proceedings of the Canada/U.S. Conference on the Impacts of Climatic Change and Climatic Variability on the Great Plains*. Department of Geography Occasional Paper Series, University of Waterloo. pp. 139-143.
7. Easterling, W. E. 1991. The Impact of Climate Change on Agriculture in the Great Plains. *Proceedings of the Great Plains Agricultural Council, Dept. of Agriculture and Resource Economics*, Colorado State University, Fort Collins, CO. pp. 155-161.
8. Changnon, S. A. and W. E. Easterling. 1994. Agriculture. In: Diaz, Henry F. and T. R. Karl (eds.) *Information Needs for Precipitation-Sensitive Systems*, National Oceanic and Atmospheric Administration's Environmental Watch Report, 94.1. pp. a/1-a13.
9. Miller, Vicki. 1994. They're Seeking Shelter from the Heat. *Research Nebraska!*, September 1, pp. 12-13. [Article on Easterling's research program written by Miller and edited by Easterling.]
10. Easterling, W. E. 1994. Assessing the Environmental Implications of Adapting to Climate Change: The Case of Great Plains Agriculture. *Proceedings of the Annual Meetings of the Air and Waste Management Association*, Pittsburgh, PA.
11. Thompson, Troy. 1995. Global Warming and the Future of Nebraska Agriculture *Nebraska Farmer*, November, pp. 56-57. [Interview with Easterling written by Thompson and edited by Easterling.]
12. Karl, T.R., F. Bretherton, W. Easterling, K. Trenberth, R. Quayle. 1995. Long-Term Climate Monitoring of the GCOS. *Global Climate Observing System (GCOS) Newsletter*, No. 3, May, pp. 4-5.
13. Easterling, W. E. 1997. How Climate Change May Affect the Dependency of Great Plains Agriculture on Water Resources. *Proceedings of The Great Plains Symposium: The Ogallala Aquifer; Managing for Drought and Climate Change*, Great Plains Foundation, Lincoln, NE, pp 16-21.
14. Ojima, Dennis, W. E. Easterling, W. Parton, R. Kelly, B. McCarl, L. Bohren, K. Galvin and B. Hurd. (1998). Integration of Ecosystem and Economic Factors Determining Land Use in the Central Great Plains. *Proceedings of the Second Open International Meeting on Human Dimensions of Global Change*, Laxenburg, Austria.
15. Easterling, W. E. 1999. Climate Change and American Agriculture: The Great Plains, *Earth and Mineral Sciences*, 67(2):4-8.

6. Research reports to sponsor

1. Robinson, P. J. and W. E. Easterling. 1980. The Availability of Solar Energy in North Carolina. Report to the North Carolina Energy Institute. 89 pp.

2. Kates, R. W., S. A. Changnon, Jr., T. R. Karl, W. E. Riebsame and W. E. Easterling. 1984. *The Climate Impact, Perception, and Adjustment Experiment (CLIMPAX): A Proposal for Collaborative Research*. A publication of the Climate and Society Research Group, Center for Technology, Environment, and Development (CENTED), Clark University, Worcester, MA. 40 pp.
3. Easterling, W. E. 1987. Improving the Detection of Agricultural Drought: A Case Study of Illinois Corn Production. (pp. 9E/1-9/E7). In: *Drought in Illinois: Their Physical and Social Dimensions*, Illinois State Water Survey Contract Report, Champaign, IL. 239 pp.
4. Easterling, W. E. 1987. A Newspaper Content Analysis of Illinois Droughts. (pp. 10B/1-10B/17.) In: *Droughts in Illinois: Their Physical and Social Dimensions*, Illinois State Water Survey Contract Report, Champaign, IL. 239 pp.
5. Easterling, W. E. and S. A. Changnon, Jr. 1987. Precipitation Drought. (pp. 2/1-2/17). In: *Droughts in Illinois: Their Physical and Social Dimensions*, Illinois State Water Survey Contract Report, Champaign, IL. 239 pp.
6. Easterling, W. E., J. Angel and S. Kirsch. 1989. On the Appropriate Use of Climatic Information in Illinois Natural Gas Utility Weather Normalization. Special Report of Investigation, Illinois State Water Survey, Champaign, IL. 70 pp.
7. Morrisette, P. M., N. J. Rosenberg, K. D. Frederick and W. E. Easterling. 1990. Integrated Framework for a National Water Management During Drought Study. Report to Institute for Water Resources, U.S. Army Corps of Engineers. 34 pp.
8. Rosenberg, N. J., P. R. Crosson, M. Bowes, J. Darmstadter, W. E. Easterling, K. D. Frederick, M. S. McKenney, R. A. Sedjo, L. A. Katz and K. M. Lemon. 1991. Processes for Identifying Regional Influences of Responses to Increasing Atmospheric CO₂ and Climate Change—The MINK Project. Report prepared for Pacific Northwest Laboratory under Contract DE-AC06-76RLO 1830 of the U.S. Department of Energy. 113 pp.
9. Easterling, W. E., M. S. McKenney, N. J. Rosenberg and K. M. Lemon. 1991. A Farm-Level Simulation of the Effects of Climate Change on Crop Production in the Missouri-Iowa-Nebraska-Kansas (MINK) Region. Report prepared for Pacific Northwest Laboratory under Contract DE-AC06-76RLO 1830 of the U.S. Department of Energy. 222 pp.
10. Wilhite, D. A. and W. E. Easterling. 1991. Drought Management and Preparedness Training Seminar for Asia and Pacific Regions, Final Report. International Drought Information Center, Department of Agricultural Meteorology, University of Nebraska-Lincoln. 4 pp.
11. Easterling, W. E. 1993. Adapting United States Agriculture to Climate Change. Technical report prepared for the Office of Technology Assessment, United States Congress. 91 pp. (*peer reviewed by OTA-sponsored panel of experts*).
12. Easterling, William E. 1994. Toward an Integrated Regional Research Program on Global Change and The Nation's Major Grasslands. First Annual Report of the Great Plains Regional Center for Global Environmental Change, University of Nebraska-Lincoln Institute of Agriculture and Natural Resources. 66 pp.
13. Easterling, William E. 1994. Great Plains Regional Center Director's Report, National Institute for Global Environmental Change 1993 Annual Report, U.S. Department of Energy. 50 pp.
14. Easterling, William E., Cynthia Hays, Mary Easterling, James Brandle. 1994. A Model-Based Sensitivity Analysis of the Benefits of Shelterbelts to Crop Growth Under Climate Change. Contract report to the USDA-Forest Service-Rocky Mountain Forest and Range Experiment Station's Interior West Global Change Program, Fort Collins, CO. 24 pp.
15. Rosenberg, N. J. and W. E. Easterling. 1994. Toward an ECO-ARM Program. Report of a workshop co-hosted by the Great Plains Regional Center of the National Institute for Global

- Environmental Change and Batelle-Pacific Northwest Laboratories, Lincoln, Nebraska. 12 pp.
16. Easterling, William E. 1995. Toward an Integrated Regional Research Program on Global Change and The Nation's Major Grasslands. Second Annual Report of the Great Plains Regional Center for Global Environmental Change, University of Nebraska-Lincoln Institute of Agriculture and Natural Resources. 80 pp.
 17. Easterling, William E. 1995. Great Plains Regional Center Director's Report. National Institute for Global Environmental Change 1994 Annual Report, U. S. Department of Energy. 62 pp.
 18. Easterling, William E. 1996. Toward an Integrated Regional Research Program on Global Change and The Nation's Major Grasslands. Third Annual Report of the Great Plains Regional Center for Global Environmental Change, University of Nebraska-Lincoln Institute of Agriculture and Natural Resources. 102 pp.
 19. Easterling, William E., S. Verma, and B. Blad. 1997. Toward an Integrated Regional Research Program on Global Change and The Nation's Major Grasslands. Fourth Annual Report of the Great Plains Regional Center for Global Environmental Change, University of Nebraska-Lincoln Institute of Agriculture and Natural Resources. 116 pp.
 20. Easterling, William E. and Dennis Ojima. 2000. A Hierarchical Approach to Estimating the Ecological Impacts of Climate and Land Use Changes with an Application to the Central United States. Methods and Models for Integrated Assessment. Final Report to the National Science Foundation.

7. Government Reports

1. Easterling, W. E. and C. Hays. 1996. What is Known About Global Warming and Why Nebraska Agriculture Should Care. *Nebguide*, University of Nebraska Cooperative Extension, Lincoln, NE.
2. Carbon and Climate Working Group, *U. S. Carbon Cycle Science Plan*, U. S. Global Change Research Program Inter-Agency Taskforce on Carbon Cycle Science (National Science Foundation, National Oceanic and Atmospheric Administration, National Aeronautics and Space Administration, U. S. Department of Energy, U. S. Geologic Survey), 69 pp. [Easterling was Working Group member and drafted sections on land use change.]
3. Easterling, W. E. and E. Ballard (eds.). 2003. *Report of the Rendell Transition Committee on Conservation and Natural Resources*, unpublished confidential report to the Governor Edward Rendell Administration.

INTERNATIONAL-FEDERAL-STATE ADVISORY BOARDS AND COMMITTEES, AND RELATED ACTIVITIES:

International Level

- Member**, Internal Scientific Advisory Committee to the National Science Foundation's Polar Ice Core Office located at the University of Nebraska-Lincoln. 1996-1997.
- U.S. Delegate**, Joint U.S.-Japan Conference on Global Change and Climate Modeling. National Science Foundation, Honolulu, Hawaii. 1996-1998.

- Convening Lead Author.** Third Assessment Report, Chapter on Ecosystems and Their Services. Intergovernmental Panel on Climate Change, United Nations Environment Programme-World Meteorological Organization. 1998-2001.
- Member,** Scientific Advisory Panel, International Research Institute, Lamont-Doherty Earth Observatory, Columbia University, 2002-2004.
- Convening Lead Author.** Fourth Assessment Report, Chapter on Food, Fibre, Forestry, and Fisheries, Intergovernmental Panel on Climate Change, United Nations Environment Programme-World Meteorological Organization. 2004-2007.
- Member,** Advisory Committee, Montreux Energy Roundtable, 2007-present.

Federal Level

National Research Council

- Review Team,** Review of the U. S. Global Change Research Program, National Research Council of the National Academy of Sciences, La Jolla, CA. 1995.
- Chair,** Panel on the Human Dimensions of Seasonal-to-Interannual Climate Variability, National Research Council of the National Academy of Sciences, 1997-1999.
- Member,** Committee on Public-Private Partnerships in the Weather Services, National Research Council of the National Academy of Sciences, 2002-2003.
- Member,** Committee on Geographical Sciences, National Research Council of the National Academy of Sciences, 2004-2007, 2011-date.
- Review Editor,** *Landscapes on the Edge: New Horizons for Research on Earth's Surface*, Committee on Challenges and Opportunities in Earth Surface Processes, Board on Earth Sciences and Resources, National Research Council of the National Academy of Sciences, 2009.
- Member,** Climate Change Education Roundtable, Board on Science Education, National Research Council, 2010-date.
- Review Editor,** *Advancing Strategic Science: A Spatial Data Infrastructure Roadmap for the U.S. Geological Survey*, Board on Earth Sciences and Resources, National Research Council of the National Academy of Sciences, 2012.

Also, made presentations before numerous National Research Council boards and committees.

Federal Agencies

- Coordinator,** Regional Climate Impact Research Initiative, National Office of the National Institute for Global Environmental Change. U. S. Department of Energy. 1997-1999.
- Member,** Climate and Global Change Working Group, National Oceanic and Atmospheric Administration–Office of Global Programs. 1998-2004.
- Member,** Organizing Committee. 1998. Community Meeting on Integrated Assessment. Sponsored by the National Science Foundation, Washington, D. C.
- Member,** User Working Group, Socioeconomic Data Acquisition and Archive Center (SEDAC). Consortium for International Earth Science Information Network (CIESIN), National Aeronautics and Space Administration, Columbia University–Lamont-Doherty Earth Observatory, Palisades, NY. 1998–2002.

Member, Carbon and Climate Working Group that authored *A U.S. Carbon Cycle Science Plan*. Sponsored by the National Oceanic and Atmospheric Administration, National Science Foundation, Department of Energy and National Aeronautics and Space Administration, published by the U. S. Global Change Research Program, Washington D.C. 1999.

Member, Scientific Advisory Panel, International Research Institute, National Oceanic and Atmospheric Administration, Lamont-Doherty Earth Observatory, Columbia University, 2002-2004.

Chair, External Advisory Board, NSF-Sponsored Center for Research on Environmental Decisions, Columbia University, 2004-2009.

Chair, External Advisory Board, NSF-Sponsored Decision Center for a Desert City, Arizona State University, 2011-present.

Institutional Representative, University Corporation for Atmospheric Research members group, National Science Foundation. 2007-present.

Chair, Nominating Committee, University Corporation for Atmospheric Research. 2011-present.

Professional Societies and Non-Government Organizations

Member, Board of Directors. Renewable Natural Resources Foundation. Bethesda, MD. 1988-1991.

Member, Committee on Applied Climatology. American Meteorological Society. 1988-1991.

Member, Committee on Global Environmental Change, American Geophysical Union, 1999-2002.

Penn State Representative, Cooperative Ecosystems Studies Units Network, 2003-2007.

Member, Steering Committee, National Phenology Network, University of Wisconsin-Milwaukee and University of Arizona, 2005-present.

Founding Partner with Conoco-Phillips establishing the Annual Conoco-Phillips Penn State Energy Prize for Innovation and Entrepreneurship, 2008-present.

Elected Member, Board of Visitors, UNC Institute for the Environment, University of North Carolina at Chapel Hill, 2009-present.

State Level

Co-Chair, Governor Edward Rendell Transition Committee on Conservation and Natural Resources, 2002-2003.

Member, Department of Environmental Protection Secretary's Hydrogen and Fuel Cell Consortium, 2003-2005.

Member, Carbon Management Advisory Group, PA Department of Conservation and Natural Resources, 2006-2007.

Member, Scientific Advisory Committee, Institute for Social Sciences and the Environment, National Center for Atmospheric Research, 2005-2008.

SIGNIFICANT UNIVERSITY SERVICE:

Departmental Committees:

- Promotion and Tenure
- Graduate Program Officer
- Faculty and Department Head Search (chaired three searches)
- Strategic Planning

- Speaker Series
- Graduate Admissions

University and College Committees:

- Distinguished Professorships
- University Research Council (elected chair for one term)
- Penn State Research Foundation
- Council of Academic Deans
- Academic Leadership Council
- Dean and Institute Director Searches (chaired two)
- University Outreach
- Academic Senate Liaison
- Executive Committees for Interdisciplinary Research Institutes
- Senate Committee on Faculty Rights and Responsibilities

Special University Task Forces:

- Strategic Planning (led as director and dean)
- Reinvestment in Energy Sciences and Engineering (co-chair)
- Rights and Responsibilities of Fixed-Term Faculty
- Presidential Commission on Health Care

SCIENTIFIC WORKSHOPS/SYMPOSIA/SEMINARS ORGANIZED

Co-organizer, Planning for the International Geosphere-Biosphere Program, National Academy of Sciences/National Research Council, Woods Hole Study Center, MA. 1983, 1984.

Co-organizer, Workshop on Future Needs in Climate Impacts Research, National Center for Atmospheric Research's Climate Impacts Networkshop. National Science Foundation. Boulder, CO. 1985.

Co-organizer, International Symposium and Workshop on Drought: Prediction, Detection, Impacts Assessment, and Response. Co-sponsored by the World Meteorological Organization, U.S. Department of Agriculture, and the National Science Foundation. Lincoln, Nebraska. 1986.

Co-organizer, Workshop on Controlling and Adapting to Greenhouse Warming, Resources for the Future, Washington, D.C.

Co-organizer, Training Seminar on Drought Management and Preparedness in Southern Africa, World Meteorological Organization. Gaborone, Botswana. 1989.

Co-organizer, Training Seminar on Drought Management and Preparedness in Southeast Asia. World Meteorological Organization, Bangkok, Thailand. 1991.

Co-organizer, Nebraska Groundwater Foundation fall symposium--"Winds of Change: Climate and Groundwater Supply," Nebraska Groundwater Foundation. Lincoln, Nebraska. 1991.

Co-organizer, Training Seminar on Drought Management and Preparedness in South and Central America. World Meteorological Organization. Montevideo, Uruguay. 1993.

Co-organizer, Joint U.S.-Canada Symposium on Sustainable Development of the North American Great Plains. National Oceanic and Atmospheric Administration and Canadian Climate Centre. Lincoln, Nebraska. 1995.

Co-organizer and Sponsor, Technology Management Policy Consortium Annual Workshop for Graduate Students (Consortium members: Penn State, MIT, Cambridge University, University of Lisbon, Utrecht University, Calgary University, CMU, George Mason University, Stanford University, Georgia Tech, Simon Fraser University) 2011.

Journal Manuscript Reviewer for:

Agricultural and Forest Meteorology
Agronomy Journal
American Journal of Agricultural Economics
Annals of the Association of American Geographers
Bioscience
Bulletin of the American Meteorological Society
Canadian Geographer
Climate Research
Climatic Change
Climate Change Mitigation and Adaptation
Consequences
Ecological Modeling
Economic Geography
Global Environmental Change
Great Plains Research
Journal of Applied Geography
Journal of Climate
Journal of Climate and Applied Meteorology
Mitigation and Adaptation Strategies for Global Change
Natural Resources Journal
Nature
Proceedings of the National Academy of Sciences
Professional Geographer
Science
South African Journal of Science
Water International

Proposal or Report Reviewer (including multiple panel reviews) for:

Canadian Tri-Councils Secretariat
National Aeronautics and Space Administration
National Institute for Global Environmental Change
National Oceanic and Atmospheric Administration
National Research Council
National Science Foundation
U.S. Department of Agriculture
U.S. Department of Energy
U.S. Environmental Protection Agency

Papers and presentations delivered at technical and professional conferences, seminars, symposia, government briefings, and workshops (divided into International and National audiences)

International

Easterling, W. E. and W. E. Riebsame (Co-Presenters). 1986. Assessing Drought Impacts and Adjustments in Agriculture and Water Resource Systems. Invited paper presented at the International Symposium on Drought: Prediction, Detection, Impacts Assessment, and Response, Lincoln, NE.

Wilhite, D. A. (Presenter) and W. E. Easterling. 1987. Coping with Drought. Invited paper presented at the International Conference on Natural Hazards in the Americas, San Juan, Puerto Rico.

Easterling, W. E. (Presenter) and D. A. Wilhite. 1987. Improving Response to Drought. Invited paper presented at the International Symposium on Climate and Food Security, American Association for the Advancement of Science, New Delhi, India.

Easterling, W. E. (Presenter) and S. T. Sonka. 1987. Economic Adjustments to Climatic Variability. Invited paper presented at the International Symposium on Climate and Food Security, American Association for the Advancement of Science, New Delhi, India.

Easterling, W. E. 1987. Climate Impacts Research at the Illinois State Water Survey. Invited seminar given at the South Australia Department of Agriculture, Adelaide, Australia.

Easterling, W. E. 1988. Climate and U.S. Agriculture. Invited presentation to the International Center for Integrated Mountain Development, Katmandu, Nepal.

Easterling, W. E. 1988. Coping with Drought Hazard: Recent Progress and New Research Directions. Invited paper presented at the International Workshop on Natural Disasters in European-Mediterranean Countries, Perugia, Italy.

Easterling, W. E. 1989. Drought and Climatic Change. Invited paper presented at the World Meteorological Organization's Seminar on Drought Management in Eastern and Southern Africa, Gabarone, Botswana.

Easterling, W. E. 1990. Influence of Climate Change on Agriculture and Related Resources. Invited paper presented at the Canada/U.S. Symposium on the Impacts of Climatic Change and Variability on the Great Plains, Calgary, Alberta.

Easterling, W. E. 1990. A Farm-Level Simulation of the Effects of Climate Change on Crop Productivity in the MINK Region. Paper presented to an international technical review panel sponsored by the U.S. Department of Energy, Interlaken, Switzerland.

Easterling, W. E. 1991. Drought and Climate Change. Invited presentation to the World Meteorological Organization's Training Seminar on Drought Management and Preparedness in Southeast Asia, Bangkok, Thailand.

Easterling, W. E. 1992. Agricultural Sustainability in a Semi-Arid Grassland: The Case of the North American Great Plains. Invited paper presented to the International Conference on Impacts of Climatic Change on Sustainable Development in Semi-Arid Regions, Fortaleza, Brazil.

Easterling, W. E. 1993. Climate Change, Drought and Agricultural Sustainability. Invited presentation to the World Meteorological Organization's Drought Management and Preparedness Training Seminar for the Latin American Region, Montevideo, Uruguay.

Easterling, W. E. 1994. Adapting North American Agriculture to Climate Change. Invited paper presented to an Agriculture Canada-sponsored Task Force on Adapting North American Agriculture to Climate Change, Ottawa, Ontario.

Easterling, W. E.. 1995. Human Impacts of Climate Variability and Change, Invited plenary speaker and working group chair, World Meteorological Organization-sponsored Global Climate Observing System (GCOS) International Symposium, Working Group C: Impacts. Asheville, NC.

Easterling, W. E. 1996. Integration of Social and Economic Driving Forces of Land Use Change with Biogeochemistry Models. Invited paper presented at the U. S. National Foundation-sponsored U.S.-Japan Conference on Global Change and Land Use, Tsukuba, Japan.

Invited Lecturer. 1996. North Atlantic Treaty Organization Advanced Workshop on Regional Integrated Assessment of Global Change, Sinaia, Romania.

Ojima, D. (Presenter), W. Easterling, W. Parton, R. Kelly, B. McCarl, L. Bohren, K. Galvin, and B. Hurd. 1997. Integration of Ecosystem and Economic Factors Determining Land Use in the Central Great Plains. Contributed paper presented at the Second Open International Meeting on Human Dimensions of Global Change, International Institute for Applied Systems Analysis, Laxenburg, Austria.

Easterling, W. E. 1998. High-Resolution Climate Change Scenarios Applied to Agricultural Models. Invited presentation to the National Science Foundation-sponsored U. S.-Japan Conference on Global Change and Climate Modeling, Honolulu, Hawaii.

Invited U. S. Representative. 1998. Scoping Meeting for the Third Assessment Report. World Meteorological Organization-Intergovernmental Panel on Climate Change (IPCC), Badmunstereifel, Germany.

Easterling, W. E. and Caitlin Simpson (Co-Presenters). 1998. Historical Lessons on the Adaptation of Agriculture to Climate Variability. Invited paper co-presented at the Intergovernmental Panel on Climate Change-sponsored Workshop on Adaptation to Climate Variability and Change, San Jose, Costa Rica.

Invited Discussant. 1999. Workshop on Climate Variability and Agriculture (CLIMAG). International Geosphere-Biosphere Program-START, Geneva, Switzerland.

Easterling, W. E. 2000. "Making Climate Forecasts Matter in Latin America", Workshop on the Economic Value of Climate Forecasts, NOAA Office of the Administrator and University of Talca, Talca, Chile.

Easterling, W. E. 2000. "Emergent Properties of Scale in Global Environmental Modeling-Are There Any?" invited paper presented to the MATRIX 2000 Workshop, International Centre for Integrated Studies, University of Maastricht, Maastricht, Holland.

Easterling, W. 2001 Making climate forecasts matter to decision makers. Invited paper presented at the Annual meetings of the South African Atmospheric Sciences Society, Cape Town, South Africa.

Easterling, W. 2002. The Consequences of Climate Change for Food and Forest Resources: A View from the IPCC, invited paper presented at the World Meteorological Association's Annual Meeting of the Commission on Agricultural Meteorology, Ljubljana, Slovenia.

Easterling, W. 2003. Through the glass largely: Problems of scale in modeling agricultural adaptation to climate change. Invited presentation to the Seminar Series on Global Change. University of Guelph, Guelph, Ontario.

Easterling, W. 2003. Observed Impacts of Climate Change on Agriculture and Forestry, Invited presentation to the IPCC Expert Meeting on Detection and Attribution of the Effects of Climate Change, Columbia University—NASA Goddard Institute for Space Studies, New York.

Invited panelist. 2003. Review of the Global Climate Observing System Workplan. World Meteorological Organization. Bonn, Germany.

Easterling, William. Emergent properties of scale in integrated assessment modeling, invited presentation to the Workshop on Bridging Scales and Epistemologies in Multi-Scale Assessments, Millennium Ecosystem Assessment, Alexandria, Egypt, March 2004.

Easterling, William. Bridging uncertainty from climate models to simulation of impacts and adaptation: the case of crop yield modeling, invited presentation to the IPCC Workshop on Describing Scientific Uncertainties, Maynooth, Ireland, May 2004.

Easterling, W. E. Problems of Scale in Modeling Agricultural Adaptation to Climate Change, invited presentation in the Environmental Systems Seminar Series, Wageningen University, Wageningen, Holland, November, 2005.

Easterling, W. E. Metrics for Measuring Agricultural Response to Climate Change: U. S. Perspectives. Invited Presentation. Climate Change Impacts and Adaptation Metrics Workshop, NASA—Goddard Institute for Space Studies, Columbia University, New York. June 2006.

See **NAMED AND OTHER SIGNIFICANT LECTURES, CONGRESSIONAL AND EXECUTIVE OFFICE PRESENTATIONS** for presentations made during 2007-present, plus the following:

Easterling, W. E. Climate Change: The State of the Science, Montreux Energy Roundtable, Montreux, Switzerland, 2007.

Easterling, W. E. Consequences of Climate Change for Chinese Food and Energy Security, Montreux Energy Roundtable, Montreux, Switzerland, 2008.

Easterling, W. E. The Obama Administration's View on Energy and Climate Change, Montreux Energy Roundtable, Montreux, Switzerland, 2009.

National

Easterling, W. E. 1979. A Methodology for Estimating Solar Energy Availability in North Carolina. Contributed paper presented at the Annual Meetings of the Association of American Geographers, Philadelphia, PA.

Easterling, W. E. 1981. The Transmission of Economic Development through the Space Economy of the United States, 1947-1972. Contributed paper presented at the Meetings of the Southern Regional Science Association, Washington, D.C.

Easterling, W. E. 1981. An Empirical Evaluation of Economic Development Within an Industrial Space Economy. Contributed paper presented at the Annual Meetings of the Southeast Division of the Association of American Geographers, Atlanta, Georgia.

Lecturer. 1983. An Alternative Basis for Modeling Regional Economic Development Changes in a Post-Industrial National Economy. Lecture delivered to the Geography Student Colloquium, University of North Carolina at Chapel Hill, Chapel Hill, NC.

Easterling, W. E. 1984. Understanding User Preferences for Medium and Long-Range Climate Forecasts. Contributed paper presented at the Annual Meetings of the Association of American Geographers, Washington, D.C.

Easterling, W. E. 1984. Climate Forecast Information-Sensitive Industries: Distinguishing Forecast Users from Nonusers. Invited paper presented at the 31st North American meetings of the Regional Association, Denver, CO.

Invited Presenting Panelist. 1984. Panel on How Will the Weather Information Sensitivities and the Demand for Weather Services Change by the Year 2000? Annual Workshop of the Natural Hazards Information and Research Center, Boulder, CO.

Easterling, W. E. 1985. The Climate Impact, Perception and Adjustment Experiment (CLIMPAX). Invited presentation of research in progress at Natural Hazards Information and Research Center Annual Workshop, Boulder, CO, July 1985.

Session Chair. 1985. Future Needs in Climate Impacts Research. National Center for Atmospheric Research's Climate Impacts Networkshop, Boulder, CO.

Invited Presenting Panelist. 1985. Panel on Weather and Climate Hazards: In What Areas Can We Expect to See Further Advances in Information? Annual Workshop of the Natural Hazards Information and Research Center Annual Workshop, Boulder, CO.

Easterling, W. E. (Invited Presenting Panelist). 1985. The Climate Impacts, Perception, and Adjustment Experiment (CLIMPAX). Panel on Climate and Society Research, Annual Meetings of the Association of American Geographers, Detroit, MI.

Easterling, W. E. 1985. A Method for Identifying Climate Fluctuations Based on Impacts Sensitivities. Contributed paper presented at the 4th Conference on Applied Climatology of the American Meteorological Society, Scottsdale, AZ.

Easterling, W. E. 1986. Defining Human Impacts of and Response to Drought: An Analysis of Drought Perception in Illinois. Contributed paper presented at Association of American Geographers Annual Meetings, Minneapolis, MN.

Invited Seminar Presentation. 1986. CLIMPAX Progress and Future Directions at the Illinois State Water Survey. Invited presentation at Seminar to the Environmental and Societal Impacts Group of the National Center for Atmospheric Research, Boulder, CO, April 1986.

Easterling, W. E. 1986. An Expert System Approach to the Identification of Climate Fluctuations for Agricultural Impacts Analysis. Contributed paper presented at the Joint American Meteorological Society-National Climatic Data Center Conference on Climate and Water Management, Asheville, NC.

Easterling, W. E., J. Shafer, and P. Lamb (Presenter). 1987. Climatic Variation and U.S. Water Resources: Lessons from the Recent Past. Invited paper presented to the Annual Meetings of the American Association for the Advancement of Science, Chicago, IL.

Richman, M. B. (Presenter) and W. E. Easterling. 1987. The Identification of Recent Interannual Climate Fluctuations for Agricultural Impacts Analysis: A Case Study of Midwestern Corn Production. Contributed paper presented to the 5th AMS Conference on Applied Climatology, Baltimore, MD.

Co-organizer. 1986. International Symposium and Workshop on Drought: Prediction, Detection, Impacts Assessment, and Response. Lincoln, Nebraska.

Easterling, W. E. 1987. The Identification of Recent Interannual Climate Fluctuations for Agricultural Impacts Analysis: A Case Study of Midwestern Corn Production. Contributed paper presented at the Annual Meetings of the Association of American Geographers, Portland, OR.

Invited Panelist. 1987. Climate Change: In What Ways Can New Research or Policy Changes Better Enable Us to Deal with Resultant Droughts, Floods, or Coastal Inundation? Invited panelist at the Natural Hazards Information and Research Center's Annual Workshop, Boulder, CO.

Co-organizer. 1988. Workshop on Controlling and Adapting to Greenhouse Warming. Resources for the Future Seminar Series, Washington, D.C.

Invited Panel Chair. 1988. Should There Be a U.S. National Drought Plan?. Panel discussion at the Natural Hazards Information and Research Center's Annual Workshop, Boulder, CO.

Invited Rapporteur. 1988. Agriculture and Urban Land Use Group. Joint United States-Canada Conference on Climate Change and the Great Lakes, Chicago, IL.

Easterling, W. E. (Read by D. Liverman). 1988. Farm Level Adjustments to Climatic Change. Contributed paper presented at the Annual Meetings of the Association of American Geographers, Phoenix, AZ.

Easterling, W. E. 1988. Facts and Uncertainties About the Impacts of Future Climate Change. Invited presentation to the Joint U.S. Department of State-National Academy of Sciences Roundtable on Issues in Science. National Academy of Sciences, Washington, D.C.

Easterling, W. E. (Invited Presenter). 1988. Drought Impacts Research. Presented at the United Nations Environment Programme-Sponsored Symposium on Climate Impacts in India, New Delhi, India.

Easterling, W. E. and M. L. Parry (Co-Presenters). 1988. Adapting Agriculture to Climatic Change. Invited paper presented to the Workshop on Controlling and Adapting to Greenhouse Warming, Resources for the Future, Washington, D.C.

Easterling, W. E. 1988. Climate Resources: Recent Trends and Prospects for the 21st Century. Invited paper presented at the Society of American Foresters and U. S. Department of Agriculture's Conference on Natural Resources in the 21st Century. Washington, D.C.

Easterling, W. E. 1989. Agricultural Research Initiatives in the Climate Resources Program. Resources for the Future Seminar Series, Washington, D. C.

Easterling, W. E. 1989. Resources of a Region and their Response to Possible Climate Change: A Methodology. Contributed paper presented at the Annual Meetings of the Association of American Geographers, Baltimore, MD.

Rapporteur and Discussion Leader. 1989. Workshop on Implications for Resource and Environmental Policy of a Rapidly Aging U.S. Population. Co-sponsored by Resources for the Future and the American Association for Retired Persons, Washington, D.C.

Easterling, W. E. 1990. Can the Agricultural Research Establishment Keep Pace with Climate Change? Contributed presentation to the Annual Meetings of the Association of American Geographers, Toronto, Ontario.

Easterling, W. E. 1990. Climate Change and Midwestern Agriculture. Invited keynote presentation to the Annual Meeting of the Middle Atlantic Division of the Association of American Geographers, Reston, VA.

Easterling, W. E. 1990. Future Changes in Climate and Future Changes in Agricultural Comparative Advantage in the Great Plains. Invited plenary presentation to the 52nd Annual Midwest Fish and Wildlife Conference, Minneapolis, MN.

Easterling, W. E. 1990. Changing Climate and Changing Agricultural Comparative Advantage in the Midwestern U.S. Invited seminar presentation to The Center for Global and Environmental Change. Indiana University, Bloomington, IN.

- Easterling, W. E.. 1991. A Methodology for Assessing the Adaptation of Great Plains Agriculture to Climate Change. Invited presentation to the Department of Geography Colloquium, University of Nebraska-Lincoln, Lincoln, NE.
- Easterling, W. E. 1991. Climate and Agricultural Comparative Advantage in the Western Corn Belt: Patterns and Prospects. Invited presentation to Annual Meetings of the American Association for the Advancement of Science, Washington, D.C.
- Easterling, W. E.. 1991. Invited presenting panelist to the Panel on Human Dimensions of Global Environmental Change: Toward a Holistic Science of the Human Environment. Annual Meetings of the Association of American Geographers, Miami, FL.
- Easterling, W. E. 1991. Simulating Farm-Level Impacts of Climate Change on Great Plains Agriculture. Contributed paper presented to the American Meteorological Society's Joint Conference on Applied Climatology–Agricultural and Forest Meteorology, Salt Lake City, UT.
- Easterling, W. E. 1992. Climate Impacts on Natural Resources. Invited paper presented to the Aspen Global Change Institute's Summer Science Session on the Coupled Climate System and Global Change, Aspen, Colorado.
- Easterling, W. E. 1992. Adapting United States Agriculture to Climate Change. Invited keynote paper presented to the Office of Technology Assessment's Workshop on Agriculture Under Climate Change, Washington, D.C.
- Easterling, W. E. 1993. Climate Change: Just the Facts Please. Invited presentation to the Department of Forestry, Fisheries and Wildlife, University of Nebraska-Lincoln, Lincoln, NE.
- Easterling, W. E. 1993. Is There Enough Water to Adapt Great Plains Agriculture to Climate Change? Invited presentation to the Water Center seminar series, University of Nebraska-Lincoln, Lincoln, NE.
- Easterling, W. E.. 1993. Climate Change and Production Agriculture: An Overview of the Issues. Invited presentation to the Department of Agronomy, Kansas State University, Manhattan, KS.
- Easterling, W. E. 1994. A Framework for Assessing the Biophysical and Socioeconomic Effects of Climate Change: Focus on the Great Plains. Invited presentation to NASA's Consortium for Integrated Earth Systems Information Network, Saginaw, MI.
- Easterling, W. E. (Panel Discussant). 1994. Session on Interdisciplinary Earth Science Data and Information Needs. Annual Meetings of the Association of American Geographers, San Francisco, CA.
- Easterling, W. E. 1994. Assessing the Environmental Implications of Adapting to Climate Change: The Case of Great Plains Agriculture. Invited paper presented to the Annual Meetings of the Air and Waste Management Association, Phoenix, AZ.

Easterling, W. E. 1994. The Role of Trees in Adapting Great Plains Agriculture to Climate Change: A Model-Based Sensitivity Analysis. Invited presentation to the Workshop on Bio-Fuels Research sponsored by Oak Ridge National Laboratory, Syracuse, NY.

Easterling, W. E. 1994. Regions, Resources and Climate Change. Invited seminar presentation to the Department of Geography Seminar Series, Kansas State University, Manhattan, KS.

Easterling, W. E. 1994. Can the Great Plains Avert a Loss of Agricultural Comparative Advantage Under Climate Change? Invited seminar presentation to the Department of Geography Colloquium, University of Nebraska-Lincoln, Lincoln, NE.

Organizer, Chair, and Facilitator. 1994, 1995, 1996. Annual Principal Investigator Workshop, Great Plains Regional Center of the National Institute for Global Environmental Change, University of Nebraska-Lincoln, Lincoln.

Facilitator. 1994. National Institute for Global Environmental Change (NIGEC)--National Technical Advisory Committee (NTAC) Meeting. Regional Center Director Discussion Group, Davis, CA.

Easterling, W. E. (Presenter and Discussant). 1995. Scaling Climate and Ecological Model Simulations: Theory and Practice I. Invited presentation of research-in-progress to the Stanford University Energy Modeling Forum 14 on Climate Impact Analysis and Integrated Assessment Modeling, Snowmass, CO.

Easterling, W. E. 1995. Issues of Scale in Agroecological Modeling of Climate Change Effects. Invited presentation to the Institute for the Study of Planet Earth Speaker Series, University of Arizona, Tucson, AZ.

Easterling, W. E. and E. Tsvetsinskaya (Presenter). 1995. The Effect of Scale on the Estimation of Crop Yield Response to Climate Change. Contributed paper presented to the Annual Meetings of the Association of American Geographers, Chicago, IL.

Easterling, W. E. 1995. Scale Resolution of Regional Agricultural Production Modeling: How Fine is Fine Enough? Contributed presentation to the First International Open Meeting on the Human Dimensions of Global Change, Duke University, Durham, NC.

Easterling, W. E. 1996. Scale Resolution of Agricultural Modeling of Climate Change Effects: How Fine is Fine Enough? Invited presentation to the National Conference on Geographic Information and Analysis, Santa Fe, NM.

Invited Co-Chair. 1995. Working Group on Research, International Forum on Forecasting El Niño: Launching an International Research Institute, National Oceanic and Atmospheric Administration. Office of Global Programs, Washington, D.C.

Invited Expert. 1995. National Research Council Summer Study to Review the U. S. Global Change Research Program and National Aeronautics and Space Administration's Mission to Planet Earth and Earth Observing System Programs, La Jolla, CA..

Easterling, W. E. (Presenter and Discussant). 1996. Scaling Climate and Ecological Model Simulations: Theory and Practice II. Invited presentation of research-in-progress to the Stanford University Energy Modeling Forum 14 on Climate Impact Analysis and Integrated Assessment Modeling, Snowmass, CO.

Easterling, W. E. 1997. Climate Change and American Agriculture: What Have We Learned? Invited presentation of the Walter Orr Roberts Memorial Lecture, Aspen Global Change Institute, Aspen, CO.

Easterling, W. E. (Presenter and Discussant). 1997. Scaling Climate and Ecological Model Simulations: Theory and Practice III. Invited presentation of research-in-progress to the Stanford University Energy Modeling Forum 14 on Climate Impact Analysis and Integrated Assessment Modeling, Snowmass, CO.

Easterling, W. E. 1997. How Climate and Climate Change Impact People and the Way They Live. Invited presentation to the Joint White House-National Oceanic and Atmospheric Administration Briefing to Broadcast Weathercasters, Washington D. C.

Easterling, W. E. (Invited Presenting Panelist). 1997. Climate Change and Great Plains Agriculture. National Climate Forum: The Consequences of Global Change for the Nation, Washington D. C.

Easterling, W. E. 1997. Everyone Talks About the Weather, But No One Does Anything About It – Or Do They? Invited seminar presentation to the Department of Forestry, Fisheries and Wildlife, University of Nebraska-Lincoln, Lincoln, NE.

Easterling, W. E. 1997. Appropriate Scales of Analysis of Agriculture-Climate Interactions. Invited lecture to the Global Environmental Assessment Program, Belfer Center for Science and International Affairs, John F. Kennedy School of Government, Harvard University, Cambridge, MA.

Easterling, W. E. 1997. Climate Change and Drought in the Great Plains. Invited speaker to the Water Center seminar series, University of Nebraska-Lincoln, Lincoln, NE.

Co-Chair. 1997. Great Plains Climate Change Impacts Workshop. Jointly sponsored by the White House Office of Science and Technology Policy and U. S. Global Change Research Program, Ft. Collins, CO, May, 1997.

Easterling, W. E. 1997. Lessons from the MINK Study. Presentation to the Center for Integrated Regional Analysis Seminar Series, The Pennsylvania State University, University Park, PA.

Easterling, W. E. 1998. Issues of Scale in Integrated Assessment Modeling, Invited plenary presentation to The Community Workshop on Integrated Assessment, National Science Foundation, Washington, D. C.

Easterling, W. E. (Presenter and Discussant). 1998. Scaling Climate and Ecological Model Simulations: Theory and Practice IV. Invited presentation of research-in-progress to the Stanford

University Energy Modeling Forum 14 on Climate Impact Analysis and Integrated Assessment Modeling, Snowmass, CO.

Easterling, W. E. 1998. Spatial Scale of Climate Change and the Estimation of Agricultural Adaptability. Contributed presentation to the annual meetings of the Association of American Geographers, Boston, MA.

Invited Chair. 1998. Working Group on Cross-Scale Issues in Integrated Assessment. Annual Workshop of the Global Environmental Assessment Project, John F. Kennedy School of Government, Harvard University, Bar Harbor, ME.

Invited Participant. 1998. Workshop to Plan the Next Decade of the U. S. Global Change Research Program. U. S. Global Change Research Program–National Science Foundation, Ayrle, VA.

Easterling, W. E.. 1998. Scales of Climate and Crop Models: Can They Ever Meet? Invited presentation to the Department of Geography Seminar Series, Northern Illinois University.

Easterling, William E. 1999. Taking an Ecosystem View of Agriculture to Investigate Climate Change Impacts. Invited presentation to the Stanford University Energy Modeling Forum Workshop on Climate Change Impacts, Snowmass, CO.

Easterling, William E. 2000. Scales of Climate Variability and Agricultural Production: Can Ever the Twain They Meet? Invited presentation. Brown Memorial Lecture Series on Scale in Geography in Commemoration of the 75th Anniversary of the Founding of the Department of Geography, University of Minnesota, Minneapolis.

Easterling, William E. 2000. Relaxing the Assumption of Clairvoyance in Modeling Agricultural Adaptation to Climate Change. Contributed paper to the Annual Meetings of the Association of American Geographers, Pittsburgh.

Easterling, William E. 2000. Conceptual Issues in Adapting to Climate Variability. Invited presentation to the Stanford University Energy Modeling Forum on Climate Change Impacts, Snowmass, CO.

Easterling, William E. 2000. Consequences of Climate Change for Great Plains Agriculture: What Can Be Learned From Modeling. Invited presentation to the Department of Agronomy Seminar Series, The Pennsylvania State University.

Easterling, W. 2001. Agriculture and food security in the IPCC-Third Assessment Report, Invited presentation to Stanford University Energy Modeling Forum Workshop, Snowmass, CO.

Invited Discussant. 2001. Session on adaptation to climate variability and change, Stanford University Energy Modeling Forum Workshop, Snowmass, CO.

Easterling, W. 2002. Making agronomic adaptation more realistic in modeling the impacts of climate change. Contributed presentation, Annual meetings of the Association of American Geographers, Los Angeles, March 2002.

Easterling, W. 2002. The science of climate change: separating the factual, probable, and speculative. Invited presentation, Goddard Chair in Forestry Symposium on Global Climate Change, The Pennsylvania State University.

Easterling, W. 2002. Global agriculture and climate change. Invited presentation, Goddard Chair in Forestry Symposium on Global Climate Change, The Pennsylvania State University.

Easterling, W. 2002. (co-organizer and presenter), Geographers and the IPCC Third Assessment Report, Annual meetings of the Association of American Geographers, Los Angeles.

Easterling, W. 2002. Modeling adaptation to climate change: the importance of temporal and spatial scale, invited paper presented to the NOAA-OGP Post-Doctoral Program Biennial Symposium, Steamboat Springs, Colorado.

Easterling, W. 2002. Getting the scale right in modeling adaptation to climate change, invited paper presented to the Stanford University's Energy Modeling Forum, Snowmass, Colorado.

Easterling, W. 2003. Global Agriculture and Food Security, Invited presenter and panelist. Symposium on Adapting Agriculture to Climate Change, Ohio State University.

Easterling, W. 2003. The Impacts of Climate Change on U.S. Agriculture; What Can Farmers Do About It? Invited presenter and panelist. Briefing to the Agriculture Committee of the United States Senate, Organized by the Harvard School of Public Health. Washington, D. C.

Invited discussant. 2002. Decision Support Panel, U. S. Climate Change Science Plan Workshop on Strategic Planning. Climate Change Science Plan-U. S. Global Change Research Program, Washington, DC.

Invited discussion leader. 2003. Session on Climate, Development, and Agriculture, Workshop on Mobilizing Solutions for Adaptation: Enhancing Resilience, U. S. Agency for International Development, New Orleans.

Invited discussion leader. 2003. Workshop on Insights and Tools for Adaptation—Learning from Climate Variability, NOAA-Office of Global Programs—Human Dimensions Program, Washington, DC.

Easterling, William. Problems of scale in modeling agricultural adaptation to climate change, invited seminar presentation, Institute for the Study of Planet Earth and Department of Geography, University of Arizona, February 2004.

Easterling, William. Time-dependent technical substitution in the adaptation of agricultural production systems to climate change, invited seminar presentation, Department of Geography, Syracuse University, March 2004.

Invited panel presentation on integrated science and geography in higher education. 2004. Human-environment systems research and graduate training at Penn State, Special session: Discussion on Geography and Education with Bruce Alberts—President of the National Academy of Sciences, Annual Meetings of the Association of American Geographers, Philadelphia, March 2004.

Easterling, W. E. Understanding the Impacts of Climate Change on Agriculture: How Far Have We Come in 25 Years of Research? Invited presentation to the *Symposium on Whole Earth Systems: Integrating Environmental Science, Technology and Policy*, Stanford University, Palo Alto, CA, February, 2005.

Easterling, W. E. Can We Feed a World of 10 Billion with a Changing Climate? Invited presentation to the Department of Nuclear Engineering Seminar Series, Ohio State University, Columbus, OH, April, 2005.

Easterling, W. E. Defining Climate Extremes from the Viewpoint of Impacts: Examples from Agriculture. Invited presentation to the *Workshop on North American Climate Extreme: Progress in Monitoring and Research*, Aspen Global Change Institute, Aspen, CO, July 2005.

Easterling, W. E. Multiple Stresses and Climate Variability: What If the Next Katrina Is a Drought? Invited presentation to the *Board on Atmospheric Sciences and Climate Workshop on Multiple Environmental Stresses*, National Research Council, Irvine, CA, September, 2005.

Easterling, W. E. Climate Change, Multiple Stresses, and Agriculture: When All Else Is Not Equal. Invited presentation to the *Board on Atmospheric Sciences and Climate Workshop on Multiple Environmental Stresses*, National Research Council, Irvine, CA, September, 2005.

Easterling, W. E. Monitoring Complex Earth System Services: The Importance of Land Use/Cover Monitoring and Modeling, Invited presentation to the *Workshop on Complex Earth System Services*, Board on Earth Sciences Research, National Research Council, Santa Fe, NM, November, 2005.

Easterling, W. E. Geography and Climate Change: The Evolving IPCC. Invited panelist. Special session on Frontiers in Human-Environment Geography. Annual Meetings of the Association of American Geographers. Chicago, March 2006.

Easterling, W. E. Modeling Path Dependence in Adaptation to Climate Change. Contributed paper. Annual Meetings of the Association of American Geographers. Chicago, March 2006.

Easterling, W. E. Implications of Climate Change for Human-Dominated Systems. Invited seminar. School of Geographic Sciences and Decision Center for a Desert City. Arizona State University, Tempe, AZ. April 2006.

Easterling, W. E. Recent Climate Variability and Future Climate Change: What They Mean for the Nation's Farming. Invited Presentation. Senate Briefing sponsored by the AAAS Center for Science, Technology and Congress. July 2006.

See **NAMED AND OTHER SIGNIFICANT LECTURES, CONGRESSIONAL AND EXECUTIVE OFFICE PRESENTATIONS** for presentations made during 2007-present, plus the following:

Easterling, W. E. Adaptation to Climate Change, Invited Panel Presentation to the Annual Meetings of the American Meteorological Society, New Orleans, 2008.

Easterling, W. E. Feeding a World of 10 Billion with Climate Change, Invited Seminar to Environmental Sciences, Colgate University, 2009.

Easterling, W. E. Guidelines for Adapting Agriculture to Climate Change, Annual Meetings of the Agronomy Society of America, Pittsburgh, PA, 2009.

Easterling, W. E. Future of Human-Environment Geography, Invited Panel Presentation to the Annual Meetings of the Association of American Geographers, Las Vegas, 2009.

Easterling, W. E. An Integrated Assessment of Climate Change Impacts on World Agriculture, Invited Seminar to the Department of Agronomy, Purdue University, 2009.

Easterling, W. E. Can the World's Farmers Feed a World of 10 Billion People In Spite of Climate Change? Invited Paper to the Annual Meetings of the American Geophysical Union, 2010.

Easterling, W. E. Anticipating Surprise in Scenarios, Invited Presentation to Workshop on Scenarios, US Global Change Research Program, Arlington, VA, 2010.

Funded Projects

1. Completed

Agency/Sponsor: National Academy of Sciences Program Initiation
Amount: \$10,000
Period: September 1983-February 1984
Project: Climate Impacts, Perception, and Adjustment Experiment
Role: Principal Investigator

Agency: NOAA/National Climate Program supplemental grant to the Board on Atmospheric Sciences and Climate of the National Research Council
Amount: \$5,000
Period: November 1983-March 1984
Project: A Climate Forecast Attribute Characterization Taxonomy (CFACT)
Role: Principal Investigator

Agency: University Corporation for Atmospheric Research Proposal Development Grant
Amount: \$10,000
Period: November 1983-March 1984
Project: Climate Impacts, Perception, and Adjustment Experiment
Role: Principal Investigator

Agency: Illinois Department of Energy and Natural Resources
Amount: \$28,300
Period: 1986
Project: Evaluating the Role of Climatic Information in Illinois Gas Utility Weather Normalization Techniques

- Role:** Principal Investigator
- Agency:** Climate Dynamics Program of the National Science Foundation and the National Climate Program Office of the National Oceanic and Atmospheric Administration
- Amount:** \$12,088
- Period:** 1986
- Project:** An International Symposium and Workshop on Drought: Prediction, Detection, Impact Assessment, and Response
- Role:** Co-Principal Investigator (with Peter J. Lamb, Donald A. Wilhite, and Norman J. Rosenberg)
- Agency:** United States Environmental Protection Agency
- Amount:** \$31,000
- Period:** 1987-1988
- Project:** Assessing Midwest Farm Level Economic and Physical Response to Climatic Change
- Role:** Principal Investigator
- Agency:** Office of Energy Research, U.S. Department of Energy
- Amount:** \$1,000,500
- Period:** 1989-1991
- Project:** Processes for Identifying Regional Influences of and Responses to Increasing Atmospheric CO₂ and Climate Change - The MINK Project
- Role:** Assistant Project Director and Co-Principal Investigator (Principal Investigator and Project Director: N. J. Rosenberg)
- Agency:** U.S. Forest Service–Rocky Mountain Forest and Range Experiment Station
- Amount:** \$82,134
- Period:** April 1, 1992-1996
- Project:** The Role of Trees in Semi-Arid Regions Under Climate Change
- Role:** Principal Investigator
- Agency:** National Institute for Global Environmental Change, U.S. Department of Energy
- Amount:** Approximately \$100,000 per year
- Period:** July 1, 1993-June 30, 1997
- Project:** Office of the Director, Great Plains Regional Center for Global Environmental Change
- Role:** Principal Investigator and Director
- Agency:** National Institute for Global Environmental Change, U.S. Department of Energy
- Amount:** Approximately \$1,600,000 per year
- Period:** July 1, 1993-June 30, 1997
- Project:** Annual Research Budget of The Great Plains Regional Center for Global Environmental Change
- Role:** Principal Investigator and Director
- Agency:** U.S. Department of Energy, Great Plains Regional Center for Global Environmental Change
- Amount:** \$362,100

- Period:** July 1, 1993-June 30, 1996
Project: Assessment of the Effects of Climate Change on a Mixed Agricultural Landscape on the North American Great Plains
Role: Co-Principal Investigator (Principal Investigator: J. Brandle)
- Agency:** U.S. Department of Energy, Great Plains Regional Center for Global Environmental Change
Amount: \$363,000
Period: July 1, 1993-June 30, 1997
Project: Development of a Nested Regional Model for the Conterminous United States and Formation of High Resolution Climate Change Scenarios with an Application to Crop Climate Models
Role: Co-Principal Investigator (Principal Investigator: L. O. Mearns)
- Agency:** U. S. Department of Energy
Amount: \$9,400,000
Period: July 1, 1996-June 30, 1997
Project: Annual Budget of The National Institute for Global Environmental Change
Role: Principal Investigator and Director
- Agency:** National Science Foundation
Amount: \$500,000
Period: October 1, 1995-September 30, 1999
Project: A Hierarchical Approach to Estimating the Ecological Impacts of Climate and Land Use Changes with an Application to the Central United States. Methods and Models for Integrated Assessment
Role: Project Leader and Principal Investigator
- Agency:** National Aeronautics and Space Administration
Amount: \$1,066,878
Period: January 1, 1997-December 31, 2001
Project: Analysis of the Effect of Changing Climate Variability on Crop Production in the Southeast: An Integration of Stochastic Modeling, Regional Climate Modeling, Crop Modeling and Remote Sensing Techniques. Mission to Planet Earth Program
Role: Co-Principal Investigator (Principal Investigator: L. O. Mearns)
- Agency:** U.S. Environmental Protection Agency
Amount: \$1,783,569
Period: January 1, 1997-December 31, 2001
Project: Sensitivity Analysis of the Effect of Changes in Mean and Variability of Climate on Crop Production and Regional Economics in the Southeastern U.S.: An Integration of Stochastic Climate, Crop and Economic Modeling
Role: Co-Principal Investigator (Principal Investigator: L. O. Mearns)
- Agency:** National Institute for Global Environmental Change-Department of Energy
Period: July 1, 1999-June 30, 2002
Project: Land Use and Climate Change Impacts on Carbon Fluxes
Role: Co-Principal Investigator (Principal Investigator: D. Ojima, Colorado State)

Agency: National Science Foundation
Amount: \$40,000
Period: January 1, 1999-May 31, 2002
Project: Agriculture as Ecosystem: Participation in the Intergovernmental Panel on Climate Change, Third Assessment Report.
Role: Principal Investigator

Agency: National Science Foundation
Amount: \$2,000,000
Period: July 1, 2000-July 31, 2004
Project: Human-Environment Research Observatory (HERO)
Role: Co-Principal Investigator (Principal Investigator: B. Yarnal) (Resigned and transferred resources back to the grant in 2002 due to new duties as Director, Penn State Institutes of the Environment)

Agency: UCAR/Visiting Scientist programs
Amount: \$36,115
Period: October 1, 2002-September 30, 2004
Project: Building the Role of Seasonal Climate Forecasts in South Africa
Role: Principal Investigator

Agency: NOAA/Office of Global Programs
Amount: \$40,000
Period: October 1, 2003-September 30, 2007
Project: Development and Analysis of a Climate-based Agricultural Index for Long-term Monitoring—Proof of Concept Grant
Role: Principal Investigator

Agency: National Science Foundation (subcontract to the University of Miami)
Amount: \$1,830,296 (\$170,004 subcontracted to Penn State)
Period: June 1, 2004-May 31, 2007
Project: Understanding and Modeling the Scope for Adaptive Management in Agroecosystems in the Pampas in Response to Interannual and Decadal Climate Variability and Other Risk Factors
Role: Co-Principal Investigator

Agency: National Institute for Global Environmental Change/U. S. Department of Energy
Amount: \$374,463
Period: August 1, 2004-August 31, 2007
Project: Climate Impact and Analysis Project (CIMAP)
Role: Principal Investigator

Agency: U.S. Agency for International Development/Department of State
Amount: \$750,000
Period: October 1, 2006-September 30, 2009
Project: Climate Change Collective Learning and Observatory Network in Ghana
Role: Co-Principal Investigator

2. **In progress**

Agency: National Science Foundation
Amount: \$6,480,600
Period: August 1, 2004-August 31, 2012
Project: Center for Research on Environmental Decisions
Role: Co-Principal Investigator for Part II

Membership in Professional Societies

Association of American Geographers
American Association for the Advancement of Science
American Geophysical Union
American Meteorological Society
Center for Great Plains Studies

INSTRUCTIONAL AND RELATED TEACHING ACTIVITIES**Courses taught in resident instruction, Spring 1993 through Fall 2003**

Semester	Course	Enrollment
<u>Courses taught at the University of Nebraska-Lincoln</u>		
SP 93	Agricultural Meteorology 907: Agricultural Climatology	11
SP 95	Agricultural Meteorology 907: Agricultural Climatology	8
SP 97	Agricultural Meteorology 907: Agricultural Climatology	10
<u>Courses taught at The Pennsylvania State University</u>		
FA 97	Geography 30: Human-Environment Relations	170
SP 98	Geography 406: Human Use of the Environment	47
SP 98	Geography 597A: Spatial Dimensions of Industrial Ecology	9
FA 98	Geography 30: Human-Environment Relations	135
FA 98	Geography 406: Human Use of the Environment	47
SP 99	Geography 597A: Issues of Scale in Environmental Geography	8
FA 99	Geography 30: Human-Environment Relations	140
SP 2000	Geography 406: Human Use of the Environment	50
SP 2000	Geography 408w: Human Dimension of Global Climate Change	21
FA 2000	Geography 30: Human-Environment Relations	109
SP 2001	Geography 30: Human-Environment Relations	136
SP 2001	Geography 408w: Human Dimensions of Global Climate Change	20
FA 2001	Geography 30: Human-Environment Relations	136
FA 2003	Geography 30: Human-Environment Relations	141

Courses taught at The Pennsylvania State University (cont.)

FA 2004	Geography 30: Human-Environment Relations	119
SP 2006	Geography 30: Human-Environment Relations	123

In addition to structured classes, Dr. Easterling supervised students in the following courses:

The Pennsylvania State University

Geography 496:Independent Studies. Dr. Easterling averages two undergraduate independent studies students per year since 1997.

Geography 596:Independent Studies (averaging two graduate courses per year since 1997), also Geography 600 Thesis and 601 Dissertation.

University of Nebraska-Lincoln

Agronomy 896:Independent Study (2 credits). Independent study course on the validation of crop-climate models - 1 student.

Geography 897:Internship in Geography (2 credits). Co-supervised, with staff scientist Dr. Linda Mearns of the National Center for Atmospheric Research, a Ph.D. student in Agricultural Meteorology in a visiting internship on global climate modeling at the National Center for Atmospheric Research.

Description of new courses developed

University of Nebraska: Agricultural Meteorology 907. Agricultural Climatology.

(with Dr. Al Weiss). This course (team-taught with Dr. Weiss) is a broad survey of topics in agricultural climatology and is a required course for Agricultural Meteorology graduate students; it was taught in the spring semesters of 1993, 1995 and 1997. Dr. Easterling developed 50% of the curriculum, focusing on human dimensions topics in agricultural climatology.

The Pennsylvania State University: Geography 597A. The Spatial Dimensions of Industrial Ecology.

This was a graduate seminar offered in the spring of 1998. The course introduces students to concepts of mass balance and the flows of energy and material through production systems and the environment, with emphasis on understanding how the location of resources, production and consumption governs such flows.

The Pennsylvania State University: Geography 597A. Issues of Scale Environmental Geography.

This was a graduate seminar offered in the spring of 1999. The course exposed students to fundamental concepts of scale in ecology, physical geography and environmental geography. Theoretical concepts of scale such as hierarchy and emergence, the Modifiable Areal Unit Problem, and allometry were introduced. Techniques such as Stommel diagrams, multi-level modeling, and partitioning were explored.

Supervision of graduate theses

Master's Thesis

Colin Polsky, 1998. "A Hierarchical Conceptual Framework of Agricultural Land Use Change"

Netra Chhetri, 1999. "A Climate-Sensitive Measure of Agricultural Intensity: An Application to Nepal"

Tania Lopez, 2002. "Characterization and Modeling of Land Cover Change: The Case of Urban Expansion in an Caribbean Landscape".

Kim Zielinski, 2004 "Environmental and anthropogenic factors: modeling the effects on fire in Zambia".

Clark Knighton, 2007 "Understanding Argentine farmers' perceptions of the utility of seasonal climate forecasts".

Kelly Vanderbrink, 2008 "Assessing DCNR's scientific information needs for carbon sequestration in Pennsylvania"

Allyson Jacobs, 2011 "Adaptation of sustainable agriculture to climate change".

Doctoral Dissertations

Elena Tsvetsinskaya, March 1999. "Linking Regional Climate Models with Landscape-Scale Agroecosystem Simulations: Investigating the Effect of Seasonal Plant Growth on Meso-Scale Climate" Boston University (faculty)

Colin Polsky, May 2002. "A Spatio-Temporal Analysis of Agricultural Vulnerability to Climate Change: The U.S. Great Plains, 1969-1992" Clark University (faculty)

Nate Currit, December 2003. "Environmental Dependency: Maquiladoras as Drivers of Land Use and Land Cover Change in Chihuahua, Mexico" West Texas State University (faculty)

Xianzeng Niu (co-advisor, Crop and Soils) 2004. "Monitoring the Soil Organic Carbon Pool: A Combined Remote Sensing, GIS and Modeling Approach". Penn State University (Senior Research Associate)

Netra Chhetri 2007. "Understanding the process of agricultural adaptation to climate change: analysis of climate-induced innovation in rice based cropping system of Nepal" Arizona State University (faculty)

Adam Terando 2011. "Quantifying the effects of climate change on crop yields" North Carolina State University (faculty)

Seth Baum Anticipated 2012. "Discounting in time and space". Columbia University (post-doctoral associate).

Mark Read In progress. "Scenario analysis for understanding relations between national security and climate change"

Justin VanderBerg In progress. “Simulating Arctic land use with the opening of trans-Arctic maritime transport”

Ryan Baxter In progress. “Geospatial analysis of land use needs for US bioenergy production”

REFERENCES AVAILABLE UPON REQUEST