

ARLENE M. FIORE

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Education

Ph.D. in Earth and Planetary Sciences, Harvard University, June, 2003.

Thesis title: *Linking regional air pollution with global chemistry and climate: The role of background ozone*

A.B. in Environmental Geoscience, *magna cum laude*, Harvard College, June 1997.

Grants and Honors

Presidential Early Career Award for Scientists and Engineers (PECASE), July 2006.

American Geophysical Union James R. Holton Junior Scientist Award, December 2005.

Invited ACCESS (Atmospheric Chemistry Colloquium for Emerging Senior Scientists) participant, September 2003.

National Science Foundation Fellowship, July 1998-July 2002.

Bok Center Distinction in Teaching Awards, Fall 1998, Fall 1999, Spring 2002.

Ecole Normale Supérieure Fellowship, Paris, France, Sept. 1997-June 1998.

Summa cum laude honors thesis, Harvard College, June 1997.

Dean's Research Award Grant, Harvard College, Summer 1996.

Professional Experience

Research Physical Scientist, Geophysical Fluid Dynamics Laboratory, Princeton, NJ, 2004-present.

Earth Science Women's Network Leadership Board Member, co-organized Leadership Training Workshop, Dec. 2008.

Coordinating Lead Author, Ozone modeling section of TF HTAP Interim Report, 2007.

Co-convener of Session on Chemistry-Climate Interactions, American Geophysical Union, San Francisco, CA, Dec., 2006.

Contributing Author, U.S. EPA Air Quality Criteria Document for Ozone and Related Photochemical Oxidants, 2003-2005.

Co-convener of Session on Biosphere-Atmosphere Exchange, American Geophysical Union, San Francisco, CA, Dec., 2005.

Research Associate, Atmospheric and Oceanic Sciences Program, Princeton University, Princeton, NJ, 2003-2004.

Graduate Researcher, Harvard Atmospheric Chemistry Modeling Group, Harvard University, Cambridge, MA, 1998-2003.

Co-convener of Special Science-Policy Session, American Geophysical Union Spring Meeting, Washington, D.C., May, 2002.

Participant in American Meteorological Society Summer Policy Colloquium, Washington, D.C., June, 2001.

Independent Consultant, to the Clean Air Task Force, Cambridge, MA, October, 1999, February, 2000.

Undergraduate Researcher, with Daniel J. Jacob, Harvard University, Cambridge, MA, 1995-1997.

Reviewer, *J. Geophys. Res.-Atmospheres*, *Geophys. Res. Lett.*, *Atmos. Environ.*, *J. Air & Waste Management*, *Atmos. Chem.*

Phys. Disc., *Earth Interactions*, *J. Appl. Meteorol. & Climatology*, *Environ. Sci. & Technol.*, NSF, EPA, NASA, NAS NRC

Publications

- Reidmiller, D.R., **A.M. Fiore**, D.J. Jaffe... , The influence of foreign vs. domestic emissions on surface ozone in the U.S., submitted to *Atmos. Chem. Phys.*, 2009.
- Casper-Anenberg, S. J.J. West, **A.M. Fiore**..., Intercontinental impacts of ozone pollution on human mortality, submitted to *Environ. Sci. & Technol.*, 2009.
- West, J.J., V.Naik, L.W. Horowitz, **A.M. Fiore**, Effect of regional precursor emission controls on long-range ozone transport: 1. Short-term changes in ozone air quality, submitted to *Atmos. Chem. Phys.*, 2009.
- West, J.J., V.Naik, L.W. Horowitz, **A.M. Fiore**, Effect of regional precursor emission controls on long-range ozone transport: 2. Steady-state changes in ozone air quality and on human mortality, submitted to *Atmos. Chem. Phys.*, 2009.
- Crevoisier, C., D. Nobileau, **A.M. Fiore**, and R. Amante, A new insight on tropospheric methane in the tropics. First year from IASI hyperspectral infrared observations, submitted to *Atmos. Chem. Phys.*, 2009.
- Liu, J., D.L. Mauzerall, L.W. Horowitz, P. Ginoux, and **A.M. Fiore**, Evaluating Inter-Continental Transport of Fine Aerosols: (1) Methodology, Global Aerosol Distribution and Optical Depth, submitted to *Atmos. Environ.*, 2009.
- Fang, Y., **A.M. Fiore**, L.W. Horowitz, A. Gnanadesikan, H. Levy II., Y. Hu, A.G. Russell, Estimating the episodic contribution to total pollutant export from the United States in summer, submitted to *J. Geophys. Res.*, 2009.
- Wu, S., B.N. Duncan, D.J. Jacob, **A.M. Fiore** and O. Wild, Chemical nonlinearities in relating intercontinental ozone pollution to anthropogenic emissions, *Geophys. Res. Lett.*, L05806, doi:10.1029/2008GL036607, 2009.
- **Fiore, A.M.**, F.J. Dentener, O. Wild, C. Cuvelier, M.G. Schultz, P. Hess, C. Textor, M. Schulz,...., Multi-model Estimates of Intercontinental Source-Receptor Relationships for Ozone Pollution, *J. Geophys. Res.*, 114, D04301, doi:10.1029/2008jd010816, 2009.
- Sanderson M. G., F.J. Dentener, **A.M. Fiore**..., A multi-model study of the hemispheric transport and deposition of oxidised nitrogen, *Geophys. Res. Lett.*, 35, L17815, doi:10.1029/2008GL035389, 2008.

- Ellingsen, K., M. Gauss, R. Van Dingenen, F.J. Dentener, L. Emberson, **A.M. Fiore**..., Global ozone and air quality: a multi-model assessment of risks to human health and crops, *Atmos. Chem. Phys. Discuss.*, 8, 2163-2223, 2008.
- Shindell, D.T., H. Teich, M. Chin, F. Dentener, R.M. Doherty, G. Faluvegi, **A.M. Fiore**..., A multi-model assessment of pollution transport to the Arctic, *Atmos. Chem. Phys.*, 8, 5353-5372., 2008.
- Quinn, P.K., T.S. Bates, E. Baum, N. Doubleday, **A.M. Fiore**..., Short-lived pollutants in the Arctic: their climate impact and possible mitigation strategies, *Atmos. Chem. Phys.*, 8, 1723-1735, 2008.
- Duncan, B.N., J.J. West, Y. Yoshida, **A.M. Fiore**, and J.R. Ziemke, The influence of European pollution on ozone in the Near East and northern Africa, *Atmos. Chem. Phys.*, 8, 2267-2283, 2008.
- **Fiore, A.M.**, J.J. West, L.W. Horowitz, V. Naik, and M.D. Schwarzkopf Characterizing the Tropospheric Ozone Response to Methane Emission Controls and the Benefits to Climate and Air Quality , *J. Geophys. Res.* , 113, D08307, doi:10.1029/2007JD009162, 2008.
- Horowitz, L.W., **A.M. Fiore**, G.P. Milly, R.C. Cohen, A. Perring, P.J. Wooldridge, P.G. Hess, L.K. Emmons, J.F. Lamarque, Observational constraints on the chemistry of isoprene nitrates over the eastern United States, *J. Geophys. Res.*, 112, D12S08, doi:10.1029/2006JD007747, 2007.
- West, J.J., **A.M. Fiore**, V. Naik, L.W. Horowitz, M.D. Schwarzkopf, D.L. Mauzerall, Ozone air quality and radiative forcing consequences of changes in ozone precursor emissions, *Geophys. Res. Lett.*, 34, L06806, doi:10.1029/2006GL029173, 2007.
- Donner, L.J., L.W. Horowitz, **A.M. Fiore**, C.J. Seman, D.R. Blake, N.J. Blake, Transport of Radon-222 and Methyl Iodide by Deep Convection in the GFDL Global Atmospheric Model AM2, *J. Geophys. Res.*, 112, D17303, doi:10.1029/2006JD007548, 2007.
- **Fiore, A.M.**, L.W. Horowitz, E.J. Dlugokencky, J.J. West, Impact of Meteorology and Emissions on Methane Trends, 1990-2004 , *Geophys. Res. Lett.*, 33, L12809, doi:10.1029/2006GL026199, 2006.
- West, J.J., **A.M. Fiore**, L.W. Horowitz, and D.L. Mauzerall, Mitigating ozone pollution with methane emission controls: Global health benefits, *Proc. Natl. Acad. Sci.*, 103(11), 3998-3993, 2006.
- Dentener, F., J. Drevet, J.F. Lamarque, I. Bey, B. Eickhout, **A.M. Fiore**..., Nitrogen and sulfur deposition on regional and global scales: a multi-model evaluation, *Global Biogeochem. Cycles*, 20, GB4003, doi:10.1029/2005GB002672, 2006.
- Dentener, F., D. Stevenson, K. Ellingsen,... **A.M. Fiore**..., The global atmospheric environment for the next generation, *Environ. Sci. Technol.*, 40, 3586-3594, 2006.
- Stevenson, D.S., F.J. Dentener, M.G. Schultz,... **A.M. Fiore**..., Multi-model ensemble simulations of present-day and near-future tropospheric ozone, *J. Geophys. Res.*, 111, D08301, doi:10.1029/2005JD006338, 2006.
- van Noije, T.P.C., H.J. Eskes, F.J. Dentener,... **A.M. Fiore**..., Multi-model ensemble simulations of tropospheric NO₂ compared with GOME retrievals for the year 2000, *Atmos. Chem. Phys.*, 6(10), 2943-2979, 2006.
- Shindell, D.T., G. Faluvegi, , D.S. Stevenson,... **A.M. Fiore**..., Multi-model simulations of carbon monoxide: Comparison with observations and projected near-future changes, *J. Geophys. Res.*, 111, D19306, doi:10.1029/2006JD007100, 2006.
- **Fiore, A.M.**, L.W. Horowitz, D.W. Purves, H. Levy II, M.J. Evans, Y. Wang, Q. Li, and R.M. Yantosca, Evaluating the contribution of changes in isoprene emissions to surface ozone trends over the eastern United States, *J. Geophys. Res.*, 110, D12303, doi:10.1029/2004JD005485, 2005.
- West, J.J., and **A.M. Fiore**, Management of tropospheric ozone by reducing methane emissions, *Environ. Sci. & Technol.*, 39(13): 4685-4691, doi:10.1021/es048629f, 2005.
- Martin, R.V., **A.M. Fiore**, A.V. Donkelaar, Space-based diagnosis of surface ozone sensitivity to anthropogenic emissions, *Geophys. Res. Lett.*, 31, L06120, doi:10.1029/2004GL019416, 2004.
- Liu, H., D.J. Jacob, J.E. Dibb, **A.M. Fiore**, R.M. Yantosca, Constraints on the sources of tropospheric ozone from ²¹⁰Pb-⁷Be-O₃ Correlations, *J. Geophys. Res.*, 109, D07306, doi:10.1029/2003JD003988, 2004.
- **Fiore, A.M.**, T. Holloway, M.G. Hastings, A Global Perspective on Air Quality: Intercontinental Transport and Linkages with Climate, *EM*, December, 2003.
- **Fiore, A.M.**, D.J. Jacob, H. Liu, R.M. Yantosca, T.D. Fairlie, Q. Li, Variability in surface ozone background over the United States: Implications for air quality policy, *J. Geophys. Res.*, 108, doi:10.1029/2003JD003855, 2003.
- **Fiore, A.M.**, D.J. Jacob, R. Mathur, R.V. Martin, Application of empirical orthogonal functions to evaluate ozone simulations for the eastern United States with regional and global models, *J. Geophys. Res.*, 108, 4431, doi:10.1029/2002JD003151, 2003.
- Holloway, T., **A.M. Fiore**, M.G. Hastings, Intercontinental Transport of Air Pollution: Will emerging science lead to a new hemispheric treaty?, *Environ. Sci. & Technol.*, 37, 4535-4542, 2003.
- Heald, C.L., D.J. Jacob, **A.M. Fiore**, and 17 others, Asian outflow and transpacific transport of carbon monoxide and ozone pollution: An integrated satellite, aircraft and model perspective, *J. Geophys. Res.*, 108, 4804, 2003.

- Palmer, P.I. D.J. Jacob, **A.M. Fiore**, R.V. Martin, K. Chance, and T. Kuruso, Mapping isoprene emissions over North America using formaldehyde column observations from space, *J. Geophys. Res.*, *108*, 4180, 2003.
- **Fiore, A.M.**, D.J. Jacob, B.D. Field, D.G. Streets, S.D. Fernandes, and C. Jang, Linking ozone pollution with climate change: The case for controlling methane, *Geophys. Res. Lett.*, *29*, 1919, doi:10.1029/2002GL015601, 2002.
- **Fiore, A.M.**, D.J. Jacob, I. Bey, R.M. Yantosca, B.D. Field, A.C. Fusco, and J.G. Wilkinson, Background ozone over the United States in Summer: Origin, trend, and contribution to pollution episodes, *J. Geophys. Res.*, *107* (D15), doi:10.1029/2001JD000982, 2002.
- Li, Q., D.J. Jacob, I. Bey, ...**A.M. Fiore**..., Transatlantic transport of pollution and its effects on surface ozone in Europe and North America, *J. Geophys. Res.*, *107*, 4166, 10.1029/2001JD001422, 2002.
- Martin, R.V., K. Chance, D.J. Jacob, ...**A.M. Fiore**..., An improved retrieval of tropospheric nitrogen dioxide from GOME, *J. Geophys. Res.*, (D20), 4437, doi:10.1029/2001JD001027, 2002.
- Martin, R.V., D.J. Jacob, J.A. Logan, ...**A.M. Fiore**..., Interpretation of TOMS observations of tropical tropospheric ozone with a global model and in-situ observations, *J. Geophys. Res.*, doi:10.1029/2001JD001480, 2002.
- Lin, C.-Y. C, D.J. Jacob and **A.M. Fiore**, Trends in exceedances of the ozone air quality standard in the continental United States, 1980-1998, *Atmos. Environ.*, *35*, 3217-3228, 2001.
- Li, Q., D.J. Jacob, J.A. Logan, I. Bey, ...**A.M. Fiore**..., A tropospheric ozone maximum over the Middle East, *Geophys. Res. Lett.*, *28*, 3235-3238, 2001.
- Bey I., D.J. Jacob, R.M. Yantosca, ...**A.M. Fiore**..., Global modeling of tropospheric chemistry with assimilated meteorology: Model description and evaluation, *J. Geophys. Res.*, *106*, 23,073-23,096, 2001.
- Palmer, P. I., D. J. Jacob, K.Chance, ...**A. Fiore**..., Air mass factor formulation for spectroscopic measurements from satellites: application to formaldehyde retrievals from GOME, *J. Geophys. Res.*, *106*, 14,539-14,550, 2001.
- Lin, C.-Y. C, D.J. Jacob, J.W. Munger, and **A.M. Fiore**, Increasing background ozone in surface air over the United States, *Geophys. Res. Lett.*, *27*, 3465-3468, 2000.
- **Fiore, A.M.**, D.J. Jacob, J.A. Logan, J.H. Yin, Long-term trends in ground level ozone over the contiguous United States, 1980-1995, *J. Geophys. Res.*, *103*, 1471-1480, 1998.
- Liang, J., L.W. Horowitz, D.J. Jacob, ...**A.M. Fiore**..., Seasonal variations of reactive nitrogen species and ozone over the United States, and export fluxes to the global atmosphere, *J. Geophys. Res.*, *103*, 13,435-13,450, 1998.

Invited Talks

- *Characterizing uncertainties in chemistry/transport models*, to the National Academy of Sciences Intercontinental Transport of Air Pollution (**NAS ITAP**) Committee, Washington, D.C., August, 2008.
- *Hemispheric Transport of Ozone Pollution: Multi-model Assessment of the Role of Methane and the Conventional Ozone Precursors*, **Quadrennial Ozone Symposium**, Tromsø, Norway, July, 2008.
- *TF HTAP Multi-model Estimates of Source-Receptor Relationships for Ozone Pollution*, **TF HTAP Workshop**, Washington, DC, June, 2008.
- *Intercontinental Source-Receptor Relationships for Ozone Pollution*, **40th Air Pollution Workshop and Symposium**, Raleigh, NC, April, 2008.
- *Tropospheric ozone response to methane emission controls: Implications for climate and global air quality*, **IGERT Joint Program Colloquium, Columbia University**, New York City, NY, April, 2007.
- *Estimating Intercontinental Source-Receptor Relationships for Ozone Pollution*, **Department of Environmental Sciences, Rutgers University**, New Brunswick, NJ, March, 2007.
- *Connecting Climate and Air Quality: The Contribution of Methane to Hemispheric Ozone Pollution*, **Center for Atmospheric and Ocean Science, New York University**, New York City, NY, February, 2007.
- *Air Quality and Climate Connections*, Green and Environmental Systems Event, Regional and Urban Air Quality: Now and in the Future, **New York Academy of Sciences**, New York City, NY, April 2007.
- *Preliminary Ozone Results from the TF HTAP Model Intercomparison*, **Task Force on Hemispheric Transport of Air Pollution Observations Workshop**, World Meteorological Organization, Geneva, Switzerland, January 2007.
- *Reducing tropospheric ozone with methane controls: Impact on Arctic radiative forcing*, **Non-CO₂ and Arctic Climate Impacts Workshop**, NASA Goddard Institute for Space Studies, New York City, NY, January 2007.
- *Recent and Future Trends in Atmospheric Methane: Connecting global chemistry, climate, and ozone pollution*, **Berkeley Atmospheric Sciences Symposium, University of California at Berkeley**, Berkeley, CA, September 2006.
- *Abating Global Ozone Pollution with Methane Emission Controls*, **EMEP Second Meeting of the Task Force on Hemispheric Transport of Air Pollution**, Moscow, Russia, June 2006.
- *Source vs. Sink Contributions to Atmospheric Methane Trends: 1990-2004*, **Global Monitoring Division, NOAA/ESRL**, Boulder, CO, January 2006.

- *Atmospheric Methane Distribution and Trends: Impacts on Climate and Ozone Air Quality*, **Earth, Atmospheric, and Planetary Sciences Department, Massachusetts Institute of Technology**, Cambridge, MA, December, 2005.
- *Background Ozone in Surface Air: Origin, Variability, and Policy Implications*, **Goddard Institute for Space Studies**, New York City, NY, May 2005.
- *Estimating background ozone in surface air over the United States with global 3-D models of tropospheric chemistry: Description, Evaluation, and Results*, to the **U.S. EPA Clean Air Science Advisory Committee Ozone Review Panel**, Research Triangle Park, NC, May 2005.
- *Background Ozone in Surface Air over the United States: Variability, Climate Linkages, and Policy Implications*, **Department of Environmental Sciences, Rutgers University**, New Brunswick, NJ, Mar. 2005.
- *Recent Changes in Eastern U.S. Forests: Implications for Air Quality*, **Center for Sustainability and the Global Environment, University of Wisconsin-Madison**, Madison, WI, Dec. 2004.
- *Background Ozone in Surface Air over the United States: Variability, Climate Linkages, and Policy Implications*, **Department of Atmospheric and Oceanic Sciences, University of Wisconsin-Madison**, Madison, WI, Dec. 2004.
- *Evaluating the impact of recent changes in isoprene and anthropogenic emissions on surface ozone over the eastern United States*, **National Center for Atmospheric Research**, Boulder, CO, Oct. 2004.
- *Uncertainties in isoprene-NO_x-O₃ chemistry: Implications for surface ozone over the eastern United States*, **Telluride Atmospheric Chemistry Workshop**, Telluride, CO, Aug. 2004.
- *Background ozone and particulate matter (PM) in the United States: Implications for public policy*, briefing with Daniel J. Jacob to **U.S. Senate Environment and Public Works Committee Staff**, Washington, D.C., Mar. 2004.
- *Variability in surface ozone background over the United States*, **EPA Peer Consultation Workshop on the Air Quality Criteria Document for Ozone and Related Photochemical Oxidants**, Research Triangle Park, NC, Oct. 2003.
- *Variability in surface ozone background over the United States: Implications for air quality policy*, **Atmospheric Chemistry Colloquium for Emerging Senior Scientists**, Yellowstone National Park, WY, Sept. 2003.
- *The Double Dividend of Methane Control*, **XIVth Global Warming International Conference and Exposition**, Cambridge, MA, May 2003.
- *Background Ozone in Surface Air Over the United States*, **U.S. EPA Meeting on Developing Criteria for the Chemistry and Physics of Atmospheric Ozone**, Adelphi, MD, Mar. 2003.
- *The Double Dividend of Methane Control*, **Workshop of UNECE Task Force on Integrated Assessment Modelling on Linkages and Synergies of Regional and Global Emission Control**, IIASA, Laxenburg, Austria, Jan. 2003.
- *Linking ozone pollution with climate change: The case for controlling methane*, **U.S. EPA/EMEP Workshop on Hemispheric Pollution**, Bad Breisig, Germany, Oct. 2002.
- *Background ozone over the United States in Summer: Origin, trend, and contribution to pollution episodes*, **Swiss Federal Institute of Technology (EPFL)**, Lausanne, Switzerland, Feb. 2002.
- *Trends in ground level ozone over the continental United States, 1980-1995*, **Northeast States for Coordinated Air Use Management meeting**, New York City, NY, Sept. 1998.

Conference and Workshop Presentations

- *Impacts on air quality objectives: Initial HTAP SR results and next steps*, **TF HTAP Workshop**, Washington DC, June, 2008.
- *Constraining uncertainties in observed methane inter-annual variability: A proposal for multi-decadal hindcast simulations*, **Joint TF HTAP and AC&C Workshop**, Washington, DC, June, 2008.
- *North America as a source and receptor of ozone pollution: Seasonal variability, uncertainties, and policy implications*, *Eos Trans. AGU*, 89(23), Jt. Assem. Suppl., Abstract A33E-01, 2008.
- *Preliminary Ozone Results from the TF HTAP Model Intercomparison, Part II*, **Task Force on Hemispheric Transport of Air Pollution Modeling Workshop**, World Meteorological Organization, Geneva, Switzerland, 2007.
- *Connecting Climate and Air Quality: Tropospheric Ozone Response to Methane Emission Controls*, *Eos Trans. AGU*, 87(52), Fall Meet. Suppl., Abstract A21E-0863, 2006.
- *Producing Science to Inform Policy on Hemispheric Transport of Air Pollution*, *Eos Trans. AGU*, 87(52), Fall Meet. Suppl., Abstract PA31A-0815, 2006.
- *Estimating Policy-Relevant Background over the United States: Contribution to NO₂, SO₂, SO₄, and deposition of NO_y and SO_x*, **EPA/NOAA Workshop of Emerging Issues in the Atmospheric Chemistry of Nitrogen and Sulfur Oxides**, NOAA GFDL, Princeton, NJ, 2006.

- *Atmospheric Methane Distribution, Trend, and Linkage with Surface Ozone*, Convention on Long-Range Transboundary Air Pollution Task Force on **Hemispheric Transport of Pollution Intercontinental Transport Modelling Intercomparison Organizational Workshop**, Washington, D.C., 2006.
- *Biogenic Contributions to Methane Trends from 1990 to 2004*, **iLEAPS Science Conference**, Boulder, CO, 2006.
- *Uncertain Isoprene Emissions and Chemistry: Implications for Ozone in the Eastern United States*, *Eos Trans. AGU*, 86(52), Fall Meet. Suppl., Abstract A51B-0036, 2005.
- *MOZART Development, Evaluation, and Applications at GFDL*, **MOZART Users' Meeting**, Boulder, CO, 2005.
- *Sensitivity of U.S. Surface Ozone to Isoprene Emissions and Chemistry: An application of the 1°x1° North American Nested GEOS-CHEM Model*, **2nd GEOS-CHEM Users' Meeting**, Cambridge, MA, 2005
- *Recent and Future Changes in BVOC vs. Anthropogenic Emissions over the Eastern United States: Impact on Surface Ozone*, **Gordon Research Conference on Biogenic Hydrocarbons and the Atmosphere**, Barga, Italy, May 2004.
- *Variability in surface ozone background over the United States: Implications for air quality policy*, **Atmospheric Chemistry Gordon Research Conference**, Big Sky, MT, September 2003.
- *Linking Air Quality and Climate Change Mitigation Objectives: The Case for Controlling Methane*, *Eos. Trans. AGU* 83 (19), Spring Meet. Suppl., Abstract A21C-10, 2002.
- *The Origins of Background Ozone in Surface Air over the United States*, *Eos. Trans. AGU*, 81 (48), Fall Meet. Suppl., Abstract A22E-02, 2000.

Teaching Experience

- Guest Lecturer, *Environmental Studies 202*, Princeton University, February 2005, 2006.
- Guest Lecturer, *Two Science Issues in the News: Climate Change and Air Pollution, Are they linked?* Hillsborough High School Physics Classes, May 2004, 2005.
- Teaching Fellow, *An Introduction to Environmental Science: The Solid Earth*, Harvard University, Spring 2001, 2002.
- Participant, Graduate Science Teaching Seminar, Derek Bok Center, Spring 2002.
- Teaching Fellow, *Natural and Environmental Disasters*, Harvard University, Fall 1999.
- Participant in Graduate Writing Fellows Program, Derek Bok Center, Harvard University, Fall 1999.
- Teaching Fellow, *An Introduction to Atmospheric Chemistry*, Harvard University, Fall 1998.